

## POWEREDGE R540

### Built for versatility

The PowerEdge R540 delivers the ideal balance of resources and affordability to adapt to a variety of application demands.

#### Power your applications with the versatility of the R540

The PowerEdge R540 delivers the versatility and flexibility to power a variety of applications. With a balanced set of resources, expandability and affordability the R540 adapts to the demands of the modern data center with the ideal value optimized design. Automatically optimize performance with one button application tuning and scale for future demands with up to 14 3.5" drives.

- Scale compute resources with Intel® Xeon® Scalable processors delivering a 27% increase in processing cores and 50% increase in bandwidth over previous generation of Xeon processors.
- Automatically optimize application performance with one-button tuning.
- Flexible storage with up to 14 3.5" drives.
- Free up storage with boot optimized M.2 SSDs.

#### Intuitive systems management with intelligent automation

Dell EMC PowerEdge servers are optimized for top efficiency and uptime, with intelligent automation that decreases time spent on the most common IT tasks. Combined with the agent-free management of the embedded iDRAC with Lifecycle Controller, the R540 is easily and effectively managed.

- Simplify data center management with OpenManage Essentials to intelligently automate the entire server life cycle management process – from bare-metal deployment, through configuration and updates, to ongoing maintenance.
- Use the OpenManage Mobile app to take advantage of new wireless Quick Sync 2 capabilities to efficiently perform management procedures at-the-server, across multiple servers within the data center, or monitor server status and respond to alerts, anytime, anywhere.

#### Rely on PowerEdge with built-in security

Every PowerEdge server is made with a cyber-resilient architecture, building security into all parts of a server's life cycle. The R540 uses these new security features so you can reliably and securely deliver the right data to where your customers are, no matter where they are. Dell EMC considers each part of system security, from design to end of life, to ensure trust and deliver worry-free, secure systems.

- Rely on a secure supply chain that protects servers from factory to the data center.
- Maintain data safety with cryptographically signed firmware packages and Secure Boot.
- Prevent unauthorized or malicious change with Server Lockdown.
- Wipe all data from storage media including hard drives, SSDs and system memory quickly and securely with System Erase.

#### PowerEdge R540

- 2U, 2 socket server
- Up to 14 3.5" drives, max 196TBs
- Internal M.2 boot drives

## PowerEdge R540

| Features                         | Technical Specification   |  |
|----------------------------------|---|--|
| Processor                        | Up to two Intel® Xeon® Scalable processors, up to 20 cores per processor  |  |
| Memory                           | 16 DDR4 DIMM slots, Supports RDIMM /LRDIMM, speeds up to 2666MT/s, 1TB max*   |  |
| Storage controllers              | Internal controllers: PERC H330, H730p, H740p, HBA330, Software RAID (SWRAID) S140<br>Boot Optimized Storage Subsystem: HWRAID 2 x M.2 SSDs 120GB, 240 GB<br>External PERC (RAID): H840<br>External HBAs (non-RAID): 12 Gbps SAS HBA  |  |
| Drive bays                       | Front drive bays: Up to 12 x 3.5" SAS/SATA HDD max 168TB<br>Rear drive bays: Up to 2 x 3.5 SAS/SATA HDD max 28TB<br>Optional DVD-ROM, DVD+RW  |  |
| Power supplies                   | Titanium 750W, Platinum 495W, 750W, and 1100W<br>450W bronze<br>240HVDC 750W, 1100W 380 VDC   |  |
| Fans                             | Six hot pluggable fans for N+1 redundancy   |  |
| Sizing                           | Form factor: Rack (2U)  | Chassis max depth: 693.81 mm (without bezel)<br>Max depth: 707.74 mm (with bezel)                                |
| Bezel                            | Optional LCD or security bezel  |  |
| Embedded / At-Server             | iDRAC9 with Lifecycle Controller<br>iDRAC Direct  | iDRAC REST API with Redfish<br>Quick Sync 2 BLE/wireless module  |
| Consoles & Mobile                | OpenManage Enterprise (available soon)<br>OpenManage Essentials   | OpenManage Mobile<br>OpenManage Power Center   |
| Integrations                     | OpenManage integrations: Microsoft® System Center, VMware® vCenter™, BMC Software   |  |
| Connections                      | Nagios Core and Nagios XI, HPE Operations Manager i (OMi)   |  |
| Tools                            | Dell EMC Repository Manager<br>Dell EMC Update Package<br>Dell EMC System Update<br>Dell EMC Server Update Utility  | iDRAC Service Module<br>OpenManage Server Administrator<br>OpenManage Storage Services                           |
| Security                         | TPM 1.2/2.0 optional<br>Cryptographically signed firmware<br>Silicon Root of Trust  | Secure Boot<br>System Lockdown<br>System Erase   |
| I/O & Ports                      | Network options: 2 x 1GE LOM + (optional) LOM Riser 2 x 1GE or 2 x 10GE SFP+ or 2 x 10GE BaseT<br>Front ports: Video, 1 x USB 2.0, dedicated iDRAC Direct USB<br>Rear ports: Video, serial, 2 x USB 3.0, dedicated iDRAC network port<br>With Optional Riser: Non rear storage config: 1xFH/FL + 1xHH/HL (2U Right riser) slots + 3 HH/HL slots<br>Rear storage config: 1xHH/HL (1U Left Riser) + 1xHH/HL (1U Right risers) slot or 1xHH/HL (1U Left Riser) + 1x FH/HL (1U Right riser) |  |
| Supported operating systems      | Canonical® Ubuntu® LTS<br>Citrix® XenServer®<br>Microsoft Windows Server® with Hyper-V<br>Red Hat® Enterprise Linux<br>SUSE® Linux Enterprise Server<br>VMware® ESXi  | For specifications and interoperability details see <a href="http://Dell.com/OSsupport">Dell.com/OSsupport</a> . |
| OEM-ready version available      | From bezel to BIOS to packaging, your servers can look and feel as if they were designed and built by you. For more information, visit <a href="http://Dell.com/OEM">Dell.com/OEM</a> .   |  |
| Recommended support and services | Choose Dell ProSupport Plus for critical systems or Dell ProSupport for premium hardware and software support for your PowerEdge solution. Consulting and deployment offerings are also available. Contact your Dell representative today for more information. Availability and terms of Dell Services vary by region. For more information, visit <a href="http://dell.com/itlifecycleservices">dell.com/itlifecycleservices</a> .  |  |
| Dell Financial Services          | Deliver results with easy financing. Explore financial options that move at the speed of business. For more information, visit <a href="https://www.emc.com/products/how-to-buy/global-financial-services/index.htm">https://www.emc.com/products/how-to-buy/global-financial-services/index.htm</a> .*   |  |

\*768GB max memory is recommended for performance optimized configurations.

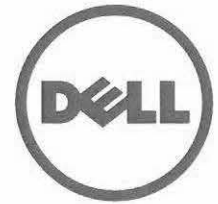
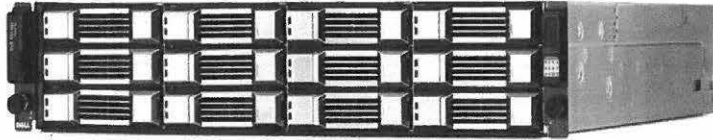
### Learn more at [Dell.com/PowerEdge](http://Dell.com/PowerEdge)

#### End-to-end technology solutions

Reduce IT complexity, lower costs and eliminate inefficiencies by making IT and business solutions work harder for you. You can count on Dell EMC for end-to-end solutions to maximize your performance and uptime. A proven leader in Servers, Storage and Networking, Dell EMC Services deliver innovation at any scale. And if you're looking to preserve cash or increase operational efficiency, Dell Financial Services™ has a wide range of options to make technology acquisition easy and affordable. Contact your Dell Sales Representative for more information.\*

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# Dell Storage PS4210 Series

The Dell™ Storage PS4210 Series arrays offer next-generation storage with increased memory, performance and connectivity options for small-to-medium data centres, remote offices and current PS Series environments. The PS4210 10 GbE iSCSI arrays feature industry-leading capabilities of the Dell PS Series product line with streamlined management, multi-generational compatibility and all-inclusive software licensing. This series offers multiple configurations in drive capacities with up to 72 TB of storage in 2U, 2.5" and 3.5" drive options. Additionally, the PS4210 Series offers a hybrid configuration to auto-tier data and store frequently accessed data on SSDs for rapid response, and store cold data on HDDs within the same array. This minimises the number of SSDs required, reducing your overall cost.

## Optimised performance, capacity and connectivity

With choices in performance, capacity and networking, the Dell Storage PS4210 Series arrays can provide your small data centre or remote office with an easy-to-manage storage solution that is optimised for virtualisation platforms and a variety of applications. The PS4210 Series allows you to auto negotiate from 1 Gb to 10 Gb to make your environment easier to manage while providing the flexibility of using SFP+ or 10 GBASE-T (copper) ports so you can leverage your existing infrastructure or build out lower-cost 10 GBASE-T.

With new hybrid arrays, the next-generation Dell Storage PS4210 Series offers up to 6x the performance improvement of the previous-generation arrays.<sup>1</sup> These hybrid-flash arrays are ideal for mission-critical workloads such as VDI deployments, OLTP databases and other mixed workloads with up to 80,000 random read performance.<sup>1</sup>

## Enterprise power, everyday simplicity

PS Series arrays are based on a virtualised, modular storage architecture that enables you to purchase only the storage you need when you need it. Sophisticated, yet simple, management features speed SAN configuration, and built-in intelligence capabilities sense network connections, automatically build RAID sets and conduct system health checks. All PS Series arrays, regardless of generation, work together to automatically manage data, load balance across all resources or seamlessly expand the storage pool when you add a new array. The PS4210 Series also includes fault-tolerant capabilities through use of fully redundant and hot-swappable controllers, fan trays, power supplies and disk drives.

The PS4210 Series arrays offer low TCO through a family of solutions that can be tailored to fit your exact needs, and grow with you, simply and cost effectively.

## Feature-rich software portfolio

The PS Series arrays include innovative firmware and host software with no additional cost or software licensing fees. PS Series Host Software extends the functionality of the array-based software enabling cooperation with the host. Host Integration Tools for Microsoft® VMware® and Linux® environments as well as PS Series SAN Headquarters (SAN HQ) management software are included with your PS Series array purchase.

PS Series SAN Headquarters (SAN HQ) provides an interface for monitoring your groups of PS Series arrays, and offers a proactive and automated support process with SupportAssist to help improve productivity and accuracy, while helping you gain insight and control. In addition, Dell Storage Manager (DSM) offers common management and cross-platform replication capabilities between PS and SC Series arrays, allowing you to take advantage of new functionality while leveraging existing investments.<sup>2</sup>

Dell Storage customers achieved up to a 513% ROI and earned back their investment in 6.2 months on average<sup>3</sup>

| Feature                | PS4210E  | PS4210X   | PS4210XV                                    | PS4210XS  |
|------------------------|--|---|---|---|
| Product configurations | Entry-level configurations for affordable capacity   | Great balance of cost, performance and capacity | Highest performance HDD system              | SSD speed and HDD capacity within one array                             |
| Storage controllers    | Dual controllers with 16 GB non-volatile memory (8 GB per controller) with up to 32 GB non-volatile memory in a group of 2 arrays  |   |   |   |
| Network interfaces     | 10 GbE connectivity<br>Management network: 1 x 100 BASE-TX per controller<br>Interfaces ports: 2 x 10 GBASE-T with RJ45 or 2 x 10 GbE SFP+ for fibre or twin-ax copper cabling |   |   |   |
| Drive types            | 12 hot-pluggable 3.5" 7.2K NL-SAS  | 24 hot-pluggable 2.5" 10K SAS                   | 24 hot-pluggable 2.5" 15K SAS               | 7 hot-pluggable 2.5" SSDs plus 17 hot-pluggable 2.5" 10K RPM SAS drives |
| Drive capacities       | 2 TB, 3 TB, 4 TB, 6 TB   | 600 GB, 900 GB, 1.2 TB, 1.8 TB                  | 300 GB, 600 GB                              | 400 GB SSD, 600 GB SAS  |
| System capacities      | Up to 72 TB (up to 144 TB with 2 arrays)   | Up to 45.2 TB (up to 86.4 TB with 2 arrays)     | Up to 14.4 TB (up to 28.8 TB with 2 arrays) | Up to 13 TB (up to 26 TB with 2 arrays)                                 |

| Technical highlights                                |   |
|---|---|
| Host protocol                                       | Any standards-compliant iSCSI initiator   |
| Expansion option                                    | Can be combined with other PS Series arrays in the same SAN group, online with a maximum of 16 total arrays per group that can support up to two PS4xxx arrays and 14 PS6xxx arrays. A maximum of two arrays can be in a group of PS4xxx Series with up to 144 TB. Additionally, Dell Storage Manager (DSM) offers common management and cross-platform replication capabilities between PS Series and SC Series arrays, providing PS Series customers the flexibility to add SC Series arrays to their environment, if and when they choose. <sup>1</sup>  |
| Operating systems and hypervisors                   | Microsoft <sup>®</sup> Windows Server <sup>®</sup> including Hyper-V <sup>®</sup><br>VMware <sup>™</sup> ESX Server <sup>™</sup><br>Red Hat <sup>®</sup> Enterprise Linux <sup>®</sup> (RHEL)<br>SUSE <sup>®</sup> Enterprise Linux <sup>®</sup> (SLES)<br>Oracle <sup>™</sup> Linux<br>Citrix <sup>®</sup> XenServer <sup>®</sup><br>For a complete list of supported OS versions including software initiators, NICs/CNAs, and HBAs, see the Dell Storage Compatibility Matrix on <a href="http://en.community.dell.com/dell-groups/dtcmmedia/m/mediagallery/20438558">http://en.community.dell.com/dell-groups/dtcmmedia/m/mediagallery/20438558</a> . |
| RAID  | RAID 6, RAID 10 and RAID 50 <sup>2</sup> Accelerated RAID 6   |
| TCP network support                                 | IPv4, IPv6 compliant, USGv6 certified.  |
| Reliability   | Redundant hot-swappable controllers with vertical port sharing<br>Hot-swappable disks and power supplies  |
| Enclosure monitoring system                         | CHAP authentication; Access control lists for iSCSI as well as new Access Control Policies; Access control for management interfaces including Active Directory, LDAP or RADIUS support   |
| Management  | DSM for day-to-day tasks across SC Series and PS Series arrays from a single management interface <sup>3</sup><br>PS Series Group Manager<br>SAN Headquarters multi-group performance and event monitoring tool<br>Serial console<br>Ability to configure a separate management network<br>SNMP, telnet, SSH, HTTP, Web (SSL), host scripting<br>Multi-administrator support  |
| Security  | CHAP authentication<br>Access control for iSCSI<br>Access control for management interfaces including RADIUS support  |
| Notification methods                                | SNMP traps, e-mail, syslog  |
| Physical  | Height: 2U 8.68 cm (3.41 in) Width: 44.63 cm (17.57 in)<br>E/XV 3.5" Depth: 59.4 cm (23.4 in) X/XV Depth: 54.1 cm (21.3 in)<br>E/XV 3.5" Weight: 29.2 Kg (64.4 lb) X/XV Weight: 24.1 Kg (53.1 lb)   |
| Power   | AC voltage: 100-240 VAC +10% single phase<br>700 W (max, total), 15 V up to 155 W; 12 V up to 621 W; 15 Vsb up to 10 W<br>Frequency: 50/60 Hz<br>Power factor: 0.98 (minimum)<br>Power supplies: Dual 700 W   |
| Rack support  | ReadyRails <sup>™</sup> II static rails for tool-less mounting in 4-post racks with square or unthreaded round holes or tooled mounting in 4-post threaded-hole racks   |
| Dell support and optional storage service offerings | Dell ProSupport Plus for critical systems or Dell ProSupport for premium hardware and software support are recommended to provide you with the right support services for your PS Series. <sup>4</sup> Contact your Dell representative today for more information.   |

<sup>1</sup> Performance will vary depending on the workload and drive type. Based on August 2014 Dell performance testing the PS410XE hybrid-flash arrays and the PS410XV HDD arrays with 4 KB block and 100% random read I/Os.

<sup>2</sup> New Dell Storage Manager (DSM) enables day-to-day management of SC Series and PS Series arrays from a single interface. DSM is available now as a free upgrade for SC9000, SC8000, SC4020 and SCv2000 arrays in Q3 2016 with a current support contract. DSM supports PS6xxx, PS-M4110 and PS4xxx arrays running PS 8.0 firmware or above. Cross-platform replication is available on SC9000, SC8000, SC4020, PS6xxx, PS-M4110 and PS4xxx arrays running SCOS 7.0/PS 9.0 firmware or above as a free upgrade with a current support contract.

<sup>3</sup> Based on Dell Storage PS Series and SC Series customer interviews from the January 2015 Dell-sponsored IDC Whitepaper: Driving Business Value with Flash-Optimized Dell Storage Solutions.

<sup>4</sup> RAID 5 is also available for non-production data, but is generally not recommended; RAID 50 is similarly not recommended for production data on drives larger than 2 TB.

<sup>5</sup> Availability and terms of Dell Services vary by region. Dell Basic Service is included standard with PS Series units. For more information, visit [Dell.com/ServiceDescriptions](http://Dell.com/ServiceDescriptions).

## End-to-end technology solutions

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FY15Q3\_8/355\_DellStorage\_PS4210\_U60/16



Share:



SMT3000RMI2U



Description: Inteligentní a efektivní ochrana síťového napájení od základní úrovně po škálovatelnost za provozu. Ideální pro servery, prodejní terminály, směrovače, přepínače, rozbočovače a další síťová zařízení  
Zahrnuje : CD with software , Country-specific detachable power cord , Documentation CD , Installation guide , Rack Mounting support rails , Smart UPS signalling RS-232 cable , Temperature Probe , USB cable



- Uživatelská příručka
- Náhradní Baterie
- Software & Firmware
- Registrace Produktu
- Časté dotazy k produktům

Přehled produktů

Technické specifikace

Dokumentace

Software ke stažení

Možnosti

## Výstup

Print Technical Specification

|   |  |
|---|--|
| Kapacita výstupního výkonu                  | 2.7 KW / 3.0 kVA   |
| Max. nastavitelný výkon (W)                 | 2.7 KW / 3.0 kVA   |
| Jmenovité výstupní napětí                   | 230V   |
| Výstupní napětí – poznámka                  | Jmenovité výstupní napětí lze nastavit na 220 : 230 nebo 240 V               |
| Výstupní kmitočet (synchr. se sítí)         | 47 - 53 Hz, nominální frekvence 50 Hz, 57 - 63 Hz, nominální frekvence 60 Hz |
| Jiná výstupní napětí                        | 220, 240   |
| Topologie                                   | Line interaktivní  |
| Typ křivky                                  | Sinusoida  |
| Výstupní připojky                           |  |
| (3) IEC Jumpers (Záložní provoz na baterie) |  |
| (1) IEC 320 C19 (Záložní provoz na baterie) |  |
| (8) IEC 320 C13 (Záložní provoz na baterie) |  |
| Doba přechodu                               | 4ms typical : 8ms maximum  |

## Vstup

|   |  |
|---|--|
| Jmenovité vstupní napětí  | 230V   |
| Kmitočet na vstupu  | 50/60 Hz +/- 3 Hz (autodetekce)                    |
| Typ připojení vstupu  | British BS1363A, IEC-320 C20, Schuko CEE 7/EU1-16P |
| Délka přívodního kabelu   | 2metrů   |
| Rozsah vstupního napětí pro napájení z rozvodné sítě              | 160 - 286V   |
| Pro napájení z rozvodné sítě lze upravit rozsah vstupního napětí. | 151 - 302V   |
| Počet napájecích kabelů   | 1  |
| Jiná vstupní napětí   | 220, 240   |

## Baterie a doba běhu

|                                    |   |
|------------------------------------|---|
| Typ baterie                        | Bezúdržbový olověný zatavený akumulátor se suspendovaným elektrolytem: neteče |
| Obvyklá doba nabíjení              | 3hod.   |
| Náhradní akumulátor                | RBC43   |
| Očekávaná životnost baterie (roky) | 3 - 5   |



1

|                                     |   |                                    |
|-------------------------------------|---|------------------------------------|
| Runtime                             | <a href="#">View Runtime Graph</a>  | <a href="#">View Runtime Chart</a> |
| Port rozhraní (s)                   | USB   |                                    |
| Ovládací panel kontrolní konzola    | Luminiscenční diody zobrazují stav: napájení ze sítě : napájení z baterie : vyměnit baterii : přetížení, Multifunkční LCD stavová a |                                    |
| Zvukové upozornění                  | Upozornění na stav, kdy je systém napájen z baterie : zřetelné upozornění na nízkou kapacitu baterie : nastavitelná doba            |                                    |
| Množství rozhraní šachet SmartSlot™ | 1   |                                    |

**Přepěťová ochrana a filtrace**

|                     |      |
|---------------------|------|
| Surge energy rating | 320J |
|---------------------|------|

**Fyzický**

|  |                |
|--|----------------|
| Maximální výška                        | 86mm , 8.6cm   |
| Maximální šířka                        | 480mm , 48.0cm |
| Maximální hloubka                      | 683mm , 68.3cm |
| Výška stojanu                          | 2U             |
| Čistá hmotnost                         | 44.28kg        |
| Hmotnost při dodání                    | 51.7kg         |
| Přepravní výška                        | 254mm , 25.4cm |
| Přepravní šířka                        | 600mm , 60.0cm |
| Přepravní hloubka                      | 980mm , 98.0cm |
| Počet jednotek připadajících na paletu | 8.0            |

**Okolní**

|                                     |              |
|-------------------------------------|--------------|
| Provozní teplota                    | 0 - 40 °C    |
| Provozní relativní vlhkost          | 0 - 95 %     |
| Provozní nadmořská výška            | 0-3000metrů  |
| Okolní teplota při uskladnění       | -15 - 45 °C  |
| Relativní vlhkost při uskladnění    | 0 - 95 %     |
| Nadmořská výška při uskladnění      | 0-15000metrů |
| Hlučnost 1 metr od povrchu jednotky | 55.0dBA      |
| Tepelné ztráty on-line              | 348.0BTU/hod |

**Vyhovuje normám**

|                   |  |
|-------------------|--|
| Schválení         | CE, EAC, EN 60950, EN/IEC 62040-1, EN/IEC 62040-2, Značka GS, IRAM, RCM, VDE, WEEE |
| Standardní záruka | 3 roky, oprava nebo výměna (kromě baterie), a 2 roky na baterii                    |

**Udržitelná Status Nabídka**

|                |   |
|----------------|---|
| Směrnice RoHS  | Vyhovuje  |
| Směrnice REACH | REACH: Neobsahuje žádné SVHC (látky vzbuzující mimořádné obavy) |
| PEP            | K dispozici na kartě Dokumentace                                |
| EOLI           | K dispozici na kartě Dokumentace                                |

# VMware vSphere

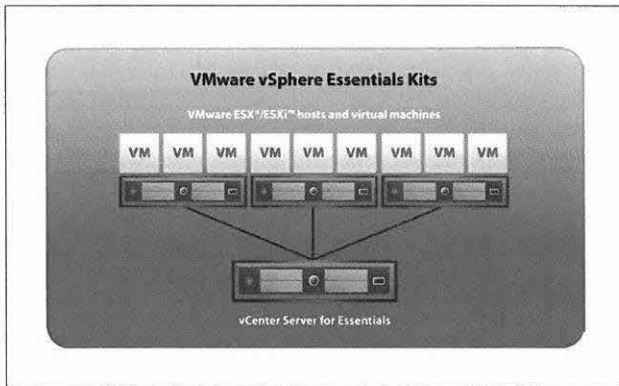
## Essentials Kit and Essentials Plus Kit

### AT A GLANCE

VMware vSphere® Essentials Kit and Essentials Plus Kit deliver the industry-leading virtualization platform at an affordable price for IT environments that run 20 or fewer server workloads. With vSphere Essentials Plus Kit, a small business can leverage a comprehensive and cost-effective virtualization solution to protect its business, reduce its IT footprint and save on IT costs.

### KEY BENEFITS

- Provide business continuity and always-available IT
- Reduce IT footprint and simplify management
- Save on IT hardware costs
- Improve service levels and application quality
- Strengthen security and data protection



VMware vSphere Essentials Kit enables you to virtualize and consolidate multiple application workloads onto three physical servers running vSphere and centrally manage them with VMware vCenter™ Server for Essentials™.

### What Is VMware vSphere?

VMware vSphere is the industry's leading and most reliable virtualization platform. vSphere simplifies IT by separating applications and operating systems (OSs) from the underlying hardware. Your existing applications see dedicated resources, but your servers can be managed as a pool of resources. The result is that your business runs on a simplified yet resilient IT environment.

### What Are vSphere Essentials Kit and Essentials Plus Kit?

vSphere Essentials Kit and Essentials Plus Kit are designed for small businesses that are getting started with virtualization. Both provide virtualization and centralized management for up to three server hosts. vSphere Essentials Kit provides server consolidation to help you get the most out of your hardware and reduce hardware costs.

vSphere Essentials Plus Kit provides business continuity with a smaller IT footprint, which reduces overall hardware costs. Small businesses can ensure business continuity without shared storage hardware by using features such as vSphere High Availability (automatic restart of applications when server failures are detected) and vSphere vMotion® (elimination of planned downtime during server maintenance). Protect your business applications and data with features such as VMware vSphere Data Protection™ (agentless backup and recovery of virtual machines) and VMware vShield Endpoint™ (agentless antivirus and antimalware protection for virtual machines). vSphere Replication adds low-cost replication for your virtual machines and provides a foundation for small businesses to leverage a cloud-based disaster-recovery solution from a VMware cloud service provider.

The result is an always-available IT environment that is more cost-effective, resilient and responsive to changing business needs. As small businesses grow and their needs increase, they can easily upgrade to vSphere with Operations Management Acceleration Kits for more-advanced capabilities.

## How Are vSphere Essentials Kit and Essentials Plus Kit Used?

- **Maximize application availability and protect information assets** – Achieve always-available IT with live migration for virtual machines and high availability for applications in virtual-machine clusters. Protect your data with the reliability of vSphere and integrated backup, recovery and failover features.
- **Consolidate and optimize IT investments** – Achieve consolidation ratios of 10:1 or higher and improve hardware utilization from 5–15 percent to 80 percent or more without sacrificing application performance.
- **Simplify management and enhance productivity** – Provision new applications in minutes instead of days or weeks, monitor virtual-machine performance and automate patch and update management.
- **Streamline software development** – Safely test complex multitier configurations in a secure, isolated sandbox environment while enabling test and development teams to share server, network and storage infrastructure.

## Key Features and Components

VMware vSphere Essentials Kit and Essentials Plus Kit include the following key features and components:

- **VMware ESXi™ hypervisor architecture** provides a robust, production-proven, high-performance virtualization layer that enables multiple virtual machines to share hardware resources with performance that can match or exceed native throughput.
- **VMware vCenter Server for Essentials** provides centralized management and performance monitoring for all virtual machines and vSphere hosts with built-in physical-to-virtual (P2V) machine conversion and rapid provisioning, using virtual-machine templates.
- **VMware vSphere VMFS** enables virtual machines to access shared storage devices (Fibre Channel, iSCSI, etc.) and is a key enabling technology for other components such as VMware vSphere Storage vMotion®.
- **VMware vSphere Thin Provisioning** provides dynamic allocation of shared storage capacity, enabling IT organizations to implement a tiered storage strategy while reducing storage spending by up to 50 percent.
- **VMware vSphere vStorage APIs** provide integration with supported third-party data protection.
- **VMware vCenter Update Manager™** automates tracking, patching and updating for vSphere hosts and for applications and OSs running in VMware virtual machines.
- **VMware vCenter Converter™** enables IT administrators to rapidly convert physical servers and third-party virtual machines to VMware virtual machines.
- **VMware vCenter Operations Manager Foundation** enables you to leverage comprehensive views into health, risk and efficiency scores of your vSphere environment infrastructure. Quickly drill down to see what's causing current workload conditions, pinpoint potential problems in the future and identify areas with inefficient use of resources.
- **VMware VMsafe® APIs** enable the use of security products that work in conjunction with the virtualization layer to provide higher levels of security to virtual machines than are possible even with physical servers.
- **Hardware compatibility** is possible with the broadest range of 32- and 64-bit servers and OSs, storage and networking equipment and enterprise management tools.

VMware vSphere Essentials Plus Kit includes the following business-continuity features and components for always-available IT:

- **vSphere High Availability** provides cost-effective, automated restart within minutes for all applications in the event of hardware or OS failures.
- **vSphere vMotion** enables live migration of virtual machines across servers with no disruption to users or service loss, eliminating the need to schedule application downtime for server maintenance.
- **vSphere Data Protection** provides simple, cost-effective backup and recovery for virtual machines. It is a newly architected solution based on EMC Avamar technology that enables agentless backups with built-in deduplication.
- **vShield Endpoint** provides agentless antivirus and antimalware protection to secure your virtual machines.
- **vSphere Replication** provides low-cost replication for your virtual machine and serves as the foundation for leveraging a cloud-based disaster-recovery solution from a VMware cloud service provider.



## Veeam Backup &amp; Replication

Dostupnost pro podniky  
Always-On Enterprise

Veeam® Backup & Replication™ poskytuje dostupnost pro VŠECHNA pracovní zatížení – virtuální, fyzická a cloudová – z jedné konzole pro správu, čímž rozšiřuje vedoucí pozici společnosti Veeam jako nejlepší dostupnosti pro prostředí VMware vSphere a Microsoft Hyper-V u všech aplikací, všech dat, na všech cloudech. Umožňuje zákazníkům navždy se zcela zbavit staršího řešení zálohování a sjednocuje zálohování a replikaci do jediného softwarového řešení.

## Funkce Veeam Backup &amp; Replication

## Zálohování

Veeam poskytuje rychlé a spolehlivé zálohování pro virtuální, fyzická i cloudová pracovní zatížení.

- **Integrovaná správa nástrojů Veeam Agent pro Microsoft Windows a Veeam Agent pro Linux**  
Získejte menší složitost řízení ochrany dat a vylepšenou použitelnost díky přidání zálohovacích funkcí založených na agentech v konzoli Veeam Backup & Replication<sup>NOVINKA</sup>, včetně jednotného přehledu dostupnosti virtuálních, fyzických a cloudových zatížení, centralizovaného nasazení zálohovacího agenta a podpory Windows Server Failover Cluster.
- **Zálohování VM na úrovni bitové kopie:** Vytváří konzistentní zálohy aplikací s pomocí pokročilých procesů, které berou do úvahy jednotlivá specifika aplikací
- **Zálohování ze snapshotů úložiště:** Vytvářejte mimořádně rychlé zálohy s nízkými RPO ze snapshotů úložiště ze stále se [rozšiřujícího seznamu předních světových poskytovatelů úložišť](#).
- **Scale-out Backup Repository™:** Vytváření sjednoceného virtuálního úložiště záloh, do kterého jsou zálohy přiřazeny. Možnost volného a snadného rozšíření kapacity úložiště záloh.
- **Veeam Cloud Connect:** Zálohy mimo lokalitu bez dalších nákladů a složitosti budování a udržování infrastruktury mimo pracoviště. Rychlé a bezpečné zálohování cloudu u poskytovatele služby.
- **SureBackup®:** Automatické testování a ověřování každé zálohy a virtuálního počítače (VM), zda je možné provést jejich obnovu.
- **Integrovaná akcelerace sítí WAN:** Externí zálohy mimo lokalitu až 50krát rychleji a nižší spotřeba šířky pásma.
- **Direct Storage Access:** Rychlejší provádění záloh vSphere, se sníženým dopadem na zálohování prostřednictvím přímého přístupu k síti SAN a přímého přístupu k NFS

## Obnovení

Veeam nabízí velmi rychlé a spolehlivé obnovení jednotlivých souborů, virtuálních počítačů a položek aplikací – to zaručuje, že můžete mít důvěru v každý scénář obnovení.

„Jestli chcete dostupnost bez starostí, vyberte si Veeam. Veeam je jako Ferrari mezi ostatními řešeními.“

John Burks,  
ředitel informačních  
technologií,  
BLR

„Musíte nechat Veeam dělat to, co umí nejlépe – zálohovat a obnovovat data rychlým způsobem.“

Ryan McClain,  
Architekt systémů,  
U.S. Legal Support, Inc.

„Měli jsme dvě možnosti: Buď strávít polovinu pracovního týdne správou a starostmi o zálohování a replikaci virtuálních počítačů, nebo nasadit Veeam a už se o nic nestarat.“

Brooks Barnes,  
Administrátor systémů,  
Great Southern Wood  
Preserving, Inc.

„Řešení Veeam prostě věříme; důvěřujeme řešení Veeam. Důvěra je něco, s čím si rozhodně nezahráváte.“

Josef Kormann,  
Vedoucí operací IT,  
Christof Holding AG

„Veeam Backup & Replication si zaslouží víc než obdiv! To je přesně to, co svět zálohování potřebuje. Společnost Veeam mi již teď každým týdnem vrací několik hodin života.“

Larry Walker,  
Viceprezident  
a ředitel pro zpracování dat,  
Chelsea Groton Bank

- **Instant VM Recovery®:** Obnovení virtuálního počítače po selhání do dvou minut
- **Okamžité obnovení na úrovni souborů** Průběžné obnovení souborů a složek operačního systému hosta
- **Veeam Explorer™ pro Microsoft Active Directory:** Okamžité obnovení jednotlivých objektů AD a celých kontejnerů, snadné obnovení uživatelských účtů a hesel, možnosti obnovení objektů skupinových politik (GPO), integrované záznamy DNS ve službě Active Directory a další.
- **Veeam Explorer pro Microsoft Exchange:** Okamžitý přehled a granulární obnovení jednotlivých položek systému Exchange, včetně odstraněných položek, detailních zpráv o exportu pro systém eDiscovery a další funkce.
- **Veeam Explorer pro Microsoft SharePoint:** Okamžitý přehled o zálohách SharePoint; snadné vyhledávání a obnova konkrétních položek SharePoint i individuálních webů
- **Veeam Explorer pro Microsoft SQL Server:** Rychlá obnova databází SQL na úrovni transakcí a tabulek pro obnovu k přesnému bodu v čase.
- **Veeam Explorer pro Oracle:** Obnovení databází Oracle na úrovni transakcí, a to včetně zálohy protokolu transakcí bez agenta, takže můžete obnovení provést do přesného bodu v čase.
- **Veeam Explorer pro snapshoty úložiště:** Využijte existující možnosti snapshotů od předních světových poskytovatelů úložišť k obnovení jednotlivých souborů nebo celých virtuálních počítačů ze snapshotů úložiště do 2 minut – bez přípravy a dalších mezikroků.
- **Nativní podpora páskových úložišť:** Ukládání celých záloh virtuálních počítačů nebo jednotlivých souborů na páskových úložištích, včetně funkcí pro rostoucí podniková prostředí

## Replikace

Řešení Veeam poskytuje moderní způsob replikace s využitím bitových kopií virtuálních počítačů a jednoduché možnosti zotavení po havárii – to zaručuje dostupnost důležitých aplikací.

- **Replikace virtuálních počítačů na základě bitových kopií** Onsite replikace virtuálních počítačů k zajištění vysoké dostupnosti offsite pro účely zotavení po havárii.
- **Veeam Cloud Connect Replication:** Repliky mimo lokalitu bez dalších nákladů a složitosti budování a udržování pracoviště, kde k havárii došlo. Rychlé a bezpečné zálohování cloudu (DRaaS) u poskytovatele služby.
- **SureReplica:** Otestujte a ověřte automaticky obnovitelnost každé repliky virtuálního počítače.
- **Integrovaná WAN akcelerace:** Externí repliky mimo lokalitu až 50krát rychleji a nižší spotřeba šířky pásma.
- **Failover a failback:** Vracení replik a asistovaný failover a failback s minimálním narušením obchodní činnosti.



Další informace  
[veeam.com/cz](http://veeam.com/cz)



Stáhnout bezplatnou zkušební verzi  
[vee.am/backupcz](http://vee.am/backupcz)

## Podporovaná prostředí

### Infrastruktura VMware

#### Platformy

- vSphere 6.x
- vSphere 5.x
- vSphere 4.1

#### Hostitelé

- ESXi 6.x
- ESXi 5.x
- ESX(i) 4.1

#### Software

- vCenter Server 6.x (volitelné)
- vCenter Server 5.x (volitelné)
- vCenter Server 4.1 (volitelné)
- vCloud Director 5.5, 8.0 (volitelné)

#### Virtuální počítače

- Všechny operační systémy podporované technologií VMware
- Všechny aplikace
- Všechny souborové systémy

### Infrastruktura Microsoft

#### Platformy

- Windows Server 2016
- Windows Server 2012 R2
- Windows Server 2012
- Windows Server 2008 R2 SP1

#### Hostitelé

- Windows Server Hyper-V 2016
- Windows Server Hyper-V 2012 R2
- Windows Server Hyper-V 2012
- Windows Server Hyper-V 2008 R2 SP1
- Microsoft Hyper-V Server (bezplatný hypervisor)

#### Software

- Microsoft System Center Virtual Machine Manager 2016 (volitelné)
- Microsoft System Center Virtual Machine Manager 2012 R2 (volitelné)
- Microsoft System Center Virtual Machine Manager 2012 SP1 (volitelné)
- Microsoft System Center Virtual Machine Manager 2008 R2 SP1 (volitelné)

#### Virtuální počítače

- Všechny operační systémy podporované prostředím Microsoft Hyper-V
- Všechny aplikace
- Všechny souborové systémy

## Správa agentů

Využití funkce správy agentů vyžaduje instalaci spustitelného balíčku Veeam Agent pro Microsoft Windows 2.1 nebo novějšího nebo Veeam Agent pro Linux v2 nebo novějšího s aplikací Veeam Backup & Replication.

## Dostupné edice

Aplikace Veeam Backup & Replication se dodává ve třech edicích – Standard, Enterprise a Enterprise Plus – takže si můžete vybrat tu, která nejlépe odpovídá vašim potřebám a rozpočtu.

Globální alianční partneři:



DELL EMC



Gold  
Microsoft  
Partner



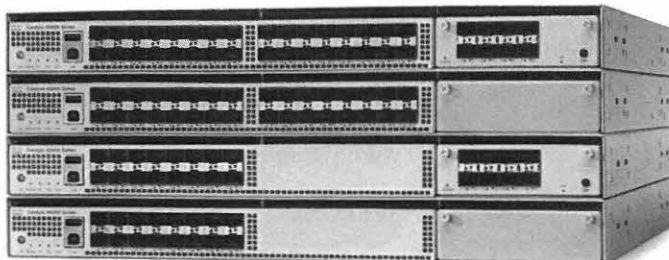
# Cisco Catalyst 4500-X Series Fixed 10 Gigabit Ethernet Aggregation Switch

## Product Overview

Cisco® Catalyst® 4500-X Series Switch (Figure 1) is a fixed aggregation switch that delivers best-in-class scalability, simplified network virtualization, and integrated network services for space-constrained environments in campus networks. It meets business growth objectives with unprecedented scalability, simplifies network virtualization with support for one-to-many (Cisco Easy Virtual Networks [EVN]) and many-to-one (Virtual Switching System [VSS]) virtual networks, and enables emerging applications by integrating many network services.

The Cisco Catalyst 4500-X Series offers key innovations, including:

- **Platform Scalability:** Delivers up-to 800 Gbps of switching capacity, capable of scaling up to 1.6-Tbps capacity with the VSS technology. Future-proof investment with modular uplink and auto-detect 10 Gigabit Ethernet and 1 Gigabit Ethernet ports.
- **High Availability:** Delivers the network availability demanded by business-critical enterprise applications through comprehensive high-availability capabilities, including VSS and EVN. Furthermore, innovative features such as redundant hot swappable fans and power supplies with AC to DC, and DC to AC failover remove single point of failure in network.
- **Application Monitoring:** Enhanced application monitoring through Flexible Netflow and eight ports of line rate bidirectional Switched Port Analyzer (SPAN)/Remote Switched Port Analyzer (RSPAN). In addition Cisco IOS® XE Software provides the ability to host third-party applications.
- **Security:** Support for Cisco TrustSec™ technology as well as robust control plane policing (CoPP) to address denial of service attacks.
- **Simplified Operations:** Support for Smart Install Director, providing a single point of management enabling zero-touch deployment for new switches and stacks in campus and branch networks.



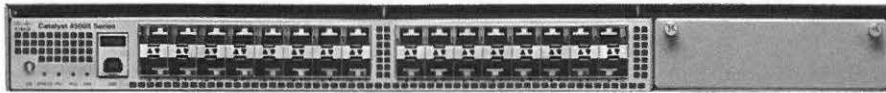
## Cisco Catalyst 4500-X Series Switch Family

Cisco Catalyst 4500-X Series provides scalable, fixed-campus aggregation solutions in space-constrained environments. The solution provides flexibility to build desired port density through two versions of base switches along with optional network module, providing line-rate 10GE capability. Both the 32-port and 16-port versions can be configured with optional network modules and offer similar features. The Small Form-Factor Pluggable Plus (SFP+) interface supports both 10 Gigabit Ethernet and 1 Gigabit Ethernet ports, allowing customers to use their investment in 1 Gigabit Ethernet SFP and upgrade to 10 Gigabit Ethernet when business demands change, without having to do a comprehensive upgrade of the existing deployment. The uplink module is hot swappable.

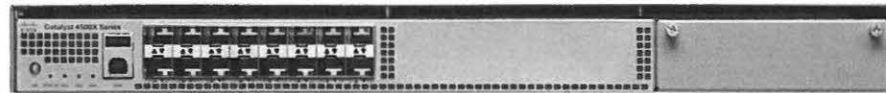
Following are key offering from this product family:

- 32 x 10 Gigabit Ethernet Port switch with optional module slot (Figure 1)
- 16 x 10 Gigabit Ethernet Port switch with optional module slot (Figure 2)
- 8 x 10 Gigabit Ethernet Port uplink module (Figure 3)

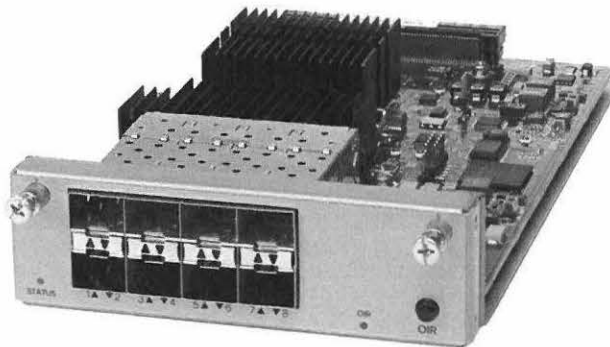
**Figure 1.** 32 x 10 Gigabit Ethernet Port Switch with Optional Uplink Module Slot



**Figure 2.** 16 x 10 Gigabit Ethernet Port Switch with Optional Uplink Module Slot

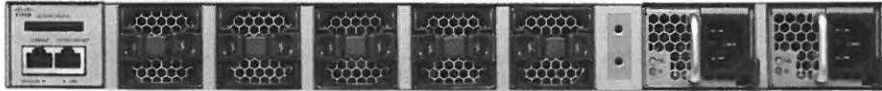


**Figure 3.** 8 x 10 Gigabit Ethernet Port Uplink Module



In addition, both 32 port and 16 port versions are available with front-to-back and back-to-front airflow. The front-to-back airflow switch comes with matching burgundy color fan and power supply handle to indicate warm side. Similarly, back-to-front airflow switch fan and power supply handles are color-coded in blue to indicate cool side. Figure 5 and Figure 6 show rear view of the switch with front-to-back and back-to-back airflow respectively.

**Figure 4.** Front-to-Back Airflow Rear View

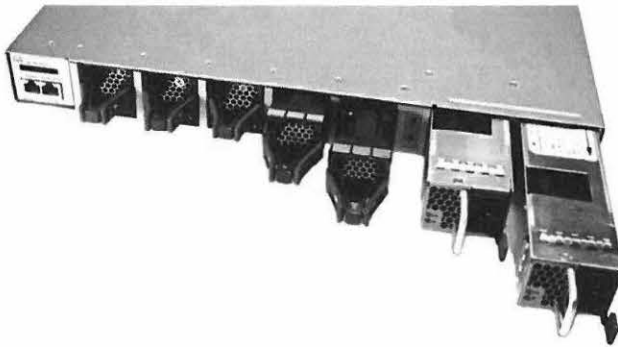


**Figure 5.** Back-to-Front Airflow Rear View



Cisco Catalyst 4500-X switch provides redundant hot swappable fans and power supplies (Figure 7) for highest resiliency with no single point of failure.

**Figure 6.** Redundant Fan and Power Supply



### Cisco Catalyst 4500-X Switch Series Feature Highlights

Cisco Catalyst 4500-X Series Switch provides nonblocking 10 Gigabit Ethernet per port bandwidth and Cisco IOS Flexible NetFlow for optimized application visibility. In addition to this, the enterprise-class Cisco Catalyst 4500-X offers the following:

- **Performance and scalability**
  - 800-Gbps switching capacity with up to 250 Mpps of throughput
  - External USB and SD card support for flexible storage options
  - 10/100/1000 RJ-45 console and management port
  - IPv6 support in hardware, providing wired-network-rate forwarding for IPv6 networks and support for dual stack with innovative resource utilization
  - Dynamic hardware forwarding-table allocations for ease of IPv4-to-IPv6 migration
  - Scalable routing (IPv4, IPv6, and multicast) tables, Layer 2 tables, and ACL and quality of service (QoS) entries to make use of eight queues per port and comprehensive security policies per port



- **Infrastructure services**

- Cisco IOS XE Software, the modular open application platform for virtualized borderless services
- Maximum resiliency with redundant components, Nonstop Forwarding/Stateful Switchover (NSF/SSO), and In-Service Software Upgrade (ISSU) support in a VSS enabled system
- Network virtualization through Multi-VRF technology for Layer 3 segmentation
- Automation through Embedded Event Manager (EEM), Cisco Smart Call Home, AutoQoS, and Auto SmartPorts for fast provisioning, diagnosis, and reporting

- **Cisco Borderless Networks services**

- Optimized application performance through deep visibility with Flexible NetFlow supporting rich Layer 2/3/4 information (MAC, VLAN, TCP flags) and synthetic traffic monitoring with IP service-level agreement (SLA)
- Medianet capabilities to simplify video quality of service, monitoring, and security. In addition, multicast features such as Protocol Independent Multicast (PIM) and Source-Specific Multicast (SSM) provide enterprise customers with the additional scalability to support multimedia applications

- **Investment protection and reduced TCO**

Cisco Catalyst 4500-X Series eliminates the need for standalone solutions by integrating many network services. Customers can lower the total cost of ownership while streamlining management and accelerating deployment time. Integrated network services available on Cisco Catalyst 4500-X Series include:

- Application visibility and control (Flexible NetFlow, Cisco IOS Embedded Event Manager)
- Security with Cisco TrustSec<sup>1</sup>
- Troubleshooting video or any User Datagram Protocol-based flows (Mediatrace)
- Video network readiness assessment (built-in traffic simulator with IP SLA Video Operation)
- Ability to run third-party applications (Wireshark)

Table 1 highlights the performance and scalability enhancements of the Cisco Catalyst 4500-X Series Switches.

**Table 1.** Cisco Catalyst 4500-X Switch Series Performance and Scalability Features

| Product Number                     | Description   |
|------------------------------------|---|
| <b>System</b>                      |   |
| <b>Base System</b>                 | Front to Back Airflow: <ul style="list-style-type: none"> <li>• 32x10 GE SFP+/SFP - WS-C4500X-32SFP+</li> <li>• 16x10 GE SFP+/SFP - WS-C4500X-16SFP+</li> </ul> Back to Front Airflow: <ul style="list-style-type: none"> <li>• 32x10 GE SFP+/SFP - WS-C4500X-F-32SFP+</li> <li>• 16x10 GE SFP+/SFP - WS-C4500X-F-16SFP+</li> </ul> |
| <b>Expansion Module (Optional)</b> | 8x10 GE SFP+/SFP - C4KX-NM-8SFP+  |
| <b>Management Port</b>             | 10/100/1000 Base-T  |
| <b>USB Port</b>                    | Type A (storage and boot) up-to 4 GB  |
| <b>Dual Power Supply</b>           | Yes   |
| <b>Field Replaceable Fans</b>      | Yes (5 fans)  |
| <b>Fan Redundancy</b>              | No performance impact with single fan failure   |
| <b>Scalability</b>                 |   |
| <b>System Throughput</b>           | Up to 800 Gbps  |
| <b>IPv4 Routing in Hardware</b>    | Up to 250 Mpps  |

45.

| Product Number  | Description  |
|---|--|
| <b>IPv6 Routing in Hardware</b>   | Up to 125 Mpps   |
| <b>L2 Bridging in Hardware</b>  | Up to 250 Mpps   |
| <b>Media Access Control (MAC) Entries</b>                                   | 55K  |
| <b>Forwarding Entries</b>   | 32x10 GE Port Base SKU: IPv4: 256K, IPv6: 128K<br>16x10 GE Port Base SKU: IPv4: 64K, IPv6: 32K |
| <b>Flexible Netflow Entries</b>   | 128K   |
| <b>Switched Port Analyzer (SPAN), Remote Switched Port Analyzer (RSPAN)</b> | 8 line rate bidirectional sessions (ingress and egress)  |
| <b>Total VLANs</b>  | 4094   |
| <b>Total Switched Virtual Interfaces (SVIs)</b>                             | 4094   |
| <b>IGMP groups</b>  | 32K  |
| <b>Multicast routes</b>   | 32x10 GE Port Base SKU: IPv4: 32K, IPv6: 32K<br>16x10 GE Port Base SKU: IPv4: 24K, IPv6: 12K   |
| <b>Dynamic Host Configuration Protocol (DHCP) Snooping Entries</b>          | 12K (DHCP snooping bindings)   |
| <b>ARP Entries</b>  | 47K  |
| <b>Spanning Tree Protocol Instances</b>                                     | 10K  |
| <b>Jumbo Frame Support for Bridged and Routed Packets</b>                   | Up to 9216 bytes   |
| <b>High Availability and Resiliency</b>                                     |  |
| <b>High Availability Solution</b>   | Virtual Switching System (VSS)   |
| <b>Number of stackable switches in VSS</b>                                  | Up to 2  |
| <b>VSS Throughput</b>   | Up to 1.6 Tbps   |
| <b>Virtual Switch Link</b>  | 1GE or 10GE  |
| <b>Max number of Virtual Switch Links</b>                                   | 8  |
| <b>In-Service Software Upgrade</b>  | Across the switches  |
| <b>Nonstop Forwarding with Stateful Switchover</b>                          | Across the switches  |
| <b>CPU and Memory</b>   |  |
| <b>Onboard Memory (SRAM DDR-II)</b>   | 4 GB   |
| <b>Port Buffers</b>   | 32-MB Shared Memory  |
| <b>CPU</b>  | Dual Core 1.5 GHz  |
| <b>NVRAM</b>  | 2 GB   |
| <b>Optional External Memory (SD Card)</b>                                   | 2 GB   |
| <b>QoS Features</b>   |  |
| <b>Port Queues</b>  | 8 Queues/Port  |
| <b>CPU Queues</b>   | 64   |
| <b>QoS Entries</b>  | 128K (64K ingress and 64K in egress) Shared with ACL   |
| <b>Aggregate Rate-Limiting</b>  | Ingress port or VLAN and egress VLAN or Layer 3 port   |
| <b>Rate-Limiting Level Types</b>  | Committed Information Rate (CIR), Peak Information Rate (PIR)                                  |
| <b>Aggregate Traffic Rate-Limiting Policers (1K=1024)</b>                   | 16K  |

| Product Number   | Description   |
|--|---|
| <b>Flow-Based Rate-Limiting Method; Number of Rates</b>                            | Supported using flow-records in the classification criteria and policing action |
| <b>Qos Policy Enforcement</b>  | Per Port or Per Vlan or Per Port, Per VLAN Granularity                          |
| <b>Class of Service (CoS)</b>  | Yes   |
| <b>Differentiated Services Code Point (DSCP)</b>                                   | Yes   |
| <b>Security Features</b>   |   |
| <b>Port Security</b>   | Yes   |
| <b>IEEE 802.1x and 802.1x Extensions</b>   | Yes   |
| <b>VLAN, Router, and Port ACLs</b>   | Yes   |
| <b>Security ACL Entries (1K=1024)</b>  | 128K (64K ingress and 64K in egress) Shared with QoS                            |
| <b>Unicast Reverse Path Forwarding (uRPF) Check in Hardware</b>                    | Yes   |
| <b>CPU Rate Limiters (DoS Protection) Includes Control Plane Policing</b>          | Yes   |
| <b>Private VLANs</b>   | Yes   |
| <b>Micro Flow Policer</b>  | Yes. Supported using flow records in the class-map                              |
| <b>CPU HW Rate Limiters by Packet Per Second (pps) and Bit Rate Policers (bps)</b> | Supported in hardware control-plane policing (CoPP)                             |
| <b>Control Plane Policing (CoPP) for Multicast</b>                                 | Yes   |
| <b>ACL Labels</b>  | Yes   |
| <b>Port ACL</b>  | Yes   |
| <b>Traffic Storm Control (formally known as Broadcast/Multicast Suppression)</b>   | Yes   |
| <b>Virtualization Features</b>   |   |
| <b>VRF-Lite Scalability</b>  | 64  |
| <b>Easy Virtual Network (EVN) Scalability</b>                                      | 32  |
| <b>Simplified Operations</b>   |   |
| <b>Smart Install</b>   | Smart Install Director <sup>2</sup>   |

<sup>2</sup> Smart Install Director support in VSS mode will be available in a future software release.

### Continued Innovations Through Infrastructure Services Modular Open Application Platform, Cisco IOS XE Software

Cisco IOS XE Software is the open service platform software operating system for the Cisco Catalyst 4500-X Series. Cisco continues to evolve Cisco IOS Software to support next-generation switching hardware and provide increased architectural flexibility to deliver Cisco Borderless Networks services. Cisco IOS XE Software provides the following customer benefits:

- Cisco IOS XE Software provides an enhanced operating system that can take advantage of the multicore CPU architecture of the Cisco Catalyst 4500-X system.
- Cisco IOS XE enables single software image, without the need to download a separate software image per license feature set.

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- Cisco IOS XE Software provides customer investment protection in the existing Cisco IOS Software by keeping a consistent feature set and operational look and feel. This supports a transparent migration experience.
  - Cisco IOS XE Software supports service virtualization capability that allows the Cisco Catalyst 4500-X to host third-party applications in parallel with Cisco IOS Software. The hosted application communicates with Cisco IOS Software to use its rich feature sets. This benefit keeps Cisco IOS Software simple and robust while allowing the customer to quickly adopt new technologies using proven code. Cisco IOS XE Software enables Cisco Catalyst 4500-X to be an open service platform and is a primary anchor for future Cisco Borderless Networks innovations.

### **Simplified Operations Through Automation**

As campus switching has grown to support increasing enterprise demands, so has the need to deploy and manage new and evolving technologies. Simplified operations are critical in meeting these challenges and achieving increased operational efficiency through proactive management and reduction in unplanned network downtime. The Cisco Catalyst 4500-X offers the following rich set of capabilities for simplified operations:

- Auto Install and AutoQoS for fast deployment
- Smart Install Director support for plug-and-play configuration and image-management
- Flexible NetFlow and IP SLA for enhanced visibility
- EEM integration with NetFlow and third-party applications
- Smart Call Home, Generic Online Diagnostic (GOLD), and Digital Optical Monitoring (DOM) for simplified operations
- Cisco EnergyWise for simplified and effective power management
- ISSU, SSO, and NSF for simplified change management and high availability for VSS enabled deployment
- Configuration rollback for improved configuration management

### **Best-in-Class Resiliency**

The Cisco Catalyst 4500-X Series is designed for excellent nonstop communications with non-interrupted hardware switching. With Cisco IOS XE Software, customers continue to reap the benefits of this best-in-class resiliency in various ways.

In addition to redundant power supplies and fans, the Cisco Catalyst 4500-X is Virtual Switching System (VSS).

Any two Cisco Catalyst 4500-X Series Switches can be pooled together into a VSS. The two switches are connected with 10 Gigabit Ethernet links called Virtual Switch Links (VSLs). Once a VSS is created, it acts as a single virtual Cisco Catalyst switch delivering the following benefits:

#### **Operational Manageability**

- Two Cisco Catalyst 4500-X Series Switches share a single point of management, single gateway IP address, and single routing instance.
- Eliminates the dependence on First Hop Redundancy Protocols (FHRP) and Spanning Tree Protocol.

#### **Scales to 1.6 Tbps**

- Scales system bandwidth capacity to 1.6 Tbps by activating all available bandwidth across redundant Cisco Catalyst 4500-X Series Switches.
- Provides up to 80 ports of 10 Gigabit Ethernet per system.

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## Enhanced Application Visibility with Flexible NetFlow

Cisco IOS Flexible NetFlow is the next generation in flow monitoring technology, allowing optimization of the network infrastructure resources, reducing operation costs, and improving capacity planning and security incident detection with increased flexibility and scalability. The Cisco Catalyst 4500-X Series provides 128K Flexible NetFlow entries. Based on a custom-built ASIC, Cisco Catalyst 4500-X Series delivers unprecedented flexibility and comprehensive flow visibility extending from Layer 2 (MAC, VLAN) to Layer 4 (TCP, UDP flags, and so on).

The flow data collected by Flexible NetFlow can be exported to an external collector for analysis and reporting or tracked by EEM. The Cisco Catalyst 4500-X Series enables powerful on-box and customizable event correlation and policy actions with EEM. This allows the switches to trigger customized event alarms or policy actions when the predefined condition is met. With no external appliance required, customers are able to use existing infrastructure to perform traffic monitoring, making traffic analysis economical even on large IP networks.

Additional details on Cisco Flexible NetFlow are available at: <http://www.cisco.com/go/fnf>.

### Features at a Glance

- **Cisco IOS XE Software IP Base:** Includes all Layer 2 features and some basic Layer 3 features.
- **Cisco IOS XE Software Enterprise Services:** Upgradable with a Software Activation License (SAL); supports full Layer 3 protocols and advanced features such as complete routing scalability, Border Gateway Protocol (BGP), Virtual Routing and Forwarding, Policy-Based Routing, and so on.

These features can be enabled using the software-licensing mechanism. For details about software licensing, see "Licensing" section later in this document or visit <http://www.cisco.com/go/sa>.

### Industry Standards

- Ethernet: IEEE 802.3
- 10 Gigabit Ethernet: IEEE 802.3ae
- IEEE 802.1D Spanning Tree Protocol
- IEEE 802.1w Rapid Reconfiguration of Spanning Tree
- IEEE 802.1s Multiple VLAN Instances of Spanning Tree
- IEEE 802.3ad LACP
- IEEE 802.1p CoS Prioritization
- IEEE 802.1Q VLAN
- IEEE 802.1X User Authentication
- IEEE 802.1x-Rev
- RMON I and II standards
- USGv6 and IPv6 Gold Logo certified

### Supported Pluggables

For details about the different optical modules and the minimum Cisco IOS Software release required for each of the supported optical modules, visit:

[http://www.cisco.com/en/US/products/hw/modules/ps5455/products\\_device\\_support\\_tables\\_list.html](http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html).



**Note:** SFP-10G-ZR modules are not supported on ports 1 to 32 (or 1 to 16) in the back-to-front airflow configuration. They are supported on the uplink module ports instead. In the back-to-front airflow configuration, limit usage of ZR optics to the uplink module only.

### Software Requirements

The Cisco Catalyst 4500-X Series is supported in Cisco IOS Software with minimum Cisco IOS XE Software Release 3.3.0SG. For VSS capability, minimum software requirement is Cisco IOS XE Software Release 3.4.0SG.

### Environmental Conditions

Table 2 lists environmental conditions for Cisco Catalyst 4500-X Series.

**Table 2.** Environmental Conditions for the Cisco Catalyst 4500-X Series

| Parameter  | Performance Range                            |
|--|--|
| Operating Temperature  | 0°C to 40°C (RH to 90%)                      |
| Storage Temperature  | -40°C to 70°C (RH 93%)                       |
| Operating Altitude   | 60m below sea level to 3000m above sea level |
| Relative Humidity  | Nonoperating Humidity: 95% RH                |
| Acoustic Noise Measured per ISO 7779 and Declared per ISO 9296 Bystander Positions Operating to an Ambient Temperature of 25°C | Industrial Product: 65 dBA maximum           |
| RoHS   | Reduction of Hazardous Substances (ROHS) 5   |

### Power Information

Table 3 lists power information for Cisco Catalyst 4500-X Series.

**Table 3.** Power Supply Information for Cisco Catalyst 4500-X Series

| Power Supply Feature                        | Support in the 4500-X Series                                    |
|---|---|
| AC Power Max Rating                         | 750W  |
| System Power Consumption                    | 330W nominal/400W max   |
| Input-Voltage Range and Frequency           | AC 100 to 240 VAC 50-60 Hz/DC -72 VDC to -40 VDC                |
| DC Power Max Rating                         | 750W  |
| AC to DC failover and vice versa            | Yes   |
| Total Output BTU (Note: 1000 BTU/hr = 293W) | 1122 BTU/hr (330 W) nominal/1365 BTU/hr (400 W) max             |
| Input Current                               | AC 11A @ 110VAC, 6 A @ 200VAC/DC 25A Max                        |
| Output Ratings                              | 12V @ 62A & 3.3V @ 3A   |
| Output Holdup Time                          | AC = 16 ms; DC = 4 ms @ maximum load                            |
| Power-Supply Input Receptacles              | AC IEC 60320 C15/DC Custom detachable screw terminal (supplied) |
| Power Cord Rating                           | AC 15A/DC 25A   |

## MTBF Information

Table 4 lists mean-time-between-failures (MTBF) information for Cisco Catalyst 4500-X Series.

**Table 4.** MTBF Information for Cisco Catalyst 4500-X Series

| Product Number     | Description                         |
|--------------------|-------------------------------------|
| WS-C4500X-16SFP+   | 209,330                             |
| WS-C4500X-24X-ES   | 209,330                             |
| WS-C4500X-32SFP+   | 199,720                             |
| WS-C4500X-40X-ES   | 199,720                             |
| C4KX-NM-8SFP+      | 2,286,500                           |
| WS-C4500X-F-16SFP+ | 209,330                             |
| WS-C4500X-F-32SFP+ | 199,720                             |
| C4KX-FAN-F         | L10 Life 60,000 at 40C <sup>1</sup> |
| C4KX-FAN-R         | L10 Life 60,000 at 40C              |
| C4KX-PWR-750AC-F   | 1,045,265                           |
| C4KX-PWR-750AC-R   | 1,045,265                           |
| C4KX-PWR-750DC-F   | 443,423                             |
| C4KX-PWR-750DC-R   | 443,423                             |

<sup>1</sup> Since fan is an electro-mechanical device it doesn't follow electronics failure mode. L10 life means the time 10% of total PS population will fail at a particular temperature.

## Regulatory Standards Compliance

Table 5 shows regulatory standards compliance information, and Table 6 provides ordering information.

**Table 5.** Cisco Catalyst 4500-X Regulatory Standards Compliance

| Standard   | Specification   |
|--|---|
| <b>Regulatory Compliance</b>                             | CE marking  |
| <b>EMI and EMC Compliance</b>                            | 47CFR Part 15 (CFR 47) Class A<br>AS/NZS CISPR22 Class A<br>CISPR22 Class A<br>EN55022 Class A<br>ICES003 Class A<br>VCCI Class A<br>EN61000-3-2<br>EN61000-3-3<br>KN22 Class A<br>CNS13438 Class A<br>EN55024<br>CISPR24<br>EN300386<br>KN24 |
| <b>Safety Certifications</b>                             | UL 60950-1 Second Edition<br>CAN/CSA-C22.2 No. 60950-1 Second Edition<br>EN 60950-1 Second Edition<br>IEC 60950-1 Second Edition<br>AS/NZS 60950-1  |
| <b>Industry EMC, Safety, and Environmental Standards</b> | GR-63-Core Network Equipment Building Systems (NEBS) Level 3<br>GR-1089-Core Level 3  |

**Table 6.** Ordering Information

| Product Number            | Description  |
|---------------------------|--|
| <b>Base Switch PIDs</b>   |  |
| <b>WS-C4500X-16SFP+</b>   | Catalyst 4500-X 16 Port 10GE IP Base, Front-to-Back Cooling, No P/S  |
| <b>WS-C4500X-24X-IPB</b>  | Catalyst 4500-X 24 Port 10GE IP Base, Front-to-Back Cooling, No P/S  |
| <b>WS-C4500X-24X-ES</b>   | Catalyst 4500-X 24 Port 10GE Enterprise Services, Front-to-Back Cooling, No P/S  |
| <b>WS-C4500X-32SFP+</b>   | Catalyst 4500-X 32 Port 10GE IP Base, Front-to-Back Cooling, No P/S  |
| <b>WS-C4500X-40X-ES</b>   | Catalyst 4500-X 40 Port 10GE Enterprise Services, Front-to-Back Cooling, No P/S  |
| <b>C4KX-NM-8SFP+</b>      | Catalyst 4500-X 8 Port 10GE Network Module   |
| <b>WS-C4500X-F-16SFP+</b> | Catalyst 4500-X 16 Port 10GE IP Base, Back-to-Front Cooling, No P/S  |
| <b>WS-C4500X-F-32SFP+</b> | Catalyst 4500-X 32 Port 10GE IP Base, Back-to-Front Cooling, No P/S  |
| <b>FRU and OIR FANS</b>   |  |
| <b>C4KX-FAN-F</b>         | Catalyst 4500-X Back-to-Front Cooling Fan  |
| <b>C4KX-FAN-R</b>         | Catalyst 4500-X Front-to-Back Cooling Fan  |
| <b>Power Supply</b>       |  |
| <b>C4KX-PWR-750AC-F</b>   | Catalyst 4500-X 750W AC Back-to-Front Cooling Power Supply   |
| <b>C4KX-PWR-750AC-R</b>   | Catalyst 4500-X 750W AC Front-to-Back Cooling Power Supply   |
| <b>C4KX-PWR-750DC-F</b>   | Catalyst 4500-X 750W DC Back-to-Front Cooling Power Supply   |
| <b>C4KX-PWR-750DC-R</b>   | Catalyst 4500-X 750W DC Front-to-Back Cooling Power Supply   |
| <b>Accessories</b>        |  |
| <b>CAB-CON-C4K-RJ45</b>   | Console Cable 6ft with RJ-45-to-RJ-45  |
| <b>SD-X45-2GB-E</b>       | Cisco Catalyst 4500 2-GB SD card   |
| <b>USB-X45-4GB-E</b>      | Cisco Catalyst 4500 4-GB USB device  |
| <b>Software</b>           |  |
| <b>S45XU-33-1511SG</b>    | Cisco IOS Software XE Release 3.3.0 SG non-crypto universal image for Cisco Catalyst 4500-X 32-port and 40-port models |
| <b>S45XUK9-33-1511SG</b>  | Cisco IOS Software XE Release 3.3.0 SG crypto universal image for Cisco Catalyst 4500-X 32-port and 40-port models     |
| <b>S45XU-331-1511SG</b>   | Cisco IOS Software XE Release 3.3.1 SG non-crypto universal image for Cisco Catalyst 4500-X 16-port and 24-port models |
| <b>S45XUK9-331-1511SG</b> | Cisco IOS Software XE Release 3.3.1 SG crypto universal image for Cisco Catalyst 4500-X 16-port and 24-port models     |
| <b>S45XU-34-1512SG</b>    | Cisco IOS Software XE Release 3.4.0 SG non-crypto universal image for all Cisco Catalyst 4500-X models                 |
| <b>S45XUK9-34-1512SG</b>  | Cisco IOS Software XE Release 3.4.0 SG crypto universal image for all Cisco Catalyst 4500-X models                     |
| <b>C4500X-LIC=</b>        | Base product ID for software upgrade licenses on Catalyst 4500-X (paper delivery)                                      |
| <b>C4500X-IPB</b>         | Catalyst 4500-X IP BASE software license (paper delivery)  |
| <b>C4500X-16P-IP-ES</b>   | Catalyst 4500-X IP BASE to Enterprise Services upgrade license (paper delivery) for 16-port and 24-port models         |
| <b>C4500X-IP-ES</b>       | Catalyst 4500-X IP BASE to Enterprise Services upgrade license (paper delivery) for 32-port and 40-port models         |
| <b>L-C4500X-LIC=</b>      | Catalyst 4500-X Base product ID for software upgrade licenses (electronic delivery)                                    |
| <b>L-C4500X-IPB</b>       | Catalyst 4500-X IP BASE software license (electronic delivery)   |
| <b>L-C4500X-16P-IP-ES</b> | Catalyst 4500-X IP BASE to Enterprise Services upgrade license (electronic delivery) for 16-port and 24-port models    |
| <b>L-C4500X-IP-ES</b>     | Catalyst 4500-X IP BASE to Enterprise Services upgrade license (electronic delivery) for 32-port and 40-port models    |

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## Licensing

### Software Activation Licensing

The Cisco Catalyst 4500-X Series enables software activation licensing. Each Cisco Catalyst 4500-X Series ships with a universal image containing all feature sets, IP Base and Enterprise Services. The level of functionality is determined by the license applied.

The software activation licensing enables customers to:

- Speed deployment and roll out new Cisco software activation feature sets across global networks
- Centrally and more accurately manage and track software and license compliance
- Easily conduct software compliance audits to meet regulations without affecting network operations

Additional benefits of Cisco activation licensing include:

- Operational simplicity
  - Simplified upgrades and license transfers save time and improve productivity. You can add new capabilities simply by using a license file.
  - You can easily track software assets, licenses, and feature set status.
  - A single software image improves service delivery.
- Ease of ordering:
  - "Try and buy" lets you use a temporary license to try and evaluate new Cisco IOS Software functionality before purchasing.
  - Pay-as-you-grow software key enables new features incrementally without service calls.

For more information about Cisco software licensing, visit: <http://www.cisco.com/go/sa>.

### Cisco ONE Software

Cisco ONE Software for Access Switching is available for the Cisco Catalyst 4500-X Series Switches.

Cisco ONE Software is a new way for customers to purchase and use our infrastructure software. It offers a simplified consumption model, centered on common customer scenarios in the data center, WANs, and LANs.

Cisco ONE Software and services provide customers with four primary benefits:

- Software suites that address typical customer use scenarios at an attractive price
- Investment protection of their software purchase through software services-enabled license portability
- Access to ongoing innovation and new technology with Cisco Software Support Service (SWSS)
- Flexible licensing models to smoothly distribute customer's software spend over time

For ordering information for Cisco ONE Software for the Cisco Catalyst 4500-X Series Switches, go to <http://www.cisco.com/c/en/us/products/software/one-access/switching-part-numbers.html>.

## Cisco Limited Lifetime Hardware Warranty

The Cisco limited lifetime hardware warranty (LLW) includes 10-day advance hardware replacement for as long as the original end user owns the product. Table 7 describes the Cisco limited lifetime hardware warranty.

The formal warranty statement, including the warranty applicable to Cisco software, appears in the Cisco information packet that accompanies your Cisco product. We encourage you to review carefully the warranty statement shipped with your specific product before use.

For additional information on warranty terms, visit: <http://www.cisco.com/go/warranty>.

**Table 7.** Cisco Limited Lifetime Hardware Warranty

| Warranty Terms   | Description <sup>1</sup>  |
|--|---|
| <b>Warranty Duration</b>                               | As long as the original end user continues to own or use the product.   |
| <b>EoL Policy</b>                                      | In the event of discontinuance of product manufacture, Cisco warranty support is limited to 5 years from the announcement of discontinuance.  |
| <b>Hardware Replacement</b>                            | Cisco or its service center will use commercially reasonable efforts to ship a replacement part within 10 business days after receipt of the RMA request and confirmation that a replacement part is the appropriate response. Actual delivery times may vary depending on customer location. |
| <b>Effective Date</b>                                  | Hardware warranty commences from the date of shipment to the customer (and in case of resale by a Cisco reseller, not more than 90 days after original shipment by Cisco).  |
| <b>Cisco Technical Assistance Center (TAC) Support</b> | None.   |
| <b>Cisco.com Access</b>                                | Warranty allows guest access only to Cisco.com.   |

<sup>1</sup> Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

Adding a Cisco Technical Services contract to your device coverage provides benefits not available through the warranty, including access to the Cisco Technical Assistance Center (TAC), a variety of hardware replacement options to meet critical business needs, updates for licensed Cisco IOS Software, and registered access to the extensive Cisco.com knowledge base and support tools. Choose from a flexible suite of support services designed to meet your business needs and help you maintain high-quality network performance while controlling operational costs. Table 8 describes the benefits and features of Cisco Technical Services. For more information about Cisco Technical Services, visit: <http://www.cisco.com/go/ts>.

**Table 8.** Cisco Technical Services for Cisco Catalyst 4500-X Series Switches

| Technical Services   |
|--|
| <p><b>Cisco SMARTnet™ Service</b></p> <ul style="list-style-type: none"> <li>• Around-the-clock, global access to the Cisco TAC</li> <li>• Unrestricted access to the extensive Cisco.com resources, communities, and tools</li> <li>• Next-business-day, 8x5x4, 24x7x4, and 24x7x2 advance hardware replacement<sup>2</sup> and onsite parts replacement and installation available</li> <li>• Ongoing operating system software updates within the licensed feature set<sup>1</sup></li> <li>• Proactive diagnostics and real-time alerts on Smart Call Home-enabled devices</li> </ul> <p><b>Cisco Smart Foundation Service</b></p> <ul style="list-style-type: none"> <li>• Next-business day advance hardware replacement as available</li> <li>• Business hours access to small and medium-sized business (SMB) TAC (access levels vary by region)</li> <li>• Access to Cisco.com SMB knowledge base</li> <li>• Online technical resources through Cisco Smart Foundation Portal</li> <li>• Operating system software bug fixes and patches</li> </ul> |



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## Technical Services

### Cisco Focused Technical Support Services

Three levels of premium, high-touch services are available:

- Cisco High-Touch Operations Management Service
- Cisco High-Touch Technical Support Service
- Cisco High-Touch Engineering Service

Valid Cisco SMARTnet Service or service provider base contracts on all network equipment are required.

### Footnotes:

<sup>1</sup> Cisco operating system updates include the following: maintenance releases, minor updates, and major updates within the licensed feature set.

<sup>2</sup> Advance hardware replacement is available in various service-level combinations. For example, 8x5xNBD indicates that shipment will be initiated during the standard 8-hour business day, 5 days a week (the generally accepted business days within the relevant region), with next business day (NBD) delivery. Where NBD is not available, same day ship is provided. Restrictions apply; please review the appropriate service descriptions for details.

## Cisco and Partner Services

Enable the innovative, secure, intelligent edge in Cisco Borderless Network Architecture using personalized services from Cisco and our partners. Through a discovery process that begins with understanding your business objectives, we help you integrate the next-generation Cisco Catalyst 4500-X Series Switches into your architecture and incorporate network services onto that platform. Sharing knowledge and leading practices, we support your success every step of the way as you deploy, absorb, manage, and scale new technology.

For additional information about Cisco services, visit: <http://www.cisco.com/go/services>.

## Cisco Capital

### Financing to Help You Achieve Your Objectives

Cisco Capital can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce CapEx. Accelerate your growth. Optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. [Learn more.](#)



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