Configuring the Domain

This chapter contains the following sections:

Information About Domains

You must create a domain for the Cisco Nexus 1000V and then add control and packet VLANs for communication and management. This process is part of the initial setup of the Cisco Nexus 1000V when you install the software. If you need to create a domain later, you can do so by using the **setup** command or the procedures described in this chapter.

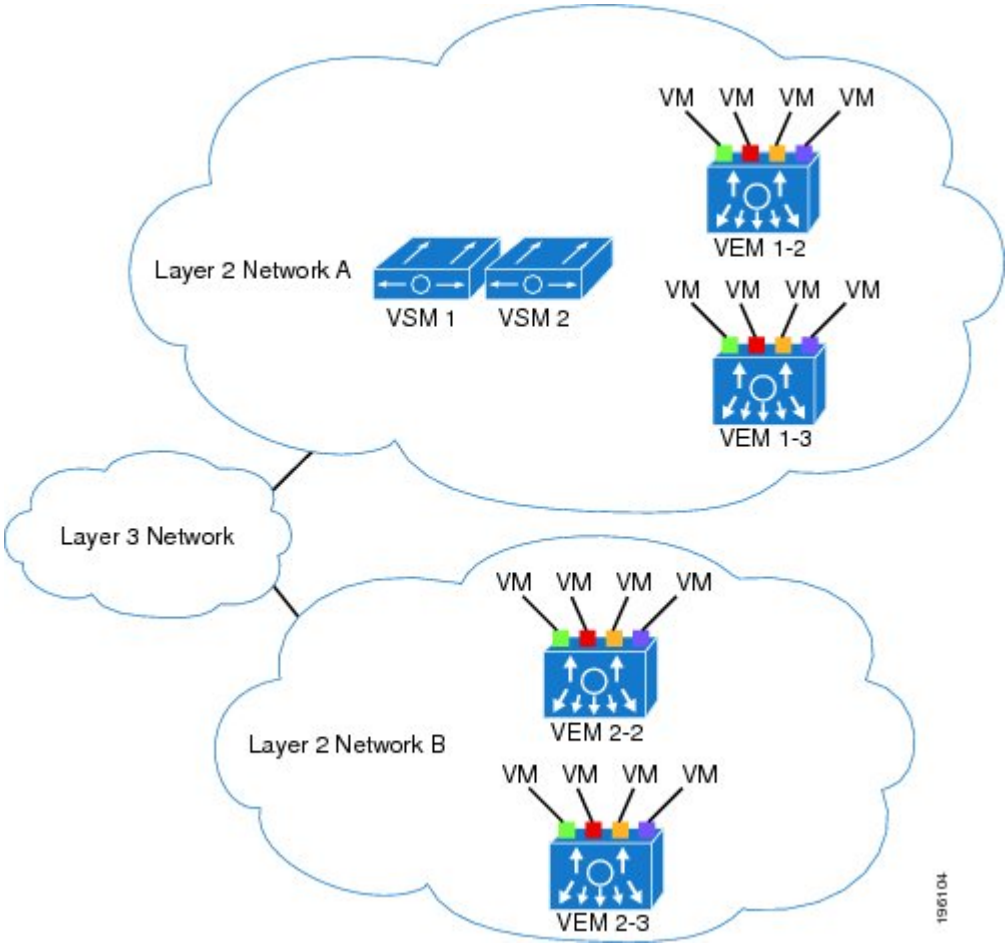
Layer 3 Control

Layer 3 control, or IP connectivity, is supported between the Virtual Supervisor Module (VSM) and the Virtual Ethernet Module (VEM) for control and packet traffic. With Layer 3 control, a VSM can be Layer 3 accessible and can control hosts that reside in a separate Layer 2 network. In the Layer 3 mode, all the VEMs hosts that are managed by VSM and the VSM can be in different networks.

To implement Layer 3 control, you must configure the VSM in Layer 3 mode.

In this figure, VSM 1 controls VEMs in Layer 2 Network A and VSM 2 controls VEMs in Layer 2 Network B.

Figure 1: Example of Layer 3 Control IP Connectivity



Guidelines and Limitations

- UDP port 4785 is required for Layer 3 communication between the VSM and VEM. If you have a firewall in your network and are configuring Layer 3 control, make sure that UDP port 4785 is open on your upstream switch or firewall device. For more information, see the documentation for your upstream switch or firewall device.
- In a Layer 2 network, you can switch between the Layer 2 and Layer 3 transport modes, but when you do so, the modules might be out of service briefly.
- The capability attribute (Layer 3 control) cannot be inherited from the port profile.
- Different hosts can use different VLANs for Layer 3 control.
- A port profile used for Layer 3 control must be an access port profile. It cannot be a trunk port profile. The port profile created for Layer 3 control, can only be used for vmknic ports and not for VM ports, specifically VSM ports if VSM is hosted on the DVS.

- You must configure Layer 3 (L3) capability control only for a vmk interface. If you add L3 capability control on a virtual ethernet (veth) interface, the system VLAN becomes ineffective for that veth.
- We recommend that if you are using the VMware kernel NIC for Layer 3 Control, you do not use it for any other purpose. For example, do not also use the Layer 3 Control VMware kernel NIC for VMotion or network file system (NFS) mount.
- You must configure control VLANs, packet VLANs, and management VLANs as regular VLANs and not as private VLANs.

Default Settings

Parameter	Default
VMware port group name (port-profile)	The name of the port profile
SVS mode (svs-domain)	Layer 3
Switchport mode (port-profile)	Access
State (port-profile)	Disabled
State (VLAN)	Active
Shut state (VLAN)	No shutdown

Configuring the Domain

This section includes the following procedures:

- Creating a Domain
- Changing to Layer 3 Transport
- Changing to Layer 2 Transport
- Creating a Port Profile for Layer 3 Control
- Creating a Control VLAN
- Creating a Packet VLAN

Creating a Domain

You can create a domain for the Cisco Nexus 1000V that identifies the VSM and VEMs and then add control and packet VLANs for communication and management. This process is part of the initial setup of the Cisco Nexus 1000V when installing the software. If you need to create a domain after initial setup, you can do so by using this procedure.

Note We recommend the following:

- Use one VLAN for control traffic and a different VLAN for packet traffic.
- Use a distinct VLAN for each instances of Cisco Nexus 1000V (different domains)

Before You Begin

Before beginning this procedure, you must be logged in to the CLI in EXEC mode.

You must know the following information:

- If two or more VSMs share the same control and/or packet VLAN, the domain helps identify the VEMs managed by each VSM.
- A unique domain ID for this Cisco Nexus 1000V instance.
- Identity of the VLANs to be used for control and packet traffic.
- The **svs mode** command in the SVS Domain Configuration mode is not used and has no effect on a configuration.

Procedure

	Command or Action	Purpose
Step 1	switch# **config terminal**	Places you in global configuration mode.
Step 2	switch(config)# **svs-domain**	Places you in SVS domain configuration mode.
Step 3	switch(config-svs-domain)# **domain id** *number*	Creates the domain ID for this Cisco Nexus 1000V instance.
Step 4	switch(config-svs-domain)# **control vlan** *number*	Assigns the control VLAN for this domain.
Step 5	switch(config-svs-domain)# **packet vlan** *number*	Assigns the packet VLAN for this domain.
Step 6	switch(config--svs-domain)# **show svs domain**	(Optional) Displays the domain configuration.
Step 7	switch(config-svs-domain)# **exit**	Returns you to global configuration mode.
Step 8	switch(config)# **copy running-config startup-config**	(Optional) Copies the running configuration to the startup configuration.

```
switch# config terminal
switch(config)# svs-domain
switch(config-svs-domain)# domain id 100
switch(config-svs-domain)# control vlan 190
switch(config-svs-domain)# packet vlan 191
switch(config-vlan)# exit
```

```
switch(config)# show svs domain
SVS domain config:
Domain id: 317
Control vlan: 317
Packet vlan: 317
L2/L3 Control mode: L2
L3 control interface: NA
Status: Config push to VC successful.

Note: Control VLAN and Packet VLAN are not used in L3 mode.

switch(config)#
switch(config)# copy run start
[########################################] 100%
switch(config)#
```

Changing to Layer 3 Transport

This procedure requires you to disable the control and packet VLANs. You cannot change to Layer 3 Control before disabling the control and packet VLANs.

Before You Begin

Before beginning this procedure, you must be logged in to the CLI in EXEC mode.

You have already configured the Layer 3 interface (mgmt 0 or control 0) and assigned an IP address.

When control 0 is used for Layer 3 transport, proxy-arp must be enabled on the control 0 VLAN gateway router.

Procedure

	Command or Action	Purpose
Step 1	switch(config)# **show svs domain**	Displays the existing domain configuration, including control and packet VLAN IDs.
Step 2	switch# **config t**	Places you in global configuration mode.
Step 3	switch(config)# **svs-domain**	Places you in SVS domain configuration mode.
Step 4	switch(config-svs-domain)# **no packet vlan**	Removes the packet VLAN configuration.
Step 5	switch(config-svs-domain)# **no control vlan**	Removes the control VLAN configuration.
Step 6	switch(config-svs-domain)# **show svs domain**	(Optional) Displays the domain configuration.
Step 7	switch(config-svs-domain)# **svs mode L3 interface** { **mgmt0** | **control0** }	Configures Layer 3 transport mode for the VSM domain. If configuring Layer 3 transport, then you must designate which interface to use; and the interface must already have an IP address configured.

	Command or Action	Purpose
Step 8	switch(config--svs-domain)# **show svs domain**	(Optional) Displays the new Layer 3 control mode configuration for this VSM domain.
Step 9	switch(config-svs-domain)# **[no] control type multicast**	Configures the control type multicast in Layer 3 mode on the VSM.
Step 10	switch(config--svs-domain)# **show svs domain**	(Optional) Displays the control type multicast status in Layer 3 mode on the VSM.
Step 11	switch(config)# **copy running-config startup-config**	(Optional) Copies the running configuration to the startup configuration.

```
switch(config)# show svs domain
SVS domain config:
  Domain id:    100
  Control vlan: 100
  Packet vlan:  101
  L2/L3 Control mode: L2
  L3 control interface:  NA
  Status: Config push to VC successful.
switch# config t
switch(config)# svs-domain
switch(config-svs-domain)# no packet vlan
switch(config-svs-domain)# no control vlan
switch(config)# show svs domain
SVS domain config:
  Domain id:    100
  Control vlan: 1
  Packet vlan:  1
  L2/L3 Control mode: L2
  L2/L3 Control interface: NA
  Status: Config push to VC successful.
switch(config-svs-domain)# svs mode l3 interface mgmt0
SVS domain config:
  Domain id:    100
  Control vlan: NA
  Packet vlan:  NA
  L2/L3 Control mode: L3
  L3 control interface: mgmt0
  Status: Config push to VC successful.
switch(config-svs-domain)# show svs domain

switch(config-svs-domain)# control type multicast
switch(config)# show svs domain
SVS domain config:
  Domain id:    343
  Control vlan:  NA
  Packet vlan:   NA
  L2/L3 Control mode: L3
  L3 control interface: mgmt0
  Status: Config push to VC successful.
  Control type multicast: Yes

switch(config-svs-domain)# no control type multicast
switch(config)# show svs domain
SVS domain config:
  Domain id:    343
  Control vlan:  NA
```

```
  Packet vlan:   NA
  L2/L3 Control mode: L3
  L3 control interface: mgmt0
  Status: Config push to VC in progress.
  Control type multicast: No
  Limitation : Control type multicast is configured. It is not applicable in svs L2 mode.

switch(config-svs-domain)# copy running-config startup-config
[########################################] 100%
switch(config-svs-domain)#
```

Changing to Layer 2 Transport

You can change the transport mode to Layer 2 for the VSM domain control and packet traffic. The transport mode is Layer 3 by default, but if it is changed, you can use this procedure to configure it again as Layer 2.

This procedure requires you to configure a control VLAN and a packet VLAN. You cannot configure these VLANs if the VSM domain capability is Layer 3 Control. You will first change the svs domain mode to Layer 2 and then configure the control VLAN and packet VLAN.

Before You Begin

Before beginning this procedure, you must be logged in to the CLI in EXEC mode.

Procedure

	Command or Action	Purpose
Step 1	switch(config)# **show svs domain**	Displays the existing domain configuration, including control and packet VLAN IDs and the Layer 3 interface configuration.
Step 2	switch# **config t**	Places you in global configuration mode.
Step 3	switch(config)# **svs-domain**	Places you in SVS domain configuration mode.
Step 4	switch(config-svs-domain)# **svs mode L2**	Configures Layer 2 transport mode for the VSM domain.
Step 5	switch(config-svs-domain)# **control vlan** *vlanID*	Configures the specified VLAN ID as the control VLAN for the VSM domain.
Step 6	switch(config-svs-domain)# **packet vlan***vlanID*	Configures the specified VLAN ID as the packet VLAN for the VSM domain.
Step 7	switch(config-svs-domain)# **show svs domain**	(Optional) Displays the new Layer 2 control mode configuration for this VSM domain.
Step 8	switch(config)# **copy running-config startup-config**	(Optional) Copies the running configuration to the startup configuration.

```
switch# show svs domain
SVS domain config:
Domain id: 317
```

```
Control vlan: NA
Packet vlan: NA
L2/L3 Control mode: L3
L3 control interface: mgmt0
Status: Config push to VC successful.
Control type multicast: No
switch# config t
switch(config)# svs-domain
switch(config-svs-domain)# svs mode l2
switch(config-svs-domain)# control vlan 100
switch(config-svs-domain)# packet vlan 101
switch(config-svs-domain)# show svs domain
SVS domain config:
  Domain id:    100
  Control vlan: 100
  Packet vlan:  101
  L2/L3 Control mode: L2
  L3 control interface: NA
  Status: Config push to VC successful.
switch(config-svs-domain)# copy running-config startup-config
[########################################] 100%
```

Creating a Port Profile for Layer 3 Control

You can allow the VSM and VEM to communicate over IP for control and packet traffic.

Before You Begin

Before beginning this procedure, you must be logged in to the CLI in EXEC mode.

You must know the following information:

- The transport mode for the VSM domain has already been configured as Layer 3.
- All VEMs belong to the same Layer 2 domain.
- The VEM VM kernel NIC connects to this Layer 3 control port profile when you add the host to the Cisco Nexus 1000V DVS.
- Only one VM kernel NIC can be assigned to this Layer 3 control port profile per host.
- The VLAN ID for the VLAN you are adding to this Layer 3 control port profile:
  - The VLAN must already be created on the Cisco Nexus 1000V.
  - The VLAN assigned to this Layer 3 control port profile must be a system VLAN.
  - One of the uplink ports must already have this VLAN in its system VLAN range.
- The port profile must be an access port profile. It cannot be a trunk port profile. This procedure includes steps to configure the port profile as an access port profile.
- More than one port profile can be configured with the **capability L3 control** command. These can only be used for vmknic ports and not for VM ports, specifically VSM ports if VSM is hosted on the DVS.
- Different hosts can use different VLANs for Layer 3 control.
- VEM modules will not register to the VSM before a vmkernel interface (vmk) is migrated to a Layer 3 control capable port profile.

Procedure

	Command or Action	Purpose
Step 1	switch# **config terminal**	Places you in global configuration mode.
Step 2	switch(config)# **port-profile** *name*	Creates a port profile and places you into Port Profile Configuration mode for the named port profile. The *name* argument can be up to 80 characters and must be unique for each port profile on the Cisco Nexus 1000V.
Step 3	switch(config-port-prof)# **capability l3control**	Allows the port to be used for IP connectivity.
Step 4	switch(config-port-prof)# **vmware port-group** [*name*]	Designates the port profile as a VMware port group. The port profile is mapped to a VMware port group of the same name. When a vCenter Server connection is established, the port group created in Cisco Nexus 1000V is then distributed to the virtual switch on the vCenter Server. If you do not specify a name, then the port group name will be the same as the port profile name. If you want to map the port profile to a different port group name, use the alternate name.
Step 5	switch(config-port-prof)# **switchport mode access**	Designates that the interfaces are switch access ports (the default).
Step 6	switch(config-port-prof)# **switchport access vlan** *vlanID*	Assigns the system VLAN ID to the access port for this Layer 3 control port profile.
Step 7	switch(config-port-prof)# **no shutdown**	Administratively enables all ports in the profile.
Step 8	switch(config-port-prof)# **system vlan** *vlanID*	Adds the system VLAN to this Layer 3 control port profile. This command ensures that, when the host is added for the first time or rebooted later, the VEM can reach the VSM. One of the uplink ports must have this VLAN in its system VLAN range.
Step 9	switch(config-port-prof)# **state enabled**	Enables the Layer 3 control port profile. The configuration for this port profile is applied to the assigned ports, and the port group is created in the VMware vSwitch on vCenter Server.
Step 10	switch(config-port-prof)# **show port-profile name** *name*	(Optional) Displays the current configuration for the port profile.
Step 11	switch(config)# **copy running-config startup-config**	(Optional) Copies the running configuration to the startup configuration.

```
switch# config terminal
switch(config)# port-profile l3control-150
switch(config-port-prof)# capability l3control
switch(config-port-prof)# vmware port-group
switch(config-port-prof)# switchport mode access
switch(config-port-prof)# switchport access vlan 150
switch(config-port-prof)# no shutdown
switch(config-port-prof)# system vlan 150
switch(config-port-prof)# state enabled
switch(config-port-prof)# show port-profile name l3control-150
port-profile l3control-150
  description:
  type: vethernet
  status: enabled
  capability l3control: yes
  pinning control-vlan: 8
  pinning packet-vlan: 8
  system vlans: 150
  port-group: l3control-150
  max ports: 32
  inherit:
  config attributes:
    switchport mode access
    switchport access vlan 150
    no shutdown
  evaluated config attributes:
    switchport mode access
    switchport access vlan 150
    no shutdown
  assigned interfaces:
switch(config-port-prof)# copy running-config startup-config
```

Creating a Control VLAN

Before You Begin

Before beginning this procedure, you must be logged in to the CLI in EXEC mode.

Be sure you have already configured and enabled the required switched virtual interface (SVI) using the document, *Cisco Nexus 1000V Interface Configuration Guide*. The SVI is also called the VLAN interface and provides communication between VLANs.

You must know the following:

- If Layer 3 Control is configured on your VSM, you cannot create a control VLAN. You must first disable Layer 3 Control.
- How VLANs are numbered.
- That newly created VLANs remain unused until Layer 2 ports are assigned to them.

Procedure

	Command or Action	Purpose
Step 1	switch# **config t**	Places you in global configuration mode.
Step 2	switch(config)# **vlan** *30*	Creates VLAN ID 30 for control traffic and places you in VLAN configuration mode.

	Command or Action	Purpose
		Note If you enter a VLAN ID that is assigned to an internally allocated VLAN, the CLI returns an error message.
Step 3	switch(config-vlan)# **name** *cp_control*	Adds the descriptive name, cp_control, to this VLAN.
Step 4	switch(config-vlan)# **state** *active*	Changes the operational state of the VLAN to active.
Step 5	switch(config-vlan)# **show vlan id** *30*	(Optional) Displays the configuration for VLAN ID 30.
Step 6	switch(config)# **copy running-config startup-config**	(Optional) Copies the running configuration to the startup configuration.

```
switch# config t
switch(config)# vlan 30
switch(config-vlan)# name cp_control
switch(config-vlan)# state active
switch(config-vlan)# show vlan id 30
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
30   cp_control                       active

VLAN Type MTU
---- -----
5    enet 1500

Remote SPAN VLAN
----------------
Disabled

Primary  Secondary  Type             Ports
-------  ---------  ---------------  ------------------------------------------
switch(config-vlan)# copy running-config startup-config
```

Creating a Packet VLAN

Before You Begin

Before beginning this procedure, be sure you have done the following:

- Logged in to the CLI in EXEC mode
- Configured and enabled the required switched virtual interface (SVI)
- Familiarized yourself with how VLANs are numbered.

Note Newly created VLANs remain unused until Layer 2 ports are assigned to them.

Procedure

	Command or Action	Purpose
Step 1	switch# **config t**	Places you in global configuration mode.
Step 2	switch(config)# **vlan** *vlan-id*	Creates VLAN ID for packet traffic and places you in VLAN configuration mode. **Note** If you enter a VLAN ID that is assigned to an internally allocated VLAN, the CLI returns an error message.
Step 3	switch(config-vlan)# **name** *vlan-name*	Adds the descriptive name to this VLAN.
Step 4	switch(config-vlan)# **state** *vlan-state*	Changes the operational state of the VLAN to active or suspend.
Step 5	switch(config-vlan)# **show vlan id** *vlan-id*	(Optional) Displays the configuration for the VLAN ID.
Step 6	switch(config-vlan)# **exit**	Returns you to global configuration mode.
Step 7	switch(config)# **copy running-config startup-config**	(Optional) Copies the running configuration to the startup configuration.

```
switch# config t
switch(config)# vlan 31
switch(config-vlan)# name cp_packet
switch(config-vlan)# state active
switch(config-vlan)# exit
switch(config)# show vlan id 31

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
31   cp_packet                        active

VLAN Type MTU
---- -----
5    enet 1500

Remote SPAN VLAN
----------------
Disabled

Primary  Secondary  Type              Ports
-------  ---------  ---------------   ------------------------------------------

switch(config)# copy run start
[########################################] 100%
switch(config)#
```

Feature History for the VSM Domain

This table only includes updates for those releases that have resulted in additions to the feature.

Feature Name	Releases	Feature Information
Layer 3 Control	4.0(4)SV1(2)	Added the following information: • About Layer 3 Control • Guidelines and Limitations • Changing to Layer 2 Transport • Changing to Layer 3 Transport • Creating a Port Profile for Layer 3 Control
VSM Domain	4.0(4)SV1(1)	This feature was introduced.