

# Configuring FDDI 802.10 Trunks

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This chapter describes how to configure Fiber Distributed Data Interface (FDDI) IEEE 802.10 VLAN trunks.

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**Note** For complete information on configuring FDDI/CDDI switching, see Chapter 44, “Configuring FDDI/CDDI Switching.”

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**Note** For complete syntax and usage information for the commands used in this chapter, refer to the *Command Reference* for your switch.

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This chapter consists of these sections:

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## Understanding How IEEE 802.10 Trunking Works

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**Note** For complete information on configuring VLANs, refer to Chapter 10, “Configuring VLANs.”

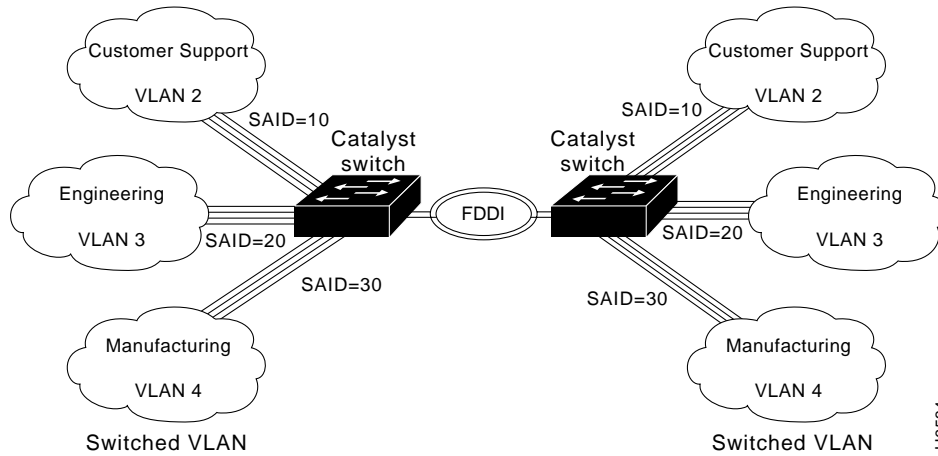
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You can extend VLANs across an FDDI backbone by multiplexing switched packets over a FDDI/CDDI interface using the 802.10 protocol. Catalyst 5000 series FDDI/CDDI interface links can operate as interswitch trunks that provide broadcast control between configured VLANs. The 802.10 protocol encapsulates frames with a VLAN identifier and packet data according to the IEEE 802.10 specification. FDDI/CDDI interfaces that support 802.10 make selective forwarding decisions within a network domain based upon the VLAN identifier.

The VLAN identifier is a user-configurable four-byte Security Association Identifier (SAID). The SAID identifies traffic as belonging to a particular VLAN. It also determines to which VLAN each packet is switched.

Figure 45-1 shows an example FDDI trunk configuration. In this example, the SAID ensures that packets destined for a particular VLAN are received on that VLAN after they are transmitted across the FDDI trunks.

**Figure 45-1 FDDI Trunk Configuration**



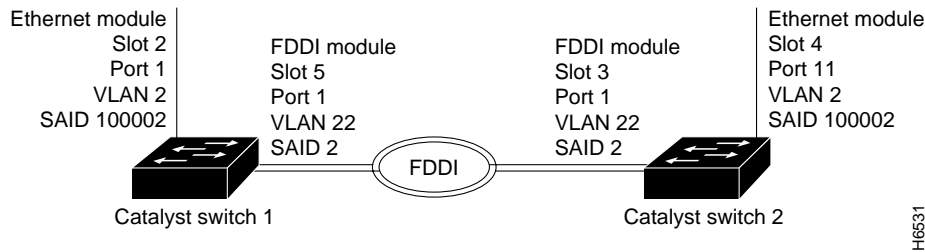
The VLAN Trunk Protocol (VTP) provides FDDI/CDDI module configuration for 802.10-based VLANs. VTP requires a protocol type (Ethernet, FDDI, or Token Ring) to be configured for each VLAN. A VLAN can only have one type associated with it. Each VLAN type must have its own unique identifier, and translations between different identifiers must be mapped. VTP advertises VLAN translation mappings to all switches in a management domain.

FDDI/CDDI modules integrate switched Ethernet and Fast Ethernet LANs into the FDDI network. To map an 802.10 FDDI VLAN to an Ethernet VLAN, you must map the 802.10 VLAN SAID to an Ethernet VLAN by mapping an Ethernet VLAN to an FDDI VLAN and assigning a SAID value to the FDDI VLAN.

If an FDDI/CDDI module receives a packet containing a VLAN SAID that maps to a locally supported Ethernet VLAN on the Catalyst 5000 series switch, the FDDI/CDDI module translates the packet into Ethernet format and forwards it across the switch backplane to the Ethernet module. FDDI/CDDI modules filter the packets they receive from reaching the backplane if the VLAN SAIDs in the packets do not map to a locally supported VLAN.

Figure 45-2 illustrates the configuration for forwarding a packet from the Ethernet module port 1 in slot 2 to the FDDI module port 1 in slot 5. For this example, you would specify the translation of Ethernet VLAN 2 to FDDI VLAN 22. FDDI VLAN 22 is translated automatically to Ethernet VLAN 2. The VLAN SAID must be identical on both FDDI modules. Because 802.10 FDDI/CDDI interface links can operate as interswitch trunks, you can configure multiple VLAN translations over a link.

**Figure 45-2 VLAN Identifiers for an FDDI 802.10 Configuration**



FDDI/CDDI modules also support one native (nontrunk) VLAN, which handles all non-802.10 encapsulated FDDI traffic. You do not need to configure a translation number for the native VLAN because packets that are forwarded to the native VLAN do not contain VLAN identifiers. To map an Ethernet VLAN to an FDDI native VLAN, you must configure the FDDI port to be on the Ethernet VLAN. To do this, configure the Ethernet VLAN with the module number and port number of the FDDI-native VLAN.

## Default FDDI 802.10 Trunk Configuration

Table 45-1 shows the FDDI/CDDI default configuration.

**Table 45-1 FDDI 802.10 Trunk Default Configuration**

Feature	Default Value
Native VLAN	VLAN 1
Ethernet-FDDI mapping	None
Trunking	Off
Allowed VLAN range	VLANs 1–1005

## 802.10 Trunk Configuration Guidelines

These recommendations apply to setting up an FDDI 802.10 configuration:

- You do not need to configure a translation number for the native VLAN. To map an Ethernet VLAN to an FDDI native VLAN, configure the Ethernet VLAN with the VLAN identifier (*vlan\_num*), module number (*mod\_num*), and port number (*port\_num*) of the FDDI native VLAN, as described in the “Setting the Native VLAN on FDDI” section on page 44-5.
- Be aware that the native VLAN overrides any trunking-allowed VLANs. For example, if the VLAN range allowed for trunking is 1 through 1000, and the native VLAN is 1, VLAN 1 is not 802.10-encapsulated on the FDDI link.
- If you are connecting a Catalyst 5000 series switch to a Catalyst 1200 series switch, the following configuration is recommended:

The Catalyst 1200 series switch is hardcoded with a specific VLAN-to-Security Association Identifier (SAID) configuration. Therefore, if you are connecting a Catalyst 5000 series switch Ethernet VLAN to a Catalyst 1200 series switch Ethernet VLAN through an FDDI trunk, the SAID value of the FDDI VLAN must be the same value as the Ethernet VLAN to which it is translated. For example, if a Catalyst 1200 series switch Ethernet VLAN value is 20, the translation FDDI VLAN SAID value must be 20.

## Configuring FDDI 802.10 Trunks

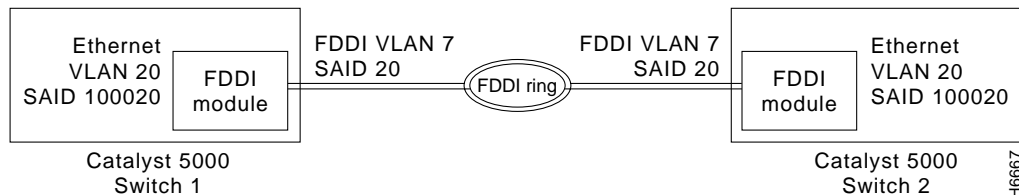
To set up an FDDI 802.10 VLAN trunk configuration, perform this task in privileged mode:

Task	Command
<b>Step 1</b> Create an Ethernet VLAN.	<b>set vlan <i>vlan_num</i></b>
<b>Step 2</b> Create an FDDI VLAN.	<b>set vlan <i>vlan_num</i> type fddi</b>
<b>Step 3</b> Map the Ethernet VLAN to the FDDI VLAN.	<b>set vlan <i>ether_vlan</i> translation <i>fddi_vlan</i></b>
<b>Step 4</b> Turn trunking on for the FDDI port.	<b>set trunk <i>mod_num/port_num</i> on</b>
<b>Step 5</b> Repeat Steps 1–3 for additional VLANs you want carried over the trunk link.	
<b>Step 6</b> Verify the trunk configuration.	<b>show vlan trunk</b> <b>show trunk</b>

## FDDI 802.10 Trunk Configuration Example

Figure 45-3 shows two Catalyst 5000 series switches in an FDDI 802.10 VLAN configuration.

**Figure 45-3 FDDI 802.10 Configuration Example**



The following prerequisites apply to the FDDI 802.10 configuration example shown in Figure 45-3:

- Before setting up an FDDI 802.10 VLAN configuration, complete the tasks in Chapter 10, “Configuring VLANs.”
- To connect Ethernet VLAN 20 in Switch 1 to Ethernet VLAN 20 in Switch 2, use a VTP server to set up the configuration as follows:
  - FDDI VLAN 7 with a SAID value of 20
  - Ethernet VLAN 20 with a translation to FDDI VLAN 7
  - Switches 1 and 2 to allow Ethernet VLAN 20 on the FDDI trunk
- Set up the native VLAN on FDDI according to the procedure in the “Setting the Native VLAN on FDDI” section on page 44-5.

After completing the tasks in “Configuring VLANs,” complete this task in privileged mode to set up the FDDI 802.10 VLAN configuration for VLAN 33:

Task	Command
<b>Step 1</b> Provide a VLAN number and activate a VLAN in the management domain.	<b>set vlan 33</b>
<b>Step 2</b> Create a VLAN with the type FDDI.	<b>set vlan 33 type fddi</b>
<b>Step 3</b> Map the Ethernet VLAN translation to an FDDI VLAN.	<b>set vlan 333 translation 33</b> or <b>set vlan 33 translation 333</b>
<b>Step 4</b> Turn trunking on for the FDDI port.	<b>set trunk 1/1 on</b>

After entering the **set vlan 33** command, you see this display:

```
Console> (enable) set vlan 33
VTP: vlan addition successful
```

This command creates a VLAN but does not assign it to a port. VTP advertises the VLAN to all available trunks of all types (such as Ethernet or FDDI) that are set to **on**, for all switches in the same management domain.

After entering the **set vlan vlan\_num type fddi** command, you see this display:

```
Console> (enable) set vlan 333 type fddi (said 338)
VTP: vlan addition successful
```

After entering the **set vlan vlan\_num translation vlan\_num** command or the **set vlan vlan\_num translation vlan\_num** command, you see this display:

```
Console> (enable) set vlan 33 translation 333
VTP: vlan modification successful
```

After entering the **set trunk 1/1 on** command, you see this display:

```
Console> (enable) set trunk 1/1 on
Port 1/1 mode set to on.
Console> (enable)
```

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**Note** You can enter the **set vlan** command to set up the native FDDI VLAN. The native VLAN overrides any trunking-allowed (802.10) VLANs. For example, if the VLAN range allowed for trunking is 1 through 1000 and the native VLAN is 1, VLAN 1 is not 802.10-encapsulated on the FDDI link.

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## FDDI 802.10 Trunk Configuration Example

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To verify that the VLAN configuration is correct, including the mapping between Ethernet, FDDI, and Token Ring, enter the **show vlan** command and the **show trunk** command. After entering the **show vlan** command, you see this display:

```
Console> (enable) show vlan
VLAN Name                               Type  Status  Mod/Ports
-----
 1   default                               enet  active  1/1
                                     2/3-4,2/7-12,2/14-16,2/18-24
11  VLAN0011                               enet  active  2/1-2
22  VLAN0022                               enet  active  2/5-6
33  VLAN0033                               enet  active  2/13,2/17
111 VLAN0111                               fddi  active
222 VLAN0222                               fddi  active
333 VLAN0333                               fddi  active
1002 fddi-default                           fddi  active
1003 token-ring-default                   tring  active
1004 fddinet-default                       fdnet  active
1005 trnet-default                       trnet  active

VLAN SAID      MTU   RingNo BridgeNo StpNo Parent Trans1 Trans2
-----
 1    1          1500  0      0      0    0      0      0
11   11          1500  0      0      0    0     111    0
22   22          1500  0      0      0    0     222    0
33   100033     1500  0      0      0    0     333    0
111  111         1500  0      0      0    0     11     0
222  222         1500  0      0      0    0     22     0
333  338         1500  0      0      0    0     33     0
1002 1002        1500  0      0      0    0     0      0
1003 1003        1500  0      0      0    0     0      0
1004 1004        1500  0      0      0    0     0      0
1005 1005        1500  0      0      0    0     0      0

Console> (enable)
```