

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 10-K**

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2019
OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Commission File Number: 0-20853

ANSYS, Inc.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

2600 ANSYS Drive, Canonsburg, PA

(Address of Principal Executive Offices)

04-3219960

(I.R.S. Employer Identification No.)

15317

(Zip Code)

844-462-6797

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of exchange on which registered
Common Stock, \$0.01 par value per share	ANSS	Nasdaq Stock Market LLC (Nasdaq Global Select Market)

Securities registered pursuant to section 12(g) of the Act:

None

(Title of class)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
Emerging growth company	<input type="checkbox"/>		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes No

The aggregate market value of the voting stock held by non-affiliates of the registrant, based upon the closing sale price per share of the registrant's common stock on June 28, 2019, as reported on the Nasdaq Global Select Market, was \$14,436,000,000.

The number of shares of the registrant's common stock, par value \$0.01 per share, outstanding as of February 20, 2020 was 85,914,375 shares.

Documents Incorporated By Reference:

Portions of the Proxy Statement for the registrant's 2020 Annual Meeting of Stockholders are incorporated by reference into Part III.

ANSYS, Inc.
ANNUAL REPORT ON FORM 10-K FOR FISCAL YEAR 2019
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Important Factors Regarding Future Results

Information provided by us in this Annual Report on Form 10-K may contain forward-looking statements concerning such matters as projected financial performance, market and industry segment growth, product development and commercialization, acquisitions or other aspects of future operations. Such statements, made pursuant to the safe harbor established by the securities laws, are based on the assumptions and expectations of management at the time such statements are made. We caution investors that our performance (and, therefore, any forward-looking statement) is subject to risks and uncertainties. Various important factors including, but not limited to, those discussed in Item 1A. Risk Factors, may cause our future results to differ materially from those projected in any forward-looking statement. All information presented is as of December 31, 2019, unless otherwise indicated.

Note About Forward-Looking Statements

The following discussion should be read in conjunction with the audited consolidated financial statements and notes thereto included elsewhere in this Annual Report on Form 10-K. Our discussion and analysis of our financial condition and results of operations in Part II, Item 7 of this Annual Report on Form 10-K are based upon our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, we evaluate our estimates, including those related to fair values of stock awards, bad debts, contract revenue, acquired deferred revenue, the standalone selling prices of our products and services, the valuation of goodwill and other intangible assets, deferred compensation, income taxes, uncertain tax positions, tax valuation reserves, operating lease assets and liabilities, useful lives for depreciation and amortization, and contingencies and litigation. We base our estimates on historical experience, market experience, estimated future cash flows and various other assumptions that management believes are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, including, but not limited to, the following statements, as well as statements that contain such words as "anticipates," "intends," "believes," "plans" and other similar expressions:

- Our intentions regarding our hybrid sales and distribution model.
- Our intentions related to investments in research and development, particularly as it relates to expanding the ease of use and capabilities of our broad portfolio of simulation software products.
- Our expectations regarding the accelerated development of new and innovative products to the marketplace while lowering design and engineering costs for customers as a result of our acquisitions.
- Our statements regarding the impact of global economic conditions.
- Our expectations regarding the outcome of our service tax audit cases.
- Our belief that, in most geographical locations, our facilities allow for sufficient space to support present and future foreseeable needs, including such expansion and growth as the business may require.
- Our expectation that we can renew existing facility leases as they expire or find alternative facilities without difficulty, as needed.
- Our assessment of the ultimate liabilities arising from various investigations, claims and legal proceedings.
- Our statements regarding the strength of the features, functionality and integrated multiphysics capabilities of our software products.
- Our belief that our overall performance is best measured by fiscal-year results rather than by quarterly results.
- Our estimates regarding the expected impact on reported revenue related to the acquisition accounting treatment of deferred revenue.
- Our expectation that we will continue to make targeted investments in our global sales and marketing organizations and our global business infrastructure to enhance and support our revenue-generating activities.

- Our intention to repatriate previously taxed earnings in excess of working capital needs and to reinvest all other earnings of our non-U.S. subsidiaries.
- Our plans related to future capital spending.
- The sufficiency of existing cash and cash equivalent balances to meet future working capital and capital expenditure requirements.
- Our belief that the best uses of our excess cash are to invest in the business, make payments on outstanding debt balances and repurchase stock in order to both offset dilution and return capital, in excess of our requirements, to stockholders with the goal of increasing stockholder value.
- Our intentions related to investments in complementary companies, products, services and technologies.
- Our expectation that changes in currency exchange rates will affect our financial position, results of operations and cash flows.
- Our expectations regarding future claims related to indemnification obligations.
- Our estimates regarding future stock-based compensation.
- Our expectations regarding the impacts of new accounting guidance.
- Our assessment of our ability to realize deferred tax assets.
- Our performance expectations related to our partnerships and strategic alliances.
- Our expectations regarding acquisitions and integrating such acquired companies to realize the benefits of cost reductions and other synergies relating thereto.
- Our statements regarding market opportunity, including the size and growth of addressable markets.

Forward-looking statements should not be unduly relied upon because they involve known and unknown risks, uncertainties and other factors, some of which are beyond our control. Our actual results could differ materially from those set forth in the forward-looking statements. Certain factors that might cause such a difference include risks and uncertainties detailed in Item 1A. Risk Factors.

PART I

ITEM 1. BUSINESS

ANSYS, Inc. (Ansys, we, us, our), a Delaware corporation formed in 1994, develops and globally markets engineering simulation software and services widely used by engineers, designers, researchers and students across a broad spectrum of industries and academia, including aerospace and defense, automotive, electronics, semiconductors, energy, materials and chemical processing, turbomachinery, consumer products, healthcare, and sports. Headquartered south of Pittsburgh, Pennsylvania, we employed approximately 4,100 people as of December 31, 2019. We focus on the development of open and flexible solutions that enable users to analyze designs directly on the desktop, providing a common platform for fast, efficient and cost-conscious product development, from design concept to final-stage testing and validation. We distribute our suite of simulation technologies through a global network of independent resellers and distributors (collectively, channel partners) and direct sales offices in strategic, global locations. It is our intention to continue to maintain this hybrid sales and distribution model. We operate and report as one segment.

Our product portfolio consists of the following:

Platform

Ansys Workbench™ is the framework upon which our suite of advanced engineering simulation technologies is built. The innovative project schematic view ties together the entire simulation process, guiding the user through complex multiphysics analyses with drag-and-drop simplicity. With bi-directional computer-aided design (CAD) connectivity, powerful highly-automated meshing, a project-level update mechanism, pervasive parameter management and integrated optimization tools, the Ansys Workbench platform enables Pervasive Engineering Simulation™.

Our Workbench framework allows engineers and designers to incorporate the compounding effects of multiple physics into a virtual prototype of their design and simulate its operation under real-world conditions. As product architectures become smaller, lighter and more complex, companies must be able to accurately predict how products will behave in real-world environments where multiple types of physics interact in a coupled way. Our multiphysics software enables engineers to simulate the interactions between structures, heat transfer, fluids and electronics all within a single, unified engineering simulation environment.

Ansys Workbench enables companies to create a customized simulation environment to deploy specialized simulation best practices and automations unique to their product development process or industry. With Ansys ACT™, our partners and end users can modify the user interface, process simulation data or embed third-party applications to create specialized tools based on Ansys Workbench.

Our high-performance computing (HPC) product suite enables enhanced insight into product performance and improves the productivity of the design process. The HPC product suite delivers cross-physics parallel processing capabilities for the full spectrum of our simulation software by supporting structures, fluids, thermal and electronics simulations. This product suite decreases turnaround time for individual simulations, allowing users to consider multiple design ideas and make the right design decisions early in the design cycle.

Refer to the section titled "New Product Offerings" for solutions added to our platform offerings in 2019.

Structures

Our structural analysis product suite offers simulation tools for product design and optimization that increase productivity, minimize physical prototyping and help to deliver better and more innovative products in less time. These tools tackle real-world analysis problems by making product development less costly and more reliable. In addition, these tools have capabilities that cover a broad range of analysis types, elements, contacts, materials, equation solvers and coupled physics capabilities, all targeted toward understanding and solving complex design problems. We also provide comprehensive topology optimization tools that engineers use to design structural components to meet loading requirements with minimal material and component weight. We offer a complete simulation workflow for additive manufacturing that allows reliable 3D printing by simulating the laser sintering process and delivering compensated CAD geometries that ensure reliable printed parts.

Fluids

Our fluids product suite enables modeling of fluid flow and other related physical phenomena. Fluid flow analysis capabilities provide all the tools needed to design and optimize new fluids equipment and to troubleshoot already existing installations. The suite contains general-purpose computational fluid dynamics software and specialized products to address specific industry applications.

Electromagnetics

Our electromagnetics product suite provides field simulation software for designing high-performance electronic and electromechanical products. The software streamlines the design process and predicts performance of mobile communication and internet-access devices, broadband networking components and systems, integrated circuits (ICs) and printed circuit boards (PCBs), as well as electromechanical systems such as automotive components and power electronics equipment, all prior to building a prototype.

Semiconductors

Advancements in semiconductor design and manufacturing enable smaller electronic architectures. Shrinking geometries, especially in the emerging 3D IC, FinFET and stacked-die architectures, reveal design challenges related to power and reliability. Our power analysis and optimization software suite manages the power budget, power delivery integrity and power-induced noise in an electronic design, from initial prototyping to system sign-off. These solutions deliver accuracy with correlation to silicon measurement; the capacity to handle an entire electronic system, including IC, package and PCB, efficiently for ease-of-debugging and fast turnaround time; and comprehensiveness to facilitate cross-domain communications and electronic ecosystem enablement.

Embedded Software

Our SCADA® product suite is a comprehensive solution for embedded software simulation, code production and automated certification. It has been developed specifically for use in critical systems with high dependability requirements, including aerospace, rail transportation, nuclear, industrial and automotive applications. SCADA software supports the entire development workflow, from requirements analysis and design, through verification, implementation and deployment. SCADA solutions easily integrate with each other and the rest of our product suite, allowing for development optimization and increased communication among team members.

Systems

We deliver a unique and comprehensive system simulation capability that is ideal for the design of today's increasingly automated products. This collaborative environment leverages our multiphysics, multibody dynamics, circuit and embedded software simulation capabilities, enabling users to simulate the complex interactions between components, circuits and control software within a single environment. These technologies provide a complete view into predicted product performance, which creates greater design confidence for engineers.

3D Design

Our Discovery™ product family allows every engineer to benefit from the insight of simulation in their product design. The Discovery products range from early design exploration tools powered by interactive real-time simulation and intuitive geometry editing, to detailed product validation solutions utilizing proven flagship solver technology with easy-to-use guided workflows. These tools allow for design engineers of all levels of expertise to utilize simulation across the entire product design process and to work seamlessly with simulation experts using our flagship products for even more advanced analysis.

Optical

Using optical sensor and closed-loop, real-time simulation, our capabilities now span the simulation of all sensors, including lidar, cameras and radar; the multiphysics simulation of physical and electronic components; the analysis of systems functional safety; as well as the automated development of safety-certified embedded software. This functionality can be integrated into a closed-loop simulation environment that interacts with weather and traffic simulators, enabling thousands of driving scenarios to be executed virtually.

Materials

Ansys Granta products give our customers access to material intelligence, including data that is critical to simulations. Refer to the section titled "New Product Offerings" for additional discussion around our materials offerings.

Academic

Our academic product suite provides a highly scalable portfolio of academic products based on several usage tiers, including associate, research and teaching. Each tier includes various non-commercial products that bundle a broad range of physics and advanced coupled field solver capabilities. The academic product suite provides entry-level tools intended for class demonstrations and hands-on instruction. It includes flexible terms of use and more complex analysis suitable for doctoral and post-doctoral research projects. We also provide a special product at no cost to students that is suitable for use away from the classroom and in non-commercial applications.

PRODUCT DEVELOPMENT

We make significant investments in research and development and emphasize frequent, integrated product releases. Our product development strategy centers on ongoing development and innovation of new technologies to increase productivity and to provide engineering simulation solutions that customers can integrate into enterprise-wide product lifecycle management (PLM) systems. Our product development efforts focus on extensions of the full product line with new functional modules, further integration with CAD, electronic CAD (ECAD) and PLM products, and the development of new products. Our products run on the most widely-used engineering computing platforms and operating systems, including Windows, Linux and most UNIX workstations.

Our total research and development expenses were \$298.2 million, \$233.8 million and \$202.7 million in 2019, 2018 and 2017, respectively, or 19.7%, 18.1% and 18.5% of total revenue, respectively. As of December 31, 2019 and 2018, our product development staff consisted of approximately 1,500 and 1,200 employees, respectively, most of whom hold advanced degrees and have industry experience in engineering, mathematics, computer science or related disciplines. We have traditionally

invested significant resources in research and development activities and intend to continue to make investments in expanding the ease of use and capabilities of our broad portfolio of simulation software products.

We recently completed the following major product development activities and releases:

- In January 2020, we released Ansys 2020 R1, which streamlines product development lifecycles and helps boost product performance with enhancements to the interfaces, functionality and power of our simulation solvers. Among these advances is Ansys Minerva, a knowledge management application platform that delivers an integrated suite of Ansys tools, fusing simulation and optimization to product lifecycle processes across any enterprise. Minerva spurs collaboration within global engineering teams and increases data sharing to innovate product designs and reduce development costs. From improving product development with Ansys Minerva to running complex simulations with substantially streamlined workflows with Ansys Fluent to optimizing electromagnetic design processes with Ansys HFSS, Ansys 2020 R1 helps enable companies to pioneer innovations and create cost-effective designs.

To leverage the combined benefits of cloud computing and best-in-class engineering simulation, we are partnering with Microsoft® Azure™ to create a secure cloud solution. In Ansys 2020 R1, Ansys Cloud™ introduced new licensing options to enable greater business flexibility. Companies can cost optimize cloud software usage by mixing elastic (usage-based) and traditional (leased or paid-up) licensing while accessing on-demand compute resources. In addition, within Ansys Mechanical, Ansys Fluent and Ansys Electronics Desktop, you can directly access HPC in the Cloud.

- In September 2019, we released Ansys 2019 R3, which strengthens our autonomous vehicles (AV) solutions with the addition of Ansys Autonomy. Ansys Autonomy enables engineers to develop safer AV through advanced closed-loop scenario simulation, automated driving and control software development, functional safety analysis, and sensor, camera, lidar, and radar simulation. Among a number of other enhancements to our product portfolio, Ansys 2019 R3 also includes the SPEOS Road Library for Sensors Simulation, a comprehensive, retro-reflecting materials database, as well as updates to Ansys HFSS SBR+ that provide greater accuracy in predicting radar cross sections of large targets with curvatures.

As fully autonomous vehicles edge closer to real-world deployment, operating safely becomes more critical than ever. AVs require rigorous testing in complex environments and under variable conditions. Physical testing would require billions of miles of driving or flying — a time-consuming, cost-prohibitive approach. Using simulation to virtually test AVs is the only viable option for validating systems safety and accelerating AV development. From sensors to virtual environments to artificial intelligence, Ansys 2019 R3 includes robust offerings that speed the safe development and deployment of AVs on the road and in the air.

- In June 2019, we released Ansys 2019 R2, which accelerates, streamlines and simplifies the product life cycle through new functionalities. With the new functionalities, including new materials capabilities for structural analysis following the acquisition of Granta Design Limited (Granta Design), our simulation solutions accelerate collaboration, validation and verification, creating a reliable digital thread throughout operations. The release also includes a revolutionary Ansys Mechanical™ user experience, simplified simulation of complex electronics and a new Ansys Fluent™ workflow that significantly speeds meshing of dirty geometries.

New Product Offerings

Our 2019 acquisitions, each a leader in their respective fields, are intended to bolster our strategy of Pervasive Engineering Simulation. The acquired technologies offer solutions that significantly enhance our portfolio, providing solutions valuable to our customers.

The acquisition of material intelligence leader Granta Design gives our customers access to material intelligence, including data that is critical to successful simulations. With Granta Design technology, our customers benefit from access to the world's premier system for managing corporate material intelligence and the market-leading solution for materials sources, selection and management. Ansys Granta MI is a leading system for materials information management in engineering enterprises. Ansys Granta Selector is the standard tool for materials selection and graphical analysis of materials properties. A comprehensive materials data library plus unique software tools enable engineers to use materials to innovate and evolve products, quickly identify solutions to material issues, confirm and validate choice of materials, and reduce material and development costs. CES EduPack is a unique set of teaching resources that supports materials education across engineering, design, science and sustainable development. Granta Materials Data for Simulation provides easy access to materials property data from within Ansys Mechanical and the Ansys Electronics Desktop environment.

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The acquisition of Helic, Inc. (Helic), an industry-leading provider of electromagnetic (EM) crosstalk solutions for systems on chips, combined with our flagship electromagnetic and semiconductor solvers, provides a comprehensive solution for on-chip, 3DIC and chip-package-system electromagnetics and noise analysis. Helic's software products (VeloceRF, RaptorX, Exalto and Pharos) help engineers analyze and mitigate the risk of on-chip EM crosstalk, which can lead to silicon failure and time to market delays. VeloceRF is an inductive device synthesizer and modeler for geometries as small as 5 nm and frequencies up to 110GHz. RaptorX is an electromagnetic modeling, extraction and analysis tool for chip designs pre-layout-vs-schematic (LVS). Exalto is a post-LVS resistance, capacitance, self and mutual inductance (RLCk) extraction tool for electromagnetic coupling. Pharos is a tool that identifies wires that are susceptible to EM and substrate crosstalk.

The acquisition of DfR Solutions' electronics reliability technology, combined with our existing multiphysics portfolio, gives customers a complete designer-level solution to analyze for electronics failure earlier in the design cycle. DfR Solutions' Sherlock is the industry's only automated design reliability analysis software. Sherlock revolutionizes electronic design by empowering designers to simulate real-world conditions and accurately model PCBs and assemblies to predict solder fatigue due to thermal, mechanical, and shock and vibration conditions. During pre-processing, Sherlock automatically translates ECAD and MCAE data into 3D finite element models in minutes. In post-processing, Sherlock automates thermal derating and democratizes the thermal and mechanical analysis of electronics - meaning analysis is done in minutes rather than weeks. Sherlock seamlessly integrates with already existing simulation workflows in the hardware design process making Ansys SIwave, Ansys Icepak and Ansys Mechanical users more efficient. It directly connects simulation to material and manufacturing costs.

Our acquisition of Livermore Software Technology (LST) and its technologies empower customers to solve a new class of engineering challenges, including developing safer automobiles, aircraft and trains while reducing or even eliminating the need for costly physical testing. LST's LS-DYNA is an advanced general-purpose multiphysics simulation software package that can simulate many complex, real-world problems. LS-DYNA is the most advanced multiphysics simulation technology for high-speed, short-duration events (for example, a cell phone drop or automotive crash). Additionally, the acquisition results in an even tighter integration between LS-DYNA and Ansys Workbench (already a leading pre- and post-processor for LS-DYNA) computations. Most automotive companies use LS-DYNA to design and optimize automobile components or entire vehicles to produce safe cars for consumers. Companies all over the world have developed a trust in LST for their vehicle development process due to deep technical relationships. While we have partnered with LST for years, their industry-leading vehicle crash capabilities were not traditionally part of our offerings. Now, we have much greater access and available know-how in those industries to sell the rest of our platform.

Our acquisition of Dynardo, a leading provider of multidisciplinary analysis and optimization technology, gives customers access to a full suite of process integration and robust design tools — empowering users to identify optimal product designs faster and more economically. Dynardo's flagship offering, optiSLang, is a comprehensive multi-disciplinary design optimization solution with a full suite of multi-objective optimization, sensitivity, reliability, and robust design capabilities. Customers of all sizes and across industries leverage optiSLang to integrate chained simulation flows and automate execution for design space exploration and optimization, greatly reducing development time and accelerating the evaluation of optimal product design alternatives for cost and performance. Ansys optiSLang has an intuitive graphical user interface that enables engineers to connect computer-aided design tools together in a way that captures both the simulation process automation and workflows, such as sensitivity analysis or robust design optimization. Ansys optiSLang supports interfacing with most software tools used in virtual product development.

Ansys Minerva is a centralized knowledge management application engineered with an open and vendor-neutral architecture that improves multiphysics collaboration by making data, project plans and analytics easily accessible in one place so team members across the world and in different functional silos can work with the same, most up-to-date information. Minerva improves productivity and maximizes the value of existing engineering technology investments by providing simulation process and data management, life cycle traceability, process integration, design optimization and simulation-driven data science capabilities. Available for both on-premise and cloud deployment, Minerva connects to most leading product life cycle management systems.

PRODUCT QUALITY

Our employees generally perform product development tasks according to predefined quality plans, procedures and work instructions. Certain technical support tasks are also subject to a quality process. These plans define, for each project, the methods to be used, the responsibilities of project participants and the quality objectives to be met. The majority of software products are developed under a quality system that is certified to the ISO 9001:2015 standard. We establish quality plans for our products and services, and subject product designs to multiple levels of testing and verification in accordance with processes established under our quality system.

SALES AND MARKETING

We distribute and support our products through our own direct sales offices, as well as a global network of independent channel partners. This channel partner network provides us with a cost-effective, highly-specialized channel of distribution and technical support. It also enables us to draw on business and technical expertise from a global network, provides relative stability to our operations to help mitigate geography-specific economic trends and provides us with an opportunity to take advantage of new geographic markets or enhance our sales coverage in existing markets.

The channel partners sell our products to new customers, expand installations within the existing customer base, offer training and consulting services, and provide the first line of our technical support. Our channel partner certification process helps to ensure that each channel partner has the ongoing capability to adequately represent our expanding product lines and to provide an acceptable level of training, consultation and customer support. We derived 22.9%, 22.4% and 24.8% of our total revenue through the indirect sales channel for the years ended December 31, 2019, 2018 and 2017, respectively.

We also have a direct sales organization to develop an enterprise-wide, focused sales approach and to implement a worldwide go-to-market account strategy. The sales management organization also functions as a focal point for requests from the channel partners and provides additional support in strategic locations through the presence of direct sales offices.

During 2019, we continued to invest in our existing domestic and international strategic sales offices. In total, our direct sales organization comprised 2,100 and 1,700 employees as of December 31, 2019 and 2018, respectively, who were responsible for the sales, technical support, consulting services, marketing initiatives and administrative activities designed to support our overall revenue growth and expansion strategies.

Our products are utilized by organizations ranging in size from small consulting firms to the world's largest industrial companies. No single customer accounted for more than 5% of our revenue in 2019, 2018 or 2017.

Information with respect to foreign and domestic revenue may be found in Note 17 to the consolidated financial statements in Part IV, Item 15 of this Annual Report on Form 10-K and in the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 of this Annual Report on Form 10-K.

STRATEGIC ALLIANCES AND MARKETING RELATIONSHIPS

We have established and continued to pursue strategic alliances with advanced technology suppliers, cloud computing providers, hardware vendors, specialized application developers, and CAD, ECAD and PLM providers. We believe that these relationships facilitate accelerated incorporation of advanced technology into our products, provide access to new customers, expand our sales channels, develop specialized product applications and provide direct integration with leading CAD, electronic design automation (EDA), product data management and PLM systems.

We have technical and marketing relationships with leading CAD vendors, such as Autodesk, PTC and Siemens Digital Industries, to provide direct links between products. These links facilitate the transfer of electronic data models between the CAD systems and our products.

We partnered with PTC to accelerate product innovation by providing customers a world-class simulation-driven design solution. Working together, we are delivering Ansys Discovery Live real-time simulation within PTC's Creo® 3D CAD software. The combined solution, Creo Simulation Live, is sold by PTC as part of the Creo product suite. This solution offers customers a unified modeling and simulation environment, removing the boundaries between CAD and simulation and enabling design engineers to gain insight into each of the many design decisions they make throughout the product development process. This insight enables design engineers to create higher quality products, while reducing product and development costs.

Similarly, we maintain marketing and software development relationships with leading EDA software companies, including Cadence Design Systems, Synopsys, Mentor Graphics, Zuken and National Instruments. These relationships support the transfer of data between electronics design and layout software and our electronics simulation portfolio. In 2017, we entered into an integration and distribution agreement with Synopsys to cooperatively integrate Ansys RedHawk technology into an in-design add-on to a Synopsys design tool for the primary purpose of providing customers with direct, in-design access to the RedHawk technology's capabilities.

We also have relationships with Siemens and Spatial Corporation to provide the 3D modeling kernel and format translation technologies upon which our in-house geometry modeling software solutions are built.

The main method we employ to democratize HPC to a wider audience is through partnerships with a number of companies, such as cloud computing providers, HPC hardware manufacturers and supercomputing centers such as HLRS in Stuttgart,

Germany. In 2019, we launched a new cloud service fully managed by us and developed in collaboration with Microsoft Azure that provides on-demand access to HPC directly from within our flagship applications. We also collaborated with Flexera to improve our elastic licensing solution by now supporting on-premise use and internet-based usage monitoring. We added Hewlett Packard Enterprises and Dell Technologies as new members to the HPC appliance program that is designed to simplify and accelerate HPC cluster deployment.

Our open cloud strategy allows us to work with various public cloud providers and cloud-hosting partners. This approach makes it easy for customers to use the same workflows on-premise and in the Cloud. Cloud-hosting partners such as Nimbix, Rescale and Gcompute provide cloud access to us and/or third-party applications for customers having very complex workflows or other restrictive security certification requirements. Furthermore, we continued to enjoy mutually-committed alliances with large cloud platform providers such as Microsoft, AWS, Google and Alibaba. In 2018, we entered into an agreement with SAP SE (SAP) to embed our pervasive simulation solutions for digital twins into SAP's market-leading digital supply chain, manufacturing and asset management portfolio. The partnership's first solution launched in 2019 and runs on the SAP Cloud Platform and empowers industrial asset operators to optimize operations and maintenance through real-time engineering insights, which reduces product cycle times and increases profitability.

Our Partner Program actively encourages developers of specialized software solutions to use our technology as a development platform for their applications and provides customers with enhanced functionality related to their use of our software. With more than 200 active solution partnerships, spanning a wide range of technologies, including materials, optimization, electronics, optical, mechanical, fluid and systems simulation, our partner ecosystem extends the depth and breadth of our technology offerings.

We have a software license agreement with HBM that provides the advanced fatigue capabilities of nCode DesignLife™, a leading durability software from HBM. nCode DesignLife™ technology leverages the open architecture of our platform and enables mechanical engineers to more easily address complex product life and durability issues before a prototype is built. A similar agreement was executed with VirtualMotion to offer Ansys Motion™ as a tightly-integrated, next-generation capability for simulating complex multi-body mechanisms and assemblies.

COMPETITION

We believe that the principal factors affecting sales of our software include ease of use, breadth and depth of functionality, flexibility, quality, ease of integration with other software systems, file compatibility across computer platforms, range of supported computer platforms, performance, price and total cost of ownership, customer service and support, company reputation and financial viability, and effectiveness of sales and marketing efforts.

We continue to experience competition across all markets for our products and services. Our competitors include large, global, publicly traded companies; small, geographically-focused firms; startup firms; and solutions produced in-house by the end users. Some of our current and possible future competitors have greater financial, technical, marketing and other resources than us, and some have well-established relationships with current and potential customers of ours. Our current and possible future competitors also include firms that have elected, or may in the future elect, to compete by means of open source licensing. These competitive pressures may result in decreased sales volumes, price reductions and/or increased operating costs, and could result in lower revenues, margins and net income.

PROPRIETARY RIGHTS AND LICENSES

We regard our software as proprietary and rely on a combination of trade secret, copyright, patent and trademark laws, license agreements, nondisclosure and other contractual provisions, and technical measures to protect our proprietary rights in our products. We distribute our software products under software license agreements that predominantly grant customers nonexclusive licenses, which are typically nontransferable, for the use of our products. License agreements for our products are generally directly between us and end users. Use of the licensed software product is restricted to specified sites unless the customer obtains a multi-site license for its use of the software product or the software product is by its nature a multi-site use product. Software security measures are also employed to prevent unauthorized use of our software products and the licensed software is subject to terms and conditions prohibiting unauthorized use or reproduction. For most products, customers may purchase a perpetual license of the technology with the right to annually purchase ongoing maintenance, technical support and upgrades, or may lease the product on a fixed-term basis for a fee that includes the license, maintenance, technical support and upgrades. For some products, customers purchase an annual subscription for a certain number of named users that includes the license, maintenance, technical support and upgrades or purchase elastic units hosted by our Cloud and use any supported product at any time until their licensed volume is met.

We license our software products utilizing a combination of web-based and hard-copy license terms and forms. For certain software products, we primarily rely on "click-wrapped" licenses (i.e. online agreements where the website provider posts terms and conditions, and the user clicks on the "accept" button). The enforceability of these types of agreements under the laws of some jurisdictions is uncertain.

We also seek to protect the source code of our software as a trade secret and as registered unpublished copyrighted work. We have obtained federal trademark registration protection for Ansys and other marks in the U.S. and foreign countries. Additionally, we were awarded numerous patents by the U.S. Patent and Trademark Office and have a number of patent applications pending. To the extent we do not choose to seek patent protection for our intellectual property, we primarily rely on the protection of our source code as a trade secret. We seek additional protection of our proprietary rights in our source code via copyright registrations.

Our employees have signed agreements under which they have agreed not to disclose trade secrets or confidential information. These agreements, where legally permitted, restrict engagement in or connection with any business that is competitive with us anywhere in the world while employed by us (and, in some cases, for specified periods thereafter) and state that any products or technology created by employees during their term of employment are our property. In addition, we require all channel partners to enter into agreements not to disclose our trade secrets and other proprietary information.

Despite these precautions, there can be no assurance that misappropriation of our technology and proprietary information (including source code) will be prevented. Further, there can be no assurance that copyright, trademark, patent and trade secret protection will be available for our products in certain jurisdictions, or that restrictions on the ability of employees and channel partners to engage in activities competitive with us will be enforceable. Costly and time-consuming litigation could be necessary in the future to enforce our rights to our trade secrets and proprietary information or to enforce our patent rights and copyrights, and it is possible that, in the future, our competitors may be able to obtain our trade secrets or to independently develop similar, unpatented technology.

The software development industry is characterized by rapid technological change. Therefore, we believe that factors such as the technological and creative skills of our personnel, new product developments, frequent product enhancements, name recognition and reliable product maintenance are also important to establishing and maintaining technology leadership in addition to the various legal protections of our technology that may be available.

We do not believe that any of our products infringe upon the proprietary rights of third parties. There can be no assurance, however, that third parties will not claim such infringement by us or our licensors or licensees with respect to current or future products. In addition, there are non-practicing entities (NPEs) and patent assertion entities (PAEs) whose business models are built on not producing any products but rather extracting payments from revenue generating companies through patent infringement assertions and/or litigation. We expect that software suppliers will increasingly be subject to the risk of such claims as the number of products and suppliers continues to expand and the functionality of products continues to increase. Any such claims, with or without merit, could be time consuming, result in costly litigation, cause product release delays or require us to enter into royalty or licensing agreements. Such royalty or licensing agreements, if required, may not be available on terms acceptable to us.

SEASONAL VARIATIONS

Our business has experienced seasonality, including quarterly reductions in software sales resulting from slowdowns of customer activities during the summer months, particularly in Europe, as well as from the seasonal purchasing and budgeting patterns of our global customers. Lease and maintenance contract renewals are typically highest in the first and fourth quarters. Our revenue is typically highest in the fourth quarter.

DEFERRED REVENUE AND BACKLOG

Deferred revenue consists of billings made or payments received in advance of revenue recognition from customer agreements. The deferred revenue on our consolidated balance sheets does not represent the total value of annual or multi-year, noncancellable agreements. Our backlog represents installment billings for periods beyond the current quarterly billing cycle. Our deferred revenue and backlog as of December 31, 2019 and 2018 consisted of the following:

<i>(in thousands)</i>	Balance at December 31, 2019		
	Total	Current	Long-Term
Deferred revenue	\$ 365,274	\$ 351,353	\$ 13,921
Backlog	505,469	218,398	287,071
Total	\$ 870,743	\$ 569,751	\$ 300,992

<i>(in thousands)</i>	Balance at December 31, 2018		
	Total	Current	Long-Term
Deferred revenue	\$ 343,174	\$ 328,584	\$ 14,590
Backlog	315,998	147,299	168,699
Total	\$ 659,172	\$ 475,883	\$ 183,289

Revenue associated with deferred revenue and backlog that will be recognized in the subsequent twelve months is classified as current in the tables above.

EMPLOYEES

As of December 31, 2019, we employed approximately 4,100 people. At that date, there were also contract personnel and co-op students providing ongoing development services and technical support. Certain employees are subject to collective bargaining agreements and have local work councils.

ACQUISITIONS

We make targeted acquisitions in order to support our long-term strategic direction, accelerate innovation, provide increased capabilities to our existing products, supply new products and services, expand our customer base and enhance our distribution channels.

2019 Acquisitions

On November 1, 2019, we completed the acquisition of 100% of the shares of LST for a purchase price of \$777.8 million.

On February 1, 2019, we completed the acquisition of 100% of the shares of Granta Design for a purchase price of \$208.7 million.

Additionally, during the year ended December 31, 2019, we acquired Dynardo, Helic and DfR Solutions to combine the acquired technologies with our existing comprehensive multiphysics portfolio. These acquisitions were not individually significant. The combined purchase price of these acquisitions was \$136.2 million.

The 2019 acquisitions are further described in the table below:

Date of Closing	Company	Details
November 1, 2019	LST	LST, the premier provider of explicit dynamics and other advanced finite element analysis technology, empowers our customers to solve a new class of engineering challenges, including developing safer automobiles, aircraft and trains while reducing or even eliminating the need for costly physical testing.
November 1, 2019	Dynardo	Dynardo, a leading provider of multidisciplinary analysis and optimization technology, gives our customers access to a full suite of process integration and robust design tools — empowering users to identify optimal product designs faster and more economically.
May 1, 2019	DfR Solutions	DfR Solutions' electronics reliability technology, combined with our existing comprehensive multiphysics portfolio, gives our customers a complete designer-level solution to analyze for electronics failure earlier in the design cycle.
February 4, 2019	Helic	Helic, the industry-leading provider of electromagnetic crosstalk solutions for systems on chips, combined with our flagship electromagnetic and semiconductor solvers, provides a comprehensive solution for on-chip, 3D integrated circuit and chip-package-system electromagnetics and noise analysis.
February 1, 2019	Granta Design	Granta Design, the premier provider of materials information technology, expands our portfolio into this important area, giving customers access to materials intelligence, including data that is critical to successful simulations.

2018 Acquisition

On May 2, 2018, we completed the acquisition of 100% of the shares of OPTIS, a premier provider of software for scientific simulation of light, human vision and physics-based visualization, for a purchase price of \$291.0 million. The acquisition extended our portfolio into the area of optical simulation to provide comprehensive sensor solutions, covering visible and infrared light, electromagnetics and acoustics for camera, radar and lidar.

2017 Acquisitions

During the year ended December 31, 2017, we completed various acquisitions which were not individually significant. The combined purchase price of the acquisitions was approximately \$67.0 million.

The 2017 technology acquisitions are further described in the table below:

Date of Closing	Company	Details
November 15, 2017	3DSIM	3DSIM, a developer of premier additive manufacturing technology, gives us a complete additive manufacturing simulation workflow solution. 3DSIM's software solutions empower manufacturers, designers, materials scientists and engineers to achieve their objectives through simulation-driven innovation rather than physical trial and error.
July 5, 2017	Computational Engineering International, Inc. (CEI Inc.)	CEI Inc., the developer of EnSight, aids engineers and scientists in their ability to analyze, visualize and communicate large simulation data sets in clear, higher-resolution outputs.
March 10, 2017	CLK Design Automation (CLK-DA)	CLK-DA offers fast transistor simulation technology that complements our semiconductor product portfolio.

For further information on our business combinations, see Note 4 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

AVAILABLE INFORMATION

Our website is www.ansys.com and our investor relations website is <https://investors.ansys.com>. We make available on our investor relations website, free of charge, Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, interactive data files, Current Reports on Form 8-K, reports filed pursuant to Section 16 and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after such materials are electronically filed or furnished to the Securities and Exchange Commission (SEC). Our reports may also be obtained by accessing the EDGAR database of the SEC's website at www.sec.gov.

ITEM 1A. RISK FACTORS

The following are important factors we have identified that could affect our future results and an investment in our common stock. In addition, from time to time we provide information, including information contained in this Annual Report on Form 10-K, that contains forward-looking statements concerning, among other things, projected financial performance, total addressable market, market and industry sector growth, product development and commercialization or other aspects of future operations. Such statements are based on the assumptions and expectations of our management at the time such statements are made. We caution investors that our performance and any forward-looking statements are subject to risks and uncertainties, including but not limited to, the following:

Global Operational Risks

Adverse economic and geopolitical conditions may impact our operations and financial performance.

Our operations and performance depend significantly on global macroeconomic, specific foreign country and U.S. domestic economic conditions. Adverse conditions in the macroeconomic environment may result in a decreased demand for our products and services, constrained credit and liquidity, reduced government spending and volatility in equity and foreign exchange markets. In addition, to the extent the global economy experiences a significant downturn or volatility, we may be exposed to impairments of certain assets if their values deteriorate. Tighter credit due to economic conditions may diminish our future borrowing ability and increase borrowing costs under our existing credit facilities. Customers' ability to pay for our products and services may also be impaired, which could lead to an increase in our allowance for doubtful accounts and write-offs of accounts receivable.

A majority of our business comes from outside the U.S. and our customers supply a wide array of goods and services to most of the world's major economic regions. International revenue represented 57.9%, 60.9% and 61.9% of our total revenue for the years ended December 31, 2019, 2018 and 2017, respectively. In fiscal year 2019, our largest geographic revenue bases included the U.S., Japan, Germany and South Korea.

If any of the foreign economies in which we do business deteriorates or suffers a period of uncertainty, our business and performance may be negatively impacted through reduced customer and government spending, changes in purchasing cycles or timing, reduced access to credit for our customers, or other factors impacting our international sales and collections. Furthermore, customer spending levels in any foreign jurisdiction may be adversely impacted by changes in domestic policies, including tax and trade policies. For example, the United Kingdom withdrew from the European Union effective as of January 31, 2020 and is now in a period of transition until the end of 2020. We have significant operations in the United Kingdom and the European Union. It remains unclear as to what the terms of the new relationship between the United Kingdom and the European Union will be. Terms that are disadvantageous to us, including those related to trade, tax and the movement of people across borders could negatively impact our results.

A substantial portion of our license and maintenance revenue is derived from annual lease and maintenance contracts which typically have a high rate of customer renewal. If the rate of renewal for these contracts is adversely affected by economic or other factors, our lease license and maintenance growth will be adversely affected. As a result, our business, financial position, results of operations and cash flows may also be adversely impacted during those periods.

We face compliance risk as a result of our international operations and our sales model, including pertaining to anti-corruption and data privacy laws.

The laws with which we need to comply due to our international operations vary from country to country and are subject to frequent change and interpretation. In May 2018, the General Data Protection Regulation (GDPR), which governs data privacy practices within the European Economic Area (EEA), went into effect. The law, which applies to our data processing activities within the EEA, as well as the processing of EEA citizen data globally, imposes various compliance obligations related to the handling of personal data in the delivery of our products and services and to business operations involving employee data. Compliance with the GDPR has and will continue to require deployment of substantial resources and increased costs. If we fail to comply with the GDPR, it may lead to regulatory enforcement actions, which can result in monetary penalties of up to 4% of annual worldwide revenue, private lawsuits, extensive and prescriptive consent decrees or judgments that may require additional resources or expenses for compliance and may cause reputational damage.

In the U.S., California implemented the California Consumer Protection Act (CCPA) as of January 2020, which requires compliance measures similar to those of the GDPR and establishes the first state standard for a comprehensive set of data privacy rights. Several other states have proposed data privacy laws that would impose obligations on us with respect to how we collect and use personal data, including customer data. In order to comply with U.S. state laws, as well as any data breach notification laws that vary across states, we may be required to invest in additional resources or tools to manage our data

processing activities. If we fail to comply with the requirements of U.S. data privacy and data breach notification laws, we will be subject to state monetary fines, consent decrees issued by the Federal Trade Commission, and possible reputational damage.

Our global reach, including within countries considered high-risk environments for public corruption, exposes us to risks associated with violations of anti-bribery laws such as the U.S. Foreign Corrupt Practices Act and the U.K. Bribery Act. We develop and sell software and consulting services and maintain support operations in more than 40 countries whose laws and practices differ from one another and are subject to unexpected changes. Managing these geographically diverse operations requires significant attention and resources to ensure compliance. To promote compliance, we forbid our agents and employees from engaging in corrupt behavior and have implemented a compliance plan to prevent and detect violations of anti-corruption laws. There remains, however, a risk that illegal conduct could occur thereby exposing us to the financial and reputational risks associated with a violation of anti-corruption laws.

Noncompliance with these regulations could adversely impact our financial results or stock price as well as divert management time and effort.

We are subject to trade restrictions that could impact our ability to sell to customers and result in liability for violations.

Due to the global nature of our business, we are subject to import and export restrictions and regulations that prohibit the shipment or provision of certain products and services to certain countries, governments and persons targeted by the U.S., including the Export Administration Regulations administered by the U.S. Bureau of Industry and Security (BIS) and economic and trade sanctions administered by the U.S. Treasury Department's Office of Foreign Assets Control (OFAC). During the second quarter of 2019, the BIS placed certain entities on the Entity List. Certain of our existing and prospective customers, including Huawei, were included in this list. In addition, restrictions implemented by OFAC restrict our ability to sell to some companies in certain countries, such as Russia. The Entity List and OFAC restrictions limit our ability to deliver products and services to these customers and, in the absence of a license, our ability to sell products and services to these customers in the future. The inclusion of companies on the Entity List may encourage them to seek substitute products from competitors who are not subject to these restrictions or to develop their own products. We cannot predict whether or when any changes will be made that eliminate or decrease these limitations on our ability to sell products and provide services to these customers. Additionally, other customers may continue to be added to the Entity List and/or be subjected to trade restrictions. There may be indirect impacts that cannot be quantified, including that our business may also be impacted by other trade restrictions that may be imposed by the U.S., China, or other countries. Restrictions on our ability to sell and ship to customers could have an adverse effect on our business, results of operations or financial condition.

Violators of these export controls may be subject to significant penalties, which may include considerable monetary fines, criminal proceedings against them and their officers and employees, a denial of export privileges, and suspension or debarment from selling products or services to the federal government. Any such penalties could have an adverse effect on our business, financial condition, operating results and cash flows. In addition, the political and media scrutiny surrounding any governmental investigation could cause significant expense and reputational harm and distract senior executives from managing normal day-to-day operations.

Our products could also be shipped to denied parties by third parties, including our channel partners. Even though we take precautions to ensure that our channel partners comply with all relevant import and export regulations, any failure by channel partners to comply with such regulations could have negative consequences for us, including reputational harm, government investigations and penalties.

The effect of foreign exchange rate fluctuation may adversely impact our revenue, expenses, cash flows and financial conditions.

As a result of our significant international presence, we have revenue, expenses, cash, accounts receivable and payment obligations denominated in foreign currencies, most notably the British Pound, Euro, Japanese Yen, South Korean Won and Indian Rupee. Our revenue and operating results are adversely affected when the U.S. Dollar strengthens relative to foreign currencies and are positively affected when the U.S. Dollar weakens relative to foreign currencies. If the U.S. Dollar strengthens relative to other currencies, certain channel partners who pay us in U.S. Dollars may have trouble paying on time or may have trouble distributing our products due to the impact of the currency exchange fluctuation on such channel partner's cash flows. This may impact our ability to distribute our products into certain regions and markets.

We seek to reduce our currency exchange transaction risks primarily through our normal operating and treasury activities, including derivative instruments, but there can be no assurance that these activities will be successful in reducing these risks. In addition, we incur transaction fees in the usage of such derivative instruments. Changes in currency exchange rates will affect our financial position, results of operations and cash flows.

A natural disaster or catastrophic event may disrupt our business.

A significant portion of our software development personnel, source code and computer equipment is located at operating facilities in the U.S., Canada, India, Japan and throughout Europe. The occurrence of a natural disaster or other unforeseen catastrophe at any of these facilities could cause disruptions to our operations, services and product development activities. Additionally, if we experience problems that impair our business infrastructure, such as a computer virus, telephone system failure or an intentional disruption of our information technology systems by a third party, these disruptions could have a material adverse effect on our business, financial position, results of operations, cash flows and the ability to meet financial reporting deadlines. Further, because our sales are not generally consistent across quarterly periods, the potential adverse effects resulting from any of the events described above or any other disruption of our business could be accentuated if they occur close to the end of a fiscal quarter.

In addition, our business could be adversely affected by the effects of a widespread outbreak of contagious disease, including the recent outbreak of respiratory illness caused by a novel coronavirus first identified in Wuhan, Hubei Province, China. Any outbreak of contagious diseases, and other adverse public health developments, may cause us or our customers to temporarily suspend operations in the affected city or country. In addition, a significant outbreak of contagious diseases in the human population could result in a widespread health crisis that could adversely affect the economies and financial markets of many countries, resulting in an economic downturn that could affect demand for our products, our ability to collect against existing trade receivables and our operating results.

Industry Operational Risks

Our industry is highly competitive, which could result in downward pressure on our prices.

We continue to experience competition across all markets for our products and services. Some of our current and potential competitors have greater financial, technical, marketing and other resources than we do, and some have well-established relationships with our current and potential customers. Our current and potential competitors also include firms that have competed, or may in the future compete, by means of open source licensing. Companies we have, or could have, strategic alliances with could reduce or discontinue technical, software development and marketing relationships with us for competitive purposes. If our competitors offer deep discounts on certain products or services, or develop products that the marketplace considers more valuable, we may need to lower prices or offer discounts or other favorable terms in order to compete successfully. Our maintenance products, which include software license updates and product support fees, are generally priced as a percentage of new software license fees. Our competitors may offer lower percentage pricing on product updates and support. Some competitors may bundle software products for promotional purposes or as a long-term pricing strategy or provide guarantees of prices, product implementations or wider geographical license usage provisions. Any of these practices could, over time, significantly constrain the prices that we can charge for certain products.

Furthermore, if we do not adapt pricing models to reflect changes in customer usage of our products or changes in customer demand, our new software license revenues could decrease. Additionally, increased distribution of applications through application service providers, including software-as-a-service providers, may reduce the average price of our products or adversely affect other sales of our products, reducing new software license revenues unless we can offset price reductions with volume increases.

These competitive pressures may result in decreased sales volumes, price reductions and/or increased operating costs, and could result in lower revenues, margins and net income.

We may not be successful in developing and marketing new products to adequately address the rapidly changing technology industry.

We operate in an industry generally characterized by rapidly changing technology and frequent new product introductions, which can render existing products obsolete or unmarketable. A major factor in our future success will be our ability to anticipate technological changes and to develop and introduce, in a timely manner, new products to meet those changes. Our ability to grow revenue will be dependent on our ability to respond to customer needs in the areas of, among others, 5G, autonomous vehicles, Industrial Internet of Things (IIoT) and electrification, and to leverage cloud computing and new computing platforms. In addition, our future success may depend on our ability to continue to develop a systems integrator ecosystem able to handle integrations and process and application development to address the challenge of the increasingly complex integration of our products' different functionalities to address customers' requirements. In addition, for those customers who authorize a third-party technology partner to access their data, we do not provide any warranty related to the functionality, security and integrity of the data transmission or processing. Despite contract provisions to protect us, customers may look to us to support and provide warranties for the third-party applications, integrations, data and content, even though not developed or sold by us, which may expose us to potential claims, liabilities and obligations, all of which could harm our business.

We devote substantial resources to research and development, which could cause our operating results to decline.

We devote substantial resources to research and development. New competitors, technological advances in the software development industry by us or our competitors, acquisitions, entry into new markets, or other competitive factors may require us to invest significantly greater resources than anticipated. If we are required to invest significantly greater resources than anticipated without a corresponding increase in revenue, operating results could decline. In addition, our periodic research and development expenses may be independent of our level of revenue, which could negatively impact financial results.

There can be no assurance that we will be successful in developing and marketing, on a timely basis, new products or product enhancements or that the new products will adequately address the changing needs of the marketplace or that we will successfully manage the transition from existing products. Software products as complex as those we offer may contain undetected errors when first introduced, or as new versions are released, and the likelihood of errors is increased as a result of our commitment to the frequency of product releases. There can be no assurance that errors will not be found in any new or enhanced products after the commencement of commercial shipments. Certain products require a higher level of sales and support expertise. Failure of our sales channel, particularly the independent channel partners, to obtain this expertise and to sell the new product offerings effectively could have an adverse impact on our sales in future periods. Any of these problems may result in the loss of or delay in customer acceptance, diversion of development resources, damage to our reputation, or increased service and warranty costs, any of which could have a material adverse effect on our business, financial position, results of operations and cash flows.

Consolidation among our customers as well as our industry competitors may negatively impact our operating results.

There have been consolidations among our customers in the semiconductor, electronics and automotive industries, among others. This may result in the newly combined entity wanting the most favorable pricing from the former contracts and expecting larger volume discounts on future purchases. If a customer is acquired by an entity that does not utilize our products in favor of a competing product, we may not have future orders from the enterprise. Further, consolidation of our competitors may result in synergies that allow those competitors to benefit from broader sales channels and increased access to capital. Any of these impacts could adversely affect our business, financial position, results of operations and cash flows.

The price of our common stock is subject to volatility.

The market price of securities of software companies is subject to significant fluctuations. The valuation and trading price of our common stock may not be predictable. Factors that may adversely impact our share price include our failure to meet analyst expectations, reduced expectations regarding financial outlook, increases in our debt levels, changes in management or our material announcements or those of our competitors. In addition, volatility could result from causes that are unrelated to our operating performance such as conditions in the financial markets or the software industry generally.

Company Operational Risks

We are dependent upon our channel partners for a significant percentage of our revenue.

We distribute our products through a global network of independent channel partners, which accounted for 22.9%, 22.4% and 24.8% of our revenue during the years ended December 31, 2019, 2018 and 2017, respectively. Channel partners sell our software products to new and existing customers, expand installations within the existing customer base, offer consulting

services and provide the first line of technical support. In Asia-Pacific and EMEA, we are highly dependent upon our channel partners. Difficulties in ongoing relationships with channel partners, such as failure to meet performance criteria and differences in handling customer relationships, could adversely affect our performance. Additionally, the loss of any major channel partner, including a channel partner's decision to sell competing products rather than ours, could result in reduced revenue. Moreover, our future success will depend substantially on the ability and willingness of our channel partners to dedicate the resources necessary to promote our portfolio of products and to support a larger installed base within each of our geographic regions. If the channel partners are unable or unwilling to do so, we may be unable to sustain revenue growth.

We have been increasing the number of channel partners, particularly in international locations. The business relationships with these channel partners are recently established and could result in additional compliance burdens for us. In addition, these partners have a less-established payment history and revenue from these partners could come with a higher rate of bad debt expense. Where channel partners operate on our behalf to collect and process personal data of customer contacts, failure to comply with relevant data privacy laws in the handling of such personal data could result in our liability for any fines, civil suits or non-financial performance obligations imposed by regulatory authorities on these partners with respect to our customer data.

We may not be able to realize the potential benefit of our acquisitions and such acquisitions could pose risks to our business.

We consummate acquisitions to support our long-term strategic direction. We have completed a number of acquisitions in recent years, and in 2019 we acquired Granta Design, Helic, DiR Solutions, LST and Dynardo.

Any acquisitions that we complete may present risks, including: difficulty in integrating the management teams, strategies, cultures and operations of the companies or businesses; failing to achieve anticipated synergies, revenue increases or cost savings; difficulty incorporating and integrating the acquired technologies or products with our existing product lines; difficulty with sales, distribution and marketing functions; failure to develop new products and services that utilize the technologies and resources of the companies; disruption of our ongoing business and diversion of management's attention to transition or integration issues; liabilities that were not identified during the buying process; the loss of our key employees, customers, partners and channel partners or those of the acquired company; and cybersecurity and data privacy risks, including any liabilities for failure to comply with data privacy laws and obligations for collection, use and retention of personal data.

Future acquisitions may involve the expenditure of significant cash resources; the incurrence of debt, which increases our interest expense and leverage; or the issuance of equity, which is dilutive to stockholders and may decrease earnings per share.

We allocate a portion of the purchase price to goodwill and intangible assets. If we do not recognize all the economic benefits of an acquisition, there could be an impairment of goodwill or intangible assets. Furthermore, impairment charges are generally not tax-deductible and will result in an increased effective income tax rate in the period the impairment is recorded.

If we do not achieve the anticipated benefits of our acquisitions as rapidly or to the extent anticipated by our management or the financial and industry analysts, there could be a material adverse effect on our stock price, business, financial position, results of operations and cash flows. Where customer contacts and leads are a significant consideration in the purchase price or expected financial outcome of an acquisition, failure to identify or mitigate data privacy concerns with the collection, use and retention of personal data may adversely impact our ability to use this information as anticipated and regulatory obligations may require that we delete all or a portion of the database, or take additional remediation measures before use. This may impact the value of the acquisition or reduce forecasted sales.

The implementation of a new CRM system may not achieve the corporate benefits initially identified in the anticipated time frame or at all.

We are in the process of implementing new functionality in our existing Customer Relationship Management (CRM) system. While this system is anticipated to simplify the demand generation, sales cycle, order processing and customer service activities, there is a risk that the project will not achieve the anticipated benefits or that the benefits will not be achieved as quickly as anticipated. There is also a risk that we will have to write off previously capitalized expenditures if the project is not successful or if implementation decisions regarding the project are modified. The project implementation timeline and scope may change and become longer and broader as new facets of the design and implementation efforts are undertaken. This may take the attention of key operational management away from other aspects of the business, including the integration of acquisitions, and may also result in increased consulting and software costs. These factors may have a significant negative impact on our business, financial position, profit, cash flows and reputation.

If we are unable to attract and retain key talent, our business could be adversely affected.

Our success depends upon the continued service of our senior executives and our key technical and sales employees. Each of our executive officers and key technical personnel could terminate his or her relationship with us at any time. The loss of any of our senior executives or key personnel for which there has not been adequate knowledge-sharing and transfer might significantly delay or prevent the achievement of our business objectives and could materially harm our business and customer relationships.

In addition, because of the highly technical nature of our products and services, we must attract and retain highly skilled engineering and development personnel. The market for this talent is highly competitive and we have difficulty filling these roles for this reason. While we have historically recruited from outside of the U.S., in recent years our ability to do so has been curbed by more restrictive domestic immigration laws. If the immigration laws become even stricter or the processing of immigration requests becomes even more cumbersome or less efficient, or if we have less success in recruiting and retaining key personnel, our business, reputation and operating results could be materially and adversely affected.

We may be subject to proceedings that could harm our business.

We are subject to various investigations, claims and legal proceedings that arise in the ordinary course of business, including commercial disputes, labor and employment matters, tax audits and litigations, alleged infringement of intellectual property rights and other matters. Use or distribution of our products could generate product liability, regulatory infraction, or similar claims by our customers, end users, channel partners, government entities or other third parties. Sales and marketing activities that impact processing of personal data, as well as measures taken to ensure license compliance, may also result in claims by customers and individual employees of customers. Each of these matters is subject to various uncertainties, and it is possible that an unfavorable resolution of one or more of these matters could materially and adversely affect our results of operations, cash flows and financial position, as well as cause damage to our reputation.

We may not be able to continue to obtain licenses to third-party software and intellectual property on reasonable terms or at all, which may disrupt our business and harm our financial results.

We license third-party software and other intellectual property for use in product research and development and, in several instances, for inclusion in our products. We also license third-party software, including the software of our competitors, to test the interoperability of our products with other industry products and in connection with our professional services. These licenses may need to be renegotiated or renewed from time to time, or we may need to obtain new licenses in the future. Third parties may stop adequately supporting or maintaining their technology, or they or their technology may be acquired by our competitors. If we are unable to obtain licenses to such third-party software and intellectual property on reasonable terms or at all, we may not be able to sell the affected products, our customers' use of the products may be interrupted, or our product development processes and professional services offerings may be disrupted, which could in turn harm our financial results, our customers' ability to utilize our software, and our reputation.

We may suffer reputational or financial harm if we have product standard or quality issues.

We have separate quality systems and registrations under the ISO 9001:2015 standard in addition to other governmental and industrial regulations. Our continued compliance with quality standards and favorable outcomes in periodic examinations is important to retain current customers and vital to procure new sales. If it was determined that we were not in compliance with various regulatory or ISO 9001 standards, our certificates of registration could be suspended, requiring remedial action and a time-consuming re-registration process. Product quality issues or failures could result in our reputation becoming diminished, resulting in a material adverse impact on revenue, operating margins, net income, financial position and cash flows.

Our short-term and long-term sales forecast may not be accurate which could result in an adverse impact on our business.

The software business is generally characterized by long sales cycles. These long sales cycles increase the difficulty of predicting sales for any particular quarter. Many operational and strategic decisions are based upon short- and long-term sales forecasts. Our sales personnel continually monitor the status of proposals, including the estimated closing date and the value of the sale, in order to forecast quarterly sales. These forecasts are subject to significant estimation and are impacted by many external factors, including global economic conditions and the performance of our customers. A variation in actual sales activity from that forecasted could cause us to plan or budget incorrectly and, therefore, could adversely affect our business, financial position, results of operations and cash flows. Management also forecasts macroeconomic trends and developments and integrates them through long-range planning into budgets, research and development strategies and a wide variety of general management duties. Global economic conditions, and the effect those conditions and any disruptions in global markets have on our customers, may have a significant impact on the accuracy of our sales forecasts. These conditions may increase the likelihood or the magnitude of variations between actual sales activity and our sales forecasts and, as a result, our performance may be hindered because of a failure to properly match corporate strategy with economic conditions. This, in turn, may adversely affect our business, financial position, results of operations and cash flows. To the extent our forecasts are incorrect and, as a result, we fail to meet analyst expectations regarding financial performance or miss or reduce the financial guidance we give to investors, our share price may be adversely impacted.

Intellectual Property and Cybersecurity Risks

Our success is highly dependent upon the legal protection of our proprietary technology.

We primarily rely upon contracts and copyright, patent, trademark and trade secrets laws to protect our technology. We maintain intellectual property programs, including applying for patents, registering trademarks and copyrights, protecting trade secrets, entering into confidentiality agreements with our employees and channel partners, and limiting access to and distribution of our software, documentation and other proprietary information. However, software programs are particularly prone to piracy, which is a global phenomenon, and as a result we may lose revenue from the distribution of unlicensed software. Additionally, patent, copyright, trademark and trade secret protection do not provide the same coverage in every country in which we sell our products and services. Policing the unauthorized distribution and use of our products is difficult, and software piracy (including online piracy) is a persistent problem. While we continue to develop better mechanisms to detect and report or investigate unauthorized use of our software, we are also constrained by data privacy laws that restrict our ability to collect data about unlawful usage in some countries. We cannot assure that the steps we take to protect our proprietary technology are adequate to prevent misappropriation of our software by third parties, or that third parties will not be able to develop similar technology independently. Despite our efforts to prevent such activities, we may nonetheless lose significant revenue due to illegal use of our software.

Costly and time-consuming litigation would be necessary to enforce and determine the scope of trade secret rights and related confidentiality and nondisclosure provisions across our contractual agreements and partnerships. While we are not aware that any of our technology infringes upon the rights of third parties, there can be no assurance that other parties will not assert technology infringement claims against us, or that, if asserted, such claims will not prevail. Any such litigation could be costly to defend, damage our reputation, and distract our employees from their daily work. Any successful infringement claims asserted against us could require us to develop technology workarounds for the impacted products or product development, which could be costly, disrupt product development, and delay go-to-market activities. Such disruption and delay could negatively impact our financial results.

Cyberattacks and security vulnerabilities could lead to reduced revenue, increased costs, liability claims, or harm to our reputation.

While we undertake commercially reasonable efforts to maintain and improve the security and integrity of our products, source code, computer systems and data with respect to the relative sensitivity of such software, systems and data, the number of computer “hackers” developing and deploying destructive software programs that attack our products and computer systems continues to increase. We have incurred and will continue to incur additional costs to enhance our cybersecurity efforts. Because the tactics and tools used to obtain unauthorized access to networks or to sabotage systems are constantly evolving, we may be unable to implement adequate preventive measures. Such an attack could disrupt the proper functioning of our products, cause errors in the output of our customers’ work, or allow unauthorized access to and disclosure of our sensitive, proprietary or confidential information or that of our customers and employees. In the event of a serious breach of our products or systems, or where a breach occurs due to our failure to implement reasonable and appropriate safeguards, our reputation may suffer, customers may stop buying products or may terminate current services, we could face lawsuits and potential civil liability, as well as regulatory fines and non-financial penalties for any personal data breach, and our financial performance could be negatively impacted.

There is also a danger of industrial espionage, cyberattacks, misuse, theft of information or assets (including source code), or damage to assets by people who have gained unauthorized access to our facilities, systems or information. This includes access to systems or information through email phishing attacks on our employees which has become a very prevalent technique used against companies, often delaying detection through increasingly complex practices. The objective of these attacks is often to acquire user account credentials in order to access other computer systems through linked accounts or where users have recycled passwords across systems.

Inadequate security practices or inadvertent acts or omissions by our employees and partners may also result in unauthorized access to our data. Employees or third parties may also intentionally compromise our or our customers' security or systems. Such cybersecurity breaches, misuse of data or other disruptions could lead to loss of or unauthorized disclosure of our source code or other confidential information, unlicensed use and distribution of our products without compensation, illegal use of our products that could jeopardize the security of customer information stored in and transmitted through our computer systems, and theft, manipulation and destruction of proprietary data, resulting in defective products, performance downtimes and possible violation of export laws and other regulatory compliance requirements. Although we actively employ measures to combat such activities, preventing unauthorized access to our systems and data is inherently difficult. In addition, litigation to either pursue our legal rights or defend any claims against us could be costly and time-consuming and may divert management's attention and adversely affect the market's perception of us and our products.

We have experienced targeted and non-targeted cybersecurity attacks and incidents in the past that have resulted in unauthorized persons gaining access to our information and systems, and we could in the future experience similar attacks. To date, no cybersecurity incident or attack has had a material impact on our business, results of operations or financial condition.

A number of our core processes, such as software development, sales and marketing, customer service and financial transactions, rely on IT infrastructure and applications. We also rely on third-party service providers and products, which are exposed to various security vulnerabilities outside of our control. Malicious software, sabotage and other cybersecurity breaches of the types discussed above could cause an outage of our infrastructure, which could cause short-term disruption in operations or, in the event of a longer disruption, lead to a substantial denial of service to our customers and ultimately to production downtime, recovery costs and customer claims for breach of contract, as well as reputational damage and impact to employee morale and productivity.

We rely on service providers for infrastructure and cloud-based products.

We use a number of third-party service providers for key components of our infrastructure, particularly with respect to development and delivery of our cloud-based products. The utilization of these service providers gives us greater flexibility in efficiently delivering a more tailored, scalable customer experience but also exposes us to additional risks and vulnerabilities. Those of our products and services that depend upon hosted components delivered by third parties are vulnerable to security risks inherent in web-based technologies, including greater risk of unauthorized access to or use of customers' protected data. Interception of data transmission, misappropriation or modification of data, corruption of data and attacks by bad actors against our service providers may also adversely affect our products or product and service delivery. Malicious code, viruses or vulnerabilities that are undetected by our service providers may disrupt our business operations generally and may have a disproportionate effect on those of our products that are developed and delivered in the cloud environment. These risks, though largely outside our control, may impact customer perception of our products, service and support, and may damage our brand. While we devote resources to maintaining the security and integrity of our products and systems, as well as ensuring adequate due diligence for our third-party service providers, cloud security and reliability is inherently challenging. In the event of a material breach of data hosted by our service providers or a serious security incident on behalf of, caused by or experienced by a service provider, we may experience significant operational and technical difficulties, loss of data including customer data, diminished competitive position or reputation, and loss of customer engagement, which could result in civil liabilities and a negative impact to financial performance.

Financial Risks

Our revenue is subject to increased volatility due to the adoption of a new revenue recognition accounting standard on January 1, 2018.

In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update No. 2014-09, *Revenue from Contracts with Customers (Topic 606)* (ASU 2014-09). We adopted ASU 2014-09 and its related amendments (collectively known as Accounting Standards Codification (ASC) 606) on January 1, 2018 which significantly impacted the timing, allocation and presentation of our lease license, perpetual license and maintenance revenue. Under previous revenue guidance, revenue was recognized ratably from the sale of software lease licenses and software maintenance subscriptions. However, under ASC 606, the license component of lease revenue is recognized up front. The post-contract support portion of lease license contracts continues to be recognized over the contract term, but it is now allocated to maintenance and service revenue.

We continue to sell perpetual licenses that involve the payment of a single, upfront fee. Historically, these licenses have been more typical in the computer software industry and remain as the preferred licensing approach in certain markets. The revenue associated with perpetual licenses continues to be recognized up front, consistent with prior revenue guidance.

The adoption of this revenue recognition guidance, coupled with our continued sales of perpetual licenses, creates the likelihood for software license revenue volatility to increase across periods, particularly as compared to our results under the previous revenue recognition standard. Our revenue in any period will depend significantly on sales contracts completed during that period.

Changes in existing financial accounting standards could adversely impact our financial results and operations.

Changes in existing accounting rules or practices, new accounting pronouncements, or varying interpretations of current accounting pronouncements could have a significant adverse effect on our results of operations or the manner in which we conduct our business.

In addition, we could incur significant costs for changes to our business systems, processes and internal controls as a result of the transition. These costs could have a significant adverse impact on our results of operations and cash flows. The transition could also cause management to divert time from day-to-day operations, which could impact our business. If we are unable to successfully transition our business systems, processes and internal controls before the guidance effective date, it could impact our ability to meet financial reporting deadlines. For further information on the impact of recently issued accounting guidance, see Note 2 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

Changes to tax laws, variable tax estimates and tax authority audits could impact our financial results and operations.

Our operations are subject to income and transaction taxes in the U.S. and in multiple foreign jurisdictions. A change in the tax law in the jurisdictions in which we do business, including an increase in tax rates, an adverse change in the treatment of an item of income or expense, or a decrease in tax rates in a jurisdiction in which we have significant deferred tax assets, could result in a material increase in tax expense. Furthermore, we have recorded significant deferred tax liabilities related to acquired intangible assets that are not deductible for tax purposes. These deferred tax liabilities are based on future statutory tax rates in the locations in which the intangible assets are recorded. Any future changes in statutory tax rates would be recorded as an adjustment to the deferred tax liabilities in the period the change is announced and could have a material impact on our effective tax rate during that period.

We also make significant estimates in determining our worldwide income tax provision. These estimates involve complex tax regulations in many jurisdictions and are subject to many transactions and calculations in which the ultimate tax outcome is uncertain. The outcome of tax matters could be different than the estimates reflected in the historical income tax provision and related accruals. Such differences could have a material impact on income tax expense and net income in the periods in which such determinations are made.

The amount of income tax we pay is subject to ongoing audits by federal, state and foreign tax authorities. These audits can result in additional assessments, including interest and penalties. Our estimates for liabilities associated with uncertain tax positions is highly judgmental and actual future outcomes may result in favorable or unfavorable adjustments to our estimated tax liabilities, including estimates for uncertain tax positions, in the period the assessments are made or resolved, audits are closed or when statutes of limitation on potential assessments expire. As a result, our effective tax rate may fluctuate significantly on a quarterly or annual basis.

Our indebtedness could adversely affect our business, financial condition and results of operations.

In connection with our acquisition of LST, we borrowed \$500.0 million under a term loan facility which matures on November 1, 2024. We also have access to a \$500.0 million revolving credit facility, which includes a \$50.0 million sublimit for the issuance of letters of credit. The credit agreement governing these loans contains customary representations and warranties, affirmative and negative covenants and events of default. The credit agreement also contains a financial covenant requiring us

to maintain a consolidated leverage ratio of indebtedness to earnings before interest, taxes, depreciation and amortization not exceeding 3.50 to 1.00 as of the end of any fiscal quarter (for the four-quarter period ending on such date) with an opportunity for a temporary increase in such consolidated leverage ratio to 4.00 to 1.00 upon the consummation of certain qualified acquisitions for which the aggregate consideration is at least \$250.0 million.

Notwithstanding the limits contained in the credit agreement governing our credit facility, we may be able to incur substantial additional debt from time to time to finance working capital, capital expenditures, share repurchases, investments or acquisitions, or for other purposes. If we do so, the risks related to our level of debt could intensify. Specifically, our level of debt could:

- make it more difficult for us to satisfy our debt obligations and other ongoing business obligations, which may result in defaults;
- result in an event of default if we fail to comply with the financial and other covenants contained in the agreement governing our debt, which could result in all of our debt becoming immediately due and payable or require us to negotiate an amendment to financial or other covenants that could cause us to incur additional fees and expenses;
- limit our ability to obtain additional financing to fund future working capital, capital expenditures, acquisitions or other general corporate requirements;
- reduce the availability of our cash flow to fund working capital, capital expenditures, acquisitions and other general corporate purposes;
- increase our vulnerability to the impact of adverse economic and industry conditions;
- expose us to the risk of increased interest rates as certain of our borrowings, including borrowings under the credit facility, are at variable rates of interest;
- limit our flexibility in planning for, or reacting to, and increasing our vulnerability to, changes in our business, the industries in which we operate, and the overall economy;
- place us at a competitive disadvantage compared to other, less leveraged competitors; and
- increase our cost of borrowing.

Any of the above-listed factors could have an adverse effect on our business, financial condition and results of operations and our ability to meet our payment obligations under our debt agreements.

Furthermore, borrowings under the credit agreement use the London Interbank Offering Rate (LIBOR) as a benchmark for establishing the interest rate. LIBOR has been the subject of recent national, international and other regulatory guidance and proposals for reform, and the financial industry is currently transitioning away from LIBOR as a benchmark for the interbank lending market. The consequences of these developments cannot be entirely predicted but could include an increase in the cost of our variable rate indebtedness.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our executive offices and those related to certain domestic product development, marketing, production and administration are located in a LEED certified, 186,000 square foot office facility in Canonsburg, Pennsylvania. The lease for this facility was effective as of September 14, 2012 and expires on December 31, 2029, excluding any renewal or termination options.

We own: a 70,000 square foot office facility in Lebanon, New Hampshire; a 62,000 square foot office building near our current Canonsburg headquarters; a 59,000 square foot facility in Pune, India; a 40,000 square foot campus in Livermore, California; and a 5,000 square foot facility in Apex, North Carolina.

We also lease office space in various locations throughout the world. We own substantially all equipment used in our facilities. Management believes that, in most geographic locations, our facilities allow for sufficient space to support present and future

foreseeable needs, including such expansion and growth as the business may require. In other geographic locations, we expect that we will be required to expand capacity beyond that which we currently own or lease.

Our properties and equipment are in good operating condition and are adequate for our current needs. We do not anticipate difficulty in renewing existing leases as they expire or in finding alternative facilities.

ITEM 3. LEGAL PROCEEDINGS

We are subject to various investigations, claims and legal proceedings that arise in the ordinary course of business, including commercial disputes, labor and employment matters, tax audits, alleged infringement of intellectual property rights and other matters. In our opinion, the resolution of pending matters is not expected to have a material adverse effect on our consolidated results of operations, cash flows or financial position. However, each of these matters is subject to various uncertainties and it is possible that an unfavorable resolution of one or more of these proceedings could materially affect our results of operations, cash flows or financial position.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

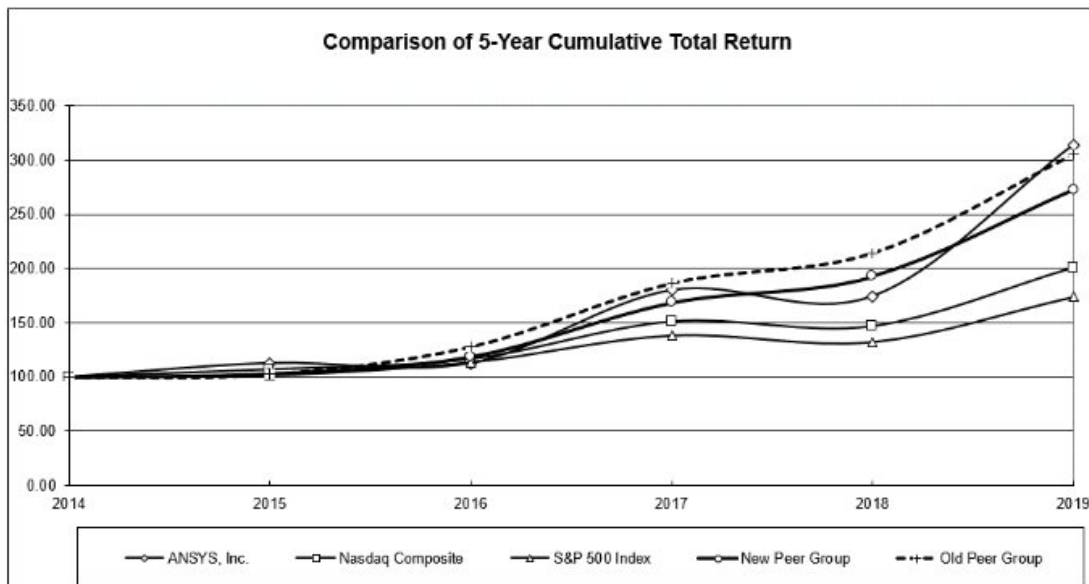
Our common stock trades on the Nasdaq Global Select Market tier of the Nasdaq Stock Market under the symbol: "ANSS".

On February 14, 2020, there were 126 stockholders of record.

We have not historically paid cash dividends on our common stock as we have retained earnings primarily for acquisitions, for future business opportunities, to make payments on outstanding debt balances and to repurchase stock when authorized by the Board of Directors and when such repurchase meets our objectives. We review our policy with respect to the payment of dividends from time to time; however, there can be no assurance that any dividends will be paid in the future.

Performance Graph

Set forth below is a line graph comparing the yearly percentage change in the cumulative total stockholder return of our common stock, based on the market price per share of our common stock, with the total return of companies included within the Nasdaq Composite Stock Market Index, the S&P 500 Stock Index, a new industry peer group of seven companies (Autodesk, Inc., PTC Inc., Cadence Design Systems, Inc., Synopsys, Inc., Altair Engineering Inc., Aspen Technology, Inc. and Dassault Systemes SE) and an old industry peer group of four companies (Autodesk, Inc., PTC Inc., Cadence Design Systems, Inc. and Synopsys, Inc.), for the period commencing December 31, 2014 and ending December 31, 2019. The calculation of total cumulative returns assumes a \$100 investment in our common stock, the Nasdaq Composite Stock Market Index, the S&P 500 Stock Index, the new peer group and the old peer group on December 31, 2014, and the reinvestment of all dividends, and accounts for all stock splits. The historical information set forth below is not necessarily indicative of future performance.



ASSUMES \$100 INVESTED ON DECEMBER 31, 2014

ASSUMES DIVIDENDS REINVESTED

FIVE FISCAL YEARS ENDED DECEMBER 31, 2019

	As of December 31,					
	2014	2015	2016	2017	2018	2019
ANSYS, Inc.	\$100	\$113	\$113	\$180	\$174	\$314
Nasdaq Composite	\$100	\$107	\$116	\$151	\$147	\$200
S&P 500 Stock Index	\$100	\$101	\$114	\$138	\$132	\$174
New Peer Group⁽¹⁾	\$100	\$103	\$119	\$169	\$193	\$273
Old Peer Group	\$100	\$103	\$128	\$187	\$214	\$305

⁽¹⁾ The new peer group is inclusive of the old peer group plus three companies added in 2019 (Altair Engineering Inc., Aspen Technology, Inc. and Dassault Systemes SE). The companies were added to enhance the comparability of the peer group to our size and business.

Unregistered Sale of Equity Securities and Use of Proceeds

None.

Issuer Purchases of Equity Securities

None.

ITEM 6. SELECTED FINANCIAL DATA

The following table sets forth selected financial data as of and for the year ended December 31 for each of the last five years. This selected financial data should be read in conjunction with the consolidated financial statements and related notes included in Part IV, Item 15 of this Annual Report on Form 10-K.

<i>(in thousands, except per share data)</i>	Year Ended December 31,				
	2019 ⁽¹⁾	2018 ⁽²⁾	2017	2016	2015
Total revenue	\$ 1,515,892	\$ 1,293,636	\$ 1,095,250	\$ 988,465	\$ 942,753
Operating income	515,040	476,574	390,728	376,242	353,679
Net income	451,295	419,375	259,251	265,636	252,521
Earnings per share – basic	\$ 5.36	\$ 4.99	\$ 3.05	\$ 3.05	\$ 2.82
Weighted average shares – basic	84,259	83,973	84,988	87,227	89,561
Earnings per share – diluted	\$ 5.25	\$ 4.88	\$ 2.98	\$ 2.99	\$ 2.76
Weighted average shares – diluted	85,925	85,913	86,854	88,969	91,502
Total assets	\$ 4,838,887	\$ 3,265,964	\$ 2,941,623	\$ 2,800,526	\$ 2,729,904
Working capital	860,340	786,410	661,713	630,301	592,280
Long-term liabilities	690,368	91,650	87,239	53,021	51,331
Stockholders' equity	3,453,379	2,649,547	2,245,831	2,208,405	2,194,427
Cash provided by operating activities ⁽³⁾	499,936	484,988	427,660	365,980	375,699

⁽¹⁾Effective January 1, 2019, we adopted new guidance on leases. We elected to adopt the change in accounting principle using the modified retrospective approach. Results for reporting periods beginning after January 1, 2019 are presented under the new guidance, while prior period amounts are not adjusted and continue to be reported in accordance with previous guidance (ASC 840). For further information, see Note 2 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

⁽²⁾Effective January 1, 2018, we adopted new guidance on revenue recognition. We elected to adopt the change in accounting principle using the modified retrospective approach. Results for reporting periods beginning after January 1, 2018 are presented under the new guidance, while prior period amounts are not adjusted and continue to be reported in accordance with previous guidance. For further information, see Note 3 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

⁽³⁾During fiscal year 2019, we retrospectively adopted new guidance on the accounting for costs incurred to implement a cloud computing arrangement (CCA) that is a service arrangement. As a result of the adoption, operating cash flows decreased with a corresponding increase to investing cash flows by \$2.5 million, \$1.4 million and \$2.8 million for the years ending December 31, 2019, 2018 and 2017, respectively. The adoption had no impact on our consolidated balance sheets or consolidated statements of income. Fiscal years 2016 and 2015 have not been restated in the table above. For further information, see Note 2 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

In the table above, the comparability of information among the years presented is impacted by our acquisitions. The operating results of our acquisitions have been included in the results of operations since their respective acquisition dates. For further information, see the "Acquisitions" section of Management's Discussion and Analysis of Financial Condition and Results of Operations in Item 7 and Note 4 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS**Overview***Overall GAAP and Non-GAAP Results*

Our growth rates of GAAP and non-GAAP results for the year ended December 31, 2019 as compared to the year ended December 31, 2018 were as follows:

	Year Ended December 31, 2019	
	GAAP	Non-GAAP
Revenue	17.2%	17.3%
Operating income	8.1%	12.0%
Diluted earnings per share	7.6%	10.0%

We experienced higher revenue during the year ended December 31, 2019 from double-digit growth in lease licenses, maintenance and service, partially driven by contributions from our recent acquisitions. We also experienced increased operating expenses primarily due to increased personnel costs, higher stock-based compensation and additional operating expenses related to acquisitions, partially offset by a reduction in expenses due to a stronger U.S. Dollar.

The non-GAAP results exclude the income statement effects of the acquisition accounting adjustments to deferred revenue, stock-based compensation, amortization of acquired intangible assets, transaction costs related to business combinations, and adjustments related to the transition tax associated with the Tax Cuts and Jobs Act. For further disclosure regarding non-GAAP results, see the section titled "Non-GAAP Results" immediately preceding the section titled "Liquidity and Capital Resources."

Impact of Foreign Currency

Our comparative financial results were impacted by fluctuations in the U.S. Dollar during the year ended December 31, 2019 as compared to the year ended December 31, 2018. The impacts on our revenue and operating income due to currency fluctuations are reflected in the table below. Amounts in brackets indicate an adverse impact from currency fluctuations.

<i>(in thousands)</i>	Year Ended December 31, 2019	
	GAAP	Non-GAAP
Revenue	\$ (24,008)	\$ (24,235)
Operating income	\$ (10,213)	\$ (11,062)

In constant currency, our growth rates were as follows:

	Year Ended December 31, 2019	
	GAAP	Non-GAAP
Revenue	19.0%	19.2%
Operating income	10.2%	13.8%

Constant currency amounts exclude the effects of foreign currency fluctuations on the reported results. To present this information, the 2019 results for entities whose functional currency is a currency other than the U.S. Dollar were converted to U.S. Dollars at rates that were in effect for the 2018 comparable period, rather than the actual exchange rates in effect for 2019. Constant currency growth rates are calculated by adjusting the 2019 reported revenue and operating income amounts by the 2019 currency fluctuation impacts and comparing to the 2018 comparable period reported revenue and operating income amounts.

Other Financial Information

Our financial position includes \$872.4 million in cash and short-term investments, and working capital of \$860.3 million as of December 31, 2019.

During the year ended December 31, 2019, we repurchased 0.3 million shares for \$59.1 million at an average price of \$179.41 per share under our stock repurchase program.

Business

Ansys, a Delaware corporation formed in 1994, develops and globally markets engineering simulation software and services widely used by engineers, designers, researchers and students across a broad spectrum of industries and academia, including aerospace and defense, automotive, electronics, semiconductors, energy, materials and chemical processing, turbomachinery, consumer products, healthcare, and sports. Headquartered south of Pittsburgh, Pennsylvania, we employed approximately 4,100 people as of December 31, 2019. We focus on the development of open and flexible solutions that enable users to analyze designs directly on the desktop, providing a common platform for fast, efficient and cost-conscious product development, from design concept to final-stage testing and validation. We distribute our suite of simulation technologies through a global network of independent resellers and distributors (collectively, channel partners) and direct sales offices in strategic, global locations. It is our intention to continue to maintain this hybrid sales and distribution model.

We license our technology to businesses, educational institutions and governmental agencies. Growth in our revenue is affected by the strength of global economies, general business conditions, currency exchange rate fluctuations, customer budgetary constraints and the competitive position of our products. Please see Part I. Item 1A. of this Annual Report on Form 10-K for a complete discussion of factors that might impact our financial condition and operating results. We believe that the features, functionality and integrated multiphysics capabilities of our software products are as strong as they have ever been. However, the software business is generally characterized by long sales cycles. These long sales cycles increase the difficulty of predicting sales for any particular quarter. We make many operational and strategic decisions based upon short- and long-term sales forecasts that are impacted not only by these long sales cycles, but also by current global economic conditions. As a result, we believe that our overall performance is best measured by fiscal year results rather than by quarterly results. Please see the sub-section entitled "Financial Risks" under Part I. Item 1A. of this Annual Report on Form 10-K for additional discussion of the potential impact of our sales forecasts on our financial condition, cash flows and operating results.

Management considers the competition and price pressure that it faces in the short- and long-term by focusing on expanding the breadth, depth, ease of use and quality of the technologies, features, functionality and integrated multiphysics capabilities of our software products as compared to our competitors; investing in research and development to develop new and innovative products and increase the capabilities of our existing products; supplying new products and services; focusing on customer needs, training, consulting and support; and enhancing our distribution channels. We also consider acquisitions to supplement our global engineering talent, product offerings and distribution channels.

Geographic Trends

The following table presents our geographic constant currency revenue growth during the year ended December 31, 2019 as compared to the year ended December 31, 2018:

	Year Ended December 31, 2019
Americas	25.4%
Europe, Middle East and Africa (EMEA)	13.8%
Asia-Pacific	15.6%
Total	19.0%

We continue to focus on a number of sales improvement activities across the geographic regions, including sales hiring, pipeline building, productivity initiatives and customer engagement activities.

As trade tensions between the U.S. and China continue, as well as the uncertainty around China's ability to control the coronavirus outbreak, our ability to sell and ship our products to certain customers and our ability to collect against existing trade receivables may be further restricted and could have an adverse effect on our business, results of operations or financial condition. For additional details, refer to Part I. Item 1A. of this Annual Report on Form 10-K.

Industry Commentary:

Our three largest industries — high-tech, automotive, and aerospace and defense (A&D) — remained strong throughout 2019. The high-tech industry was positively impacted by companies' investments in 5G and smart connected products. The automotive industry continued its momentum due to continued investments by our customers to capture the disruptive mobility trends of autonomy and electrification. Defense spending continued to support growth in the aerospace and defense industry.

Acquisitions

On November 1, 2019, we completed the acquisition of 100% of the shares of LST, the premier provider of explicit dynamics and other advanced finite element analysis technology, for a purchase price of \$777.8 million. The acquisition empowers our customers to solve a new class of engineering challenges, including developing safer automobiles, aircraft and trains while reducing or even eliminating the need for costly physical testing.

On February 1, 2019, we completed the acquisition of 100% of the shares of Granta Design, the premier provider of materials information technology, for a purchase price of \$208.7 million. The acquisition expands our portfolio into this important area, giving customers access to materials intelligence, including data that is critical to successful simulations.

Additionally, during the year ended December 31, 2019, we acquired Dynardo, Helic and DfR Solutions to combine the acquired technologies with our existing comprehensive multiphysics portfolio. These acquisitions were not individually significant. The combined purchase price of these acquisitions was \$136.2 million.

During the year ended December 31, 2018, we completed the acquisition of 100% of the shares of OPTIS, a premier provider of software for scientific simulation of light, human vision and physics-based visualization, for a purchase price of \$291.0 million. The acquisition extended our portfolio into the area of optical simulation to provide comprehensive sensor solutions, covering visible and infrared light, electromagnetics and acoustics for camera, radar and lidar.

During the year ended December 31, 2017, we completed various acquisitions to expand our customer base and accelerate the development of new and innovative products to the marketplace while lowering design and engineering costs for customers. The acquisitions were not individually significant. The combined purchase price of the acquisitions was approximately \$67.0 million.

For further information on our business combinations during the years ended December 31, 2019, 2018 and 2017, see Note 4 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

Results of Operations

For purposes of the following discussion and analysis, the table below sets forth certain consolidated financial data for the years 2019, 2018 and 2017. The operating results of our acquisitions have been included in the results of operations since their respective acquisition dates.

<i>(in thousands)</i>	Year Ended December 31,		
	2019	2018	2017
Revenue:			
Software licenses	\$ 699,630	\$ 576,717	\$ 624,964
Maintenance and service	816,262	716,919	470,286
Total revenue	1,515,892	1,293,636	1,095,250
Cost of sales:			
Software licenses	23,944	18,619	34,421
Amortization	21,710	27,034	36,794
Maintenance and service	120,619	110,232	78,949
Total cost of sales	166,273	155,885	150,164
Gross profit	1,349,619	1,137,751	945,086
Operating expenses:			
Selling, general and administrative	521,200	413,580	338,640
Research and development	298,210	233,802	202,746
Amortization	15,169	13,795	12,972
Total operating expenses	834,579	661,177	554,358
Operating income	515,040	476,574	390,728
Interest income	12,796	11,419	6,962
Interest expense	(3,461)	(59)	(86)
Other expense, net	(1,792)	(849)	(1,910)
Income before income tax provision	522,583	487,085	395,694
Income tax provision	71,288	67,710	136,443
Net income	\$ 451,295	\$ 419,375	\$ 259,251

Effective January 1, 2018, we adopted new guidance on revenue recognition. We elected to adopt the change in accounting principle using the modified retrospective approach. Results for reporting periods beginning after January 1, 2018 are presented under the new guidance, while prior period amounts are not adjusted and continue to be reported in accordance with previous guidance. For further information, see Note 3 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

Year Ended December 31, 2019 Compared to Year Ended December 31, 2018
Revenue:

<i>(in thousands, except percentages)</i>	Year Ended December 31,		Change		
	2019	2018	Amount	%	Constant Currency %
Revenue:					
Lease licenses	\$ 406,043	\$ 275,619	\$ 130,424	47.3	49.4
Perpetual licenses	293,587	301,098	(7,511)	(2.5)	(1.1)
Software licenses	699,630	576,717	122,913	21.3	23.1
Maintenance	760,574	676,883	83,691	12.4	14.3
Service	55,688	40,036	15,652	39.1	41.5
Maintenance and service	816,262	716,919	99,343	13.9	15.8
Total revenue	\$ 1,515,892	\$ 1,293,636	\$ 222,256	17.2	19.0

Our revenue in the year ended December 31, 2019 increased 17.2% as compared to the year ended December 31, 2018, or 19.0% in constant currency. The growth rate was favorably impacted by our continued investments in our global sales, support and marketing organizations, as well as our 2019 and 2018 acquisitions which contributed incremental revenue of \$72.9 million. Lease license revenue increased 47.3%, or 49.4% in constant currency, as compared to the year ended December 31, 2018, driven primarily by an increase in multi-year lease contracts. Annual maintenance contracts that were sold with new perpetual licenses, maintenance contracts for new perpetual licenses sold in previous years and the maintenance portion of lease license contracts each contributed to maintenance revenue growth of 12.4%, or 14.3% in constant currency. Service revenue, driven primarily by a focus on service offerings that provide on-site mentorship on simulation best practices, training and expanding simulation adoption, increased 39.1%, or 41.5% in constant currency, as compared to the year ended December 31, 2018. Perpetual license revenue, which is derived primarily from new sales during the year ended December 31, 2019, decreased 2.5%, or 1.1% in constant currency, as compared to the year ended December 31, 2018.

We continue to experience increased interest by some of our larger customers in enterprise agreements that often include longer-term, time-based licenses involving a larger number of our software products. While these arrangements typically involve a higher overall transaction price, the upfront recognition of license revenue related to these larger, multi-year transactions can result in significantly higher lease license revenue and corresponding revenue growth volatility. As software products, across a large variety of applications and industries, become increasingly distributed in software-as-a-service, cloud and other subscription environments in which the licensing approach is time-based rather than perpetual, we are also experiencing a shifting preference from perpetual licenses to time-based licenses across a broader spectrum of our customers.

With respect to revenue, on average for the year ended December 31, 2019, the U.S. Dollar was approximately 3.3% stronger, when measured against our primary foreign currencies, than for the year ended December 31, 2018. The table below presents the impacts of currency fluctuations on revenue for the year ended December 31, 2019. Amounts in brackets indicate an adverse impact from currency fluctuations.

<i>(in thousands)</i>	Year Ended December 31, 2019
Euro	\$ (17,361)
South Korean Won	(5,097)
British Pound	(1,881)
Japanese Yen	1,791
Other	(1,460)
Total	\$ (24,008)

The net overall stronger U.S. Dollar also resulted in decreased operating income of \$10.2 million for the year ended December 31, 2019 as compared to the year ended December 31, 2018.

As a percentage of revenue, our international and domestic revenues, and our direct and indirect revenues, were as follows:

	Year Ended December 31,	
	2019	2018
International	57.9%	60.9%
Domestic	42.1%	39.1%
Direct	77.1%	77.6%
Indirect	22.9%	22.4%

In valuing deferred revenue on the balance sheets of our recent acquisitions as of their respective acquisition dates, we applied the fair value provisions applicable to the accounting for business combinations, resulting in a reduction of deferred revenue as compared to the historical carrying amount. As a result, our post-acquisition revenue will be less than the sum of what would have otherwise been reported by us and each acquiree absent the acquisitions. The impacts on reported revenue were \$12.5 million and \$9.4 million for the years ended December 31, 2019 and 2018, respectively. The expected impacts on reported revenue are \$3.9 million and \$8.0 million for the quarter ending March 31, 2020 and the year ending December 31, 2020, respectively.

Cost of Sales and Operating Expenses:

The tables below reflect our operating results as presented on the consolidated statements of income, which are inclusive of foreign currency translation impacts. Amounts included in the discussions that follow each table are provided in constant currency and are inclusive of costs related to our acquisitions. The impact of foreign exchange translation is discussed separately, where material. The 2019 and 2018 acquisitions contributed \$54.7 million to the overall increase in cost of sales and operating expenses with the most significant contributions from the OPTIS (May 2, 2018) and Granta Design (February 1, 2019) acquisitions of \$17.3 million and \$18.9 million, respectively.

(in thousands, except percentages)	Year Ended December 31,					
	2019		2018		Change	
	Amount	% of Revenue	Amount	% of Revenue	Amount	%
Cost of sales:						
Software licenses	\$ 23,944	1.6	\$ 18,619	1.4	\$ 5,325	28.6
Amortization	21,710	1.4	27,034	2.1	(5,324)	(19.7)
Maintenance and service	120,619	8.0	110,232	8.5	10,387	9.4
Total cost of sales	166,273	11.0	155,885	12.1	10,388	6.7
Gross profit	\$ 1,349,619	89.0	\$ 1,137,751	87.9	\$ 211,868	18.6

Software Licenses: The increase in the cost of software licenses was primarily due to increased third-party royalties of \$5.6 million.

Amortization: The net decrease in amortization expense was primarily due to a decrease in the amortization of trade names and acquired technology due to assets that became fully amortized, which was partially offset by the amortization of newly acquired intangible assets.

Maintenance and Service: The net increase in maintenance and service costs was primarily due to the following:

- Increased salaries of \$4.0 million.
- Increased stock-based compensation of \$3.3 million.
- Increased consulting costs of \$1.7 million.
- Increased IT maintenance and software hosting costs of \$1.3 million.
- Decreased costs related to foreign exchange translation of \$2.0 million due to a stronger U.S. Dollar.

The improvement in gross profit was a result of the increase in revenue, partially offset by the increase in the related cost of sales.

(in thousands, except percentages)	Year Ended December 31,					
	2019		2018		Change	
	Amount	% of Revenue	Amount	% of Revenue	Amount	%
Operating expenses:						
Selling, general and administrative	\$ 521,200	34.4	\$ 413,580	32.0	\$ 107,620	26.0
Research and development	298,210	19.7	233,802	18.1	64,408	27.5
Amortization	15,169	1.0	13,795	1.1	1,374	10.0
Total operating expenses	\$ 834,579	55.1	\$ 661,177	51.1	\$ 173,402	26.2

Selling, General and Administrative: The net increase in selling, general and administrative costs was primarily due to the following:

- Increased salaries, incentive compensation and other headcount-related costs of \$63.7 million.
- Increased stock-based compensation of \$13.5 million.
- Increased business travel of \$6.5 million.
- Increased marketing expenses of \$5.4 million.
- Increased professional fees of \$4.5 million.
- Increased consulting costs of \$4.2 million.
- Decreased costs related to foreign exchange translation of \$7.1 million due to a stronger U.S. Dollar.

We anticipate that we will continue to make targeted investments in our global sales and marketing organizations and our global business infrastructure to enhance and support our revenue-generating activities.

Research and Development: The increase in research and development costs was primarily due to the following:

- Increased salaries, incentive compensation and other headcount-related costs of \$41.1 million.
- Increased stock-based compensation of \$16.0 million.

We have traditionally invested significant resources in research and development activities and intend to continue to make investments in expanding the ease of use and capabilities of our broad portfolio of simulation software products.

Interest Income: Interest income for the year ended December 31, 2019 was \$12.8 million as compared to \$11.4 million for the year ended December 31, 2018. Interest income increased as a result of an increase in the average rate of return on invested cash balances.

Interest Expense: Interest expense for the year ended December 31, 2019 was \$3.5 million as compared to \$0.1 million for the year ended December 31, 2018. Interest expense increased as a result of the interest incurred on debt financing obtained in fiscal year 2019.

Other Expense, net: Our other expense consisted of the following:

(in thousands)	Year Ended December 31,	
	2019	2018
Foreign currency losses, net	\$ (2,510)	\$ (3,058)
Investment gains, net	333	2,204
Other	385	5
Total other expense, net	\$ (1,792)	\$ (849)

Income Tax Provision: Our income before income tax provision, income tax provision and effective tax rate were as follows:

<i>(in thousands, except percentages)</i>	Year Ended December 31,	
	2019	2018
Income before income tax provision	\$ 522,583	\$ 487,085
Income tax provision	\$ 71,288	\$ 67,710
Effective tax rate	13.6%	13.9%

The decrease in the effective tax rate from the prior year was primarily due to \$6.7 million of benefit related to the release of valuation allowance in a foreign jurisdiction and \$1.8 million of benefit related to transition tax recorded in 2019. These benefits are offset by \$6.7 million of benefit recorded in 2018 related to global legal entity restructuring activities that did not recur in 2019.

When compared to the federal and state combined statutory rate for each respective period, the effective tax rates for the years ended December 31, 2019 and 2018 were favorably impacted by tax benefits from stock-based compensation, the foreign-derived intangible income deduction, and research and development credits.

Net Income: Our net income, diluted earnings per share and weighted average shares used in computing diluted earnings per share were as follows:

<i>(in thousands, except per share data)</i>	Year Ended December 31,	
	2019	2018
Net income	\$ 451,295	\$ 419,375
Diluted earnings per share	\$ 5.25	\$ 4.88
Weighted average shares outstanding - diluted	85,925	85,913

Year Ended December 31, 2018 Compared to Year Ended December 31, 2017
Revenue:

<i>(in thousands, except percentages)</i>	Year Ended December 31,		Change		
	2018 (ASC 606)	2017 (ASC 605)	Amount	%	Constant Currency %
Revenue:					
Lease licenses	\$ 275,619	\$ 376,886	\$ (101,267)	(26.9)	(27.4)
Perpetual licenses	301,098	248,078	53,020	21.4	20.2
Software licenses	576,717	624,964	(48,247)	(7.7)	(8.5)
Maintenance	676,883	440,428	236,455	53.7	51.6
Service	40,036	29,858	10,178	34.1	33.1
Maintenance and service	716,919	470,286	246,633	52.4	50.4
Total revenue	\$ 1,293,636	\$ 1,095,250	\$ 198,386	18.1	16.8

The adoption of ASC 606 significantly impacted the timing, allocation and presentation of lease license, perpetual license and maintenance revenue. For further information about this adoption, see Note 3 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

For purposes of comparability, the changes in the following table and the related discussion that follows are presented in accordance with ASC 605.

<i>(in thousands, except percentages)</i>	Year Ended December 31,		Change		
	2018 (ASC 605)	2017 (ASC 605)	Amount	%	Constant Currency %
Revenue:					
Lease licenses	\$ 421,268	\$ 376,886	\$ 44,382	11.8	10.7
Perpetual licenses	255,578	248,078	7,500	3.0	2.0
Software licenses	676,846	624,964	51,882	8.3	7.2
Maintenance	499,510	440,428	59,082	13.4	11.6
Service	40,113	29,858	10,255	34.3	33.4
Maintenance and service	539,623	470,286	69,337	14.7	13.0
Total revenue	\$ 1,216,469	\$ 1,095,250	\$ 121,219	11.1	9.7

Our ASC 605 revenue in the year ended December 31, 2018 increased 11.1% as compared to the year ended December 31, 2017, while revenue grew 9.7% in constant currency. The growth rate was favorably impacted by our continued investments in our global sales, support and marketing organizations; continued progress with market segmentation and go-to-market adjustments; and the May 2018 acquisition of OPTIS. Lease license revenue increased 11.8%, or 10.7% in constant currency, as compared to the year ended December 31, 2017. Perpetual license revenue, which is derived primarily from new sales during the year, increased 3.0%, or 2.0% in constant currency, as compared to the year ended December 31, 2017. Annual maintenance contracts that were sold with new perpetual licenses, along with maintenance contracts for perpetual licenses sold in previous years, contributed to maintenance revenue growth of 13.4%, or 11.6% in constant currency. Service revenue, driven primarily by a focus on service offerings that provide on-site mentorship on simulation best practices, training and expanding simulation adoption, increased 34.3%, or 33.4% in constant currency, as compared to the year ended December 31, 2017.

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With respect to revenue, on average for the year ended December 31, 2018, the U.S. Dollar was approximately 2.3% weaker and 2.6% weaker, when measured against our primary foreign currencies, than for the year ended December 31, 2017 under ASC 606 and ASC 605, respectively. The table below presents the impacts of currency fluctuations on revenue for the year ended December 31, 2018. Amounts in brackets indicate a net adverse impact from currency fluctuations.

<i>(in thousands)</i>	Year Ended December 31, 2018	
	ASC 606	ASC 605
Euro	\$ 12,498	\$ 11,915
Japanese Yen	2,088	2,075
South Korean Won	918	1,182
British Pound	870	1,083
Indian Rupee	(1,623)	(1,372)
Other	(129)	(36)
Total	\$ 14,622	\$ 14,847

The net overall weaker U.S. Dollar also resulted in increased operating income of \$9.6 million and \$10.3 million for the year ended December 31, 2018 as compared to the year ended December 31, 2017 under ASC 606 and ASC 605, respectively.

As a percentage of revenue, our international and domestic revenues, and our direct and indirect revenues, were as follows:

	Year Ended December 31,		
	2018 (ASC 606)	2018 (ASC 605)	2017 (ASC 605)
International	60.9%	60.5%	61.9%
Domestic	39.1%	39.5%	38.1%
Direct	77.6%	76.5%	75.2%
Indirect	22.4%	23.5%	24.8%

In valuing deferred revenue on the balance sheets of our recent acquisitions as of their respective acquisition dates, we applied the fair value provisions applicable to the accounting for business combinations, resulting in a reduction of deferred revenue as compared to the historical carrying amount. As a result, our post-acquisition revenue will be less than the sum of what would have otherwise been reported by us and each acquiree absent the acquisitions. Under ASC 606, the impact on reported revenue was \$9.4 million for the year ended December 31, 2018. Under ASC 605, the impacts on reported revenue were \$15.6 million and \$2.9 million for the years ended December 31, 2018 and 2017, respectively.

Cost of Sales and Operating Expenses:

The tables below reflect our operating results as presented on the consolidated statements of income, which are inclusive of foreign currency translation impacts. The adoption of ASC 606 resulted in a reclassification of expenses within cost of sales from software licenses to maintenance and service. Amounts included in the discussion that follows are provided in constant currency and do not include the impact of the OPTIS acquisition. The impact of the OPTIS acquisition on each expense line is provided separately, where material. The impact, where material, of foreign exchange translation on each expense line is also provided separately and is inclusive of the OPTIS acquisition.

<i>(in thousands, except percentages)</i>	Year Ended December 31,					
	2018		2017		Change	
	Amount	% of Revenue	Amount	% of Revenue	Amount	%
Cost of sales:						
Software licenses	\$ 18,619	1.4	\$ 34,421	3.1	\$ (15,802)	(45.9)
Amortization	27,034	2.1	36,794	3.4	(9,760)	(26.5)
Maintenance and service	110,232	8.5	78,949	7.2	31,283	39.6
Total cost of sales	155,885	12.1	150,164	13.7	5,721	3.8
Gross profit	\$ 1,137,751	87.9	\$ 945,086	86.3	\$ 192,665	20.4

Software Licenses: The net decrease in the cost of software licenses was primarily due to the following:

- Reclassification of \$18.2 million of cost of sales, previously reflected within software licenses, to maintenance and service due to the adoption of ASC 606 in 2018.
- OPTIS-related software license expenses of \$1.6 million for the period from the acquisition date (May 2, 2018) through December 31, 2018.

Amortization: The decrease in amortization expense was primarily due to a net decrease in the amortization of trade names and acquired technology due to assets that became fully amortized.

Maintenance and Service: The increase in maintenance and service costs was primarily due to the following:

- Reclassification of \$18.2 million of cost of sales, previously reflected within software licenses, to maintenance and service due to the adoption of ASC 606 in 2018.
- Increased third-party technical support of \$5.5 million.
- OPTIS-related maintenance and service expenses of \$2.8 million for the period from the acquisition date (May 2, 2018) through December 31, 2018.
- Increased salaries of \$2.1 million.

The improvement in gross profit was a result of the increase in revenue, partially offset by the increase in the related cost of sales.

(in thousands, except percentages)	Year Ended December 31,					
	2018		2017		Change	
	Amount	% of Revenue	Amount	% of Revenue	Amount	%
Operating expenses:						
Selling, general and administrative	\$ 413,580	32.0	\$ 338,640	30.9	\$ 74,940	22.1
Research and development	233,802	18.1	202,746	18.5	31,056	15.3
Amortization	13,795	1.1	12,972	1.2	823	6.3
Total operating expenses	\$ 661,177	51.1	\$ 554,358	50.6	\$ 106,819	19.3

Selling, General and Administrative: The net increase in selling, general and administrative costs was primarily due to the following:

- Increased salaries, incentive compensation and other headcount-related costs of \$35.2 million.
- Increased stock-based compensation of \$15.3 million.
- OPTIS-related selling, general and administrative expenses of \$13.8 million for the period from the acquisition date (May 2, 2018) through December 31, 2018.
- Increased business travel of \$3.9 million.
- Increased severance expenses of \$3.7 million.
- Decreased consulting costs of \$7.1 million.

Research and Development: The net increase in research and development costs was primarily due to the following:

- Increased salaries, incentive compensation and other headcount-related costs of \$15.2 million.
- Increased stock-based compensation of \$11.6 million.
- OPTIS-related research and development expenses of \$5.9 million for the period from the acquisition date (May 2, 2018) through December 31, 2018.
- Increased IT maintenance and software hosting costs of \$1.5 million.
- Restructuring costs of \$6.8 million related to 2017 workforce realignment activities that did not reoccur in 2018.

Interest Income: Interest income for the year ended December 31, 2018 was \$11.4 million as compared to \$7.0 million for the year ended December 31, 2017. Interest income increased as a result of an increase in the average rate of return on invested cash balances.

Other Expense, net: Our other expense, net consists of the following:

(in thousands)	Year Ended December 31,	
	2018	2017
Foreign currency losses, net	\$ (3,058)	\$ (1,935)
Investment gains, net	2,204	24
Other	5	1
Total other expense, net	\$ (849)	\$ (1,910)

Income Tax Provision: Our income before income tax provision, income tax provision and effective tax rate were as follows:

(in thousands, except percentages)	Year Ended December 31,		
	2018 (ASC 606)	2018 (ASC 605)	2017 (ASC 605)
Income before income tax provision	\$ 487,085	\$ 409,918	\$ 395,694
Income tax provision	\$ 67,710	\$ 53,067	\$ 136,443
Effective tax rate	13.9%	12.9%	34.5%

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (Tax Reform). Tax Reform made broad and complex changes to the U.S. tax code, including, but not limited to, (1) reducing the U.S. federal corporate tax rate from 35 percent to 21 percent; (2) requiring companies to pay a one-time federal income tax on certain unrepatriated earnings of foreign subsidiaries (transition tax); (3) generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; (4) creating a new provision designed to tax global intangible low-taxed income (GILTI) which allows for the possibility of using foreign tax credits (FTCs) and a deduction of up to 50 percent to offset the income tax liability (subject to some limitations); (5) repealing the domestic production activity deduction; (6) creating the foreign-derived intangible income deduction; (7) creating the base erosion anti-abuse tax, a new minimum tax; (8) allowing for full expensing of qualified property through bonus depreciation; and (9) creating limitations on the deductibility of certain executive compensation.

The SEC staff issued Staff Accounting Bulletin (SAB) 118, which provides guidance on accounting for the tax effects of Tax Reform. SAB 118 provided a measurement period that was limited to one year from enactment for companies to complete the accounting under ASC 740, *Income Taxes*. In accordance with SAB 118, throughout the measurement period, a company must reflect the income tax effects of those aspects of Tax Reform for which the accounting under ASC 740 was complete in the financial statements. To the extent that a company's accounting for certain income tax effects of Tax Reform was incomplete, but a reasonable estimate was able to be made, the company must record a provisional estimate in the financial statements. If a company could not determine a provisional estimate to be included in the financial statements, it should continue to apply ASC 740 on the basis of the tax laws that were in effect immediately before the enactment of Tax Reform.

As further discussed below, we finalized our provisional Tax Reform calculations as of the end of the measurement period, based on guidance and information available as of the reporting date. The U.S. government has not yet issued final guidance related to a portion of the new rules enacted as part of Tax Reform. Subsequent adjustments, if any, will be recorded in the period in which guidance is finalized.

Our accounting for the impact of the reduction in the U.S. federal corporate tax rate on our deferred tax assets and liabilities is complete. Tax Reform reduced the corporate tax rate to 21 percent, effective January 1, 2018. Consequently, we recorded a net adjustment to deferred income tax expense of \$1.9 million for the year ended December 31, 2017 to revalue our deferred tax assets and liabilities. No further adjustments were recorded for the year ended December 31, 2018.

Our accounting for the transition tax is complete. Reasonable estimates of certain effects were calculated and a provisional adjustment of \$16.0 million was recorded in the December 31, 2017 financial statements. To determine the amount of the transition tax, we determined, in addition to other factors, the amount of post-1986 earnings and profits (E&P) of the relevant subsidiaries, as well as the amount of non-U.S. income taxes paid on such earnings. Based on revised E&P calculations updated during the measurement period, we recognized an additional measurement-period adjustment for the year ended December 31, 2018 of \$0.9 million to the transition tax obligation and a corresponding adjustment to tax expense.

Our accounting for the indefinite reinvestment assertion is complete. In general, it is our intention to permanently reinvest all earnings in excess of previously taxed amounts. As part of Tax Reform, substantially all of the previous earnings of our non-U.S. subsidiaries were taxed through the transition tax and current earnings are taxed as part of GILTI tax expense. These taxes increased our previously taxed earnings and allow for the repatriation of the majority of our foreign earnings without any residual U.S. federal tax. During the year ended December 31, 2018, we repatriated \$144.3 million of foreign cash. We did not make any adjustments related to our indefinite reinvestment assertion during the year ended December 31, 2018.

Our accounting policy choice for GILTI is complete. Under U.S. GAAP, we are allowed to make an accounting policy choice of either (1) treating taxes due on future U.S. inclusions in taxable income related to GILTI as a current-period expense when incurred (the period cost method) or (2) factoring such amounts into the measurement of our deferred taxes (the deferred method). We selected the period cost method and recorded GILTI tax expense of \$0.4 million in the financial statements for the year ended December 31, 2018.

The decrease in the effective tax rate from the prior year was primarily due to the reduction in the U.S. federal corporate tax rate from 35 percent to 21 percent enacted as part of Tax Reform, the additional \$15.1 million of transition tax in 2017 when compared to 2018, and a net \$6.7 million benefit related to global legal entity restructuring activities. The effective tax rate was also reduced by the foreign-derived intangible income deduction, increased research and development credits and increased stock-based compensation benefits, partially offset by the loss of the domestic manufacturing deduction, which was repealed as part of Tax Reform.

When compared to the federal and state combined statutory rate, the effective tax rates for the years ended December 31, 2018 and 2017 were favorably impacted by tax benefits from stock-based compensation and research and development credits.

Net Income: Our net income, diluted earnings per share and weighted average shares used in computing diluted earnings per share were as follows:

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2018 (ASC 606)	2018 (ASC 605)	2017 (ASC 605)
Net income	\$ 419,375	\$ 356,851	\$ 259,251
Diluted earnings per share	\$ 4.88	\$ 4.15	\$ 2.98
Weighted average shares outstanding - diluted	85,913	85,913	86,854

Non-GAAP Results

We provide non-GAAP revenue, non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share as supplemental measures to GAAP regarding our operational performance. These financial measures exclude the impact of certain items and, therefore, have not been calculated in accordance with GAAP. A detailed explanation and a reconciliation of each non-GAAP financial measure to our most comparable GAAP financial measure are described below.

<i>(in thousands, except percentages and per share data)</i>	ASC 606					
	Year Ended December 31,					
	2019			2018		
	GAAP Results	Adjustments	Non-GAAP Results	GAAP Results	Adjustments	Non-GAAP Results
Total revenue	\$ 1,515,892	\$ 12,514 (1)	\$ 1,528,406	\$ 1,293,636	\$ 9,442 (4)	\$ 1,303,078
Operating income	515,040	177,093 (2)	692,133	476,574	141,442 (5)	618,016
Operating profit margin	34.0%		45.3%	36.8%		47.4%
Net income	\$ 451,295	\$ 113,702 (3)	\$ 564,997	\$ 419,375	\$ 94,510 (6)	\$ 513,885
Earnings per share – diluted:						
Earnings per share	\$ 5.25		\$ 6.58	\$ 4.88		\$ 5.98
Weighted average shares	85,925		85,925	85,913		85,913

- (1) Amount represents the revenue not reported during the period as a result of the acquisition accounting adjustment associated with the accounting for deferred revenue in business combinations.
- (2) Amount represents \$116.2 million of stock-based compensation expense, \$4.9 million of excess payroll taxes related to stock-based awards, \$36.9 million of amortization expense associated with intangible assets acquired in business combinations, \$6.6 million of transaction expenses related to business combinations and the \$12.5 million adjustment to revenue as reflected in (1) above.
- (3) Amount represents the impact of the adjustments to operating income referred to in (2) above, decreased for the related income tax impact of \$61.2 million, adjustments related to the transition tax associated with the Tax Cuts and Jobs Act of \$1.8 million, and rabbi trust income of \$0.4 million.
- (4) Amount represents the revenue not reported during the period as a result of the acquisition accounting adjustment associated with the accounting for deferred revenue in business combinations.
- (5) Amount represents \$83.3 million of stock-based compensation expense, \$4.3 million of excess payroll taxes related to stock-based awards, \$40.8 million of amortization expense associated with intangible assets acquired in business combinations, \$3.5 million of transaction expenses related to business combinations and the \$9.4 million adjustment to revenue as reflected in (4) above.
- (6) Amount represents the impact of the adjustments to operating income referred to in (5) above, decreased for the related income tax impact of \$47.9 million and increased for a measurement-period adjustment related to the Tax Cuts and Jobs Act of \$0.9 million and rabbi trust expense of \$0.1 million.

ASC 605							
Year Ended December 31,							
<i>(in thousands, except percentages and per share data)</i>	2018			2017			
	GAAP Results	Adjustments	Non-GAAP Results	GAAP Results	Adjustments	Non-GAAP Results	
Total revenue	\$ 1,216,469	\$ 15,583 (1)	\$ 1,232,052	\$ 1,095,250	\$ 2,856 (4)	\$ 1,098,106	
Operating income	399,407	147,583 (2)	546,990	390,728	118,567 (5)	509,295	
Operating profit margin	32.8%		44.4%	35.7%		46.4%	
Net income	\$ 356,851	\$ 98,832 (3)	\$ 455,683	\$ 259,251	\$ 88,663 (6)	\$ 347,914	
Earnings per share – diluted:							
Earnings per share	\$ 4.15		\$ 5.30	\$ 2.98		\$ 4.01	
Weighted average shares	85,913		85,913	86,854		86,854	

- (1) Amount represents the revenue not reported during the period as a result of the acquisition accounting adjustment associated with the accounting for deferred revenue in business combinations.
- (2) Amount represents \$83.3 million of stock-based compensation expense, \$4.3 million of excess payroll taxes related to stock-based awards, \$40.8 million of amortization expense associated with intangible assets acquired in business combinations, \$3.5 million of transaction expenses related to business combinations and the \$15.6 million adjustment to revenue as reflected in (1) above.
- (3) Amount represents the impact of the adjustments to operating income referred to in (2) above, decreased for the related income tax impact of \$49.7 million and increased for a measurement-period adjustment related to the Tax Cuts and Jobs Act of \$0.9 million and rabbi trust expense of \$0.1 million.
- (4) Amount represents the revenue not reported during the period as a result of the acquisition accounting adjustment associated with the accounting for deferred revenue in business combinations.
- (5) Amount represents \$53.2 million of stock-based compensation expense, \$49.8 million of amortization expense associated with intangible assets acquired in business combinations, \$11.7 million of restructuring charges, \$1.1 million of transaction expenses related to business combinations and the \$2.9 million adjustment to revenue as reflected in (4) above.
- (6) Amount represents the impact of the adjustments to operating income referred to in (5) above, decreased for the related income tax impact of \$52.5 million, excluding the impact of the Tax Cuts and Jobs Act, and rabbi trust income of \$0.1 million, and increased for total net impacts of the Tax Cuts and Jobs Act of \$22.7 million.

Non-GAAP Measures

We use non-GAAP financial measures (a) to evaluate our historical and prospective financial performance as well as our performance relative to our competitors, (b) to set internal sales targets and spending budgets, (c) to allocate resources, (d) to measure operational profitability and the accuracy of forecasting, (e) to assess financial discipline over operational expenditures and (f) as an important factor in determining variable compensation for management and employees. In addition, many financial analysts that follow us focus on and publish both historical results and future projections based on non-GAAP financial measures. We believe that it is in the best interest of our investors to provide this information to analysts so that they accurately report the non-GAAP financial information. Moreover, investors have historically requested, and we have historically reported, these non-GAAP financial measures as a means of providing consistent and comparable information with past reports of financial results.

While we believe that these non-GAAP financial measures provide useful supplemental information to investors, there are limitations associated with the use of these non-GAAP financial measures. These non-GAAP financial measures are not prepared in accordance with GAAP, are not reported by all our competitors and may not be directly comparable to similarly titled measures of our competitors due to potential differences in the exact method of calculation. We compensate for these limitations by using these non-GAAP financial measures as supplements to GAAP financial measures and by reviewing the reconciliations of the non-GAAP financial measures to their most comparable GAAP financial measures.

The adjustments to these non-GAAP financial measures, and the basis for such adjustments, are outlined below:

Acquisition accounting for deferred revenue and its related tax impact. Historically, we have consummated acquisitions in order to support our strategic and other business objectives. In accordance with the fair value provisions applicable to the accounting for business combinations, acquired deferred revenue is often recorded on the opening balance sheet at an amount that is lower than the historical carrying value. Although this acquisition accounting requirement has no impact on our business or cash flow, it adversely impacts our reported GAAP revenue in the reporting periods following an acquisition. In order to provide investors with financial information that facilitates comparison of both historical and future results, we provide non-GAAP financial measures which exclude the impact of the acquisition accounting adjustment. We believe that this non-GAAP financial adjustment is useful to investors because it allows investors to (a) evaluate the effectiveness of the methodology and information used by us in our financial and operational decision-making, and (b) compare our past and future reports of financial results as the revenue reduction related to acquired deferred revenue will not recur when related annual lease licenses and software maintenance contracts are renewed in future periods.

Amortization of intangible assets from acquisitions and its related tax impact. We incur amortization of intangible assets, included in our GAAP presentation of amortization expense, related to various acquisitions we have made. We exclude these expenses and their related tax impact for the purpose of calculating non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share when we evaluate our continuing operational performance because these costs are fixed at the time of an acquisition, are then amortized over a period of several years after the acquisition and generally cannot be changed or influenced by us after the acquisition. Accordingly, we do not consider these expenses for purposes of evaluating our performance during the applicable time period after the acquisition, and we exclude such expenses when making decisions to allocate resources. We believe that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate the effectiveness of the methodology and information used by us in our financial and operational decision-making, and (b) compare our past reports of financial results as we have historically reported these non-GAAP financial measures.

Stock-based compensation expense and its related tax impact. We incur expense related to stock-based compensation included in our GAAP presentation of cost of software licenses; cost of maintenance and service; research and development expense; and selling, general and administrative expense. This non-GAAP adjustment also includes excess payroll tax expense related to stock-based compensation. Stock-based compensation expense (benefit) incurred in connection with our deferred compensation plan held in a rabbi trust includes an offsetting benefit (charge) recorded in other income (expense). Although stock-based compensation is an expense and viewed as a form of compensation, we exclude these expenses for the purpose of calculating non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share when we evaluate our continuing operational performance. We similarly exclude income (expense) related to assets held in a rabbi trust in connection with our deferred compensation plan. Specifically, we exclude stock-based compensation and income (expense) related to assets held in the deferred compensation plan rabbi trust during our annual budgeting process and our quarterly and annual assessments of our performance. The annual budgeting process is the primary mechanism whereby we allocate resources to various initiatives and operational requirements. Additionally, the annual review by our board of directors during which it compares our historical business model and profitability to the planned business model and profitability for the forthcoming year excludes the impact of stock-based compensation. In evaluating the performance of our senior management and department managers, charges related to stock-based compensation are excluded from expenditure and profitability results. In fact, we record stock-based compensation expense into a stand-alone cost center for which no single operational manager is responsible or accountable. In this way, we can review, on a period-to-period basis, each manager's performance and assess financial discipline over operational expenditures without the effect of stock-based compensation. We believe that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate our operating results and the effectiveness of the methodology used by us to review our operating results, and (b) review historical comparability in our financial reporting as well as comparability with competitors' operating results.

Restructuring charges and the related tax impact. We occasionally incur expenses for restructuring our workforce included in our GAAP presentation of cost of software licenses; cost of maintenance and service; research and development expense; and selling, general and administrative expense. We exclude these expenses for the purpose of calculating non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share when we evaluate our continuing operational performance, as we generally do not incur these expenses as a part of our operations. We believe that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate our operating results and the effectiveness of the methodology used by us to review our operating results, and (b) review historical comparability in our financial reporting as well as comparability with competitors' operating results.

Transaction costs related to business combinations. We incur expenses for professional services rendered in connection with business combinations, which are included in our GAAP presentation of selling, general and administrative expense. These expenses are generally not tax-deductible. We exclude these acquisition-related transaction expenses, derived from announced

acquisitions, for the purpose of calculating non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share when we evaluate our continuing operational performance, as we generally would not have otherwise incurred these expenses in the periods presented as a part of our operations. We believe that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate our operating results and the effectiveness of the methodology used by us to review our operating results, and (b) review historical comparability in our financial reporting as well as comparability with competitors' operating results.

Tax Cuts and Jobs Act. We recorded impacts to our income tax provision related to the enactment of the Tax Cuts and Jobs Act, specifically for the transition tax related to unrepatriated cash and the impacts of the tax rate change on net deferred tax assets. We exclude these impacts for the purpose of calculating non-GAAP net income and non-GAAP diluted earnings per share when we evaluate our continuing operational performance, as (i) the charges are not expected to recur as part of our normal operations and (ii) the charges resulted from the extremely infrequent event of major U.S. tax reform, the last such reform having occurred in 1986. We believe that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate our operating results and the effectiveness of the methodology used by us to review our operating results, and (b) review historical comparability in our financial reporting.

Non-GAAP financial measures are not in accordance with, or an alternative for, GAAP. Our non-GAAP financial measures are not meant to be considered in isolation or as a substitute for comparable GAAP financial measures and should be read only in conjunction with our consolidated financial statements prepared in accordance with GAAP.

We have provided a reconciliation of the non-GAAP financial measures to the most directly comparable GAAP financial measures as listed below:

GAAP Reporting Measure

Revenue
Operating Income
Operating Profit Margin
Net Income
Diluted Earnings Per Share

Non-GAAP Reporting Measure

Non-GAAP Revenue
Non-GAAP Operating Income
Non-GAAP Operating Profit Margin
Non-GAAP Net Income
Non-GAAP Diluted Earnings Per Share

Liquidity and Capital Resources

<i>(in thousands, except percentages)</i>	As of December 31,		Change	
	2019	2018	Amount	%
Cash, cash equivalents and short-term investments	\$ 872,382	\$ 777,364	\$ 95,018	12.2
Working capital	\$ 860,340	\$ 786,410	\$ 73,930	9.4

Cash, Cash Equivalents and Short-Term Investments

Cash and cash equivalents consist primarily of highly liquid investments such as money market funds and deposits held at major banks. Short-term investments consist primarily of deposits held by certain of our foreign subsidiaries with original maturities of three months to one year. The following table presents our foreign and domestic holdings of cash, cash equivalents and short-term investments:

<i>(in thousands, except percentages)</i>	As of December 31,			
	2019	% of Total	2018	% of Total
Domestic	\$ 626,433	71.8	\$ 616,249	79.3
Foreign	245,949	28.2	161,115	20.7
Total	\$ 872,382		\$ 777,364	

In general, it is our intention to permanently reinvest all earnings in excess of previously taxed amounts. As part of Tax Reform, substantially all of the previous earnings of our non-U.S. subsidiaries were taxed through the transition tax and current earnings are taxed as part of GILTI tax expense. These taxes increased our previously taxed earnings and allow for the repatriation of the majority of our foreign earnings without any residual U.S. federal tax. While we believe that the financial reporting bases may be greater than the tax bases of investments in foreign subsidiaries for any earnings in excess of previously taxed amounts, such amounts are considered permanently reinvested. The cumulative temporary difference related to such permanently reinvested earnings is approximately \$32.8 million and we would anticipate the tax effect on those earnings to be immaterial as a result of Tax Reform.

The amount of cash, cash equivalents and short-term investments held by foreign subsidiaries is subject to translation adjustments caused by changes in foreign currency exchange rates as of the end of each respective reporting period, the offset to which is recorded in accumulated other comprehensive loss on our consolidated balance sheet.

Cash Flows from Operating Activities

<i>(in thousands)</i>	Year Ended December 31,			Change	
	2019	2018	2017	2019 vs. 2018	2018 vs. 2017
Net cash provided by operating activities	\$ 499,936	\$ 484,988	\$ 427,660	\$ 14,948	\$ 57,328

Fiscal year 2019 as compared to fiscal year 2018

Net cash provided by operating activities increased during the current fiscal year due to increased net income (net of non-cash operating adjustments) of \$107.4 million, partially offset by decreased net cash flows from operating assets and liabilities of \$92.4 million.

Fiscal year 2018 as compared to fiscal year 2017

Net cash provided by operating activities increased during the prior fiscal year due to increased net income (net of non-cash operating adjustments) of \$151.4 million, partially offset by decreased net cash flows from operating assets and liabilities of \$94.1 million.

Cash Flows from Investing Activities

<i>(in thousands)</i>	Year Ended December 31,			Change	
	2019	2018	2017	2019 vs. 2018	2018 vs. 2017
Net cash used in investing activities	\$ (833,548)	\$ (312,231)	\$ (94,665)	\$ (521,317)	\$ (217,566)

Fiscal year 2019 as compared to fiscal year 2018

Net cash used in investing activities increased during the current fiscal year due primarily to increased acquisition-related net cash outlays of \$504.2 million and increased capital expenditures of \$23.2 million. We currently plan capital spending of \$45.0 million to \$55.0 million during fiscal year 2020 as compared to the \$44.9 million that was spent in fiscal year 2019. The level of spending will depend on various factors, including the growth of the business and general economic conditions.

Fiscal year 2018 as compared to fiscal year 2017

Net cash used in investing activities increased during the prior fiscal year due primarily to increased acquisition-related net cash outlays of \$219.1 million.

Cash Flows from Financing Activities

<i>(in thousands)</i>	Year Ended December 31,			Change	
	2019	2018	2017	2019 vs. 2018	2018 vs. 2017
Net cash provided by (used in) financing activities	\$ 429,409	\$ (262,675)	\$ (294,651)	\$ 692,084	\$ 31,976

Fiscal year 2019 as compared to fiscal year 2018

Net cash provided by financing activities increased during the current fiscal year due primarily to \$500.0 million in proceeds from long-term debt obtained in fiscal year 2019 related to the LST acquisition and decreased stock repurchases of \$210.7 million, partially offset by increased restricted stock unit withholding taxes paid in lieu of issuing shares of \$13.6 million.

Fiscal year 2018 as compared to fiscal year 2017

Net cash used in financing activities decreased during the prior fiscal year due primarily to decreased stock repurchases of \$66.2 million, partially offset by increased restricted stock unit withholding taxes paid in lieu of issuing shares of \$17.8 million and decreased proceeds from shares issued for stock-based compensation of \$11.5 million.

Other Cash Flow Information

We believe that existing cash and cash equivalent balances of \$872.1 million, together with cash generated from operations and access to the \$500.0 million revolving credit facility, will be sufficient to meet our working capital and capital expenditure requirements through the next twelve months. Our cash requirements in the future may also be financed through additional equity or debt financings. There can be no assurance that such financings can be obtained on favorable terms, if at all. We repaid \$75.0 million of our unsecured term loan in January 2020 prior to its scheduled maturity date.

Under our stock repurchase program, we repurchased shares as follows:

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2019	2018	2017
Number of shares repurchased	330	1,674	2,750
Average price paid per share	\$ 179.41	\$ 161.12	\$ 122.20
Total cost	\$ 59,116	\$ 269,801	\$ 336,042

In February 2018, our Board of Directors increased the number of shares authorized for repurchase to a total of 5.0 million shares under the stock repurchase program. As of December 31, 2019, 3.5 million shares remained available for repurchase under the program.

The authorized repurchase program does not have an expiration date, and the pace of the repurchase activity will depend on factors such as working capital needs, cash requirements for acquisitions, our stock price, and economic and market conditions. Our stock repurchases may be effected from time to time through open market purchases or pursuant to a Rule 10b5-1 plan.

We continue to generate positive cash flows from operating activities and believe that the best uses of our excess cash are to invest in the business; acquire or make investments in complementary companies, products, services and technologies; and make payments on our outstanding debt balances. Any future acquisitions may be funded by available cash and investments, cash generated from operations, debt financing, or the issuance of additional securities. Additionally, we have in the past, and expect in the future, to repurchase stock in order to both offset dilution and return capital, in excess of our requirements, to stockholders with the goal of increasing stockholder value.

Off-Balance-Sheet Arrangements

We do not have any special-purpose entities or off-balance-sheet arrangements.

Contractual Obligations

Our significant contractual obligations as of December 31, 2019 are summarized below:

<i>(in thousands)</i>	Payments Due by Period				
	Total	Within 1 year	2 – 3 years	4 – 5 years	After 5 years
Long-term debt:					
Principal payments ⁽¹⁾	\$ 500,000	\$ —	\$ 25,000	\$ 475,000	\$ —
Interest payments ⁽²⁾	70,488	17,372	29,400	23,716	—
Global headquarters operating lease ⁽³⁾	45,199	4,464	8,928	8,944	22,863
Other operating leases ⁽⁴⁾	83,566	17,153	27,127	15,990	23,296
Unconditional purchase obligations ⁽⁵⁾	71,382	37,183	24,723	9,476	—
Obligations related to uncertain tax positions, including interest and penalties ⁽⁶⁾	—	—	—	—	—
Other long-term obligations ⁽⁷⁾	44,767	22,776	10,568	2,856	8,567
Total contractual obligations	\$ 815,402	\$ 98,948	\$ 125,746	\$ 535,982	\$ 54,726

- (1) We repaid \$75.0 million of the unsecured term loan in January 2020 prior to its scheduled maturity date. As such, the payment is reflected as current on our consolidated balance sheet but not in the table above.
- (2) Interest on the long-term debt is estimated using the interest rate as of December 31, 2019, as the interest rate is variable. For additional information, see Note 10 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K. The interest payments reflected in the table above have not been reduced for the effect of the \$75.0 million principal payment discussed in (1) above.
- (3) We previously entered into a lease agreement for 186,000 square feet of rentable space located in an office facility in Canonsburg, Pennsylvania, which serves as our headquarters. The term of the lease is 183 months, beginning on October 1, 2014 and expiring on December 31, 2029. We have a one-time right to terminate the lease on December 31, 2025 by providing the landlord with at least 18 months' prior written notice of such termination.
- (4) Other operating leases primarily include noncancellable lease commitments for our other domestic and international offices as well as certain operating equipment.
- (5) Unconditional purchase obligations primarily include royalties and software licenses and services, which are unrecorded as of December 31, 2019.
- (6) We have \$64.4 million of unrecognized tax benefits, including estimated interest and penalties, that have been recorded as liabilities in accordance with income tax accounting guidance for which we are uncertain as to if or when such amounts may be settled. As a result, such amounts are excluded from the table above.
- (7) Other long-term obligations primarily include third-party commissions of \$28.3 million; post-employment benefits, including pension obligations, of \$12.7 million for certain foreign locations; and office space restoration of \$3.1 million. These amounts include the related current portions when applicable.

Critical Accounting Policies and Estimates

We believe that the following critical accounting policies affect the more significant judgments and estimates used in the preparation of our consolidated financial statements.

Revenue Recognition: Our revenue is derived principally from the licensing of computer software products and from related maintenance contracts. We adopted ASC 606 on January 1, 2018 using the modified retrospective approach for all contracts not completed as of the date of adoption. Results for reporting periods beginning after January 1, 2018 are presented under ASC 606, while prior period amounts are not adjusted and continue to be reported in accordance with ASC 605. The adoption of ASC 606 represents a change in accounting principle that will more closely align revenue recognition with the delivery of our software licenses, maintenance and services.

Revenue Recognition Policy 2019 and 2018 (ASC 606)

We enter into contracts that include combinations of products, maintenance and services, which are accounted for as separate performance obligations with differing revenue recognition patterns.

Revenue from perpetual licenses is classified as software license revenue. Software license revenue is recognized up front upon delivery of the licensed product and/or the utility that enables the customer to access authorization keys, provided that an enforceable contract has been received. Typically, our perpetual licenses are sold with post-contract support (PCS), which includes unspecified technical enhancements and customer support. We allocate value in bundled perpetual and PCS arrangements based on the standalone selling prices of the perpetual license and PCS. Revenue from PCS is classified as maintenance revenue and is recognized ratably over the term of the contract, as we satisfy the PCS performance obligation over time.

In addition to perpetual licenses, we sell time-based lease licenses. Lease licenses are sold only as a bundled arrangement that includes the rights to a term software license and PCS. Utilizing observable inputs, we determined that 50% of the estimated standalone selling price of the lease license is attributable to the term license and 50% is attributable to the PCS. This determination considered the value relationship for our products between PCS to time-based lease licenses, the value relationship between PCS and perpetual licenses, the average economic life of our products, software renewal rates and the price of the bundled arrangement in relation to the perpetual licensing approach. Consistent with the perpetual sales, the license component is classified as software license revenue and recognized as revenue up front at the commencement of the lease upon delivery of the licensed product and/or utility that enables the customer to access authorization keys. The PCS is classified as maintenance revenue and is recognized ratably over the term of the contract, as we provide the PCS benefit over time.

Revenue from training, support and other services is recognized as the services are performed. For contracts in which the service consists of a single performance obligation, such as providing a training class to a customer, we recognize revenue upon completion of the performance obligation. For service contracts that are longer in duration and often include multiple performance obligations (for example, both training and consulting), we measure the progress toward completion of the obligations and recognize revenue accordingly. In measuring progress towards the completion of performance obligations, we typically utilize output-based estimates for services with contractual billing arrangements that are not based on time and materials, and estimate output based on the total tasks completed as compared to the total tasks required for each work contract. Input-based estimates are utilized for services that involve general consultations with contractual billing arrangements based on time and materials, utilizing direct labor as the input measure. Proceeds from customers for the purpose of expediting road-map items, developing new products or creating specific features and functionality for existing products is classified as revenue.

We also execute arrangements through independent channel partners in which the channel partners are authorized to market and distribute our software products to end users of our products and services in specified territories. In sales facilitated by channel partners, the channel partner bears the risk of collection from the end-user customer. We recognize revenue from transactions with channel partners in a manner consistent with the direct sales described above for both perpetual and time-based licenses. Revenue from channel partner transactions is the amount remitted to us by the channel partners. This amount includes a fee for PCS that is compensation for providing technical enhancements and the second level of technical support to the end user, which is recognized over the period that PCS is to be provided.

Non-income related taxes collected from customers and remitted to governmental authorities are recorded on the consolidated balance sheet as accounts receivable and accrued expenses. The collection and payment of these amounts are reported on a net basis in the consolidated statements of income and do not impact reported revenues or expenses.

We do not offer right of return. We warrant to our customers that our software will perform substantially as specified in our current user manuals. We have not experienced significant claims related to software warranties beyond the scope of

maintenance support, which we are already obligated to provide. The warranty is not sold, and cannot be purchased, separately. The warranty does not provide any type of additional service to the customer or performance obligation for us.

Our agreements with our customers generally require us to indemnify the customer against claims that our software infringes third-party patent, copyright, trademark or other proprietary rights. Such indemnification obligations are generally limited in a variety of industry-standard respects, including our right to replace an infringing product.

Significant Judgments (ASC 606)

Our contracts with customers typically include promises to transfer licenses and services to a customer. Judgment is required to determine if the promises are separate performance obligations, and if so, to allocate the transaction price to each performance obligation. We use the estimated standalone selling price method to allocate the transaction price for each performance obligation. The estimated standalone selling price is determined using all information reasonably available to us, including market conditions and other observable inputs. The corresponding revenues are recognized as the related performance obligations are satisfied.

We apply a practical expedient to expense sales commissions as incurred when the amortization period would have been one year or less. Sales commissions associated with the initial year of multi-year contracts are expensed as incurred due to their immateriality. Sales commissions associated with multi-year contracts beyond the initial year are subject to an employee service requirement and are expensed as incurred as they are not considered incremental costs to obtain a contract.

We are required to adjust promised amounts of consideration for the effects of the time value of money if the timing of the payments provides the customer or us with a significant financing benefit. We consider various factors in assessing whether a financing component exists, including the duration of the contract, market interest rates and the timing of payments. Our contracts do not include a significant financing component requiring adjustment to the transaction price.

Revenue Recognition Policy 2017 (ASC 605)

Revenue from perpetual licenses was classified as license revenue and was recognized upon delivery of the licensed product and/or the utility that enabled the customer to access authorization keys, provided that acceptance had occurred and a signed contractual obligation was received, the price was fixed and determinable, and collectibility of the receivable was probable. We determined the fair value of PCS sold together with perpetual licenses based on the rate charged for PCS when sold separately. Revenue from PCS contracts was classified as maintenance and service revenue and was recognized ratably over the term of the contract.

Revenue for software lease licenses was classified as license revenue and was recognized over the period of the lease contract. Typically, our software leases include PCS which, due to the short term (principally one year or less) of our software lease licenses, were not permitted to be separated from lease revenue for accounting purposes. As a result, both the lease licenses and PCS were recognized ratably over the lease period. We included the revenue for the entire lease arrangement within software license revenue in the consolidated statements of income.

Many of our semiconductor products are typically licensed via longer term leases of 24–36 months. We recognized revenue for these licenses over the term of the lease contract. Because we did not have vendor-specific objective evidence of the fair value of these leases, we also recognized revenue from perpetual licenses over the term of the lease contract during the infrequent occurrence of these licenses being sold with semiconductor leases in multiple-element arrangements.

Revenue from training, support and other services was recognized as the services were performed. We applied the specific performance method to contracts in which the service consisted of a single act, such as providing a training class to a customer, and the proportional performance method to other service contracts that were longer in duration and often included multiple acts (for example, both training and consulting). In applying the proportional performance method, we typically utilized output-based estimates for services with contractual billing arrangements that were not based on time and materials, and estimated output based on the total tasks completed as compared to the total tasks required for each work contract. Input-based estimates were utilized for services that involved general consultations with contractual billing arrangements based on time and materials, utilizing direct labor as the input measure.

The accounting treatment under ASC 605 associated with arrangements through independent channel partners, non-income related taxes, warranties and indemnification obligations is consistent with the accounting treatment under ASC 606 described above.

Goodwill and Other Intangible Assets: We test goodwill and indefinite-lived intangible assets for impairment at least annually by performing a quantitative assessment of whether the fair value of each reporting unit or asset exceeds its carrying amount. We have one reporting unit. Goodwill is tested at this reporting unit level and indefinite-lived intangible assets are tested at the individual asset level. This requires us to assess and make judgments regarding a variety of factors which impact the fair value

of the reporting unit or asset being tested, including business plans, anticipated future cash flows, economic projections and other market data. Because there are inherent uncertainties involved in these factors, significant differences between these estimates and actual results could result in future impairment charges and could materially impact our future financial results. During the first quarter of 2019, we completed the annual impairment test for goodwill and the indefinite-lived intangible asset and determined that these assets had not been impaired as of the test date, January 1, 2019. No other events or circumstances changed during the year ended December 31, 2019 that would indicate that the fair values of our reporting unit and indefinite-lived intangible asset are below their carrying values.

Intangible assets are recognized apart from goodwill whenever an acquired intangible asset arises from contractual or other legal rights, or whenever it is capable of being separated or divided from the acquired entity and sold, transferred, licensed, rented, or exchanged, either individually or in combination with a related contract, asset or liability. We determined the fair value of our intangible assets using various valuation techniques, including the relief-from-royalty method and the multi-period excess earnings method. These models utilize certain unobservable inputs classified as Level 3 measurements as defined by ASC 820, *Fair Value Measurements and Disclosures*. The determination of fair value requires considerable judgment and is sensitive to changes in underlying assumptions, estimates and market factors. Estimating fair value requires us to make assumptions and estimates regarding our future plans, as well as industry and economic conditions. These assumptions and estimates include, but are not limited to: royalty rate, discount rate and attrition rate. The fair values of the intangible assets will be amortized over their useful lives. Impairment losses are recognized if the carrying amounts of finite-lived intangible assets are both not recoverable and exceed the fair values.

Income Taxes: We account for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period of the enactment date.

We record net deferred tax assets to the extent we believe these assets will more likely than not be realized. In making such determination, we consider all available positive and negative evidence, including scheduled reversals of deferred tax liabilities, projected future taxable income, tax planning strategies and recent financial operations. In the event we determine that we will be able to realize deferred tax assets for which a valuation allowance was used to reduce their carrying value, the adjustment to the valuation allowance will be recorded as a reduction to the provision for income taxes.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more-likely-than-not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively settled, which means that the statute of limitations has expired or the appropriate taxing authority has completed its examination even though the statute of limitations remains open.

We recognize interest and penalties related to income taxes within the income tax expense line in the consolidated statements of income. Accrued interest and penalties are included within the related tax liability line in the consolidated balance sheets.

Stock-Based Compensation: We grant restricted stock units and other stock awards to employees and directors under our equity incentive plan. Eligible employees can also purchase shares of our common stock at a discount under our employee stock purchase plan. The benefits provided under these plans are stock-based payments subject to the provisions of stock-based payment accounting guidance. We use the fair value method to apply the provisions of stock-based payment accounting guidance. Stock-based compensation expense for 2019, 2018 and 2017 was \$116.2 million, \$83.3 million and \$53.2 million, respectively. As of December 31, 2019, total unrecognized estimated compensation expense related to awards granted prior to that date was \$186.4 million, which is expected to be recognized over a weighted average period of 1.5 years.

Prior to 2017, we granted stock option awards. The value of each stock option award was estimated on the date of grant, or date of acquisition for options issued in a business combination, using the Black-Scholes option pricing model (Black-Scholes model). The determination of the fair value of stock-based payment awards using an option pricing model was affected by our stock price as well as assumptions regarding a number of complex and subjective variables. These variables included our stock volatility during the preceding six years, actual and projected employee stock option exercise behaviors, interest rate assumptions using the five-year U.S. Treasury Note yield on the date of grant or acquisition date, and expected dividends. The stock-based compensation expense for options is recorded ratably over the requisite service period.

We issue various restricted stock unit awards which contain either a market condition, a performance condition, a service condition, or certain combinations of the three. Restricted stock unit awards are valued based on the grant-date fair value of the award. Stock-based compensation expense is recognized over the employee's requisite service period for awards with only a service condition. For awards with a performance condition, stock-based compensation expense is recorded from the service

inception date through the conclusion of the measurement period based on management's estimates concerning the probability of vesting.

Vesting of restricted stock unit awards with a market condition is based on our performance as measured by total stockholder return relative to the appreciation of a specified stock index over the measurement period, subject to each participant's continued employment through the conclusion of the measurement period. The fair value of the restricted stock unit awards with a market condition is estimated using a Monte Carlo simulation model. The determination of the fair value of the awards is affected by the grant date and several variables, each of which has been identified in the chart below. Stock-based compensation expense based on the fair value of the award is recorded from the grant date through the conclusion of the measurement period.

Assumptions used in Monte Carlo lattice pricing model	Year Ended December 31,		
	2019	2018	2017
Risk-free interest rate	2.5%	2.4%	1.5%
Expected dividend yield	—%	—%	—%
Expected volatility—Ansys stock price	23%	21%	19%
Expected volatility—Nasdaq Composite Index	16%	15%	15%
Expected term	2.8 years	2.8 years	2.8 years
Correlation factor	0.71	0.65	0.70
Weighted average fair value per share	\$238.99	\$191.76	\$120.94

We also grant restricted stock units to non-employee Directors, which vest upon the earlier of one year from the date of grant or the date of the next regular annual meeting of stockholders. If a non-employee Director retires prior to the vest date, the non-employee Director receives a pro-rata portion of the restricted stock units.

To the extent we change the terms of our stock-based compensation programs, experience market volatility in the pricing of our common stock that increases the implied volatility assumption used in the pricing models, refine different assumptions, or assume stock awards from acquired companies that are different in nature than our stock award arrangements, among other potential impacts, the stock-based compensation expense recorded in future periods and the related tax benefits may differ significantly from what was recorded in previous reporting periods. Forfeitures of awards are accounted for as they occur.

Estimates of stock-based compensation expense are significant to our financial statements, but this expense is partially based on the aforementioned option valuation and Monte Carlo simulation models and will never result in the payment of cash by us other than through the payment of withholding taxes in lieu of additional share issuance. For this reason, and because we do not view stock-based compensation as related to our operational performance, the Board of Directors and management exclude stock-based compensation expense when evaluating our underlying business performance.

Contingencies: We are involved in various investigations, claims and legal proceedings that arise in the ordinary course of business, including commercial disputes, labor and employment matters, tax audits, alleged infringement of intellectual property rights and other matters. We review the status of these matters, assess our financial exposure and record a related accrual if the potential loss from an investigation, claim or legal proceeding is probable and the amount is reasonably estimable. Significant judgment is involved in the determination of probability and in the determination of whether an exposure is reasonably estimable. As a result of the uncertainties involved in making these estimates, we may have to revise our estimates as facts and circumstances change. The revision of these estimates could have a material impact on our financial position and results of operations.

Recent Accounting Guidance

For information regarding recent accounting guidance and its impact on our consolidated financial statements, see Note 2 to the consolidated financial statements in Part IV, Item 15 of this Annual Report on Form 10-K.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Interest Rate Risk. Changes in the overall level of interest rates affect the interest income that is generated from our cash, cash equivalents and short-term investments and the interest expense that is generated from our outstanding borrowings. For the year ended December 31, 2019, interest income was \$12.8 million and interest expense was \$3.5 million. Cash and cash equivalents consist primarily of highly liquid investments such as money market funds and deposits held at major banks. Short-term investments consist primarily of deposits held by certain foreign subsidiaries with original maturities of three months to one year.

Foreign Currency Transaction Risk. As we operate in international regions, a portion of our revenue, expenses, cash, accounts receivable and payment obligations are denominated in foreign currencies. As a result, changes in currency exchange rates will affect our financial position, results of operations and cash flows. We are most impacted by movements in and among the British Pound, Euro, Japanese Yen, South Korean Won and U.S. Dollar.

With respect to revenue, on average for the year ended December 31, 2019, the U.S. Dollar was approximately 3.3% stronger, when measured against our primary foreign currencies, than for the year ended December 31, 2018. The table below presents the impacts of currency fluctuations on revenue for the year ended December 31, 2019. Amounts in brackets indicate a net adverse impact from currency fluctuations.

<i>(in thousands)</i>	Year Ended December 31, 2019
Euro	\$ (17,361)
South Korean Won	(5,097)
British Pound	(1,881)
Japanese Yen	1,791
Other	(1,460)
Total	\$ (24,008)

The net overall stronger U.S. Dollar also resulted in decreased operating income of \$10.2 million for the year ended December 31, 2019 as compared to the year ended December 31, 2018.

The most significant currency impacts on revenue and operating income are typically attributable to U.S. Dollar exchange rate changes against the British Pound, Euro, Japanese Yen and South Korean Won. Historical exchange rates for these currency pairs are reflected in the charts below:

As of	Period End Exchange Rates			
	GBP/USD	EUR/USD	USD/JPY	USD/KRW
December 31, 2016	1.234	1.051	116.918	1,208.313
December 31, 2017	1.351	1.200	112.701	1,068.376
December 31, 2018	1.276	1.147	109.589	1,115.325
December 31, 2019	1.326	1.121	108.637	1,156.069

Year Ended	Average Exchange Rates			
	GBP/USD	EUR/USD	USD/JPY	USD/KRW
December 31, 2017	1.289	1.130	112.139	1,130.945
December 31, 2018	1.335	1.181	110.405	1,100.786
December 31, 2019	1.277	1.119	109.033	1,165.479

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The following tables set forth selected unaudited quarterly information. We believe that the amounts stated below present fairly the results of such periods when read in conjunction with the consolidated financial statements and related notes included in Part IV, Item 15 of this Annual Report on Form 10-K.

Other information required by this Item is included in Part IV, Item 15 of this Annual Report on Form 10-K.

<i>(in thousands, except per share data)</i>	Fiscal Quarter Ended			
	December 31, 2019	September 30, 2019	June 30, 2019	March 31, 2019
Revenue	\$ 486,228	\$ 343,899	\$ 368,635	\$ 317,130
Gross profit	436,632	302,534	328,138	282,315
Operating income	185,716	105,047	128,628	95,649
Net income	165,852	89,463	109,750	86,230
Earnings per share – basic	\$ 1.95	\$ 1.06	\$ 1.31	\$ 1.03
Earnings per share – diluted	\$ 1.91	\$ 1.04	\$ 1.28	\$ 1.01

<i>(in thousands, except per share data)</i>	Fiscal Quarter Ended			
	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018
Revenue	\$ 415,432	\$ 289,418	\$ 305,913	\$ 282,873
Gross profit	375,343	253,110	265,463	243,835
Operating income	179,936	93,024	108,553	95,061
Net income	153,163	89,336	92,596	84,280
Earnings per share – basic	\$ 1.83	\$ 1.06	\$ 1.10	\$ 1.00
Earnings per share – diluted	\$ 1.79	\$ 1.04	\$ 1.08	\$ 0.98

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures. As required by Rules 13a-15 and 15d-15 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, we have evaluated, with the participation of management, including the Chief Executive Officer and the Chief Financial Officer, the effectiveness of the design and operation of our disclosure controls and procedures as of the end of the period covered by this report. Based on such evaluation, the Chief Executive Officer and Chief Financial Officer have concluded that such disclosure controls and procedures are effective, as defined in Rule 13a-15(e) of the Exchange Act.

We believe, based on our knowledge, that the financial statements and other financial information included in this report fairly present, in all material respects, our financial condition, results of operations and cash flows as of and for the periods presented in this report. We are committed to both a sound internal control environment and to good corporate governance.

From time to time, we review the disclosure controls and procedures, and may periodically make changes to enhance their effectiveness and to ensure that our systems evolve with our business.

Management's Report on Internal Control over Financial Reporting. Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f). Under the supervision and with the participation of management, including our Chief Executive Officer and Chief Financial Officer, we have conducted an evaluation of the effectiveness of our internal control over financial reporting based upon the *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that our internal control over financial reporting was effective at December 31, 2019.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies or procedures may deteriorate.

Additionally, Deloitte & Touche LLP, an independent registered public accounting firm, has audited the financial statements included in this Annual Report on Form 10-K and has issued an attestation report on our internal control over financial reporting. This report is included in Item 15 of this Annual Report on Form 10-K.

Changes in Internal Controls. There were no changes in our internal control over financial reporting that occurred during the three months ended December 31, 2019 that materially affected, or were reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this Item is incorporated by reference to our 2020 Proxy Statement and is set forth under “Corporate Governance at Ansys,” “Director Nominations,” “Continuing Directors Following the 2020 Annual Meeting,” “Our Executive Officers,” “Delinquent Section 16(a) Reports” and “Audit Committee” therein.

We adopted a Code of Business Conduct and Ethics that applies to our principal executive officer, principal financial and accounting officer, and all of our directors and employees. Our Code of Business Conduct and Ethics is posted under the Corporate Responsibility tab of the Investor Relations section of our website at <https://investors.ansys.com>. We will post any amendments to, or waiver of, our Code of Business Conduct and Ethics that apply to our principal executive officer and principal financial and accounting officer on our website.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item is incorporated by reference to our 2020 Proxy Statement and is set forth under “Compensation Discussion and Analysis,” “Compensation Policies and Practices Related to Risk Management,” “Fiscal 2019 Compensation Tables,” “2019 CEO Pay Ratio,” “Compensation Committee Report,” “Compensation Committee Interlocks and Insider Participation,” “Director Nominations” and “Non-Employee Director Compensation” therein.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT, AND RELATED STOCKHOLDER MATTERS

Equity Compensation Plan Information as of December 31, 2019

Plan Category	(a) Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights	(b) Weighted Average Exercise Price of Outstanding Options, Warrants and Rights ⁽¹⁾	(c) Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (excluding securities reflected in column (a))
Equity Compensation Plans Approved by Security Holders			
1996 Stock Option and Grant Plan	2,617,302 ⁽²⁾	\$ 69.69	4,064,783 ⁽³⁾
1996 Employee Stock Purchase Plan	(4)	(5)	191,960
Equity Compensation Plans Not Approved by Security Holders⁽⁶⁾			
Ansoft Corporation 2006 Stock Incentive Plan	18,650	\$ 48.97	—
Apache Design Solutions, Inc. 2001 Stock/Option Issuance Plan	31,031	\$ 21.27	—
SpaceClaim Corporation 2005 Stock Incentive Plan	1,253	\$ 23.41	—
Gear Design Solutions, Inc. Stock Incentive Plan	3,740	\$ 12.26	—
Total	2,671,976		4,256,743

- (1) The weighted average exercise price does not take into account the shares for outstanding restricted stock units or deferred stock awards, which have no exercise price.
- (2) Includes 1,617,974 shares for outstanding restricted stock units for employees, 929,559 shares for outstanding stock options, 9,688 shares for outstanding restricted stock units for non-employee directors and 60,081 shares for deferred stock awards for non-employee directors. Restricted stock units with a performance or market condition are included based on target performance, unless performance is otherwise known.
- (3) The number of securities remaining available for future issuance assumes maximum attainment for awards with a performance condition or a market condition.
- (4) The number of shares issuable with respect to the current offering period is not determinable until the end of the period.
- (5) The per share purchase price of shares issuable with respect to the current offering period is not determinable until the end of the period.
- (6) We no longer issue awards under equity compensation plans not approved by security holders.

All other information required by this Item is incorporated by reference to our 2020 Proxy Statement and is set forth under “Ownership of Our Common Stock” therein.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this Item is incorporated by reference to our 2020 Proxy Statement and is set forth under “Director Independence” and “Related-Party Transactions” therein.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this Item is incorporated by reference to our 2020 Proxy Statement and is set forth under “Independent Registered Accounting Firm Services and Fees” therein.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) Documents Filed as Part of this Annual Report on Form 10-K:

1. *Financial Statements:* The following consolidated financial statements and reports are filed as part of this report:

- Management's Report on Internal Control over Financial Reporting	61
- Reports of Independent Registered Public Accounting Firm	62
- Consolidated Balance Sheets as of December 31, 2019 and 2018	66
- Consolidated Statements of Income for the years ended December 31, 2019, 2018 and 2017	67
- Consolidated Statements of Comprehensive Income for the years ended December 31, 2019, 2018 and 2017	68
- Consolidated Statements of Cash Flows for the years ended December 31, 2019, 2018 and 2017	69
- Consolidated Statements of Stockholders' Equity for the years ended December 31, 2019, 2018 and 2017	70
- Notes to Consolidated Financial Statements	71

2. *Financial Statement Schedule:* The following financial statement schedule is filed as part of this report and should be read in conjunction with the consolidated financial statements.

- Schedule II - Valuation and Qualifying Accounts	98
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Schedules not listed above have been omitted because they are not applicable, are not required or the information required to be set forth therein is included in the consolidated financial statements or notes thereto.

3. *Exhibits:* The exhibits listed in the accompanying Exhibit Index immediately following the financial statement schedule are filed as part of, or incorporated by reference into, this Annual Report on Form 10-K.

(b) Exhibits:

We hereby file as part of this Annual Report on Form 10-K the exhibits listed in the Exhibit Index immediately following the financial statement schedule of this Annual Report on Form 10-K.

(c) Financial Statement Schedule:

We hereby file as part of this Annual Report on Form 10-K the financial statement schedule listed in Item 15(a)(2) as set forth above.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management is responsible for establishing and maintaining an adequate system of internal control over our financial reporting. In order to evaluate the effectiveness of internal control over financial reporting, management has conducted an assessment, including testing, using the financial reporting criteria in the *Internal Control - Integrated Framework (2013)*, issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Our system of internal control over financial reporting is designed to provide reasonable assurance to management and the Board of Directors regarding the reliability of financial records used in preparation of our published financial statements. As all internal control systems have inherent limitations, even systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation. Based on their assessment, management has concluded that we maintained an effective system of internal control over financial reporting as of December 31, 2019. Deloitte & Touche LLP, an independent registered public accounting firm, has audited our internal control over financial reporting as of December 31, 2019, as stated in their report which appears in Part IV, Item 15 of this Annual Report on Form 10-K.

/s/ AJEI S. GOPAL

Ajei S. Gopal
President and Chief Executive Officer
February 27, 2020

/s/ MARIA T. SHIELDS

Maria T. Shields
Chief Financial Officer
February 27, 2020

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of ANSYS, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of ANSYS, Inc. and subsidiaries (the “Company”) as of December 31, 2019 and 2018, the related consolidated statements of income, comprehensive income, stockholders’ equity, and cash flows for each of the three years in the period ended December 31, 2019, and the related notes and the schedule listed in the Index at Item 15 (collectively referred to as the “financial statements”). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company’s internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 27, 2020, expressed an unqualified opinion on the Company’s internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 2 to the financial statements, the Company has changed its method of accounting for leases in 2019 due to the adoption of the new leasing standard. The Company adopted the new leasing standard using a modified retrospective approach.

As discussed in Note 3 to the financial statements, the Company has changed its method of accounting for revenue from contracts with customers in 2018 due to the adoption of the new revenue standard. The Company adopted the new revenue standard using a modified retrospective approach.

Basis for Opinion

These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current-period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Revenue—Time-Based Lease Licenses—Refer to Notes 2 and 3 to the financial statements

Critical Audit Matter Description

The Company sells time-based lease (TBL) licenses that are a bundled arrangement that include the rights to a term software license as well as post-contract support (PCS). Revenue is recognized up front at the commencement of the lease for the term software license and recognized ratably over the term of the contract for the PCS in the arrangement. Utilizing observable

inputs, the Company determined that 50% of the estimated standalone selling price of the TBL is attributable to the term software license, while 50% is attributable to PCS. This determination involved judgment, particularly as it relates to the value relationship between the Company's PCS to TBLs, the value relationship between PCS and the Company's perpetual licenses and its linkage to the shortened term of a TBL, the average economic life of the Company's software, renewal rates of its customers, and the price of the bundled arrangement in relation to the perpetual licensing approach.

Given the judgments necessary to determine the allocation between the term software license and PCS, auditing this estimate involved a high degree of auditor judgment.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to management's estimate of the allocation between the term software license and PCS in a TBL included the following, among others:

- We tested the effectiveness of controls over TBL revenue, including those over the determination of the estimated standalone selling price of the Company's licenses and services, as well as the allocation of this standalone selling price within the arrangement.
- We evaluated the pricing relationship between PCS and perpetual licenses on the net licensing fee of the arrangement, as well as the Company's renewal rate of PCS sales on perpetual licenses through those arrangements selected for testing that contained both elements as a consideration point of the value relationship between the term software license and PCS when a customer purchases a bundled TBL.
- We evaluated the estimated economic life of the Company's software through observable data points.
- Through our current and historical audit procedures, we confirmed that the term software license portion and PCS portion of an arrangement are not sold separately from one another.
- We selected a sample of arrangements and performed the following:
 - Compared the list price of the TBL to the consideration received from the customer and recalculated the discount from list price for each arrangement
 - Evaluated whether management appropriately calculated the estimated standalone selling price for the TBL
 - Tested management's identification of distinct performance obligations
 - Tested the mathematical accuracy of revenue recognized at a point in time or over time based upon the identification of TBLs within the arrangement

Acquisitions—Livermore Software Technology, LLC— Developed Software and Core Technologies Intangible Asset—Refer to Notes 2 and 4 to the financial statements

Critical Audit Matter Description

The Company completed the acquisition of Livermore Software Technology, LLC for \$777.8 million on November 1, 2019. The Company accounted for the acquisition under the acquisition method of accounting for business combinations. Accordingly, the purchase price was allocated to the assets acquired and liabilities assumed based on their respective fair values, including the developed software and core technologies intangible asset of \$167.7 million. Management estimated the fair value of the developed software and core technologies intangible asset using the relief from royalty method. The fair value determination of the developed software and core technologies intangible asset required management to make significant estimates and assumptions related to the royalty rate, revenue growth rate, and the selection of the discount rate.

Given the fair value determination of the developed software and core technologies intangible asset requires management to make significant estimates and assumptions related to the selected royalty rate, forecasts of future revenue growth, and the selection of the discount rate, performing audit procedures to evaluate the reasonableness of these estimates and assumptions required a high degree of auditor judgment and an increased extent of effort, including the need to involve our fair value specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the selection of the royalty rate, forecasts of future revenue growth, and the selection of the discount rate for the developed software and core technologies intangible asset included the following, among others:

- We tested the effectiveness of controls over the valuation of the developed software and core technologies intangible asset, including management’s controls over the selection of the royalty rate, forecasts of future revenue growth, and selection of the discount rate.
- We assessed the reasonableness of management’s forecasts of future revenue growth by comparing the projections to historical results and certain industry data.
- We selected a sample of historical revenue transactions included within the valuation model and evaluated the appropriate recognition of revenue within the relevant period.
- With the assistance of our fair value specialists, we evaluated the reasonableness of the (1) valuation methodology, (2) royalty rate, and (3) discount rate by:
 - Testing the source information underlying the determination of the discount rate and testing the mathematical accuracy of the calculation
 - Evaluating the selected royalty rate against market data of comparable licensing agreements, as well as historical licensing agreements
 - Developing a range of independent estimates and comparing those to the discount rate selected by management

/s/ Deloitte & Touche LLP

Pittsburgh, Pennsylvania

February 27, 2020

We have served as the Company's auditor since 2002.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of ANSYS, Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of ANSYS, Inc. and subsidiaries (the “Company”) as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2019, of the Company and our report dated February 27, 2020, expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company’s management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company’s internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP
Pittsburgh, Pennsylvania
February 27, 2020

ANSYS, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

	December 31,	
	2019	2018
<i>(in thousands, except share and per share data)</i>		
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 872,094	\$ 777,139
Short-term investments	288	225
Accounts receivable, less allowance for doubtful accounts of \$8,700 and \$8,000, respectively	433,479	317,700
Other receivables and current assets	249,619	216,113
Total current assets	<u>1,555,480</u>	<u>1,311,177</u>
Long-term assets:		
Property and equipment, net	83,636	61,655
Operating lease right-of-use assets	105,671	—
Goodwill	2,413,280	1,572,455
Other intangible assets, net	476,711	211,272
Other long-term assets	180,032	82,775
Deferred income taxes	24,077	26,630
Total long-term assets	<u>3,283,407</u>	<u>1,954,787</u>
Total assets	<u>\$ 4,838,887</u>	<u>\$ 3,265,964</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 14,298	\$ 7,953
Accrued bonuses and commissions	101,546	79,945
Accrued income taxes	9,996	8,726
Current portion of long-term debt	75,000	—
Other accrued expenses and liabilities	142,947	99,559
Deferred revenue	351,353	328,584
Total current liabilities	<u>695,140</u>	<u>524,767</u>
Long-term liabilities:		
Deferred income taxes	78,643	30,077
Long-term operating lease liabilities	91,768	—
Long-term debt	423,531	—
Other long-term liabilities	96,426	61,573
Total long-term liabilities	<u>690,368</u>	<u>91,650</u>
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, \$.01 par value; 2,000,000 shares authorized; zero shares issued or outstanding	—	—
Common stock, \$.01 par value; 300,000,000 shares authorized; 94,627,585 and 93,236,023 shares issued, respectively	946	932
Additional paid-in capital	1,188,939	867,462
Retained earnings	3,370,706	2,919,411
Treasury stock, at cost: 8,893,177 and 9,601,670 shares, respectively	(1,041,831)	(1,075,879)
Accumulated other comprehensive loss	(65,381)	(62,379)
Total stockholders' equity	<u>3,453,379</u>	<u>2,649,547</u>
Total liabilities and stockholders' equity	<u>\$ 4,838,887</u>	<u>\$ 3,265,964</u>

The accompanying notes are an integral part of the consolidated financial statements.

ANSYS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF INCOME

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2019	2018	2017
Revenue:			
Software licenses	\$ 699,630	\$ 576,717	\$ 624,964
Maintenance and service	816,262	716,919	470,286
Total revenue	<u>1,515,892</u>	<u>1,293,636</u>	<u>1,095,250</u>
Cost of sales:			
Software licenses	23,944	18,619	34,421
Amortization	21,710	27,034	36,794
Maintenance and service	120,619	110,232	78,949
Total cost of sales	<u>166,273</u>	<u>155,885</u>	<u>150,164</u>
Gross profit	<u>1,349,619</u>	<u>1,137,751</u>	<u>945,086</u>
Operating expenses:			
Selling, general and administrative	521,200	413,580	338,640
Research and development	298,210	233,802	202,746
Amortization	15,169	13,795	12,972
Total operating expenses	<u>834,579</u>	<u>661,177</u>	<u>554,358</u>
Operating income	<u>515,040</u>	<u>476,574</u>	<u>390,728</u>
Interest income	12,796	11,419	6,962
Interest expense	(3,461)	(59)	(86)
Other expense, net	(1,792)	(849)	(1,910)
Income before income tax provision	<u>522,583</u>	<u>487,085</u>	<u>395,694</u>
Income tax provision	<u>71,288</u>	<u>67,710</u>	<u>136,443</u>
Net income	<u>\$ 451,295</u>	<u>\$ 419,375</u>	<u>\$ 259,251</u>
Earnings per share – basic:			
Earnings per share	<u>\$ 5.36</u>	<u>\$ 4.99</u>	<u>\$ 3.05</u>
Weighted average shares	<u>84,259</u>	<u>83,973</u>	<u>84,988</u>
Earnings per share – diluted:			
Earnings per share	<u>\$ 5.25</u>	<u>\$ 4.88</u>	<u>\$ 2.98</u>
Weighted average shares	<u>85,925</u>	<u>85,913</u>	<u>86,854</u>

The accompanying notes are an integral part of the consolidated financial statements.

ANSYS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

<i>(in thousands)</i>	Year Ended December 31,		
	2019	2018	2017
Net income	\$ 451,295	\$ 419,375	\$ 259,251
Other comprehensive (loss) income:			
Foreign currency translation adjustments	(3,002)	(24,535)	19,808
Comprehensive income	<u>\$ 448,293</u>	<u>\$ 394,840</u>	<u>\$ 279,059</u>

The accompanying notes are an integral part of the consolidated financial statements.

ANSYS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

<i>(in thousands)</i>	Year Ended December 31,		
	2019	2018	2017
Cash flows from operating activities:			
Net income	\$ 451,295	\$ 419,375	\$ 259,251
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	60,516	59,255	67,678
Operating lease right-of-use assets amortization	18,459	—	—
Deferred income tax benefit	(14,511)	(33,675)	(2,693)
Provision for bad debts	2,928	1,577	1,474
Stock-based compensation expense	116,190	83,346	53,154
Other	2,778	410	21
Changes in operating assets and liabilities:			
Accounts receivable	(154,403)	(74,455)	(14,406)
Other receivables and current assets	(26,182)	(30,241)	(18,498)
Other long-term assets	(5,622)	1,839	(435)
Accounts payable, accrued expenses and current liabilities	38,543	19,920	27,045
Accrued income taxes	575	1,086	1,215
Deferred revenue	17,245	56,213	20,648
Other long-term liabilities	(7,875)	(19,662)	33,206
Net cash provided by operating activities	<u>499,936</u>	<u>484,988</u>	<u>427,660</u>
Cash flows from investing activities:			
Acquisitions, net of cash acquired	(787,196)	(283,026)	(63,885)
Capital expenditures	(44,940)	(21,762)	(19,149)
Other investing activities	(1,412)	(7,443)	(11,631)
Net cash used in investing activities	<u>(833,548)</u>	<u>(312,231)</u>	<u>(94,665)</u>
Cash flows from financing activities:			
Proceeds from long-term debt	500,000	—	—
Purchase of treasury stock	(59,116)	(269,801)	(336,042)
Restricted stock withholding taxes paid in lieu of issued shares	(42,431)	(28,879)	(11,112)
Proceeds from shares issued for stock-based compensation	34,093	41,019	52,503
Other financing activities	(3,137)	(5,014)	—
Net cash provided by (used in) financing activities	<u>429,409</u>	<u>(262,675)</u>	<u>(294,651)</u>
Effect of exchange rate fluctuations on cash and cash equivalents	(842)	(14,444)	20,678
Net increase (decrease) in cash and cash equivalents	94,955	(104,362)	59,022
Cash and cash equivalents, beginning of period	777,139	881,501	822,479
Cash and cash equivalents, end of period	<u>\$ 872,094</u>	<u>\$ 777,139</u>	<u>\$ 881,501</u>
Supplemental disclosures of cash flow information:			
Income taxes paid	\$ 86,770	\$ 87,244	\$ 116,389
Interest paid	\$ 787	\$ 114	\$ 199
Fair value of common stock issued as consideration in connection with acquisitions	\$ 307,173	\$ —	\$ —

The accompanying notes are an integral part of the consolidated financial statements.

ANSYS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

<i>(in thousands)</i>	Common Stock		Additional Paid-In Capital	Retained Earnings	Treasury Stock		Accumulated Other Comprehensive (Loss)/Income	Total Stockholders' Equity
	Shares	Amount			Shares	Amount		
Balance, January 1, 2017	93,236	\$ 932	\$ 883,010	\$ 2,057,665	7,548	\$ (675,550)	\$ (57,652)	\$ 2,208,405
Treasury shares acquired					2,750	(336,042)		(336,042)
Stock-based compensation activity			(9,653)		(1,254)	104,062		94,409
Other comprehensive income							19,808	19,808
Net income for the year				259,251				259,251
Balance, December 31, 2017	93,236	932	873,357	2,316,916	9,044	(907,530)	(37,844)	2,245,831
Cumulative effect of the ASC 606 adoption				183,120				183,120
Treasury shares acquired					1,674	(269,801)		(269,801)
Stock-based compensation activity			(5,895)		(1,116)	101,452		95,557
Other comprehensive loss							(24,535)	(24,535)
Net income for the year				419,375				419,375
Balance, December 31, 2018	93,236	932	867,462	2,919,411	9,602	(1,075,879)	(62,379)	2,649,547
Acquisition of Livermore Software Technology, LLC	1,392	14	307,159					307,173
Treasury shares acquired					330	(59,116)		(59,116)
Stock-based compensation activity			14,318		(1,039)	93,164		107,482
Other comprehensive loss							(3,002)	(3,002)
Net income for the year				451,295				451,295
Balance, December 31, 2019	94,628	\$ 946	\$ 1,188,939	\$ 3,370,706	8,893	\$ (1,041,831)	\$ (65,381)	\$ 3,453,379

The accompanying notes are an integral part of the consolidated financial statements.

ANSYS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
December 31, 2019

1. Organization

We develop and globally market engineering simulation software and services widely used by engineers, designers, researchers and students across a broad spectrum of industries and academia, including aerospace and defense, automotive, electronics, semiconductors, energy, materials and chemical processing, turbomachinery, consumer products, healthcare, and sports.

As defined by the accounting guidance for segment reporting, we operate as one segment.

Given the integrated approach to the multi-discipline problem-solving needs of our customers, a single sale of software may contain components from multiple product areas and include combined technologies. We also have a multi-year product and integration strategy that will result in new, combined products or changes to the historical product offerings. As a result, it is impracticable for us to provide accurate historical or current reporting among our various product lines.

2. Accounting Policies

Accounting Principles

The financial statements and accompanying notes are prepared in accordance with accounting principles generally accepted in the United States. Certain items in the consolidated financial statements and the notes to the consolidated financial statements of prior years have been reclassified to conform to the current year's presentation. These reclassifications had no effect on reported net income, comprehensive income, cash flows, total assets or total liabilities and stockholders' equity.

Principles of Consolidation

The accompanying consolidated financial statements include our accounts and those of our wholly owned subsidiaries. All intercompany accounts and transactions have been eliminated.

Recently Adopted Accounting Guidance

Leases: In February 2016, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2016-02, *Leases (Topic 842)* (ASU 2016-02). We adopted ASU 2016-02 and its related amendments (collectively known as Accounting Standards Codification (ASC) 842) on January 1, 2019 using the modified retrospective approach. Results for reporting periods beginning after January 1, 2019 are presented under ASC 842, while prior period amounts are not adjusted and continue to be reported in accordance with ASC 840, *Leases*. ASC 842 requires virtually all leases, other than leases of intangible assets, to be recorded on the balance sheet with a right-of-use (ROU) asset and a corresponding lease liability.

We elected the package of practical expedients permitted under the transition guidance within the new standard, which allowed us to carry forward our historical assessments of whether a contract contains a lease, lease classification and initial direct costs. In addition, we elected the accounting policy to combine the lease and nonlease components as a single component for all asset classes.

We determine if an arrangement is a lease at inception. Leases are classified as either operating or finance leases based on certain criteria. This classification determines the timing and presentation of expenses on the income statement, as well as the presentation of the related cash flows and balance sheet. Operating leases are recorded on the balance sheet as operating lease right-of-use assets, other accrued expenses and liabilities, and long-term operating lease liabilities. We currently have no finance leases.

ROU assets and related liabilities are recorded at lease commencement based on the present value of the lease payments over the expected lease term. Lease payments include future increases unless the increases are based on changes in an index or rate. As our leases do not usually provide an implicit rate, our incremental borrowing rate is used to calculate ROU assets and related liabilities. The incremental borrowing rate is determined based on our estimated credit rating, the term of the lease, the economic environment where the asset resides and full collateralization. The ROU assets and related lease liabilities include optional renewals for which we are reasonably certain to exercise; whereas, optional terminations are included unless it is reasonably certain not to be elected.

The adoption of the new standard resulted in the recognition of ROU assets of \$90.9 million and lease liabilities of \$92.5 million, and corresponding deferred tax assets and liabilities, on our consolidated balance sheet as of January 1, 2019. The adoption had no impact on our consolidated statements of income or cash flows.

Implementation cost accounting for cloud computing arrangements: In August 2018, the FASB issued ASU No. 2018-15, *Intangibles—Goodwill and Other—Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract* (ASU 2018-15). The standard aligns the accounting for costs incurred to implement a cloud computing arrangement (CCA) that is a service arrangement with the guidance on capitalizing costs associated with developing or obtaining internal-use software. Under ASU 2018-15, an entity would apply Subtopic 350-40 to determine which implementation costs related to a CCA that is a service contract should be capitalized. The standard does not change the accounting for the service component of a CCA. The associated cash flows will be reflected within operating activities.

We retrospectively adopted the guidance during the quarter ended December 31, 2019. The adoption resulted in the reclassification of cash flows associated with implementation costs related to CCAs that are service contracts on our consolidated statements of cash flows. This resulted in a decrease to operating cash flows, and a corresponding increase to investing cash flows, of \$2.5 million, \$1.4 million and \$2.8 million for the years ending December 31, 2019, 2018 and 2017, respectively. The adoption had no impact on our consolidated balance sheets or consolidated statements of income.

Accounting Guidance Issued and Not Yet Adopted

Credit losses: In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments* (ASU 2016-13). The current guidance requires the allowance for doubtful accounts to be estimated based on an incurred loss model, which considers past and current conditions. ASU 2016-13 requires companies to use an expected loss model that also considers reasonable and supportable forecasts of future conditions. ASU 2016-13 is effective for annual periods beginning after December 15, 2019, including interim periods within that reporting period. Early adoption is permitted for annual periods beginning after December 15, 2018, including interim periods within that reporting period. The standard requires a cumulative-effect adjustment to the balance sheet as of the beginning of the first reporting period in which the guidance is effective. We will adopt the standard effective January 1, 2020 and do not expect the adoption of the new standard to have a material effect on our consolidated financial statements.

Income taxes: In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes* (ASU 2019-12), as part of its initiative to reduce complexity in the accounting standards. The amendments in ASU 2019-12 eliminate certain exceptions related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition of deferred tax liabilities for outside basis differences. ASU 2019-12 also clarifies and simplifies other aspects of the accounting for income taxes. ASU 2019-12 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2020. Early adoption is permitted, including adoption in any interim period. We are currently evaluating the impact that this guidance will have upon our financial position and results of operations, if any.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements. Estimates also affect the amounts of revenue and expenses during the reported periods. Significant estimates included in these consolidated financial statements include:

- Allowances for doubtful accounts receivable
- Income tax accruals, including those related to the Tax Cuts and Jobs Act
- Uncertain tax positions
- Tax valuation reserves
- Fair value of stock-based compensation and probabilities of performance award attainment
- Contract revenue
- Standalone selling prices of our products and services
- Acquired deferred revenue
- Useful lives for depreciation and amortization
- Valuations of goodwill and other intangible assets
- Deferred compensation

- Loss contingencies
- Operating lease assets and liabilities

Actual results could differ from these estimates. Changes in estimates are recorded in the results of operations in the period that the changes occur.

Revenue Recognition

Our revenue is derived principally from the licensing of computer software products and from related maintenance contracts. We adopted ASC 606 on January 1, 2018. ASC 606 requires an entity to evaluate revenue recognition by identifying a contract with a customer, identifying the performance obligations in the contract, determining the transaction price, allocating the transaction price to the performance obligations in the contract, and recognizing revenue when (or as) the entity satisfies a performance obligation.

Revenue Recognition Policy 2019 and 2018 (ASC 606)

We enter into contracts that include combinations of products, maintenance and services, which are accounted for as separate performance obligations with differing revenue recognition patterns.

Revenue from perpetual licenses is classified as software license revenue. Software license revenue is recognized up front upon delivery of the licensed product and/or the utility that enables the customer to access authorization keys, provided that an enforceable contract has been received. Typically, our perpetual licenses are sold with post-contract support (PCS), which includes unspecified technical enhancements and customer support. We allocate value in bundled perpetual and PCS arrangements based on the standalone selling prices of the perpetual license and PCS. Revenue from PCS is classified as maintenance revenue and is recognized ratably over the term of the contract, as we satisfy the PCS performance obligation over time.

In addition to perpetual licenses, we sell time-based lease licenses. Lease licenses are sold only as a bundled arrangement that includes the rights to a term software license and PCS. Utilizing observable inputs, we determined that 50% of the estimated standalone selling price of the lease license is attributable to the term license and 50% is attributable to the PCS. This determination considered the value relationship for our products between PCS to time-based lease licenses, the value relationship between PCS and perpetual licenses, the average economic life of our products, software renewal rates and the price of the bundled arrangement in relation to the perpetual licensing approach. Consistent with the perpetual sales, the license component is classified as software license revenue and recognized as revenue up front at the commencement of the lease upon delivery of the licensed product and/or utility that enables the customer to access authorization keys. The PCS is classified as maintenance revenue and is recognized ratably over the term of the contract, as we satisfy the PCS performance obligation over time.

Revenue from training, support and other services is recognized as the services are performed. For contracts in which the service consists of a single performance obligation, such as providing a training class to a customer, we recognize revenue upon completion of the performance obligation. For service contracts that are longer in duration and often include multiple performance obligations (for example, both training and consulting), we measure the progress toward completion of the obligations and recognize revenue accordingly. In measuring progress towards the completion of performance obligations, we typically utilize output-based estimates for services with contractual billing arrangements that are not based on time and materials, and estimate output based on the total tasks completed as compared to the total tasks required for each work contract. Input-based estimates are utilized for services that involve general consultations with contractual billing arrangements based on time and materials, utilizing direct labor as the input measure. Proceeds from customers for the purpose of expediting road-map items, developing new products or creating specific features and functionality for existing products is classified as revenue.

We also execute arrangements through independent channel partners in which the channel partners are authorized to market and distribute our software products to end users of our products and services in specified territories. In sales facilitated by channel partners, the channel partner bears the risk of collection from the end-user customer. We recognize revenue from transactions with channel partners in a manner consistent with the direct sales described above for both perpetual and time-based licenses. Revenue from channel partner transactions is the amount remitted to us by the channel partners. This amount includes a fee for PCS that is compensation for providing technical enhancements and the second level of technical support to the end user, which is recognized over the period that PCS is to be provided.

Non-income related taxes collected from customers and remitted to governmental authorities are recorded on the consolidated balance sheet as accounts receivable and accrued expenses. The collection and payment of these amounts are reported on a net basis in the consolidated statements of income and do not impact reported revenues or expenses.

We do not offer right of return. We warrant to our customers that our software will perform substantially as specified in our current user manuals. We have not experienced significant claims related to software warranties beyond the scope of

maintenance support, which we are already obligated to provide. The warranty is not sold, and cannot be purchased, separately. The warranty does not provide any type of additional service to the customer or performance obligation for us.

Our agreements with our customers generally require us to indemnify the customer against claims that our software infringes third-party patent, copyright, trademark or other proprietary rights. Such indemnification obligations are generally limited in a variety of industry-standard respects, including our right to replace an infringing product.

Significant Judgments (ASC 606)

Our contracts with customers typically include promises to transfer licenses and services to a customer. Judgment is required to determine if the promises are separate performance obligations, and if so, to allocate the transaction price to each performance obligation. We use the estimated standalone selling price method to allocate the transaction price for each performance obligation. The estimated standalone selling price is determined using all information reasonably available to us, including market conditions and other observable inputs. The corresponding revenues are recognized as the related performance obligations are satisfied.

We apply a practical expedient to expense sales commissions as incurred when the amortization period would have been one year or less. Sales commissions associated with the initial year of multi-year contracts are expensed as incurred due to their immateriality. Sales commissions associated with multi-year contracts beyond the initial year are subject to an employee service requirement and are expensed as incurred as they are not considered incremental costs to obtain a contract.

We are required to adjust promised amounts of consideration for the effects of the time value of money if the timing of the payments provides the customer or us with a significant financing benefit. We consider various factors in assessing whether a financing component exists, including the duration of the contract, market interest rates and the timing of payments. Our contracts do not include a significant financing component requiring adjustment to the transaction price.

Revenue Recognition Policy 2017 (ASC 605)

Revenue from perpetual licenses was classified as license revenue and was recognized upon delivery of the licensed product and/or the utility that enabled the customer to access authorization keys, provided that acceptance had occurred and a signed contractual obligation was received, the price was fixed and determinable, and collectibility of the receivable was probable. We determined the fair value of PCS sold together with perpetual licenses based on the rate charged for PCS when sold separately. Revenue from PCS contracts was classified as maintenance and service revenue and was recognized ratably over the term of the contract.

Revenue for software lease licenses was classified as license revenue and was recognized over the period of the lease contract. Typically, our software leases include PCS which, due to the short term (principally one year or less) of our software lease licenses, were not permitted to be separated from lease revenue for accounting purposes. As a result, both the lease licenses and PCS were recognized ratably over the lease period. We included the revenue for the entire lease arrangement within software license revenue in the consolidated statements of income.

Many of our semiconductor products are typically licensed via longer term leases of 24–36 months. We recognized revenue for these licenses over the term of the lease contract. Because we did not have vendor-specific objective evidence of the fair value of these leases, we also recognized revenue from perpetual licenses over the term of the lease contract during the infrequent occurrence of these licenses being sold with semiconductor leases in multiple-element arrangements.

Revenue from training, support and other services was recognized as the services were performed. We applied the specific performance method to contracts in which the service consisted of a single act, such as providing a training class to a customer, and the proportional performance method to other service contracts that were longer in duration and often included multiple acts (for example, both training and consulting). In applying the proportional performance method, we typically utilized output-based estimates for services with contractual billing arrangements that were not based on time and materials, and estimated output based on the total tasks completed as compared to the total tasks required for each work contract. Input-based estimates were utilized for services that involved general consultations with contractual billing arrangements based on time and materials, utilizing direct labor as the input measure.

The accounting treatment under ASC 605 associated with arrangements through independent channel partners, non-income related taxes, warranties and indemnification obligations is consistent with the accounting treatment under ASC 606 described above.

Cash and Cash Equivalents

Cash and cash equivalents consist primarily of highly liquid investments such as deposits held at major banks and money market funds. Cash equivalents are carried at cost, which approximates fair value. Our cash and cash equivalents balances comprise the following:

<i>(in thousands, except percentages)</i>	December 31, 2019		December 31, 2018	
	Amount	% of Total	Amount	% of Total
Cash accounts	\$ 549,639	63.0	\$ 331,084	42.6
Money market funds	322,455	37.0	446,055	57.4
Total	\$ 872,094		\$ 777,139	

Our money market fund balances are held in various funds of a single issuer.

Property and Equipment

Property and equipment is stated at cost. Depreciation is computed using the straight-line method over the estimated useful lives of the various classes of assets, which range from one year to forty years. Repairs and maintenance are charged to expense as incurred. Gains or losses from the sale or retirement of property and equipment are included in operating income.

Research and Development

Research and development costs are expensed as incurred. Internally developed software costs required to be capitalized as defined by the accounting guidance are not material to our consolidated financial statements.

Business Combinations

When we consummate an acquisition, the assets acquired and the liabilities assumed are recognized separately from goodwill at their acquisition date fair values. Goodwill as of the acquisition date is measured as the excess of the fair value of consideration transferred over the acquisition date fair value of the net identifiable assets acquired. While best estimates and assumptions are used to accurately value assets acquired and liabilities assumed at the acquisition date as well as contingent consideration, where applicable, our estimates are inherently uncertain and subject to refinement. As a result, during the measurement period, which may be up to one year from the acquisition date, we record adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill as we obtain new information about facts and circumstances that existed as of the acquisition date that, if known, would have affected the measurement of the amounts recognized as of that date. Upon the earlier of the conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, any subsequent adjustments are recorded in the consolidated statements of income.

Goodwill and Other Intangible Assets

Goodwill represents the excess of the fair value of consideration transferred over the fair value of net identifiable assets acquired. Other intangible assets consist of trade names, customer lists, contract backlog and acquired software and technology. Intangible assets that are not considered to have an indefinite useful life are amortized over their useful lives, which range from two years to seventeen years. Amortization expense for intangible assets was \$36.9 million, \$40.8 million and \$49.8 million for the years ended December 31, 2019, 2018 and 2017, respectively.

We test goodwill and indefinite-lived intangible assets for impairment at least annually by performing a quantitative assessment of whether the fair value of each reporting unit or asset exceeds its carrying amount. We have one reporting unit. Goodwill is tested at this reporting unit level and indefinite-lived intangible assets are tested at the individual asset level. This requires us to assess and make judgments regarding a variety of factors which impact the fair value of the reporting unit or asset being tested, including business plans, anticipated future cash flows, economic projections and other market data.

We perform our annual impairment tests for goodwill and indefinite-lived intangible assets as of January 1 of each year unless there is an indicator that would require a test during the year. We periodically review the carrying value of other intangible assets and will recognize impairments when events or circumstances indicate that such assets may be impaired.

Concentrations of Credit Risk

We have a concentration of credit risk with respect to revenue and trade receivables due to the use of certain significant channel partners to market and sell our products. We perform periodic credit evaluations of our customers' financial condition and generally do not require collateral. The following table outlines concentrations of risk with respect to our revenue:

<i>(as a % of revenue)</i>	Year Ended December 31,		
	2019	2018	2017
Revenue from channel partners	23%	22%	25%
Largest channel partner	4%	4%	5%
2 nd largest channel partner	2%	2%	2%

No single customer accounted for more than 5% of our revenue in 2019, 2018 or 2017.

In addition to the concentration of credit risk with respect to trade receivables, our cash and cash equivalents are also exposed to concentration risk. Our cash and cash equivalent accounts are insured through various public and private bank deposit insurance programs, foreign and domestic; however, a significant portion of our funds are not insured. The following table outlines concentrations of risk with respect to our cash and cash equivalents:

<i>(in thousands)</i>	As of December 31,	
	2019	2018
Cash and cash equivalents held domestically	\$ 626,433	\$ 616,249
Cash and cash equivalents held by foreign subsidiaries	245,661	160,890
Cash and cash equivalents held in excess of deposit insurance, foreign and domestic	855,721	754,163
Largest balance of cash and cash equivalents held with one financial institution, foreign and domestic	330,551	452,166

Allowance for Doubtful Accounts

We make judgments as to our ability to collect outstanding receivables and provide allowances for a portion of receivables when collection becomes doubtful. Provisions are made based upon a specific review of all significant outstanding invoices from both value and delinquency perspectives. For those invoices not specifically reviewed, provisions are estimated at differing rates based upon the age of the receivable and the geographic area of origin. In determining these percentages, we consider our historical collection experience and current economic trends in the customer's industry and geographic region. We recorded provisions for bad debts of \$2.9 million, \$1.6 million and \$1.5 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Income Taxes

We account for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period of the enactment date.

We record net deferred tax assets to the extent we believe these assets will more likely than not be realized. In making such determination, we consider all available positive and negative evidence, including scheduled reversals of deferred tax liabilities, projected future taxable income, tax planning strategies and recent financial operations. In the event we determine that we will be able to realize deferred tax assets for which a valuation allowance was used to reduce their carrying value, the adjustment to the valuation allowance will be recorded as a reduction to the provision for income taxes.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more-likely-than-not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively settled, which means that the statute of limitations has expired or the appropriate taxing authority has completed its examination even though the statute of limitations remains open.

We recognize interest and penalties related to income taxes within the income tax expense line in the consolidated statements of income. Accrued interest and penalties are included within the related tax liability line in the consolidated balance sheets.

Foreign Currencies

Certain of our sales and intercompany transactions are denominated in foreign currencies. These transactions are translated to the functional currency at the exchange rate on the transaction date. Assets and liabilities denominated in a currency other than our functional currency or our subsidiaries' functional currencies are translated at the effective exchange rate on the balance sheet date. Gains and losses resulting from foreign exchange transactions are included in other expense, net. We recorded net foreign exchange losses of \$2.5 million, \$3.1 million and \$1.9 million for the years ended December 31, 2019, 2018 and 2017, respectively.

The financial statements of our foreign subsidiaries are translated from the functional (local) currency to U.S. Dollars. Assets and liabilities are translated at the exchange rates on the balance sheet date. Results of operations are translated at average exchange rates, which approximate rates in effect when the underlying transactions occurred.

Accumulated Other Comprehensive Loss

Accumulated other comprehensive loss is composed entirely of foreign currency translation adjustments.

Earnings Per Share

Basic earnings per share (EPS) amounts are computed by dividing earnings by the weighted average number of common shares outstanding during the period. Diluted EPS amounts assume the issuance of common stock for all potentially dilutive equivalents outstanding. To the extent stock awards are anti-dilutive, they are excluded from the calculation of diluted EPS.

The details of basic and diluted EPS are as follows:

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2019	2018	2017
Net income	\$ 451,295	\$ 419,375	\$ 259,251
Weighted average shares outstanding – basic	84,259	83,973	84,988
Dilutive effect of stock plans	1,666	1,940	1,866
Weighted average shares outstanding – diluted	85,925	85,913	86,854
Basic earnings per share	\$ 5.36	\$ 4.99	\$ 3.05
Diluted earnings per share	\$ 5.25	\$ 4.88	\$ 2.98
Anti-dilutive shares	14	7	84

Stock-Based Compensation

We account for stock-based compensation in accordance with share-based payment accounting guidance. The guidance requires an entity to measure the cost of employee services received in exchange for an award of equity instruments based on the grant-date fair value of the award. The cost is recognized over the period during which an employee is required to provide services in exchange for the award, typically the vesting period.

Fair Value of Financial Instruments

We account for certain assets and liabilities at fair value in accordance with the accounting guidance applicable to fair value measurements and disclosures. The carrying values of cash, cash equivalents, short-term investments, accounts receivable, accounts payable, accrued expenses, other accrued liabilities and short-term obligations are deemed to be reasonable estimates of their fair values because of their short-term nature.

3. Revenue from Contracts with Customers

Adoption of ASC 606, Revenue from Contracts with Customers

We adopted ASC 606 on January 1, 2018 using the modified retrospective approach for all contracts not completed as of the date of adoption. Results for reporting periods beginning after January 1, 2018 are presented under ASC 606, while prior period amounts are not adjusted and continue to be reported in accordance with ASC 605. The adoption of ASC 606 represents a change in accounting principle that will more closely align revenue recognition with the delivery of our software licenses, maintenance and services.

We recorded an increase to retained earnings of \$242.4 million, or \$183.1 million net of tax, on January 1, 2018 due to the cumulative effect of the ASC 606 adoption, with the impact primarily derived from revenue related to time-based software lease licenses. Software lease license revenue was recognized ratably over the term of the contract under the previous guidance; however, approximately 50% of the contract is recognized up front at the commencement of the lease under ASC 606 with the remainder recognized ratably to maintenance and service revenue.

Disaggregation of Revenue

The following table summarizes revenue:

<i>(in thousands)</i>	Year Ended December 31,		
	2019 (ASC 606)	2018 (ASC 606)	2017 (ASC 605)
Revenue:			
Lease licenses	\$ 406,043	\$ 275,619	\$ 376,886
Perpetual licenses	293,587	301,098	248,078
Software licenses	699,630	576,717	624,964
Maintenance	760,574	676,883	440,428
Service	55,688	40,036	29,858
Maintenance and service	816,262	716,919	470,286
Total revenue	\$ 1,515,892	\$ 1,293,636	\$ 1,095,250
Direct revenue, as a percentage of total revenue	77.1%	77.6%	75.2%
Indirect revenue, as a percentage of total revenue	22.9%	22.4%	24.8%

Our software licenses revenue is recognized up front, while maintenance and service revenue is generally recognized over the term of the contract.

Deferred Revenue

Deferred revenue consists of billings made or payments received in advance of revenue recognition from customer agreements. The timing of revenue recognition may differ from the timing of billings to customers. Payment terms vary by the type and location of customer and the products or services offered. The time between invoicing and when payment is due is not significant.

The changes in deferred revenue, inclusive of both current and long-term deferred revenue, during the years ended December 31, 2019 and 2018 were as follows:

<i>(in thousands)</i>	2019	2018
Beginning balance – January 1	\$ 343,174	\$ 299,730
Acquired deferred revenue	6,880	2,470
Deferral of revenue	1,532,549	1,339,964
Recognition of deferred revenue	(1,515,892)	(1,293,636)
Currency translation	(1,437)	(5,354)
Ending balance – December 31	\$ 365,274	\$ 343,174

Revenue allocated to remaining performance obligations represents contracted revenue that has not yet been recognized, which includes both deferred revenue and backlog. Our backlog represents installment billings for periods beyond the current

quarterly billing cycle. Revenue recognized during the years ended December 31, 2019 and 2018 included amounts in deferred revenue and backlog at the beginning of the period of \$475.9 million and \$387.2 million, respectively.

Total revenue allocated to remaining performance obligations as of December 31, 2019 will be recognized as revenue as follows:

<i>(in thousands)</i>	
Next 12 months	\$ 569,751
Months 13-24	177,364
Months 25-36	93,097
Thereafter	30,531
Total revenue allocated to remaining performance obligations	<u>\$ 870,743</u>

4. Acquisitions

2019 Acquisitions

On November 1, 2019, we completed the acquisition of 100% of the shares of LST, the premier provider of explicit dynamics and other advanced finite element analysis technology. The acquisition empowers our customers to solve a new class of engineering challenges, including developing safer automobiles, aircraft and trains while reducing or even eliminating the need for costly physical testing. The transaction closed with a purchase price of \$777.8 million, which included \$470.6 million in cash and the issuance of 1.4 million shares of our common stock in an unregistered offering to the prior owners of LST. The fair value of the common stock issued as consideration was based on the volume-weighted average price of our common stock on November 1, 2019 of \$220.74, resulting in a fair value of \$307.2 million.

On February 1, 2019, we completed the acquisition of 100% of the shares of Granta Design for a purchase price of \$208.7 million, paid in cash and inclusive of final net working capital adjustments. The acquisition of Granta Design, the premier provider of materials information technology, expands our portfolio into this important area, giving customers access to materials intelligence, including data that is critical to successful simulations.

Additionally, during the year ended December 31, 2019, we acquired Dynardo, Helic and DfR Solutions to combine the acquired technologies with our existing comprehensive multiphysics portfolio. These acquisitions were not individually significant. The combined purchase price of these other acquisitions was \$136.2 million, paid in cash.

During the year ended December 31, 2019, we incurred \$6.6 million in acquisition-related expenses, recognized as selling, general and administrative expense on the consolidated statements of income.

The assets and liabilities of the acquisitions have been recorded based upon management's estimates of their fair market values as of each respective date of acquisition. The following tables summarize the fair values of consideration transferred and the fair values of identified assets acquired and liabilities assumed at each respective date of acquisition:

Fair Value of Consideration Transferred:

<i>(in thousands)</i>	LST	Granta Design	Other Acquisitions	Total
Cash	\$ 470,623	\$ 208,736	\$ 136,232	\$ 815,591
Ansys common stock	307,173	—	—	307,173
Total consideration transferred at fair value	<u>\$ 777,796</u>	<u>\$ 208,736</u>	<u>\$ 136,232</u>	<u>\$ 1,122,764</u>

Recognized Amounts of Identifiable Assets Acquired and Liabilities Assumed:

<i>(in thousands)</i>	LST	Granta Design	Other Acquisitions	Total
Cash	\$ 8,520	\$ 13,644	\$ 6,231	\$ 28,395
Accounts receivable and other tangible assets	20,568	6,941	10,746	38,255
Developed software and core technologies (10-year weighted-average life)	167,700	32,445	25,018	225,163
Customer lists (15-year weighted-average life)	25,900	20,016	15,743	61,659
Trade names (10-year weighted-average life)	10,600	4,579	2,051	17,230
Indemnification asset	34,039	—	—	34,039
Accounts payable and other liabilities	(3,721)	(6,714)	(6,425)	(16,860)
Deferred revenue	(3,565)	(1,426)	(1,889)	(6,880)
Uncertain tax positions	(34,039)	—	(257)	(34,296)
Net deferred tax liabilities	(47,596)	(9,822)	(8,294)	(65,712)
Total identifiable net assets	<u>\$ 178,406</u>	<u>\$ 59,663</u>	<u>\$ 42,924</u>	<u>\$ 280,993</u>
Goodwill	<u>\$ 599,390</u>	<u>\$ 149,073</u>	<u>\$ 93,308</u>	<u>\$ 841,771</u>

LST has uncertain tax positions inclusive of interest and penalties of \$34.0 million and a corresponding indemnification asset. The uncertain tax positions reflect potential federal and state tax liabilities associated with tax years 2016 to 2019. Settlements of the tax positions, if any, will be funded by the indemnification asset that was created in accordance with the executed Agreement and Plan of Merger.

The goodwill, which is generally not tax-deductible, is attributed to intangible assets that do not qualify for separate recognition, including the assembled workforce of the acquired business and the synergies expected to arise as a result of the acquisitions.

The fair values of the assets acquired and liabilities assumed are based on preliminary calculations. The estimates and assumptions for these items are subject to change as additional information about what was known and knowable at the acquisition date is obtained during the measurement period (up to one year from the acquisition date).

We determined the fair value of our intangible assets using various valuation techniques, including the relief-from-royalty method and the multi-period excess earnings method. These models utilize certain unobservable inputs classified as Level 3 measurements as defined by ASC 820, *Fair Value Measurements and Disclosures*. The determination of fair value requires considerable judgment and is sensitive to changes in underlying assumptions, estimates and market factors. Estimating fair value requires us to make assumptions and estimates regarding our future plans, as well as industry and economic conditions. These assumptions and estimates include, but are not limited to: royalty rate, discount rate and attrition rate.

The valuation method and assumptions used to determine the fair value of the significant intangible assets acquired in 2019 are as follows:

Intangible Asset	Valuation Method	LST Assumptions	Granta Design Assumptions
Developed software and core technologies	Relief-from-royalty	Royalty rate: 50% Discount rate: 10%	Royalty rate: 8% - 10% Discount rate: 12.5%
Trade names	Relief-from-royalty	Royalty rate: 2% Discount rate: 10%	Royalty rate: 2% Discount rate: 14%
Customer lists	Multi-period excess earnings	Attrition rate: 10% Discount rate: 11%	Attrition rate: 10% Discount rate: 12.5%

The operating results of each acquisition have been included in our consolidated financial statements since each respective date of acquisition. The effects of the business combinations were not material to our consolidated results of operations individually. The table presented below reflects the aggregate impact on our results of operations of the 2019 acquisitions from the date of acquisition to December 31, 2019. The operating income does not include integration costs borne directly by us and our non-acquired subsidiaries as a result of the acquisitions.

<i>(in thousands)</i>	Year Ended December 31, 2019	
Revenue	\$	44,079
Operating income	\$	6,733

2018 Acquisition

On May 2, 2018, we completed the acquisition of 100% of the shares of OPTIS, a premier provider of software for scientific simulation of light, human vision and physics-based visualization, for a purchase price of \$291.0 million, paid in cash. The acquisition extends our portfolio into the area of optical simulation to provide comprehensive sensor solutions, covering visible and infrared light, electromagnetics and acoustics for camera, radar and lidar.

The operating results of OPTIS have been included in our consolidated financial statements since May 2, 2018, the date of acquisition.

The assets and liabilities of OPTIS have been recorded based upon management's estimates of their fair market values as of the acquisition date. The following tables summarize the fair value of consideration transferred and the fair values of identified assets acquired and liabilities assumed at the acquisition date:

Fair Value of Consideration Transferred:

<i>(in thousands)</i>	OPTIS	
Cash	\$	290,983

Recognized Amounts of Identifiable Assets Acquired and Liabilities Assumed:

<i>(in thousands)</i>	OPTIS	
Cash	\$	7,957
Accounts receivable and other tangible assets		15,910
Developed software and core technologies (10-year weighted-average life)		47,597
Customer lists (12-year life)		41,303
Trade names (9-year weighted-average life)		10,749
Accounts payable and other liabilities		(11,941)
Deferred revenue		(2,470)
Net deferred tax liabilities		(23,438)
Total identifiable net assets	\$	85,667
Goodwill	\$	205,316

The goodwill, which is generally not tax-deductible, is attributed to intangible assets that do not qualify for separate recognition, including the assembled workforce of the acquired business and the synergies expected to arise as a result of the acquisition of OPTIS.

During the one-year measurement period since the OPTIS acquisition date, we adjusted the fair values of the assets acquired and liabilities assumed, with the offset recorded as a \$2.6 million increase to goodwill. These adjustments were made as we obtained new information about facts and circumstances that existed as of the acquisition date that, if known, would have affected the measurement of the amounts recognized as of that date.

Full pro forma results of operations have not been presented as the effects of the OPTIS business combination were not material to our consolidated results of operations. The table presented below reflects the impact of OPTIS from the date of acquisition to December 31, 2018. The operating loss does not include integration costs borne directly by us and our non-OPTIS subsidiaries as a result of the acquisition.

<i>(in thousands)</i>	Year Ended December 31, 2018	
Revenue	\$	18,532
Operating loss	\$	(5,462)

2017 Acquisitions

During the year ended December 31, 2017, we completed various acquisitions to expand our customer base and accelerate the development of new and innovative products to the marketplace while lowering design and engineering costs for customers. The acquisitions were not individually significant. The combined purchase price of the acquisitions was approximately \$67.0 million. The 2017 technology acquisitions are further described in the table below:

Date of Closing	Company	Details
November 15, 2017	3DSIM	3DSIM, a developer of premier additive manufacturing technology, gives us a complete additive manufacturing simulation workflow solution. 3DSIM's software solutions empower manufacturers, designers, materials scientists and engineers to achieve their objectives through simulation-driven innovation rather than physical trial and error.
July 5, 2017	Computational Engineering International, Inc. (CEI Inc.)	CEI Inc., the developer of EnSight, aids engineers and scientists in their ability to analyze, visualize and communicate large simulation data sets in clear, higher-resolution outputs.
March 10, 2017	CLK Design Automation (CLK-DA)	CLK-DA offers fast transistor simulation technology that complements our semiconductor product portfolio.

The operating results of each acquisition have been included in our consolidated financial statements since each respective date of acquisition. The effects of the business combinations were not material to our consolidated results of operations individually or in the aggregate.

5. Other Receivables and Current Assets and Other Accrued Expenses and Liabilities

Our other receivables and current assets, and other accrued expenses and liabilities, comprise the following balances:

<i>(in thousands)</i>	December 31,	
	2019	2018
Receivables related to unrecognized revenue	\$ 177,679	\$ 167,144
Income taxes receivable, including overpayments and refunds	26,672	13,709
Prepaid expenses and other current assets	45,268	35,260
Total other receivables and current assets	\$ 249,619	\$ 216,113
Consumption, sales and VAT tax liabilities	\$ 36,398	\$ 24,192
Accrued expenses and other current liabilities	106,549	75,367
Total other accrued expenses and liabilities	\$ 142,947	\$ 99,559

Receivables related to unrecognized revenue represent the current portion of billings made for customer contracts that have not yet been recognized as revenue.

6. Property and Equipment

Property and equipment consists of the following:

<i>(in thousands)</i>	Estimated Useful Lives	December 31,	
		2019	2018
Equipment	1-15 years	\$ 105,428	\$ 92,409
Computer software	1-5 years	33,878	35,053
Buildings and improvements	5-40 years	38,095	27,352
Leasehold improvements	1-17 years	19,876	15,782
Furniture	1-13 years	12,766	10,846
Land		2,696	1,759
Property and equipment, gross		212,739	183,201
Less: Accumulated depreciation		(129,103)	(121,546)
Property and equipment, net		\$ 83,636	\$ 61,655

Depreciation expense related to property and equipment was \$23.6 million, \$18.4 million and \$17.9 million for the years ended December 31, 2019, 2018 and 2017, respectively.

7. Goodwill and Intangible Assets

Goodwill represents the excess of the fair value of consideration transferred over the fair value of net identifiable assets acquired. Identifiable intangible assets acquired in business combinations are recorded based on their fair values on the date of acquisition.

During the first quarter of 2019, we completed the annual impairment test for goodwill and the indefinite-lived intangible asset and determined that these assets had not been impaired as of the test date, January 1, 2019. No other events or circumstances changed during the year ended December 31, 2019 that would indicate that the fair values of our reporting unit and indefinite-lived intangible asset are below their carrying values.

Intangible assets are classified as follows:

<i>(in thousands)</i>	December 31, 2019		December 31, 2018	
	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Finite-lived intangible assets:				
Developed software and core technologies	\$ 635,063	\$ (332,622)	\$ 410,680	\$ (314,730)
Customer lists and contract backlog	269,629	(132,596)	209,031	(117,614)
Trade names	154,259	(117,379)	137,225	(113,677)
Total	\$ 1,058,951	\$ (582,597)	\$ 756,936	\$ (546,021)
Indefinite-lived intangible asset:				
Trade name	\$ 357		\$ 357	

Finite-lived intangible assets are amortized over their estimated useful lives of two years to seventeen years. Amortization expense for the intangible assets reflected above was \$36.9 million, \$40.8 million and \$49.8 million for the years ended December 31, 2019, 2018 and 2017, respectively.

As of December 31, 2019, estimated future amortization expense for the intangible assets reflected above is as follows:

<i>(in thousands)</i>	
2020	\$ 54,735
2021	53,231
2022	53,548
2023	52,474
2024	50,530
Thereafter	211,836
Total intangible assets subject to amortization, net	476,354
Indefinite-lived trade name	357
Other intangible assets, net	<u>\$ 476,711</u>

The changes in goodwill during the years ended December 31, 2019 and 2018 were as follows:

<i>(in thousands)</i>	2019	2018
Beginning balance - January 1	\$ 1,572,455	\$ 1,378,553
Acquisitions and adjustments ⁽¹⁾	842,588	204,381
Currency translation	(1,763)	(10,479)
Ending balance - December 31	<u>\$ 2,413,280</u>	<u>\$ 1,572,455</u>

⁽¹⁾ In accordance with the accounting for business combinations, we recorded adjustments to goodwill for the effect of changes in the provisional fair values of the assets acquired and liabilities assumed during the measurement period (up to one year from the acquisition date) as we obtained new information about facts and circumstances that existed as of the acquisition date that, if known, would have affected the measurement of the amounts recognized as of that date.

8. Fair Value Measurement

The valuation hierarchy for disclosure of assets and liabilities reported at fair value prioritizes the inputs for such valuations into three broad levels:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities;
- Level 2: quoted prices for similar assets and liabilities in active markets or inputs that are observable for the asset or liability, either directly or indirectly through market corroboration, for substantially the full term of the financial instrument; or
- Level 3: unobservable inputs based on our own assumptions used to measure assets and liabilities at fair value.

A financial asset's or liability's classification within the hierarchy is determined based on the lowest level input that is significant to the fair value measurement.

The following tables provide the assets carried at fair value and measured on a recurring basis:

<i>(in thousands)</i>	December 31, 2019	Fair Value Measurements at Reporting Date Using:		
		Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Cash equivalents	\$ 322,455	\$ 322,455	\$ —	\$ —
Short-term investments	\$ 288	\$ —	\$ 288	\$ —
Deferred compensation plan investments	\$ 1,110	\$ 1,110	\$ —	\$ —

<i>(in thousands)</i>	December 31, 2018	Fair Value Measurements at Reporting Date Using:		
		Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Cash equivalents	\$ 446,055	\$ 446,055	\$ —	\$ —
Short-term investments	\$ 225	\$ —	\$ 225	\$ —
Deferred compensation plan investments	\$ 1,646	\$ 1,646	\$ —	\$ —

The cash equivalents in the preceding tables represent money market funds, valued at net asset value, with carrying values which approximate their fair values because of their short-term nature.

The short-term investments in the preceding tables represent deposits held by certain foreign subsidiaries. The deposits have fixed interest rates with original maturities ranging from three months to one year.

The deferred compensation plan investments in the preceding tables represent trading securities held in a rabbi trust for the benefit of the non-employee Directors. These securities consist of mutual funds traded in an active market with quoted prices. As a result, the plan assets are classified as Level 1 in the fair value hierarchy. The plan assets are recorded within other long-term assets on our consolidated balance sheets.

9. Leases

We primarily have operating leases for office space and leased cars included in our ROU assets and lease liabilities. Our executive offices and those related to certain domestic product development, marketing, production and administration are located in a 186,000 square foot office facility in Canonsburg, Pennsylvania. The term of the lease is 183 months, which began on October 1, 2014 and expires on December 31, 2029. The lease agreement includes options to renew the contract through August 2044, an option to lease additional space in January 2025 and an option to terminate the lease in December 2025. No options are included in the lease liability as renewal is not reasonably certain. In addition, we are reasonably certain we will not terminate the lease agreement. Absent the exercise of options in the lease, our base rent (inclusive of property taxes and certain operating costs) was \$4.3 million per annum for the first five years of the lease term, \$4.5 million per annum for years six through ten and \$4.7 million per annum for years eleven through fifteen.

The components of our global lease cost reflected in the consolidated statements of income for the year ended December 31, 2019 are as follows:

<i>(in thousands)</i>	
Lease liability cost	\$ 22,507
Variable lease cost not included in the lease liability ⁽¹⁾	3,754
Total lease cost	\$ 26,261

⁽¹⁾ Variable lease cost includes common area maintenance, property taxes, utilities and fluctuations in rent due to a change in an index or rate.

For the years ended December 31, 2018 and 2017, lease cost totaled \$21.3 million and \$18.4 million, respectively.

Other information related to operating leases for the year ended December 31, 2019 is as follows:

<i>(in thousands)</i>	
Cash paid for amounts included in the measurement of the lease liability:	
Operating cash flows from operating leases	\$ (20,031)
Right-of-use assets obtained in exchange for new operating lease liabilities	\$ 35,191

As of December 31, 2019, the weighted-average remaining lease term of operating leases was 7.7 years, and the weighted-average discount rate of operating leases was 3.7%.

The maturity schedule of the operating lease liabilities as of December 31, 2019 is as follows:

<i>(in thousands)</i>	
2020	\$ 21,617
2021	19,439
2022	16,616
2023	12,513
2024	12,421
Thereafter	46,159
Total future lease payments	<u>128,765</u>
Less: Present value adjustment	(18,838)
Present value of future lease payments ⁽¹⁾	<u>\$ 109,927</u>

⁽¹⁾Includes the current portion of operating lease liabilities of \$18.2 million, which is reflected in other accrued expenses and liabilities in the consolidated balance sheets.

As of December 31, 2019, we had operating office leases that have not yet commenced with combined lease obligations of \$16.3 million. The leases commence in 2020 and have a weighted-average lease term of 7.2 years.

The future minimum lease payments under ASC 840, including termination fees, under noncancellable operating leases for office space in effect at December 31, 2018 were as follows:

<i>(in thousands)</i>	
2019	\$ 16,354
2020	12,469
2021	10,177
2022	8,523
2023	6,809
Thereafter	14,267
Total	<u>\$ 68,599</u>

10. Debt

In February 2019, we entered into a credit agreement for a \$500.0 million unsecured revolving credit facility, which includes a \$50.0 million sublimit for the issuance of letters of credit, with Bank of America, N.A. as the Administrative Agent. The revolving credit facility becomes payable in full on February 22, 2024 and is available for general corporate purposes, including, among others, to finance acquisitions and capital expenditures.

In connection with the acquisition of LST, we amended our existing credit agreement (amended credit agreement). The amendment provides for a new \$500.0 million unsecured term loan facility to finance the acquisition. The term loan was funded on November 1, 2019 and matures on November 1, 2024. Principal on the term loan will be payable on the last business day of each fiscal quarter commencing with the ninth full fiscal quarter after the funding date at a rate of 1.25% per quarter, increasing to 2.50% per quarter after the next four fiscal quarters.

Borrowings under the amended credit agreement will accrue interest at the Eurodollar rate plus an applicable margin or at the base rate, at our election. For the quarter ended December 31, 2019, we elected to apply the Eurodollar rate. The base rate is the applicable margin plus the highest of (i) the federal funds rate plus 0.500%, (ii) the Bank of America prime rate and (iii) the Eurodollar rate plus 1.000%. The applicable margin for these borrowings is a percentage per annum based on the lower of (1) a pricing level determined by our then-current consolidated leverage ratio and (2) a pricing level determined by our debt ratings (if such debt ratings exist). This results in a margin ranging from 1.125% to 1.750% and 0.125% to 0.750% for the Eurodollar rate and base rate, respectively. The interest rate in effect as of December 31, 2019 was 2.964%.

The amended credit agreement contains language in the event the Eurodollar rate is not available due to LIBOR changes. If this occurs, the base rate will be used for borrowings. However, we may work with the Administrative Agent to amend the agreement to replace the Eurodollar rate with (i) one or more rates based on the Secured Overnight Financing Rate (SOFR); or (ii) another alternative benchmark rate, subject to the lenders' approval.

The amended credit agreement contains customary representations and warranties, affirmative and negative covenants and events of default. The amended credit agreement also contains a financial covenant requiring us to maintain a consolidated leverage ratio of indebtedness to earnings before interest, taxes, depreciation and amortization not exceeding 3.50 to 1.00 as of the end of any fiscal quarter (for the four-quarter period ending on such date) with an opportunity for a temporary increase in such consolidated leverage ratio to 4.00 to 1.00 upon the consummation of certain qualified acquisitions for which the aggregate consideration is at least \$250.0 million.

As of December 31, 2019, there were no outstanding borrowings under the unsecured revolving credit agreement, and the carrying value of the term loan was \$498.5 million, which is net of \$1.5 million of unamortized debt issuance costs. We were in compliance with all covenants.

As of December 31, 2019, scheduled maturities of total debt for each of the five succeeding fiscal years is as follows:

<i>(in thousands)</i>	
2020 ⁽¹⁾	\$ —
2021	—
2022	25,000
2023	50,000
2024	425,000
Total	<u>\$ 500,000</u>

⁽¹⁾We repaid \$75.0 million of the unsecured term loan in January 2020 prior to its scheduled maturity date. As such, the payment is reflected as current on our consolidated balance sheet but not in the table above.

11. Income Taxes

Income before income taxes included the following components:

<i>(in thousands)</i>	Year Ended December 31,		
	2019	2018	2017
Domestic	\$ 448,271	\$ 455,478	\$ 344,447
Foreign	74,312	31,607	51,247
Total	<u>\$ 522,583</u>	<u>\$ 487,085</u>	<u>\$ 395,694</u>

The provision for income taxes was composed of the following:

<i>(in thousands)</i>	Year Ended December 31,		
	2019	2018	2017
Current:			
Federal	\$ 44,824	\$ 58,138	\$ 112,414
State	9,554	12,888	7,879
Foreign	31,421	30,359	18,843
Deferred:			
Federal	(8,833)	(20,764)	(7,387)
State	(965)	(2,901)	(584)
Foreign	(4,713)	(10,010)	5,278
Total	<u>\$ 71,288</u>	<u>\$ 67,710</u>	<u>\$ 136,443</u>

The reconciliation of the U.S. federal statutory tax rate to the consolidated effective tax rate was as follows:

	Year Ended December 31,		
	2019	2018	2017
Federal statutory tax rate	21.0 %	21.0 %	35.0 %
State income taxes, net of federal benefit	1.5	1.5	1.1
Foreign rate differential	0.8	0.8	0.1
Uncertain tax positions	(0.2)	0.5	0.3
U.S. tax reform enactment	(0.4)	0.2	4.5
Valuation allowance release	(1.3)	—	—
Domestic production activity benefit	—	—	(2.6)
Benefit from entity structuring activities	—	(1.4)	—
Research and development credits	(2.2)	(2.3)	(1.4)
Stock-based compensation	(3.1)	(3.3)	(3.1)
Foreign-derived intangible income deduction	(3.8)	(3.9)	—
Other	1.3	0.8	0.6
	13.6 %	13.9 %	34.5 %

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (Tax Reform). Tax Reform made broad and complex changes to the U.S. tax code, including, but not limited to, (1) reducing the U.S. federal corporate tax rate from 35 percent to 21 percent; (2) requiring companies to pay a one-time federal income tax on certain unrepatriated earnings of foreign subsidiaries (transition tax); (3) generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; (4) creating a new provision designed to tax global intangible low-taxed income (GILTI) which allows for the possibility of using foreign tax credits (FTCs) and a deduction of up to 50 percent to offset the income tax liability (subject to some limitations); (5) repealing the domestic production activity deduction; (6) creating the foreign-derived intangible income deduction; (7) creating the base erosion anti-abuse tax, a new minimum tax; (8) allowing for full expensing of qualified property through bonus depreciation; and (9) creating limitations on the deductibility of certain executive compensation.

The SEC staff issued Staff Accounting Bulletin (SAB) 118, which provides guidance on accounting for the tax effects of Tax Reform. SAB 118 provided a measurement period that was limited to one year from enactment for companies to complete the accounting under ASC 740, *Income Taxes*. In accordance with SAB 118, throughout the measurement period, a company must reflect the income tax effects of those aspects of Tax Reform for which the accounting under ASC 740 was complete in the financial statements. To the extent that a company's accounting for certain income tax effects of Tax Reform was incomplete, but a reasonable estimate was able to be made, the company must record a provisional estimate in the financial statements. If a company could not determine a provisional estimate to be included in the financial statements, it should continue to apply ASC 740 on the basis of the tax laws that were in effect immediately before the enactment of Tax Reform.

As further discussed below, we finalized our provisional Tax Reform calculations as of the end of the measurement period, based on guidance and information available as of the reporting date. The U.S. government has not yet issued final guidance related to a portion of the new rules enacted as part of Tax Reform. Subsequent adjustments, if any, will be recorded in the period in which guidance is finalized.

Our accounting for the impact of the reduction in the U.S. federal corporate tax rate on our deferred tax assets and liabilities is complete. Tax Reform reduced the corporate tax rate to 21 percent, effective January 1, 2018. Consequently, we recorded a net adjustment to deferred income tax expense of \$1.9 million for the year ended December 31, 2017 to revalue our deferred tax assets and liabilities. No further adjustments were recorded for the years ended December 31, 2019 and 2018.

Our accounting for the transition tax is complete. Reasonable estimates of certain effects were calculated and a provisional adjustment of \$16.0 million was recorded in the December 31, 2017 financial statements. To determine the amount of the transition tax, we determined, in addition to other factors, the amount of post-1986 earnings and profits (E&P) of the relevant subsidiaries, as well as the amount of non-U.S. income taxes paid on such earnings. Based on revised E&P calculations updated during the measurement period, we recognized an additional measurement-period adjustment for the year ended December 31, 2018 of \$0.9 million to the transition tax obligation and a corresponding adjustment to tax expense. In February 2019, the U.S. government published final regulations relating to transition tax. In accordance with the final regulations, we recognized a post-measurement period reduction for the year ended December 31, 2019 of \$1.8 million to the transition tax obligation and a corresponding adjustment to tax expense, resulting in a final transition tax obligation of \$15.1 million. We have elected to pay this liability over eight years; however, in accordance with IRS issued guidance, tax overpayments from the year ended

December 31, 2017 are required to be applied to the transition tax obligation. Based on this guidance, the entire balance of the obligation has been paid as of December 31, 2019.

Our accounting for the indefinite reinvestment assertion is complete. In general, it is our intention to permanently reinvest all earnings in excess of previously taxed amounts. As part of Tax Reform, substantially all of the previous earnings of our non-U.S. subsidiaries were taxed through the transition tax and current earnings are taxed as part of GILTI tax expense. These taxes increased our previously taxed earnings and allow for the repatriation of the majority of our foreign earnings without any residual U.S. federal tax. While we believe that the financial reporting bases may be greater than the tax bases of investments in foreign subsidiaries for any earnings in excess of previously taxed amounts, such amounts are considered permanently reinvested. The cumulative temporary difference related to such permanently reinvested earnings is approximately \$32.8 million and we would anticipate the tax effect on those earnings to be immaterial as a result of Tax Reform. During the year ended December 31, 2018, we repatriated \$144.3 million of foreign cash. We did not make any adjustments related to our indefinite reinvestment assertion during the years ended December 31, 2019 and 2018.

Our accounting policy choice for GILTI is complete. Under U.S. GAAP, we are allowed to make an accounting policy choice of either (1) treating taxes due on future U.S. inclusions in taxable income related to GILTI as a current-period expense when incurred (the period cost method) or (2) factoring such amounts into the measurement of our deferred taxes (the deferred method). We selected the period cost method and recorded GILTI tax expense of \$0.6 million and \$0.4 million in the financial statements for the years ended December 31, 2019 and 2018, respectively.

The components of deferred tax assets and liabilities are as follows:

<i>(in thousands)</i>	December 31,	
	2019	2018
Deferred tax assets:		
Net operating loss carryforwards	\$ 35,044	\$ 39,290
Operating lease liabilities	26,628	—
Stock-based compensation	24,254	20,464
Uncertain tax positions	19,227	17,823
Employee benefits	9,392	15,048
Research and development credits	5,865	5,951
Other	6,309	4,121
Valuation allowance	(17,524)	(21,676)
Total deferred tax assets	109,195	81,021
Deferred tax liabilities:		
Other intangible assets	(99,193)	(38,787)
Operating lease right-of-use assets	(25,648)	—
Accounting method change	(21,396)	(31,626)
Deferred revenue	(13,744)	(12,021)
Property and equipment	(3,780)	(2,034)
Total deferred tax liabilities	(163,761)	(84,468)
Net deferred tax liabilities	\$ (54,566)	\$ (3,447)

The valuation allowance decreased by \$4.2 million for the year ended December 31, 2019. Due to an enacted law change in a foreign jurisdiction during the year ended December 31, 2019, certain expenses will become nondeductible for tax purposes in 2020, resulting in the ability to utilize net operating losses in a jurisdiction where we previously determined utilization was remote. Considering all positive and negative evidence, we determined significant positive evidence exists to release \$6.7 million of valuation allowance previously established. This decrease in the valuation allowance is offset by other increases in unrealizable tax assets. As of each reporting date, management considers new evidence, both positive and negative, that could affect the future realization of deferred tax assets. If management determines it is more likely than not that an asset, or a portion of an asset, will not be realized, a valuation allowance is recorded.

As of December 31, 2019, we had federal net operating loss carryforwards of \$4.2 million. These losses expire between 2025 - 2037, and are subject to limitations on their utilization. Deferred tax assets of \$0.3 million have been recorded for state operating loss carryforwards. These losses expire between 2030 - 2038, and are subject to limitations on their utilization. We had total foreign net operating loss carryforwards of \$142.0 million, of which \$113.2 million are not currently subject to expiration dates. The remainder, \$28.8 million, expires between 2024 - 2036. We had tax credit carryforwards of \$4.1 million, of which \$1.2 million are subject to limitations on their utilization. Approximately \$0.6 million of these tax credit

carryforwards are not currently subject to expiration dates. The remainder, \$3.5 million, expires in various years between 2020 - 2039.

The following is a reconciliation of the total amounts of unrecognized tax benefits:

<i>(in thousands)</i>	Year Ended December 31,		
	2019	2018	2017
Unrecognized tax benefit as of January 1	\$ 22,827	\$ 19,657	\$ 15,209
Gross increases—acquisitions	26,914	—	—
Gross increases—tax positions in prior period	207	1,229	905
Gross decreases—tax positions in prior period	(1,743)	(376)	(765)
Gross increases—tax positions in current period	3,563	4,014	3,757
Reductions due to a lapse of the applicable statute of limitations	(2,230)	(994)	(847)
Changes due to currency fluctuation	(453)	(703)	1,414
Settlements	—	—	(16)
Unrecognized tax benefit as of December 31	\$ 49,085	\$ 22,827	\$ 19,657

We believe that it is reasonably possible that approximately \$8.3 million of uncertain tax positions included in the table above may be resolved within the next twelve months as a result of settlement with a taxing authority or a lapse of the statute of limitations. If the unrecognized tax benefit as of December 31, 2019 were to be recognized, a benefit of \$47.3 million would impact the effective tax rate.

We recognize interest and penalties related to income taxes as income tax expense. During the years ended December 31, 2019, 2018 and 2017, we recorded penalty expense of \$0.5 million, \$0.8 million and \$1.1 million, respectively. We recorded interest expense of less than \$0.1 million, interest income of \$0.1 million and interest expense of \$0.4 million for the years ended December 31, 2019, 2018 and 2017, respectively. As of December 31, 2019, we accrued a liability for penalties of \$11.7 million and interest of \$6.6 million. As of December 31, 2018, we accrued a liability for penalties of \$4.7 million and interest of \$4.0 million.

We are subject to taxation in the U.S. and various states and foreign jurisdictions. In the U.S., our only major tax jurisdiction, the 2016 - 2019 tax years are open to examination by the Internal Revenue Service.

12. Pension and Profit-Sharing Plans

We have a 401(k)/profit-sharing plan for all qualifying domestic employees that permits participants to defer a portion of their pay pursuant to Section 401(k) of the Internal Revenue Code. We make matching contributions on behalf of each eligible participant in an amount equal to 100% of the first 3% and an additional 25% of the next 5%, for a maximum total of 4.25% of the employee's compensation. We may make a discretionary contribution based on the participant's eligible compensation, provided the employee is employed at the end of the year and has worked at least 1,000 hours. We also maintain and contribute to various defined contribution and defined benefit pension arrangements for our international employees. We meet the minimum statutory funding requirements for our foreign plans. As of December 31, 2019, the total unfunded portion of the defined benefit obligations is \$11.2 million.

Expenses related to our retirement programs were \$16.3 million in 2019, \$12.4 million in 2018 and \$10.1 million in 2017.

13. Non-Compete and Employment Agreements

Our employees have signed agreements under which they have agreed not to disclose trade secrets or confidential information that, where legally permitted, restrict engagement in or connection with any business that is competitive with us anywhere in the world while employed by us (and, in some cases, for specified periods thereafter in relevant geographic areas), and that any products or technology created by them during their term of employment are our property. In addition, we require all channel partners to enter into agreements not to disclose our trade secrets and other proprietary information.

We have an employment agreement with our Chief Executive Officer. This agreement provides for, among other things, in the case of termination by us other than for Cause (as defined therein) or by the Chief Executive Officer for Good Reason (as defined therein) and subject to his execution and delivery of a release of claims against us, he will receive minimum severance payments equal to the sum of two times his base salary and target bonus to be paid out over two years from the date of

termination and up to two years of COBRA payments for health care coverage after termination. During his employment with us and for two years thereafter, following termination of employment under certain circumstances described in the contract, he will be subject to non-competition and non-solicitation obligations.

We also have employment agreements with several other employees, primarily in foreign jurisdictions. The terms of these employment agreements generally include annual compensation and non-compete clauses.

14. Stock-Based Compensation

We have an equity incentive plan - the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (Stock Plan). The Stock Plan, as amended, authorizes the grant of approximately 39.8 million shares of our common stock in the form of: (i) incentive stock options (ISOs), (ii) nonqualified stock options, (iii) common stock with or without vesting or other restrictions, (iv) common stock upon the attainment of specified performance goals, (v) restricted stock awards, (vi) the right to receive cash dividends with the holders of the common stock as if the recipient held a specified number of shares of the common stock, (vii) deferred stock awards, (viii) restricted stock unit awards, (ix) stock appreciation rights and (x) cash-based awards.

The Stock Plan provides that: (i) the exercise price of any stock option must be no less than the fair value of the stock at the date of grant and (ii) the exercise price of an ISO held by an optionee who possesses more than 10% of the total combined voting power of all classes of stock must be no less than 110% of the fair market value of the stock at the time of grant. The Compensation Committee of the Board of Directors has the authority to set expiration dates that are no later than ten years from the date of grant (or five years for an optionee who meets the 10% criterion), payment terms, and other provisions for each grant. Shares associated with unexercised options or reacquired shares of common stock (except those shares withheld as a result of tax withholding, shares used to pay an option exercise price or pursuant to a net issuance) become available again for option grants and common stock-related awards under the Stock Plan.

The Compensation Committee of the Board of Directors may, at its sole discretion, accelerate the date or dates on which an award granted under the Stock Plan may vest or extend, in the case of a stock option, the exercise period up to the expiration date of the option, subject to the terms and conditions of the Stock Plan. Upon termination of service of a participant due to the participant's death or disability, the vesting of restricted stock units held by the participant accelerates (in case of performance-based vesting, subject to the attainment of the performance requirement).

In the event of a "sale event," defined in the Stock Plan as a "Transaction," all outstanding awards will be assumed or continued by the successor entity, with appropriate adjustment in the awards to reflect the transaction. In such event, except as the Compensation Committee may otherwise specify with respect to particular awards in the award agreements, if the service relationship of the holder of an award is terminated without cause on or within 18 months after the sale event, then all awards held by such holder will become fully vested and exercisable at that time. If there is a sale event in which the successor entity refuses to assume or continue outstanding awards, then subject to the consummation of the sale event, all awards with time-based vesting conditions will become fully vested and exercisable at the effective time of the sale event and all awards with performance-based vesting conditions may become vested at the discretion of the Compensation Committee and then all such awards will terminate at the time of the sale event. In the event of the termination of stock options or stock appreciation rights in connection with a sale event, the Compensation Committee may either make or provide for a cash payment to the holders of such awards equal to the difference between the per share transaction consideration and the exercise price of such awards or permit each holder to have at least a 15-day period to exercise such awards prior to their termination.

We currently issue shares related to exercised stock options or vested awards from our existing pool of treasury shares and have no specific policy to repurchase treasury shares as stock options are exercised or as awards vest. If the treasury pool is depleted, we will issue new shares.

Total stock-based compensation expense recognized for the years ended December 31, 2019, 2018 and 2017 is as follows:

<i>(in thousands, except per share amounts)</i>	Year Ended December 31,		
	2019	2018	2017
Cost of sales:			
Software licenses	\$ —	\$ —	\$ 969
Maintenance and service	8,494	5,224	2,533
Operating expenses:			
Selling, general and administrative	60,639	47,099	30,817
Research and development	47,057	31,023	18,835
Stock-based compensation expense before taxes	116,190	83,346	53,154
Related income tax benefits	(47,454)	(34,518)	(20,503)
Stock-based compensation expense, net of taxes	\$ 68,736	\$ 48,828	\$ 32,651
Net impact on earnings per share:			
Basic earnings per share	\$ (0.82)	\$ (0.58)	\$ (0.38)
Diluted earnings per share	\$ (0.80)	\$ (0.57)	\$ (0.38)

Stock Options

Prior to 2017, we granted stock option awards. The value of each stock option award was estimated on the date of grant, or date of acquisition for options issued in a business combination, using the Black-Scholes option pricing model (Black-Scholes model). The determination of the fair value of stock-based payment awards using an option pricing model was affected by our stock price as well as assumptions regarding a number of complex and subjective variables. These variables included our stock volatility during the preceding six years, actual and projected employee stock option exercise behaviors, interest rate assumptions using the five-year U.S. Treasury Note yield on date of grant or acquisition date, and expected dividends. The stock-based compensation expense for options is recorded ratably over the requisite service period.

Forfeitures of awards are accounted for as they occur.

As of December 31, 2019, total unrecognized estimated compensation cost related to unvested stock options granted prior to that date was \$1.0 million, which is expected to be recognized over a weighted average period of less than 1.0 year.

Information regarding stock option transactions is summarized below:

<i>(options in thousands)</i>	Year Ended December 31,					
	2019		2018		2017	
	Options	Weighted-Average Exercise Price	Options	Weighted-Average Exercise Price	Options	Weighted-Average Exercise Price
Outstanding, beginning of year	1,484	\$ 62.80	2,170	\$ 59.17	3,136	\$ 56.37
Granted	—	\$ —	—	\$ —	—	\$ —
Exercised	(495)	\$ 53.53	(679)	\$ 50.92	(956)	\$ 49.78
Forfeited	(5)	\$ 64.21	(7)	\$ 86.28	(10)	\$ 80.92
Outstanding, end of year	984	\$ 67.49	1,484	\$ 62.80	2,170	\$ 59.17
Vested and Exercisable, end of year	924	\$ 65.71	1,347	\$ 59.69	1,930	\$ 55.11
Nonvested	60	\$ 94.77	137	\$ 93.44	240	\$ 91.71

	2019	2018	2017
Weighted Average Remaining Contractual Term (in years)			
Outstanding	3.18	3.55	4.10
Vested and Exercisable	2.95	3.14	3.57
Nonvested	6.71	7.60	8.30
Aggregate Intrinsic Value (in thousands)			
Exercised	\$ 72,098	\$ 78,648	\$ 58,472
Outstanding	\$ 186,926	\$ 118,908	\$ 191,895
Vested and Exercisable	\$ 177,111	\$ 112,133	\$ 178,456
Nonvested	\$ 9,815	\$ 6,775	\$ 13,439
Compensation Expense - Stock Options (in thousands)	\$ 1,709	\$ 2,006	\$ 2,948

Historical and future expected forfeitures have not been significant and, as a result, the outstanding option amounts reflected in the tables above approximate the options expected to vest.

Information regarding stock options outstanding as of December 31, 2019 is summarized below:

Range of Exercise Prices	Options Outstanding			Options Exercisable			Options Unvested		
	Options	Weighted-Average Remaining Contractual Life (years)	Weighted-Average Exercise Price	Options	Weighted-Average Remaining Contractual Life (years)	Weighted-Average Exercise Price	Options	Weighted-Average Remaining Contractual Life (years)	Weighted-Average Exercise Price
\$11.99 - \$48.97	181	1.01	\$ 43.29	181	1.01	\$ 43.29	—	0.00	\$ —
\$58.67	267	1.87	\$ 58.67	267	1.87	\$ 58.67	—	0.00	\$ —
\$67.44	280	2.87	\$ 67.44	280	2.87	\$ 67.44	—	0.00	\$ —
\$76.31 - \$95.09	256	6.44	\$ 93.89	196	6.36	\$ 93.62	60	6.71	\$ 94.77

Restricted Stock Units

Under the terms of the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan, we issue various restricted stock unit awards. The following table summarizes the types of awards and vesting conditions:

Award	Vesting Period	Vesting Condition
Restricted stock units with a market and service condition	Three years	Our performance measured by total stockholder return relative to the Nasdaq Composite Index for the measurement period and subject to continued employment through the vesting period.
Restricted stock units with an operating performance and service condition	Three years	Operating performance metrics as defined at the beginning of the performance cycle.
Restricted stock units with a service condition only	Three or four years	Continued employment through the yearly vesting period.

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The fair values of restricted stock units (RSUs) with a market condition were estimated using a Monte Carlo simulation model and are recognized over the vesting period. The determination of the fair values of the awards was affected by the grant date and several variables, each of which has been identified in the chart below:

Assumptions used in Monte Carlo lattice pricing model	Year Ended December 31,		
	2019	2018	2017
Risk-free interest rate	2.5%	2.4%	1.5%
Expected dividend yield	—%	—%	—%
Expected volatility—Ansys stock price	23%	21%	19%
Expected volatility—Nasdaq Composite Index	16%	15%	15%
Expected term	2.8 years	2.8 years	2.8 years
Correlation factor	0.71	0.65	0.70
Weighted average fair value per share	\$238.99	\$191.76	\$120.94

The fair value of RSUs with operating performance metrics is based on the fair market value of our stock on the date of the grant and is recognized from the grant date through the conclusion of the measurement period associated with each operating performance metric based on management's estimates concerning the probability of vesting.

The fair value of RSUs with only a service condition is based on the fair market value of our stock on the date of the grant and is recognized over the vesting period.

Total compensation expense for employee RSU awards recorded for the years ended December 31, 2019, 2018 and 2017 was \$109.9 million, \$77.4 million and \$46.3 million, respectively.

Information regarding all employee RSU transactions is summarized below:

(RSUs in thousands)	Year Ended December 31,					
	2019		2018		2017	
	RSUs	Weighted-Average Grant Date Fair Value	RSUs	Weighted-Average Grant Date Fair Value	RSUs	Weighted-Average Grant Date Fair Value
Nonvested, beginning of year	1,522	\$ 129.96	1,361	\$ 100.66	906	\$ 86.45
Granted ⁽¹⁾	843	\$ 192.37	681	\$ 163.67	866	\$ 109.67
Performance adjustment ⁽²⁾	74	\$ 167.87	76	\$ 151.52	35	\$ 98.29
Vested	(704)	\$ 125.84	(524)	\$ 101.38	(341)	\$ 88.58
Forfeited	(117)	\$ 140.43	(72)	\$ 125.29	(105)	\$ 90.80
Nonvested, end of year	1,618	\$ 165.26	1,522	\$ 129.96	1,361	\$ 100.66

⁽¹⁾ Includes all RSUs granted during the year. RSUs with operating performance conditions are issued annually and have one or three performance cycles. Performance conditions are assigned at the beginning of each performance cycle and are reflected as grants at target at that time.

⁽²⁾ RSUs with a market or performance condition are granted at target and vest based on achievement of the market or operating performance and service conditions. The actual number of RSUs issued may be more or less than the target RSUs depending on the achievement of the market or operating performance conditions.

Board of Directors

During and prior to 2015, we granted deferred stock awards to non-employee Directors, which are rights to receive shares of common stock upon termination of service as a Director. Associated with these awards, we established a non-qualified 409(a) deferred compensation plan with assets held under a rabbi trust to provide Directors an opportunity to diversify their vested awards. During open trading windows and at their elective option, the Directors may convert their Ansys shares into a variety of non-Ansys-stock investment options in order to diversify a portion of their holdings, subject to meeting ownership guidelines.

Information regarding deferred stock awards to non-employee Directors is summarized below:

	Year Ended December 31, 2019		
	Diversified	Undiversified	Total
Deferred Awards Outstanding, beginning of year	12,250	120,449	132,699
Shares Diversified	13,348	(13,348)	—
Shares Issued Upon Retirement	(20,000)	(47,020)	(67,020)
Deferred Awards Outstanding, end of year	5,598	60,081	65,679

In 2019, 2018 and 2017, we granted 11,259, 13,632 and 18,018 RSUs to non-employee Directors, respectively, which will vest in full upon the earlier of one year from the date of grant or the date of the next regular meeting of stockholders. If a non-employee Director retires prior to the vest date, the non-employee Director receives a pro-rata portion of the RSUs. The weighted-average grant date fair values per RSU were \$187.53, \$165.71 and \$123.38 for the years ended December 31, 2019, 2018 and 2017, respectively. Total compensation expense associated with the awards recorded for the years ended December 31, 2019, 2018 and 2017 was \$2.5 million, \$2.3 million and \$2.6 million, respectively.

Employee Stock Purchase Plan

Our 1996 Employee Stock Purchase Plan (the “Purchase Plan”) was adopted by the Board of Directors on April 19, 1996 and was subsequently approved by our stockholders. The stockholders approved an amendment to the Purchase Plan in May 2016 to increase the number of shares available for offerings to 1.8 million shares. The Purchase Plan is administered by the Compensation Committee. Offerings under the Purchase Plan commence on each February 1 and August 1, and have a duration of six months. An employee who owns or is deemed to own shares of stock representing in excess of 5% of the combined voting power of all classes of our stock may not participate in the Purchase Plan.

During each offering, an eligible employee may purchase shares under the Purchase Plan by authorizing payroll deductions of up to 10% of his or her cash compensation during the offering period. The maximum number of shares that may be purchased by any participating employee during any offering period is limited to 3,840 shares (as adjusted by the Compensation Committee from time to time). Unless the employee has previously withdrawn from the offering, his or her accumulated payroll deductions will be used to purchase common stock on the last business day of the period at a price equal to 90% of the fair market value of the common stock on the first or last day of the offering period, whichever is lower. Under applicable tax rules, an employee may not accrue the right to purchase more than \$25,000 of common stock, based on the grant-date fair value, in any calendar year in which the option is outstanding at any time. As of December 31, 2019, 1.6 million shares of common stock had been issued under the Purchase Plan. The total compensation expense recorded under the Purchase Plan during the years ended December 31, 2019, 2018 and 2017 was \$2.0 million, \$1.8 million and \$1.2 million, respectively.

15. Stock Repurchase Program

Under our stock repurchase program, we repurchased shares as follows:

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2019	2018	2017
Number of shares repurchased	330	1,674	2,750
Average price paid per share	\$ 179.41	\$ 161.12	\$ 122.20
Total cost	\$ 59,116	\$ 269,801	\$ 336,042

In February 2018, our Board of Directors increased the number of shares authorized for repurchase to a total of 5.0 million shares under the stock repurchase program. As of December 31, 2019, 3.5 million shares remained available for repurchase under the program.

16. Royalty Agreements

We have entered into various renewable license agreements under which we have been granted access to the licensor's technology and the right to sell the technology in our product line. Royalties are payable to developers of the software at various rates and amounts, which generally are based upon unit sales, revenue or flat fees. Royalty fees are reported in cost of software licenses and were \$22.4 million, \$16.9 million and \$16.0 million for the years ended December 31, 2019, 2018 and 2017, respectively.

17. Geographic Information

Revenue to external customers is attributed to individual countries based upon the location of the customer. Revenue by geographic area was as follows:

<i>(in thousands)</i>	Year Ended December 31,		
	2019 (ASC 606)	2018 (ASC 606)	2017 (ASC 605)
United States	\$ 637,916	\$ 506,335	\$ 417,343
Japan	162,154	145,951	126,097
Germany	158,809	140,506	108,211
South Korea	90,082	72,724	63,011
France	68,551	67,657	53,672
China	64,725	57,567	54,415
Other EMEA	211,193	193,317	166,472
Other international	122,462	109,579	106,029
Total revenue	\$ 1,515,892	\$ 1,293,636	\$ 1,095,250

Property and equipment by geographic area was as follows:

<i>(in thousands)</i>	December 31,	
	2019	2018
United States	\$ 59,473	\$ 46,605
India	5,660	4,176
Germany	4,237	2,158
United Kingdom	4,194	1,238
Other EMEA	5,532	3,724
Other international	4,540	3,754
Total property and equipment, net	\$ 83,636	\$ 61,655

18. Unconditional Purchase Obligations

We have entered into various unconditional purchase obligations which primarily include royalties and software licenses and services. We expended \$24.2 million, \$22.4 million and \$14.1 million related to unconditional purchase obligations that existed as of the beginning of each year for the years ended December 31, 2019, 2018 and 2017, respectively. Future expenditures under unconditional purchase obligations in effect as of December 31, 2019 are as follows:

<i>(in thousands)</i>	
2020	\$ 37,183
2021	14,034
2022	10,689
2023	6,212
2024	3,264
Total	<u>\$ 71,382</u>

19. Restructuring

During the fourth quarter of 2016, we initiated workforce realignment activities to reallocate resources to align with our future strategic plans. We completed the workforce realignment activities as of September 30, 2017. We incurred related restructuring charges as follows:

<i>(in thousands)</i>	Gross	Net of Tax
Q4 2016	\$ 3,419	\$ 2,355
Q1 2017	9,273	6,176
Q2 2017	2,000	1,435
Q3 2017	466	331
Total restructuring charges	<u>\$ 15,158</u>	<u>\$ 10,297</u>

The restructuring charges are included in the presentation of cost of software licenses; cost of maintenance and service; research and development expense; and selling, general and administrative expense. The gross charges were fully paid as of March 31, 2018.

20. Contingencies and Commitments

We are subject to various investigations, claims and legal proceedings that arise in the ordinary course of business, including commercial disputes, labor and employment matters, tax audits, alleged infringement of intellectual property rights and other matters. In our opinion, the resolution of pending matters is not expected to have a material adverse effect on our consolidated results of operations, cash flows or financial position. However, each of these matters is subject to various uncertainties and it is possible that an unfavorable resolution of one or more of these proceedings could materially affect our results of operations, cash flows or financial position.

Our Indian subsidiary has several service tax audits pending that have resulted in formal inquiries being received on transactions through mid-2012. We could incur tax charges and related liabilities of approximately \$7.2 million. The service tax issues raised in our notices and inquiries are very similar to the case, M/s Microsoft Corporation (I) (P) Ltd. Vs. Commissioner of Service Tax, New Delhi, wherein the Delhi Customs, Excise and Service Tax Appellate Tribunal (CESTAT) passed a favorable ruling to Microsoft. The Microsoft case ruling was subsequently challenged in the Supreme Court by the Indian tax authority. We can provide no assurances on the impact that the present Microsoft case's decision will have on our cases. We are uncertain as to when these service tax matters will be concluded.

We sell software licenses and services to our customers under contractual agreements. Such agreements generally include certain provisions indemnifying the customer against claims of intellectual property infringement by third parties arising from such customer's usage of our products or services. To date, payments related to these indemnification provisions have been immaterial. For several reasons, including the lack of prior material indemnification claims, we cannot determine the maximum amount of potential future payments, if any, related to such indemnification provisions.

ANSYS, INC. AND SUBSIDIARIES
Valuation and Qualifying Accounts

<i>(in thousands)</i>	Description	Balance at Beginning of Year	Additions: Charges to Costs and Expenses	Deductions: Returns and Write-Offs	Balance at End of Year
Year ended December 31, 2019	Allowance for doubtful accounts	\$ 8,000	\$ 2,928	\$ 2,228	\$ 8,700
Year ended December 31, 2018	Allowance for doubtful accounts	\$ 6,800	\$ 1,577	\$ 377	\$ 8,000
Year ended December 31, 2017	Allowance for doubtful accounts	\$ 5,700	\$ 1,474	\$ 374	\$ 6,800

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Exhibit No.	Exhibit
3.1	Restated Certificate of Incorporation of the Company; filed herewith.
3.2	Third Amended and Restated By-laws of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed January 19, 2018, and incorporated herein by reference).
4.1	Description of Securities; filed herewith.
10.1	Form of Indemnification Agreement between ANSYS, Inc. and Non-Employee Directors (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed March 20, 2013, and incorporated herein by reference).*
10.2	Non-Employee Director Deferred Compensation Plan (filed as Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q, filed November 7, 2019, and incorporated herein by reference).*
10.3	Executive Severance Plan, as amended and restated, dated July 29, 2014; filed herewith.*
10.4	Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed May 17, 2011, and incorporated herein by reference).*
10.5	Form of Deferred Stock Unit Agreement under the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.6	Form of Employee Non-Qualified Stock Option Agreement under the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed May 2, 2013, and incorporated herein by reference).*
10.7	Form of Restricted Stock Unit Agreement under the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.39 to the Company's Annual Report on Form 10-K, filed February 27, 2014, and incorporated herein by reference).*
10.8	Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Appendix 1 to the registrant's Definitive Proxy Statement on Schedule 14A, filed with the SEC on March 31, 2016 and incorporated herein by reference).*
10.9	Form of Non-Qualified Stock Option Agreement under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.36 to the Company's Annual Report on Form 10-K, filed February 23, 2017, and incorporated herein by reference).*
10.10	2017 Form of Restricted Stock Unit Agreement under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.35 to the Company's Annual Report on Form 10-K, filed February 23, 2017, and incorporated herein by reference).*
10.11	2018 Form of Restricted Stock Unit Agreement under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.12	2019 Form of Restricted Stock Unit Agreement under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.13	Form of Restricted Stock Unit Award Agreement (Non-Employee Directors) under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.14	2018 Form of Award Notice (Operating Margin) under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.15	2018 Form of Award Notice (Total Shareholder Return) under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.16	2019 Form of Award Notice (Annual Contract Value) under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.17	2019 Form of Award Notice (Total Shareholder Return) under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.18	2019 Form of Special Performance Stock Unit Agreement under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan; filed herewith.*
10.19	Employment Agreement between ANSYS, Inc. and Ajei S. Gopal, dated August 29, 2016 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed August 29, 2016, and incorporated herein by reference).*
10.20	Form of Non-Qualified Stock Option Agreement with Ajei S. Gopal (filed as Exhibit 10.3 to the Company's Current Report on Form 8-K, filed August 29, 2016, and incorporated herein by reference).*

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10.21	Lease by and between ANSYS, Inc. and Quattro Investment Group, L.P., dated as of September 14, 2012 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed September 18, 2012, and incorporated herein by reference).
10.22	Credit Agreement, dated as of February 22, 2019, among ANSYS, Inc. as borrower, Bank of America, N.A. as Administrative Agent and the banks listed therein (filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed May 2, 2019, and incorporated herein by reference).
10.23	First Amendment to Credit Agreement dated October 16, 2019, by and among ANSYS, Inc., the lenders party thereto and Bank of America, N.A. (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed October 21, 2019, and incorporated herein by reference).
21.1	Subsidiaries of the Registrant; filed herewith.
23.1	Consent of Deloitte & Touche LLP, independent registered public accounting firm.
24.1	Powers of Attorney. Contained on the Signatures page of the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2019 and incorporated herein by reference.
31.1	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	Inline XBRL Instance Document (the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document)
101.SCH	Inline XBRL Taxonomy Extension Schema
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)

* *Indicates management contract or compensatory plan, contract or arrangement.*

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

ANSYS, Inc.

Date: February 27, 2020

By: _____ /s/ AJEI S. GOPAL

Ajei S. Gopal
President and Chief Executive Officer
(Principal Executive Officer)

Date: February 27, 2020

By: _____ /s/ MARIA T. SHIELDS

Maria T. Shields
Chief Financial Officer
(Principal Financial Officer and Principal Accounting Officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Ajei S. Gopal, his or her attorney-in-fact, with the power of substitution, for such person in any and all capacities, to sign any amendments to this Report on Form 10-K, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that said attorney-in-fact, or substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated below.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ AJEI S. GOPAL</u> Ajei S. Gopal	President and Chief Executive Officer (Principal Executive Officer)	February 27, 2020
<u>/s/ MARIA T. SHIELDS</u> Maria T. Shields	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	February 27, 2020
<u>/s/ NICOLE ANASENES</u> Nicole Anasenes	Director	February 27, 2020
<u>/s/ GLENDA M. DORCHAK</u> Glenda M. Dorchak	Director	February 27, 2020
<u>/s/ GUY E. DUBOIS</u> Guy E. Dubois	Director	February 27, 2020
<u>/s/ DR. ALEC D. GALLIMORE</u> Dr. Alec D. Gallimore	Director	February 27, 2020
<u>/s/ RONALD W. HOVSEPIAN</u> Ronald W. Hovsepian	Chairman of the Board of Directors	February 27, 2020
<u>/s/ BARBARA V. SCHERER</u> Barbara V. Scherer	Director	February 27, 2020

**RESTATED
CERTIFICATE OF INCORPORATION
OF
ANSYS, INC.**

ANSYS, Inc., a corporation organized and existing under the laws of the State of Delaware (the "*Corporation*"), hereby certifies as follows:

1. The name of the Corporation is ANSYS, Inc. The date of the filing of its original Certificate of Incorporation with the Secretary of State of the State of Delaware was January 12, 1994. The name under which the Corporation filed its original Certificate of Incorporation was SAS Holdings, Inc.
2. This Restated Certificate of Incorporation only restates and integrates and does not further amend the provisions of the Fourth Certificate of Incorporation of the Corporation filed with the Secretary of State of the State of Delaware on July 11, 1996 (the "*Fourth Restated Certificate of Incorporation*"), as theretofore amended or supplemented. There is no discrepancy between the provisions of this Restated Certificate of Incorporation and the provisions of the Fourth Restated Certificate of Incorporation, as theretofore amended or supplemented. This Restated Certificate of Incorporation was duly adopted by the Board of Directors in accordance with the provisions of Section 245 of the General Corporation Law of the State of Delaware (the "*DGCL*").
3. The text of the Fourth Restated Certificate of Incorporation is hereby restated and integrated in its entirety to provide as herein set forth in full.

**ARTICLE I
NAME**

The name of the Corporation is ANSYS, Inc.

**ARTICLE II
REGISTERED OFFICE**

The address of the registered office of the Corporation in the State of Delaware is 1209 Orange Street, in the City of Wilmington, County of New Castle. The name of its registered agent at such address is The Corporation Trust Company.

**ARTICLE III
PURPOSES**

The nature of the business or purposes to be conducted or promoted by the Corporation is to engage in any lawful act or activity for which corporations may be organized under the DGCL.

**ARTICLE IV
CAPITAL STOCK**

Section 1. Number of Shares.

The total number of shares of capital stock which the Corporation shall have the authority to issue is Three Hundred Two Million (302,000,000) shares, of which (i) Two Million (2,000,000) shares shall be Undesignated

Preferred Stock, par value \$.01 per share (the “**Preferred Stock**”), and (ii) Three Hundred Million (300,000,000) shares shall be Common Stock, par value \$.01 per share (the “**Common Stock**”). As set forth in this Article IV, the Board of Directors or any authorized committee thereof is authorized from time to time to establish and designate one or more series of Preferred Stock, to fix and determine the variations in the relative rights and preferences as between the different series of Preferred Stock in the manner hereinafter set forth in this Article IV, and to fix or alter the number of shares comprising any such series and the designation thereof to the extent permitted by law.

The number of authorized shares of the class of Preferred Stock may be increased or decreased (but not below the number of shares outstanding) by the affirmative vote of the holders of a majority of the Common Stock, without a vote of the holders of the Preferred Stock, pursuant to the resolution or resolutions establishing the class of Preferred Stock or this Restated Certificate of Incorporation, as it may be amended from time to time.

Section 2. General.

The designations, powers, preferences and rights of, and the qualifications, limitations and restrictions upon, each class or series of stock shall be determined in accordance with, or as set forth below in, Sections 3 and 4 of this Article IV.

Section 3. Common Stock.

Subject to all of the rights, powers and preferences of the Preferred Stock, and except as provided by law or in this Article IV (or in any certificate of designation of any series of Preferred Stock) or by the Board of Directors or any authorized committee thereof pursuant to this Article IV:

- (a) the holders of the Common Stock shall have the exclusive right to vote for the election of Directors and on all other matters requiring stockholder action, each share being entitled to one vote;
- (b) dividends may be declared and paid or set apart for payment upon the Common Stock out of any assets or funds of the Corporation legally available for the payment of dividends, but only when and as declared by the Board of Directors or any authorized committee thereof; and
- (c) upon the voluntary or involuntary liquidation, dissolution or winding up of the Corporation, the net assets of the Corporation shall be distributed pro rata to the holders of the Common Stock in accordance with their respective rights and interests.

Section 4. Preferred Stock.

Subject to any limitations prescribed by law, the Board of Directors or any authorized committee thereof is expressly authorized to provide for the issuance of the shares of Preferred Stock in one or more series of such stock, and by filing a certificate pursuant to applicable law of the State of Delaware, to establish or change from time to time the number of shares to be included in each such series, and to fix the designations, powers, preferences and the relative, participating, optional or other special rights of the shares of each series and any qualifications, limitations and restrictions thereof. Any action by the Board of Directors or any authorized committee thereof under this Section 4 shall require the affirmative vote of a majority of the Directors then in office or a majority of the members of such committee. The Board of Directors or any authorized committee thereof shall have the right to determine or fix one or more of the following with respect to each series of Preferred Stock to the extent permitted by law:

- (a) The distinctive serial designation and the number of shares constituting such series;
- (b) The dividend rates or the amount of dividends to be paid on the shares of such series, whether dividends shall be cumulative and, if so, from which date or dates, the payment date or dates for dividends, and the participating and other rights, if any, with respect to dividends;

- (c) The voting powers, full or limited, if any, of the shares of such series;
- (d) Whether the shares of such series shall be redeemable and, if so, the price or prices at which, and the terms and conditions on which, such shares may be redeemed;
- (e) The amount or amounts payable upon the shares of such series and any preferences applicable thereto in the event of voluntary or involuntary liquidation, dissolution or winding up of the Corporation;
- (f) Whether the shares of such series shall be entitled to the benefit of a sinking or retirement fund to be applied to the purchase or redemption of such shares, and if so entitled, the amount of such fund and the manner of its application, including the price or prices at which such shares may be redeemed or purchased through the application of such fund;
- (g) Whether the shares of such series shall be convertible into, or exchangeable for, shares of any other class or classes or of any other series of the same or any other class or classes of stock of the Corporation and, if so convertible or exchangeable, the conversion price or prices, or the rate or rates of exchange, and the adjustments thereof, if any, at which such conversion or exchange may be made, and any other terms and conditions of such conversion or exchange;
- (h) The price or other consideration for which the shares of such series shall be issued;
- (i) Whether the shares of such series which are redeemed or converted shall have the status of authorized but unissued shares of Preferred Stock (or series thereof) and whether such shares may be reissued as shares of the same or any other class or series of stock; and
- (j) Such other powers, preferences, rights, qualifications, limitations and restrictions thereof as the Board of Directors or any authorized committee thereof may deem advisable.

ARTICLE V STOCKHOLDER ACTION

Any action required or permitted to be taken by the stockholders of the Corporation at any annual or special meeting of stockholders of the Corporation must be effected at a duly called annual or special meeting of stockholders and may not be taken or effected by a written consent of stockholders in lieu thereof.

ARTICLE VI DIRECTORS

Section 1. General.

The business and affairs of the Corporation shall be managed by or under the direction of the Board of Directors except as otherwise provided herein or required by law.

Section 2. Election of Directors.

Election of Directors need not be by written ballot unless the By-laws of the Corporation shall so provide.

Section 3. Terms of Directors.

The number of Directors of the Corporation shall be fixed by resolution duly adopted from time to time by the Board of Directors. The Directors, other than those who may be elected by the holders of any series of Preferred

Stock of the Corporation, shall be classified, with respect to the term for which they severally hold office, into three classes, as nearly equal in number as possible. The initial Class I Directors of the Corporation shall be Peter J. Smith and Dr. John A. Swanson; the initial Class II Directors of the Corporation shall be Roger J. Heinen, Jr., Roger B. Kafker and Jacqueline C. Morby; and the initial Class III Directors of the Corporation shall be Gary B. Eichhorn and John F. Smith. The initial Class I Directors shall serve for a term expiring at the annual meeting of stockholders to be held in 1997, the initial Class II Directors shall serve for a term expiring at the annual meeting of stockholders to be held in 1998, and the initial Class III Directors shall serve for a term expiring at the annual meeting of stockholders to be held in 1999. At each annual meeting of stockholders, the successor or successors of the class of Directors whose term expires at that meeting shall be elected and shall hold office for a term expiring at the annual meeting of stockholders held in the third year following the year of their election. The Directors elected to each class shall hold office until their successors are duly elected and qualified or until their earlier resignation or removal.

Notwithstanding the foregoing, whenever, pursuant to the provisions of Article IV of this Restated Certificate of Incorporation, the holders of any one or more series of Preferred Stock shall have the right, voting separately as a series or together with holders of other such series, to elect Directors at an annual or special meeting of stockholders, the election, term of office, filling of vacancies and other features of such directorships shall be governed by the terms of this Restated Certificate of Incorporation and any certificate of designations applicable thereto, and such Directors so elected shall not be divided into classes pursuant to this Section 3.

During any period when the holders of any series of Preferred Stock have the right to elect additional Directors as provided for or fixed pursuant to the provisions of Article IV hereof, then upon commencement and for the duration of the period during which such right continues: (i) the then otherwise total authorized number of Directors of the Corporation shall automatically be increased by such specified number of Directors, and the holders of such Preferred Stock shall be entitled to elect the additional Directors so provided for or fixed pursuant to said provisions, and (ii) each such additional Director shall serve until such Director's successor shall have been duly elected and qualified, or until such Director's right to hold such office terminates pursuant to said provisions, whichever occurs earlier, subject to such Director's earlier death, disqualification, resignation or removal. Except as otherwise provided by the Board in the resolution or resolutions establishing such series, whenever the holders of any series of Preferred Stock having such right to elect additional Directors are divested of such right pursuant to the provisions of such stock, the terms of office of all such additional Directors elected by the holders of such stock, or elected to fill any vacancies resulting from the death, resignation, disqualification or removal of such additional Directors, shall forthwith terminate and the total and authorized number of Directors of the Corporation shall be reduced accordingly.

Section 4. Vacancies.

Subject to the rights, if any, of the holders of any series of Preferred Stock to elect Directors and to fill vacancies in the Board of Directors relating thereto, any and all vacancies in the Board of Directors, however occurring, including, without limitation, by reason of an increase in size of the Board of Directors, or the death, resignation, disqualification or removal of a Director, shall be filled solely by the affirmative vote of a majority of the remaining Directors then in office, even if less than a quorum of the Board of Directors. Any Director appointed in accordance with the preceding sentence shall hold office for the remainder of the full term of the class of Directors in which the new directorship was created or the vacancy occurred and until such Director's successor shall have been duly elected and qualified or until his or her earlier resignation or removal. Subject to the rights, if any, of the holders of any series of Preferred Stock to elect Directors, when the number of Directors is increased or decreased, the Board of Directors shall determine the class or classes to which the increased or decreased number of Directors shall be apportioned; provided, however, that no decrease in the number of Directors shall shorten the term of any incumbent Director. In the event of a vacancy in the Board of Directors, the remaining Directors, except as otherwise provided by law, may exercise the powers of the full Board of Directors until the vacancy is filled.

Section 5. Removal.

Subject to the rights, if any, of any series of Preferred Stock to elect Directors and to remove any Director whom the holders of any such stock have the right to elect, any Director (including persons elected by Directors to fill vacancies in the Board of Directors) may be removed from office (i) only with cause and (ii) only by the affirmative vote of at least two-thirds of the total votes which would be eligible to be cast by stockholders in the election of such Director. At least 30 days prior to any meeting of stockholders at which it is proposed that any Director be removed from office, written notice of such proposed removal shall be sent to the Director whose removal will be considered at the meeting. For purposes of this Restated Certificate of Incorporation, "cause," with respect to the removal of any Director shall mean only (i) conviction of a felony, (ii) declaration of unsound mind by order of court, (iii) gross dereliction of duty, (iv) commission of any action involving moral turpitude, or (v) commission of an action which constitutes intentional misconduct or a knowing violation of law if such action in either event results both in an improper substantial personal benefit and a material injury to the Corporation.

ARTICLE VII LIMITATION OF LIABILITY

A Director of the Corporation shall not be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a Director, except for liability (i) for any breach of the Director's duty of loyalty to the Corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the DGCL or (iv) for any transaction from which the Director derived an improper personal benefit. If the DGCL is amended after the effective date of this Restated Certificate of Incorporation to authorize corporate action further eliminating or limiting the personal liability of Directors, then the liability of a Director of the Corporation shall be eliminated or limited to the fullest extent permitted by the DGCL, as so amended.

Any repeal or modification of this Article VII by either of (i) the stockholders of the Corporation or (ii) an amendment to the DGCL, shall not adversely affect any right or protection existing at the time of such repeal or modification with respect to any acts or omissions occurring before such repeal or modification of a person serving as a Director at the time of such repeal or modification.

ARTICLE VIII AMENDMENT OF BY-LAWS

Section 1. Amendment by Directors.

Except as otherwise provided by law, the By-laws of the Corporation may be amended or repealed by the Board of Directors.

Section 2. Amendment by Stockholders.

The By-laws of the Corporation may be amended or repealed at any annual meeting of stockholders, or special meeting of stockholders called for such purpose, by the affirmative vote of at least two-thirds of the total votes eligible to be cast on such amendment or repeal by holders of voting stock, voting together as a single class; provided, however, that if the Board of Directors recommends that stockholders approve such amendment or repeal at such meeting of stockholders, such amendment or repeal shall only require the affirmative vote of a majority of the total votes eligible to be cast on such amendment or repeal by holders of voting stock, voting together as a single class.

ARTICLE IX AMENDMENT OF CERTIFICATE OF INCORPORATION

The Corporation reserves the right to amend or repeal this Restated Certificate of Incorporation in the manner now or hereafter prescribed by statute and this Restated Certificate of Incorporation, and all rights conferred upon stockholders herein are granted subject to this reservation. No amendment or repeal of this Restated

Certificate of Incorporation shall be made unless the same is first approved by the Board of Directors pursuant to a resolution adopted by the Board of Directors in accordance with Section 242 of the DGCL, and, except as otherwise provided by law, thereafter approved by the stockholders. Whenever any vote of the holders of voting stock is required, and in addition to any other vote of holders of voting stock that is required by this Restated Certificate of Incorporation or by law, the affirmative vote of a majority of the total votes eligible to be cast by holders of voting stock with respect to such amendment or repeal, voting together as a single class, at a duly constituted meeting of stockholders called expressly for such purpose shall be required to amend or repeal any provisions of this Restated Certificate of Incorporation; provided, however, that the affirmative vote of not less than 80% of the total votes eligible to be cast by holders of voting stock, voting together as a single class, shall be required to amend or repeal any of the provisions of Article VI or Article IX of this Restated Certificate of Incorporation.

IN WITNESS WHEREOF, ANSYS, Inc. has caused this certificate to be signed by Ajei S. Gopal, its President and Chief Executive Officer, this 14th day of February, 2020.

/s/ Ajei S. Gopal
Ajei S. Gopal

President and Chief Executive Officer

**DESCRIPTION OF THE REGISTRANT'S SECURITIES
REGISTERED PURSUANT TO SECTION 12 OF THE
SECURITIES EXCHANGE ACT OF 1934**

The following description sets forth certain material terms and provisions of the securities of ANSYS, Inc. (the "*Company*") that are registered under Section 12 of the Securities Exchange Act of 1934, as amended, and relevant provisions of the Delaware General Corporation Law (the "*DGCL*"). This description does not purport to be complete. It is subject to, and qualified in its entirety by reference to, the applicable provisions of the DGCL and our Restated Certificate of Incorporation (the "*Certificate of Incorporation*") and our Third Amended and Restated By-laws (the "*By-Laws*"), each of which is incorporated by reference as an exhibit to the Annual Report on Form 10-K of which this Exhibit 4.1 is a part. We encourage you to read our Certificate of Incorporation, our By-Laws, and the applicable provisions of the DGCL for additional information.

Authorized Capital Stock

We are authorized to issue a total of three hundred two million (302,000,000) shares of capital stock consisting of (i) two million (2,000,000) shares of undesignated Preferred Stock, par value \$.01 per share (the "*Preferred Stock*") and (ii) three hundred million (300,000,000) shares designated as Common Stock, par value \$.01 per share (the "*Common Stock*").

Common Stock

Holders of Common Stock will be entitled to one vote per share on all matters submitted to a vote of stockholders, unless otherwise provided by law or the Certificate of Incorporation. Our By-Laws provide that, except as otherwise provided in our Certificate of Incorporation, our By-Laws, or by law, any matter before any meeting of stockholders shall be decided by a majority of the votes properly cast for and against such matter; provided, however, that directors will be elected by a plurality of votes cast at any meeting of stockholders at which there is a contested election of directors. Our Common Stock does not have cumulative voting rights.

Subject to the rights of holders of any outstanding Preferred Stock, holders of Common Stock are entitled to receive dividends as may be declared and paid or set apart for payment from time to time by our Board of Directors, or any authorized committee thereof, out of any assets or funds of the Company legally available for the payment of dividends. Holders of Common Stock will be entitled to receive, upon any voluntary or involuntary liquidation, dissolution or winding up of the Company, the net assets of the Company available for distribution to stockholders after satisfaction of our liabilities and the preferential rights of any Preferred Stock that may then be issued and outstanding.

Holders of Common Stock have no conversion rights, or any redemption, sinking fund or preemptive rights with respect to the Common Stock. Our Common Stock is not liable to further call or assessment by the Company or subject to any restriction on alienability, except as required by law.

Preferred Stock

The rights of holders of Common Stock may be materially limited or qualified by the rights of holders of Preferred Stock that we may issue in the future. Set forth below is a description of the Company's authority to issue Preferred Stock and the possible terms of that stock.

No shares of Preferred Stock are currently outstanding. Pursuant to our Certificate of Incorporation and subject to any limitation prescribed by law, our Board of Directors or any authorized committee thereof has the authority, without further action by our stockholders, to issue Preferred Stock from time to time in one or more

series. Our Board of Directors or any authorized committee thereof shall have the right to determine or fix the rights, preferences, and restrictions of the Preferred Stock, including:

- the title or designation of the series;
- the number of shares in the series;
- the dividend rate and whether dividends will be cumulative;
- the voting rights, if any, of the holders of the series;
- the terms, if any, on which the series may or will be redeemed;
- the preference, if any, to which holders of the series will be entitled upon our liquidation, dissolution or winding up;
- any sinking or retirement fund provisions of the shares;
- the right, if any, of holders of the shares to convert or exchange them into, or for, another class of our stock or securities;
- the purchase price of the shares;
- the status of shares upon redemption or conversion; and
- any other powers, preferences, rights, qualifications, limitations and restrictions as the Board of Directors or any authorized committee thereof may deem advisable.

Certain Anti-Takeover Effects of Provisions of Our Certificate of Incorporation, Our By-Laws and the DGCL

Certain provisions of our Certification of Incorporation, our By-Laws, and the DGCL could have anti-takeover effects and may delay, deter or prevent a tender offer or takeover attempt that a stockholder might consider to be in its best interests, as discussed below:

DGCL Section 203 – Business Combinations with Interested Stockholders

We are subject to the provisions of Section 203 of the DGCL, regulating corporate takeovers. In general, those provisions prohibit a Delaware corporation from engaging in any “business combination” with any interested stockholder for a period of three years following the date that the stockholder became an interested stockholder, unless:

- prior to the time that the person became an interested stockholder, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
 - upon consummation of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for the purpose of determining the number of shares outstanding (but not the outstanding voting stock owned by the interested stockholder) those shares owned by (i) the corporation’s officers and directors and (ii) employee stock
-

plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or

- at or subsequent to the time the business combination is approved by the corporation's board of directors and authorized at an annual or special meeting of its stockholders, and not by written consent, by the affirmative vote of at least 66-2/3% of its outstanding voting stock that is not owned by the interested stockholder.

The term "business combination" is broadly defined to include mergers, consolidations, and sales and other dispositions of assets having an aggregate market value equal to 10% or more of the consolidated assets of the corporation, and other specified transactions resulting in financial benefits to the interested stockholder. An "interested stockholder" is a person who, together with affiliates and associates, owns (or within three years did own) 15% or more of the corporation's voting stock.

The restrictions on business combinations with interested stockholders contained in Section 203 of the DGCL do not apply to a corporation whose certificate of incorporation or bylaws contains a provision expressly electing not to be governed by the statute. Neither our Certificate of Incorporation nor our By-Laws contains a provision electing to "opt-out" of Section 203. Section 203 of the DGCL could prohibit or delay mergers or other takeover or change in control attempts and, accordingly, may discourage attempts to acquire us.

Undesignated Preferred Stock

As discussed above under "Preferred Stock," our Board of Directors has the authority to designate and issue Preferred Stock with voting or other rights or preferences that could delay, defer or prevent any attempt to acquire or control us.

Classified Board of Directors

The number of directors is fixed by resolution duly adopted from time to time by our Board of Directors. The directors, other than those directors who may be elected by the holders of Preferred Stock, are in classes with respect to the term for which they severally hold office. Our Certificate of Incorporation provides that our Board of Directors is divided into three classes, with the number of directors in each class to be as nearly equal as possible. Our classified Board of Directors staggers the three-year terms of the three classes. With this structure, only approximately one-third of the members of our Board of Directors is elected each year. This classification of directors has the effect of making it more difficult for stockholders to change the composition of our Board of Directors.

Vacancies; Removal

Subject to any rights of any holders of Preferred Stock to elect directors and fill vacancies on the Board of Directors, all vacancies created in our Board of Directors resulting from any increase in the authorized number of directors or the death, resignation, retirement, disqualification, removal from office or other cause will be filled solely by the affirmative vote of a majority of the remaining directors on our Board of Directors then in office, even if less than a quorum is present. Any director appointed to fill a vacancy on our Board of Directors will be appointed for the full term of the class of directors in which the new directorship was created or the vacancy occurred and until such director's successor will have been duly elected and qualified or until his or her earlier resignation or removal. Subject to any rights of any holders of Preferred Stock to elect directors, when the number of directors is increased or decreased, the Board of Directors will determine the class or classes to which the increased or decreased number of directors will be apportioned; provided, however, that no decrease in the number of directors will shorten the terms of any incumbent director.

Subject to the rights of any holders of Preferred Stock to elect or remove any director, any director may be removed from office only (i) with "cause" (as defined in the Certificate of Incorporation) and (ii) by the affirmative

vote of at least two-thirds of the total votes which would be eligible to be cast by stockholders in the election of such director.

Proxy Access

Our By-Laws also include provisions permitting, subject to certain terms and conditions, stockholders who have maintained continuous qualifying ownership of at least 3% of our outstanding Common Stock for at least three years to use our annual meeting proxy statement to nominate a number of director candidates not to exceed the greater of two candidates or 20% of the number of directors in office.

Advance Notice Requirements

Our By-Laws establish advance notice procedures for stockholders seeking to nominate candidates for election to the Board of Directors or for proposing matters which can be acted upon at stockholders' meetings.

No Stockholder Action by Written Consent

Our Certificate of Incorporation prohibits stockholder action by written consent in lieu of a meeting.

Special Meetings of Stockholders

Our By-Laws provide that special meetings of stockholders may be called only by our Board of Directors.

Amendments/Repeal of Provisions in the Certificate of Incorporation or By-Laws

Our Certificate of Incorporation provides that no amendment or repeal of one of its provisions will be made unless the same is first approved by our Board of Directors pursuant to a resolution adopted by the Board of Directors in accordance with Section 242 of the DGCL and, except as otherwise provided by law, thereafter approved by the stockholders. Whenever any vote of the holders of voting stock is required and, in addition to any other vote of holders of voting stock that is required by the Certificate of Incorporation or by law, the affirmative vote of a majority of the total votes eligible to be cast by holders of voting stock with respect to such amendment or repeal, at a stockholder meeting called for that purpose is required; provided, however, that the affirmative vote of not less than 80% of the total votes eligible to be cast by holders of voting stock will be required to amend or repeal any of the provisions of Article VI (Directors) or Article IX (Amendment of Certificate of Incorporation) of the Certificate of Incorporation.

Our By-Laws provide that amendments to, or repeal of any provisions of, our By-Laws require the affirmative vote of the holders of at least two-thirds of the total votes eligible to be cast on an amendment or repeal of a By-Law by the holders of voting stock at a stockholder meeting, unless the Board of Directors recommends that stockholders approve such amendment or repeal, in which case the amendment or repeal requires only the affirmative vote of a majority of the total votes eligible to be cast on such amendment or repeal by the holders of voting stock at a stockholder meeting.

Certain Effects of Authorized but Unissued Stock

We may issue additional shares of Common Stock or Preferred Stock without stockholder approval, subject to applicable rules of the Nasdaq Stock Market and the DGCL, for a variety of corporate purposes, including future public or private offerings to raise additional capital, corporate acquisitions, and employee benefit plans and equity grants. The existence of unissued and unreserved Common Stock and Preferred Stock may enable us to issue shares to persons who are friendly to current management, which could discourage an attempt to obtain control of the Company by means of a proxy contest, tender offer, merger or otherwise. We will not solicit approval of our stockholders for issuance of Common Stock or Preferred Stock unless our Board of Directors believes that approval is advisable or is required by applicable stock exchange rules or the DGCL.

ANSYS, INC.

EXECUTIVE SEVERANCE PLAN

1. Purpose. ANSYS, Inc. (the "Company") considers it essential to the best interests of its stockholders to foster the continuous employment of key management personnel. The Board of Directors of the Company (the "Board") recognizes, however, that, as is the case with many publicly held corporations, the possibility of an involuntary termination of employment, either before or after a Change in Control (as defined in Section 2 hereof), exists and that such possibility, and the uncertainty and questions which it may raise among management, may result in the departure or distraction of management personnel to the detriment of the Company and its stockholders. Therefore, the Board has determined that the ANSYS, Inc. Executive Severance Plan (the "Plan") should be adopted to reinforce and encourage the continued attention and dedication of each of the Company's officers who have been designated by the Board for participation in the Plan and who have executed an acknowledgement in the form of the attached Exhibit A (each, a "Covered Executive" and collectively, the "Covered Executives") to their assigned duties without distraction. Nothing in this Plan shall be construed as creating an express or implied contract of employment and, except as otherwise agreed in writing between the Covered Executive and the Company, the Covered Executive shall not have any right to be retained in the employ of the Company.

2. Definitions. The following terms shall be defined as set forth below:

(a) "*Base Salary*" shall mean the annual base salary in effect immediately prior to the Terminating Event or Change in Control Terminating Event.

(b) "*Cause*" shall mean, and shall be limited to a determination by the Company that the Covered Executive's employment shall be terminated as a result of any one or more of the following events:

(i) any material breach by the Covered Executive of any agreement between the Covered Executive and the Company; or

(ii) the conviction of, indictment for or plea of nolo contendere by the Covered Executive to a felony or a crime involving moral turpitude; or

(iii) any material misconduct or willful and deliberate non-performance (other than by reason of disability) by the Covered Executive of the Covered Executive's duties to the Company; or

(iv) willful failure to cooperate with a bona fide internal investigation or an investigation by regulatory or law enforcement authorities, after being instructed by the Company to cooperate, or the willful destruction or failure to preserve documents or other

materials known to be relevant to such investigation or the willful inducement of others to fail to cooperate or to produce documents or other materials in connection with such investigation.

(c) *"Change in Control"* shall be deemed to have occurred upon the occurrence of any one of the following events:

(i) any "person," as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended (the "Act") (other than the Company, any of its subsidiaries, or any trustee, fiduciary or other person or entity holding securities under any employee benefit plan or trust of the Company or any of its subsidiaries), together with all "affiliates" and "associates" (as such terms are defined in Rule 12b-2 under the Act) of such person, shall become the "beneficial owner" (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, of securities of the Company representing 50 percent or more of the combined voting power of the Company's then outstanding securities having the right to vote in an election of the Board ("Voting Securities") (in such case other than as a result of an acquisition of securities directly from the Company); or

(ii) the date a majority of the members of the Board is replaced during any 12-month period by directors whose appointment or election is not endorsed by a majority of the members of the Board before the date of the appointment or election; or

(iii) the consummation of (A) any consolidation or merger of the Company where the stockholders of the Company, immediately prior to the consolidation or merger, would not, immediately after the consolidation or merger, beneficially own (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, shares representing in the aggregate more than 50 percent of the voting shares of the Company issuing cash or securities in the consolidation or merger (or of its ultimate parent corporation, if any), or (B) any sale or other transfer (in one transaction or a series of transactions contemplated or arranged by any party as a single plan) of all or substantially all of the assets of the Company.

Notwithstanding the foregoing, a "Change in Control" shall not be deemed to have occurred for purposes of the foregoing clause (i) solely as the result of an acquisition of securities by the Company which, by reducing the number of shares of Voting Securities outstanding, increases the proportionate number of Voting Securities beneficially owned by any person to 50 percent or more of the combined voting power of all of the then outstanding Voting Securities; provided, however, that if any person referred to in this sentence shall thereafter become the beneficial owner of any additional shares of Voting Securities (other than pursuant to a stock split, stock dividend, or similar transaction or as a result of an acquisition of securities directly from the Company) and immediately thereafter beneficially owns 50 percent or more of the combined voting power of all of the then outstanding Voting Securities, then a "Change in Control" shall be deemed to have occurred for purposes of the foregoing clause (i).

(d) "*Change in Control Terminating Event*" shall mean during the 18-month period following the occurrence of a Change in Control, any of the following events: (i) termination by the Company of the Covered Executive's employment for any reason other than for Cause, death or disability; or (ii) the termination by the Covered Executive of his or her employment with the Company for Good Reason. Notwithstanding the foregoing, a Change in Control Terminating Event shall not be deemed to have occurred herein solely as a result of the Covered Executive being an employee of any direct or indirect successor to the business or assets of the Company.

(e) "*Code*" shall mean the Internal Revenue Code of 1986, as amended.

(f) "*Good Reason*" shall mean that the Covered Executive has complied with the "Good Reason Process" (hereinafter defined) following the occurrence of any of the following events:

(i) a material diminution in the Covered Executive's responsibilities, authority or duties; or

(ii) a material reduction in the Covered Executive's Base Salary except for across-the-board salary reductions similarly affecting all or substantially all management employees; or

(iii) a material change in the geographic location at which the Covered Executive is principally employed.

For purposes of this Section 2(f)(i), a change in the reporting relationship, or a change in a title will not, by itself, be sufficient to constitute a material diminution of responsibilities, authority or duty.

(g) "Good Reason Process" shall mean:

(i) the Covered Executive reasonably determines in good faith that a "Good Reason" condition has occurred;

(ii) the Covered Executive notifies the Company in writing of the occurrence of the Good Reason condition within 60 days of the first occurrence of such condition;

(iii) the Covered Executive cooperates in good faith with the Company's efforts, for a period not less than 30 days following such notice (the "Cure Period"), to remedy the condition;

(iv) notwithstanding such efforts, the Good Reason condition continues to exist following the Cure Period; and

(v) the Covered Executive terminates his or her employment within 30 days after the end of the Cure Period.

If the Company cures the Good Reason condition during the Cure Period, Good Reason shall be deemed not to have occurred.

(h) "*Pro-Rata Bonus*" shall mean, as of the date of termination, an amount equal to the earned, if any, but unpaid portion of the target bonus award, as determined in the absolute discretion of the Company.

(i) "*Target Bonus*" shall mean, as of the date of termination, an amount equal to the annual target bonus for the year in which the termination of employment occurs.

(j) "*Terminating Event*" shall mean a termination by the Company of the Covered Executive's employment for any reason other than for Cause, death or disability.

3. Termination Benefits. In the event a Terminating Event or a Change in Control Terminating Event occurs with respect to a Covered Executive, the Company shall pay or provide to the Covered Executive any earned but unpaid Base Salary, unpaid expense reimbursements, accrued but unused vacation and any vested benefits the Covered Executive may be entitled to, as of the date of termination, under any employee benefit plan of the Company.

(a) Terminating Event. In the event a Terminating Event occurs with respect to a Covered Executive, subject to the execution and effectiveness of a general release of claims in a form and manner satisfactory to the Company (the "Release") by the Covered Executive within 45 days of the Terminating Event, the Company shall:

(i) pay the Covered Executive an amount equal to the sum of the following:

- (A) six months of Base Salary of the Covered Executive;
- (B) six months of Target Bonus of the Covered Executive; and
- (C) the Pro-Rata Bonus.

Such amount shall be paid in a single lump sum cash payment within 60 days after the date of the Terminating Event, but if such 60-day period spans two calendar years, such amount shall be paid in the second calendar year.

(ii) continue to provide (or to reimburse Covered Executive for) health and dental coverage to the Covered Executive, on the same terms and conditions as though the Covered Executive had remained an active employee, for 12 months following the Terminating Event; and

(iii) reimburse the Covered Executive for outplacement services not to exceed \$15,000, provided that such expenses are incurred by the Covered Executive within 12 months of the termination of employment and such reimbursement shall be made by the Company within 30 days of receipt of satisfactory evidence of such expenses.

(b) Change in Control Terminating Event. In the event a Change in Control Terminating Event occurs with respect to a Covered Executive, subject to the execution and effectiveness of a Release by the Covered Executive within 45 days of the Change in Control Terminating Event, in lieu of the amounts payable under Section 3(a), the Company shall:

- (i) pay the Covered Executive an amount equal to the sum of the following:
 - (A) one times the amount of the Base Salary of the Covered Executive;
 - (B) one times the amount of the Target Bonus of the Covered Executive; and
 - (C) the Pro-Rata Bonus.

Such amount shall be paid in a single lump sum cash payment within 60 days of the Change in Control Terminating Event, but if such 60-day period spans two calendar years, such amount shall be paid in the second calendar year.

(ii) continue to provide (or to reimburse Covered Executive for) health and dental insurance coverage to the Covered Executive, on the same terms and conditions as though the Covered Executive had remained an active employee, for 12 months following the Change in Control Terminating Event;

(iii) reimburse the Covered Executive for outplacement services not to exceed \$15,000, provided that such expenses are incurred by the Covered Executive within 12 months of the termination of employment and such reimbursement shall be made by the Company within 30 days of receipt of satisfactory evidence of such expenses; and

(iv) cause all outstanding stock options and other stock-based awards held by the Covered Executive to immediately accelerate and become fully exercisable, vested or nonforfeitable as of the Covered Executive's Change in Control Terminating Event.

4. Additional Limitation.

(a) Anything in this Plan to the contrary notwithstanding, in the event that any compensation, payment or distribution by the Company to or for the benefit of the Covered Executive, whether paid or payable or distributed or distributable pursuant to the terms of this Plan or otherwise (the "Severance Payments"), would be subject to the excise tax imposed by Section 4999 of the Code, the following provisions shall apply:

(i) If the Severance Payments, reduced by the sum of (A) the Excise Tax and (B) the total of the Federal, state, and local income and employment taxes payable by the Covered Executive on the amount of the Severance Payments which are in excess of the

Threshold Amount (as defined below), are greater than or equal to the Threshold Amount, the Covered Executive shall be entitled to the full benefits payable under this Plan.

(ii) If the Threshold Amount is less than (A) the Severance Payments, but greater than (B) the Severance Payments reduced by the sum of (1) the Excise Tax and (2) the total of the Federal, state, and local income and employment taxes on the amount of the Severance Payments which are in excess of the Threshold Amount, then the benefits payable under this Plan shall be reduced (but not below zero) to the extent necessary so that the sum of all Severance Payments shall not exceed the Threshold Amount. In such event, the Severance Payments shall be reduced in the following order: (1) cash payments not subject to Section 409A of the Code; (2) cash payments subject to Section 409A of the Code; (3) equity-based payments and acceleration; and (4) non-cash forms of benefits. To the extent any payment is to be made over time (e.g., in installments, etc.), then the payments shall be reduced in reverse chronological order.

(b) For the purposes of this Section 4, "Threshold Amount" shall mean three times the Covered Executive's "base amount" within the meaning of Section 280G(b)(3) of the Code and the regulations promulgated thereunder less one dollar (\$1.00); and "Excise Tax" shall mean the excise tax imposed by Section 4999 of the Code, and any interest or penalties incurred by the Covered Executive with respect to such excise tax.

(c) The determination as to which of the alternative provisions of Section 4(a) shall apply to the Covered Executive shall be made by a nationally recognized accounting firm selected by the Company (the "Accounting Firm"), which shall provide detailed supporting calculations both to the Company and the Covered Executive within 15 business days of the Change in Control Terminating Event, if applicable, or at such earlier time as is reasonably requested by the Company or the Covered Executive. For purposes of determining which of the alternative provisions of Section 4(a) shall apply, the Covered Executive shall be deemed to pay federal income taxes at the highest marginal rate of federal income taxation applicable to individuals for the calendar year in which the determination is to be made, and state and local income taxes at the highest marginal rates of individual taxation in the state and locality of the Covered Executive's residence on the Change in Control Terminating Event, net of the maximum reduction in federal income taxes which could be obtained from deduction of such state and local taxes. Any determination by the Accounting Firm shall be binding upon the Company and the Covered Executive.

5. Consent to Jurisdiction. To the extent that any court action is permitted consistent with or to enforce this Plan, the parties hereby consent to the jurisdiction of the state and federal courts of western Pennsylvania. Accordingly, with respect to any such court action, the Covered Executive (a) submits to the personal jurisdiction of such courts; (b) consents to service of process; and (c) waives any other requirement (whether imposed by statute, rule of court, or otherwise) with respect to personal jurisdiction or service of process.

6. Withholding. All payments made by the Company under this Plan shall be net of any tax or other amounts required to be withheld by the Company under applicable law.

7. Section 409A.

(a) the Covered Executive becomes entitled to under this Plan on account of the Covered Executive's separation from service would be considered deferred compensation subject to the 20 percent additional tax imposed pursuant to Section 409A(a) of the Code as a result of the application of Section 409A(a)(2)(B)(i) of the Code, such payment shall not be payable and such benefit shall not be provided until the date that is the earlier of (A) six months and one day after the Covered Executive's separation from service, or (B) the Covered Executive's death. If any such delayed cash payment is otherwise payable on an installment basis, the first payment shall include a catch-up payment covering amounts that would otherwise have been paid during the six-month period but for the application of this provision, and the balance of the installments shall be payable in accordance with their original schedule.

(b) All in-kind benefits provided and expenses eligible for reimbursement under this Plan shall be provided by the Company or incurred by the Covered Executive during the time periods set forth in this Plan. All reimbursements shall be paid as soon as administratively practicable, but in no event shall any reimbursement be paid after the last day of the taxable year following the taxable year in which the expense was incurred. The amount of in-kind benefits provided or reimbursable expenses incurred in one taxable year shall not affect the in-kind benefits to be provided or the expenses eligible for reimbursement in any other taxable year. Such right to reimbursement or in-kind benefits is not subject to liquidation or exchange for another benefit.

(c) To the extent that any payment or benefit described in this Plan constitutes "non-qualified deferred compensation" under Section 409A of the Code, and to the extent that such payment or benefit is payable upon the Covered Executive's termination of employment, then such payments or benefits shall be payable only upon the Covered Executive's "separation from service." The determination of whether and when a separation from service has occurred shall be made in accordance with the presumptions set forth in Treasury Regulation Section 1.409A-1(h).

(d) The parties intend that all payments made pursuant to this Plan shall be exempt from Section 409A of the Code or otherwise comply with Section 409A of the Code and this Plan shall be interpreted accordingly. The parties agree that this Plan may be amended, as reasonably requested by either party, and as may be necessary to fully comply with Section 409A of the Code and all related rules and regulations in order to preserve the payments and benefits provided hereunder without additional cost to either party.

(e) The Company makes no representation or warranty and shall have no liability to the Covered Executive or any other person if any provisions of this Plan are determined

to constitute deferred compensation subject to Section 409A of the Code but do not satisfy an exemption from, or the conditions of, such Section.

8. No Mitigation. The Covered Executive is not required to seek other employment or to attempt in any way to reduce any amounts payable to the Covered Executive by the Company under this Plan. Further, the amount of any payment provided for in this Plan shall not be reduced by any compensation earned by the Covered Executive as the result of employment by another employer, by retirement benefits, by offset against any amount claimed to be owed by the Covered Executive to the Company, or otherwise.

9. Benefits and Burdens. This Plan shall inure to the benefit of and be binding upon the Company and the Covered Executives, their respective successors, executors, administrators, heirs and permitted assigns. In the event of a Covered Executive's death after a Terminating Event but prior to the completion by the Company of all payments due him under this Plan, the Company shall continue such payments to the Covered Executive's beneficiary designated in writing to the Company prior to his or her death (or to his or her estate, if the Covered Executive fails to make such designation).

10. Enforceability. If any portion or provision of this Plan shall to any extent be declared illegal or unenforceable by a court of competent jurisdiction, then the remainder of this Plan, or the application of such portion or provision in circumstances other than those as to which it is so declared illegal or unenforceable, shall not be affected thereby, and each portion and provision of this Plan shall be valid and enforceable to the fullest extent permitted by law.

11. Waiver. No waiver of any provision hereof shall be effective unless made in writing and signed by the waiving party. The failure of any party to require the performance of any term or obligation of this Plan, or the waiver by any party of any breach of this Plan, shall not prevent any subsequent enforcement of such term or obligation or be deemed a waiver of any subsequent breach.

12. Notices. Any notices, requests, demands, and other communications provided for by this Plan shall be sufficient if in writing and delivered in person or sent by registered or certified mail, postage prepaid, to a Covered Executive at the last address the Covered Executive has filed in writing with the Company, or to the Company at its main office, attention of the Board of Directors.

13. Effect on Other Plans. Nothing in this Plan shall be construed to limit the rights of the Covered Executives under the Company benefit plans, programs or policies.

14. Amendment or Termination of Plan. The Company may amend or terminate this Plan at any time or from time to time, provided, however, that the Plan may not be amended or terminated after a Change in Control.

15. Governing Law. This Plan shall be construed under and be governed in all respects by the laws of The Commonwealth of Pennsylvania.

16. Obligations of Successors. In addition to any obligations imposed by law upon any successor to the Company, the Company will use its reasonable efforts to require any successor (whether direct or indirect, by purchase, merger, consolidation or otherwise) to all or substantially all of the business or assets of the Company to expressly assume and agree to perform this Plan in the same manner and to the same extent that the Company would be required to perform if no such succession had taken place.

Adopted: As of February 17, 2010

Amended: As of July 29, 2014

EXHIBIT A

Acknowledgement

The undersigned acknowledges and agrees that: (i) he or she has been designated as a Covered Executive under the ANSYS, Inc. Executive Severance Plan (the "Plan"), (ii) any payment, rights or benefits to which the undersigned may become eligible for under such Plan are subject to all of the terms and conditions of the Plan, and (iii) this acknowledgement and the Plan constitute the entire agreement between ANSYS, Inc. and the undersigned regarding the subject matter hereof and thereof.

Covered Executive

Name: _____

Title: _____

Date: _____

**DEFERRED STOCK UNIT AGREEMENT
UNDER THE
FOURTH AMENDED AND RESTATED
ANSYS, INC.
1996 STOCK OPTION AND GRANT PLAN**

Name of Grantee: []

No. of Deferred Stock Units Granted: []

Grant Date: []

Pursuant to the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (the "Plan") as amended through the date hereof, ANSYS, Inc. (the "Company") hereby grants the number of Deferred Stock Units listed above (the "Award") to the Grantee named above. Each "Deferred Stock Unit" shall relate to one share of Common Stock par value \$.01 per share (the "Stock") of the Company, subject to the restrictions and conditions set forth herein and in the Plan.

1. Restrictions on Transfer of Award. The Award shall not be sold, transferred, pledged, assigned or otherwise encumbered or disposed of by the Grantee, until shares of Stock have been issued pursuant to Section 3 hereof.

2. Vesting of Deferred Stock Units. The Deferred Stock Units shall be fully vested upon the Grant Date specified above.

3. Issuance of Shares of Stock.

(a) Subject to the terms of the Plan and this Award, each Deferred Stock Unit entitles the Grantee to receive one share of Stock as soon as reasonably practicable following the Settlement Date. The "Settlement Date" shall be the date of the cessation of the Grantee's service as a director of the Company.

(b) As soon as reasonably practicable following the Settlement Date, but in no event later than 10 days after the Settlement Date, the Company shall direct its transfer agent to issue to the Grantee in book entry form the number of shares of Stock equal to the number of Deferred Stock Units credited to the Grantee in satisfaction of the Award.

(c) Shares of Stock shall be issued and delivered to the Grantee in accordance with Section 3(b) upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Grantee.

(d) Until such time as shares of Stock are issued to the Grantee pursuant to Section 3(b), the Grantee shall have no rights as a stockholder with respect to any shares of Stock underlying the Deferred Stock Units, including but not limited to any voting rights, provided, however, that any dividends or other distributions paid with respect to the shares of Stock underlying the Deferred Stock Units shall accrue and shall be converted into additional Deferred Stock Units based on the closing price of the Stock on any such distribution date and any such additional Deferred Stock Units shall be subject to the same conditions and restrictions as are the Deferred Stock Units with respect to which they were paid.

(e) Notwithstanding anything to the contrary herein or in the Plan, if the Grantee is a “key employee” (as defined in Section 416(i) of the Code, without regard to paragraph 5 thereof), any issuance of shares of Stock on account of such Grantee’s cessation of service shall be delayed until at least six months after such cessation of service to the extent necessary to avoid any penalty taxes under Section 409A of the Code.

4. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 2(b) of the Plan. Capitalized terms in this Award shall have the meaning specified in the Plan, unless a different meaning is specified herein.

5. Transferability of this Award. This Award is personal to the Grantee, is non-assignable and is not transferable in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution.

6. Miscellaneous.

(a) Notice hereunder shall be given to the Company at its principal place of business, and shall be given to the Grantee at the address set forth below, or in either case at such other address as one party may subsequently furnish to the other party in writing.

(b) This Award does not confer upon the Grantee any rights with respect to continuation of service as a director of the Company.

ANSYS, INC.

Dated:

— By:

Name:

Title:

The foregoing Award is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned.

Dated: ___ GRANTEE

[]

—

Grantee's Address:

**RESTRICTED STOCK UNIT AGREEMENT
UNDER THE FIFTH AMENDED AND RESTATED ANSYS, INC.
1996 STOCK OPTION AND GRANT PLAN**

Name of Grantee:

No. of Restricted Stock Units Granted:

Grant Date:

Pursuant to the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (the "Plan") as amended through the date hereof, ANSYS, Inc. (the "Company") hereby grants the number of Restricted Stock Units listed above (the "Award") to the Grantee named above. Each "Restricted Stock Unit" shall relate to one share of Common Stock par value \$.01 per share (the "Stock") of the Company, subject to the restrictions and conditions set forth in this Restricted Stock Unit Agreement (the "Agreement") and in the Plan.

1. Restrictions on Transfer of Award. The Award shall not be sold, transferred, pledged, assigned or otherwise encumbered or disposed of by the Grantee, until shares of Stock have been issued pursuant to Section 3 hereof.

2. Vesting of Restricted Stock Units.

(a) The Restricted Stock Units shall become vested pursuant to the following schedule (each, a "Vesting Date"), so long as the Grantee continues to be employed by the Company on each such date;

Incremental Number of
Restricted Stock Units Vested

Vest Date

%%SHARES_PERIOD1,'999,999,999'%%-%	33%	%%VEST_DATE_PERIOD1,'Month DD, YYYY'%%-%
%%SHARES_PERIOD2,'999,999,999'%%-%	33%	%%VEST_DATE_PERIOD2,'Month DD, YYYY'%%-%
%%SHARES_PERIOD3,'999,999,999'%%-%	34%	%%VEST_DATE_PERIOD3,'Month DD, YYYY'%%-%

Notwithstanding the foregoing, if the Grantee's employment with the Company is terminated on account of the Grantee's death or Disability (as defined below), any Restricted Stock Units that are not vested shall automatically vest in full as of the date that the Grantee's employment terminates by reason of death or Disability. For purposes hereof, "Disability" shall mean the Grantee's termination of employment with the Company: (i) after becoming eligible to receive benefits under the Company's then current long-term disability plan that is applicable to Grantee; (ii) where Grantee is not eligible under a Company long-term disability plan, after being officially declared permanently disabled under the mandatorily applicable health or welfare regulations of the applicable jurisdiction; or, (iii) in the absence of such a determination under said regulations, officially declared permanently disabled by a physician appointed by the Company in its sole discretion.

(b) Notwithstanding anything herein to the contrary, in the event that this Award is assumed in the sole discretion of the parties to a Transaction (as defined in Section 3 of the Plan) or is continued by the Company and thereafter remains in effect following such Transaction, then this Award shall be deemed vested in full upon the date on which the Grantee's employment with the Company and its subsidiaries or successor entities terminates if (i) such termination occurs within 18 months of such Transaction and (ii) such termination is by either the Company without Cause (as defined below), or by the Grantee if such termination by the Grantee is preceded during such 18-month period by any material adverse modification of the duties, principal employment location or compensation of the Grantee without his or her consent, subject, however, to the following sentence. In addition and notwithstanding anything herein to the contrary, in the event that the Grantee is not offered employment by the Company and its subsidiaries or any successor entities following a Transaction on substantially the same or better terms (including, without limitation, duties and compensation) than those in effect immediately prior to such Transaction, then this Award shall be deemed vested in full upon the date on which the Grantee's employment with the Company and its subsidiaries terminates. For this purpose, "Cause" shall have the meaning given such term in the employment, severance or similar agreement between the Company and the Grantee and, in the absence of any such agreement, shall mean a determination by the Company that the Grantee shall be dismissed as a result of (i) any material breach by the Grantee of any agreement between the Grantee and the Company; (ii) the conviction of, indictment for or plea of nolo contendere by the Grantee to a felony or a crime involving moral turpitude; or (iii) any material misconduct or willful and

deliberate non-performance (other than by reason of disability) by the Grantee of the Grantee's duties to the Company.

3. Issuance of Shares of Stock.

(a) Subject to the terms of the Plan and this Agreement, each Restricted Stock Unit entitles the Grantee to receive one share of Stock as soon as reasonably practicable following the Vesting Date.

(b) As soon as reasonably practicable following each Vesting Date, but in no event later than 60 days after the end of the year in which such Vesting Date occurs, the Company shall direct its transfer agent to issue to the Grantee the number of shares of Stock equal to the incremental number of Restricted Stock Units that became vested on such Vesting Date in satisfaction of the Award via the Company's dedicated on-line broker.

(c) Shares of Stock shall be issued and delivered to the Grantee in accordance with Section 3(b) upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Grantee.

(d) Until such time as shares of Stock are issued to the Grantee pursuant to Section 3(b), the Grantee shall have no rights as a stockholder with respect to any shares of Stock underlying the Restricted Stock Units, including but not limited to any voting rights.

4. Termination of Employment. Except as provided in Section 2 hereof, if the Grantee's employment by the Company or its subsidiaries is terminated for any reason or under any circumstances, this Award shall no longer vest with respect to any unvested Restricted Stock Units.

5. Effect of Certain Transactions. Subject to Section 2(b) hereof, in the case of a Transaction (as defined in Section 3 of the Plan), the unvested portion of this Award shall terminate on the effective date of such Transaction, unless provision is made in such Transaction in the sole discretion of the parties thereto for the assumption or continuation of the unvested Award or the substitution for the unvested Award of new restricted stock units of the successor person or entity or a parent or subsidiary thereof, with appropriate adjustment as to the number and kind of shares, as provided in the Plan.

6. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 2(b) of the Plan. Capitalized terms used herein shall have the meaning specified in the Plan, unless a different meaning is specified herein.

7. Transferability. This Award is personal to the Grantee, is non-assignable and is not transferable by Grantee in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution. The Stock to be issued upon the vesting of this Award to the Grantee shall be issued, during the Grantee's lifetime, only to the Grantee.

8. Tax Withholding. Any issuance of shares of Stock to a Grantee pursuant to this Award shall be subject to applicable tax withholding requirements. The Grantee shall,

not later than the date as of which the transfer of shares of Stock pursuant to this Award becomes a taxable event for Federal income tax or other applicable withholding tax purposes, pay to the Company or make arrangements satisfactory to the Committee for payment of any Federal, state, local, non-U.S., or other taxes required by law to be withheld on account of such taxable event. The Company shall have the authority to cause the required minimum tax withholding amount to be satisfied, in whole or in part, by withholding from shares of Stock to be issued to the Grantee a number of shares of Stock with an aggregate Fair Market Value that would satisfy such minimum withholding obligation.

9. No Obligation to Continue Employment. Neither the Company nor any Subsidiary is obligated by or as a result of the Plan or this Award to continue the Grantee in employment and neither the Plan nor this Award shall interfere in any way with the right of the Company or any Subsidiary to terminate the employment of the Grantee at any time, in accordance with applicable law.

10. Non-Competition, Non-Solicitation. As additional consideration for this Award to the Grantee, the Grantee hereby agrees that, if at any time during and for a period of one year after the termination of his or her employment with the Company or any Subsidiary no matter what the cause of that termination, he or she engages for any reason, directly or indirectly, whether as owner, part-owner, shareholder, member, partner, director, officer, trustee, employee, agent or consultant, or in any other capacity, on behalf of himself or herself or any firm, corporation or other business organization other than the Company and its subsidiaries in any one or more of the following activities:

(a) the development, marketing, solicitation, or selling of any product or service that is competitive with the products or services of the Company, or products or services that the Company has under development or that are subject to active planning at any time during Grantee's employment;

(b) the use of any of the Company's confidential or proprietary information, copyrights, patents or trade secrets which was acquired by the Grantee as an employee of the Company and its subsidiaries; or

(c) any activity for the purpose of inducing, encouraging, or arranging for the employment or engagement by anyone other than the Company and its subsidiaries of any employee, officer, director, agent, consultant, or sales representative of the Company and its subsidiaries or attempt to engage any of them in a manner which would deprive the Company and its subsidiaries of their services or place them in a conflict of interest with the Company and its subsidiaries;

then (i) this Award shall terminate effective on the date on which he or she first engages in such activity, unless terminated sooner by operation of any other term or condition of this Award or the Plan, and (ii) all shares of Stock issued to the Grantee pursuant to this Award shall become immediately due and payable by Grantee to the Company and if such shares of Stock have been sold by the Grantee, an amount equal to the proceeds from such sale shall become immediately due and payable by the Grantee to the Company. Grantee acknowledges and agrees that the activities set forth in this Section 10(a)-(c) are adverse to the Company's interests, and that it would be inequitable for Grantee to benefit from this Award should Grantee engage in any such activities during or within one year after termination of his or her employment with the Company.

The Grantee may be released from his or her obligations as stated above only if the Committee (or its duly appointed agent) determines in its sole discretion that such action is in the best interests of the Company and its subsidiaries.

11. Section 409A of the Code. This Agreement shall be interpreted in such a manner that the Award shall be exempt from the requirements of Section 409A of the Code as a "short-term deferral" as described in Section 409A of the Code.

12. Integration. This Agreement constitutes the entire agreement between the parties with respect to this Award and supersedes all prior agreements and discussions between the parties concerning such subject matter.

13. ***Data Privacy. The Grantee hereby explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Grantee's personal data as described in this Agreement and any other Award grant materials by and among, as applicable, the company employing the Grantee (the "Employer"), the Company and***

any other Subsidiary for the exclusive purpose of implementing, administering and managing the Grantee's participation in the Plan.

The Grantee understands that the Company and the Employer may hold certain personal information about the Grantee, including, but not limited to, the Grantee's name, home address and telephone number, date of birth, social insurance number or other identification number, salary, nationality, job title, any shares of Stock or directorships held in the Company, details of all awards or any other entitlement to shares of Stock awarded, canceled, exercised, vested, unvested or outstanding in the Grantee's favor ("Data"), for the exclusive purpose of implementing, administering and managing the Plan.

The Grantee understands that Data will be transferred to the stock plan service provider selected by the Company, which is assisting the Company with the implementation, administration and management of the Plan. The Grantee understands that the recipients of the Data may be located in the United States or elsewhere, and that the recipient's country (e.g., the United States) may have different data privacy laws and protections than the Grantee's country. The Grantee understands that he or she may request a list with the names and addresses of any potential recipients of the Data by contacting his or her local human resources representative. The Grantee authorizes the Company, the stock plan service provider and any other possible recipients which may assist the Company (presently or in the future) with implementing, administering and managing the Plan to receive, possess, use, retain and transfer the Data, in electronic or other form, for the sole purposes of implementing, administering and managing the Grantee's participation in the Plan. The Grantee understands that Data will be held only as long as is necessary to implement, administer and manage the Grantee's participation in the Plan. The Grantee understands that he or she may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing his or her local human resources representative. Further, the Grantee understands that he or she is providing the consents herein on a purely voluntary basis. If the Grantee does not consent, or if the Grantee later seeks to revoke his or her consent, his or her employment status or service and career with the Employer will not be adversely affected; the only adverse consequence of refusing or withdrawing consent is that the Company would not be able to grant the Grantee the Award or other equity awards or administer or maintain such awards. Therefore, the Grantee understands that refusing or withdrawing his or her consent may affect the Grantee's ability to participate in the Plan. For more information on the consequences of the Grantee's refusal to consent or withdrawal of consent, the Grantee understands that he or she may contact his or her local human resources representative.

14. Nature of Grant. In accepting the Award, the Grantee acknowledges, understands and agrees that:

(a) the Plan is established voluntarily by the Company, it is discretionary in nature and it may be modified, amended, suspended or terminated by the Company at any time, to the extent permitted by the Plan;

- (b) the grant of the Award is voluntary and occasional and does not create any contractual or other right to receive future grants;
- (c) all decisions with respect to future Awards or other grants, if any, will be at the sole discretion of the Company;
- (d) the Award and the Grantee's participation in the Plan shall not be interpreted as forming an employment contract with the Company;
- (e) the Grantee is voluntarily participating in the Plan;
- (f) the Award and any shares of Stock acquired under the Plan are not intended to replace any pension rights or compensation;
- (g) the Award and any shares of Stock acquired under the Plan, and the income and value of same, are not part of normal or expected compensation for any purpose, including, without limitation, calculating any severance, resignation, termination, redundancy, dismissal, end-of-service payments, bonuses, long-service awards, pension or retirement benefits or payments or welfare benefits or similar payments;
- (h) the future value of the shares of Stock underlying the Award is unknown, indeterminable, and cannot be predicted with certainty;
- (i) no claim or entitlement to compensation or damages shall arise from forfeiture of the Award resulting from the termination of the Grantee's employment relationship (for any reason whatsoever, whether or not later found to be invalid or in breach of employment laws in the jurisdiction where the Grantee is employed or the terms of the Grantee's employment agreement, if any);
- (j) unless otherwise provided in the Plan or by the Company in its discretion, the Award and the benefits evidenced by this Agreement do not create any entitlement to have the Award or any such benefits transferred to, or assumed by, another company nor to be exchanged, cashed out or substituted for, in connection with any corporate transaction affecting the Company's Stock; and
- (k) neither the Employer, the Company nor any other Subsidiary shall be liable for any foreign exchange rate fluctuation between the Grantee's local currency and the United States Dollar that may affect the value of the Award or of any amounts due to the Grantee pursuant to settlement of the Award or the subsequent sale of any shares of Stock acquired upon settlement.

15. No Advice Regarding Grant. The Company is not providing any tax, legal or financial advice, nor is the Company making any recommendations regarding the Grantee's participation in the Plan, or the Grantee's acquisition or sale of the underlying shares of Stock. The Grantee is hereby advised to consult with his or her own personal tax, legal and financial advisors regarding his or her

participation in the Plan before taking any action related to the Plan.

16. Language. If the Grantee has received this Agreement, or any other document related to the Award and/or the Plan translated into a language other than English and if the meaning of the translated version is different than the English version, the English version will control.

17. Notices. Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Grantee at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

18. Amendment. Pursuant to Section 18 of the Plan, the Committee may at any time amend or cancel any unvested portion of this Award, but no such action may be taken that adversely affects the Grantee's rights under hereunder without the Grantee's consent.

19. Severability. If any provision(s) hereof shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

20. Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

A handwritten signature in black ink, appearing to be 'K. S. J.', with a horizontal line extending to the right from the end of the signature.

ANSYS, Inc.

By: _____

Name: Ajei S. Gopal

Title: President and CEO

The foregoing Award is hereby accepted and the terms and conditions of this Agreement are hereby agreed to by the undersigned. Electronic acceptance of this Award pursuant to the Company's instructions to the Grantee (including through an online acceptance process) is acceptable.

Dated: __ __

Optionee's Signature

Optionee's name and address:

%%FIRST_NAME%- %%%LAST_NAME%- %
%%ADDRESS_LINE_1%- %
%%ADDRESS_LINE_2%- %
%%ADDRESS_LINE_3%- %
%%CITY%- %%%STATE%- %%%ZIPCODE%- %
%%COUNTRY%- %

INTERNATIONAL APPENDIX

Additional Terms and Conditions

Terms and Conditions

This International Appendix includes additional terms and conditions that govern the award granted to you under the Plan for your country. Certain capitalized terms used but not defined in this International Appendix have the meanings set forth in the Plan and the Agreement that relate to your award. By acceptance of the award you agree to be bound by the terms and conditions contained in the paragraphs below in addition to the terms of the Plan and the Agreement and the terms of any other document that may apply to you and your award.

Notifications

This International Appendix also includes information regarding issues of which you should be aware with respect to participation in the Plan. The information is based on the securities, exchange control, and other laws in effect in the respective countries as of the date set forth above. Such laws are often complex and change frequently. As a result, it is strongly recommended that you not rely on the information in this International Appendix as the only source of information relating to the consequences of your participation in the Plan because the information may be out of date at the time you vest in your award or sell shares acquired under the Plan.

The information contained herein is general in nature and may not apply to your particular situation, and the Company is not in a position to assure you of a particular result. In addition, please note that the requirements may differ for residents and non-residents. Accordingly, you are advised to seek appropriate professional advice as to how the relevant laws in your country may apply to your situation.

Finally, if you are a citizen or resident of a country other than the one in which you are currently working, transferred employment to another country after the award was granted to you, or are considered a resident of another country for local law purposes, the information contained herein may not apply.

Provisions Applicable to all International Awards

Data Privacy. The Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Participant's personal data by and among, as applicable, the Company, its subsidiaries and affiliates, for the exclusive purpose of implementing, administering and managing the Participant's participation in the Plan. The Participant hereby understands that the Company, its subsidiaries and affiliates hold (but only process or transfer to the extent required or permitted by local law) certain personal information about the Participant, including, but not limited to, the Participant's name, home address and telephone number, date of birth, social insurance number or other identification number, salary, nationality, job title,

any Shares or directorships held in the Company, details of all Restricted Stock Units or any other entitlement to Shares awarded, canceled, exercised, vested, unvested or outstanding in the Participant's favor, for the purpose of implementing, administering and managing the Plan ("Data"). The Participant hereby understands that Data may be transferred to any third parties assisting in the implementation, administration and management of the Plan, that these recipients may be located in the Participant's country or elsewhere (including countries outside of the European Economic Area such as the United States of America), and that the recipient's country may have different data privacy laws and protections than the Participant's country. The Participant hereby understands that the Participant may request a list with the names and addresses of any potential recipients of the Data by contacting the Participant's local human resources representative. The Participant authorizes the recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the purposes of implementing, administering and managing the Participant's participation in the Plan, including any requisite transfer of such Data as may be required to a broker or other third party with whom the Participant may elect to deposit any Shares acquired upon exercise. The Participant hereby understands that Data will be held only as long as is necessary to implement, administer and manage the Participant's participation in the Plan and in accordance with local law. The Participant hereby understands that the Participant may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing the Participant's local human resources representative. The Participant hereby understands, however, that refusing or withdrawing the Participant's consent may affect the Participant's ability to participate in the Plan. For more information on the consequences of the Participant's refusal to consent or withdrawal of consent, the Participant hereby understands that the Participant may contact the Participant's local human resources representative.

Nature of Grant. In accepting the grant of Restricted Stock Units, the Participant acknowledges that:

- (a) the Plan is established voluntarily by the Company, is discretionary in nature and may be modified, amended, suspended or terminated by the Company at any time, unless otherwise provided in the Plan and this Agreement;
- (b) the grant of Restricted Stock Units is voluntary and occasional and does not create any contractual or other right to receive future grants of Restricted Stock Units, or benefits in lieu of Restricted Stock Units, even if Restricted Stock Units have been granted repeatedly in the past;
- (c) all decisions with respect to future Restricted Stock Units, if any, will be at the sole discretion of the Company;

(d) the Participant's participation in the Plan will not create a right to further employment with the Participant's employer (the "Employer") and shall not interfere with the ability of the Employer to terminate the Participant's employment relationship;

(e) the Participant is voluntarily participating in the Plan;

(f) the Restricted Stock Units are an extraordinary item that does not constitute compensation of any kind for services of any kind rendered to the Company or the Employer, and which is outside the scope of the Participant's employment contract, if any;

(g) the Restricted Stock Units are not part of normal or expected compensation or salary for any purposes, including, but not limited to, calculating any severance, resignation, termination, redundancy, end of service payments, bonuses, long-service awards, pension or retirement benefits or similar payments and in no event should be considered as compensation for, or relating in any way to, past services for the Company or the Employer;

(h) in the event that the Participant is not an employee of the Company, the grant of Restricted Stock Units will not be interpreted to form an employment contract or relationship with the Company; and furthermore, the grant of Restricted Stock Units will not be interpreted to form an employment contract with the Employer or any subsidiary or affiliate of the Company;

(i) the future value of the underlying Shares is unknown and cannot be predicted with certainty;

(j) if the Participant vests in the Restricted Stock Units and obtains Shares, the value of those Shares may increase or decrease in value;

(k) in consideration of the grant of the Restricted Stock Units, no claim or entitlement to compensation or damages shall arise from termination of the Restricted Stock Units or diminution in value of the Restricted Stock Units or Shares acquired resulting from termination of the Participant's employment by the Company or the Employer, and the Participant irrevocably releases the Company and the Employer from any such claim that may arise; if, notwithstanding the foregoing, any such claim is found by a court of competent jurisdiction to have arisen, then, by signing this Agreement, the Participant will be deemed irrevocably to have waived his or her entitlement to pursue such claim; and

(l) in the event of termination of the Participant's employment, Participant's right to receive the Restricted Stock Units and vest in the Restricted Stock Units under the Plan, if any, will terminate effective as of the date that the Participant is no longer actively employed.

Country-Specific Language

Below please find country-specific language that applies to you if you are a citizen or resident of one of the following countries: Belgium, Canada, China, France, Germany, India, Italy, Japan, South Korea, Spain, Switzerland, Taiwan and United Kingdom.

BELGIUM

Notifications

Tax Reporting Information. Participants are required to report any bank accounts opened and maintained outside Belgium on their annual tax return.

CANADA

Terms and Conditions

Restricted Stock Units Settled in Shares Only. Notwithstanding anything to the contrary in the Plan and/or the Agreement, you understand that any Restricted Stock Units granted to you shall be paid in shares only and do not provide any right for you to receive a cash payment.

The following provision will apply to residents of Quebec:

Language Consent. The parties to the Agreement have expressly required that the Agreement and all documents and notices relating to the Agreement be drafted in English.

Les parties aux présentes ont expressément exigé que la présente convention et tous les documents et avis qui y sont afférents soient rédigés en anglais.

Notifications

Additional Restrictions on Resale. In addition to the restrictions on resale and transfer noted in Plan materials, securities purchased under the Plan may be subject to certain restrictions on resale imposed by Canadian provincial securities laws. Participants are encouraged to seek legal advice prior to any resale of such securities. In general, Participants resident in Canada may resell their securities in transactions carried out on exchanges outside of Canada.

Tax Reporting. The Tax Act and the regulations thereunder require a Canadian resident individual (among others) to file an information return disclosing prescribed information where, at any time in a tax year, the total cost amount of such individual's "specified foreign property" (which includes shares) exceeds Cdn.\$100,000. Participants should consult their own tax advisor regarding this reporting requirement.

CHINA

Due to Chinese legal requirements, Shares of ANSYS, Inc. acquired under any company equity plans must be maintained in the designated brokerage account until the Shares are sold through the designated brokerage account with the net sales proceeds being paid to you through your current or most recent PRC employer. As a condition of the grant of RSUs, to the extent that you hold any Shares on the date that is six (6) months after the date of your termination of active employment with ANSYS and its subsidiaries and affiliates, you authorize E*Trade Financial Corporate Services, Inc. (or any successor broker designated by ANSYS) to sell such Shares on your behalf at that time or as soon as is administratively practical thereafter.

Under local law, Participant is required to repatriate to China the proceeds from your participation in any company equity Plans, including proceeds from the sale of Shares acquired through RSU lapses and any dividends or dividend equivalents paid to you through a special exchange control account established by ANSYS or one of its subsidiaries or affiliates in China. You hereby agree that any proceeds from your participation in the Plan may be transferred to such special account prior to being delivered to you through your current or most recent PRC employer. Further, if the proceeds from your participation in the Plan are converted to local currency, you acknowledge that the Company (including its subsidiaries and affiliates) are under no obligation to secure any currency conversion rate, and may face delays in converting the proceeds to local currency due to exchange control restrictions in China. You agree to bear the risk of any currency conversion rate fluctuation between the date that your proceeds are delivered to the special exchange control account and the date of conversion of the proceeds to local currency.

ANSYS reserves the right to impose such further restrictions or conditions as may be necessary to comply with changes in applicable local laws in China.

Please note that the above provisions will apply to all RSUs granted to you under a company equity plan.

If you are not a PRC national, the above provision will apply to you to the extent approved by SAFE or its local branch office in accordance with local laws.

FRANCE

Notifications

Exchange Control Information. If a Participant imports or exports cash (*e.g.*, sale proceeds received under the Plan) with a value equal to or exceeding €10,000 and does not use a financial institution to do so, Participant must submit a report to the customs and excise authorities. If Participant maintains a foreign bank account, Participant is required to report such account to the French tax authorities when filing his/her annual tax return.

GERMANY

Notifications

Exchange Control Information. Cross-border payments in excess of €12,500 must be reported monthly to the German Federal Bank. If a Participant uses a German bank to transfer a cross-border payment in excess of €12,500 in connection with the sale of Shares acquired under the Plan, the bank will file the report for the Participant.

INDIA

Terms and Conditions

Repatriation of Proceeds. You understand that you must repatriate any proceeds from the sale of Shares acquired upon vesting of the Restricted Stock Units to India and convert the proceeds into local currency within 90 days of receipt. You will receive a foreign inward remittance certificate (“FIRC”) from the bank where you deposit the foreign currency. You should maintain the FIRC as evidence of the repatriation of funds in the event the Reserve Bank of India or your employer requests proof of repatriation.

Notifications

Tax Information. The amount subject to tax at vesting may partially be dependent upon a valuation of Shares from a Merchant Banker in India. The Company has no responsibility or obligation to obtain the most favorable valuation possible nor obtain valuations more frequently than required under Indian tax law.

ITALY

Terms and Conditions

Data Privacy. In addition to the data privacy provision that is set forth above, by accepting the grant of Restricted Stock Units, you also consent to the following additional data privacy-related terms:

I am aware that providing the Company and my employer with Data is necessary for participation in the Plan and that my refusal to provide such Data may affect my ability to participate in the Plan. The Controller of personal data processing is Ansys, Inc., with registered offices at 2600 Ansys Drive, Canonsburg, PA 15317 and, pursuant to D.lgs 196/2003, its representative in Italy is ANSYS Italia Srl with registered offices at via G. B. Pergolesi n. 25 20124 Milano MI Italy.

I understand that I may at any time exercise the rights acknowledged by Section 7 of Legislative Decree June 30, 2003 n.196, including, but not limited to, the right to access, delete, update, request the rectification of my Data and cease, for legitimate reasons, the data processing. Furthermore, I am aware that my Data will not be used for direct marketing purposes.

Notifications

Exchange Control Information. By September 30th of each year, the Participants are required to report on their annual tax return (Form RW) any foreign investments (including proceeds from the sale of Shares acquired upon vesting) held outside of Italy if the investment may give rise to income in Italy. However, deposits and bank accounts held outside of Italy only need to be disclosed if the value of the assets exceeds €10,000 during any part of the tax year.

With respect to Shares received upon vesting of the Restricted Stock Units, the Participants must report (i) the value of the Shares at the beginning of the year or on the day the Participant acquired the Shares, whichever is later; and (ii) the value of the Shares when sold, or if the Participant still owns the Shares at the end of the year, the value of the Shares at the end of the year. The value to be reported is the fair market value of the Shares on the applicable dates mentioned above.

JAPAN

Notifications

Exchange Control Information. If you acquire Shares valued at more than ¥100,000,000 in a single transaction, you must file a Securities Acquisition Report with the Ministry of Finance through the Bank of Japan within 20 days of the acquisition of the Shares.

RUSSIA

Notifications

You acknowledge that the grant of RSUs, the Plan and all other materials you may receive regarding participation in the Plan do not constitute an advertising or offering of securities in Russia. The issuance of securities pursuant to the Plan has not and will not be registered in Russia and therefore, the securities described in any Plan-related documents may not be used for offering or public circulation in Russia.

You further acknowledge that in no event will Shares that may be issued to you with respect to the RSUs be delivered to you in Russia; all Shares issued to you with respect to the RSUs will be maintained on your behalf in the United States.

You are not permitted to sell Shares directly to a Russian legal entity or resident.

SOUTH KOREA

Notifications

Exchange Control Information. If you receive US\$500,000 or more from the sale of underlying Shares, Korean exchange control laws require you to repatriate the proceeds to South Korea within 18 months of sale.

SPAIN

Notifications

Exchange Control Information. All acquisitions of foreign shares by Spanish residents must comply with exchange control regulations in Spain. Because of foreign investment requirements, the acquisition of Shares upon vesting of the Restricted Stock Units must be declared for statistical purposes to the Spanish Direccion General de Politica Comercial y de Inversiones Extranjeras (the “DGPCIE”). If you acquire Shares through the use of a Spanish financial institution, that institution will automatically make the declaration to the DGPCIE for you. Otherwise, you must make the declaration by filing a form with the DGPCIE.

If you import the Shares acquired upon vesting of the Restricted Stock Units into Spain, you must declare the importation of the share certificates to the DGPCIE.

In addition, you must also file a declaration of the ownership of the Shares with the Directorate of Foreign Transactions each January while the shares are owned. These filings are made on standard forms furnished by the Directorate of Foreign Transactions.

When you receive any foreign currency payments (*i.e.*, as a result of the sale of the Shares), you must inform the institution receiving the payment of the basis upon which such payment is made and provide certain specific information (*e.g.*, name, address, and fiscal identification number; the name and corporate domicile of the company; the amount of the payment; the type of foreign currency received; the country of origin; and the reason for the payment).

Tax Reporting. If you hold assets (*e.g.*, cash or shares in a bank or brokerage account) or rights outside Spain that exceed €50,000 per type of asset, you must file a Form 720 with the Spanish Tax Authorities by April 30th of each year.

SWITZERLAND

Notifications

Securities Law Information. The offer of the Restricted Stock Units is considered a private offering in Switzerland and is not subject to registration in Switzerland.

TAIWAN

Notifications

Exchange Control Information. Taiwan's foreign exchange control regulations may have an impact on the grant and vesting of the Restricted Stock Units as well as the repatriation of capital gains realized from the holding or sale of the underlying Shares. Under current foreign exchange regulations, a Taiwanese resident can remit up to US \$5 million (or an equivalent amount of other foreign currencies) per year into or out of Taiwan without prior approval from the Taiwan Central Bank.

If the transaction amount is TWD500,000 or more in a single transaction, you must submit a Foreign Exchange Transaction Form. If the transaction amount is US\$500,000 or more in a single transaction, you must also provide supporting documentation to the satisfaction of the remitting bank.

UNITED KINGDOM

Terms and Conditions

Purpose. This section is to modify those provisions of the Plan in order for awards made under the Plan, and communications concerning those awards, to be exempt from provisions of the United Kingdom Financial Services and Markets Act 2000 (the "FSMA").

Application. These provisions shall be used solely to grant awards to employees of the Company or any member of the same group as the Company resident and providing services in the United Kingdom. (The term "group" in relation to the Company shall bear the meaning given to such term in section 421 of the FSMA.)

Restricted Delivery of Awards. Payments of benefits under these provisions shall be made only in Shares or such other securities of the Company that may arise from such Shares under the adjustment provisions of the Plan. For the avoidance of doubt, and without limitation, no cash settlement of awards (including dividends or dividend equivalent payments in cash) shall be permissible.

Exercise of Restricted Stock Units/Vesting of Awards. The Administrator may specify, in its discretion, any other conditions of exercise and/or vesting of awards that will be specified in the award agreement.

Restricted Transfer of Rights. The persons to whom rights under awards may be assigned or transferred, whether by will or the laws of descent and distribution or any transferability of awards shall be limited to a Participant's children and step-children under the age of eighteen, spouses and surviving spouses and civil partners and civil partners (within the meaning of the United Kingdom Civil Partnerships Act 2004) and surviving partners.

Tax. All awards will be subject to tax withholding and all references to "tax" shall be read and construed as including, without limitation, United Kingdom income tax and primary class 1 (employee's) national insurance contributions that the Participant's employer is liable to account for and, if so agreed between the Company and the Participant, secondary class 1 (employer's) national insurance contributions that the Participant's employer is liable to account for.

**RESTRICTED STOCK UNIT AGREEMENT
UNDER THE FIFTH AMENDED AND RESTATED ANSYS, INC.
1996 STOCK OPTION AND GRANT PLAN**

Name of Grantee:

No. of Restricted Stock Units Granted:

Grant Date:

Pursuant to the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (the “Plan”) as amended through the date hereof, ANSYS, Inc. (the “Company”) hereby grants the number of Restricted Stock Units listed above (the “Award”) to the Grantee named above. Each “Restricted Stock Unit” shall relate to one share of Common Stock par value \$.01 per share (the “Stock”) of the Company, subject to the restrictions and conditions set forth in this Restricted Stock Unit Agreement (the “Agreement”) and in the Plan.

1. Restrictions on Transfer of Award. The Award shall not be sold, transferred, pledged, assigned or otherwise encumbered or disposed of by the Grantee, until shares of Stock have been issued pursuant to Section 3 hereof.

2. Vesting of Restricted Stock Units.

(a) The Restricted Stock Units shall become vested pursuant to the following schedule (each, a “Vesting Date”), so long as the Grantee continues to be employed by the Company on each such date;

<u>Incremental Number of Restricted Stock Units Vested</u>		<u>Vest Date</u>
%%SHARES_PERIOD1,'999,999,999'-%-	33%	%%VEST_DATE_PERIOD1,'Month DD, YYYY'-%-
%%SHARES_PERIOD2,'999,999,999'-%-	33%	%%VEST_DATE_PERIOD2,'Month DD, YYYY'-%-
%%SHARES_PERIOD3,'999,999,999'-%-	34%	%%VEST_DATE_PERIOD3,'Month DD, YYYY'-%-

Notwithstanding the foregoing, if the Grantee’s employment with the Company is terminated on account of the Grantee’s death or Disability (as defined below), any Restricted Stock Units that are not vested shall automatically vest in full as of the date that the Grantee’s employment terminates by reason of death or Disability. For purposes hereof, “Disability” shall mean the Grantee’s termination of employment

with the Company: (i) after becoming eligible to receive benefits under the Company's then current long-term disability plan that is applicable to Grantee; (ii) where Grantee is not eligible under a Company long-term disability plan, after being officially declared permanently disabled under the mandatorily applicable health or welfare regulations of the applicable jurisdiction; or, (iii) in the absence of such a determination under said regulations, after being officially declared permanently disabled by a physician appointed by the Company in its sole discretion.

(b) Notwithstanding anything herein to the contrary, in the event that this Award is assumed in the sole discretion of the parties to a Transaction (as defined in Section 3 of the Plan) or is continued by the Company and thereafter remains in effect following such Transaction, then this Award shall be deemed vested in full upon the date on which the Grantee's employment with the Company and its subsidiaries or successor entities terminates if (i) such termination occurs within 18 months of such Transaction and (ii) such termination is by either the Company without Cause (as defined below), or by the Grantee if such termination by the Grantee is preceded during such 18-month period by any material adverse modification of the duties, principal employment location or compensation of the Grantee without his or her consent, subject, however, to the following sentence. In addition and notwithstanding anything herein to the contrary, in the event that the Grantee is not offered employment by the Company and its subsidiaries or any successor entities following a Transaction on substantially the same or better terms (including, without limitation, duties and compensation) than those in effect immediately prior to such Transaction, then this Award shall be deemed vested in full upon the date on which the Grantee's employment with the Company and its subsidiaries terminates. For this purpose, "Cause" shall have the meaning given such term in the employment, severance or similar agreement between the Company and the Grantee and, in the absence of any such agreement, shall mean a determination by the Company that the Grantee shall be dismissed as a result of (i) any material breach by the Grantee of any agreement between the Grantee and the Company; (ii) the conviction of, indictment for or plea of nolo contendere by the Grantee to a felony or a crime involving moral turpitude; or (iii) any material misconduct or willful and deliberate non-performance (other than by reason of disability) by the Grantee of the Grantee's duties to the Company.

3. Issuance of Shares of Stock.

(a) Subject to the terms of the Plan and this Agreement, each Restricted Stock Unit entitles the Grantee to receive one share of Stock as soon as reasonably practicable following the Vesting Date.

(b) As soon as reasonably practicable following each Vesting Date, but in no event later than 60 days after the end of the year in which such Vesting Date occurs, the Company shall direct its transfer agent to issue to the Grantee the number of shares of Stock equal to the incremental number of Restricted Stock Units that became vested on such Vesting Date in satisfaction of the Award via the Company's dedicated on-line broker.

(c) Shares of Stock shall be issued and delivered to the Grantee in accordance with Section 3(b) upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Grantee.

(d) Until such time as shares of Stock are issued to the Grantee pursuant to Section 3(b), the Grantee shall have no rights as a stockholder with respect to any shares of Stock underlying the Restricted Stock Units, including but not limited to any voting rights.

4. Termination of Employment. Except as provided in Section 2(b) hereof, if the Grantee's employment by the Company or its subsidiaries is terminated for any reason or under any circumstances, this Award shall no longer vest with respect to any unvested Restricted Stock Units.

5. Effect of Certain Transactions. Subject to Section 2(b) hereof, in the case of a Transaction (as defined in Section 3 of the Plan), the unvested portion of this Award shall terminate on the effective date of such Transaction, unless provision is made in such Transaction in the sole discretion of the parties thereto for the assumption or continuation of the unvested Award or the substitution for the unvested Award of new restricted stock units of the successor person or entity or a parent or subsidiary thereof, with appropriate adjustment as to the number and kind of shares, as provided in the Plan.

6. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 2(b) of the Plan. Capitalized terms used herein shall have the meaning specified in the Plan, unless a different meaning is specified herein.

7. Transferability. This Award is personal to the Grantee, is non-assignable and is not transferable by Grantee in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution. The Stock to be issued upon the vesting of this Award to the Grantee shall be issued, during the Grantee's lifetime, only to the Grantee.

8. Tax Withholding. Any issuance of shares of Stock to a Grantee pursuant to this Award shall be subject to applicable tax withholding requirements. The Grantee shall, not later than the date as of which the transfer of shares of Stock pursuant to this Award becomes a taxable event for Federal income tax or other applicable withholding tax purposes, pay to the Company or make arrangements satisfactory to the Committee for payment of any Federal, state, local, non U.S., or other taxes required by law to be withheld on account of such taxable event. The Company shall have the authority to cause the required minimum tax withholding amount to be satisfied, in whole or in part, by withholding from shares of Stock to be issued to the Grantee a number of shares of Stock with an aggregate Fair Market Value that would satisfy such minimum withholding obligation.

9. No Obligation to Continue Employment. Neither the Company nor any Subsidiary is obligated by or as a result of the Plan or this Award to continue the Grantee in employment and neither the Plan nor this Award shall interfere in any way with the right of the Company or any Subsidiary to terminate the employment of the Grantee at any time, in accordance with applicable law.

10. Non-Competition, Non-Solicitation. As additional consideration for this Award to the Grantee, the Grantee hereby agrees that if he or she engages for any reason, directly or indirectly, whether as owner, part-owner, shareholder, member, partner, director, officer, trustee, employee, agent or consultant, or in any other capacity, on behalf of himself or herself or any firm, corporation or other business organization other than the Company and its subsidiaries in any one or more of the following activities:

(a) at any time during his or her employment with the Company or any Subsidiary (the "Employment Period") and for a period of one year after the termination of his or her employment with the Company or any Subsidiary no matter what the cause of that termination (the "Post-Employment Period"), the development, marketing, solicitation, or selling of any product or service that is competitive with the products or services of the Company, or products or services that the Company has under development or that are subject to active planning at any time during Grantee's employment; provided that the restrictions set forth in this Section 10(a) for the Post-Employment Period shall not apply to any Grantee who is a California-based employee;

(b) during the Employment Period and/or Post-Employment Period, the use of any of the Company's confidential or proprietary information, copyrights, patents or trade secrets which was acquired by the Grantee as an employee of the Company and its subsidiaries; or

(c) during the Employment Period and/or Post-Employment Period, any activity for the purpose of inducing, encouraging, or arranging for the employment or engagement by anyone other than the Company and its subsidiaries of any employee, officer, director, agent, consultant, or sales representative of the Company and its subsidiaries or attempt to engage any of them in a manner which would deprive the Company and its subsidiaries of their services or place them in a conflict of interest with the Company and its subsidiaries;

then (i) this Award shall terminate effective on the date on which he or she first engages in such activity, unless terminated sooner by operation of any other term or condition of this Award or the Plan, and (ii) all shares of Stock issued to the Grantee pursuant to this Award shall become immediately due and payable by Grantee to the Company and if such shares of Stock have been sold by the Grantee, an amount equal to the proceeds from such sale shall become immediately due and payable by the Grantee to the Company. Grantee acknowledges and agrees that the activities set forth in this Section 10(a)-(c) are adverse to the Company's interests, and that it would be inequitable for Grantee to benefit from this Award should Grantee engage in any such activities during or within one year after termination of his or her employment with the Company. Grantee acknowledges and agrees that the rights and remedies set forth in this Section 10 are in addition to and are not intended to limit any other rights or remedies the Company may have available to it, both during and at any time after the termination of Grantee's employment with the Company, including without limitation, any rights or remedies the Company may have under the ANSYS Intellectual Property Protection Agreement or other similar agreements.

The Grantee may be released from his or her obligations as stated above only if the Committee (or its duly appointed agent) determines in its sole discretion that such action is in the best interests of the Company and its subsidiaries.

Notwithstanding the foregoing, if the Grantee has an agreement with the Company in which any of the provisions therein are inconsistent with the covenants set forth in this Section 10, the terms of such other agreement shall control and shall supersede the covenants of this Section 10 but only to the extent of such inconsistency.

11. Section 409A of the Code. This Agreement shall be interpreted in such a manner that the Award shall be exempt from the requirements of Section 409A of the Code as a "short-term deferral" as described in Section 409A of the Code.

12. Integration. This Agreement constitutes the entire agreement between the parties with respect to this Award and supersedes all prior agreements and discussions between the parties concerning such subject matter.

13. Data Privacy. Collection and use of Grantee's personal data, as well as any personal data belonging to Grantee's permitted beneficiaries hereunder, for the purposes of implementing, administering, and managing Grantee's participation in the Plan shall be processed by Company in accordance with the ANSYS Global Data Protection Notice. Additional details about the types of personal data used to administer the Plan, including, where applicable, the Company's policies on sharing of personal data with third-party service providers and cross-border data transfer, may be found in the Global Data Protection Notice.

14. Nature of Grant. In accepting the Award, the Grantee acknowledges, understands and agrees that:

- (a) the Plan is established voluntarily by the Company, it is discretionary in nature and it may be modified, amended, suspended or terminated by the Company at any time, to the extent permitted by the Plan;
- (b) the grant of the Award is voluntary and occasional and does not create any contractual or other right to receive future grants;
- (c) all decisions with respect to future Awards or other grants, if any, will be at the sole discretion of the Company;
- (d) the Award and the Grantee's participation in the Plan shall not be interpreted as forming an employment contract with the Company;
- (e) the Grantee is voluntarily participating in the Plan;
- (f) the Award and any shares of Stock acquired under the Plan are not intended to replace any pension rights or compensation;
- (g) the Award and any shares of Stock acquired under the Plan, and the income and value of same, are not part of normal or expected compensation for any purpose, including, without limitation, calculating any severance, resignation, termination, redundancy, dismissal, end-of-service payments, bonuses, long-service awards, pension or retirement benefits or payments or welfare benefits or similar payments;
- (h) the future value of the shares of Stock underlying the Award is unknown, indeterminable, and cannot be predicted with certainty;
- (i) no claim or entitlement to compensation or damages shall arise from forfeiture of the Award resulting from the termination of the Grantee's employment relationship (for any reason whatsoever, whether or not later found to be invalid or in breach of employment laws in the jurisdiction where the Grantee is employed or the terms of the Grantee's employment agreement, if any);

(j) unless otherwise provided in the Plan or by the Company in its discretion, the Award and the benefits evidenced by this Agreement do not create any entitlement to have the Award or any such benefits transferred to, or assumed by, another company nor to be exchanged, cashed out or substituted for, in connection with any corporate transaction affecting the Company's Stock; and

(k) neither the Employer, the Company nor any other Subsidiary shall be liable for any foreign exchange rate fluctuation between the Grantee's local currency and the United States Dollar that may affect the value of the Award or of any amounts due to the Grantee pursuant to settlement of the Award or the subsequent sale of any shares of Stock acquired upon settlement.

15. No Advice Regarding Grant. The Company is not providing any tax, legal or financial advice, nor is the Company making any recommendations regarding the Grantee's participation in the Plan, or the Grantee's acquisition or sale of the underlying shares of Stock. The Grantee is hereby advised to consult with his or her own personal tax, legal and financial advisors regarding his or her participation in the Plan before taking any action related to the Plan.

16. Language. If the Grantee has received this Agreement, or any other document related to the Award and/or the Plan translated into a language other than English and if the meaning of the translated version is different than the English version, the English version will control.

17. Notices. Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Grantee at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

18. Amendment. Pursuant to Section 18 of the Plan, the Committee may at any time amend or cancel any unvested portion of this Award, but no such action may be taken that adversely affects the Grantee's rights under hereunder without the Grantee's consent.

19. Severability. If any provision(s) hereof shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

20. Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

21. Electronic Delivery and Acceptance. The Company may, in its sole discretion, decide to deliver any documents related to Restricted Stock Units awarded under the Plan or future Restricted Stock Units that may be awarded under the Plan by electronic means or request the Grantee's consent to participate in the Plan by electronic means. The Grantee hereby consents to receive such documents by electronic delivery and agrees to participate in the Plan through any on-line or electronic system established and maintained by the Company or a third party designated by the Company.

22. Imposition of Other Requirements. The Company reserves the right to impose other requirements on the Restricted Stock Unit Award and the shares of Stock acquired pursuant to the Award, to the extent the Company determines it is necessary or advisable for legal or administrative reasons, and to

require the Grantee to sign any additional agreements or undertakings that may be necessary to accomplish the foregoing.

23. Waiver. The Grantee acknowledges that a waiver by the Company of breach of any provision of this Agreement shall not operate or be construed as a waiver of any other provision of this Agreement, or of any subsequent breach by the Grantee or any other Grantee.

24. Governing Law and Venue. This Agreement and the Award will be governed by, and construed in accordance with, the laws of the state of Delaware without giving effect to the conflict of law principles thereof. For any dispute that may arise in connection with this Agreement or the Award, the parties hereby submit to and consent to the jurisdiction of the Courts of the State of Delaware or the federal courts of the United States for the Third District, and no other courts.



ANSYS, Inc.

By: _____

Name: Ajei S. Gopal

Title: President and CEO

The foregoing Award is hereby accepted and the terms and conditions of this Agreement are hereby agreed to by the undersigned. Electronic acceptance of this Award pursuant to the Company's instructions to the Grantee (including through an online acceptance process) is acceptable.

Dated: — —

Grantee's signature

Grantee's name and address:

%%FIRST_NAME%- %%%LAST_NAME%-
%%ADDRESS_LINE_1%-
%%ADDRESS_LINE_2%-
%%ADDRESS_LINE_3%-
%%CITY%- %%%STATE%- %%%ZIPCODE%-
%%COUNTRY%-

INTERNATIONAL APPENDIX

Additional Terms and Conditions

Terms and Conditions

This International Appendix includes additional terms and conditions that govern the award granted to you under the Plan for your country. Certain capitalized terms used but not defined in this International Appendix have the meanings set forth in the Plan and the Agreement that relate to your award. By acceptance of the award you agree to be bound by the terms and conditions contained in the paragraphs below in addition to the terms of the Plan and the Agreement and the terms of any other document that may apply to you and your award.

Notifications

This International Appendix also includes information regarding issues of which you should be aware with respect to participation in the Plan. The information is based on the securities, exchange control, and other laws in effect in the respective countries as of the date set forth above. Such laws are often complex and change frequently. As a result, it is strongly recommended that you not rely on the information in this International Appendix as the only source of information relating to the consequences of your participation in the Plan because the information may be out of date at the time you vest in your award or sell shares acquired under the Plan.

The information contained herein is general in nature and may not apply to your particular situation, and the Company is not in a position to assure you of a particular result. In addition, please note that the requirements may differ for residents and non-residents. Accordingly, you are advised to seek appropriate professional advice as to how the relevant laws in your country may apply to your situation.

Finally, if you are a citizen or resident of a country other than the one in which you are currently working, transferred employment to another country after the award was granted to you, or are considered a resident of another country for local law purposes, the information contained herein may not apply.

Provisions Applicable to all International Awards

Tax Obligations. The following provision replaces Section 8 of the Agreement:

The Grantee acknowledges that, regardless of any action the Company or, if different, the subsidiary employing or retaining the Grantee (the “Employer”) takes with respect to any or all income tax, social insurance, payroll tax, fringe benefit tax, payment on account or other tax-related items related to the Grantee’s participation in the Plan and legally applicable to the Grantee (“Tax-Related Items”), the ultimate liability for Tax-Related Items is and remains the Grantee’s responsibility and may exceed the amount, if

any, actually withheld by the Company or the Employer. The Grantee further acknowledges that the Company and/or the Employer (i) make no representations or undertakings regarding the treatment of any Tax-Related Items in connection with any aspect of the Restricted Stock Units, including, but not limited to, the grant, vesting or settlement of the Restricted Stock Units, the subsequent sale of shares of Stock acquired pursuant to such settlement and the receipt of any dividends or other distributions, and (ii) do not commit to and are under no obligation to structure the terms of the grant or any aspect of the Restricted Stock Units to reduce or eliminate the Grantee's liability for Tax-Related Items or achieve any particular tax result. Further, if the Grantee is subject to Tax-Related Items in more than one jurisdiction, the Grantee acknowledges that the Company and/or the Employer (or former employer, as applicable) may be required to withhold or account for Tax-Related Items in more than one jurisdiction. If the Grantee fails to make satisfactory arrangements for the payment of any required Tax-Related Items hereunder at the time of the applicable taxable event, the Grantee acknowledges and agrees that the Company may refuse to issue or deliver the shares of Stock or the proceeds of the sale of shares of Stock.

Prior to the relevant taxable or tax withholding event, as applicable, the Grantee agrees to make adequate arrangements satisfactory to the Company or the Employer to satisfy all Tax-Related Items. In this regard, the Grantee authorizes the Company and the Employer, or their respective agents, at their discretion, to satisfy their withholding obligations with regard to all Tax-Related Items, if any, by withholding from proceeds of the sale of shares of Stock acquired at vesting of the Restricted Stock Units, either through a voluntary sale or through a mandatory sale arranged by the Company (on the Grantee's behalf pursuant to this authorization) without further consent. Alternatively, the Company and the Employer, or their respective agents, in their sole discretion and pursuant to such procedures as they may specify from time to time, may satisfy their withholding obligations with regard to all Tax-Related Items, if any, in whole or in part (without limitation) by:

- (i) requiring the Grantee to deliver cash or a check to the Company or the Employer,
- (ii) withholding from the Grantee's wages or other cash compensation paid to the Grantee by the Company or the Employer, or
- (iii) withholding in shares of Stock to be issued upon settlement of the Restricted Stock Units; provided, however, that if the Grantee is a Section 16 officer of the Company under the Exchange Act, then the Company will withhold from proceeds of the sale of shares of Stock acquired at vesting of the Restricted Stock Units, unless the use of such withholding method is inadvisable under applicable laws or has materially adverse accounting consequences, in which case, the withholding obligation for Tax-Related Items, if any, may be satisfied by one or a combination of methods (i) and (ii) above.

Further, depending on the withholding method, the Company or the Employer may withhold or account for Tax-Related Items by considering applicable statutory rates or other applicable withholding rates, including the maximum rates applicable in the Grantee's jurisdiction, in which case the Grantee may receive a refund of any over-withheld amount in cash and will have no entitlement to the Stock equivalent. If the obligation for Tax-Related Items is satisfied by withholding a number of shares of Stock, for tax purposes, the Grantee will be deemed to have been issued the full number of shares of Stock subject to the vested Restricted Stock Units, notwithstanding that a number of the shares of Stock is held back solely for the purpose of paying the Tax-Related Items. The Grantee agrees to pay to the Company and/or the

Employer any amount of Tax-Related Items that the Company or the Employer may be required to withhold or account for as a result of the Grantee's participation in the Plan that cannot be satisfied by the means previously described.

The Company shall not be obligated to deliver any shares of Stock to the Grantee or the Grantee's legal representative unless and until the Grantee or the Grantee's legal representative shall have paid or otherwise satisfied the Grantee's obligations in connection with the Tax-Related Items resulting from the Restricted Stock Units or the shares of Stock subject to the Restricted Stock Units.

Nature of Grant. The following provision replaces Section 14 of the Agreement:

In accepting the grant of Restricted Stock Units, the Grantee acknowledges that:

- (a) the Plan is established voluntarily by the Company, is discretionary in nature and may be modified, amended, suspended or terminated by the Company at any time, unless otherwise provided in the Plan and this Agreement;
- (b) the grant of Restricted Stock Units is voluntary and occasional and does not create any contractual or other right to receive future grants of Restricted Stock Units, or benefits in lieu of Restricted Stock Units, even if Restricted Stock Units have been granted repeatedly in the past;
- (c) all decisions with respect to future Restricted Stock Units, if any, will be at the sole discretion of the Company;
- (d) the Grantee's participation in the Plan will not create a right to further employment with the Grantee's employer (the "Employer") and shall not interfere with the ability of the Employer to terminate the Grantee's employment relationship;
- (e) the Grantee is voluntarily participating in the Plan;
- (f) the Restricted Stock Units are an extraordinary item that does not constitute compensation of any kind for services of any kind rendered to the Company or the Employer, and which is outside the scope of the Grantee's employment contract, if any;
- (g) the Restricted Stock Units are not part of normal or expected compensation or salary for any purposes, including, but not limited to, calculating any severance, resignation, termination, redundancy, end of service payments, bonuses, long-service awards, pension or retirement benefits or similar payments and in no event should be considered as compensation for, or relating in any way to, past services for the Company or the Employer;
- (h) in the event that the Grantee is not an employee of the Company, the grant of Restricted Stock Units will not be interpreted to form an employment contract or relationship with the Company; and furthermore, the grant of Restricted Stock Units will not be interpreted to form an employment contract with the Employer or any subsidiary or affiliate of the Company;

(i) the future value of the underlying Shares is unknown and cannot be predicted with certainty;

(j) if the Grantee vests in the Restricted Stock Units and obtains Shares, the value of those Shares may increase or decrease in value;

(k) in consideration of the grant of the Restricted Stock Units, no claim or entitlement to compensation or damages shall arise from termination of the Restricted Stock Units or diminution in value of the Restricted Stock Units or Shares acquired resulting from termination of the Grantee's employment by the Company or the Employer; and

(l) in the event of termination of the Grantee's employment, Grantee's right to receive the Restricted Stock Units and vest in the Restricted Stock Units under the Plan, if any, will terminate effective as of the date that the Grantee is no longer actively providing services to the Company or any subsidiary (regardless of the reason for such termination and whether or not later to be found invalid or in breach of employment laws in the jurisdiction where the Grantee is employed or the terms of the Grantee's employment or service agreement, if any), and unless otherwise expressly provided in this Agreement or determined by the Committee, the Grantee's right to vest in the Restricted Stock Units under the Plan, if any, will terminate as of such date and will not be extended by any notice period (e.g., the Grantee's period of service would not include any contractual notice period or any period of "garden leave" or similar period mandated under employment laws in the jurisdiction where the Grantee is employed or the terms of the Grantee's employment or service agreement, if any, unless the Grantee is providing bona fide services during such time); the Committee shall have the exclusive discretion to determine when the Grantee is no longer actively providing services for purposes of the Restricted Stock Units grant (including whether the Grantee may still be considered to be providing services while on a leave of absence).

Country-Specific Language

Below please find country-specific language that applies to you if you are a citizen or resident of one of the following countries: Belgium, Canada, China, France, Germany, Greece, India, Ireland, Italy, Japan, Poland, Singapore, South Korea, Spain, Sweden, Switzerland, Taiwan and United Kingdom.

BELGIUM

Notifications

Tax Reporting Information. Grantees are required to report any bank accounts opened and maintained outside Belgium on their annual tax return.

CANADA

Terms and Conditions

Restricted Stock Units Settled in Shares Only. Notwithstanding anything to the contrary in the Plan and/or the Agreement, you understand that any Restricted Stock Units granted to you shall be paid in shares only and do not provide any right for you to receive a cash payment.

The following provision will apply to residents of Quebec:

Language Consent. The parties to the Agreement have expressly required that the Agreement and all documents and notices relating to the Agreement be drafted in English.

Les parties aux présentes ont expressément exigé que la présente convention et tous les documents et avis qui y sont afférents soient rédigés en anglais.

Notifications

Additional Restrictions on Resale. In addition to the restrictions on resale and transfer noted in Plan materials, securities purchased under the Plan may be subject to certain restrictions on resale imposed by Canadian provincial securities laws. Grantees are encouraged to seek legal advice prior to any resale of such securities. In general, Grantees resident in Canada may resell their securities in transactions carried out on exchanges outside of Canada.

Tax Reporting. The Tax Act and the regulations thereunder require a Canadian resident individual (among others) to file an information return disclosing prescribed information where, at any time in a tax year, the total cost amount of such individual's "specified foreign property" (which includes shares) exceeds Cdn.\$100,000. Grantees should consult their own tax advisor regarding this reporting requirement.

CHINA

Due to Chinese legal requirements, Shares of ANSYS, Inc. acquired under any company equity plans must be maintained in the designated brokerage account until the Shares are sold through the designated brokerage account with the net sales proceeds being paid to you through your current or most recent PRC employer. As a condition of the grant of RSUs, to the extent that you hold any Shares on the date that is six (6) months after the date of your termination of active employment with ANSYS and its subsidiaries and affiliates, you authorize E*Trade Financial Corporate Services, Inc. (or any successor broker designated by ANSYS) to sell such Shares on your behalf at that time or as soon as is administratively practical thereafter.

Under local law, Grantee is required to repatriate to China the proceeds from your participation in any company equity Plans, including proceeds from the sale of Shares acquired through RSU lapses and any dividends or dividend equivalents paid to you through a special exchange control account established by ANSYS or one of its subsidiaries or affiliates in China. You hereby agree that any proceeds from your participation in the Plan may be transferred to such special account prior to being delivered to you through your current or most recent PRC employer. Further, if the proceeds from your participation in the Plan are converted to local currency, you acknowledge that the Company (including its subsidiaries and affiliates) are

under no obligation to secure any currency conversion rate, and may face delays in converting the proceeds to local currency due to exchange control restrictions in China. You agree to bear the risk of any currency conversion rate fluctuation between the date that your proceeds are delivered to the special exchange control account and the date of conversion of the proceeds to local currency.

ANSYS reserves the right to impose such further restrictions or conditions as may be necessary to comply with changes in applicable local laws in China.

Please note that the above provisions will apply to all RSUs granted to you under a company equity plan.

If you are not a PRC national, the above provision will apply to you to the extent approved by SAFE or its local branch office in accordance with local laws.

FRANCE

Terms and Conditions

French Sub-Plan. The Restricted Stock Units are intended to qualify for the special tax and social security treatment in France applicable to shares granted for no consideration under Sections L. 225-197-1 to L. 225-197-6 of the French Commercial Code, as amended, and are subject to the provisions below and the Rules of the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan for Restricted Stock Units Granted to French Grantees (the “French Sub-Plan”), which has been provided to the Grantee and is incorporated herein. The Company does not undertake to maintain the qualified status of the Restricted Stock Units and the Grantee will not be entitled to damages of any nature whatsoever if the Restricted Stock Units become disqualified. Capitalized terms not defined herein will have the same meanings as set forth in the French Sub-Plan and the Agreement.

Consent to Receive Information in English. By accepting the Restricted Stock Units, the Grantee confirms having read and understood the Agreement and the Plan, including all terms and conditions included therein, which were provided in the English language. The Grantee accepts the terms of those documents accordingly.

Consentement relatif à la réception d'informations en langue anglaise. En acceptant les droits sur des actions assujetties à des restrictions, le Grantee confirme avoir lu et compris le Contrat et le Plan, y compris tous leurs termes et conditions, qui ont été transmis en langue anglaise. Le Grantee accepte les dispositions de ces documents en connaissance de cause.

Vesting of Restricted Stock Units. This provision supplements Section 2 of the Agreement:

Notwithstanding the vesting schedule set forth in Section 2 of the Agreement, the Restricted Stock Units will not vest and the underlying shares of Stock will not be delivered to the Grantee prior to the expiration of any specific period calculated from the Grant Date as may be required to comply with the minimum mandatory vesting period applicable to French-Qualified RSUs under Section L. 225-197-1 of the French Commercial Code, as amended, or under the relevant sections of the French Tax Code or the French Social Security Code,

as amended, to benefit from the special tax and social security treatment in France. The applicable minimum mandatory vesting period currently is one year from the Grant Date.

Termination Due to Death. This provision supplements Section 2 of the Agreement:

Notwithstanding anything to the contrary in Section 2 of the Agreement or in the Plan, in the case of the Grantee's death, the shares of Stock subject to unvested Restricted Stock Units will vest only if the Grantee's heir or heirs request the delivery of the share of Stock subject to the Restricted Stock Units within a period of six months following the Grantee's death. If a timely request is made, the Restricted Stock Units will be settled in shares of Stock as soon as practicable following the request. If no such request is made within six months following the Grantee's death, the Restricted Stock Units will be forfeited.

Mandatory Holding Period. Notwithstanding anything to the contrary in the Agreement or in the Plan, any shares of Stock issued to the Grantee upon settlement of the Restricted Stock Units must be held (and cannot be sold or transferred) until the expiration of a period which currently shall not be less than two years from the Grant Date, or such other period as is required to comply with the minimum mandatory holding period applicable to French-Qualified Restricted Stock Units under Section L. 225-197-1 of the French Commercial Code, as amended, or under the relevant sections of the French Tax Code or the French Social Security Code, as amended, to benefit from the special tax and social security treatment in France; provided, however, that this mandatory holding period will not apply in the event the Grantee dies or terminates his or her employment due to Disability (as defined in the French Sub-Plan). In order to enforce this provision, the Company may, in its discretion, issue appropriate "stop transfer" instructions to its transfer agent or hold the shares of Stock until the expiration of the mandatory holding period set forth above. Such shares of Stock may be held by the Company, a transfer agent designated by the Company or with a broker designated by the Company.

Closed Periods. Notwithstanding the mandatory holding period and even after such holding period has expired, any shares of Stock acquired upon vesting of the Restricted Stock Units may not be sold during certain Closed Periods as provided for and defined by Section L. 225-197-1 of the French Commercial Code, as amended, and by the French Sub-Plan, for so long as and to the extent that the Closed Periods are applicable to the shares of Stock underlying French-Qualified Restricted Stock Units granted by the Company.

Notifications

Foreign Asset/Account Reporting Information. French residents are required to report all foreign accounts (whether open, current or closed) to the French tax authorities when filing their annual tax returns. The Grantee should consult his or her personal advisor to ensure compliance with applicable reporting obligations.

GERMANY

Notifications

Exchange Control Information. Cross-border payments in excess of €12,500 must be reported monthly to the German Federal Bank. If a Grantee uses a German bank to transfer a cross-border payment in excess of

€12,500 in connection with the sale of Shares acquired under the Plan, the bank will file the report for the Grantee.

INDIA

Terms and Conditions

Repatriation of Proceeds. You understand that you must repatriate any proceeds from the sale of Shares acquired upon vesting of the Restricted Stock Units to India and convert the proceeds into local currency within 90 days of receipt. You will receive a foreign inward remittance certificate (“FIRC”) from the bank where you deposit the foreign currency. You should maintain the FIRC as evidence of the repatriation of funds in the event the Reserve Bank of India or your employer requests proof of repatriation.

Notifications

Tax Information. The amount subject to tax at vesting may partially be dependent upon a valuation of Shares from a Merchant Banker in India. The Company has no responsibility or obligation to obtain the most favorable valuation possible nor obtain valuations more frequently than required under Indian tax law.

IRELAND

Notifications

Director Notification Requirement. If you are a director or a shadow director or secretary of an Irish affiliate of Ansys, pursuant to Section 53 of the Irish Company Act of 1990, and you own more than a 1% interest in Ansys, you must notify the Irish affiliate of Ansys in writing within five business days of receiving or disposing of an interest in Ansys (*e.g.*, stock options, RSUs, shares, etc.) or within five business days of the event giving rise to the notification requirement, or within five days of becoming a director, shadow director or secretary if such an interest exists at that time. This notification requirement also applies with respect to the interests of a spouse or minor child, whose interests will be attributed to the director, shadow director or secretary.

ITALY

Notifications

Exchange Control Information. By September 30th of each year, the Grantees are required to report on their annual tax return (Form RW) any foreign investments (including proceeds from the sale of Shares acquired upon vesting) held outside of Italy if the investment may give rise to income in Italy. However, deposits and bank accounts held outside of Italy only need to be disclosed if the value of the assets exceeds €10,000 during any part of the tax year.

With respect to Shares received upon vesting of the Restricted Stock Units, the Grantees must report (i) the value of the Shares at the beginning of the year or on the day the Grantee acquired the Shares, whichever is later; and (ii) the value of the Shares when sold, or if the Grantee still owns the Shares at the end of the year, the value of the Shares at the end of the year. The value to be reported is the fair market value of the Shares on the applicable dates mentioned above.

JAPAN

Notifications

Exchange Control Information. If you acquire Shares valued at more than ¥100,000,000 in a single transaction, you must file a Securities Acquisition Report with the Ministry of Finance through the Bank of Japan within 20 days of the acquisition of the Shares.

POLAND

Notifications

Exchange Control Information. While you are responsible for any exchange control filings, no advance foreign exchange permit is required for the acquisition, holding or disposal of Shares. However, if the value of your Shares exceeds the equivalent of PLN 7,000,000, you will have to notify the National Bank of Poland of such holdings on a quarterly basis. If such reporting obligation applies to you and your shareholding exceeds 10% of the Company's total voting stock, you will also be required to notify the National Bank of Poland by the end of May of each subsequent year.

Exchange Control Information. If a Polish resident transfers funds in excess of €15,000 into Poland, the funds must be transferred via a Polish bank account or financial institution. Polish residents are required to retain the documents connected with a foreign exchange transaction for a period of five years, as measured from the end of the year in which such transaction occurred.

SINGAPORE

Notifications

Director Notification Requirement - If you are a director, associate director or shadow director of a Singapore affiliate of the Company, you are subject to certain notification requirements under the Singapore Companies Act. Among these requirements is an obligation to notify the Singaporean affiliate in writing when you receive an interest in shares (e.g., RSUs or Shares) in the Company or any related companies. In addition, you must notify the Singapore affiliate when you sell Shares or any related company (including when you sell Shares acquired through vesting of your RSU or pursuant to any other Award granted under the Plan). These notifications must be made within two business days of acquiring or disposing of any interest in shares of the Company or any related company. In addition, a notification must be made of your interests in shares of the Company or any related company within two business days of becoming a director.

Securities Law Information - The grant of the Awards is being made pursuant to the “Qualifying Person” exemption” under section 273(1)(f) of the Securities and Futures Act (Chapter 289, 2006 Ed.) (“SFA”). As a result, the grant is exempt from the prospectus and registration requirements under Singaporean law and is not made with a view to the underlying Shares being subsequently offered for sale to any other party. The Plan has not been, and will not be, lodged or registered as a prospectus with the Monetary Authority of Singapore.

SOUTH KOREA

Notifications

Exchange Control Information. If you receive US\$500,000 or more from the sale of underlying Shares, Korean exchange control laws require you to repatriate the proceeds to South Korea within 18 months of sale.

SPAIN

Notifications

Exchange Control Information. All acquisitions of foreign shares by Spanish residents must comply with exchange control regulations in Spain. Because of foreign investment requirements, the acquisition of Shares upon vesting of the Restricted Stock Units must be declared for statistical purposes to the Spanish Direccion General de Politica Comercial y de Inversiones Extranjeras (the “DGPCIE”). If you acquire Shares through the use of a Spanish financial institution, that institution will automatically make the declaration to the DGPCIE for you. Otherwise, you must make the declaration by filing a form with the DGPCIE.

If you import the Shares acquired upon vesting of the Restricted Stock Units into Spain, you must declare the importation of the share certificates to the DGPCIE.

In addition, you must also file a declaration of the ownership of the Shares with the Directorate of Foreign Transactions each January while the shares are owned. These filings are made on standard forms furnished by the Directorate of Foreign Transactions.

When you receive any foreign currency payments (*i.e.*, as a result of the sale of the Shares), you must inform the institution receiving the payment of the basis upon which such payment is made and provide certain specific information (*e.g.*, name, address, and fiscal identification number; the name and corporate domicile of the company; the amount of the payment; the type of foreign currency received; the country of origin; and the reason for the payment).

Tax Reporting. If you hold assets (*e.g.*, cash or shares in a bank or brokerage account) or rights outside Spain that exceed €50,000 per type of asset, you must file a Form 720 with the Spanish Tax Authorities by April 30th of each year.

SWITZERLAND

Notifications

Securities Law Information. The offer of the Restricted Stock Units is considered a private offering in Switzerland and is not subject to registration in Switzerland.

TAIWAN

Notifications

Exchange Control Information. Taiwan's foreign exchange control regulations may have an impact on the grant and vesting of the Restricted Stock Units as well as the repatriation of capital gains realized from the holding or sale of the underlying Shares. Under current foreign exchange regulations, a Taiwanese resident can remit up to US \$5 million (or an equivalent amount of other foreign currencies) per year into or out of Taiwan without prior approval from the Taiwan Central Bank.

If the transaction amount is TWD500,000 or more in a single transaction, you must submit a Foreign Exchange Transaction Form. If the transaction amount is US\$500,000 or more in a single transaction, you must also provide supporting documentation to the satisfaction of the remitting bank.

UNITED KINGDOM

Terms and Conditions

Purpose. This section is to modify those provisions of the Plan in order for awards made under the Plan, and communications concerning those awards, to be exempt from provisions of the United Kingdom Financial Services and Markets Act 2000 (the "FSMA").

Application. These provisions shall be used solely to grant awards to employees of the Company or any member of the same group as the Company resident and providing services in the United Kingdom. (The term "group" in relation to the Company shall bear the meaning given to such term in section 421 of the FSMA.)

Restricted Delivery of Awards. Payments of benefits under these provisions shall be made only in Shares or such other securities of the Company that may arise from such Shares under the adjustment provisions of the Plan. For the avoidance of doubt, and without limitation, no cash settlement of awards (including dividends or dividend equivalent payments in cash) shall be permissible.

Exercise of Restricted Stock Units/Vesting of Awards. The Administrator may specify, in its discretion, any other conditions of exercise and/or vesting of awards that will be specified in the award agreement.

Restricted Transfer of Rights. The persons to whom rights under awards may be assigned or transferred, whether by will or the laws of descent and distribution or any transferability of awards shall be limited to a Grantee's children and step-children under the age of eighteen, spouses and surviving spouses and civil partners and civil partners (within the meaning of the United Kingdom Civil Partnerships Act 2004) and surviving partners.

Tax. All awards will be subject to tax withholding and all references to "tax" shall be read and construed as including, without limitation, United Kingdom income tax and primary class 1 (employee's) national insurance contributions that the Grantee's employer is liable to account for and, if so agreed between the Company and the Grantee, secondary class 1 (employer's) national insurance contributions that the Grantee's employer is liable to account for.

**RESTRICTED STOCK UNIT AGREEMENT (NON-EMPLOYEE DIRECTORS)
UNDER THE FIFTH AMENDED AND RESTATED ANSYS, INC.
1996 STOCK OPTION AND GRANT PLAN**

Name of Grantee:

No. of Restricted Stock Units Granted:

Grant Date:

Pursuant to the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (the “**Plan**”) as amended through the date hereof, ANSYS, Inc. (the “**Company**”) hereby grants the number of Restricted Stock Units listed above (the “**Award**”) to the Grantee named above. Each “Restricted Stock Unit” shall relate to one share of Stock of the Company, subject to the restrictions and conditions set forth in this Restricted Stock Unit Agreement (the “**Agreement**”) and in the Plan.

1. Restrictions on Transfer of Award. The Award shall not be sold, transferred, pledged, assigned or otherwise encumbered or disposed of by the Grantee, until shares of Stock have been issued pursuant to Section 3 hereof.

2. Vesting of Restricted Stock Units. The Award shall initially be unvested and shall be eligible to become vested as specified below. The date on which the Restricted Stock Units become vested as described below and in accordance with the terms and conditions of this Agreement and the Plan shall be the “**Vesting Date.**”

(a) Time-Based Vesting. The Restricted Stock Units shall become vested in full on the date that is the earlier of (x) the one-year anniversary of the Grant Date specified above; or (y) the date of the Company’s next regular annual meeting of stockholders which occurs after the Grant Date specified above, subject in each case to the Grantee’s continued service as a member of the Board of Directors of the Company (a “**Director**”) through such date.

(b) Death or Disability. The Restricted Stock Units shall become vested in full upon the Grantee’s death or Disability. For purposes hereof, “**Disability**” means that the Grantee ceases to be a Director as a result of his or her physical or mental illness or impairment as determined by the Committee.

(c) Approved Departure. A pro-rata portion of the Restricted Stock Units shall become vested upon the Grantee's departure from the Board under circumstances approved by the Committee, such as a departure in order to avoid a conflict of interest or other similar circumstances. In such case, one-twelfth of the Restricted Stock Units shall become vested for each full month of the Grantee's continued service as a Director between the Grant Date and the date on which the Grantee ceases to be a Director. The determination of the reason for a Grantee's departure shall be made by the Committee in its sole discretion.

(d) Transaction. In the case of a Transaction (as defined in the Plan), the Restricted Stock Units shall be subject to Section 3(c) of the Plan. The Restricted Stock Units shall become vested in full upon the earlier of: (x) consummation of the Transaction if Grantee's service as a Director ceases on the closing date of the Transaction or (y) if the Award is assumed or continued by a successor entity (or parent thereof) following the Transaction, upon Grantee's involuntary cessation of service as a Director with such entity.

3. Issuance of Shares of Stock.

(a) No Deferral Election. Subject to the terms of the Plan and this Agreement, as soon as reasonably practicable following the Vesting Date, but in no event later than 60 days after the end of the year in which such Vesting Date occurs, the Company shall direct its transfer agent to issue to the Grantee via the Company's dedicated on-line broker the number of shares of Stock equal to the number of Restricted Stock Units that became vested on such Vesting Date in satisfaction of the Award.

(b) Deferral Election. If the Committee has given the Grantee the option to elect to defer the settlement of the Award, and the Grantee has made an irrevocable written election to so defer the settlement of the Award in accordance with the terms and conditions required by the Committee (the "**Deferral Election**"), then, in lieu of the terms specified in Section 3(a) (above), subject to the terms of the Plan and this Agreement, the Company shall direct its transfer agent to issue to the Grantee via the Company's dedicated on-line broker the number of shares of Stock equal to the number of Restricted Stock Units that became vested on the Vesting Date in satisfaction of the Award, in accordance with the terms of the Deferral Election.

(c) Shares of Stock shall be issued and delivered to the Grantee in accordance with this Section 3 upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Grantee.

(d) Until such time as shares of Stock are issued to the Grantee pursuant to this Section 3, the Grantee shall have no rights as a stockholder with respect to any shares of Stock underlying the Restricted Stock Units, including but not limited to any voting rights.

4. Termination of Service. Except as otherwise provided herein, if the Grantee ceases to continue in service as a Director for any reason, this Award shall no longer vest with respect to any unvested Restricted Stock Units and such unvested Restricted Stock Units shall lapse.

5. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 2 of the Plan. Capitalized terms used herein shall have the meaning specified in the Plan, unless a different meaning is specified herein. In the event of any conflict between the Plan and this Agreement, the Plan shall control and this Agreement shall be deemed to be modified accordingly, except to the extent that the Plan gives the Committee the express authority to vary the terms of the Plan by means of this Agreement, in which case this Agreement shall govern.

6. Transferability. This Award is personal to the Grantee, is non-assignable and is not transferable by Grantee in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution. The Stock to be issued upon the vesting of this Award to the Grantee shall be issued, during the Grantee's lifetime, only to the Grantee.

7. Tax Withholding.

(a) Grantee acknowledges that, if Grantee is a Pennsylvania resident, Grantee is responsible for any and all applicable income and other taxes, as well as any social insurance contributions and other deductions or withholdings required by applicable law, from this Award, including federal, FICA, state, and local taxes applicable to Grantee (such taxes, the "**Tax-Related Items**"). Grantee further acknowledges that the Company (x) makes no representations or undertakings regarding the Tax-Related Items in connection with any aspect of the Award, including, but not limited to, the grant, vesting, or delivery of shares of Stock under the Award, the subsequent sale of shares of

Stock acquired pursuant to the Award, and the receipt of any dividends, and (y) does not commit to and is under no obligation to structure the terms of the grant or any aspect of the Award to reduce or eliminate Grantee's liability for Tax-Related Items.

(b) If Grantee is not a Pennsylvania resident, Grantee acknowledges that any issuance of shares of Stock to Grantee pursuant to this Award shall be subject to any applicable tax withholding requirements. The Company shall automatically, not later than the date as of which the transfer of shares of Stock pursuant to this Award becomes a taxable event for federal income tax or other applicable withholding tax purposes, cause the required minimum federal, state, local, non-U.S., or other taxes required by law to be withheld on account of such taxable event to be satisfied by withholding from shares of Stock to be issued to Grantee a number of shares of Stock with an aggregate Fair Market Value that would satisfy such minimum withholding obligation.

8. No Obligation to Continue Service. Neither the Company nor any Subsidiary is obligated by or as a result of the Plan or this Award to continue the Grantee in service as a Director.

9. Section 409A of the Code. The Company and the Grantee intend that this Agreement will be administered in accordance with Section 409A of the Code. To the extent that any provision of this Agreement is ambiguous as to its exemption from, or compliance with, Section 409A of the Code, the provision shall be read in such a manner so that all payments hereunder either are exempt from, or comply with, Section 409A of the Code. The parties agree that this Agreement may be amended, as reasonably requested by either party, as may be necessary to fully comply with Section 409A of the Code and all related rules and regulations.

10. Integration. This Agreement constitutes the entire agreement between the parties with respect to this Award and supersedes all prior agreements and discussions between the parties concerning such subject matter.

11. Data Privacy. *The Grantee hereby explicitly and unambiguously consents to the collection, retention, use*

and transfer, in any form, of the Grantee's personal data described below and any other Award grant materials by and among, as applicable, the Company and any other Subsidiary for the purpose of implementing, administering and managing the Grantee's participation in the Plan.

The Grantee understands and consents that the Company will process personal data about the Grantee consisting of the name, home address, personal and business telephone number, date of birth, social insurance number or other governmental identification number, personal electronic mail address, nationality, and job title, as well as the Grantee's salary, any shares of Stock or directorships held in the Company, details of all awards or any other entitlement to shares of Stock awarded, canceled, exercised, vested, unvested or outstanding in the Grantee's favor, (collectively, "Data"), for the Company's legitimate interest of implementing, administering and managing the Plan and complying with the terms of this Agreement.

The Grantee understands and agrees that the Data will be transferred to (i) a stock plan service provider selected by the Company to process the Data when providing in the implementation, administration and management of the Plan on behalf of the Company, (ii) the Company's legal and financial advisers that process the Data when providing advisory services to the Company in connection with the implementation, administration and management of the Plan and this Agreement, and (iii) third party service providers as data processors to the Company and who process the Data in support of the Company's business. The Grantee may request a list with the names and addresses of any recipients of the Data by contacting his or her local human resources representative. The Company will process the Data as so long as is necessary to further the purposes for such processing as described herein. The Grantee may, at any time, request access to Data, request additional information about the storage and processing of Data, require any necessary amendments to Data, withdraw consent to processing of Data, or otherwise exercise any data protection right the Grantee may have under applicable law, in any case without cost, by contacting in writing his or her local human resources representative. Further, the Grantee understands that he or she is providing the consents herein on a purely voluntary basis. If the Grantee does not consent, or if the Grantee later seeks to revoke his or her consent, his or her service with the Company will not be adversely affected; the only adverse consequence of refusing or withdrawing consent is that the Company would not be able to grant the Grantee the Award or other equity awards or administer or maintain such awards. Therefore, the Grantee understands that refusing or withdrawing his or her consent may affect the Grantee's ability to participate in the Plan. For more information on the consequences of the Grantee's refusal to consent or withdrawal of consent, the Grantee understands that he or she may contact his or her local human resources representative.

12. Nature of Grant. In accepting the Award, the Grantee acknowledges, understands and agrees that:

- (a) the Plan is established voluntarily by the Company, it is discretionary in nature and it may be modified, amended, suspended or terminated by the Company at any time, to the extent permitted by the Plan;
- (b) the grant of the Award is voluntary and occasional and does not create any contractual or other right to receive future grants;
- (c) all decisions with respect to future Awards or other grants, if any, will be at the sole discretion of the Committee;
- (d) the Award and the Grantee's participation in the Plan shall not be interpreted as forming an employment contract with the Company;
- (e) the Grantee is voluntarily participating in the Plan;
- (f) the Award and any shares of Stock acquired under the Plan are not intended to replace any pension rights or compensation;
- (g) the Award and any shares of Stock acquired under the Plan, and the income and value of the same, are not part of normal or expected compensation for any purpose, including, without limitation, calculating any severance, resignation, termination, redundancy, dismissal, end-of-service payments, bonuses, long-service awards, pension or retirement benefits or payments or welfare benefits or similar payments;
- (h) the future value of the shares of Stock underlying the Award is unknown, indeterminable, and cannot be predicted with certainty;
- (i) no claim or entitlement to compensation or damages shall arise from forfeiture of the Award resulting from the termination of the Grantee's service relationship; and
- (j) neither the Company nor any other Subsidiary shall be liable for any foreign exchange rate fluctuation between the Grantee's local currency and the United States Dollar that may affect the value of the Award or of any amounts due to the Grantee pursuant to settlement of the Award or the subsequent sale of any shares of Stock acquired upon settlement.

13. No Advice Regarding Grant. The Company is not providing any tax, legal or financial advice, nor is the Company making any recommendations regarding the Grantee's participation in the Plan, or the Grantee's acquisition or sale of the underlying shares of Stock. The Grantee is hereby advised to consult with his or her own personal tax, legal and financial advisors regarding his or her participation in

the Plan before taking any action related to the Plan.

14. Language. If the Grantee has received this Agreement, or any other document related to the Award and/or the Plan translated into a language other than English and if the meaning of the translated version is different than the English version, the English version will control.

15. Notices. Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Grantee at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

16. Amendment. Pursuant to Section 18 of the Plan, the Committee may at any time amend or cancel any unvested portion of this Award, but no such action may be taken that adversely affects the Grantee's rights hereunder without the Grantee's consent.

17. Severability. If any provision(s) hereof shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

18. Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.



ANSYS, Inc.

By: _____

Name: Ajei S. Gopal

Title: President and CEO

The foregoing Award is hereby accepted and the terms and conditions of this Agreement are hereby agreed to by the undersigned. Electronic acceptance of this Award pursuant to the Company's instructions to the Grantee (including through an online acceptance process) is acceptable.

Dated: ___ ___

Grantee's Signature

Grantee's name and address:

%%FIRST_NAME%-%% %%LAST_NAME%-%%

%%ADDRESS_LINE_1%-%%

%%ADDRESS_LINE_2%-%%

%%ADDRESS_LINE_3%-%%

%%CITY%-%% %%STATE%-%% %%ZIPCODE%-%%

%%COUNTRY%-%%

**AWARD NOTICE
UNDER THE FIFTH AMENDED AND RESTATED
ANSYS, INC. 1996 STOCK OPTION AND GRANT PLAN**

Name of Participant:

Target Award:

Grant Date of Target Award:

Performance Cycles: January 1, 2018 to December 31, 2018

January 1, 2019 to December 31, 2019

January 1, 2020 to December 31, 2020

Pursuant to the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (the “Plan”), ANSYS, Inc., a Delaware corporation, (the “Company”) has selected the Participant named above to be awarded the Target Award specified above, subject to the terms and conditions of the Plan and this Award Notice. Capitalized terms used but not defined in this Award Notice shall have the meaning given such terms in the Plan. A copy of the Plan is attached hereto as Exhibit A.

1. Acceptance of Award. The total number of Restricted Stock Units that may be credited to the Participant (if any) shall be determined by the Company’s performance for the Performance Cycles specified above, as set forth in Section 5 below. One third of the Target Award is eligible to be credited for each Performance Cycle (the “Annual Target”). The actual number of Restricted Stock Units that may be credited could be up to 200% of the Target Award and could also be lower than the Target Award and could be zero.

2. Termination of Employment. Subject to Sections 3 and 5(a) below, a Participant must be employed through the last day of the final Performance Cycle to vest in any of the Restricted Stock Units that may be credited with respect to all three Performance Cycles, and all Restricted Stock Units not yet vested upon the termination of the Participant’s employment with the Company (or a Subsidiary(ies) as applicable) for any reason shall automatically be forfeited as of the date of termination of employment.

3. Transaction. Upon a Transaction, the Award shall be treated as specified in Section 3(c) of the Plan.

4. Issuance of Shares.

(a) Each Restricted Stock Unit relates to one share of the Company’s Stock. Shares of Stock (if any) shall be issued in settlement of any credited Restricted Stock Units within 74 days after the end of the final Performance Cycle, subject to the Participant’s continued employment with the Company through the last day of the final Performance Cycle. Shares of Stock (if any) shall be delivered to the Participant in accordance with the terms of this Award Notice and of the Plan, upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Participant.

(b) Until such time as shares of Stock are issued to the Participant pursuant to the terms hereof and of the Plan, the Participant shall have no rights as a stockholder with respect to any shares of Stock underlying the Restricted Stock Units, including but not limited to any voting rights.

5. Determination and Payment of Awards

(a) The Annual Target shall become credited based on achievement by the Company of the Performance Criteria for the applicable Performance Cycle as set forth in Exhibit B attached hereto (as updated for each Performance Cycle) and incorporated herein by reference, subject to the Participant's continued employment with the Company through the conclusion of the final Performance Cycle. For purposes of clarity and by way of example: If, during the Performance Cycle ending December 31, 2018, the Participant is credited 75% of the Annual Target for the 2018 Performance Cycle, determined by reference to the Performance Criteria included in Exhibit B, 25% of the Annual Target shall be forfeited and the credited Restricted Stock Units (75% of the Annual Target) shall vest and be settled if the Participant remains employed through the last day of the end of the final Performance Cycle.

(b) For purposes of this Section 5, the following definitions shall apply:

(i) "Revenue" means non-GAAP revenue as reported in the Company's public filings.

(ii) "Operating Margin" means non-GAAP operating margin percent as reported in the Company's public filings.

(c) For purposes of the foregoing definitions, (1) there shall be constant currency measurement for both Revenue compared to the prior year and Operating Margin; (1) future years' annual performance targets will be designed to exclude future acquisitions depending on the closing date, subject to the Committee's discretion; and (iii) the Committee shall assess the materiality of any merger or acquisition and reserves the discretion to determine the impact thereof on the applicable targets.

(d) The Committee, at its first regular meeting following the conclusion of each Performance Cycle and the delivery to the Company of its audited financial statements for such Performance Cycle, shall determine the actual number of Restricted Stock Units that will be deemed to have been credited as of the final day of such Performance Cycle, in accordance with the Performance Criteria set forth in Exhibit B.

(e) Notwithstanding the foregoing, as soon as practicable (but in no event later than 74 days) following the conclusion of the final (third) Performance Cycle, the Restricted Stock Units that were credited over all three Performance Cycles, if any, will vest and be settled in an equal number of shares of Stock, subject to the Participant's continued employment with the Company.

6. Non-Competition and Non-Solicitation. As additional consideration for the grant of this Award to the Participant, the Participant hereby agrees that he or she shall not, at anytime during his or her employment with the Company or any Subsidiary, **[for non-California employees only:** and for a period of one year immediately after the termination of such employment (no matter if terminated by the Participant or the Company and no matter what the reason for that termination),]

engage for any reason, directly or indirectly, whether as owner, part-owner, shareholder, member, partner, director, officer, trustee, employee, agent or consultant, or in any other capacity, on behalf of himself or herself or any firm, corporation or other business organization other than the Company and its subsidiaries, in any one or more of the following activities:

(a) the development, marketing, solicitation, or selling of any product or service that is competitive with the products or services of the Company, or products or services that the Company has under development or that are subject to active planning at any time during Participant's employment;

(b) the use of any of the Company's confidential or proprietary information, copyrights, patents or trade secrets which was acquired by the Participant as an employee of the Company and its subsidiaries; or

(c) any activity for the purpose of inducing, encouraging, or arranging for the employment or engagement by anyone other than the Company and its subsidiaries of any employee, officer, director, agent, consultant, or sales representative of the Company and its subsidiaries or attempt to engage any of them in a manner which would deprive the Company and its subsidiaries of their services or place them in a conflict of interest with the Company and its subsidiaries.

The Participant acknowledges and agrees that the activities set forth in (a)-(c) (above) are adverse to the Company's interests, and that it would be inequitable for Participant to benefit from this Award should Participant engage in any such activities during or within one year after termination of his or her employment with the Company. The Participant may be released from his or her obligations as stated above only if the Committee (or its duly appointed agent) determines in its sole discretion that such action is in the best interests of the Company and its subsidiaries.

7. Claw-Back of Award Proceeds. The Committee shall have the authority to unilaterally terminate this Award and/or cause some or all of the proceeds relating to this Award that have been received by the Participant to become immediately due and payable by the Participant to the Company upon the occurrence of any of the following events:

(a) the Participant's violation of Section 6 of this Agreement (entitled Non-Competition and Non-Solicitation);

(b) the material restatement of the Company's financial statements due to misconduct by the Participant;

(c) the material restatement of the Company's financial statements that results in the Participant receiving more compensation under the Award than the Participant would have received absent the incorrect financial statements.

The determination of whether any of the foregoing events has occurred and the extent of the application of this Section to the Participant and this Award shall be determined by the Committee in its sole discretion.

8. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award Notice shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 2 of the Plan.

9. Transferability. This Award is personal to the Participant, is non-assignable and is not transferable by Participant in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution. The Stock to be issued upon the vesting of this Award to the Participant shall be issued, during the Participant's lifetime, only to the Participant, and thereafter, only to the Participant's beneficiary. The Participant may designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company.

10. Section 409A. This Award is intended as a short-term deferral, and to not be subject to any tax, penalty, or interest under, Section 409A of the Internal Revenue Code and the regulations promulgated thereunder. This Award, this Agreement and the Plan (as to the Award) shall be construed and interpreted consistent with such intent.

11. Tax Withholding. Any issuance of shares of Stock to a Participant shall be subject to tax withholding. The minimum tax withholding obligation shall be satisfied through a net issuance of shares. The Company shall withhold from shares of Stock to be issued to the Participant a number of shares of Stock with an aggregate fair market value that would satisfy the minimum withholding amount due.

12. No Contract for Continuing Services. Neither the Plan nor this Award Notice shall be construed as creating any contract for continued services between the Company or any of its subsidiaries and the Participant and nothing herein contained shall give the Participant the right to be retained as an employee or consultant of the Company or any of its subsidiaries.

13. Mandatory Arbitration. The Participant and the Company agree that any dispute or claim arising out of or in any way related to (i) the Participant's employment with the Company, and/or (ii) this Agreement or any breach hereof, this Award, the Plan and/or any actions taken under the Plan, to the fullest extent permitted by law, shall be submitted to and resolved by confidential, binding arbitration by a single, neutral arbitrator. The arbitration shall be held in the county where the Company has an office at which the Participant provides services (for remote Participants, the nearest county where the Company has an office) or any other locale to which the parties jointly agree. The arbitration shall be administered by and under the auspices of JAMS in accordance with the then-current Employment Arbitration Rules & Procedures of JAMS (which are available at www.jamsadr.com/rules-employment). Arbitrator selection and discovery shall be conducted pursuant to the JAMS Rules. The arbitrator shall issue a written award setting forth the essential findings and conclusions on which the award is based, which shall be final and binding and judgment thereon may be entered in any court of competent jurisdiction. Other than an amount equal to the fee for filing such an action in the local state court, which amount the Participant shall pay toward the costs of the arbitration, the Company shall bear the administrative, filing and forum costs of the arbitration, including the JAMS administrative fees and the arbitrator's fees. Except as otherwise provided by law or in the arbitrator's ruling, each party shall otherwise bear its own respective attorneys' fees and costs of the arbitration. The Participant and the Company agree that each may bring claims against the other only in an individual capacity, and not as a plaintiff, claimant or class member in any purported class action, collective action or other representative proceeding, or otherwise seeking to represent the interests of any other person. This agreement to arbitrate shall survive any separation of the Participant's employment. Notwithstanding the foregoing, nothing herein or otherwise shall preclude the Company from pursuing a court action for the purpose of obtaining a temporary restraining order

or other injunctive relief to enforce any restrictive covenants the Participant has with or for the benefit of the Company.

14. General Release of Claims by the Participant.

(a) As a condition of and in consideration for the promises made by the Company herein, including without limitation to provide the Award hereunder, the Participant hereby knowingly and voluntarily releases and discharges to the fullest extent permitted by law the Company and its past, present and future parents, subsidiaries, affiliates, and related entities, any and all of its or their past, present or future directors, shareholders, officers, executives, employees, and/or agents, and/or its and their respective predecessors, successors, and assigns (individually and collectively, the “Company Releasees”), from and with respect to any and all claims and causes of action whatsoever, in law or in equity, known or unknown, which the Participant ever had, has or may have against the Company and/or any or all of the other Company Releasees for, upon, or by reason of any matter whatsoever up to the date on which the Participant signs this Agreement (individually and collectively, “Claims”). The parties intend the foregoing to be a general release of any and all Claims to the fullest extent permissible by law. Notwithstanding the foregoing, nothing herein is a release by the Participant of (A) any rights or Claims with respect to accrued and vested benefits and/or previously awarded equity interests, subject in each instance to the terms and conditions of any applicable plan, grant, and/or agreement pertaining to such benefits, awards or interests and applicable law, (B) any rights or Claims arising under or to enforce this Agreement, or (C) any rights or Claims that, under applicable law, cannot lawfully be released by private agreement or otherwise.

(b) **FOR CALIFORNIA RESIDENTS ONLY:** In granting the foregoing release, the Participant acknowledges that he/she has been advised to consult with legal counsel and is familiar with the provision of California Civil Code Section 1542, a statute that otherwise prohibits the release of unknown claims, which provides as follows:

“A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR.”

Being aware of said Code section, the Participant hereby expressly waives any rights the Participant may have thereunder, as well as under any other state or federal statutes or common law principles of similar effect.

(c) Nothing contained in this Agreement (including the foregoing general release) limits the Participant’s ability to file a charge or complaint with any federal, state or local governmental agency, commission or regulatory entity (a “Government Agency”). If the Participant files any charge or complaint with any Government Agency, if any Government Agency pursues any charge or claim on the Participant’s behalf, or if any other third party pursues any claim or charge on the Participant’s behalf, the Participant waives any right to monetary or other individualized relief (either individually, or as part of any collective or class action); provided, however, that nothing in this Agreement limits any right the Participant may have to receive a whistleblower award or bounty for information provided to the Securities and Exchange Commission. The Participant represents that he/she is not aware of any unlawful conduct or violations of any federal, state or local law, rule or

regulation by the Company and/or any other Company Releasees or any basis to bring a charge or complaint to any Government Agency.

15. Notices. Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Participant at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

16. Severability. If any provision(s) hereof shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

17. Counterparts. For the convenience of the parties and to facilitate execution, this document may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

18. Time to Review and Accept; Right to Revoke; Effective Date. The Participant is advised by the Company to consult with an attorney in connection with this Agreement. The Participant understands that as part of his/her agreement to release Claims against the Company and the other Company Releasees, the Participant is releasing Claims for age discrimination under the federal Age Discrimination in Employment Act (the "ADEA"). Accordingly, the Participant has the right, and acknowledges that he/she has been given the opportunity, to review and consider this Agreement for a period of twenty-one (21) days from the Participant's receipt of this Agreement before signing it (the "Review Period"). To accept this Agreement and the Award granted hereunder, the Participant must return a signed original or signed .pdf copy of this Agreement to: [NAME, TITLE, ADDRESS; E-MAIL ADDRESS] at any time before the end of the Review Period. If the Participant signs this Agreement before the end of the Review Period, the Participant acknowledges that such decision was voluntary and that he/she had the opportunity to consider this Agreement for the full Review Period. For the period of seven (7) days from the date when the Participant signs this Agreement, the Participant has the right to revoke this Agreement by written notice to [NAME, TITLE, ADDRESS; E-MAIL ADDRESS], provided such notice is delivered so that it is received at or before the expiration of the 7-day revocation period. This Agreement shall not become effective or enforceable during the revocation period. If timely accepted and not revoked by the Participant prior to the end of the revocation period, this Agreement shall become effective on the first business day following the expiration of the revocation period (the "Effective Date"). If not timely accepted or if (after timely signing) the Participant revokes prior to the expiration of the revocation period, this Agreement shall not become effective and the Participant will not be entitled to or receive the Award granted hereunder and/or such Award shall be rescinded.

19. Knowing and Voluntary Agreement. By signing this Agreement, the Participant acknowledges and represents that the Participant (a) has carefully read this Agreement in its entirety; (b) is hereby advised by the Company in writing to consult with an attorney of the Participant's choice before signing this Agreement; (c) has been afforded and has had a full and reasonable opportunity and period of time of at least 21 days to consider the terms and conditions of this Agreement; (d) fully understands the meaning and significance, and consequences, of all of the terms and conditions of this Agreement (including without limitation the general release given by the Participant in this Agreement); and (e) is signing this Agreement knowingly, voluntarily and of the Participant's own free will and with the intent to be fully bound hereby.



ANSYS, Inc.

By: _____

Name: Ajei S. Gopal

Title: President and CEO

The foregoing Award is hereby accepted and the terms and conditions of this Agreement are hereby agreed to by the undersigned. Electronic acceptance of this Award pursuant to the Company's instructions to the Grantee (including through an online acceptance process) is acceptable.

Dated: __ __

Optionee's Signature

Optionee's name and address:

%%FIRST_NAME%- %%%LAST_NAME%-%
%%ADDRESS_LINE_1%-%
%%ADDRESS_LINE_2%-%
%%ADDRESS_LINE_3%-%
%%CITY%- %%%STATE%- %%%ZIPCODE%-%
%%COUNTRY%-%

INTERNATIONAL APPENDIX

Additional Terms and Conditions

Terms and Conditions

This International Appendix includes additional terms and conditions that govern the award granted to you under the Plan for your country. Certain capitalized terms used but not defined in this International Appendix have the meanings set forth in the Plan and the Agreement that relate to your award. By acceptance of the award you agree to be bound by the terms and conditions contained in the paragraphs below in addition to the terms of the Plan and the Agreement and the terms of any other document that may apply to you and your award.

Notifications

This International Appendix also includes information regarding issues of which you should be aware with respect to participation in the Plan. The information is based on the securities, exchange control, and other laws in effect in the respective countries as of the date set forth above. Such laws are often complex and change frequently. As a result, it is strongly recommended that you not rely on the information in this International Appendix as the only source of information relating to the consequences of your participation in the Plan because the information may be out of date at the time you vest in your award or sell shares acquired under the Plan.

The information contained herein is general in nature and may not apply to your particular situation, and the Company is not in a position to assure you of a particular result. In addition, please note that the requirements may differ for residents and non-residents. Accordingly, you are advised to seek appropriate professional advice as to how the relevant laws in your country may apply to your situation.

Finally, if you are a citizen or resident of a country other than the one in which you are currently working, transferred employment to another country after the award was granted to you, or are considered a resident of another country for local law purposes, the information contained herein may not apply.

Provisions Applicable to all International Awards

Data Privacy. The Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Participant's personal data by and among, as applicable, the Company, its subsidiaries and affiliates, for the exclusive purpose of implementing, administering and managing the Participant's participation in the Plan. The Participant hereby understands that the Company, its subsidiaries and affiliates hold (but only process or transfer to the extent required or permitted by local law) certain personal information about the Participant, including, but not limited to, the Participant's name, home address and telephone number, date of birth, social insurance number or other identification number, salary, nationality, job title, any Shares or directorships held in the Company, details of all Restricted Stock Units or

any other entitlement to Shares awarded, canceled, exercised, vested, unvested or outstanding in the Participant's favor, for the purpose of implementing, administering and managing the Plan ("Data"). The Participant hereby understands that Data may be transferred to any third parties assisting in the implementation, administration and management of the Plan, that these recipients may be located in the Participant's country or elsewhere (including countries outside of the European Economic Area such as the United States of America), and that the recipient's country may have different data privacy laws and protections than the Participant's country. The Participant hereby understands that the Participant may request a list with the names and addresses of any potential recipients of the Data by contacting the Participant's local human resources representative. The Participant authorizes the recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the purposes of implementing, administering and managing the Participant's participation in the Plan, including any requisite transfer of such Data as may be required to a broker or other third party with whom the Participant may elect to deposit any Shares acquired upon exercise. The Participant hereby understands that Data will be held only as long as is necessary to implement, administer and manage the Participant's participation in the Plan and in accordance with local law. The Participant hereby understands that the Participant may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing the Participant's local human resources representative. The Participant hereby understands, however, that refusing or withdrawing the Participant's consent may affect the Participant's ability to participate in the Plan. For more information on the consequences of the Participant's refusal to consent or withdrawal of consent, the Participant hereby understands that the Participant may contact the Participant's local human resources representative.

Nature of Grant. In accepting the grant of Restricted Stock Units, the Participant acknowledges that:

- (a) the Plan is established voluntarily by the Company, is discretionary in nature and may be modified, amended, suspended or terminated by the Company at any time, unless otherwise provided in the Plan and this Agreement;
- (b) the grant of Restricted Stock Units is voluntary and occasional and does not create any contractual or other right to receive future grants of Restricted Stock Units, or benefits in lieu of Restricted Stock Units, even if Restricted Stock Units have been granted repeatedly in the past;
- (c) all decisions with respect to future Restricted Stock Units, if any, will be at the sole discretion of the Company;

(d) the Participant's participation in the Plan will not create a right to further employment with the Participant's employer (the "Employer") and shall not interfere with the ability of the Employer to terminate the Participant's employment relationship;

(e) the Participant is voluntarily participating in the Plan;

(f) the Restricted Stock Units are an extraordinary item that does not constitute compensation of any kind for services of any kind rendered to the Company or the Employer, and which is outside the scope of the Participant's employment contract, if any;

(g) the Restricted Stock Units are not part of normal or expected compensation or salary for any purposes, including, but not limited to, calculating any severance, resignation, termination, redundancy, end of service payments, bonuses, long-service awards, pension or retirement benefits or similar payments and in no event should be considered as compensation for, or relating in any way to, past services for the Company or the Employer;

(h) in the event that the Participant is not an employee of the Company, the grant of Restricted Stock Units will not be interpreted to form an employment contract or relationship with the Company; and furthermore, the grant of Restricted Stock Units will not be interpreted to form an employment contract with the Employer or any subsidiary or affiliate of the Company;

(i) the future value of the underlying Shares is unknown and cannot be predicted with certainty;

(j) if the Participant vests in the Restricted Stock Units and obtains Shares, the value of those Shares may increase or decrease in value;

(k) in consideration of the grant of the Restricted Stock Units, no claim or entitlement to compensation or damages shall arise from termination of the Restricted Stock Units or diminution in value of the Restricted Stock Units or Shares acquired resulting from termination of the Participant's employment by the Company or the Employer, and the Participant irrevocably releases the Company and the Employer from any such claim that may arise; if, notwithstanding the foregoing, any such claim is found by a court of competent jurisdiction to have arisen, then, by signing this Agreement, the Participant will be deemed irrevocably to have waived his or her entitlement to pursue such claim; and

(l) in the event of termination of the Participant's employment, Participant's right to receive the Restricted Stock Units and vest in the Restricted Stock Units under the Plan, if any, will terminate effective as of the date that the Participant is no longer actively employed.

Country-Specific Language

Below please find country-specific language that applies to you if you are a citizen or resident of one of the following countries: Belgium, Canada, France, Germany, India, Italy, Japan, South Korea, Spain, Sweden, Switzerland, Taiwan and United Kingdom.

BELGIUM

Notifications

Tax Reporting Information. Participants are required to report any bank accounts opened and maintained outside Belgium on their annual tax return.

CANADA

Terms and Conditions

Restricted Stock Units Settled in Shares Only. Notwithstanding anything to the contrary in the Plan and/or the Agreement, you understand that any Restricted Stock Units granted to you shall be paid in shares only and do not provide any right for you to receive a cash payment.

The following provision will apply to residents of Quebec:

Language Consent. The parties to the Agreement have expressly required that the Agreement and all documents and notices relating to the Agreement be drafted in English.

Les parties aux présentes ont expressément exigé que la présente convention et tous les documents et avis qui y sont afférents soient rédigés en anglais.

Notifications

Additional Restrictions on Resale. In addition to the restrictions on resale and transfer noted in Plan materials, securities purchased under the Plan may be subject to certain restrictions on resale imposed by Canadian provincial securities laws. Participants are encouraged to seek legal advice prior to any resale of such securities. In general, Participants resident in Canada may resell their securities in transactions carried out on exchanges outside of Canada.

Tax Reporting. The Tax Act and the regulations thereunder require a Canadian resident individual (among others) to file an information return disclosing prescribed information where, at any time in a tax year, the total cost amount of such individual's "specified foreign property" (which includes shares) exceeds Cdn.\$100,000. Participants should consult their own tax advisor regarding this reporting requirement.

FRANCE

Notifications

Exchange Control Information. If a Participant imports or exports cash (*e.g.*, sale proceeds received under the Plan) with a value equal to or exceeding €10,000 and does not use a financial institution to do so, Participant must submit a report to the customs and excise authorities. If Participant maintains a foreign bank account, Participant is required to report such account to the French tax authorities when filing his/her annual tax return.

GERMANY

Notifications

Exchange Control Information. Cross-border payments in excess of €12,500 must be reported monthly to the German Federal Bank. If a Participant uses a German bank to transfer a cross-border payment in excess of €12,500 in connection with the sale of Shares acquired under the Plan, the bank will file the report for the Participant.

INDIA

Terms and Conditions

Repatriation of Proceeds. You understand that you must repatriate any proceeds from the sale of Shares acquired upon vesting of the Restricted Stock Units to India and convert the proceeds into local currency within 90 days of receipt. You will receive a foreign inward remittance certificate ("FIRC") from the bank where you deposit the foreign currency. You should maintain the FIRC as evidence of the repatriation of funds in the event the Reserve Bank of India or your employer requests proof of repatriation.

Notifications

Tax Information. The amount subject to tax at vesting may partially be dependent upon a valuation of Shares from a Merchant Banker in India. The Company has no responsibility or obligation to obtain the most favorable valuation possible nor obtain valuations more frequently than required under Indian tax law.

ITALY

Terms and Conditions

Data Privacy. In addition to the data privacy provision that is set forth above, by accepting the grant of Restricted Stock Units, you also consent to the following additional data privacy-related terms:

I am aware that providing the Company and my employer with Data is necessary for participation in the Plan and that my refusal to provide such Data may affect my ability to participate in the Plan. The Controller of personal data processing is Ansys, Inc., with registered offices at 2600 Ansys Drive, Canonsburg, PA 15317 and, pursuant to D.lgs 196/2003, its representative in Italy is ANSYS Italia Srl with registered offices at via G. B. Pergolesi n. 25 20124 Milano MI Italy.

I understand that I may at any time exercise the rights acknowledged by Section 7 of Legislative Decree June 30, 2003 n.196, including, but not limited to, the right to access, delete, update, request the rectification of my Data and cease, for legitimate reasons, the data processing. Furthermore, I am aware that my Data will not be used for direct marketing purposes.

Notifications

Exchange Control Information. By September 30th of each year, the Participants are required to report on their annual tax return (Form RW) any foreign investments (including proceeds from the sale of Shares acquired upon vesting) held outside of Italy if the investment may give rise to income in Italy. However, deposits and bank accounts held outside of Italy only need to be disclosed if the value of the assets exceeds €10,000 during any part of the tax year.

With respect to Shares received upon vesting of the Restricted Stock Units, the Participants must report (i) the value of the Shares at the beginning of the year or on the day the Participant acquired the Shares, whichever is later; and (ii) the value of the Shares when sold, or if the Participant still owns the Shares at the end of the year, the value of the Shares at the end of the year. The value to be reported is the fair market value of the Shares on the applicable dates mentioned above.

JAPAN

Notifications

Exchange Control Information. If you acquire Shares valued at more than ¥100,000,000 in a single transaction, you must file a Securities Acquisition Report with the Ministry of Finance through the Bank of Japan within 20 days of the acquisition of the Shares.

SOUTH KOREA

Notifications

Exchange Control Information. If you receive US\$500,000 or more from the sale of underlying Shares, Korean exchange control laws require you to repatriate the proceeds to South Korea within 18 months of sale.

SPAIN

Notifications

Exchange Control Information. All acquisitions of foreign shares by Spanish residents must comply with exchange control regulations in Spain. Because of foreign investment requirements, the acquisition of Shares upon vesting of the Restricted Stock Units must be declared for statistical purposes to the Spanish Direccion General de Politica Comercial y de Inversiones Extranjeras (the “DGPCIE”). If you acquire Shares through the use of a Spanish financial institution, that institution will automatically make the declaration to the DGPCIE for you. Otherwise, you must make the declaration by filing a form with the DGPCIE.

If you import the Shares acquired upon vesting of the Restricted Stock Units into Spain, you must declare the importation of the share certificates to the DGPCIE.

In addition, you must also file a declaration of the ownership of the Shares with the Directorate of Foreign Transactions each January while the shares are owned. These filings are made on standard forms furnished by the Directorate of Foreign Transactions.

When you receive any foreign currency payments (*i.e.*, as a result of the sale of the Shares), you must inform the institution receiving the payment of the basis upon which such payment is made and provide certain specific information (*e.g.*, name, address, and fiscal identification number; the name and corporate domicile of the company; the amount of the payment; the type of foreign currency received; the country of origin; and the reason for the payment).

Tax Reporting. If you hold assets (*e.g.*, cash or shares in a bank or brokerage account) or rights outside Spain that exceed €50,000 per type of asset, you must file a Form 720 with the Spanish Tax Authorities by April 30th of each year.

SWITZERLAND

Notifications

Securities Law Information. The offer of the Restricted Stock Units is considered a private offering in Switzerland and is not subject to registration in Switzerland.

TAIWAN

Notifications

Exchange Control Information. Taiwan's foreign exchange control regulations may have an impact on the grant and vesting of the Restricted Stock Units as well as the repatriation of capital gains realized from the holding or sale of the underlying Shares. Under current foreign exchange regulations, a Taiwanese resident can remit up to US \$5 million (or an equivalent amount of other foreign currencies) per year into or out of Taiwan without prior approval from the Taiwan Central Bank.

If the transaction amount is TWD500,000 or more in a single transaction, you must submit a Foreign Exchange Transaction Form. If the transaction amount is US\$500,000 or more in a single transaction, you must also provide supporting documentation to the satisfaction of the remitting bank.

UNITED KINGDOM

Terms and Conditions

Purpose. This section is to modify those provisions of the Plan in order for awards made under the Plan, and communications concerning those awards, to be exempt from provisions of the United Kingdom Financial Services and Markets Act 2000 (the "FSMA").

Application. These provisions shall be used solely to grant awards to employees of the Company or any member of the same group as the Company resident and providing services in the United Kingdom. (The term "group" in relation to the Company shall bear the meaning given to such term in section 421 of the FSMA.)

Restricted Delivery of Awards. Payments of benefits under these provisions shall be made only in Shares or such other securities of the Company that may arise from such Shares under the adjustment provisions of the Plan. For the avoidance of doubt, and without limitation, no cash settlement of awards (including dividends or dividend equivalent payments in cash) shall be permissible.

Exercise of Restricted Stock Units/Vesting of Awards. The Administrator may specify, in its discretion, any other conditions of exercise and/or vesting of awards that will be specified in the award agreement.

Restricted Transfer of Rights. The persons to whom rights under awards may be assigned or transferred, whether by will or the laws of descent and distribution or any transferability of awards shall be limited to a Participant's children and step-children under the age of eighteen, spouses and surviving spouses and civil partners and civil partners (within the meaning of the United Kingdom Civil Partnerships Act 2004) and surviving partners.

Tax. All awards will be subject to tax withholding and all references to "tax" shall be read and construed as including, without limitation, United Kingdom income tax and primary class 1 (employee's) national insurance contributions that the Participant's employer is liable to account for and, if so agreed between the Company and the Participant, secondary class 1 (employer's) national insurance contributions that the Participant's employer is liable to account for.

**AWARD NOTICE
UNDER THE ANSYS, INC.
FIFTH AMENDED AND RESTATED LONG-TERM INCENTIVE PLAN**

Name of Participant:

Target Award:

Grant Date of Target Award:

Performance Measurement Period: January 1, 2018 to December 31, 2020

Pursuant to the ANSYS, Inc. Fifth Amended and Restated Long-Term Incentive Plan (the "Plan"), ANSYS, Inc. (the "Company") has selected the Participant named above to be awarded the Target Award specified above, subject to the terms and conditions of the Plan and this Award Notice. Capitalized terms used but not defined in this Award Notice shall have the meaning given such terms in the Plan. A copy of the Plan is attached hereto as Exhibit A.

1. Acceptance of Award. The total number of Restricted Stock Units that may be credited to the Participant (if any) shall be determined by the Company's performance during the Performance Measurement Period specified above and as set forth in Section 4(b) of the Plan. The Measurement Period Target for the Performance Measurement Period shall be equal to the Target Award. The actual number of Restricted Stock Units that may be credited could be up to 200% of such Target Award and could also be lower than the Target Award and could be zero.

2. Termination of Employment. Subject to Section 3 below, if at any time prior to the conclusion of the Performance Measurement Period, the Participant's employment with the Company terminates for any reason, the Participant shall automatically forfeit the right to receive any portion of the Award.

3. Change in Control. Upon a Change in Control, the Award shall be treated as specified in Section 6 of the Plan.

4. Issuance of Shares.

(a) Each Restricted Stock Unit relates to one share of the Company's Stock. Shares of Stock (if any) shall be issued and delivered to the Participant in accordance with the terms of this Award Notice and of the Plan upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Participant.

(b) Until such time as shares of Stock are issued to the Participant pursuant to the terms hereof and of the Plan, the Participant shall have no rights as a stockholder with respect to any shares of Stock underlying the Restricted Stock Units, including but not limited to any voting rights.

5. Non-Competition and Non-Solicitation. As additional consideration for the grant of this Award to the Participant, the Participant hereby agrees that he or she shall not, at any time during his or her employment with the Company, **[for non-California employees only]**; and for a period of one year immediately after the termination of such employment (no matter if terminated by the Participant or the Company and no matter what the reason for that termination),] engage for any reason, directly or indirectly, whether as owner, part-owner, shareholder, member, partner, director, officer, trustee, employee, agent or consultant, or in any other capacity, on behalf of himself or herself or any firm, corporation or other business organization other than the Company and its subsidiaries, in any one or more of the following activities:

(a) the development, marketing, solicitation, or selling of any product or service that is competitive with the products or services of the Company, or products or services that the Company has under development or that are subject to active planning at any time during Participant's employment;

(b) the use of any of the Company's confidential or proprietary information, copyrights, patents or trade secrets which was acquired by the Participant as an employee of the Company and its subsidiaries; or

(c) any activity for the purpose of inducing, encouraging, or arranging for the employment or engagement by anyone other than the Company and its subsidiaries of any employee, officer, director, agent, consultant, or sales representative of the Company and its subsidiaries or attempt to engage any of them in a manner which would deprive the Company and its subsidiaries of their services or place them in a conflict of interest with the Company and its subsidiaries.

The Participant acknowledges and agrees that the activities set forth in (a)-(c) (above) are adverse to the Company's interests, and that it would be inequitable for Participant to benefit from this Award should Participant engage in any such activities during or within one year after termination of his or her employment with the Company. The Participant may be released from his or her obligations as stated above only if the Committee (or its duly appointed agent) determines in its sole discretion that such action is in the best interests of the Company and its subsidiaries.

6. Claw-Back of Award Proceeds. The Committee shall have the authority to unilaterally terminate this Award and/or cause some or all of the proceeds relating to this Award that have been received by the Participant to become immediately due and payable by the Participant to the Company upon the occurrence of any of the following events:

(a) the Participant's violation of Section 5 of this Agreement (entitled Non-Competition and Non-Solicitation);

(b) the material restatement of the Company's financial statements due to misconduct by the Participant;

(c) the material restatement of the Company's financial statements that results in the Participant receiving more compensation under the Award than the Participant would have received absent the incorrect financial statements.

The determination of whether any of the foregoing events has occurred and the extent of the application of this Section to the Participant and this Award shall be determined by the Committee in its sole discretion.

7. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award Notice shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 3 of the Plan.

8. Transferability. This Award is personal to the Participant, is non-assignable and is not transferable by Participant in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution. The Stock to be issued upon the settlement of this Award to the Participant shall be issued, during the Participant's lifetime, only to the Participant, and thereafter, only to the Participant's beneficiary. The Participant may designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company.

9. No Contract for Continuing Services. Neither the Plan nor this Award Notice shall be construed as creating any contract for continued services between the Company or any of its subsidiaries and the Participant and nothing herein contained shall give the Participant the right to be retained as an employee or consultant of the Company or any of its subsidiaries.

10. Integration. This Agreement constitutes the entire agreement between the parties with respect to this Award and supersedes all prior agreements and discussions between the parties concerning such subject matter.

11. Mandatory Arbitration. The Participant and the Company agree that any dispute or claim arising out of or in any way related to (i) the Participant's employment with the Company, and/or (ii) this Agreement or any breach hereof, this Award, the Plan and/or any actions taken under the Plan, to the fullest extent permitted by law, shall be submitted to and resolved by confidential, binding arbitration by a single, neutral arbitrator. The arbitration shall be held in the county where the Company has an office at which the Participant provides services (for remote Participants, the nearest county where the Company has an office) or any other locale to which the parties jointly agree. The arbitration shall be administered by and under the auspices of JAMS in accordance with the then-current Employment Arbitration Rules & Procedures of JAMS (which are available at www.jamsadr.com/rules-employment). Arbitrator selection and discovery shall be conducted pursuant to the JAMS Rules. The arbitrator shall issue a written award setting forth the essential findings and conclusions on which the award is based, which shall be final and binding and judgment thereon may be entered in any court of competent jurisdiction. Other than an amount equal to the fee for filing such an action in the local state court, which amount the Participant shall pay toward the costs of the arbitration, the Company shall bear the administrative, filing and forum costs of the arbitration, including the JAMS administrative fees and the arbitrator's fees. Except as otherwise provided by law or in the arbitrator's ruling, each party shall otherwise bear its own respective attorneys' fees and costs of the arbitration. The Participant and the Company agree that each may bring claims against the other only in an individual capacity, and not as a plaintiff, claimant or class member in any purported class action, collective action or other representative proceeding, or otherwise seeking to represent the interests of any other person. This agreement to arbitrate shall survive any separation of the Participant's employment. Notwithstanding the foregoing, nothing herein or otherwise shall preclude the Company from pursuing a court action for

the purpose of obtaining a temporary restraining order or other injunctive relief to enforce any restrictive covenants the Participant has with or for the benefit of the Company.

12. General Release of Claims by the Participant.

(a) As a condition of and in consideration for the promises made by the Company herein, including without limitation to provide the Award hereunder, the Participant hereby knowingly and voluntarily releases and discharges to the fullest extent permitted by law the Company and its past, present and future parents, subsidiaries, affiliates, and related entities, any and all of its or their past, present or future directors, shareholders, officers, executives, employees, and/or agents, and/or its and their respective predecessors, successors, and assigns (individually and collectively, the "Company Releasees"), from and with respect to any and all claims and causes of action whatsoever, in law or in equity, known or unknown, which the Participant ever had, has or may have against the Company and/or any or all of the other Company Releasees for, upon, or by reason of any matter whatsoever up to the date on which the Participant signs this Agreement (individually and collectively, "Claims"). The parties intend the foregoing to be a general release of any and all Claims to the fullest extent permissible by law. Notwithstanding the foregoing, nothing herein is a release by the Participant of (A) any rights or Claims with respect to accrued and vested benefits and/or previously awarded equity interests, subject in each instance to the terms and conditions of any applicable plan, grant, and/or agreement pertaining to such benefits, awards or interests and applicable law, (B) any rights or Claims arising under or to enforce this Agreement, or (C) any rights or Claims that, under applicable law, cannot lawfully be released by private agreement or otherwise.

(b) **FOR CALIFORNIA RESIDENTS ONLY:** In granting the foregoing release, the Participant acknowledges that he/she has been advised to consult with legal counsel and is familiar with the provision of California Civil Code Section 1542, a statute that otherwise prohibits the release of unknown claims, which provides as follows:

“A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR.”

Being aware of said Code section, the Participant hereby expressly waives any rights the Participant may have thereunder, as well as under any other state or federal statutes or common law principles of similar effect.

(c) Nothing contained in this Agreement (including the foregoing general release) limits the Participant's ability to file a charge or complaint with any federal, state or local governmental agency, commission or regulatory entity (a "Government Agency"). If the Participant files any charge or complaint with any Government Agency, if any Government Agency pursues any charge or claim on the Participant's behalf, or if any other third party pursues any claim or charge on the Participant's behalf, the Participant waives any right to monetary or other individualized relief (either individually, or as part of any collective or class action); provided, however, that nothing in this Agreement limits any right the Participant may have to receive a whistleblower award or bounty for information provided to the Securities and Exchange Commission. The Participant represents that he/she is not aware of any unlawful conduct or violations of any federal, state or local law, rule or regulation by the Company and/or any other Company Releasees or any basis to bring a charge or complaint to any Government Agency.

13. Notices. Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Participant at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

14. Severability. If any provision(s) hereof shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

15. Counterparts. For the convenience of the parties and to facilitate execution, this document may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

16. Time to Review and Accept; Right to Revoke; Effective Date. The Participant is advised by the Company to consult with an attorney in connection with this Agreement. The Participant understands that as part of his/her agreement to release Claims against the Company and the other Company Releasees, the Participant is releasing Claims for age discrimination under the federal Age Discrimination in Employment Act (the "ADEA"). **ACCORDINGLY, THE PARTICIPANT HAS THE RIGHT, AND ACKNOWLEDGES THAT HE/SHE HAS BEEN GIVEN THE OPPORTUNITY, TO REVIEW AND CONSIDER THIS AGREEMENT FOR A PERIOD OF TWENTY-ONE (21) DAYS FROM THE PARTICIPANT'S RECEIPT OF THIS AGREEMENT BEFORE SIGNING IT (THE "REVIEW PERIOD").** To accept this Agreement and the Award granted hereunder, the Participant must return a signed original or signed .pdf copy of this Agreement to: [NAME, TITLE, ADDRESS; E-MAIL ADDRESS] at any time before the end of the Review Period. If the Participant signs this Agreement before the end of the Review Period, the Participant acknowledges that such decision was voluntary and that he/she had the opportunity to consider this Agreement for the full Review Period. For the period of seven (7) days from the date when the Participant signs this Agreement, the Participant has the right to revoke this Agreement by written notice to [NAME, TITLE, ADDRESS; E-MAIL ADDRESS], provided such notice is delivered so that it is received at or before the expiration of the 7-day revocation period. This Agreement shall not become effective or enforceable during the revocation period. If timely accepted and not revoked by the Participant prior to the end of the revocation period, this Agreement shall become effective on the first business day following the expiration of the revocation period (the "Effective Date"). If not timely accepted or if (after timely signing) the Participant revokes prior to the expiration of the revocation period, this Agreement shall not become effective and the Participant will not be entitled to or receive the Award granted hereunder and/or such Award shall be rescinded.

17. Knowing and Voluntary Agreement. By signing this Agreement, the Participant acknowledges and represents that the Participant (a) has carefully read this Agreement in its entirety; (b) is hereby advised by the Company in writing to consult with an attorney of the Participant's choice before signing this Agreement; (c) has been afforded and has had a full and reasonable opportunity and period of time of at least 21 days to consider the terms and conditions of this Agreement; (d) fully understands the meaning and significance, and consequences, of all of the terms and conditions of this Agreement (including without limitation the general release given by the Participant in this Agreement); and (e) is signing this Agreement knowingly, voluntarily and of the Participant's own free will and with the intent to be fully bound hereby.



ANSYS, Inc.

By: _____

Name: Ajei S. Gopal

Title: President and CEO

The foregoing Award is hereby accepted and the terms and conditions of this Agreement are hereby agreed to by the undersigned. Electronic acceptance of this Award pursuant to the Company's instructions to the Grantee (including through an online acceptance process) is acceptable.

Dated: _____

Optionee's Signature

Optionee's name and address:

%%FIRST_NAME%-%% %%LAST_NAME%-%%
%%ADDRESS_LINE_1%-%%
%%ADDRESS_LINE_2%-%%
%%ADDRESS_LINE_3%-%%
%%CITY%-%% %%STATE%-%% %%ZIPCODE%-%%
%%COUNTRY%-%%

Exhibit A
ANSYS, INC.
FIFTH AMENDED AND RESTATED LONG-TERM INCENTIVE PLAN

1. Purpose

This Fifth Amended and Restated Long-Term Incentive Plan (the “Plan”) is intended to provide an incentive for superior work and to motivate executives and employees of ANSYS, Inc. (the “Company”) toward even higher achievement and business results, to tie their goals and interests to those of the Company and its stockholders and to enable the Company to attract and retain highly qualified executives and employees. The Plan is for the benefit of Participants (as defined below). Awards made under this Plan constitute Restricted Stock Unit Awards under Section 11 of the Company’s Fifth Amended and Restated 1996 Stock Option and Grant Plan (the “1996 Option Plan”) and shall be granted under, and subject to, the terms of the 1996 Option Plan.

2. Definitions

For purposes of this Plan:

- (a) “Award” means a grant to a Participant hereunder. From and after a Change in Control, any references to an Award shall mean the fixed number of Restricted Stock Units eligible to be earned by a Participant, as determined by the Committee pursuant to Section 6 hereof.
- (b) “Award Notice” means a notice or agreement provided to a Participant that sets forth the terms, conditions and limitations of the Participant’s participation in this Plan, including, without limitation, the Participant’s Target Award.
- (c) “Board” means the Board of Directors of the Company.
- (d) “Cause” means, and shall be limited to a determination by the Company that the Participant’s employment shall be terminated as a result of any one or more of the following events:
 - (i) any material breach by the Participant of any agreement between the Participant and the Company; or
 - (ii) the conviction of, indictment for or plea of nolo contendere by the Participant to a felony or a crime involving moral turpitude;
or
 - (iii) any material misconduct or willful and deliberate non-performance (other than by reason of disability) by the Participant of the Participant’s duties to the Company; or

(iv) willful failure to cooperate with a bona fide internal investigation or an investigation by regulatory or law enforcement authorities, after being instructed by the Company to cooperate, or the willful destruction or failure to preserve documents or other materials known to be relevant to such investigation or the willful inducement of others to fail to cooperate or to produce documents or other materials in connection with such investigation.

(e) “Change in Control” means any of the following:

(i) any “person,” as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended (the “Act”) (other than the Company, any of its subsidiaries, or any trustee, fiduciary or other person or entity holding securities under any employee benefit plan or trust of the Company or any of its subsidiaries), together with all “affiliates” and “associates” (as such terms are defined in Rule 12b-2 under the Act) of such person, shall become the “beneficial owner” (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, of securities of the Company representing 50 percent or more of the combined voting power of the Company’s then outstanding securities having the right to vote in an election of the Board (“Voting Securities”) (in such case other than as a result of an acquisition of securities directly from the Company); or

(ii) the consummation of (A) any consolidation or merger of the Company where the stockholders of the Company, immediately prior to the consolidation or merger, would not, immediately after the consolidation or merger, beneficially own (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, shares representing in the aggregate more than 50 percent of the voting shares of the Company issuing cash or securities in the consolidation or merger (or of its ultimate parent corporation, if any), or (B) any sale or other transfer (in one transaction or a series of transactions contemplated or arranged by any party as a single plan) of all or substantially all of the assets of the Company.

Notwithstanding the foregoing, a “Change in Control” shall not be deemed to have occurred for purposes of the foregoing clause (i) solely as the result of an acquisition of securities by the Company which, by reducing the number of shares of Voting Securities outstanding, increases the proportionate number of Voting Securities beneficially owned by any person to 50 percent or more of the combined voting power of all of the then outstanding Voting Securities; provided, however, that if any person referred to in this sentence shall thereafter become the beneficial owner of any additional shares of Voting Securities (other than pursuant to a stock split, stock dividend, or similar transaction or as a result of an acquisition of securities directly from the Company) and immediately thereafter beneficially owns 50 percent or more of the combined voting power of all of the then outstanding Voting Securities, then a “Change in Control” shall be deemed to have occurred for purposes of the foregoing clause (i).

(f) “Change in Control Date” means with respect to each Change in Control Performance Measurement Period, the last day of the month immediately preceding the effective date of the Change in Control.

(g) “Change in Control Performance Measurement Period” means the Performance Measurement Period that is shortened by the Committee such that such period shall be deemed to have concluded as of the Change in Control Date.

- (h) “Change in Control Terminating Event” means during the 18-month period following the occurrence of a Change in Control, any of the following events: (i) termination by the Company of the Participant’s employment for any reason other than for Cause, death or disability; or (ii) the termination by the Participant of his or her employment with the Company for Good Reason. Notwithstanding the foregoing, a Change in Control Terminating Event shall not be deemed to have occurred herein solely as a result of the Participant being an employee of any direct or indirect successor to the business or assets of the Company.
- (i) “Closing Index Value” means the Performance Measurement Index Value as of the last day of the Performance Measurement Period.
- (j) “Closing Stock Price” means the Stock Price as of the last day of the Performance Measurement Period.
- (k) “Code” means Internal Revenue Code of 1986, as amended.
- (l) “Committee” means the Compensation Committee of the Board.
- (m) “Effective Date” means as of January 1, 2018.
- (n) “Good Reason” means that the Participant has complied with the “Good Reason Process” (hereinafter defined) following the occurrence of any of the following events:
 - (i) a material diminution in the Participant’s responsibilities, authority or duties; or
 - (ii) a material reduction in the Participant’s Base Salary and Target Bonus except for across-the-board salary reductions similarly affecting all or substantially all management employees; or
 - (iii) a material change in the geographic location at which the Participant is principally employed.

For purposes of this Section 2(n)(i), a change in the reporting relationship, or a change in a title will not, by itself, be sufficient to constitute a material diminution of responsibilities, authority or duty.

- (o) “Good Reason Process” means:
 - (i) the Participant reasonably determines in good faith that a “Good Reason” condition has occurred;
 - (ii) the Participant notifies the Company in writing of the occurrence of the Good Reason condition within 60 days of the first occurrence of such condition;
 - (iii) the Participant cooperates in good faith with the Company’s efforts, for a period not less than 30 days following such notice (the “Cure Period”), to remedy the condition;
 - (iv) notwithstanding such efforts, the Good Reason condition continues to exist following the Cure Period; and

(v) the Participant terminates his or her employment within 30 days after the end of the Cure Period.

If the Company cures the Good Reason condition during the Cure Period, Good Reason shall be deemed not to have occurred.

- (p) “Initial Index Value” means, the Performance Measurement Index Value as of January 1 of the first calendar year in any Performance Measurement Period.
- (q) “Initial Stock Price” means the Stock Price as of January 1 of the first calendar year in any Performance Measurement Period.
- (r) “Participant” means an executive or employee of the Company selected by the Committee to participate in the Plan.
- (s) “Performance Measurement Index” means the NASDAQ Composite Index (^IXIC), or, in the event such index is discontinued or its methodology significantly changed, a comparable index selected by the Committee in good faith.
- (t) “Performance Measurement Index Value” means, with respect to any date, the average value of the Performance Measurement Index for the ten consecutive trading days immediately preceding such date.
- (u) “Performance Measurement Period” means a three-year period commencing on January 1 and ending on the third December 31 thereafter. There shall be overlapping Performance Measurement Periods. The first Performance Measurement Period under the Plan will commence on January 1, 2018 and subsequent Performance Measurement Periods will commence on each January 1 thereafter while the Plan is effective.
- (v) “Performance Multiplier” means the percentage between 0% and 200% by which the applicable portion of the Target Award is multiplied to determine the number of credited Restricted Stock Units for the Performance Measurement Period.
- (w) “Restricted Stock Units” means the stock units of the Company to be settled in shares of Stock.
- (x) “Stock” means the Company’s common stock, par value \$0.01 per share.
- (y) “Stock Price” means, as of a particular date, the average closing price of one share of Stock for the ten consecutive trading days ending on, and including, such date; provided however, that in the event of a Change in Control of the Company, the Stock Price shall equal the fair market value, as determined by the Committee in its discretion, of the total consideration paid or payable in the transaction resulting in the Change in Control for one share of Stock.
- (z) “Target Award” means the target number of Restricted Stock Units that comprise a Participant’s Award for each Performance Measurement Period, as set forth in the Participant’s Award Notice.

- (aa) “Total Shareholder Return” means, with respect to a Performance Measurement Period, the total percentage return per share, achieved by the Stock assuming contemporaneous reinvestment in the Stock of all dividends and other distributions (excluding dividends and distributions paid in the form of additional shares of Stock) at the closing price of one share of Stock on the date such dividend or other distribution was paid, based on the Initial Stock Price, and the Closing Stock Price for the last day of the applicable Performance Measurement Period.

3. Administration

(a) The Plan shall be administered by the Committee. The Committee shall have the discretionary authority to make all determinations (including, without limitation, the interpretation and construction of the Plan and the determination of relevant facts) regarding the entitlement to any Award hereunder and the amount of any Award to be paid under the Plan (including the number of shares of Stock issuable to any Participant), provided such determinations are made in good faith and are consistent with the purpose and intent of the Plan. In particular, but without limitation and subject to the foregoing, the Committee shall have the authority:

- (i) to select Participants under the Plan;
- (ii) to determine the number and length of each Performance Measurement Period;
- (iii) to determine the Target Award and any formula or criteria for the determination of the Target Award for each Participant;
- (iv) to determine the terms and conditions, not inconsistent with the terms of this Plan, which shall govern Award Notices and all other written instruments evidencing an Award hereunder, including the waiver or modification of any such conditions;
- (v) to adopt, alter and repeal such administrative rules, guidelines and practices governing the Plan as it shall from time to time deem advisable; and
- (vi) to interpret the terms and provisions of the Plan and any Award granted under the Plan (and any Award Notices or other agreements relating thereto) and to otherwise supervise the administration of the Plan.

(b) Notwithstanding anything herein to the contrary, the Committee may, in its discretion, make appropriate adjustments to any Award, any Target Award, any Initial Stock Price, any Closing Stock Price or the Total Shareholder Return for any period in connection with or as a result of any of the following events which occur or have occurred after the Effective Date: reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Company’s capital stock, if the outstanding shares of Stock are increased or decreased or are exchanged for a different number or kind of shares or other securities of the Company, or additional shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such shares of Stock or other securities.

(c) Subject to the terms hereof, all decisions made by the Committee pursuant to the Plan shall be final, conclusive and binding on all persons, including the Company and the Participants. No

member of the Board or the Committee, nor any officer or employee of the Company acting on behalf of the Board or the Committee shall be personally liable for any action, determination or interpretation taken or made in good faith with respect to the Plan, and all members of the Board or Committee and each and any officer or employee of the Company acting on their behalf shall, to the extent permitted by law, be fully indemnified and protected by the Company in respect of any such action, determination or interpretation.

4. Determination and Payment of Awards

(a) Measurement Period Target. Each Participant’s Award Notice shall specify such Participant’s Target Award, and the portion of which shall be eligible to be credited for the Performance Measurement Period (the “Measurement Period Target”). The Target Award shall be expressed as a number of Restricted Stock Units. The percentage of the Measurement Period Target that is eligible to be credited shall be determined by reference to the Company’s performance for the Performance Measurement Period as measured by the Total Shareholder Return relative to the percentage appreciation of the Performance Measurement Index for such calendar year or years. The percentage appreciation of the Performance Measurement Index shall be established by comparing the Initial Index Value to the Closing Index Value.

(b) Performance Multiplier: If Total Shareholder Return for a Performance Measurement Period is less than the Performance Measurement Index, the Performance Multiplier shall be 100% minus A, where A is (the amount by which the Performance Measurement Index exceeds Total Shareholder Return) times three; provided however that the Performance Multiplier shall be zero if A results in a number greater than 75. If Total Shareholder Return for a Performance Measurement Period, is equal to the Performance Measurement Index, the Performance Multiplier shall be 100%. If Total Shareholder Return for a Performance Measurement Period is greater than the Performance Measurement Index, the Performance Multiplier is 100% plus B, where B is (the amount by which Total Shareholder Return exceeds the Performance Measurement Index) times two.

In no event will any portion of a Participant’s Target Award be credited for a Performance Measurement Period in which either: (A) the Performance Multiplier calculates to a number of less than 25% (i.e., in such event the Performance Multiplier shall be 0% for such Performance Measurement Period); or (ii) both absolute Total Shareholder Return and relative Total Shareholder Return (i.e., where Total Shareholder Return is less than the Performance Measurement Index) are negative. For purposes of clarity, see the following examples:

Sample ANSYS Total Shareholder Return	Sample Performance Measurement Index	Difference between Sample ANSYS TSR & Performance Measurement Index	2018 Performance Multiplier
40	15	+25	200%
40	30	+10	140%
40	40	0	100%
40	42	-2	94%
40	56	-16	52%
40	65	-25	25%
40	70	-30	0%
-10	-20	+10	100%
-10	-5	-5	0%

Notwithstanding the foregoing, in no event shall the Performance Multiplier be less than 0% or exceed 200%, regardless of a Total Shareholder Return that would result in a Performance Multiplier of less than 0% or in excess of 200%.

Notwithstanding the foregoing, if the Total Shareholder Return in a Performance Measurement Period is a negative percentage, then a maximum of 100% of the Measurement Period Target may be credited for such period, even if the Total Shareholder Return relative to the median percentage appreciation (depreciation) of the Performance TSR Measurement Index would result in a greater Performance Multiplier.

(c) Committee Determination. The Committee, at its first meeting following the conclusion of a Performance Measurement Period, shall determine the actual number of Restricted Stock Units that will be deemed to have been credited as of the final day of such Performance Measurement Period. The number of Restricted Stock Units credited for such period shall equal the Measurement Period Target multiplied by the Performance Multiplier, subject to the terms and conditions hereof.

(d) Vesting and Settlement. Subject to Section 5, as soon as practicable (but in no event later than 74 days) following the conclusion of the Performance Measurement Period, the Restricted Stock Units that were credited, if any, for the Performance Measurement Period will be vested and settled in an equal number of shares of Stock.

5. Termination of Employment. Unless otherwise provided in any Award Notice or as provided in Section 6 below, if at any time prior to the conclusion of a Performance Measurement Period, a Participant’s employment with the Company terminates for any reason, such Participant shall automatically forfeit the right to receive any Award credited as of the date of termination of employment.

6. Change in Control. Unless otherwise provided in any Award Notice, upon a Change in Control of the Company, the following shall occur:

(a) With respect to each Change In Control Performance Measurement Period, the Committee, in accordance with Section 4, shall determine the actual number of Restricted Stock Units that are eligible to be credited based on the Total Shareholder Return for the Change in Control Performance Measurement Period relative to the median percentage appreciation of the Performance Measurement Index for such Change in Control Performance Measurement Period and such Award shall not be deemed fully vested until the conclusion of the Performance Measurement Period, subject to the continued employment of the Participant through such date. For example, if a Change in Control occurs during the eleventh month of the Performance Measurement Period, the Committee shall determine the number of Restricted Stock Units that are eligible to be credited with respect to the applicable Change in Control Performance Measurement Period based on performance for such period, but the Award shall not be deemed vested and will not be settled until the end of the full 36 month Performance Measurement Period. For the avoidance of doubt, since the Plan contemplates overlapping Performance Measurement Periods, there may be up to three different Change In Control Performance Measurement Periods.

(b) In the event that subsequent to a Change in Control, a Participant's employment with the Company terminates for any reason other than a Change in Control Terminating Event, such Participant shall automatically forfeit the right to receive all outstanding Awards that have been credited as of the date of termination of employment.

(c) In the event a Change in Control Terminating Event occurs with respect to a Participant, all outstanding Awards held by such Participant shall immediately vest and become payable.

(d) If as a result of a Change in Control, no Stock remains outstanding and the surviving corporation (or its ultimate parent) does not agree to convert the Awards into a number of restricted stock units of equivalent value of the surviving corporation (or its ultimate parent), then the Awards shall be converted to a dollar value based on the Stock Price.

7. Miscellaneous

- (a) Amendment and Termination. The Company reserves the right to amend or terminate the Plan at any time in its discretion without the consent of any Participants, but no such amendment shall adversely affect the rights of the Participants with regard to outstanding Awards. In the event the Plan is terminated, the Company shall determine the Awards payable to Participants based on the Total Shareholder Return relative to the Performance Measurement Index for each Performance Measurement Period ending on the date of Plan termination. The Awards for each Performance Measurement Period shall be further prorated to reflect the shortened Performance Measurement Period.
- (b) No Contract for Continuing Services. This Plan shall not be construed as creating any contract for continued services between the Company or any of its subsidiaries and any Participant and nothing herein contained shall give any Participant the right to be retained as an employee or consultant of the Company or any of its subsidiaries.
- (c) No Transfers. A Participant's rights in an interest under the Plan may not be assigned or transferred.

- (d) Unfunded Plan. The Plan shall be unfunded and shall not create (or be construed to create) a trust or separate fund. Likewise, the Plan shall not establish any fiduciary relationship between the Company or any of subsidiaries or affiliates and any Participant. To the extent that any Participant holds any rights by virtue of an Award under the Plan, such right shall be no greater than the right of an unsecured general creditor of the Company or any of its subsidiaries.
- (e) Governing Law. The Plan and each Award Notice awarded under the Plan shall be construed in accordance with and governed the laws of the State of Delaware, without regard to principles of conflict of laws of such state.
- (f) Tax Withholding. Any issuance of shares of Stock to a Participant shall be subject to tax withholding. The minimum tax withholding obligation shall be satisfied through a net issuance of shares. The Company shall withhold from shares of Stock to be issued to the Participant a number of shares of Stock with an aggregate fair market value that would satisfy the minimum withholding amount due.
- (g) Construction. Wherever appropriate, the use of the masculine gender shall be extended to include the feminine and/or neuter or vice versa; and the singular form of words shall be extended to include the plural; and the plural shall be restricted to mean the singular.
- (h) Headings. The Section headings and Section numbers are included solely for ease of reference. If there is any conflict between such headings or numbers and the text of this Plan, the text shall control.
- (i) Effect on Other Plans. Nothing in this Plan shall be construed to limit the rights of Participants under the Company's or its subsidiaries' benefit plans, programs or policies.
- (j) Effective Date. The Plan shall be effective as of the Effective Date.

8. Section 409A.

- (a) All payments and benefits described in this Plan are intended to constitute a short term deferral for purposes of Section 409A of the Internal Revenue Code of 1986, as amended. To the extent that any payment or benefit described in this Plan constitutes "non-qualified deferred compensation" under Section 409A of the Code, and to the extent that such payment or benefit is payable upon the Participant's termination of employment, then such payments or benefits shall be payable only upon the Participant's "separation from service." The determination of whether and when a separation from service has occurred shall be made in accordance with the presumptions set forth in Treasury Regulation Section 1.409A-1(h).
- (b) The parties intend that this Plan will be administered in accordance with Section 409A of the Code. To the extent that any provision of this Plan is ambiguous as to its compliance with Section 409A of the Code, the provision shall be read in such a manner so that all payments hereunder comply with Section 409A of the Code. The parties agree that this Plan may be amended, as reasonably requested by either party, and as may be necessary to fully comply with Section 409A of the Code and all related rules and regulations in

order to preserve the payments and benefits provided hereunder without additional cost to either party.

- (c) The Company makes no representation or warranty and shall have no liability to the Participant or any other person if any provisions of this Plan are determined to constitute deferred compensation subject to Section 409A of the Code but do not satisfy an exemption from, or the conditions of, such Section.

INTERNATIONAL APPENDIX

Additional Terms and Conditions

Terms and Conditions

This International Appendix includes additional terms and conditions that govern the award granted to you under the Plan for your country. Certain capitalized terms used but not defined in this International Appendix have the meanings set forth in the Plan and the Agreement that relate to your award. By acceptance of the award you agree to be bound by the terms and conditions contained in the paragraphs below in addition to the terms of the Plan and the Agreement and the terms of any other document that may apply to you and your award.

Notifications

This International Appendix also includes information regarding issues of which you should be aware with respect to participation in the Plan. The information is based on the securities, exchange control, and other laws in effect in the respective countries as of the date set forth above. Such laws are often complex and change frequently. As a result, it is strongly recommended that you not rely on the information in this International Appendix as the only source of information relating to the consequences of your participation in the Plan because the information may be out of date at the time you vest in your award or sell shares acquired under the Plan.

The information contained herein is general in nature and may not apply to your particular situation, and the Company is not in a position to assure you of a particular result. In addition, please note that the requirements may differ for residents and non-residents. Accordingly, you are advised to seek appropriate professional advice as to how the relevant laws in your country may apply to your situation.

Finally, if you are a citizen or resident of a country other than the one in which you are currently working, transferred employment to another country after the award was granted to you, or are considered a resident of another country for local law purposes, the information contained herein may not apply.

Provisions Applicable to all International Awards

Data Privacy. The Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Participant's personal data by and among, as applicable, the Company, its subsidiaries and affiliates, for the exclusive purpose of implementing, administering and managing the Participant's participation in the Plan. The Participant hereby understands that the Company, its subsidiaries and affiliates hold (but only process or transfer to the extent required or permitted by local law) certain personal information about the Participant, including, but not limited to, the Participant's name, home address and telephone number, date of birth, social insurance number or other identification number, salary, nationality, job title, any Shares or directorships held in the Company, details of all Restricted Stock Units or any other entitlement to Shares awarded, canceled, exercised,

vested, unvested or outstanding in the Participant's favor, for the purpose of implementing, administering and managing the Plan ("Data"). The Participant hereby understands that Data may be transferred to any third parties assisting in the implementation, administration and management of the Plan, that these recipients may be located in the Participant's country or elsewhere (including countries outside of the European Economic Area such as the United States of America), and that the recipient's country may have different data privacy laws and protections than the Participant's country. The Participant hereby understands that the Participant may request a list with the names and addresses of any potential recipients of the Data by contacting the Participant's local human resources representative. The Participant authorizes the recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the purposes of implementing, administering and managing the Participant's participation in the Plan, including any requisite transfer of such Data as may be required to a broker or other third party with whom the Participant may elect to deposit any Shares acquired upon exercise. The Participant hereby understands that Data will be held only as long as is necessary to implement, administer and manage the Participant's participation in the Plan and in accordance with local law. The Participant hereby understands that the Participant may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing the Participant's local human resources representative. The Participant hereby understands, however, that refusing or withdrawing the Participant's consent may affect the Participant's ability to participate in the Plan. For more information on the consequences of the Participant's refusal to consent or withdrawal of consent, the Participant hereby understands that the Participant may contact the Participant's local human resources representative.

Nature of Grant. In accepting the grant of Restricted Stock Units, the Participant acknowledges that:

- (a) the Plan is established voluntarily by the Company, is discretionary in nature and may be modified, amended, suspended or terminated by the Company at any time, unless otherwise provided in the Plan and this Agreement;
- (b) the grant of Restricted Stock Units is voluntary and occasional and does not create any contractual or other right to receive future grants of Restricted Stock Units, or benefits in lieu of Restricted Stock Units, even if Restricted Stock Units have been granted repeatedly in the past;
- (c) all decisions with respect to future Restricted Stock Units, if any, will be at the sole discretion of the Company;

(d) the Participant's participation in the Plan will not create a right to further employment with the Participant's employer (the "Employer") and shall not interfere with the ability of the Employer to terminate the Participant's employment relationship;

(e) the Participant is voluntarily participating in the Plan;

(f) the Restricted Stock Units are an extraordinary item that does not constitute compensation of any kind for services of any kind rendered to the Company or the Employer, and which is outside the scope of the Participant's employment contract, if any;

(g) the Restricted Stock Units are not part of normal or expected compensation or salary for any purposes, including, but not limited to, calculating any severance, resignation, termination, redundancy, end of service payments, bonuses, long-service awards, pension or retirement benefits or similar payments and in no event should be considered as compensation for, or relating in any way to, past services for the Company or the Employer;

(h) in the event that the Participant is not an employee of the Company, the grant of Restricted Stock Units will not be interpreted to form an employment contract or relationship with the Company; and furthermore, the grant of Restricted Stock Units will not be interpreted to form an employment contract with the Employer or any subsidiary or affiliate of the Company;

(i) the future value of the underlying Shares is unknown and cannot be predicted with certainty;

(j) if the Participant vests in the Restricted Stock Units and obtains Shares, the value of those Shares may increase or decrease in value;

(k) in consideration of the grant of the Restricted Stock Units, no claim or entitlement to compensation or damages shall arise from termination of the Restricted Stock Units or diminution in value of the Restricted Stock Units or Shares acquired resulting from termination of the Participant's employment by the Company or the Employer, and the Participant irrevocably releases the Company and the Employer from any such claim that may arise; if, notwithstanding the foregoing, any such claim is found by a court of competent jurisdiction to have arisen, then, by signing this Agreement, the Participant will be deemed irrevocably to have waived his or her entitlement to pursue such claim; and

(l) in the event of termination of the Participant's employment, Participant's right to receive the Restricted Stock Units and vest in the Restricted Stock Units under the Plan, if any, will terminate effective as of the date that the Participant is no longer actively employed.

Country-Specific Language

Below please find country-specific language that applies to you if you are a citizen or resident of one of the following countries: Belgium, Canada, France, Germany, India, Italy, Japan, South Korea, Spain, Sweden, Switzerland, Taiwan and United Kingdom.

BELGIUM

Notifications

Tax Reporting Information. Participants are required to report any bank accounts opened and maintained outside Belgium on their annual tax return.

CANADA

Terms and Conditions

Restricted Stock Units Settled in Shares Only. Notwithstanding anything to the contrary in the Plan and/or the Agreement, you understand that any Restricted Stock Units granted to you shall be paid in shares only and do not provide any right for you to receive a cash payment.

The following provision will apply to residents of Quebec:

Language Consent. The parties to the Agreement have expressly required that the Agreement and all documents and notices relating to the Agreement be drafted in English.

Les parties aux présentes ont expressément exigé que la présente convention et tous les documents et avis qui y sont afférents soient rédigés en anglais.

Notifications

Additional Restrictions on Resale. In addition to the restrictions on resale and transfer noted in Plan materials, securities purchased under the Plan may be subject to certain restrictions on resale imposed by Canadian provincial securities laws. Participants are encouraged to seek legal advice prior to any resale of such securities. In general, Participants resident in Canada may resell their securities in transactions carried out on exchanges outside of Canada.

Tax Reporting. The Tax Act and the regulations thereunder require a Canadian resident individual (among others) to file an information return disclosing prescribed information where, at any time in a tax year, the total cost amount of such individual's "specified foreign property" (which includes shares) exceeds Cdn.\$100,000. Participants should consult their own tax advisor regarding this reporting requirement.

FRANCE

Notifications

Exchange Control Information. If a Participant imports or exports cash (*e.g.*, sale proceeds received under the Plan) with a value equal to or exceeding €10,000 and does not use a financial institution to do so, Participant must submit a report to the customs and excise authorities. If Participant maintains a foreign bank account, Participant is required to report such account to the French tax authorities when filing his/her annual tax return.

GERMANY

Notifications

Exchange Control Information. Cross-border payments in excess of €12,500 must be reported monthly to the German Federal Bank. If a Participant uses a German bank to transfer a cross-border payment in excess of €12,500 in connection with the sale of Shares acquired under the Plan, the bank will file the report for the Participant.

INDIA

Terms and Conditions

Repatriation of Proceeds. You understand that you must repatriate any proceeds from the sale of Shares acquired upon vesting of the Restricted Stock Units to India and convert the proceeds into local currency within 90 days of receipt. You will receive a foreign inward remittance certificate ("FIRC") from the bank where you deposit the foreign currency. You should maintain the FIRC as evidence of the repatriation of funds in the event the Reserve Bank of India or your employer requests proof of repatriation.

Notifications

Tax Information. The amount subject to tax at vesting may partially be dependent upon a valuation of Shares from a Merchant Banker in India. The Company has no responsibility or obligation to obtain the most favorable valuation possible nor obtain valuations more frequently than required under Indian tax law.

ITALY

Terms and Conditions

Data Privacy. In addition to the data privacy provision that is set forth above, by accepting the grant of Restricted Stock Units, you also consent to the following additional data privacy-related terms:

I am aware that providing the Company and my employer with Data is necessary for participation in the Plan and that my refusal to provide such Data may affect my ability to participate in the Plan. The Controller of personal data processing is Ansys, Inc., with registered offices at 2600 Ansys Drive, Canonsburg, PA 15317 and, pursuant to D.lgs 196/2003, its representative in Italy is ANSYS Italia Srl with registered offices at via G. B. Pergolesi n. 25 20124 Milano MI Italy.

I understand that I may at any time exercise the rights acknowledged by Section 7 of Legislative Decree June 30, 2003 n.196, including, but not limited to, the right to access, delete, update, request the rectification of my Data and cease, for legitimate reasons, the data processing. Furthermore, I am aware that my Data will not be used for direct marketing purposes.

Notifications

Exchange Control Information. By September 30th of each year, the Participants are required to report on their annual tax return (Form RW) any foreign investments (including proceeds from the sale of Shares acquired upon vesting) held outside of Italy if the investment may give rise to income in Italy. However, deposits and bank accounts held outside of Italy only need to be disclosed if the value of the assets exceeds €10,000 during any part of the tax year.

With respect to Shares received upon vesting of the Restricted Stock Units, the Participants must report (i) the value of the Shares at the beginning of the year or on the day the Participant acquired the Shares, whichever is later; and (ii) the value of the Shares when sold, or if the Participant still owns the Shares at the end of the year, the value of the Shares at the end of the year. The value to be reported is the fair market value of the Shares on the applicable dates mentioned above.

JAPAN

Notifications

Exchange Control Information. If you acquire Shares valued at more than ¥100,000,000 in a single transaction, you must file a Securities Acquisition Report with the Ministry of Finance through the Bank of Japan within 20 days of the acquisition of the Shares.

SOUTH KOREA

Notifications

Exchange Control Information. If you receive US\$500,000 or more from the sale of underlying Shares, Korean exchange control laws require you to repatriate the proceeds to South Korea within 18 months of sale.

SPAIN

Notifications

Exchange Control Information. All acquisitions of foreign shares by Spanish residents must comply with exchange control regulations in Spain. Because of foreign investment requirements, the acquisition of Shares upon vesting of the Restricted Stock Units must be declared for statistical purposes to the Spanish Direccion General de Politica Comercial y de Inversiones Extranjeras (the “DGPCIE”). If you acquire Shares through the use of a Spanish financial institution, that institution will automatically make the declaration to the DGPCIE for you. Otherwise, you must make the declaration by filing a form with the DGPCIE.

If you import the Shares acquired upon vesting of the Restricted Stock Units into Spain, you must declare the importation of the share certificates to the DGPCIE.

In addition, you must also file a declaration of the ownership of the Shares with the Directorate of Foreign Transactions each January while the shares are owned. These filings are made on standard forms furnished by the Directorate of Foreign Transactions.

When you receive any foreign currency payments (*i.e.*, as a result of the sale of the Shares), you must inform the institution receiving the payment of the basis upon which such payment is made and provide certain specific information (*e.g.*, name, address, and fiscal identification number; the name and corporate domicile of the company; the amount of the payment; the type of foreign currency received; the country of origin; and the reason for the payment).

Tax Reporting. If you hold assets (*e.g.*, cash or shares in a bank or brokerage account) or rights outside Spain that exceed €50,000 per type of asset, you must file a Form 720 with the Spanish Tax Authorities by April 30th of each year.

SWITZERLAND

Notifications

Securities Law Information. The offer of the Restricted Stock Units is considered a private offering in Switzerland and is not subject to registration in Switzerland.

TAIWAN

Notifications

Exchange Control Information. Taiwan's foreign exchange control regulations may have an impact on the grant and vesting of the Restricted Stock Units as well as the repatriation of capital gains realized from the holding or sale of the underlying Shares. Under current foreign exchange regulations, a Taiwanese resident can remit up to US \$5 million (or an equivalent amount of other foreign currencies) per year into or out of Taiwan without prior approval from the Taiwan Central Bank.

If the transaction amount is TWD500,000 or more in a single transaction, you must submit a Foreign Exchange Transaction Form. If the transaction amount is US\$500,000 or more in a single transaction, you must also provide supporting documentation to the satisfaction of the remitting bank.

UNITED KINGDOM

Terms and Conditions

(i) Purpose. This section is to modify those provisions of the Plan in order for awards made under the Plan, and communications concerning those awards, to be exempt from provisions of the United Kingdom Financial Services and Markets Act 2000 (the "FSMA").

(ii) Application. These provisions shall be used solely to grant awards to employees of the Company or any member of the same group as the Company resident and providing services in the United Kingdom. (The term "group" in relation to the Company shall bear the meaning given to such term in section 421 of the FSMA.)

(iii) Restricted Delivery of Awards. Payments of benefits under these provisions shall be made only in Shares or such other securities of the Company that may arise from such Shares under the adjustment provisions of the Plan. For the avoidance of doubt, and without limitation, no cash settlement of awards (including dividends or dividend equivalent payments in cash) shall be permissible.

(iv) Exercise of Restricted Stock Units/Vesting of Awards. The Administrator may specify, in its discretion, any other conditions of exercise and/or vesting of awards that will be specified in the award agreement.

(v) Restricted Transfer of Rights. The persons to whom rights under awards may be assigned or transferred, whether by will or the laws of descent and distribution or any transferability of awards shall be limited to a Participant's children and step-children under the age of eighteen, spouses and surviving spouses and civil partners and civil partners (within the meaning of the United Kingdom Civil Partnerships Act 2004) and surviving partners.

(vi) Tax. All awards will be subject to tax withholding and all references to "tax" shall be read and construed as including, without limitation, United Kingdom income tax and primary class 1 (employee's) national insurance contributions that the Participant's employer is liable to account for and, if so agreed between the Company and the Participant, secondary class 1 (employer's) national insurance contributions that the Participant's employer is liable to account for.

AWARD NOTICE
UNDER THE FIFTH AMENDED AND RESTATED
ANSYS, INC. 1996 STOCK OPTION AND GRANT PLAN

Name of Participant:

Target Award:

Grant Date of Target Award:

Performance Cycles: January 1, 2019 to December 31, 2019

January 1, 2020 to December 31, 2020

January 1, 2021 to December 31, 2021

Pursuant to the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (the “Plan”), ANSYS, Inc., a Delaware corporation, (the “Company”) has selected the Participant named above to be awarded the Target Award specified above, subject to the terms and conditions of the Plan and this Award Notice. Capitalized terms used but not defined in this Award Notice shall have the meaning given such terms in the Plan. A copy of the Plan is attached hereto as Exhibit A.

1. Acceptance of Award. The total number of Restricted Stock Units that may be credited to the Participant (if any) shall be determined by the Company’s performance for the Performance Cycles specified above, as set forth in Section 5 below. One third of the Target Award is eligible to be credited for each Performance Cycle (the “Annual Target”). The actual number of Restricted Stock Units that may be credited could be up to 200% of the Target Award and could also be lower than the Target Award and could be zero.

2. Termination of Employment. Subject to Sections 3 and 5(a) below, a Participant must be employed through the last day of the final Performance Cycle to vest in any of the Restricted Stock Units that may be credited with respect to all three Performance Cycles, and all Restricted Stock Units not yet vested upon the termination of the Participant’s employment with the Company (or a Subsidiary(ies) as applicable) for any reason shall automatically be forfeited as of the date of termination of employment.

Notwithstanding the foregoing, if the Participant’s employment with the Company is terminated on account of the Participant’s death or Disability (as defined below), any Restricted Stock Units that are not vested will remain eligible to vest in accordance with their terms based upon achievement of the applicable performance condition and subject to the Company’s certification of the performance metric attainment but on a prorated basis based upon the number of months that the Participant provided services as a Participant to the Company prior to the Participant’s death or Disability during the applicable performance period. For purposes hereof, “Disability” shall mean the Participant’s termination of employment with the Company: (i) after becoming eligible to receive benefits under the Company’s then current long-term disability plan that is applicable to the Participant; (ii) where the Participant is not eligible under a Company long-term disability plan, after being officially declared permanently disabled under the mandatorily applicable health or welfare

regulations of the applicable jurisdiction; or, (iii) in the absence of such a determination under said regulations, after being officially declared permanently disabled by a physician appointed by the Company in its sole discretion.

3. Transaction. Upon a Transaction, the Award shall be treated as specified in Section 3(c) of the Plan.

4. Issuance of Shares.

(a) Each Restricted Stock Unit relates to one share of the Company's Stock. Shares of Stock (if any) shall be issued in settlement of any credited Restricted Stock Units within 74 days after the end of the final Performance Cycle, subject to the Participant's continued employment with the Company through the last day of the final Performance Cycle. Shares of Stock (if any) shall be delivered to the Participant in accordance with the terms of this Award Notice and of the Plan, upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Participant.

(b) Until such time as shares of Stock are issued to the Participant pursuant to the terms hereof and of the Plan, the Participant shall have no rights as a stockholder with respect to any shares of Stock underlying the Restricted Stock Units, including but not limited to any voting rights.

5. Determination and Payment of Awards

(a) The Annual Target shall become credited based on achievement by the Company of the Performance Criteria for the applicable Performance Cycle as set forth in Exhibit B attached hereto (as updated for each Performance Cycle) and incorporated herein by reference, subject to the Participant's continued employment with the Company through the conclusion of the final Performance Cycle. For purposes of clarity and by way of example: If, during the Performance Cycle ending December 31, 2018, the Participant is credited 75% of the Annual Target for the 2018 Performance Cycle, determined by reference to the Performance Criteria included in Exhibit B, 25% of the Annual Target shall be forfeited and the credited Restricted Stock Units (75% of the Annual Target) shall vest and be settled if the Participant remains employed through the last day of the end of the final Performance Cycle.

(b) For purposes of this Section 5, the following definitions shall apply:

(i) "Revenue" means non-GAAP revenue as reported in the Company's public filings.

(ii) "Operating Margin" means non-GAAP operating margin percent as reported in the Company's public filings.

(c) For purposes of the foregoing definitions, (1) there shall be constant currency measurement for both Revenue compared to the prior year and Operating Margin; (1) future years' annual performance targets will be designed to exclude future acquisitions depending on the closing date, subject to the Committee's discretion; and (iii) the Committee shall assess the materiality of any merger or acquisition and reserves the discretion to determine the impact thereof on the applicable targets.

(d) The Committee, at its first regular meeting following the conclusion of each Performance Cycle and the delivery to the Company of its audited financial statements for such Performance Cycle, shall determine the actual number of Restricted Stock Units that will be deemed to have been credited as of the final day of such Performance Cycle, in accordance with the Performance Criteria set forth in Exhibit B.

(e) Notwithstanding the foregoing, as soon as practicable (but in no event later than 74 days) following the conclusion of the final (third) Performance Cycle, the Restricted Stock Units that were credited over all three Performance Cycles, if any, will vest and be settled in an equal number of shares of Stock, subject to the Participant's continued employment with the Company.

6. Non-Competition and Non-Solicitation. As additional consideration for the grant of this Award to the Participant, the Participant hereby agrees that he or she shall not, at anytime during his or her employment with the Company or any Subsidiary, **[for non-California employees only:** and for a period of one year immediately after the termination of such employment (no matter if terminated by the Participant or the Company and no matter what the reason for that termination),] engage for any reason, directly or indirectly, whether as owner, part-owner, shareholder, member, partner, director, officer, trustee, employee, agent or consultant, or in any other capacity, on behalf of himself or herself or any firm, corporation or other business organization other than the Company and its subsidiaries, in any one or more of the following activities:

(a) the development, marketing, solicitation, or selling of any product or service that is competitive with the products or services of the Company, or products or services that the Company has under development or that are subject to active planning at any time during Participant's employment;

(b) the use of any of the Company's confidential or proprietary information, copyrights, patents or trade secrets which was acquired by the Participant as an employee of the Company and its subsidiaries; or

(c) any activity for the purpose of inducing, encouraging, or arranging for the employment or engagement by anyone other than the Company and its subsidiaries of any employee, officer, director, agent, consultant, or sales representative of the Company and its subsidiaries or attempt to engage any of them in a manner which would deprive the Company and its subsidiaries of their services or place them in a conflict of interest with the Company and its subsidiaries.

The Participant acknowledges and agrees that the activities set forth in (a)-(c) (above) are adverse to the Company's interests, and that it would be inequitable for Participant to benefit from this Award should Participant engage in any such activities during or within one year after termination of his or her employment with the Company. The Participant may be released from his or her obligations as stated above only if the Committee (or its duly appointed agent) determines in its sole discretion that such action is in the best interests of the Company and its subsidiaries.

7. Claw-Back of Award Proceeds. The Committee shall have the authority to unilaterally terminate this Award and/or cause some or all of the proceeds relating to this Award that have been received by the Participant to become immediately due and payable by the Participant to the Company upon the occurrence of any of the following events:

- (a) the Participant's violation of Section 6 of this Agreement (entitled Non-Competition and Non-Solicitation);
- (b) the material restatement of the Company's financial statements due to misconduct by the Participant;
- (c) the material restatement of the Company's financial statements that results in the Participant receiving more compensation under the Award than the Participant would have received absent the incorrect financial statements.

The determination of whether any of the foregoing events has occurred and the extent of the application of this Section to the Participant and this Award shall be determined by the Committee in its sole discretion.

8. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award Notice shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 2 of the Plan.

9. Transferability. This Award is personal to the Participant, is non-assignable and is not transferable by Participant in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution. The Stock to be issued upon the vesting of this Award to the Participant shall be issued, during the Participant's lifetime, only to the Participant, and thereafter, only to the Participant's beneficiary. The Participant may designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company.

10. Section 409A. This Award is intended as a short-term deferral, and to not be subject to any tax, penalty, or interest under, Section 409A of the Internal Revenue Code and the regulations promulgated thereunder. This Award, this Agreement and the Plan (as to the Award) shall be construed and interpreted consistent with such intent.

11. Tax Withholding. Any issuance of shares of Stock to a Participant shall be subject to tax withholding. The minimum tax withholding obligation shall be satisfied through a net issuance of shares. The Company shall withhold from shares of Stock to be issued to the Participant a number of shares of Stock with an aggregate fair market value that would satisfy the minimum withholding amount due.

12. No Contract for Continuing Services. Neither the Plan nor this Award Notice shall be construed as creating any contract for continued services between the Company or any of its subsidiaries and the Participant and nothing herein contained shall give the Participant the right to be retained as an employee or consultant of the Company or any of its subsidiaries.

13. Mandatory Arbitration. The Participant and the Company agree that any dispute or claim arising out of or in any way related to (i) the Participant's employment with the Company, and/or (ii) this Agreement or any breach hereof, this Award, the Plan and/or any actions taken under the Plan, to the fullest extent permitted by law, shall be submitted to and resolved by confidential, binding arbitration by a single, neutral arbitrator. The arbitration shall be held in the county where the Company has an office at which the Participant provides services (for remote Participants, the nearest

county where the Company has an office) or any other locale to which the parties jointly agree. The arbitration shall be administered by and under the auspices of JAMS in accordance with the then-current Employment Arbitration Rules & Procedures of JAMS (which are available at www.jamsadr.com/rules-employment). Arbitrator selection and discovery shall be conducted pursuant to the JAMS Rules. The arbitrator shall issue a written award setting forth the essential findings and conclusions on which the award is based, which shall be final and binding and judgment thereon may be entered in any court of competent jurisdiction. Other than an amount equal to the fee for filing such an action in the local state court, which amount the Participant shall pay toward the costs of the arbitration, the Company shall bear the administrative, filing and forum costs of the arbitration, including the JAMS administrative fees and the arbitrator's fees. Except as otherwise provided by law or in the arbitrator's ruling, each party shall otherwise bear its own respective attorneys' fees and costs of the arbitration. The Participant and the Company agree that each may bring claims against the other only in an individual capacity, and not as a plaintiff, claimant or class member in any purported class action, collective action or other representative proceeding, or otherwise seeking to represent the interests of any other person. This agreement to arbitrate shall survive any separation of the Participant's employment. Notwithstanding the foregoing, nothing herein or otherwise shall preclude the Company from pursuing a court action for the purpose of obtaining a temporary restraining order or other injunctive relief to enforce any restrictive covenants the Participant has with or for the benefit of the Company.

14. General Release of Claims by the Participant.

(a) As a condition of and in consideration for the promises made by the Company herein, including without limitation to provide the Award hereunder, the Participant hereby knowingly and voluntarily releases and discharges to the fullest extent permitted by law the Company and its past, present and future parents, subsidiaries, affiliates, and related entities, any and all of its or their past, present or future directors, shareholders, officers, executives, employees, and/or agents, and/or its and their respective predecessors, successors, and assigns (individually and collectively, the "Company Releasees"), from and with respect to any and all claims and causes of action whatsoever, in law or in equity, known or unknown, which the Participant ever had, has or may have against the Company and/or any or all of the other Company Releasees for, upon, or by reason of any matter whatsoever up to the date on which the Participant signs this Agreement (individually and collectively, "Claims"). The parties intend the foregoing to be a general release of any and all Claims to the fullest extent permissible by law. Notwithstanding the foregoing, nothing herein is a release by the Participant of (A) any rights or Claims with respect to accrued and vested benefits and/or previously awarded equity interests, subject in each instance to the terms and conditions of any applicable plan, grant, and/or agreement pertaining to such benefits, awards or interests and applicable law, (B) any rights or Claims arising under or to enforce this Agreement, or (C) any rights or Claims that, under applicable law, cannot lawfully be released by private agreement or otherwise.

(b) **FOR CALIFORNIA RESIDENTS ONLY:** In granting the foregoing release, the Participant acknowledges that he/she has been advised to consult with legal counsel and is familiar with the provision of California Civil Code Section 1542, a statute that otherwise prohibits the release of unknown claims, which provides as follows:

"A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE

TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR.”

Being aware of said Code section, the Participant hereby expressly waives any rights the Participant may have thereunder, as well as under any other state or federal statutes or common law principles of similar effect.

(c) Nothing contained in this Agreement (including the foregoing general release) limits the Participant’s ability to file a charge or complaint with any federal, state or local governmental agency, commission or regulatory entity (a “Government Agency”). If the Participant files any charge or complaint with any Government Agency, if any Government Agency pursues any charge or claim on the Participant’s behalf, or if any other third party pursues any claim or charge on the Participant’s behalf, the Participant waives any right to monetary or other individualized relief (either individually, or as part of any collective or class action); provided, however, that nothing in this Agreement limits any right the Participant may have to receive a whistleblower award or bounty for information provided to the Securities and Exchange Commission. The Participant represents that he/she is not aware of any unlawful conduct or violations of any federal, state or local law, rule or regulation by the Company and/or any other Company Releasees or any basis to bring a charge or complaint to any Government Agency.

15. Notices. Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Participant at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

16. Severability. If any provision(s) hereof shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

17. Counterparts. For the convenience of the parties and to facilitate execution, this document may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

18. Time to Review and Accept; Right to Revoke; Effective Date. The Participant is advised by the Company to consult with an attorney in connection with this Agreement. The Participant understands that as part of his/her agreement to release Claims against the Company and the other Company Releasees, the Participant is releasing Claims for age discrimination under the federal Age Discrimination in Employment Act (the “ADEA”). Accordingly, the Participant has the right, and acknowledges that he/she has been given the opportunity, to review and consider this Agreement for a period of twenty-one (21) days from the Participant’s receipt of this Agreement before signing it (the “Review Period”). To accept this Agreement and the Award granted hereunder, the Participant must return a signed original or signed .pdf copy of this Agreement to: [NAME, TITLE, ADDRESS; E-MAIL ADDRESS] at any time before the end of the Review Period. If the Participant signs this Agreement before the end of the Review Period, the Participant acknowledges that such decision was voluntary and that he/she had the opportunity to consider this Agreement for the full Review Period. For the period of seven (7) days from the date when the Participant signs this Agreement, the Participant has the right to revoke this Agreement by written notice to [NAME, TITLE, ADDRESS; E-MAIL ADDRESS], provided such notice is delivered so that it is received at or

before the expiration of the 7-day revocation period. This Agreement shall not become effective or enforceable during the revocation period. If timely accepted and not revoked by the Participant prior to the end of the revocation period, this Agreement shall become effective on the first business day following the expiration of the revocation period (the "Effective Date"). If not timely accepted or if (after timely signing) the Participant revokes prior to the expiration of the revocation period, this Agreement shall not become effective and the Participant will not be entitled to or receive the Award granted hereunder and/or such Award shall be rescinded.

19. Knowing and Voluntary Agreement. By signing this Agreement, the Participant acknowledges and represents that the Participant (a) has carefully read this Agreement in its entirety; (b) is hereby advised by the Company in writing to consult with an attorney of the Participant's choice before signing this Agreement; (c) has been afforded and has had a full and reasonable opportunity and period of time of at least 21 days to consider the terms and conditions of this Agreement; (d) fully understands the meaning and significance, and consequences, of all of the terms and conditions of this Agreement (including without limitation the general release given by the Participant in this Agreement); and (e) is signing this Agreement knowingly, voluntarily and of the Participant's own free will and with the intent to be fully bound hereby.



ANSYS, Inc.

By: _____

Name: Ajei S. Gopal

Title: President and CEO

The foregoing Award is hereby accepted and the terms and conditions of this Agreement are hereby agreed to by the undersigned. Electronic acceptance of this Award pursuant to the Company's instructions to the Participant (including through an online acceptance process) is acceptable.

Dated: __ __

Participant's signature

Participant's name and address:

%%FIRST_NAME%- %%%LAST_NAME%-%
%%ADDRESS_LINE_1%-%
%%ADDRESS_LINE_2%-%
%%ADDRESS_LINE_3%-%
%%CITY%- %%%STATE%- %%%ZIPCODE%-%
%%COUNTRY%-%

INTERNATIONAL APPENDIX

Additional Terms and Conditions

Terms and Conditions

This International Appendix includes additional terms and conditions that govern the award granted to you under the Plan for your country. Certain capitalized terms used but not defined in this International Appendix have the meanings set forth in the Plan and the Agreement that relate to your award. By acceptance of the award you agree to be bound by the terms and conditions contained in the paragraphs below in addition to the terms of the Plan and the Agreement and the terms of any other document that may apply to you and your award.

Notifications

This International Appendix also includes information regarding issues of which you should be aware with respect to participation in the Plan. The information is based on the securities, exchange control, and other laws in effect in the respective countries as of the date set forth above. Such laws are often complex and change frequently. As a result, it is strongly recommended that you not rely on the information in this International Appendix as the only source of information relating to the consequences of your participation in the Plan because the information may be out of date at the time you vest in your award or sell shares acquired under the Plan.

The information contained herein is general in nature and may not apply to your particular situation, and the Company is not in a position to assure you of a particular result. In addition, please note that the requirements may differ for residents and non-residents. Accordingly, you are advised to seek appropriate professional advice as to how the relevant laws in your country may apply to your situation.

Finally, if you are a citizen or resident of a country other than the one in which you are currently working, transferred employment to another country after the award was granted to you, or are considered a resident of another country for local law purposes, the information contained herein may not apply.

Provisions Applicable to all International Awards

Data Privacy. The Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Participant's personal data by and among, as applicable, the Company, its subsidiaries and affiliates, for the exclusive purpose of implementing, administering and managing the Participant's participation in the Plan. The Participant hereby understands that the Company, its subsidiaries and affiliates hold (but only process or transfer to the extent required or permitted by local law) certain personal information about the Participant, including, but not limited to, the Participant's name, home address and telephone number, date of birth, social insurance number or other

identification number, salary, nationality, job title, any Shares or directorships held in the Company, details of all Restricted Stock Units or any other entitlement to Shares awarded, canceled, exercised, vested, unvested or outstanding in the Participant's favor, for the purpose of implementing, administering and managing the Plan ("Data"). The Participant hereby understands that Data may be transferred to any third parties assisting in the implementation, administration and management of the Plan, that these recipients may be located in the Participant's country or elsewhere (including countries outside of the European Economic Area such as the United States of America), and that the recipient's country may have different data privacy laws and protections than the Participant's country. The Participant hereby understands that the Participant may request a list with the names and addresses of any potential recipients of the Data by contacting the Participant's local human resources representative. The Participant authorizes the recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the purposes of implementing, administering and managing the Participant's participation in the Plan, including any requisite transfer of such Data as may be required to a broker or other third party with whom the Participant may elect to deposit any Shares acquired upon exercise. The Participant hereby understands that Data will be held only as long as is necessary to implement, administer and manage the Participant's participation in the Plan and in accordance with local law. The Participant hereby understands that the Participant may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing the Participant's local human resources representative. The Participant hereby understands, however, that refusing or withdrawing the Participant's consent may affect the Participant's ability to participate in the Plan. For more information on the consequences of the Participant's refusal to consent or withdrawal of consent, the Participant hereby understands that the Participant may contact the Participant's local human resources representative.

Nature of Grant. In accepting the grant of Restricted Stock Units, the Participant acknowledges that:

- (a) the Plan is established voluntarily by the Company, is discretionary in nature and may be modified, amended, suspended or terminated by the Company at any time, unless otherwise provided in the Plan and this Agreement;
- (b) the grant of Restricted Stock Units is voluntary and occasional and does not create any contractual or other right to receive future grants of Restricted Stock Units, or benefits in lieu of Restricted Stock Units, even if Restricted Stock Units have been granted repeatedly in the past;
- (c) all decisions with respect to future Restricted Stock Units, if any, will be at the sole discretion of the Company;

(d) the Participant's participation in the Plan will not create a right to further employment with the Participant's employer (the "Employer") and shall not interfere with the ability of the Employer to terminate the Participant's employment relationship;

(e) the Participant is voluntarily participating in the Plan;

(f) the Restricted Stock Units are an extraordinary item that does not constitute compensation of any kind for services of any kind rendered to the Company or the Employer, and which is outside the scope of the Participant's employment contract, if any;

(g) the Restricted Stock Units are not part of normal or expected compensation or salary for any purposes, including, but not limited to, calculating any severance, resignation, termination, redundancy, end of service payments, bonuses, long-service awards, pension or retirement benefits or similar payments and in no event should be considered as compensation for, or relating in any way to, past services for the Company or the Employer;

(h) in the event that the Participant is not an employee of the Company, the grant of Restricted Stock Units will not be interpreted to form an employment contract or relationship with the Company; and furthermore, the grant of Restricted Stock Units will not be interpreted to form an employment contract with the Employer or any subsidiary or affiliate of the Company;

(i) the future value of the underlying Shares is unknown and cannot be predicted with certainty;

(j) if the Participant vests in the Restricted Stock Units and obtains Shares, the value of those Shares may increase or decrease in value;

(k) in consideration of the grant of the Restricted Stock Units, no claim or entitlement to compensation or damages shall arise from termination of the Restricted Stock Units or diminution in value of the Restricted Stock Units or Shares acquired resulting from termination of the Participant's employment by the Company or the Employer, and the Participant irrevocably releases the Company and the Employer from any such claim that may arise; if, notwithstanding the foregoing, any such claim is found by a court of competent jurisdiction to have arisen, then, by signing this Agreement, the Participant will be deemed irrevocably to have waived his or her entitlement to pursue such claim; and

(l) in the event of termination of the Participant's employment, Participant's right to receive the Restricted Stock Units and vest in the Restricted Stock Units under the Plan, if any, will terminate effective as of the date that the Participant is no longer actively employed.

Country-Specific Language

Below please find country-specific language that applies to you if you are a citizen or resident of one of the following countries: Belgium, Canada, China, France, Germany, Greece, India, Ireland, Italy, Japan, Poland, Singapore, South Korea, Spain, Sweden, Switzerland, Taiwan and United Kingdom.

BELGIUM

Notifications

Tax Reporting Information. Participants are required to report any bank accounts opened and maintained outside Belgium on their annual tax return.

CANADA

Terms and Conditions

Restricted Stock Units Settled in Shares Only. Notwithstanding anything to the contrary in the Plan and/or the Agreement, you understand that any Restricted Stock Units granted to you shall be paid in shares only and do not provide any right for you to receive a cash payment.

The following provision will apply to residents of Quebec:

Language Consent. The parties to the Agreement have expressly required that the Agreement and all documents and notices relating to the Agreement be drafted in English.

Les parties aux présentes ont expressément exigé que la présente convention et tous les documents et avis qui y sont afférents soient rédigés en anglais.

Notifications

Additional Restrictions on Resale. In addition to the restrictions on resale and transfer noted in Plan materials, securities purchased under the Plan may be subject to certain restrictions on resale imposed by Canadian provincial securities laws. Participants are encouraged to seek legal advice prior to any resale of such securities. In general, Participants resident in Canada may resell their securities in transactions carried out on exchanges outside of Canada.

Tax Reporting. The Tax Act and the regulations thereunder require a Canadian resident individual (among others) to file an information return disclosing prescribed information where, at any time in a tax year, the total cost amount of such individual's "specified foreign property" (which includes shares) exceeds Cdn.\$100,000. Participants should consult their own tax advisor regarding this reporting requirement.

CHINA

Due to Chinese legal requirements, Shares of ANSYS, Inc. acquired under any company equity plans must be maintained in the designated brokerage account until the Shares are sold through the designated brokerage account with the net sales proceeds being paid to you through your current or most recent PRC employer. As a condition of the grant of PSUs, to the extent that you hold any Shares on the date that is six (6) months after the date of your termination of active employment with ANSYS and its subsidiaries and affiliates, you authorize E*Trade Financial Corporate Services, Inc. (or any successor broker designated by ANSYS) to sell such Shares on your behalf at that time or as soon as is administratively practical thereafter.

Under local law, Participant is required to repatriate to China the proceeds from your participation in any company equity Plans, including proceeds from the sale of Shares acquired through PSU lapses and any dividends or dividend equivalents paid to you through a special exchange control account established by ANSYS or one of its subsidiaries or affiliates in China. You hereby agree that any proceeds from your participation in the Plan may be transferred to such special account prior to being delivered to you through your current or most recent PRC employer. Further, if the proceeds from your participation in the Plan are converted to local currency, you acknowledge that the Company (including its subsidiaries and affiliates) are under no obligation to secure any currency conversion rate, and may face delays in converting the proceeds to local currency due to exchange control restrictions in China. You agree to bear the risk of any currency conversion rate fluctuation between the date that your proceeds are delivered to the special exchange control account and the date of conversion of the proceeds to local currency.

ANSYS reserves the right to impose such further restrictions or conditions as may be necessary to comply with changes in applicable local laws in China.

Please note that the above provisions will apply to all PSUs granted to you under a company equity plan.

If you are not a PRC national, the above provision will apply to you to the extent approved by SAFE or its local branch office in accordance with local laws.

FRANCE

Notifications

Exchange Control Information. If a Participant imports or exports cash (*e.g.*, sale proceeds received under the Plan) with a value equal to or exceeding €10,000 and does not use a financial institution to do so, Participant must submit a report to the customs and excise authorities. If Participant maintains a foreign bank account, Participant is required to report such account to the French tax authorities when filing his/her annual tax return.

GERMANY

Notifications

Exchange Control Information. Cross-border payments in excess of €12,500 must be reported monthly to the German Federal Bank. If a Participant uses a German bank to transfer a cross-border payment in excess of €12,500 in connection with the sale of Shares acquired under the Plan, the bank will file the report for the Participant.

INDIA

Terms and Conditions

Repatriation of Proceeds. You understand that you must repatriate any proceeds from the sale of Shares acquired upon vesting of the Restricted Stock Units to India and convert the proceeds into local currency within 90 days of receipt. You will receive a foreign inward remittance certificate (“FIRC”) from the bank where you deposit the foreign currency. You should maintain the FIRC as evidence of the repatriation of funds in the event the Reserve Bank of India or your employer requests proof of repatriation.

Notifications

Tax Information. The amount subject to tax at vesting may partially be dependent upon a valuation of Shares from a Merchant Banker in India. The Company has no responsibility or obligation to obtain the most favorable valuation possible nor obtain valuations more frequently than required under Indian tax law.

IRELAND

Notifications

Director Notification Requirement. If you are a director or a shadow director or secretary of an Irish affiliate of Ansys, pursuant to Section 53 of the Irish Company Act of 1990, and you own more than a 1% interest in Ansys, you must notify the Irish affiliate of Ansys in writing within five business days of receiving or disposing of an interest in Ansys (e.g., stock options, RSUs, shares, etc.) or within five business days of the event giving rise to the notification requirement, or within five days of becoming a director, shadow director or secretary if such an interest exists at that time. This notification requirement also applies with respect to the interests of a spouse or minor child, whose interests will be attributed to the director, shadow director or secretary.

ITALY

Notifications

Exchange Control Information. By September 30th of each year, the Participants are required to report on their annual tax return (Form RW) any foreign investments (including proceeds from the sale of Shares acquired upon vesting) held outside of Italy if the investment may give rise to income in Italy. However, deposits and bank accounts held outside of Italy only need to be disclosed if the value of the assets exceeds €10,000 during any part of the tax year.

With respect to Shares received upon vesting of the Restricted Stock Units, the Participants must report (i) the value of the Shares at the beginning of the year or on the day the Participant acquired the Shares, whichever is later; and (ii) the value of the Shares when sold, or if the Participant still owns the Shares at the end of the year, the value of the Shares at the end of the year. The value to be reported is the fair market value of the Shares on the applicable dates mentioned above.

JAPAN

Notifications

Exchange Control Information. If you acquire Shares valued at more than ¥100,000,000 in a single transaction, you must file a Securities Acquisition Report with the Ministry of Finance through the Bank of Japan within 20 days of the acquisition of the Shares.

POLAND

Notifications

Exchange Control Information. While you are responsible for any exchange control filings, no advance foreign exchange permit is required for the acquisition, holding or disposal of Shares. However, if the value of your Shares exceeds the equivalent of PLN 7,000,000, you will have to notify the National Bank of Poland of such holdings on a quarterly basis. If such reporting obligation applies to you and your shareholding exceeds 10% of the Company's total voting stock, you will also be required to notify the National Bank of Poland by the end of May of each subsequent year.

Exchange Control Information. If a Polish resident transfers funds in excess of €15,000 into Poland, the funds must be transferred via a Polish bank account or financial institution. Polish residents are required to retain the documents connected with a foreign exchange transaction for a period of five years, as measured from the end of the year in which such transaction occurred.

SINGAPORE

Notifications

Director Notification Requirement - If you are a director, associate director or shadow director of a Singapore affiliate of the Company, you are subject to certain notification requirements under the Singapore Companies Act. Among these requirements is an obligation to notify the Singaporean affiliate in writing when you receive an interest in shares (e.g., RSUs or Shares) in the Company or any related companies. In addition, you must notify the Singapore affiliate when you sell Shares or any related company (including when you sell Shares acquired through vesting of your RSU or pursuant to any other Award granted under the Plan). These notifications must be made within two business days of acquiring or disposing of any interest in shares of the Company or any related company. In addition, a notification must be made of your interests in shares of the Company or any related company within two business days of becoming a director.

Securities Law Information - The grant of the Awards is being made pursuant to the "Qualifying Person" exemption" under section 273(1)(f) of the Securities and Futures Act (Chapter 289, 2006 Ed.) ("SFA"). As a result, the grant is exempt from the prospectus and registration requirements under Singaporean law and is not made with a view to the underlying Shares being subsequently offered for sale to any other party. The Plan has not been, and will not be, lodged or registered as a prospectus with the Monetary Authority of Singapore.

SOUTH KOREA

Notifications

Exchange Control Information. If you receive US\$500,000 or more from the sale of underlying Shares, Korean exchange control laws require you to repatriate the proceeds to South Korea within 18 months of sale.

SPAIN

Notifications

Exchange Control Information. All acquisitions of foreign shares by Spanish residents must comply with exchange control regulations in Spain. Because of foreign investment requirements, the acquisition of Shares upon vesting of the Restricted Stock Units must be declared for statistical purposes to the Spanish Direccion General de Politica Comercial y de Inversiones Extranjeras (the “DGPCIE”). If you acquire Shares through the use of a Spanish financial institution, that institution will automatically make the declaration to the DGPCIE for you. Otherwise, you must make the declaration by filing a form with the DGPCIE.

If you import the Shares acquired upon vesting of the Restricted Stock Units into Spain, you must declare the importation of the share certificates to the DGPCIE.

In addition, you must also file a declaration of the ownership of the Shares with the Directorate of Foreign Transactions each January while the shares are owned. These filings are made on standard forms furnished by the Directorate of Foreign Transactions.

When you receive any foreign currency payments (*i.e.*, as a result of the sale of the Shares), you must inform the institution receiving the payment of the basis upon which such payment is made and provide certain specific information (*e.g.*, name, address, and fiscal identification number; the name and corporate domicile of the company; the amount of the payment; the type of foreign currency received; the country of origin; and the reason for the payment).

Tax Reporting. If you hold assets (*e.g.*, cash or shares in a bank or brokerage account) or rights outside Spain that exceed €50,000 per type of asset, you must file a Form 720 with the Spanish Tax Authorities by April 30th of each year.

SWITZERLAND

Notifications

Securities Law Information. The offer of the Restricted Stock Units is considered a private offering in Switzerland and is not subject to registration in Switzerland.

TAIWAN

Notifications

Exchange Control Information. Taiwan's foreign exchange control regulations may have an impact on the grant and vesting of the Restricted Stock Units as well as the repatriation of capital gains realized from the holding or sale of the underlying Shares. Under current foreign exchange regulations, a Taiwanese resident can remit up to US \$5 million (or an equivalent amount of other foreign currencies) per year into or out of Taiwan without prior approval from the Taiwan Central Bank.

If the transaction amount is TWD500,000 or more in a single transaction, you must submit a Foreign Exchange Transaction Form. If the transaction amount is US\$500,000 or more in a single transaction, you must also provide supporting documentation to the satisfaction of the remitting bank.

UNITED KINGDOM

Terms and Conditions

(i) Purpose. This section is to modify those provisions of the Plan in order for awards made under the Plan, and communications concerning those awards, to be exempt from provisions of the United Kingdom Financial Services and Markets Act 2000 (the "FSMA").

(ii) Application. These provisions shall be used solely to grant awards to employees of the Company or any member of the same group as the Company resident and providing services in the United Kingdom. (The term "group" in relation to the Company shall bear the meaning given to such term in section 421 of the FSMA.)

(iii) Restricted Delivery of Awards. Payments of benefits under these provisions shall be made only in Shares or such other securities of the Company that may arise from such Shares under the adjustment provisions of the Plan. For the avoidance of doubt, and without limitation, no cash settlement of awards (including dividends or dividend equivalent payments in cash) shall be permissible.

(iv) Exercise of Restricted Stock Units/Vesting of Awards. The Administrator may specify, in its discretion, any other conditions of exercise and/or vesting of awards that will be specified in the award agreement.

(v) Restricted Transfer of Rights. The persons to whom rights under awards may be assigned or transferred, whether by will or the laws of descent and distribution or any transferability of awards shall be limited to a Participant's children and step-children under the age of eighteen, spouses and surviving spouses and civil partners and civil partners (within the meaning of the United Kingdom Civil Partnerships Act 2004) and surviving partners.

(vi) Tax. All awards will be subject to tax withholding and all references to "tax" shall be read and construed as including, without limitation, United Kingdom income tax and primary class 1 (employee's) national insurance contributions that the Participant's employer is liable to account for and, if so agreed between the Company and the Participant, secondary class 1 (employer's) national insurance contributions that the Participant's employer is liable to account for.

**AWARD NOTICE
UNDER THE ANSYS, INC.
FIFTH AMENDED AND RESTATED LONG-TERM INCENTIVE PLAN**

Name of Participant:

Target Award:

Grant Date of Target Award:

Performance Measurement Period: January 1, 2019 to December 31, 2021

Pursuant to the ANSYS, Inc. Fifth Amended and Restated Long-Term Incentive Plan (the “Plan”), ANSYS, Inc. (the “Company”) has selected the Participant named above to be awarded the Target Award specified above, subject to the terms and conditions of the Plan and this Award Notice. Capitalized terms used but not defined in this Award Notice shall have the meaning given such terms in the Plan. A copy of the Plan is attached hereto as Exhibit A.

1. Acceptance of Award. The total number of Restricted Stock Units that may be credited to the Participant (if any) shall be determined by the Company’s performance during the Performance Measurement Period specified above and as set forth in Section 4(b) of the Plan. The Measurement Period Target for the Performance Measurement Period shall be equal to the Target Award. The actual number of Restricted Stock Units that may be credited could be up to 200% of such Target Award and could also be lower than the Target Award and could be zero.

2. Termination of Employment. Subject to Section 3 below, if at any time prior to the conclusion of the Performance Measurement Period, the Participant’s employment with the Company terminates for any reason, the Participant shall automatically forfeit the right to receive any portion of the Award.

Notwithstanding the foregoing, if the Participant’s employment with the Company is terminated on account of the Participant’s death or Disability (as defined below), any Restricted Stock Units that are not vested will remain eligible to vest in accordance with their terms based upon achievement of the applicable performance condition and subject to the Company’s certification of the performance metric attainment but on a prorated basis based upon the number of months that the Participant provided services as a Participant to the Company prior to the Participant’s death or Disability during the applicable performance period. For purposes hereof, “Disability” shall mean the Participant’s termination of employment with the Company: (i) after becoming eligible to receive benefits under the Company’s then current long-term disability plan that is applicable to the Participant; (ii) where the Participant is not eligible under a Company long-term disability plan, after being officially declared permanently disabled under the mandatorily applicable health or welfare regulations of the applicable jurisdiction; or, (iii) in the absence of such a determination under said regulations, after being officially declared permanently disabled by a physician appointed by the Company in its sole discretion.

3. Change in Control. Upon a Change in Control, the Award shall be treated as specified in Section 6 of the Plan.

4. Issuance of Shares.

(a) Each Restricted Stock Unit relates to one share of the Company's Stock. Shares of Stock (if any) shall be issued and delivered to the Participant in accordance with the terms of this Award Notice and of the Plan upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Participant.

(b) Until such time as shares of Stock are issued to the Participant pursuant to the terms hereof and of the Plan, the Participant shall have no rights as a stockholder with respect to any shares of Stock underlying the Restricted Stock Units, including but not limited to any voting rights.

5. Non-Competition and Non-Solicitation. As additional consideration for the grant of this Award to the Participant, the Participant hereby agrees that he or she shall not, at any time during his or her employment with the Company, **[for non-California employees only]**; and for a period of one year immediately after the termination of such employment (no matter if terminated by the Participant or the Company and no matter what the reason for that termination),] engage for any reason, directly or indirectly, whether as owner, part-owner, shareholder, member, partner, director, officer, trustee, employee, agent or consultant, or in any other capacity, on behalf of himself or herself or any firm, corporation or other business organization other than the Company and its subsidiaries, in any one or more of the following activities:

(a) the development, marketing, solicitation, or selling of any product or service that is competitive with the products or services of the Company, or products or services that the Company has under development or that are subject to active planning at any time during Participant's employment;

(b) the use of any of the Company's confidential or proprietary information, copyrights, patents or trade secrets which was acquired by the Participant as an employee of the Company and its subsidiaries; or

(c) any activity for the purpose of inducing, encouraging, or arranging for the employment or engagement by anyone other than the Company and its subsidiaries of any employee, officer, director, agent, consultant, or sales representative of the Company and its subsidiaries or attempt to engage any of them in a manner which would deprive the Company and its subsidiaries of their services or place them in a conflict of interest with the Company and its subsidiaries.

The Participant acknowledges and agrees that the activities set forth in (a)-(c) (above) are adverse to the Company's interests, and that it would be inequitable for Participant to benefit from this Award should Participant engage in any such activities during or within one year after termination of his or her employment with the Company. The Participant may be released from his or her obligations as stated above only if the Committee (or its duly appointed agent) determines in its sole discretion that such action is in the best interests of the Company and its subsidiaries.

6. Claw-Back of Award Proceeds. The Committee shall have the authority to unilaterally terminate this Award and/or cause some or all of the proceeds relating to this Award that have been received by the Participant to become immediately due and payable by the Participant to the Company upon the occurrence of any of the following events:

(a) the Participant's violation of Section 5 of this Agreement (entitled Non-Competition and Non-Solicitation);

(b) the material restatement of the Company's financial statements due to misconduct by the Participant;

(c) the material restatement of the Company's financial statements that results in the Participant receiving more compensation under the Award than the Participant would have received absent the incorrect financial statements.

The determination of whether any of the foregoing events has occurred and the extent of the application of this Section to the Participant and this Award shall be determined by the Committee in its sole discretion.

7. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award Notice shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 3 of the Plan.

8. Transferability. This Award is personal to the Participant, is non-assignable and is not transferable by Participant in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution. The Stock to be issued upon the settlement of this Award to the Participant shall be issued, during the Participant's lifetime, only to the Participant, and thereafter, only to the Participant's beneficiary. The Participant may designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company.

9. No Contract for Continuing Services. Neither the Plan nor this Award Notice shall be construed as creating any contract for continued services between the Company or any of its subsidiaries and the Participant and nothing herein contained shall give the Participant the right to be retained as an employee or consultant of the Company or any of its subsidiaries.

10. Integration. This Agreement constitutes the entire agreement between the parties with respect to this Award and supersedes all prior agreements and discussions between the parties concerning such subject matter.

11. Mandatory Arbitration. The Participant and the Company agree that any dispute or claim arising out of or in any way related to (i) the Participant's employment with the Company, and/or (ii) this Agreement or any breach hereof, this Award, the Plan and/or any actions taken under the Plan, to the fullest extent permitted by law, shall be submitted to and resolved by confidential, binding arbitration by a single, neutral arbitrator. The arbitration shall be held in the county where the Company has an office at which the Participant provides services (for remote Participants, the nearest county where the Company has an office) or any other locale to which the parties jointly agree. The arbitration shall be administered by and under the auspices of JAMS in accordance with the then-current Employment

Arbitration Rules & Procedures of JAMS (which are available at www.jamsadr.com/rules-employment). Arbitrator selection and discovery shall be conducted pursuant to the JAMS Rules. The arbitrator shall issue a written award setting forth the essential findings and conclusions on which the award is based, which shall be final and binding and judgment thereon may be entered in any court of competent jurisdiction. Other than an amount equal to the fee for filing such an action in the local state court, which amount the Participant shall pay toward the costs of the arbitration, the Company shall bear the administrative, filing and forum costs of the arbitration, including the JAMS administrative fees and the arbitrator's fees. Except as otherwise provided by law or in the arbitrator's ruling, each party shall otherwise bear its own respective attorneys' fees and costs of the arbitration. The Participant and the Company agree that each may bring claims against the other only in an individual capacity, and not as a plaintiff, claimant or class member in any purported class action, collective action or other representative proceeding, or otherwise seeking to represent the interests of any other person. This agreement to arbitrate shall survive any separation of the Participant's employment. Notwithstanding the foregoing, nothing herein or otherwise shall preclude the Company from pursuing a court action for the purpose of obtaining a temporary restraining order or other injunctive relief to enforce any restrictive covenants the Participant has with or for the benefit of the Company.

12. General Release of Claims by the Participant.

(a) As a condition of and in consideration for the promises made by the Company herein, including without limitation to provide the Award hereunder, the Participant hereby knowingly and voluntarily releases and discharges to the fullest extent permitted by law the Company and its past, present and future parents, subsidiaries, affiliates, and related entities, any and all of its or their past, present or future directors, shareholders, officers, executives, employees, and/or agents, and/or its and their respective predecessors, successors, and assigns (individually and collectively, the "Company Releasees"), from and with respect to any and all claims and causes of action whatsoever, in law or in equity, known or unknown, which the Participant ever had, has or may have against the Company and/or any or all of the other Company Releasees for, upon, or by reason of any matter whatsoever up to the date on which the Participant signs this Agreement (individually and collectively, "Claims"). The parties intend the foregoing to be a general release of any and all Claims to the fullest extent permissible by law. Notwithstanding the foregoing, nothing herein is a release by the Participant of (A) any rights or Claims with respect to accrued and vested benefits and/or previously awarded equity interests, subject in each instance to the terms and conditions of any applicable plan, grant, and/or agreement pertaining to such benefits, awards or interests and applicable law, (B) any rights or Claims arising under or to enforce this Agreement, or (C) any rights or Claims that, under applicable law, cannot lawfully be released by private agreement or otherwise.

(b) **FOR CALIFORNIA RESIDENTS ONLY:** In granting the foregoing release, the Participant acknowledges that he/she has been advised to consult with legal counsel and is familiar with the provision of California Civil Code Section 1542, a statute that otherwise prohibits the release of unknown claims, which provides as follows:

"A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR."

Being aware of said Code section, the Participant hereby expressly waives any rights the Participant may have thereunder, as well as under any other state or federal statutes or common law principles of similar effect.

(c) Nothing contained in this Agreement (including the foregoing general release) limits the Participant's ability to file a charge or complaint with any federal, state or local governmental agency, commission or regulatory entity (a "Government Agency"). If the Participant files any charge or complaint with any Government Agency, if any Government Agency pursues any charge or claim on the Participant's behalf, or if any other third party pursues any claim or charge on the Participant's behalf, the Participant waives any right to monetary or other individualized relief (either individually, or as part of any collective or class action); provided, however, that nothing in this Agreement limits any right the Participant may have to receive a whistleblower award or bounty for information provided to the Securities and Exchange Commission. The Participant represents that he/she is not aware of any unlawful conduct or violations of any federal, state or local law, rule or regulation by the Company and/or any other Company Releasees or any basis to bring a charge or complaint to any Government Agency.

13. Notices. Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Participant at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

14. Severability. If any provision(s) hereof shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

15. Counterparts. For the convenience of the parties and to facilitate execution, this document may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

16. Time to Review and Accept; Right to Revoke; Effective Date. The Participant is advised by the Company to consult with an attorney in connection with this Agreement. The Participant understands that as part of his/her agreement to release Claims against the Company and the other Company Releasees, the Participant is releasing Claims for age discrimination under the federal Age Discrimination in Employment Act (the "ADEA"). **ACCORDINGLY, THE PARTICIPANT HAS THE RIGHT, AND ACKNOWLEDGES THAT HE/SHE HAS BEEN GIVEN THE OPPORTUNITY, TO REVIEW AND CONSIDER THIS AGREEMENT FOR A PERIOD OF TWENTY-ONE (21) DAYS FROM THE PARTICIPANT'S RECEIPT OF THIS AGREEMENT BEFORE SIGNING IT (THE "REVIEW PERIOD").** To accept this Agreement and the Award granted hereunder, the Participant must return a signed original or signed .pdf copy of this Agreement to: [NAME, TITLE, ADDRESS; E-MAIL ADDRESS] at any time before the end of the Review Period. If the Participant signs this Agreement before the end of the Review Period, the Participant acknowledges that such decision was voluntary and that he/she had the opportunity to consider this Agreement for the full Review Period. For the period of seven (7) days from the date when the Participant signs this Agreement, the Participant has the right to revoke this Agreement by written notice to [NAME, TITLE, ADDRESS; E-MAIL ADDRESS], provided such notice is delivered so that it is received at or before the expiration of the 7-day revocation period. This Agreement shall not become effective or enforceable during the revocation period. If timely accepted and not revoked by the Participant prior to the end of

the revocation period, this Agreement shall become effective on the first business day following the expiration of the revocation period (the "Effective Date"). If not timely accepted or if (after timely signing) the Participant revokes prior to the expiration of the revocation period, this Agreement shall not become effective and the Participant will not be entitled to or receive the Award granted hereunder and/or such Award shall be rescinded.

17. Knowing and Voluntary Agreement. By signing this Agreement, the Participant acknowledges and represents that the Participant (a) has carefully read this Agreement in its entirety; (b) is hereby advised by the Company in writing to consult with an attorney of the Participant's choice before signing this Agreement; (c) has been afforded and has had a full and reasonable opportunity and period of time of at least 21 days to consider the terms and conditions of this Agreement; (d) fully understands the meaning and significance, and consequences, of all of the terms and conditions of this Agreement (including without limitation the general release given by the Participant in this Agreement); and (e) is signing this Agreement knowingly, voluntarily and of the Participant's own free will and with the intent to be fully bound hereby.



ANSYS, Inc.

By: _____

Name: Ajei S. Gopal

Title: President and CEO

The foregoing Award is hereby accepted and the terms and conditions of this Agreement are hereby agreed to by the undersigned. Electronic acceptance of this Award pursuant to the Company's instructions to the Participant (including through an online acceptance process) is acceptable.

Dated: _____

Participant's signature

Participant's name and address:

%%FIRST_NAME%-%% %%LAST_NAME%-%

%%ADDRESS_LINE_1%-%

%%ADDRESS_LINE_2%-%

%%ADDRESS_LINE_3%-%

%%CITY%-%% %%STATE%-%% %%ZIPCODE%-%

%%COUNTRY%-%

Exhibit A
ANSYS, INC.
FIFTH AMENDED AND RESTATED LONG-TERM INCENTIVE PLAN

1. Purpose

This Fifth Amended and Restated Long-Term Incentive Plan (the “Plan”) is intended to provide an incentive for superior work and to motivate executives and employees of ANSYS, Inc. (the “Company”) toward even higher achievement and business results, to tie their goals and interests to those of the Company and its stockholders and to enable the Company to attract and retain highly qualified executives and employees. The Plan is for the benefit of Participants (as defined below). Awards made under this Plan constitute Restricted Stock Unit Awards under Section 11 of the Company’s Fifth Amended and Restated 1996 Stock Option and Grant Plan (the “1996 Option Plan”) and shall be granted under, and subject to, the terms of the 1996 Option Plan.

2. Definitions

For purposes of this Plan:

- (a) “Award” means a grant to a Participant hereunder. From and after a Change in Control, any references to an Award shall mean the fixed number of Restricted Stock Units eligible to be earned by a Participant, as determined by the Committee pursuant to Section 6 hereof.
- (b) “Award Notice” means a notice or agreement provided to a Participant that sets forth the terms, conditions and limitations of the Participant’s participation in this Plan, including, without limitation, the Participant’s Target Award.
- (c) “Board” means the Board of Directors of the Company.
- (d) “Cause” means, and shall be limited to a determination by the Company that the Participant’s employment shall be terminated as a result of any one or more of the following events:
 - (i) any material breach by the Participant of any agreement between the Participant and the Company; or
 - (ii) the conviction of, indictment for or plea of nolo contendere by the Participant to a felony or a crime involving moral turpitude;
or
 - (iii) any material misconduct or willful and deliberate non-performance (other than by reason of disability) by the Participant of the Participant’s duties to the Company; or

(iv) willful failure to cooperate with a bona fide internal investigation or an investigation by regulatory or law enforcement authorities, after being instructed by the Company to cooperate, or the willful destruction or failure to preserve documents or other materials known to be relevant to such investigation or the willful inducement of others to fail to cooperate or to produce documents or other materials in connection with such investigation.

(e) “Change in Control” means any of the following:

(i) any “person,” as such term is used in Sections 13(d) and 14(d) of the Securities Exchange Act of 1934, as amended (the “Act”) (other than the Company, any of its subsidiaries, or any trustee, fiduciary or other person or entity holding securities under any employee benefit plan or trust of the Company or any of its subsidiaries), together with all “affiliates” and “associates” (as such terms are defined in Rule 12b-2 under the Act) of such person, shall become the “beneficial owner” (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, of securities of the Company representing 50 percent or more of the combined voting power of the Company’s then outstanding securities having the right to vote in an election of the Board (“Voting Securities”) (in such case other than as a result of an acquisition of securities directly from the Company); or

(ii) the consummation of (A) any consolidation or merger of the Company where the stockholders of the Company, immediately prior to the consolidation or merger, would not, immediately after the consolidation or merger, beneficially own (as such term is defined in Rule 13d-3 under the Act), directly or indirectly, shares representing in the aggregate more than 50 percent of the voting shares of the Company issuing cash or securities in the consolidation or merger (or of its ultimate parent corporation, if any), or (B) any sale or other transfer (in one transaction or a series of transactions contemplated or arranged by any party as a single plan) of all or substantially all of the assets of the Company.

Notwithstanding the foregoing, a “Change in Control” shall not be deemed to have occurred for purposes of the foregoing clause (i) solely as the result of an acquisition of securities by the Company which, by reducing the number of shares of Voting Securities outstanding, increases the proportionate number of Voting Securities beneficially owned by any person to 50 percent or more of the combined voting power of all of the then outstanding Voting Securities; provided, however, that if any person referred to in this sentence shall thereafter become the beneficial owner of any additional shares of Voting Securities (other than pursuant to a stock split, stock dividend, or similar transaction or as a result of an acquisition of securities directly from the Company) and immediately thereafter beneficially owns 50 percent or more of the combined voting power of all of the then outstanding Voting Securities, then a “Change in Control” shall be deemed to have occurred for purposes of the foregoing clause (i).

(f) “Change in Control Date” means with respect to each Change in Control Performance Measurement Period, the last day of the month immediately preceding the effective date of the Change in Control.

(g) “Change in Control Performance Measurement Period” means the Performance Measurement Period that is shortened by the Committee such that such period shall be deemed to have concluded as of the Change in Control Date.

- (h) “Change in Control Terminating Event” means during the 18-month period following the occurrence of a Change in Control, any of the following events: (i) termination by the Company of the Participant’s employment for any reason other than for Cause, death or disability; or (ii) the termination by the Participant of his or her employment with the Company for Good Reason. Notwithstanding the foregoing, a Change in Control Terminating Event shall not be deemed to have occurred herein solely as a result of the Participant being an employee of any direct or indirect successor to the business or assets of the Company.
- (i) “Closing Index Value” means the Performance Measurement Index Value as of the last day of the Performance Measurement Period.
- (j) “Closing Stock Price” means the Stock Price as of the last day of the Performance Measurement Period.
- (k) “Code” means Internal Revenue Code of 1986, as amended.
- (l) “Committee” means the Compensation Committee of the Board.
- (m) “Effective Date” means as of January 1, 2019.
- (n) “Good Reason” means that the Participant has complied with the “Good Reason Process” (hereinafter defined) following the occurrence of any of the following events:
 - (i) a material diminution in the Participant’s responsibilities, authority or duties; or
 - (ii) a material reduction in the Participant’s Base Salary and Target Bonus except for across-the-board salary reductions similarly affecting all or substantially all management employees; or
 - (iii) a material change in the geographic location at which the Participant is principally employed.

For purposes of this Section 2(n)(i), a change in the reporting relationship, or a change in a title will not, by itself, be sufficient to constitute a material diminution of responsibilities, authority or duty.

- (o) “Good Reason Process” means:
 - (i) the Participant reasonably determines in good faith that a “Good Reason” condition has occurred;
 - (ii) the Participant notifies the Company in writing of the occurrence of the Good Reason condition within 60 days of the first occurrence of such condition;
 - (iii) the Participant cooperates in good faith with the Company’s efforts, for a period not less than 30 days following such notice (the “Cure Period”), to remedy the condition;
 - (iv) notwithstanding such efforts, the Good Reason condition continues to exist following the Cure Period; and

(v) the Participant terminates his or her employment within 30 days after the end of the Cure Period.

If the Company cures the Good Reason condition during the Cure Period, Good Reason shall be deemed not to have occurred.

- (p) “Initial Index Value” means, the Performance Measurement Index Value as of January 1 of the first calendar year in any Performance Measurement Period.
- (q) “Initial Stock Price” means the Stock Price as of January 1 of the first calendar year in any Performance Measurement Period.
- (r) “Participant” means an executive or employee of the Company selected by the Committee to participate in the Plan.
- (s) “Performance Measurement Index” means the NASDAQ Composite Index (^IXIC), or, in the event such index is discontinued or its methodology significantly changed, a comparable index selected by the Committee in good faith.
- (t) “Performance Measurement Index Value” means, with respect to any date, the average value of the Performance Measurement Index for the ten consecutive trading days immediately preceding such date.
- (u) “Performance Measurement Period” means a three-year period commencing on January 1 and ending on the third December 31 thereafter. There shall be overlapping Performance Measurement Periods. The first Performance Measurement Period under the Plan will commence on January 1, 2019 and subsequent Performance Measurement Periods will commence on each January 1 thereafter while the Plan is effective.
- (v) “Performance Multiplier” means the percentage between 0% and 200% by which the applicable portion of the Target Award is multiplied to determine the number of credited Restricted Stock Units for the Performance Measurement Period.
- (w) “Restricted Stock Units” means the stock units of the Company to be settled in shares of Stock.
- (x) “Stock” means the Company’s common stock, par value \$0.01 per share.
- (y) “Stock Price” means, as of a particular date, the average closing price of one share of Stock for the ten consecutive trading days ending on, and including, such date; provided however, that in the event of a Change in Control of the Company, the Stock Price shall equal the fair market value, as determined by the Committee in its discretion, of the total consideration paid or payable in the transaction resulting in the Change in Control for one share of Stock.
- (z) “Target Award” means the target number of Restricted Stock Units that comprise a Participant’s Award for each Performance Measurement Period, as set forth in the Participant’s Award Notice.

- (aa) “Total Shareholder Return” means, with respect to a Performance Measurement Period, the total percentage return per share, achieved by the Stock assuming contemporaneous reinvestment in the Stock of all dividends and other distributions (excluding dividends and distributions paid in the form of additional shares of Stock) at the closing price of one share of Stock on the date such dividend or other distribution was paid, based on the Initial Stock Price, and the Closing Stock Price for the last day of the applicable Performance Measurement Period.

3. Administration

(a) The Plan shall be administered by the Committee. The Committee shall have the discretionary authority to make all determinations (including, without limitation, the interpretation and construction of the Plan and the determination of relevant facts) regarding the entitlement to any Award hereunder and the amount of any Award to be paid under the Plan (including the number of shares of Stock issuable to any Participant), provided such determinations are made in good faith and are consistent with the purpose and intent of the Plan. In particular, but without limitation and subject to the foregoing, the Committee shall have the authority:

- (i) to select Participants under the Plan;
- (ii) to determine the number and length of each Performance Measurement Period;
- (iii) to determine the Target Award and any formula or criteria for the determination of the Target Award for each Participant;
- (iv) to determine the terms and conditions, not inconsistent with the terms of this Plan, which shall govern Award Notices and all other written instruments evidencing an Award hereunder, including the waiver or modification of any such conditions;
- (v) to adopt, alter and repeal such administrative rules, guidelines and practices governing the Plan as it shall from time to time deem advisable; and
- (vi) to interpret the terms and provisions of the Plan and any Award granted under the Plan (and any Award Notices or other agreements relating thereto) and to otherwise supervise the administration of the Plan.

(b) Notwithstanding anything herein to the contrary, the Committee may, in its discretion, make appropriate adjustments to any Award, any Target Award, any Initial Stock Price, any Closing Stock Price or the Total Shareholder Return for any period in connection with or as a result of any of the following events which occur or have occurred after the Effective Date: reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Company’s capital stock, if the outstanding shares of Stock are increased or decreased or are exchanged for a different number or kind of shares or other securities of the Company, or additional shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such shares of Stock or other securities.

(c) Subject to the terms hereof, all decisions made by the Committee pursuant to the Plan shall be final, conclusive and binding on all persons, including the Company and the Participants. No

member of the Board or the Committee, nor any officer or employee of the Company acting on behalf of the Board or the Committee shall be personally liable for any action, determination or interpretation taken or made in good faith with respect to the Plan, and all members of the Board or Committee and each and any officer or employee of the Company acting on their behalf shall, to the extent permitted by law, be fully indemnified and protected by the Company in respect of any such action, determination or interpretation.

4. Determination and Payment of Awards

(a) Measurement Period Target. Each Participant’s Award Notice shall specify such Participant’s Target Award, and the portion of which shall be eligible to be credited for the Performance Measurement Period (the “Measurement Period Target”). The Target Award shall be expressed as a number of Restricted Stock Units. The percentage of the Measurement Period Target that is eligible to be credited shall be determined by reference to the Company’s performance for the Performance Measurement Period as measured by the Total Shareholder Return relative to the percentage appreciation of the Performance Measurement Index for such calendar year or years. The percentage appreciation of the Performance Measurement Index shall be established by comparing the Initial Index Value to the Closing Index Value.

(b) Performance Multiplier: If Total Shareholder Return for a Performance Measurement Period is less than the Performance Measurement Index, the Performance Multiplier shall be 100% minus A, where A is (the amount by which the Performance Measurement Index exceeds Total Shareholder Return) times three; provided however that the Performance Multiplier shall be zero if A results in a number greater than 75. If Total Shareholder Return for a Performance Measurement Period, is equal to the Performance Measurement Index, the Performance Multiplier shall be 100%. If Total Shareholder Return for a Performance Measurement Period is greater than the Performance Measurement Index, the Performance Multiplier is 100% plus B, where B is (the amount by which Total Shareholder Return exceeds the Performance Measurement Index) times two.

In no event will any portion of a Participant’s Target Award be credited for a Performance Measurement Period in which either: (A) the Performance Multiplier calculates to a number of less than 25% (i.e., in such event the Performance Multiplier shall be 0% for such Performance Measurement Period); or (ii) both absolute Total Shareholder Return and relative Total Shareholder Return (i.e., where Total Shareholder Return is less than the Performance Measurement Index) are negative. For purposes of clarity, see the following examples:

Sample ANSYS Total Shareholder Return	Sample Performance Measurement Index	Difference between Sample ANSYS TSR & Performance Measurement Index	2019 Performance Multiplier
40	15	+25	200%
40	30	+10	140%
40	40	0	100%
40	42	-2	94%
40	56	-16	52%
40	65	-25	25%
40	70	-30	0%
-10	-20	+10	100%
-10	-5	-5	0%

Notwithstanding the foregoing, in no event shall the Performance Multiplier be less than 0% or exceed 200%, regardless of a Total Shareholder Return that would result in a Performance Multiplier of less than 0% or in excess of 200%.

Notwithstanding the foregoing, if the Total Shareholder Return in a Performance Measurement Period is a negative percentage, then a maximum of 100% of the Measurement Period Target may be credited for such period, even if the Total Shareholder Return relative to the median percentage appreciation (depreciation) of the Performance Measurement Index would result in a greater Performance Multiplier.

(c) Committee Determination. The Committee, at its first meeting following the conclusion of a Performance Measurement Period, shall determine the actual number of Restricted Stock Units that will be deemed to have been credited as of the final day of such Performance Measurement Period. The number of Restricted Stock Units credited for such period shall equal the Measurement Period Target multiplied by the Performance Multiplier, subject to the terms and conditions hereof.

(d) Vesting and Settlement. Subject to Section 5, as soon as practicable (but in no event later than 74 days) following the conclusion of the Performance Measurement Period, the Restricted Stock Units that were credited, if any, for the Performance Measurement Period will be vested and settled in an equal number of shares of Stock.

5. Termination of Employment. Unless otherwise provided in any Award Notice or as provided in Section 6 below, if at any time prior to the conclusion of a Performance Measurement Period, a Participant’s employment with the Company terminates for any reason, such Participant shall automatically forfeit the right to receive any Award credited as of the date of termination of employment.

6. Change in Control. Unless otherwise provided in any Award Notice, upon a Change in Control of the Company, the following shall occur:

(a) With respect to each Change In Control Performance Measurement Period, the Committee, in accordance with Section 4, shall determine the actual number of Restricted Stock Units that are eligible to be credited based on the Total Shareholder Return for the Change in Control Performance Measurement Period relative to the median percentage appreciation of the Performance Measurement Index for such Change in Control Performance Measurement Period and such Award shall not be deemed fully vested until the conclusion of the Performance Measurement Period, subject to the continued employment of the Participant through such date. For example, if a Change in Control occurs during the eleventh month of the Performance Measurement Period, the Committee shall determine the number of Restricted Stock Units that are eligible to be credited with respect to the applicable Change in Control Performance Measurement Period based on performance for such period, but the Award shall not be deemed vested and will not be settled until the end of the full 36 month Performance Measurement Period. For the avoidance of doubt, since the Plan contemplates overlapping Performance Measurement Periods, there may be up to three different Change In Control Performance Measurement Periods.

(b) In the event that subsequent to a Change in Control, a Participant's employment with the Company terminates for any reason other than a Change in Control Terminating Event, such Participant shall automatically forfeit the right to receive all outstanding Awards that have been credited as of the date of termination of employment.

(c) In the event a Change in Control Terminating Event occurs with respect to a Participant, all outstanding Awards held by such Participant shall immediately vest and become payable.

(d) If as a result of a Change in Control, no Stock remains outstanding and the surviving corporation (or its ultimate parent) does not agree to convert the Awards into a number of restricted stock units of equivalent value of the surviving corporation (or its ultimate parent), then the Awards shall be converted to a dollar value based on the Stock Price.

7. Miscellaneous

- (a) Amendment and Termination. The Company reserves the right to amend or terminate the Plan at any time in its discretion without the consent of any Participants, but no such amendment shall adversely affect the rights of the Participants with regard to outstanding Awards. In the event the Plan is terminated, the Company shall determine the Awards payable to Participants based on the Total Shareholder Return relative to the Performance Measurement Index for each Performance Measurement Period ending on the date of Plan termination. The Awards for each Performance Measurement Period shall be further prorated to reflect the shortened Performance Measurement Period.
- (b) No Contract for Continuing Services. This Plan shall not be construed as creating any contract for continued services between the Company or any of its subsidiaries and any Participant and nothing herein contained shall give any Participant the right to be retained as an employee or consultant of the Company or any of its subsidiaries.
- (c) No Transfers. A Participant's rights in an interest under the Plan may not be assigned or transferred.

- (d) Unfunded Plan. The Plan shall be unfunded and shall not create (or be construed to create) a trust or separate fund. Likewise, the Plan shall not establish any fiduciary relationship between the Company or any of subsidiaries or affiliates and any Participant. To the extent that any Participant holds any rights by virtue of an Award under the Plan, such right shall be no greater than the right of an unsecured general creditor of the Company or any of its subsidiaries.
- (e) Governing Law. The Plan and each Award Notice awarded under the Plan shall be construed in accordance with and governed the laws of the State of Delaware, without regard to principles of conflict of laws of such state.
- (f) Tax Withholding. Any issuance of shares of Stock to a Participant shall be subject to tax withholding. The minimum tax withholding obligation shall be satisfied through a net issuance of shares. The Company shall withhold from shares of Stock to be issued to the Participant a number of shares of Stock with an aggregate fair market value that would satisfy the minimum withholding amount due.
- (g) Construction. Wherever appropriate, the use of the masculine gender shall be extended to include the feminine and/or neuter or vice versa; and the singular form of words shall be extended to include the plural; and the plural shall be restricted to mean the singular.
- (h) Headings. The Section headings and Section numbers are included solely for ease of reference. If there is any conflict between such headings or numbers and the text of this Plan, the text shall control.
- (i) Effect on Other Plans. Nothing in this Plan shall be construed to limit the rights of Participants under the Company's or its subsidiaries' benefit plans, programs or policies.
- (j) Effective Date. The Plan shall be effective as of the Effective Date.

8. Section 409A.

- (a) All payments and benefits described in this Plan are intended to constitute a short term deferral for purposes of Section 409A of the Internal Revenue Code of 1986, as amended. To the extent that any payment or benefit described in this Plan constitutes "non-qualified deferred compensation" under Section 409A of the Code, and to the extent that such payment or benefit is payable upon the Participant's termination of employment, then such payments or benefits shall be payable only upon the Participant's "separation from service." The determination of whether and when a separation from service has occurred shall be made in accordance with the presumptions set forth in Treasury Regulation Section 1.409A-1(h).
- (b) The parties intend that this Plan will be administered in accordance with Section 409A of the Code. To the extent that any provision of this Plan is ambiguous as to its compliance with Section 409A of the Code, the provision shall be read in such a manner so that all payments hereunder comply with Section 409A of the Code. The parties agree that this Plan may be amended, as reasonably requested by either party, and as may be necessary to fully comply with Section 409A of the Code and all related rules and regulations in

order to preserve the payments and benefits provided hereunder without additional cost to either party.

- (c) The Company makes no representation or warranty and shall have no liability to the Participant or any other person if any provisions of this Plan are determined to constitute deferred compensation subject to Section 409A of the Code but do not satisfy an exemption from, or the conditions of, such Section.

INTERNATIONAL APPENDIX

Additional Terms and Conditions

Terms and Conditions

This International Appendix includes additional terms and conditions that govern the award granted to you under the Plan for your country. Certain capitalized terms used but not defined in this International Appendix have the meanings set forth in the Plan and the Agreement that relate to your award. By acceptance of the award you agree to be bound by the terms and conditions contained in the paragraphs below in addition to the terms of the Plan and the Agreement and the terms of any other document that may apply to you and your award.

Notifications

This International Appendix also includes information regarding issues of which you should be aware with respect to participation in the Plan. The information is based on the securities, exchange control, and other laws in effect in the respective countries as of the date set forth above. Such laws are often complex and change frequently. As a result, it is strongly recommended that you not rely on the information in this International Appendix as the only source of information relating to the consequences of your participation in the Plan because the information may be out of date at the time you vest in your award or sell shares acquired under the Plan.

The information contained herein is general in nature and may not apply to your particular situation, and the Company is not in a position to assure you of a particular result. In addition, please note that the requirements may differ for residents and non-residents. Accordingly, you are advised to seek appropriate professional advice as to how the relevant laws in your country may apply to your situation.

Finally, if you are a citizen or resident of a country other than the one in which you are currently working, transferred employment to another country after the award was granted to you, or are considered a resident of another country for local law purposes, the information contained herein may not apply.

Provisions Applicable to all International Awards

Data Privacy. The Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Participant's personal data by and among, as applicable, the Company, its subsidiaries and affiliates, for the exclusive purpose of implementing, administering and managing the Participant's participation in the Plan. The Participant hereby understands that the Company, its subsidiaries and affiliates hold (but only process or transfer to the extent required or permitted by local law) certain personal information about the Participant, including, but not limited to, the Participant's name, home address and telephone number, date of birth, social insurance number or other identification number, salary, nationality, job title, any Shares or directorships held in the Company, details of all Restricted

Stock Units or any other entitlement to Shares awarded, canceled, exercised, vested, unvested or outstanding in the Participant's favor, for the purpose of implementing, administering and managing the Plan ("Data"). The Participant hereby understands that Data may be transferred to any third parties assisting in the implementation, administration and management of the Plan, that these recipients may be located in the Participant's country or elsewhere (including countries outside of the European Economic Area such as the United States of America), and that the recipient's country may have different data privacy laws and protections than the Participant's country. The Participant hereby understands that the Participant may request a list with the names and addresses of any potential recipients of the Data by contacting the Participant's local human resources representative. The Participant authorizes the recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, for the purposes of implementing, administering and managing the Participant's participation in the Plan, including any requisite transfer of such Data as may be required to a broker or other third party with whom the Participant may elect to deposit any Shares acquired upon exercise. The Participant hereby understands that Data will be held only as long as is necessary to implement, administer and manage the Participant's participation in the Plan and in accordance with local law. The Participant hereby understands that the Participant may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing the Participant's local human resources representative. The Participant hereby understands, however, that refusing or withdrawing the Participant's consent may affect the Participant's ability to participate in the Plan. For more information on the consequences of the Participant's refusal to consent or withdrawal of consent, the Participant hereby understands that the Participant may contact the Participant's local human resources representative.

Nature of Grant. In accepting the grant of Restricted Stock Units, the Participant acknowledges that:

- (a) the Plan is established voluntarily by the Company, is discretionary in nature and may be modified, amended, suspended or terminated by the Company at any time, unless otherwise provided in the Plan and this Agreement;
- (b) the grant of Restricted Stock Units is voluntary and occasional and does not create any contractual or other right to receive future grants of Restricted Stock Units, or benefits in lieu of Restricted Stock Units, even if Restricted Stock Units have been granted repeatedly in the past;
- (c) all decisions with respect to future Restricted Stock Units, if any, will be at the sole discretion of the Company;

(d) the Participant's participation in the Plan will not create a right to further employment with the Participant's employer (the "Employer") and shall not interfere with the ability of the Employer to terminate the Participant's employment relationship;

(e) the Participant is voluntarily participating in the Plan;

(f) the Restricted Stock Units are an extraordinary item that does not constitute compensation of any kind for services of any kind rendered to the Company or the Employer, and which is outside the scope of the Participant's employment contract, if any;

(g) the Restricted Stock Units are not part of normal or expected compensation or salary for any purposes, including, but not limited to, calculating any severance, resignation, termination, redundancy, end of service payments, bonuses, long-service awards, pension or retirement benefits or similar payments and in no event should be considered as compensation for, or relating in any way to, past services for the Company or the Employer;

(h) in the event that the Participant is not an employee of the Company, the grant of Restricted Stock Units will not be interpreted to form an employment contract or relationship with the Company; and furthermore, the grant of Restricted Stock Units will not be interpreted to form an employment contract with the Employer or any subsidiary or affiliate of the Company;

(i) the future value of the underlying Shares is unknown and cannot be predicted with certainty;

(j) if the Participant vests in the Restricted Stock Units and obtains Shares, the value of those Shares may increase or decrease in value;

(k) in consideration of the grant of the Restricted Stock Units, no claim or entitlement to compensation or damages shall arise from termination of the Restricted Stock Units or diminution in value of the Restricted Stock Units or Shares acquired resulting from termination of the Participant's employment by the Company or the Employer, and the Participant irrevocably releases the Company and the Employer from any such claim that may arise; if, notwithstanding the foregoing, any such claim is found by a court of competent jurisdiction to have arisen, then, by signing this Agreement, the Participant will be deemed irrevocably to have waived his or her entitlement to pursue such claim; and

(l) in the event of termination of the Participant's employment, Participant's right to receive the Restricted Stock Units and vest in the Restricted Stock Units under the Plan, if any, will terminate effective as of the date that the Participant is no longer actively employed.

Country-Specific Language

Below please find country-specific language that applies to you if you are a citizen or resident of one of the following countries: Belgium, Canada, China, France, Germany, Greece, India, Ireland, Italy, Japan, Poland, Singapore, South Korea, Spain, Sweden, Switzerland, Taiwan and United Kingdom.

BELGIUM

Notifications

Tax Reporting Information. Participants are required to report any bank accounts opened and maintained outside Belgium on their annual tax return.

CANADA

Terms and Conditions

Restricted Stock Units Settled in Shares Only. Notwithstanding anything to the contrary in the Plan and/or the Agreement, you understand that any Restricted Stock Units granted to you shall be paid in shares only and do not provide any right for you to receive a cash payment.

The following provision will apply to residents of Quebec:

Language Consent. The parties to the Agreement have expressly required that the Agreement and all documents and notices relating to the Agreement be drafted in English.

Les parties aux présentes ont expressément exigé que la présente convention et tous les documents et avis qui y sont afférents soient rédigés en anglais.

Notifications

Additional Restrictions on Resale. In addition to the restrictions on resale and transfer noted in Plan materials, securities purchased under the Plan may be subject to certain restrictions on resale imposed by Canadian provincial securities laws. Participants are encouraged to seek legal advice prior to any resale of such securities. In general, Participants resident in Canada may resell their securities in transactions carried out on exchanges outside of Canada.

Tax Reporting. The Tax Act and the regulations thereunder require a Canadian resident individual (among others) to file an information return disclosing prescribed information where, at any time in a tax year, the total cost amount of such individual's "specified foreign property" (which includes shares) exceeds Cdn.\$100,000. Participants should consult their own tax advisor regarding this reporting requirement.

CHINA

Due to Chinese legal requirements, Shares of ANSYS, Inc. acquired under any company equity plans must be maintained in the designated brokerage account until the Shares are sold through the designated brokerage account with the net sales proceeds being paid to you through your current or most recent PRC employer. As a condition of the grant of PSUs, to the extent that you hold any Shares on the date that is six (6) months after the date of your termination of active employment with ANSYS and its subsidiaries and affiliates, you authorize E*Trade Financial Corporate Services, Inc. (or any successor broker designated by ANSYS) to sell such Shares on your behalf at that time or as soon as is administratively practical thereafter.

Under local law, Participant is required to repatriate to China the proceeds from your participation in any company equity Plans, including proceeds from the sale of Shares acquired through PSU lapses and any dividends or dividend equivalents paid to you through a special exchange control account established by ANSYS or one of its subsidiaries or affiliates in China. You hereby agree that any proceeds from your participation in the Plan may be transferred to such special account prior to being delivered to you through your current or most recent PRC employer. Further, if the proceeds from your participation in the Plan are converted to local currency, you acknowledge that the Company (including its subsidiaries and affiliates) are under no obligation to secure any currency conversion rate, and may face delays in converting the proceeds to local currency due to exchange control restrictions in China. You agree to bear the risk of any currency conversion rate fluctuation between the date that your proceeds are delivered to the special exchange control account and the date of conversion of the proceeds to local currency.

ANSYS reserves the right to impose such further restrictions or conditions as may be necessary to comply with changes in applicable local laws in China.

Please note that the above provisions will apply to all PSUs granted to you under a company equity plan.

If you are not a PRC national, the above provision will apply to you to the extent approved by SAFE or its local branch office in accordance with local laws.

FRANCE

Notifications

Exchange Control Information. If a Participant imports or exports cash (*e.g.*, sale proceeds received under the Plan) with a value equal to or exceeding €10,000 and does not use a financial institution to do so, Participant must submit a report to the customs and excise authorities. If Participant maintains a foreign bank account, Participant is required to report such account to the French tax authorities when filing his/her annual tax return.

GERMANY

Notifications

Exchange Control Information. Cross-border payments in excess of €12,500 must be reported monthly to the German Federal Bank. If a Participant uses a German bank to transfer a cross-border payment in excess of €12,500 in connection with the sale of Shares acquired under the Plan, the bank will file the report for the Participant.

INDIA

Terms and Conditions

Repatriation of Proceeds. You understand that you must repatriate any proceeds from the sale of Shares acquired upon vesting of the Restricted Stock Units to India and convert the proceeds into local currency within 90 days of receipt. You will receive a foreign inward remittance certificate (“FIRC”) from the bank where you deposit the foreign currency. You should maintain the FIRC as evidence of the repatriation of funds in the event the Reserve Bank of India or your employer requests proof of repatriation.

Notifications

Tax Information. The amount subject to tax at vesting may partially be dependent upon a valuation of Shares from a Merchant Banker in India. The Company has no responsibility or obligation to obtain the most favorable valuation possible nor obtain valuations more frequently than required under Indian tax law.

IRELAND

Notifications

Director Notification Requirement. If you are a director or a shadow director or secretary of an Irish affiliate of Ansys, pursuant to Section 53 of the Irish Company Act of 1990, and you own more than a 1% interest in Ansys, you must notify the Irish affiliate of Ansys in writing within five business days of receiving or disposing of an interest in Ansys (*e.g.*, stock options, RSUs, shares, etc.) or within five business days of the event giving rise to the notification requirement, or within five days of becoming a director, shadow director or secretary if such an interest exists at that time. This notification requirement also applies with respect to the interests of a spouse or minor child, whose interests will be attributed to the director, shadow director or secretary.

ITALY

Notifications

Exchange Control Information. By September 30th of each year, the Participants are required to report on their annual tax return (Form RW) any foreign investments (including proceeds from the sale of Shares acquired upon vesting) held outside of Italy if the investment may give rise to income in Italy. However, deposits and bank accounts held outside of Italy only need to be disclosed if the value of the assets exceeds €10,000 during any part of the tax year.

With respect to Shares received upon vesting of the Restricted Stock Units, the Participants must report (i) the value of the Shares at the beginning of the year or on the day the Participant acquired the Shares, whichever is later; and (ii) the value of the Shares when sold, or if the Participant still owns the Shares at the end of the year, the value of the Shares at the end of the year. The value to be reported is the fair market value of the Shares on the applicable dates mentioned above.

JAPAN

Notifications

Exchange Control Information. If you acquire Shares valued at more than ¥100,000,000 in a single transaction, you must file a Securities Acquisition Report with the Ministry of Finance through the Bank of Japan within 20 days of the acquisition of the Shares.

POLAND

Notifications

Exchange Control Information. While you are responsible for any exchange control filings, no advance foreign exchange permit is required for the acquisition, holding or disposal of Shares. However, if the value of your Shares exceeds the equivalent of PLN 7,000,000, you will have to notify the National Bank of Poland of such holdings on a quarterly basis. If such reporting obligation applies to you and your shareholding exceeds 10% of the Company's total voting stock, you will also be required to notify the National Bank of Poland by the end of May of each subsequent year.

Exchange Control Information. If a Polish resident transfers funds in excess of €15,000 into Poland, the funds must be transferred via a Polish bank account or financial institution. Polish residents are required to retain the documents connected with a foreign exchange transaction for a period of five years, as measured from the end of the year in which such transaction occurred.

SINGAPORE

Notifications

Director Notification Requirement - If you are a director, associate director or shadow director of a Singapore affiliate of the Company, you are subject to certain notification requirements under the Singapore Companies Act. Among these requirements is an obligation to notify the Singaporean affiliate in writing when you receive an interest in shares (e.g., RSUs or Shares) in the Company or any related companies. In addition, you must notify the Singapore affiliate when you sell Shares or any related company (including when you sell Shares acquired through vesting of your RSU or pursuant to any other Award granted under the Plan). These notifications must be made within two business days of acquiring or disposing of any interest in shares of the Company or any related company. In addition, a notification must be made of your interests in shares of the Company or any related company within two business days of becoming a director.

Securities Law Information - The grant of the Awards is being made pursuant to the "Qualifying Person" exemption" under section 273(1)(f) of the Securities and Futures Act (Chapter 289, 2006 Ed.) ("SFA"). As a result, the grant is exempt from the prospectus and registration requirements under Singaporean law and is not made with a view to the underlying Shares being subsequently offered for sale to any other party. The Plan has not been, and will not be, lodged or registered as a prospectus with the Monetary Authority of Singapore.

SOUTH KOREA

Notifications

Exchange Control Information. If you receive US\$500,000 or more from the sale of underlying Shares, Korean exchange control laws require you to repatriate the proceeds to South Korea within 18 months of sale.

SPAIN

Notifications

Exchange Control Information. All acquisitions of foreign shares by Spanish residents must comply with exchange control regulations in Spain. Because of foreign investment requirements, the acquisition of Shares upon vesting of the Restricted Stock Units must be declared for statistical purposes to the Spanish Direccion General de Politica Comercial y de Inversiones Extranjeras (the “DGPCIE”). If you acquire Shares through the use of a Spanish financial institution, that institution will automatically make the declaration to the DGPCIE for you. Otherwise, you must make the declaration by filing a form with the DGPCIE.

If you import the Shares acquired upon vesting of the Restricted Stock Units into Spain, you must declare the importation of the share certificates to the DGPCIE.

In addition, you must also file a declaration of the ownership of the Shares with the Directorate of Foreign Transactions each January while the shares are owned. These filings are made on standard forms furnished by the Directorate of Foreign Transactions.

When you receive any foreign currency payments (*i.e.*, as a result of the sale of the Shares), you must inform the institution receiving the payment of the basis upon which such payment is made and provide certain specific information (*e.g.*, name, address, and fiscal identification number; the name and corporate domicile of the company; the amount of the payment; the type of foreign currency received; the country of origin; and the reason for the payment).

Tax Reporting. If you hold assets (*e.g.*, cash or shares in a bank or brokerage account) or rights outside Spain that exceed €50,000 per type of asset, you must file a Form 720 with the Spanish Tax Authorities by April 30th of each year.

SWITZERLAND

Notifications

Securities Law Information. The offer of the Restricted Stock Units is considered a private offering in Switzerland and is not subject to registration in Switzerland.

TAIWAN

Notifications

Exchange Control Information. Taiwan's foreign exchange control regulations may have an impact on the grant and vesting of the Restricted Stock Units as well as the repatriation of capital gains realized from the holding or sale of the underlying Shares. Under current foreign exchange regulations, a Taiwanese resident can remit up to US \$5 million (or an equivalent amount of other foreign currencies) per year into or out of Taiwan without prior approval from the Taiwan Central Bank.

If the transaction amount is TWD500,000 or more in a single transaction, you must submit a Foreign Exchange Transaction Form. If the transaction amount is US\$500,000 or more in a single transaction, you must also provide supporting documentation to the satisfaction of the remitting bank.

UNITED KINGDOM

Terms and Conditions

(i) Purpose. This section is to modify those provisions of the Plan in order for awards made under the Plan, and communications concerning those awards, to be exempt from provisions of the United Kingdom Financial Services and Markets Act 2000 (the "FSMA").

(ii) Application. These provisions shall be used solely to grant awards to employees of the Company or any member of the same group as the Company resident and providing services in the United Kingdom. (The term "group" in relation to the Company shall bear the meaning given to such term in section 421 of the FSMA.)

(iii) Restricted Delivery of Awards. Payments of benefits under these provisions shall be made only in Shares or such other securities of the Company that may arise from such Shares under the adjustment provisions of the Plan. For the avoidance of doubt, and without limitation, no cash settlement of awards (including dividends or dividend equivalent payments in cash) shall be permissible.

(iv) Exercise of Restricted Stock Units/Vesting of Awards. The Administrator may specify, in its discretion, any other conditions of exercise and/or vesting of awards that will be specified in the award agreement.

(v) Restricted Transfer of Rights. The persons to whom rights under awards may be assigned or transferred, whether by will or the laws of descent and distribution or any transferability of awards shall be limited to a Participant's children and step-children under the age of eighteen, spouses and surviving spouses and civil partners and civil partners (within the meaning of the United Kingdom Civil Partnerships Act 2004) and surviving partners.

(vi) Tax. All awards will be subject to tax withholding and all references to "tax" shall be read and construed as including, without limitation, United Kingdom income tax and primary class 1 (employee's) national insurance contributions that the Participant's employer is liable to

account for and, if so agreed between the Company and the Participant, secondary class 1 (employer's) national insurance contributions that the Participant's employer is liable to account for.

**AWARD NOTICE
UNDER THE FIFTH AMENDED AND RESTATED
ANSYS, INC. 1996 STOCK OPTION AND GRANT PLAN**

Name of Participant:

Target Award:

Grant Date of Target Award:

Performance Cycle: January 1, 2020 to December 31, 2022

Pursuant to the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (the “Plan”), ANSYS, Inc., a Delaware corporation (the “Company”), has selected the Participant named above to be awarded the Target Award specified above, subject to the terms and conditions of the Plan and this Award Notice. Capitalized terms used but not defined in this Award Notice or as otherwise provided herein shall have the meaning given such terms in the Plan.

1. Acceptance of Award. The total number of Restricted Stock Units that may be credited to the Participant (if any) shall be determined by the Company’s and the Participant’s performance for the Performance Cycle specified above, as set forth in Section 5 below. The actual number of Restricted Stock Units that may be credited could be up to 180% of the Target Award and could also be lower than the Target Award, including zero.

2. Termination of Employment. Subject to this Section 2 and Sections 3 and 5(a) below, a Participant must be employed through the last day of the Performance Cycle to vest in any of the Restricted Stock Units that may be credited, and all Restricted Stock Units not yet vested upon the termination of the Participant’s employment with the Company (or a Subsidiary(ies) as applicable) for any reason shall automatically be forfeited as of the date of termination of employment.

Notwithstanding the foregoing, if prior to the last day of the Performance Cycle, the Participant’s employment with the Company is terminated on account of the Participant’s death, the Participant incurs a Disability (as defined below), or the Participant’s employment is terminated by the Company without “Cause” (as defined in the ANSYS, Inc. Executive Severance Plan (the “Executive Severance Plan”) or, in the case of the Company’s Chief Executive Officer (the “CEO”), the Employment Agreement between the Company and the CEO dated August 29, 2016 (the “CEO Employment Agreement”)) (each such event a “Qualifying Event”), any Restricted Stock Units that are not vested will remain eligible to vest in accordance with their terms based upon achievement of the applicable performance conditions and subject to the Company’s certification of the performance metrics attainment but on a prorated basis based upon the number of whole months that the Participant provided services as a Participant to the Company prior to the Participant’s Qualifying Event during the Performance Cycle; provided,

however, in the case of death or Disability, the prorated payment shall be based on the greater of 100% of the Target Award or the actual amount determined based upon the achievement of the applicable performance conditions. Payment shall be made as provided for in Section 4, except as necessary in the case of death or Disability to fall within the short-term deferral period specified in Treas. Reg. § 1.409A-1(b)(4).

In the case of a termination on account of a termination by the Company of the Participant's employment without Cause, entitlement is subject to the Participant's satisfaction of the release requirement set forth in the Executive Severance Plan or, in the case of the CEO, the CEO Employment Agreement. For purposes hereof, "Disability" shall mean the Participant: (a) becoming eligible to receive benefits under the Company's then current long-term disability plan that is applicable to the Participant; or, (b) where the Participant is not eligible to participate in the Company long-term disability plan, after becoming permanently disabled under the mandatorily applicable health or welfare regulations of the applicable jurisdiction; or, (c) in the absence of such a determination under said regulations, after becoming permanently disabled from performing work in any occupation.

3. Termination in Connection with Certain Corporate Transactions. Notwithstanding any agreement or plan to the contrary, in the event of the occurrence of a Transaction as defined in the Plan, the Award shall vest in accordance with the Plan and as specified in the Executive Severance Plan (or, in the case of the CEO, the CEO Employment Agreement) in the case of certain qualifying terminations in connection with such Transactions (and not pursuant to the change in control events specified in the Executive Severance Plan (or, in the case of the CEO, the CEO Employment Agreement) to the extent different or consistent with the definition of Transaction in the Plan), provided further that payout will be made within 30 days of such qualifying termination event.

4. Issuance of Shares.

(a) Notwithstanding anything to the contrary, payment shall be made within the short-term deferral period specified in Treas. Reg. § 1.409A-1(b)(4). Shares of Stock (if any) shall be issued in settlement of any credited Restricted Stock Units within 74 days after the end of the final day of the Performance Cycle, subject to the Participant's continued employment with the Company through the last day of the final Performance Cycle (except as otherwise provided for pursuant to Sections 2 and 3 above). Each Restricted Stock Unit relates to one share of Stock. Shares of Stock (if any) shall be delivered to the Participant in accordance with the terms of this Award Notice and of the Plan, upon compliance to the satisfaction of the Committee with all requirements under applicable laws or regulations in connection with such issuance and with the requirements hereof and of the Plan. The determination of the Committee as to such compliance shall be final and binding on the Participant.

(b) Until such time as shares of Stock are issued to the Participant pursuant to the terms hereof and of the Plan, the Participant shall have no rights as a stockholder with respect to any shares of Stock underlying the Restricted Stock Units, including but not limited to any voting rights.

5. Determination of Awards

(a) The number of Restricted Stock Units to be credited shall be determined by the Committee pursuant to the performance conditions described in the enclosed Exhibits.

(b) The Committee, at its first regular meeting following the conclusion of the Performance Cycle and the delivery to the Company of its audited financial statements for such Performance Cycle, shall determine the actual number of Restricted Stock Units that will be deemed to have been earned and credited to the Participant, in accordance with the enclosed Exhibits.

6. Non-Competition and Non-Solicitation. As additional consideration for the grant of this Award to the Participant, the Participant hereby agrees that if at any time during his or her employment with the Company or any Subsidiary (the "Employment Period") and for a period of one year after the termination of his or her employment with the Company or any Subsidiary no matter what the cause of that termination (the "Post-Employment Period"), he or she engages for any reason, directly or indirectly, whether as owner, part-owner, shareholder, member, partner, director, officer, trustee, employee, agent or consultant, or in any other capacity, on behalf of himself or herself or any firm, corporation or other business organization other than the Company and its Subsidiaries, in any one or more of the following activities:

(a) during the Employment Period and/or Post-Employment Period, the development, marketing, solicitation, or selling of any product or service that is competitive with the products or services of the Company, or products or services that the Company has under development or that are subject to active planning at any time during Participant's employment provided that the restrictions set forth in this Section 6(a) for the Post-Employment Period shall not apply to any Participant who is a California-based employee;

(b) during the Employment Period and/or Post-Employment Period, the use of any of the Company's confidential or proprietary information, copyrights, patents or trade secrets which was acquired by the Participant as an employee of the Company and its Subsidiaries; or

(c) during the Employment Period and/or Post-Employment Period, any activity for the purpose of inducing, encouraging, or arranging for the employment or engagement by anyone other than the Company and its Subsidiaries of any employee, officer, director, agent, consultant, or sales representative of the Company and its Subsidiaries or attempt to engage any of them in a manner which would deprive the Company and its Subsidiaries of their services or place them in a conflict of interest with the Company and its Subsidiaries;

then (i) this Award shall terminate effective on the date on which he or she first engages in such activity, unless terminated sooner by operation of any other term or condition of this Award or the Plan, and (ii) all shares of Stock issued to the Participant pursuant to this Award shall become immediately due and payable by Participant to the Company and if such shares of Stock have been sold by the Participant, an amount equal to the proceeds from such sale shall become immediately due and payable by the Participant to the Company. Participant acknowledges and agrees that the activities set forth in this Section 6(a)-(c) are adverse to the Company's interests, and that it would be inequitable for Participant to benefit from this Award should Participant

engage in any such activities during or within one year after termination of his or her employment with the Company. Participant acknowledges and agrees that the rights and remedies set forth in this Section 6 are in addition to and are not intended to limit any other rights or remedies the Company may have available to it, both during and at any time after the termination of Participant's employment with the Company, including without limitation, any rights or remedies the Company may have under the ANSYS Intellectual Property Protection Agreement or other similar agreements.

The Participant may be released from his or her obligations as stated above only if the Committee (or its duly appointed agent) determines in its sole discretion that such action is in the best interests of the Company and its subsidiaries.

Notwithstanding the foregoing, if the Participant has an agreement with the Company in which any of the provisions therein are inconsistent with the covenants set forth in this Section 6, the terms of such other agreement shall control and shall supersede the covenants of this Section 6 but only to the extent of such inconsistency.

7. Claw-Back of Award Proceeds. The Committee shall have the authority to unilaterally terminate this Award and/or cause some or all of the proceeds relating to this Award that have been received by the Participant to become immediately due and payable by the Participant to the Company upon the occurrence of any of the following events:

- (a) the Participant's violation of Section 6 of this Agreement (entitled Non-Competition and Non-Solicitation) or any other similar provisions in any other agreement with the Company;
- (b) the material restatement of the Company's financial statements due to misconduct by the Participant; and/or
- (c) the material restatement of the Company's financial statements that results in the Participant receiving more compensation under the Award than the Participant would have received absent the incorrect financial statements.

The determination of whether any of the foregoing events has occurred and the extent of the application of this Section to the Participant and this Award shall be determined by the Committee in its sole discretion.

8. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Award Notice shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Committee set forth in Section 2 of the Plan (except as otherwise expressly provided herein).

9. Transferability. This Award is personal to the Participant, is non-assignable and is not transferable by Participant in any manner, by operation of law or otherwise, other than by will or the laws of descent and distribution. The Stock to be issued upon the vesting of this Award to the Participant shall be issued, during the Participant's lifetime, only to the Participant, and thereafter, only to the Participant's beneficiary. The Participant may designate a beneficiary

by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company.

10. Section 409A. This Award is intended as a short-term deferral, and to not be subject to any tax, penalty, or interest under, Section 409A of the Internal Revenue Code and the regulations promulgated thereunder. This Award, this Agreement and the Plan (as to the Award) shall be construed and interpreted consistent with such intent.

11. Tax Withholding. Any issuance of shares of Stock to a Participant shall be subject to tax withholding. The minimum tax withholding obligation shall be satisfied through a net issuance of shares. The Company shall automatically and mandatorily withhold from shares of Stock to be issued to the Participant a number of shares of Stock with an aggregate fair market value that would satisfy the minimum withholding amount due.

12. No Contract for Continuing Services. Neither the Plan nor this Award Notice shall be construed as creating any contract for continued services between the Company or any of its subsidiaries and the Participant and nothing herein contained shall give the Participant the right to be retained as an employee or consultant of the Company or any of its subsidiaries.

13. Mandatory Arbitration. The Participant and the Company agree that any dispute or claim arising out of or in any way related to (a) the Participant's employment with the Company, and/or (b) this Agreement or any breach hereof, this Award, the Plan and/or any actions taken under the Plan, to the fullest extent permitted by law, shall be submitted to and resolved by confidential, binding arbitration by a single, neutral arbitrator. The arbitration shall be held in the county where the Company has an office at which the Participant provides services (for remote Participants, the nearest county where the Company has an office) or any other locale to which the parties jointly agree. The arbitration shall be administered by and under the auspices of JAMS in accordance with the then-current Employment Arbitration Rules & Procedures of JAMS (which are available at www.jamsadr.com/rules-employment). Arbitrator selection and discovery shall be conducted pursuant to the JAMS Rules. The arbitrator shall issue a written award setting forth the essential findings and conclusions on which the award is based, which shall be final and binding and judgment thereon may be entered in any court of competent jurisdiction. Other than an amount equal to the fee for filing such an action in the local state court, which amount the Participant shall pay toward the costs of the arbitration, the Company shall bear the administrative, filing and forum costs of the arbitration, including the JAMS administrative fees and the arbitrator's fees. Except as otherwise provided by law or in the arbitrator's ruling, each party shall otherwise bear its own respective attorneys' fees and costs of the arbitration. The Participant and the Company agree that each may bring claims against the other only in an individual capacity, and not as a plaintiff, claimant or class member in any purported class action, collective action or other representative proceeding, or otherwise seeking to represent the interests of any other person. This agreement to arbitrate shall survive any separation of the Participant's employment. Notwithstanding the foregoing, nothing herein or otherwise shall preclude the Company from pursuing a court action for the purpose of obtaining

a temporary restraining order or other injunctive relief to enforce any restrictive covenants the Participant has with or for the benefit of the Company.

14. General Release of Claims by the Participant.

(a) As a condition of and in consideration for the promises made by the Company herein, including without limitation to provide the Award hereunder, the Participant hereby knowingly and voluntarily releases and discharges to the fullest extent permitted by law the Company and its past, present and future parents, subsidiaries, affiliates, and related entities, any and all of its or their past, present or future directors, shareholders, officers, executives, employees, and/or agents, and/or its and their respective predecessors, successors, and assigns (individually and collectively, the “Company Releasees”), from and with respect to any and all claims and causes of action whatsoever, in law or in equity, known or unknown, which the Participant ever had, has or may have against the Company and/or any or all of the other Company Releasees for, upon, or by reason of any matter whatsoever up to the date on which the Participant signs this Agreement (individually and collectively, “Claims”). The parties intend the foregoing to be a general release of any and all Claims to the fullest extent permissible by law, including any claims related to the Participant’s purported or perceived status as a whistleblower, except as noted in Section 14(c) below. Notwithstanding the foregoing, nothing herein is a release by the Participant of (A) any rights or Claims with respect to accrued and vested benefits and/or previously awarded equity interests, subject in each instance to the terms and conditions of any applicable plan, grant, and/or agreement pertaining to such benefits, awards or interests and applicable law, (B) any rights or Claims arising under or to enforce this Agreement, or (C) any rights or Claims that, under applicable law, cannot lawfully be released by private agreement or otherwise.

(b) **FOR CALIFORNIA RESIDENTS ONLY:** In granting the foregoing release, the Participant acknowledges that he/she has been advised to consult with legal counsel and is familiar with the provision of California Civil Code Section 1542, a statute that otherwise prohibits the release of unknown claims, which provides as follows:

“A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR.”

Being aware of said Code section, the Participant hereby expressly waives any rights the Participant may have thereunder, as well as under any other state or federal statutes or common law principles of similar effect.

(c) Nothing contained in this Agreement (including the foregoing general release) limits the Participant’s ability to file a charge or complaint with any federal, state or local governmental agency, commission or regulatory entity (a “Government Agency”). If the Participant files any charge or complaint with any Government Agency, if any Government Agency pursues any charge or claim on the Participant’s behalf, or if any other third party pursues any claim or charge on the Participant’s behalf, the Participant waives any right to

monetary or other individualized relief (either individually, or as part of any collective or class action); provided, however, that nothing in this Agreement limits any right the Participant may have to receive a whistleblower award or bounty for information provided to the Securities and Exchange Commission. The Participant represents that he/she is not aware of any unlawful conduct or violations of any federal, state or local law, rule or regulation by the Company and/or any other Company Releasees or any basis to bring a charge or complaint to any Government Agency.

15. Notices. Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Participant at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

16. Severability. If any provision(s) hereof shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

17. Counterparts. For the convenience of the parties and to facilitate execution, this document may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

18. Time to Review and Accept; Right to Revoke; Effective Date. The Participant is advised by the Company to consult with an attorney in connection with this Agreement. The Participant understands that as part of his/her agreement to release Claims against the Company and the other Company Releasees, the Participant is releasing Claims for age discrimination under the federal Age Discrimination in Employment Act (the "ADEA"). Accordingly, the Participant has the right, and acknowledges that he/she has been given the opportunity, to review and consider this Agreement for a period of twenty-one (21) days from the Participant's receipt of this Agreement before signing it (the "Review Period"). For a Participant to accept this Agreement and the Award granted hereunder, the Participant must electronically approve and accept this Agreement at www.etrade.com at any time before the end of the Review Period. If the Participant signs this Agreement before the end of the Review Period, the Participant acknowledges that such decision was voluntary and that he/she had the opportunity to consider this Agreement for the full Review Period. For the period of seven (7) days from the date when the Participant signs this Agreement, the Participant has the right to revoke this Agreement by written notice to stockadmin@ansys.com, provided such notice is delivered so that it is received at or before the expiration of the 7-day revocation period. This Agreement shall not become effective or enforceable during the revocation period. If timely accepted and not revoked by the Participant prior to the end of the revocation period, this Agreement shall become effective on the first business day following the expiration of the revocation period (the "Effective Date"). If not timely accepted or if (after timely signing) the Participant revokes prior to the expiration of the revocation period, this Agreement shall not become effective and the Participant will not be entitled to or receive the Award granted hereunder and/or such Award shall be rescinded.

19. Knowing and Voluntary Agreement. By signing this Agreement, the Participant acknowledges and represents that the Participant (a) has carefully read this Agreement in its entirety; (b) is hereby advised by the Company in writing to consult with an attorney of the

Participant's choice before signing this Agreement; (c) has been afforded and has had a full and reasonable opportunity and period of time of at least 21 days to consider the terms and conditions of this Agreement; (d) fully understands the meaning and significance, and consequences, of all of the terms and conditions of this Agreement (including without limitation the general release given by the Participant in this Agreement); and (e) is signing this Agreement knowingly, voluntarily and of the Participant's own free will and with the intent to be fully bound hereby.

ANSYS, Inc.

By:

Name:

Title:

The foregoing Award is hereby accepted and the terms and conditions of this Agreement are hereby agreed to by the undersigned. Electronic acceptance of this Award pursuant to the Company's instructions to the Participant (including through an online acceptance process) is acceptable.

Dated: __ __

Participant's signature

Participant's name and address:

Subsidiaries of the Registrant as of December 31, 2019**Jurisdiction of Incorporation**

DYNARDO Austria GmbH	Austria
Fluent China Holdings Limited	Barbados
ANSYS Belgium S.A.	Belgium
Livermore Software Technology, LLC	California
ANSYS Canada Limited	Canada
2011767 Ontario, Inc.	Canada
Helic, Inc.	Delaware
ANSYS France SAS	France
OPTIS SAS	France
ANSYS Germany GmbH	Germany
DYNARDO (Dynamic Software and Engineering) GmbH	Germany
ANSYS HELLAS SINGLE MEMBER S.A.	Greece
OPTIS Hong Kong	Hong Kong
ANSYS Software Private Limited	India
ANSYS Ireland Ltd.	Ireland
ANSYS Software, Ltd.	Israel
ANSYS Italia, S.r.l	Italy
ANSYS Japan K.K.	Japan
OPTIS Japan K.K.	Japan
ANSYS Luxembourg Holding Company S.à.r.l.	Luxembourg
ANSYS Luxembourg S.à.r.l.	Luxembourg
Computational Engineering International, Inc.	North Carolina
Fluent Software (Shanghai) Co., Limited	People's Republic of China
ANSYS-Fluent (Shanghai) Engineering Software Trading Co., Ltd.	People's Republic of China
Apache Science and Technology (Shanghai) Co. Ltd.	People's Republic of China
Apache Design Solutions Chengdu, Inc.	People's Republic of China
OPTIS CN Limited	People's Republic of China
ANSYS Poland Z.o.o.	Poland
ANSYS OOO	Russia
ANSYS Singapore Pte. Ltd.	Singapore
ANSYS Korea LLC	South Korea
OPTIS KOREA Co., Ltd.	South Korea
ANSYS Iberia, S.L.	Spain
ANSYS Sweden AB	Sweden
ANSYS Switzerland GmbH	Switzerland
OPTIS World SA	Switzerland
Taiwan ANSYS Technologies Co.	Taiwan

ANSYS UK Limited

United Kingdom

Granta Design Limited

United Kingdom

OPTIS Pristine Limited

United Kingdom

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-08613, 333-69506, 333-110728, 333-137274, 333-152765, 333-174670, 333-177030, 333-196393, 333-206111 and 333-212412 on Form S-8 of our reports dated February 27, 2020, relating to the consolidated financial statements and financial statement schedule of ANSYS, Inc. and subsidiaries, and the effectiveness of ANSYS, Inc. and subsidiaries' internal control over financial reporting appearing in this Annual Report on Form 10-K of ANSYS, Inc. for the year ended December 31, 2019.

/s/ Deloitte & Touche LLP
Pittsburgh, Pennsylvania
February 27, 2020

CHIEF EXECUTIVE OFFICER CERTIFICATION

I, Ajei S. Gopal, certify that:

1. I have reviewed this annual report on Form 10-K of ANSYS, Inc. (“Ansys”);
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of Ansys as of, and for, the periods presented in this report;
4. Ansys’ other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for Ansys and have:
 - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to Ansys, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c. Evaluated the effectiveness of Ansys’ disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d. Disclosed in this report any change in Ansys’ internal control over financial reporting that occurred during Ansys’ most recent fiscal quarter (Ansys’ fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, Ansys’ internal control over financial reporting; and
5. Ansys’ other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to Ansys’ auditors and the audit committee of Ansys’ board of directors (or persons performing the equivalent functions):
 - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect Ansys’ ability to record, process, summarize and report financial information; and
 - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in Ansys’ internal control over financial reporting.

Date: February 27, 2020

/s/ Ajei S. Gopal

Ajei S. Gopal

President and Chief Executive Officer

CHIEF FINANCIAL OFFICER CERTIFICATION

I, Maria T. Shields, certify that:

1. I have reviewed this annual report on Form 10-K of ANSYS, Inc. (“Ansys”);
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of Ansys as of, and for, the periods presented in this report;
4. Ansys’ other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for Ansys and have:
 - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to Ansys, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c. Evaluated the effectiveness of Ansys’ disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d. Disclosed in this report any change in Ansys’ internal control over financial reporting that occurred during Ansys’ most recent fiscal quarter (Ansys’ fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, Ansys’ internal control over financial reporting; and
5. Ansys’ other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to Ansys’ auditors and the audit committee of Ansys’ board of directors (or persons performing the equivalent functions):
 - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect Ansys’ ability to record, process, summarize and report financial information; and
 - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in Ansys’ internal control over financial reporting.

Date: February 27, 2020

/s/ Maria T. Shields

Maria T. Shields
Chief Financial Officer

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of ANSYS, Inc. (the "Company") on Form 10-K for the year ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Ajei S. Gopal, President and Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

- (1) The Report fully complies with requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

This certification is provided solely pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed to be part of the Report or filed for any purpose whatsoever.

/s/ Ajei S. Gopal

Ajei S. Gopal

President and Chief Executive Officer

February 27, 2020

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of ANSYS, Inc. (the "Company") on Form 10-K for the year ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Maria T. Shields, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

- (1) The Report fully complies with requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

This certification is provided solely pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed to be part of the Report or filed for any purpose whatsoever.

/s/ Maria T. Shields

Maria T. Shields

Chief Financial Officer

February 27, 2020