

Cisco Prime Data Center Network Manager Release 6.1

Product Overview

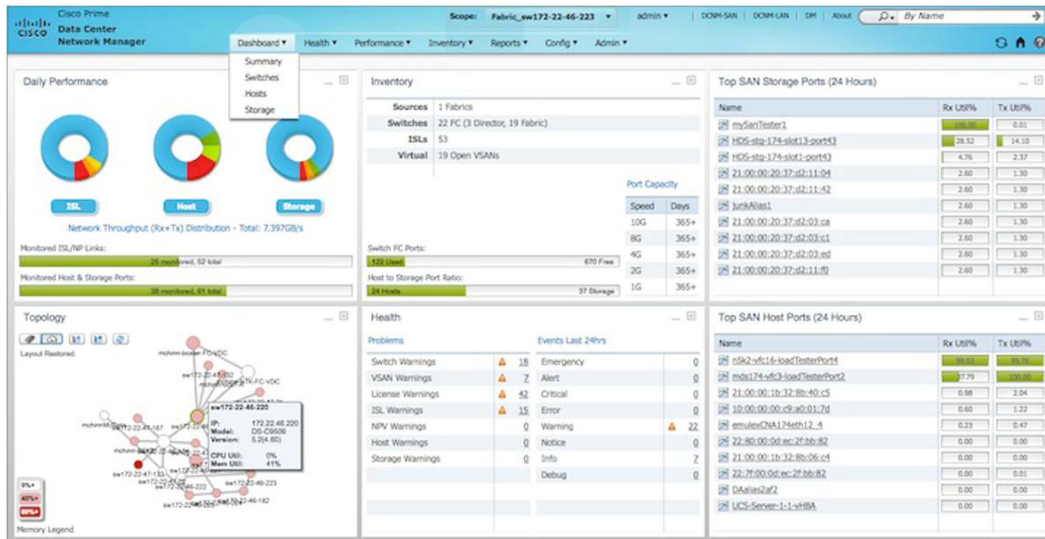
Modern data centers are becoming increasingly massive and complex. Proliferation of new technologies such as virtualization is adding yet another level of complexity while enabling higher workloads to be placed on the network. Innovations such as Cisco® Unified Fabric unify storage and data networking to deliver convergence, scalability, and intelligence with reduced total cost of ownership (TCO) and faster return on investment (ROI). IT departments today are challenged to look beyond traditional silos of networking and storage to manage this converged, virtualized data center. Meeting this challenge calls for unification of the management plane to enable holistic management of the data center infrastructure.

Cisco Prime™ Data Center Network Manager (DCNM) combines management of both Ethernet and storage networks in a single dashboard. The dashboard enables network and storage administrators to troubleshoot health and performance across the whole range of Cisco NX-OS Software platforms, including the Cisco Nexus® and Cisco MDS 9000 Families, regardless of protocol type such as Fibre Channel, Fibre Channel over Ethernet (FCoE), Ethernet, IBM Fibre Connection (FICON), and Small Computer System over IP (iSCSI). By using Cisco DCNM, IT administrators can identify available port capacity, reclaim orphaned ports, and maintain inventory of logical and physical switch components. Cisco DCNM also simplifies deployment SAN and LAN components by providing wizard- and template-based provisioning and configuration. Role-based access control (RBAC) helps separate configuration of LAN and SAN networks on converged network switches. DCNM supports TACACS+, RADIUS, and now Lightweight Directory Access Protocol (LDAP) remote authentication protocols to help manage user access to switching infrastructure.

Cisco Prime™ DCNM can be licensed for SAN and LAN environments separately or together. Majority of DCNM features used for provisioning and discovery are available for free with base image (essentials edition) while advanced features need an advanced edition license to unlock. DCNM is priced by switch platform and licensed per number of switches. In addition yearly service contract is required to upgrade from one major release to another.

The remainder of this document summarizes the Cisco Prime™ DCNM features.

Figure 1. DCNM Converged Summary Dashboard



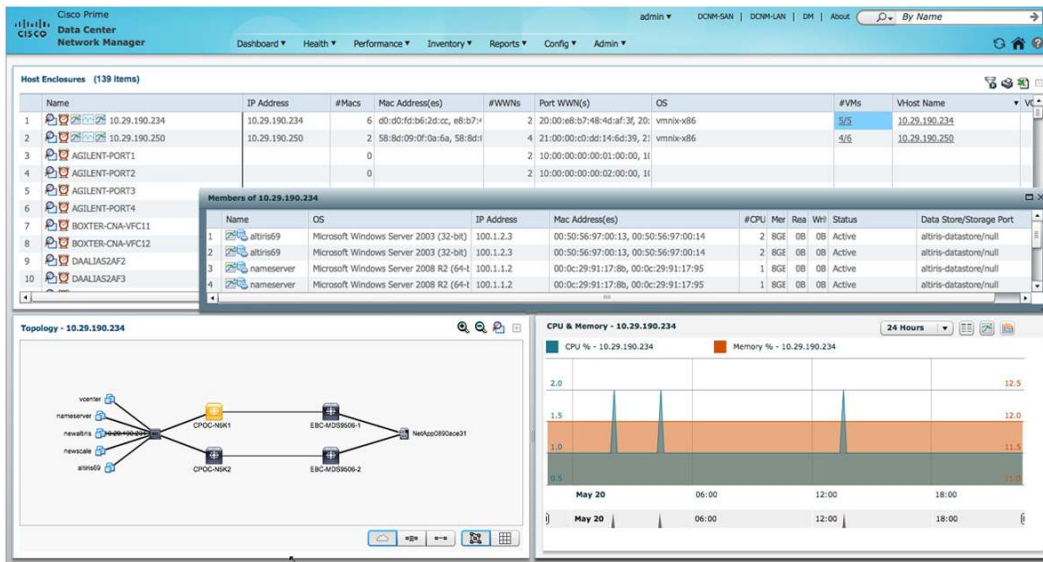
Features and Benefits

Cisco Prime™ DCNM offers a number of features and benefits for the data center, discussed here and summarized in Table 1.

Virtual Machine-Aware Path Management

Cisco Prime™ DCNM extends network visibility to virtual infrastructure by mapping the entire path from the virtual machine and switch to the physical storage and Ethernet networks. The Cisco VMpath feature that is part of the host dashboard provides views to help troubleshoot the performance of a virtual machine and virtual host while also reporting on the health and performance of the network and storage paths. The virtual machine-aware dashboard displays performance charts, path attributes, topology, path alerts, and information about the utilization of virtual machines and virtual hosts (Figure 2). The increased visibility into virtualized infrastructure helps IT administrators locate performance anomalies that may be causing service degradation as well as eliminate virtual computing and networking as a root cause of the problem.

Figure 2. VmPath View Extends to Storage and Ethernet Networks



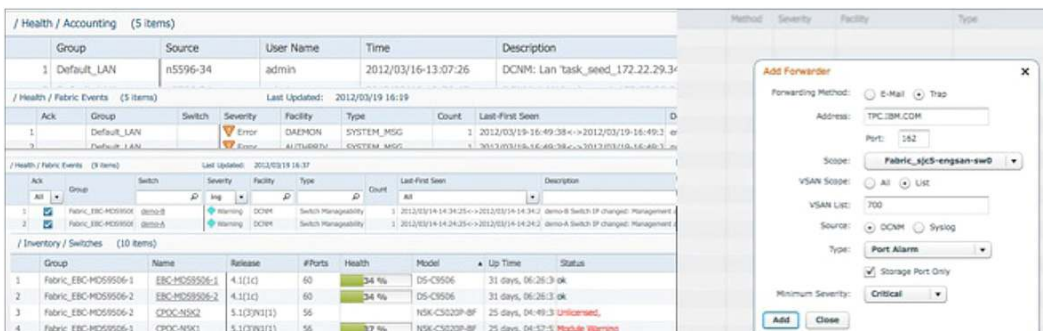
Planning: Performance Trending and Forecasting

By analyzing historic performance and projecting future bandwidth consumption, Cisco Prime™ DCNM helps IT departments understand the baseline traffic pattern for a deployed application and identify any performance anomalies that may affect customer service levels. Cisco Prime™ DCNM also helps IT design teams plan new deployments and redesign existing deployments based on peak utilization information collected as far back as a year or more. By monitoring historic performance, the design team can optimize switch consolidation activities by choosing modules with higher port densities based on the performance of applications, thus reducing the need to deploy more switches, reducing power utilization, and leaving more tile space in the data center for computing and storage resources (also shown in Figure 2).

Troubleshooting: Event Management

Cisco Prime™ DCNM consolidates all the events on the network, such as threshold breaches and switch and path alerts, and tracks configuration changes by individual network and storage administrators that may have caused outages or performance degradation. In addition, the Cisco Prime™ DCNM event-forwarding mechanism notifies, in real time, the appropriate email address, pager, or third-party management application when predefined thresholds are breached or the health of the network affected (Figure 3). The IT administrator can then acknowledge the alert in the event dashboard and, after the problem is resolved, delete the alert.

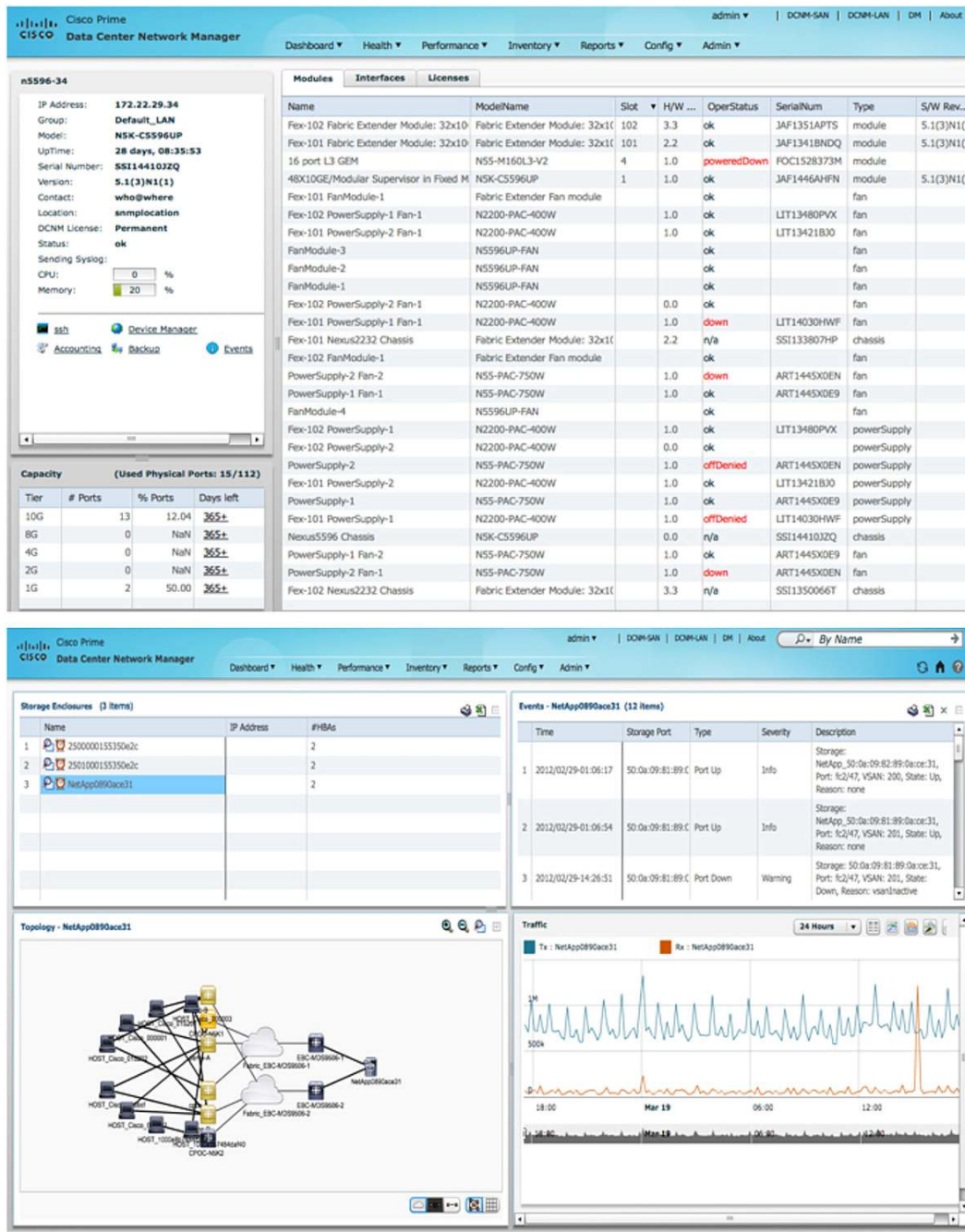
Figure 3. Enhanced Event Management



Domain Views

Through the concept of domain dashboards, Cisco Prime™ DCNM creates contextual views of the host, switch, and storage infrastructure (Figure 4). These views help IT administrators identify individual components and display their health and performance attributes. In addition, Cisco Prime™ DCNM provides a search engine that launches these dashboards in the context of the search attributes. IT administrators can in seconds determine the source of a network problem, thus reducing the outage time or preventing an outage from occurring in the first place.

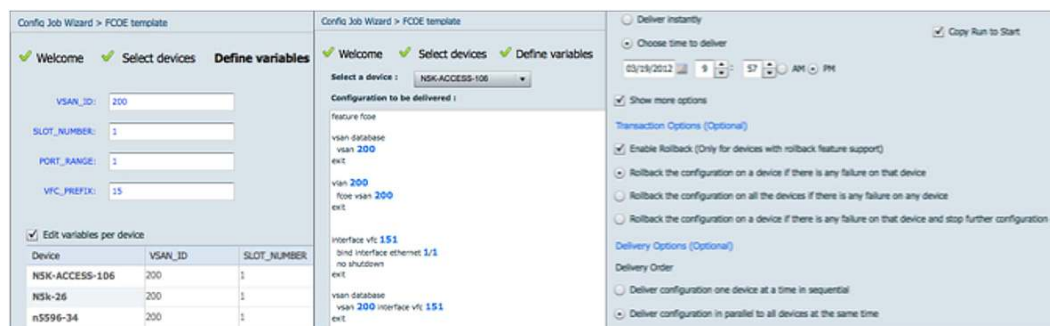
Figure 4. Switch and Storage Dashboards



Configuration and Provisioning: Web Templates

Cisco Prime™ DCNM provides IT administrators with wizards and predefined scripts for deploying configuration changes to Ethernet and storage networks (Figure 5). Wizard-based provisioning guides IT staff through the provisioning of hosts, Inter-Switch Links (ISLs) and trunks, and storage ports, regardless of whether the ports reside on the physical or virtual Cisco switch. In addition, Cisco Prime™ DCNM provides predefined template scripts for common tasks, which administrators also can customize; administrators also can import their own scripts into template formats and store them in the template repository.

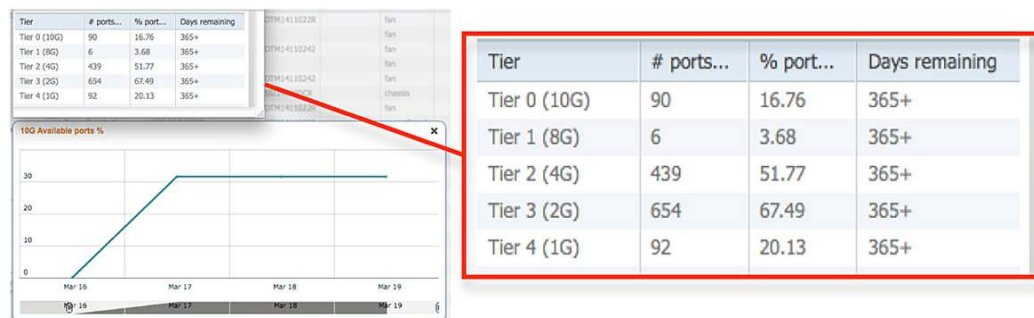
Figure 5. Web Template Provisioning



Capacity Manager: Managing Port Capacity by Tier

Understanding resource consumption is essential to increase throughput of applications and projects into the data center. To help prevent the Ethernet or storage network from becoming a bottleneck in this process, Cisco Prime™ DCNM helps track port utilization by tier, and through trending capacity manager predicts when an individual tier will be consumed (Figure 6). The information provides the capacity management team with enough time to order more ports or switches, thus reducing the risk that the network will become a bottleneck for application and project throughput. Increased throughput allows organizations to grow at a quicker pace, while reducing operational and capital expenses and most importantly improving overall customer experience.

Figure 6. Managing Port Capacity by Tier



Cisco Prime

The new release of Data Center Network Manager joins Cisco Prime Infrastructure family of management products on the journey to unify management of Cisco Data Center, Campus, and Collaboration-driven networks.

Cisco Prime is an innovative strategy and portfolio of management products that empower IT departments to more effectively manage their networks and the services they deliver. Cisco Prime is built upon a network services management foundation and a set of common attributes. It delivers an intuitive workflow-oriented user experience across Cisco architectures, technologies, and networks. Cisco Prime simplifies network management, improves operations efficiency, reduces errors, and makes the delivery of network services more predictable.

Scale-Out Architecture

Data center management tools must scale to meet the needs of large and distributed data center deployments. Customers do not want to spend time switching between multiple servers and dashboards. Prime DCNM maintains a consolidated view of the entire network by leveraging scale-out node architecture. As a result, network operations centers (NOCs) can now have a single dashboard for monitoring network alerts and events across multiple data centers.

Table 1. Features and Benefits

Feature	Benefit
Operations	
Event Management	<ul style="list-style-type: none"> • Provides real-time network health summary with detailed view of individual network components, enabling operations staff to respond quickly to events based on their severity • Ability to Acknowledge working on the alert and when resolved delete it • Forward syslog alerts based on monitored facility
Web Templates	<ul style="list-style-type: none"> • Pre-built Templates for provisioning LAN and SAN components • Pre-built Template deployment scheduler and rollback mechanism • Customizable Templates with conditional statements • Create new templates using template editor • Import configuration script and turn it into Template
Dashboards	<ul style="list-style-type: none"> • Provides operational monitoring views of SAN, LAN and Server environments • Domain driven dashboards for host, storage and switch • Context driven searches launch within domain dashboards
Performance and Capacity	<ul style="list-style-type: none"> • Provides detailed visibility into real-time and historical performance statistics in the data center • Provides insight into port and bandwidth utilization, error count, traffic statistics, etc. • Includes scheduled custom reports that can be offloaded for postprocessing
Capacity Manager	<ul style="list-style-type: none"> • Track port utilization by port tier and predict when an individual tier pool will be consumed • Chart view of port consumption based on custom groupings
VMpath Analysis for LAN and SAN	<ul style="list-style-type: none"> • Provides view of virtual machine path through physical network to storage array and to the data store • Provides capability to view performance for every switch hop all the way to the individual VMware ESX server and virtual machine
Topology Views	<ul style="list-style-type: none"> • Displays real-time operationally focused topology of the data center infrastructure • Offers Layer 2 overlay topology maps to streamline the troubleshooting process and reduce the mean time to repair; roll the cursor over the topology to view detailed information about paths and switch attributes
Reports	<ul style="list-style-type: none"> • Lets you build custom reports from predefined templates • Provides easy-to-schedule reports that can be exported for postprocessing or sent by email
Automated Discovery	<ul style="list-style-type: none"> • Using automated network discovery, provides up-to-date physical and logical inventory information • Tracks inventory and performance information in real time; information can be used as a source of truth for asset tracking or as a data source for a configuration management database (CMDB)
Configuration and Change Management	<ul style="list-style-type: none"> • Provides predeployment validation of configuration changes, reducing opportunities for human error • Using historical configuration archive coupled with configuration comparison, enables you to identify the last-known good state if configuration problems occur • Provides capability to back up configuration files from all switches
Image Management	<ul style="list-style-type: none"> • Enables easy-to-perform, nondisruptive (In-Service Software Upgrade [ISSU]) mass deployment of Cisco NX-OS Software images, which can be scheduled or run on demand

Feature	Benefit
Integration with Enterprise Systems	
Web Services APIs	<ul style="list-style-type: none"> • Abstracts the network to implement an IT service management framework (Information Technology Infrastructure Library [ITIL]) with a CMDB at its center as well as to integrate with business intelligence reporting solutions • Enables easy integration with third-party applications, allowing accurate flow-through provisioning and data mining • Enables integration into enterprise storage management systems through Storage Management Initiative Specification (SMI-S)-based APIs
Event Forwarding	<ul style="list-style-type: none"> • Enables integration with enterprise operations console (NOC) for alerts and events • Uses email and traps to notify operations staff of service disruptions • Add context to path alert by identifying name of host, ISL and storage entity

Supported Technologies and Platforms

Cisco Prime™ DCNM is designed to help customers efficiently implement and manage next-generation virtualized data centers. It provides timely management support for data center hardware platforms and Cisco NX-OS features.

Cisco Prime™ DCNM supports a variety of Cisco hardware platforms, including:

- Cisco MDS 9500 Series Multilayer Directors and Cisco MDS 9200 and 9100 Series Multilayer Switches
- Cisco Nexus 1000V Series Switches; Cisco Nexus 1010 Virtual Services Appliance; Cisco Nexus 2000 Series Fabric Extenders; Cisco Nexus 3000, 4000, 5000, and 7000 Series Switches
- Cisco Catalyst® 6500 Series Switches*
- Cisco UCS™ 6100 and 6200 Series Fabric Interconnects*
- Cisco FWSM* - FireWall Service Module

* [[Provide Reference]]

System Requirements

Cisco Prime™ DCNM is a Java-based client-server application that can be deployed on Windows or Linux operating systems, or as a virtual service blade on Nexus 1010 appliance LAN and SAN java clients provide advanced monitoring and provisioning capability and Dashboard to monitor health and performance of data center. DCNM scale-out architecture grows with the expansion of the network while maintaining a single Data Center view.

Table 2 summarizes the system requirements.

Table 2. System Requirements

Description	Small: Up to 50 Switches	Medium: 100 Switches	Large: 100 Switches and Above	Client Requirements
Hardware	Dual-core CPUs; 2 GHz	Quad-core CPUs; 2 GHz	Federation/Clustering: Up to 10 nodes (SAN) and above (LAN)	2 GHz
Memory	8 GB	12 GB minimum		1 GB
Free Hard Disk	40 GB	60 GB		1 GB
Operating System	<ul style="list-style-type: none"> • Microsoft Windows 2008 (32-bit and 64-bit) • Red Hat Enterprise Linux AS Release 5.4 (64-bit) • Hypervisor support same as guest OS 			<ul style="list-style-type: none"> • Microsoft Windows 7 • Red Hat Enterprise Linux AS Release 5.4 (64-bit)
Other	<ul style="list-style-type: none"> • PostgreSQL 8.4 • Oracle 10g and 11g XE 	<ul style="list-style-type: none"> • Oracle 10g and 11g Standard and Enterprise • Oracle 11g Real Application Clusters (RAC) 		<ul style="list-style-type: none"> • Java 6.29 • Internet Explorer, Safari, Firefox

Ordering Information

Cisco Prime™ DCNM is available with multiple licensing options for a wide range of data center deployments. Cisco Prime™ DCNM can be licensed for SAN and LAN environments separately or together. An important change in the licensing model with Cisco Prime™ DCNM (compared to Cisco Fabric Manager) is that licenses are hosted on the server and not the switch. All prior Cisco Fabric Manager licenses will be accepted for this model, and customers do not need to order or deploy any additional licenses to manage their existing Cisco MDS 9000 Family switches (see the Q&A document at <http://www.cisco.com/go/dcnm>).

The Cisco Prime™ DCNM Essentials Features (basic) license is included as part of the Cisco Prime™ DCNM image and can be downloaded from <http://www.cisco.com/go/dcnm>. The Cisco DCNM Advanced Edition license adds capabilities such as vCenter integration, performance trending, advanced provisioning, backup, dashboards, and scale-out architecture (Table 3). Cisco Prime™ DCNM Advanced Edition can be licensed for both LAN and SAN switches using the part numbers listed in Table 3.

Table 3. Cisco DCNM Ordering Information

Product Name	Electronic Part Numbers	Physical Part Numbers	Chassis Part Numbers
DCNM for SAN Advanced Edition for MDS 9100	L-DCNM-S-M91-K9=	DCNM-SAN-M91-K9=	DCNM-SAN-M91-K9
DCNM for SAN Advanced Edition for MDS 9200	L-DCNM-S-M92-K9=	DCNM-SAN-M92-K9=	DCNM-SAN-M92-K9
DCNM for SAN Advanced Edition for MDS 9500	L-DCNM-S-M95-K9=	DCNM-SAN-M95-K9=	DCNM-SAN-M95-K9
DCNM for SAN Advanced Edition for Nexus 7000	L-DCNM-S-N7K-K9=	DCNM-SAN-N7K-K9=	DCNM-SAN-N7K-K9
DCNM for SAN Advanced Edition for Nexus 5000	L-DCNM-S-N5K-K9=	DCNM-SAN-N5K-K9=	DCNM-SAN-N5K-K9
DCNM for LAN Advanced Edition for Nexus 5000	L-DCNM-L-N5K-K9=	DCNM-LAN-N5K-K9=	DCNM-LAN-N5K-K9
DCNM for LAN Advanced Edition for Nexus 3000	L-DCNM-L-N3K-K9=	DCNM-LAN-N3K-K9=	DCNM-LAN-N3K-K9
DCNM for LAN Advanced Edition for Nexus 7000	L-DCNM-N7K-K9=	DCNM-N7K-K9=	DCNM-N7K-K9

Service and Support

Realize the full business value of your technology investments with smart, personalized services from Cisco and our partners. Backed by deep networking expertise and a broad ecosystem of partners, Cisco Services help enable you to successfully plan, build, and run your network as a powerful business platform. Whether you are looking to quickly seize new opportunities to meet rising customer expectations, improve operational efficiency to lower costs, mitigate risk, or accelerate growth, we have a service that can help you.

Technical Service Options

Purchasing a Cisco Application Support plus Upgrades (SASU) service provides benefits not available with warranty including access to maintenance releases, minor and major upgrades, online resources, and Technical Assistance Center support services. For more information about Cisco warranties, go to <http://www.cisco.com/go/warranty>.

For information about Cisco Technical Services, go to <http://www.cisco.com/go/ts>.

For More Information

For more information about the Cisco Prime™ DCNM software, send an email to ask-dcnm@cisco.com, visit the product homepage at <http://www.cisco.com/go/dcnm>, or contact your local account representative.

Important Links

[Download Linux, Microsoft Windows, and Cisco Nexus 1010 Cisco Prime™ DCNM Virtual Service Blade \(VSB\) images](#)

[Installation guide](#)

[Configuration guides](#)

[Reference guides](#)

[Release notes](#)

[How-to video series](#)

[Evaluation licenses](#)



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