



Configuring VLANs

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Named VLANs

A named VLAN creates a connection to a specific external LAN. The VLAN isolates traffic to that external LAN, including broadcast traffic.

The name that you assign to a VLAN ID adds a layer of abstraction that allows you to globally update all servers associated with service profiles that use the named VLAN. You do not need to reconfigure the servers individually to maintain communication with the external LAN.

You can create more than one named VLAN with the same VLAN ID. For example, if servers that host business services for HR and Finance need to access the same external LAN, you can create VLANs named HR and Finance with the same VLAN ID. Then, if the network is reconfigured and Finance is assigned to a different LAN, you only have to change the VLAN ID for the named VLAN for Finance.

In a cluster configuration, you can configure a named VLAN to be accessible only to one fabric interconnect or to both fabric interconnects.

Guidelines for VLAN IDs



Important

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

The VLAN name is case sensitive.

Private VLANs

A private VLAN (PVLAN) partitions the Ethernet broadcast domain of a VLAN into subdomains and allows you to isolate some ports. Each subdomain in a PVLAN includes a primary VLAN and one or more secondary VLANs. All secondary VLANs in a PVLAN must share the same primary VLAN. The secondary VLAN ID differentiates one subdomain from another.

Isolated VLANs

All secondary VLANs in a Cisco UCS domain must be isolated VLANs. Cisco UCS does not support community VLANs.

Ports on Isolated VLANs

Communications on an isolated VLAN can only use the associated port in the primary VLAN. These ports are isolated ports and are not configurable in Cisco UCS Manager. If the primary VLAN includes multiple secondary VLANs, those isolated VLANs cannot communicate directly with each other.

An isolated port is a host port that belongs to an isolated secondary VLAN. This port has complete isolation from other ports within the same private VLAN domain. PVLANS block all traffic to isolated ports except traffic from promiscuous ports. Traffic received from an isolated port is forwarded only to promiscuous ports. You can have more than one isolated port in a specified isolated VLAN. Each port is completely isolated from all other ports in the isolated VLAN.

Guidelines for Uplink Ports

When you create PVLANS, be aware of the following guidelines:

- The uplink Ethernet port channel cannot be in promiscuous mode.
- Each primary VLAN can have only one isolated VLAN.
- VIFs on VNTAG adapters can have only one isolated VLAN.

Guidelines for VLAN IDs

**Important**

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

The VLAN name is case sensitive.

VLAN Port Limitations

Cisco UCS Manager limits the number of VLAN port instances that can be configured under border and server domains on a fabric interconnect to 6000.

Types of Ports Included in the VLAN Port Count

The following types of ports are counted in the VLAN port calculation:

- Border uplink Ethernet ports
- Border uplink Ether-channel member ports
- FCoE ports in a SAN cloud
- Ethernet ports in a NAS cloud
- Static and dynamic vNICs created through service profiles
- VM vNICs created as part of a port profile in a hypervisor in hypervisor domain

Based on the number of VLANs configured for these ports, Cisco UCS Manager keeps track of the cumulative count of VLAN port instances and enforces the VLAN port limit during validation. Cisco UCS Manager reserves some pre-defined VLAN port resources for control traffic. These include management VLANs configured under HIF and NIF ports.

VLAN Port Limit Enforcement

Cisco UCS Manager validates VLAN port availability during the following operations.

- Configuring and unconfiguring border ports and border port channels
- Adding or removing VLANs from a cloud
- Configuring or unconfiguring SAN or NAS ports
- Associating or disassociating service profiles that contain configuration changes
- Configuring or unconfiguring VLANs under vNICs or vHBAs
- Upon receiving creation or deleting notifications from a VMWare vNIC, from an ESX hypervisor



Note This is outside the control of Cisco UCS Manager

- Fabric interconnect reboot
- Cisco UCS Manager upgrade or downgrade

Cisco UCS Manager strictly enforces the VLAN port limit on service profile operations. If Cisco UCS Manager detects that you have exceeded the VLAN port limit service profile configuration will fail during deployment.

Exceeding the VLAN port count in a border domain is less disruptive. When the VLAN port count is exceeded in a border domain Cisco UCS Manager changes the allocation status to Exceeded. In order to change the status back to Available, you should complete one of the following actions:

- Unconfigure one or more border ports
- Remove VLANs from the LAN cloud
- Unconfigure one or more vNICs or vHBAs

Configuring Named VLANs

Creating a Named VLAN Accessible to Both Fabric Interconnects (Uplink Ethernet Mode)



Important

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # create vlan <i>vlan-name vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet uplink VLAN mode.
Step 3	UCS-A /eth-uplink/fabric/vlan # set sharing { isolated none primary }	Sets the sharing for the specified VLAN. This can be one of the following: <ul style="list-style-type: none"> • isolated —This is a secondary VLAN associated with a primary VLAN. This VLAN is private.

	Command or Action	Purpose
		<ul style="list-style-type: none"> • none —This VLAN does not have any secondary or private VLANs. • primary —This VLAN can have one or more secondary VLANs.
Step 4	UCS-A /eth-uplink/vlan # commit-buffer	Commits the transaction to the system configuration.

The following example creates a named VLAN for both fabric interconnects, names the VLAN accounting, assigns the VLAN ID 2112, sets the sharing to none, and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # create vlan accounting 2112
UCS-A /eth-uplink/vlan* # set sharing none
UCS-A /eth-uplink/vlan* # commit-buffer
UCS-A /eth-uplink/vlan #
```

Creating a Named VLAN Accessible to Both Fabric Interconnects (Ethernet Storage Mode)



Important

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # create vlan <i>vlan-name vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet storage VLAN mode.
Step 3	UCS-A /eth-storage/vlan # create member-port {a b} slot-id port-id	Creates a member port for the specified VLAN on the specified fabric.
Step 4	UCS-A /eth-storage/vlan/member-port # commit-buffer	Commits the transaction to the system configuration.

The following example creates a named VLAN for both fabric interconnects, names the VLAN accounting, assigns the VLAN ID 2112, creates a member port on slot 2, port 20, and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # create vlan accounting 2112
UCS-A /eth-storage/vlan* # create member-port a 2 20
UCS-A /eth-storage/vlan/member-port* # commit-buffer
UCS-A /eth-storage/vlan/member-port #
```

Creating a Named VLAN Accessible to One Fabric Interconnect (Uplink Ethernet Mode)



Important

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b}	Enters Ethernet uplink fabric interconnect mode for the specified fabric interconnect (A or B).
Step 3	UCS-A /eth-uplink/fabric # create vlan <i>vlan-name</i> <i>vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet uplink fabric interconnect VLAN mode.
Step 4	UCS-A /eth-uplink/fabric/vlan # set sharing {isolated none primary}	Sets the sharing for the specified VLAN. This can be one of the following: <ul style="list-style-type: none"> • isolated —This is a secondary VLAN associated with a primary VLAN. This VLAN is private. • none —This VLAN does not have any secondary or private VLANs. • primary —This VLAN can have one or more secondary VLANs.
Step 5	UCS-A /eth-uplink/fabric/vlan # commit-buffer	Commits the transaction to the system configuration.

The following example creates a named VLAN for fabric interconnect A, names the VLAN finance, assigns the VLAN ID 3955, sets the sharing to none, and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # create vlan finance 3955
UCS-A /eth-uplink/fabric/vlan* # set sharing none
UCS-A /eth-uplink/fabric/vlan* # commit-buffer
UCS-A /eth-uplink/fabric/vlan #
```

Creating a Named VLAN Accessible to One Fabric Interconnect (Ethernet Storage Mode)



Important

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b}	Enters Ethernet storage fabric interconnect mode for the specified fabric interconnect.
Step 3	UCS-A /eth-storage/fabric # create vlan <i>vlan-name vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet storage fabric interconnect VLAN mode.
Step 4	UCS-A /eth-storage/vlan # create member-port {a b} slot-id port-id	Creates a member port for the specified VLAN on the specified fabric.
Step 5	UCS-A /eth-storage/fabric/vlan/member-port # commit-buffer	Commits the transaction to the system configuration.

The following example creates a named VLAN for fabric interconnect A, names the VLAN finance, assigns the VLAN ID 3955, creates a member port on slot 2, port 20, and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric a
UCS-A /eth-storage/fabric # create vlan finance 3955
UCS-A /eth-storage/fabric/vlan* # create member-port a 2 20
UCS-A /eth-storage/fabric/vlan/member-port* # commit-buffer
UCS-A /eth-storage/fabric/vlan/member-port #
```

Deleting a Named VLAN

If Cisco UCS Manager includes a named VLAN with the same VLAN ID as the one you delete, the VLAN is not removed from the fabric interconnect configuration until all named VLANs with that ID are deleted.

If you are deleting a private primary VLAN, make sure to reassign the secondary VLANs to another working primary VLAN.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b}	(Optional) Enters Ethernet uplink fabric mode. Use this command when you want to delete a named VLAN only from the specified fabric (a or b).
Step 3	UCS-A /eth-uplink # delete vlan <i>vlan-name</i>	Deletes the specified named VLAN.
Step 4	UCS-A /eth-uplink # commit-buffer	Commits the transaction to the system configuration.

The following example deletes a named VLAN accessible to both fabric interconnects and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # delete vlan accounting
UCS-A /eth-uplink* # commit-buffer
UCS-A /eth-uplink #
```

The following example deletes a named VLAN accessible to one fabric interconnect and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # delete vlan finance
UCS-A /eth-uplink/fabric* # commit-buffer
UCS-A /eth-uplink/fabric #
```

Configuring Private VLANs

Creating a Primary VLAN for a Private VLAN (Accessible to Both Fabric Interconnects)



Important

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # create vlan <i>vlan-name vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet uplink VLAN mode.
Step 3	UCS-A /eth-uplink/vlan # set sharing primary	Sets the VLAN as the primary VLAN.
Step 4	UCS-A /eth-uplink/vlan # commit-buffer	Commits the transaction to the system configuration.

The following example creates a named VLAN for both fabric interconnects, names the VLAN accounting, assigns the VLAN ID 2112, makes this VLAN the primary VLAN, and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # create vlan accounting 2112
UCS-A /eth-uplink/vlan* # set sharing primary
UCS-A /eth-uplink/vlan* # commit-buffer
UCS-A /eth-uplink/vlan #
```

Creating a Primary VLAN for a Private VLAN (Accessible to One Fabric Interconnect)



Important

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b}	Enters Ethernet uplink fabric interconnect mode for the specified fabric interconnect.
Step 3	UCS-A /eth-uplink/fabric # create vlan <i>vlan-name vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet uplink fabric interconnect VLAN mode.
Step 4	UCS-A /eth-uplink/fabric/vlan # set sharing primary	Sets the VLAN as the primary VLAN.
Step 5	UCS-A /eth-uplink/fabric/vlan # commit-buffer	Commits the transaction to the system configuration.

The following example creates a named VLAN for fabric interconnect A, names the VLAN finance, assigns the VLAN ID 3955, makes this VLAN the primary VLAN, and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # create vlan finance 3955
UCS-A /eth-uplink/fabric/vlan* # set sharing primary
UCS-A /eth-uplink/fabric/vlan* # commit-buffer
UCS-A /eth-uplink/fabric/vlan #
```

Creating a Secondary VLAN for a Private VLAN (Accessible to Both Fabric Interconnects)



Important

You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

VLANs in the LAN cloud and FCoE VLANs in the SAN cloud must have different IDs. Using the same ID for a VLAN and an FCoE VLAN in a VSAN results in a critical fault and traffic disruption for all vNICs and uplink ports using that VLAN. Ethernet traffic is dropped on any VLAN which has an ID that overlaps with an FCoE VLAN ID.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # create vlan <i>vlan-name vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet uplink VLAN mode.
Step 3	UCS-A /eth-uplink/vlan # set sharing isolated	Sets the VLAN as the secondary VLAN.
Step 4	UCS-A /eth-uplink/vlan # set pubnwnname <i>primary-vlan-name</i>	Specifies the primary VLAN to be associated with this secondary VLAN.
Step 5	UCS-A /eth-uplink/vlan # commit-buffer	Commits the transaction to the system configuration.

The following example creates a named VLAN for both fabric interconnects, names the VLAN accounting, assigns the VLAN ID 2112, makes this VLAN the secondary VLAN, associates the secondary VLAN with the primary VLAN, and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # create vlan accounting 2112
UCS-A /eth-uplink/vlan* # set sharing isolated
UCS-A /eth-uplink/vlan* # set pubnwnname pvlan1000
UCS-A /eth-uplink/vlan* # commit-buffer
UCS-A /eth-uplink/vlan #
```

Creating a Secondary VLAN for a Private VLAN (Accessible to One Fabric Interconnect)



Important

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Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b}	Enters Ethernet uplink fabric interconnect mode for the specified fabric interconnect (A or B).
Step 3	UCS-A /eth-uplink/fabric # create vlan <i>vlan-name vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet uplink fabric interconnect VLAN mode.
Step 4	UCS-A /eth-uplink/vlan # set sharing isolated	Sets the VLAN as the secondary VLAN.
Step 5	UCS-A /eth-uplink/vlan # set pubnwnname <i>primary-vlan-name</i>	Specifies the primary VLAN to be associated with this secondary VLAN.
Step 6	UCS-A /eth-uplink/fabric/vlan/member-port # commit-buffer	Commits the transaction to the system configuration.

The following example creates a named VLAN for fabric interconnect A, names the VLAN finance, assigns the VLAN ID 3955, makes this VLAN the secondary VLAN, associates the secondary VLAN with the primary VLAN, and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # create vlan finance 3955
UCS-A /eth-uplink/fabric/vlan* # set sharing isolated
UCS-A /eth-uplink/fabric/vlan* # set pubnwnname pvlan1000
UCS-A /eth-uplink/fabric/vlan* # commit-buffer
UCS-A /eth-uplink/fabric/vlan #
```

Viewing the VLAN Port Count

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fabric-interconnect {a b}	Enters fabric interconnect mode for the specified fabric interconnect.
Step 2	UCS-A /fabric-interconnect # show vlan-port-count	Displays the VLAN port count.

The following example displays the VLAN port count for fabric interconnect A:

```
UCS-A# scope fabric-interconnect a
UCS-A /fabric-interconnect # show vlan-port-count

VLAN-Port Count:
VLAN-Port Limit      Access VLAN-Port Count      Border VLAN-Port Count      Alloc Status
-----
6000                  3                            0                            Available
```

