Cisco Nexus 1100 Series Cloud Services Platforms

Product Overview

The Cisco Nexus® 1100 Series Cloud Services Platforms (CSPs) offer dedicated hardware appliances for the deployment of network services critical to virtualized data center infrastructure (Figure 1). The appliances host a number of virtual service blades (VSBs), including the following:

- Cisco Nexus 1000V Virtual Supervisor Module (VSM), which acts as the control plane (VMware vSphere and Microsoft Hyper-V deployments)
- Cisco Virtual Security Gateway (VSG), which provides a firewall for east-west traffic (VMware vSphere and Microsoft Hyper-V deployments)
- Cisco Prime™ Network Analysis Module (NAM), which provides in-depth analytics
- Citrix NetScaler 1000V Application Delivery Controller (ADC)

These VSBs provide a comprehensive solution for virtual networking services in the data center. Dedicated hardware for the Cisco Nexus 1000V VSM eases virtual access switch deployment for the network administrator, and with its support for additional VSBs, the Cisco Nexus 1100 Series CSPs are crucial components of a virtualized data center.

Figure 1.   Cisco Nexus 1100 CSP

Cisco Nexus 1000V Switches

Cisco Nexus 1000V Switches are intelligent virtual machine access switches designed for hypervisor environments. Operating inside a hypervisor, the Cisco Nexus 1000V supports server virtualization technology to provide:

- Policy-based virtual machine connectivity
- Mobile virtual machine security and network policy
- Nondisruptive operation model for your server virtualization and networking teams

Server virtualization usually changes the deployment and management of server operating systems, leading to longer deployment times, with a greater amount of coordination among server, network, storage, and security administrators. The Cisco Nexus 1000V offers a consistent networking feature set and provisioning process all the way from the virtual machine access layer to the core of the data center network infrastructure. Virtual servers can use the same network configuration, security policy, diagnostic tools, and operation models as their physical server counterparts attached to dedicated physical network ports. Virtualization administrators can access predefined network policies that follow mobile virtual machines to help ensure proper connectivity, saving valuable time that administrators can use to focus on virtual machine administration. This comprehensive set of capabilities helps you deploy server virtualization faster and achieve its benefits sooner. Figure 2 shows VMware vSphere; however, Microsoft Hyper-V is also supported.

Figure 2. Cisco Nexus 1000V Architecture
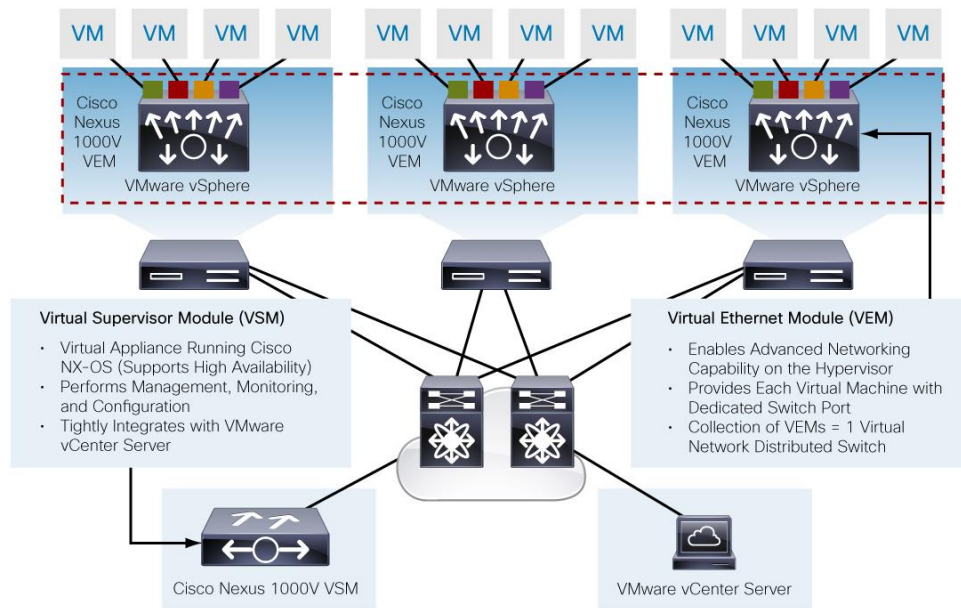
Product Architecture

Network administrators can install and configure virtual access switches similar to the way they install and configure physical switches. Dedicated VSM hardware is especially helpful during data center power up because there is no dependency in finding server resources for the VSM. Thus, the Cisco® CSP allows network administrators to manage the Cisco Nexus 1000V virtual access switches like physical switches and scale server virtualization deployments (Figure 3).
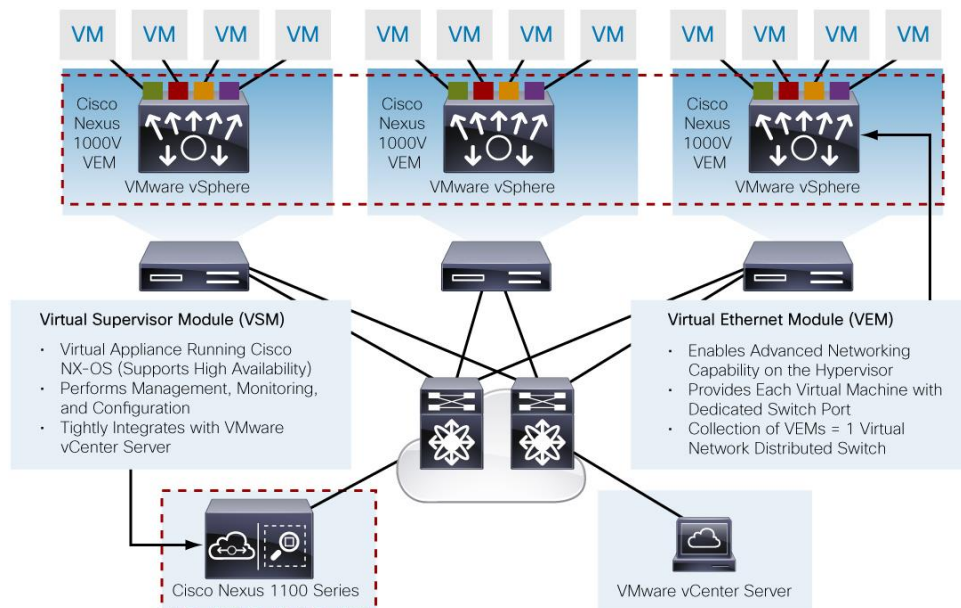
Figure 3. Cisco CSP Architecture

Figure 4 shows the internal architecture of the CSP. Cisco CSP Manager, based on the Cisco NX-OS Software, manages VSBs, installation, and blade configuration. Cisco CSP Manager offers a familiar Cisco NX-OS interface for network administrators installing and configuring VSBs. It also supports Cisco NX-OS high availability, allowing a standby CSP to become active if the primary CSP fails.

Figure 4.   CSP Internal Architecture
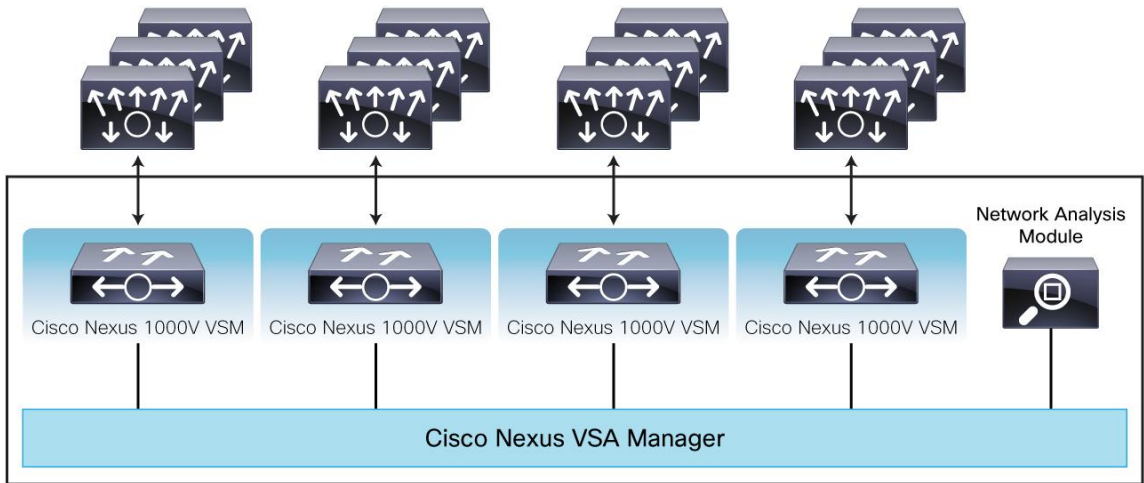
Cisco CSP High Availability

The Cisco CSP offers high-availability features for large-scale networking. Within a single appliance, a CSP offers process-level availability conferred by the modular nature of Cisco NX-OS, as well as VSB availability features such as restart-on-failure. Cisco Nexus 1000V VSM active-standby high availability is fully supported on the CSP. With dual CSPs deployed in a high-availability pair, active-standby failover of Cisco CSP Manager and the VSBs is also supported.

Cisco Nexus 1000V VSM on CSP Compared to a Virtual Appliance

Table 1 compares deployment of a Cisco Nexus 1000V VSM as a virtual appliance and on the CSP. For customers who want a complete software deployment of the Cisco Nexus 1000V, deployment of the VSM as a virtual appliance provides flexibility in VSM placement and even mobility with VMware vMotion. However, for network administrators who want greater control over the management of the VSM, the CSP provides a complete Cisco NX-OS experience using the Cisco Nexus 1000V virtual access switch. In addition, the CSP has fewer dependencies when the data center is powered on because the VSM can be initiated at the same time as the Cisco Nexus 1000V Virtual Ethernet Modules (VEMs). The VEMs reside within the hypervisor (VMware vSphere or Microsoft Hyper-V).

Table 1. VSM on the CSP Compared to VSM as a Virtual Appliance

Feature	VSM on CSP	VSM as Virtual Appliance (VMware vSphere or Microsoft Hyper-V)
Cisco Nexus 1000V features and scalability	Yes	Yes
VEM running on a hypervisor	Yes	Yes
Cisco NX-OS high availability of VSM	Yes	Yes
Installation like that of a standard Cisco switch	Yes	No
Network team ownership and management of the VSM	Yes	No
Support for multiple-hypervisor virtual machine traffic	Yes	No

Product Specifications

The Cisco Nexus 1110-S Cloud Services Platform (CSP) maximum supported configuration is up to nine VSBs total; the number may be smaller depending on the types of network services running the platform.

The Cisco Nexus 1110-X Cloud Services Platform (CSP) maximum supported configuration is up to 14 VSBs total; the number may be smaller depending on the types of network services running the platform.

See the Compatibility Information webpage for the latest weighting matrix, which describes the amount of resources that the various VSBs consume.

High Availability

- Stateful failover between active and standby Cisco CSP Managers
- Restart of VSMs and VSBs
- VSB export and import and VSM backup and restore

Management

- Cisco NX-OS command-line interface (CLI) console
- Cisco Discovery Protocol Versions 1 and 2
- Simple Network Management Protocol (SNMP) (read) Versions 1, 2, and 3
- XML API support
- Enhanced SNMP MIB support
- Secure Shell (SSH) Version 2
- Telnet
- Authentication, Authorization, and Accounting (AAA)
- TACACS+
- RADIUS
- Syslog
- Role-based access control (RBAC)
- Ingress and egress packet counters per interface
- Network Time Protocol (NTP) RFC 1305
- Domain Name System (DNS) for management interfaces
- CiscoWorks LAN Management Solution (LMS) 3.2, 3.1, and 3.0.1

SNMP MIBs

- Generic MIBs
  - CISCO-TC
  - SNMPv2-MIB
  - SNMP-COMMUNITY-MIB
  - SNMP-FRAMEWORK-MIB
  - SNMP-NOTIFICATION-MIB
  - SNMP-TARGET-MIB
- Configuration MIBs
  - IF-MIB (only the control0 and mgmt0 interfaces of Cisco CSP Manager use this MIB; any physical interfaces and VSB interfaces are not covered by this MIB)
  - CISCO-IMAGE-MIB
  - CISCO-CONFIG-COPY-MIB
  - CISCO-ENTITY-VENDORTYPE-OID-MIB
  - ETHERLIKE-MIB
  - MIB-II
- Monitoring MIBs
  - NOTIFICATION-LOG-MIB
  - CISCO-PROCESS-MIB
- Security MIBs
  - CISCO-AAA-SERVER-MIB
  - CISCO-COMMON-MGMT-MIB
- Miscellaneous MIBs
  - CISCO-CDP-MIB
  - CISCO-ENTITY-ASSET-MIB

Supported Standards

Table 2 presents IEEE compliance information, and Table 3 presents RFC compliance information.

Table 2.   IEEE Compliance

Standard	Description
IEEE 802.1Q	VLAN tagging
IEEE 802.3	Ethernet
IEEE 802.3ad	Link Aggregation Control Protocol (LACP)

Table 3. RFC Compliance

Standard	Description
IP Services	
RFC 768	User Datagram Protocol (UDP)
RFC 791	IP
RFC 792	Internet Control Message Protocol (ICMP)
RFC 793	TCP
RFC 826	Address Resolution Protocol (ARP)
RFC 854	Telnet
RFC 894	IP over Ethernet
RFC 1305	NTP Version 3
RFC 1492	TACACS+
RFC 1591	DNS client
RFC 2068	HTTP server
RFC 2138	RADIUS authentication
RFC 2139	RADIUS accounting

System Requirements

The solution must be compatible with any upstream physical switches, including all Cisco Nexus and Cisco Catalyst® switches as well as Ethernet switches from other vendors.

Hardware Specifications

Table 4 lists the hardware specifications for the Cisco Nexus 1110-S and 1110-X.

Table 4. Cisco Nexus 1110-S and 1110-X Specifications

Item	Specification
Processor	2 Intel® Xeon® E5-2650 processors: 2.00 GHz, 95 watts (W), 8 cores, 20-MB cache, and DDR3 1600-MHz RDIMM
Memory	Cisco Nexus 1110-S: 4 x 8-GB DDR3 1600-MHz RDIMM Cisco Nexus 1110-X: 8 x 8-GB DDR3 1600-MHz RDIMM
Network I/O	• LAN on motherboard (LOM): 2 x 1 Gigabit Ethernet • Intel Quad Gigabit Ethernet adapter • Cisco Nexus 1110-X: 10 Gigabit Ethernet ready with Cisco UCS Virtual Interface Card (VIC) 1225 dual-port 10 Gigabit Ethernet Enhanced Small Form-Factor Pluggable (SFP+) converged network adapter (CNA) installed (must have software Release 5.2(1)SP1(7.1) or later to use this card; Release 5.2(1)SP1(7.2) or later is recommended)
SSL offload card	Only for the Cisco Nexus 1110-X platform to be used in conjunction with the Citrix NetScaler 1000V; orderable SKU is C-CRYPTO-COMP-1.0= for a field-replaceable unit (FRU) (can also be ordered with a new Cisco Nexus 1110-X platform)
RAID card	LSI 2008 SAS RAID mezzanine card Cisco Nexus 1110-S: RAID 1 Cisco Nexus 1110-X: RAID 10
Hard disk drives	Cisco Nexus 1110-S: 2 x 1-TB SATA, 7200-rpm, 2.5-inch drive Cisco Nexus 1110-X: 4 x 1-TB SATA, 7200-rpm, 2.5-inch drive
Cisco Flexible Flash (FlexFlash)	One internal 16-GB Cisco FlexFlash drive (Secure Digital [SD] card)
Power supply	650W redundant power supply is optional when ordering or as an FRU

Item	Specification
Cisco UCS® Integrated Management Controller (IMC)	• Integrated Emulex Pilot-3 baseboard management controller (BMC) • IPMI 2.0 compliant for management and control • One 10/100/1000 Ethernet out-of-band management interface • CLI and WebGUI management tool for automated, lights-out management • Keyboard, video, and mouse (KVM)
Front-panel connector	One KVM console connector (supplies 2 USB, 1 VGA, and 1 serial connector)
Front-panel locator LED	Indicator to help direct administrators to specific servers in large data center environments
Additional rear connectors	Additional interfaces including a VGA video port, 2 USB 2.0 ports, an RJ-45 serial port, and a 1 Gigabit Ethernet management port
Physical dimensions (H x W x D)	One rack unit (1RU): 1.7 x 16.9 x 28.5 in. (4.32 x 43 x 72.4 cm)
Temperature: Operating	32 to 104°F (0 to 40°C) (at sea level, with no fan fail, no CPU throttling, and turbo mode)
Temperature: Nonoperating	-40 to 158°F (-40 to 70°C)
Humidity: Operating	10 to 90% noncondensing
Humidity Nonoperating	5 to 93% noncondensing
Altitude: Operating	0 to 10,000 ft (0 to 3000m); maximum ambient temperature decreases by 1°C per 300m)
Altitude: Nonoperating	0 to 40,000 ft (12,000m)
Other	• Cable management arm (CMA) • Rail kit

Solution Deployment Requirements

Table 5 presents deployment requirements for the CSP.

Table 5.   Deployment Requirements

Product	Requirement
Cisco Nexus 1100 Series CSPs	Recommended software Release: 5.2(1)SP1(7.2) or later
Citrix NetScaler 1000V	Recommended software Release: 10.5-52.11 or later

Regulatory Compliance

Table 6 provides regulatory standards compliance information for the Cisco Nexus 1110-S and 1110-X.

Table 6.   Regulatory Standards Compliance: Safety and EMC

Specification	Description
Safety	• UL 60950-1 No. 21CFR1040 Second Edition • CAN/CSA-C22.2 No. 60950-1 Second Edition • IEC 60950-1 Second Edition • EN 60950-1 Second Edition • IEC 60950-1 Second Edition • AS/NZS 60950-1 • GB4943 2001
EMC: Emissions	• 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • CISPR2 2 Class A • EN55022 Class A • ICES003 Class A • VCCI Class A • EN61000-3-2 • EN61000-3-3 • KN22 Class A • CNS13438 Class A

Specification	Description
EMC: Immunity	• EN55024 • CISPR24 • EN300386 • KN24

Ordering Information

Table 7 provides ordering information for the Cisco Nexus 1100 Series CSPs.

Table 7.   Cisco Nexus 1100 Series CSPs Ordering Information

Part Number	Description
C-CRYPTO-COMP-1.0=	SSL card ONLY for the Nexus 1110-X (for existing Nexus 1110-X deployments)
N1K-1110-X-SSL	Nexus 1110-X with SSL card (No licenses; Hardware Only)
N1K-1110-X-SSL-5S	Nexus 1110-X with SSL card and 5 Gbps Standard Edition NetScaler 1000V license
N1K-1110-X-SSL-5SC	Nexus 1110-X with SSL card and 5 Gbps Standard Edition NetScaler 1000V license (clustering)
N1K-1110-X-SSL-5E	Nexus 1110-X with SSL card and 5 Gbps Enterprise Edition NetScaler 1000V license
N1K-1110-X-SSL-5EC	Nexus 1110-X with SSL card and 5 Gbps Enterprise Edition NetScaler 1000V license (clustering)
N1K-1110-X-SSL-5P	Nexus 1110-X with SSL card and 5 Gbps Platinum Edition NetScaler 1000V license
N1K-1110-X-SSL-5PC	Nexus 1110-X with SSL card and 5 Gbps Platinum Edition NetScaler 1000V (clustering)
N1K-1110-X-HA96	Nexus 1110-X HA Pair with 96x Nexus 1000V (option to add SSL card) Advanced Edition multi-hypervisor Licenses
N1K-1110-X-HA48	Nexus 1110-X HA Pair with 48x Nexus 1000V (option to add SSL card) Advanced Edition multi-hypervisor Licenses
N1K-1110-X-HA00	Nexus 1110-X HA Pair without Nexus 1000V (option to add SSL card) Advanced Edition multi-hypervisor Licenses
N1K-1110-X	One Nexus 1110-X with 48x Nexus 1000V (option to add SSL card) Advanced Edition multi-hypervisor Licenses
N1K-1110-S-HA64	Nexus 1110-S HA Pair with 64x Nexus 1000V Advanced Edition multi-hypervisor Licenses
N1K-1110-S-HA32	Nexus 1110-S HA Pair with 32x Nexus 1000V Advanced Edition multi-hypervisor Licenses
N1K-1110-S-HA00	Nexus 1110-S HA Pair without Nexus 1000V Advanced Edition multi-hypervisor Licenses
N1K-1110-S	One Nexus 1110-S with 32x Nexus 1000V Advanced Edition multi-hypervisor Licenses
Redundant power supply available as FRU; also available as a configurable item on the Cisco Nexus CSP	
UCSC-PSU-650W=	650W Power Supply

For More Information

- For additional information about the Cisco Nexus 1100 Series Cloud Services Platforms, visit http://www.cisco.com/go/1100.

- For additional information about the Cisco Nexus 1000V Switch portfolio, visit http://www.cisco.com/go/nexus1000v.

- For additional information about the Cisco VSG, visit http://www.cisco.com/go/vsg.

- For additional information about the Cisco Prime NAM, visit http://www.cisco.com/go/1000nam.

- For additional information about the Citrix NetScaler 1000V, visit http://www.cisco.com/go/ns1000v.

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