Configure the 1721 Router for VLANs Using a Switch Module (WIC-4ESW)

Document ID: 50036

Contents

Introduction

This document demonstrates how to use Security Device Manager (SDM) to configure a Cisco 1721 router with a Catalyst 2950 switch that has two virtual LANs (VLANs). A VLAN is a group of devices on one or more local networks that are configured via management software to communicate as if they were physically connected. In other words, VLANs are based on logical groupings instead of physical connections.

In this scenario, the Cisco 1721 router performs two tasks:

- The router allows communication between the VLANs. VLANs cannot communicate directly with each other, so all traffic between the separate VLANs must must be handled by the router.
- The router provides connectivity to IP networks that are not connected directly to the switch.

Prerequisites

Requirements

Before you can use the procedures described in this document, you must complete initial configuration of the Cisco 1721 router.

- If you have the Cisco START client application installed on your computer, you can use the application to set up the switch for the first time. For details on installing the START client application, refer to Cisco START Client Installation and Uninstallation.
- If you are not using the START client application, refer to 1721 Router Initial Setup and Configuration with Security Device Manager.

You must have an active SDM session on the Cisco 1721 router. For detailed instructions on launching SDM, refer to Launch Security Device Manager on a Cisco Router. For general information on SDM, refer to the SDM support page.

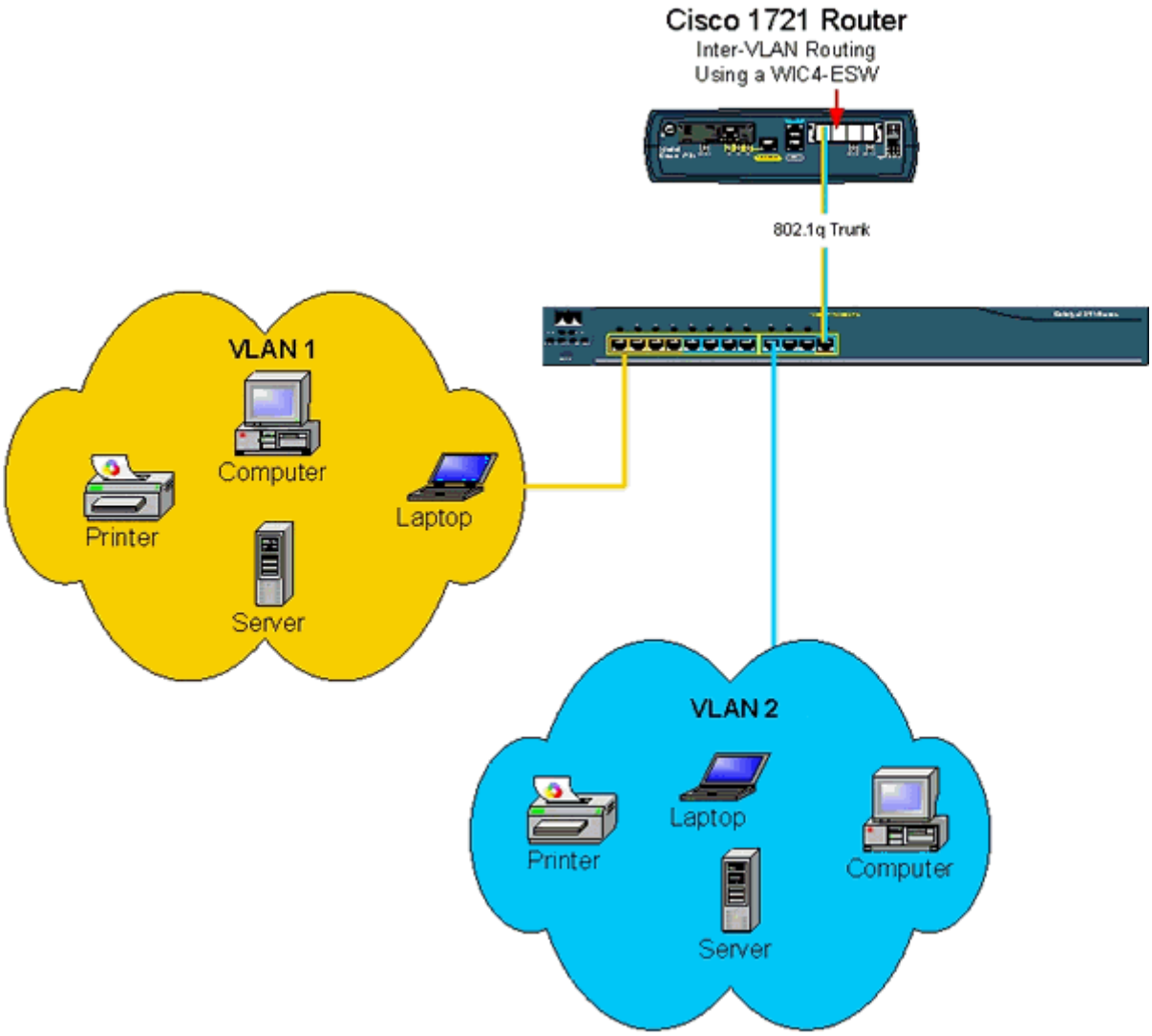
Components Used

The information in this document is based on these software and hardware versions:

- Cisco 1721 router with Cisco IOS® Software Release 12.3(7)T (c1700-k9o3sy7-mz.123-7.T.bin) and SDM 1.1
- WIC-4ESW switch card

Network Diagram

This document is based on a sample diagram that shows a Cisco 1721 router connected to a Catalyst 2950 switch that has two VLANs. The workgroup devices (computers, printers, and so on) attached to the switch are on separate VLANs.



The Role of Switched Virtual Interfaces in Layer 2 and Layer 3 Switching

Switched Virtual Interfaces (SVI) are software-based interfaces used to provide Layer 3 (IP) connectivity to the switch over its Layer 2 ports. To access an SVI over a Layer 2 port using IP, the Layer 2 port must be on the VLAN for the SVI. For example, to access an SVI of VLAN 1 on a switch, at least one of its interfaces must also be in VLAN 1.

Switches such as the Catalyst 2950 series only support one active SVI at a time. This is also referred to as the management interface because it is the interface that you give the IP address for managing the switch.

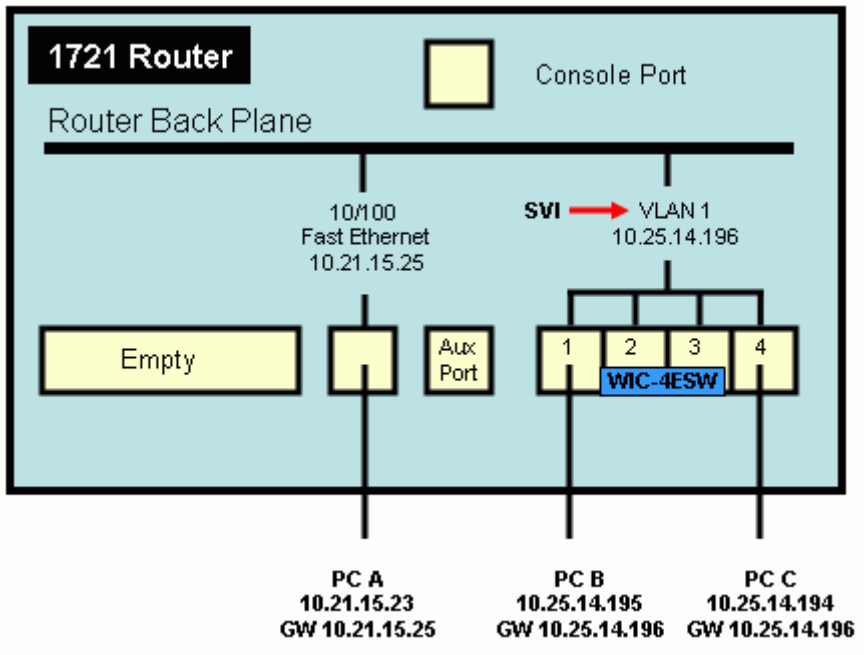
Other Catalyst switch series such as the 3550 support multiple SVIs. These switches support Layer 2 and Layer 3 switching. In addition, some switch modules support Layer 2 and layer 3 switching, such as the WIC4-ESW that is used to provide switch ports for routers.

The following three sections show three common uses of SVIs.

Default SVI Configuration

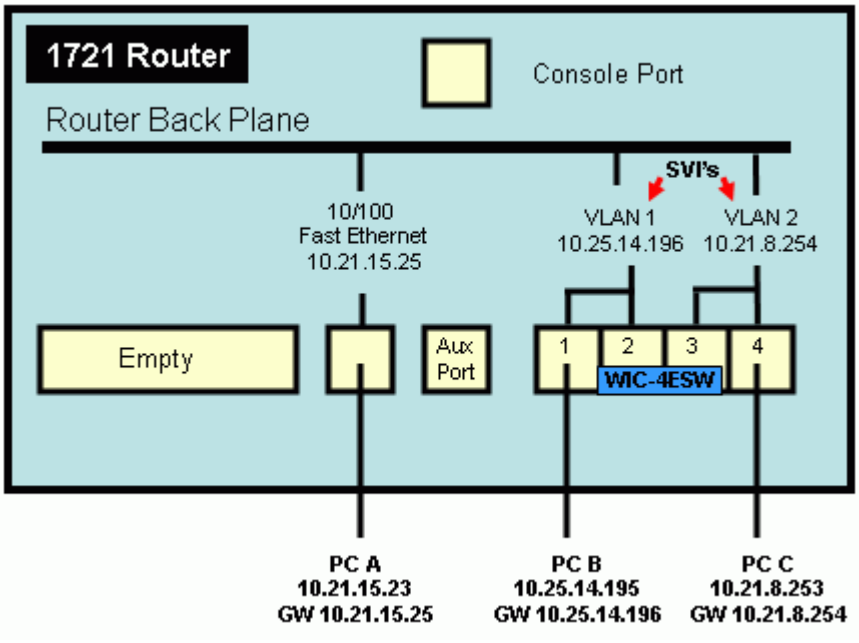
This is the default SVI configuration found on most Catalyst switches when they come from the factory. There is one SVI (VLAN 1) that contains all of the switched interfaces.

Note: An SVI can be shutdown and enabled in the same way a physical interface can be shutdown and enabled. If you shutdown an SVI, you will break connectivity for all of the devices that use the SVI for to pass traffic between VLANs.



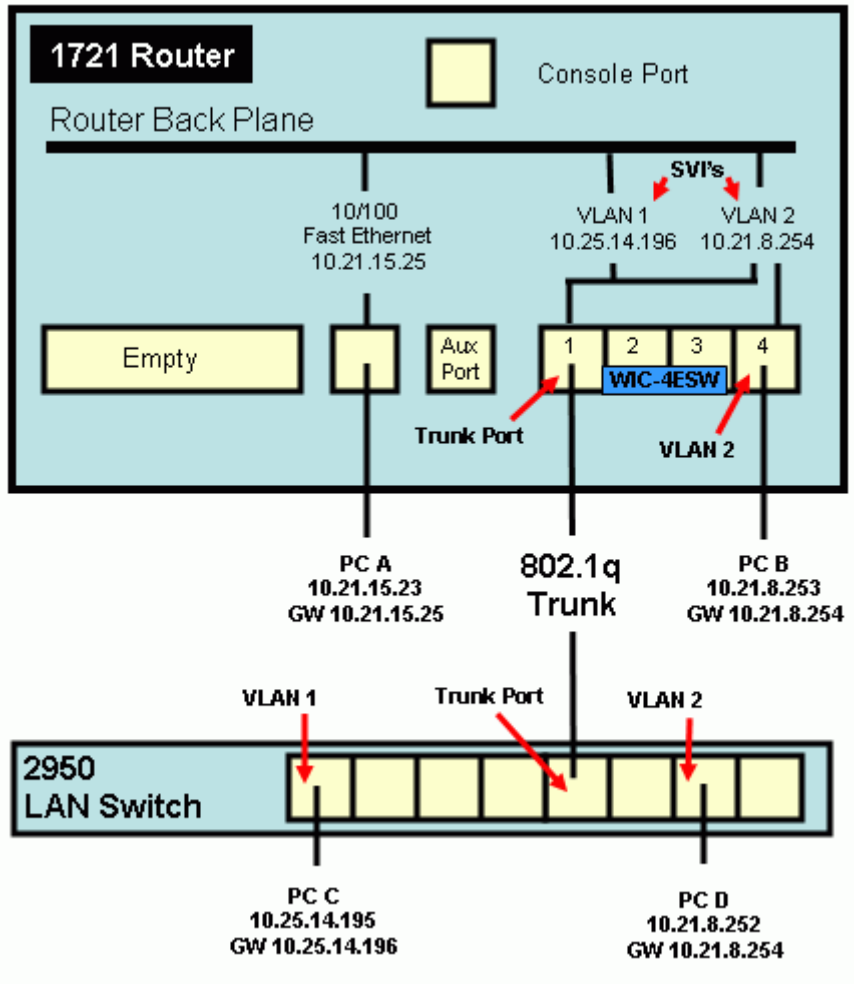
Two SVIs and Inter-VLAN Routing on the WIC-4ESW Card

This is a typical configuration where there are two or more SVIs. Interfaces are assigned to the VLANs for each SVI. In this case, interfaces 1 and 2 are in VLAN 1, and interfaces 3 and 4 are in VLAN 2. The IP address of the SVI is used as the default gateway for the devices that are attached to interfaces that are in the VLAN assigned to the SVI. For example, PC B uses 10.0.0.1 as its default gateway.



Two SVIs and Inter-VLAN Routing on the WIC-4ESW Card with a Trunk Port and a Second Switch

This is another common configuration. An interface on the WIC-4ESW has been configured as a trunk port. It is connected to a trunk port interface on another switch. The SVIs can be used to perform inter-VLAN routing for devices on VLANs 1 and 2 on the Catalyst 2950 switch. Note that PC B is connected directly to the WIC-4ESW using an interface that is assigned to VLAN 2. All of the PCs in this diagram can connect to each other using IP by using their local default IP gateway.



Configure Routing Between VLANs

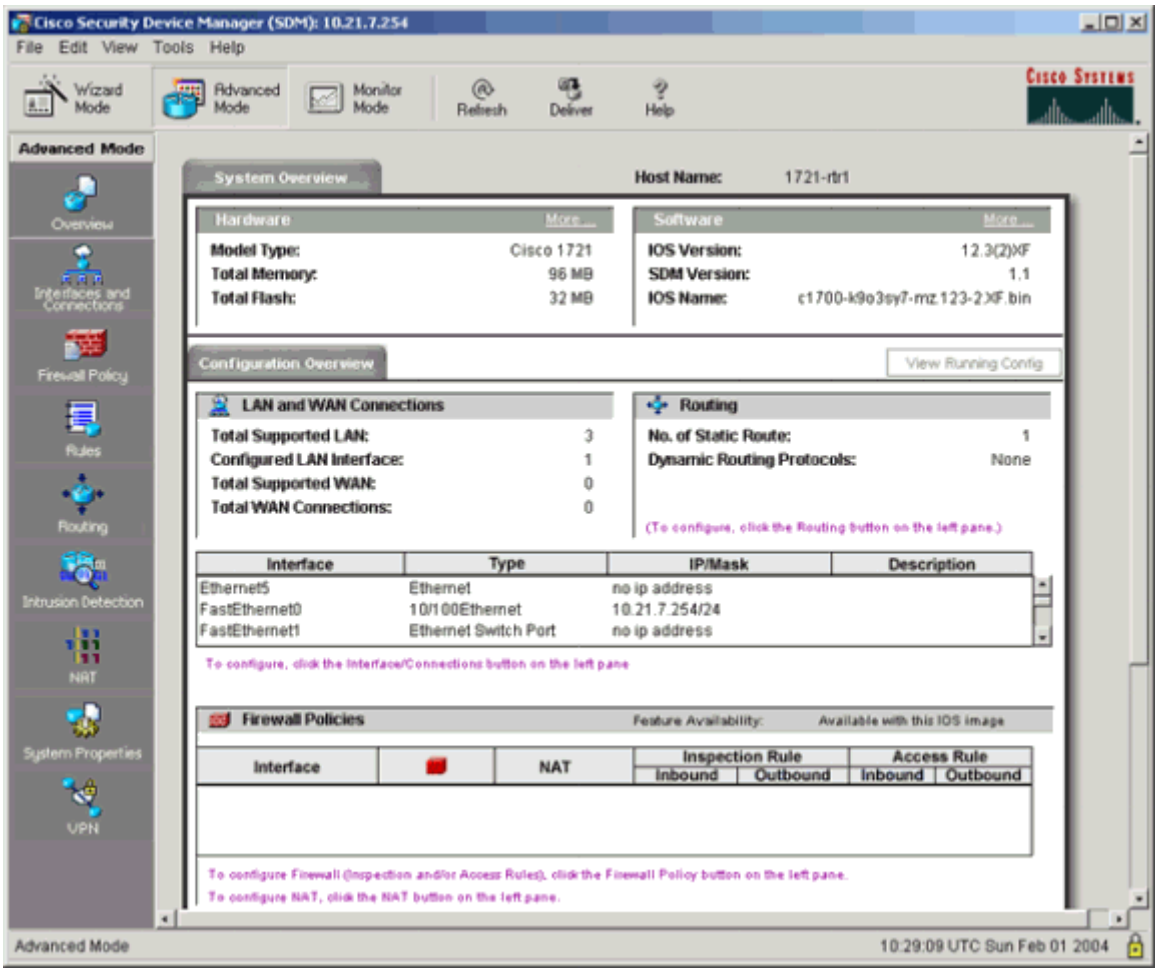
This configuration uses a Cisco 1721 router and a WIC4-ESW switch card to create a Layer 2 and Layer 3 switched environment.

Note: If this document was launched by the START client application, you should already have established an SDM session with the 1721 router. If you need help launching SDM, refer to Launch Security Device Manager on a Cisco Router.

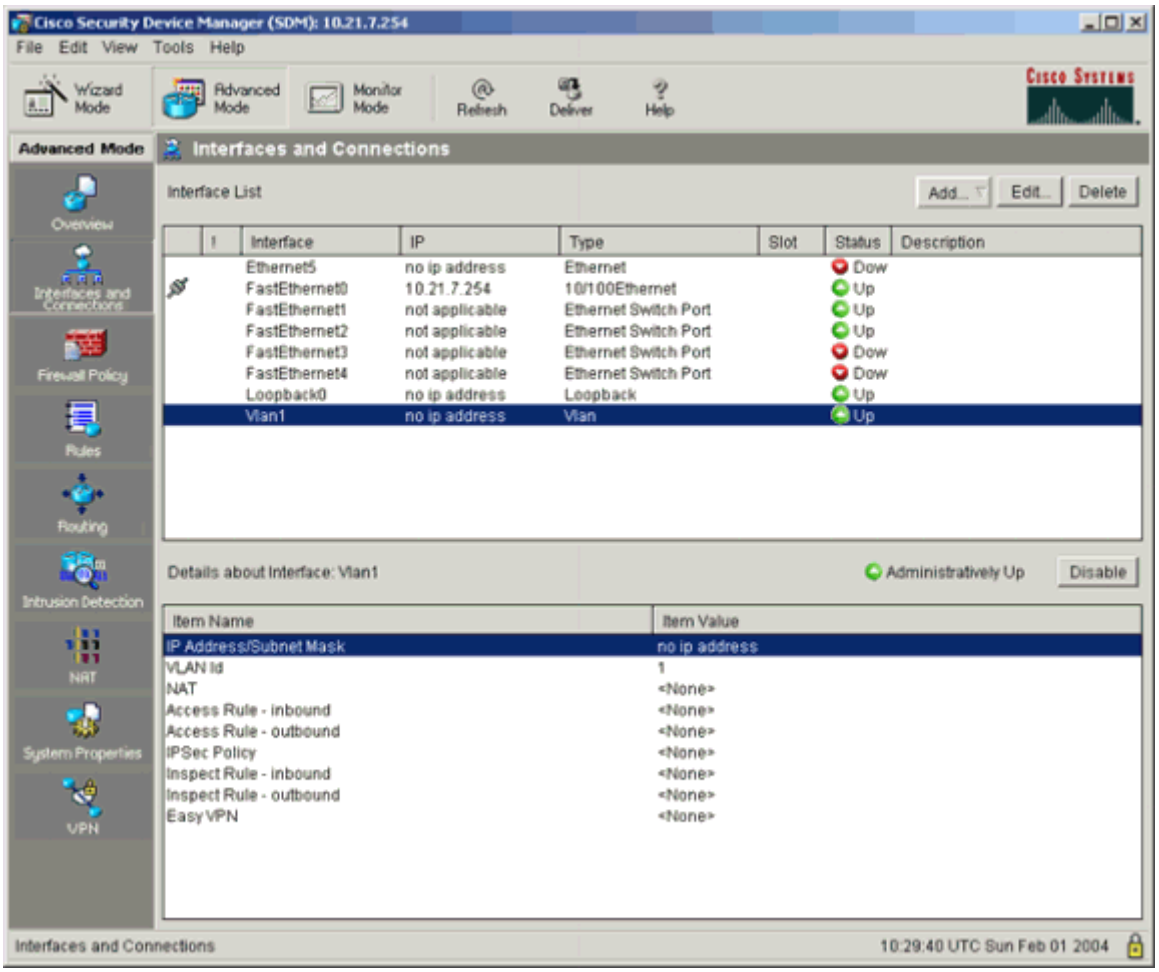
Use SDM to Configure the IP Address on VLAN1

Follow these steps to assign an IP address to VLAN 1:

1. Click **Advanced Mode**.

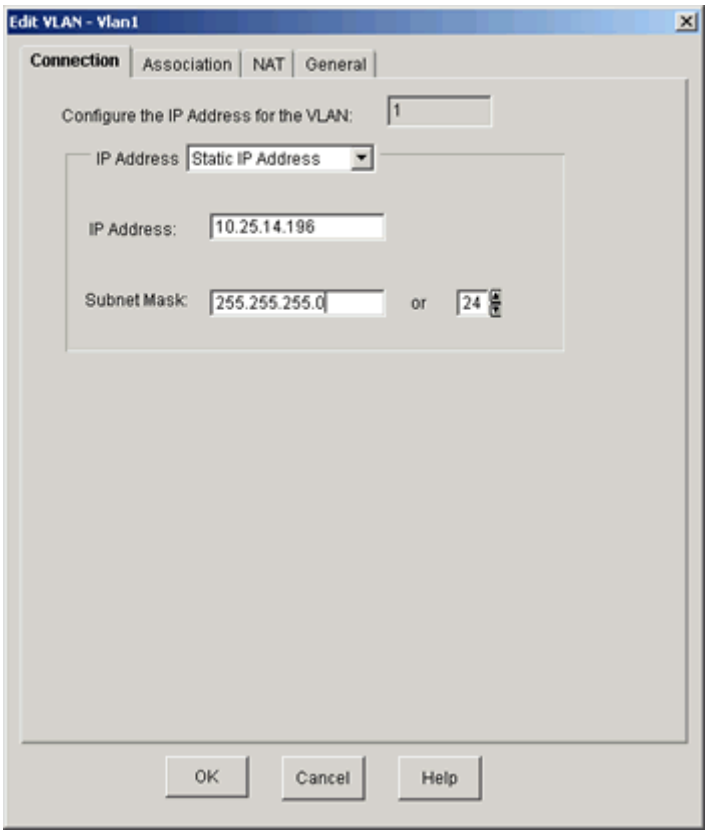


2. Click **Interfaces and Connections**.

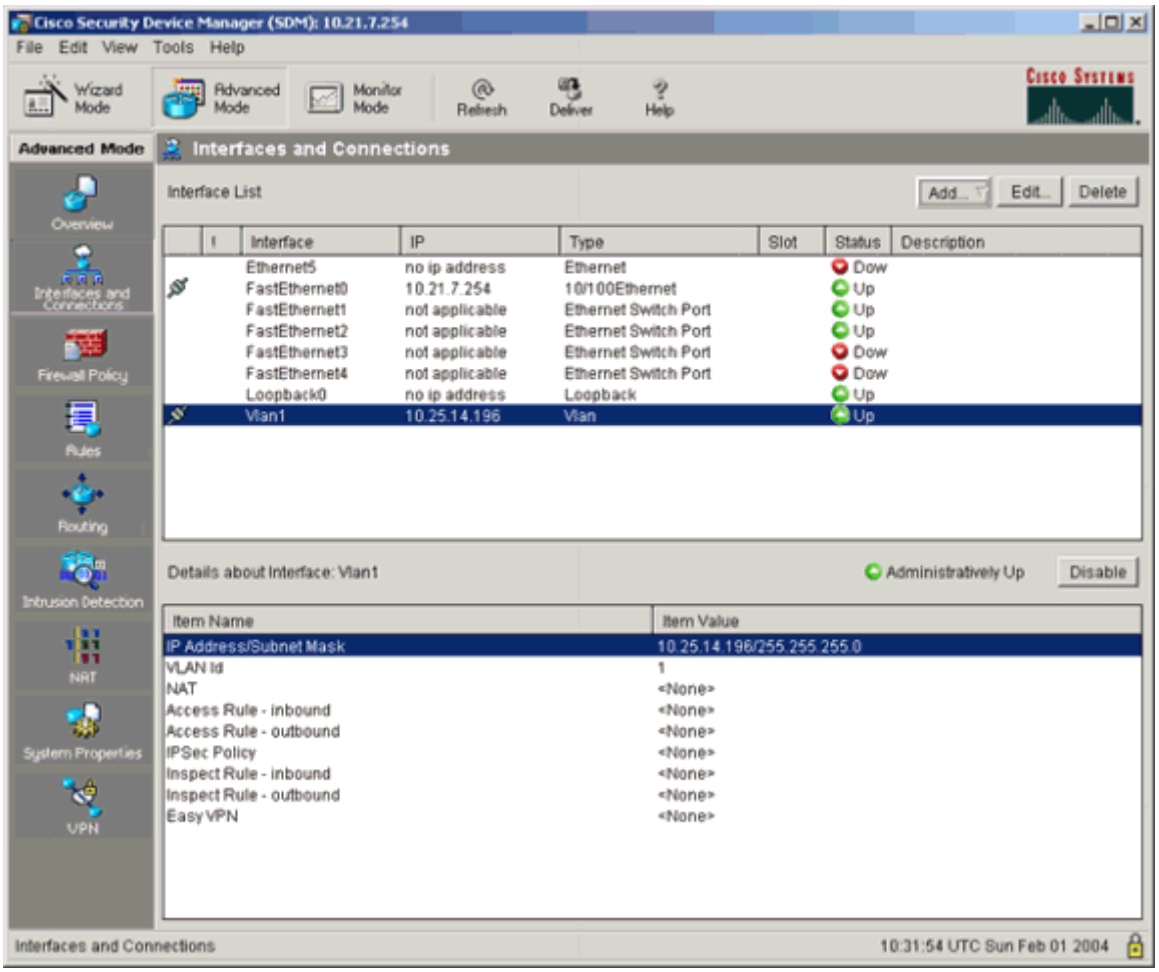


3. In the Interface List area, choose **VLAN1**, and then click **Edit**.
4. In the Edit VLAN window, click the Connection tab and type the IP address information for VLAN1.
    - From the the IP Address drop-down menu, choose **Static IP Address**.
    - In the IP Address field, type the IP address for VLAN 1.
    - In the Subnet Mask field, type the subnet mask.

    Click **OK** when you are finished.



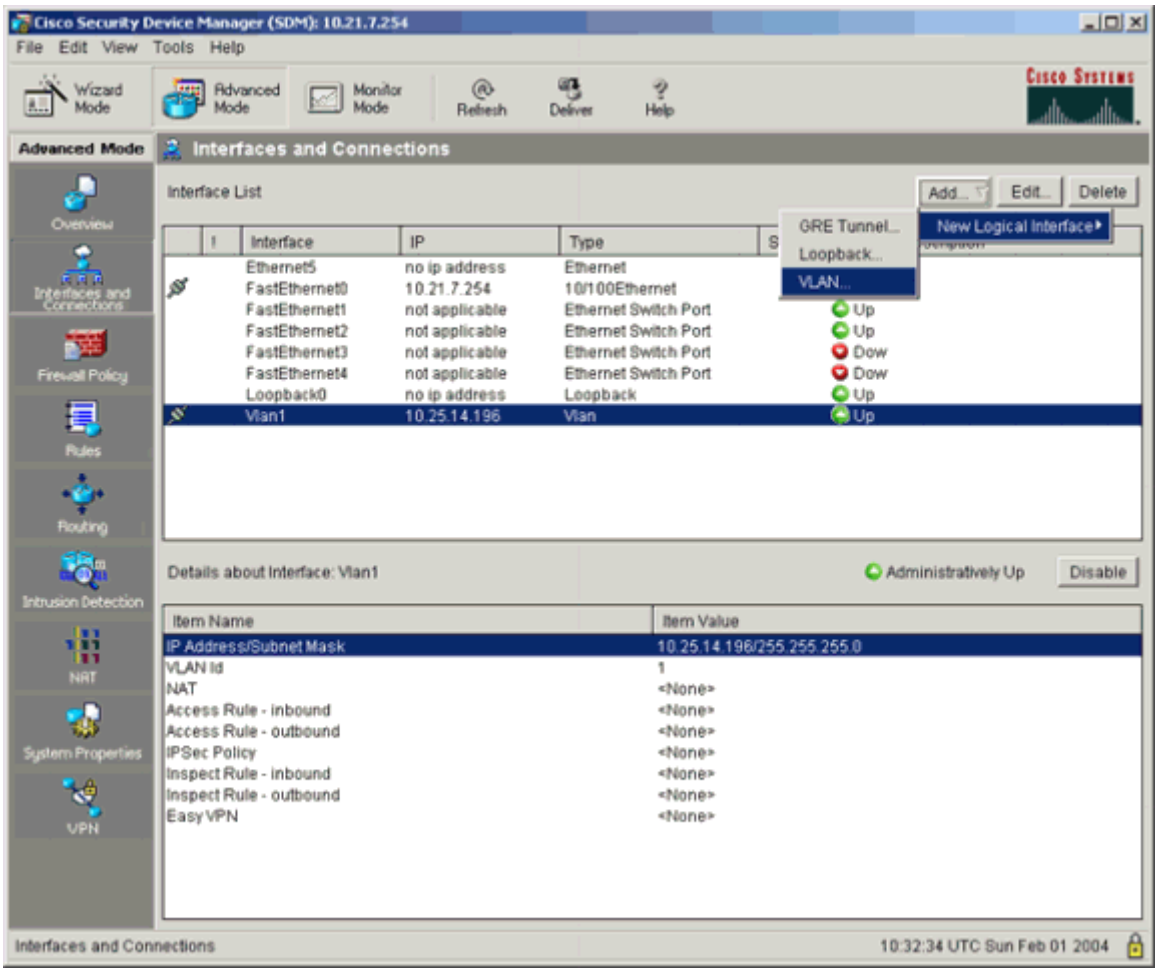
5. Verify that the IP address for VLAN 1 appears in the Interface List area.



Add Another VLAN

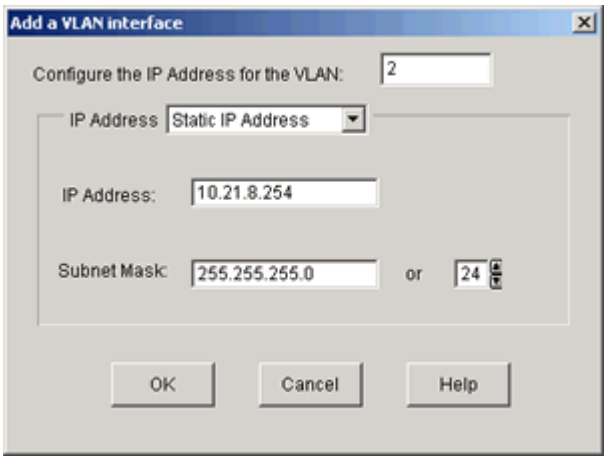
Follow these steps to add a second VLAN to the Catalyst 2950 switch.

1. In the Interface List area, click **Add**, and then choose **New Logical Interface > VLAN**.

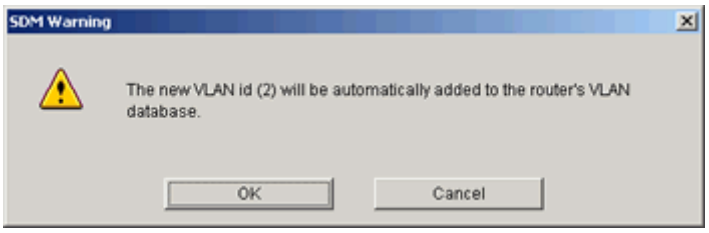


2. In the Add a VLAN Interface, type the IP address information for the new VLAN.
   - Type the new VLAN number.
   - From the the IP Address drop-down menu, choose **Static IP Address**.
   - In the IP Address field, type the IP address for the new VLAN.
   - In the Subnet Mask field, type the subnet mask.

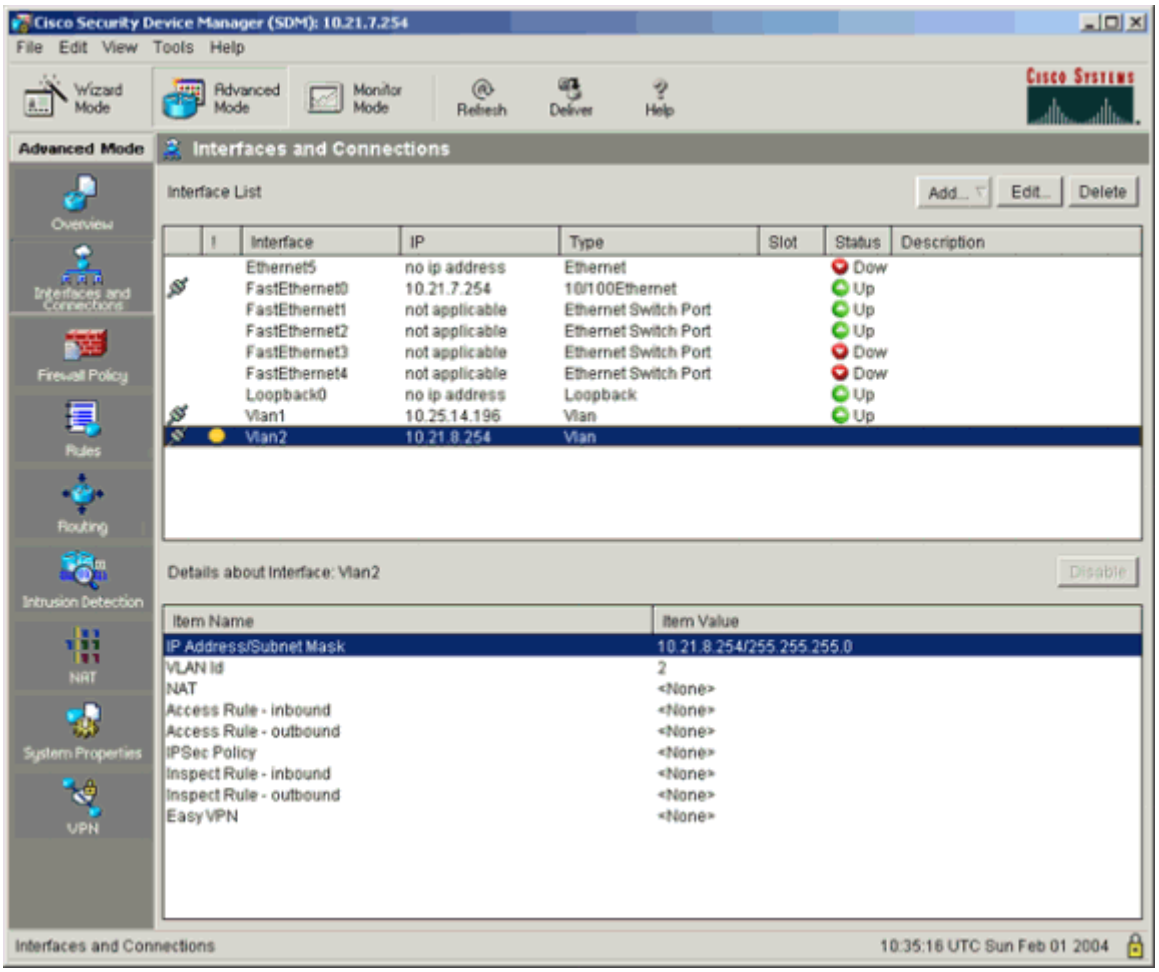
   Click **OK** when you are finished.



3. When the confirmation window appears, click **OK** to confirm the addition of the new VLAN.



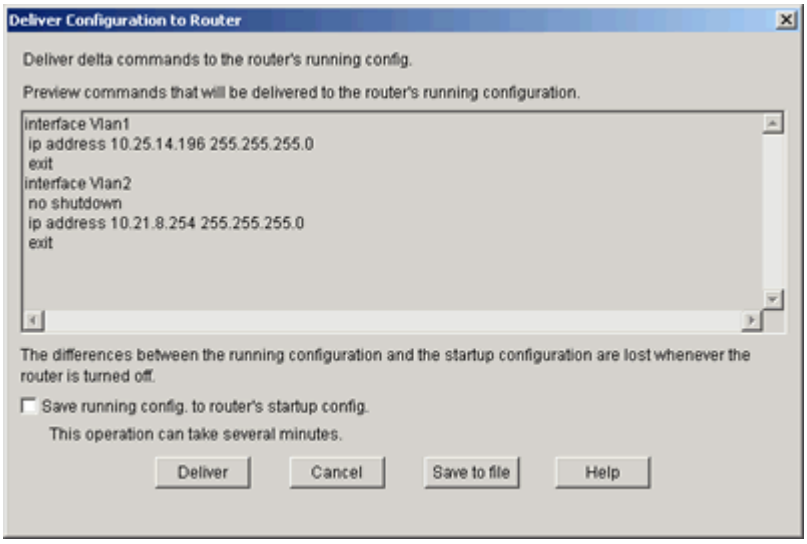
4. Verify that VLAN 2 appears in the Interface List area and that the correct IP address information is displayed.



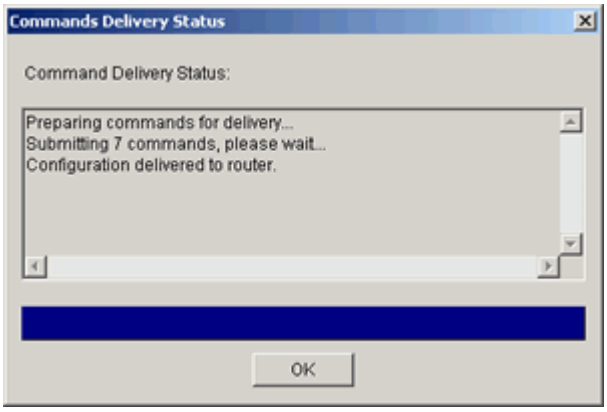
5. Click **Deliver** to send the configuration changes to the router.

   Note: The new VLAN will not be operational until you deliver the configuration to the router.

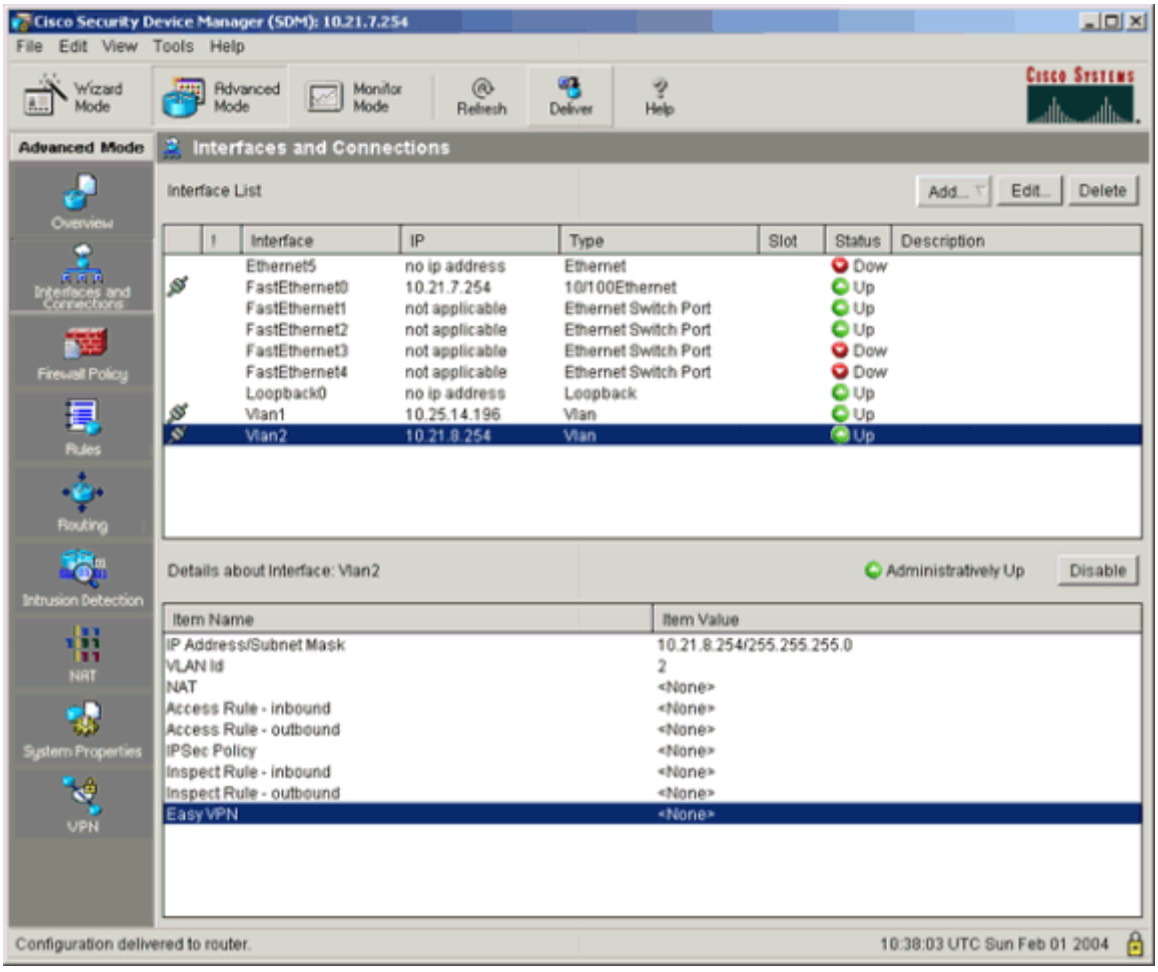
6. When the delivery confirmation window appears, click **Deliver**.



7. When the delivery status window appears, click **OK**.



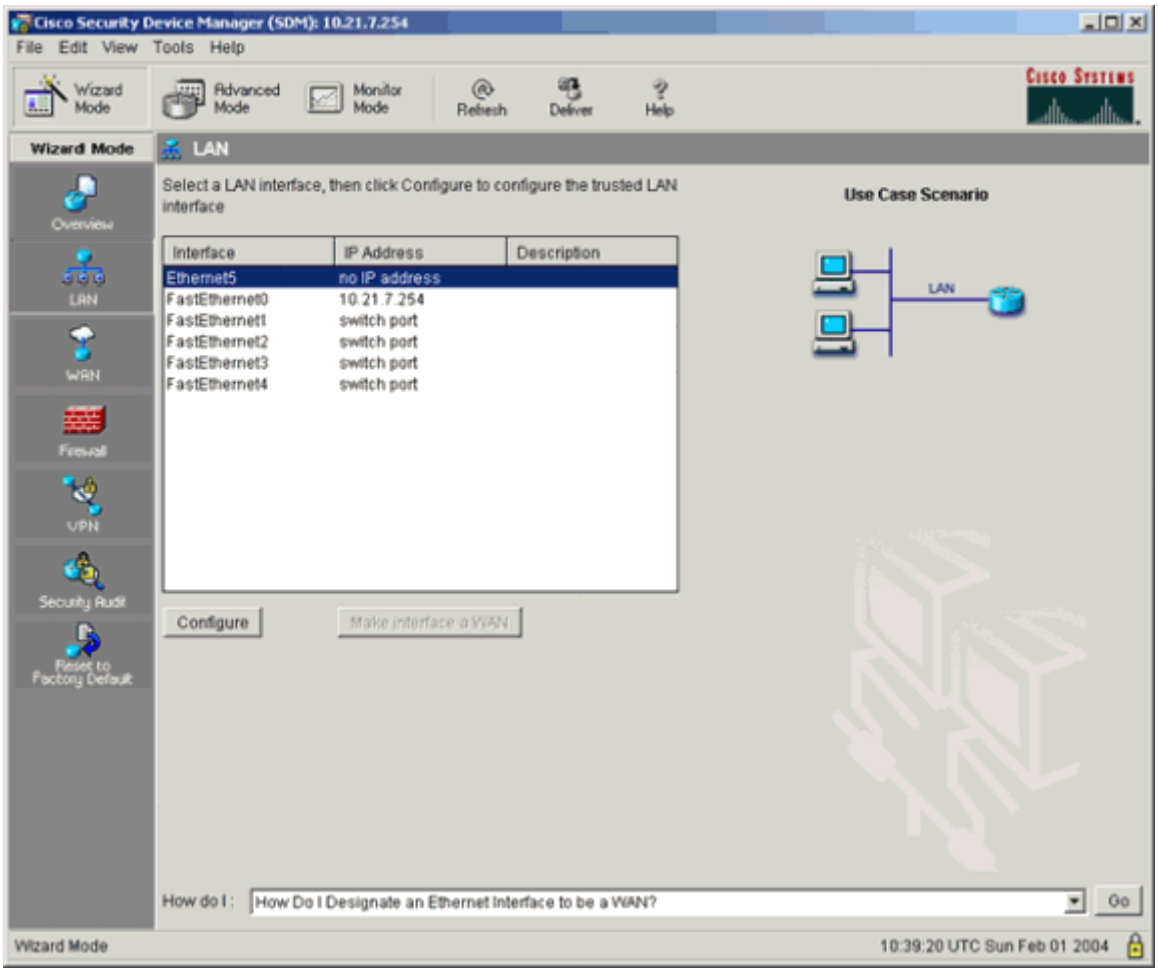
8. Verify that the status for VLAN 2 is shown as Up.



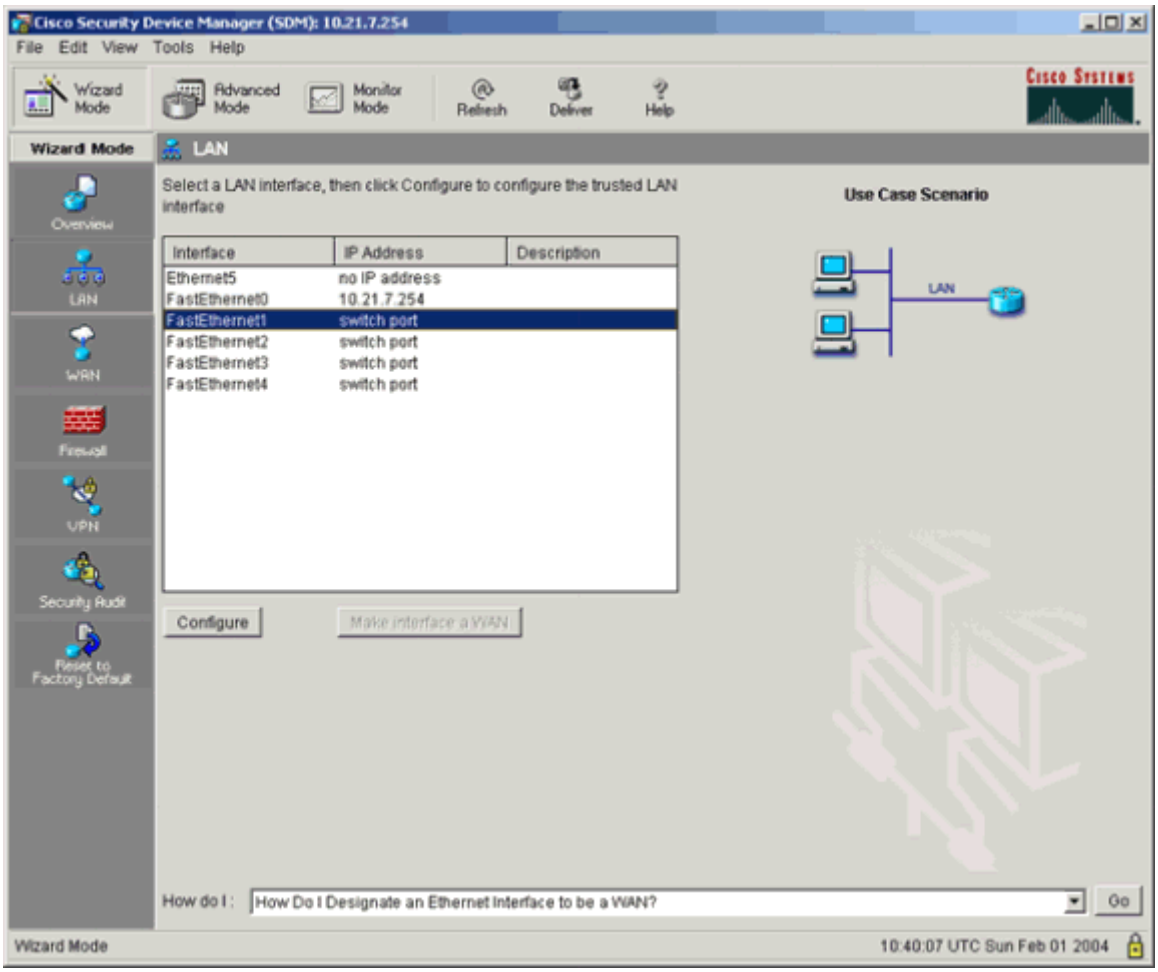
Configure the WIC-4ESW Switch Card for Trunking

Follow these steps to configure the WIC-4ESW switch card.

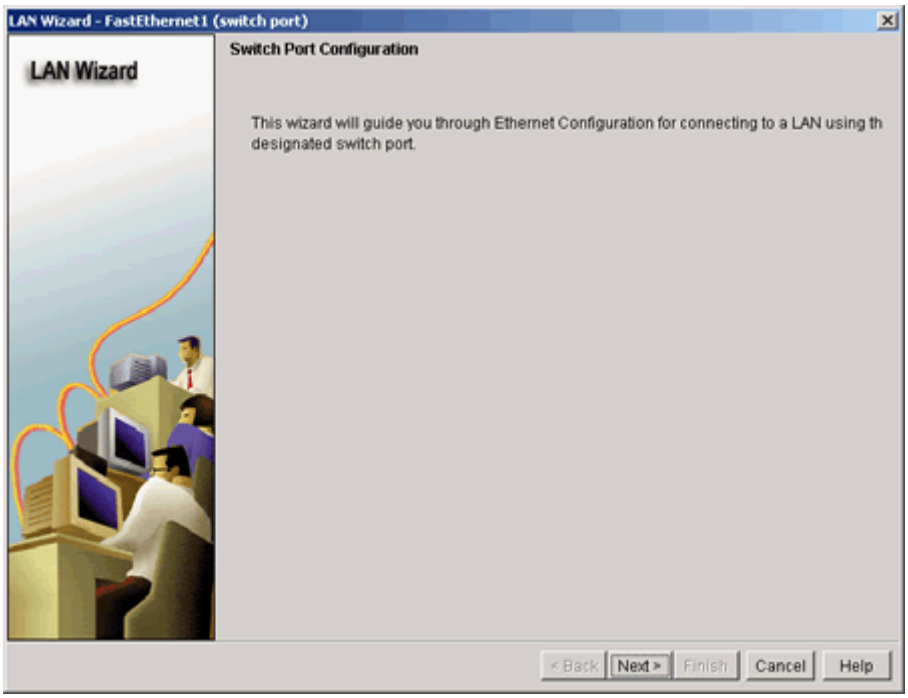
1. Click **Wizard Mode**.



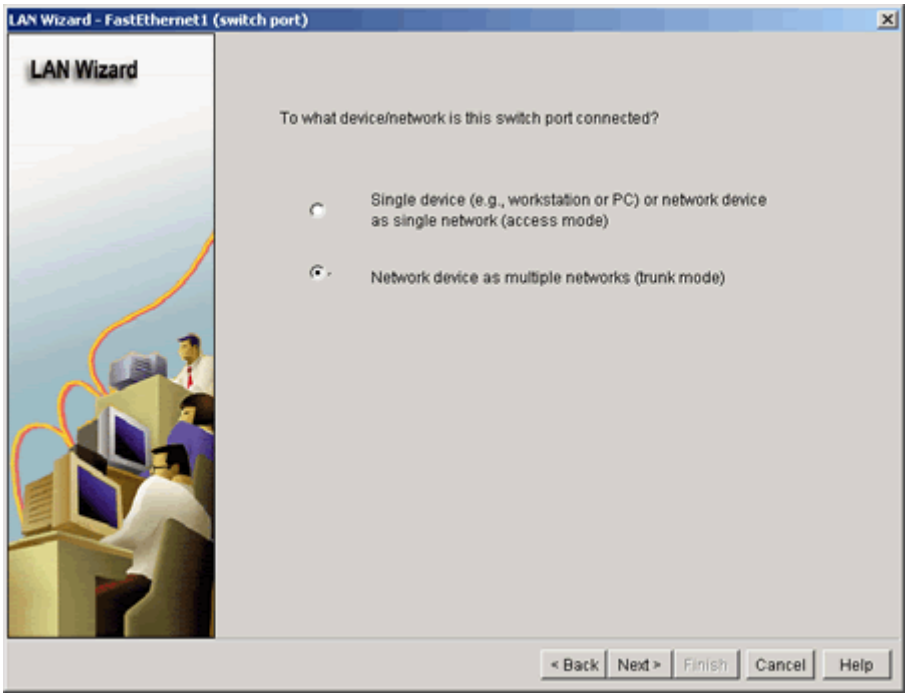
2. Click **LAN**, and then choose the first Fast Ethernet switch port.



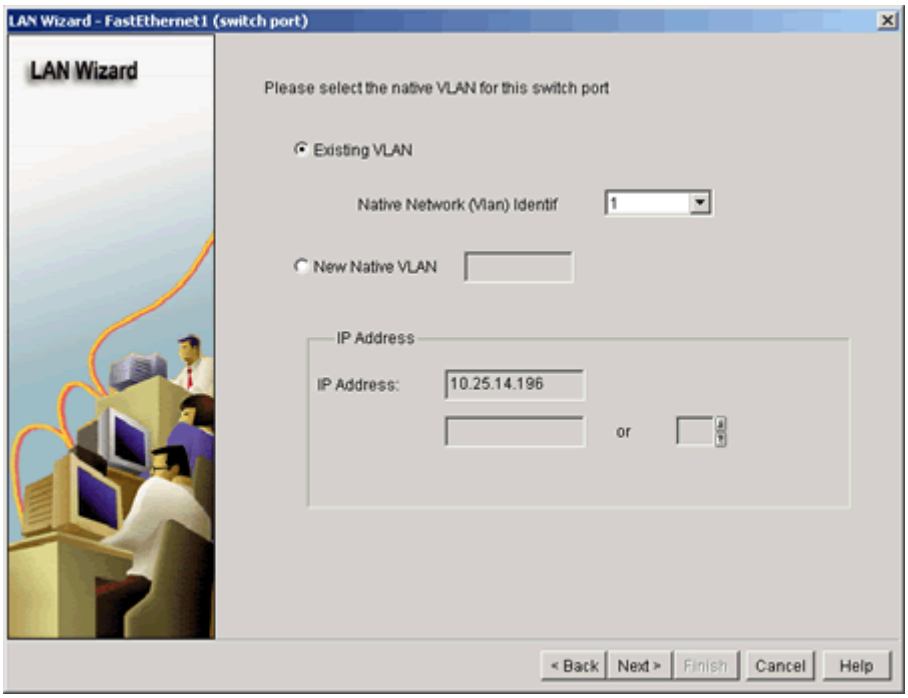
3. Click **Configure**.
4. When the LAN configuration wizard window appears, click **Next**.



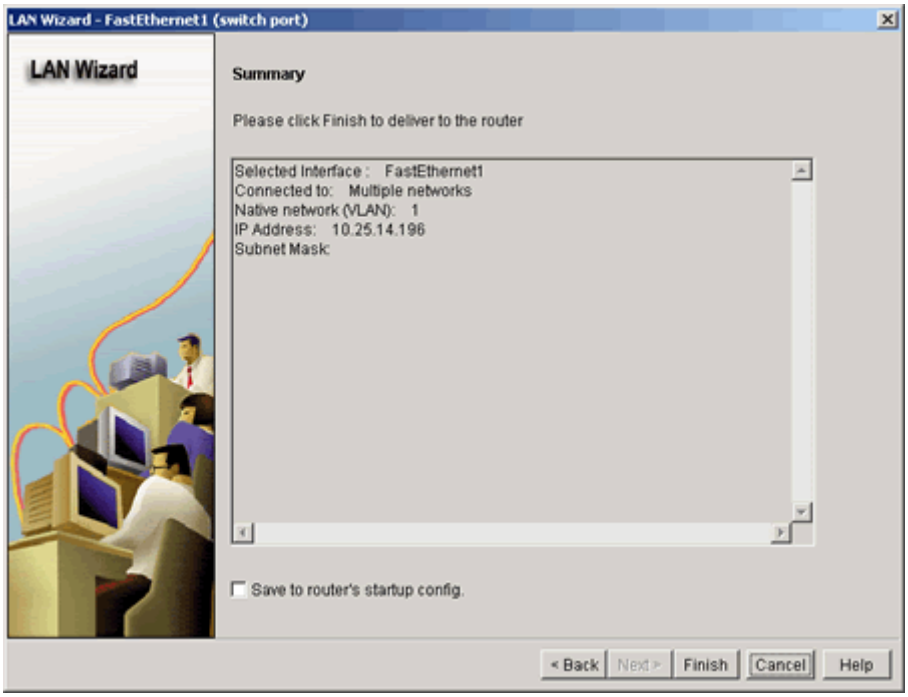
5. Click **Network device as multiple networks (trunk mode)**, and then click **Next**.



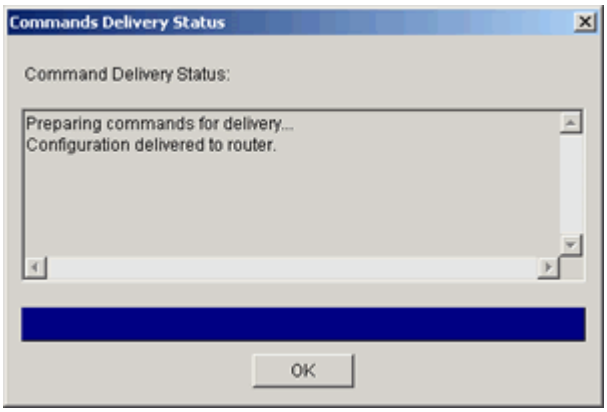
6. Click **Existing VLAN**, and then use the drop-down menu to choose VLAN 1 as the native network VLAN. Click **Next** when you are finished.



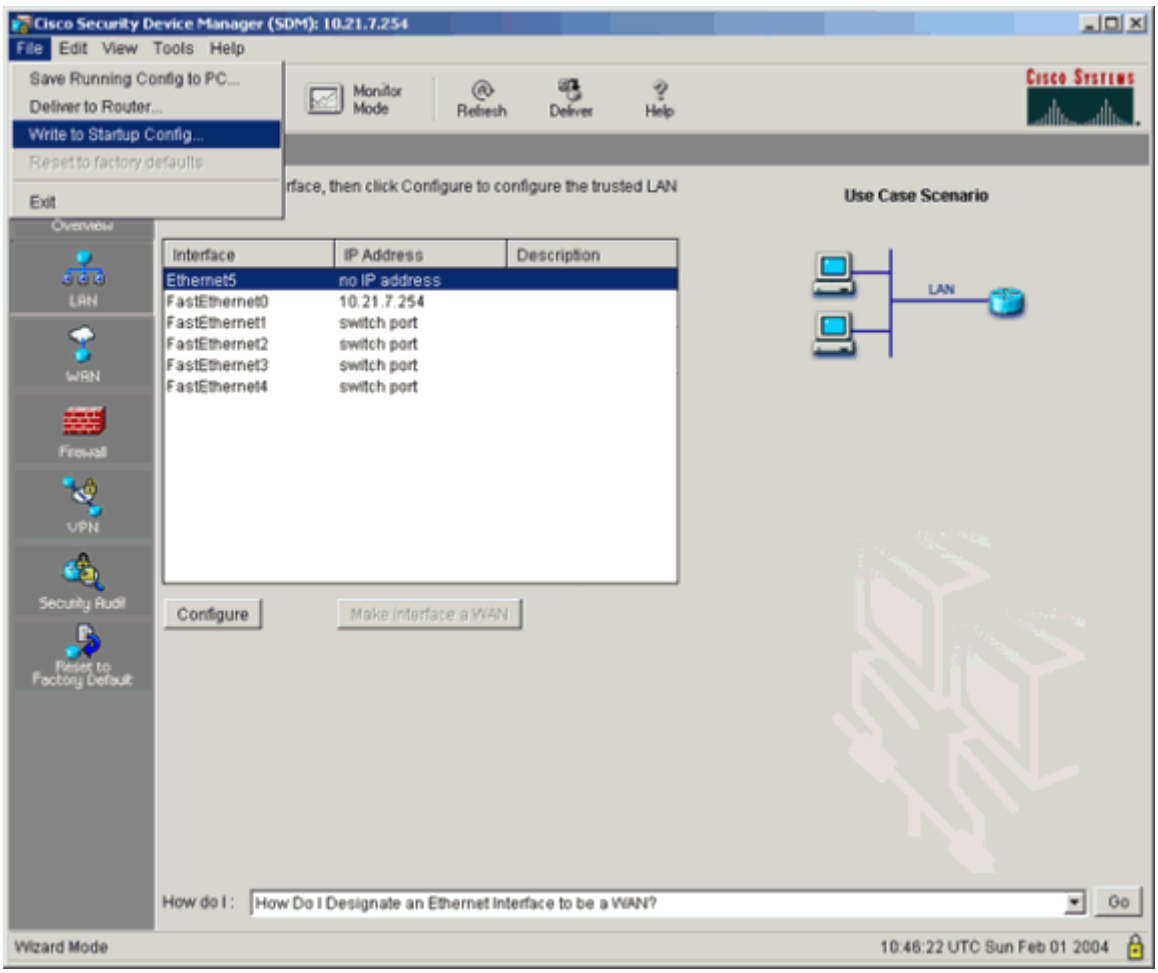
7. When the wizard summary window appears, verify the configuration information, and then click **Finish**.



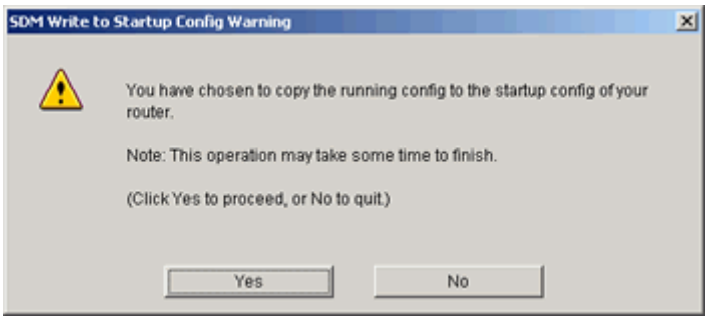
8. When the delivery status window appears, click **OK**.



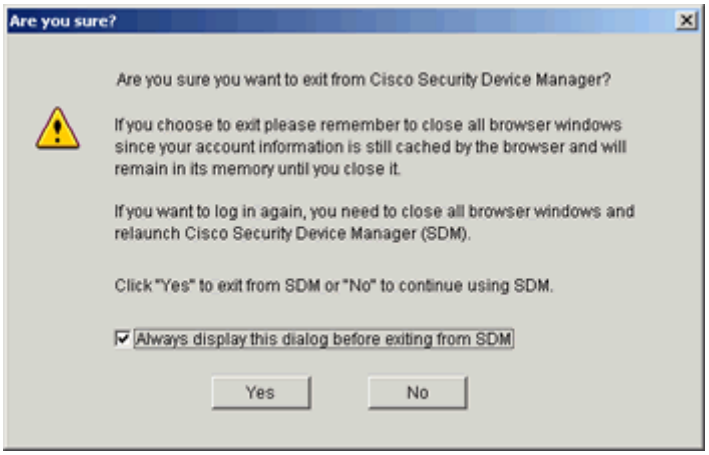
9. Choose **File > Write to Startup Config**.



10. When the configuration copy window appears, click **Yes** to copy the configuration to the router.



11. Click **Yes** to exit SDM.



This completes the configuration of the Cisco 1721 router and WIC-4ESW switch card for communication between two VLANs.

Related Information

- **Cisco START Client Installation and Uninstallation**
- **1721 Router Initial Setup and Configuration with Security Device Manager**
- **SDM Support Page**
- **SDM Problems During 1721 Router Initial Installation**

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