Overview

This chapter describes the Cisco Nexus Cloud Services Platform product family and hosted virtual service blades. This chapter includes the following sections:

- Information About the Cisco Nexus Cloud Services Platform, page 1-1
- Comparison with a Virtual Machine, page 1-4
- Cisco Integrated Management Controller, page 1-5
- Virtual Service Blades, page 1-5
- Uplinks, page 1-6

Information About the Cisco Nexus Cloud Services Platform

The Cisco Nexus Cloud Services Platform product family includes the Cisco Nexus 1010, Cisco Nexus 1010-X, Cisco Nexus 1110-S, and Cisco Nexus 1110-X. The Cisco Nexus Cloud Services Platform provides dedicated hardware for Cisco Nexus 1000V Virtual Supervisor Modules (VSMs) and can now host VSMs that were hosted on virtual machines, which allows you to install and manage a Cisco Nexus 1000V VSM like a standard Cisco switch. The Cisco Nexus Cloud Services Platform supports the Cisco Nexus 1000V for VMware vSphere and Microsoft Hyper-V.

The services managed by the Cisco Nexus Cloud Services Platform product family are called virtual service blades (VSBs). The Cisco Nexus Cloud Services Platform product family supports the following VSBs:

- Cisco Nexus 1000V VSM for VMware vSphere
- Cisco Nexus 1000V VSM for Microsoft Hyper-V
- Cisco Network Analysis Module (NAM)
- Cisco Virtual Security Gateway (VSG)
- Cisco Nexus VXLAN Gateway
- Citrix NetScaler 1000V

For more information about VSBs, see the Virtual Service Blades section.

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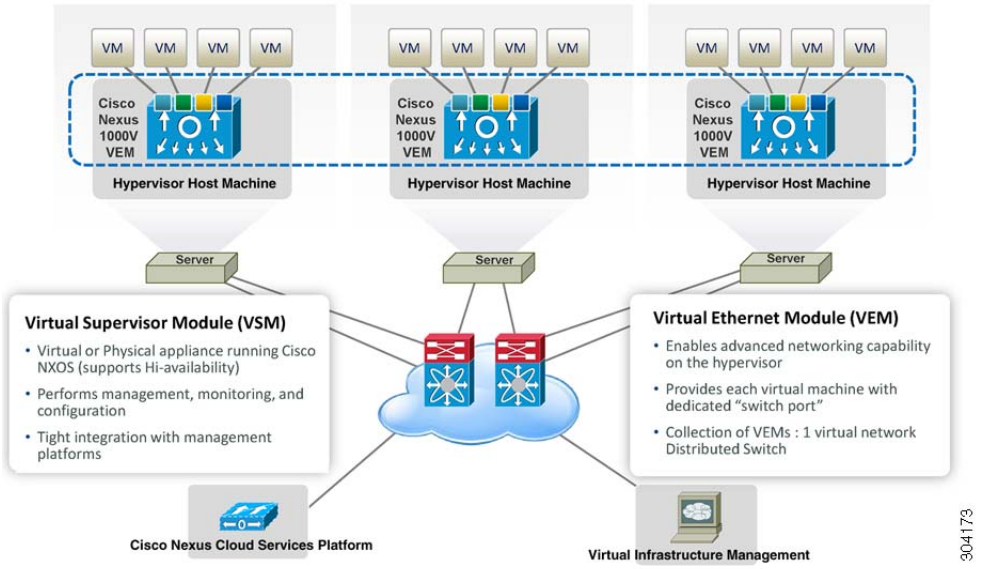
The following table lists the number of VSBs supported by the Cisco Nexus Cloud Services Platform product family.

Cisco Nexus Cloud Services Platform Product Family	Number of Supported VSBs
Cisco Nexus 1010	6
Cisco Nexus 1010-X	10
Cisco Nexus 1110-S	10
Cisco Nexus 1110-X	14

For more information about the number of VSBs supported and hosted on the Cisco Nexus Cloud Services Platform product family, see the *Cisco Nexus Cloud Services Platform Compatibility Information Guide*.

Figure 1-1 shows how the Cisco Nexus Cloud Services Platform hosts a Cisco Nexus 1000V VSM and its Virtual Ethernet Modules (VEMs) VEMs in your network.

Figure 1-1 Cisco Nexus Cloud Services Platform Architecture



Cisco Nexus Cloud Services Platform High Availability

The Cisco Nexus Cloud Services Platform supports high availability. Two Cisco Nexus Cloud Services Platforms can form a HA pair to provide high availability. If control connectivity is lost for a Cisco Nexus Cloud Services Platform, but management connectivity is preserved, the active Cisco Nexus Cloud Services Platform reloads the standby once. The standby comes up in a wait state until control connectivity is restored. In a HA pair, the active and standby Cisco Nexus Cloud Services Platforms use control connectivity to synchronize data.

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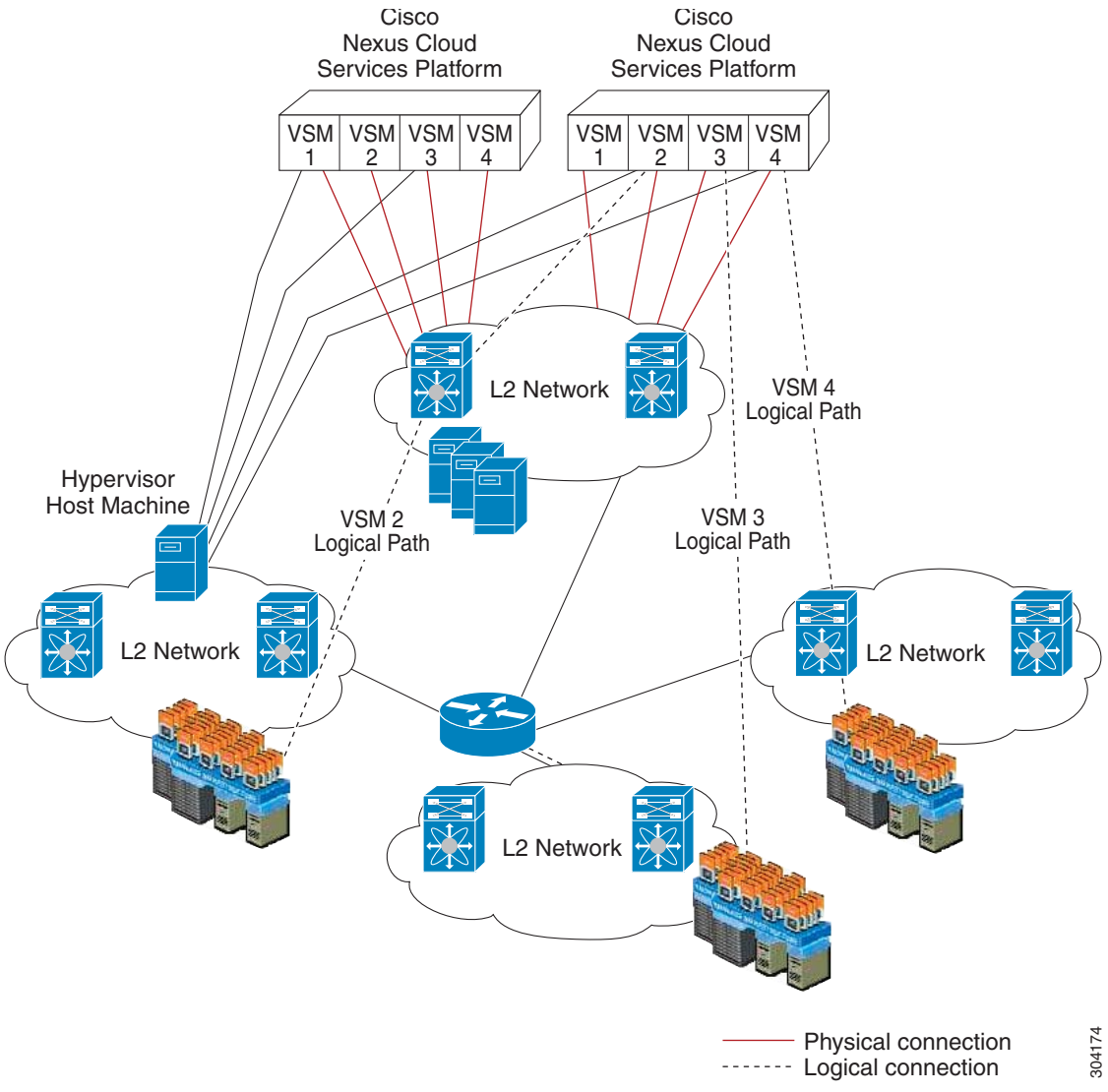
The Cisco Nexus Cloud Services Platform supports the following two forms of high availability concurrently:

- Active-Standby in Management Deployment — The active Cisco Nexus Cloud Services Platform is reachable over the network and a majority of the commands are supported only on the active Cisco Nexus Cloud Services Platform. The standby Cisco Nexus Cloud Services Platform is not reachable over the IP network, but can be accessed through the active Cisco Nexus Cloud Services Platform or directly through a serial connection.
- Active-Active in VSB Deployment— When you deploy a VSB on the Cisco Nexus Cloud Services Platform, you can deploy the VSB on either the active or the standby Cisco Nexus Cloud Services Platform. The VSBs can be active on both the active and standby Cisco Nexus Cloud Services Platform. This configuration helps balance the distribution of traffic as well as reduce the potential fault domain.

Figure 1-2 shows the HA components and the communication links between them.

Figure 1-2 Cisco Nexus Cloud Services Platform HA Components and Communication Links



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Comparison with a Virtual Machine

Table 1-1 compares running a VSM on a Cisco Nexus Cloud Services Platform with running a VSM on a virtual machine.

Table 1-1 VM and Cisco Nexus Cloud Services Platform Comparison

Feature	Virtual Machine	Cisco Nexus 1010	Cisco Nexus 1010-X	Cisco Nexus 1110-S	Cisco Nexus 1110-X
Host management capacity	64	384[1]	640[2]	384[1]	640[2]
VSM with Cisco NX-OS high availability	Yes	Yes	Yes	Yes	Yes
VEM running on Hypervisor Host Machine	Yes	Yes	Yes	Yes	Yes
Cisco Nexus 1000 features and scalability	Yes	Yes	Yes	Yes	Yes
Software-only switch	Yes	No	No	No	No
Dedicated services appliance, such as the Cisco NAM	No	Yes	Yes	Yes	Yes
Installation similar to a standard Cisco switch	No	Yes	Yes	Yes	Yes
Network Team manages the switch hardware	No	Yes	Yes	Yes	Yes

1. 64 hosts per VSM X 4 VSMs
2. 64 hosts per VSM X 4 VSMs

Note The Cisco Nexus 1000V currently supports the hypervisor host machine that runs on VMware vSphere or Microsoft Hyper-V hypervisors.

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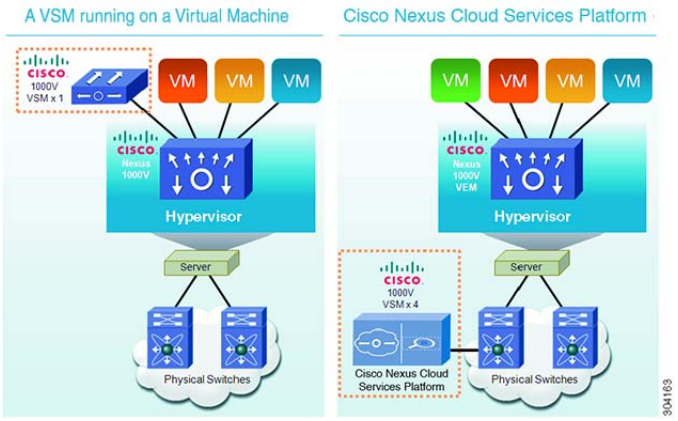
Figure 1-3 compares running a VSM on a Cisco Nexus Cloud Services Platform with running a VSM on a virtual machine.

Figure 1-3 VM and Cisco Nexus Cloud Services Platform Comparison



Cisco Integrated Management Controller

The Cisco Integrated Management Controller (CIMC) is a software interface included with the Cisco Nexus Cloud Services Platform. CIMC allows you to configure serial over LAN (SoL) access and set up remote management if the device becomes unreachable. For more information about remote management, see the *Cisco Nexus Cloud Services Platform Software Installation and Upgrade Guide*.

When installing the Cisco Nexus Cloud Services Platform, you have the option to configure the CIMC interface. To configure the CIMC software while installing the Cisco Nexus Cloud Services Platform, see the *Cisco Nexus Cloud Services Platform Hardware Installation Guide*.

Virtual Service Blades

The services (VSM, NAM, VSG, VXLAN Gateway) hosted, created, and managed by the Cisco Nexus Cloud Services Platform product family are called virtual service blades (VSBs).

Note A Cisco Nexus 1000V Virtual Supervisor Module (VSM) in this guide refers to the service hosted on VMware vSphere and Microsoft Hyper-V.

VSBs are created using ISO or OVA image files found in the Cisco Nexus Cloud Services Platform bootflash repository. The ISO defines the following for a VSB:

- Required number of interfaces

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- Required hard disk emulation
- Disk and RAM defaults
- Type of virtual service blade

  For more information about VSBs, see the Configuring Virtual Blades section.

For information about the supported VSBs, software compatibility, and the weighing matrix to determine the maximum capacity on the Cisco Nexus Cloud Services Platform, see the *Cisco Nexus Cloud Services Platform Compatibility Information Guide*.

Uplinks

This section describes the uplinks that you connected during your installation of the hardware. For more information about these connections and the prerequisites for the switches that are upstream from your Cisco Nexus Cloud Services Platform, see the *Cisco Nexus Cloud Services Platform Hardware Installation Guide*.

This section includes the following topics:

- Traffic Classification, page 1-7
- Options for Connecting to the Network, page 1-8
- Topology 5: Flexible Network Uplink Configuration, page 1-9
- Topology 1: Single Uplink, page 1-10
- Topology 2: Two Uplinks—1) Management and Control and 2) Data, page 1-11
- Topology 3: Two Uplinks—1) Management and 2) Control and Data, page 1-12
- Topology 4: Three Uplinks—1) Management, 2) Control, and 3) Data, page 1-13

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Traffic Classification

Table 1-2 lists and describes the classes of network traffic carried on the Cisco Nexus Cloud Services Platform uplinks:

Table 1-2 Traffic Classifications

Traffic Class	Data packets exchanged
Management	• For Cisco Nexus Cloud Services Platform and VSB management such as the following: – Telnet – Secure Shell (SSH) – HTTP **Note** If your virtual service blade uses the management class of traffic, it inherits the management VLAN from the Cisco Nexus Cloud Services Platform.
Control	• Between the Cisco Nexus 1000V VSMs (VSBs) and VEMs. • Between redundant Cisco Nexus Cloud Services Platform active and standby supervisors. • Between redundant Cisco Nexus 1000V active and standby VSMs.
Data	• VSB traffic that is not classified as either management or control. • High volume, application-specific traffic between virtual interfaces. • Traffic that is not considered management for other VSBs should be isolated to a separate interface and classified as data. If the same interface is used for both management and data, as is the case with NAM, the traffic is classified as data. **Note** Cisco Nexus 1000V VSM VSB traffic is not classified as data traffic.

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Options for Connecting to the Network

Table 1-3 describes the available uplink configurations.

Table 1-3 Uplink Topologies

Uplink Topology	Description	Advantages	Disadvantages
5	Flexible Network Uplink	Complete flexibility in terms of port configuration and usage. Flexible building of ports into a port channel. Flexible assignment of a port or port channel to a VSB interface. Easy uplink configuration. Ability to achieve maximum uplink.	Manual involvement required for uplink assignment.
1	All traffic shares a single uplink.	Simplicity. If a switch goes down, the Cisco Nexus Cloud Services Platform is not affected.	No traffic separation. Less bandwidth. Not suitable for NAM.
2	Management and control traffic share an uplink.	Data traffic can scale up to 4 Gbps. Control and data traffic separation.	The upstream switch must support LACP. Traffic distribution is subject to a hash algorithm and might not be evenly distributed. A small set of relatively static sources (up to 64) could result in one over-used link and one under-used link.
3	Control and data traffic share an uplink.	Control and data traffic together can scale up to 4 Gbps. Management and data traffic separation.	The upstream switch must support LACP[1]. Traffic distribution is subject to a hash algorithm and might not be evenly distributed.
4	Management, control, and data traffic are all on separate uplinks.	Management, control, and data traffic separation. The upstream switch does not need LACP.	Maximum 1 GB bandwidth for data traffic.

You choose the type of uplink for your network. See the *Cisco Nexus Cloud Services Platform Software Installation and Upgrade Guide*, for more information.

1. LACP = Link aggregation Control protocol

Note After you configure an uplink type, the only way to modify it is to reload the software.

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Topology 5: Flexible Network Uplink Configuration

A flexible network uplink offers complete flexibility to connect the Cisco Nexus 1110-S or Cisco Nexus 1110-X to the network, and allows flexible deployment of the VSBs on the Cisco Nexus Cloud Services Platform product family. A flexible configuration enables appropriate traffic segregation policies such as VSB traffic segregation. In the default flexible network uplink configuration, each physical port acts as an individual uplink. See Figure 1-4. You can then make changes to the default configuration by adding ports to a port channel or by assigning uplinks to a VSB interface. See figure 1-5.

Figure 1-4 Topology 5: Flexible network Uplink Without vPC or VSS (Default)

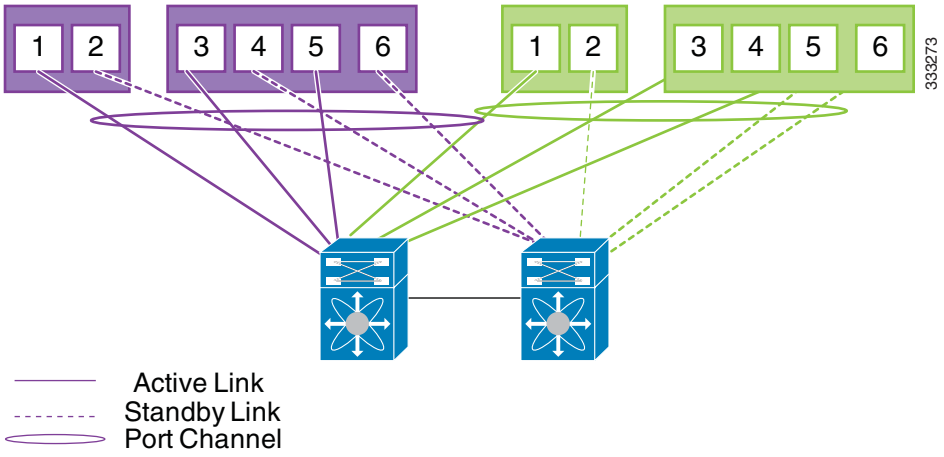

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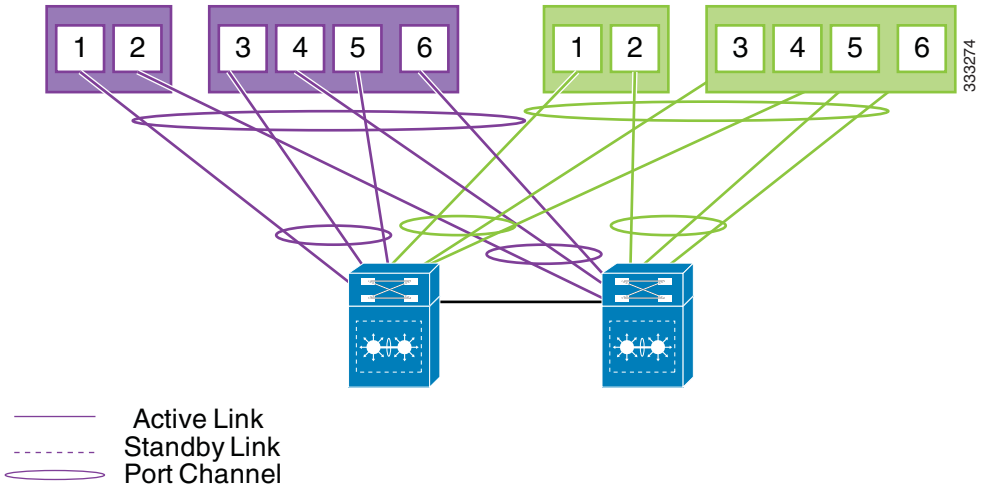
Figure 1-5 Topology 5: Flexible network Uplink With vPC or VSS (Default)



Topology 1: Single Uplink

In this topology, your Cisco Nexus Cloud Services Platform pair connects to your network in two uplinks as shown in the following figures:

- Figure 1-6, without vPC or VSS
- Figure 1-7, with vPC or VSS

For detailed information about connecting uplinks, see the *Cisco Nexus Cloud Services Platform Hardware Installation Guide*.

Figure 1-6 Topology 1: Single Uplink Without vPC or VSS

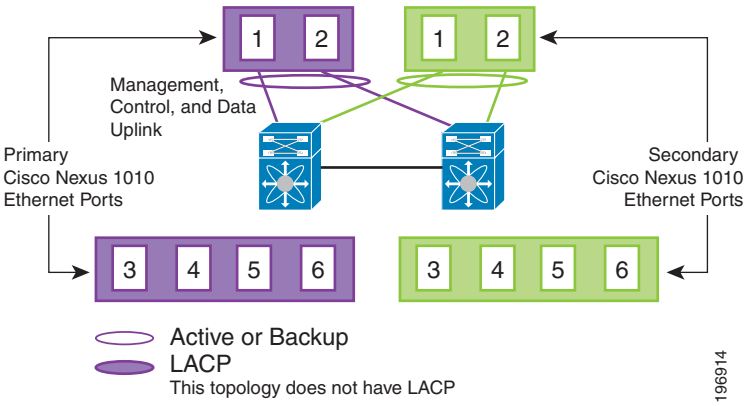


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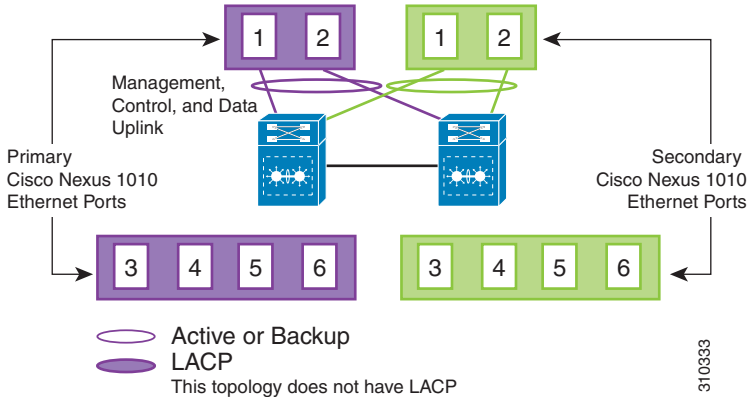
Figure 1-7 Topology 1: Single Uplink With vPC or VSS



Topology 2: Two Uplinks—1) Management and Control and 2) Data

In topology 2, six Gigabit Ethernet ports on each Cisco Nexus Cloud Services Platform create two uplinks. The ports in each Cisco Nexus Cloud Services Platform internally form a port channel and network traffic is load balanced based on the source MAC algorithm.

You must configure LACP on the upstream switches that connect to ports 3, 4, 5, and 6.

In topology 2, your Cisco Nexus Cloud Services Platform pair connects to your network in two uplinks as shown in the following figures:

- Figure 1-8, without vPC or VSS
- Figure 1-9, with vPC or VSS

For detailed information about connecting uplinks, see the *Cisco Nexus Cloud Services Platform Hardware Installation Guide*.

Figure 1-8 Topology 2: Two Uplinks Without vPC or VSS— 1) Management and Control Uplink and 2) Data Uplink

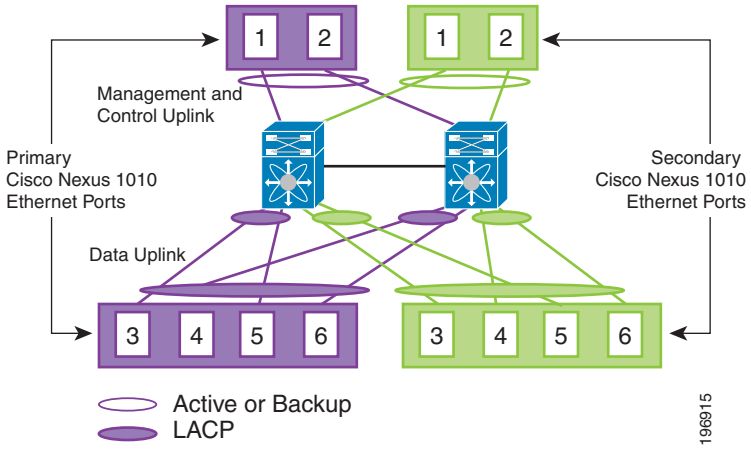


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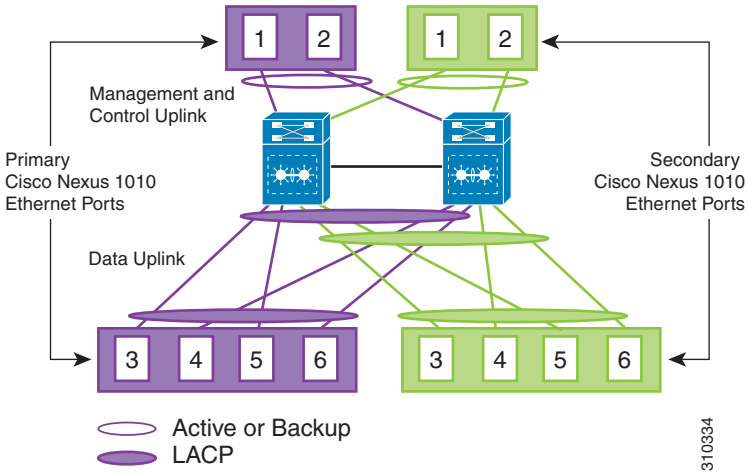
Figure 1-9 Topology 2: Two Uplinks With vPC or VSS— 1) Management and Control Uplink and 2) Data Uplink



Topology 3: Two Uplinks—1) Management and 2) Control and Data

In topology 3, the ports in each Cisco Nexus Cloud Services Platform internally form a port channel and network traffic is load balanced based on the source MAC algorithm.

LACP must be configured on the upstream switches connecting to ports 3, 4, 5, and 6.

In topology 3, your Cisco Nexus Cloud Services Platform pair connects to your network in two uplinks as shown in the following figures:

- Figure 1-10, without vPC or VSS
- Figure 1-11, with vPC or VSS

For detailed information about connecting uplinks, see the *Cisco Nexus Cloud Services Platform Hardware Installation Guide*.

Figure 1-10 Topology 3: Two Uplinks Without vPC or VSS— 1) Management Uplink, and 2) Control and Data Uplink

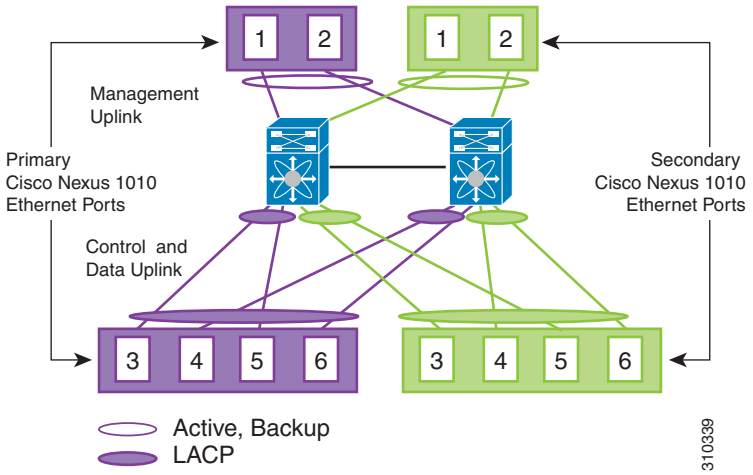


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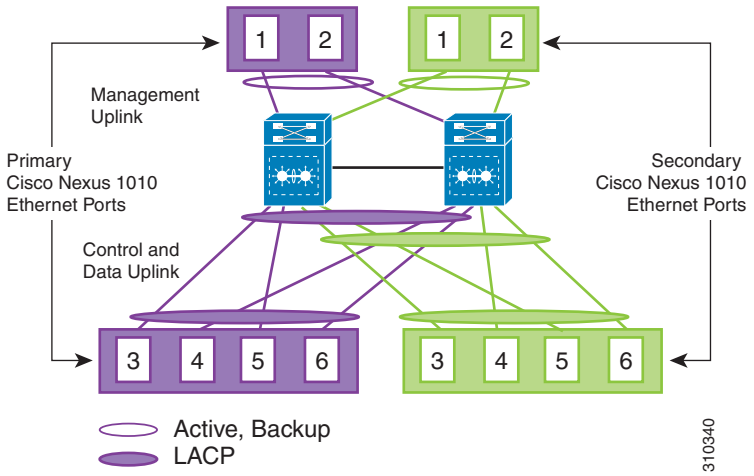
Figure 1-11 Topology 3: Two Uplinks With vPC or VSS— 1) Management Uplink, and 2) Control and Data Uplink



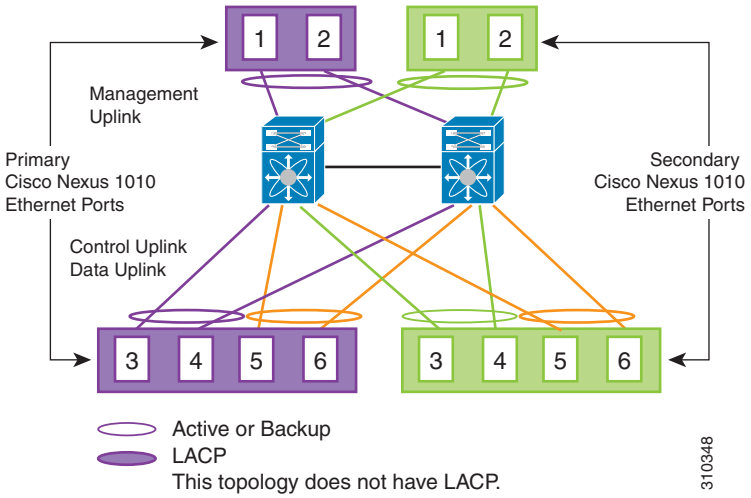
Topology 4: Three Uplinks—1) Management, 2) Control, and 3) Data

In topology 4, six Gigabit Ethernet ports on each Cisco Nexus Cloud Services Platform create three uplinks as shown in one of the following figures:

- Figure 1-12, without vPC or VSS
- Figure 1-13, with vPC or VSS

For detailed information about connecting uplinks, see the *Cisco Nexus Cloud Services Platform Hardware Installation Guide*.

Figure 1-12 Topology 4: Three Uplinks Without vPC or VSS 1) Management, 2) Control, and 3) Data



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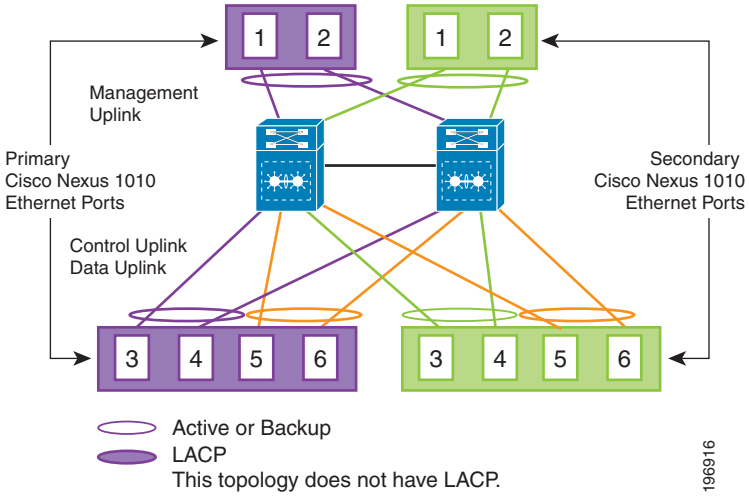
Figure 1-13 Topology 4: Three Uplinks With vPC or VSS 1) Management, 2) Control, and 3) Data