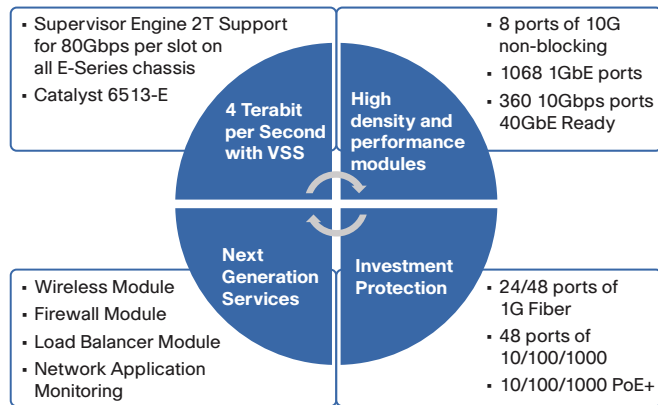


What Is the Value of the Cisco Catalyst 6500 2-Terabit Portfolio?

The Cisco® Catalyst® 6500 Series, Cisco's flagship switching product line, has been the benchmark for innovation in the networking industry. This sustained innovation has built flexibility and versatility in the essence of the platform, allowing it to be deployed in campus, data center, WAN, and metro Ethernet networks worldwide. The platform has a \$700,000+ installed base and has been meeting the business needs of its diverse customers for the past decade. The Cisco Catalyst 6500 is breaking new ground once again, tripling the performance, quadrupling the scalability, and introducing groundbreaking new technologies with the introduction of its 2-terabit portfolio. Consistent with its history, the platform is offering innovation with investment protection while introducing massive bandwidth boosts with the introduction of 40 Gigabit Ethernet. (See Figure1.)

Figure 1. Introducing the Cisco Catalyst 6500 2T Family



The Cisco Catalyst 6500 Supervisor Engine 2T is the next-generation switching system that paves the way for 2-Tbps of switching capacity, scaling to 4 Tbps when deployed in a virtual switching system (VSS) configuration. The Cisco Catalyst 6500 with Supervisor Engine 2T in a VSS configuration quadruples

port density offerings by supporting 1068 1-Gbps and 360 10-Gbps ports per system. The Cisco Catalyst 6500 supports a wide range of service modules compatible with the 2-Terabit portfolio. The next generation firewall, load balancer, and wireless services modules solidify the Cisco Catalyst 6500 position as the lead platform in Borderless Networks. The Cisco Catalyst 6500 with the Supervisor Engine 2T offers investment protection through backward compatibility with existing E-Series chassis and power supplies and Cisco Catalyst 6700 Series line cards as well as 10/100/1000 data and Power over Ethernet (PoE) line cards of the Cisco Catalyst 6100 Series.

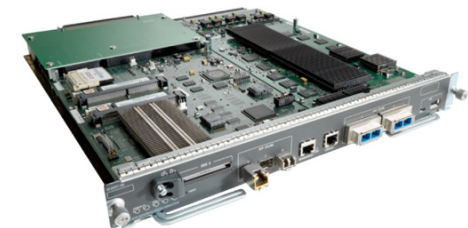
What Problems Does It Help Solve?

Market transitions toward user mobility and video collaboration are primary challenges customers face as they strive to deliver positive workplace experiences. Increasing boundary blurriness between consumers and the workforce, as well as employees and partners, makes it critical to choose the right infrastructure. The Cisco Catalyst 6500 family architecture with new innovations delivers the infrastructure needed to support a borderless experience. The Cisco Catalyst 6500 product portfolio is the ideal platform to support anyone to anything to anywhere at any time connectivity while making sure of high performance, scalability, and security enforcements needed to deploy a true Borderless Network. The Cisco Catalyst 6500 family supports Cisco TrustSec® security to deliver connectivity between the right people, resources, and locations in a secure manner. The Cisco Catalyst 6500 family with flexible NetFlow and application monitoring helps customers with resource optimization and capacity planning. The Cisco Catalyst 6500 family is the ideal platform to support bandwidth-intensive video applications and collaboration through support for medianet, multicast performance enhancements, and high-performance modules. The Cisco Catalyst 6500 with wireless integration enhancements provides a comprehensive solution to address ever-increasing user mobility requirements.

Catalyst 6500 Supervisor Engine 2T

The Supervisor Engine 2T (Figure 2), with an improved switching fabric, unlocks the 80 Gbps of bandwidth with all the E-Series platforms. The Supervisor Engine 2T switch fabric supports two 40-Gbps fabric channels to each slot for all slots of all Cisco Catalyst 6500 E-Series chassis. The Supervisor Engine 2T with its Policy Feature Card 4 (PFC4) delivers performance and scalability improvements as well as hardware-enabled features. With PFC4, there is increased performance of up to 60 mpps for Layer 2, IPv4, and Multiprotocol Label Switching (MPLS) forwarding and up to 30 mpps for IPv6 and Virtual Private LAN Services (VPLS) forwarding. The Cisco TrustSec architecture includes access control, authentication, and encryption capabilities, which are all critical to building a scalable and secure network. With PFC4, Cisco TrustSec is supported at line rate. The PFC4 increases NetFlow table size up to 1M entries (XL model) and adds support for Flexible NetFlow (FnF). FnF includes a number of new field options to allow for an extended collection of IPv4, IPv6, and multicast information in a customizable NetFlow record. With PFC4, Supervisor Engine 2T delivers hardware-accelerated features such as VPLS and Layer 2 over multipoint generic routing encapsulation (mGRE) for deploying network virtualization.

Figure 2. Supervisor Engine 2T



The Multilayer Switch Feature Card 5 (MSFC5) is a next-generation CPU daughter card for the Supervisor Engine 2T. The MSFC5 provides high-performance, multilayer switching and routing intelligence. The MSFC5 handles Layer 2 and Layer 3 control plane processes such as the



routing protocols, management protocols such as Simple Network Management Protocol (SNMP) and SYSLOG, Layer 2 protocols (such as spanning tree, Cisco Discovery Protocol, and so on), the switch console, and many more functions.

The Supervisor Engine 2T uplink ports include three 1-Gbps (Small Form-Factor Pluggable [SFP] optics) and two 10-Gbps (X2 optics) ports. The Supervisor Engine 2T has an integrated connectivity management processor (CMP) that provides a dedicated out-of-band management path. The manageability enhancement improvements include remote system recover, system reset, reboots, and software upgrade.

2-Terabit Infrastructure: 6900 Series Modules

The 6900 Series 8-port 10GE module with 80-Gbps connections to the 2-Tbps switch fabric of Supervisor Engine 2T is able to deliver 10-Gbps performance on all 8 ports. The 6900 Series 8-port 10-Gbps module supports IEEE 802.1ae encryption at line rate as well as Virtual Switch Link (VSL) on all 8 ports. The 8-port 10-Gbps module supports pluggable X2 optics, providing operational distances of up to 80 km over single-mode fiber and 300m over multimode fiber, allowing for deployment in various types of networking environments. The 8-port 10-Gbps module in a single Cisco Catalyst 6513-E chassis provides up to 88 10 Gigabit Ethernet fiber ports. The 8-port 10-Gbps module with large buffering (256 MB) is the ideal connectivity option for the backbone of the campus network.

2-Terabit Infrastructure: 6800 Series Modules

The 6800 Series modules provide 1-Gbps copper/fiber and 10-Gbps copper/fiber connectivity installed with the latest forwarding engine needed for the Cisco Catalyst 6500 2-Terabit product family. The 6800 Series 24-port and 48-port modules offer 1-Gbps fiber interfaces with the Cisco Catalyst 6500 family. The 6800 Series also offers a 48-port 1-Gbps and a 16-port 10-Gbps module for copper connectivity. The 6800 Series modules are ideal for customers looking to expand their 1-Gbps and 10-Gbps footprint with the Cisco Catalyst 6500 2-terabit product family.

Performance and Scale

The performance leap of the 2-Terabit portfolio is complemented by quadrupling of the NetFlow and access control list (for security and quality of service [QoS]) table capacities to meet the increasing manageability, security, and service demands of customers. All this is possible with the introduction of the forwarding engine Distributed Forwarding Card 4 (DFC4 and DFC4XL) residing on the 6900 and 6800 Series modules and Policy Feature Card 4 with Supervisor Engine 2T. Each forwarding engine adds 60 mpps of forwarding performance to the aggregate forwarding capacity of the chassis. With the latest ASIC innovations, the forwarding engines support larger table scalability for MAC addresses, NetFlow entries, and ACL entries. The forwarding engines deliver an unparalleled feature set for virtualization, MPLS, VPLS, IPv6, security, and QoS.

Table 1 lists primary performance and feature enhancements.

Table 1. Primary Performance and Feature Enhancements

Name	DFC4/PFC4	DFC4XL/PFC4XL
IPv4 routing	Up to 720 mpps	Up to 720 mpps
IPv6 routing	Up to 390 mpps	Up to 390 mpps
L2 bridging	Up to 720 mpps	Up to 720 mpps
MPLS	MPLS in hardware to enable use of Layer 3 VPNs and EoMPLS tunneling. Up to 8192 VRFs with a total of up to 256K* forwarding entries per system.	MPLS in hardware to enable use of Layer 3 VPNs and EoMPLS tunneling. Up to 8192 VRFs with a total of up to 1024K forwarding entries per system.
VPLS	Up to 390 mpps	Up to 390 mpps
GRE	Up to 390 mpps	Up to 390 mpps
MAC entries	128K	128K
Routes	256K (IPv4) 128K (IPv6)	1024K (IPv4) 512K (IPv6)
NetFlow entries	512K	1024K
ACL	64K	256K

*1K=1024

Next-Generation Services

One of the unique elements of the Cisco Catalyst 6500 has been the integration of rich services through its comprehensive service module portfolio. These service modules allow customers to reduce the number of devices in their network they need to manage, improve energy efficiency, and reduce carbon footprint. The Cisco Catalyst 6500 product family also supports a variety of service module options to address Layer 4 through 7 requirements.

The Cisco Catalyst 6500 Series Wireless Services Module (WiSM-2) provides unparalleled security, mobility, redundancy, and ease of use for business-critical wireless LANs (WLANs). The 20-Gbps Cisco WiSM-2 supports up to 1000 access points, scaling to 18,000 access points per roaming domain. The WiSM-2 will support up to 10,000 wireless client devices.

The Cisco Catalyst 6500 Series Adaptive Security Appliance (ASA-SM) is a high-performance integrated stateful inspection firewall with application and protocol inspection engines. The 16-Gbps Cisco ASA-SM supports 2 million concurrent sessions and up to 375,000 connections per second. In addition, up to four ASA Services Module blades can be installed in a single Cisco Catalyst 6500, providing scalability to 64 Gbps from a single chassis. The ASA-SM leverages the industry's most deployed firewall and provides large enterprise and service providers superior security, performance, and reliability.

The Cisco Catalyst 6500 Series Application Control Engine 30 (ACE30) module represents the next generation of application switches for increasing availability, acceleration, and security of data center applications. The ACE30 module with 16-Gbps throughput supports up to 30,000 transactions per second. The ACE30 module delivers powerful 6-Gbps hardware-accelerated data compression and provides faster application performance for application users.



The Cisco Catalyst 6500 Series Network Analysis Module (NAM-2) is an integrated services module that provides in-depth traffic analysis, granular response time measurements, and comprehensive troubleshooting to optimize network operations in campus, data center, and WAN edge environments. The NAM-2 offers a tenfold improvement in performance, allowing application visibility and analysis at 10 Gigabit speeds.

Maximize Investment Protection

In addition to the new innovations, the new Cisco Catalyst 6500 family also offers strong investment protection for existing customer deployments. The 6700 Series modules with CFC are supported with the Supervisor Engine 2T with no hardware or software changes. The new Cisco Catalyst 6500 family also provides a DFC4/DFC4XL upgrade option for a select number of 6700 Series modules. For cost-effective 1-Gbps and 10-Gbps expansion, the 6800 Series modules with integrated DFC4 or DFC4XL offer an attractive option, particularly for 1-Gbps deployments. A select set of 6100 Series modules is also supported with the Cisco Catalyst 6500 with no hardware or software change.

What Are the Benefits?

The Cisco Catalyst 6500 with innovation and investment protection helps customers protect, optimize, and grow their network to address new connectivity models. The Cisco Catalyst 6500 establishes itself in Borderless Networks through support for higher performance supervisor engines and modules as well as the breadth of service modules for mobility, security, and resiliency. The Cisco Catalyst 6500 with high-performance 1-Gbps and 10-Gbps modules supports bandwidth-intensive video applications to support collaboration. The Cisco Catalyst 6500 with E-Series switches deliver the innovation and investment protection to establish the series as the lead platform in Borderless Networks.

Warranty Coverage and Technical Service Options

The Cisco Catalyst 6500 System comes with a Cisco 90-day hardware warranty. Adding a contract for a technical service offering such as Cisco SMARTnet® Service to your device coverage provides access to the Cisco Technical Assistance Center (TAC) and can provide a variety of hardware replacement options to meet critical business needs, updates for licensed OS software, and registered access to the extensive Cisco.com knowledge base and support tools.

For more information about Cisco warranties, go to www.cisco.com/go/warranty.

For information about Cisco Technical Services, go to www.cisco.com/go/ts.