

# VLAN Configuration in Cisco UCS

Document ID: 110517

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## Introduction

This document shows you how to create VLANs in the Cisco Unified Computing System (UCS).

In the Cisco UCS, a named VLAN creates a connection to a specific external LAN. The VLAN isolates traffic to that external LAN, which includes any 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.

## Prerequisites

### Requirements

Cisco recommends that you have a working knowledge of these:

- Cisco UCS Server Blade software and hardware
- UCS management application, the UCS Manager
- Impact and implications of the different commands described in this document

- UCS components and topology; refer to the network diagram for a typical solution.

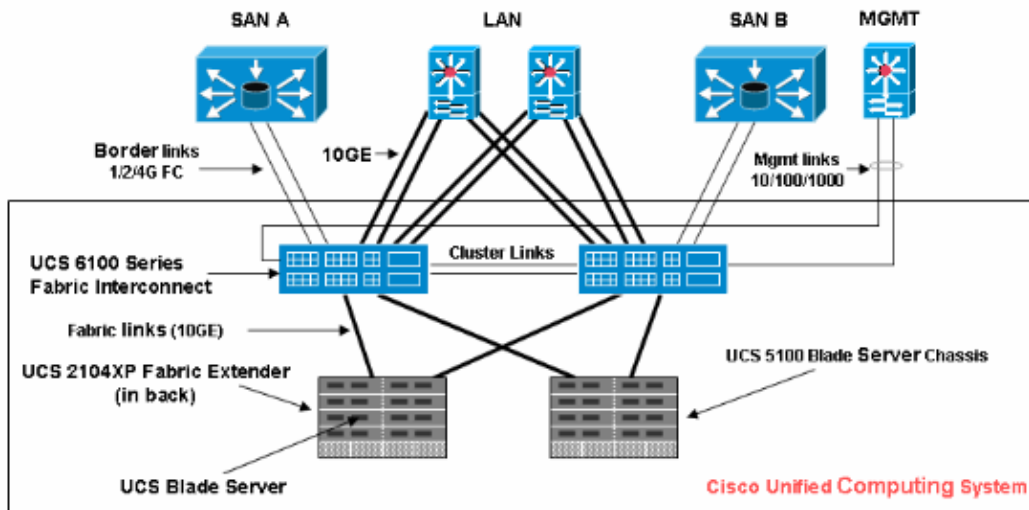
## Components Used

The information in this document is based on the Cisco UCS.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a default configuration. If your network is live, make sure that you understand the potential impact of any command.

## Network Diagram

A typical Cisco UCS topology looks similar to this:



## Conventions

Refer to the Cisco Technical Tips Conventions for more information on document conventions.

## Background Information

UCS Fabric Interconnect:

- 6120XP 20 Fixed ports, 10GE/FCoE, 1 expansion module

## Main Task

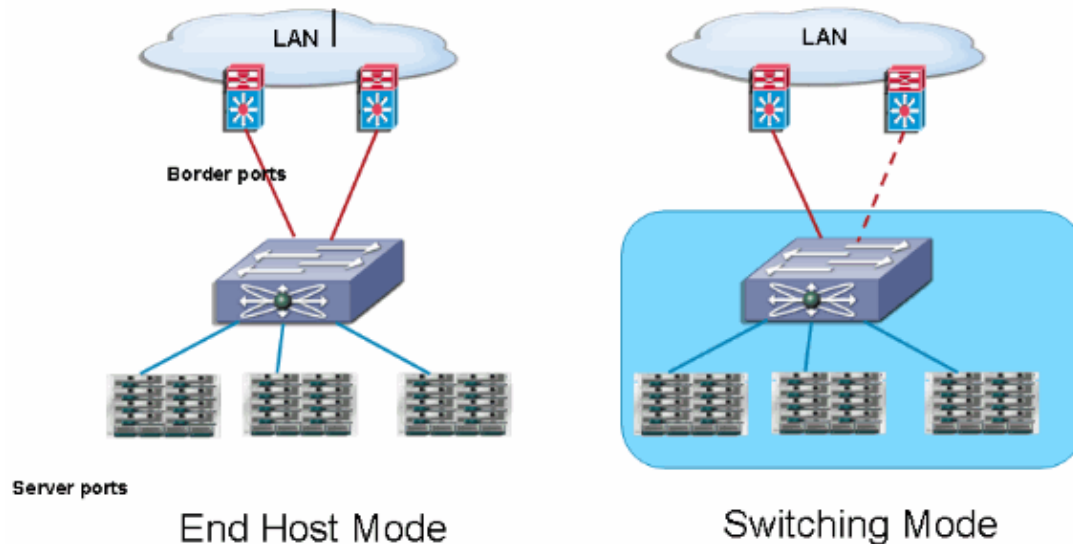
### Fabric Interconnect Ethernet Switching Modes

The Ethernet switching mode determines how the Fabric Interconnect behaves as a switching device between the servers and the network. The UCS fabric interconnect operates in either of the following Ethernet switching modes:

- End-Host Mode
- Switch Mode

**Note:** For both ethernet switching modes even when vnic's are hard pinned to uplink ports, all server-to-server unicast traffic in the server array is switched locally. Server-to-server multicast and broadcast traffic is sent through all uplink ports in the same VLAN.

## Ethernet Switch Mode



**IMPORTANT:** When you change the Ethernet switching mode, Cisco UCS Manager logs you out and restarts the Fabric Interconnect. For a cluster configuration, Cisco UCS Manager restarts both Fabric Interconnects sequentially.

### End-Host Mode

End-host mode allows the Fabric Interconnect to act as an end host to the network, representing all server (hosts) connected to it through vNICs. This is achieved by pinning (either dynamically pinned or hard pinned) vNICs to uplink ports, which provides redundancy toward the network, and makes the uplink ports appear as server ports to the rest of the fabric. When in end-host mode, the Fabric Interconnect does not run the Spanning Tree Protocol (STP) and avoids loops by denying uplink ports from forwarding traffic to each other, and by denying egress server traffic on more than one uplink port at a time.

End-Host Mode:

- A UCS Fabric Interconnect operating in End Host Mode is called an EH-node
- An EH-node appears to the external LAN as an end station with many adapters
- An EH-node has two types of ports (by configuration)
  - ◆ Border port (can be port channel) connect to upstream L2 network
  - ◆ Server port connect to servers
- The EH-node does not participate in STP on the border ports
  - ◆ Reduces scale of STP control plane
  - ◆ Active-Active use of redundant links towards upstream L2 network
  - ◆ Traffic **cannot** be forwarded between one border port to another border port
- End-host mode is the default Ethernet switching mode, and should be used if either of the following are used upstream:

- ◆ Layer 2 switching for L2 Aggregation
- ◆ Virtual Switching System (VSS) aggregation layer

**Note:** When end–host mode is enabled, if a vNIC is hard pinned to an uplink port and this uplink port goes down, the system cannot re–pin the vNIC, and the vNIC stays down.

This is the procedure:

1. Log in to UCS Manager.
2. In the navigation pane, click the **Equipment** tab.
3. In the Equipment tab, expand **Equipment** > **Fabric Interconnects** > **Fabric Interconnect\_Name**.
4. In the work pane, click the **General** tab.
5. In the Actions area of the General tab, click **Set End–Host Mode**.

The action for the current switch mode is dimmed.

6. In the dialog box, click **Yes**.

Cisco UCS Manager restarts the Fabric Interconnect, logs you out, and disconnects Cisco UCS Manager GUI.

7. Launch Cisco UCS Manager GUI and log back in to continue configuring your system.

## Switching Mode

Switch Mode:

- Switch mode is the traditional Ethernet switching mode. In this mode the Fabric Interconnect runs STP to avoid loops, and broadcast and multicast packets are handled in the traditional way.
- Switch mode is not the default Ethernet switching mode in UCS, and should be used only if the Fabric Interconnect is directly connected to a router, or if either of the following are used upstream:

- ◆ Layer 3 aggregation
- ◆ vLAN in a box

This is the procedure:

1. Log in to UCS Manager.
2. In the navigation pane, click the **Equipment** tab.
3. In the Equipment tab, expand **Equipment** > **Fabric Interconnects** > **Fabric Interconnect\_Name**.
4. In the work pane, click the **General** tab.
5. In the Actions area of the General tab, click **Set Switching Mode**. The action for the current switch mode is dimmed.
6. In the dialog box, click **Yes**. Cisco UCS Manager restarts the Fabric Interconnect, logs you out, and disconnects Cisco UCS Manager GUI.
7. Launch Cisco UCS Manager GUI and log back in to continue configuring your system.

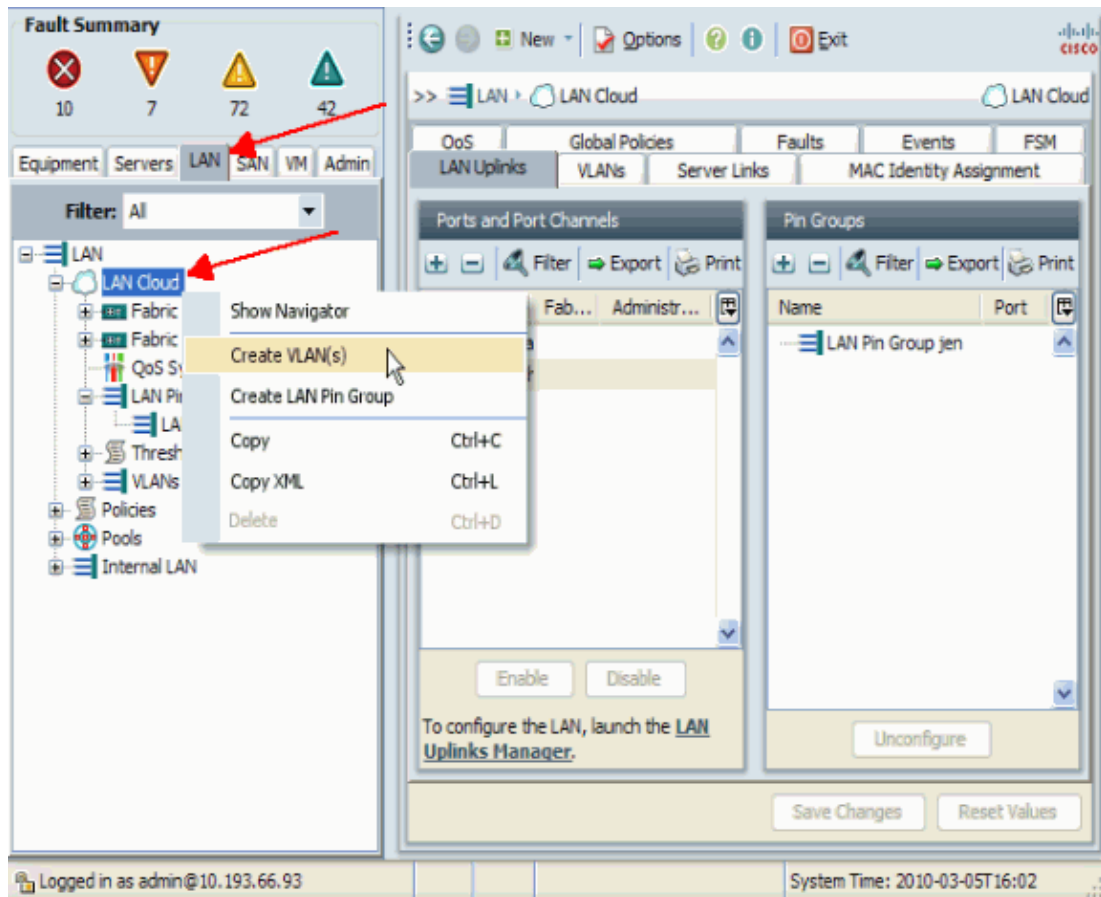
## Configuring Named VLANs

- A named VLAN creates a connection to a specific external LAN.
- In a cluster configuration, a named VLAN can be configured to be accessible only to one Fabric Interconnect or to both Fabric Interconnects.
- You need a unique VLAN ID for each named VLAN that you create.
- You cannot create VLANs with IDs from 3968 to 4048. This range of VLAN IDs is reserved.

## Creating a Named VLAN on Both Fabric Interconnects

In order to create a Named VLAN on both Fabric Interconnects, complete these steps:

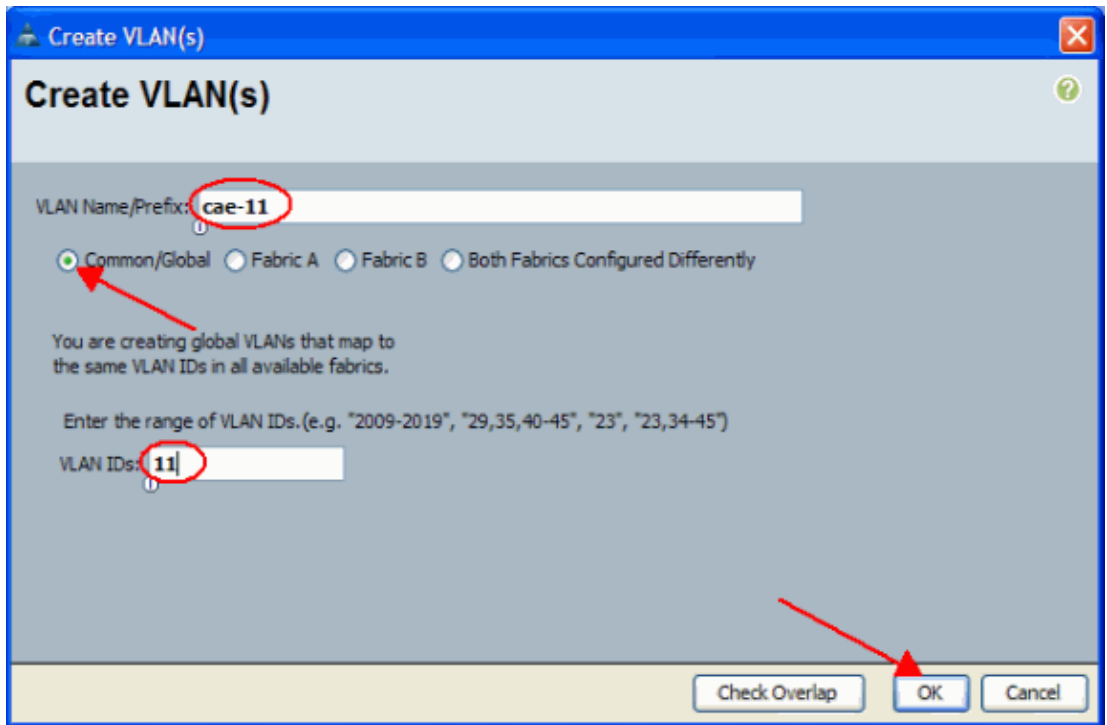
1. Log in to UCS Manager.
2. In the navigation pane, select the **LAN** tab.
3. In the LAN tab, expand **LAN > LAN Cloud**.
4. Right-click on the LAN Cloud node and select **Create VLAN**.



**Note:** The Name is only known within UCS and will not show up under NXOS.

5. In the Name field, enter a unique name for the VLAN.
6. In the ID field, enter the network ID assigned to the VLAN.
7. Click **OK**.
8. Cisco UCS Manager GUI adds the VLAN to the VLANs node under LAN Cloud.

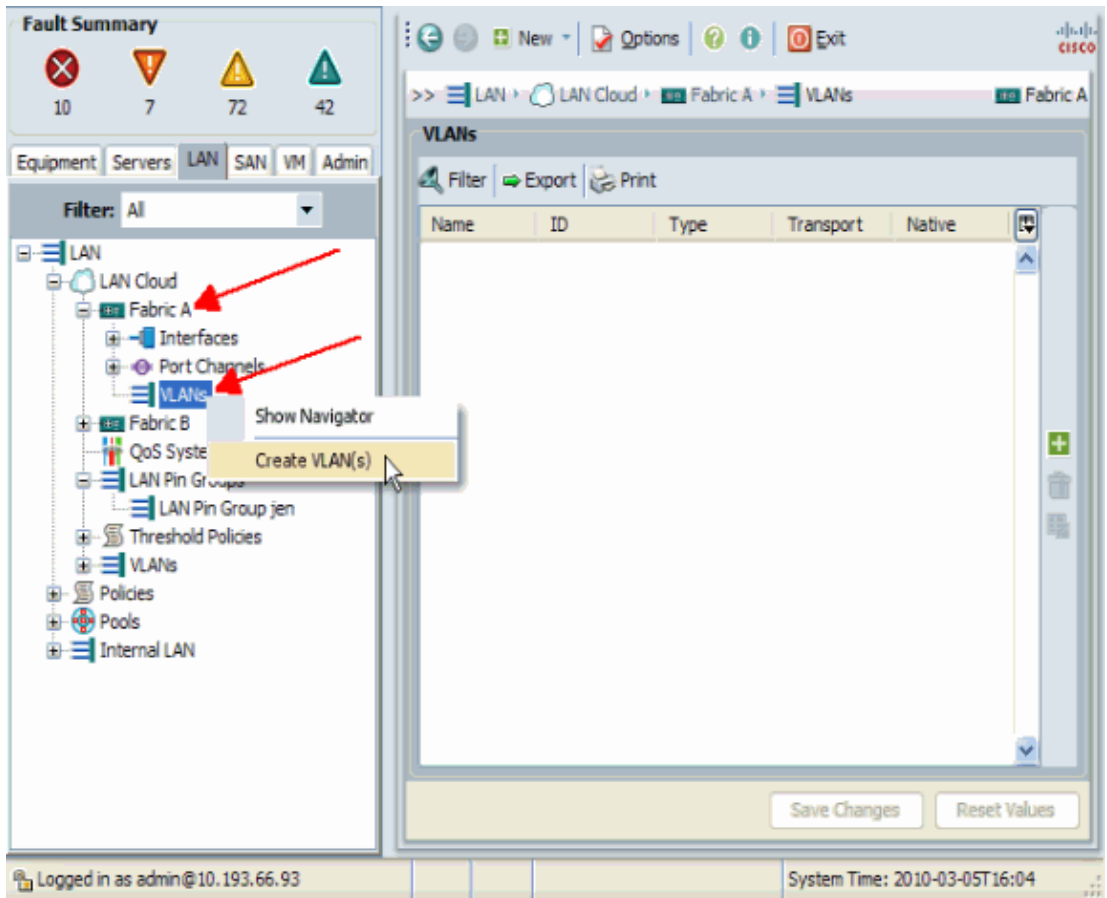
**Note:** VLANs that are accessible to both Fabric Interconnects are visible only under the LAN Cloud-->VLANs node. You cannot see them under the Fabric Interconnect-->VLANs node, which displays only the VLANs accessible to just that Fabric Interconnect.



## Creating a Named VLAN on One Fabric Interconnect

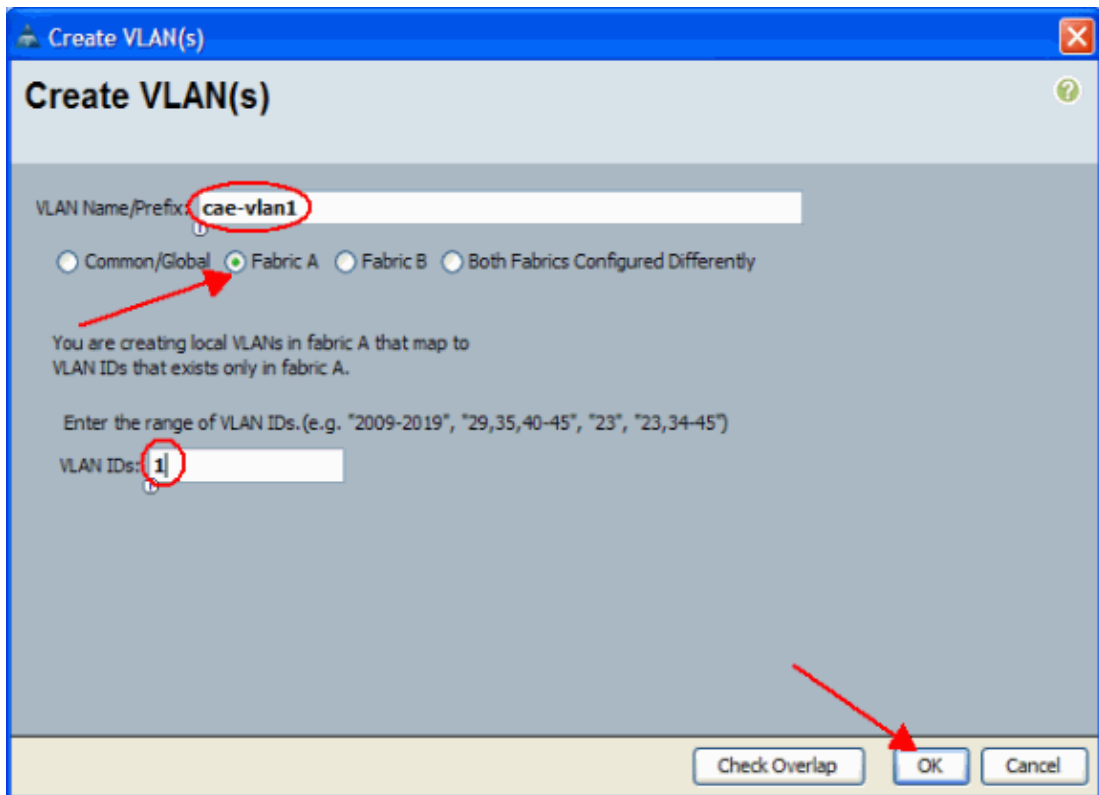
In order to create a Named VLAN on one Fabric Interconnect, complete these steps:

1. In the navigation pane, select the **LAN** tab.
2. In the LAN tab, expand **LAN > LAN Cloud**.
3. Right-click on the Fabric Interconnect where you want to create the VLAN and select **Create VLAN**.



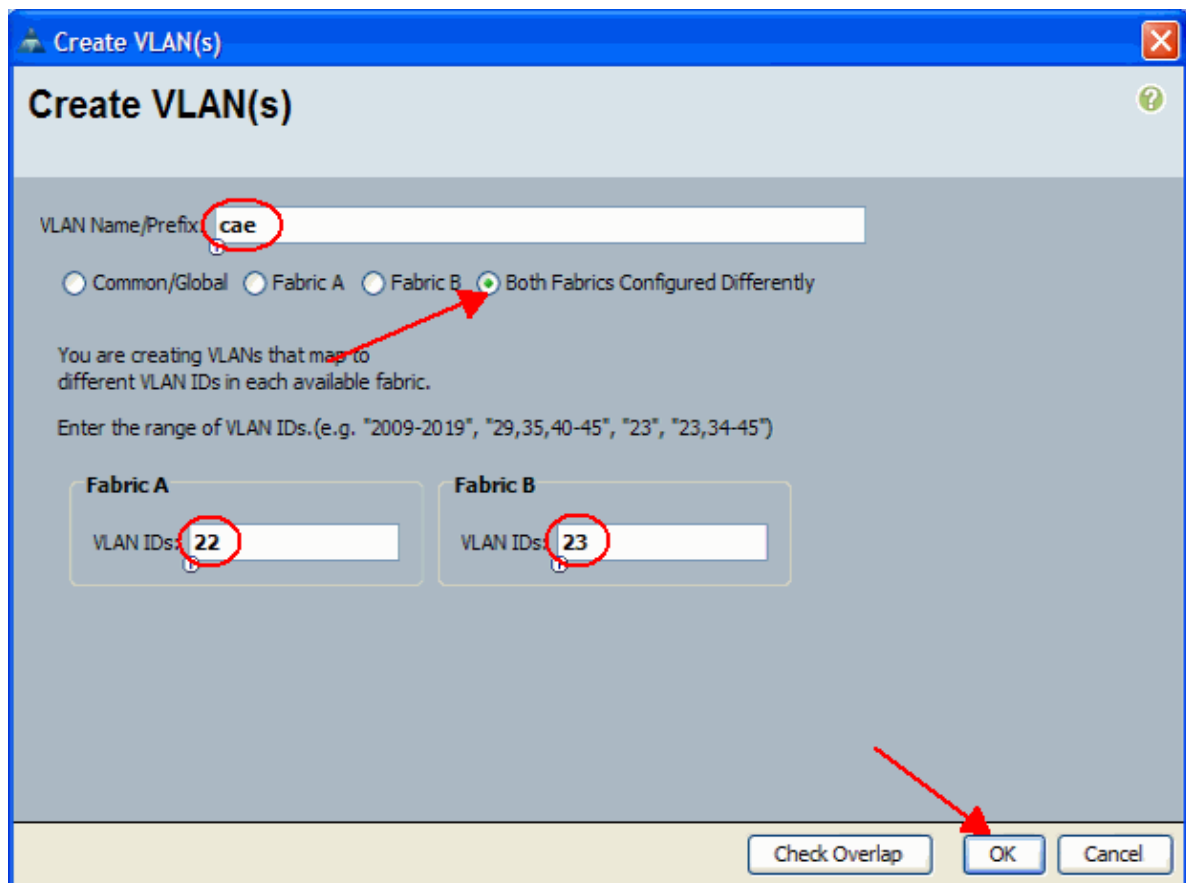
4. In the Name field, enter a unique name for the VLAN.
5. In the ID field, enter the network ID assigned to the VLAN.
6. Click **OK**.

Cisco UCS Manager GUI adds the VLAN to the VLANs node under the Fabric Interconnect you chose.



## Same Named VLAN but Different VLAN IDs

This option will create a pair of VLANs (one per Fabric Interconnect) with the same name but different VLAN IDs.





## Verify VLAN Creation

Complete these steps:

1. Log in to UCS Manager.
2. In the navigation pane, select the **LAN** tab.
3. Expand **LAN Cloud**, also expand **VLANs** under Fabric Interconnect A and Fabric Interconnect B.
4. Select the **VLANs** tab in the work pane to the right.
5. You can see VLANs in All, Dual Mode, Fabric Interconnect A, or Fabric Interconnect B.

The screenshot displays the Cisco UCS Manager interface. On the left, the navigation pane shows the hierarchy: LAN > LAN Cloud > Fabric A > VLANs and Fabric B > VLANs. Red arrows point to these 'VLANs' nodes. The main work pane shows the 'VLANs' tab selected, displaying a table of VLANs. The table has columns for Name, ID, Fabric ID, Type, Transport, and a status icon. The table lists various VLANs with their IDs and Fabric IDs (A, B, or dual).

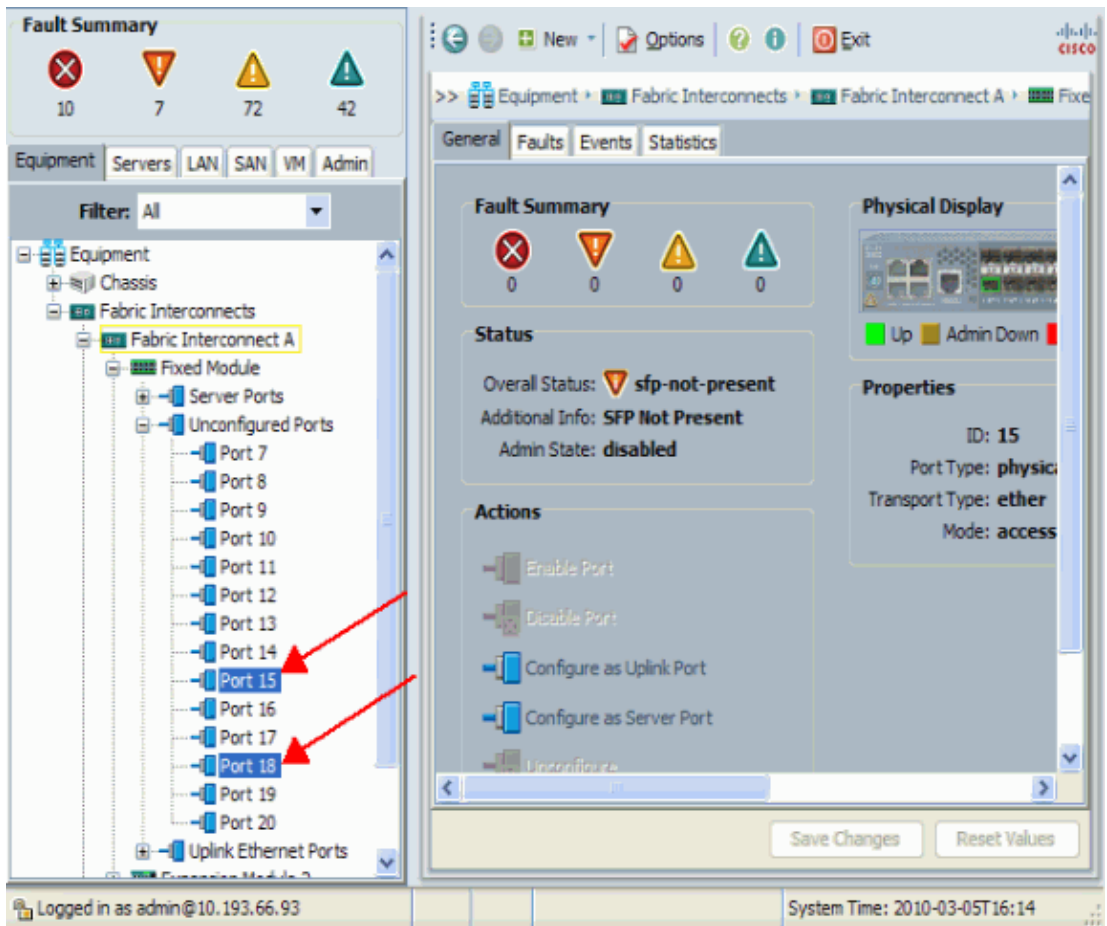
Name	ID	Fabric ID	Type	Transport	
VLAN VL...	180	dual	lan	ether	nc
VLAN ca...	22	A	lan	ether	nc
VLAN ca...	23	B	lan	ether	nc
VLAN ca...	11	dual	lan	ether	nc
VLAN ca...	1	A	lan	ether	nc
VLAN ch...	2009	dual	lan	ether	nc
VLAN de...	1	dual	lan	ether	ye
VLAN fr...	2	dual	lan	ether	nc
VLAN je...	1	dual	lan	ether	ye
VLAN pr...	12	dual	lan	ether	nc
VLAN pr...	13	dual	lan	ether	nc

## Configuring Uplink Ethernet Ports

- Uplink Ethernet ports handle ethernet traffic between the Fabric Interconnect and the next layer of the network.
- All network-bound Ethernet traffic is pinned to one of these ports (which might be a port channel).
- You can configure uplink Ethernet ports on either the fixed module or an expansion module.

This is only one method of configuring ports. You can also configure ports through a right-click menu or from the General tab for the port.

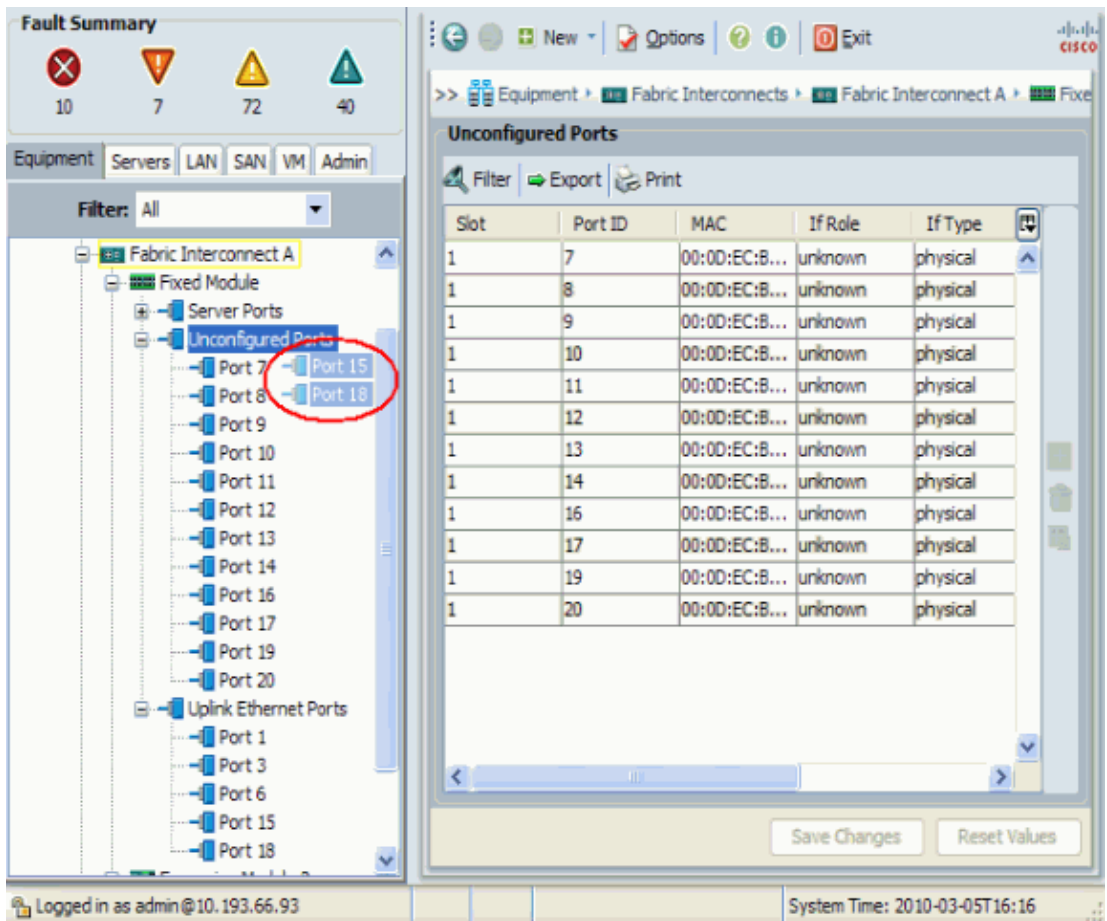
1. In the navigation pane, select the **Equipment** tab.
2. In the Equipment tab, expand **Fabric Interconnects** > **Fabric Interconnect\_Name**.
3. Depending on the location of the ports you want to configure, expand one of the following:
  - ◆ Fixed Module
  - ◆ Expansion Module
4. Select one or more of the ports under the Unconfigured Ports node.



5. Drag the selected port or ports and drop them in the Uplink Ethernet Ports node.

The port or ports are configured as uplink ethernet ports, removed from the list of unconfigured ports, and added to the Uplink Ethernet Ports node.

6. In order to reconfigure a port just select it then drag and drop it into either Server Ports or Unconfigured Ports node.



## Verify

There is currently no specific verification for this configuration.

## Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

## Related Information

- [Technical Support & Documentation – Cisco Systems](#)

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Updated: Aug 28, 2009

Document ID: 110517