Cisco Nexus 1010 and 1010-X Virtual Services Appliances

Q. Why should I use the Cisco Nexus® 1010 and 1010-X Virtual Services Appliances (VSAs)?

A. The Cisco® Nexus 1010 and Cisco Nexus1010-X VSAs are appliances that can provide improved management and scalability in Cisco Nexus 1000V Series Switches and VMware vSphere deployments. The Cisco Nexus 1000V Series can be deployed exclusively as software running in a VMware ESX or ESXi cluster; however, the Cisco Nexus 1010 and 1010-X VSAs provide customers with an additional deployment option with several benefits. The VSAs are used to manage and host the Cisco Nexus 1000V Series Virtual Supervisor Modules (VSMs) that control the Cisco Nexus 1000V Series Virtual Ethernet Modules (VEMs), which reside in the hypervisor of the host server. Also, the Cisco Nexus 1010 and 1010-X can host a variety of virtual network services, including the Cisco Prime™ Network Analysis Module (NAM) for Nexus 1010, Cisco Virtual Security Gateway (VSG) for Nexus 1000V Series Switch, and Cisco Data Center Network Manager (DCNM).

- The Cisco Nexus 1010 and 1010-X VSAs act like terminal servers for the networking team, providing consoles for any of the available VSM instances residing on the VSAs. This capability is accessed through the command-line interface (CLI) and does not require the use of VMware vCenter as a console for the VSM instance.
- Placing the management and control path elements, such as the VSM, on a Cisco Nexus 1010 or 1010-X allows you to manage policies separately from VMware vCenter administrators, helping you meet compliance and audit requirements and also reducing administrative errors. Offloading the VSM to a dedicated appliance delivers scalability and performance improvements to the virtualized data center infrastructure. Eliminating the dependency on VMware vCenter means that networking services no longer depend on host servers being up and running, which can be helpful during scenarios such as data center restarts.
- A virtual services platform close to, but not resident within, the virtualization infrastructure permits a virtual machine-aware solution such as Cisco Prime NAM to gain accurate network statistics directly from data sources, including virtual ports within the hypervisor.

Q. How are the Cisco Nexus 1010 and 1010-X deployed?

A. Based on the Cisco Unified Computing System™ (Cisco UCS™) C200 M2 High-Density Rack-Mount Server and running Cisco NX-OS Software, the Cisco Nexus 1010 and 1010-X use a modular service blade architecture to host multiple VSMs and other virtual network services such as Cisco VSG, Cisco Prime NAM, and Cisco DCNM. When deployed in pairs, the appliances improve system availability by automatically supporting active-standby configuration of the VSMs.

Q. What other services can be hosted on the Cisco Nexus 1010 and 1010-X? And how many?

A. The Cisco Nexus 1010 and 1010-X can host virtual networking services called virtual service blades (VSBs). As of Cisco NX-OS Release 4.2(1)SP1(3), up to six VSBs are supported on the 1010 or 1010-X. Cisco NX-OS Release 4.2(1)SP1(4) will support up to 10 VSBs on the Nexus 1010-X platform. The following VSBs are supported today:

- Cisco Nexus 1000V Series (VSM), which includes all current releases
- Cisco Prime NAM
- Cisco VSG
- Cisco DCNM

Nexus 1010 maximum supported configurations (up to 6 VSBs total)

- 6 Cisco Nexus 1000V VSMs, each capable of managing 64 ESX or ESXi for a total of 384 VMware ESX/ESXi hosts
- 6 Cisco VSG VSBs
- NAM VSB (see weighting matrix)
- DCNM VSB (see weighting matrix)

Nexus 1010-X maximum supported configurations [up to 10 VSBs total using Cisco Nexus 1010 Release 4.2(1)SP1(4) and later; up to 6 VSBs total using Cisco Nexus 1010 Release 4.2(1)SP1(3)]*

- 10 Cisco Nexus 1000V VSMs, each capable of managing 64 ESX or ESXi for a total of 640 VMware ESX/ESXi hosts*
- 10 Cisco VSG VSBs*
- NAM VSB (see weighting matrix)
- DCNM VSB (see weighting matrix)

Weighting Matrix (for determining maximum capacity and mixingVSBs on the Nexus 1010)

	VSM	VSG	NAM	DCNM	Total Weighting
Nexus 1010 and 1010-X **NX-OS Release 4.2(1)SP1(3)**	1	1	1	2	<=6
Nexus 1010-X **NX-OS Release 4.2(1)SP1(4)**	1	1	2	2	<=10

Q. What is the difference between the Cisco Nexus 1010 and the new Cisco Nexus 1010-X?

A. The Cisco Nexus 1010-X provides the same functionality and services as the Cisco Nexus 1010 in an expanded appliance form factor with additional memory, hard disk space, and capacity to support more VSBs. Table 1 shows the expanded configuration and capacity of the new Nexus 1010-X compared with the Nexus 1010.

Table 1. Comparison of Cisco Nexus 1010 and Cisco Nexus 1010-X Virtual Services Appliances

Metric	Nexus 1010	Nexus 1010-X
Memory	16 GB	48 GB
Hard disk drive	1 TB SATA total raw capacity	4 TB SAS total raw capacity
VSBs	6 [Release 4.2(1)SP**1(3)**]	6 [Release 4.2(1)SP**1(3)**] 10 [Release 4.2(1)SP**1(4)**]
Availability	Shipping	Shipping

Q. What is the difference between a Virtual Supervisor Module (VSM) and a Virtual Service Blade (VSB)?

A. A VSB is any application that is hosted on the Nexus 1010 or 1010-X. The VSM was the first VSB to be hosted on the 1010/1010-X. The VSM is the NX-OS control plane for the Nexus 1000V. The NAM, VSG, and DCNM are all examples of other VSBs that can also be hosted on the 1010.

Q. Can I just use one Cisco Nexus 1010 or 1010-X? Why do I need two appliances?

A. As a best practice, the use of two Cisco Nexus 1010 or 1010-X appliances is recommended. Cisco does not support and the products do not allow the primary and secondary VSMs to be installed on the same Cisco Nexus 1010 or 1010-X. Having two appliances provides the necessary redundancy for a virtualized production environment. Note: Nexus 1010 and 1010-X VSAs cannot be mixed in a high-availability configuration.

Q. Can I have one VSM instance using Layer 2 communication and another VSM instance using Layer 3?

A. Yes. Each VSM can use whichever method of communication with the VEM is needed.

Q. Does the management VLAN for all VSMs on the Cisco Nexus 1010 or 1010-X have to be the same?

A. Yes. Every management interface on the VSMs must reside in the same management VLAN as the Cisco Nexus 1010 or 1010-X management VLAN. However, Cisco Prime NAM uses only data-class traffic, and its VLAN does not have to be same as the Cisco Nexus 1010 management VLAN; the user can choose any VLAN that he or she wants for Cisco Prime NAM.

Q. Do multiple VSMs on the Cisco Nexus 1010 or 1010-X appliance have to have different domain IDs?

A. If the VSMs are in Layer 2 mode and are using the same VLAN for the control or management VLAN, then their domain IDs must be unique. As a best practice, the domain IDs should be unique to identify the instances correctly, but this is not required if the VSMs are using different control VLANs. If the VSMs are using Layer 3 communication, then the VSM instances must have unique domain IDs.

Q. Can multiple Cisco Nexus 1000V Series instances with unique domain IDs be active for the same VEM?

A. No. A VEM can belong to only a single Cisco Nexus 1000V Series instance, whether the Cisco Nexus 1000V Series instance is running on the Cisco Nexus 1010 or 1010-X VSA or whether it is a virtual machine on a VMware ESX or ESXi server.

Q. Can the Cisco Nexus 1000V Series Switch have the same domain ID as the Cisco Nexus 1010 or 1010-X?

A. No. The Cisco Nexus 1010 or 1010-X and all the VSMs share same management VLAN. Consequently, sharing the same domain ID can cause problems for high availability.

Q. How can I view the uplink connectivity on the Cisco Nexus 1010 or 1010-X?

A. The Cisco Nexus 1010 or 1010-X uplink supports Cisco Discovery Protocol, so you can use the Show Network CDP Neighbors command to see the upstream port connectivity. The Show Network and Show Network Summary commands display details about PortChannels and Ethernet ports on the Cisco Nexus 1010 or 1010-X.

Q. How do I migrate a VSM running as a virtual appliance in a VMware ESX or ESXi cluster to the Cisco Nexus 1010 or 1010-X?

A. The procedure can be found in our software configuration guide at the following link: http://www.cisco.com/en/US/docs/switches/datacenter/nexus1000/sw/4_2_1_s_p_1_3/software/configuration/guide/n1010_vsvcs_cfg_6migrate.html#wp1082495.

Q. How do I change the switch from primary to secondary or secondary to primary when running the Cisco Nexus 1010 or 1010-X in high-availability mode?

A. Use the Write Erase command to change the roles. All configurations will be lost on the Cisco Nexus 1010 or 1010-X appliance, and it will come up in the fresh install mode. The system redundancy role <primary|secondary> command cannot be used to change the role.

Q. How do I upgrade the BIOS and the Cisco Integrated Management Controller (IMC)?

A. The latest release of the Cisco IMC and BIOS can be found at the following link: http://www.cisco.com/cisco/software/release.html?mdfid=283860950&flow%3E%3E%20id=25801%3E%3E%20&softwareid=283850974&release=1.4%281c%29&relind=AVAILABLE&rellifecyc%3E%3E%20le=&relt%3E%3E%20ype=latest

For the Cisco IMC upgrade procedure, see the following link: http://www.cisco.com/en/US/products/ps10493/products_configuration_example09186a0080b07b7c.shtml#gui-firmware-browser

Note: The Cisco UCS C200 M1 and M2 Rack-Mount Server and C210 M1 and M2 General-Purpose Rack Mount Server Host Upgrade Utility does not contain the part number for the Cisco Nexus 1010, which is N1K-C1010, so it is not supported for Cisco Nexus 1010 at this time. The workaround is to use the Cisco Nexus 1010 IMC GUI to update Cisco IMC.

For the BIOS upgrade procedure, see the following link: http://www.cisco.com/en/US/docs/unified_computing/ucs/c/sw/bios/b_Upgrading_BIOS_Firmware.html#task_DD83FB75DB8C485FA4E8ED222C77BD3C

Note: Update the BIOS individually using the manual procedure described at the preceding link.

Q. What should I expect after the Cisco Nexus 1010 or 1010-X is configured?

A. After the Cisco Nexus 1010 or 1010-X is configured, management connectivity should be active if the uplink ports have been connected and configured. After the VSB ISO files are placed in the bootflash repository folder, the user can start deploying VSBs such as the Cisco Prime NAM, VSM, Cisco VSG, and Cisco DCNM.

Q. How do I upgrade the Cisco Nexus 1010 or 1010-X and the VSBs?

A. Cisco Nexus 1010 or 1010-X and VSB upgrades are performed independently.

To upgrade to the latest Cisco NX-OS Software for the appliances, download the latest Cisco Nexus 1010 ISO file and copy it to the bootflash repository and then use the command Install Nexus 1010 <iso-file> to perform the upgrade. The upgrade procedure is hitless for Cisco NX-OS Release 4.2.(1)SP1(2) and later because In Service Software Upgrade (ISSU) is supported; however, a brief maintenance window is recommended while you upgrade the software.

The latest software for the Cisco Nexus 1010 and 1010-X can be found here: http://www.cisco.com/cisco/pub/software/portal/select.html?&i=!m&mdfid=282940122

Detailed Cisco Nexus 1010 and 1010-X upgrade procedures can be found here: http://www.cisco.com/en/US/docs/switches/datacenter/nexus1000/sw/4_2_1_s_p_1_3/install_upgrade/guide/n1010_install_software.html#wp92206

VSB upgrade information is published separately in each of the respective VSB documents, and the VSB upgrade can be performed independently of the Cisco Nexus 1010 or 1010-X upgrade.

Q. If I upgrade a VSB, do I need to upgrade the Cisco Nexus 1010 or 1010-X VSA, and if I upgrade the VSA, do I need to upgrade the VSB?

A. No. The Cisco Nexus 1010 or 1010-X and VSB upgrades are independent of each other.

Q. Can two Cisco Nexus 1010 or 1010-X appliances with different software versions form a high-availability pair?

A. No. The software code must be the same to form a high-availability pair.

Q. How do I enable high availability on the Cisco Nexus 1010 or 1010-X?

A. Cable and connect upstream switches and then enable VLANs for both primary and secondary Cisco Nexus 1010 or 1010-X appliances before bringing them up. Bring up the primary VSA, configure it, and check whether it is connected upstream by checking management connectivity. Bring up the secondary VSA and configure it. After it reloads, it should be in standby mode because it will identify the primary Cisco Nexus 1010 or 1010-X as active through the control and management traffic.

In some cases, the primary and secondary Cisco Nexus 1010 or 1010-X appliances are brought up independently without being connected to the upstream switches. In this case, they will come up as an active-active pair because of the split-brain scenario. To correct this split-brain scenario, connect the appliances to the upstream switches and configure the VLANs. Then power off the secondary appliance so that it does not reload the primary appliance. After connectivity is restored on both the primary and secondary appliances, power on the secondary VSM so that it joins primary (active) appliance in standby mode.

Q. What is the recommended uplink connection when configuring the Cisco Nexus 1010?

A. Currently, four options are available to connect to the network. These options can be found here: http://www.cisco.com/en/US/docs/switches/datacenter/nexus1000/sw/4_2_1_s_p_1_3/software/configuration/guide/n1010_vsvcs_cfg_1oview.html#wp1104545

The most commonly used option is option 1, in which all traffic flows through the two LAN-on-motherboard (LOM) interfaces. Because most VSBs mainly use control traffic, excluding the Cisco Prime NAM, the amount of bandwidth needed is limited, and the two Gigabit Ethernet interfaces have plenty of bandwidth to accommodate six VSBs. Depending on the amount of bandwidth needed for Cisco Prime NAM traffic, option 1 usually is preferred for this traffic, too. If more dedicated bandwidth is needed, however, option 2 should be sufficient for connectivity if there is a Cisco Prime NAM on the Cisco Nexus 1010 or 1010-X.

Cisco Prime NAM and Cisco VSG deployments need data, so network uplink option 2 can be used for separate data traffic. If you want to segregate management and control traffic, then you can choose option 3, in which the last four ports are used for control and data traffic. If you want to segregate all control, management, and data traffic, you can use option 4.

Q. How can I tell which uplink type has been configured on the Cisco Nexus 1010?

A. Enter the following commands:

```
show network-uplink type
Administrative topology id: 3
Operational topology id: 3
```

Q. After setting up the Cisco IMC for the Cisco Nexus 1010 or 1010-X, what is the best way to access the CLI?

A. The best approach is to use your existing terminal server and connect through Telnet, just as you would do for a regular switch.

Q. When and how do I need to interact with the serial-over-LAN (SOL) or terminal server with respect to Cisco Nexus 1010 or 1010-X configuration?

A. For SOL, do the following:

1. Activate SOL from the Cisco IMC IP address by choosing Server > Remote Presence > Serial Over LAN (SOL) and setting this feature to Enabled and to 9600 bits per second (bps).
2. Log into the serial connection using SSH admin@CIMC-IP and your password.
3. Connect the host.

This procedure will provide the SOL connection.

To set the terminal server, configure the terminal port to the terminal server.

This procedure can be used to access the serial console. This console is useful for upgrade scenarios, allowing you to monitor both active and standby appliances at the same time because of the management connectivity switch between them. This console also is useful if the management IP address is not set or reachable.

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Printed in USA C67-578700-02 01/12