Cisco Data Center Network Manager Release 5.1 (LAN)

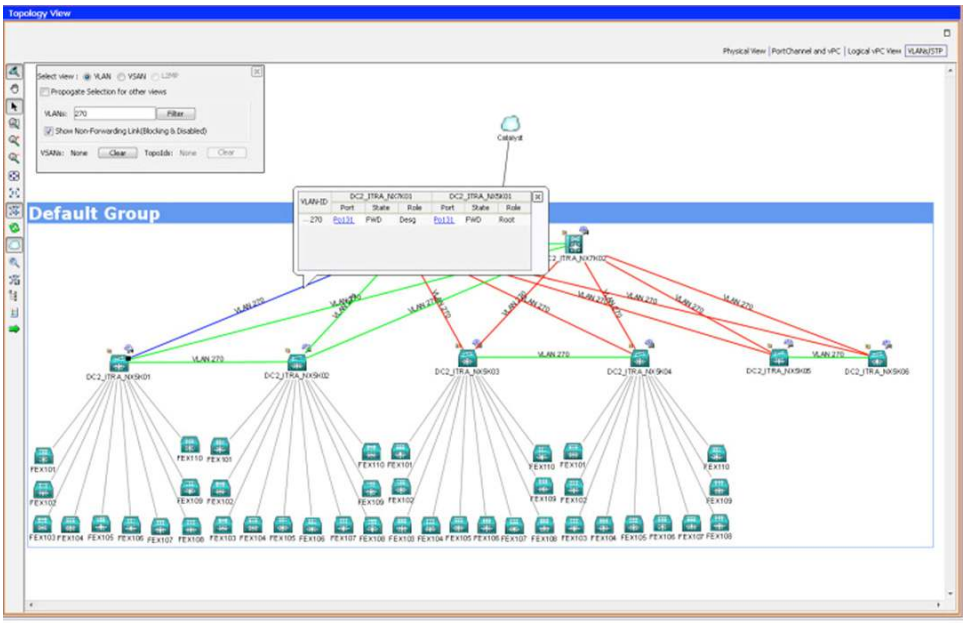
Product Overview

Modern data centers are becoming increasingly large and complex. New technology architectures such as cloud computing and virtualization are adding another level of complexity to the data center management plane. Today's IT departments are challenged to meet the business needs for scalability, flexibility, and agility in deploying and managing new technologies and services in the data center. To address this challenge, they depend on a variety of tools from numerous vendors to manage different parts of the network, which results in limited views of different parts of the data center and a lack of a holistic view of the health and performance of the overall infrastructure.

Cisco® Data Center Network Manager (DCNM) is a Cisco management solution that increases overall data center infrastructure uptime and reliability, improving business continuity. Focused on supporting efficient operations and management of the data center network, Cisco DCNM provides a robust framework and rich feature set that meets the routing, switching, and storage administration needs of present and future data centers. In particular, Cisco DCNM automates the provisioning process, proactively monitors the SAN and LAN by detecting performance degradation, streamlines the diagnosis of dysfunctional network elements, and secures the network. Offering an exceptional level of visibility and control through a single pane to Cisco Nexus® and Cisco MDS 9000 Family products, Cisco DCNM is the Cisco recommended solution for mission-critical data centers.

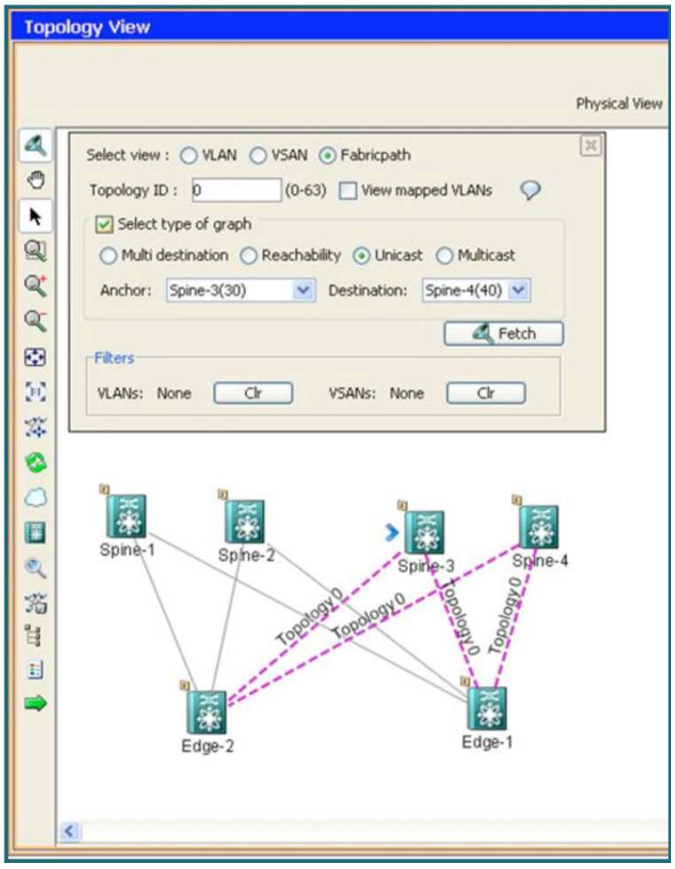
Features and Benefits

Innovative data center technologies, mainly related to network and server virtualization, are built into the Cisco Nexus Family platforms. Virtual device context (VDC), virtual PortChannel (vPC), Cisco FabricPath, and port profile technologies are powerful new networking constructs and create challenges from a management perspective. Cisco DCNM is built to provide visibility into these features, helping remove deployment hurdles and monitor their health.



- **VDC:** Cisco DCNM enables network virtualization by creating VDCs, facilitating resource allocation across VDCs and providing independent management for each VDC. VDCs are managed transparently throughout the application; the role-based access control (RBAC) model and topology maps are VDC aware.

- **vPC:** Cisco DCNM fully automates vPC operations. Two vPC peers can be managed as one logical device, allowing enforcement of the vPC peer configuration synchronization policy. Configuration mismatches between the primary and secondary vPC peers are prevented during the initialization phase, and vPC policy compliance is monitored on an ongoing basis. If an inconstancy is detected, it can be automatically repaired, bringing the network back to an operational state.



- **Cisco FabricPath:** Because of the dynamic nature of Cisco FabricPath, which auto-regulates the traffic load across Layer 2 multiple paths, the operations team must get visual feedback as to where and how traffic is actually traversing the fabric. A dedicated Cisco FabricPath topology view with unicast, multicast, and broadcast graphs provides this visibility (Figure 1). The path taken by the traffic between two edge switches is identified. When the return path is different from the entry path, the return path is also clearly identified. An easy-to-use, prebuilt template enables quick, error-free provisioning of Cisco FabricPath across the data center fabric.

  Cisco DCNM proactively measures bandwidth consumption and traffic patterns in the network, enabling early identification Cisco FabricPath hotspots, and thus congestion can be circumvented. The health of a Cisco FabricPath domain can be measured in real time for better service delivery.

Table 1 summarizes the main features and benefits of Cisco DCNM 5.1.

Table 1. Features and Benefits

Feature	Benefit
Operational Monitoring of Data Center Infrastructure	
Proactive monitoring	• The overall network health is summarized in a scoreboard-type interface, with at-a-glance, real-time, color-coded status information about all the faults in the data center. • Monitoring facilitates early detection and prevention of outages, increasing network availability. • There are no rules to write; monitoring works out of the box with prebuilt rules and thresholds.
Performance and capacity	• Get visibility into real-time and historical performance statistics in the data center. • Gain insight into port and bandwidth utilization, error count, traffic statistics, security violations, etc. Reports can be offloaded for postprocessing. • Get visibility into hardware resource utilization, ternary content addressable memory (TCAM) statistics, and environmental resource utilization information such as power draw and temperature.
Topology views	• View the real-time operationally focused topology of the data center infrastructure. • Accurate stateful Layer 2 topology maps streamline the troubleshooting process and reduce the mean time to repair (MTTR). • Technology-specific overlays for vPC, Cisco FabricPath, VDC, and VLAN enable provisioning and efficient management of these features.
Data Center Resource Management	
Automated discovery	• Automated high-fidelity network discovery provides up-to-date physical and logical inventory information at a glance. • Inventory information is tracked continuously and can be used as a source of accurate network asset and configuration information that can be integrated into configuration management databases (CMDBs).
Configuration and change management	• Pre-deployment validation of configuration changes based on domain rules reduces chances of misconfiguration. • Out-of-the-box configuration wizards are provided for critical Cisco NX-OS Software features such as vPC, VDC, and Cisco FabricPath. • Historical configuration archive coupled with configuration comparison and granular rollback enables an organization to return to a previously known good state in case of configuration problems.
Template-based provisioning	• Accelerate service rollout by using parameterized prebuilt templates for critical Cisco NX-OS features. • Roll out bulk configuration changes with templates on demand or on a specified schedule. • Templates help ensure consistency in configurations and reduce the likelihood of operator errors and mis-configuration. • Multiple administrators can create, edit, and share templates across the entire operating staff.
Image management	• Easy-to-use, non-disruptive In-Service Software Upgrade (ISSU) mass deployment of Cisco NX-OS images can be scheduled or run on demand. • Image upgrades are pre-validated, helping ensure compatibility with the running configuration, and in the event of a failure, rollback is initiated automatically.
Integration with Enterprise Systems	
Web services APIs	• Abstract the network to implement IT service management frameworks and CMDB integration. • Easy integration with third-party applications allows accurate flow-through provisioning and data mining. • Out-of-the-box integration & coresidency with Cisco Fabric Manager.
Event forwarding	• Integrate with the enterprise network operations console (NOC) for alerts and events. • Use email and alerts to notify operations staff of critical outages that may be service-impacting.

Supported Technologies and Platforms

Cisco DCNM is built with the specific objective of helping customers efficiently implement and manage next-generation virtualized data centers. It provides timely management support for data center hardware platforms and Cisco NX-OS innovations. Table 2 provides a sample of the supported technologies and specifications.

Table 2. Product Specifications and Supported Technologies

Ethernet Switching	Network Security	General
Cisco FabricPath	IEEE 802.1X	VDC
vPC	Port security and IP source guard	Port profile (Cisco VN-Link)
Port and PortChannel	IP tunnel interface and traffic storm control	FCoE Initialization Protocol (FIP) snooping
Multi-instance Spanning Tree Protocol (MISTP)	Access control lists (ACLs): MAC address ACL, IP ACL, and VLAN ACL	Hot Standby Router Protocol (HSRP)

Ethernet Switching	Network Security	General
Rapid Spanning Tree Protocol (RSTP)	Dynamic Host Configuration Protocol (DHCP) snooping	Gateway Load-Balancing Protocol (GLBP)
VLAN and private VLAN (PVLAN)	Dynamic Address Resolution Protocol (ARP) inspection	Switched Port Analyzer (SPAN)
Link Aggregation Control Protocol (LACP)	Authentication, authorization, and accounting (AAA)	ISSU-based software upgrades

Cisco DCNM supports the entire Cisco Nexus Family of hardware platforms:

- Cisco Nexus 7000 Series Switches (Cisco Nexus 7000 10-Slot and 18-Slot Switches)
- Cisco Nexus 5000 Series Switches (Cisco Nexus 5020 and 5010 Switches)
- Cisco Nexus 4000 Series Switches
- Cisco Nexus 2000 Series Fabric Extenders
- Cisco Nexus 1000V Series Switches and Cisco Nexus 1010 Virtual Service Appliance

System Requirements

Cisco DCNM is a Java-based client-server application that allows the client to be run remotely. The server & client components can be deployed on a variety of hardware and OS platforms, summarized in Table 3.

Table 3. System Requirements

Description	Server Requirements	Client Requirements
Hardware	Two multicore CPUs, 2 GHz minimum	One dual-core CPU, 2 GHz minimum
Memory	4 GB minimum; 6 GB recommended	1 GB
Hard disk	60 GB minimum; 80 GB recommended	100 MB free space for client
Operating system	• Microsoft Windows 2008 • Microsoft Windows 2003 Enterprise Edition with Service Pack 1 (SP1) or SP2 (32-bit & 64-bit) • Red Hat Enterprise Linux Advanced Server Release 5.4 (32-bit & 64-bit) • VMware ESX 4.0	• Microsoft Windows 7 • Microsoft Windows XP Professional with SP2 or SP3 (32-bit and 64-bit) • Red Hat Enterprise Linux AS Release 5.4 (32-bit and 64-bit)
Other	• PostgreSQL (embedded) • Oracle 11g Enterprise (external)	Mozilla Firefox or Microsoft Internet Explorer

Ordering Information

Cisco DCNM is available with multiple licensing options for a wide range of data center deployments (Table 4). The no-charge Cisco DCNM-LAN is made available with every Cisco Nexus hardware purchase and can be downloaded from http://www.cisco.com/go/dcnm. The licensed version is called Cisco DCNM-LAN Enterprise and adds capabilities for managing advanced technologies such as Cisco FabricPath and VDC and provides configuration and image management for Cisco Nexus 7000 Series Switches.

Table 4. Ordering Information

Description	Part Number
DCNM Enterprise license for one Nexus 7000 device (SW + License)	DCNM-N7K-K9
DCNM Enterprise license for one Nexus 7000 device (License only)	DCNM-N7K-PAK=
DCNM Enterprise license for 100 Nexus access devices (Nexus 1000 series, 2000 series, 4000 series, 5000 series only)	DCNM-NXACC-100-K9
DCNM Enterprise license for 250 Nexus access devices (Nexus 1000 series, 2000 series, 4000 series, 5000 series only)	DCNM-NXACC-250-K9

Service and Support

Using the Cisco Lifecycle Services approach, Cisco and its partners provide a broad portfolio of end-to-end services and support that can help increase your network's business value and return on investment (ROI). This approach defines the minimum set of activities needed, by technology and by network complexity, to help you successfully deploy and operate Cisco technologies and optimize their performance throughout the lifecycle of your network.

For More Information

For more information about the Cisco 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 Cisco account representative.

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Printed in USA C78-631924-02 05/11