

CIENA CORP  
Form 10-K  
December 22, 2017  
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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 October 31, 2017

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

For the transition period from \_\_\_\_\_ to \_\_\_\_\_  
Commission file number 001-36250

Ciena Corporation

(Exact name of registrant as specified in its charter)

Delaware 23-2725311

(State or other jurisdiction of (I.R.S. Employer  
Incorporation or organization) Identification No.)

7035 Ridge Road, Hanover, MD 21076  
(Address of principal executive offices) (Zip Code)  
(410) 694-5700

(Registrant's telephone number, including area code)

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

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, \$0.01 par value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

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 Section 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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.4-5 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). YES  NO

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

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Large accelerated filer  Non-accelerated filer  Smaller reporting company   
 Accelerated filer (Do not check if a smaller reporting company)  Emerging growth company

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act) YES  NO

The aggregate market value of the Registrant's Common Stock held by non-affiliates of the Registrant was approximately \$3.2 billion based on the closing price of the Common Stock on the New York Stock Exchange on April 28, 2017.

The number of shares of Registrant's Common Stock outstanding as of December 15, 2017 was 143,679,592.

**DOCUMENTS INCORPORATED BY REFERENCE**

Part III of the Form 10-K incorporates by reference certain portions of the Registrant's definitive proxy statement for its 2018 Annual Meeting of Stockholders to be filed with the Commission not later than 120 days after the end of the fiscal year covered by this report.

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## PART I

This annual report contains statements that discuss future events or expectations, projections of results of operations or financial condition, changes in the markets for our products and services, trends in our business, business prospects and strategies, and other “forward-looking” information. In some cases, you can identify “forward-looking statements” by words like “may,” “will,” “should,” “expects,” “plans,” “anticipates,” “believes,” “estimates,” “predicts,” “intends,” “potential,” “targets,” or “continue” or the negative of those words and other comparable words. These statements may relate to, among other things, our competitive landscape; market conditions and growth opportunities; factors impacting our industry; factors impacting the businesses of network operators and their network architectures; adoption of next-generation network technology and software programmability and control of networks; our strategy, including our research and development, supply chain and go-to-market initiatives; efforts to increase application of our solutions in customer networks and to increase the reach of our business into new or growing customer and geographic markets; our backlog and seasonality in our business; expectations for our financial results, revenue, gross margin, operating expense and key operating measures in future periods; the adequacy of our sources of liquidity to satisfy our working capital needs, capital expenditures, and other liquidity requirements; business initiatives including IT transitions or initiatives; and market risks associated with financial instruments and foreign currency exchange rates. These statements are subject to known and unknown risks, uncertainties and other factors, and actual events or results may differ materially due to factors such as:

- our ability to execute our business and growth strategies;
  - fluctuations in our revenue, gross margin and operating results and our financial results generally;
- the loss of any of our large customers, a significant reduction in their spending, or a material change in their networking or procurement strategies;
- the competitive environment in which we operate;
- market acceptance of products and services currently under development and delays in product or software development;
- lengthy sales cycles and onerous contract terms with communications service providers, Web-scale providers and other large customers;
- product performance or security problems and undetected errors;
- our ability to diversify our customer base beyond our traditional customers and to broaden the application for our solutions in communications networks;
- the level of growth in network traffic and bandwidth consumption and the corresponding level of investment in network infrastructures by network operators;
- the international scale of our operations and fluctuations in currency exchange rates;
- our ability to forecast accurately demand for our products for purposes of inventory purchase practices;
- the impact of pricing pressure and price erosion that we regularly encounter in our markets;
- our ability to enforce our intellectual property rights, and costs we may incur in response to intellectual property right infringement claims made against us;
- the continued availability, on commercially reasonable terms, of software and other technology under third-party licenses;
- the potential failure to maintain the security of confidential, proprietary or otherwise sensitive business information or systems or to protect against cyber security attacks;
- the performance of our third-party contract manufacturers;
- changes or disruption in components or supplies provided by third parties, including sole and limited source suppliers;
- our ability to manage effectively our relationships with third-party service partners and distributors;
- unanticipated risks and additional obligations in connection with our resale of complementary products or technology of other companies;
- our ability to grow and maintain our new distribution relationships under which we will make available certain technology as a component;

our exposure to the credit risks of our customers and our ability to collect receivables;  
modification or disruption of our internal business processes and information systems;  
the effect of our outstanding indebtedness on our liquidity and business;  
fluctuations in our stock price and our ability to access the capital markets to raise capital;  
unanticipated expenses or disruptions to our operations caused by facilities transitions or restructuring activities;  
our ability to attract and retain experienced and qualified personnel;  
disruptions to our operations caused by strategic acquisitions and investments or the inability to achieve the expected  
benefits and synergies of newly-acquired businesses;  
our ability to grow our software business and address networking strategies, including software-defined networking  
and network function virtualization;

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changes in, and the impact of, government regulations, including with respect to: the communications industry generally; the business of our customers; the use, import or export of products; and the environment, potential climate change and other social initiatives;

future legislation or executive action in the U.S. relating to tax policy or trade regulation;

the write-down of significant assets including goodwill, long-lived assets or our deferred tax assets;

our ability to maintain effective internal controls over financial reporting and liabilities that result from the inability to comply with corporate governance requirements; and

adverse results in litigation matters.

These are only some of the factors that may affect the forward-looking statements contained in this annual report. For a discussion identifying additional important factors that could cause actual results to vary materially from those anticipated in the forward-looking statements, see “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Risk Factors” in this annual report. You should review these risk factors for a more complete understanding of the risks associated with an investment in our securities. However, we operate in a very competitive and rapidly changing environment and new risks and uncertainties emerge, are identified or become apparent from time to time. We cannot predict all risks and uncertainties that could have an impact on the forward-looking statements contained in this annual report. You should be aware that the forward-looking statements contained in this annual report are based on our current views and assumptions. We undertake no obligation to revise or update any forward-looking statements made in this annual report to reflect events or circumstances after the date hereof or to reflect new information or the occurrence of unanticipated events, except as required by law. The forward-looking statements in this annual report are intended to be subject to protection afforded by the safe harbor for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995.

### Item 1. Business

#### Overview

We are a network strategy and technology company, providing solutions that enable a wide range of network operators to deploy and manage next-generation communication architectures that deliver a broad array of services. We provide network hardware, software and services that support the transport, switching, aggregation, service delivery and management of video, data, and voice traffic on communications networks. Our high-capacity hardware and network management and control software solutions enable open, programmable networks that enhance automation, reduce network complexity and support changing service requirements. Our solutions create business and operational value for our customers by enabling them to introduce new revenue-generating services and reduce network costs.

Our solutions include a diverse set of Networking Platform products, which are used by a broad range of network operator customers and market segments, including communications service providers, cable and multiservice operators, Web-scale providers, submarine network operators, governments, enterprises, research and education (R&E) institutions, and other emerging network operators. These products, which can be applied from the network core to network access points, allow network operators to scale capacity, increase transmission speeds, allocate traffic and adapt dynamically to changing end-user service demands. In addition to our portfolio of high-capacity hardware systems and components, we offer network management and domain control software platforms, along with advanced applications software, designed to simplify the creation, automation and delivery of services across multi-vendor and multi-domain network environments. To complement our hardware and software solutions, we offer a broad range of services that help our customers design, optimize, integrate, deploy, manage and maintain their networks.

#### Certain Financial Information and Segment Data

We generated revenue of \$2.8 billion in fiscal 2017, as compared to \$2.6 billion in fiscal 2016. Sales to AT&T were \$448.9 million, or 16.0% of total revenue in fiscal 2017, and \$479.1 million, or 18.4% of total revenue in fiscal 2016. Verizon accounted for \$288.0 million or 10.3% of total revenue for fiscal 2017. No other customer accounted for greater than 10% of our revenue in fiscal 2017 or fiscal 2016. For more information regarding our results of operations, see “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in Item 7 of Part II of this annual report.

The matters discussed in this “Business” section should be read in conjunction with the Consolidated Financial Statements found in Item 8 of Part II of this annual report, which include additional financial information about our operating segments, total assets, revenue, measures of profit and loss, and financial information about geographic areas and customers representing greater than 10% of revenue.

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### Corporate Information and Access to SEC Reports

We were incorporated in Delaware in November 1992 and completed our initial public offering on February 7, 1997. Our principal executive offices are located at 7035 Ridge Road, Hanover, Maryland 21076. Our telephone number is (410) 694-5700, and our website address is [www.ciena.com](http://www.ciena.com). We make our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports, available free of charge in the “Investors” section of our website as soon as reasonably practicable after we file these reports with the Securities and Exchange Commission (the “SEC”). We routinely post the reports above, recent news and announcements, financial results and other important information about our business on our website at [www.ciena.com](http://www.ciena.com). Information contained on our website is not a part of this annual report.

### Industry Background

#### Network Traffic Growth and Increased Capacity Requirements

The markets in which we sell our communications networking solutions have seen significant changes in recent years. In particular, optical networks – which carry video, data, and voice traffic by encoding digital information on multiple wavelengths of light traveling across fiber optic cables – have experienced strong traffic growth for several years. This growth in bandwidth demand, and the resulting requirements for increased network capacity and transmission speeds, is being driven by the rapid proliferation and increased reliance upon a diverse set of communications services and applications. These services and applications, including those set forth below, are redefining the bandwidth and service demands placed upon networks, and are challenging the business models and infrastructures of many network operators.

**Cloud-Based Services.** Enterprises and consumers continue to replace locally-housed computing by adopting a broad array of innovative cloud-based models – including Platform as a Service (PaaS), Software as a Service (SaaS) and Infrastructure as a Service (IaaS) – and an expanding range of cloud-based services that host key applications, store data, enable the viewing and downloading of content, and utilize on-demand computing resources.

**Over-the-Top (OTT) Services and Video Streaming.** OTT content refers to video, multimedia and other applications provided directly from the content source to the viewer or end user across a third-party network. Traffic from streaming and OTT services, including high definition and ultra-high definition video, has expanded with the increased availability of, and end-user demand for, video content accessible through a variety of devices and media.

**On-Demand Services.** Users of communications services are requiring an on-demand service level that allows them to be connected wherever and whenever they desire. Businesses rely upon enterprise services and data center connectivity that facilitate global operations, employee mobility and access to critical business applications and data. Consumers expect broadband services, including peer-to-peer internet applications, augmented reality applications and multimedia streaming and downloads, to be available on-demand.

**Mobile Devices and Applications.** Traffic from mobile applications, including video, internet and data services, has expanded with the proliferation of smartphones, tablets and other wireless devices. Because much of the wireless traffic ultimately travels across a wireline network to reach its destination, growth in mobile communications continues to place demands upon wireline networks, including backhaul and fronthaul networks emanating from cell sites.

In addition, emerging services and applications are likely to present further challenges for and place significant service, capacity and automation demands upon network infrastructures. These include:



Network Densification. Network operators will be required to adopt next-generation network standards in order to cost-effectively accommodate increased bandwidth and service demands from emerging wireless and cable initiatives and to deliver greater capacity closer to the end users. Fifth-Generation wireless broadband technology (5G) is expected to enable significant increases in data consumption by a growing number of users and devices, thereby better supporting what some refer to as the “Internet of Things” and other emerging applications. “Fiber deep” initiatives by cable and multiservice operators are designed to push fiber closer to the end-user, increasing potential bandwidth to homes and enterprises while addressing power, space and maintenance costs. Implementation of these initiatives is expected to affect wireline networks significantly, particularly in access networks and mobile backhaul applications.

Internet of Things. As the number of networked connections between devices and servers grows, machine-to-machine-related traffic (M2M) is expected to represent an increasing portion of traffic as the Internet of Things evolves. These connections can provide value-added services and allow sharing of data that can be monitored and analyzed. We

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expect network traffic relating to the interconnection of devices to grow as internet and cloud-based content delivery, smart grid applications, health care and safety monitoring, resource and inventory management, home entertainment, consumer appliances, connected transportation, and other M2M data applications become more widely adopted.

Ultra-High Definition TV and Virtual and Augmented Reality. Ultra-high definition TV and the advent of immersive technologies like 360° video, virtual reality, and augmented reality are likely to place meaningful capacity and capability demands on networks as adoption of these technologies grows. The television, internet and consumer electronics industries are rapidly advancing these technologies and making them more widely available and affordable to consumers.

We believe that increased adoption of these services and applications, along with the desire to provide content and service delivery closer to the end user for an improved quality of experience, will require network operators to adopt higher capacity networks with increased transmission speeds, particularly in regional and metropolitan networks.

### Network Transition to Open, Programmable Networks

The dynamics discussed above, together with ongoing efforts by network operators to reduce network costs and promote flexibility, are causing our customers to adopt next-generation infrastructures that are more open, programmable and automated. Network operators are increasingly leveraging information technology (IT) strategies that emphasize software capability, virtualization and standardized network solutions in order to adapt more quickly to changing end-user demands, and to deliver efficiently a wider range of revenue-generating services. We expect these new network infrastructure strategies to include one or more of the following:

Orchestration and Automation. Software-based orchestration simplifies the end-to-end creation, automation and deployment of services across multiple physical and virtual network domains. We believe software-based orchestration presents an opportunity to reduce network complexity and offers an alternative to certain elements of traditional operations support and business support systems, which network operators have historically relied upon to support network management functions such as inventory, service provisioning, network configuration and fault management.

Network Function Virtualization (NFV). Through NFV, network operators can decouple physical network assets from the services or capabilities they provide. We believe that NFV can decrease power and space requirements, reduce cost, and improve network flexibility and agility by eliminating costly, single-function network appliances and enabling these functions via software and general computing hardware and servers.

Software-Defined Networking (SDN). SDN seeks to simplify networks to create more open environments that ease management, support automation, and quickly deliver customized services to end users, by enabling individual network elements to be directly programmable by standards-based software control. This results in end-to-end visibility of network flows, enabling the ability to optimize traffic paths and control data flows through a network.

We believe that adoption of these strategies will require network operators, and their network solutions vendors, to increasingly look to utilize an ecosystem of physical and virtual network resources. We expect that these network architectural approaches, in turn, will drive increased openness and interoperability of multi-vendor, multi-domain network environments, requiring an increased degree of cooperation, collaboration and interoperability among us and other solutions providers, including our competitors.

### Different Approaches to Procurement of Network Infrastructure

The industry dynamics described above are leading network operators to consider a diverse range of approaches, or “consumption models,” to manage the design and procurement of their network infrastructures. These consumption models can include: the traditional systems procurement of fully integrated solutions including hardware, software and services from the same vendor; the procurement of a fully integrated hardware solution from one vendor with the separate use of a network operator’s own or another vendor’s SDN-based control; the procurement of an integrated photonic line system with open interfaces from one vendor and the separate or “disaggregated” procurement of modem technology from a different vendor; or the use of published reference designs and open source specifications for the procurement of off-the-shelf or commoditized hardware (often referred to as “white box” hardware) to be used with open source software. In parallel, network operators are also exploring procurement alternatives for software solutions, ranging from integrated and proprietary software platforms to fully open source software.

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We believe that network operators will pursue a variety of different consumption models. Many of these approaches continue to be in their early stages of evaluation, and the models that ultimately emerge and their level of adoption will depend in significant part on the circumstances and strategies of particular network operators. We also believe that broader adoption of procurement models involving greater disaggregation remains uncertain, particularly for those network operators for whom such an approach would result in increased operational complexity, expense, and integration and support obligations. Based on our views of the market and customer interactions, we expect that the largest portion of deployed capacity, for at least the next few years, will continue to be through the purchase of fully integrated hardware solutions. We expect that customer consideration of a variety of consumption models will require network operators and vendors alike to assess, and possibly broaden, their existing commercial models over time. We also believe that these dynamics will place a premium on a vendor's ability to accommodate multiple consumption models and to balance the provision of commercially robust network solutions with the maximum amount of flexibility and choice.

### Strategy

In the context of the foregoing current market dynamics, our strategy to leverage our technology leadership, diversify and expand our addressable market, and drive the profitable growth of our business includes the following initiatives:

**Promote Choice and Openness.** Our philosophy is rooted in enabling choice in the market by developing network technologies that facilitate openness through innovation, virtualization, automation and collaboration. Choice is an increasingly important element of our customers' efforts to keep pace with bandwidth and infrastructure demands, and the need to manage network costs. Our technology heritage and investment capacity in forward innovation position us well to offer an expansive range of choice to our customers – including our packet-optical convergence, coherent modem leadership and merchant modem strategy, and multi-vendor network orchestration, management and control through our Blue Planet software platform. By offering collaborative tools and environments, including our Emulation Cloud and DevOps Toolkit, we enable the development, testing and customization of services and applications. Our desire to promote choice also influences our go-to-market approach. We expect to increasingly partner with an ecosystem of integrators, solutions vendors and virtual network function providers to address services and applications across multi-vendor and multi-domain networks. We also intend to offer solutions and pursue opportunities across a range of customer consumption models in order to drive the evolution of next-generation network infrastructures and to increase choice and openness.

**Extend Technology Leadership and Expand Application of Our Solutions.** We are focused on providing market leading technology offerings that expand our role and the application of our solutions in customer networks. We seek to force the pace of innovation in our industry and to extend our coherent modem technology leadership. In 2017 we launched WaveLogic Ai, our next-generation programmable coherent modem that significantly improves transport network economics and flexibility across a broad set of network applications. We also recently introduced Liquid Spectrum, an integrated solution offering that combines WaveLogic Ai and our Blue Planet software. We are also focused on introducing Converged Packet Optical and Packet Networking solutions that offer greater transmission speeds and that expand the capacity and service delivery capabilities of access and metro networks, data center interconnect, submarine networks, and other WAN applications.

**Leverage Blue Planet for Automated Networks.** To address the various challenges faced by network operators, we seek to promote our Blue Planet software as an intelligent automation platform that we believe is capable of transforming network operations and management. Our Blue Planet software platform is designed to automate, orchestrate, and manage physical network resources and virtualized services across data centers and the WAN. We believe that Blue Planet can transform legacy networks into “service ready” networks, accelerating the creation, delivery and lifecycle management of new, cloud-based services. Analytics and machine learning technology are also critical

components of our automation strategy, and we have introduced analytics capabilities aimed at delivering measurable business improvements to the planning, operations, and utilization of transport networks.

We are implementing a new go-to-market strategy for our Blue Planet software platform, with an enhanced focus on selling the software as one component of an overall software and software-related service solution. This solutions-based selling approach seeks to leverage our insights into our customers' common networking issues, and to use those insights to help drive creative and efficient solutions using our Blue Planet and software-related service capabilities. We intend to leverage the transition from our legacy network management solutions to our Blue Planet Manage, Control and Plan (MCP) network domain controller to position us for additional Blue Planet applications, including orchestration and analytics solutions.

**Capture Merchant Modem Business Opportunities.** To further leverage our technology leadership and expand our addressable market, we have taken steps to enter the market for merchant modem sales opportunities. Merchant modems, often called transponders, are the combination of an optical chipset or ASIC with other key optical components that are sold

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independent of integrated systems. Merchant modem vendors often sell their modem technology in the form of an optical module or pluggable component to a variety of market participants, including some of our system vendor competitors. To pursue this strategy, we have entered into global distribution relationships to supply our WaveLogic coherent optical modem technology to leading component vendors Lumentum, NeoPhotonics and Oclaro. Through these relationships, we believe that we can further our efforts to diversify our business and expand our addressable market to include new geographies and market segments, while enabling greater choice for network operators in offering an alternative to merchant modems currently in the market.

**Increase Diversification of Our Business.** We believe that continued diversification of our business is important to address the dynamic industry environment in which we operate, to continue to grow our business, and to better withstand potential slowdowns adversely affecting particular geographies, markets, or customer segments. Our strategy is to increase adoption of our packet access and aggregation solutions, and to secure and grow market share with our Blue Planet software platform and merchant modem initiatives, while also pursuing opportunities with a diverse set of network operators in growth customer segments and geographies. Our go-to-market strategy seeks to capture additional market share with current customers and other internet content providers, data center operators, and emerging network operators, and to displace competitors in international markets, particularly Asia-Pacific. We intend to use our direct and indirect sales channels to expand our sales with several other market verticals, including cable and multiservice operators, submarine network operators, enterprise customers and in the government and research and education (R&E) markets.

### Customers and Markets

We sell our product and service solutions through direct and indirect sales channels to network operators in the following customer and market segments:

**Communications Service Providers.** Our communications service provider customers, including regional, national and international wireline and wireless carriers, form our historical customer base and represent a majority of our revenue.

**Web-scale Providers.** Our “Web-scale” or “Web 2.0” customers include a diverse range of internet content providers and data center operators, focused on applications such as search, social media, video, real-time communications and cloud-based service offerings, data center operators and other emerging network operators.

**Cable & Multiservice Operators (MSO).** Our customers include regional, national and international cable and multiservice operators.

**Submarine Network Operators.** Our customers include service providers, Web-scale providers, and consortia operators of submarine communications networks across the globe.

**Enterprises.** Our enterprise customers include large, multi-site commercial organizations, including participants in the financial, health care, transportation, utilities, energy and retail industries.

**Government, Research and Education (R&E).** Our government customers include federal and state agencies in the United States as well as international government entities. Our R&E customers include research and education institutions around the world, as well as communities or consortia including leaders in research, academia, industry and government.

### Products and Services

To address a broad range of network operator customers and their preferred consumption models, we offer the market a comprehensive set of networking solutions that include hardware platforms and systems, our leading modem technology, network software solutions and a broad range of services. We also offer a broad set of service offerings that allow us to gain valuable insight into network and business challenges faced by our customers and to work closely with them in the assessment, planning, deployment and transformation of their networks.

#### Networking Platforms

Our Networking Platforms segment consists of our Converged Packet Optical, Packet Networking and Optical Transport product portfolios.

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Converged Packet Optical. Our Converged Packet Optical portfolio includes a range of hardware networking solutions optimized for the convergence of coherent optical transport, Optical Transport Network (OTN) switching and packet switching.

Using our WaveLogic coherent optical transport technology, our 6500 Packet-Optical Platform provides a flexible and scalable dense wavelength division multiplexing (DWDM) solution that adds capacity to core, regional, metro, and submarine networks and enables efficient transport at high transmission speeds. Our 6500 Packet-Optical Platform provides leading coherent wavelength capacities, from 40G to 400G, along with control plane capabilities for scale and service differentiation. It offers a fully instrumented, flexible open line system, as well as hybrid OTN and packet switching technologies, addressing market demand for converged network features, functions and layers to drive more robust and cost-effective network infrastructures. This platform, which includes several chassis sizes and a comprehensive set of line cards optimized for individual services or applications, can be used throughout the network, from customer premises to metropolitan networks, the regional core, and submarine cable landing sites, all of which have a strong need for high capacity and carrier-class performance. With its flexible architecture and support of modern open Application Programming Interfaces (APIs), operators can use the 6500 Packet-Optical Platform to enable a more automated, programmable infrastructure.

Our Waveserver product is a stackable interconnect platform that allows network operators, including Web-scale providers and data center operators, to scale bandwidth quickly and to support high bandwidth applications, such as high-speed data transfer, content delivery, virtual machine migration and disaster recovery/backup between data centers. Waveserver is a specialized platform, purpose-built for addressing high-capacity interconnect applications using a small footprint and low power design. It combines our leading WaveLogic coherent chipset with an IT operations model optimized for the capacity, speed, space and power requirements of data center and other space-constrained environments. With its full suite of management interfaces and open APIs, Waveserver Ai is easy to operate and integrate into existing networks and facilitates deployment of on-demand cloud and high-capacity connectivity services.

Within our Converged Packet Optical portfolio, we offer products that provide solutions to transport legacy services efficiently while scaling networks to higher capacity rates. Our 5400 family of Packet-Optical Platforms consists of multi-terabit reconfigurable switching systems that combine WaveLogic coherent optics and intelligent mesh networking to provide high capacity scalability with industry-leading service resiliency. Our CoreDirector® Multiservice Optical Switch and 5400 family of Packet-Optical Platforms offer multiservice, multi-protocol switching systems that consolidate the functionality of an add/drop multiplexer and digital cross-connect into a single, high-capacity intelligent switching system. These products address both core and metro segments of communications networks and support key managed services, including Ethernet/TDM Private Line and IP services.

Our family of Z-Series multi-layer switching and transport platforms are used in regional and metro networks and are designed to support a variety of use cases including Ethernet business services and Ethernet backhaul. These products provide for optical transport, traffic aggregation at the network edge, and switching that is optimized for handoff at the network core.

Leveraging our WaveLogic coherent modem technology, we are taking steps to pursue merchant modem sales opportunities through our Optical Microsystems division. These activities principally include our distribution relationships with optical component suppliers Lumentum, NeoPhotonics and Oclaro for our coherent modem technology. To date, we have not generated revenue from sales through these partnerships; however, such sales will be reflected within the Converged Packet Optical product line of our Networking Platforms segment.

Packet Networking. Our Packet Networking products allow customers to simplify their network designs while scaling the deployment and delivery of new, revenue-generating services to both consumer and business end users. These products have applications from the network edge, where packet-based services are terminated, to the metro and core networks, where they aggregate and switch traffic to support such applications as Ethernet business services, mobile backhaul services, as well as ongoing network infrastructure scaling. Our Packet Networking products facilitate network simplicity and cost effectiveness, including reduced costs associated with power and space, as compared to more complex traditional IP routing network designs.



To date, revenue from our Packet Networking segment has been primarily related to our 3000 family of Service Delivery Switches, and our 5000 family of Service Aggregation Switches. Our 3000 and 5000 families support the access and aggregation tiers of communications networks and have principally been deployed to support business data services and wireless backhaul applications. Our 3000 family of Service Delivery Switches are purpose-built to fit small, medium and large customer sites as well as multi-tenant office and residential buildings. Our 5000 family of Service Aggregation Switches provide aggregation to fill higher capacity links efficiently within both the metro access and aggregation tiers of networks, minimizing the number of router assets required in the core. The recent introduction of our 3000 family of Service Virtualization Switches allows for customers to migrate towards software-based networking and services based on Network Function Virtualization.

Our Packet Networking portfolio also includes our 8700 Packetwave Platform, a multi-terabit packet switching platform for high-density metro networks and inter-data center wide area networks. The 8700 combines high-capacity packet switching and coherent DWDM optical transport technologies for both data center networks and metro networks, to help network

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operators rapidly deliver cloud-based services, streaming video, and internet content distribution, efficiently aggregate users, and provide express connections to data centers. By increasing the traffic density while reducing power and space requirements, the 8700 also enables network operators to reduce capital and operating expense associated with their networks and to simplify service management and enablement.

**Optical Transport.** Our Optical Transport products include stand-alone WDM and SONET/SDH-based optical transport solutions that are used in metro and regional networks and enable cost-effective and efficient transport of voice, video and data traffic at high transmission speeds. The products in this segment principally include the 4200 Advanced Services Platform, Corestream® Agility Optical Transport System, 5100/5200 Advanced Services Platform, Common Photonic Layer (CPL) and 6100 Multiservice Optical Platform. As of the end of fiscal 2017, our Optical Transport products have either been previously discontinued, or are expected to be discontinued, reflecting network operators' transition toward next-generation converged network architectures and stackable interconnect platforms addressed by solutions within our Converged Packet Optical product line. Accordingly, commencing in fiscal 2018, sales of Optical Transport will be reflected within the Converged Packet Optical product line of our Networking Platforms segment.

### Software and Software-Related Services

Historically, our software business principally consisted of element and network management software and software-related services that support our hardware offerings. As a result of our acquisition of Cyan, we refocused our software initiatives toward next-generation, multi-vendor network virtualization, service orchestration and management applications oriented around our Blue Planet software platform.

**Blue Planet Platform.** Our Blue Planet software is an open, intelligent automation platform that allows service providers to use deep knowledge about the network to power adaptive optimization of their services and operations. Blue Planet facilitates the evolution toward more efficient, modernized network operations and software-defined programmability to accelerate the delivery of on-demand services, reduce costs and enable a path to increased network autonomy. The Blue Planet platform is a cohesive system combining multi-domain service orchestration, analytics, and SDN in a common microservices-based architecture. Blue Planet products can be deployed individually or in any combination and include:

**Manage, Control and Plan (MCP).** Blue Planet MCP software provides SDN-based domain control of Ciena's next-generation packet and optical networks, including equipment commissioning, service provisioning, assurance and performance monitoring. Operations are greatly automated and simplified through MCP's open programmatic APIs and its intuitive GUI. This enables granular resource management and control, and the ability to plan networks efficiently and effectively to meet customer service needs. Built on Blue Planet's open, extensible microservices-based architecture, MCP marks a strategic shift from legacy, fragmented network management software, leading the transformation to programmable cloud-native operations that easily integrate into operators' business processes.

**Multi-Domain Service Orchestration (MDSO).** Network infrastructures are comprised of multiple technology layers and domains — such as the data center, cloud, metro, access and core networks — and it is often complex for network operators to offer services end-to-end in this environment. Blue Planet enables service orchestration across multiple network (physical and virtual) domains and multiple hardware and software vendors. By using open APIs and intent-based, model-driven templates, Blue Planet simplifies end-to-end services lifecycle management and increases service velocity by abstracting the complexity of underlying domains. We believe our MDSO solution can enable network operators to minimize vendor-specific management silos, reduce network complexity and improve end-to-end service visibility and control.

**NFV Orchestration (NFVO).** To reduce their dependence upon single-purpose hardware platforms and accelerate the time to market for new revenue-generating services, network operators are increasingly looking for solutions that enable network functions through software that runs on industry-standard servers, network and storage platforms.

Blue Planet provides network operators with carrier-grade, NFV management and orchestration capabilities for instantiating and managing virtualized network functions and data center resources. Blue Planet uses an open, vendor-agnostic approach that allows network operators to select and scale those virtual network functions (VNFs) they wish to offer to their end customers. We believe that our NFVO solution can enable network operators to increase network programmability, reduce complexity and cost, and reduce time-to-market with new, revenue-generating services.

Analytics. Blue Planet Analytics incorporates big data analytics and machine-learning innovations for generating deep insights into the network, thereby helping operators make smarter, data-driven business decisions. Analytics consists of two components: a robust and flexible framework for collecting, processing, and storing data from multiple sources across the network; and upper-layer analytics applications that leverage machine learning innovations. This design approach gives operators the ability to visualize and identify trends to create more profitable services, better predict

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capacity requirements, and anticipate potential network and service disruptions before they happen. The related Network Health Predictor application provides preemptive network maintenance across the optical, Ethernet, and IP layers of the network.

The market relating to these automation capabilities is in the early stages and, as such, revenue from our Blue Planet software has not been significant to date.

Element and Network Management Solutions and Software. Our software offerings also include our OneControl Unified Management System used by network operators in connection with our networking platforms. This integrated network and service management solution supports our Converged Packet Optical, Packet Networking and Optical Transport product lines from a single platform. OneControl offers end-to-end service creation, activation, and assurance to enable rapid deployment of next-generation wavelength, OTN and packet services. It also provides visualization of fault and performance information for network health status and enables management functions, including network inventory, network element configuration backup, network element software delivery and security administration. Our element and network management software offering also includes a number of legacy software solutions that support our installed base of network solutions. Our software suite includes Ciena OnePlanner, a suite of planning tools for advanced, multi-layer network design. OnePlanner correlates data from different network layers, allowing the network planner to easily see the connection between services, facilities, and equipment.

Software-Related Services. To complement our software portfolio, we offer a range of software-related services including software subscription services, consulting, network migration and integration, installation and upgrade support services, and technical support relating to our software offerings. These services are focused on enhancing network automation and network analytics, enabling multivendor integration and support, and implementing programmable multi-domain next-generation networks.

### Global Services

To complement our Networking Platforms portfolio, we offer a broad suite of “attached services” that help our customers to design, optimize, deploy, integrate, manage and maintain their communications networks. We believe that our broad set of services offerings is a significant differentiator from our competitors. We believe that our services offerings and our close collaborative engagement with customers provide us with valued insight into network and business challenges faced by our customers, enabling them to achieve their desired outcomes for their network investment. Our services offerings enable us to work closely with our customers in the assessment, planning, deployment, and transformation of their networks. We have begun a multi-year transformation process to enhance our service delivery capability, expand our portfolio and drive greater incremental value for our customers in new ways.

Our Global Services portfolio includes the following offerings:

Network planning and design services, including:

network analytics;

reconfiguration and migration services;

Deployment services, including turn-key installation and turn-up and test services;

Network maintenance and support services, including:

helpdesk and technical support assistance;

spares and logistics management;

engineering dispatch, preventive maintenance, and on-site professional services; and

equipment repair and replacement;

Network management and monitoring through network operations center (NOC) services; and

Project management services, including staging, site preparation and installation support activities.

We also provide training services to educate our customers and sales channels on the implementation, use, functionality and support of our solutions. We provide the services above using a combination of Ciena technical support engineers and qualified and authorized third-party service partners.

#### Product Development

To remain competitive, we must continually invest in and enhance our product platforms, adding new features and functionality and ensuring alignment with market demand. Our research and development strategy emphasizes software-enabled programmability, automation and open interfaces, and seeks to promote broad application of our solutions, including in long-haul, metropolitan and access networks, data center interconnect, enterprise networking, and packet-based infrastructures

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for cloud-based service delivery. Our approach is also focused on designing products that enable network operators to achieve improved economics and efficiency, including with respect to power, space and operating cost, as the capacity and service demands upon their networks increase. Our current development efforts are focused upon:

Enhancing and extending our Packet-Optical and Packet Networking solutions, including:

- Coherent modem leadership and continued development of our WaveLogic optical processor to advance transmission speed, spectral efficiency, power usage and reach;
  - Legacy service migration to next-generation packet infrastructures; and
  - Support of fiber densification initiatives, such as 5G and fiber deep.
- Developing products that enhance software-based network management, automation and control, service orchestration and network function virtualization, and analytics capabilities.

Our research and development efforts are also geared toward portfolio optimization and engineering changes intended to drive product and manufacturing cost reductions across our platforms.

We regularly review our existing solution offering and prospective development of new components, features or products, to determine their fit within our portfolio and broader corporate strategy. We also assess the market demand, technology evolution, prospective return on investment and growth opportunities, as well as the costs and resources necessary to develop and support these products. To ensure that our product development investments and solutions offerings are closely aligned with market demand, we continually seek input from customers and promote collaboration among our product development, marketing and global field organizations. In some cases, where we seek to utilize or gain access to complementary or emerging technologies or solutions, we may obtain technology through an acquisition or, alternatively, through initiatives with third parties pursuant to technology licenses, original equipment manufacturer (OEM) arrangements and other strategic technology relationships or investments. In addition, we participate in industry and standards organizations, and, where appropriate, incorporate information from these affiliations throughout the product development process.

Our research and development expense was \$475.3 million, \$451.8 million and \$414.2 million for fiscal 2017, 2016 and 2015, respectively. For more information regarding our research and development expense, see “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in Item 7 of Part II of this annual report.

## Sales and Marketing

Within our Global Sales and Marketing organization, we maintain a direct sales presence that is organized geographically around the following markets: (i) United States and Canada; (ii) Caribbean and Latin America; (iii) Europe, Middle East and Africa; and (iv) Asia-Pacific and India. Within each geographic area, we maintain specific teams or personnel that focus on a particular region, country, customer or market vertical. These teams include sales management, account salespersons, and sales engineers, as well as services professionals and commercial management personnel, who ensure that we maintain a high-touch, consultative relationship with our customers.

We also maintain a global channel program that involves resellers, systems integrators, service providers, and other third-party distributors, who market and sell our products and services. Our strategic third-party channel partners include Ericsson and TE SubCom for our systems, as well as optical component suppliers Lumentum, NeoPhotonics and Oclaro for our coherent modem technology. We see opportunities to leverage these relationships to address new customer segments, additional applications for our solutions, and new geographies, while reducing the financial and operational risk of entering these additional markets.

To support our sales efforts, we engage in marketing activities to generate demand for our products and services. Our marketing strategy is highly focused on building our brand to create customer preference for Ciena, engaging in

thought leadership programs to illustrate how our innovations solve customer business problems, and enabling our sales teams to drive customer adoption of our solutions. Our marketing team supports our sales efforts through a variety of activities, including direct customer interaction, account-based marketing campaigns, portfolio marketing, industry events, media relations, industry analyst relations, social media, trade shows, our website and other marketing vehicles for our customers and channel partners.

#### Operations and Supply Chain Management

Our operations personnel manage our relationships with our third-party manufacturers and global supply chain, addressing component sourcing, manufacturing, product testing and quality, and fulfillment and logistics relating to the distribution and support of our products.

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We utilize a global sourcing strategy that emphasizes procurement of materials and product manufacturing in lower cost regions. We rely upon third-party contract manufacturers, with facilities in Canada, Mexico, Thailand and the United States, to manufacture, support and ship our products, and therefore are exposed to risks associated with their businesses, financial condition and the geographies in which they operate. We also rely upon these contract manufacturers and other third parties to perform design and prototype development, component procurement, full production, final assembly, testing and distribution operations. Our manufacturers procure components necessary for assembly and manufacture of our products based on our specifications, approved vendor lists, bills of materials and testing and quality standards. Our manufacturers' activity is based on rolling forecasts that we provide to them to estimate demand for our products. This build-to-forecast purchase model exposes us to the risk that our customers will not order those products for which we have forecast sales, or will purchase less than we have forecast. As a result, we may incur carrying charges or obsolete material charges for components purchased by our manufacturers that they do not ultimately use. We work closely with our manufacturers and suppliers to manage material, quality, cost and delivery times, and we continually evaluate their services to ensure performance on a reliable and cost-effective basis.

We are currently using a direct order fulfillment model for the sale of our products. This model allows us to rely on our third-party contract manufacturers to perform final system integration and testing prior to shipment of products from their facilities directly to our customers. We believe that our sourcing and manufacturing strategy allows us to conserve capital, lower costs of product sales, adjust quickly to changes in market demand, and operate without dedicating significant resources to manufacturing-related plant and equipment.

As part of our effort to optimize our operations, we continue to focus on driving cost reductions through sourcing, rationalizing our supply chain, outsourcing or virtualizing certain activities, and consolidating distribution sites and service logistics partners. These efforts also include process optimization initiatives, such as vendor-managed inventory, and other operational models and strategies designed to drive improved efficiencies in our sourcing, production, logistics and fulfillment.

## Backlog

Generally, we make sales pursuant to purchase orders placed by customers under framework agreements that govern the general commercial terms and conditions of the sale of our products and services. These agreements do not obligate customers to purchase any minimum or guaranteed order quantities. Moreover, we are periodically awarded business for new network opportunities or network upgrades following a selection process. In calculating backlog, we only include (i) customer purchase orders for products that have not been shipped and for services that have not yet been performed; and (ii) customer orders relating to products that have been delivered and services that have been performed, but are awaiting customer acceptance under the applicable contract terms. Generally, our customers may cancel or change their orders with limited advance notice, or they may decide not to accept our products and services, although both cancellation and non-acceptance are infrequent. Backlog may be fulfilled several quarters following receipt of a purchase order, or in the case of certain service obligations, may relate to multi-year support period. As a result, backlog should not necessarily be viewed as an accurate indicator of future revenue for any particular period.

Our backlog was \$1.13 billion as of October 31, 2017 as compared to \$1.15 billion as of October 31, 2016. Backlog includes product and service orders from commercial and government customers combined. Backlog at October 31, 2017 includes approximately \$278.2 million primarily related to orders for products and maintenance and support services that are not expected to be filled or performed within fiscal 2018. Because backlog can be defined in different ways by different companies, our presentation of backlog may not be comparable with figures presented by other companies in our industry.

## Seasonality



Like other companies in our industry, we experience quarterly fluctuations in customer activity due to seasonal considerations. We typically experience reductions in order volume toward the end of the calendar year, as the procurement cycles of some of our customers slow and network deployment activity by service providers is curtailed. This period coincides with the first quarter of our fiscal year. This seasonality in our order flows has often resulted in weaker revenue results in the first quarter of our fiscal year. These seasonal effects may not apply consistently in future periods and may not be a reliable indicator of our future revenue or results of operations.

#### Competition

Competition among communications network solution vendors remains intense on a global basis. The markets in which we compete are characterized by rapidly advancing technologies, frequent introduction of new networking solutions and aggressive selling efforts, including significant pricing pressure, to displace incumbent vendors and capture market share.

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Competition for sales of communications networking solutions is dominated by a small number of very large, multi-national companies. Our competitors include Huawei, Nokia, Cisco, Fujitsu, Juniper Networks, and ZTE. As compared to us, many of these competitors have substantially greater financial, operational and marketing resources, significantly broader product offerings, and more established relationships with service providers and other customer segments. Because of their scale and resources, they may be perceived to be a better fit for the procurement or network strategies of larger network operators. We also continue to compete with several smaller, but established, companies that offer one or more products that compete directly or indirectly with our offerings or whose products address specific niches within the markets and customer segments we address. These competitors include Infinera, ADVA, Coriant, and ECI. We also compete with a number of smaller companies that provide significant competition for a specific product, application, customer segment or geographic market.

Because some of our competitors, both large and small, are not vertically integrated in their packet-optical supply chain, they rely upon coherent modem technology developed by and procured from third-party “merchant” providers, including Acacia Communications. We may compete with these providers as we pursue our strategy of capturing market share within these merchant modem sales opportunities. We have entered into global distribution relationships to sell our WaveLogic coherent optical technology into this market through Lumentum, NeoPhotonics and Oclaro. Each has the unrestricted ability to sell such optical modules to end users, including our customers, our competitors, and other vendors or network operators that plan to build or use “white box” hardware. Accordingly, we may ultimately compete in the marketplace with these partners.

The principal competitive factors applicable to our markets include:

- product functionality, speed, capacity, scalability and performance;
- price, cost per bit and total cost of ownership of our solutions;
- incumbency and strength of existing business relationships;
- ability to offer comprehensive networking solutions, consisting of hardware, software and services;
- product development that satisfies customers’ immediate and future network requirements;
- flexibility and openness of platforms, including ease of integration, interoperability and integrated management;
- ability to offer solutions that accommodate a range of different consumption models;
- space and power considerations;
  - manufacturing and lead-time capability; and
- services and support capabilities.

As a result of the intense and fragmented environment in which we compete, winning new opportunities can often require that we agree to unfavorable commercial terms or pricing, and certain other onerous contractual commitments. These terms can adversely affect our results of operations. These terms can also lengthen our revenue recognition or cash collection cycles, add start-up costs to initial sales or deployment of our solutions, require financial commitments or performance bonds, and place a disproportionate allocation of risk upon us.

We expect the competition in our industry to continue to broaden and to intensify as network operators pursue a diverse range of network strategies. As these changes occur, we expect that our business will overlap more directly with additional networking solution suppliers, including IP router vendors, data center switch providers and other suppliers or integrators of networking technology traditionally geared toward different network applications, layers or functions. In addition, as we seek increased customer adoption of our Blue Planet software platform, and network operator demands for software programmability, management and control increase, we expect to compete more directly with software vendors and information technology vendors or system integrators. We may also face competition from system and component vendors, including those in our supply chain, who develop networking products based on off-the-shelf or commoditized hardware technology, referred to as “white box” hardware, particularly

where a customer's network strategy seeks to emphasize deployment of such product offerings or to adopt a disaggregated approach to the procurement of hardware and software.

#### Patents, Trademarks and Other Intellectual Property Rights

The success of our business and technology leadership is significantly dependent upon our proprietary and internally developed technology. We rely upon the intellectual property protections afforded by patents, copyrights, trademarks, and trade secret laws to establish, maintain and enforce rights in our proprietary technologies and product branding. We maintain an incentive program for inventions and patents that seeks to reward innovation and an internal invention review board that selects appropriate protection mechanisms for our technology. We regularly file applications for patents and have a significant number of patents in the United States and other countries where we do business. As of December 1, 2017, we had 1,624 issued U.S. patents, 241 pending U.S. patent applications, 393 issued non-U.S. patents, and 166 pending non-U.S. patent applications.

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We also rely on non-disclosure agreements and other contracts and policies regarding confidentiality with employees, contractors and customers to establish proprietary rights and to protect trade secrets and confidential information. Our practice is to require employees and relevant consultants to execute non-disclosure and proprietary rights agreements upon commencement of their employment or consulting arrangements with us. These agreements acknowledge our ownership of intellectual property developed by the individual during the course of his or her work with us. The agreements also require that these persons maintain the confidentiality of all proprietary information disclosed to them.

Enforcing proprietary rights, especially patents, can be costly, and we cannot be certain that the steps that we are taking will detect or prevent all unauthorized use. The industry in which we compete is characterized by rapidly changing technology, a large number of patents, and frequent claims and related litigation regarding patent and other intellectual property rights. We have been subject to several claims related to patent infringement, including by competitors and also by non-practicing patent assertion entities, and we have been requested to indemnify customers pursuant to contractual indemnity obligations relating to infringement claims made by third parties. Intellectual property infringement assertions could cause us to incur substantial costs, including settlement costs and legal fees in the defense of related actions. If we are not successful in defending these claims, our business could be adversely affected. For example, we may be required to enter into a license agreement requiring us to make ongoing royalty payments; we may be required to redesign our products; or we may be prohibited from selling infringing technology in certain jurisdictions.

Our operating system, element management and network virtualization, management, and orchestration software and other solutions incorporate software and components under licenses from third parties, including software subject to various open source software licenses. As network operators seek to adopt network infrastructures with increased software control and programmability and to utilize an open ecosystem of physical and virtual network resources provided by multiple third parties, we expect to incorporate into our solutions additional elements of open source software or license additional software or technology from third parties. We expect that these network architectural approaches will require increased openness and interoperability of multi-vendor, multi-domain network environments, requiring an increased degree of cooperation among solutions providers. Failure to obtain or maintain such licenses or other third-party intellectual property rights could affect our development efforts and market opportunities, or could require us to re-engineer our products or to obtain alternate technologies. Moreover, there is a risk that open source and other technology licenses could be construed in a manner that could impose unanticipated conditions or restrictions on our ability to commercialize our products.

## Environmental Matters

Our business and operations are subject to environmental laws in various jurisdictions around the world, including the Waste Electrical and Electronic Equipment (WEEE) and Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) regulations adopted by the European Union. We are also subject to disclosure and related requirements that apply to the presence of “conflict minerals” in our products or supply chain. We seek to operate our business in compliance with such laws relating to the materials and content of our products and product takeback and recycling. Environmental regulation is increasing, particularly outside of the United States, and we expect that our domestic and international operations may be subject to additional environmental compliance requirements, which could expose us to additional costs. To date, our compliance actions and costs relating to environmental regulations have not resulted in a material cost or effect on our business, results of operations or financial condition.

## Employees

As of October 31, 2017, we had a global workforce consisting of 5,737 employees. We have not experienced any work stoppages, and we consider the relationships with our employees to be good. While we have been able to recruit and retain key personnel with the capabilities required by our business and markets, competition for highly skilled technical, engineering and other personnel with experience in our industry is intense. We believe that our future success depends in critical part on our continued ability to recruit, motivate and retain such qualified personnel.

Directors and Executive Officers

The table below sets forth certain information concerning our directors and executive officers:

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Name	Age	Position
Patrick H. Nettles, Ph.D.	74	Executive Chairman of the Board of Directors
Gary B. Smith	57	President, Chief Executive Officer and Director
Stephen B. Alexander	58	Senior Vice President and Chief Technology Officer
James A. Frodsham	51	Senior Vice President and Chief Strategy Officer
Rick L. Hamilton	46	Senior Vice President, Global Software and Services
Scott A. McFeely	54	Senior Vice President, Networking Platforms
James E. Moylan, Jr.	66	Senior Vice President and Chief Financial Officer
Andrew C. Petrik	54	Vice President and Controller
Jason M. Phipps	45	Senior Vice President, Global Sales and Marketing
David M. Rothenstein	49	Senior Vice President, General Counsel and Secretary
Harvey B. Cash (1)(3)	79	Director
Bruce L. Claflin (1)(2)	66	Director
William D. Fathers (1)(3)	49	Director
Lawton W. Fitt (2)	64	Director
Patrick T. Gallagher (1)(3)	62	Director
T. Michael Nevens (2)	68	Director
Judith M. O'Brien (1)(3)	67	Director
Michael J. Rowny (2)	67	Director

(1)Member of the Compensation Committee

(2)Member of the Audit Committee

(3)Member of the Governance and Nominations Committee

Our Directors hold staggered terms of office, expiring as follows: Messrs. Claflin, Nevens and Gallagher in 2018; Ms. Fitt, Dr. Nettles and Mr. Rowny in 2019; and Ms. O'Brien and Messrs. Cash and Smith in 2020. In August 2017, Mr. Fathers was appointed to fill a newly created vacancy in the Board of Directors. Accordingly, he will stand for election at the 2018 Annual Meeting of stockholders and, if elected by stockholders, his term of office will expire in 2020.

Patrick H. Nettles, Ph.D. has served as a Director of Ciena since April 1994 and as Executive Chairman of the Board of Directors since May 2001. From October 2000 to May 2001, Dr. Nettles was Chairman of the Board of Directors and Chief Executive Officer of Ciena, and he was President and Chief Executive Officer from April 1994 to October 2000. Dr. Nettles serves as a Trustee for the California Institute of Technology and the Georgia Tech Foundation, Inc. Dr. Nettles also serves on the boards of directors of The Progressive Corporation and Axcelis Technologies, Inc., where he is independent chairman of the board. Dr. Nettles has previously served on the boards of directors of Appttrigger, Inc., formerly known as Carrius Technologies, Inc., and Optiwind Corp, a privately held company.

Gary B. Smith joined Ciena in 1997 and has served as President and Chief Executive Officer since May 2001. Mr. Smith has served on Ciena's Board of Directors since October 2000. Prior to his current role, his positions with Ciena included Chief Operating Officer and Senior Vice President, Worldwide Sales. Mr. Smith previously served as Vice President of Sales and Marketing for INTELSAT and Cray Communications, Inc. Mr. Smith also serves on the boards of directors of Avaya Inc. and CommVault Systems, Inc. Mr. Smith is a member of the President's National Security Telecommunications Advisory Committee, the Global Information Infrastructure Commission and the Center for Corporate Innovation (CCI).

Stephen B. Alexander joined Ciena in 1994 and has served as Chief Technology Officer since September 1998 and as a Senior Vice President since January 2000. Mr. Alexander has previously served as General Manager of Products & Technology and General Manager of Transport and Switching & Data Networking.

James A. Frodsham joined Ciena in May 2004 and has served as Senior Vice President and Chief Strategy Officer since March 2010 with responsibility for our strategic planning and corporate development activities. Mr. Frodsham previously served as General Manager of Ciena's former Broadband Access Group and Metro and Enterprise Solutions

Group. Prior to joining Ciena, Mr. Frodsham served as chief operating officer of Innovance Networks. Prior to that, Mr. Frodsham was employed in senior level positions with Nortel Networks in product development and marketing strategy. Mr. Frodsham serves on the board of directors of Innovance Networks.

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Rick L. Hamilton joined Ciena in October 2016 and has served as Senior Vice President, Global Software and Services since February 2017. Mr. Hamilton is responsible for Ciena's software platform, including Blue Planet, and global services organization, including consulting and support services for designing, deploying, managing and maintaining communications networks. Mr. Hamilton previously served as Senior Vice President, Global Services & Automation. Prior to joining Ciena, he served as Corporate Vice President, Professional Services for Juniper Networks from January to October 2016. From January 2004 to December 2015, Mr. Hamilton served with Cisco Systems in various services leadership positions, including most recently as Vice President, Cloud & Managed Services.

Scott A. McFeely joined Ciena in March 2010 and has served as Senior Vice President, Networking Platforms since November 2015. Mr. McFeely is responsible for Ciena's research and development activities relating to its packet-optical and packet networking portfolios, product line management, supply chain operations, and network integration functions on a global basis. From March 2010 to October 2015, he served as Vice President, Global Portfolio Management and Business Operations. Mr. McFeely joined Ciena in connection with the its acquisition of Nortel's Metro Ethernet Networks business, with which he spent more than 20 years in a variety of technical and management roles.

James E. Moylan, Jr. has served as Senior Vice President and Chief Financial Officer since December 2007.

Andrew C. Petrik joined Ciena in 1996 and has served as Vice President, Controller since August 1997. He also served as Treasurer from August 1997 to October 2008.

Jason M. Phipps joined Ciena in 2002 and has served as Senior Vice President, Global Sales and Marketing since February 2017. Mr. Phipps is responsible for Ciena's global sales organization and its marketing and communications functions. From January 2014 to February 2017, Mr. Phipps served as Vice President and General Manager, North America Sales, during which time he also oversaw the Global Partners & Channels practice, and from March 2011 to December 2013 he served as Vice President, Global Sales Operations. Mr. Phipps has also previously held a number of sales and marketing leadership positions with Ciena.

David M. Rothenstein joined Ciena in January 2001 and has served as Senior Vice President, General Counsel and Secretary since November 2008. Mr. Rothenstein served as Vice President and Associate General Counsel from July 2004 to October 2008 and previously as Assistant General Counsel.

Harvey B. Cash has served as a Director of Ciena since April 1994. Mr. Cash is a general partner of InterWest Partners, a venture capital firm in Menlo Park, California, which he joined in 1985. Mr. Cash serves on the boards of directors of First Acceptance Corp. and Argonaut Group, Inc. and has previously served on the boards of directors of Silicon Laboratories, Inc., i2 Technologies, Inc., Voyence, Inc. and Staktek Holdings, Inc.

Bruce L. Claflin has served as a Director of Ciena since August 2006. Mr. Claflin served as President and Chief Executive Officer of 3Com Corporation from January 2001 until his retirement in February 2006. Mr. Claflin joined 3Com as President and Chief Operating Officer in August 1998. Prior to 3Com, Mr. Claflin served as Senior Vice President and General Manager, Sales and Marketing, for Digital Equipment Corporation. Mr. Claflin also worked for 22 years at IBM, where he held various sales, marketing and management positions, including general manager of IBM PC Company's worldwide research and development, product and brand management, as well as president of IBM PC Company Americas. Mr. Claflin currently serves on the board of directors of IDEXX Laboratories, Inc., where he is the Chairman of the Nominating and Governance Committee. Mr. Claflin previously served on the board of directors of Advanced Micro Devices (AMD).

William D. Fathers has served as a director of Ciena since August 2017. Mr. Fathers currently serves as the Senior Operating Partner responsible for investments in Communications Infrastructure at Stonepeak Infrastructure Partners, a private equity firm specializing in North American middle-market infrastructure. He also currently serves as Senior Advisor to Berkshire Partners, a leading private investment firm. From 2013 through 2016, Mr. Fathers was Executive Vice President and General Manager of Cloud Services at VMWare, Inc. From 2011 to 2013, he served as President of Savvis Inc., a public data center and cloud infrastructure provider. Mr. Fathers also previously worked for Thomson Reuters, where he helped build businesses in a number of international markets throughout Europe, Asia and North America. Mr. Fathers also serves on the board of directors of Cologix Inc and previously served on the board of directors of Telx, Inc.



Lawton W. Fitt has served as a Director of Ciena since November 2000. From October 2002 to March 2005, Ms. Fitt served as Director of the Royal Academy of Arts in London. From 1979 to October 2002, Ms. Fitt was an investment banker with Goldman Sachs & Co., where she was a partner from 1994 to October 2002. Ms. Fitt currently serves on the boards of directors of The Carlyle Group LP, The Progressive Corporation and Micro Focus International PLC. Ms. Fitt also has previously served on the boards of directors of ARM Holdings PLC and Thomson Reuters Corporation. She also serves as a director or trustee of several non-profit organizations.

Patrick T. Gallagher has served as a Director of Ciena since May 2009. Mr. Gallagher currently serves as Chairman of Harmonic Inc., a global provider of high-performance video solutions to the broadcast, cable, telecommunications and managed service provider sectors. From March 2008 until April 2012, Mr. Gallagher was Chairman of Ubiquisys Ltd., a

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leading developer and supplier of femtocells for the global 3G mobile wireless market. From January 2008 until February 2009, Mr. Gallagher was Chairman of Macro 4 plc, a global software solutions company, and from May 2006 until March 2008, served as Vice Chairman of Golden Telecom Inc., a leading facilities-based provider of integrated communications in Russia and the CIS. From 2003 until 2006, Mr. Gallagher was Executive Vice Chairman and served as Chief Executive Officer of FLAG Telecom Group and, prior to that role, held various senior management positions at British Telecom. Mr. Gallagher is also Chairman of Intercloud SAS, a Paris-headquartered provider of global private cloud connectivity services. Mr. Gallagher previously served on the board of directors of Sollers JSC.

T. Michael Nevens has served as a Director of Ciena since February 2014. Since 2006, Mr. Nevens has served as senior adviser to Permira Advisers, LLC, an international private equity fund. From 1980 to 2002, Mr. Nevens held various leadership positions at McKinsey & Co., most recently as a director (senior partner) and as managing partner of the firm's Global Technology Practice. He also served on the board of the McKinsey Global Institute, which conducts research on economic and policy issues. Mr. Nevens has been an adjunct professor of Corporate Governance and Strategy at the Mendoza College of Business at the University of Notre Dame. Mr. Nevens also serves as the Chairman of the board of directors of NetApp, Inc. Mr. Nevens previously served on the board of directors of Altera Corporation.

Judith M. O'Brien has served as a Director of Ciena since July 2000. Since November 2012, Ms. O'Brien has served as a partner and head of the Emerging Company Practice Group at the law firm of King & Spalding. Ms. O'Brien served as Executive Vice President and General Counsel of Obopay, Inc., a provider of mobile payment services, from November 2006 through December 2010. From February 2001 until October 2006, Ms. O'Brien served as a Managing Director at Incubic Venture Fund, a venture capital firm. From August 1980 until February 2001, Ms. O'Brien was a lawyer with Wilson Sonsini Goodrich & Rosati, where, from February 1984 to February 2001, she was a partner specializing in corporate finance, mergers and acquisitions, and general corporate matters. Ms. O'Brien serves on the boards of directors of privately-held companies, Teatro Labs, Inc., Inform, Inc. and MagicCube, Inc. Ms. O'Brien has also previously served on the board of directors of Adaptec, Inc.

Michael J. Rowny has served as a Director of Ciena since August 2004. Mr. Rowny has been Chairman of Rowny Capital, a private equity firm, since 1999. From 1994 to 1999, and previously from 1983 to 1986, Mr. Rowny was with MCI Communications in positions including President and Chief Executive Officer of MCI's International Ventures, Alliances and Correspondent group, acting Chief Financial Officer, Senior Vice President of Finance, and Treasurer. Mr. Rowny's career in business and government has also included positions as Chairman and Chief Executive Officer of the Ransohoff Company, Chief Executive Officer of Hermitage Holding Company, Executive Vice President and Chief Financial Officer of ICF Kaiser International, Inc., Vice President of the Bendix Corporation, and Deputy Staff Director of the White House. Mr. Rowny has also previously served on the board of directors of Neustar, Inc.

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Item 1A. Risk Factors

Investing in our securities involves a high degree of risk. In addition to the other information contained in this report, you should consider the following risk factors before investing in our securities.

Our revenue, gross margin and operating results can fluctuate significantly and unpredictably from quarter to quarter. Our revenue, gross margin and results of operations can fluctuate significantly and unpredictably from quarter to quarter. Our budgeted expense levels are based on our visibility into customer spending plans and our projections of future revenue and gross margin. Customer spending levels are uncertain and subject to change, and reductions in our expense levels can take significant time to implement. A significant portion of our quarterly revenue is generated from customer orders received in that same quarter (which we refer to as “book to revenue”). Accordingly, our revenue for a particular quarter is difficult to predict, and a shortfall in expected orders in a given quarter can materially adversely affect our revenue and results of operations for that quarter or future quarterly periods. Additional factors that contribute to fluctuations in our revenue, gross margin and operating results include:

- broader macroeconomic conditions, including weakness and volatility in global markets, that affect our customers;
- changes in capital spending by customers, in particular our large communications service provider customers;
- changes in networking strategies;
- order timing, volume and cancellations;
- backlog levels;
- the level of competition and pricing pressure in our industry;
- the impact of commercial concessions or unfavorable commercial terms required to maintain incumbency or secure new opportunities with key customers;
- our level of success in achieving cost reductions and improved efficiencies in our supply chain;
- the pace and impact of price erosion that we regularly encounter in our markets;
- our incurrence of start-up costs, including lower margin phases of projects required to support initial deployments, gain new customers or enter new markets;
- the impact of technology-based price compression and the introduction or substitution of new platforms for existing solutions;
- the timing of revenue recognition on sales, particularly relating to large orders;
- the mix of revenue by product segment, geography and customer in any particular quarter;
- installation service availability and readiness of customer sites;
  - availability of components and manufacturing capacity;
- adverse impact of foreign exchange; and
- seasonal effects in our business.

Quarterly fluctuations from these and other factors may also cause our revenue, gross margin and results of operations to fall short of the expectations of securities analysts or investors, which may cause volatility or decreases in our stock price.

A small number of customers, including some of the largest communications service providers, account for a significant portion of our revenue. The loss of any of these customers or a significant reduction in their spending could have a material adverse effect on our business and results of operations.

While our customer base has diversified in recent years to include network operators in additional customer segments and geographies, a significant portion of our revenue remains concentrated among a small number of customers, including large communications service providers. For example, AT&T and Verizon accounted for approximately 16.0% and 10.3% of fiscal 2017 revenue, respectively, and our ten largest customers contributed 55.6% of fiscal 2017 revenue. Consequently, our financial results are closely correlated with the spending of a relatively small number of customers. Our business and results of operations can be materially adversely impacted by reductions in spending or capital expenditure budgets by our largest customers. A number of our large service provider customers, including AT&T, with whom we experienced a decline in annual revenue during fiscal 2017, have announced various procurement initiatives or efforts to reduce capital expenditures on network infrastructure in future periods. Moreover,

because we do not have long-term contracts that obligate AT&T or our other customers to purchase any minimum or guaranteed order volumes, and because customers often have the right to modify or cancel orders, there can be no assurance as to customer spending levels, which can be unpredictable, and sales to any customer could significantly decrease or cease at any time.

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Because a number of our largest customers are communications service providers, our business and results of operations can be significantly affected by market, industry or competitive dynamics adversely affecting this segment. Our communications service provider customers continue to face a rapidly shifting competitive landscape as cloud service operators, "over-the-top" (OTT) providers and other content providers challenge their traditional business models and network infrastructures. Moreover, a number of our communications service provider and cable operator customers, including AT&T, Verizon and Centurylink, have either recently announced significant acquisition transactions or are in the process of significant related integration activities. Such transactions have in the past, and may in the future, result in spending delays or deferrals, or changes in preferred vendors, as the integration of combined network infrastructures proceeds and procurement strategies are determined. There can be no assurance that we will be able to maintain the revenue levels we have previously achieved with customers, including our communications service provider customers. The loss of any of our largest customers, or a significant reduction in their spending, could have a material adverse effect on our business and results of operations.

We face intense competition that could hurt our sales and results of operations, and we expect the competitive landscape in which we operate to continue to broaden to include additional solutions providers.

We face an intense competitive market for sales of communications networking equipment, software and services. Competition is intense on a global basis, as we and our competitors aggressively seek to capture market share and displace incumbent equipment vendors. A small number of very large vendors have historically dominated our industry, many of which have substantially greater financial and marketing resources, broader product offerings, and more established relationships with service providers and other customer segments than we do. Moreover, certain customers are adopting procurement strategies that seek to purchase a broader set of networking solutions from a single or small number of vendors. Because of their scale and resources, and a more diverse set of solution offerings, certain of our larger competitors may be perceived to be a better fit for the procurement or network operating and management strategies of large service providers. We also compete with a number of smaller companies that provide significant competition for a specific product, application, customer segment or geographic market. Due to the narrower focus of their efforts, these competitors may achieve commercial availability of their products more quickly or may be more attractive to customers in a particular product niche.

Generally, competition in our markets is based on any one or a combination of the following factors:

- product functionality, speed, capacity, scalability and performance;
- price, cost per bit and total cost of ownership of our solutions;
- incumbency and strength of existing business relationships;
- ability to offer comprehensive networking solutions, consisting of hardware, software and services;
- product development that satisfies customers' immediate and future network requirements;
- flexibility and openness of platforms, including ease of integration, interoperability and integrated management;
- ability to offer solutions that accommodate a range of different consumption models;
- space and power considerations;
  - manufacturing and lead-time capability; and
- services and support capabilities.

Part of our strategy for fiscal 2018 is to leverage our technology leadership and to aggressively capture additional market share and displace competitors, particularly with communications service providers internationally. In an effort to maintain our incumbency or to secure new customer opportunities, we have in the past, and may in the future, agree to aggressive pricing, commercial concessions and other unfavorable terms that result in low or negative gross margins on a particular order or group of orders. Competition can also result in commercial and legal terms and conditions that place a disproportionate amount of risk on us.

We expect the competition in our industry to continue to broaden and to intensify, as network operators pursue a diverse range of network strategies and consumption models. As these changes occur, we expect that our business will compete more directly with additional networking solution suppliers, including IP router vendors, data center switch providers and other suppliers or integrators of networking technology. In addition, as we seek increased customer adoption of our Blue Planet software platform, and network operator demands for software programmability,

management and control increase, we expect to compete more directly with software vendors and information technology vendors or integrators of these solutions. We may also face competition from system and component vendors, including those in our supply chain, that develop networking products based on off-the-shelf or commoditized hardware technology, referred to as “white box” hardware, particularly where a customer's network strategy seeks to emphasize deployment of such product offerings or adopt a disaggregated approach to the procurement of hardware and software. Such an increase in competitive intensity, or the entry of new competitors into our markets and customers, may adversely impact our business and results of operations. If competitive pressures increase, or if we fail to compete successfully in our markets, our business and results of operations could suffer.

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Our business and operating results could be adversely affected by unfavorable changes in macroeconomic and market conditions and reductions in the level of spending by customers in response to these conditions.

Our business and operating results, which depend significantly on general economic conditions and demand for our products and services, could be materially adversely affected by unfavorable or uncertain macroeconomic and market conditions, globally or in a particular region or country where we operate. Broad macroeconomic weakness and market volatility have previously resulted in sustained periods of decreased demand for our products and services, which has adversely affected our operating results. Macroeconomic and market conditions could be adversely affected by a variety of political, economic or other factors in the United States and international markets, which could in turn adversely affect spending levels of our customers and their end users, and could create volatility or deteriorating conditions in the markets in which we operate. Macroeconomic uncertainty or weakness could result in:

- reductions in customer spending and delay, deferral or cancellation of network infrastructure initiatives;
  - increased competition for fewer network projects and sales opportunities;
  - increased pricing pressure that may adversely affect revenue, gross margin and profitability;
  - difficulty forecasting operating results and making decisions about budgeting, planning and future investments;
  - increased overhead and production costs as a percentage of revenue;
  - tightening of credit markets needed to fund capital expenditures by us or our customers;
  - customer financial difficulty, including longer collection cycles and difficulties collecting accounts receivable or write-offs of receivables; and
  - increased risk of charges relating to excess and obsolete inventories and the write-off of other intangible assets.
- Reductions in customer spending in response to unfavorable or uncertain macroeconomic and market conditions, globally or in a particular region where we operate, would adversely affect our business, results of operations and financial condition.

Investment of research and development resources in communications networking technologies for which there is not an adequate market demand, or failure to sufficiently or timely invest in technologies for which there is market demand, would adversely affect our revenue and profitability.

The market for communications networking hardware and software solutions is characterized by rapidly evolving technologies, changes in market demand and increasing adoption of software-based networking solutions. We continually invest in research and development to sustain or enhance our existing hardware and software solutions and to develop or acquire new technologies including new software platforms. There is often a lengthy period between commencing these development initiatives and bringing new or improved solutions to market. During this time, technology preferences, customer demand and the markets for our solutions, or those introduced by our competitors, may move in directions that we had not anticipated. There is no guarantee that our new products, including our Blue Planet software platform, or enhancements to other solutions, will achieve market acceptance or that the timing of market adoption will be as predicted. As a result, there is a significant possibility that some of our development decisions, including significant expenditures on acquisitions, research and development costs, or investments in technologies, will not meet our expectations, and that our investment in some projects will be unprofitable. There is also a possibility that we may miss a market opportunity because we failed to invest, or invested too late, in a technology, product or enhancement sought by our customers. Changes in market demand or investment priorities may also cause us to discontinue existing or planned development for new products or features, which can have a disruptive effect on our relationships with customers. If we fail to make the right investments or fail to make them at the right time, our competitive position may suffer, and our revenue and profitability could be adversely affected.

Network equipment sales to communications service providers, Web-scale providers and other large customers often involve lengthy sales cycles and protracted contract negotiations that may require us to agree to commercial terms or conditions that negatively affect pricing, risk allocation, payment and the timing of revenue recognition.

Our sales initiatives, particularly with communications service providers, Web-scale providers and other large customers, often involve lengthy sales cycles. These selling efforts often involve a significant commitment of time and resources by us and our customers that may include extensive product testing, laboratory or network certification, network or region-specific product certification and homologation requirements for deployment in networks. Even after a customer awards its business to us or decides to purchase our solutions, the length of deployment time can vary

depending upon the customer's schedule, site readiness, the size of the network deployment, the degree of custom configuration required and other factors. Additionally, these sales also often involve protracted and sometimes difficult contract negotiations in which we may deem it necessary to agree to unfavorable contractual or commercial terms that adversely affect pricing, expose us to penalties for delays or non-performance, and require us to assume a disproportionate amount of risk. To maintain incumbency with key customers for existing and future business opportunities, we may be required to offer discounted pricing, make commercial concessions or offer less favorable terms as compared to our historical business arrangements with these customers. We may also be requested to provide deferred



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payment terms, vendor or third-party financing or other alternative purchase structures that extend the timing of payment and revenue recognition. Alternatively, customers may insist upon terms and conditions that we deem too onerous or not in our best interest, and we may be unable to reach a commercial agreement. As a result, we may incur substantial expense and devote time and resources to potential sales opportunities that never materialize or result in lower than anticipated sales.

If the market for software solutions does not evolve in the way we anticipate or if customers do not adopt our Blue Planet solutions, we may not be able to realize a key part of our business strategy.

A key part of our business strategy depends on our ability to gain market adoption for our Blue Planet software platform. If the markets relating to software solutions, including software management and control, service orchestration and automation, and SDN or NFV, do not develop as we anticipate, or if we are unable to increase market awareness and adoption of our Blue Planet solutions as a preferred solution within those markets, demand for our Blue Planet solutions may not grow. Our long-term success in the software market will depend to a significant extent on both potential customers recognizing the benefits of our next-generation Blue Planet software solutions, and the willingness of service providers and high-performance data center and other network operators to increase software programmability and automation within their networks. The market for these solutions is at an early stage, and it is difficult to predict important trends, including the potential growth, if any, of this market. If the market for these software solutions does not evolve in the way we anticipate or if customers do not adopt our solutions, we may not be able to increase sales of our Blue Planet platform, and a key part of our business strategy would be adversely affected.

Changes in networking or procurement strategies by our customers could adversely affect our business, competitive position and results of operations.

Growing bandwidth demands and network operator efforts to reduce costs are causing network operators to consider a diverse range of approaches to the design and procurement of network infrastructure. We refer to these different approaches as “consumption models.” These consumption models can include: the traditional systems procurement of fully integrated solutions including hardware, software and services from the same vendor; the procurement of a fully integrated hardware solution from one vendor with the separate use of a network operator’s own SDN-based controller; the procurement of an integrated photonic line system with open interfaces from one vendor and the separate or “disaggregated” procurement of modem technology from a different vendor; or the use of published reference designs and open source specifications for the procurement of off-the-shelf or commoditized hardware (often referred to as “white box” hardware) to be used with open source software. In parallel, network operators are also exploring procurement alternatives for software solutions, ranging from integrated and proprietary software platforms to fully open source software. We believe that network operators will continue to consider a variety of different consumption models. Many of these approaches are in their very early stages of development and evaluation, and the types of models and their levels of adoption will depend in significant part on the nature of the circumstances and strategies of particular network operators. Among our customers, AT&T is pursuing network strategies that emphasize enhanced software programmability, management and control of networks, and deployment of “white box” hardware. Other network operators, including our Web-scale customers, are playing a leading role in the transition to software-defined networking or the standardization of communications network solutions. We believe that the potential for different approaches to the procurement of networking infrastructure will require network operators and vendors to evolve and broaden their existing commercial models over time. Adoption of a range of consumption models may also alter and broaden our competitive landscape to include other technology vendors, including component vendors and software vendors. If we are unable to offer attractive solutions and commercial models that accommodate the range of consumption models ultimately adopted by our customers or within our markets, our business, competitive position and results of operations could be adversely affected.

We may experience delays in the development and production of our products that may negatively affect our competitive position and business.

Our hardware and software networking solutions, including our Blue Planet software platform, are based on complex technology, and we can experience unanticipated delays in developing, manufacturing and introducing these solutions to market. Delays in product development efforts by us or our supply chain may affect our reputation with customers,

affect our ability to seize market opportunities and impact the timing and level of demand for our products. The development of new technologies may increase the complexity of supply chain management or require the acquisition, licensing or interworking with the technology of third parties. As a result, each step in the development cycle of our products presents serious risks of failure, rework or delay, any one of which could adversely affect the cost-effectiveness and timely development of our products. We may encounter delays relating to engineering development activities and software, design, sourcing and manufacture of critical components, and the development of prototypes. In addition, intellectual property disputes, failure of critical design elements, and other execution risks may delay or even prevent the release of these products. If we do not successfully develop or produce products in a timely manner, our competitive position may suffer, and our business, financial condition and results of operations could be harmed.

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We rely upon third-party contract manufacturers and our business and results of operations may be adversely affected by risks associated with their businesses, financial condition, and the geographies in which they operate.

We rely upon third-party contract manufacturers with facilities in Canada, Mexico, Thailand and the United States to perform a substantial portion of our supply chain activities, including component sourcing, manufacturing, product testing and quality, and fulfillment and logistics relating to the distribution and support of our products. There are a number of risks associated with our dependence on contract manufacturers, including:

- reduced control over delivery schedules and planning;
- reliance on the quality assurance procedures of third parties;
- potential uncertainty regarding manufacturing yields and costs;
- availability of manufacturing capability and capacity, particularly during periods of high demand;
- risks and uncertainties associated with the locations or countries where our products are manufactured, including
  - potential manufacturing disruptions caused by social, geopolitical or environmental factors;
  - changes in U.S. law or policy governing foreign trade, manufacturing, development and investment in the countries where we currently manufacture our products, including the World Trade Organization Information Technology Agreement or other free trade agreements;
  - limited warranties provided to us; and
  - potential misappropriation of our intellectual property.

These and other risks could impair our ability to fulfill orders, harm our sales and impact our reputation with customers. If our contract manufacturers are unable or unwilling to continue manufacturing our products or components of our products, or if our contract manufacturers discontinue operations, we may be required to identify and qualify alternative manufacturers, which could cause us to be unable to meet our supply requirements to our customers and result in the breach of our customer agreements. The process of qualifying a new contract manufacturer and commencing volume production is expensive and time-consuming, and if we are required to change or qualify a new contract manufacturer, we would likely lose sales revenue and damage our existing customer relationships.

A substantial portion of our products are manufactured by third-party contract manufacturers in Mexico. The U.S. government has indicated a willingness to revise, renegotiate, or terminate various multilateral trade agreements and to impose new taxes on certain goods imported into the U.S. Such steps, if adopted, could adversely impact our business and operations, and may make our products less competitive in the U.S. and other markets. At this time, it remains unclear what actions, if any, will be taken by the U.S. government with respect to such trade agreements, tax policy related to international commerce, or the imposition of tariffs on goods imported into the U.S. There can be no assurance that any future legislation or executive action in the in the U.S. relating to tax policy and trade regulation would not adversely affect our business, operations and financial results.

Our reliance upon third-party component suppliers, including sole and limited source suppliers, exposes our business to additional risk and could limit our sales, increase our costs and harm our customer relationships.

We maintain a global sourcing strategy and depend on third-party suppliers in international markets for support in our product design and development, and in the sourcing of key product components and subsystems. Our products include optical and electronic components for which reliable, high-volume supply is often available only from sole or limited sources. Increases in market demand or scarcity of resources or manufacturing capability have resulted, and may in the future result, in shortages in availability of important components for our solutions, product allocation challenges, deployment delays and increased lead times. We are exposed to risks relating to unfavorable economic conditions or other similar challenges affecting the businesses and results of operations of our component providers that can affect their liquidity levels, ability to continue investing in their businesses, ability to meet development commitments and manufacturing capability. These and other challenges affecting our suppliers could expose our business to increased costs, loss or lack of supply, or discontinuation of components that can result in lost revenue, additional product costs, increased lead times and deployment delays that could harm our business and customer relationships. We do not have any guarantees of supply from these third parties, and in certain cases we are relying upon temporary commercial arrangements or standard purchase orders. As a result, there is no assurance that we will be able to secure the components or subsystems that we require, in sufficient quantity and quality, and on reasonable terms. Moreover, our access to necessary components could be adversely impacted by competition from component

vendors, including those in our supply chain, that develop competing networking products based on off-the-shelf or commoditized hardware technology, referred to as “white box” hardware. The loss of a source of supply, or lack of sufficient availability of key components, could require that we locate an alternate source or redesign our products, either of which could result in business interruption and increased costs and could negatively affect our product gross margin and results of operations. Our business and results of operations would be negatively affected if we were to experience any significant disruption or difficulties with key suppliers affecting the price, quality, availability or timely delivery of required components.

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Product performance problems and undetected errors affecting the performance, reliability or security of our products could damage our business reputation and negatively affect our results of operations.

The development and production of sophisticated hardware and software for communications network equipment is highly complex. Some of our products can be fully tested only when deployed in communications networks or when carrying traffic with other equipment, and software products may contain bugs that can interfere with expected performance. As a result, undetected defects or errors, and product quality, interoperability, reliability and performance problems are often more acute for initial deployments of new products and product enhancements. We have recently launched, and are in the process of launching, a number of new hardware and software offerings, including solutions targeting metro network applications and data center interconnect. Unanticipated product performance problems can relate to the design, manufacturing, installation, operation and interoperability of our products. Undetected errors can also arise as a result of defects in components, software or manufacturing, installation or maintenance services supplied by third parties, and technology acquired from or licensed by third parties. From time to time we have had to replace certain components, provide software remedies or other remediation in response to defects or bugs, and we may have to do so again in the future. Remediation of such events could materially adversely impact our business and results of operations. In addition, unanticipated security vulnerabilities relating to our products or the activities of our supply chain, including any actual or perceived exposure of our solutions to malicious software or cyber-attacks, could adversely affect our business and results of operations. Product performance, reliability, security and quality problems can negatively affect our business, and may result in some or all of the following effects:

- damage to our reputation, declining sales and order cancellations;
- increased costs to remediate defects or replace products;
- payment of liquidated damages, contractual or similar penalties, or other claims for performance failures or delays;
- increased warranty expense or estimates resulting from higher failure rates, additional field service obligations or other rework costs related to defects;
- increased inventory obsolescence;
- costs and claims that may not be covered by liability insurance coverage or recoverable from third parties; and
- delays in recognizing revenue or collecting accounts receivable.

These and other consequences relating to undetected errors affecting the quality, reliability and security of our products could negatively affect our business and results of operations.

The international scale of our sales and operations exposes us to additional risk and expense that could adversely affect our results of operations.

We market, sell and service our products globally, maintain personnel in numerous countries, and rely upon a global supply chain for sourcing important components and manufacturing our products. Our international sales and operations are subject to inherent risks, including:

- the impact of economic conditions in countries outside the United States;
- effects of adverse changes in currency exchange rates;
- greater difficulty in collecting accounts receivable and longer collection periods;
- difficulty and cost of staffing and managing foreign operations;
- higher incidence of corruption or unethical business practices;
- less protection for intellectual property rights in some countries;
- tax and customs changes that adversely impact our global sourcing strategy, manufacturing practices, transfer-pricing, or competitiveness of our products for global sales;
- social, political and economic instability;
- compliance with certain testing, homologation or customization of products to conform to local standards;
- significant changes to free trade agreements, trade protection measures, tariffs, export compliance, domestic preference procurement requirements, qualification to transact business and additional regulatory requirements; and
- natural disasters, epidemics and acts of war or terrorism.

Our international operations are subject to complex foreign and U.S. laws and regulations, including anti-bribery and corruption laws, antitrust or competition laws, environmental regulations, and data privacy laws, among others. In particular, recent years have seen a substantial increase in anti-bribery law enforcement activity by U.S. regulators, and we currently operate and seek to operate in many parts of the world that are recognized as having a greater potential for corruption. Violations of any of these laws and regulations could result in fines and penalties, criminal sanctions against us or our employees, prohibitions on the conduct of our business and on our ability to offer our products and services in certain geographies, and significant harm to our business reputation. We cannot assure that our policies and procedures to ensure compliance with these laws and regulations and to mitigate these risks will protect us from all acts committed by our employees or third-party vendors,

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including contractors, agents and services partners. Additionally, the costs of complying with these laws (including the costs of investigations, auditing and monitoring) could adversely affect our current or future business. The U.S. government has indicated a willingness to revise, renegotiate, or terminate various, existing multilateral trade agreements and to impose new taxes on certain goods imported into the U.S. Because we rely upon a global sourcing strategy and third-party contract manufacturers in markets outside of the U.S. to perform substantially all of the manufacturing of our products, such steps, if adopted, could adversely impact our business and operations, and may make our products less competitive in the U.S. and other markets. At this time, it remains unclear what actions, if any, the U.S. government will take with respect to such trade agreements, tax policy related to international commerce, or imposition of tariffs on goods imported into the U.S. There can be no assurance that any future legislation or executive action in the U.S. relating to tax policy and trade regulation would not adversely affect our business, operations and financial results.

The success of our international sales and operations will depend, in large part, on our ability to anticipate and manage effectively these risks. Our failure to manage any of these risks could harm our international operations, reduce our international sales, and could give rise to liabilities, costs or other business difficulties that could adversely affect our operations and financial results.

We may be required to write off significant amounts of inventory as a result of our inventory purchase practices, the obsolescence of product lines or unfavorable market or contractual conditions.

To avoid delays and meet customer demand for shorter delivery terms, we place orders with our contract manufacturers and component suppliers based on forecasts of customer demand. In a number of cases these suppliers may require longer lead times for fulfillment than we have with our customers. Thus, our practice of buying inventory based on forecasted demand exposes us to the risk that our customers ultimately may not order the products we have forecast or will purchase fewer products than forecast. As a result, we may purchase inventory in anticipation of sales that ultimately do not occur. We regularly incur, on a quarterly basis, expense provisions against excess or obsolete inventory. Market uncertainty can also limit our visibility into customer spending plans and compound the difficulty of forecasting inventory at appropriate levels. Moreover, our customer purchase agreements generally do not include any minimum purchase commitment. Also, customers often have the right to modify, reduce or cancel purchase quantities, and spending levels can be uncertain and subject to significant fluctuation. Our products are highly configurable, and certain new products have overlapping feature sets or application with existing products.

Accordingly, it is increasingly possible that customers may forgo purchases of certain products we have inventoried in favor of a similar, newer product. We may also be exposed to the risk of inventory write-offs as a result of certain supply chain initiatives, including consolidation and transfer of key manufacturing activities. If we are required to write off or write down a significant amount of inventory, our results of operations for the applicable period would be materially adversely affected.

Our new distribution channel for our WaveLogic coherent technology could be unprofitable, expose us to increased or new forms of competition, or adversely affect our systems business and competitive position.

Our new distribution relationships with Lumentum, NeoPhotonics and Oclaro present a number of risks for our business as we make available and distribute key elements of our WaveLogic coherent optical technology as a component for the first time. In order to develop these components and design the module to be sold by our partners, we will be required to incur additional research and development costs. However, this form of distribution channel for an existing system vendor is new in our industry and unproven in the market. The success of these distribution relationships will depend on, among other things, our ability to adapt to this new component market and commercial model and the ability of our partners to manufacture, market and sell optical modules containing our components in the merchant market. There is no guarantee that the modules containing our components will achieve market acceptance or that the timing of market adoption will be as predicted. As a result, it is possible that our research and development investments in this new distribution channel will be unprofitable.

Lumentum, NeoPhotonics and Oclaro each have the unrestricted ability to sell such modules to end users, including our customers, our competitors, and other vendors or network operators that plan to build or use “white box” hardware. Making our critical technology available in this manner could adversely impact the sale of products in our existing systems business. For example, our customers may choose to adopt disaggregated consumption models or third-party

solutions using these Ciena-designed optical modules instead of purchasing systems-based solutions from us. Alternatively, we may encounter situations where we are competing for opportunities in the market directly against a system from one of our competitors that incorporates Ciena-designed modules. In addition, making this key technology available and enabling third-party partner sales of Ciena-designed modules may adversely affect our competitive position and increase the risk that third parties misappropriate or attempt to use our technology or related intellectual property without our authorization. These and other risks or unanticipated liabilities or costs associated with our new distribution strategy could harm our reputation and adversely affect our business and our results of operations.



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Efforts to increase our sales and capture market share in targeted international markets may be unsuccessful. Part of our business and growth strategy is to expand our geographic reach and increase market share in international markets through a combination of direct and indirect sales resources. We are also aggressively pursuing opportunities with service provider customers in additional geographies, including Asia-Pacific and India. This diversification of our markets and customer base has been a significant component of the growth of our business. Our efforts to continue to increase our sales and capture market share in international markets may ultimately be unsuccessful or may adversely impact our financial results, including our gross margin. Our failure to continue to increase our sales and market share in international markets could limit our growth and could harm our results of operations.

Our intellectual property rights may be difficult and costly to enforce.

We generally rely on a combination of patents, copyrights, trademarks and trade secret laws to establish and maintain proprietary rights in our products and technology. Although we have been issued numerous patents and other patent applications are currently pending, there can be no assurance that any of these patents or other proprietary rights will not be challenged, invalidated or circumvented, or that our rights will provide us with any competitive advantage. In addition, there can be no assurance that patents will be issued from pending applications or that claims allowed on any patents will be sufficiently broad to protect our technology. Further, the laws of some foreign countries may not protect our proprietary rights to the same extent as do the laws of the United States.

We are subject to the risk that third parties may attempt to access, divert or use our intellectual property without authorization. Protecting against the unauthorized use of our products, technology and other proprietary rights is difficult, time-consuming and expensive, and we cannot be certain that the steps that we are taking will prevent or minimize the risks of such unauthorized use. In addition, our intellectual property strategy must continually evolve to protect our proprietary rights in new solutions, including our software solutions. Litigation may be necessary to enforce or defend our intellectual property rights or to determine the validity or scope of the proprietary rights of others. Such litigation could result in substantial cost and diversion of management time and resources, and there can be no assurance that we will obtain a successful result. Any inability to protect and enforce our intellectual property rights could harm our ability to compete effectively.

We may incur significant costs in response to claims by others that we infringe their intellectual property rights.

From time to time third parties may assert claims or initiate litigation or other proceedings related to patent, copyright, trademark and other intellectual property rights to technologies and related standards that are relevant to our business.

The rate of infringement assertions by patent assertion entities is increasing, particularly in the United States.

Generally, these patent owners neither manufacture nor use the patented invention directly, and they seek to derive value from their ownership solely through royalties from patent licensing programs.

We could be adversely affected by litigation, other proceedings or claims against us, as well as claims against our manufacturers, suppliers or customers, alleging infringement of third-party proprietary rights by our products and technology, or components thereof. Regardless of the merit of these claims, they can be time-consuming, divert the time and attention of our technical and management personnel, and result in costly litigation. These claims, if successful, could require us to:

- pay substantial damages or royalties;
- comply with an injunction or other court order that could prevent us from offering certain of our products;
- seek a license for the use of certain intellectual property, which may not be available on commercially reasonable terms or at all;
- develop non-infringing technology, which could require significant effort and expense and ultimately may not be successful; and
- indemnify our customers or other third parties pursuant to contractual obligations to hold them harmless or pay expenses or damages on their behalf.

Any of these events could adversely affect our business, results of operations and financial condition. Our exposure to risks associated with the use of intellectual property may increase as a result of acquisitions, as we would have a lower level of visibility into the development process with respect to such technology and the steps taken to safeguard against the risks of infringing the rights of third parties.

Our products incorporate software and other technology under license from third parties, and our business would be adversely affected if this technology were no longer available to us on commercially reasonable terms.

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We integrate third-party software and other technology into our operating system, network management and control platforms and other products. As network operators adopt software management and control and virtualized network functions, we believe that we will be increasingly required to work with third-party technology providers. As a result, we may be required to license certain software or technology from third parties, including competitors. Licenses for software or other technology may not be available or may not continue to be available to us on commercially reasonable terms. Third-party licensors may insist on unreasonable financial or other terms in connection with our use of such technology. Our failure to comply with the terms of any license may result in our inability to continue to use such license, which may result in significant costs, harm our market opportunities and require us to obtain or develop a substitute technology.

Our solutions, including our Blue Planet software platform, utilize elements of open source or publicly available software. As network operators seek to enhance programmability of networks, we expect that we and other communications networking solutions vendors will increasingly contribute to and use technology or open source software developed by standards settings bodies or other industry forums that seek to promote the integration of network layers and functions. The terms of such licenses could be construed in a manner that could impose unanticipated conditions or restrictions on our ability to commercialize our products. This increases our risks associated with our use of such software and may require us to seek licenses from third parties, to re-engineer our products or to discontinue the sale of such solutions. Difficulty obtaining and maintaining technology licenses with third parties may disrupt development of our products, increase our costs and adversely affect our business. Data security breaches and cyber-attacks could compromise our intellectual property or other sensitive information and cause significant damage to our business and reputation.

In the ordinary course of our business, we maintain on our network systems, and the networks of third-party providers, certain information that is confidential, proprietary or otherwise sensitive in nature. This information includes intellectual property, financial information and confidential business information relating to us and our customers, suppliers and other business partners. We also produce networking equipment solutions and software used by network operators to ensure security and reliability in their management and transmission of data. Our customers, particularly those in regulated industries, are increasingly focused on the security features of our technology solutions, and maintaining the security of information sensitive to us and our business partners is critical to our business and reputation. Companies in the technology industry have been increasingly subject to a wide variety of security incidents, cyber-attacks and other attempts to gain unauthorized access to networks or sensitive information. Our network systems and storage applications, and those systems and storage applications maintained by our third-party providers, may be subject to unauthorized access by hackers or breached due to operator error, malfeasance or other system disruptions. The network solutions we sell to end customers may be exposed to similar risks. In some cases, it is difficult to anticipate or to detect immediately such incidents and the damage caused thereby. If an actual or perceived breach of network security occurs in our network or in the network of a business partner, the market perception of our products could be harmed. While we continually work to safeguard our products and internal network systems to mitigate these potential risks, there is no assurance that such actions will be sufficient to prevent cyber-attacks or security breaches. Security incidents involving access or improper use of our systems, networks or products could compromise confidential or otherwise protected information, destroy or corrupt data, or otherwise disrupt our operations. These security events could also negatively impact our reputation and our competitive position and could result in litigation with third parties, regulatory action, loss of business, potential liability and increased remediation costs, any of which could have a material adverse effect on our financial condition and results of operations.

We rely on third-party resellers and distribution partners to sell our solutions, and our failure to effectively develop and manage these relationships could adversely affect our business and result of operations.

In order to sell into new geographic markets, diversify our customer base and broaden the application for our solutions, and to complement our global field resources, we rely on a number of third-party resellers, distribution partners and sales agents, both domestic and international, and we expect these relationships to be an important part of our business. There can be no assurance that we will successfully identify and qualify these resources or that we will realize the expected benefits of these sales relationships. Our failure to effectively identify, develop and manage our

third-party sales relationships could adversely affect our business, growth and result of operations. We must also assess and qualify resellers, distribution partners and sales agents under our channel programs to ensure their understanding of and willingness and ability to adhere to our Code of Business Conduct and Ethics. We may be held responsible or liable for the actions or omissions of these third parties. Actions, omissions or violations of law by our third-party sales partners or agents could have a material adverse effect on our business, operating results, and financial condition.

Our failure to manage our relationships with third-party service partners effectively could adversely impact our financial results and relationships with customers.

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We rely on a number of third-party service partners, both domestic and international, to complement our global service and support resources. We rely upon these partners for certain installation, maintenance and support functions. In addition, as network operators increasingly seek to rely on vendors to perform additional services relating to the design, construction and operation of their networks, the scope of work performed by our support partners is likely to increase and may include areas where we have less experience providing or managing such services. We must successfully identify, assess, train and certify qualified service partners in order to ensure the proper installation, deployment and maintenance of our products, as well as to ensure the skillful performance of other services associated with expanded solutions offerings, including site assessment and construction-related services. We must also assess and certify service partners in order to ensure their understanding of and willingness and ability to adhere to our Code of Business Conduct and Ethics. Vetting and certification of these partners can be costly and time-consuming, and certain partners may not have the same operational history, financial resources and scale as Ciena. Moreover, certain service partners may provide similar services for other companies, including our competitors. We may not be able to manage our relationships with our service partners effectively, and we cannot be certain that they will be able to deliver services in the manner or time required, that we will be able to maintain the continuity of their services, or that they will adhere to our approach to ethical business practices. We may also be exposed to a number of risks or challenges relating to the performance of our service partners, including:

- delays in recognizing revenue;
- liability for injuries to persons, damage to property or other claims relating to the actions or omissions of our service partners;
- our services revenue and gross margin may be adversely affected; and
- our relationships with customers could suffer.

As our service offering expands and customers look to identify vendors capable of managing, integrating and optimizing multi-domain, multi-vendor networks with unified software, our relationships with third-party service partners will become increasingly important. If we do not effectively manage our relationships with third-party service partners, or if they fail to perform these services in the manner or time required, our financial results and relationships with customers could be adversely affected.

We may be adversely affected by fluctuations in currency exchange rates.

As a company with global operations, we face exposure to movements in foreign currency exchange rates. Due to our global presence, a significant percentage of our revenue, operating expense and assets and liabilities are non-U.S. Dollar denominated and therefore subject to foreign currency fluctuation. We face exposure to currency exchange rates as a result of the growth in our non-U.S. Dollar denominated operating expense in Canada, Europe, Asia and Latin America. An increase in the value of the U.S. Dollar could increase the real cost to our customers of our products in those markets outside the United States where we sell in Dollars, and a weakened Dollar could increase the cost of local operating expenses and procurement of materials or service that we purchase in foreign currencies. From time to time, we may hedge against currency exposure associated with anticipated foreign currency cash flows or assets and liabilities denominated in foreign currency. Such attempts to offset the impact of currency fluctuations are costly, and we cannot hedge against all foreign exchange rate volatility. Losses associated with these hedging instruments and the adverse effect of foreign currency exchange rate fluctuation may negatively affect our results of operations.

We may be exposed to unanticipated risks and additional obligations in connection with our resale of complementary products or technology of other companies.

We have entered into agreements with strategic supply partners that permit us to distribute their products or technology. We may rely upon these relationships to add complementary products or technologies, to diversify our product portfolio, or to address a particular customer or geographic market. We may enter into additional original equipment manufacturer (OEM), resale or similar strategic arrangements in the future. We may incur unanticipated costs or difficulties relating to our resale of third-party products. Our third-party relationships could expose us to risks associated with the business, financial condition, intellectual property rights and supply chain continuity of such partners, as well as delays in their development, manufacturing or delivery of products or technology. We may also be required by customers to assume warranty, indemnity, service and other commercial obligations, including potential

liability to customers, greater than the commitments, if any, made to us by our technology partners. Some of our strategic supply partners are relatively small companies with limited financial resources. If they are unable to satisfy their obligations to us or our customers, we may have to expend our own resources to satisfy these obligations. Exposure to these risks could harm our reputation with key customers and could negatively affect our business and our results of operations.

Our exposure to the credit risks of our customers and resellers may make it difficult to collect receivables and could adversely affect our revenue and operating results.

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In the course of our sales to customers and resale channel partners, we may have difficulty collecting receivables, and our business and results of operations could be exposed to risks associated with uncollectible accounts. Lack of liquidity in the capital markets, macroeconomic weakness and market volatility may increase our exposure to these credit risks. Our attempts to monitor customer payment capability and to take appropriate measures to protect ourselves may not be sufficient, and it is possible that we may have to write down or write off accounts receivable. Such write-downs or write-offs could negatively affect our operating results for the period in which they occur, and, if large, could have a material adverse effect on our revenue and operating results.

Our business is dependent upon the proper functioning of our internal business processes and information systems, and modification or interruption of such systems or external factors may disrupt our business, processes and internal controls.

We rely upon a number of internal business processes and information systems to support key business functions, and the efficient operation of these processes and systems is critical to managing our business. Our business processes and information systems must be sufficiently scalable to support the growth of our business and may require modifications or upgrades that expose us to a number of operational risks. We continually pursue initiatives to transform and optimize our business operations through the reengineering of certain processes, investment in automation, and engagement of strategic partners or resources to assist with certain business functions. These changes require a significant investment of capital and human resources and may be costly and disruptive to our operations, and they could impose substantial demands on management time. These changes may also require changes in our information systems, modification of internal control procedures and significant training of employees or third-party resources. There can be no assurance that our business and operations will not experience disruption in connection with our current system upgrade or other initiatives. Even if we do not encounter these adverse effects or disruption in our business, the design and implementation of these new systems may be more costly than anticipated.

Our information technology systems, and those of third-party information technology providers or business partners, may also be vulnerable to damage or disruption caused by circumstances beyond our control, including catastrophic events, power anomalies or outages, natural disasters, viruses or malware, and computer system or network failures. We may also be exposed to cyber-security related incidents, including unauthorized access of information systems and disclosure or diversion of intellectual property or confidential data. There can be no assurance that our business systems or those of our third-party business partners will not be subject to similar incidents, exposing us to significant cost, reputational harm and disruption or damage to our business.

Outstanding indebtedness under our convertible notes and senior secured credit facilities may adversely affect our liquidity and results of operations and could limit our business.

As of the date of this report, we had approximately \$567.1 million in indebtedness repayable at maturity under our outstanding convertible notes. In the event that some or all of these notes are converted into common stock, the ownership interests of our existing stockholders will be diluted, and any sales of such shares in the public market following conversion may adversely affect the market price for our common stock. We are also a party to credit agreements relating to a \$250 million senior secured asset-based revolving credit facility and outstanding senior secured term loans with approximately \$398.0 million repayable at maturity. The agreements governing these credit facilities contain certain covenants that limit our ability, among other things, to incur additional debt, create liens and encumbrances, pay cash dividends, redeem or repurchase stock, enter into certain acquisition transactions or transactions with affiliates, repay certain indebtedness, make investments, or dispose of assets. The agreements also include customary remedies, including the right of the lenders to take action with respect to the collateral securing the loans, that would apply should we default or otherwise be unable to satisfy our debt obligations.

Our indebtedness could have important negative consequences, including:

- increasing our vulnerability to adverse economic and industry conditions;
- limiting our ability to obtain additional financing, particularly in unfavorable capital and credit market conditions;
- debt service and repayment obligations that may adversely impact our results of operations and reduce the availability of cash resources for other business purposes;
- limiting our flexibility in planning for, or reacting to, changes in our business and the markets; and
- placing us at a possible competitive disadvantage to competitors that have better access to capital resources.

We may also enter into additional transactions or credit facilities, including equipment loans, working capital lines of credit and other long-term debt, which may increase our indebtedness and result in additional restrictions upon our business. In addition, major debt rating agencies regularly evaluate our debt based on a number of factors. There can be no assurance that we will be able to maintain our existing debt ratings, and failure to do so could adversely affect our cost of funds, liquidity and access to capital markets.



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Significant volatility and uncertainty in the capital markets may limit our access to funding on favorable terms or at all.

The operation of our business requires significant capital. We have accessed the capital markets in the past and have successfully raised funds, including through the issuance of equity, convertible notes and other indebtedness, to increase our cash position, support our operations and undertake strategic growth initiatives. We regularly evaluate our liquidity position, debt obligations, and anticipated cash needs to fund our long-term operating plans, and we may consider it necessary or advisable to raise additional capital or incur additional indebtedness in the future. If we raise additional funds through further issuance of equity or securities convertible into equity, or undertake certain transactions intended to address our existing indebtedness, our existing stockholders could suffer dilution in their percentage ownership of our company or our leverage and outstanding indebtedness could increase. Global capital markets have undergone periods of significant volatility and uncertainty in the past, and there can be no assurance that such financing alternatives will be available to us on favorable terms or at all, should we determine it necessary or advisable to seek additional capital.

We are a party to legal proceedings, investigations and other claims or disputes, which are costly to defend and, if determined adversely to us, could require us to pay fines or damages, undertake remedial measures or prevent us from taking certain actions, any of which could adversely affect our business.

In the course of our business, we are, and in the future may be, a party to legal proceedings, investigations and other claims or disputes, which have related and may relate to subjects including commercial transactions, intellectual property, securities, employee relations, or compliance with applicable laws and regulations. A description of certain of these matters can be found in Note 24, Commitments and Contingencies, in the Notes to Consolidated Financial Statements in Item 8 of Part II of this Report. Among these matters, recently we voluntarily contacted the Securities and Exchange Commission and the U.S. Department of Justice to advise them of an internal investigation that we initiated to determine whether certain payments to an individual employed by a customer in a country in the ASEAN region may have violated applicable laws and regulations, including the U.S. Foreign Corrupt Practices Act. Legal proceedings and investigations are inherently uncertain and we cannot predict their duration, scope, outcome or consequences. There can be no assurance that these or any such matters that have been or may in the future be brought against us will be resolved favorably. In connection with any government investigations, in the event the government takes action against us or the parties resolve or settle the matter, we may be required to pay substantial fines or civil and criminal penalties and/or be subject to equitable remedies, including disgorgement or injunctive relief. And, other legal or regulatory proceedings, including lawsuits filed by private litigants, may also follow as a consequence. These matters are likely to be expensive and time-consuming to defend, settle, and/or resolve, and may require us to implement certain remedial measures that could prove costly or disruptive to our business and operations. They may also cause damage to our business reputation. The unfavorable resolution of one or more of these matters could have a material adverse effect on our business, results of operations, financial condition or cash flows.

The potential effects of the referendum on the UK's membership in the European Union remain uncertain.

On June 23, 2016, the United Kingdom (UK) held a referendum in which voters approved an exit from the European Union (EU), commonly referred to as "Brexit," and on March 29, 2017, notified the EU that it intended to exit as provided in Article 50 of the Treaty on European Union. The terms of the withdrawal are subject to a negotiation period that could last at least two years from the withdrawal notification date. This will be either accompanied or followed by additional negotiations between the EU and the UK concerning the future relations between the parties. Nevertheless, Brexit has created significant uncertainty about the future relationship between the UK and the EU. It is possible that the level of economic activity in this region will be adversely impacted and that there will be increased regulatory and legal complexities, including those relating to tax, trade, security, and employees. Such changes could be costly and potentially disruptive to our operations and business relationships in these markets. In addition, Brexit could lead to economic uncertainty, including significant volatility in global stock markets and currency exchange rates, that may adversely impact our business. While we have adopted certain financial measures to reduce the risks of doing business internationally, we cannot ensure that such measures will be adequate to allow us to operate without disruption or adverse impact to our business and financial results in the affected regions.

Restructuring activities could disrupt our business and affect our results of operations.

We have often taken steps, including reductions in force, office closures, and internal reorganizations to reduce the size and cost of our operations, improve efficiencies, or realign our organization and staffing to better match our market opportunities and our technology development initiatives. We may take similar steps in the future as we seek to realize operating synergies, to optimize our operations to achieve our target operating model and profitability objectives, or to reflect more closely changes in the strategic direction of our business. These changes could be disruptive to our business, including our research and development efforts, and could result in significant expense, including accounting charges for inventory and technology-related

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write-offs, workforce reduction costs and charges relating to consolidation of excess facilities. Substantial expense or charges resulting from restructuring activities could adversely affect our results of operations and use of cash in those periods in which we undertake such actions.

If we are unable to attract and retain qualified personnel, we may be unable to manage our business effectively. Competition to attract and retain highly skilled technical, engineering and other personnel with experience in our industry is intense, and our employees have been the subject of targeted hiring by our competitors. Competition is particularly intense in certain jurisdictions where we have research and development centers, including the Silicon Valley area of northern California, and we may experience difficulty retaining and motivating existing employees and attracting qualified personnel to fill key positions. Because we rely upon equity awards as a significant component of compensation, particularly for our executive team, a lack of positive performance in our stock price, reduced grant levels, or changes to our compensation program may adversely affect our ability to attract and retain key employees. In addition, none of our executive officers is bound by an employment agreement for any specific term. The loss of members of our management team or other key personnel could be disruptive to our business, and, were it necessary, it could be difficult to replace members of our management team or other key personnel. If we are unable to attract and retain qualified personnel, we may be unable to manage our business effectively, and our operations and financial results could suffer.

Strategic acquisitions and investments could disrupt our operations and may expose us to increased costs and unexpected liabilities.

We may acquire or make investments in other technology companies, or enter into other strategic relationships, to expand the markets we address, diversify our customer base or acquire, or accelerate the development of, technology or products. To do so, we may use cash, issue equity that could dilute our current stockholders, or incur debt or assume indebtedness. Strategic transactions can involve numerous additional risks, including:

- failure to achieve the anticipated transaction benefits or the projected financial results and operational synergies;
- greater than expected acquisition and integration costs;
- disruption due to the integration and rationalization of operations, products, technologies and personnel;
- diversion of management attention;
- difficulty completing projects of the acquired company and costs related to in-process projects;
- difficulty managing customer transitions or entering into new markets;
- the loss of key employees;
- disruption or termination of business relationships with customers, suppliers, vendors, landlords, licensors and other business partners;
- ineffective internal controls over financial reporting;
- dependence on unfamiliar suppliers or manufacturers;
- assumption of or exposure to unanticipated liabilities, including intellectual property infringement or other legal claims; and
- adverse tax or accounting impact.

As a result of these and other risks, our acquisitions, investments or strategic transactions may not realize the intended benefits and may ultimately have a negative impact on our business, results of operation and financial condition.

Changes in government regulation affecting the communications industry and the businesses of our customers could harm our prospects and operating results.

The Federal Communications Commission (the “FCC”) has jurisdiction over the U.S. communications industry, and similar agencies have jurisdiction over the communication industries in other countries. Many of our largest customers, including service providers and cable and multiservice network operators, are subject to the rules and regulations of these agencies, while others participate in and benefit from government-funded programs that encourage the development of network infrastructures. These regulatory requirements and funding programs are subject to changes that may adversely impact our customers, with resulting adverse impacts on our business.

Under current rules, the FCC regulates broadband internet service providers as telecommunications service carriers under Title II of the Telecommunications Act and enforces net neutrality regulations that prohibit blocking, degrading or prioritizing certain types of internet traffic. On December 14, 2017, the FCC voted to repeal these net neutrality

regulations, however, the repeal has not yet taken effect and the future impact of such repeal and any challenges thereto remains uncertain. Changes in regulatory requirements or uncertainty associated with the regulatory environment could delay or serve as a disincentive to investment in network infrastructures by network operators, which could adversely affect the sale of our products and services.

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Similarly, changes in regulatory tariff requirements or other regulations relating to pricing or terms of carriage on communications networks could slow the development or expansion of network infrastructures and adversely affect our business, operating results, and financial condition.

Government regulations affecting the use, import or export of products could adversely affect our operations, negatively affect our revenue and increase our costs.

The United States and various foreign governments have established certain trade and tariff requirements under which we have implemented a global approach to the sourcing and manufacture of our products, as well as the distribution and fulfillment to customers around the world. Changes or restrictions impacting the import of our components to manufacturing facilities outside of the U.S., the importation of finished goods to the U.S., or the export of products globally, would adversely affect our operations, increase our costs and adversely impact our revenue. Government regulation of usage, import or export of our products, or our technology within our products, or our failure to obtain required approvals for our products, could harm our international and domestic sales and adversely affect our revenue and costs of sales. Failure to comply with such regulations could result in enforcement actions, fines, penalties or restrictions on export privileges. In addition, costly tariffs on our equipment, restrictions on importation, trade protection measures and domestic preference requirements of certain countries could limit our access to these markets and harm our sales. These regulations could adversely affect the sale or use of our products, substantially increase our cost of sales and adversely affect our business and revenue.

Government regulations related to the environment, potential climate change and other social initiatives could adversely affect our business and operating results.

Our operations are regulated under various federal, state, local and international laws relating to the environment and potential climate change. If we were to violate or become liable under these laws or regulations, we could incur fines, costs related to damage to property or personal injury, and costs related to investigation or remediation activities. Our product design efforts and the manufacturing of our products are also subject to evolving requirements relating to the presence of certain materials or substances in our equipment, including regulations that make producers for such products financially responsible for the collection, treatment and recycling of certain products. For example, our operations and financial results may be negatively affected by environmental regulations, such as the Waste Electrical and Electronic Equipment (WEEE) and Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) that have been adopted by the European Union. Compliance with these and similar environmental regulations may increase our cost of designing, manufacturing, selling and removing our products. The SEC has adopted disclosure requirements regarding the use of “conflict minerals” mined from the Democratic Republic of Congo and adjoining countries (“DRC”) and disclosure requirements with respect to procedures regarding a manufacturer’s efforts to prevent the sourcing of such minerals from the DRC. Certain of these minerals are present in our products. SEC rules implementing these requirements may have the effect of reducing the pool of suppliers that can supply DRC “conflict free” components and parts, and we may not be able to obtain conflict free products or supplies in sufficient quantities for our operations. Because our supply chain is complex, we may face reputational challenges with our customers, stockholders and other stakeholders if we are unable to verify sufficiently the origins for the “conflict minerals” used in our products and cannot assert that our products are “conflict free.” Environmental or similar social initiatives may also make it difficult to obtain supply of compliant components or may require us to write off non-compliant inventory, which could have an adverse effect on our business and operating results.

We may be required to write down the value of certain significant assets which would adversely affect our operating results.

We have a number of significant assets on our balance sheet as of October 31, 2017 and the value of these assets can be adversely impacted by factors related to our business and operating performance, as well as factors outside of our control. As of October 31, 2017, our balance sheet includes a \$1.155 billion net deferred tax asset. The value of our net deferred tax assets can be significantly impacted by changes in tax policy or our tax planning strategy. For example, the value of our net deferred tax asset would decrease significantly if the U.S. corporate income tax rate is reduced, as proposed in tax reform legislation recently passed by both houses of the U.S. Congress on December 20, 2017. Consequently, when, and if, the President signs this proposed legislation into law, we expect our operating results to be materially adversely affected by a non-cash charge to reflect the reduction in value of these assets.

As of October 31, 2017, our balance sheet also includes \$267.5 million of goodwill. We test each reporting unit for impairment of goodwill on an annual basis and, between annual tests, if an event occurs or circumstances change that would, more likely than not, reduce the fair value of the reporting unit below its carrying value. As of October 31, 2017, our balance sheet also includes \$456.3 million in long-lived assets, which includes \$101.0 million of intangible assets. Valuation of our long-lived assets requires us to make assumptions about future sales prices and sales volumes for our products. These assumptions are used to forecast future, undiscounted cash flows upon which our estimates are based. The value of our net deferred tax asset

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above may also be subject to change in the future, based on our actual or projected generation of future taxable income. If market conditions or our forecasts for our business or any particular operating segment change, we may be required to reassess the value of these assets. We could be required to record an impairment charge against our goodwill and long-lived assets or a valuation allowance against our deferred tax assets. Any write down of the value of these significant assets would have the effect of decreasing our earnings or increasing our losses in such period. If we are required to take a substantial write down or charge, our operating results would be materially adversely affected in such period.

Failure to maintain effective internal controls over financial reporting could have a material adverse effect on our business, operating results and stock price.

Section 404 of the Sarbanes-Oxley Act of 2002 requires that we include in our annual report a report containing management's assessment of the effectiveness of our internal controls over financial reporting as of the end of our fiscal year and a statement as to whether or not such internal controls are effective. Compliance with these requirements has resulted in, and is likely to continue to result in, significant costs and the commitment of time and operational resources. Certain ongoing initiatives, including efforts to transform business processes or to transition certain functions to third-party resources or providers, will necessitate modifications to our internal control systems, processes and related information systems as we optimize our business and operations. Our expansion into new regions could pose further challenges to our internal control systems. We cannot be certain that our current design for internal control over financial reporting, or any additional changes to be made, will be sufficient to enable management to determine that our internal controls are effective for any period, or on an ongoing basis. If we are unable to assert that our internal controls over financial reporting are effective, market perception of our financial condition and the trading price of our stock may be adversely affected, and customer perception of our business may suffer.

Our stock price is volatile.

Our common stock price has experienced substantial volatility in the past and may remain volatile in the future. Volatility in our stock price can arise as a result of a number of the factors discussed in this "Risk Factors" section. During fiscal 2017, our closing stock price ranged from a high of \$27.50 per share to a low of \$19.21 per share. The stock market has experienced significant price and volume fluctuation that has affected the market price of many technology companies, with such volatility often unrelated to the operating performance of these companies. Divergence between our actual or anticipated financial results and published expectations of investment analysts, or the expectations of the market generally, can cause significant swings in our stock price. Our stock price can also be affected by market conditions in our industry as well as announcements that we, our competitors, vendors or our customers may make. These may include announcements of financial results or changes in estimated financial results, technological innovations, the gain or loss of customers, or key opportunities. Our common stock is also included in certain market indices, and any change in the composition of these indices to exclude our company would adversely affect our stock price. These and other factors affecting macroeconomic conditions or financial markets may materially adversely affect the market price of our common stock in the future.

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Item 1B. Unresolved Staff Comments

Not applicable.

Item 2. Properties

Overview. As of October 31, 2017, all of our properties are leased, and we do not own any real property. We lease facilities globally related to the ongoing operations of our three business segments and related functions. Our principal executive offices are located in two buildings in Hanover, Maryland.

Our largest facility is our research and development center located in Ottawa, Canada. We also have engineering and/or service facilities located in San Jose, California; Petaluma, California; Alpharetta, Georgia; Spokane, Washington; Quebec, Canada and Gurgaon, India. In addition, we lease various smaller offices in the United States, Canada, Mexico, South America, Europe, the Middle East and the Asia-Pacific region to support our sales and services operations. We believe the facilities we are now using are adequate and suitable for our business requirements.

Hanover, Maryland Headquarters Lease. We entered into an agreement dated November 3, 2011, with W2007 RDG Realty, L.L.C. relating to a 15-year lease of office space for our corporate headquarters in Hanover, Maryland, consisting of an agreed-upon rentable area of approximately 154,100 square feet.

Ottawa Lease. On October 23, 2014, Ciena Canada, Inc. entered into an agreement to lease the office building located at 5050 Innovation Drive, Ottawa, Canada, consisting of a rentable area of 170,582 square feet. In addition, on April 15, 2015, Ciena Canada, Inc. entered into a work letter and a lease agreement related to the construction and lease of two new office buildings in Ottawa, Canada, consisting of a rentable area of approximately 254,318 square feet. Construction of these two new buildings was completed during fiscal 2017. As of October 31, 2017, all of our employees and business activity have been relocated to the Innovation Drive location. These three facilities replaced our prior Lab 10 building, for which our lease will terminate on December 31, 2017.

For additional information regarding our lease obligations, see Note 24 to the Consolidated Financial Statements included in Item 8 of Part II of this annual report.



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Item 3. Legal Proceedings

The information set forth under the headings “Litigation” and “Investigations” in Note 24, Commitments and Contingencies, in Notes to Consolidated Financial Statements in Item 8 of Part II of this Report, is incorporated herein by reference.

Item 4. Mine Safety Disclosures

Not applicable.

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## Item 5. Market for Registrant’s Common Stock, Related Stockholder Matters and Issuer Purchases of Equity Securities

(a) Our common stock is traded on the New York Stock Exchange under the stock symbol “CIEN.”

The following table sets forth the high and low sales prices of our common stock, as reported on the New York Stock Exchange for the fiscal periods indicated.

	High	Low
Fiscal Year 2016		
First Quarter ended January 31	\$25.46	\$16.63
Second Quarter ended April 30	\$21.14	\$16.32
Third Quarter ended July 31	\$21.87	\$15.62
Fourth Quarter ended October 31	\$23.60	\$18.72
Fiscal Year 2017		
First Quarter ended January 31	\$25.32	\$18.94
Second Quarter ended April 30	\$26.84	\$21.43
Third Quarter ended July 31	\$27.98	\$22.35
Fourth Quarter ended October 31	\$26.32	\$20.29

As of December 15, 2017, there were approximately 1,009 holders of record of our common stock and 143,679,592 shares of common stock outstanding. We have never paid cash dividends on our capital stock. We currently intend to retain earnings for use in our business, and we do not anticipate paying any cash dividends in the foreseeable future. See Note 25 to the Consolidated Financial Statements in Item 8 of Part II of this Report for information regarding the share repurchase program authorized by our Board of Directors.

The following graph shows a comparison of cumulative total returns for an investment in our common stock, the S&P Telecom Select Index and the S&P Global SmallCap Index from October 31, 2012 to October 31, 2017. The S&P Telecom Select Industry Index comprises stocks in the S&P Total Market Index that are classified in the Global Industry Classification Standard as alternative carriers, communications equipment, integrated telecom services, and wireless telecom services sub-industries. The S&P Global SmallCap Index comprises the stocks representing the lowest 15% of float-adjusted market cap in each developed and emerging country. This graph is not deemed to be “filed” with the SEC or subject to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and the graph shall not be deemed to be incorporated by reference into any prior or subsequent filing by us under the Securities Act of 1933, as amended, or the Exchange Act.

Assumes \$100 invested in Ciena Corporation, the S&P Telecom Select Index and the S&P Global SmallCap Index, respectively, on October 31, 2012 with all dividends reinvested at month-end.

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(b) Not applicable.

(c) Not applicable.

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## Item 6. Selected Consolidated Financial Data

The following selected consolidated financial data should be read in conjunction with Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and the Consolidated Financial Statements and the notes thereto included in Item 8, “Financial Statements and Supplementary Data” in Part II of this annual report. We have a 52 or 53-week fiscal year, which ends on the Saturday nearest to the last day of October in each year. For purposes of financial statement presentation, each fiscal year is described as having ended on October 31. Fiscal 2017, 2016, 2015, 2014 and 2013 consisted of 52 weeks.

	Year Ended October 31,				
	(in thousands, except per share data)				
	2017 <sup>(1) (2)</sup>	2016 <sup>(2) (4)</sup>	2015 <sup>(2) (3)</sup> <sup>(4)</sup>	2014 <sup>(4)</sup>	2013 <sup>(4)</sup>
Revenue	\$2,801,687	\$2,600,573	\$2,445,669	\$2,288,289	\$2,082,546
Gross profit	\$1,245,786	\$1,161,576	\$1,075,563	\$948,352	\$865,175
Income (loss) from operations	\$214,722	\$156,169	\$100,448	\$45,704	\$(1,775 )
Net income (loss)	\$1,261,953	\$72,584	\$11,667	\$(40,637 )	\$(85,431 )
Basic net income (loss) per common share	\$8.89	\$0.52	\$0.10	\$(0.38 )	\$(0.83 )
Diluted net income (loss) per potential common share	\$7.53	\$0.51	\$0.10	\$(0.38 )	\$(0.83 )
Weighted average basic common shares outstanding	141,997	138,312	118,416	105,783	102,350
Weighted average diluted potential common shares outstanding	169,919	150,704	120,101	105,783	102,350
Net cash provided by operating activities	\$234,882	\$289,520	\$262,112	\$89,816	\$44,678
Cash, cash equivalents and investments	\$969,429	\$1,143,035	\$1,021,183	\$776,982	\$486,497
Deferred tax asset, net	\$1,155,104	\$1,116	\$—	\$—	\$—
Total assets	\$3,951,711	\$2,873,575	\$2,685,001	\$2,058,842	\$1,788,857
Short-term and long-term debt, net	\$935,981	\$1,253,682	\$1,264,089	\$1,451,064	\$1,198,106
Total liabilities	\$1,815,369	\$2,107,234	\$2,064,125	\$2,128,457	\$1,871,534
Stockholders’ equity (deficit)	\$2,136,342	\$766,341	\$620,876	\$(69,615 )	\$(82,677 )

(1) Net income, deferred tax asset, net, total assets, stockholders’ equity for fiscal 2017 reflect a \$1.2 billion deferred tax asset valuation allowance reversal. See Note 20 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for additional information.

(2) See Note 18 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for additional information regarding the increase of the weighted average basic and diluted potential common shares outstanding.

(3) See Note 2 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for additional information regarding the acquisition of Cyan Inc. (“Cyan”) on August 3, 2015.

(4) Reflects the impact of the adoption of the ASU No. 2015-03, Simplifying the Presentation of Debt Issuance Costs in fiscal year 2017 related to balance sheet classification of unamortized debt issuance costs from other long-term assets to current portion of long-term debt and long-term debt in the amount of \$10.0 million, \$13.8 million and \$13.9 million at October 31, 2015, 2014 and 2013, respectively. See Notes 1 and 16 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for additional information.

No other factors materially affected the comparability of the information presented above.

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### Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion and analysis should be read in conjunction with our "Selected Consolidated Financial Data" and consolidated financial statements and notes thereto included elsewhere in this annual report.

#### Overview

We are a network strategy and technology company, providing solutions that enable a wide range of network operators to deploy and manage next-generation communication architectures that deliver a broad array of services. We provide network hardware, software and services that support the transport, switching, aggregation, service delivery and management of video, data, and voice traffic on communications networks. Our high-capacity hardware and network management and control software solutions enable open, programmable networks that enhance automation, reduce network complexity and support changing service requirements. Our solutions create business and operational value for our customers by enabling them to introduce new revenue-generating services and reduce network costs.

Our solutions include a diverse set of Networking Platform products, which are used by a broad range of network operator customers and market segments, including communications service providers, cable and multiservice operators, Web-scale providers, submarine network operators, governments, enterprises, research and education (R&E) institutions, and other emerging network operators. These products, which can be applied from the network core to network access points, allow network operators to scale capacity, increase transmission speeds, allocate traffic and adapt dynamically to changing end-user service demands. In addition to our portfolio of high-capacity hardware systems and components, we offer network management and domain control software platforms, along with advanced applications software, designed to simplify the creation, automation and delivery of services across multi-vendor and multi-domain network environments. To complement our hardware and software solutions, we offer a broad range of services that help our customers design, optimize, integrate, deploy, manage and maintain their networks.

Our quarterly reports on Form 10-Q, annual reports on Form 10-K, and current reports on Form 8-K filed with the SEC are available through the SEC's website at [www.sec.gov](http://www.sec.gov) or free of charge on our website as soon as reasonably practicable after we file these documents. We routinely post the reports above, recent news and announcements, financial results and other information about Ciena that is important to investors in the "Investors" section of our website at [www.ciena.com](http://www.ciena.com). Investors are encouraged to review the "Investors" section of our website because, as with the other disclosure channels that we use, from time to time we may post material information on that site that is not otherwise disseminated by us.

#### Market Opportunity

The markets in which we sell our communications networking solutions have seen significant changes in recent years, including rapid growth in bandwidth demand, proliferation of cloud-based services and heightened end-user service demands. We have also seen the impact of Web-scale network operators and their services on service provider architectures. These conditions have placed significant demands on networks, challenged the business models of network operators, and altered the overall competitive landscape of network operators. Existing and emerging network operators are competing to distinguish their service offerings and rapidly introduce differentiated, revenue-generating services, while managing the costs of their networks and seeking to ensure a profitable business model. We believe that these dynamics, and the need to adapt to rapidly changing business and network demands, will cause network operators to leverage increased software-based network control and programmability, and that network operators will adopt or evolve their infrastructures to be more open, programmable and automated.

While drivers of bandwidth growth and network evolution remain strong, our customers are under constant pressure to constrain their capital expenditure budgets and cannot grow their network spending at the rate of bandwidth growth. As a result, as we innovate and introduce new and more robust solutions that increase capacity or features, there is a market expectation of solutions that are more cost-effective than existing or competing solutions. The combination of this regular technology-driven price compression in our industry and ongoing customer efforts to manage network costs can impact growth rates in our markets, and requires that we increase our volume of product shipments to grow revenue. During fiscal 2017, we saw slower market growth rates in a number of our geographies. Notwithstanding these market dynamics, we grew annual revenue and benefited meaningfully from our continued efforts to diversify our business and to take market share from competitors. Specifically, we continued to diversify our customer base to include additional customer segments, such as Web-scale providers and data center operators and enterprise customers, which contributed to our growth in North America during fiscal 2017. We also benefited from geographic diversification and growth of our business in Asia-Pacific during fiscal 2017,

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including sales to additional service provider customers in India. We believe that continued diversification of our business and share capture are important parts of our strategy and necessary for continued revenue growth.

Our strategy to capitalize on these market dynamics and drive the profitable growth of our business includes the initiatives set forth in the “Strategy” section of the description of our business in Item 1 of Part 1 of this annual report.

### Competitive Landscape

The markets in which we compete are characterized by rapidly advancing technologies, frequent introduction of new networking solutions and aggressive selling and pricing efforts to gain or retain market share. The markets for our solutions are both highly competitive and fragmented, as we regularly compete with number of large, multi-national vendors with greater financial, operational and marketing resources, and significantly broader product offerings. Our sales of Converged Packet Optical solutions face an intense competitive environment as we and our competitors introduce new, higher-capacity, higher-speed network solutions with improved reach, spectral efficiency, automation, power consumption and cost per bit. We expect competition in our industry to continue to broaden and to remain challenging and dynamic. As we expand our Packet Networking solutions and our Waveserver DCI platform, our solutions have become increasingly competitive with IP router vendors, data center switch providers, and other IT suppliers or integrators. Similarly, as we seek increased customer adoption of our Blue Planet software platform, we expect to compete more directly with additional software vendors and information technology vendors or integrators of these solutions.

Network operators are pursuing a variety of “consumption models,” or approaches to the design and procurement of their network infrastructure. While broader adoption of procurement models that emphasize disaggregation of hardware and software remains uncertain, we expect that a diversity of consumption models will require us and other system vendors to broaden our existing offering and commercial models over time. We may face competition from component vendors, including those in our supply chain, that develop networking products based on off-the-shelf or commoditized hardware technology, referred to as “white box” hardware. Further, some of our competitors, both large and small, are not vertically integrated in their packet optical supply chain, and sell solutions that rely upon third-party coherent modem technology from merchant modem providers. We may compete with these providers as we pursue merchant modem sales opportunities. We have entered into global distribution relationships to sell our WaveLogic coherent optical technology into this market through Lumentum, NeoPhotonics and Oclaro. Each has the unrestricted ability to sell such optical modules to end users, including our customers, our competitors, and other vendors or network operators that plan to build or use “white box” hardware. Accordingly, we may ultimately compete with these partners in the marketplace. In connection with consumption models involving greater disaggregation, the continued use of such third-party modem technology and/or the availability of such technology in the market may increase overall pricing pressure in this space and may negatively impact our ability to derive higher gross margins for Converged Packet Optical solutions.

See the “Industry Background” and “Competition” sections of the description of our business in Item 1 of Part 1 of this annual report for more information related to the competitive landscape of our markets.

### Balance Sheet Initiatives

**Share Repurchase Authorization.** On December 7, 2017, we announced that our Board of Directors authorized a program to repurchase up to \$300 million of our outstanding common stock through the end of fiscal 2020. We may purchase shares at management’s discretion in the open market, in privately negotiated transactions, in transactions structured through investment banking institutions, or a combination of the foregoing. We may also, from time to time, enter into Rule 10b5-1 plans to facilitate repurchases of shares under this authorization. The amount and timing of repurchases are subject to a variety of factors including liquidity, cash flow, stock price, and general business and

market conditions.

Exchange Offer for 2018 Convertible Notes to Add Cash Settlement Conversion Options. On August 2, 2017, we completed an offer to exchange our currently outstanding 3.75% Convertible Senior Notes due 2018 (the “Original Notes”) for a new series of 3.75% Convertible Senior Notes due 2018 (the “New Notes”) and an exchange fee of \$2.50 per \$1,000 original principal amount. The New Notes give us the option, at our election, to settle conversions of the New Notes for cash, shares of our common stock, or a combination of cash and shares. It is our current intent that upon any conversion of the New Notes we will settle the principal amount thereof in cash. Accordingly, we used the treasury stock method for the New Notes in our diluted earnings per share calculation starting in the fourth quarter of fiscal 2017. Following settlement of the exchange offer, approximately \$61.3 million in aggregate principal amount at maturity of Original Notes and \$288.7 million in aggregate principal amount at maturity of New Notes were outstanding. See Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for more information relating to our outstanding convertible notes.



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Repurchase and Repayment at Maturity of 0.875% Convertible Senior Notes due June 15, 2017. During fiscal 2017, we repurchased \$46.3 million of the outstanding aggregate principal amount of our 0.875% Convertible Senior Notes due June 15, 2017 (the "2017 Notes") in private transactions. We repaid in cash the remaining \$185.3 million in aggregate principal amount outstanding of the 2017 Notes at maturity on June 15, 2017.

Term Loan Refinancing. On January 30, 2017, we refinanced our existing term loans in the aggregate principal amount of \$250 million, maturing on July 15, 2019 (the "2019 Term Loan") and \$250 million, maturing on April 25, 2021 (the "2021 Term Loan") into a single term loan with an aggregate principal amount of \$400 million maturing on January 30, 2022 (the "2022 Term Loan"). The remaining balances under the 2019 Term Loan and 2021 Term Loan were refinanced and replaced by the 2022 Term Loan and the aggregate amount of borrowing was reduced. This arrangement was accounted for as a modification of debt. See Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for more information relating to our term loan refinancing.

### Reversal of Deferred Tax Asset Valuation Allowance

Our fourth quarter of fiscal 2017 and fiscal 2017 results of operations reflect a non-cash \$1.1 billion deferred tax asset valuation allowance reversal. See Note 20 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for more information relating to this reversal. The value of the deferred tax assets on our balance sheet as of October 31, 2017 would decrease significantly if the U.S. corporate income tax rate is reduced, as proposed in tax reform legislation recently passed by both houses of the U.S. Congress on December 20, 2017. Consequently, if the President signs this proposed legislation into law as expected, we expect that our results of operations for the first quarter of fiscal 2018 would be materially adversely affected by a non-cash charge to reflect the reduction in value of these assets.

### Financial Results for Fourth Quarter of Fiscal 2017 and Sequential Comparison

Revenue for the fourth quarter of fiscal 2017 was \$744.4 million, representing a sequential increase of 2.2% from \$728.7 million in the third quarter of fiscal 2017. Revenue-related details reflecting sequential changes from the third quarter of fiscal 2017 include the following:

Product revenue for the fourth quarter of fiscal 2017 increased by \$5.5 million, primarily reflecting an increase of \$6.6 million in Networking Platforms partially offset by a decrease of \$1.1 million in software platforms within our Software-Related Services segment.

Services revenue for the fourth quarter of fiscal 2017 increased by \$10.2 million.

North America revenue for the fourth quarter of fiscal 2017 was \$440.5 million, a decrease from \$465.2 million in the third quarter of fiscal 2017. This primarily reflects decreases of \$27.4 million in Networking Platforms and \$1.0 million in Software and Software-Related Services. These decreases were partially offset by an increase of \$3.7 million in Global Services.

Europe, Middle East and Africa ("EMEA") revenue for the fourth quarter of fiscal 2017 was \$110.7 million, an increase from \$96.1 million in the third quarter of fiscal 2017. This primarily reflects increases of \$8.5 million in Networking Platforms and \$6.5 million in Global Services.

Caribbean and Latin America ("CALA") revenue for the fourth quarter of fiscal 2017 was \$43.5 million, a decrease from \$51.7 million in the third quarter of fiscal 2017, primarily reflecting a decrease of \$9.0 million in Networking Platforms.

Asia Pacific ("APAC") revenue for the fourth quarter of fiscal 2017 was \$149.7 million, an increase from \$115.7 million in the third quarter of fiscal 2017. This reflects an increase of \$34.5 million in Networking Platforms partially offset by a decrease of \$1.2 million in Global Services.

For the fourth quarter fiscal 2017, AT&T accounted for 16.7% and Verizon accounted for 11.0% of total revenue. AT&T accounted for 16.6% and Verizon accounted for 11.4% of total revenue for the third quarter of fiscal 2017.

Gross margin for the fourth quarter of fiscal 2017 was 43.7%, a decrease from 45.0% in the third quarter of fiscal 2017. The reduced gross margin was primarily due to aggressive efforts to take market share from competitors and secure new customers and the effects of the early stages of these deployments. Our gross margin can fluctuate, particularly when viewed on a quarterly basis, as a result of a number of factors, including the additional costs we incur associated with the early stages of new network deployments that typically include a higher concentration of lower margin “common” equipment sales. Part of our strategy for fiscal 2018 is to leverage our technology leadership and to aggressively capture additional market share and displace competitors, particularly with communications service providers internationally. Accordingly, we may encounter fluctuations or reductions in quarterly gross margin during this period.

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Operating expense was \$269.9 million for the fourth quarter of fiscal 2017, a \$23.8 million increase from \$246.1 million in the third quarter of fiscal 2017. This reflects increases of \$9.1 million in selling and marketing expense, primarily due to increased incentive sales compensation and \$1.4 million in research and development expenses. Operating expense also reflects a \$13.7 million significant asset impairment related to a trade receivable for a single customer in the APAC region. No revenue was recognized from this customer in the fourth quarter of fiscal 2017 and \$4.8 million of the impairment was related to revenue recorded during the first nine months of fiscal 2017.

Income from operations for the fourth quarter of fiscal 2017 was \$55.8 million, as compared to \$82.0 million during the third quarter of fiscal 2017. Our net income for the fourth quarter of fiscal 2017 was \$1.2 billion, or \$7.32 per diluted common share which reflects a tax benefit of \$1.1 billion related to the reversal of a deferred tax asset valuation allowance. This compares to a net income of \$60.0 million or \$0.39 per diluted common share, for the third quarter of fiscal 2017.

We generated \$138.5 million of cash from operations during the fourth quarter of fiscal 2017. This compares with \$50.6 million in cash generated from operations during the third quarter of fiscal 2017. As of October 31, 2017, we had \$640.5 million in cash and cash equivalents, \$279.1 million of short-term investments in U.S. treasury securities and commercial paper and \$49.8 million of long-term investments in U.S. treasury securities. This compares to \$559.5 million in cash and cash equivalents, \$234.7 million of short-term investments in U.S. treasury securities and commercial paper, and \$59.9 million of long-term investments in U.S. treasury securities at July 31, 2017. As of October 31, 2017, we had 5,737 employees, a decrease from 5,780 as of July 31, 2017 and an increase from 5,555 and 5,345 at October 31, 2016 and 2015, respectively.

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## Consolidated Results of Operations

## Operating Segments

Ciena has the following operating segments for reporting purposes: (i) Networking Platforms, (ii) Software and Software-Related Services, and (iii) Global Services. See Note 22 to our Consolidated Financial Statements included in Item 8 of Part II of this report.

Fiscal 2017 compared to Fiscal 2016

## Revenue

During fiscal 2017, approximately 17.4% of our revenue was non-U.S. Dollar denominated, including sales in Euros, Canadian Dollars, Brazilian Reals, British Pounds, and Japanese Yen. During fiscal 2017 as compared to fiscal 2016, the U.S. Dollar fluctuated against these currencies. Consequently, our revenue reported in U.S. Dollars was slightly reduced by approximately \$4.9 million, or 0.2%, as compared to fiscal 2016 due to fluctuations in foreign currency. The table below (in thousands, except percentage data) sets forth the changes in our operating segment revenue for the periods indicated:

	Fiscal Year				Increase (decrease)	%**
	2017	%*	2016	%*		
Revenue:						
Networking Platforms						
Converged Packet Optical	\$1,926,087	68.7	\$1,779,932	68.5	\$146,155	8.2
Packet Networking	313,089	11.2	252,862	9.7	60,227	23.8
Optical Transport	13,534	0.5	35,989	1.4	(22,455 )	(62.4)
Total Networking Platforms	2,252,710	80.4	2,068,783	79.6	183,927	8.9
Software and Software-Related Services						
Software Platforms	65,871	2.4	48,689	1.9	17,182	35.3
Software-Related Services	95,248	3.4	76,380	2.9	18,868	24.7
Total Software and Software-Related Services	161,119	5.8	125,069	4.8	36,050	28.8
Global Services						
Maintenance Support and Training	227,400	8.1	228,982	8.8	(1,582 )	(0.7 )
Installation and Deployment	117,524	4.2	130,916	5.0	(13,392 )	(10.2)
Consulting and Network Design	42,934	1.5	46,823	1.8	(3,889 )	(8.3 )
Total Global Services	387,858	13.8	406,721	15.6	(18,863 )	(4.6 )
Consolidated revenue	\$2,801,687	100.0	\$2,600,573	100.0	\$201,114	7.7

\* Denotes % of total revenue

\*\*Denotes % change from 2016 to 2017

Networking Platforms revenue increased, primarily reflecting product line sales increases of \$146.2 million of our Converged Packet Optical products and \$60.2 million of our Packet Networking products, partially offset by a product line sales decrease of \$22.5 million in our Optical Transport products.

Converged Packet Optical sales primarily reflect increases of \$100.8 million of our Waveserver stackable interconnect system, \$61.5 million of our 6500 Packet-Optical Platform, \$34.2 million of our 5430 Reconfigurable Switching System and \$6.8 million of our OTN configuration for the 5410 Reconfigurable



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Switching System. These increases were partially offset by sales decreases of \$49.9 million of our Z-Series Packet-Optical Platform and \$7.4 million of our CoreDirector® Multiservice Optical Switches.

Packet Networking sales primarily reflect increases of \$38.7 million of our 3000 and 5000 families of service delivery and aggregation switches, \$11.9 million in initial sales of packet networking platform independent software and \$10.2 million of our 8700 Packetwave Platform.

Optical Transport sales have continued to experience significant declines, as expected. Our Optical Transport products have either been previously discontinued, or are expected to be discontinued, reflecting network operators' transition toward next-generation converged network architectures addressed by solutions within our Converged Packet Optical product line. Accordingly, commencing in fiscal 2018, sales of Optical Transport will be reflected within the Converged Packet Optical product line of our Networking Platforms segment.

Software and Software-Related Services revenue increased, primarily reflecting sales increases of \$19.0 million in software-related services and \$17.2 million of our software platforms. The increase in software-related services is primarily due to sales increases of \$12.5 million of software subscription services, \$4.2 million of services supporting our Blue Planet software platform and advance software applications and \$1.5 million of software-enabled services. The increase in software platform sales primarily reflects increases of \$9.0 million in sales of our Blue Planet software platform and advanced software applications and \$6.5 million in sales of our OneControl Unified Management System.

Global Services revenue decreased, primarily reflecting sales decreases of \$13.4 million of our installation and deployment services, \$3.9 million of our consulting and network design services and \$1.6 million of our maintenance support and training services. These sales decreases were primarily due to reduced activity in the North America and CALA regions as described below.

Our operating segments each engage in business and operations across four geographic regions: North America; EMEA; CALA; and APAC. Results for North America include only activities in the United States and Canada. Part of our business and growth strategy is to continue to diversify our customer base and secure additional service provider customers outside of North America, including in high-growth geographies such as India. We believe that this is an important part of our strategy, and that it is required for continued revenue growth. The following table reflects our geographic distribution of revenue principally based on the relevant location for our delivery of products and performance of services. Our revenue, particularly when considered by geographic distribution, can fluctuate significantly and the timing of revenue recognition for large network projects, particularly outside of North America, can result in large variations in geographic revenue results in any particular quarter. The table below (in thousands, except percentage data) sets forth the changes in geographic distribution of revenue for the periods indicated:

	Fiscal Year			Fiscal Year		Increase (decrease)	%**
	2017	%*		2016	%*		
North America	\$1,736,047	62.0	\$1,689,263	65.0	\$46,784	2.8	
EMEA	404,099	14.4	393,705	15.1	10,394	2.6	
CALA	164,308	5.9	195,085	7.5	(30,777)	(15.8)	
APAC	497,233	17.7	322,520	12.4	174,713	54.2	
Total	\$2,801,687	100.0	\$2,600,573	100.0	\$201,114	7.7	

\* Denotes % of total revenue

\*\*Denotes % change from 2016 to 2017

North America revenue primarily reflects increases of \$34.7 million within our Networking Platforms segment and \$25.7 million within our Software and Software-Related Services segment, partially offset by a revenue decrease of \$13.6 million within our Global Services segment.

Networking Platforms revenue primarily reflects product line increases of \$29.0 million of Packet Networking sales and \$11.5 million of Converged Packet Optical sales, partially offset by a product line decrease of \$5.7 million in

Optical Transport sales.

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The revenue increase within Converged Packet Optical sales primarily reflects increases of \$85.7 million in sales of our Waveserver stackable interconnect system, partially offset by decreases in sales of \$48.2 million of our Z-Series Packet-Optical Platform, \$14.8 million of our 6500 Packet-Optical Platform and \$13.3 million of our 5430 Reconfigurable Switching System. The revenue increase for our Waveserver stackable interconnect system primarily reflects increased sales to Web-scale providers.

The revenue increase within Packet Networking primarily reflects increases of \$15.5 million in sales of our 3000 and 5000 families of service delivery and aggregation switches and \$11.9 million of packet networking platform independent software. Packet Networking sales have traditionally been concentrated, with significant sales to AT&T. However, during fiscal 2017, a significant portion of the growth benefited from sales to other network operators. Software and Software-Related Services revenue primarily reflects sales increases of \$10.7 million of our software subscription services, \$5.3 million of our OneControl Unified Management System, \$5.2 million of our Blue Planet software platform and \$2.8 million of services supporting our Blue Planet software platform and advance software applications.

Global Services revenue primarily reflects decreases of \$9.0 million for installation and deployment activities and \$5.0 million in maintenance support and training. Installation and deployment activities were impacted by the contribution of sales of our Waveserver stackable interconnect system, which does not typically include installation services.

EMEA revenue primarily reflects increases of \$5.4 million within our Networking Platforms segment and \$5.4 million within our Software and Software-Related Services segment.

Networking Platforms segment revenue primarily reflects product line increases of \$9.7 million in Converged Packet Optical sales and \$3.7 million in Packet Networking sales. These increases were partially offset by a decrease of \$8.0 million in Optical Transport sales. The increase in Converged Packet Optical sales primarily reflects an increase of \$10.8 million in sales from our Waveserver stackable interconnect system.

CALA revenue primarily reflects decreases of \$22.1 million within our Networking Platforms segment and \$8.9 million within our Global Services segment. The decrease in CALA revenue primarily relates to decreased sales to certain communications service providers in Brazil and to AT&T in Mexico.

Networking Platforms segment revenue primarily reflects product line decreases of \$20.4 million of Converged Packet Optical sales and \$5.4 million in Optical Transport sales partially offset by a product line increase of \$3.7 million of Packet Networking sales. The decrease in Converged Packet Optical sales primarily reflects \$15.8 million in sales of our 5430 Reconfigurable Switching System and \$3.4 million in sales of our 6500 Packet-Optical Platform. Global Services segment revenue primarily reflects reduced installation and deployment activities which reflect the decrease in sales of our Networking Platforms products as described above.

APAC revenue primarily reflects increases of \$165.9 million within our Networking Platforms segment, \$4.9 million within our Software and Software-Related Services segment and \$3.9 million within our Global Services segment. Revenue contribution from India, which increased by \$115.5 million in fiscal 2017, was a significant driver of our annual revenue growth.

Networking Platforms segment revenue primarily reflects product line increases of \$145.4 million of Converged Packet Optical sales and \$23.9 million of Packet Networking sales, partially offset by a product line decrease of \$3.4 million in Optical Transport sales.

Converged Packet Optical revenue primarily reflects an increase of \$79.5 million in sales of our 6500 Packet-Optical Platform primarily due to increases in sales through our strategic relationship with Ericsson in Australia, sales to Reliance Jio Infocomm in India and sales to service providers in Japan. The revenue increase within Converged Packet Optical also reflects an increase of \$64.3 million of our 5430 Reconfigurable Switching System sales primarily due to increased sales to Reliance Jio Infocomm in India.

Packet Networking revenue primarily reflects increases of \$15.9 million in sales of our 3000 and 5000 families of service delivery and aggregation switches and \$8.0 million in sales of our 8700 Packetwave Platform primarily to certain communication service providers in India.





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In fiscal 2017 and fiscal 2016, our top ten customers contributed 55.6% and 51.1% of revenue, respectively. A sizable portion of our revenue continues to be derived from sales to large service provider customers. Consequently, our financial results are closely correlated with the spending of a relatively small number of customers and can be significantly affected by market, industry or competitive dynamics affecting their businesses. Our reliance upon a relatively small number of customers also increases our exposure to changes in their spending levels, network priorities and purchasing strategies. The loss of a significant customer could have a material adverse effect on our business and results of operations, and our results of operations can fluctuate quarterly depending upon sales volumes and purchasing priorities with these large customers.

Sales to AT&T were \$448.9 million, or 16.0% of total revenue in fiscal 2017, and \$479.1 million, or 18.4% of total revenue in fiscal 2016. Verizon accounted for \$288.0 million or 10.3% of total revenue for fiscal 2017. Some customers, including AT&T, are pursuing network strategies that seek to utilize enhanced software programmability, management and control of networks and to deploy off-the-shelf or commoditized hardware technology, referred to as “white box” hardware, in lieu of existing solutions. These strategies may present challenges and opportunities for our business, particularly where we are an incumbent equipment vendor. No other customer accounted for greater than 10% of our revenue in fiscal 2017 or fiscal 2016.

As our business has diversified, we have taken a number of steps to increase the velocity of our business and improve our operating efficiency, including through inventory management and lead time reduction. As a result, the percentage of quarterly product revenue that we generate from customer orders placed during that particular quarter has increased meaningfully, as compared to our historical periods. Our increased reliance upon orders placed during a particular quarter may make it harder to predict our revenue and results of operations, and may further increase the likelihood of fluctuations in our results.

### Cost of Goods Sold and Gross Profit

Product cost of goods sold consists primarily of amounts paid to third-party contract manufacturers, component costs, employee-related costs and overhead, shipping and logistics costs associated with manufacturing-related operations, warranty and other contractual obligations, royalties, license fees, amortization of intangible assets, cost of excess and obsolete inventory and, when applicable, estimated losses on committed customer contracts.

Services cost of goods sold consists primarily of direct and third-party costs associated with our provision of services including installation, deployment, maintenance support, consulting and training activities and, when applicable, estimated losses on committed customer contracts. The majority of these costs relate to personnel, including employee and third-party contractor-related costs.

Our gross profit as a percentage of revenue, or “gross margin,” has remained relatively consistent in recent fiscal years. However, gross margin, particularly when viewed on a quarterly basis, can fluctuate due to a number of factors. Our gross margin remains highly dependent upon our continued ability to drive product cost reductions relative to the price erosion that we regularly encounter in our markets. Moreover, we are often required to compete with aggressive pricing and commercial terms and to secure business with new and existing customers we may agree to pricing or other unfavorable commercial terms that adversely affect our gross margin. Our success in taking share and winning new business can result in additional costs associated with the early stages of network deployments, including an increased concentration of lower margin “common” equipment sales and installation services, as compared to higher margin products including channel cards, software services and maintenance services. Gross margin can be impacted by technology-based price compression and the introduction or substitution of new platforms for existing solutions that carry higher margins. Gross margin can also be impacted by changes in expense for excess and obsolete inventory and warranty obligations and our revenue concentration within a particular segment, product line, geography, or

customer.

Service gross margin can be affected by the mix of customers and services, particularly the mix between deployment and maintenance services, geographic mix and the timing and extent of any investments in internal resources to support this business.

The tables below (in thousands, except percentage data) set forth the changes in revenue, cost of goods sold and gross profit for the periods indicated:

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	Fiscal Year					
	2017	%*	2016	%*	Increase (decrease)	%**
Total revenue	\$2,801,687	100.0	\$2,600,573	100.0	\$201,114	7.7
Total cost of goods sold	1,555,901	55.5	1,438,997	55.3	116,904	8.1
Gross profit	\$1,245,786	44.5	\$1,161,576	44.7	\$84,210	7.2

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\* Denotes % of total revenue

\*\*Denotes % change from 2016 to 2017

	Fiscal Year					
	2017	%*	2016	%*	Increase (decrease)	%**
Product revenue	\$2,318,581	100.0	\$2,117,472	100.0	\$201,109	9.5
Product cost of goods sold	1,308,295	56.4	1,176,304	55.6	131,991	11.2
Product gross profit	\$1,010,286	43.6	\$941,168	44.4	\$69,118	7.3

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\* Denotes % of product revenue

\*\*Denotes % change from 2016 to 2017

	Fiscal Year					
	2017	%*	2016	%*	Increase (decrease)	%**
Service revenue	\$483,106	100.0	\$483,101	100.0	\$5	—
Service cost of goods sold	247,606	51.3	262,693	54.4	(15,087 )	(5.7)
Service gross profit	\$235,500	48.7	\$220,408	45.6	\$15,092	6.8

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\* Denotes % of service revenue

\*\*Denotes % change from 2016 to 2017

Gross profit as a percentage of revenue, or gross margin reflects improved services gross profit partially offset by reduced product gross profit.

Gross profit on products as a percentage of product revenue, or product gross margin, decreased primarily as a result of market-based price erosion partially offset by product cost reductions and increased software platform sales.

Gross profit on services as a percentage of services revenue, or services gross margin, increased, primarily due to increased sales of higher margin software subscription services and decreased sales of lower margin installation and deployment services.

#### Operating Expense

Operating expense increased in fiscal 2017 from the level reported for fiscal 2016 primarily due to increased research and development initiatives, investments in information technology related to the re-engineering of company-wide enterprise resource planning platforms, and the transition costs of key facilities. In particular, the development of our new facilities and the transition of our operations in Ottawa, Canada required significant effort, time and cost. For additional information regarding this lease and the facility transitions, see Item 2 of Part I of this annual report.

Operating expense consists of the component elements described below.

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Research and development expense primarily consists of salaries and related employee expense (including share-based compensation expense), prototype costs relating to design, development, and testing of our products, depreciation expense and third-party consulting costs.

Selling and marketing expense primarily consists of salaries, incentive-based sales commissions and related employee expense (including share-based compensation expense), and sales and marketing support expense, including travel, demonstration units, trade show expense and third-party consulting costs.

General and administrative expense primarily consists of salaries and related employee expense (including share-based compensation expense), and costs for third-party consulting and other services.

Amortization of intangible assets primarily reflects the amortization of both purchased technology and the value of customer relationships derived from our acquisitions.

Acquisition and integration costs consist of expenses for financial, legal and accounting advisors and severance and other employee-related costs, associated with our acquisition activity.

Significant asset impairments and restructuring costs primarily reflect actions we have taken to better align our workforce, facilities and operating costs with perceived market opportunities, business strategies and changes in market and business conditions and significant impairment of assets.

During fiscal 2017, approximately 51.8% of our operating expense was non-U.S. Dollar denominated, including Canadian Dollars, British Pounds, Euros, Indian Rupees and Brazilian Reais. During fiscal 2017 as compared to fiscal 2016, the U.S. Dollar fluctuated against these currencies. Consequently, our operating expense reported in U.S. Dollars was slightly reduced by approximately \$2.1 million, or 0.2%, as compared to fiscal 2016 due to fluctuations in foreign currency. The table below (in thousands, except percentage data) sets forth the changes in operating expense for the periods indicated:

	Fiscal Year					
	2017	%*	2016	%*	Increase (decrease)	%**
Research and development	\$475,329	17.0	\$451,794	17.4	\$23,535	5.2
Selling and marketing	356,169	12.7	349,731	13.4	6,438	1.8
General and administrative	142,604	5.1	132,828	5.1	9,776	7.4
Amortization of intangible assets	33,029	1.2	61,508	2.4	(28,479 )	(46.3 )
Acquisition and integration costs	—	—	4,613	0.2	(4,613 )	(100.0)
Significant asset impairments and restructuring costs	23,933	0.9	4,933	0.2	19,000	385.2
Total operating expenses	\$1,031,064	36.9	\$1,005,407	38.7	\$25,657	2.6

\* Denotes % of total revenue

\*\*Denotes % change from 2016 to 2017

Research and development expense was adversely affected by \$2.0 million as a result of foreign exchange rates, net of hedging, primarily due to a weaker U.S. Dollar in relation to the Canadian Dollar. Including the effect of foreign exchange rates, research and development expenses increased by \$23.5 million. This increase primarily reflects increases of \$17.6 million in employee and compensation costs and \$9.5 million in facilities and information technology costs largely due to the facilities transitions described above. These increases were partially offset by decreases of \$2.9 million in professional services and \$1.1 million in prototype expense.

Selling and marketing expense increased by \$6.4 million, primarily reflecting increases of \$1.5 million in facilities and information technology costs, \$1.5 million in technology and related costs, \$1.4 million in employee and compensation costs and \$1.1 million in travel and related costs.

General and administrative expense increased by \$9.8 million, primarily reflecting increases of \$4.5 million for employee and compensation costs, \$2.9 million for professional services and legal fees and \$1.2 million for facilities and information technology costs.

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Amortization of intangible assets decreased due to certain intangible assets having reached the end of their economic lives.

Acquisition and integration costs incurred during fiscal 2016 reflects expense for financial, legal and accounting advisors and severance and other employee compensation costs, related to our acquisition of Cyan on August 3, 2015 and our acquisition of certain high-speed photonics components (“HSPC”) assets of TeraXion, Inc. (“Teraxion”) and its wholly-owned subsidiary on February 1, 2016.

Significant asset impairments and restructuring costs during fiscal 2017 primarily reflects a \$13.7 million asset impairment related to a trade receivable for a single customer in the APAC region, \$5.9 million for workforce reductions and \$4.4 million for unfavorable lease commitments and relocation costs incurred in connection with our research and development center facility transitions in Ottawa, Canada. For more information about the significant asset impairment related to a trade receivable, see “Overview” above. For more information on our workforce reductions, see Note 3 to our Consolidated Financial Statements included in in Item 8 of Part II of this annual report for more information. For more information on our research and development facility transition, see Item 2 of Part I and Note 3 to our Consolidated Financial Statements included in in Item 8 of Part II of this annual report.

## Other items

The table below (in thousands, except percentage data) sets forth the changes in other items for the periods indicated:

	Fiscal Year				Increase (decrease)	%**
	2017	%*	2016	%*		
Interest and other income (loss), net	\$(2,744 )	(0.1 )	\$(12,795)	(0.5)	\$10,051	78.6
Interest expense	\$55,852	2.0	\$56,656	2.2	\$(804 )	(1.4 )
Provision (benefit) for income taxes	\$(1,105,827)	(39.5)	\$14,134	0.5	\$(1,119,961)	(7,923.9)

\* Denotes % of total revenue

\*\*Denotes % change from 2016 to 2017

Interest and other income (loss), net primarily reflects \$11.9 million of improved impact of foreign exchange rates on assets and liabilities denominated in a currency other than the relevant functional currency, net of hedging activity, partially offset by \$3.6 million in debt modification expenses related to the 2022 Term Loan that was entered into in the second quarter of fiscal 2017 and the exchange offer of our New Notes in the fourth quarter of fiscal 2017. For additional information about our term loans and convertible senior notes, see Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this report.

Interest expense decreased slightly, primarily due to a reduction in our aggregate outstanding debt due to the refinancing of our term loans during the second quarter of fiscal 2017 and the maturity of the 2017 Notes on June 15, 2017. This decrease was offset by higher interest expense related to our new facilities in Ottawa, Canada which are subject to capital lease accounting treatment. See Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for more information on our debt and see Note 10 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for more information regarding our buildings subject to capital leases.

Provision (benefit) for income taxes decreased primarily due to a reversal of a deferred tax asset valuation allowance. See Note 20 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for more information.

## Fiscal 2016 compared to Fiscal 2015

## Revenue

Our total revenue in fiscal 2016 was slightly impacted by the strengthening of the U.S. Dollar. During fiscal 2016, as compared to fiscal 2015, the U.S. Dollar strengthened against a number of foreign currencies, including the Canadian Dollar and Brazilian Reals, in which we have our most significant foreign currency revenue exposure. As a result, our total revenue reported in U.S. Dollars during fiscal 2016 was adversely impacted by approximately \$16.7 million or

0.6% as compared to

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fiscal 2015. The table below (in thousands, except percentage data) sets forth the changes in our operating segment revenue for the periods indicated:

	Fiscal Year				Increase (decrease)	%**
	2016	%*	2015	%*		
Revenue:						
Networking Platforms						
Converged Packet Optical	\$1,779,932	68.5	\$1,661,702	67.9	\$118,230	7.1
Packet Networking	252,862	9.7	229,223	9.4	23,639	10.3
Optical Transport	35,989	1.4	73,004	3.0	(37,015 )	(50.7)
Total Networking Platforms	2,068,783	79.6	1,963,929	80.3	104,854	5.3
Software and Software-Related Services						
Software Platforms	48,689	1.9	38,466	1.6	10,223	26.6
Software-Related Services	76,380	2.9	61,821	2.5	14,559	23.6
Total Software and Software-Related Services	125,069	4.8	100,287	4.1	24,782	24.7
Global Services						
Maintenance Support and Training	228,982	8.8	224,079	9.2	4,903	2.2
Installation and Deployment	130,916	5.0	115,531	4.7	15,385	13.3
Consulting and Network Design	46,823	1.8	41,843	1.7	4,980	11.9
Total Global Services	406,721	15.6	381,453	15.6	25,268	6.6
Consolidated revenue	\$2,600,573	100.0	\$2,445,669	100.0	\$154,904	6.3

\* Denotes % of total revenue

\*\*Denotes % change from 2015 to 2016

Networking Platforms revenue increased, primarily reflecting product line sales increases of \$118.2 million of our Converged Packet Optical products and \$23.6 million of our Packet Networking products, partially offset by a decrease of \$37.0 million in sales of our Optical Transport products.

Converged Packet Optical sales primarily reflect increases of \$107.7 million of our 6500 Packet-Optical Platform, \$33.7 million in sales relating to the Z-Series Packet-Optical Platform, acquired from Cyan in the fourth quarter of fiscal 2015, and \$8.2 million in sales of our Waveserver stackable data center interconnect system. Increased 6500 Packet-Optical Platform revenue reflects increased sales to a diverse set of customers including communications service providers, Web-scale providers and enterprise customers, partially offset by a decrease in sales to AT&T. These increases were also partially offset by decreases of \$23.7 million in sales of our OTN configuration for the 5410 Reconfigurable Switching System and \$7.9 million in sales of our CoreDirector® Multiservice Optical Switches.

Packet Networking sales reflect increases of \$16.2 million in sales of our 3000 and 5000 family of service delivery and aggregation switches and \$9.3 million in sales of our 8700 Packetwave Platform, partially offset by a decrease of \$1.4 million in sales of Ethernet packet configuration for our 5410 Service Aggregation Switch.

Optical Transport sales have continued to experience significant declines, as expected. Our Optical Transport products have either been previously discontinued, or are expected to be discontinued, reflecting network operators' transition toward next-generation converged network architectures addressed by solutions within our Converged Packet Optical product line.

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Software and Software-Related Services revenue increased, primarily reflecting increases of \$14.6 million in software-related services sales and \$10.2 million in sales of our software platforms. The increase in software-related services revenue primarily reflects increased sales of software subscription services. The increase in software platform revenue reflects \$6.7 million in initial sales of our Blue Planet software platform and advanced software applications and a \$1.4 million increase in sales of our OneControl Unified Management System. Segment revenue also includes \$2.1 million in sales of Planet Operate software acquired from Cyan.

Global Services revenue increased, primarily reflecting increases of \$15.4 million in sales of our installation and deployment services, \$5.0 million in sales of our consulting and network design services and \$4.9 million in sales of our maintenance and support services. Global Services segment revenue includes \$16.1 million and \$3.4 million of services revenue acquired from Cyan for fiscal 2016 and fiscal 2015, respectively.

The table below (in thousands, except percentage data) sets forth the changes in geographic distribution of revenue for the periods indicated:

	Fiscal Year		2015	%*	Increase (decrease)	%**
	2016	%*				
North America	\$1,689,263	65.0	\$1,598,328	65.4	\$90,935	5.7
EMEA	393,705	15.1	400,294	16.4	(6,589)	(1.6)
CALA	195,085	7.5	201,499	8.2	(6,414)	(3.2)
APAC	322,520	12.4	245,548	10.0	76,972	31.3
Total	\$2,600,573	100.0	\$2,445,669	100.0	\$154,904	6.3

\* Denotes % of total revenue

\*\* Denotes % change from 2015 to 2016

North America revenue primarily reflects increases of \$54.8 million within our Networking Platforms segment, \$22.8 million within our Software and Software-Related Services segment and \$13.3 million within our Global Services segment. Increased Networking Platforms segment revenue primarily reflects product line increases of \$63.1 million of Converged Packet Optical sales and \$11.0 million of Packet Networking sales, partially offset by a decrease of \$19.3 million in Optical Transport sales. Converged Packet Optical sales reflect a \$42.3 million increase in sales of our 6500 Packet-Optical Platform, reflecting increased sales to a diverse set of customers including communications service providers, Web-scale providers and enterprise customers, partially offset by a decrease in sales to AT&T and cable and multiservice operators. Converged Packet Optical sales also reflect an increase of \$24.6 million of sales for our Z-Series Packet-Optical Platform acquired from Cyan.

EMEA revenue primarily reflects a decrease of \$9.6 million within our Networking Platforms segment, partially offset by an increase of \$3.8 million within our Global Services segment. Networking Platforms segment revenue reflects product line decreases of \$10.8 million in Optical Transport sales and \$1.6 million in Converged Packet Optical sales, partially offset by a product line increase of \$2.8 million in Packet Networking sales. In recent periods, we have seen certain of our large service provider customers in EMEA take steps to constrain their capital expenditure budgets.

CALA revenue primarily reflects a decrease of \$11.1 million within our Networking Platforms segment, partially offset by an increase of \$4.5 million within our Global Services segment. CALA revenue reflects decreased sales to certain communication service providers, primarily in Brazil, partially offset by increased sales to AT&T in Mexico. APAC revenue reflects increases of \$70.8 million within our Networking Platforms segment, \$3.6 million within our Global Services segment and \$2.5 million within our Software and Software-Related Services segment. The revenue increase within our Networking Platforms segment primarily reflects an increase of our 6500 Packet-Optical Platform sales to certain communications service providers, particularly in India, enterprise customers, submarine network operators and sales through our strategic partnership with Ericsson.

Cost of Goods Sold and Gross Profit

The tables below (in thousands, except percentage data) set forth the changes in revenue, cost of goods sold and gross profit for the periods indicated:

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	Fiscal Year				Increase (decrease)	%**
	2016	%*	2015	%*		
Total revenue	\$2,600,573	100.0	\$2,445,669	100.0	\$154,904	6.3
Total cost of goods sold	1,438,997	55.3	1,370,106	56.0	68,891	5.0
Gross profit	\$1,161,576	44.7	\$1,075,563	44.0	\$86,013	8.0

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\* Denotes % of total revenue

\*\*Denotes % change from 2015 to 2016

	Fiscal Year				Increase (decrease)	%**
	2016	%*	2015	%*		
Product revenue	\$2,117,472	100.0	\$2,002,395	100.0	\$115,077	5.7
Product cost of goods sold	1,176,304	55.6	1,120,373	56.0	55,931	5.0
Product gross profit	\$941,168	44.4	\$882,022	44.0	\$59,146	6.7

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\* Denotes % of product revenue

\*\*Denotes % change from 2015 to 2016

	Fiscal Year				Increase (decrease)	%**
	2016	%*	2015	%*		
Service revenue	\$483,101	100.0	\$443,274	100.0	\$39,827	9.0
Service cost of goods sold	262,693	54.4	249,733	56.3	12,960	5.2
Service gross profit	\$220,408	45.6	\$193,541	43.7	\$26,867	13.9

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\* Denotes % of service revenue

\*\*Denotes % change from 2015 to 2016

Gross profit as a percentage of revenue, or gross margin, increased as a result of the factors described below.

Gross profit on products as a percentage of product revenue, or product gross margin, increased as a result of our success in driving product cost reductions as compared to the market-based price erosion we encountered during the period, and increased software revenue.

Gross profit on services as a percentage of services revenue, or services gross margin, increased, primarily due to increased sales of higher margin software subscription services, reduced repair costs to support maintenance service contracts and increased sales and improved margins on consulting services.

Operating expense

The table below (in thousands, except percentage data) sets forth the changes in operating expense for the periods indicated:

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	Fiscal Year					
	2016	%*	2015	%*	Increase (decrease)	%**
Research and development	\$451,794	17.4	\$414,201	16.9	\$37,593	9.1
Selling and marketing	349,731	13.4	333,836	13.7	15,895	4.8
General and administrative	132,828	5.1	123,402	5.0	9,426	7.6
Amortization of intangible assets	61,508	2.4	69,511	2.8	(8,003 )	(11.5)
Acquisition and integration costs	4,613	0.2	25,539	1.0	(20,926 )	(81.9)
Significant asset impairments and restructuring costs	4,933	0.2	8,626	0.4	(3,693 )	(42.8)
Total operating expenses	\$1,005,407	38.7	\$975,115	39.8	\$30,292	3.1

\* Denotes % of total revenue

\*\* Denotes % change from 2015 to 2016

Research and development expense benefited by \$16.4 million as a result of foreign exchange rates, net of hedging, primarily due to a stronger U.S. Dollar in relation to the Canadian Dollar. Including the effect of foreign exchange rates, research and development expenses increased by \$37.6 million, primarily reflecting increases of \$16.7 million in employee compensation and related costs, \$11.0 million in facilities and information systems expense, \$7.4 million in professional services and \$4.0 million in depreciation expense. These increases were partially offset by a decrease of \$4.8 million in prototype expense.

Selling and marketing expense benefited by \$4.9 million as a result of foreign exchange rates, primarily due to a stronger U.S. Dollar in relation to the Euro and the Canadian Dollar. Including the effect of foreign exchange rates, selling and marketing expenses increased by \$15.9 million, primarily reflecting increases of \$7.2 million in employee compensation and related costs, \$3.6 million in facilities and information systems expense, \$3.5 million in professional services and \$1.5 million in travel and related costs. These increases were partially offset by a decrease of \$1.8 million in trade show and related costs.

General and administrative expense benefited by \$1.7 million as a result of foreign exchange rates, primarily due to a stronger U.S. Dollar in relation to the Canadian Dollar and Brazilian Real. Including the effect of foreign exchange rates, general and administrative expense increased by \$9.4 million, primarily reflecting increases of \$5.0 million in employee compensation and related costs, \$2.3 million in facilities and information systems expense and \$1.6 million in professional services.

Amortization of intangible assets decreased due to certain intangible assets having reached the end of their economic lives.

Acquisition and integration costs reflect expense for financial, legal and accounting advisors and severance and other employee compensation costs, related to our acquisition of Cyan on August 3, 2015 and our acquisition of certain HSPC assets of TeraXion and its wholly-owned subsidiary on February 1, 2016.

Significant asset impairments and restructuring costs primarily reflect certain severance and related expense associated with headcount reductions and initiatives to improve efficiency. As we look to manage operating expense and drive further efficiency and leverage from our operations, we will continue to assess allocation of headcount, facilities and other resources to ensure that they are optimized toward key growth opportunities. See Note 3 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for more information.

Other items

The table below (in thousands, except percentage data) sets forth the changes in other items for the periods indicated:

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	Fiscal Year				Increase (decrease)	%**
	2016	%*	2015	%*		
Interest and other income (loss), net	\$(12,795)	(0.5)	\$(25,505)	(1.0)	\$ 12,710	49.8
Interest expense	\$56,656	2.2	\$51,179	2.1	\$ 5,477	10.7
Provision for income taxes	\$ 14,134	0.5	\$ 12,097	0.5	\$ 2,037	16.8

\* Denotes % of total revenue

\*\*Denotes % change from 2015 to 2016

Interest and other income (loss), net reflects a beneficial impact, as compared to the prior period, of foreign exchange rates on assets and liabilities denominated in a currency other than the relevant functional currency, net of hedging activity. Interest and other income (loss), net also reflects an increase in investment interest income.

Interest expense increased, primarily due to additional outstanding indebtedness, including our \$250 million 2021 Term Loan that was entered into in the second quarter of fiscal 2016, as compared to fiscal 2015. See Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for more information.

Provision for income taxes increased primarily due to state taxes.

## Segment Profit

The table below (in thousands, except percentage data) sets forth the changes in our segment profit for the respective periods:

	Fiscal Year		Increase (decrease)	%*
	2017	2016		
Segment profit:				
Networking Platforms	\$578,039	\$544,744	\$ 33,295	6.1
Software and Software-Related Services	\$32,536	\$ 7,123	\$ 25,413	356.8
Global Services	\$ 159,882	\$ 157,915	\$ 1,967	1.2

\*Denotes % change from 2016 to 2017

Networking Platforms segment profit increased, primarily due to higher sales volume, as described above, resulting in increased gross profits, slightly offset by increased research and development costs. Research and development costs primarily reflect increased expenses relating to the continued development of our coherent modem technology, including our WaveLogic Ai coherent optical chipset, and relocation costs in connection with our research and development center facility transitions in Ottawa, Canada.

Software and Software-Related Services segment profit increased, reflects higher sales volume, as described above, and improved gross margin, partially offset by increased research and development costs. Research and development costs primarily reflect increased expenses relating to the continued development of our Blue Planet software platform. Global Services segment profit increased, primarily due to improved gross margin, as described above, partially offset by lower sales volume.

The table below (in thousands, except percentage data) sets forth the changes in our segment profit for the respective periods:

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	Fiscal Year		Increase (decrease)	%*
	2016	2015		
Segment profit:				
Networking Platforms	\$544,744	\$515,550	\$ 29,194	5.7
Software and Software-Related Services	\$7,123	\$4,174	\$ 2,949	70.7
Global Services	\$157,915	\$141,638	\$ 16,277	11.5

\*Denotes % change from 2015 to 2016

Networking Platforms segment profit increased, primarily due to higher sales volume, as described above, and improved gross margin, partially offset by higher research and development costs. The improved gross margin was the result of product cost reductions, including on our WaveLogic coherent optical processor for 100G and 200G optical transport, partially offset by market-based price erosion.

Software and Software-Related Services segment profit increased primarily reflecting higher sales volume, partially offset by higher research and development costs and reduced gross margin from increased amortization of intangibles expense. Higher research and development costs reflect the addition of expenses relating to the development of our Blue Planet software platform.

Global Services segment profit increased, primarily due to higher sales volume, as described above, and improved gross margin. The improved gross margin was the result of improved efficiencies for consulting and network design services.

#### Liquidity and Capital Resources

Overview. For the fiscal year ended October 31, 2017, we generated \$234.9 million in cash to fund our operating needs, as our net income (adjusted for non-cash charges) of \$390.6 million exceeded our working capital requirements of \$155.7 million. Our net income (adjusted for non-cash charges) reflects a non-cash tax benefit of \$1.1 billion related to a reversal of a deferred tax asset valuation allowance. For additional details on this reversal, see Note 20 to our Consolidated Financial Statements included in Item 8 of Part II of this report. For additional details of our cash from operations, see the discussion below entitled "Cash from Operations."

Total cash, cash equivalents and investments decreased by \$173.6 million during fiscal 2017. This decrease principally reflects the use of cash to:

- fund the repurchase of \$46.3 million in aggregate principal amount outstanding of the 2017 notes;
- repay at maturity the remaining \$185.3 million in aggregate principal amount outstanding of the 2017 Notes; and
- reduce the principal balance of our outstanding Term Loans by \$93.6 million in connection with the refinancing and consolidation of our 2019 and 2021 Term Loans into a new 2022 Term Loan.

See Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this report for information relating to these transactions. The decrease also reflects cash used in investing activities for capital expenditures totaling \$94.6 million, and our settlement of certain foreign currency forward contracts of \$2.8 million and cash used in financing activities for capital lease obligations totaling \$3.6 million and payments on our term loans of \$2.0 million. Proceeds from the issuance of equity under our employee stock purchase plans provided approximately \$20.4 million in cash during the period. The following table sets forth changes in our cash and cash equivalents and investments in marketable debt securities (in thousands):

	October 31,		Increase (decrease)
	2017	2016	
Cash and cash equivalents	\$640,513	\$777,615	\$(137,102)
Short-term investments in marketable debt securities	279,133	275,248	3,885
Long-term investments in marketable debt securities	49,783	90,172	(40,389 )
Total cash and cash equivalents and investments in marketable debt securities	\$969,429	\$1,143,035	\$(173,606)





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**Principal Sources of Liquidity.** Our principal sources of liquidity on hand include our cash and investments, which as of October 31, 2017 totaled \$1.0 billion, as well as our ABL credit facility. Ciena and certain of its subsidiaries are parties to a senior secured asset-based revolving credit facility (the “ABL Credit Facility”) providing for a total commitment of \$250 million with a maturity date of December 31, 2020. We principally use the ABL Credit Facility to support the issuance of letters of credit that arise in the ordinary course of our business and thereby to reduce our use of cash required to collateralize these instruments. As of October 31, 2017, letters of credit totaling \$69.6 million were collateralized by our ABL Credit Facility. There were no borrowings outstanding under the ABL Credit Facility as of October 31, 2017.

**Foreign Liquidity.** The amount of cash, cash equivalents and short-term investments held by our foreign subsidiaries was \$41.6 million as of October 31, 2017. Given this amount, we do not believe that there are significant amounts held by foreign subsidiaries in which we consider earnings to be permanently reinvested, that may not be available for U.S. operations. In the event such funds held by our foreign subsidiaries were repatriated, we believe that any resulting tax implications would not be material.

**Intent to Cash Settle New 2018 Convertible Notes.** As more fully described in Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this report, following the settlement of an exchange offer on August 2, 2017, approximately \$288.7 million in aggregate principal amount at maturity of Original Notes were exchanged for New Notes, which provide us with the option, at our election, to settle conversions for cash, shares of our common stock, or a combination of cash and shares. It is our current intent that upon any conversion of the New Notes we will settle the principal amount thereof in cash.

**Share Repurchase Authorization.** On December 7, 2017, we announced that our Board of Directors authorized a program to repurchase up to \$300 million of our outstanding common stock through the end of fiscal 2020. We may purchase shares at management’s discretion in the open market, in privately negotiated transactions, in transactions structured through investment banking institutions, or a combination of the foregoing. We may also, from time to time, enter into Rule 10b5-1 plans to facilitate repurchases of shares under this authorization. The amount and timing of repurchases are subject to a variety of factors including liquidity, cash flow, stock price, and general business and market conditions.

**Liquidity Position.** We regularly evaluate our liquidity position, debt obligations, and anticipated cash needs to fund our operating or investment plans and may consider capital raising and other market opportunities that may be available to us. We regularly evaluate alternatives to manage our capital structure and reduce our debt and may continue to opportunistically repurchase or refinance our outstanding convertible notes. Based on past performance and current expectations, we believe that cash from operations, cash, cash equivalents and investments and other sources of liquidity, including our ABL Credit Facility, will satisfy our working capital needs, capital expenditures, and other liquidity requirements associated with our operations, including the settlement of the principal amount of the New Notes in cash, through at least the next 12 months.

**Cash from Operations**

The following sections set forth the components of our \$234.9 million of cash provided by operating activities for fiscal 2017:

Net income adjusted for non-cash charges

The following tables set forth (in thousands) our net income adjusted for non-cash charges during fiscal 2017:

	Year ended October 31, 2017
Net income	\$ 1,261,953
Adjustments for non-cash charges:	
Depreciation of equipment, building, furniture and fixtures, and amortization of leasehold improvements	77,189
Share-based compensation costs	48,360
Amortization of intangible assets	45,713

Deferred taxes	(1,126,732 )
Provision for doubtful accounts	18,221
Provision for inventory excess and obsolescence	35,459
Provision for warranty	7,965
Other	22,417
Net income adjusted for non-cash charges	\$390,545

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## Working Capital

Our working capital used \$155.7 million of cash during fiscal 2017. The following tables set forth (in thousands) the major components of the reduction in working capital:

	Year ended October 31, 2017
Cash used in accounts receivable	\$(66,123 )
Cash used in inventories	(91,567 )
Cash used in prepaid expenses and other	(33,834 )
Cash provided by accounts payable, accruals and other obligations	33,897
Cash used in deferred revenue	1,964
Cash used in working capital	\$(155,663)

As compared to the end of fiscal 2016:

• The \$66.1 million of cash used in accounts receivable during fiscal 2017 reflects higher sales volume in the fourth quarter of fiscal 2017 as compared to fiscal 2016;

• The \$91.6 million in cash used in inventory during fiscal 2017 primarily reflects increases in finished goods to meet customer delivery schedules;

• Cash used in prepaid expenses and other during fiscal 2017 was \$33.8 million, primarily reflecting higher prepaid value added taxes and higher deferred deployment expense;

• The \$33.9 million of cash provided by accounts payable, accruals and other obligations during fiscal 2017 reflects increased inventory purchases at the end of fiscal 2017; and

• The \$2.0 million of cash provided by deferred revenue represents an increase in advanced payments received from customers prior to revenue recognition.

Our days sales outstanding (DSOs) remained unchanged at 80 days for fiscal 2017 as compared to fiscal 2016. Our inventory turns decreased from 5.6 turns during fiscal 2016 to 4.9 turns during fiscal 2017.

## Cash paid for interest

The following tables set forth (in thousands) our interest paid during fiscal 2017:

	Year ended October 31, 2017
0.875% Convertible Senior Notes, due June 15, 2017 <sup>(1)</sup>	\$ 1,824
3.75% Convertible Senior Notes, due October 15, 2018 <sup>(2)</sup>	13,125
4.0% Convertible Senior Notes, due December 15, 2020 <sup>(3)</sup>	7,500
Term Loan due July 15, 2019 <sup>(4)</sup>	2,599
Term Loan due April 25, 2021 <sup>(5)</sup>	2,997
Term Loan due January 30, 2022 <sup>(6)</sup>	10,381
Interest rate swaps <sup>(7)</sup>	3,243
ABL Credit Facility <sup>(8)</sup>	1,636
Capital leases	3,930
Total	\$ 47,235

(1) The final interest payment owing on our 0.875% Convertible Senior Notes, due June 15, 2017 was paid during the third quarter of fiscal 2017.

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- (2) Interest on our outstanding 3.75% Convertible Senior Notes, due October 15, 2018, is payable on April 15 and October 15 of each year.
- (3) Interest on our outstanding 4.0% Convertible Senior Notes, due December 15, 2020, is payable on June 15 and December 15 of each year.
- Interest on the 2019 Term Loan was payable periodically based on the underlying market index rate selected for borrowing. The 2019 Term Loan bore interest at LIBOR plus a spread of 3.00% subject to a minimum LIBOR rate (4) of 0.75%. On the first day of our second quarter of fiscal 2017, we refinanced and replaced this term loan with the 2022 Term Loan. See Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this report for more information.
- Interest on the 2021 Term Loan was payable periodically based on the underlying market index rate selected for borrowing. The 2021 Term Loan bore interest at LIBOR plus a spread of 3.25% to 3.50% subject to a minimum (5) LIBOR rate of 0.75%. On the first day of our second quarter of fiscal 2017, we refinanced and replaced this term loan with the 2022 Term Loan. See Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this report for more information.
- Interest on the 2022 Term Loan is payable periodically based on the underlying market index rate selected for (6) borrowing. The 2022 Term Loan bears interest at LIBOR plus a spread of 2.5% subject to a minimum LIBOR rate of 0.75%. As of the end of fiscal 2017, the interest rate on the 2022 Term Loan was 3.74%.
- Prior to the term loan refinancing, payments on our interest rate swaps were variable and effectively fixed the total interest rate under the 2019 Term Loan at 5.004% from July 20, 2015 through July 19, 2018 and the 2021 Term Loan at 4.62% to 4.87%, depending on applicable margin, from June 20, 2016 through June 22, 2020. In connection with the refinancing of the 2019 and 2021 Term Loans into the 2022 Term Loan, in order to align our (7) interest rate hedges to the reduced 2022 Term Loan principal value and later maturity date, we reduced the total outstanding value of our interest rate swaps and also entered into new forward starting interest rate swaps in January 2017 and February 2017, respectively. The interest rate swaps, as adjusted, fix 98%, 82% and 77% of the principal value of the 2022 Term Loan from February 2017 through July 2018, July 2018 through June 2020 and June 2020 through January 2021, respectively. The fixed rate on the amounts hedged during the periods described above will be 4.25%, 4.25% and 4.75%, respectively.
- During fiscal 2017, we utilized the ABL Credit Facility to collateralize certain standby letters of credit and paid (8) \$1.6 million in commitment fees, interest expense and other administrative charges relating to our ABL Credit Facility.

For additional information about our convertible notes, term loans (including the refinancing of our 2019 and 2021 Term Loans into the 2022 Term Loan), ABL Credit Facility and interest rate swaps see Notes 14, 16 and 17 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report and Item 7A of Part II of this annual report.

Contractual Obligations

The following is a summary of our future minimum payments under contractual obligations as of October 31, 2017 (in thousands):

	Total	Less than one year	One to three years	Three to five years	Thereafter
Principal due at maturity on convertible notes <sup>(1)</sup>	\$567,127	\$350,000	\$—	\$217,127	\$—
Principal due on Term Loan due January 30, 2022 <sup>(2)</sup>	398,000	4,000	8,000	8,000	378,000
Interest due on convertible notes	39,375	20,625	15,000	3,750	—
Interest due on Term Loan due January 30, 2022 <sup>(2)</sup>	63,164	15,081	29,502	18,581	—
Payments due under interest rate swaps <sup>(2)</sup>	6,457	1,927	3,759	771	—
Operating leases <sup>(3)</sup>	116,306	25,339	33,100	23,279	34,588

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Purchase obligations <sup>(4)</sup>	223,263	223,263	—	—	—
Capital leases - equipment	3,133	1,709	1,424	—	—
Capital leases - buildings <sup>(5)</sup>	124,009	7,542	15,250	15,805	85,412
Other obligations	1,860	1,025	835	—	—
Total (6)	\$1,542,694	\$650,511	\$106,870	\$287,313	\$498,000

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- (1) Includes the accretion of the principal amount on the 4% Senior Convertible Notes, due December 15, 2020, payable at maturity at a rate of 1.85% per year compounded semi-annually, commencing December 27, 2012. Interest on the 2022 Term Loan and payments due under the interest rate swaps is variable and calculated using the rate in effect on the balance sheet date. For additional information about our term loans and the interest rate swaps,
- (2) see Notes 14 and 16 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report and Item 7A of Part II of this annual report.
- (3) Does not include variable insurance, taxes, maintenance and other costs that may be required by the applicable operating lease. These costs are not expected to have a material future impact. Purchase obligations relate to purchase order commitments to our contract manufacturers and component suppliers
- (4) for inventory. In certain instances, we are permitted to cancel, reschedule or adjust these orders. Consequently, only a portion of the amount reported above relates to firm, non-cancelable and unconditional obligations. This represents the total minimum lease payments due for all buildings that are subject to capital lease accounting.
- (5) Does not include variable insurance, taxes, maintenance and other costs required by the applicable capital lease. These costs are not expected to have a material future impact. As of October 31, 2017, we also had \$15.4 million of other long-term obligations on our Consolidated Balance
- (6) Sheet for unrecognized tax positions that are not included in this table because the timing or amount of any cash settlement with the respective tax authority cannot be reasonably estimated.

Some of our commercial commitments, including some of the future minimum payments in operating leases set forth above and certain commitments to customers, are secured by standby letters of credit collateralized under our ABL Credit Facility or restricted cash. Restricted cash balances are included in other current assets or other long-term assets depending upon the duration of the underlying letter of credit obligation. The following is a summary of our commercial commitments secured by standby letters of credit by commitment expiration date as of October 31, 2017 (in thousands):

	Total	Less than one year	One to three years	Three to five years	Thereafter
Standby letters of credit	\$73,318	\$35,747	\$17,797	\$12,900	\$ 6,874

**Off-Balance Sheet Arrangements**

We do not engage in any off-balance sheet financing arrangements. In particular, we do not have any equity interests in so-called limited purpose entities, which include special purpose entities (SPEs) and structured finance entities.

**Critical Accounting Policies and Estimates**

The preparation of our consolidated financial statements requires that we make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expense, and related disclosure of contingent assets and liabilities. By their nature, these estimates and judgments are subject to an inherent degree of uncertainty. On an ongoing basis, we reevaluate our estimates, including those related to share-based compensation, bad debts, inventories, intangible and other long-lived assets, goodwill, income taxes, warranty obligations, restructuring, derivatives and hedging, and contingencies and litigation. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. Among other things, these estimates form the basis for judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. To the extent that there are material differences between our estimates and actual results, our consolidated financial statements will be affected.

We believe that the following critical accounting policies reflect those areas where significant judgments and estimates are used in the preparation of our consolidated financial statements.

## Revenue Recognition

We recognize revenue when all of the following criteria are met: persuasive evidence of an arrangement exists; delivery has occurred or services have been rendered; the price to the buyer is fixed or determinable; and collectibility is reasonably assured. Customer purchase agreements and customer purchase orders are generally used to determine the existence of an arrangement. Shipping documents and evidence of customer acceptance, when applicable, are used to verify delivery or services rendered. We assess whether the price is fixed or determinable based on the payment terms associated with the

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transaction and whether the sales price is subject to refund or adjustment. We assess collectibility based primarily on the creditworthiness of the customer as determined by credit checks and analysis, as well as the customer's payment history. Revenue for maintenance services is deferred and recognized ratably over the period during which the services are to be performed. Shipping and handling fees billed to customers are included in revenue, with the associated expenses included in product cost of goods sold.

Software revenue is recognized when persuasive evidence of an arrangement exists, delivery has occurred, the fee is fixed or determinable, and collectibility is probable. In instances where final acceptance criteria of the software are specified by the customer, revenue is deferred until there are no uncertainties regarding customer acceptance.

We limit the amount of revenue recognition for delivered elements to the amount that is not contingent on the future delivery of products or services, future performance obligations or subject to customer-specified return or refund privileges.

Revenue for multiple element arrangements is allocated to each unit of accounting based on the relative selling price of each delivered element, with revenue recognized for each delivered element when the revenue recognition criteria are met. We determine the selling price for each deliverable based upon the selling price hierarchy for multiple-deliverable arrangements. Under this hierarchy, we use vendor-specific objective evidence ("VSOE") of selling price, if it exists, or third-party evidence ("TPE") of selling price if VSOE does not exist. If neither VSOE nor TPE of selling price exists for a deliverable, we use our best estimate of selling price ("BESP") for that deliverable. For multiple element software arrangements where VSOE of undelivered maintenance does not exist, revenue for the entire arrangement is recognized over the maintenance term.

VSOE, when determinable, is established based on our pricing and discounting practices for the specific product or service when sold separately. In determining whether VSOE exists, we require that a substantial majority of the selling prices for a product or service fall within a reasonably narrow pricing range. We have generally been unable to establish TPE of selling price because our go-to-market strategy differs from that of others in our markets, and the extent of customization and differentiated features and functions varies among comparable products or services from our peers. We determine BESP based upon management-approved pricing guidelines, which consider multiple factors including the type of product or service, gross margin objectives, competitive and market conditions, and the go-to-market strategy, all of which can affect pricing practices.

Our total deferred revenue for products was \$49.1 million and \$45.2 million as of October 31, 2017 and October 31, 2016, respectively. Our services revenue is deferred and recognized ratably over the period during which the services are to be performed. Our total deferred revenue for services was \$135.9 million and \$137.7 million as of October 31, 2017 and October 31, 2016, respectively.

## Business Combinations

We record acquisitions using the purchase method of accounting. All of the assets acquired, liabilities assumed, contractual contingencies and contingent consideration are recognized at their fair value as of the acquisition date. The excess of the purchase price over the estimated fair values of the net tangible and net intangible assets acquired is recorded as goodwill. The application of the purchase method of accounting for business combinations requires management to make significant estimates and assumptions in the determination of the fair value of assets acquired and liabilities assumed in order to allocate purchase price consideration properly between assets that are depreciated and amortized from goodwill. These assumptions and estimates include a market participant's use of the asset and the appropriate discount rates for a market participant. Our estimates are based on historical experience, information obtained from the management of the acquired companies and, when appropriate, includes assistance from independent third-party appraisal firms. Our significant assumptions and estimates can include, but are not limited to,



the cash flows that an asset is expected to generate in the future, the appropriate weighted-average cost of capital, and the cost savings expected to be derived from acquiring an asset. These estimates are inherently uncertain and unpredictable. In addition, unanticipated events and circumstances may occur which may affect the accuracy or validity of such estimates. During fiscal 2015, we completed the Cyan acquisition for a purchase price of \$335.7 million. During fiscal 2016, we completed the acquisition of TeraXion's HSPC assets for a purchase price of \$32.0 million. See Note 2 to the Consolidated Financial Statements included in Item 8 of Part II of this annual report.

#### Share-Based Compensation

We estimate the fair value of our restricted stock unit awards based on the fair value of our common stock on the date of grant. Our outstanding restricted stock unit awards are subject to service-based vesting conditions and/or performance-based vesting conditions. We recognize the estimated fair value of service-based awards, net of estimated forfeitures, as share-based expense ratably over the vesting period on a straight-line basis. Awards with performance-based vesting conditions require the achievement of certain financial or other performance criteria or targets as a condition to the vesting, or acceleration of vesting.

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We recognize the estimated fair value of performance-based awards, net of estimated forfeitures, as share-based expense over the performance period, using graded vesting, which considers each performance period or tranche separately, based upon our determination of whether it is probable that the performance targets will be achieved. At the end of each reporting period, we reassess the probability of achieving the performance targets and the performance period required to meet those targets, and the expense is adjusted accordingly. Determining whether the performance targets will be achieved involves judgment, and the estimate of expense may be revised periodically based on changes in the probability of achieving the performance targets. Revisions are reflected in the period in which the estimate is changed. If any performance goals are not met, no compensation cost is ultimately recognized against that goal and, to the extent previously recognized, compensation cost is reversed.

Because share-based compensation expense is based on awards that are ultimately expected to vest, the amount of expense takes into account estimated forfeitures. We estimate forfeitures at the time of grant and revise these estimates, if necessary, in subsequent periods if actual forfeitures differ from those estimates. Changes in these estimates and assumptions can materially affect the measurement of estimated fair value of our share-based compensation. See Note 21 to our Consolidated Financial Statements in Item 8 of Part II of this annual report for information regarding our assumptions related to share-based compensation and the amount of share-based compensation expense we incurred for the periods covered in this report. As of October 31, 2017, total unrecognized compensation expense was \$69.9 million, which consists of (i) \$0.1 million that relates to unvested stock options and is expected to be recognized over a weighted-average period of 0.9 years and (ii) \$69.8 million that relates to unvested restricted stock units and is expected to be recognized over a weighted-average period of 1.4 years.

We recognize windfall tax benefits associated with the exercise of stock options or release of restricted stock units directly to stockholders' equity only when realized. A windfall tax benefit occurs when the actual tax benefit realized by us upon an employee's disposition of a share-based award exceeds the deferred tax asset, if any, associated with the award that we had recorded. When assessing whether a tax benefit relating to share-based compensation has been realized, we follow the "with-and-without" method. Under the with-and-without method, the windfall is considered realized and recognized for financial statement purposes only when an incremental benefit is provided after considering all other tax benefits including our net operating losses. The with-and-without method results in the windfall from share-based compensation awards always being effectively the last tax benefit to be considered. Consequently, the windfall attributable to share-based compensation will not be considered realized in instances where our net operating loss carryover (that is unrelated to windfalls) is sufficient to offset the current year's taxable income before considering the effects of current-year windfalls.

### Reserve for Inventory Obsolescence

We make estimates about future customer demand for our products when establishing the appropriate reserve for excess and obsolete inventory. We write down inventory that has become obsolete or unmarketable by an amount equal to the difference between the cost of inventory and the estimated market value based on assumptions about future demand and market conditions. Inventory write downs are a component of our product cost of goods sold. Upon recognition of the write down, a new lower cost basis for that inventory is established, and subsequent changes in facts and circumstances do not result in the restoration or increase in that newly established cost basis. In an effort to limit our exposure to delivery delays and to satisfy customer needs, we purchase inventory based on forecasted sales across our product lines. In addition, part of our research and development strategy is to promote the convergence of similar features and functionalities across our product lines. Each of these practices exposes us to the risk that our customers will not order products for which we have forecasted sales, or will purchase less than we have forecasted.

We have experienced write downs due to changes in our strategic direction, discontinuance of a product or introduction of newer versions of our products, declines in the sales of or forecasted demand for certain products, and

general market conditions. We recorded charges for excess and obsolete inventory of \$35.5 million, \$33.7 million and \$26.8 million in fiscal 2017, 2016 and 2015, respectively. Our inventory net of allowance for excess and obsolescence was \$267.1 million and \$211.3 million as of October 31, 2017 and October 31, 2016, respectively.

#### Allowance for Doubtful Accounts Receivable

Our allowance for doubtful accounts receivable is based on management's assessment, on a specific identification basis, of the collectibility of customer accounts. We perform ongoing credit evaluations of our customers and generally have not required collateral or other forms of security from customers. In determining the appropriate balance for our allowance for doubtful accounts receivable, management considers each individual customer account receivable in order to determine collectibility. In doing so, we consider creditworthiness, payment history, account activity and communication with such customer. If a customer's financial condition changes, or if actual defaults are higher than our historical experience, we may be required to take a charge for an allowance for doubtful accounts receivable which could have an adverse impact on our results of operations.

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During fiscal 2017, Ciena's allowance for doubtful accounts included a provision for a significant asset impairment of \$13.7 million for a trade receivable related to a single customer in the APAC region. Our accounts receivable, net of allowance for doubtful accounts, was \$622.2 million and \$576.2 million as of October 31, 2017 and October 31, 2016, respectively. Our allowance for doubtful accounts was \$17.6 million and \$4.0 million as of October 31, 2017 and October 31, 2016, respectively.

## Goodwill

Our goodwill was generated from the acquisition of Cyan during fiscal 2015 and the acquisition of the HSPC assets from TeraXion during fiscal 2016, and is primarily related to expected synergies. Goodwill is the excess of the purchase price over the fair values assigned to the net assets acquired in a business combination. We test goodwill for impairment on an annual basis, which we have determined to be the last business day of fiscal September each year. We also test goodwill for impairment between annual tests if an event occurs or circumstances change that would, more likely than not, reduce the fair value of the reporting unit below its carrying value.

The first step in the process of assessing goodwill impairment is to compare the fair value of the reporting unit with the unit's carrying amount, including goodwill. If this test indicates that the fair value is less than the carrying value, then step two as amended by ASU No. 2017-04, which we adopted in the first quarter in fiscal 2017, requires goodwill impairments to be measured on the basis of the fair value of the reporting unit relative to the reporting unit's carrying amount. A non-cash goodwill impairment charge would have the effect of decreasing earnings or increasing losses in such period. If we are required to take a substantial impairment charge, our operating results would be materially adversely affected in such period. As of October 31, 2017 and October 31, 2016, the goodwill balance was \$267.5 million and \$267.0 million, respectively. There were no goodwill impairments resulting from fiscal 2017 and 2016 impairment tests and no reporting unit was determined to be at risk of failing step one of the goodwill impairment test. See Note 2 to the Consolidated Financial Statements included in Item 8 of Part II of this annual report.

## Long-lived Assets

Our long-lived assets include equipment, building, furniture and fixtures, finite-lived intangible assets, in-process research and development, and maintenance spares. As of October 31, 2017 and October 31, 2016 these assets totaled \$456.3 million and \$484.7 million, net, respectively. We test long-lived assets for impairment whenever events or changes in circumstances indicate that the assets' carrying amount is not recoverable from its undiscounted cash flows. Our long-lived assets are assigned to asset groups which represent the lowest level for which we identify cash flows. We measure impairment loss as the amount by which the carrying amount of the asset or asset group exceeds its fair value.

## Deferred Tax Assets

Pursuant to Accounting Standards Codification ("ASC") Topic 740, Income Taxes, we maintain a valuation allowance for a deferred tax asset when it is deemed to be more likely than not that some or all of the deferred tax asset will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income (including the reversals of deferred tax liabilities) during the periods in which those deferred tax assets will become deductible. In evaluating whether a valuation allowance is required under such rules, we consider all available positive and negative evidence, including prior operating results, the nature and reason for any losses, our forecast of future taxable income, utilization of tax planning strategies, and the dates on which any deferred tax assets are expected to expire. These assumptions and estimates require a significant amount of judgment and are made based on current and projected circumstances and conditions.

Quarterly, we perform an analysis to determine the likelihood of realizing our deferred tax assets and whether sufficient evidence existed to support reversal of all or a portion of the valuation allowance. During the fourth quarter of fiscal 2017, this analysis consisted of the evaluation of all available positive and negative evidence, including our improved profitability in fiscal 2016 (which resulted in us having three years of cumulative income on our U.S. business in the second half of fiscal 2016) and our fiscal 2017 results of operations. We also considered third-party estimates of market growth and our internal projections of future profitability as indicated in our annual update to our operating plan for fiscal 2018 and our long-term strategic forecast which were completed during the fourth quarter of fiscal 2017. We also considered our strong performance against our annual operating plans in recent years and our ability to utilize tax planning strategies. Based on this analysis, we concluded that it was more likely than not that the majority of our U.S. deferred tax assets will be realized, and we therefore reversed most of the valuation allowance against those deferred assets. This reversal resulted in a one-time, non-cash income tax benefit of \$1.125 billion and a \$26.0 million adjustment to additional paid-in capital. The valuation allowance balance at October 31, 2017 was \$185.9 million and the corresponding net deferred tax asset was \$1.155 billion. We will continue to evaluate future financial performance to determine whether such performance is both sustained and significant enough to provide sufficient evidence to support reversal of all or a portion of the remaining valuation allowance. The value of our net

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deferred tax asset may be subject to change in the future, depending upon our generation or projections of future taxable income, as well as changes in tax policy or our tax planning strategy. For example, the value of the deferred tax assets on our balance sheet as of October 31, 2017 would decrease significantly if the U.S. corporate income tax rate is reduced, as proposed in tax reform legislation recently passed by both houses of the U.S. Congress on December 20, 2017. Consequently, if the President signs this proposed legislation into law as expected, we expect that our results of operations for the first quarter of fiscal 2018 would be materially adversely affected by a non-cash charge to reflect the reduction in value of these assets. For further discussion, see Note 20 to the Consolidated Financial Statements included in Item 8 of Part II of this annual report.

## Warranty

Our liability for product warranties, included in other accrued liabilities, was \$42.5 million and \$52.3 million as of October 31, 2017 and October 31, 2016, respectively. Our products are generally covered by a warranty for periods ranging from one to five years. We accrue for warranty costs as part of our cost of goods sold based on associated material costs, technical support labor costs and associated overhead. Material cost is estimated based primarily upon historical trends in the volume of product returns within the warranty period and the cost to repair or replace the equipment. Technical support labor cost is estimated based primarily upon historical trends and the cost to support the customer cases within the warranty period. The provision for product warranties, net of adjustments for previous years provisions, was \$8.0 million, \$15.5 million and \$17.9 million for fiscal 2017, 2016 and 2015 respectively. The provision for warranty claims may fluctuate on a quarterly basis depending upon the mix of products and customers in that period. If actual product failure rates, material replacement costs, service or labor costs differ from our estimates, revisions to the estimated warranty provision would be required. As a result of actual failure rates lower than expected, we have reduced current year provisions for warranty due to these adjustments. These adjustments for previous years provisions had the effect of reducing warranty provisions by \$9.7 million, \$5.3 million and \$6.5 million for fiscal 2017, 2016 and 2015 respectively. See Note 13 to the Consolidated Financial Statements included in Item 8 of Part II of this annual report. An increase in warranty claims or the related costs associated with satisfying our warranty obligations could increase our cost of sales and negatively affect our gross margin.

## Effects of Recent Accounting Pronouncements

See Note 1 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for information relating to our discussion of the effects of recent accounting pronouncements.

## Unaudited Quarterly Results of Operations

The tables below (in thousands, except per share data) set forth the operating results in our consolidated statements of operations for each of the eight quarters in the period ended October 31, 2017. Our revenue can fluctuate from quarter to quarter as a result of a number of factors, including changes in customer spending levels or networking strategies, order timing and volume, backlog levels, timing of revenue recognition and other competitive dynamics. As our business has evolved, including the sales of our solutions to meet the “on-demand” service requirements of both our customers and their end-users, the amount of quarterly revenue that we recognize in a quarter from customer orders received in that same quarter (which we refer to as “book to revenue”) has increased as compared to our historical periods. Increased reliance on book to revenue introduces a number of risks, including the inherent difficulty in forecasting the amount and timing of book to revenue in any given quarter, and may increase the likelihood of fluctuations in our results. This information is unaudited, but in our opinion reflects all adjustments (consisting only of normal recurring adjustments) that we consider necessary for a fair statement of such information in accordance with generally accepted accounting principles. The results for any quarter are not necessarily indicative of results for any future period.



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	Oct. 31, 2017	Jul. 31, 2017	Apr. 30, 2017	Jan. 31, 2017	Oct. 31, 2016	Jul. 31, 2016	Apr. 30, 2016	Jan. 31, 2016
Revenue:								
Products	\$616,216	\$610,742	\$584,630	\$506,993	\$582,455	\$553,450	\$523,978	\$457,589
Services	128,233	117,977	122,392	114,504	133,736	117,100	116,739	115,526
Total Revenue	744,449	728,719	707,022	621,497	716,191	670,550	640,717	573,115
Cost of goods sold:								
Products	352,992	341,197	327,295	286,811	324,663	299,381	291,778	260,482
Services	65,772	59,446	61,487	60,901	72,980	62,684	65,846	61,183
Total costs of goods sold	418,764	400,643	388,782	347,712	397,643	362,065	357,624	321,665
Gross profit	325,685	328,076	318,240	273,785	318,548	308,485	283,093	251,450
Operating expenses:								
Research and development	119,108	117,729	121,623	116,869	112,448	116,697	114,603	108,046
Selling and marketing	95,877	86,739	88,551	85,002	96,853	83,732	86,668	82,478
General and administrative	36,181	35,569	34,990	35,864	32,147	34,336	35,203	31,142
Amortization of intangible assets	3,661	3,837	10,980	14,551	14,551	14,529	15,566	16,862
Acquisition and integration costs	—	—	—	—	—	1,029	2,285	1,299
Significant asset impairments and restructuring costs	15,059	2,203	4,276	2,395	2,876	1,138	535	384
Total operating expenses	269,886	246,077	260,420	254,681	258,875	251,461	254,860	240,211
Income from operations	55,799	81,999	57,820	19,104	59,673	57,024	28,233	11,239
Interest and other income (loss), net	652	(848 )	(2,918 )	370	(1,339 )	(3,647 )	967	(8,776 )
Interest expense	(13,926 )	(13,415 )	(13,308 )	(15,203 )	(15,371 )	(15,967 )	(12,608 )	(12,710 )
Income (loss) before income taxes	42,525	67,736	41,594	4,271	42,963	37,410	16,592	(10,247 )
Provision (benefit) for income tax	(1,117,531 )	7,726	3,568	410	6,376	3,864	2,595	1,299
Net income (loss)	\$1,160,056	\$60,010	\$38,026	\$3,861	\$36,587	\$33,546	\$13,997	\$(11,546 )
Basic net income (loss) per common share	\$8.11	\$0.42	\$0.27	\$0.03	\$0.26	\$0.24	\$0.10	\$(0.08 )
Diluted net income (loss) per potential common share	\$7.32	\$0.39	\$0.25	\$0.03	\$0.25	\$0.23	\$0.10	\$(0.08 )
Weighted average basic common shares outstanding	143,097	142,464	141,743	140,682	139,741	138,881	137,950	136,675
Weighted average diluted potential common shares outstanding	158,791	172,112	165,273	142,184	165,298	169,349	138,889	136,675





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## Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to market risk related to changes in interest rates and foreign currency exchange rates. The following discussion about these market risks includes forward-looking statements. Actual results could differ materially from those projected in these forward-looking statements.

**Interest Rate Sensitivity.** We currently hold investments in U.S. Government obligations and commercial paper with varying maturities. See Notes 5 and 6 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for information relating to investments and fair value. These investments are sensitive to interest rate movements, and their fair value will decline as interest rates rise and increase as interest rates decline. The estimated impact on these investments of a 100 basis point (1.0%) increase in interest rates across the yield curve from rates in effect as of the balance sheet date would be a \$1.8 million decline in value.

Our earnings and cash flows from operations would be exposed to changes in interest rates because of the floating rate of interest in our 2022 Term Loan if such loan was not hedged using floating to fixed rate interest rate swaps. See Note 14 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report. The 2022 Term Loan bears interest at LIBOR plus a spread of 2.5%, subject to a minimum LIBOR rate of 0.75%. We have entered into interest rate swap arrangements ("interest rate swaps") that hedge 77% to 98% of the 2022 Term Loan principal value through January 2021. As such, a 100 basis point (1.0%) increase in the LIBOR rate as of our most recent LIBOR rate setting would have an immaterial impact in annualized interest expense on our 2022 Term Loan as recognized in our Consolidated Financial Statements. See Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report for information relating to our 2022 Term Loan.

**Foreign Currency Exchange Risk.** As a global concern, our business and results of operations are exposed to and can be impacted by movements in foreign currency exchange rates. For example, the announcement of the United Kingdom (UK) referendum in which voters approved an exit from the European Union (EU), commonly referred to as "Brexit," has previously caused, and may continue to cause, significant volatility in currency exchange rate fluctuations. Because we sell globally, some of our sales transactions and revenue are non-U.S. Dollar denominated, with the Canadian Dollar, Euro, British Pound and Brazilian Real being our most significant foreign currency revenue exposures. If the U.S. Dollar strengthens against these currencies, our revenue for these transactions reported in U.S. Dollars would decline. For our U.S. Dollar denominated sales, an increase in the value of the U.S. Dollar would increase the real costs of our products to customers in markets outside the United States, which could impact our competitive position. During fiscal 2017, approximately 17.4% of revenue was non-U.S. Dollar denominated. During fiscal 2017 as compared to fiscal 2016, the U.S. Dollar strengthened against a number of foreign currencies, including the British Pound and Argentine Peso, primarily offset by weakening against the Brazilian Real and Canadian Dollar. Consequently, our revenue reported in U.S. Dollars was minimally impacted by approximately \$4.9 million or 0.2%. As it relates to costs of goods sold, employee-related and facilities costs associated with certain manufacturing-related operations in Canada represent our primary exposure to foreign currency exchange risk.

With regard to operating expense, our primary exposure to foreign currency exchange risk relates to the Canadian Dollar, British Pound, Euro, Indian Rupee and Brazilian Real. During fiscal 2017, approximately 51.8% of our operating expense was non-U.S. Dollar denominated. If these currencies strengthen against the U.S. Dollar, costs reported in U.S. Dollars will increase. During fiscal 2017, research and development expense was adversely affected by approximately \$2.0 million, net of hedging gains of \$1.8 million, primarily due to the weakening of the U.S. Dollar in relation to the Canadian Dollar in comparison to fiscal 2016.

From time to time, we use foreign currency forward contracts to reduce variability in certain forecasted non-U.S. Dollar denominated cash flows. Generally, these derivatives have maturities of 12 months or less and are designated as cash flow hedges. At the inception of the cash flow hedge, and on an ongoing basis, we assess whether the forward contract has been effective in offsetting changes in cash flows attributable to the hedged risk during the hedging

period. The effective portion of the derivative's net gain or loss is initially reported as a component of accumulated other comprehensive income (loss) and, upon the occurrence of the forecasted transaction, is subsequently reclassified to the line item in the Consolidated Statement of Operations to which the hedged transaction relates. Any net gain or loss associated with the ineffectiveness of the hedging instrument is reported in interest and other income (loss), net. Ciena Corporation, as the U.S. parent entity, uses the U.S. Dollar as its functional currency. However, some of our foreign branch offices and subsidiaries use the local currency as their functional currency. During fiscal 2017, we recorded \$4.4 million in foreign currency exchange losses, as a result of monetary assets and liabilities that were transacted in a currency other than the entity's functional currency, and the re-measurement adjustments were recorded in interest and other income (loss), net on the Consolidated Statement of Operations. From time to time, we use foreign currency forwards to hedge these balance sheet

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exposures. These forwards are not designated as hedges for accounting purposes, and any net gain or loss associated with these derivatives is reported in interest and other income (loss), net. During fiscal 2017, we recorded losses of \$1.2 million from these derivatives. See Note 1, Note 4 and Note 14 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report.

Convertible Notes Outstanding. The fair market value of each of our outstanding issues of convertible notes is subject to interest rate and market price risk due to the convertible feature of the notes and other factors. Generally the fair market value of fixed interest rate debt will increase as interest rates fall and decrease as interest rates rise. The fair market value of the notes may also increase as the market price of our stock rises or due to increased volatility in our stock price, and decrease as the market price of our stock falls or due to decreased volatility in our stock price. Interest rate and market value changes affect the fair market value of the notes, and may affect the prices at which we would be able to repurchase such notes were we to do so. These changes do not impact our financial position, cash flows or results of operations. For additional information on the fair value of our outstanding notes, see Note 16 to our Consolidated Financial Statements included in Item 8 of Part II of this annual report.

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Item 8. Financial Statements and Supplementary Data

The following is an index to the consolidated financial statements:

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<u>Consolidated Balance Sheets</u>	<u>69</u>
<u>Consolidated Statements of Operations</u>	<u>70</u>
<u>Consolidated Statements of Comprehensive Income (Loss)</u>	<u>71</u>
<u>Consolidated Statements of Changes in Stockholders' Equity (Deficit)</u>	<u>72</u>
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<u>Notes to Consolidated Financial Statements</u>	<u>74</u>

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Ciena Corporation:

In our opinion, the accompanying consolidated balance sheets and the related consolidated statements of operations, comprehensive income (loss), changes in stockholders' equity (deficit) and cash flows present fairly, in all material respects, the financial position of Ciena Corporation and its subsidiaries (the "Company") as of October 31, 2017 and 2016, and the results of their operations and their cash flows for each of the three years in the period ended October 31, 2017 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of October 31, 2017, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The Company's management is responsible for these financial statements, 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 Report of Management on Internal Control Over Financial Reporting under Item 9A. Our responsibility is to express opinions on these financial statements and on the Company's internal control over financial reporting based on our integrated audits. We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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 (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) 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 (iii) 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/ PricewaterhouseCoopers LLP  
Baltimore, Maryland

December 22, 2017



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CIENA CORPORATION  
CONSOLIDATED BALANCE SHEETS  
(in thousands, except share data)

	October 31,	
	2017	2016
<b>ASSETS</b>		
Current assets:		
Cash and cash equivalents	\$640,513	\$777,615
Short-term investments	279,133	275,248
Accounts receivable, net	622,183	576,235
Inventories, net	267,143	211,251
Prepaid expenses and other	197,339	172,843
Total current assets	2,006,311	2,013,192
Long-term investments	49,783	90,172
Equipment, building, furniture and fixtures, net	308,465	288,406
Goodwill	267,458	266,974
Other intangible assets, net	100,997	146,711
Deferred tax asset, net	1,155,104	1,116
Other long-term assets	63,593	67,004
Total assets	\$3,951,711	\$2,873,575
<b>LIABILITIES AND STOCKHOLDERS' EQUITY (DEFICIT)</b>		
Current liabilities:		
Accounts payable	\$260,098	\$235,942
Accrued liabilities and other short-term obligations	322,934	310,353
Deferred revenue	102,418	109,009
Current portion of long-term debt	352,293	236,241
Total current liabilities	1,037,743	891,545
Long-term deferred revenue	82,589	73,854
Other long-term obligations	111,349	124,394
Long-term debt, net	583,688	1,017,441
Total liabilities	\$1,815,369	\$2,107,234
Commitments and contingencies (Note 24)		
Stockholders' equity:		
Preferred stock — par value \$0.01; 20,000,000 shares authorized; zero shares issued and outstanding	—	—
Common stock — par value \$0.01; 290,000,000 shares authorized; 143,043,227 and 139,767,627 shares issued and outstanding	1,430	1,398
Additional paid-in capital	6,810,182	6,715,478
Accumulated other comprehensive loss	(11,017 )	(24,329 )
Accumulated deficit	(4,664,253 )	(5,926,206 )
Total stockholders' equity	2,136,342	766,341
Total liabilities and stockholders' equity	\$3,951,711	\$2,873,575
The accompanying notes are an integral part of these consolidated financial statements.		



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CIENA CORPORATION  
CONSOLIDATED STATEMENTS OF OPERATIONS  
(in thousands, except per share data)

	Year Ended October 31,		
	2017	2016	2015
Revenue:			
Products	\$2,318,581	\$2,117,472	\$2,002,395
Services	483,106	483,101	443,274
Total revenue	2,801,687	2,600,573	2,445,669
Cost of goods sold:			
Products	1,308,295	1,176,304	1,120,373
Services	247,606	262,693	249,733
Total cost of goods sold	1,555,901	1,438,997	1,370,106
Gross profit	1,245,786	1,161,576	1,075,563
Operating expenses:			
Research and development	475,329	451,794	414,201
Selling and marketing	356,169	349,731	333,836
General and administrative	142,604	132,828	123,402
Amortization of intangible assets	33,029	61,508	69,511
Acquisition and integration costs	—	4,613	25,539
Significant asset impairments and restructuring costs	23,933	4,933	8,626
Total operating expenses	1,031,064	1,005,407	975,115
Income from operations	214,722	156,169	100,448
Interest and other income (loss), net	(2,744 )	(12,795 )	(25,505 )
Interest expense	(55,852 )	(56,656 )	(51,179 )
Income before income taxes	156,126	86,718	23,764
Provision (benefit) for income taxes	(1,105,827 )	14,134	12,097
Net income	\$1,261,953	\$72,584	\$11,667
Basic net income per common share	\$8.89	\$0.52	\$0.10
Diluted net income per potential common share	\$7.53	\$0.51	\$0.10
Weighted average basic common shares outstanding	141,997	138,312	118,416
Weighted average diluted potential common shares outstanding	169,919	150,704	120,101

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

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CIENA CORPORATION  
 CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)  
 (in thousands)

	Year ended October 31,		
	2017	2016	2015
Net income	\$1,261,953	\$72,584	\$11,667
Change in unrealized gain (loss) on available-for-sale securities, net of tax	(590	) 217	(149 )
Change in unrealized loss on foreign currency forward contracts, net of tax	(295	) (823	) (95 )
Change in unrealized gain (loss) on forward starting interest rate swaps, net of tax	6,185	(445	) (3,439 )
Change in accumulated translation adjustments	8,012	(1,152	) (3,775 )
Other comprehensive income (loss)	13,312	(2,203	) (7,458 )
Total comprehensive income	\$1,275,265	\$70,381	\$4,209

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

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## CIENA CORPORATION

## CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY (DEFICIT)

(in thousands, except share data)

	Common Stock Shares	Par Value	Additional Paid-in-Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity (Deficit)
Balance at October 31, 2014	106,979,960	\$ 1,070	\$ 5,954,440	\$ (14,668 )	\$ (6,010,457)	\$ (69,615 )
Net income	—	—	—	—	11,667	11,667
Other comprehensive loss	—	—	—	(7,458 )	—	(7,458 )
Issuance of shares from Cyan acquisition	10,638,553	106	302,008	—	—	302,114
Equity component of convertible note acquired	—	—	82,164	—	—	82,164
Conversion of convertible notes into common shares	13,488,013	135	216,254	—	—	216,389
Issuance of shares from employee equity plans	4,505,691	45	30,230	—	—	30,275
Share-based compensation expense	—	—	55,340	—	—	55,340
Balance at October 31, 2015	135,612,217	1,356	6,640,436	(22,126 )	(5,998,790 )	620,876
Net income	—	—	—	—	72,584	72,584
Other comprehensive loss	—	—	—	(2,203 )	—	(2,203 )
Issuance of shares from employee equity plans	4,155,410	42	23,049	—	—	23,091
Share-based compensation expense	—	—	51,993	—	—	51,993
Balance at October 31, 2016	139,767,627	1,398	6,715,478	(24,329 )	(5,926,206 )	766,341
Net income	—	—	—	—	1,261,953	1,261,953
Other comprehensive income	—	—	—	13,312	—	13,312
Issuance of shares from employee equity plans	3,275,600	32	20,380	—	—	20,412
Share-based compensation expense	—	—	48,360	—	—	48,360
Reversal of deferred tax asset valuation allowance	—	—	25,964	—	—	25,964
Balance at October 31, 2017	143,043,227	\$ 1,430	\$ 6,810,182	\$ (11,017 )	\$ (4,664,253)	\$ 2,136,342

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

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CIENA CORPORATION  
CONSOLIDATED STATEMENTS OF CASH FLOWS  
(in thousands)

	Year Ended October 31,		
	2017	2016	2015
Cash flows from operating activities:			
Net income	\$1,261,953	\$72,584	\$11,667
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation of equipment, building, furniture and fixtures, and amortization of leasehold improvements	77,189	63,394	55,901
Share-based compensation costs	48,360	51,993	55,340
Amortization of intangible assets	45,713	78,298	79,866
Deferred taxes	(1,126,732)	(1,116)	—
Provision for doubtful accounts	18,221	1,701	1,576
Provision for inventory excess and obsolescence	35,459	33,713	26,846
Provision for warranty	7,965	15,483	17,881
Other	22,417	24,929	25,797
Changes in assets and liabilities:			
Accounts receivable	(66,123)	(26,074)	(37,297)
Inventories	(91,567)	(53,000)	46,898
Prepaid expenses and other	(33,834)	30,047	(46,383)
Accounts payable, accruals and other obligations	33,897	7,153	(10,505)
Deferred revenue	1,964	(9,585)	34,525
Net cash provided by operating activities	234,882	289,520	262,112
Cash flows used in investing activities:			
Payments for equipment, furniture, fixtures and intellectual property	(94,600)	(107,185)	(62,109)
Restricted cash	(54)	11	(40)
Purchase of available for sale securities	(299,038)	(365,191)	(245,323)
Proceeds from maturities of available for sale securities	335,075	230,612	205,000
Purchase of cost method investment	—	(4,000)	(2,000)
Settlement of foreign currency forward contracts, net	(2,810)	(18,506)	24,133
Acquisition of business, net of cash acquired	—	(32,000)	37,212
Net cash used in investing activities	(61,427)	(296,259)	(43,127)
Cash flows from financing activities:			
Proceeds from issuance of long-term debt, net	—	248,750	—
Payment of long-term debt	(233,554)	(266,116)	(29,867)
Payment for modification of term loans	(93,625)	—	—
Payment of debt and equity issuance costs	(722)	(3,987)	(421)
Payment of capital lease obligations	(3,562)	(5,966)	(8,038)
Proceeds from issuance of common stock	20,412	23,091	30,275
Net cash used in financing activities	(311,051)	(4,228)	(8,051)
Effect of exchange rate changes on cash and cash equivalents	494	(2,389)	(6,683)
Net increase (decrease) in cash and cash equivalents	(137,102)	(13,356)	204,251
Cash and cash equivalents at beginning of fiscal year	777,615	790,971	586,720
Cash and cash equivalents at end of fiscal year	\$640,513	\$777,615	\$790,971
Supplemental disclosure of cash flow information			
Cash paid during the fiscal year for interest	\$47,235	\$46,897	\$40,772
Cash paid during the fiscal year for income taxes, net	\$22,136	\$15,268	\$10,668
Non-cash investing activities			

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Purchase of equipment in accounts payable	\$6,214	\$15,030	\$20,922
Equipment acquired under capital leases	\$—	\$5,322	\$464
Building subject to capital lease	\$50,370	\$8,993	\$14,939
Construction in progress subject to build-to-suit lease	\$—	\$39,914	\$18,663
Non-cash financing activities			
Conversion of 4.0% convertible senior notes, due March 15, 2015 into 8,898,387 shares of common stock	\$—	\$—	\$180,645
Conversion of 8.0% convertible senior notes, due December 15, 2019, assumed from the Cyan acquisition, into 4,589,626 shares of common stock	\$—	\$—	\$117,140
Fair value of shares issued related to acquisition of business	\$—	\$—	\$302,114
The accompanying notes are an integral part of these consolidated financial statements.			

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CIENA CORPORATION  
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(1) CIENA CORPORATION AND SIGNIFICANT ACCOUNTING POLICIES AND ESTIMATES

Description of Business

Ciena Corporation (“Ciena” or the “Company”) is a network strategy and technology company, providing solutions that enable a wide range of network operators to deploy and manage next-generation communication architectures that deliver a broad array of services. Ciena provides network hardware, software and services that support the transport, switching, aggregation, service delivery and management of video, data, and voice traffic on communications networks. Ciena’s high-capacity hardware and network management and control software solutions enable open, programmable networks that enhance automation, reduce network complexity and support changing service requirements. Ciena’s solutions create business and operational value for its customers by enabling them to introduce new revenue-generating services and reduce network costs.

Ciena’s solutions include a diverse set of Networking Platform products, which are used by a broad range of network operator customers and market segments, including communications service providers, cable and multiservice operators, Web-scale providers, submarine network operators, governments, enterprises, research and education (R&E) institutions, and other emerging network operators. These products, which can be applied from the network core to network access points, allow network operators to scale capacity, increase transmission speeds, allocate traffic and adapt dynamically to changing end-user service demands. In addition to its portfolio of high-capacity hardware systems and components, Ciena offers network management and domain control software platforms, along with advanced applications software, designed to simplify the creation, automation and delivery of services across multi-vendor and multi-domain network environments. To complement its hardware and software solutions, Ciena offers a broad range of services that help our customers design, optimize, integrate, deploy, manage and maintain their networks.

Basis of Presentation

The accompanying consolidated financial statements include the accounts of Ciena and its wholly owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Ciena has a 52 or 53 week fiscal year, which ends on the Saturday nearest to the last day of October in each year (October 28, 2017, October 29, 2016 and October 31, 2015 for the periods reported). Fiscal 2017, fiscal 2016 and fiscal 2015 each consisted of a 52-week fiscal year. For purposes of financial statement presentation, each fiscal year is described as having ended on October 31.

Business Combinations

Ciena records acquisitions using the purchase method of accounting. All of the assets acquired, liabilities assumed, contractual contingencies and contingent consideration are recognized at their fair value as of the acquisition date. The excess of the purchase price over the estimated fair values of the net tangible and net intangible assets acquired is recorded as goodwill. The application of the purchase method of accounting for business combinations requires management to make significant estimates and assumptions in the determination of the fair value of assets acquired and liabilities assumed, in order to properly allocate purchase price consideration between assets that are depreciated and amortized from goodwill. These assumptions and estimates include a market participant’s use of the asset and the appropriate discount rates for a market participant. Ciena’s estimates are based on historical experience, information obtained from the management of the acquired companies and, when appropriate, include assistance from independent third-party appraisal firms. Significant assumptions and estimates can include, but are not limited to, the cash flows that an asset is expected to generate in the future, the appropriate weighted-average cost of capital, and the cost savings expected to be derived from acquiring an asset. These estimates are inherently uncertain and unpredictable. In addition, unanticipated events and circumstances may occur which may affect the accuracy or validity of such

estimates.

#### Use of Estimates

The preparation of the financial statements and related disclosures in conformity with Generally Accepted Accounting Principles (“GAAP”) requires management to make estimates and judgments that affect the amounts reported in the consolidated financial statements and accompanying notes. Estimates are used for selling prices for multiple element arrangements, shared-based compensation, convertible notes payable valuations, bad debts, valuation of inventories and investments, recoverability of intangible assets, other long-lived assets and goodwill, income taxes, warranty obligations, restructuring liabilities, derivatives, contingencies and litigation. Ciena bases its estimates on historical experience and assumptions that it believes are reasonable. Actual results may differ materially from management’s estimates.

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### Cash and Cash Equivalents

Ciena considers all highly liquid investments purchased with original maturities of three months or less to be cash equivalents. Any restricted cash collateralizing letters of credit is included in other current assets and other long-term assets depending upon the duration of the restriction.

### Investments

Ciena's investments are classified as available-for-sale and are reported at fair value, with unrealized gains and losses recorded in accumulated other comprehensive income (loss). Ciena recognizes losses in the income statement when it determines that declines in the fair value of its investments below their cost basis are other-than-temporary. In determining whether a decline in fair value is other-than-temporary, Ciena considers various factors, including market price (when available), investment ratings, the financial condition and near-term prospects of the investee, the length of time and the extent to which the fair value has been less than Ciena's cost basis, and Ciena's intent and ability to hold the investment until maturity or for a period of time sufficient to allow for any anticipated recovery in market value. Ciena considers all marketable debt securities that it expects to convert to cash within one year or less to be short-term investments, with all others considered to be long-term investments.

Ciena has minority equity investments in privately held technology companies that are classified in other long-term assets. These investments are carried at cost because Ciena owns less than 20% of the voting equity and does not have the ability to exercise significant influence over the company. Ciena monitors these investments for impairment and makes appropriate reductions to the carrying value when necessary. As of October 31, 2017, the combined carrying value of these investments was \$6.0 million. Ciena has not estimated the fair value of these cost method investments because determining the fair value is not practicable. Ciena has not evaluated these investments for impairment as there have not been any events or changes in circumstances that Ciena believes would have had a significant adverse effect on the fair value of these investments.

### Inventories

Inventories are stated at the lower of cost or market, with cost computed using standard cost, which approximates actual cost, on a first-in, first-out basis. Ciena records a provision for excess and obsolete inventory when an impairment has been identified.

### Segment Reporting

Ciena's chief operating decision maker, its chief executive officer, evaluates the company's performance and allocates resources based on multiple factors, including measures of segment profit (loss). Operating segments are defined as components of an enterprise that engage in business activities that may earn revenue and incur expense, for which discrete financial information is available, and for which such information is evaluated regularly by the chief operating decision maker for purposes of allocating resources and assessing performance. Ciena has the following operating segments for reporting purposes: (i) Networking Platforms, (ii) Software and Software-Related Services, and (iii) Global Services. See Note 22 below.

### Goodwill

Goodwill is the excess of the purchase price over the fair values assigned to the net assets acquired in a business combination. Ciena tests goodwill for impairment on an annual basis, which it has determined to be the last business day of fiscal September each year. Ciena also tests goodwill for impairment between annual tests if an event occurs or



circumstances change that would, more likely than not, reduce the fair value of the reporting unit below its carrying value.

The first step in the process of assessing goodwill impairment is to compare the fair value of the reporting unit with the unit's carrying amount, including goodwill. If this test indicates that the fair value is less than the carrying value, then step two as amended by Financial Accounting Standards Board ("FASB") Accounting Standards Update ("ASU") No.2017-04, Simplifying the Test for Goodwill Impairment, adopted by Ciena in the first quarter of fiscal 2017, requires goodwill impairments to be measured on the basis of the fair value of the reporting unit relative to the reporting unit's carrying amount. A non-cash goodwill impairment charge would have the effect of decreasing earnings or increasing losses in such period. If Ciena is required to take a substantial impairment charge, its operating results would be materially adversely affected in such period.

Long-lived Assets

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Long-lived assets include: equipment, building, furniture and fixtures; intangible assets; and maintenance spares. Ciena tests long-lived assets for impairment whenever triggering events or changes in circumstances indicate that the asset's carrying amount is not recoverable from its undiscounted cash flows. An impairment loss is measured as the amount by which the carrying amount of the asset or asset group exceeds its fair value. Ciena's long-lived assets are assigned to asset groups that represent the lowest level for which cash flows can be identified.

### Equipment, Building, Furniture and Fixtures and Internal Use Software

Equipment, building, furniture and fixtures are recorded at cost. Depreciation and amortization are computed using the straight-line method over useful lives of two to five years for equipment and furniture and fixtures and the shorter of useful life or lease term for leasehold improvements.

Ciena establishes assets and liabilities for the estimated construction costs incurred under build-to-suit lease arrangements to the extent that Ciena is involved in the construction of structural improvements or takes construction risk prior to commencement of a lease. See Notes 10 and 13 below.

Qualifying internal use software and website development costs incurred during the application development stage, which consist primarily of outside services and purchased software license costs, are capitalized and amortized straight-line over the estimated useful lives of two to five years.

### Intangible Assets

Ciena has recorded finite-lived intangible assets as a result of several acquisitions. Finite-lived intangible assets are carried at cost less accumulated amortization. Amortization is computed using the straight-line method over the expected economic lives of the respective assets, up to seven years, which approximates the use of intangible assets.

Ciena has recorded in-process research and development projects acquired as the result of an acquisition as indefinite-lived intangible assets. Upon completion of the projects, the assets will be amortized on a straight-line basis over the expected economic life of the asset, which will be determined on that date. Should the project be determined to be abandoned, and if the asset developed has no alternative use, the full value of the asset will be charged to expense.

### Maintenance Spares

Maintenance spares are recorded at cost. Spares usage cost is expensed ratably over four years.

### Concentrations

Substantially all of Ciena's cash and cash equivalents are maintained at a small number of major U.S. financial institutions. The majority of Ciena's cash equivalents consist of money market funds. Deposits held with banks may exceed the amount of insurance provided on such deposits. Because these deposits generally may be redeemed upon demand, management believes that they bear minimal risk.

Historically, a significant percentage of Ciena's revenue has been concentrated among sales to a small number of large communications service providers. Consolidation among Ciena's customers has increased this concentration. Consequently, Ciena's accounts receivable are concentrated among these customers. See Note 22 below.

Additionally, Ciena's access to certain materials or components is dependent upon sole or limited source suppliers. The inability of any of these suppliers to fulfill Ciena's supply requirements, or significant changes in supply cost, could affect future results. Ciena relies on a small number of contract manufacturers to perform the majority of the manufacturing for its products. If Ciena cannot effectively manage these manufacturers or forecast future demand, or if these manufacturers fail to deliver products or components on time, Ciena's business and results of operations may suffer.

#### Revenue Recognition

Ciena recognizes revenue when all of the following criteria are met: persuasive evidence of an arrangement exists; delivery has occurred or services have been rendered; the price to the buyer is fixed or determinable; and collectibility is reasonably assured. Customer purchase agreements and customer purchase orders are generally used to determine the existence of an arrangement. Shipping documents and evidence of customer acceptance, when applicable, are used to verify delivery or

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services rendered. Ciena assesses whether the price is fixed or determinable based on the payment terms associated with the transaction and whether the sales price is subject to refund or adjustment. Ciena assesses collectibility based primarily on the creditworthiness of the customer as determined by credit checks and analysis, as well as the customer's payment history. Revenue for maintenance services is deferred and recognized ratably over the period during which the services are performed. Shipping and handling fees billed to customers are included in revenue, with the associated expenses included in product cost of goods sold.

Software revenue is recognized when persuasive evidence of an arrangement exists, delivery has occurred, the fee is fixed or determinable, and collectibility is probable. In instances where final acceptance criteria of the software are specified by the customer, revenue is deferred until there are no uncertainties regarding customer acceptance.

Ciena limits the amount of revenue recognition for delivered elements to the amount that is not contingent on the future delivery of products or services, future performance obligations or subject to customer-specified return or refund privileges.

Revenue for multiple element arrangements is allocated to each unit of accounting based on the relative selling price of each delivered element, with revenue recognized for each delivered element when the revenue recognition criteria are met. Ciena determines the selling price for each deliverable based upon the selling price hierarchy for multiple-deliverable arrangements. Under this hierarchy, Ciena uses vendor-specific objective evidence ("VSOE") of selling price, if it exists, or third-party evidence ("TPE") of selling price if VSOE does not exist. If neither VSOE nor TPE of selling price exists for a deliverable, Ciena uses its best estimate of selling price ("BESP") for that deliverable. For multiple element software arrangements where VSOE of undelivered maintenance does not exist, revenue for the entire arrangement is recognized over the maintenance term.

VSOE, when determinable, is established based on Ciena's pricing and discounting practices for the specific product or service when sold separately. In determining whether VSOE exists, Ciena requires that a substantial majority of the selling prices for a product or service falls within a reasonably narrow pricing range. Ciena has been unable to establish TPE of selling price because its go-to-market strategy differs from that of others in its markets, and the extent of customization and differentiated features and functions varies among comparable products or services from its peers. Ciena determines BESP based upon management-approved pricing guidelines, which consider multiple factors including the type of product or service, gross margin objectives, competitive and market conditions, and the go-to-market strategy, all of which can affect pricing practices.

## Warranty Accruals

Ciena provides for the estimated costs to fulfill customer warranty obligations upon recognition of the related revenue. Estimated warranty costs include estimates for material costs, technical support labor costs and associated overhead. Warranty is included in cost of goods sold and is determined based upon actual warranty cost experience, estimates of component failure rates and management's industry experience. Ciena's sales contracts do not permit the right of return of the product by the customer after the product has been accepted.

## Accounts Receivable, Net

Ciena's allowance for doubtful accounts is based on its assessment, on a specific identification basis, of the collectibility of customer accounts. Ciena performs ongoing credit evaluations of its customers and generally has not required collateral or other forms of security from them. In determining the appropriate balance for Ciena's allowance for doubtful accounts, management considers each individual customer account receivable in order to determine collectibility. In doing so, management considers creditworthiness, payment history, account activity and communication with the customer. If a customer's financial condition changes, Ciena may be required to record an

allowance for doubtful accounts for that customer, which could negatively affect its results of operations.

#### Research and Development

Ciena charges all research and development costs to expense as incurred. Types of expense incurred in research and development include employee compensation, prototype equipment, consulting and third-party services, depreciation, facility costs and information technology.

#### Advertising Costs

Ciena expenses all advertising costs as incurred.

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### Legal Costs

Ciena expenses legal costs associated with litigation as incurred.

### Share-Based Compensation Expense

Ciena measures and recognizes compensation expense for share-based awards based on estimated fair values on the date of grant. Ciena estimates the fair value of each option-based award on the date of grant using the Black-Scholes option-pricing model. This model is affected by Ciena's stock price as well as estimates regarding a number of variables, including expected stock price volatility over the expected term of the award and projected employee stock option exercise behaviors. Ciena estimates the fair value of each restricted stock unit award based on the fair value of the underlying common stock on the date of grant. In each case, Ciena only recognizes expense in its Consolidated Statement of Operations for those stock options or restricted stock units that are expected ultimately to vest. Ciena recognizes the estimated fair value of performance-based awards, net of estimated forfeitures, as share-based expense over the performance period, using graded vesting, which considers each performance period or tranche separately, based upon Ciena's determination of whether it is probable that the performance targets will be achieved. At the end of each reporting period, Ciena reassesses the probability of achieving the performance targets and the performance period required to meet those targets, and the expense is adjusted accordingly. Ciena uses the straight-line method to record expense for share-based awards with only service-based vesting. See Note 21 below.

### Income Taxes

Ciena accounts for income taxes using an asset and liability approach. This approach recognizes deferred tax assets and liabilities for the expected future tax consequences attributable to differences between the carrying amounts of assets and liabilities for financial reporting purposes and their respective tax bases, and for operating loss and tax credit carryforwards. In estimating future tax consequences, Ciena considers all expected future events other than the enactment of changes in tax laws or rates. Valuation allowances are provided if, based upon the weight of the available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

In the ordinary course of business, transactions occur for which the ultimate outcome may be uncertain. In addition, tax authorities periodically audit Ciena's income tax returns. These audits examine significant tax filing positions, including the timing and amounts of deductions and the allocation of income tax expenses among tax jurisdictions. Ciena is currently under audit in India for 2012 and 2014 through 2016 and in Canada for 2011 through 2013. Management does not expect the outcome of these audits to have a material adverse effect on Ciena's consolidated financial position, results of operations or cash flows. Ciena's major tax jurisdictions and the earliest open tax years are as follows: United States (2014), United Kingdom (2014), Canada (2011), India (2012) and Brazil (2012). Limited adjustments can be made to Federal U.S. tax returns in earlier years in order to reduce net operating loss carryforwards. Ciena classifies interest and penalties related to uncertain tax positions as a component of income tax expense.

Ciena has not provided for U.S. deferred income taxes on the cumulative unremitted earnings of its non-U.S. affiliates, as it plans to indefinitely reinvest cumulative unremitted foreign earnings outside the U.S., and it is not practicable to determine the unrecognized deferred income taxes. These cumulative unremitted foreign earnings relate to ongoing operations in foreign jurisdictions and are required to fund foreign operations, capital expenditures and future expansion requirements.

Ciena recognizes windfall tax benefits associated with the exercise of stock options or release of restricted stock units directly to stockholders' equity only when realized. A windfall tax benefit occurs when the actual tax benefit realized

by Ciena upon an employee's disposition of a share-based award exceeds the deferred tax asset, if any, associated with the award that Ciena had recorded. When assessing whether a tax benefit relating to share-based compensation has been realized, Ciena follows the "with-and-without" method. Under the with-and-without method, the windfall is considered realized and recognized for financial statement purposes only when an incremental benefit is provided after considering all other tax benefits including Ciena's net operating losses. The with-and-without method results in the windfall from share-based compensation awards always being effectively the last tax benefit to be considered. Consequently, the windfall attributable to share-based compensation will not be considered realized in instances where Ciena's net operating loss carryover (that is unrelated to windfalls) is sufficient to offset the current year's taxable income before considering the effects of current-year windfalls.

#### Loss Contingencies

Ciena is subject to the possibility of various losses arising in the ordinary course of business. These may relate to disputes, litigation and other legal actions. Ciena considers the likelihood of loss or the incurrence of a liability, as well as Ciena's ability

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to estimate the amount of loss reasonably, in determining loss contingencies. An estimated loss contingency is accrued when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. Ciena regularly evaluates current information available to it in order to determine whether any accruals should be adjusted and whether new accruals are required.

### Fair Value of Financial Instruments

The carrying value of Ciena's cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities approximates fair market value due to the relatively short period of time to maturity. For information related to the fair value of Ciena's convertible notes and term loans, see Note 16 below.

Fair value for the measurement of financial assets and liabilities is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. Ciena utilizes a valuation hierarchy for disclosure of the inputs for fair value measurement. This hierarchy prioritizes the inputs into three broad levels as follows:

Level 1 inputs are unadjusted quoted prices in active markets for identical assets or liabilities;

Level 2 inputs are quoted prices for identical or similar assets or liabilities in less active markets or model-derived valuations in which significant inputs are observable for the asset or liability, either directly or indirectly through market corroboration, for substantially the full term of the financial instrument; and

Level 3 inputs are unobservable inputs based on Ciena's assumptions used to measure assets and liabilities at fair value.

By distinguishing between inputs that are observable in the marketplace, and therefore more objective, and those that are unobservable, and therefore more subjective, the hierarchy is designed to indicate the relative reliability of the fair value measurements. 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.

### Restructuring

From time to time, Ciena takes actions to better align its workforce, facilities and operating costs with perceived market opportunities, business strategies and changes in market and business conditions. Ciena recognizes a liability for the cost associated with an exit or disposal activity in the period in which the liability is incurred, except for one-time employee termination benefits related to a service period, typically of more than 60 days, which are accrued over the service period. See Note 3 below.

### Foreign Currency

Certain of Ciena's foreign branch offices and subsidiaries use the U.S. Dollar as their functional currency because Ciena Corporation, as the U.S. parent entity, exclusively funds the operations of these branch offices and subsidiaries. For those subsidiaries using the local currency as their functional currency, assets and liabilities are translated at exchange rates in effect at the balance sheet date, and the statement of operations is translated at a monthly average rate. Resulting translation adjustments are recorded directly to a separate component of stockholders' equity. Where the monetary assets and liabilities are transacted in a currency other than the entity's functional currency, re-measurement adjustments are recorded in interest and other income (loss), net on the Consolidated Statement of Operations. See Note 4 below.



## Derivatives

From time to time, Ciena uses foreign currency forward contracts to reduce variability in certain forecasted non-U.S. Dollar denominated cash flows. Generally, these derivatives have maturities of 12 months or less. Ciena also has interest rate hedge arrangements to reduce variability in certain forecasted interest expense associated with its term loans. All of these derivatives are designated as cash flow hedges. At the inception of the cash flow hedge, and on an ongoing basis, Ciena assesses whether the derivative has been effective in offsetting changes in cash flows attributable to the hedged risk during the hedging period. The effective portion of the derivative's net gain or loss is initially reported as a component of accumulated other comprehensive income (loss), and, upon occurrence of the forecasted transaction, is subsequently reclassified to the line item in the Consolidated Statement of Operations to which the hedged transaction relates. Any net gain or loss associated with

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the ineffectiveness of the hedging instrument is reported in interest and other income (loss), net. To date, no ineffectiveness has occurred.

Ciena records derivative instruments in the Consolidated Statements of Cash Flows within operating, investing, or financing activities consistent with the cash flows of the hedged items.

From time to time, Ciena uses foreign currency forward contracts to hedge certain balance sheet exposures. These forward contracts are not designated as hedges for accounting purposes, and any net gain or loss associated with these derivatives is reported in interest and other income (loss), net on the Consolidated Statement of Operations.

See Notes 6 and 14 below.

## Computation of Net Income (Loss) per Share

Ciena calculates basic earnings per share ("EPS") by dividing earnings attributable to common stock by the weighted average number of common shares outstanding for the period. Diluted EPS includes other potential dilutive shares that would be outstanding if securities or other contracts to issue common stock were exercised or converted into common stock. Ciena uses a dual presentation of basic and diluted EPS on the face of its income statement. A reconciliation of the numerator and denominator used for the basic and diluted EPS computations is set forth in Note 18 below.

## Software Development Costs

Ciena develops software for sale to its customers. GAAP requires the capitalization of certain software development costs that are incurred subsequent to the date technological feasibility is established and prior to the date the product is generally available for sale. The capitalized cost is then amortized using the straight-line method over the estimated life of the product. Ciena defines technological feasibility as being attained at the time a working model is completed. To date, the period between Ciena achieving technological feasibility and the general availability of such software has been short, and software development costs qualifying for capitalization have been insignificant. Accordingly, Ciena has not capitalized any software development costs.

## Newly Issued Accounting Standards - Effective

In April 2015, the FASB issued ASU No. 2015-03, Simplifying the Presentation of Debt Issuance Costs ("ASU 2015-03"). ASU 2015-03 requires debt issuance costs related to a recognized debt liability to be presented in the balance sheet as a direct deduction from the carrying value of that debt liability, consistent with debt discounts. ASU 2015-03 is to be applied on a retrospective basis and represents a change in accounting principle. In August 2015, the FASB issued Accounting Standards Update No. 2015-15, "Interest — Imputation of Interest (Subtopic 835-30): Presentation and Subsequent Measurement of Debt Issuance Costs Associated with Line-of-Credit Arrangements — Amendments to SEC Paragraphs Pursuant to Staff Announcement at June 18, 2015 EITF Meeting" ("ASU 2015-15"), which clarifies the treatment of debt issuance costs from line-of-credit arrangements after the adoption of ASU 2015-03. In particular, ASU 2015-15 clarifies that the SEC staff would not object to an entity deferring and presenting debt issuance costs related to a line-of-credit arrangement as an asset and subsequently amortizing the deferred debt issuance costs ratably over the term of such arrangement, regardless of whether there are any outstanding borrowings on the line-of-credit arrangement. Ciena adopted these ASU's during the first quarter of fiscal 2017. The adoption of ASU 2015-03 resulted in the reclassification of unamortized debt issuance costs related to Ciena's convertible notes and term loans from other long-term assets to current portion of long-term debt and long-term debt, net in Ciena's Consolidated Balance sheets in the amount of \$8.9 million at October 31, 2016. As permitted by ASU 2015-15, Ciena elected not to reclassify unamortized debt issuance costs associated with its ABL Credit Facility (described in Note 17 below) and to continue to present such capitalized costs in other long-term assets.

In January 2017, the FASB issued ASU No. 2017-04, Simplifying the Test for Goodwill Impairment ("ASU 2017-04"), which simplifies the accounting for goodwill impairments by eliminating step two from the goodwill impairment test. ASU 2017-04 requires goodwill impairments to be measured on the basis of the fair value of the reporting unit relative to the reporting unit's carrying amount rather than on the basis of the implied amount of goodwill relative to the goodwill balance of the reporting unit. ASU 2017-04 is effective for annual and interim impairment tests for periods beginning after December 15, 2021. Early adoption is allowed for annual and interim impairment tests occurring after January 1, 2017. Ciena elected to adopt ASU 2017-04 during the first quarter of fiscal 2017.

Newly Issued Accounting Standards - Not Yet Effective

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In May 2014, the FASB issued ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606) ("ASU 2014-09"), which provides guidance for revenue recognition. This ASU affects any entity that either enters into contracts with customers to transfer goods or services or enters into contracts for the transfer of non-financial assets. This ASU will supersede the revenue recognition requirements in Topic 605, Revenue Recognition, and most industry-specific guidance. This ASU also supersedes some cost guidance included in Subtopic 605-35, Revenue Recognition-Construction-Type and Production-Type Contracts.

For multiple element software arrangements where VSOE of undelivered maintenance does not exist, Ciena currently recognizes revenue for the entire arrangement over the maintenance term. Ciena expects that the adoption of this ASU will require that it determine the stand alone selling price for each of the software and software-related deliverables at the contract inception, and Ciena consequently expects certain software deliverables will be recognized at a point in time rather than over a period of time.

Ciena also expects certain installation and deployment, and consulting and network design services, will be recognized over a period of time rather than at a point in time.

Ciena has considered the impact of the guidance in ASC 340-40, Other Assets and Deferred Costs; Contracts with Customers, and the interpretations of the FASB Transition Resource Group for Revenue Recognition (TRG) with respect to capitalization and amortization of incremental costs of obtaining a contract. In conjunction with this interpretation, Ciena has elected to implement the practical expedient clause allowing for incremental costs to be recognized as an expense when incurred if the period of the asset recognition is one year or less, and amortized over the period of performance, if the period of the asset recognition is greater than one year.

Ciena expects to implement this standard using the modified retrospective approach whereby the cumulative effect at adoption will be presented as an adjustment to the opening balance of retained earnings. The comparative information will not be restated and will continue to be reported under the accounting standards in effect for those periods. ASU 2014-09 will be effective for Ciena beginning in the first quarter of fiscal 2019. Ciena is continuing to evaluate other possible impacts of the adoption of this ASU on its Consolidated Financial Statements and disclosures.

In February 2016, the FASB issued ASU No. 2016-02, Leases ("ASU 2016-02"), which requires an entity to recognize assets and liabilities on the balance sheet for the rights and obligations created by leased assets and to provide additional disclosures. ASU 2016-02 is effective for Ciena beginning in the first quarter of fiscal 2020. Under current GAAP, the majority of Ciena's leases for its properties are considered operating leases, and Ciena expects that the adoption of this ASU will require these leases to be classified as financing leases and to be recognized as assets and liabilities on Ciena's balance sheet. Ciena is continuing to evaluate other possible impacts of the adoption of this ASU on its Consolidated Financial Statements and disclosures.

In March 2016, the FASB issued ASU No. 2016-09 ("ASU 2016-09"), Improvements to Employee Share-Based Payment Accounting, which provides guidance on several aspects of accounting for share-based payment transactions, including the accounting for income taxes, forfeitures, and statutory tax withholding requirements, as well as classification on the statement of cash flows. ASU 2016-09 is effective for Ciena beginning in the first quarter of fiscal 2018. Currently, the recognition of windfall tax benefits from stock-based compensation deducted on the tax return is prohibited until realized through a reduction of income tax payable. Under the new guidance, Ciena would recognize all excess tax benefits previously unrecognized, or approximately \$62 million, along with any related valuation allowance, on a modified retrospective basis as a cumulative-effect adjustment to retained earnings as of the date of adoption of this updated standard. Additionally, the consolidated statements of cash flows will include excess tax benefits as an operating activity, with the prior periods adjusted accordingly, as a result of the adoption. Finally, Ciena will elect to recognize forfeitures when they occur, rather than estimate the impact of forfeitures when the award is granted. Accordingly Ciena will account for this change through a cumulative effect adjustment recorded to

opening retained earnings in the period of adoption.

In January 2017, the FASB issued ASU No. 2017-01 ("ASU 2017-01"), Business Combinations: Clarifying the Definition of a Business, which clarifies the definition of a business with the objective of adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisition or disposal of assets or businesses. The amendments in this update provide a screen to determine when a set of assets is not a business. The screen requires that when substantially all of the fair value of the gross assets acquired (or disposed of) is concentrated in a single identifiable asset or a group of similar identifiable assets, the set of assets is not a business. ASU 2017-01 is effective for Ciena beginning first quarter of fiscal 2018. Ciena will evaluate the effect of the update at the time of any future acquisition or disposal.

In August 2017, the FASB issued ASU No. 2017-12 ("ASU 2017-12"), Derivatives and Hedging: Targeted Improvements to Accounting for Hedging Activities, which improves the financial reporting of hedging relationships to better portray the

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economic results of an entity's risk management activities in its financial statements and make certain targeted improvements to simplify the application of the hedge accounting guidance in current GAAP. The amendments in this update better align an entity's risk management activities and financial reporting for hedging relationships, through changes to both the designation and measurement guidance for qualifying hedging relationships and presentation of hedge results. ASU 2017-12 is effective for Ciena beginning in the first quarter of fiscal 2020. Ciena is evaluating the effect of the update on its Consolidated Financial Statements and disclosures.

**(2) BUSINESS COMBINATIONS****Cyan Acquisition**

On August 3, 2015, Ciena acquired Cyan, Inc. (“Cyan”), a leading provider of SDN, NFV and metro packet-optical solutions, in a cash and stock transaction. Subject to the terms and conditions of the merger agreement, at the closing of the transaction, each outstanding Cyan share was exchanged for 0.19936 shares of Ciena common stock and \$0.63 in cash, resulting in an exchange of all of the outstanding shares of Cyan common stock for approximately \$33.6 million in cash and 10.6 million shares of Ciena common stock. Ciena assumed all the then-outstanding Cyan unvested restricted stock unit awards and stock options and substituted for them approximately 1.0 million Ciena restricted stock unit awards and stock options exercisable for approximately 2.4 million shares of Ciena common stock.

Upon the closing of the acquisition, Ciena assumed Cyan’s \$50.0 million in outstanding principal amount of 8.0% Convertible Senior Secured Notes due 2019 (the “2019 Notes”). Under the terms of the indenture governing the 2019 Notes, following the closing of the acquisition, the note holders were given the right to convert the 2019 Notes at an increased conversion rate of approximately 91.79 shares of Ciena common stock and \$290.08 in cash for each \$1,000 principal amount of 2019 Notes surrendered for conversion. Subsequently, during the fourth quarter of fiscal 2015, holders representing all of the outstanding aggregate principal amount of the 2019 Notes surrendered their 2019 Notes for conversion and, accordingly, there are no remaining 2019 Notes outstanding. In satisfaction of such conversions, Ciena issued approximately 4.6 million shares of Ciena common stock and paid \$14.5 million in cash.

During fiscal 2015, Ciena incurred approximately \$25.5 million of acquisition-related costs associated with this transaction. These costs and expenses include fees associated with financial, legal and accounting advisors, facilities and systems consolidation costs, and severance and other employment-related costs, including payments to certain former Cyan executives, and approximately \$7.6 million of non-cash share-based compensation expense.

The following table summarizes the purchase price for the acquisition (in thousands):

	Amount
Cash	\$33,621
Value of common stock issued	270,113
Fair value of vested stock awards	32,001
Total purchase price	\$335,735

The fair value of Ciena’s common stock issued in the acquisition was based on Ciena’s opening stock price on August 3, 2015, the closing date. The fair value of replacement vested stock options was determined using the Black-Scholes option-pricing model.

The following table summarizes the final allocation related to Cyan based on the estimated fair value of the acquired assets and assumed liabilities (in thousands):



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	Amount
Cash and cash equivalents	\$60,831
Restricted cash	10,001
Accounts receivable	23,891
Inventory	12,849
Prepaid expenses and other	3,502
Equipment, furniture and fixtures	7,962
Goodwill	256,434
Customer relationships	36,323
Trademarks	3,432
Developed technology	88,814
Order backlog	25,293
Other long-term assets	789
Accounts payable	(30,856 )
Accrued liabilities	(15,887 )
Deferred revenue	(16,643 )
Long-term debt	(48,836 )
Additional paid-in capital related to equity component of long-term debt	(82,164 )
Total purchase consideration	\$ 335,735

Under purchase accounting rules, Ciena valued the acquired finished goods inventory to fair value, which is defined as the estimated selling price less the sum of (a) costs of disposal, and (b) a reasonable profit allowance for Ciena's selling effort. This valuation resulted in an increase in inventory carrying value of approximately \$3.1 million for marketable inventory.

Customer relationships and contracts represent agreements with existing Cyan customers and have estimated useful lives of 4 years to 7 years. The majority of the order backlog, which is amortized over the fulfillment period, was fulfilled during the fourth quarter of fiscal 2015.

Developed technology represents purchased technology that had reached technological feasibility and for which Cyan had substantially completed development as of the date of acquisition. Fair value was determined using future discounted cash flows related to the projected income stream of the developed technology for a discrete projection period. Cash flows were discounted to their present value as of the closing date. Developed technology is amortized on a straight line basis over its estimated useful lives of 5 years to 7 years.

The goodwill generated from the acquisition of Cyan was primarily related to expected synergies. The amount of goodwill allocated to the Networking Platforms segment and to the Software and Software-Related Services segment was \$55.0 million and \$201.4 million, respectively. The goodwill is not deductible for income tax purposes.

The following unaudited pro forma financial information summarizes the results of operations for the periods indicated as if Ciena's acquisition of Cyan had been completed as of the beginning of the earliest period. Revenue attributable to Cyan from the August 3, 2015 acquisition date through the end of Ciena's fiscal 2015 was \$84.4 million. As Ciena has begun to integrate the combined operations, eliminating overlapping processes and expenses and integrating its products and sales efforts with those of Cyan, it is impractical to determine the earnings specific to Cyan since the acquisition date. These unaudited pro forma amounts (in thousands) do not purport to be indicative of the results that would have actually been obtained if the acquisition occurred as of the beginning of the periods presented, or that may be obtained in the future.



	Year Ended October 31, 2015
Pro forma revenue	\$2,565,081
Pro forma net income	\$ 16,286

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The pro forma earnings were adjusted to exclude \$25.5 million in acquisition-related costs and \$3.1 million of nonrecurring expense related to the fair value adjustment to acquisition-date inventory incurred in fiscal 2015.

Additionally, pro forma earnings were adjusted to (i) exclude the mark to market changes in the fair value of Cyan's warrants, as they were automatically exercised on a cashless basis immediately prior to the effective time of the merger and (ii) exclude the fair value of bifurcated conversion features in Cyan's convertible notes, as these features were no longer bifurcated upon the consummation of the merger. The total amount of these adjustments was \$60.6 million for fiscal 2015.

## TeraXion HSPC Asset Acquisition

On February 1, 2016, Ciena, through a Canadian subsidiary, acquired certain high-speed photonics components ("HSPC") assets of TeraXion Inc. ("TeraXion") and its wholly-owned subsidiary for approximately \$32 million in cash. The assets purchased include TeraXion's high-speed indium phosphide and silicon photonics technologies, as well as the underlying intellectual property. These technologies support the development of Ciena's WaveLogic coherent optical chipsets. This transaction has been accounted for as the acquisition of a business.

The following table summarizes the final purchase price allocation related to the acquisition of the HSPC assets based on the estimated fair value of the acquired assets and assumed liabilities (in thousands):

	Amount
Inventory	\$119
Fixed assets	1,381
Developed technology	16,468
In-process technology	3,949
Goodwill	10,083
Total purchase consideration	\$32,000

Developed technology represents purchased technology that had reached technological feasibility and for which TeraXion had substantially completed development as of the date of acquisition. Fair value was determined using future discounted cash flows related to the projected income stream of the developed technology for a discrete projection period. Cash flows were discounted to their present value as of the closing date. Developed technology is amortized on a straight line basis over its estimated useful life of five years.

In-process technology represents purchased technology that had not reached technological feasibility as of the date of acquisition. Fair value was determined using future discounted cash flows related to the projected income stream of the in-process technology for a discrete projection period. Cash flows were discounted to their present value as of the closing date. Upon completion of the in-process technology, it will be amortized on a straight line basis over its estimated useful life, which will be determined on that date.

The goodwill generated from the acquisition of the HSPC assets was primarily related to expected synergies and has been allocated to the Networking Platforms segment. The goodwill is not deductible for income tax purposes.

Pro forma disclosures have not been included due to immateriality.

**(3) RESTRUCTURING COSTS**

Ciena has undertaken a number of restructuring activities intended to reduce expense and better align its workforce and costs with market opportunities, product development and business strategies. The following table sets forth the restructuring activity and balance of the restructuring liability accounts for the fiscal years indicated (in thousands):



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	Workforce reduction	Consolidation of excess facilities	Total
Balance at October 31, 2014	\$ 181	\$ 1,134	\$1,315
Additional liability recorded	8,631	(1) (5 )	8,626
Cash payments	(8,221 )	(441 )	(8,662 )
Balance at October 31, 2015	591	688	1,279
Additional liability recorded	2,844	(2) 2,089	4,933
Cash payments	(2,567 )	(807 )	(3,374 )
Balance at October 31, 2016	868	1,970	2,838
Additional liability recorded	5,883	(3) 5,432	(4) 11,315
Adjustment to previous estimates	—	(1,048 )	(1,048 )
Cash payments	(5,460 )	(4,706 )	(10,166)
Balance at October 31, 2017	\$ 1,291	\$ 1,648	\$2,939
Current restructuring liabilities	\$ 1,291	\$ 1,648	\$2,939
Non-current restructuring liabilities	\$ —	\$ —	\$—

(1) During fiscal 2015, Ciena recorded a charge of \$8.6 million of severance and other employee-related costs associated with a workforce reduction of approximately 125 employees.

(2) During fiscal 2016, Ciena recorded a charge of \$2.8 million of severance and other employee-related costs associated with a workforce reduction of approximately 75 employees.

(3) During fiscal 2017, Ciena recorded a charge of \$5.9 million of severance and other employee-related costs associated with a workforce reduction of approximately 100 employees.

(4) Reflects unfavorable lease commitments and relocation costs incurred in connection with our research and development center facility transitions in Ottawa, Canada

**(4) INTEREST AND OTHER INCOME (LOSS), NET**

The components of interest and other income (loss), net, were as follows (in thousands):

	Year Ended October 31,		
	2017	2016	2015
Interest income	\$6,579	\$4,058	\$1,178
Gain (loss) on non-hedge designated foreign currency forward contracts	(1,198 )	(23,355 )	23,243
Foreign currency exchange gains (losses)	(4,376 )	5,870	(47,607 )
Modification of debt	(3,616 )	—	—
Other	(133 )	632	(2,319 )
Interest and other income (loss), net	\$(2,744)	\$(12,795)	\$(25,505)

Ciena Corporation, as the U.S. parent entity, uses the U.S. Dollar as its functional currency; however, some of its foreign branch offices and subsidiaries use the local currency as their functional currency. During fiscal 2017 and fiscal 2015, Ciena recorded \$4.4 million and \$47.6 million, respectively, in exchange rate losses, as a result of monetary assets and liabilities that were transacted in a currency other than the entity's functional currency, and the re-measurement adjustments were recorded in interest and other income (loss), net. In fiscal 2016, Ciena recorded \$5.9 million in foreign currency exchange gains. From time to time, Ciena uses foreign currency forwards to hedge these balance sheet exposures. These forwards are not designated as hedges for accounting purposes, and any net gain or loss associated with these derivatives is reported in interest and other income (loss), net. During fiscal 2017 and fiscal 2016, Ciena recorded losses of \$1.2 million and \$23.4 million, respectively, from non-hedge designated foreign currency forward contracts. During fiscal 2015, Ciena recorded gains of \$23.2 million from non-hedge designated foreign currency forward contracts.

**(5) SHORT-TERM AND LONG-TERM INVESTMENTS**

As of October 31, 2017, investments are comprised of the following (in thousands):

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	October 31, 2017			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
U.S. government obligations:				
Included in short-term investments	\$249,498	\$ —	\$ (305 )	\$249,193
Included in long-term investments	49,910	—	(127 )	49,783
	\$299,408	\$ —	\$ (432 )	\$298,976
Commercial paper:				
Included in short-term investments	\$29,939	\$ 1	\$ —	\$29,940
	\$29,939	\$ 1	\$ —	\$29,940

As of October 31, 2016, investments are comprised of the following (in thousands):

	October 31, 2016			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
U.S. government obligations:				
Included in short-term investments	\$260,125	\$ 140	\$ (6 )	\$260,259
Included in long-term investments	90,145	57	(30 )	90,172
	\$350,270	\$ 197	\$ (36 )	\$350,431
Commercial paper:				
Included in short-term investments	\$14,989	\$ —	\$ —	\$14,989
	\$14,989	\$ —	\$ —	\$14,989

The following table summarizes the legal maturities of debt investments at October 31, 2017:

	October 31, 2017	
	Amortized Cost	Estimated Fair Value
Less than one year	\$279,437	\$279,133
Due in 1-2 years	49,910	49,783
	\$329,347	\$328,916

**(6) FAIR VALUE MEASUREMENTS**

As of the dates indicated, the following tables summarize the fair value of assets and liabilities that were recorded at fair value on a recurring basis (in thousands):

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	October 31, 2017			
	Level 1	Level 2	Level 3	Total
Assets:				
Money market funds	\$511,355	\$—	\$—	—\$511,355
U.S. government obligations	—	298,976	—	298,976
Commercial paper	—	89,865	—	89,865
Foreign currency forward contracts	—	227	—	227
Forward starting interest rate swaps	—	218	—	218
Total assets measured at fair value	\$511,355	\$389,286	\$—	—\$900,641
Liabilities:				
Foreign currency forward contracts	\$—	\$2,129	\$—	—\$2,129
Total liabilities measured at fair value	\$—	\$2,129	\$—	—\$2,129
	October 31, 2016			
	Level 1	Level 2	Level 3	Total
Assets:				
Money market funds	\$625,277	\$—	\$—	—\$625,277
U.S. government obligations	—	350,431	—	350,431
Commercial paper	—	69,959	—	69,959
Foreign currency forward contracts	—	175	—	175
Total assets measured at fair value	\$625,277	\$420,565	\$—	—\$1,045,842
Liabilities:				
Foreign currency forward contracts	\$—	\$1,396	\$—	—\$1,396
Forward starting interest rate swap	—	5,967	—	5,967
Total liabilities measured at fair value	\$—	\$7,363	\$—	—\$7,363

As of the dates indicated, the assets and liabilities above were presented on Ciena's Consolidated Balance Sheet as follows (in thousands):

	October 31, 2017			
	Level 1	Level 2	Level 3	Total
Assets:				
Cash equivalents	\$511,355	\$59,925	\$—	—\$571,280
Short-term investments	—	279,133	—	279,133
Prepaid expenses and other	—	227	—	227
Long-term investments	—	49,783	—	49,783
Other long-term assets	—	218	—	218
Total assets measured at fair value	\$511,355	\$389,286	\$—	—\$900,641
Liabilities:				
Accrued liabilities	\$—	\$2,129	\$—	—\$2,129
Total liabilities measured at fair value	\$—	\$2,129	\$—	—\$2,129

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	October 31, 2016			Total
	Level 1	Level 2	Level 3	
Assets:				
Cash equivalents	\$625,277	\$54,970	\$	—\$680,247
Short-term investments	—	275,248	—	275,248
Prepaid expenses and other	—	175	—	175
Long-term investments	—	90,172	—	90,172
Total assets measured at fair value	\$625,277	\$420,565	\$	—\$1,045,842
Liabilities:				
Accrued liabilities	\$—	\$1,396	\$	—\$1,396
Other long-term obligations	—	5,967	—	5,967
Total liabilities measured at fair value	\$—	\$7,363	\$	—\$7,363

Ciena did not have any transfers between Level 1 and Level 2 fair value measurements during the periods presented.

**(7) ACCOUNTS RECEIVABLE**

As of October 31, 2017, two customers accounted for 23.0% of net accounts receivable. As of October 31, 2016, one customer accounted for 10.4% of net accounts receivable. Prior to fiscal 2017, Ciena has not historically experienced a significant amount of bad debt expense. During fiscal 2017, Ciena's allowance for doubtful accounts includes a provision for a significant asset impairment of \$13.7 million for a trade receivable related to a single customer in the APAC region. The following table summarizes the activity in Ciena's allowance for doubtful accounts for the fiscal years indicated (in thousands):

Year ended	Beginning		Net	Ending
October 31,	Balance	Provisions	Deductions	Balance
2015	\$ 2,083	\$ 1,576	\$ 696	\$2,963
2016	\$ 2,963	\$ 1,701	\$ 701	\$3,963
2017	\$ 3,963	\$ 18,221	\$ 4,604	\$17,580

**(8) INVENTORIES**

As of the dates indicated, inventories are comprised of the following (in thousands):

	October 31,	
	2017	2016
Raw materials	\$52,898	\$44,644
Work-in-process	18,623	12,852
Finished goods	185,488	156,402
Deferred cost of goods sold	61,340	59,856
	318,349	273,754
Provision for excess and obsolescence	(51,206 )	(62,503 )
	\$267,143	\$211,251



Ciena writes down its inventory for estimated obsolescence or unmarketable inventory by an amount equal to the difference between the cost of inventory and the estimated net realizable value based on assumptions about future demand and market conditions. During fiscal 2017, Ciena recorded a provision for excess and obsolescence of \$35.5 million, primarily related to a decrease in the forecasted demand for certain Converged Packet Optical products. During fiscal 2016, Ciena recorded a provision for excess and obsolescence of \$33.7 million, primarily related to a decrease in the forecasted demand for certain

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Converged Packet Optical and Optical Transport products. During fiscal 2015, Ciena recorded a provision for excess and obsolescence of \$26.8 million, primarily related to the discontinuance of certain parts and components used in the manufacture of its Converged Packet Optical products and a decrease in the forecasted demand for both its legacy, stand-alone WDM and SONET/SDH-based transport platforms and its 5410 Service Aggregation Switch. Deductions from the provision for excess and obsolete inventory relate to disposal activities.

The following table summarizes the activity in Ciena's reserve for excess and obsolete inventory for the fiscal years indicated (in thousands):

Year ended	Beginning			Ending
October 31,	Balance	Provisions	Disposals	Balance
2015	\$ 60,126	\$ 26,846	\$ 33,971	\$ 53,001
2016	\$ 53,001	\$ 33,713	\$ 24,211	\$ 62,503
2017	\$ 62,503	\$ 35,459	\$ 46,756	\$ 51,206

**(9) PREPAID EXPENSES AND OTHER**

As of the dates indicated, prepaid expenses and other are comprised of the following (in thousands):

	October 31,	
	2017	2016
Prepaid VAT and other taxes	\$91,647	\$77,474
Product demonstration equipment, net	40,713	42,259
Deferred deployment expense	26,934	19,138
Prepaid expenses	26,114	25,659
Financing receivable	2,049	3,740
Other non-trade receivables	9,655	4,398
Derivative assets	227	175
	\$197,339	\$172,843

Depreciation of product demonstration equipment was \$10.0 million, \$10.7 million and \$9.8 million for fiscal 2017, 2016 and 2015, respectively.

**(10) EQUIPMENT, BUILDING, FURNITURE AND FIXTURES**

As of the dates indicated, equipment, building, furniture and fixtures are comprised of the following (in thousands):

	October 31,	
	2017	2016
Equipment, furniture and fixtures	\$486,451	\$451,029
Building subject to capital lease	76,702	22,529
Construction in progress, subject to build-to-suit lease	—	57,602
Leasehold improvements	87,763	60,011
	650,916	591,171
Accumulated depreciation and amortization	(342,451 )	(302,765 )
	\$308,465	\$288,406

Ciena capitalizes construction in progress and records a corresponding long-term liability for build-to-suit lease agreements where Ciena is considered the owner, for accounting purposes, during the construction period. On April 15, 2015, Ciena entered into a build-to-suit lease arrangement pursuant to which the landlord constructed, and Ciena subsequently leased, two new office buildings at its new Ottawa, Canada campus. The landlord constructed the buildings and contributed up to a maximum of CAD\$290.00 per rentable square foot in total construction costs plus certain allowances for tenant improvements, and Ciena was responsible for any additional construction costs. As of

May 1, 2017, occupancy for both of the office buildings

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was complete. As such, Ciena recorded capital leases of \$50.4 million for these buildings, which will be depreciated over the lease term and removed the build-to-suit construction in progress asset and the corresponding long-term liability.

During fiscal 2017, fiscal 2016 and fiscal 2015, Ciena recorded depreciation of equipment, furniture and fixtures, and amortization of leasehold improvements of \$67.2 million, \$52.7 million and \$46.1 million, respectively.

**(11) INTANGIBLE ASSETS**

As of the dates indicated, intangible assets are comprised of the following (in thousands):

	October 31, 2017			2016		
	Gross Intangible	Accumulated Amortization	Net Intangible	Gross Intangible	Accumulated Amortization	Net Intangible
Developed technology	\$ 341,255	\$ (266,693 )	\$ 74,562	\$ 347,727	\$ (248,128 )	\$ 99,599
In-process research and development	671	—	671	4,200	—	4,200
Patents and licenses	7,165	(6,535 )	630	7,165	(6,285 )	880
Customer relationships, covenants not to compete, outstanding purchase orders and contracts	334,642	(309,508 )	25,134	358,647	(316,615 )	42,032
Total intangible assets	\$ 683,733	\$ (582,736 )	\$ 100,997	\$ 717,739	\$ (571,028 )	\$ 146,711

During the third quarter of fiscal 2017 and the second quarter of fiscal 2016, certain fully amortized intangible assets of approximately \$34.0 million and \$246.4 million, respectively, were eliminated from gross intangible assets and accumulated amortization during the period, with no corresponding impact to the income statement. These assets were primarily technology for products no longer being sold by Ciena.

As the result of the acquisition of the high-speed photonics components assets from TeraXion and its wholly-owned subsidiary on February 1, 2016, Ciena had recorded in-process research and development projects acquired as indefinite-lived intangible assets. Upon completion of the projects, the assets will be amortized on a straight-line basis over the expected economic life of the assets. In the third quarter of fiscal 2017, Ciena placed into service \$3.5 million of developed technology, which will be amortized over the expected economic life of five years.

The aggregate amortization expense of intangible assets was \$45.7 million, \$78.3 million and \$79.9 million for fiscal 2017, fiscal 2016 and fiscal 2015, respectively. Expected future amortization of intangible assets for the fiscal years indicated is as follows (in thousands):

Year Ended October 31,	
2018	\$ 23,386
2019	22,839
2020	21,812
2021	18,878
2022	13,347
Thereafter	64
	\$ 100,326 <sup>(1)</sup>

(1) Does not include amortization of in-process research and development, as estimation of the timing of future amortization expense would be impractical.

**(12) GOODWILL**

Ciena's goodwill was generated from its acquisition of Cyan during fiscal 2015 and its acquisition of the HSPC assets of TeraXion during fiscal 2016, and it is primarily related to expected synergies. The following table presents the goodwill allocated to Ciena's reportable segments as of the dates indicated (in thousands):

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	Balance at October 31, 2016	Acquisitions	Impairments	Translation	Balance at October 31, 2017
Software and Software-Related Services	\$201,428	\$ —	—\$	—	\$201,428
Networking Platforms	65,546	—	—	484	66,030
Total	\$266,974	\$ —	—\$	484	\$267,458

**(13) OTHER BALANCE SHEET DETAILS**

As of the dates indicated, other long-term assets are comprised of the following (in thousands):

	October 31,	
	2017	2016
Maintenance spares inventory, net	\$46,872	\$49,535
Minority equity investments	6,000	6,000
Deferred debt issuance costs, net <sup>(1)</sup>	1,041	1,363
Financing receivable	1,052	1,870
Forward starting interest rate swaps	219	—
Other	8,409	8,236
	\$63,593	\$67,004

(1) As described in Note 1 above, in connection with Ciena's adoption of ASU 2015-03 during the first quarter of fiscal 2017, deferred debt issuance costs associated with its convertible notes and term loans were retrospectively reclassified from other long-term assets to current portion of long-term debt and long-term debt, net on the Consolidated Balance Sheets. The remaining deferred debt issuance costs reflected relate to Ciena's ABL Credit Facility (described in Note 17 below). The amortization of deferred debt issuance costs for Ciena's ABL Credit Facility is included in interest expense, and was \$0.3 million, \$0.4 million and \$0.7 million for fiscal 2017, fiscal 2016 and fiscal 2015, respectively.

As of the dates indicated, accrued liabilities and other short-term obligations are comprised of the following (in thousands):

	October 31,	
	2017	2016
Compensation, payroll related tax and benefits	\$113,272	\$106,687
Warranty	42,456	52,324
Vacation	39,778	36,112
Capital lease obligations	3,772	2,321
Interest payable	3,612	4,649
Other	120,044	108,260
	\$322,934	\$310,353

The following table summarizes the activity in Ciena's accrued warranty for the fiscal years indicated (in thousands):

Year ended	Beginning		Current	Ending	
October 31,	Balance	Acquired	Year Provisions <sup>(1)</sup>	Settlements	Balance
2015	\$ 55,997	\$ 2,996	\$ 17,881	\$ 20,220	\$56,654
2016	\$ 56,654	\$ —	\$ 15,483	\$ 19,813	\$52,324

2017	\$ 52,324	\$ —	\$ 7,965	\$ 17,833	\$42,456
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(1) As a result of actual failure rates lower than expected, we adjusted our current year provisions for warranty. These adjustments for previous years provisions had the effect of reducing warranty provisions by \$9.7 million, \$5.3 million and \$6.5 million for fiscal 2017, 2016 and 2015 respectively.

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The decreases in the current year warranty provisions and the recording of adjustments on prior year provisions during fiscal 2017, fiscal 2016 and fiscal 2015 were primarily due to lower failure rates than previously estimated, as mentioned above, and reduced costs due to efficiencies.

As of the dates indicated, deferred revenue is comprised of the following (in thousands):

	October 31,	
	2017	2016
Products	\$49,135	\$45,216
Services	135,872	137,647
	185,007	182,863
Less current portion	(102,418)	(109,009)
Long-term deferred revenue	\$82,589	\$73,854

As of the dates indicated, other long-term obligations are comprised of the following (in thousands):

	October 31,	
	2017	2016
Capital lease obligations	73,407	24,298
Income tax liability	15,445	14,122
Deferred tenant allowance	8,162	9,164
Straight-line rent	7,267	6,406
Forward starting interest rate swaps	—	5,967
Construction liability	—	57,602
Other	7,068	6,835
	\$111,349	\$124,394

Ciena capitalizes construction in progress and records a corresponding long-term liability for build-to-suit lease agreements where Ciena is considered the owner during the construction period for accounting purposes. As of May 1, 2017, occupancy of both office buildings was complete. As such, Ciena recorded capital leases for these buildings, which will be depreciated over the lease terms, and removed the build-to-suit construction in progress asset and the corresponding long-term liability. See Note 10 for more details regarding this arrangement.

The following is a schedule by fiscal years of future minimum lease payments under capital leases and the present value of minimum lease payments as of October 31, 2017 (in thousands):

Year Ending October 31,	Amount
2018	\$9,251
2019	8,828
2020	7,846
2021	7,742
2022	8,064
Thereafter	85,405
Net minimum capital lease payments	127,136
Less: Amount representing interest	(49,957 )
Present value of minimum lease payments	77,179
Less: Current portion of present value of minimum lease payments	(3,772 )
Long-term portion of present value of minimum lease payments	\$73,407



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## (14) DERIVATIVE INSTRUMENTS

## Foreign Currency Derivatives

As of October 31, 2017 and 2016, Ciena had forward contracts to hedge its foreign exchange exposure in order to reduce the variability in its Canadian Dollar and Indian Rupee denominated expense, which principally relates to research and development activities, and its British Pound denominated expense, which principally relates to sales and marketing activities. The notional amount of these contracts was approximately \$86.1 million and \$107.6 million as of October 31, 2017 and October 31, 2016, respectively. These foreign exchange contracts have maturities of 12 months or less and have been designated as cash flow hedges.

During fiscal 2017 and fiscal 2016, in order to hedge certain balance sheet exposures, Ciena entered into forward contracts to mitigate risk due to volatility in the Brazilian Real, Canadian Dollar and Mexican Peso. The notional amount of these contracts was approximately \$83.4 million and \$59.6 million as of October 31, 2017 and October 31, 2016. These foreign exchange contracts have maturities of 12 months or less and have not been designated as hedges for accounting purposes.

## Interest Rate Derivatives

Ciena is exposed to floating rates of LIBOR interest on its term loan borrowings (see Note 16 below) and has hedged such risk by entering into floating to fixed interest rate swap arrangements ("interest rate swaps"). During the second quarter of fiscal 2017, Ciena refinanced its existing 2019 and 2021 Term Loans into a new 2022 Term Loan, thereby reducing the aggregate outstanding principal to \$400 million and extending the maturity to January 2022 (see Note 16 below). In order to align its interest rate hedges to the reduced 2022 Term Loan principal value and later maturity date, Ciena also reduced the total outstanding value of its interest rate swaps, as described below, and entered into new forward starting interest rate swaps in January 2017 and February 2017, respectively. The interest rate swaps, as adjusted, fix 98%, 82% and 77% of the principal value of the 2022 Term Loan from February 2017 through July 2018, July 2018 through June 2020, and June 2020 through January 2021, respectively. The fixed rate on the amounts hedged during these periods will be 4.25%, 4.25% and 4.75%, respectively. The total notional amount of these interest rate swaps in effect as of October 31, 2017 was \$389.6 million.

During fiscal 2014, Ciena entered into interest rate swaps that fixed the interest rate under the 2019 Term Loan (as defined in Note 16) at 5.004% for the period commencing on July 20, 2015 through July 19, 2018. The total notional amount of these derivatives as of October 31, 2016 was \$244.4 million. In May 2016, Ciena entered into interest rate swaps that fixed the total interest rate under the 2021 Term Loan (as defined in Note 16) at 4.62% to 4.87%, depending on the applicable margin, for the period commencing on June 20, 2016 through June 22, 2020. The total notional amount of these derivatives as of October 31, 2016 was \$248.8 million.

Ciena expects the variable rate payments to be received under the terms of the interest rate swaps to offset exactly the forecasted variable rate payments on the equivalent notional amounts of the term loans. These derivative contracts have been designated as cash flow hedges.

Other information regarding Ciena's derivatives is immaterial for separate financial statement presentation. See Note 4 and Note 6 above.

## (15) ACCUMULATED OTHER COMPREHENSIVE INCOME

The following table summarizes the changes in accumulated balances of other comprehensive income ("AOCI"):

	Unrealized Gain/(Loss) on Available-for-Sale Securities	Unrealized Gain/(Loss) on Foreign Currency Forward Contracts	Unrealized Gain/(Loss) on Forward Starting Interest Rate Swaps	Cumulative Foreign Currency Translation Adjustment	Total
Balance at October 31, 2014	\$ 71	\$ (173 )	\$ (2,083 )	\$ (12,483 )	\$ (14,668 )
Other comprehensive loss before reclassifications	(149 )	(5,547 )	(4,232 )	(3,775 )	(13,703 )
Amounts reclassified from AOCI	—	5,452	793	—	6,245
Balance at October 31, 2015	(78 )	(268 )	(5,522 )	(16,258 )	(22,126 )
Other comprehensive gain/(loss) before reclassifications	217	(1,453 )	(4,101 )	(1,152 )	(6,489 )
Amounts reclassified from AOCI	—	630	3,656	—	4,286
Balance at October 31, 2016	139	(1,091 )	(5,967 )	(17,410 )	(24,329 )
Other comprehensive gain/(loss) before reclassifications	(590 )	1,290	3,669	8,012	12,381
Amounts reclassified from AOCI	—	(1,585 )	2,516	—	931
Balance at October 31, 2017	\$ (451 )	\$ (1,386 )	\$ 218	\$ (9,398 )	\$ (11,017 )

All amounts reclassified from AOCI related to settlement (gains) losses on foreign currency forward contracts designated as cash flow hedges impacted research and development expense or sales and marketing expense on the Consolidated Statements of Operations. All amounts reclassified from AOCI related to settlement (gains) losses on forward starting interest rate swaps designated as cash flow hedges impacted interest and other income (loss), net on the Consolidated Statements of Operations.

#### (16) SHORT-TERM AND LONG-TERM DEBT

##### Outstanding Term Loan Payable

The net carrying values of Ciena's term loans were comprised of the following for the fiscal periods indicated (in thousands):

	October 31, 2017	October 31, 2016
Term Loan Payable due July 15, 2019	\$—	\$241,359
Term Loan Payable due April 25, 2021	—	244,944
Term Loan Payable due January 30, 2022	392,972	—
	\$392,972	\$486,303

The term loan balances in the table above reflect Ciena's adoption of ASU 2015-03, as described in Note 1 above. Deferred debt issuance costs that were deducted from the carrying amounts of the term loans totaled \$3.1 million at October 31, 2017 and \$4.9 million at October 31, 2016. Deferred debt issuance costs are amortized using the straight-line method, which approximates the effect of the effective interest rate method, through the maturity of the term loans. The amortization of deferred debt issuance costs for these term loans is included in interest expense, and was \$0.9 million, \$1.1 million and \$0.8 during fiscal 2017, fiscal 2016 and fiscal 2015, respectively. The carrying values of the term loans listed above are also net of any unamortized debt discounts.

##### 2022 Term Loan

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On January 30, 2017, Ciena, as borrower, and Ciena Communications, Inc. and Ciena Government Solutions, Inc., as guarantors, entered into an Omnibus Refinancing Amendment to the Credit Agreement, Security Agreement and Pledge Agreement with the lenders party thereto and the administrative agent (the “Refinancing Agreement”), pursuant to which Ciena refinanced its existing 2019 Term Loan and 2021 Term Loan (as described under "Prior Term Loans" below) into a single term loan with an aggregate principal amount of \$400 million maturing on January 30, 2022 (the “2022 Term Loan”). In connection with the transaction, Ciena received a loan in the amount of \$399.5 million, net of original discount, from the 2022 Term Loan and repaid \$493.1 million of outstanding principal under the 2019 Term Loan and 2021 Term Loan. The 2022 Term Loan requires Ciena to make installment payments of approximately \$1.0 million on a quarterly basis. This arrangement was accounted for as a modification of debt and, as such, \$2.9 million of debt issuance costs associated with the 2022 Term Loan were expensed. The aggregate balance of \$3.5 million of debt issuance costs and approximately \$1.7 million of original discount from the 2019 Term Loan and the 2021 Term Loan, and approximately \$0.5 million of original discount from the 2022 Term Loan, were included in the carrying value of the 2022 Term Loan.

The Refinancing Agreement amends the Term Loan Credit Agreement (as defined below) and provides that the 2022 Term Loan will, among other things:

be subject to mandatory prepayment on the same basis as under the Term Loan Credit Agreement;

bear interest, at Ciena’s election, at a per annum rate equal to (a) LIBOR (subject to a floor of 0.75%) plus an applicable margin of 2.50%, or (b) a base rate (subject to a floor of 1.75%) plus an applicable margin of 1.50%; and

be repayable at any time at Ciena's election, provided that repayment of the 2022 Term Loan with proceeds of certain indebtedness prior to July 30, 2017 will require a prepayment premium of 1.00% of the aggregate principal amount of such prepayment.

Except as amended by the Refinancing Agreement, the remaining terms of the Term Loan Credit Agreement remain in full force and effect.

The principal balance, unamortized debt discount, deferred debt issuance costs and net carrying value of the liability components of Ciena's 2022 Term Loan were as follows as of October 31, 2017 (in thousands):

	Principal Balance	Unamortized Discount	Deferred Debt Issuance Costs	Net Carrying Value
Term Loan Payable due January 30, 2022	\$398,000	\$ (1,923 )	\$(3,105 )	\$392,972

The following table sets forth the carrying value and the estimated fair value of Ciena's 2022 Term Loan (in thousands):

	October 31, 2017	
	Carrying Value <sup>(1)</sup>	Fair Value <sup>(2)</sup>
Term Loan Payable due January 30, 2022	\$392,972	\$398,995

(1) Includes unamortized debt discount and debt issuance costs.

Ciena's term loan is categorized as Level 2 in the fair value hierarchy. Ciena estimated the fair value of its 2022

(2) Term Loan using a market approach based upon observable inputs, such as current market transactions involving comparable securities.

Prior Term Loans

On July 15, 2014, Ciena entered into a Term Loan Credit Agreement (the "Term Loan Credit Agreement") providing for senior secured term loans in an aggregate principal amount of \$250 million (the "2019 Term Loan") with a maturity date of July 15, 2019. The 2019 Term Loan required Ciena to make installment payments of approximately \$0.6 million on a quarterly basis.

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On April 25, 2016, Ciena entered into an Incremental Joinder and Amendment Agreement (the “Incremental Term Loan Credit Agreement”) that amended the Term Loan Credit Agreement. The Incremental Term Loan Credit Agreement provided for a new tranche of senior secured term loans under the Term Loan Credit Agreement in an aggregate principal amount of \$250 million (the “2021 Term Loan”). The 2021 Term Loan required Ciena to make installment payments of approximately \$0.6 million on a quarterly basis.

## Outstanding Convertible Notes Payable

The net carrying values of Ciena's outstanding convertible notes payable was comprised of the following for the fiscal periods indicated (in thousands):

	October 31, 2017	October 31, 2016
0.875% Convertible Senior Notes due June 15, 2017	\$—	\$231,240
3.75% Convertible Senior Notes due October 15, 2018 (Original)	61,071	347,630
3.75% Convertible Senior Notes due October 15, 2018 (New)	287,221	—
4.0% Convertible Senior Notes due December 15, 2020	194,717	188,509
	\$543,009	\$767,379

The convertible notes payable balances in the table above reflects Ciena's adoption of ASU 2015-03, as described in Note 1 above. Deferred debt issuance costs that were deducted from the carrying amounts of the convertible notes payable totaled \$2.1 million at October 31, 2017 and \$4.0 million at October 31, 2016. Deferred debt issuance costs are amortized using the straight-line method, which approximates the effect of the effective interest rate method, through the maturity of the convertible notes payable. The amortization of deferred debt issuance costs for these convertible notes are included in interest expense, and were \$1.8 million, \$2.7 million and \$3.2 million during fiscal 2017, fiscal 2016 and fiscal 2015, respectively. The carrying values of the term loans listed above are also net of any unamortized debt discounts.

Ciena has three issuances of convertible notes payable outstanding. The notes are senior unsecured obligations of Ciena and rank equally with all of Ciena's other existing and future senior unsecured debt. The indentures governing Ciena's notes provide for customary events of default which include (subject in certain cases to customary grace and cure periods), among others, the following: nonpayment of principal or interest; breach of covenants or other agreements in the indenture; defaults in or failure to pay certain other indebtedness; and certain events of bankruptcy or insolvency. Generally, if an event of default occurs and is continuing, the trustee or the holders of at least 25% in aggregate principal amount of the notes may declare the principal of, accrued interest on, and premium, if any, on all the notes immediately due and payable. Under the indentures, if Ciena undergoes a “fundamental change” (as that term is defined in the indenture governing the notes to include certain change in control transactions), holders of notes will have the right, subject to certain exemptions, to require Ciena to purchase for cash any or all of their notes at a price equal to the principal amount, plus accrued interest. If the holder elects to convert his or her notes in connection with a specified fundamental change Ciena will be required, in certain circumstances, to increase the applicable conversion rate, depending on the price paid per share for Ciena common stock and the effective date of the fundamental change.

## 0.875% Convertible Senior Notes due June 15, 2017

On June 11, 2007, Ciena completed a public offering of 0.875% Convertible Senior Notes due June 15, 2017 (the “2017 Notes”), in aggregate principal amount of \$500.0 million. Interest was payable on June 15 and December 15 of each year, beginning on December 15, 2007.

At the election of the holder, the 2017 Notes could be converted prior to maturity into shares of Ciena common stock at the initial conversion rate of 26.2154 shares per \$1,000 in principal amount, which is equivalent to an initial conversion price of approximately \$38.15 per share. The 2017 Notes were not redeemable by Ciena prior to maturity. Ciena used approximately \$42.5 million of the net proceeds of this offering to purchase a call spread option on its common stock that intended to limit exposure to potential dilution from conversion of the 2017 Notes. See Note 19 below for a description of this call spread option.

During fiscal 2016 and fiscal 2017, Ciena entered into certain private transactions to repurchase \$262.5 million and \$46.3 million of the 2017 Notes, respectively, in cash for purchase prices slightly below par. On July 15, 2017, the outstanding 0.875% Convertible Senior Notes matured and Ciena repaid the approximately \$185.3 million in aggregate principal amount outstanding, together with approximately \$0.8 million in accrued interest through the date of maturity.

3.75% Convertible Senior Notes, due October 15, 2018

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On October 18, 2010, Ciena completed a private placement of 3.75% Convertible Senior Notes due October 15, 2018 (the “Original Notes”), in aggregate principal amount of \$350.0 million. Interest is payable on the Original Notes on April 15 and October 15 of each year, beginning on April 15, 2011.

At the election of the holder, the Original Notes may be converted prior to maturity into shares of Ciena common stock at the initial conversion rate of 49.5872 shares per \$1,000 in principal amount, which is equivalent to an initial conversion price of approximately \$20.17 per share. The net proceeds from the offering were approximately \$340.4 million after deducting the placement agents’ fees and other fees and expenses.

On August 2, 2017, Ciena completed its offer to exchange its outstanding 3.75% Convertible Senior Notes due 2018 (the “Original Notes”) for a new series of 3.75% Convertible Senior Notes due 2018 (the “New Notes”) and an exchange fee of \$2.50 per \$1,000 original principal amount, or \$0.7 million. Following settlement of the exchange, \$61.3 million in aggregate principal amount at maturity of Original Notes and \$288.7 million in aggregate principal amount at maturity of the New Notes were outstanding. Interest is payable on the New Notes on April 15 and October 15 of each year, beginning October 15, 2017.

The New Notes give Ciena the option, at its election, to settle conversions of such notes for cash, shares of its common stock, or a combination of cash and shares equal to the aggregate amount due upon conversion. It is Ciena’s intent to settle the principal amount of the New Notes in cash upon any conversion. As a result, only the amounts payable in excess of the principal amounts upon conversion of the New Notes are considered diluted earnings per share under the treasury stock method. Except with respect to the additional cash settlement options upon conversion, the New Notes were issued on substantially the same terms as the Original Notes including the holder conversion option and interest payment dates described above. Since the calculated fair value of the liability component was greater than the fair value of the New Notes, there was no impact to equity for the New Notes. This arrangement was accounted for as a modification of debt and, as such, \$0.7 million of debt issuance costs associated with the New Notes was expensed, and the aggregate balance of \$1.2 million of debt issuance costs for the Old Notes and approximately \$0.7 million of original discount from the New Notes were included in the carrying value of the New Notes.

#### 4.0% Convertible Senior Notes due December 15, 2020

On December 27, 2012, Ciena issued \$187.5 million in aggregate principal amount of 4.0% Convertible Senior Notes due December 15, 2020 (the “2020 Notes”) in separate private offerings in exchange for \$187.5 million in aggregate principal amount of 2015 Notes above.

The 2020 Notes are senior unsecured obligations and rank equally with all of Ciena’s other existing and future senior unsecured debt. The 2020 Notes pay interest from the date of issuance at a rate of 4.0% per year. The interest is payable semi-annually on June 15 and December 15, commencing on June 15, 2013. The principal amount of the 2020 Notes will also accrete at a rate of 1.85% per year commencing December 27, 2012, compounding on a semi-annual basis. The accreted portion of the principal payable at maturity does not bear interest and is not convertible into shares of Ciena’s common stock. The 2020 Notes will mature on December 15, 2020. Consequently, in the event the 2020 Notes are converted, the accreted liability will extinguish without payment.

The 2020 Notes may be converted prior to maturity, at the option of the holder, into shares of Ciena’s common stock at an initial conversion rate of 49.0557 shares of common stock per \$1,000 in original principal amount, which is equal to an initial conversion price of \$20.39 per share. In addition, Ciena may elect to convert the 2020 Notes, in whole or in part, at any time on or prior to December 15, 2020, if the daily volume weighted average price of the common stock equals or exceeds 130% of the conversion price then in effect for at least 20 trading days in any 30 consecutive trading day period. If Ciena elects to convert the 2020 Notes on or before maturity, the conversion rate will be adjusted to include an amount of additional shares, determined by reference to a make-whole table, payable in Ciena common stock, or its cash equivalent, at Ciena’s election. An aggregate of 9,197,944 shares of Ciena common stock issuable upon conversion of the 2020 Notes has been reserved for issuance.

Upon certain fundamental changes, holders of the 2020 Notes have the option to require Ciena to purchase the 2020 Notes at a price equal to the accreted principal amount of the notes delivered for repurchase plus any accrued and unpaid interest on the original principal amount. Upon a holder’s election to convert the 2020 Notes in connection with certain fundamental changes, the conversion rate will be adjusted to include an amount of additional shares,

determined by reference to a make-whole table, payable in Ciena common stock, or its cash equivalent, at Ciena's election.

Accounting guidance issued by the FASB requires the issuer of convertible debt instruments with cash settlement features, including partial cash settlement, to account separately for the liability and equity components of the instrument. Under this guidance, the debt is recognized at the present value of its cash flows discounted using the issuer's nonconvertible debt borrowing rate at the time of issuance, and the equity component is recognized as the difference between the proceeds from the issuance of the note and the fair value of the liability. The reduced carrying value on the convertible debt results in a debt discount that is accreted back to the convertible debt's principal amount through the recognition of non-cash interest expense



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over the expected life of the debt, which results in recognizing the interest expense on these borrowings at effective rates approximating what Ciena would have incurred had nonconvertible debt with otherwise similar terms been issued.

Because the additional make-whole shares can be settled in cash or common stock at Ciena's option, the debt and equity components were accounted for separately. Ciena measured the fair value of the debt component of the 2020 Notes using an effective interest rate of 7.0%. As a result, Ciena attributed \$170.4 million of the fair value of the 2020 Notes to the debt component. The debt component was netted against the face value of the 2020 Notes to determine the debt discount. The debt discount will be accreted over the period from the date of issuance to the contractual maturity date, resulting in the recognition of non-cash interest expense. In addition, Ciena recorded \$43.1 million within additional paid-in capital representing the equity component of the 2020 Notes. There was no net tax expense recorded at that time due to Ciena's full valuation allowance against its deferred tax assets.

The 2020 Notes were issued pursuant to an Indenture entered into as of December 27, 2012 (the "Indenture") with The Bank of New York Mellon Trust Company, N.A., as trustee. The Indenture provides for customary events of default which include (subject in certain cases to customary grace and cure periods), among others, the following: nonpayment of principal (including accreted portion) or interest; breach of covenants or other agreements in the Indenture; defaults in failure to pay certain other indebtedness; and certain events of bankruptcy or insolvency.

Generally, if an event of default occurs and is continuing under the Indenture, the trustee or the holders of at least 25% in aggregate original principal amount of the 2020 Notes then outstanding may declare the principal (including accreted portion), premium, if any, and accrued interest on all the 2020 Notes immediately due and payable.

The principal balance, unamortized discount, deferred debt issuance costs and net carrying value of the liability and equity components of Ciena's outstanding issues of convertible notes were as follows as of October 31, 2017:

	Liability Component			Equity Component	
	Principal Balance	Unamortized Discount	Deferred Debt Issuance Costs	Net Carrying Amount	Net Carrying Amount
Original 3.75% Convertible Senior Notes, due October 15, 2018	\$61,270	\$ —	\$ (199 )	\$61,071	\$ —
New 3.75% Convertible Senior Notes, due October 15, 2018	\$288,730	\$ (574 )	\$ (935 )	\$287,221	\$ —
4.0% Convertible Senior Notes due December 15, 2020	\$204,963	\$ (9,289 )	\$ (957 )	\$194,717	\$ 43,131

The following table sets forth, in thousands, the carrying value and the estimated current fair value of Ciena's outstanding convertible notes:

Description	October 31, 2017	
	Carrying Value	Fair Value <sup>(1)</sup>
Original 3.75% Convertible Senior Notes, due October 15, 2018	\$61,071	\$71,900
New 3.75% Convertible Senior Notes, due October 15, 2018 <sup>(2)</sup>	287,221	338,825
4.0% Convertible Senior Notes, due December 15, 2020 <sup>(3)</sup>	194,717	244,406
	\$543,009	\$655,131

The convertible notes were categorized as Level 2 in the fair value hierarchy. Ciena estimates the fair value of its (1) outstanding convertible notes using a market approach based on observable inputs, such as current market transactions involving comparable securities.

(2) Includes unamortized discount.

(3) Includes unamortized discount and accretion of principal.

## (17) ABL CREDIT FACILITY

Ciena Corporation and certain of its subsidiaries are parties to a senior secured asset-based revolving credit facility (the “ABL Credit Facility”) providing for a total commitment of \$250 million with a maturity date of December 31, 2020. Ciena principally uses the ABL Credit Facility to support the issuance of letters of credit that arise in the ordinary course of its business and thereby to reduce its use of cash required to collateralize these instruments.

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As of October 31, 2017, letters of credit totaling \$69.6 million were collateralized by the ABL Credit Facility. There were no borrowings outstanding under the ABL Credit Facility as of October 31, 2017.

**(18) EARNINGS (LOSS) PER SHARE CALCULATION**

The following table (in thousands except per share amounts) is a reconciliation of the numerator and denominator of the basic net income (loss) per common share (“Basic EPS”) and the diluted net income (loss) per potential common share (“Diluted EPS”). Basic EPS is computed using the weighted average number of common shares outstanding. Diluted EPS is computed using the weighted average number of the following, in each case, to the extent the effect is not anti-dilutive: (i) common shares outstanding, (ii) shares issuable upon vesting of restricted stock units, (iii) shares issuable under Ciena’s employee stock purchase plan and upon exercise of outstanding stock options, using the treasury stock method, (iv) shares underlying Ciena’s outstanding convertible notes for which Ciena uses the treasury stock method (New Notes), and (v) shares underlying Ciena’s outstanding convertible notes for which Ciena uses the if-converted method.

## Numerator

	Year Ended October 31,		
	2017	2016	2015
Net income	\$ 1,261,953	\$ 72,584	\$ 11,667
Add: Interest expense associated with 0.875% Convertible Senior Notes due 2017	853	4,801	—
Add: Interest expense associated with 3.75% Convertible Senior Notes due 2018 (Original Notes)	7,224	—	—
Add: Interest expense associated with 4.0% Convertible Senior Notes due 2020	8,691	—	—
Net income used to calculate Diluted EPS	\$ 1,278,721	\$ 77,385	\$ 11,667

## Denominator

	Year Ended October 31,		
	2017	2016	2015
Basic weighted average shares outstanding	141,997	138,312	118,416
Add: Shares underlying outstanding stock options, employee stock purchase plan and restricted stock units	1,354	1,311	1,685
Add: Shares underlying 3.75% Convertible Senior Notes due 2018 (New Notes) <sup>(1)</sup>	404	—	—
Add: Shares underlying 0.875% Convertible Senior Notes due 2017	3,032	11,081	—
Add: Shares underlying 3.75% Convertible Senior Notes due 2018 (Original Notes)	13,934	—	—
Add: Shares underlying 4.0% Convertible Senior Notes due 2020	9,198	—	—
Diluted weighted average shares outstanding	169,919	150,704	120,101

Since Ciena expects to settle the principal amount of the outstanding 3.75% Convertible Senior Notes due 2018 (New Notes) in cash, Ciena uses the treasury stock method for calculating any potential dilutive effect of the conversion spread on diluted net income per share, if applicable. The conversion spread on 14.3 million shares that were converted to the New Notes will have a dilutive impact on diluted net income per share of common stock when the average market price of the Ciena common stock for a given period exceeds the conversion price of \$20.17 per share for the New Notes. During the fourth quarter of fiscal 2017, the average market price of the common stock was \$22.74 which was above \$20.17, as such, the New Notes are dilutive by the conversion spread, or 0.4 million shares.

## EPS

	Year Ended		
	October 31,		
	2017	2016	2015
Basic EPS	\$8.89	\$0.52	\$0.10
Diluted EPS	\$7.53	\$0.51	\$0.10

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The following table summarizes the weighted average shares excluded from the calculation of the denominator for Diluted EPS due to their anti-dilutive effect for the fiscal years indicated (in thousands):

	Year Ended October 31,		
	2017	2016	2015
Shares underlying stock options and restricted stock units	958	1,882	1,562
4.0% Convertible Senior Notes due March 15, 2015	—	—	3,386
0.875% Convertible Senior Notes due June 15, 2017	—	—	13,080
3.75% Convertible Senior Notes due October 15, 2018 (Original Notes)	—	17,355	17,355
8.0% Cyan Convertible Senior Notes due 2019	—	—	187
4.0% Convertible Senior Notes due December 15, 2020	—	9,198	9,198
Total excluded due to anti-dilutive effect	958	28,435	44,768

**(19) STOCKHOLDERS' EQUITY****Call Spread Option**

Ciena purchased a call spread option relating to the 2017 Notes for \$42.5 million during the third quarter of fiscal 2007. The call spread option was designed to mitigate exposure to potential dilution from the conversion of the notes. The call spread option was purchased at the time of the notes offering from an affiliate of the underwriter. The cost of the call spread option was recorded as a reduction in paid-in capital. On June 15, 2017, the outstanding 0.875% Convertible Senior Notes matured and Ciena repaid the approximately \$185.3 million in aggregate principal amount outstanding, together with approximately \$0.8 million in accrued interest through the date of maturity. At this time, the call spread option relating to the 2017 Notes expired.

**(20) INCOME TAXES**

For the periods indicated, the provision (benefit) for income taxes consists of the following (in thousands):

	Year Ended October 31,		
	2017	2016	2015
Provision (benefit) for income taxes:			
Current:			
Federal	\$—	\$—	\$—
State	6,342	5,281	1,435
Foreign	14,563	9,969	10,662
Total current	20,905	15,250	12,097
Deferred:			
Federal	(1,047,699 ) <sup>(1)</sup>	—	—
State	(77,429 ) <sup>(1)</sup>	—	—
Foreign	(1,604 )	(1,116 )	—
Total deferred	(1,126,732 )	(1,116 )	—
Provision (benefit) for income taxes	\$(1,105,827)	\$14,134	\$12,097

(1) The income tax benefit for 2017 includes the reversal of a significant portion of the valuation allowance on Ciena's deferred tax assets in the U.S. See further discussion below.

For the periods indicated, income before provision for income taxes consists of the following (in thousands):

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	Year Ended October 31,		
	2017	2016	2015
United States	\$ 114,242	\$ 58,237	\$ (1,029 )
Foreign	41,884	28,481	24,793
Total	\$ 156,126	\$ 86,718	\$ 23,764

Ciena's foreign income tax as a percentage of foreign income may appear disproportionate compared to the expected tax based on the U.S. federal statutory rate and is dependent upon the mix of earnings and tax rates in our foreign jurisdictions.

For the periods indicated, the tax provision (benefit) reconciles to the amount computed by multiplying income before income taxes by the U.S. federal statutory rate of 35% as follows:

	Year Ended October 31,					
	2017		2016		2015	
Provision at statutory rate	35.00	%	35.00	%	35.00	%
State taxes	2.29	%	4.00	%	6.04	%
Foreign taxes	(0.35	)%	3.11	%	28.98	%
Research and development credit	(15.38	)%	(22.61)	%	(25.55)	%
Non-deductible compensation and other	10.12	%	4.13	%	30.16	%
Valuation allowance	(739.97)	%	(7.33	)%	(23.73)	%
Effective income tax rate	(708.29)	%	16.30	%	50.90	%

As a result of prospective application of Accounting Standards Update No. 2015-17, Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes, Ciena offset all deferred tax liabilities and assets, as well as any related valuation allowance, and is presenting them as a single non-current amount as of October 31, 2017 and 2016. The significant components of deferred tax assets and liabilities are as follows (in thousands):

	October 31,	
	2017	2016
Deferred tax assets:		
Reserves and accrued liabilities	\$ 56,597	\$ 59,791
Depreciation and amortization	451,385	298,497
NOL and credit carry forward	803,622	1,109,304
Other	29,398	23,304
Gross deferred tax assets	1,341,002	1,490,896
Valuation allowance	(185,898 )	(1,489,780)
Deferred tax asset, net of valuation allowance	\$ 1,155,104	\$ 1,116

A reconciliation of the beginning and ending amount of unrecognized tax benefits, excluding interest and penalties, is as follows (in thousands):

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	Amount
Unrecognized tax benefits at October 31, 2014	\$15,100
Increase related to positions taken in prior period	3,658
Increase related to positions taken in current period	9,138
Reductions related to expiration of statute of limitations	(360 )
Unrecognized tax benefits at October 31, 2015	27,536
Increase related to positions taken in prior period	2,187
Increase related to positions taken in current period	2,654
Reductions related to expiration of statute of limitations	(1,709 )
Unrecognized tax benefits at October 31, 2016	30,668
Increase related to positions taken in prior period	122
Increase related to positions taken in current period	111,412
Reductions related to expiration of statute of limitations	(620 )
Unrecognized tax benefits at October 31, 2017	\$141,582

As of October 31, 2017 and 2016, Ciena had accrued \$4.0 million and \$4.6 million of interest and penalties, respectively, related to unrecognized tax benefits within other long-term liabilities in the Consolidated Balance Sheets. Interest and penalties of \$1.2 million and \$0.9 million were recorded to the provision for income taxes during fiscal 2016 and fiscal 2015, respectively. During fiscal 2017, Ciena recorded a net benefit for interest and penalties in its provision for income taxes of \$0.6 million, primarily as a result of recognizing a portion of previously unrecognized tax benefits. If recognized, the entire balance of unrecognized tax benefits would impact the effective tax rate. Over the next 12 months, Ciena does not estimate any material changes in unrecognized income tax benefits.

Ciena has not provided for U.S. deferred income taxes on the cumulative unremitted earnings of its non-U.S. affiliates, as it plans to indefinitely reinvest these foreign earnings outside the U.S. As of October 31, 2017, the cumulative amount of such temporary differences for which a deferred tax liability has not been recognized totaled approximately \$384 million. If these earnings were distributed to the U.S. in the form of dividends, or otherwise, or if the shares of the relevant foreign subsidiaries were sold or otherwise transferred, Ciena would be subject to additional U.S. income taxes (subject to an adjustment for foreign tax credits) and foreign withholding taxes. Determination of the amount of unrecognized deferred income tax liability related to these earnings is not practicable. Additionally, there are no other significant temporary differences for which a deferred tax liability has not been recognized. Since 2002, Ciena has maintained a valuation allowance against its net U.S. deferred tax assets. On a quarterly basis, Ciena evaluates all available positive and negative evidence to determine if a valuation allowance is required.

Improved profitability led to Ciena's U.S. business having cumulative income over a three-year period towards the end of fiscal 2016 for the first time since the valuation allowance was established. However, at that time, Ciena determined that a valuation allowance was still necessary, due to, among other things, the relatively low level of cumulative pre-tax income during this period and Ciena's history of operating losses. In the fourth quarter of fiscal 2017, based on the sustained and increasing earnings of Ciena's U.S. business throughout 2017, Ciena's future projections of profitability and a positive industry outlook, Ciena has concluded that it is more likely than not that Ciena will realize the benefit of most of its U.S. deferred tax assets and accordingly has reversed a majority of the valuation allowance that was recorded against its net U.S. deferred tax assets. This reversal resulted in a one-time, non-cash income tax benefit of \$1.125 billion recorded in Ciena's Consolidated Statement of Operations and a \$26.0 million adjustment to Additional Paid-in-Capital in the Consolidated Statement of Changes in Stockholders' Equity related to certain previously settled call spread options. As of October 31, 2017, Ciena continues to maintain a valuation allowance against net deferred tax assets of \$185.9 million primarily related to state and foreign net operating losses and credits that Ciena estimates it will not be able to use. Approximately \$38.0 million of the retained valuation allowance relates to deductions for stock compensation which Ciena anticipates will be released through retained earnings in the first quarter of fiscal 2018 upon the adoption of ASU 2016-09.

The following table summarizes the activity in Ciena's valuation allowance against its gross deferred tax assets (in thousands):





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Year ended	Beginning		Ending
October 31,	Balance	Additions	Deductions
	Balance		Balance
2015	\$ 1,496,835	\$ —	\$ 1,495,672
2016	\$ 1,495,672	\$ —	\$ 1,489,780
2017	\$ 1,489,780	\$ —	\$ 185,898

As of October 31, 2017, Ciena had a \$1.65 billion net operating loss carry forward and a \$0.1 billion income tax credit carry forward which begin to expire in fiscal year 2019 and 2017, respectively. Ciena's ability to use net operating losses and credit carry forwards is subject to limitations pursuant to the ownership change rules of the Internal Revenue Code Section 382.

Currently, the recognition of windfall tax benefits from stock-based compensation deducted on the tax return is prohibited until realized through a reduction of income tax payable. In fiscal 2018, Ciena will adopt ASU 2016-09, Improvements to Employee Share-Based Payment Accounting. At that time, the cumulative tax benefits totaling approximately \$62 million will be recorded in beginning retained earnings effective November 1, 2017.

**(21) SHARE-BASED COMPENSATION EXPENSE**

Ciena has outstanding equity awards issued under its 2008 Omnibus Incentive Plan, as well as certain legacy equity plans, equity plans assumed as a result of previous acquisitions, and its 2017 Omnibus Incentive Plan (the "2017 Plan"), which was approved by Ciena's stockholders on March 23, 2017. All equity awards granted on or after March 23, 2017 are made exclusively from the 2017 Plan. Ciena also makes shares of its common stock available for purchase under its Amended and Restated 2003 Employee Stock Purchase Plan (the "ESPP"). Each of the 2017 Plan and the ESPP are described below.

**2017 Plan**

The 2017 Plan has a ten year term and authorizes the issuance of awards including stock options, restricted stock units (RSUs), restricted stock, unrestricted stock, stock appreciation rights (SARs) and other equity and/or cash performance incentive awards to employees, directors and consultants of Ciena. Subject to certain restrictions, the Compensation Committee of the Board of Directors has broad discretion to establish the terms and conditions for awards under the 2017 Plan, including the number of shares, vesting conditions, and the required service or performance criteria. Options and SARs have a maximum term of ten years, and their exercise price may not be less than 100% of fair market value on the date of grant. Repricing of stock options and SARs is prohibited without stockholder approval. Certain change in control transactions may cause awards granted under the 2017 Plan to vest, unless the awards are continued or substituted for in connection with the transaction.

The 2017 Plan authorizes and reserves 8.9 million shares for issuance. In addition, any shares that remained available for issuance under the 2008 Plan as of March 23, 2017 were added to the 2017 Plan and are available for issuance thereunder. The number of shares available under the 2017 Plan will also be increased from time to time by: (i) the number of shares subject to outstanding awards granted under Ciena's prior equity compensation plans that are forfeited, expire or are canceled without delivery of common stock following the effective date of the 2017 Plan, and (ii) the number of shares subject to awards assumed or substituted in connection with the acquisition of another company. As of October 31, 2017, the total number of shares authorized for issuance under the 2017 Plan is 8.9 million and approximately 10.2 million shares remained available for issuance thereunder.

**Stock Options**

Outstanding stock option awards to employees are generally subject to service-based vesting conditions and vest over a four-year period. The following table is a summary of Ciena's stock option activity for the periods indicated (shares in thousands):

Shares	Weighted
Underlying	Average
Options	

	Outstanding	Exercise Price
Balance as of October 31, 2016	1,387	\$ 26.90
Granted	—	—
Exercised	(224 )	10.76
Canceled	(288 )	29.44
Balance as of October 31, 2017	875	\$ 30.19

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The total intrinsic value of options exercised during fiscal 2017, fiscal 2016 and fiscal 2015 was \$3.1 million, \$5.7 million and \$11.8 million, respectively. There were no stock options granted by Ciena during fiscal 2017, fiscal 2016 or fiscal 2015. The weighted average fair value of each stock option granted by Ciena in exchange for Cyan awards was \$13.04 in fiscal 2015.

The following table summarizes information with respect to stock options outstanding at October 31, 2017, based on Ciena's closing stock price on the last trading day of Ciena's fiscal 2017 (shares and intrinsic value in thousands):

Range of Exercise Price	Options Outstanding at October 31, 2017				Vested Options at October 31, 2017			
	Weighted		Weighted	Aggregate	Weighted		Weighted	Aggregate
	Number	Average			Number	Average		
	of	Contractual	Average	Intrinsic	of	Contractual	Average	Intrinsic
	Underlying	(Years)	Exercise Price	Value	Underlying	(Years)	Exercise Price	Value
	Share				Share			
\$1.88 —\$11.16	65	2.59	\$ 8.66	\$ 801	65	2.54	\$ 8.64	\$ 794
\$11.34 —\$17.24	176	4.61	13.43	1,321	172	4.55	13.40	1,293
\$17.50 —\$30.46	127	1.56	25.91	73	121	1.32	26.20	60
\$31.93 —\$37.10	291	1.53	35.08	—	290	1.53	35.08	—
\$37.82 —\$55.63	216	3.76	46.30	—	216	3.76	46.30	—
\$1.88 —\$55.63	875	2.78	\$ 30.19	\$ 2,195	864	2.73	\$ 30.35	\$ 2,147

## Assumptions for Option-Based Awards

Ciena recognizes the fair value of stock options as share-based compensation expense on a straight-line basis over the requisite service period. Ciena did not grant any option-based awards during fiscal 2017, fiscal 2016 or fiscal 2015. Ciena used the following assumptions for option-based awards issued in exchange for Cyan options in fiscal 2015:

Expected volatility	35.87	%
Risk-free interest rate	1.26	%
Expected term (years)	0.72-6.88	
Expected dividend yield	0.0	%

## Restricted Stock Units

A restricted stock unit is a stock award that entitles the holder to receive shares of Ciena common stock as the unit vests. Ciena's outstanding restricted stock unit awards are subject to service-based vesting conditions and/or performance-based vesting conditions. Awards subject to service-based conditions typically vest in increments over a three or four-year period. However, the 2017 Plan permits Ciena to grant service-based stock awards with a minimum one-year vesting period. Awards with performance-based vesting conditions require the achievement of certain operational, financial or other performance criteria or targets as a condition of vesting, or the acceleration of vesting, of such awards. Ciena recognizes the estimated fair value of performance-based awards, net of estimated forfeitures, as share-based compensation expense over the performance period, using graded vesting, which considers each performance period or tranche separately, based upon Ciena's determination of whether it is probable that the performance targets will be achieved. At the end of each reporting period, Ciena reassesses the probability of achieving the performance targets and the performance period required to meet those targets.

The following table is a summary of Ciena's restricted stock unit activity for the period indicated, with the aggregate fair value of the balance outstanding at the end of each period, based on Ciena's closing stock price on the last trading day of the relevant period (shares and aggregate fair value in thousands):



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	Restricted Stock Units Outstanding	Weighted Average Grant Date Fair Value Per Share	Aggregate Fair Value
Balance as of October 31, 2016	4,280	\$ 19.96	\$ 83,511
Granted	2,489		
Vested	(2,057 )		
Canceled or forfeited	(569 )		
Balance as of October 31, 2017	4,143	\$ 21.46	\$ 86,721

The total fair value of restricted stock units that vested and were converted into common stock during fiscal 2017, fiscal 2016 and fiscal 2015 was \$49.5 million, \$50.3 million and \$50.5 million, respectively. The weighted average fair value of each restricted stock unit granted by Ciena during fiscal 2017, fiscal 2016 and fiscal 2015 was \$23.29, \$19.81 and \$19.41, respectively. The weighted average fair value of each restricted stock unit granted by Ciena in exchange for Cyan awards was \$25.39.

**Assumptions for Restricted Stock Unit Awards**

The fair value of each restricted stock unit award is based on the closing price on the date of grant. Share-based expense for service-based restricted stock unit awards is recognized, net of estimated forfeitures, ratably over the vesting period on a straight-line basis.

Share-based expense for performance-based restricted stock unit awards, net of estimated forfeitures, is recognized ratably over the performance period based upon Ciena's determination of whether it is probable that the performance targets will be achieved. At each reporting period, Ciena reassesses the probability of achieving the performance targets and the performance period required to meet those targets. The estimation of whether the performance targets will be achieved involves judgment, and the estimate of expense is revised periodically based on the probability of achieving the performance targets. Revisions are reflected in the period in which the estimate is changed. If any performance goals are not met, no compensation cost is ultimately recognized against that goal and, to the extent previously recognized, compensation expense is reversed.

Because share-based compensation expense is recognized only for those awards that are ultimately expected to vest, the amount of share-based compensation expense recognized reflects a reduction for estimated forfeitures. Ciena estimates forfeitures at the time of grant and revises those estimates in subsequent periods based upon new or changed information.

**Amended and Restated Employee Stock Purchase Plan (ESPP)**

Under the ESPP, eligible employees may enroll in a twelve-month offer period that begins in December and June of each year. Each offer period includes two six-month purchase periods. Employees may purchase a limited number of shares of Ciena common stock at 85% of the fair market value on either the day immediately preceding the offer date or the purchase date, whichever is lower. The ESPP is considered compensatory for purposes of share-based compensation expense. Pursuant to the ESPP's "evergreen" provision, on December 31 of each year, the number of shares available under the ESPP increases by up to 0.6 million shares, provided that the total number of shares available at that time shall not exceed 8.2 million. Unless earlier terminated, the ESPP will terminate on January 24, 2023.

During fiscal 2017, fiscal 2016 and fiscal 2015, Ciena issued 1.0 million, 1.1 million and 1.0 million shares under the ESPP, respectively. At October 31, 2017, 5.5 million shares remained available for issuance under the ESPP.

**Share-Based Compensation Expense for Periods Reported**

The following table summarizes share-based compensation expense for the periods indicated (in thousands):



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	Year Ended October 31,		
	2017	2016	2015
Product costs	\$2,672	\$2,457	\$2,400
Service costs	2,487	2,479	2,156
Share-based compensation expense included in cost of goods sold	5,159	4,936	4,556
Research and development	12,957	13,870	10,665
Sales and marketing	12,846	15,138	15,539
General and administrative	17,321	17,342	17,018
Acquisition and integration costs	—	714	7,588
Share-based compensation expense included in operating expense	43,124	47,064	50,810
Share-based compensation expense capitalized in inventory, net	77	(7	) (26
Total share-based compensation	\$48,360	\$51,993	\$55,340

As of October 31, 2017, total unrecognized share-based compensation expense was \$69.9 million: (i) \$0.1 million, which relates to unvested stock options and is expected to be recognized over a weighted-average period of 0.9 years; and (ii) \$69.8 million which relates to unvested restricted stock units and is expected to be recognized over a weighted-average period of 1.4 years.

**(22) SEGMENT AND ENTITY WIDE DISCLOSURES****Segment Reporting**

Ciena's internal organizational structure and the management of its business are grouped into the following operating segments:

• **Networking Platforms** reflects sales of Ciena's Converged Packet Optical, Packet Networking and Optical Transport product lines.

**Converged Packet Optical** — includes the 6500 Packet-Optical Platform and the 5430 Reconfigurable Switching System, which feature Ciena's WaveLogic coherent optical processors. Products also include the Waveserver stackable interconnect system, the family of CoreDirector® Multiservice Optical Switches and the OTN configuration for the 5410 Reconfigurable Switching System. This product line also includes sales of the Z-Series Packet-Optical Platform.

**Packet Networking** — includes the 3000 family of service delivery switches and service aggregation switches and the 5000 family of service aggregation switches. This product line also includes the 8700 Packetwave Platform and the Ethernet packet configuration for the 5410 Service Aggregation Switch.

**Optical Transport** — includes the 4200 Advanced Services Platform, 5100/5200 Advanced Services Platform, Common Photonic Layer (CPL) and 6100 Multiservice Optical Platform. As of the end of fiscal 2017, the Optical Transport products have either been previously discontinued, or are expected to be discontinued, reflecting network operators' transition toward next-generation converged network architectures and stackable interconnect platforms addressed by solutions within our Converged Packet Optical product line. Accordingly, commencing in fiscal 2018, sales of Optical Transport will be reflected within the Converged Packet Optical product line of our Networking Platforms segment. The Networking Platforms segment also includes sales of operating system software and enhanced software features embedded in each of the product lines above. Revenue from this segment is included in product revenue on the Consolidated Statement of Operations.

**Software and Software-Related Services** reflects sales of Ciena's network virtualization, management, control and orchestration software solutions and software-related services, including subscription, installation, support, and consulting services.

This segment includes Ciena's element and network management solutions and planning tools, including the OneControl Unified Management System, ON-Center® Network & Service Management Suite, Ethernet Services Manager, Optical Suite Release and Planet Operate. As Ciena seeks adoption of its Blue Planet software platform and transitions features, functionality and customers to this platform, Ciena expects revenue declines for its other element and network management solutions.

This segment includes Ciena's Blue Planet network virtualization, service orchestration and network management software platform. Ciena's Blue Planet platform includes multi-domain service orchestration

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(MDSO), network function virtualization (NFV), management and orchestration (NFV MANO), and Ciena's manage, control and plan (MCP) solution, SDN Multilayer Controller and V-WAN application.

Revenue from the software platforms portion of this segment is included in product revenue on the Consolidated Statement of Operations. Revenue from software-related services is included in services revenue on the Consolidated Statement of Operations.

Global Services reflects sales of a broad range of Ciena's services for consulting and network design, installation and deployment, maintenance support and training activities. Revenue from this segment is included in services revenue on the Consolidated Statement of Operations.

Ciena's long-lived assets, including equipment, building, furniture and fixtures, finite-lived intangible assets, and maintenance spares, are not reviewed by the chief operating decision maker for purposes of evaluating performance and allocating resources. As of October 31, 2017, equipment, building, furniture and fixtures totaling \$308.5 million primarily supports asset groups within Ciena's Networking Platforms and Software and Software-Related Services segments and Ciena's unallocated selling and general and administrative activities. As of October 31, 2017, \$37.9 million of Ciena's intangible assets were assigned to asset groups within Ciena's Networking Platforms segment and \$63.1 million of Ciena's intangible assets were assigned to asset groups within Ciena's Software and Software-Related Services. As of October 31, 2017, all of the maintenance spares totaling \$46.9 million were assigned to asset groups within Ciena's Global Services segment.

## Segment Revenue

The table below (in thousands, except percentage data) sets forth Ciena's segment revenue for the respective periods indicated:

	Year Ended October 31,		
	2017	2016	2015
Revenue:			
Networking Platforms			
Converged Packet Optical	\$1,926,087	\$1,779,932	\$1,661,702
Packet Networking	313,089	252,862	229,223
Optical Transport	13,534	35,989	73,004
Total Networking Platforms	2,252,710	2,068,783	1,963,929
Software and Software-Related Services			
Software Platforms	65,871	48,689	38,466
Software-Related Services	95,248	76,380	61,821
Total Software and Software-Related Services	161,119	125,069	100,287
Global Services			
Maintenance Support and Training	227,400	228,982	224,079
Installation and Deployment	117,524	130,916	115,531
Consulting and Network Design	42,934	46,823	41,843
Total Global Services	387,858	406,721	381,453
Consolidated revenue	\$2,801,687	\$2,600,573	\$2,445,669
Segment Profit			

Segment profit is determined based on internal performance measures used by the chief executive officer to assess the performance of each operating segment in a given period. In connection with that assessment, the chief executive officer excludes the following items: selling and marketing costs; general and administrative costs; acquisition and integration costs; amortization of intangible assets; significant asset impairments and restructuring costs; interest and other income (loss), net; interest expense; and provision (benefit) for income taxes.

The table below (in thousands) sets forth Ciena's segment profit and the reconciliation to consolidated net income during the respective periods indicated:

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	Year Ended October 31,		
	2017	2016	2015
Segment profit:			
Networking Platforms	\$578,039	\$544,744	\$515,550
Software and Software-Related Services	32,536	7,123	4,174
Global Services	159,882	157,915	141,638
Total segment profit	770,457	709,782	661,362
Less: non-performance operating expenses			
Selling and marketing	356,169	349,731	333,836
General and administrative	142,604	132,828	123,402
Amortization of intangible assets	33,029	61,508	69,511
Acquisition and integration costs	—	4,613	25,539
Significant asset impairments and restructuring costs	23,933	4,933	8,626
Add: other non-performance financial items			
Interest expense and other income (loss), net	(58,596 )	(69,451 )	(76,684 )
Less: Provision (benefit) for income taxes	(1,105,827 )	14,134	12,097
Consolidated net income	\$1,261,953	\$72,584	\$11,667

## Entity Wide Reporting

Ciena's operating segments each engage in business across four geographic regions: North America; Europe, Middle East and Africa ("EMEA"); Asia-Pacific ("APAC"); and Caribbean and Latin America ("CALA"). North America includes only activities in the United States and Canada. The following table reflects Ciena's geographic distribution of revenue principally based on the relevant location for Ciena's delivery of products and performance of services. For the periods below, Ciena's geographic distribution of revenue was as follows (in thousands):

	Year Ended October 31,		
	2017	2016	2015
North America	\$1,736,047	\$1,689,263	\$1,598,328
EMEA	404,099	393,705	400,294
CALA	164,308	195,085	201,499
APAC	497,233	322,520	245,548
Total	\$2,801,687	\$2,600,573	\$2,445,669

North America includes \$1.63 billion, \$1.58 billion and \$1.48 billion of United States revenue for fiscal years ended October 31, 2017, 2016 and 2015, respectively. No other country accounted for at least 10% of total revenue for the periods presented above.

The following table reflects Ciena's geographic distribution of equipment, building, furniture and fixtures, net, with any country accounting for at least 10% of total equipment, building, furniture and fixtures, net, specifically identified. Equipment, building, furniture and fixtures, net, attributable to geographic regions outside of the United States and Canada are reflected as "Other International." For the periods below, Ciena's geographic distribution of equipment, building, furniture and fixtures, net, was as follows (in thousands):

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	October 31,	
	2017	2016
Canada	\$203,491	\$173,885
United States	90,482	103,018
Other International	14,492	11,503
Total	\$308,465	\$288,406

While we have benefited from the diversification of our business and customer base, our ten largest customers contributed 55.6% of fiscal 2017 revenue, 51.1% of fiscal 2016 revenue and 52.5% of fiscal 2015 revenue.

For the periods below, customers accounting for at least 10% of Ciena's revenue were as follows (in thousands):

	October 31,		
	2017	2016	2015
AT&T	\$448,943	\$479,077	\$487,831
Verizon	288,048	n/a	