



Set Up Your Cisco Router

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Introduction

This document describes how to install your Cisco 800 Series or Small Business (SB) 100 Series router. This document applies to Cisco 831, 836, 837, 851, 857, 871, 876, 877, SB 101, SB106, and SB 107 model routers, and includes routers with wireless capability.

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Requirements

To install the 800 or SB 100 series router, you need to have these items:

- Completed worksheets as instructed in the [Site Survey](#), which includes the Internet Worksheet for the router
- The router and power supply assembly included with the router
- A PC with an Ethernet card
- [Straight-through Ethernet cables](#) (two cables for the 831, 851, 871 and SB 101)
- ADSL cable for the 836, 837, SB 106, or SB 107 router
- Orange ISDN cable for the 836 or SB 106 router (ordered separately)
- Antenna(s) for the wireless 851, 857, 871, 876, or 877 router
- Before you install the router, check the TCP/IP settings on your computer. Your PC should be configured to receive an IP address automatically with Dynamic Host Configuration Protocol (DHCP). For more information on how to configure your TCP/IP settings, refer to [Configure an IP Address on](#)

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Install the Router

To install the router, follow these steps:

Connect Antennas (Wireless Models Only)

Cisco wireless routers use 2.4-GHz antennas to connect to provide a wireless signal to the network. Cisco 850 series wireless routers use one antenna, and Cisco 870 series wireless routers use two antennas.

If you have a wireless router, follow these steps to connect antennas:

1. Attach the antenna to the connector on the back of the router and tighten the connector hand-tight.
2. After you connect the antenna to the back of the router, orient the antenna so that it is straight up.

Connect the Router Interfaces

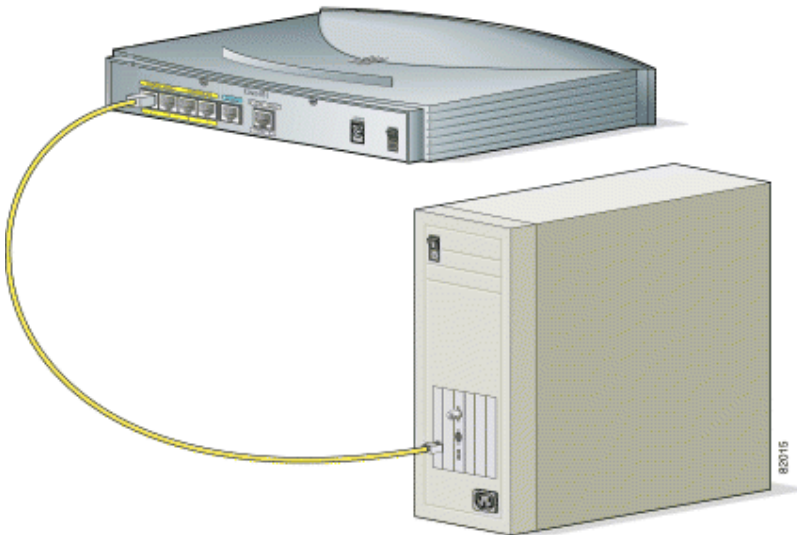
Select the necessary cables to connect the router to a PC, broadband modem, or ADSL. For more information about cables, refer to [Cable Descriptions](#).

1. Connect the router to the PC with the straight-through Ethernet cable as shown in the illustration. Connect one end of the Ethernet cable to port 4 on the built-in Ethernet switch.



Caution: Always connect the Ethernet cable to the yellow Ethernet port on the router. If you connect the cable to a WAN port, you may damage the router.

2. Connect the other end of the cable to the RJ-45 port on the Ethernet card installed in the PC.



3. Connect additional cables according to your router model:

- For the 831, 851, 871, and SB 101, connect the second Ethernet cable between the Internet port of the router and an available port on an installed DSL or cable modem. Turn on the broadband modem if it is not already on.
- For the 836, 876, and SB 106, connect the lavender ADSL cable between the ADSL port of the router and the telephone wall jack or ADSL splitter, and connect the orange ISDN cable between the ISDN port of the router and the Network Termination (NT1) box or ADSL splitter.

Note: The ADSL port is labeled ADSLoISDN on the 836, 876, and SB 106 routers.

- For the 837, 857, 877, and SB 107, connect the lavender ADSL cable between the ADSL

port of the router and a telephone wall jack. If the ADSL line is also used for voice communication, you can connect the router to an ADSL splitter to prevent disruption of data communication.

Note: The ADSL port is labeled ADSLoPOTS on the 857 and 877 routers.

Connect Power to the Router

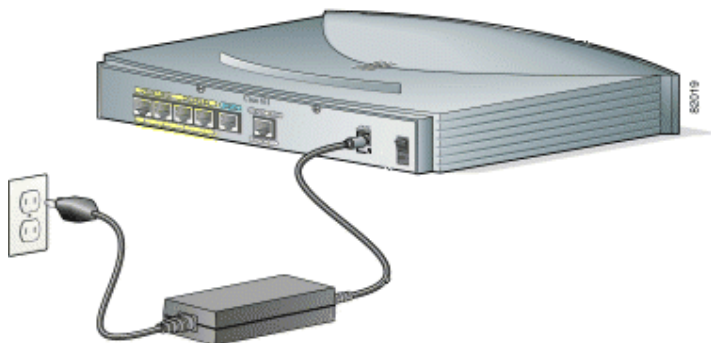
Note: Before you connect the router to its power source, read the [Regulatory Compliance and Safety Information for the 800 Series Routers](#) or [Regulatory Compliance and Safety Information for Cisco SB 100 Series Routers](#) document that came with your router.

Follow these steps to connect the router to the AC adapter:

1. Check the power switch of the router and make sure it is turned off. Connect one end of the power supply cable to the input jack of the router.

You can use the power latch included in your accessory kit to prevent the power adapter plug from disconnecting from the router. Attach the power latch to the cable near the power plug and push it toward the plug until it sits inside the latch. Connect the plug to the input jack and hook the latches to the holes on either side of the jack until the plug is secure.

2. Connect the other end of the power supply cable to the desktop power adapter.
3. Plug the power cord of the desktop power adapter into an electrical outlet.



4. Turn the power switch on. The green OK LED on the front panel of the router lights up when you connect the router to a power source. The router is now ready for use.

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Verify Your Installation

To verify your installation, check for normal LED activity, as described in this table. All lights are green when activity is normal. If you do not see normal LED activity, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

LED	Label	Meaning
OK	None	Lit when power is supplied to the router.
1, CD	Internet, ADSL	Lit when the router detects status and connects to the digital subscriber line access multiplexer (DSLAM) successfully.
RXD	Internet, ADSL	Blinks when a port on the Internet port receives network traffic.

TXD	Internet, ADSL	Blinks when a port on the Internet port sends network traffic.
ISDN 1, Line	ISDN	Lit when ISDN D channel connects successfully.
ISDN CH1, B1	ISDN	Lit when ISDN B1 channel connects successfully. Blinks when the B1 channel receives or sends data.
ISDN CH2, B2	ISDN	Lit when ISDN B2 channel connects successfully. Blinks when the B2 channel receives or sends data.
1, 2, 3 or 4	Ethernet, Ethernet LAN, Computers	Lit when the LAN port is physically connected to a server, PC, or workstation.
RXD	Ethernet, Ethernet LAN, Computers	Blinks when a port on the built-in Ethernet switch receives network traffic.
TXD	Ethernet, Ethernet LAN, Computers	Blinks when a port on the built-in Ethernet switch sends network traffic.
PPP	None	Lit when one or more PPPoE or PPPoA client sessions are running.
VPN	None	Lit when one or more VPN sessions are active.
OK	WLAN	Lit solid green when at least one wireless client is associated. Blinks if no client is associated. Solid green if at least one client is associated.
DATA	WLAN	Blinks if there is traffic on the wireless LAN. Off if there is no traffic.

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Next Step

You have completed hardware installation and are ready to configure your router with Security Device Manager (SDM). SDM is a configuration tool that allows you to configure LAN and WAN interfaces, routing, Network Address Translation (NAT), firewalls, VPNs, and other features on your router.

For further instructions, refer to [Configure Your Router with Security Device Manager](#).

Note: If you have an ASA Security Appliance in your network, refer to [Configure Your Router with Security Device Manager for ASA](#).

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[Step 2: Hardware Setup Procedure for Cisco 1700 Series Routers](#)

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Introduction

This document describes how to install your Cisco 1700 series router. The Cisco 1700 series routers have either fixed or modular configurations that provide these features:

- One to four WAN Interface Cards (WIC) or a combination of WIC and Voice Interface Cards (VIC)
- Fast Ethernet LAN port

The Cisco WICs support Ethernet, ADSL, ISDN, T1/E1, and serial connections for WAN connectivity.

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Requirements

To install the 1700 series router, you need to have these items:

- Completed worksheets as instructed in the [Site Survey](#), which includes the Internet Worksheet for the router
- The router and power supply assembly (you must use the power supply that shipped with the router)
- Access to local AC power
- A PC with an Ethernet card
- A [crossover Ethernet cable](#)

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Install the Router

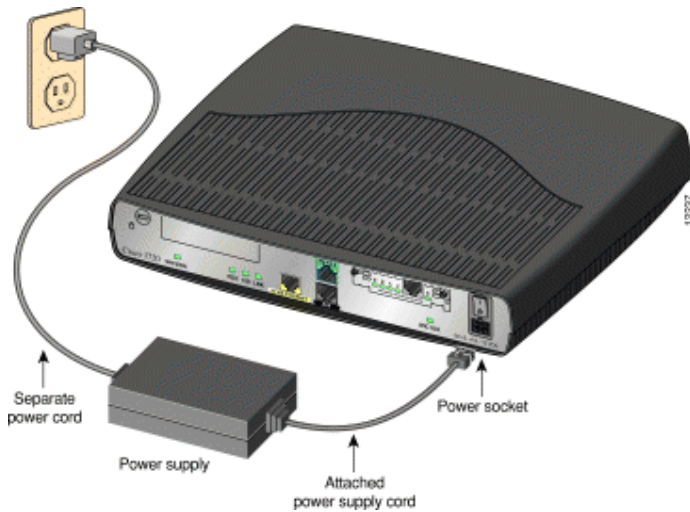
Before you install your 1700 series router, read the [Regulatory Compliance and Safety Information for Cisco 1700 Routers](#) document that came with your router. As advised in this document, the 1700 series router should be connected to a reliable earth ground when in use.

You can install the 1700 series router on a desktop or flat surface. Position the router where you have access to both front and back panels.

Connect Power to the Router

Follow these steps to connect power to the router.

1. Connect the attached power supply cord to the power socket (labeled +5, +12, -12 VDC) on the back panel of the router.



2. Connect the separate power cord to the power socket on the power supply.
3. Connect the other end of the power cord to a standard AC power outlet.
4. Press the power switch to the on (|) position.
5. To confirm that the router has power, verify that the PWR LED on the front panel is on. The OK light blinks until the router has completed its self-test, and then the light stays on.

Connect the Router to a PC

To configure the router, you must connect the router to a PC with a crossover Ethernet cable. Follow these steps:

1. Connect one end of the Ethernet cable to the 10/100BaseT Fast Ethernet port on the router.



Caution: Always connect the Ethernet cable to the yellow Ethernet port on the router. If you connect the cable to the wrong port, you may damage your router.

2. Connect the other end of the cable to the RJ-45 port on the Ethernet card installed in the PC.

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Verify Your Installation

To verify your installation, check for normal LED activity, as described in this table. All lights are green when activity is normal. If you do not see normal LED activity, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

LED	Panel	Meaning
PWR	Front	On when power is being supplied to the router.
OK	Front	On when the router software is loaded and functional. This LED blinks when the router runs a power-on self test (POST) or when it loads operating system software (which may take 3 to 5 minutes). If the LED blinks continuously, the router may be experiencing a problem.
LNK	Back	On when the router is correctly connected to the Ethernet network through the 10/100 ETHERNET port.
ETH ACT	Front	Blinks when there is network traffic on the local Ethernet LAN.
WIC0 ACT and WIC1 ACT	Front	On solid or blinking when there is data traffic on the corresponding WIC port.
WIC0 OK and WIC1 OK	Back	On when a WIC is correctly installed in the corresponding WIC slot.

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Next Step

You have completed hardware installation and are ready to configure your router with Security Device Manager (SDM). SDM is a configuration tool that allows you to configure LAN and WAN interfaces, routing, Network Address Translation (NAT), firewalls, VPNs, and other features on your router.

For further instructions, refer to [Configure Your Router with Security Device Manager](#).

Note: If you have an ASA Security Appliance in your network, refer to [Configure Your Router with Security Device Manager for ASA](#).

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Introduction

This document describes how to install your Cisco 1800 series router. The 1800 series includes modular and fixed-configuration routers that offer high-speed data, security, and voice features.

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Requirements

To install the 1800 series router, you need to have these items:

- Completed worksheets as instructed in the [Site Survey](#), which includes the Internet Worksheet for the router
- The router and power cord
- Access to local AC power
- A PC with an Ethernet card
- A [crossover Ethernet cable](#)

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Install the Router

Follow these steps to install your 1800 series router:

Review Safety Information

Before you install your router, read the regulatory compliance and safety information for your router:

- [Regulatory Compliance and Safety Information for Cisco 1800 Integrated Services Routers](#)
- [Regulatory Compliance and Safety Information for Cisco 1840 Routers](#)

As advised in this document, the router should be connected to a reliable earth ground when in use.

Set Up the Chassis

If you want to install the router on a desktop or shelf, follow these steps:

1. Place the router upside-down on a smooth, flat surface.

2. Peel the rubber feet from the black adhesive strip and attach them to the four corners of the bottom of the chassis.
3. Place the router top-side up on a flat, smooth, secure surface. Position the router where you have access to both front and back panels.



Caution: Do not place anything on top of the router that weighs more than 10 pounds (4.5 kg). Excessive weight on top could damage the chassis.

Connect Wireless Antennas

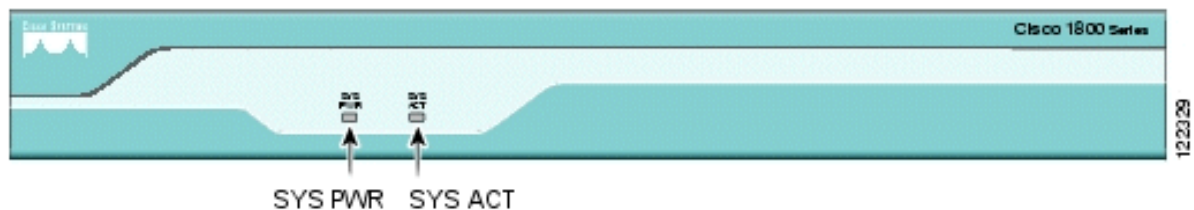
If your router has the wireless LAN option, follow these steps to connect the antennas:

1. Screw the antenna connectors in a clockwise direction onto the connectors on the back panel of the router.
2. After you have attached the antennas, you must orient them. For best radio performance, orient the antennas so that they are perpendicular to the ground.

Connect Power to the Router

Follow these steps to connect power to the router:

1. Connect the power cord to the power socket on the back panel of the router.
2. Connect the other end of the power cord to a standard AC power outlet.
3. Press the power switch to the on (|) position.
4. To confirm that the router has power, verify that the Power LED on the front panel is on. The Activity light blinks slowly until the router has finished the boot process.



Connect the Router to a PC

To configure the router, you must connect the router to a PC with a crossover Ethernet cable. Follow these steps:

1. Connect one end of the Ethernet cable to the 10/100 BaseT Fast Ethernet port on the router.



Caution: Always connect the Ethernet cable to the yellow Ethernet port on the router. If you connect the cable to the wrong port, you may damage your router.

2. Connect the other end of the Ethernet cable to the RJ-45 port on the Ethernet card installed in the PC.

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Verify Your Installation

To verify your installation, check for normal LED activity, as described in this table. All lights are green when activity is normal. If you do not see normal LED activity, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

LED	Panel	Meaning
SYS PWR	Front	<ul style="list-style-type: none"> • On when the system is operates normally. • Blinks slowly when the system is booting or in the ROM monitor.
SYS ACT	Front	Blinks to indicate network or system activity.
CF	Back	On when flash memory is busy. Do not remove the CompactFlash memory card when this light is on.
FDX	Back	On indicates full-duplex operation. Off indicates half-duplex operation.
100	Back	On indicates a 100-Mbps link. Off indicates a 10-Mbps link.

LNK (FE 0/0)	Back	On when the router is correctly connected to a local Ethernet network through Ethernet port 0.
LNK (FE 0/1)	Back	On when the router is correctly connected to a local Ethernet network through Ethernet port 1.

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Next Step

You have completed hardware installation and are ready to configure your router using Security Device Manager (SDM). SDM is a configuration tool that allows you to configure LAN and WAN interfaces, routing, Network Address Translation (NAT), firewalls, VPNs, and other features on your router.

For further instructions, refer to [Configure Your Router with Security Device Manager](#).

Note: If you have an ASA Security Appliance in your network, refer to [Configure Your Router with Security Device Manager for ASA](#).

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Introduction

This document describes how to install your Cisco 2600 series router. The Cisco 2600 series features modular access routers that support Ethernet, Fast Ethernet, Token Ring, and mixed LAN environments. The 2600 routers are either single rack-unit (1RU) or two rack-units (2RU) high.

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Requirements

To install the 2600 series router, you need to have these items:

- Completed worksheets as instructed in the [Site Survey](#), which includes the Internet Worksheet for the router
- The router and power cord
- Access to local AC power
- A PC with an Ethernet card
- A [crossover Ethernet cable](#)

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Install the Router

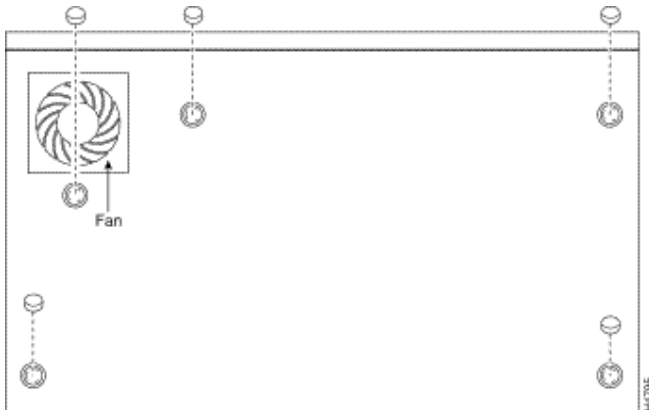
The Cisco 2600 series router is rack-mountable, but the router can also be set up on a desktop or flat surface. These setup instructions describe the desktop installation.

Before you install your 2600 series router, read the [Cisco 2600 Series Regulatory Compliance and Safety Information](#) document that came with your router. As advised in this document, the 2600 series router should be connected to a reliable earth ground when in use.

Set Up the Chassis

These instructions describe how to set up the chassis on a desktop.

1. Place the router upside-down on a smooth, flat surface.
2. Peel the rubber feet from the black adhesive strip and attach them to the five round, recessed areas on the bottom of the chassis.



3. Place the router top-side up on a flat, smooth, secure surface. Position the router where you have access to both front and back panels.



Caution: Do not place anything on top of the router that weighs more than 10 pounds (4.5 kg). Excessive weight on top could damage the chassis.

Connect Power to the Router

Follow these steps to connect power to the router:

1. Connect the power cord to the power socket on the back panel of the router.
2. Connect the other end of the power cord to a standard AC power outlet.
3. Press the power switch to the on (|) position.
4. To confirm that the router has power, verify that the Power LED on the front panel is on. The Activity light blinks slowly until the router has finished the boot process.

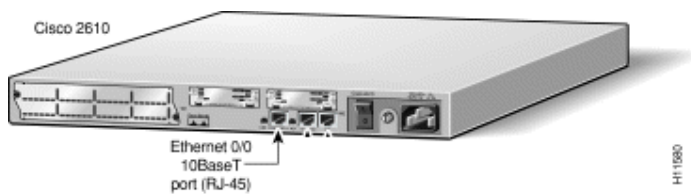
Connect the Router to a PC

To configure the router, you must connect the router to a PC with a crossover Ethernet cable. Follow these steps:

1. Connect one end of the Ethernet cable to the 10/100 BaseT Fast Ethernet port on the router.



Caution: Always connect the Ethernet cable to the yellow Ethernet port on the router. If you connect the cable to the wrong port, you may damage your router.



2. Connect the other end of the Ethernet cable to the RJ-45 port on the Ethernet card installed in the PC.

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Verify Your Installation

To verify your installation, check for normal LED activity, as described in this table. All lights are green when activity is normal. If you do not see normal LED activity, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Router Type	LED	Meaning
1-RU Chassis Height	POWER	On when power is supplied to the router.
	RPS	<ul style="list-style-type: none"> On when the redundant power supply (RPS) is installed and operating normally. Off when RPS is not installed. Blinks when RPS has failed.
	ACTIVITY	<ul style="list-style-type: none"> Blinks slowly when system is booting. Blinks to indicate network or system activity.
2-RU Chassis Height	PWR	On when power is supplied to the router.
	SYS/RPS	<ul style="list-style-type: none"> On when the redundant power supply (RPS) is installed and operating normally. Blinks rapidly when system is booting. Blinks slowly when RPS has failed.
	ACT	Blinks to indicate network or system activity.

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Next Step

You have completed hardware installation and are ready to configure your router using Security Device Manager (SDM). SDM is a configuration tool that allows you to configure LAN and WAN interfaces, routing, Network Address Translation (NAT), firewalls, VPNs, and other features on your router.

For further instructions, refer to [Configure Your Router with Security Device Manager](#).

Note: If you have an ASA Security Appliance in your network, refer to [Configure Your Router with Security Device Manager for ASA](#).

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Introduction

This document describes how to install your Cisco 2800 series router. The Cisco 2800 series features integrated service routers (ISR) that offer high-speed data, security, and voice features.

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Requirements

To install the 2800 series router, you need to have these items:

- Completed worksheets as instructed in the [Site Survey](#), which includes the Internet Worksheet for the router
- The router and power cord
- Access to local AC power
- A PC with an Ethernet card
- A [crossover Ethernet cable](#)

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Install the Router

Follow these steps to install your 2800 series router:

Review Safety Information

Before you install your router, read the [Cisco 2800 Series Regulatory Compliance and Safety Information](#).

As advised in this document, the router should be connected to a reliable earth ground when in use.

Set Up the Chassis

If you want to install the router on a desktop or shelf, follow these steps:

1. Place the router upside-down on a smooth, flat surface.
2. Peel the rubber feet from the black adhesive strip and attach them to the four corners of the bottom of the chassis.
3. Place the router top-side up on a flat, smooth, secure surface. Position the router where you have access to both front and back panels.



Caution: Do not place anything on top of the router that weighs more than 10 pounds (4.5 kg). Excessive weight on top could damage the chassis.

Connect Power to the Router

Follow these steps to connect power to the router:

1. Connect the power cord to the power socket on the front panel of the router.



Note: This illustration shows the 2811 model. The 2801 model has the power socket on the back panel.

2. Connect the other end of the power cord to a standard AC power outlet.
3. Press the power switch to the on (|) position.
4. To confirm that the router has power, verify that the SYS PWR LED on the front panel is on. The SYS PWR LED blinks slowly until the router has finished the boot process.

Connect the Router to a PC

To configure the router, you must connect the router to a PC with a crossover Ethernet cable. Follow these steps:

1. Connect one end of the Ethernet cable to the 10/100 BaseT Fast Ethernet port on the router.



Caution: Always connect the Ethernet cable to the yellow Ethernet port on the router. If you connect the cable to the wrong port, you may damage your router.

2. Connect the other end of the Ethernet cable to the RJ-45 port on the Ethernet card installed in the PC.

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Verify Your Installation

To verify your installation, check for normal LED activity, as described in this table. All lights are green when activity is normal. If you do not see normal LED activity, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

LED	Meaning
SYS PWR	<ul style="list-style-type: none"> • Solid green when the system operates normally. • Blinks green when system is booting or in the ROM monitor. • Amber when there is a system error. • Off when there is no power or system board is faulty.
AUX PWR	<ul style="list-style-type: none"> • On when Redundant Power System (RPS) is installed and operating normally. • Off when RPS is not installed.
SYS ACT	Blinks to indicate network or system activity.
CF	On when flash memory is busy. Do not remove the CompactFlash memory card when this light is on.

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Next Step

You have completed hardware installation and are ready to configure your router using Security Device Manager (SDM). SDM is a configuration tool that allows you to configure LAN and WAN interfaces, routing, Network Address Translation (NAT), firewalls, VPNs, and other features on your router.

For further instructions, refer to [Configure Your Router with Security Device Manager](#).

Note: If you have an ASA Security Appliance in your network, refer to [Configure Your Router with Security Device Manager for ASA](#).

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This document describes how to install your Cisco 3800 series router. The Cisco 3800 series features integrated service routers (ISR) that offer high-speed data, security, and voice features.

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Requirements

To install the 3800 series router, you need to have these items:

- Completed worksheets as instructed in the [Site Survey](#), which includes the Internet Worksheet for the router
- The router and power cord
- Access to local AC power
- A PC with an Ethernet card
- A [crossover Ethernet cable](#)

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Install the Router

Follow these steps to install your 3800 series router:

Review Safety Information

Before you install your router, read the [Cisco 3800 Series Regulatory Compliance and Safety Information](#).

As advised in this document, the router should be connected to a reliable earth ground when in use.

Set Up the Chassis

If you want to install the router on a desktop or shelf, follow these steps:

1. Place the router upside-down on a smooth, flat surface.
2. Peel the rubber feet from the black adhesive strip and attach them to the four corners of the bottom of the chassis.
3. Place the router top-side up on a flat, smooth, secure surface. Position the router where you have access to both front and back panels.

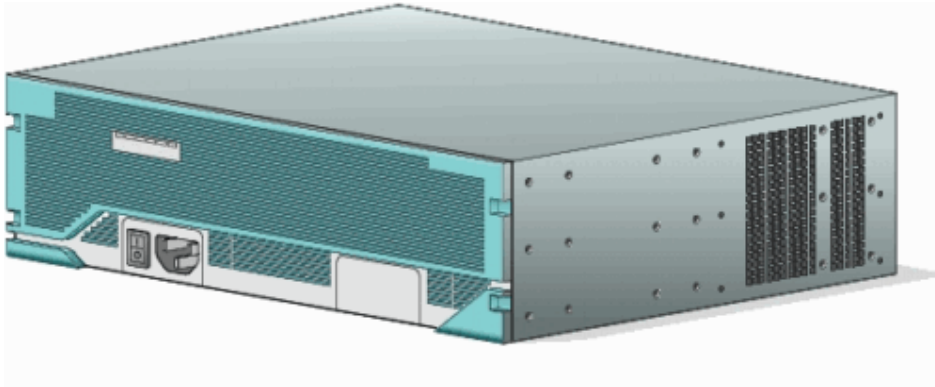


Caution: Do not place anything on top of the router that weighs more than 10 pounds (4.5 kg). Excessive weight on top could damage the chassis.

Connect Power to the Router

Follow these steps to connect power to the router:

1. Connect the power cord to the power socket on the front panel of the router.



Note: This illustration shows the 3845 model.

2. Connect the other end of the power cord to a standard AC power outlet.
3. Press the power switch to the on (|) position.
4. To confirm that the router has power, verify that the SYS PWR LED on the front panel is on. The SYS PWR LED blinks slowly until the router has finished the boot process.

Note: For the Cisco 3845 router, the SYS PWR1 or SYS PWR2 LED is lit after the router completes startup.

Connect the Router to a PC

To configure the router, you must connect the router to a PC with a crossover Ethernet cable. Follow these steps:

1. Connect one end of the Ethernet cable to the GigabitEthernet port on the router.
2. Connect the other end of the Ethernet cable to the RJ-45 port on the Ethernet card installed in the PC.

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Verify Your Installation

To verify your installation, check for normal LED activity, as described in this table. All lights are green when activity is normal. If you do not see normal LED activity, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

LED	Meaning
SYS	<ul style="list-style-type: none"> • Off indicates router not receiving power • Steady green indicates normal operation (power-up complete) • Blinking green indicates booting or in ROM monitor mode (immediately after power-up) • Amber indicates that the router is powered but malfunctioning
SYS PWR	<ul style="list-style-type: none"> • Off indicates router not receiving power • Steady green indicates normal operation (power-up complete)
SYS PWR1	<ul style="list-style-type: none"> • Off indicates router not receiving power, power supply 1 not present, or power-up not completed • Steady green indicates power supply is present and enabled (power-up completed) • Amber indicates power supply is present and off or malfunctioning
SYS PWR2	<ul style="list-style-type: none"> • Off indicates router not receiving power, power supply 2 not present, or power-up not completed • Steady green indicates power supply is present and enabled (power-up completed) • Amber indicates power supply is present and off or malfunctioning
AUX PWR	<ul style="list-style-type: none"> • Off indicates IP phone power is off or not present, or power-up not completed • Steady green indicates auxilliary power is present and enabled (power-up completed) • Amber indicates router is powered but malfunctioning
AUX PWR1	<ul style="list-style-type: none"> • Off indicates IP phone power supply 1 is off or not present, or power-up not completed • Steady green indicates auxilliary power is present and enabled (power-up completed) • Amber indicates router is powered but malfunctioning

AUX PWR2	<ul style="list-style-type: none"> • Off indicates IP phone power supply 2 is off or not present, or power-up not completed • Steady green indicates auxilliary power is present and enabled (power-up completed) • Amber indicates router is powered but malfunctioning
ACT	<ul style="list-style-type: none"> • Off indicates no packet activity • Steady or blinking green indicates packets transmitted or received on any WAN or LAN port, or router is monitoring internal activities (power-up completed)
CF	<ul style="list-style-type: none"> • Off indicates CompactFlash memory card not being accessed • Steady green indicates CompactFlash card being accessed; do not eject • Blinking green indicates CompactFlash card being accessed; do not eject

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Next Step

You have completed hardware installation and are ready to configure your router using Security Device Manager (SDM). SDM is a configuration tool that allows you to configure LAN and WAN interfaces, routing, Network Address Translation (NAT), firewalls, VPNs, and other features on your router.

For further instructions, refer to [Configure Your Router with Security Device Manager](#).

Note: If you have an ASA Security Appliance in your network, refer to [Configure Your Router with Security Device Manager for ASA](#).

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- [Site Survey](#)
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[Step 3: Download and Install Security Device Manager](#)



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Security Device Manager (SDM) allows you to manage your Cisco router with a graphical web interface. This document explains how to install SDM on your router if SDM is not already installed on your router.

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Requirements

To perform the steps described in this document, you need to have these items:

- A PC with an Internet connection
- A [crossover Ethernet cable](#)

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Prepare Your Router to Support SDM

Before you download SDM, you need to make changes to your router to support SDM. To prepare your router to support SDM, follow these steps:

Connect to the Router

To connect to your router, follow these steps:

1. Create a HyperTerminal connection to your router. For more information about how to create a HyperTerminal connection refer to the [Create a HyperTerminal Connection](#) document.
2. Log into the router. The default login is username cisco, password cisco. Otherwise, use the administrator login and password you entered in the Internet Worksheet (B10 and B11).

```
Username: cisco
Password:
```

Note: If you do not know the password for your router, refer to [Reset the Password on the Router](#).

3. Type **enable** to access the privileged mode. If you have set an enable password, use the password that you entered in the Internet Worksheet (B12).

```
Router> enable
Router#
```

Verify the Software Image on the Router

To confirm the version of Cisco IOS® software on your router, follow these steps:

Type **show version** to view your software version.

The command-line output looks similar to this example:

```
Router# show version
Cisco IOS Software, C831 Software (C831-K9O3Y6-M), Version 12.3(8)YG, RELEASE SOFTWARE (fc1)
Synched to technology version 12.3(10.3)T2
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2004 by Cisco Systems, Inc.
Compiled Thu 16-Dec-04 23:46 by ealyon
```

If your Cisco IOS software version is earlier than 12.3, you must upgrade your software. For detailed instructions, refer to [Upgrade the Software Image on a Cisco Router](#).

Verify Router Flash Memory

To verify the amount of space available in flash memory, type **show flash** to display details about flash memory usage.

```
Router#show flash

System flash directory:
File Length Name/status
  1  5638936 c831-k9o3y6-mz.123-2.XC2.bin
[5639000 bytes used, 19264680 available, 24903680 total]
24576K bytes of processor board System flash (Read/Write)
```

If you have at least 8 MB (8000000 bytes) available in flash memory, you do not need to remove files from flash memory in order to install SDM.

Note: If you have a wireless router, you need 9.7 MB available in flash memory to install Security Device Manager (SDM) with the wireless configuration module.

If you have less than 8 MB available in flash memory, you need to delete files before you install SDM. See [Reclaim Flash Memory](#) for instructions. If you have less than 8 MB of total flash memory, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Erase Webflash Memory

If you have an 830 series router, you need to remove Cisco Router Web Setup Tool (CRWS) files from from webflash memory in order to access SDM. To remove the files from webflash memory, follow these steps:

1. Type **erase webflash** and press **Enter**, and press **Enter** again to confirm.

```
Router#erase webflash
Erasing the webflash filesystem will remove all files! Continue? [confirm]
```

2. The router displays this message during the erase.

```
Erasing device... eeeeeeeeeeeeeeeee ..erased
Erase of webflash: complete
Router#
```

Configure Your Router to Support SDM

To configure your router to support SDM, follow these steps:

1. Type **configure terminal** and press **Enter** to enter configuration mode.

```
Router# configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#
```

2. Type **ip http server** and press **Enter** to enable HTTP server.

```
Router(config)#ip http server
```

3. Type **ip http secure-server** and press **Enter** to enable Secure HTTP server.

```
Router(config)#ip http secure-server
```

4. Type **ip http authentication local** to enable local authentication.

```
Router(config)#ip http authentication local
```

5. Type **ip http timeout-policy idle 600 life 86400 requests 10000** and press **Enter**.

```
Router(config)#ip http timeout-policy idle 600 life 86400 requests 10000
```

6. Type **username *username* privilege 15 password 0 *password*** to create a user account with configuration privileges. Use the username and password that you entered in the LAN Addressing Worksheet (B10 and B11).

```
Router(config)#username username privilege 15 password 0 password
```

Note: You will use this username and password to access SDM.

7. Enter these commands to enable telnet and SSH:

- a. Type **line vty 0 4** and press **Enter**.

```
Router(config)#line vty 0 4
```

- b. Type **privilege level 15** and press **Enter**.

```
Router(config-line)#privilege level 15
```

- c. Type **login local** and press **Enter**.

```
Router(config-line)#login local
```

d. Type **transport input telnet ssh** and press **Enter**.

```
Router(config-line)#transport input telnet ssh
```

e. Type **exit** and press **Enter**.

```
Router(config-line)#exit
Router(config)#
```

- Type **interface FastEthernet0** and press **Enter** to configure the Ethernet interface.

Note: The name of the Ethernet interface varies with some router models. Review this table to confirm the name for the Ethernet interface on your router. For example, if your router interface lists Ethernet0, you need to enter the command **interface Ethernet0**.

Router Model	First Ethernet Interface
SOHO	Ethernet0
800 Series	Ethernet0
1760	FastEthernet0/0
1700 Series	FastEthernet0
1800	FastEthernet0/0
2600 Series	FastEthernet0/0
2800	FastEthernet0/0

```
Router(config-if)#interface FastEthernet0
Router(config-if)#
```

- Type **ip address ip-address subnet-mask** with the IP address and subnet mask from the LAN Addressing Worksheet (L6A and L2A). Press **Enter**.

```
Router(config-if)#ip address 192.168.10.1 255.255.255.0
```

- Type **no shutdown** and press **Enter** to make the interface active.

```
Router(config-if)# no shutdown
```

- Type **end** to leave configuration mode.

```
Router(config)#end  
Router
```

- Type **write memory** to save the configuration.

```
Router(config)#write memory  
Building configuration...  
[OK]
```

- Click **File > Exit** to exit HyperTerminal.

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Download SDM

To download the SDM files, follow these steps:

Note: SDM is provided on the CD included with your router. However, Cisco recommends that you download the software from Cisco.com to ensure that you have the most recent version.

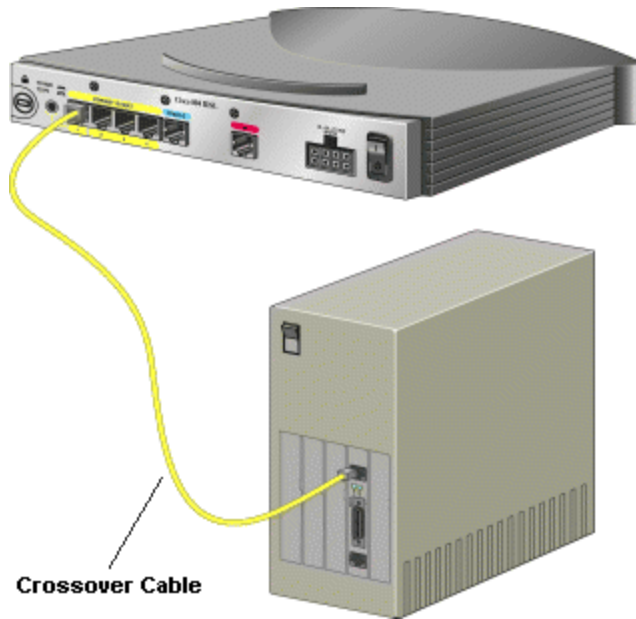
1. Open <http://www.cisco.com/pcgi-bin/tablebuild.pl/sdm>.
2. Click the SDM-Vnn.zip file for the SDM version you want download.
3. Review the End User License Agreement and click **Accept**.
4. Click the SDM-Vnn.zip file to download the file.
5. Log in with your Cisco.com user ID and password to begin the download.
6. Extract the SDM-Vnn.zip file to your PC desktop. For more information about how to extract the files from .zip format, review the documentation for your zip utility.

Confirm Connectivity to the Router

To confirm connectivity between your PC and the router, follow these steps:

1. Change your PC IP address to an address that matches the router Ethernet IP address you entered in the LAN Addressing Worksheet (fields **L6A** and **L2A**). For example, if your router has IP address 192.168.10.1, change your PC to 192.168.10.2. To change your PC IP address, go to **Control Panel > Network and Dial-Up Connections > TCP/IP Properties**. For more information on how to configure an IP address on your PC, refer to [Configure an IP Address on Your PC](#).

2. Connect the crossover cable to the RJ-45 Ethernet port of your PC and the yellow Ethernet port of the router.



3. Verify that your PC can send traffic to the router with a ping test.
 - a. Click **Start > Run**
 - b. Type **command** or **cmd** to launch a DOS prompt.
 - c. Type **ping router-IP-address** and press **Enter**.

For more information on how to do a ping test, refer to [Troubleshoot Ethernet Connectivity](#).

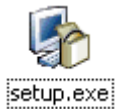
```
Command Prompt
C:\>ping 192.168.10.1
Pinging 192.168.10.1 with 32 bytes of data:
Reply from 192.168.10.1: bytes=32 time<10ms TTL=128
Reply from 192.168.10.1: bytes=32 time<10ms TTL=128
Reply from 192.168.10.1: bytes=32 time<10ms TTL=128
Reply from 192.168.10.1: bytes=32 time<10ms TTL=128
Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
```

4. Type **exit** and press **Enter** to close the window.

Install Security Device Manager

To install Security Device Manager, follow these steps:

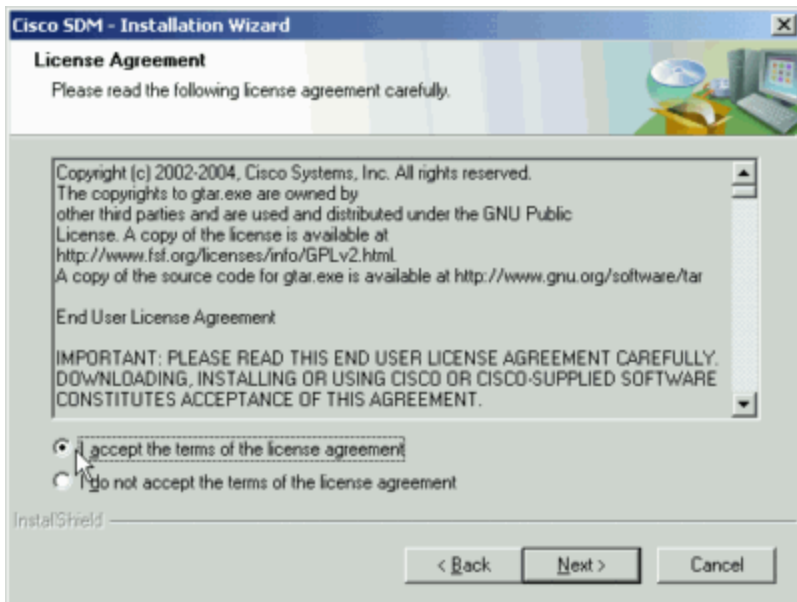
1. Open the SDM folder on the desktop and double click the **setup.exe** file.



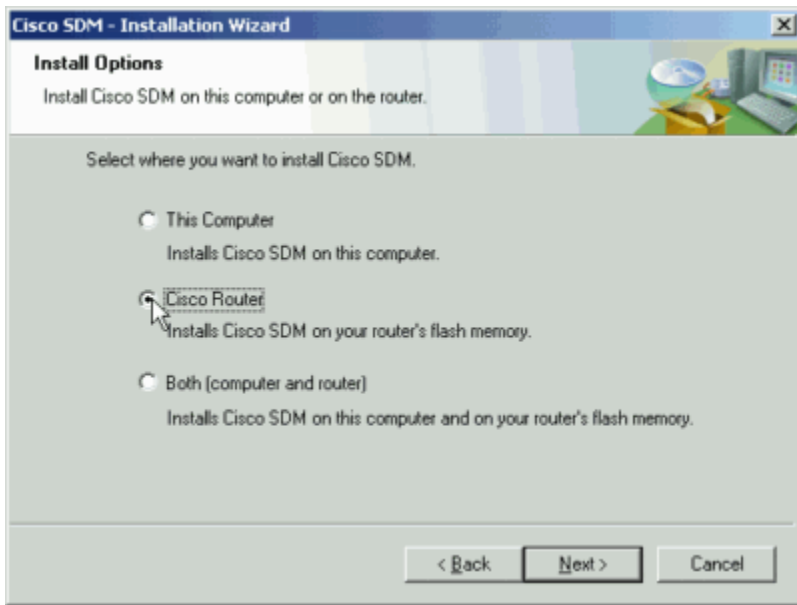
2. Click **Next**.



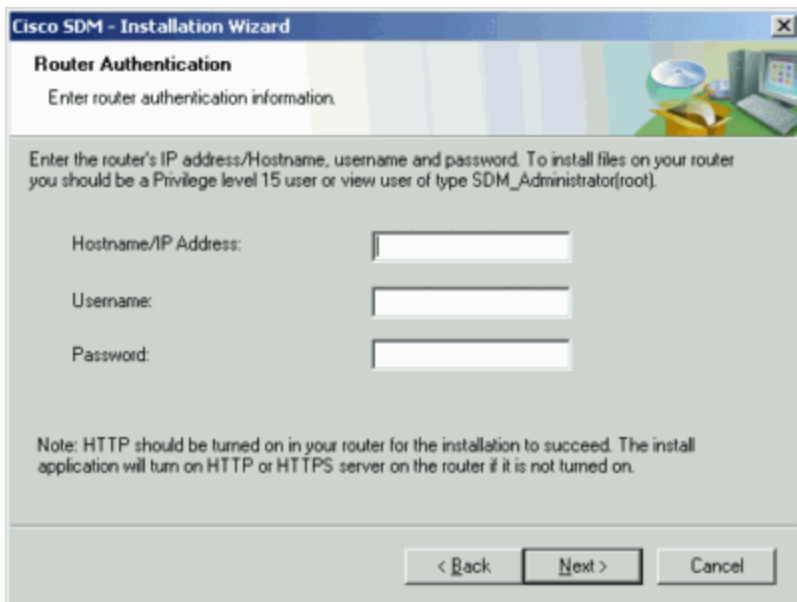
3. Choose **I accept the terms of the license agreement** and click **Next**.



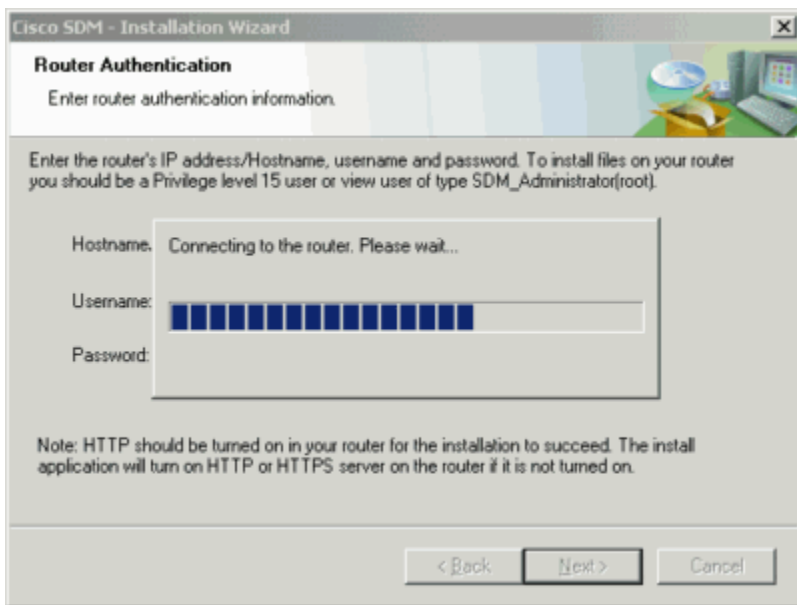
4. Choose **Cisco Router** and click **Next** to install SDM on the router.



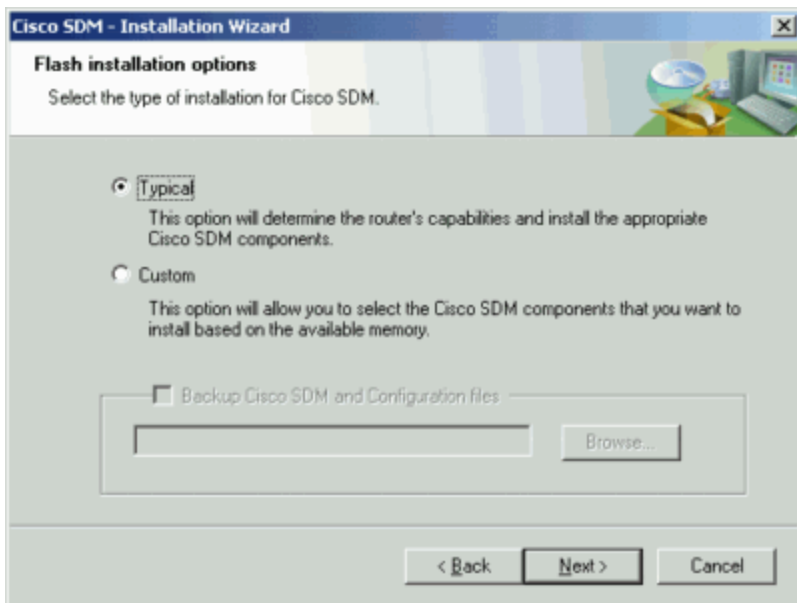
5. In the **Hostname/IP Address** field, enter the IP address from the LAN Addressing Worksheet (L6A). In the **Username** field, enter the username that you entered in the LAN Addressing Worksheet (B10). In the Password field, enter the password that you entered in the LAN Addressing Worksheet (B11).



6. SDM accesses the router with your login information. If SDM cannot access the router, see [Troubleshoot the Procedure](#).

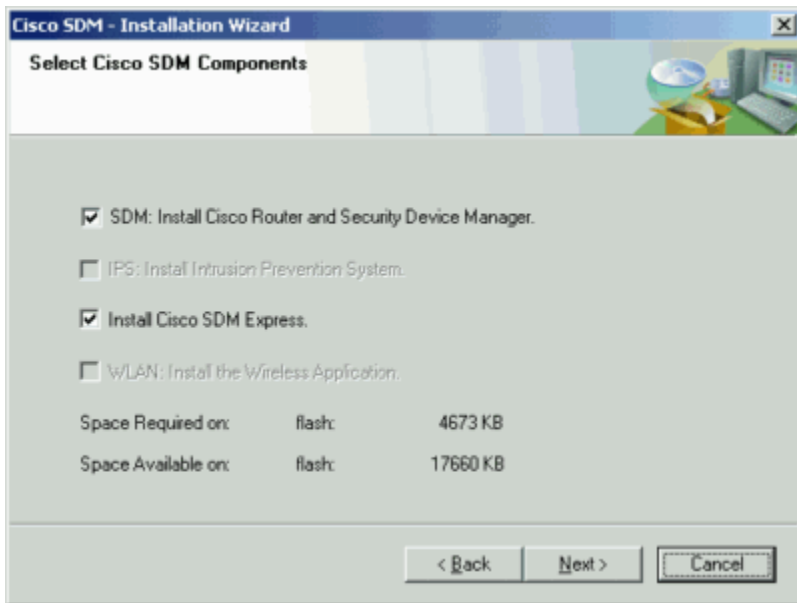


7. Choose **Typical** and click **Next**.

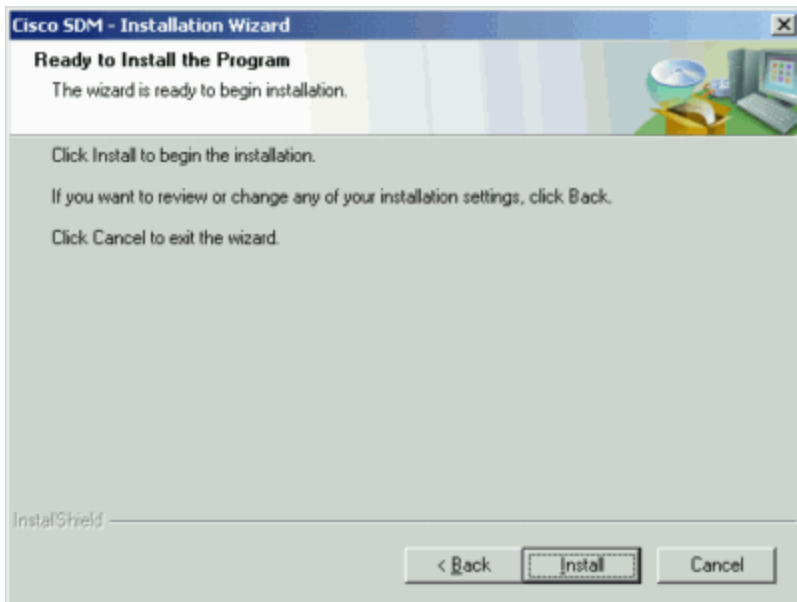


8. Check **SDM: Install Cisco Router and Security Device Manager** and **Install Cisco SDM Express**. If you have a wireless router, check **WLAN: Install the Wireless Application**. Click **Next**.

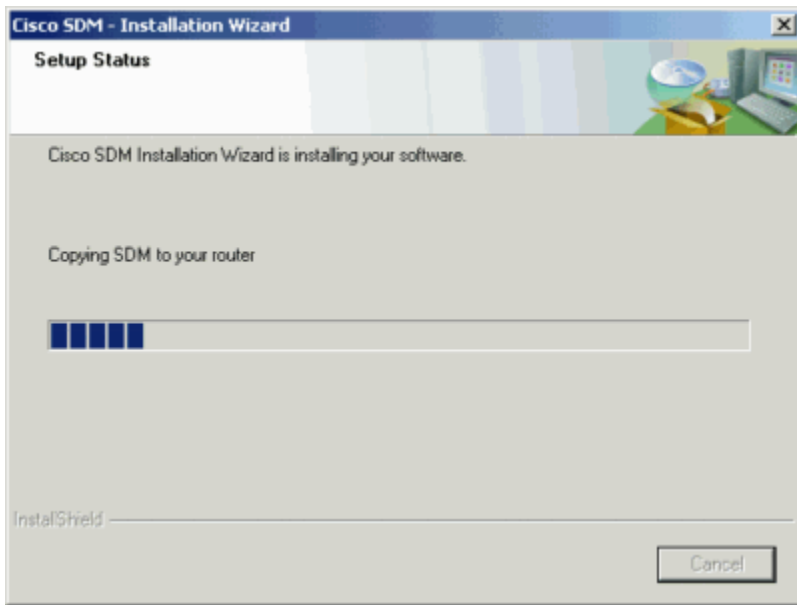
Note: If you want to use Intrusion Prevention System (IPS), you need to upgrade your IOS image to Release 12.3(8)T4 or later. For more information, contact the [SMB Technical Assistance Center \(SMB TAC\)](#).



9. Click **Install** to begin installation.



10. The Installation Wizard copies the SDM files to the router.



11. Click **Finish** to complete the installation.

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Next Step

You have now installed SDM on your router.

Refer to [Configure your Router with Security Device Manager](#) to configure your router with SDM.

Note: If you have an ASA Security Appliance in your network, refer to [Configure Your Router with Security Device Manager with ASA](#).

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)

SDM cannot access my router when I enter my login information.

- See to the [Confirm Connectivity to the Router](#).
- If the tests in [Confirm Connectivity to the Router](#) are successful, see [Prepare Your Router to Support SDM](#).

Reclaim Flash Memory

If there is insufficient space to copy the new software image into flash, the router displays an error message. To resolve this problem, you need to delete files from Flash memory and reclaim flash memory space. To reclaim flash memory, follow these steps:

1. Type **show flash** and press **Enter** to show the files in flash memory.

```
System flash directory:
File Length Name/status
  1  5877460 c1700-y-mz.123-12.bin
  2  3885056 sdm.tar
  3  1545 sdmconfig-1721.cfg
[9764061 bytes used, 23528223 available, 33292284 total]
32768K bytes of processor board System flash (Read/Write)
```

2. Review the files to determine what files you can delete. You can delete unused .cfg configuration files or .bin software image files.



Caution: Ensure that you do not delete a .cfg configuration file or a .bin software image file that is in use.

3. Type **del filename.ext** to remove unnecessary files. Press **Enter** to confirm.

```
Router# del filename.ext

Router# Delete filename [filename.ext]?
Router# Delete flash:filename.ext [confirm]
Router#
```

4. Type **squeeze flash** to reclaim flash memory. Press **Enter**.

```
Router# squeeze flash
Squeeze operation may take a while. Continue? [confirm]
squeeze in progress... eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
Rebuild file system directory...
Squeeze of flash complete
Router#
```

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Related Information

- [Cable Descriptions](#)
- [Configure an IP Address on Your PC](#)
- [Reset the Password on a Cisco Router](#)
- [Configure Your Router with Security Device Manager](#)

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Introduction

This document explains how to configure and manage your router with Cisco Security Device Manager (SDM).

Note: If you have an ASA Security Appliance in your network, refer to [Configure Your Router with Security Device Manager for ASA](#).

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Requirements

To perform the steps described in this document, you need to have these items:

- A router with Cisco Security Device Manager (SDM) installed. If your router does not come with SDM installed, refer to [Download and Install Security Device Manager](#).
- A [crossover Ethernet cable](#)
- A [console cable](#)
- A PC with a Pentium III or higher processor
- Windows 2000 or XP

Note: Windows 2000 Advanced Server is not supported.

- One of these web browsers:
 - Netscape version 7.1 or later.
 - Internet Explorer version 5.5 or later.

Note: If you are using the Java plugin, you need to use SUN Java Runtime Environment (JRE) version 1.4.2_05. For information about how to update your version of JRE, refer to [Sun](#)

[Microsystems](#) .

- Completed worksheets from the [Site Survey](#):
 - LAN Addressing Worksheet
 - Internet Worksheet
 - ISR Router Worksheet

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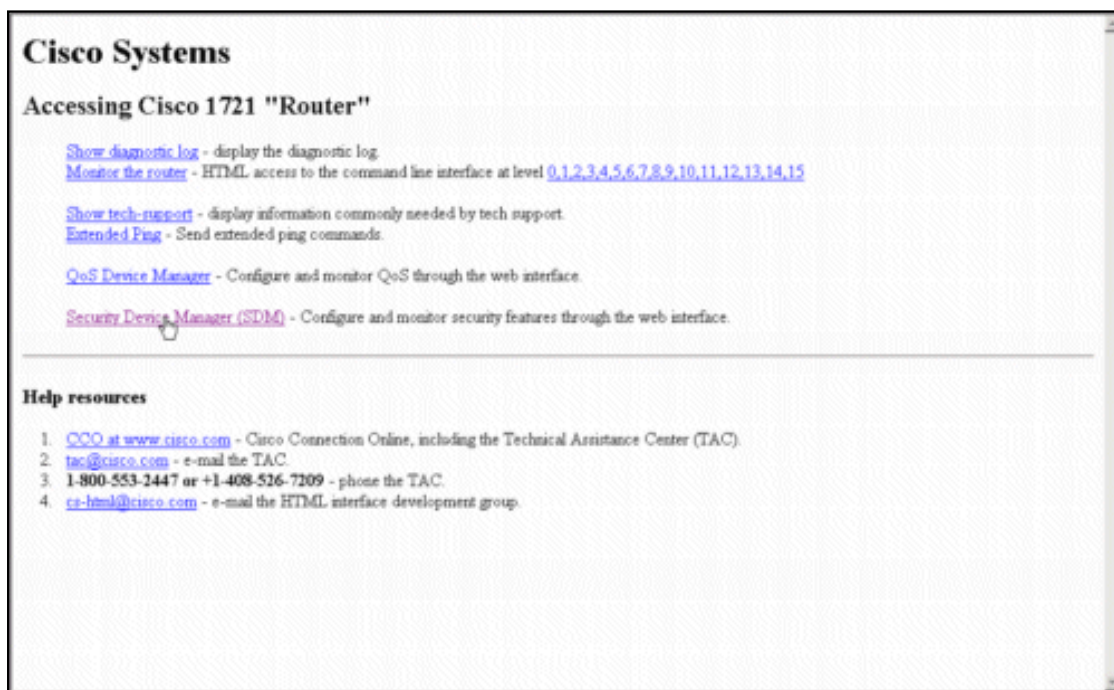
Launch SDM

To start SDM, follow these steps:

1. Open a web browser and type **http://router IP address** in the Address field. The router's IP address is the IP address that you entered in the LAN Addressing Worksheet (L6A).
2. At the login prompt, enter the username and password for the privileged (privilege level 15) account on your router. If your router has the default configuration, use the username "cisco" and password "cisco".

Note: If you are unable to log in, see [Troubleshoot the Procedure](#) for assistance.

3. If you see a screen similar to the example, click **Security Device Manager (SDM)** to launch SDM. If you see a screen labeled Home: Summary Status, continue to the next step.



Note: If you do not see an option for SDM, see [Troubleshoot the Procedure](#) for assistance.

4. If the router's home page appears, click **Cisco Router and Security Device Manager** in the left column.

Cisco Router - Microsoft Internet Explorer provided by Cisco Systems, Inc.

Address: http://192.168.10.1/archive/home/html/router.html?presence=111111118SecureFormChecked

Cisco Systems

Cisco 1841

HOME: Summary Status

Network Identity

IP Address	192.168.10.1 (FastEthernet0/0)
------------	--------------------------------

System Details

Host Name	youname
System Uptime	55 minutes
Software Version	12.3(0)T4

Copyright (c) 2003-2004 by Cisco Systems, Inc.

Note: If you see an option **A more secure connection (HTTPS) to this device is available**, click **Yes**.

5. SDM displays a launch page and opens the main interface in a separate window.



6. The SDM Java applet loads on your PC. If your browser displays a security warning, click **Yes** to accept the SDM download.
7. When the application has loaded completely, SDM displays the SDM Home page. If your router has a default configuration, SDM launches a the SDM Express Wizard Wizard.

The screenshot displays the Cisco Router and Security Device Manager (SDM) interface. The top navigation bar includes 'Home', 'Configure', 'Monitor', 'Refresh', 'Save', and 'Help'. The main content area is divided into two sections:

About Your Router: This section shows the router's hardware and software details. The hardware table lists the Model Type as Cisco 1721, Available / Total Memory(MB) as 74/96 MB, and Total Flash Capacity as 32 MB. The software table lists the IOS Version as 12.3(12) and the SDM Version as 2.0a. Below these tables, feature availability is indicated for IP, Firewall, VPN, and IPS.

Configuration Overview: This section provides a summary of the router's configuration. It includes a 'View Running Config' button and several expandable sections:

- Interfaces and Connections:** Shows 3 Total Supported LAN interfaces, 1 Configured LAN Interface, and 1 DHCP Server. It also shows 0 Total Supported WAN interfaces and 0 Total WAN Connections.
- Firewall Policies:** Shows 1 Inactive policy, 0 Trusted, 0 Untrusted, and 0 DMZ policies.
- VPN:** Shows 0 IPSec (Site-to-Site), 0 GRE over IPSec, 0 Easy VPN Remote, and 0 No. of Active VPN Clients. It also shows N/A for Xauth Login Required and No. of DMVPN Clients.
- Routing:** Shows 0 No. of Static Routes and None for Dynamic Routing Protocols.
- Intrusion Prevention:** Shows 0 Active Signatures and 0 No. of IPS-enabled Interfaces.

The bottom status bar shows 'SDM Home' and the date '12:01:28 PCTue Thu Feb 03 2006'.

8. If your router loads SDM Express Setup, see [Complete the Startup Wizard](#). Otherwise, proceed to [Reset the Router to the Default Configuration](#).

Note: If you want to modify an existing configuration on the router, refer to [Modify Your Router Configuration with Security Device Manager](#).

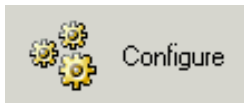
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Reset the Router to the Default Configuration

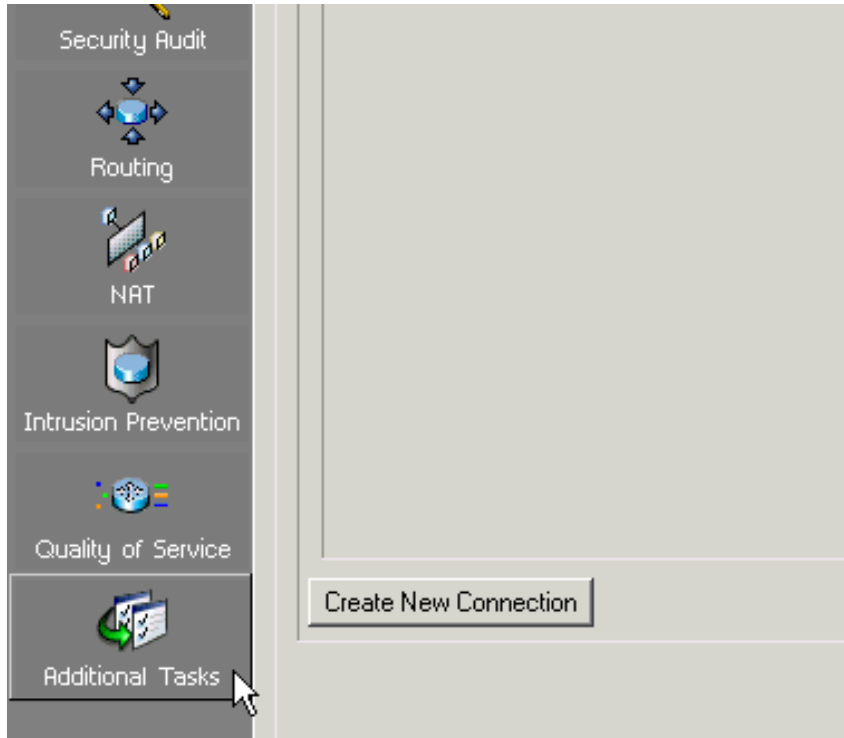
If you have an existing configuration and want to reconfigure your router, reset your router to a default configuration. To reset your router to a default configuration, follow these steps:

Note: This procedure will delete your current configuration and replace it with a factory default configuration.

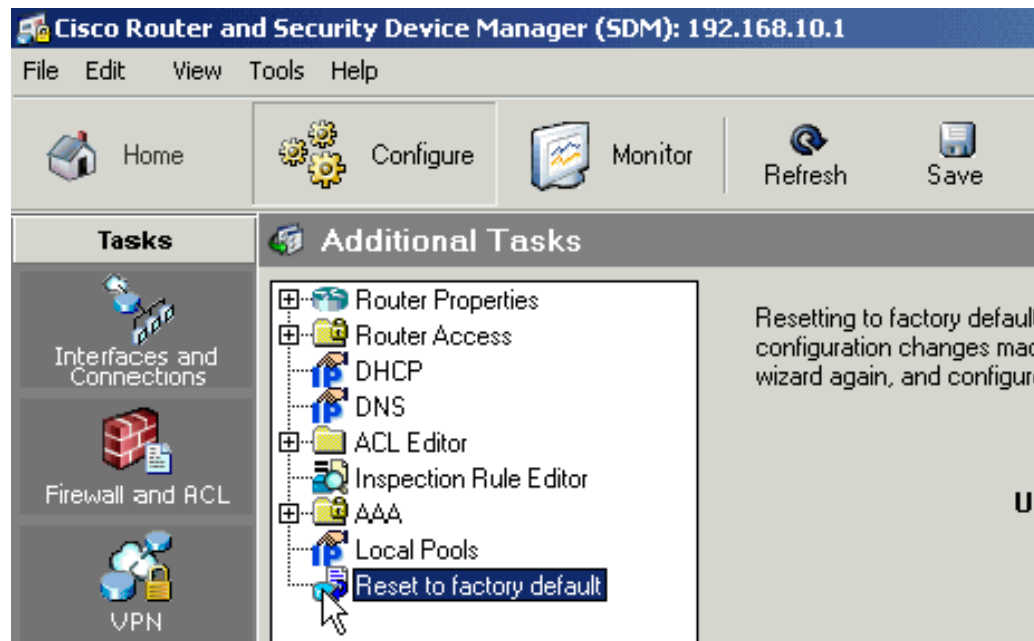
1. Click **Configure**.



2. Click **Additional Tasks**.



3. Click **Reset to Factory Default**.



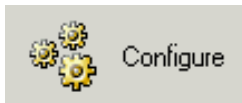
4. Under **Step 1** enter the location on your computer where you want to store a backup copy of the current router configuration.
5. Click **Reset Router**.
Note: The router requires 1-2 minutes to reset.
6. Change your PC IP address to 10.10.10.2 with a subnet mask of 255.255.255.248. For further information about how to configure an IP address on your PC, refer to the document.
7. Open <http://10.10.10.1> in a web browser.
8. Log into SDM with the username **cisco** and password **cisco**.

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Record Interfaces

Follow these steps to record the available interfaces on your router:

1. Click **Configure**.



2. Click **Interfaces and Connections**.
3. Click **Edit Interface/Connection**.

The screenshot shows the Cisco Router and Security Device Manager (SDM) interface. The main window displays the 'Interfaces and Connections' configuration page. The 'Interface List' table is as follows:

Interface	IP	Type	Slot	Status	Description
FastEthernet0/0	192.168.10.1	10/100 Ethernet	0	Up	
FastEthernet0/1	no ip address	10/100 Ethernet	0	Down	
ATM0/0/0	no ip address	ADSL	0	Down	
FastEthernet0/10	not applicable	Ethernet Switch Port	0	Down	
FastEthernet0/11	not applicable	Ethernet Switch Port	0	Down	
FastEthernet0/12	not applicable	Ethernet Switch Port	0	Down	
FastEthernet0/13	not applicable	Ethernet Switch Port	0	Down	
Vlan1	no ip address	Vlan		Up	

Below the table, the 'Details about Interface: FastEthernet0/0' section shows the following configuration:

Item Name	Item Value
IP Address/Outlet Mask	192.168.10.1/255.255.255.0
NAT	-None-
Access Rule - inbound	-None-
Access Rule - outbound	-None-
IPSec Policy	-None-
Inspect Rule - inbound	-None-
Inspect Rule - outbound	-None-
Easy VPN Remote	-None-
QoS Policy - outbound	-None-

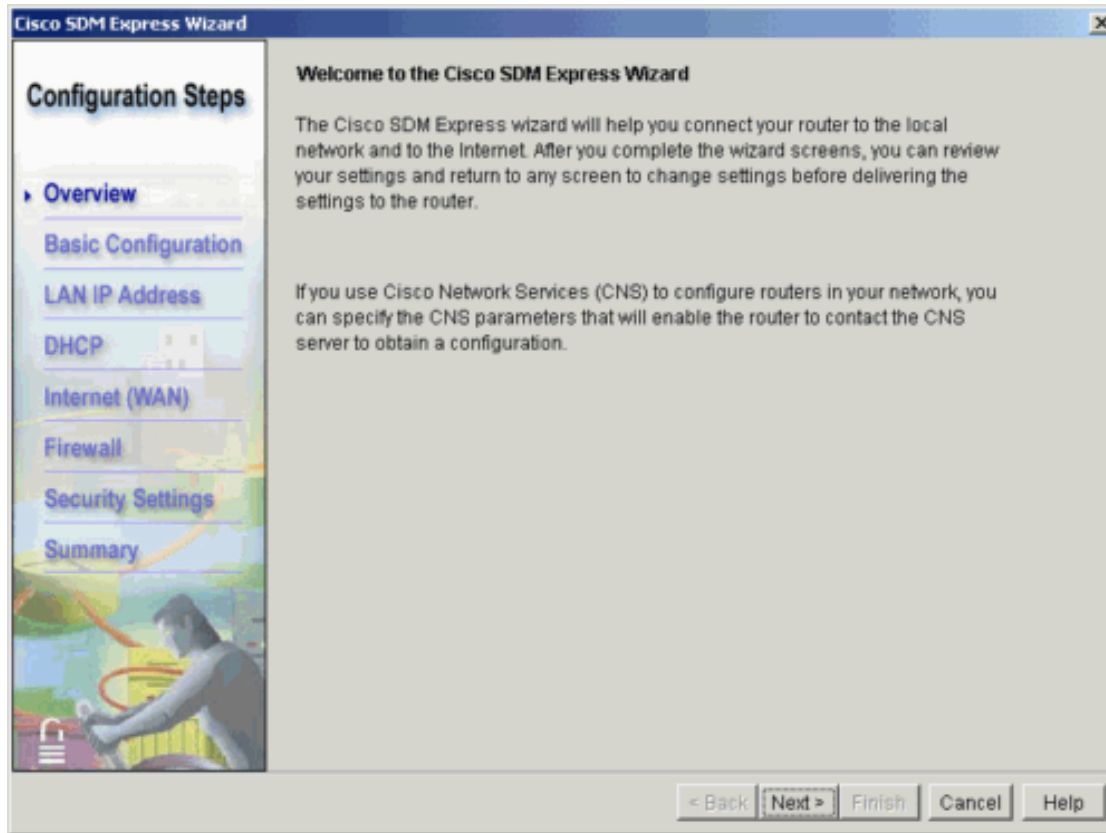
4. Record the interfaces listed in fields B35-B38 of the ISR Router Worksheet.

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Complete the Startup Wizard

If your router has a default configuration, SDM runs the Startup Wizard. To complete the wizard, follow these steps:

1. On the Welcome screen, click **Next**.



2. At the Basic Configuration screen, enter your new username and password. Use the administrative account and password that you entered in fields B10 and B11 of the ISR Router Worksheet. Next to Enable Secret Password, type the enable secret password that you entered in field B12 of the ISR Router Worksheet. Click **Next**.

Note: For recommendations on how to implement strong passwords, refer to [Password Security](#).

The screenshot shows the 'Cisco SDM Express Wizard' window. On the left is a 'Configuration Steps' sidebar with options: Overview, Basic Configuration (selected), LAN IP Address, DHCP, Internet (WAN), Firewall, Security Settings, and Summary. The main area is titled 'Basic Configuration' and contains the following fields and instructions:

- Host Name: Domain Name:
- Section: Username and Password
 - Text: Your router comes with a factory default login username and password. You must change these values to make your router secure.
 - Text: After you complete the Cisco SDM Express Wizard, enter this new login username and password to reconnect to the router.
 - Field: * Enter new username:
 - Field: * Enter new password: (minimum 6 characters)
 - Field: * Reenter new password:
- Section: Enable Secret Password
 - Text: This password is used to administer the router when using the command-line interface (CLI).
 - Field: * Enter new password: (minimum 6 characters)
 - Field: * Reenter new password:

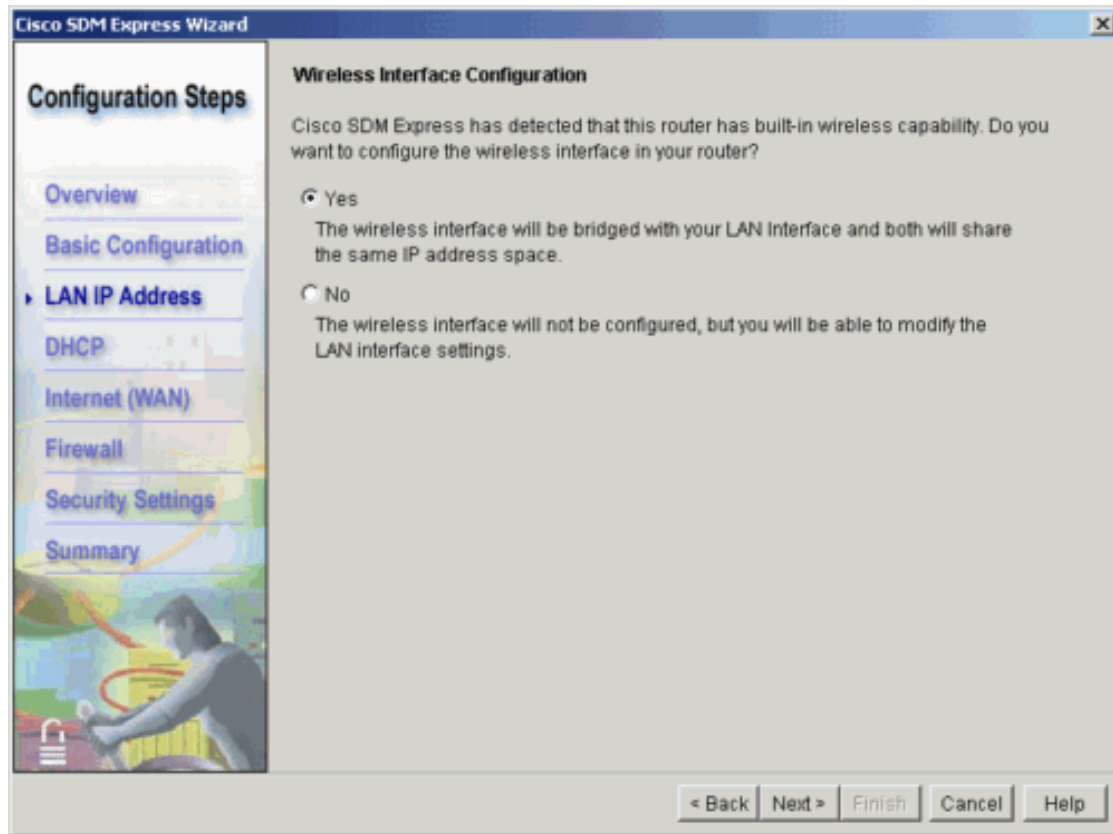
* Indicates required field.

Navigation buttons at the bottom: < Back, Next >, Finish, Cancel, Help.

3. If you have a wireless router, follow these steps:

Note: If you have a non-wireless router, proceed to the next step.

- a. SDM displays the Wireless Interface Configuration screen. Choose **Yes** and click **Next** to configure the wireless interface.

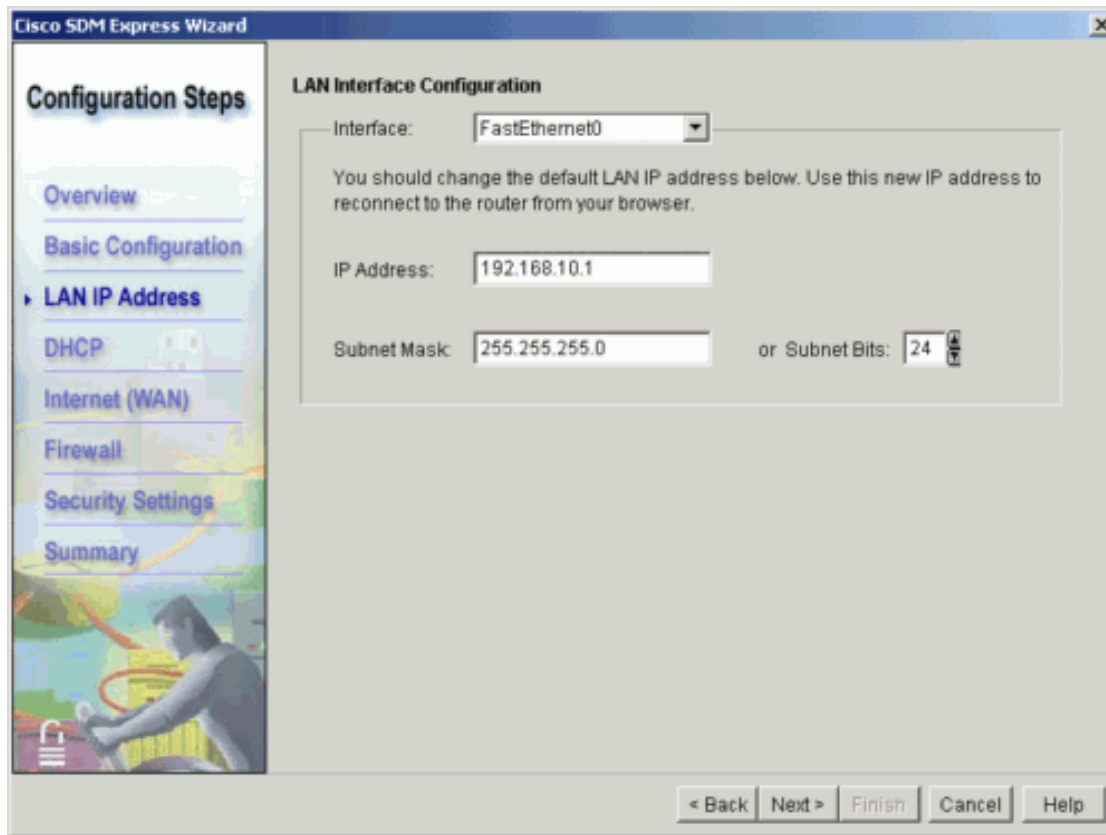


- b. On the LAN Interface Configuration screen, enter the IP address and subnet mask for the router (from fields L6A and L1A on the LAN Addressing Worksheet). Enter the Wireless Network Name that you entered in field W14 of the ISR Router Worksheet and click **Next**.

The screenshot shows the Cisco SDM Express Wizard interface. On the left, a 'Configuration Steps' sidebar lists: Overview, Basic Configuration, LAN IP Address (selected), DHCP, Internet (WAN), Firewall, Security Settings, and Summary. The main area is titled 'LAN Interface Configuration' and contains the following text: 'You should change the default LAN IP address below. Use this new IP address to reconnect to the router from your browser.' Below this, the 'Bridge-to Interface' is set to 'Vlan1 (HWIC 4ESW)'. The 'IP Address' field contains '192.168.10.1' and the 'Subnet Mask' field contains '255.255.255.0'. An alternative 'Subnet Bits' field is set to '24'. A 'Wireless Parameters' section is visible, with a note: 'The SSID is a unique identifier that wireless networking devices use to establish and maintain wireless connectivity. Enter the SSID here.' The 'SSID' field contains 'rugby1'. A legend at the bottom indicates that a red asterisk (*) denotes a required field. At the bottom right, there are navigation buttons: '< Back', 'Next >', 'Finish', 'Cancel', and 'Help'.

4. On the LAN Interface Configuration screen, enter the IP address and subnet mask for the router (from fields L6A and L1A on the LAN Addressing Worksheet). Click **Next**.

Note: If you have a wireless router, proceed to the next step.

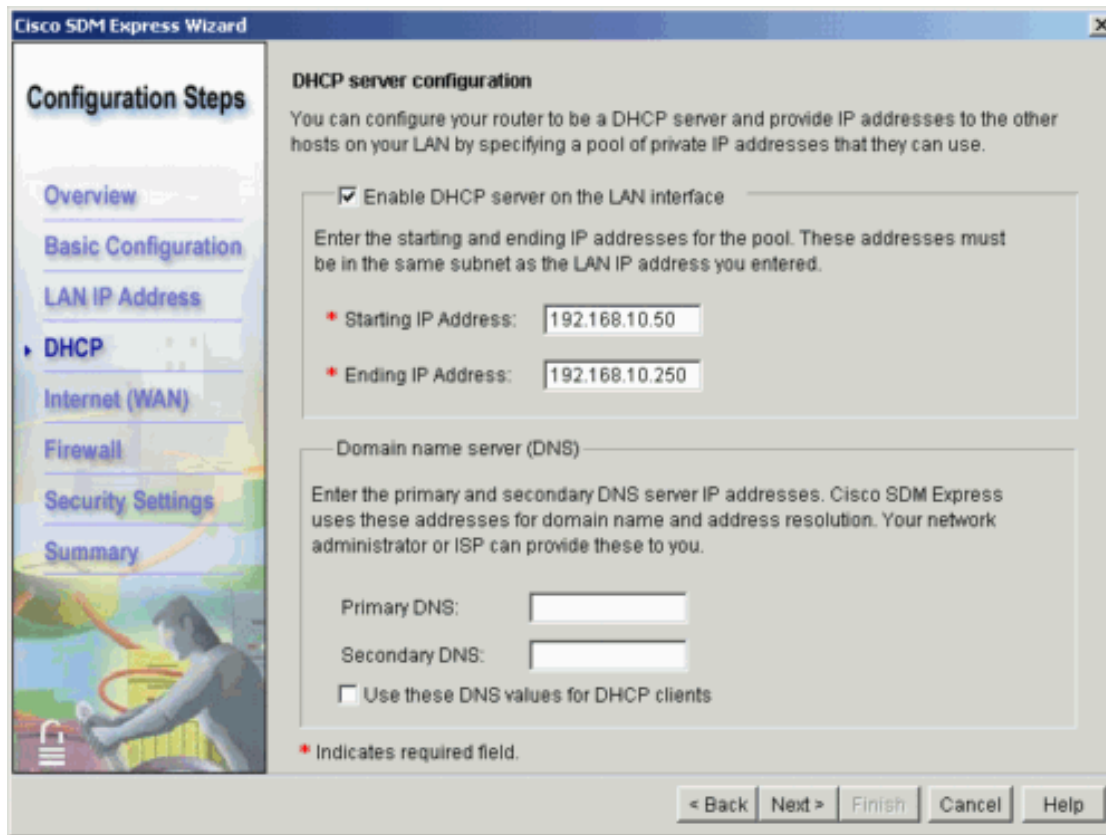


5. On the DHCP Configuration screen, check Enable DHCP server on the LAN interface and enter the IP address of the DHCP start range and the DHCP end range that you entered in the LAN Addressing Worksheet (L50 and L51).

In the Domain Name Server Configuration section, enter the DNS information for your network.

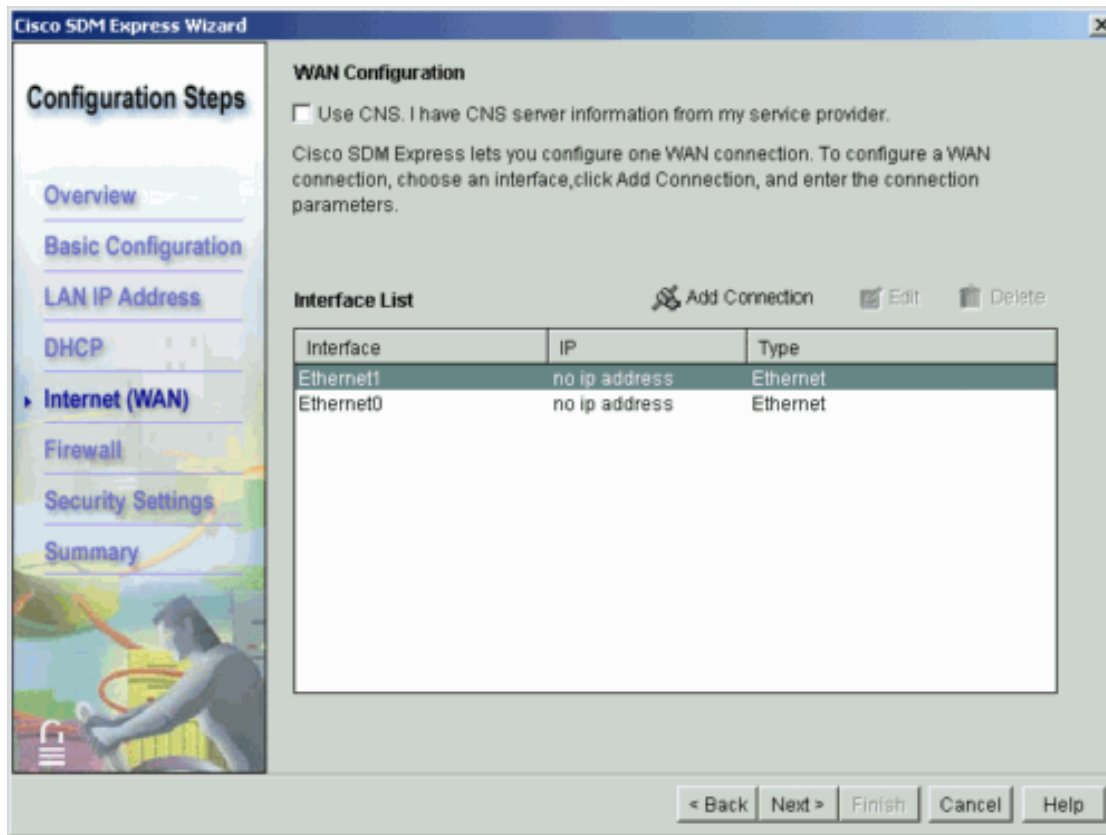
- o If you have an internal DNS server, enter the IP addresses of your internal DNS servers that you completed in the LAN Addressing Worksheet (L4 and L5).
- o If you do not have an internal DNS server, copy the IP addresses you completed in the Internet Worksheet (B50 and B51).

Click **Next**.

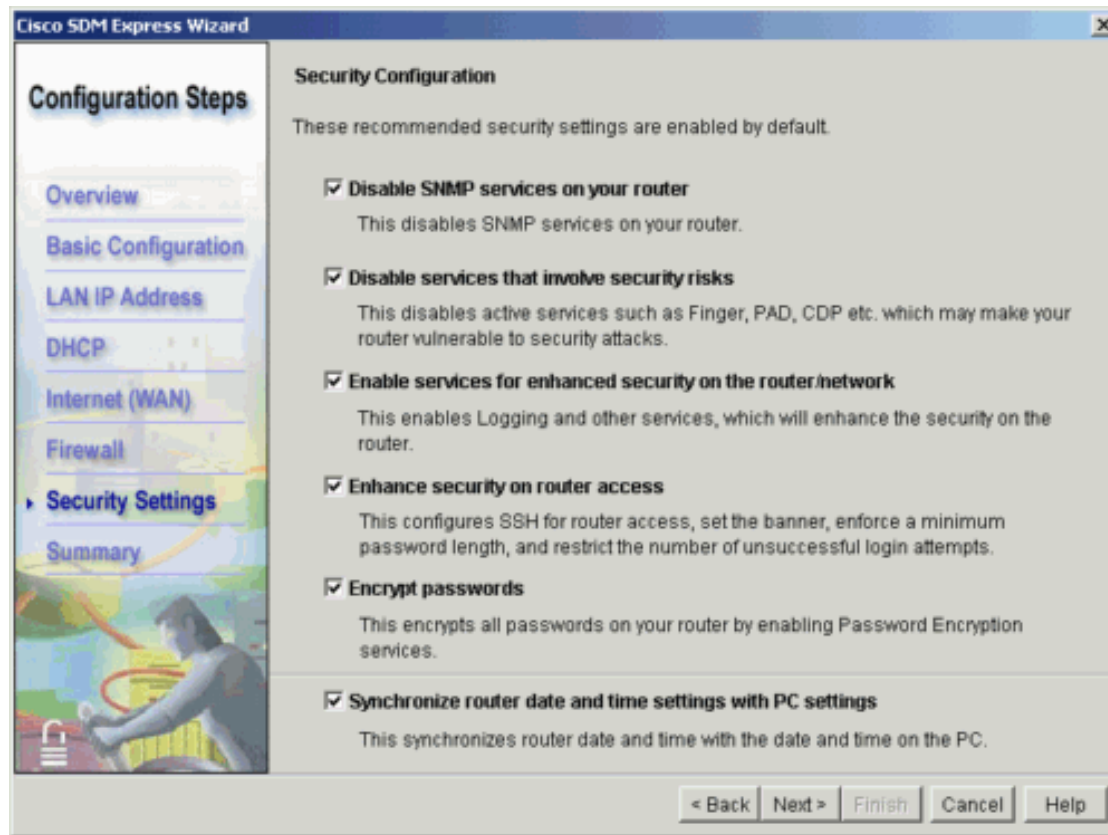


The screenshot shows the Cisco SDM Express Wizard interface. On the left, a vertical sidebar titled "Configuration Steps" lists: Overview, Basic Configuration, LAN IP Address, DHCP (selected), Internet (WAN), Firewall, Security Settings, and Summary. The main window is titled "DHCP server configuration" and contains the following text: "You can configure your router to be a DHCP server and provide IP addresses to the other hosts on your LAN by specifying a pool of private IP addresses that they can use." Below this, there is a checkbox labeled "Enable DHCP server on the LAN interface" which is checked. A text box below it says "Enter the starting and ending IP addresses for the pool. These addresses must be in the same subnet as the LAN IP address you entered." Two input fields are shown: "Starting IP Address:" with the value "192.168.10.50" and "Ending IP Address:" with the value "192.168.10.250". Below these is a section for "Domain name server (DNS)" with the text: "Enter the primary and secondary DNS server IP addresses. Cisco SDM Express uses these addresses for domain name and address resolution. Your network administrator or ISP can provide these to you." There are two input fields for "Primary DNS:" and "Secondary DNS:". A checkbox "Use these DNS values for DHCP clients" is unchecked. A legend at the bottom left of the main area states "* Indicates required field." At the bottom of the window are five buttons: "< Back", "Next >", "Finish", "Cancel", and "Help".

6. On the WAN Configuration screen, click **Next**, and click **No** to skip WAN Configuration.



7. On the Security Configuration screen, check all of the check boxes, and then click **Next**.



8. On the Wizard Summary screen, review your configuration to ensure that it is accurate, and then click **Finish**.
9. When the Reconnection Instructions screen appears, click OK to save the new configuration. To reconnect to SDM, open the new router IP address (from Step 5) in a web browser and log in with the new password (from Step 4).

Note: Since the router IP address has changed, you will lose your connection to the router. To reconnect to the router with SDM, configure your PC with an IP address to match the IP address for your Ethernet interface. For example, if you configured your router Ethernet interface with the address 192.168.10.1 with a subnet mask of 255.255.255.0, your PC must have an IP address from 192.168.10.2-254 with the same subnet mask. For more information on how to configure an IP address on your PC, refer to [Configure an IP Address on Your PC](#).

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Perform Additional Configurations

When you have completed configuration with the wizard, you need to add these configurations to the router manually.

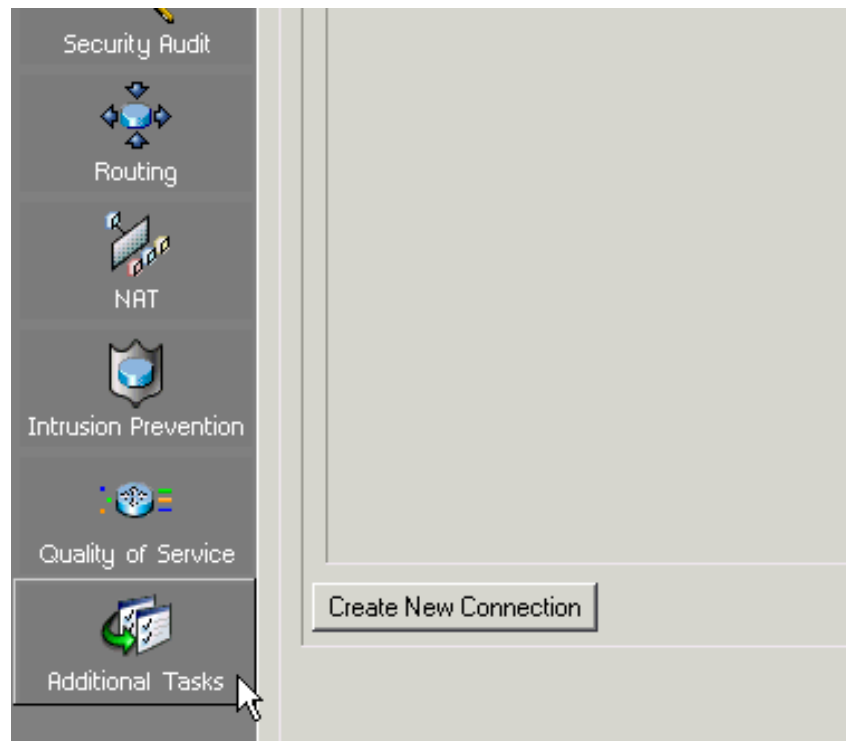
Configure a Time Server

A time server ensures that your router has the correct time. To configure a time server, follow these steps:

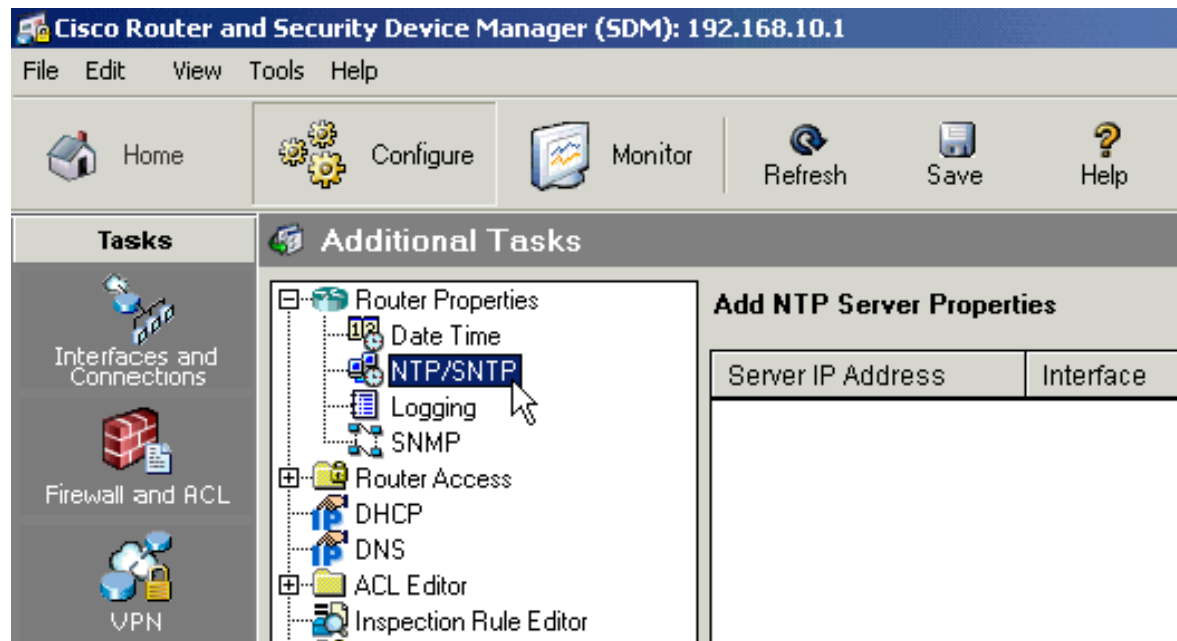
1. Click **Configure**.



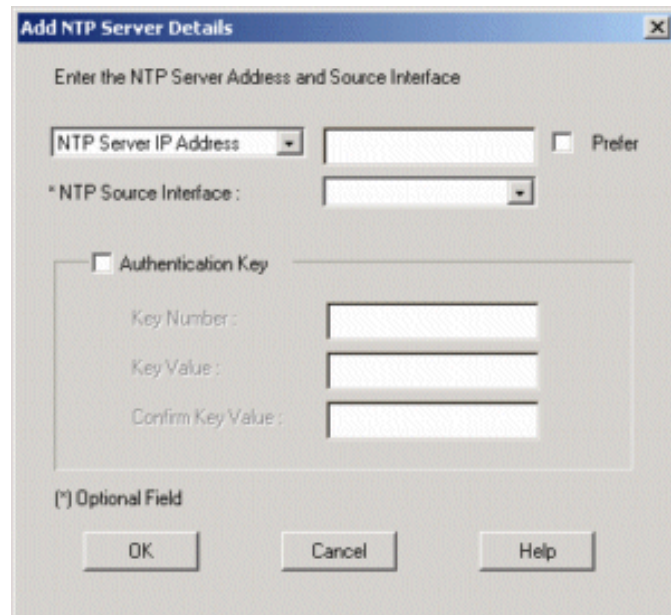
2. Click **Additional Tasks**.



3. Double-click **Router Properties**, and then click **NTP/SNTP**.



4. Click **Add**.
5. Choose **SNTP Server IP Address** and enter **192.43.244.18**.



Note: You can also choose **SNTP Server Hostname** and enter **time.nist.gov**. Your router must have an active Internet connection to use a host name.

6. Click **OK**.
7. Click **File > Write to Startup Config** to save your configuration.

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Next Step

You have now configured your router with SDM.

If you have an Integrated Services Router with a wireless antenna, proceed to [Configure Wireless Security on an Integrated Service Router](#).

If you want to configure an Internet connection, refer to the appropriate document for your connection. If you are not sure what connection type you have, refer to your Internet Worksheet.

- [Set Up an Ethernet Connection](#)
- [Set Up an ADSL Connection](#)
- [Set up a T1/E1/Serial Connection](#)
- [Set up an ISDN Connection](#)

Note: If your router is already connected to the Internet, refer to [Set Up Internet Security on a Cisco Router](#).

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)

I do not see a login prompt.	<ul style="list-style-type: none"> • SDM may not be installed on your router. Refer to Download and Install Security Device Manager for further assistance. • Your Ethernet interface may be down. Refer to Download and Install Security Device Manager for assistance.
I cannot log in with the default username and password.	If you are unable to log in, you need to create a privileged username and password for your router. Refer to Download and Install Security Device Manager for further assistance.
When I access the router I do not see an option to load SDM.	SDM may not be installed on your router. Refer to Download and Install Security Device Manager for further assistance.
When I connect to the router, it loads Cisco Router Web Setup instead of SDM.	Refer to Download and Install Security Device Manager and review the Erase Webflash Memory section.

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Related Information

- [Download and Install Security Device Manager](#)
- [Cable Descriptions](#)
- [Configure an IP Address on Your PC](#)



Set Up Your Cisco Router

Home > Work With My Routers > Cisco Routers > Set Up Your Cisco Router

Step 5: Configure Wireless Security on an Integrated Service Router

- Step 1: [SMB Support Assistant Site Survey](#)
- Step 2: [Set Up Your 800 or SB 100 Router Hardware](#)
[Set Up Your 1700 Series Router Hardware](#)
[Set Up Your 1800 Series Router Hardware](#)
[Set Up Your 2600 Series Router Hardware](#)
[Set Up Your 2800 Series Router Hardware](#)
[Set Up Your 3800 Series Router Hardware](#)
- Step 3: [Download and Install Security Device Manager](#)
- Step 4: [Configure Your Router with Security Device Manager](#)
- Step 5: Configure Wireless Security on an Integrated Services Router (ISR Only)**
[Introduction](#)
[Requirements](#)
[Overview](#)
[Configure Security Settings](#)
[Access the Router](#)
[Local RADIUS Server](#)
[Express Security](#)
[Encryption Manager](#)
[Next Step](#)
[Troubleshoot the Procedure](#)
[Related Information](#)
- Step 6: [Add or Remove a Wireless User on an Integrated Services Router \(ISR Only\)](#)
- Step 7: [Set Up an ADSL Internet Connection](#)
[Set Up an Ethernet Internet Connection](#)
[Set Up an ISDN Internet Connection](#)
[Set Up a T1, E1, or Serial Internet Connection](#)
- Step 8: [Set Up Internet Security on a Cisco Router](#)

Service Requests

- [Open a service request](#)
- [Update a service request](#)

Feedback

Please rate this document.

++ + +/- - --

This document solved my problem.

Yes No Just Browsing

Suggestions for improvement:

Download PDF

- [Step 5: Configure Wireless Security on an Integrated Service Router](#)
- [Set Up Your Cisco Router](#)

If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information:

Full
Name:
Email:

Introduction

This document describes how to configure wireless security on a Cisco Integrated Services Router (ISR).

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Requirements

- You must have completed the steps in [Configure Your Router with Security Device Manager](#)

To perform the steps described in this document, you need to have these items:

- Completed ISR Router Worksheet as instructed in the [Site Survey](#)
- An Wireless ISR that is powered on and connected to a PC with a [straight-through Ethernet cable](#)
- Cisco IOS® Software Release 12.2 installed on the ISR

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Overview

Any wireless networking device within range of an AP can receive its radio transmissions. Therefore, you need to configure security settings to prevent unauthorized access to your network. This document explains how to configure security settings to ensure that unauthorized users cannot connect to your AP.

Cisco recommends LEAP for security, an implementation of the EAP/802.1x protocol.

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Configure Security Settings

Follow these steps to configure security on the ISR:

Access the Router

Follow these steps to access the ISR:

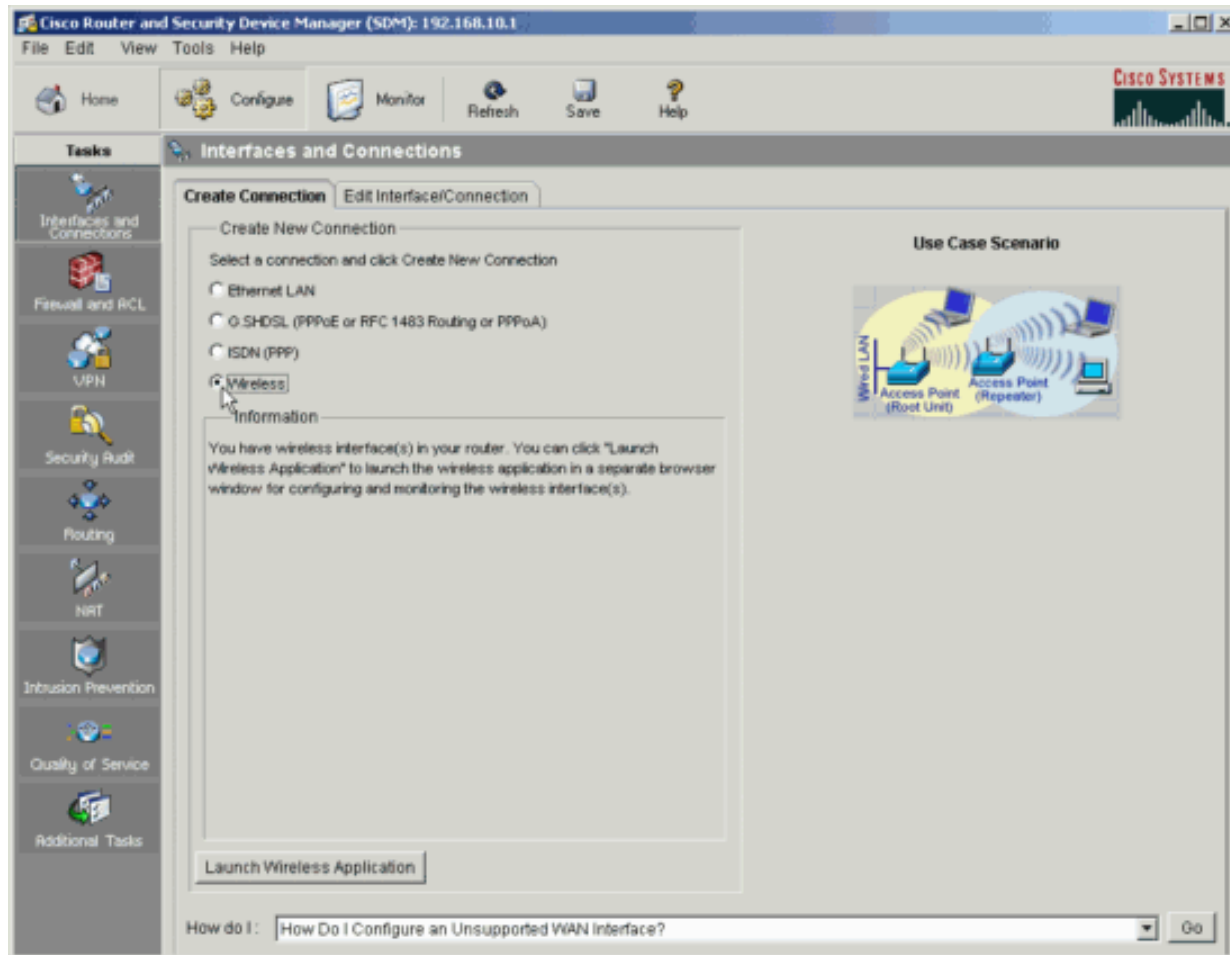
1. Open your browser and type **http://isr-ip-address** and press **Enter**. For isr-ip-address, use the IP address in field W10 of the ISR Router Worksheet.
2. Enter the ISR username and password that you entered in fields B10 and B11 of the Integrated Services Router worksheet and press **Enter**.

Note: If you cannot log into the router, see [Troubleshoot the Procedure](#).

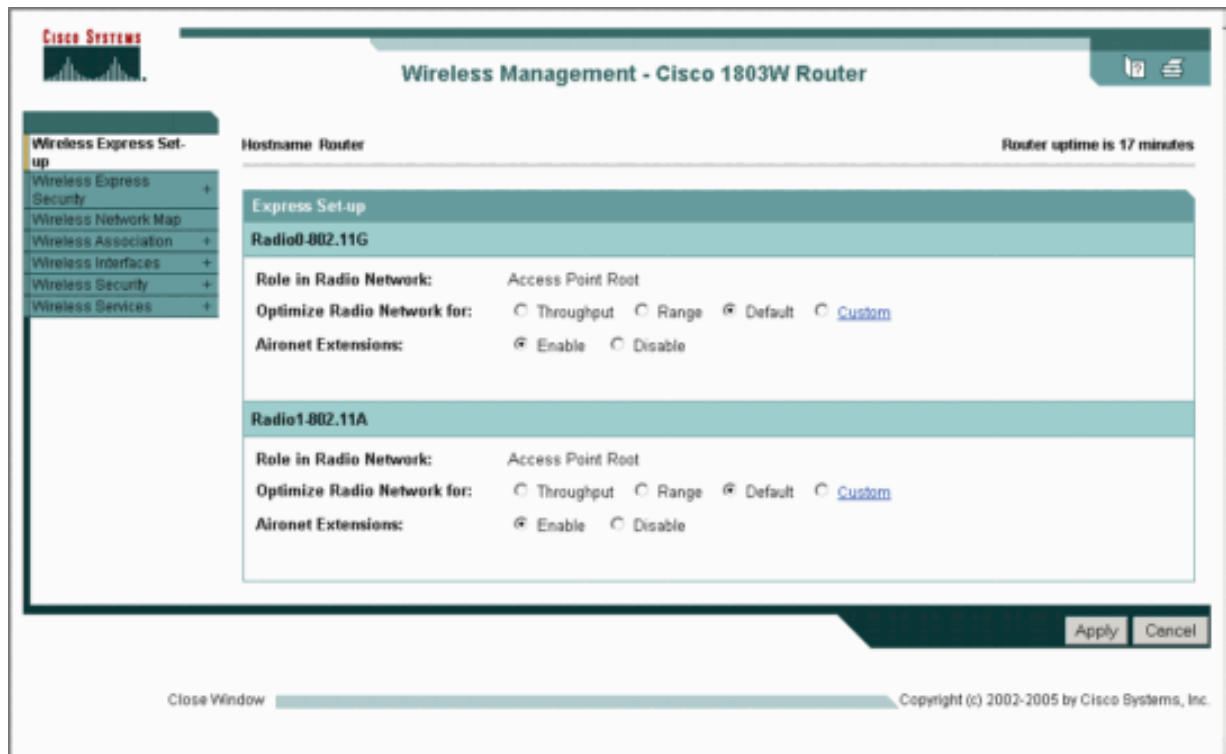
3. Click **Configure**.



4. In the **Create Connection** tab, select **Wireless** and click **Launch Wireless Application**.



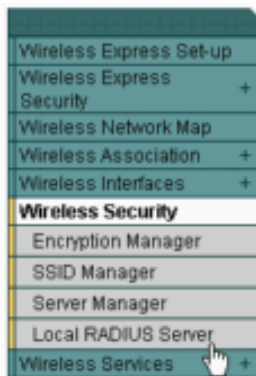
5. The wireless application launches in a separate window.



Local RADIUS Server

Follow these steps to enable a local RADIUS server:

1. Click **Wireless Security > Local Radius Server**.



2. Click the **General Set-Up** tab.
3. Scroll to the **User Groups** area of the **Security: Local RADIUS Server** screen.

STATISTICS GENERAL SET-UP

Hostname Router

Security: Local RADIUS Server - General Set-up

Network Access Servers (AAA Clients)

Current Network Access Servers

< NEW >

Network Access Server: (IP Address)

Shared Secret:

Delete

Apply Cancel

Individual Users

Current Users

< NEW >

Username:

Password: Text NT Hash

Confirm Password:

Group Name:

MAC Authentication Only

Delete

Apply Cancel

User Groups

Current User Groups

< NEW >

Group Name:

Session Timeout (optional): (1-4294967295 sec)

Failed Authentications before Lockout (optional): (1-4294967295)

Lockout (optional): Infinite Interval (1-4294967295 sec)

VLAN ID (optional):

SSID (optional): Add

Delete

Apply Cancel

4. Enter these values under **User Groups**:

Field	Value
Group Name	Default

Session Timeout	(Leave this field blank)
Failed Authentication before Lockout	3
Lockout	Interval, 600
VLAN ID	20
SSID	(Enter the Wireless Network Name from field W14 of the ISR Router Worksheet)

Click **Add** to add the SSID number.

User Groups

Current User Groups

< NEW >

Delete

Group Name:

Session Timeout (optional): (1-4294967295 sec)

Failed Authentications before Lockout (optional): (1-4294967295)

Lockout (optional):
 Infinite
 Interval (1-4294967295 sec)

VLAN ID (optional):

SSID (optional): Add

Delete

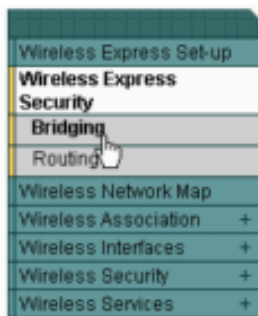
Apply
Cancel

5. Click **Apply** to save the changes.

Express Security

Follow these steps to set up Express Security:

1. Click **Wireless Express Security > Bridging**.



2. Enter these values in the **Express Security Bridging** screen:

Field	Value
SSID	(Enter the Wireless Network Name from field W14 of the ISR Router Worksheet)
VLAN	Enable VLAN ID, 20 Check Native VLAN
Bridge	1
Security	EAP Authentication
RADIUS Server	Enter the router IP address from field W10 of the ISR Router Worksheet.
RADIUS Server Secret	Enter the RADIUS Password from field W15 of the ISR Router Worksheet.

Express Security Bridging

SSID Configuration

1. **SSID** [Broadcast SSID in Beacon](#)

2. **VLAN** No VLAN Enable VLAN ID: (1-4094) Native VLAN

3. **Bridge** Bridge Group Number: (1-255)

4. **Security** [No Security](#)

[Static WEP Key](#)

[EAP Authentication](#)

RADIUS Server: (Hostname or IP Address)

RADIUS Server Secret:

[WPA](#)

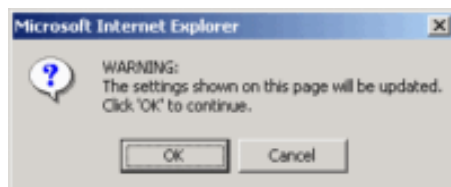
RADIUS Server: (Hostname or IP Address)

RADIUS Server Secret:

SSID Table

SSID	VLAN	Bridge Grp. Number	Encryption	Authentication	Key Management	Native VLAN	Broadcast SSID

3. Click **Apply** to save the changes. If a warning message appears to indicate that you are about to update your settings, click **OK** to continue.



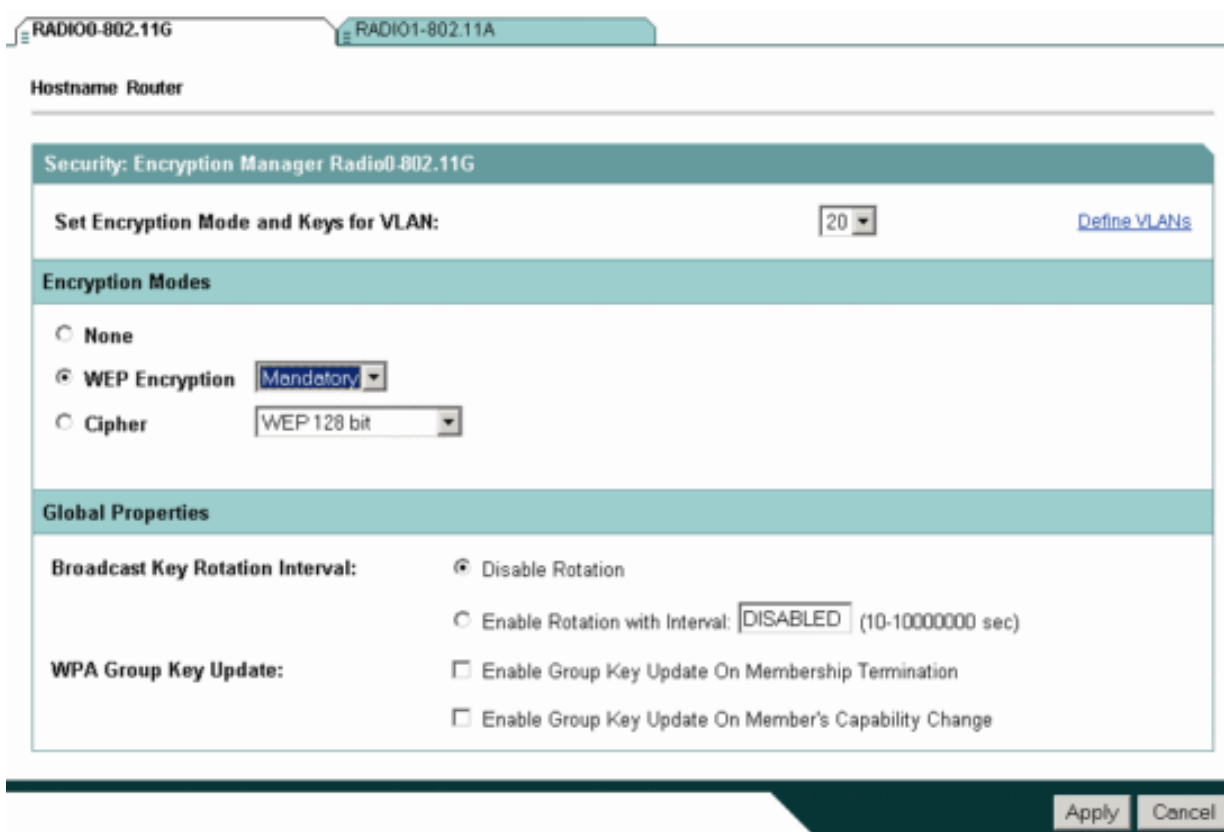
Encryption Manager

Follow these steps to complete the Encryption Manager:

1. Click **Wireless Security > Encryption Manager**.

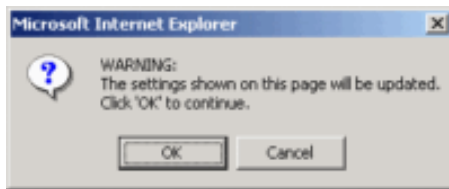


2. In the **Encryption Modes** area, choose **WEP Encryption** and **Mandatory**.



3. Click **Apply** to save the changes. When a warning message appears to indicate that you are about to

update your settings, click **OK** to continue.



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Next Step

You have completed basic configuration of the wireless module of your router.

To add additional users to your wireless network, refer to [Add or Remove a Wireless User](#).

If you want to configure an Internet connection, refer to the appropriate document for your connection. If you are not sure what connection type you have, refer to your Internet Worksheet.

- [Set Up an Ethernet Connection](#)
- [Set Up an ADSL Connection](#)
- [Set up a T1/E1/Serial Connection](#)
- [Set up an ISDN Connection](#)

Note: If your router is already connected to the Internet, refer to [Set Up Internet Security on a Cisco Router](#).

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)

I cannot access the router.

Refer to [Configure Your Router with Security Device Manager](#).

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Related Information

- [Configure Your Router with Security Device Manager](#)
- [Add or Remove a Wireless User](#)
- [Password Security](#)
- [Configure an IP Address on Your PC](#)



Set Up Your Cisco Router

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Step 6: Add or Remove a Wireless User on an Integrated Services Router

- Step 1: [SMB Support Assistant Site Survey](#)
- Step 2: [Set Up Your 800 or SB 100 Router Hardware](#)
[Set Up Your 1700 Series Router Hardware](#)
[Set Up Your 1800 Series Router Hardware](#)
[Set Up Your 2600 Series Router Hardware](#)
[Set Up Your 2800 Series Router Hardware](#)
[Set Up Your 3800 Series Router Hardware](#)
- Step 3: [Download and Install Security Device Manager](#)
- Step 4: [Configure Your Router with Security Device Manager](#)
- Step 5: [Configure Wireless Security on an Integrated Services Router \(ISR Only\)](#)
- Step 6: Add or Remove a Wireless User on an Integrated Services Router (ISR Only)**
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[Requirements](#)
[Connect to the Router](#)
[Add a New Wireless User](#)
[Remove a Wireless User](#)
[Next Step](#)
[Troubleshoot the Procedure](#)
[Related Information](#)
- Step 7: [Set Up an ADSL Internet Connection](#)
[Set Up an Ethernet Internet Connection](#)
[Set Up an ISDN Internet Connection](#)
[Set Up a T1, E1, or Serial Internet Connection](#)
- Step 8: [Set Up Internet Security on a Cisco Router](#)

Introduction

This document describes how to add or remove a wireless user on a Cisco Integrated Services Router.

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- [Step 6: Add or Remove a Wireless User on an Integrated Services Router](#)
- [Set Up Your Cisco Router](#)

This document solved my problem.

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Email:

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Requirements

To perform the steps described in this document, you need to have these items:

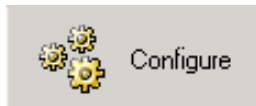
- Completed ISR Router Worksheet as instructed in the [Site Survey](#)
- A [crossover Ethernet cable](#) to connect the router to a PC
- You must have completed [Configure Wireless Security on an Integrated Services Router](#)

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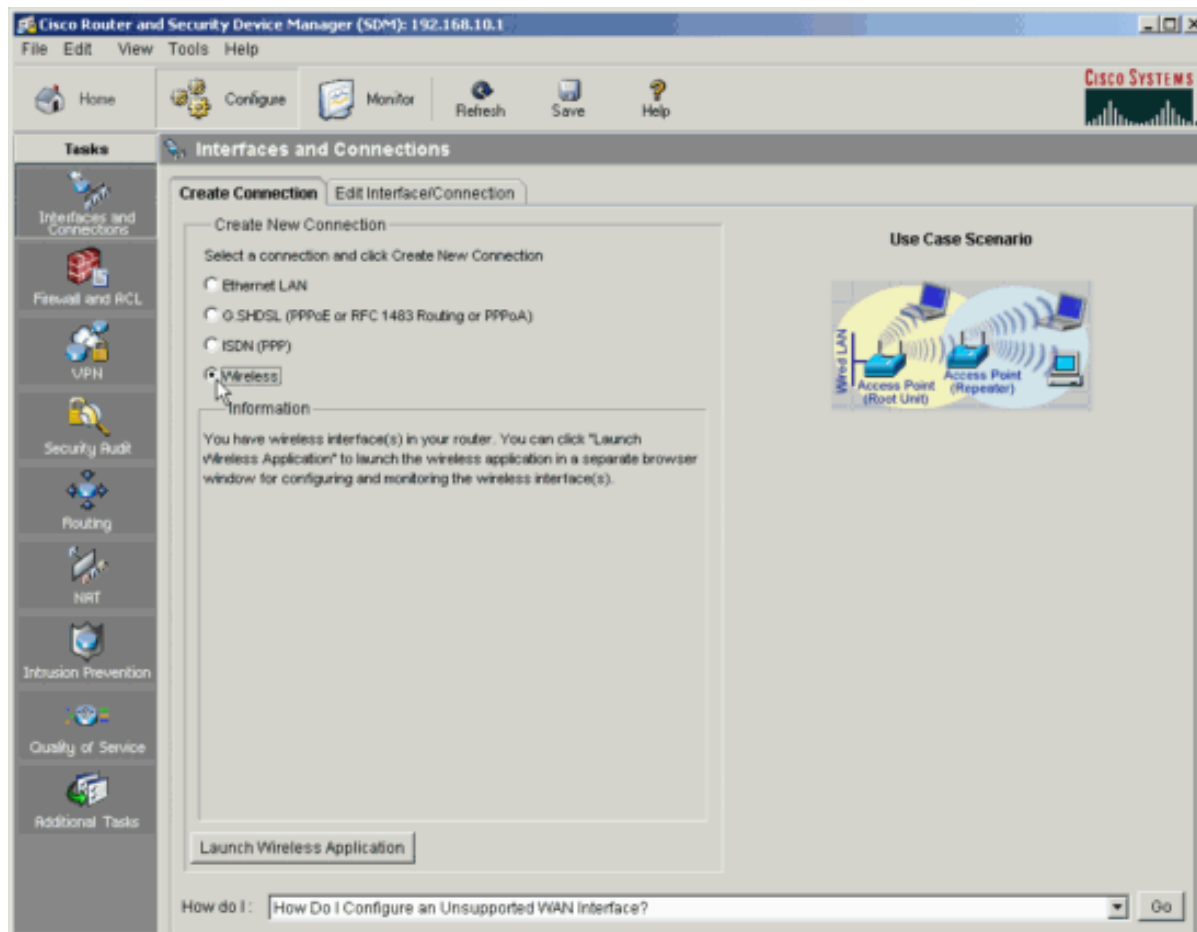
Connect to the Router

To connect to the ISR wireless management interface, follow these steps:

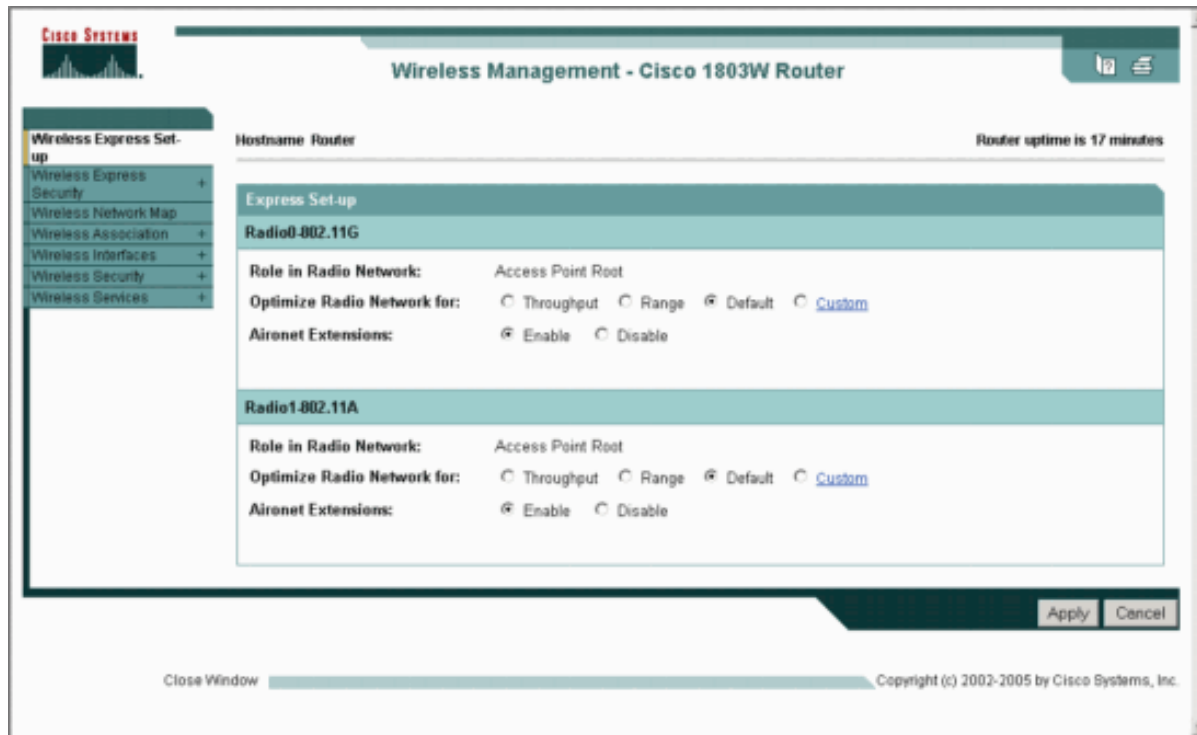
1. Connect your PC to the router with a [crossover Ethernet cable](#).
2. Configure your PC with an IP address that is on the same subnet as the AP. For instructions on how to change your PC Internet settings, refer to [Configure an IP Address on Your PC](#).
3. Open a web browser and enter the router IP address that you entered in field W10 of the Integrated Services Router Worksheet.
4. At the login prompt, enter the router password that you entered in field B11 of the Integrated Services Router Worksheet.
5. Click **Configure**.



6. In the **Create Connection** tab, select **Wireless** and click **Launch Wireless Application**.



7. The wireless application launches in a separate window.



8. Click **Wireless Security > Local RADIUS Server**.



9. Click the **General Setup** tab.

10. Scroll to the **Individual Users** area of the screen.



<div style="border: 1px solid #ccc; padding: 2px;">< NEW ></div>	Network Access Server: <input type="text"/> (IP Address)
<div style="border: 1px solid #ccc; padding: 2px;">Delete</div>	Shared Secret: <input type="text"/>
<div style="border: 1px solid #ccc; padding: 2px;">Apply</div> <div style="border: 1px solid #ccc; padding: 2px;">Cancel</div>	
Individual Users	
Current Users	
<div style="border: 1px solid #ccc; padding: 2px;">< NEW > ejones tmorrison</div>	Username: <input type="text"/>
<div style="border: 1px solid #ccc; padding: 2px;">Delete</div>	Password: <input type="text"/> <input checked="" type="radio"/> Text <input type="radio"/> NT Hash
	Confirm Password: <input type="text"/>
	Group Name: < NONE > ▼
	<input type="checkbox"/> MAC Authentication Only
<div style="border: 1px solid #ccc; padding: 2px;">Apply</div> <div style="border: 1px solid #ccc; padding: 2px;">Cancel</div>	
User Groups	
Current User Groups	
<div style="border: 1px solid #ccc; padding: 2px;">< NEW > Default</div>	Group Name: <input type="text"/>
<div style="border: 1px solid #ccc; padding: 2px;">Delete</div>	Session Timeout (optional): <input type="text"/> (1-4294967295 sec)
	Failed Authentications before Lockout (optional): <input type="text"/> (1-4294967295)
	Lockout (optional): <input type="radio"/> Infinite
	<input checked="" type="radio"/> Interval <input type="text"/> (1-4294967295 sec)
	VLAN ID (optional): <input type="text"/>
	SSID (optional): <input type="text"/> <div style="border: 1px solid #ccc; padding: 2px;">Add</div>
	<div style="border: 1px solid #ccc; padding: 2px; width: 100px; height: 30px; margin-top: 10px;"> </div> <div style="border: 1px solid #ccc; padding: 2px; float: right;">Delete</div>



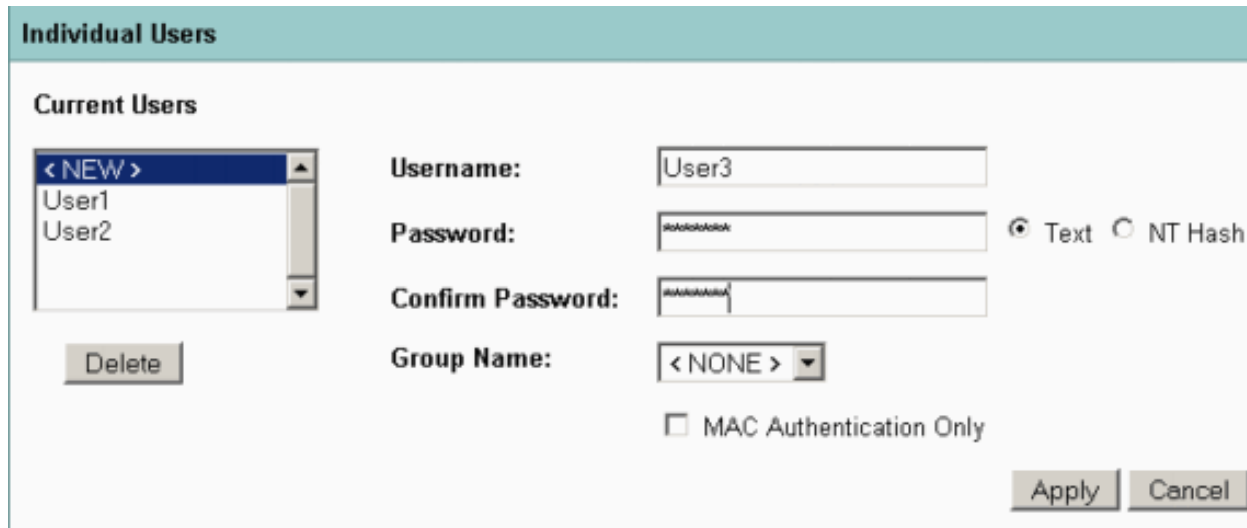
11. To add or remove a user, see [add a user](#) or [remove a user](#).

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Add a New Wireless User

To add a new user to your wireless network, follow these steps:

1. Scroll to the **Individual Users** area of the General Setup screen.
2. Ensure that **<NEW>** is selected under **Current Users**.
3. In the Username field, enter the username that you entered in field W33 of the Integrated Services Router Worksheet.



The screenshot shows the "Individual Users" configuration window. On the left, under "Current Users", a list box contains "<NEW>", "User1", and "User2", with "<NEW>" selected. Below the list is a "Delete" button. To the right, the "Username:" field contains "User3". The "Password:" field contains masked characters, and the "Confirm Password:" field also contains masked characters. The "Text" radio button is selected, and the "NT Hash" radio button is unselected. The "Group Name:" dropdown menu is set to "<NONE >". There is an unchecked checkbox for "MAC Authentication Only". At the bottom right, there are "Apply" and "Cancel" buttons.

4. Next to Password, choose **Text**.
5. Enter the user password in the **Password** field. Enter the password again in the **Confirm Password** field.

Note: Refer to [Password Security](#) for information about how to create strong passwords.

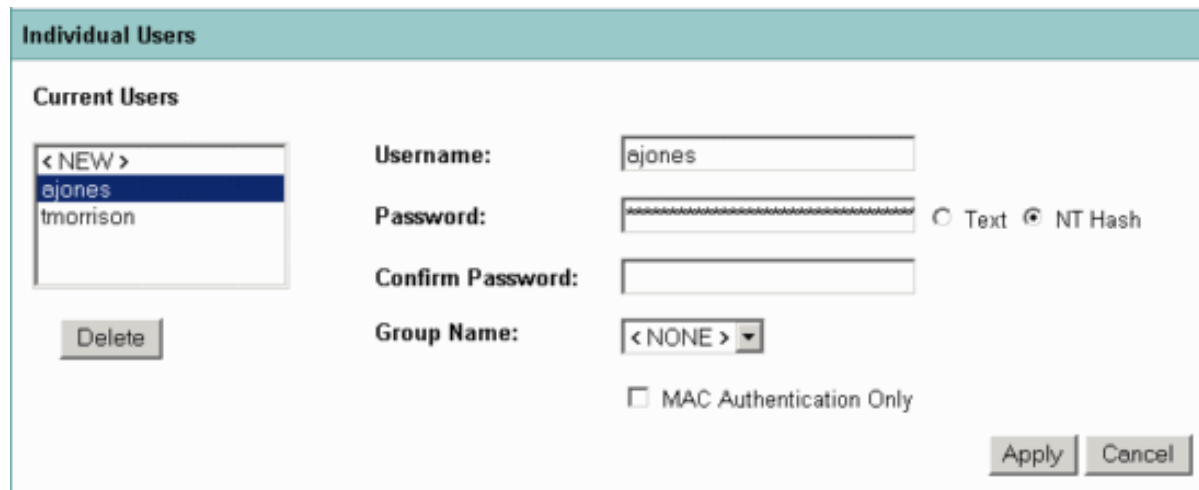
6. Click **Apply**.

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Remove a Wireless User

To remove a user from your wireless network, follow these steps:

1. Scroll to the **Individual Users** area of the General Setup screen.
2. Under **Current Users**, select the user that you want to delete.



The screenshot shows the "Individual Users" configuration window. On the left, under "Current Users", there is a list box containing "< NEW >", "ejones", and "tmorrison". The "ejones" user is selected. Below the list is a "Delete" button. To the right of the list are form fields: "Username:" with "ejones" entered, "Password:" with a masked field and radio buttons for "Text" and "NT Hash" (selected), "Confirm Password:" with an empty field, and "Group Name:" with "< NONE >" selected in a dropdown. There is also a checkbox for "MAC Authentication Only" which is unchecked. At the bottom right are "Apply" and "Cancel" buttons.

3. Click **Delete** to remove the user.

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Next Step

You have completed this procedure.

To configure an Internet connection, refer to the appropriate link for your connection type. If you are not sure what connection type you have, refer to your Internet Worksheet.

- [Set Up an Ethernet Connection](#)
- [Set Up an ADSL Connection](#)

- [Set up a T1/E1/Serial Connection](#)
- [Set up an ISDN Connection](#)

Note: If your router is already connected to the Internet, refer to [Set Up Internet Security on a Cisco Router](#).

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
I cannot access the router.	Refer to Configure Your Router with Security Device Manager .

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Related Information



- [Site Survey](#)
- [Cable Descriptions](#)
- [Configure Wireless Security on an Integrated Services Router](#)
- [Configure an IP Address on Your PC](#)
- [Password Security](#)



Set Up Your Cisco Router

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[Step 7: Set Up an ADSL WAN Connection](#)



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Step 7: Set Up an ADSL WAN Connection

- Step 1: [SMB Support Assistant Site Survey](#)
- Step 2: [Set Up Your 800 or SB 100 Router Hardware](#)
[Set Up Your 1700 Series Router Hardware](#)
[Set Up Your 1800 Series Router Hardware](#)
[Set Up Your 2600 Series Router Hardware](#)
[Set Up Your 2800 Series Router Hardware](#)
[Set Up Your 3800 Series Router Hardware](#)
- Step 3: [Download and Install Security Device Manager](#)
- Step 4: [Configure Your Router with Security Device Manager](#)
- Step 5: [Configure Wireless Security on an Integrated Services Router](#)
- Step 6: [Add or Remove a Wireless User on an Integrated Service Router](#)
- Step 7: Set Up an ASDL WAN Connection**
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 - [Troubleshoot the WAN Connection](#)
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- Step 8: [Set Up Internet Security on a Cisco Router](#)

Introduction

This document explains how to set up an ADSL WAN connection with PPPoE or RFC 1483 (PPPoA) encapsulation on your router.

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Requirements

- You must have completed the initial configuration of your router as presented in [Configure Your Router with Security Device Manager](#).
- You must have completed the [Site Survey](#), which includes the Internet worksheet for the router.
- Your router must have an ADSL WAN Interface Card (WIC). If you do not have an ADSL WIC or need assistance to install a new one, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

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Set Up an ADSL Connection

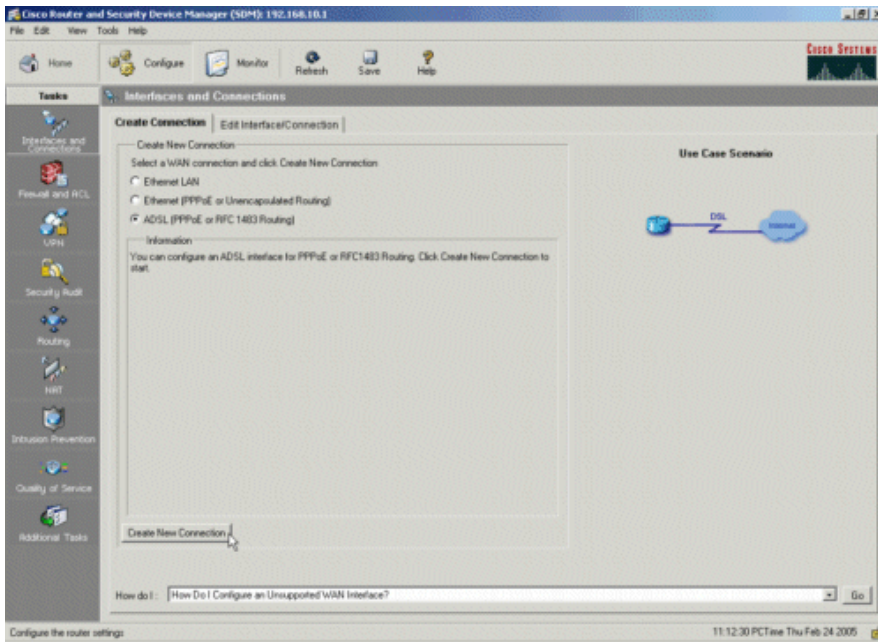
To set up an ADSL connection, follow these steps:

1. Open a web browser and type **http://router IP address** in the Address field. The router's IP address is the IP address that you entered in the LAN Addressing Worksheet (L6A).

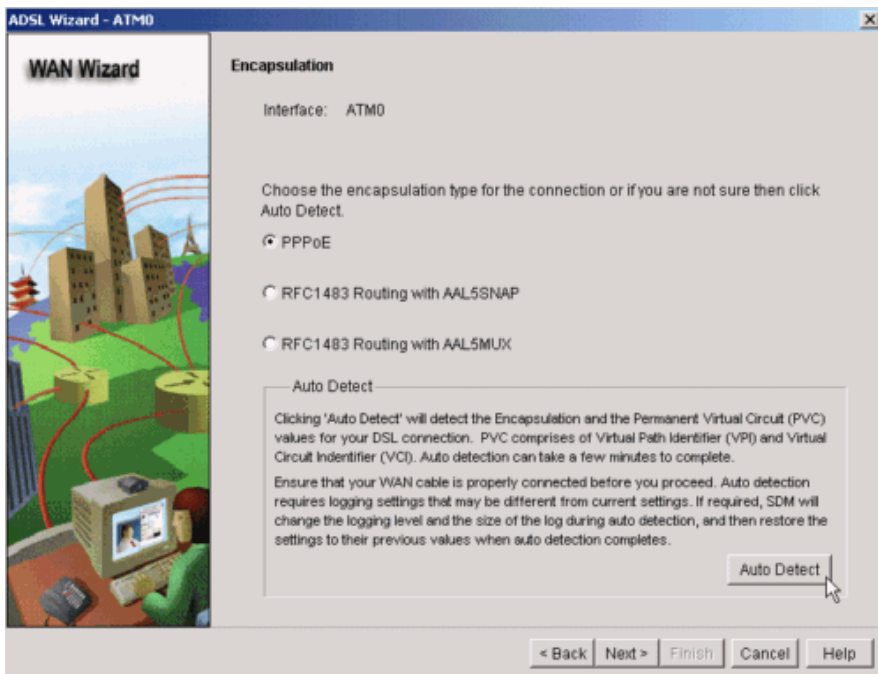
Note: For further information about how to launch SDM, refer to [Configure Your Router with Security Device Manager](#).

2. Click **Configure > Interfaces and Connections**.

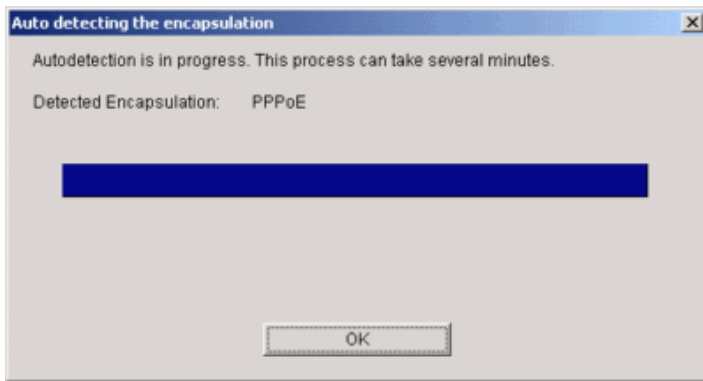
3. Choose **ADSL (PPPoE or RFC 1483 Routing)**, and then click **Create New Connection**.



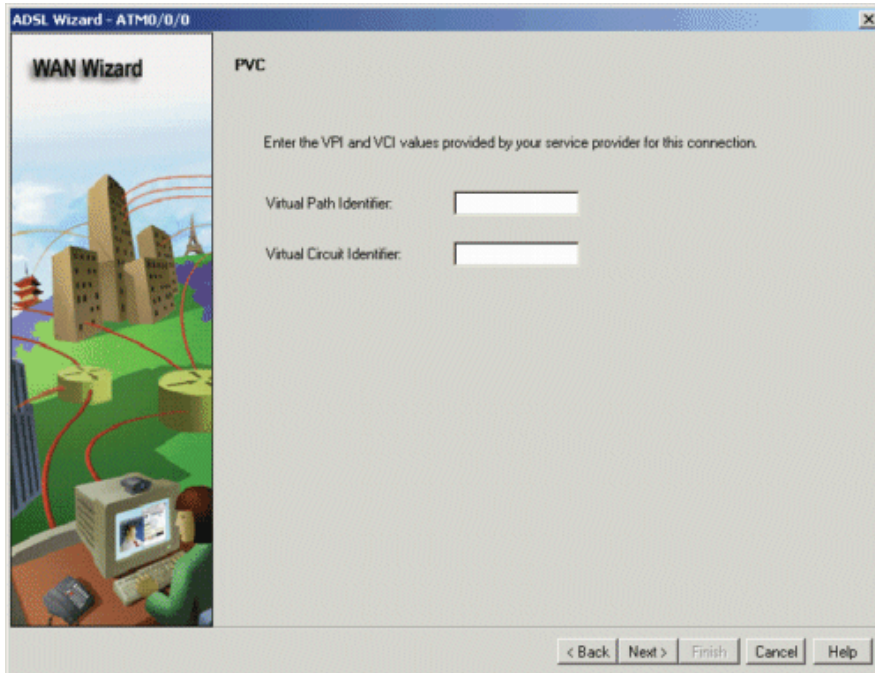
4. On the Welcome screen, click **Next** to begin the ADSL Wizard.
5. Click **Auto Detect**.



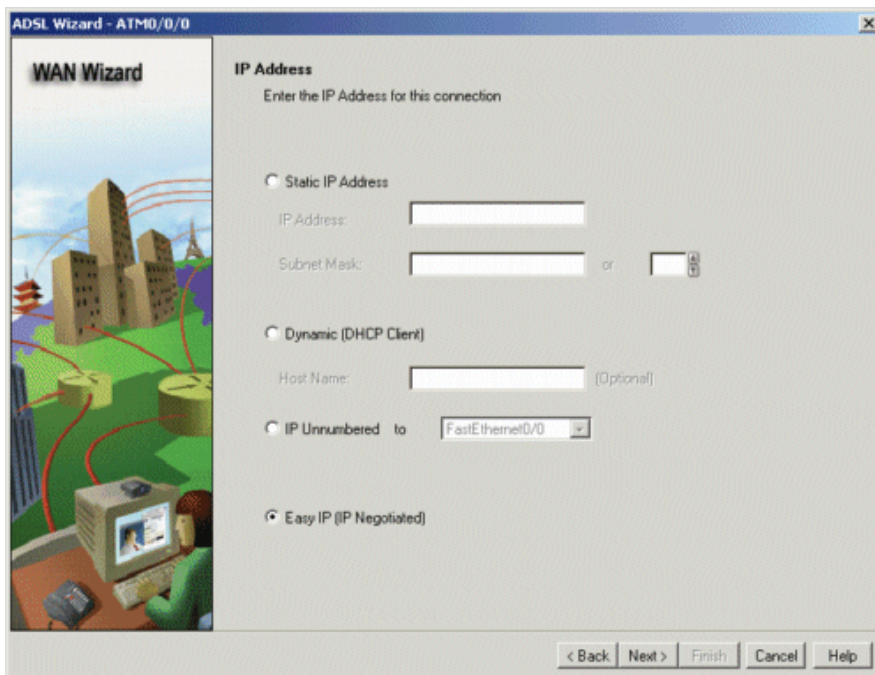
6. SDM attempts to determine the encapsulation for your ADSL connection. If SDM is unable to determine your encapsulation, click **OK** and manually enter the encapsulation type that you entered in the Internet Worksheet (A51), then click **Next**.



7. On the PVC screen, enter the VPI and VCI values that you entered in the Internet Worksheet (A52 and A53). Click **Next**.

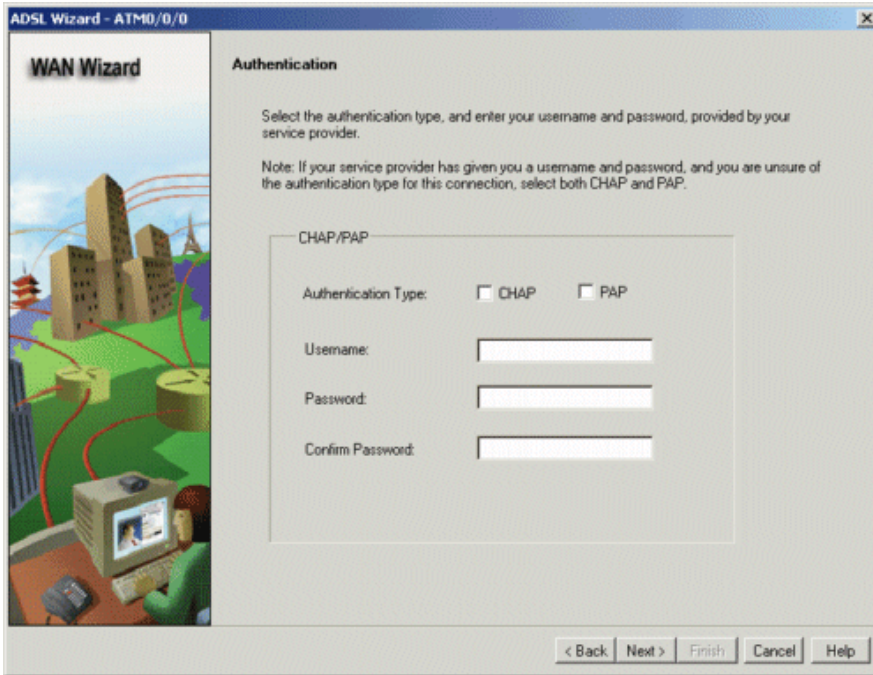


8. On the IP Address screen, choose the value you entered in the Internet Worksheet (B45 and B46). Click **Next**.

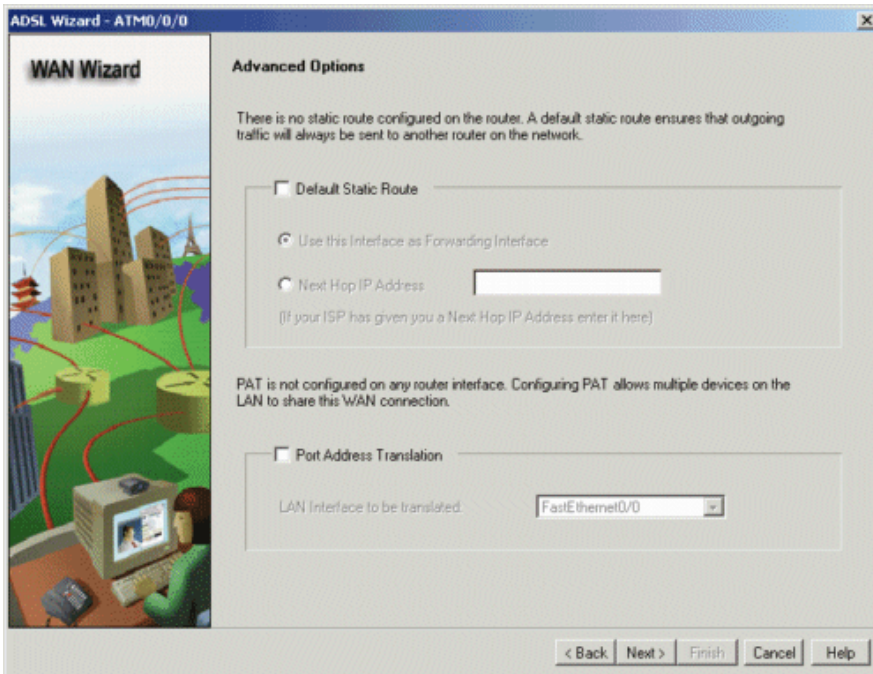


9. If you selected PPPoE in the Encapsulation screen, the Authentication screen appears. Enter the values

you entered in your Internet Worksheet (B62-B64). Click **Next**.



10. If you chose Static IP Address in the IP Address screen, the Advanced Options screen appears. Check **Default Static Route** and choose **Next Hop IP Address**. Enter the ISP Router IP Address that you entered in the Internet Worksheet (B47). Click **Next**.



11. On the Summary screen, review your configuration to ensure that it is accurate, and then click **Finish**.
12. When the Commands Delivery Status screen appears, click **OK** to confirm.
13. Click **Save** to save your new configuration.

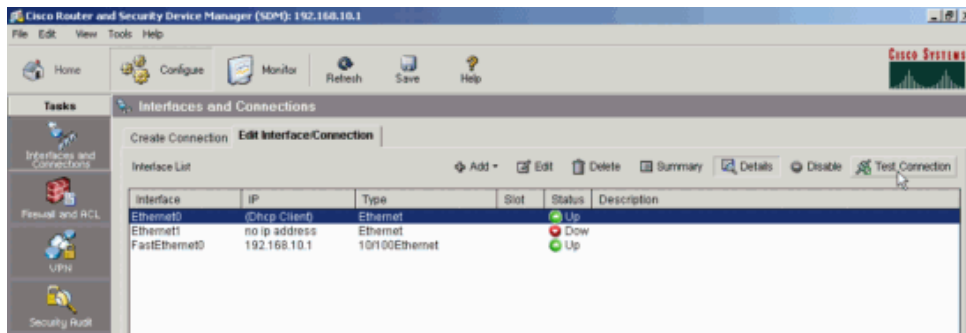


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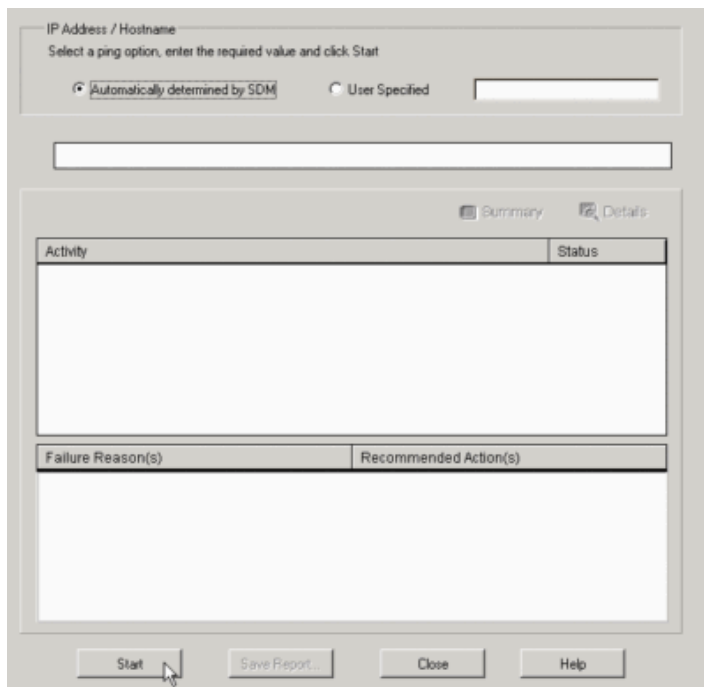
Verify the WAN Connection

To verify your WAN connection, follow these steps:

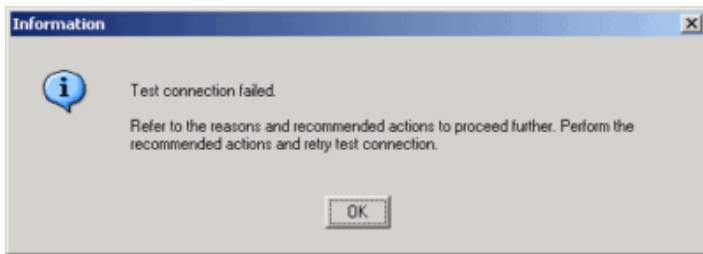
1. Click **Configure > Interfaces and Connections**.
2. Select your new WAN interface and click **Test Connection**.



3. Choose **Automatically determined by SDM**, and then click **Start** to begin the test.



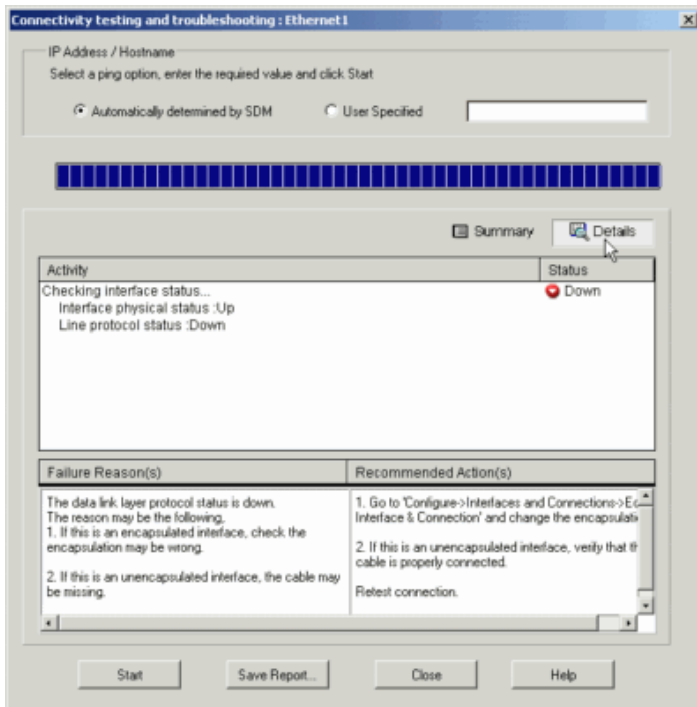
4. SDM displays a window that indicates whether or not the test was successful.



Click **OK** to close the Information window.

5. If the test is successful, proceed to the next step.

If the test failed, click **Details** to display the interface state. Make a note of the Interface State and proceed to [Troubleshoot WAN Connection](#).



6. Click **Close** to exit the testing interface.
7. Click **File > Exit** to exit SDM.

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Next Step

You have now set up an ADSL WAN connection.

You can now set up firewall and security options on your router. For instructions, refer to [Set Up Internet Security on a Cisco Router](#).

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)

<p>The Create Connection screen does not display an option for the WAN connection I want to set up.</p>	<ul style="list-style-type: none"> • Make sure the ADSL card is properly installed. For further assistance, contact SMB TAC. • If the card is installed and the router does not detect the card, contact SMB TAC for assistance. • If the router detects your WIC card but the settings you require are not available in the Create Connection Wizard, you have an unsupported interface type. You need to use the command-line interface (CLI) to configure your interface. Cisco recommends that you contact your Internet Service Provider to request a sample configuration. To access the CLI, refer to Create a HyperTerminal Connection. If you require further assistance, contact the SMB TAC.
<p>I need more information about my WAN connection to complete wizard.</p>	<p>Contact your Internet Service Provider (ISP) to confirm the details of your WAN connection.</p>
<p>I set up my WAN connection but it does not function properly.</p>	<p>See the Troubleshoot WAN Connection section.</p>

Troubleshoot the WAN Connection

If your WAN connection does not function correctly, use the table to determine the appropriate solution.

Interface physical status	Line Protocol Status	Action
Up	Up	<p>This interface status indicates that the router can communicate with the remote device on the WAN. If you still experience problems with the connection, contact your Internet Service Provider (ISP) for assistance.</p>
Administratively Down	Down	<p>This interface status indicates that the interface is disabled in the router configuration.</p> <p>To enable your interface, click Edit Interface/Connection, select your WAN interface, and click Enable.</p>
Down	Down	<p>This interface status indicates that the WAN interface is unable to communicate with a remote device.</p> <ul style="list-style-type: none"> • The router configuration does not match the configuration of the network. Contact your Internet Service Provider (ISP) to verify your configurations. • The router is not physically connected to the network. Ensure that the router is properly plugged into the WAN connection. • Verify with your Internet Service Provider (ISP) that service is ready for use. Make a note of your current interface state and your current configuration before you contact your ISP.

Up	Down	<p>This interface status indicates that the interface is enabled and the router is physically connected to a remote WAN device but the interface cannot communicate properly with the remote WAN device.</p> <ul style="list-style-type: none">• The router configuration does not match the configuration of the network. Contact your Internet Service Provider (ISP) to verify your configurations.• Check to ensure that you have the proper cable type connected to your WAN connection (from the ISP). Make a note of your current interface state and your current configuration before you contact your ISP. For more information about cable types, refer to Cable Descriptions.• Reset the router.
----	------	--

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Related Information



- [Configure Your Router with Security Device Manager](#)
- [Site Survey](#)
- [Set Up Internet Security on a Cisco Router](#)
- [Create a HyperTerminal Connection](#)
- [Cable Descriptions](#)



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 [Step 7: Set Up an Ethernet WAN Connection](#)

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Step 7: Set Up an Ethernet WAN Connection

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- Step 8: [Set Up Internet Security on a Cisco Router](#)

Introduction

This document explains how to set up an Ethernet WAN connection on your router.

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Requirements

- You must have completed the initial configuration of your router as presented in [Configure Your Router with Security Device Manager](#).
- You must have completed the [Site Survey](#), which includes the Internet worksheet for the router.
- Your router must have an Ethernet WAN Interface Card (WIC). If you do not have an Ethernet WIC or need assistance to install a new one, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

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Set Up an Ethernet Connection

To set up an Ethernet WAN connection, follow these steps:

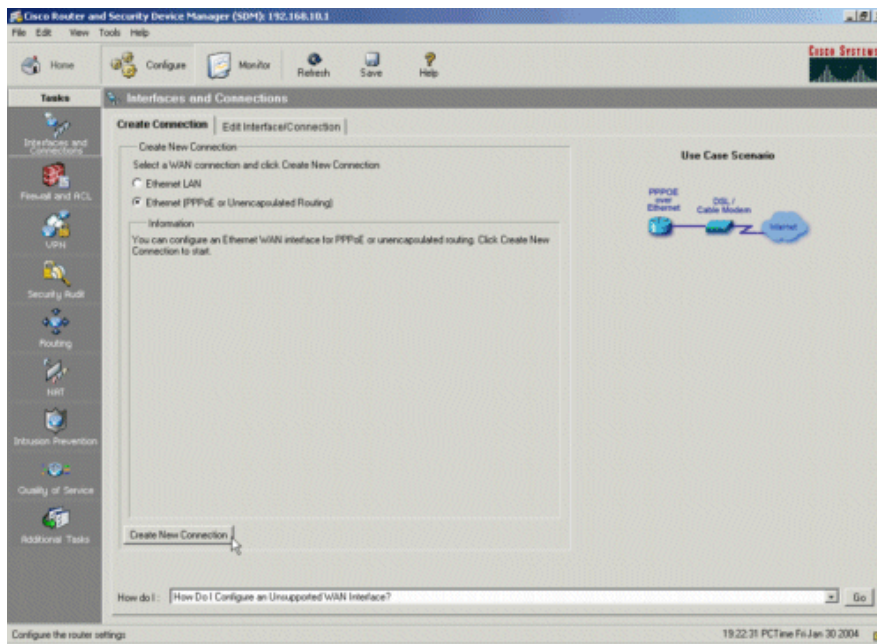
1. Open a web browser and type **http://router IP address** in the Address field. The router's IP address is the IP address that you entered in the LAN Addressing Worksheet (field L6A).

Note: For further information about how to launch SDM, refer to [Configure Your Router with Security Device Manager](#).

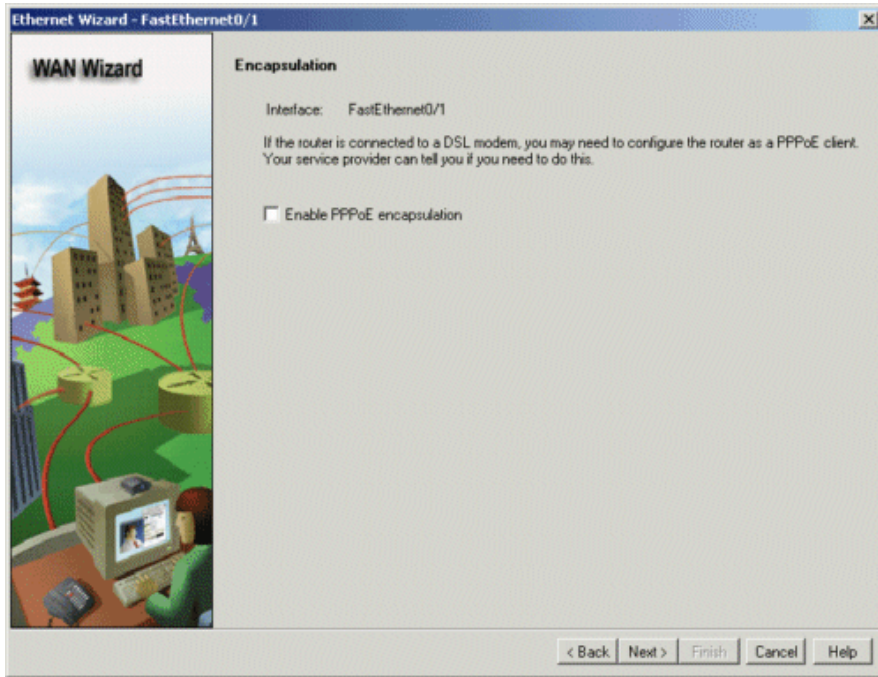
2. Click **Configure > Interfaces and Connections**.



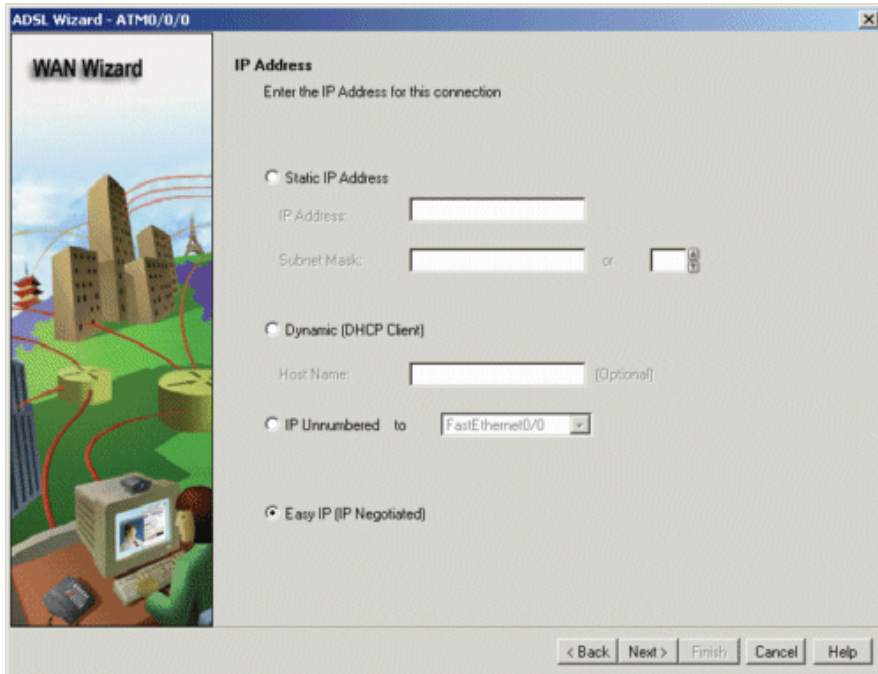
3. Choose **Ethernet (PPPoE or Unencapsulated Routing)**, and then click **Create New Connection**.



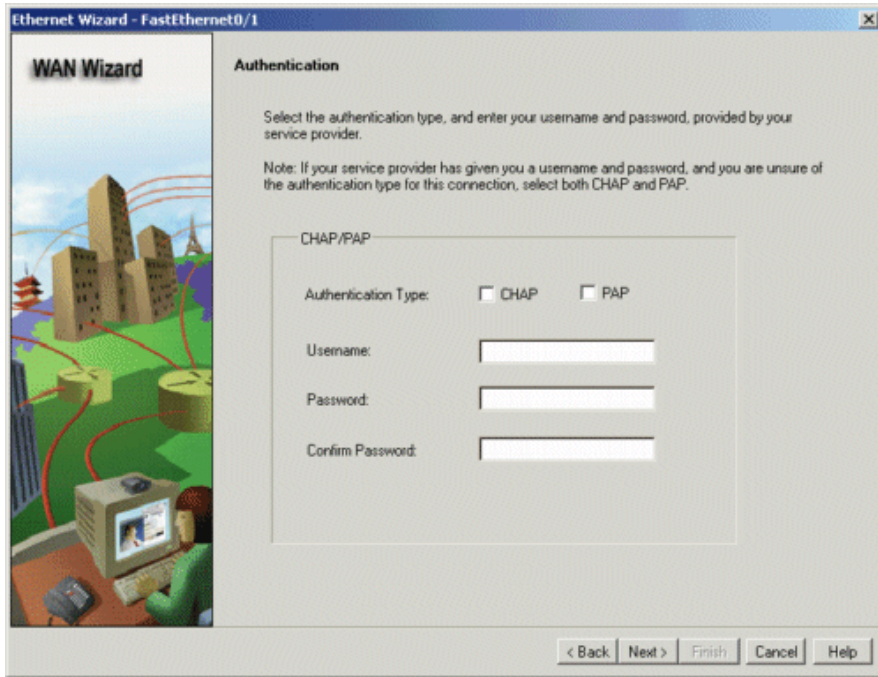
4. On the wizard's Welcome screen, click **Next** to begin the Ethernet Wizard.
5. On the Encapsulation screen, choose the encapsulation type that you entered in the Internet Worksheet (field A51). Click **Next**.



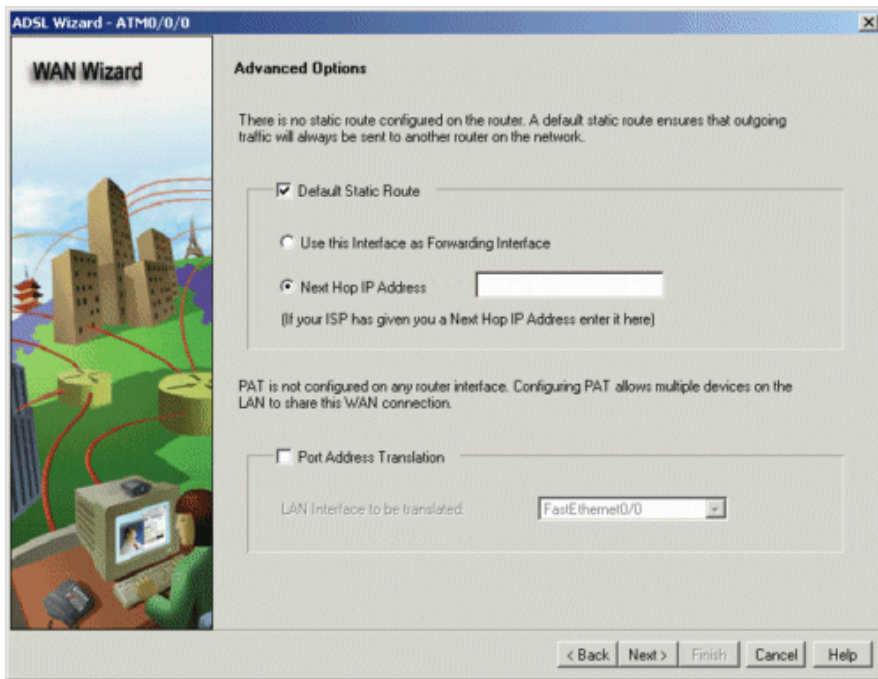
6. On the IP Address screen, choose the value you entered in the Internet Worksheet (fields B45 and B46). Click **Next**.



7. If you checked Enable PPPoE Encapsulation in the Encapsulation screen (Step 5), the Authentication screen appears. Enter the values you entered in your Internet Worksheet (fields B62-B64). Click **Next**.



8. If you chose Static IP Address in the IP Address screen (Step 6), the Advanced Options screen appears. Check **Default Static Route** and choose **Next Hop IP Address**. Enter the ISP Router IP address that you entered in the Internet Worksheet (field B47). Click **Next**.



9. On the Summary screen, review your configuration to ensure that it is accurate, and then click **Finish**.
10. When the Commands Delivery Status screen appears, click **OK** to confirm.
11. Click **Save** to save your new configuration.

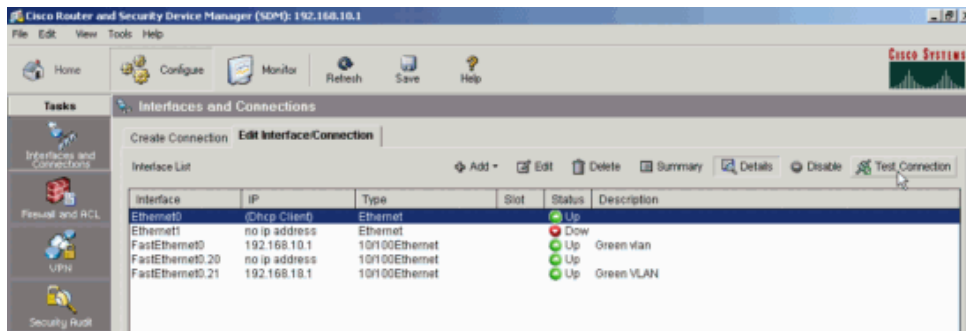


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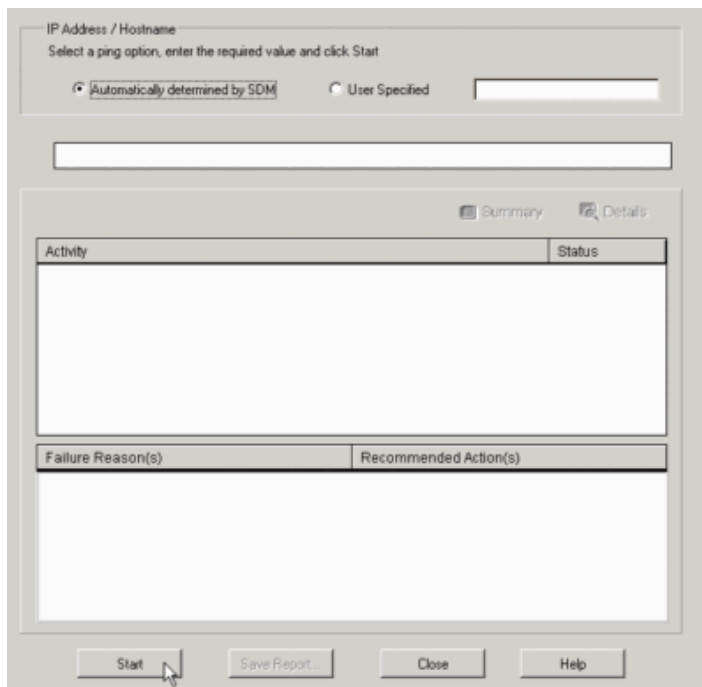
Verify the WAN Connection

To verify your WAN connection, follow these steps:

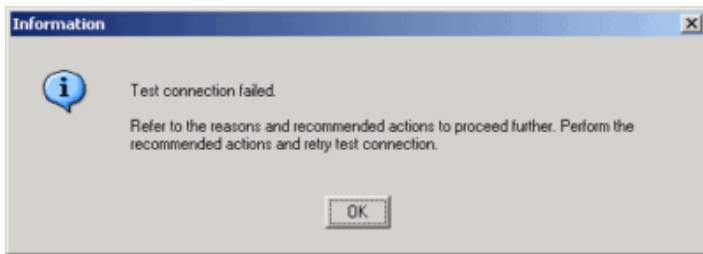
1. Click **Configure > Interfaces and Connections**.
2. Select your new WAN interface and click **Test Connection**.



3. Click **Automatically determined by SDM**, and then click **Start** to begin the test.



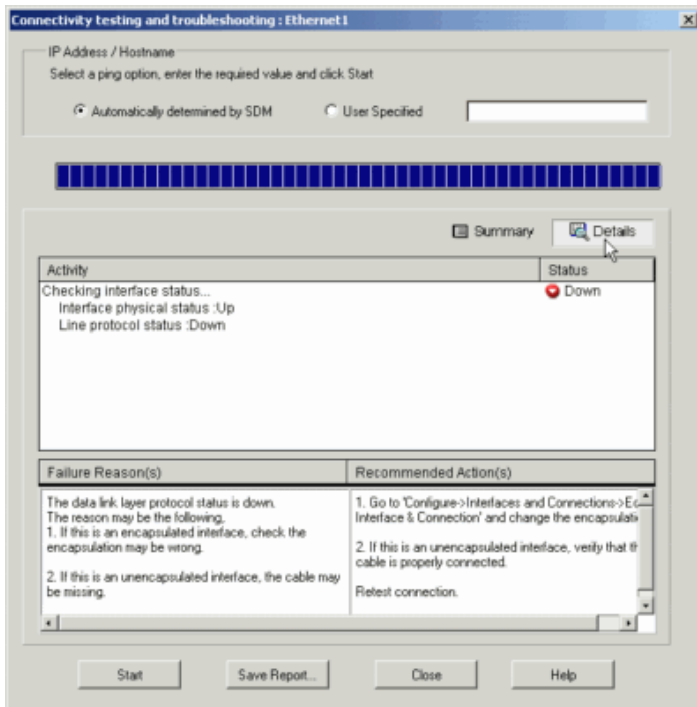
4. SDM displays a window that indicates whether or not the test was successful.



Click **OK** to close the Information window.

5. If the test is successful, proceed to the next step.

If the test failed, click **Details** to display the interface state. Note the Interface State and proceed to [Troubleshoot WAN Connection](#).



6. Click **Close** to exit the testing interface.

7. Click **File > Exit** to exit SDM.

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Next Step

You have now set up an Ethernet WAN connection.

You can now proceed to [Set Up Internet Security on a Cisco Router](#) to set up firewall and security options on your router.

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)

<p>The Create Connection screen does not display an option for my WAN connection type.</p>	<ul style="list-style-type: none"> • Make sure the Ethernet WIC is properly installed. Contact the SMB TAC for further assistance. • If the WIC is installed and SDM does not detect the card, contact the SMB TAC for assistance. . • If the router detects your WIC card but the settings you require are not available in the Create Connection Wizard, you have an unsupported interface type. You need to use the command-line interface (CLI) to configure your interface. Cisco recommends that you contact your Internet Service Provider to request a sample configuration. To access the CLI, refer to Create a HyperTerminal Connection. If you require further assistance, contact the SMB TAC.
<p>I need more information about my WAN connection to complete wizard.</p>	<p>Contact your Internet Service Provider (ISP) to confirm the details of your WAN connection.</p>
<p>I set up my WAN connection but it does not function properly.</p>	<p>See the Troubleshoot WAN Connection section.</p>

Troubleshoot the WAN Connection

Use the table to determine your problem and the appropriate solution.

Interface physical status:	Line Protocol Status	Action
Up	Up	<p>This interface status indicates that the interface functions properly and the router can communicate with the remote device on the WAN.</p>
Administratively Down	Down	<p>This interface status indicates that the interface is disabled in the router configuration.</p> <p>To enable your interface, click Edit Interface/Connection, select your WAN interface, and click Enable.</p>
Down	Down	<p>This interface status indicates that the WAN interface is unable to communicate with a remote device.</p> <ul style="list-style-type: none"> • Configurations do not match at all. Check your configurations. • Physical connection is not in place. Ensure that the router is properly plugged into the WAN connection. • Verify with your Internet Service Provider (ISP) that service is ready for use. Make a note of your current interface state and your current configuration before you contact your ISP.

Up	Down	<p>This interface status indicates that the interface is enabled and the router is physically connected to a remote WAN device, but the interface cannot communicate properly with the remote WAN device.</p> <ul style="list-style-type: none">• Check your configuration to make sure it matches exactly what your ISP says you should have.• Check to ensure that you have the proper cable type connected to your WAN connection (from the ISP). Make a note of your current interface state and your current configuration before you contact your ISP. For more information about cable types, refer to Cable Descriptions.• Reset the router.
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Related Information

- [Configure Your Router with Security Device Manager](#)
- [Site Survey](#)
- [Set Up Internet Security on a Cisco Router](#)
- [Create a HyperTerminal Connection](#)
- [Cable Descriptions](#)




Set Up Your Cisco Router

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Step 7: Set Up an ISDN WAN Connection

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- Step 2: [Set Up Your 800 or SB 100 Router Hardware](#)
[Set Up Your 1700 Series Router Hardware](#)
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Service Requests

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-  [Step 7: Set Up an ISDN WAN Connection](#)
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If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information:

Full Name:
Email:

Introduction

This document explains how to set up an ISDN WAN connection on your router.

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Requirements

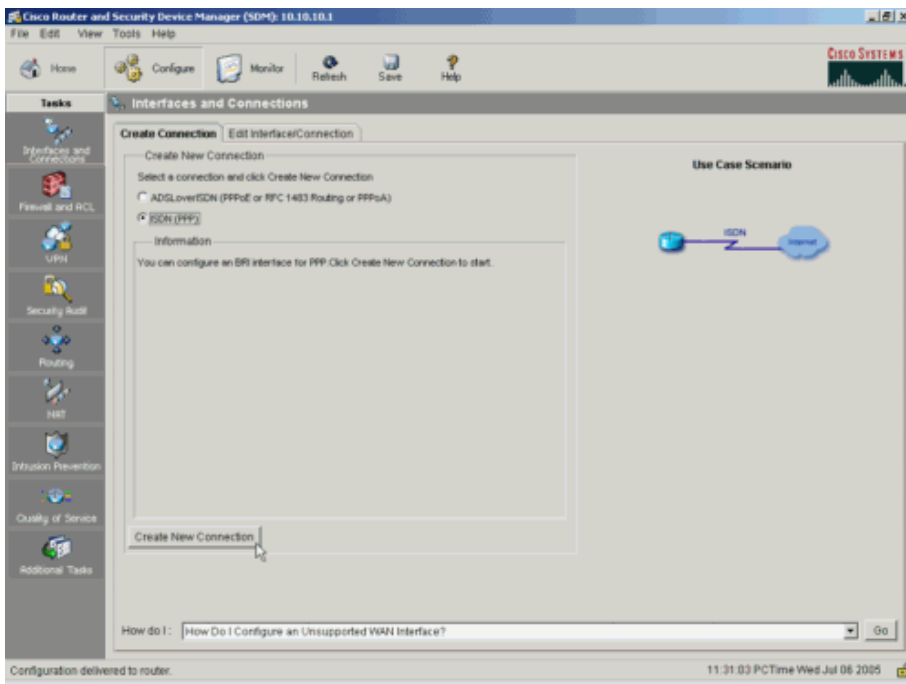
- You must have completed the initial configuration of your router as presented in [Configure Your Router with Security Device Manager](#).
- You must have completed the [Site Survey](#), which includes the Internet worksheet for the router.
- Your router must have a WAN Interface Card (WIC). If you do not have a WIC or need assistance to install a new one, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

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Set Up an ISDN WAN Connection

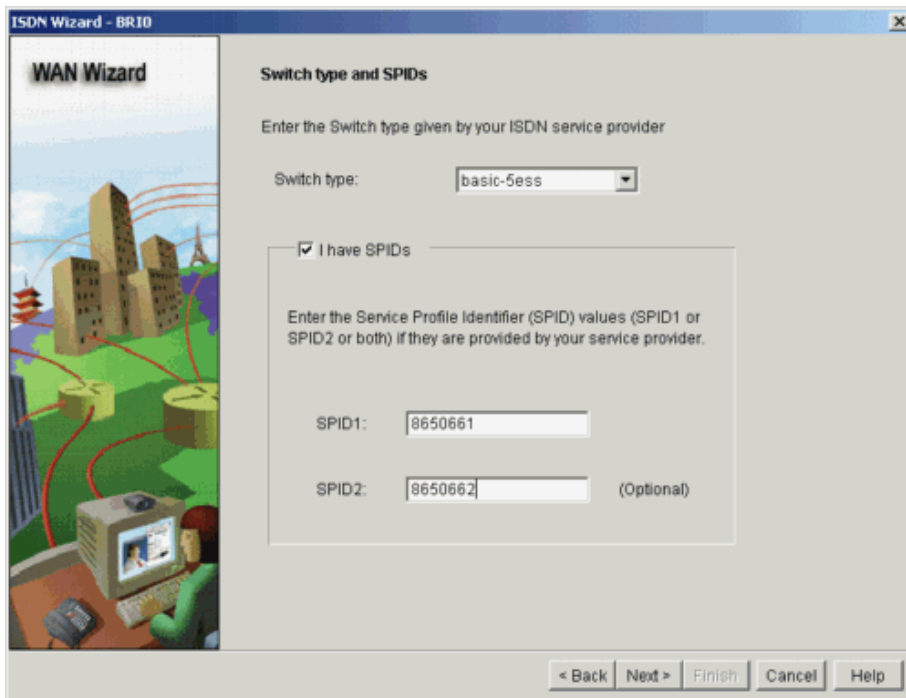
To set up an ISDN WAN connection, follow these steps:

1. Click **Create New Connection**.

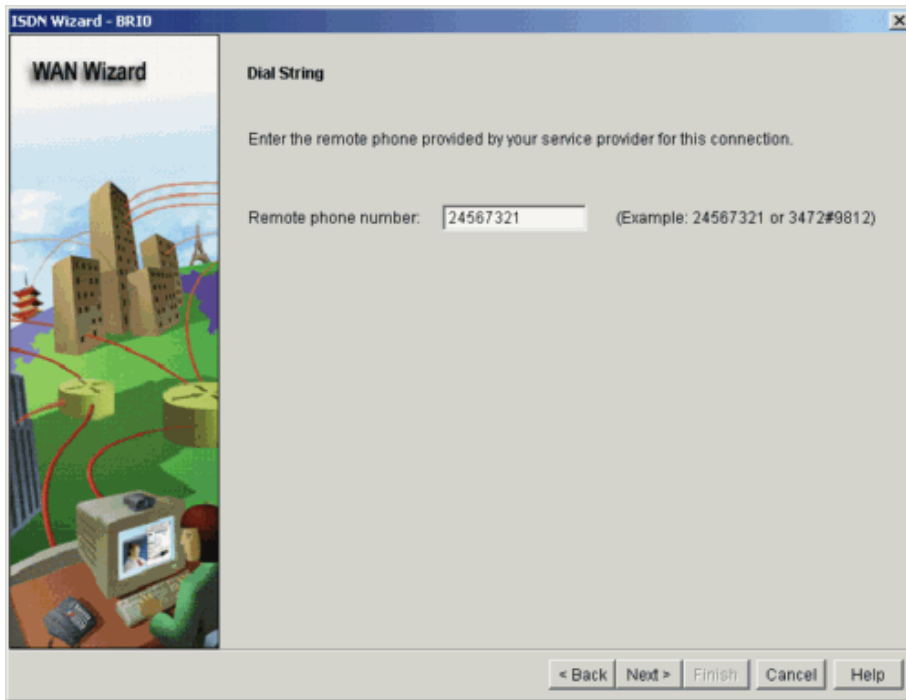


2. Click **Next** at the **Welcome to the ISDN connection Wizard** screen.
3. Next to **Switch type**, select the switch type that you entered in the Internet Worksheet (A30).

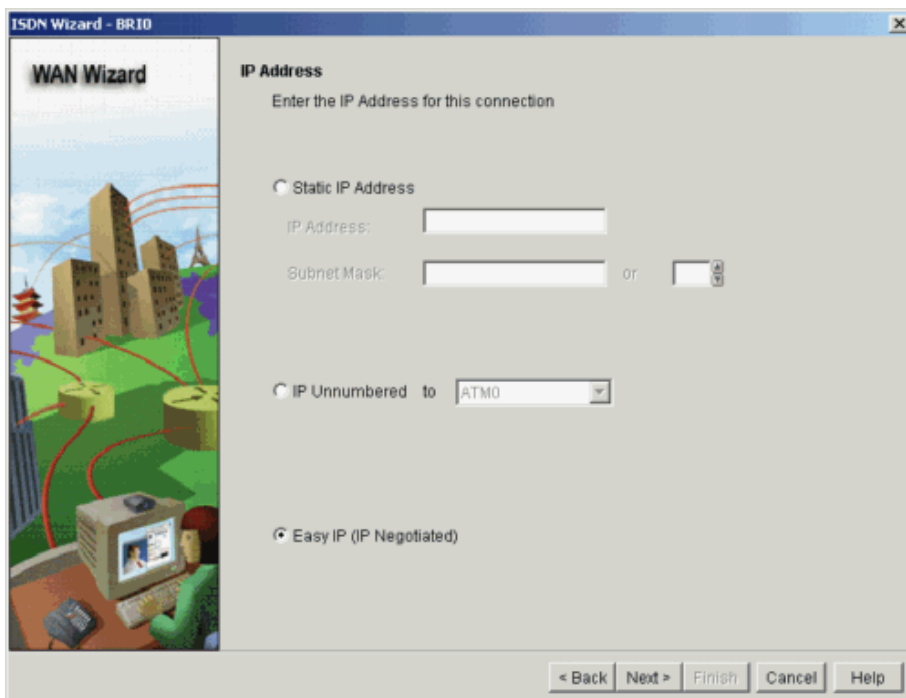
If you entered SPIDs in the Internet Worksheet (A33, A34), check **I have SPIDs**. If you entered a SPID 1 number(A33), enter the number next to **SPID1**. If you entered a SPID 2 number(A34), enter the number next to **SPID2**. Click **Next**.



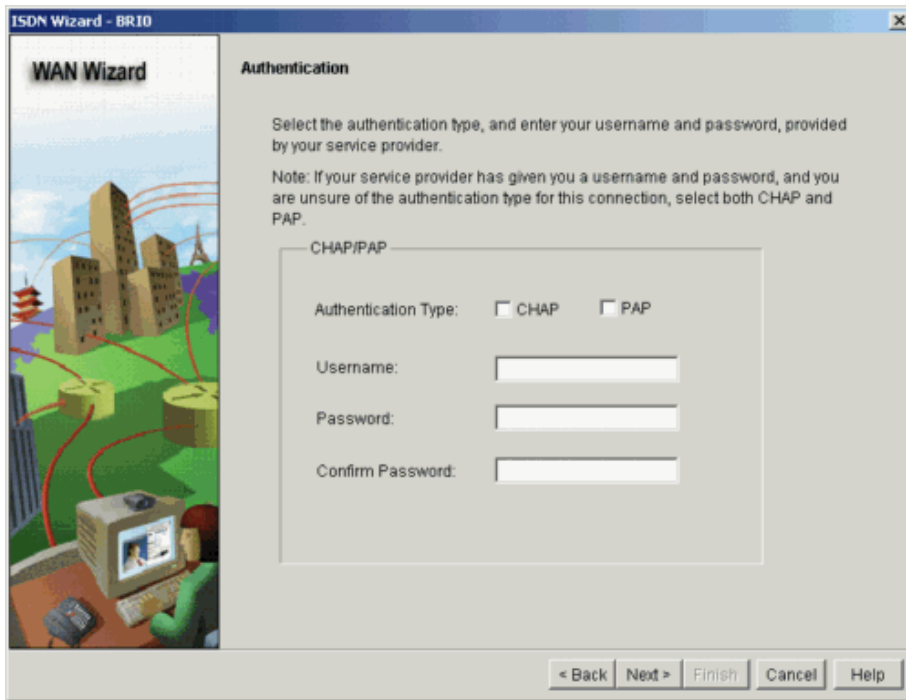
4. Next to **Remote phone number**, enter the ISP ISDN Access Number that you entered in the Internet Worksheet (A35). Click **Next**.



5. If you checked Static in field B43 of the Internet Worksheet, choose **Static IP Address** and enter the IP address and subnet mask that you entered in the Internet Worksheet (B46, B41). If you checked Dynamic in field B43 of the Internet Worksheet, choose **Easy IP (IP Negotiated)**. Click **Next**.

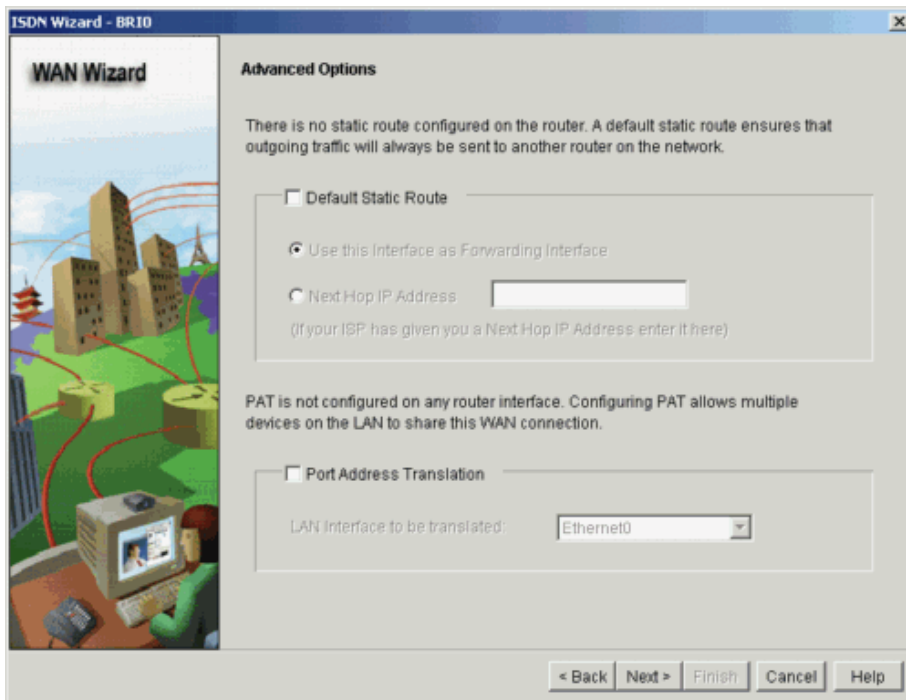


6. If you selected PPP PAP or PPP CHAP authentication in the Internet Worksheet (A37), check the appropriate type next to **Authentication Type**. In the **Username** and **Password** fields, enter the username and password that you entered in the Internet Worksheet (A38, A39). Click **Next**.



Note: If you have already configured another WAN connection, SDM displays the Backup Configuration screen. If you see the Backup Configuration screen, choose **Do not configure this connection as backup** and click **Next**.

7. If you checked Static in field B43 of the Internet Worksheet, check **Default Static Route** and choose **Next Hop IP Address**. Enter the ISP Router IP address that you entered in the Internet Worksheet (field B47). Click **Next**.



8. On the Summary screen, review your configuration to ensure that it is accurate, and then click **Finish**.
9. When the Commands Delivery Status screen appears, click **OK** to confirm.
10. Click **Save** to save your new configuration.

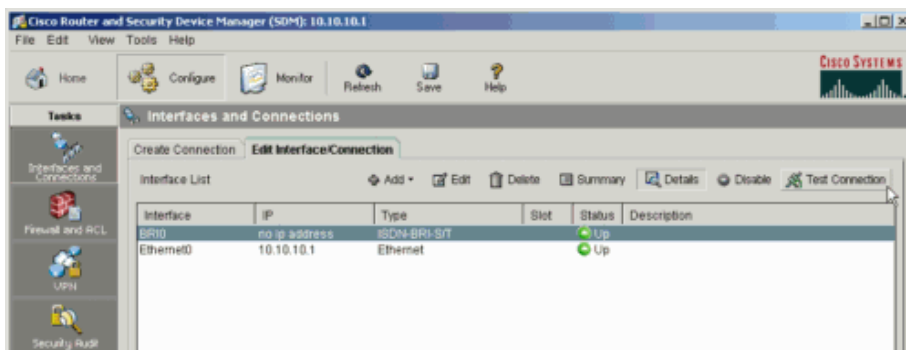


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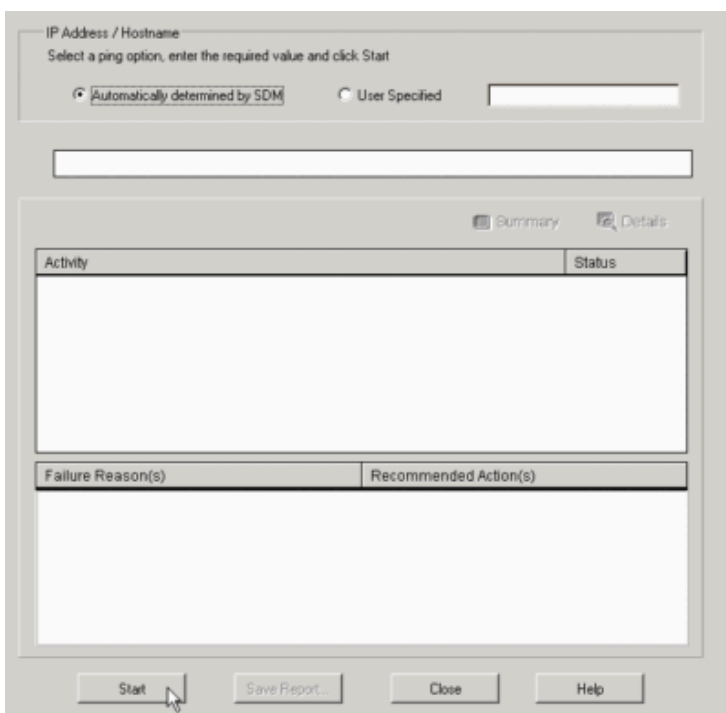
Verify the WAN Connection

To verify your WAN connection, follow these steps:

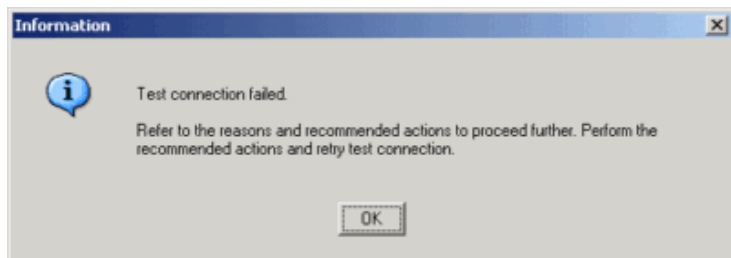
1. Click **Configure > Interfaces and Connections**.
2. Select your new WAN interface and click **Test Connection**.



3. Click **Automatically determined by SDM**, and then click **Start** to begin the test.



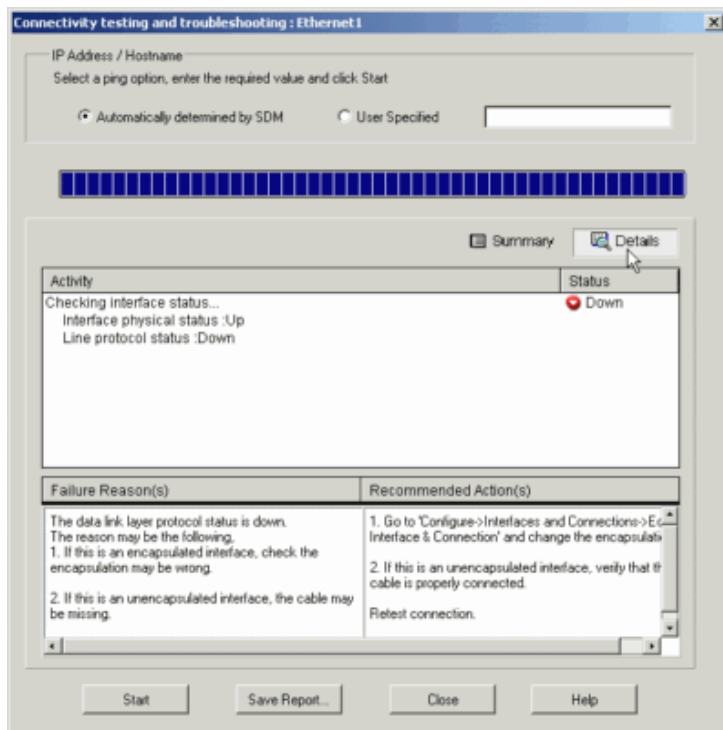
4. SDM displays a window that indicates whether or not the test was successful.



Click **OK** to close the Information window.

5. If the test is successful, proceed to the next step.

If the test failed, click **Details** to display the interface state. Note the Interface State and proceed to [Troubleshoot WAN Connection](#).



6. Click **Close** to exit the testing interface.

7. Click **File > Exit** to exit SDM.

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Next Step

You have now set up an ISDN WAN connection.

You can now set up firewall and security options on your router. For instructions, refer to [Set Up Internet Security on a Cisco Router](#).

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
I need more information about my ISDN connection in order to complete the configuration.	Contact your Internet Service Provider (ISP) to confirm the details of your ISDN connection.
I set up my WAN connection but it does not function properly.	See the Troubleshoot the WAN Connection section.
I want to set up an ISDN connection in addition to my primary Internet connection.	Contact the SMB Technical Assistance Center (SMB TAC) for assistance.
I want to set up an ISDN connection as a failover for my primary Internet connection.	Contact the SMB Technical Assistance Center (SMB TAC) for assistance.

Troubleshoot the WAN Connection

Use the table to determine your problem and the appropriate solution.

Interface physical status:	Line Protocol Status	Action
Up	Up	This interface status indicates that the interface functions properly and the router can communicate with the remote device on the WAN.
Administratively Down	Down	<p>This interface status indicates that the interface is disabled in the router configuration. To enable your interface, follow these steps:</p> <ol style="list-style-type: none"> 1. Type interface bri0/0 and press Enter. 2. Type no shutdown and press Enter. 3. Type end to exit configuration mode. 4. Type write memory to save the new configuration.
Down	Down	<p>This interface status indicates that the WAN interface is unable to communicate with a remote device.</p> <ul style="list-style-type: none"> • Your router configurations do not match the configurations used by your Internet Service Provider (ISP). Contact your ISP to verify that you have the correct settings. • A physical WAN connection is not in place. Ensure that the router is properly plugged into the WAN connection and that your ISP has completed installation of the WAN connection. • Verify with your Internet Service Provider (ISP) that service is ready for use. Make a note of your current interface state and your current configuration before you contact your ISP.

Up	Down	<p>This interface status indicates that the interface is enabled and the router is physically connected to a remote WAN device but the interface cannot communicate properly with the remote WAN device.</p> <ul style="list-style-type: none">• Your configuration partially matches the settings used in the ISP network. Contact your ISP to verify that you have the correct settings.• Check to ensure that you have the proper cable type attached to your WAN connection. Make a note of your current interface state and your current configuration before you contact your ISP. For more information about cable types, refer to Cable Descriptions.
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Related Information

- [Set Up Internet Security on a Cisco Router](#)
- [Configure Your Router with Security Device Manager](#)
- [Reset the Password on a Cisco Router](#)
- [Cable Descriptions](#)



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Step 7: Set Up a T1, E1, or Serial WAN Connection

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- Step 2: [Set Up Your 800 or SB 100 Router Hardware](#)
[Set Up Your 1700 Series Router Hardware](#)
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- Step 8: [Set Up Internet Security on a Cisco Router](#)

Introduction

This document explains how to set up a T1, E1, or serial WAN connection on your router.

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Requirements

- You must have completed the [Configure Your Router with Security Device Manager](#) document.

Service Requests

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[Step 7: Set Up a T1, E1, or Serial WAN Connection](#)

[Set Up Your Cisco Router](#)

Suggestions for improvement:

If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information.

Full Name:

E-mail:

- You must have completed the [Site Survey](#), which includes the Internet worksheet for the router.
- A WAN Interface Card (WIC). If you do not have a WIC card or need assistance to install a new WIC, contact the [SMB Technical Assistance Center \(SMB TAC\)](#).

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Verify Encapsulation Type

In order to configure your WAN Connection, you need to verify the encapsulation that the connection uses.

Consult the Internet Worksheet to determine the encapsulation type that your WAN connection will use (A22). Then select the appropriate section to configure your connection:

- If your connection uses HDLC encapsulation, see [Set Up a Connection with HDLC Encapsulation](#).
- If your connection uses PPP encapsulation, see [Set Up a Connection with PPP Encapsulation](#).
- If your connection uses Frame Relay encapsulation, see [Set Up a Connection with Frame Relay Encapsulation](#).

Note: If you have a Fractional T1 connection that uses fewer than 24 channels, contact [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

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Configure Your WAN Connection

To configure your WAN connection, follow these steps:

Set Up a Connection with HDLC Encapsulation

To set up a T1 connection with HDLC encapsulation, follow these steps:

1. Enter the IP address of your router in a browser window to open Security Device Manager (SDM). For more information about how to launch SDM, refer to the [Configure your Router with Security Device Manager](#) document.
2. Click **Configure > Interfaces and Connections**.
3. Choose **Serial (PPP, HDLC, or Frame Relay)** and click **Create New Connection**.

The screenshot displays the Cisco Router and Security Device Manager (SDM) interface. The title bar reads "Cisco Router and Security Device Manager (SDM): 64.171.105.51". The menu bar includes "File", "Edit", "View", "Tools", and "Help". The main toolbar contains icons for "Home", "Configure", "Monitor", "Refresh", "Save", and "Help". The "Cisco Systems" logo is in the top right corner.

The left sidebar shows a "Tasks" menu with icons for "Interfaces and Connections", "Firewall and ACL", "VPN", "Security Audit", "Routing", "NAT", "Intrusion Prevention", "Quality of Service", and "Additional Tasks".

The main content area is titled "Interfaces and Connections" and has two tabs: "Create Connection" (selected) and "Edit Interface/Connection".

Under "Create New Connection", there are radio buttons for:
 Ethernet LAN
 Ethernet (PPPoE or Unencapsulated Routing)
 Serial (PPP, HDLC or Frame Relay)
 Other (Unsupported by SDM)

An "Information" section contains the text: "You can configure a Serial interface for HDLC, PPP or Frame Relay. Click Create New Connection to start."

A "Use Case Scenario" diagram shows a router icon connected to a cloud icon labeled "Internet". The connection is labeled "Serial (PPP, HDLC or Frame Relay)".

A "Create New Connection" button is highlighted with a mouse cursor.

At the bottom, a "How do I:" dropdown menu shows "How Do I Configure an Unsupported WAN Interface?" and a "Go" button.

The status bar at the bottom left says "Configure the router settings" and the bottom right shows the time "08:29:31 PST Wed Mar 16 2005" and a lock icon.

4. Click **Next** at the **Welcome to the Serial WAN Configuration Wizard** screen.
5. Choose **High-Level Data Link Control** and click **Next**.



6. If you have an WAN connection with a static IP address, enter the router IP address and subnet mask that you entered in the Internet Worksheet (B46, B41). If you have WAN connection that is unnumbered, choose **IP Unnumbered** and select the first available LAN interface such as Ethernet0, FastEthernet0 or FastEthernet0/0.

Serial Wizard - Serial0/0(T1 CSU/DSU)

WAN Wizard

IP Address

Enter the IP Address for this connection


Static IP Address

IP Address:

Subnet Mask: or

IP Unnumbered to:

< Back Next > Finish Cancel Help



7. Choose these clock settings:

- o **Clock Source:** Choose **line** unless your Internet Service Provider (ISP) recommends a different setting.
- o **T1 Framing:** Enter the value you entered in the Internet Worksheet (A21).
- o **Linecode:** Enter the value you entered in the Internet Worksheet (A20).
- o **Data Coding:** Choose **normal** unless your ISP recommends a different setting.
- o **Facilities Data Link(FDL):** Choose **none** unless your ISP recommends a different setting.
- o **Line Build Out(LBO):** Choose **none** unless your ISP recommends a different setting.
- o **Remote-loopback Request:** Choose **full** unless your ISP recommends a different setting.

Serial Wizard - Serial0/0(T1 CSU/DSU)

WAN Wizard

Configure Clock Settings

These are the default clock settings. Change them only if you have a different requirement. This information should be provided by your service provider.

Clock Source	line
T1 Framing	esf
Lincode	b8zs
Data Coding	normal
Facilities Data Link(FDL)	none
Line Build Out(LBO)	none
Remote-loopback Request	full

Enable generation/detection of remote alarms

< Back Next > Finish Cancel Help

8. Review the configuration in the **Summary** screen and click **Finish**.
9. The **Commands Delivery Status** screen appears. Click **OK** to confirm.
10. Click **Save** to save your new configuration.



11. Click **File > Exit** to exit SDM.



Set Up a Connection with PPP Encapsulation

To set up a T1 connection with HDLC encapsulation, follow these steps:

- Encapsulation (Y/N)
- Encapsulation type
(A22)

1. Enter the IP address of your router in a browser window to open Security Device Manager (SDM). For more information about how to launch SDM, refer to the [Configure your Router with Security Device Manager](#) document.
2. Click **Configure > Interfaces and Connections**.
3. Choose **Serial (PPP, HDLC, or Frame Relay)** and click **Create New Connection**.

The screenshot displays the Cisco Router and Security Device Manager (SDM) interface. The title bar shows the URL "Cisco Router and Security Device Manager (SDM): 64.171.105.51". The main window is titled "Interfaces and Connections" and contains a "Create Connection" wizard. The wizard has two tabs: "Create Connection" (selected) and "Edit Interface/Connection".

The "Create Connection" tab is divided into two sections:

- Create New Connection:** This section prompts the user to "Select a WAN connection and click Create New Connection". It features four radio button options:
 - Ethernet LAN
 - Ethernet (PPPoE or Unencapsulated Routing)
 - Serial (PPP, HDLC or Frame Relay)
 - Other (Unsupported by SDM)
- Information:** This section contains the text: "You can configure a Serial interface for HDLC, PPP or Frame Relay. Click Create New Connection to start."

At the bottom of the wizard, there is a "Create New Connection" button. Below the main content area, there is a search bar labeled "How do I:" with the text "How Do I Configure an Unsupported WAN Interface?" and a "Go" button.

On the right side of the wizard, there is a "Use Case Scenario" diagram showing a router connected to the Internet via a "Serial" link, with the text "(PPP, HDLC or Frame Relay)" below it.

The left sidebar contains a "Tasks" menu with icons for: Interfaces and Connections, Firewall and ACL, VPN, Security Audit, Routing, NAT, Intrusion Prevention, Quality of Service, and Additional Tasks.

The bottom status bar shows "Configure the router settings" on the left and "08:29:31 PST Wed Mar 16 2005" on the right.

4. Click **Next** at the **Welcome to the Serial WAN Configuration Wizard** screen.
5. Choose **Point-to-Point Protocol** and click **Next**.



6. Enter the router IP address and subnet mask that you entered in the Internet Worksheet (B46, B41).

Serial Wizard - Serial0/0(T1 CSU/DSU)

WAN Wizard

IP Address

Enter the IP Address for this connection


Static IP Address

IP Address:

Subnet Mask: or

IP Unnumbered to:

< Back Next > Finish Cancel Help



7. Choose the Authentication Type and authentication Username and Password that you entered in the Internet Worksheet (A25, A26, A27).

Serial Wizard - Serial0/0(T1 CSU/DSU)

WAN Wizard

Authentication

Select the authentication type, and enter your username and password, provided by your service provider.

Note: If your service provider has given you a username and password, and you are unsure of the authentication type for this connection, select both CHAP and PAP.

CHAP/PAP


Authentication Type: CHAP PAP

Username:

Password:

Confirm Password:

< Back Next > Finish Cancel Help



8. Choose these clock settings:

- o **Clock Source:** Choose **line** unless your Internet Service Provider (ISP) recommends a different setting.
- o **T1 Framing:** Enter the value you entered in the Internet Worksheet (A21).
- o **Linecode:** Enter the value you entered in the Internet Worksheet (A20).
- o **Data Coding:** Choose **normal** unless your ISP recommends a different setting.
- o **Facilities Data Link(FDL):** Choose **none** unless your ISP recommends a different setting.
- o **Line Build Out(LBO):** Choose **none** unless your ISP recommends a different setting.
- o **Remote-loopback Request:** Choose **full** unless your ISP recommends a different setting.

Serial Wizard - Serial0/0(T1 CSU/DSU)

WAN Wizard

Configure Clock Settings

These are the default clock settings. Change them only if you have a different requirement. This information should be provided by your service provider.

Clock Source	line
T1 Framing	esf
Lincode	b8zs
Data Coding	normal
Facilities Data Link(FDL)	none
Line Build Out(LBO)	none
Remote-loopback Request	full

Enable generation/detection of remote alarms

< Back Next > Finish Cancel Help

- Review the configuration in the **Summary** screen and click **Finish**.
- The **Commands Delivery Status** screen appears. Click **OK** to confirm.
- Click **Save** to save your new configuration.



12. Click **File > Exit** to exit SDM.



Set Up a Connection with Frame Relay Encapsulation

To set up a T1 connection with HDLC encapsulation, follow these steps:

1. Enter the IP address of your router in a browser window to open Security Device Manager (SDM). For more information about how to launch SDM, refer to the [Configure your Router with Security Device Manager](#) document.
2. Click **Configure > Interfaces and Connections**.
3. Choose **Serial (PPP, HDLC, or Frame Relay)** and click **Create New Connection**.

The screenshot displays the Cisco Router and Security Device Manager (SDM) interface. The title bar indicates the device IP is 64.171.105.51. The main window is titled 'Interfaces and Connections' and shows the 'Create Connection' wizard. The 'Create New Connection' section is active, with the 'Serial (PPP, HDLC or Frame Relay)' option selected. The 'Information' section provides instructions: 'You can configure a Serial interface for HDLC, PPP or Frame Relay. Click Create New Connection to start.' A 'Create New Connection' button is highlighted with a mouse cursor. To the right, a 'Use Case Scenario' diagram shows a router connected to the Internet via a Serial link (PPP, HDLC or Frame Relay). The bottom status bar shows 'Configure the router settings' and the time '08:29:31 PST Wed Mar 16 2005'.

4. Click **Next** at the **Welcome to the Serial WAN Configuration Wizard** screen.
5. Choose **Frame Relay** encapsulation and click **Next**.



6. Enter the router IP address and subnet mask that you entered in the Internet Worksheet (B46, B41).

Serial Wizard - Serial0/0(T1 CSU/DSU)

WAN Wizard

IP Address

Enter the IP Address for this connection


Static IP Address

IP Address:

Subnet Mask: or

IP Unnumbered to:


< Back Next > Finish Cancel Help



7. Choose **autosense** in the **LMI Type** field unless your ISP recommends a different setting. Enter the DLCI value that you entered in the Internet Worksheet in the **DLCI** field (A24). Check the **Use IETF Frame Relay Encapsulation** box if you are connecting to a Frame Relay network with non-Cisco equipment. For more information, consult your Internet Service Provider (ISP).

Serial Wizard - Serial0/0(T1 CSU/DSU)

WAN Wizard



Configure LMI & DLCI

The Local Management Interface (LMI) Type specifies the protocol used to monitor this frame relay connection. This information should be provided by your service provider

LMI Type

ANSI Cisco ITU-T Q.933 autosense

Because a serial interface can be shared among many connections, a unique identifier known as Data Link Connection Identifier is required. This information should be provided by your service provider

DLCI:

Select IETF check box when connecting to non Cisco routers

Use IETF Frame Relay Encapsulation

< Back Next > Finish Cancel Help

8. Choose these clock settings:

- **Clock Source:** Choose **line** unless your Internet Service Provider (ISP) recommends a different setting.
- **T1 Framing:** Enter the value you entered in the Internet Worksheet (A21).
- **Linecode:** Enter the value you entered in the Internet Worksheet (A20).
- **Data Coding:** Choose **normal** unless your ISP recommends a different setting.
- **Facilities Data Link(FDL):** Choose **none** unless your ISP recommends a different setting.
- **Line Build Out(LBO):** Choose **none** unless your ISP recommends a different setting.
- **Remote-loopback Request:** Choose **full** unless your ISP recommends a different setting.

Serial Wizard - Serial0/0(T1 CSU/DSU)

WAN Wizard

Configure Clock Settings

These are the default clock settings. Change them only if you have a different requirement. This information should be provided by your service provider.

Clock Source	line
T1 Framing	esf
Lincode	b8zs
Data Coding	normal
Facilities Data Link(FDL)	none
Line Build Out(LBO)	none
Remote-loopback Request	full

Enable generation/detection of remote alarms

< Back Next > Finish Cancel Help

- Review the configuration in the **Summary** screen and click **Finish**.
- The **Commands Delivery Status** screen appears. Click **OK** to confirm.
- Click **Save** to save your new configuration.

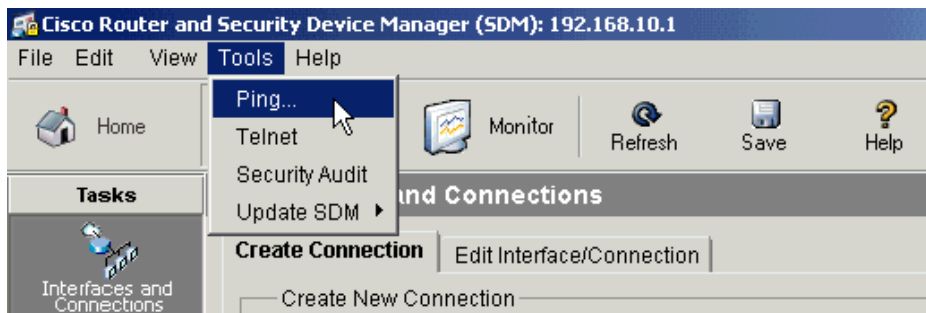


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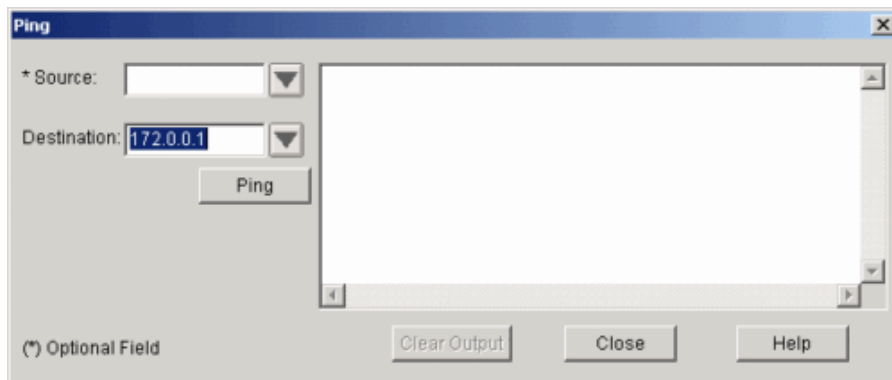
Verify WAN Connection

To verify your WAN connection, follow these steps:

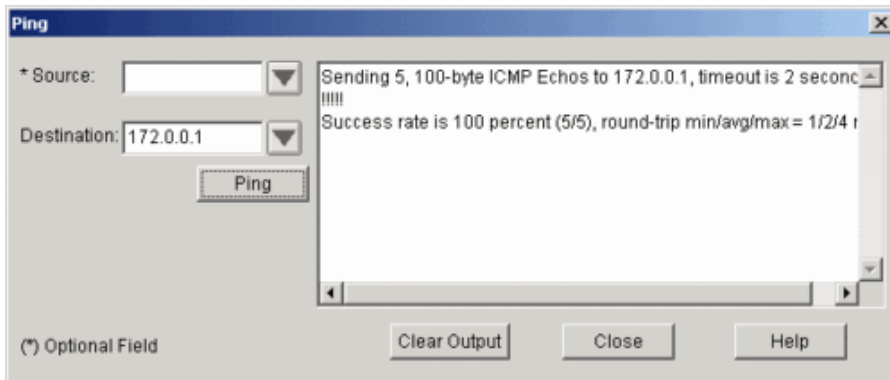
1. Click **Tools > Ping**



2. Enter the ISP router address in the Destination Field. Use the value that you entered in the Internet Worksheet (B47).



3. Click **Ping**.
4. Review the results. If the ping success rate was 100%, proceed to the next step. If the ping success rate was less than 100%, see the [Troubleshoot WAN Connection](#) section.



5. Click **File > Exit** to exit SDM.



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Next Step

You have now set up a T1 WAN connection.

You can now set up firewall and security options on your router. For instructions, refer to the [Set Up Internet Security on a Cisco Router](#) document.

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
The Create Connection screen does not display an option for the WAN connection I want to set up.	<ul style="list-style-type: none"> • Make sure the WIC is properly installed. For further assistance, contact SMB Technical Assistance Center (SMB TAC). • If you have installed the card and the router does not detect the card, contact SMB Technical Assistance Center (SMB TAC) for assistance. • If the router detects your WIC card but the settings you require are not available in the Create Connection Wizard, you have an unsupported interface type. You need to use Command Line Interface (CLI) to configure your interface. Cisco recommends that you contact your Internet Service Provider to request a sample configuration. To access CLI, refer to the Create a HyperTerminal Connection document. If you require further assistance, contact SMB Technical Assistance Center (SMB TAC).
I need more information about my WAN connection to complete wizard.	Contact your Internet Service Provider (ISP) to confirm the the details of your WAN connection.
I set up my WAN connection but it does not function properly.	See the Troubleshoot WAN Connection section.

Troubleshoot WAN Connection

To troubleshoot your WAN connection, follow these steps:

1. If you are using SDM, click **File > Exit** to exit SDM.
2. Create a terminal connection to the router. For more information, refer to the [Create a HyperTerminal Connection](#) document.
3. Log into the router. The default login is username cisco, password cisco. Otherwise, use the administrator login and password that you entered in the Internet Worksheet (B10, B11).

```
Username: cisco
Password:
```

4. Type **show interface serial0/0** and press **Enter**.

```
Router#show interface serial0/0
FastEthernet0/0 is up, line protocol is down !--- Interface state

Hardware is Gt96k FE, address is 0011.21a8.5ca2 (bia 0011.21a8.5ca2)
!--- Output truncated
```

Note: If the router displays an error, try the commands **show interface serial0** or **show interface serial0/1**.

5. The router displays the interface state on the first line of output. Note the interface state and use the table to determine your problem and the appropriate solution.

Interface physical status:	Line Protocol Status	Action
Up	Up	This interface status indicates that the interface functions properly and the router can communicate with the remote device on the WAN.
Administratively Down	Down	<p>This interface status indicates that the interface is disabled in the router configuration. To enable your interface, follow these steps:</p> <ol style="list-style-type: none"> Type interface serial0/0 and press Enter. Type no shutdown and press Enter. Type end to exit configuration mode. Type write memory to save the new configuration.
Down	Down	<p>This interface status indicates that the WAN interface is unable to communicate with a remote device.</p> <ul style="list-style-type: none"> Your router configurations do not match the configurations used by your Internet Service Provider (ISP). Contact your ISP to verify that you have the correct settings. Physical WAN connection is not in place. Ensure that the router is properly plugged into the WAN connection and that your ISP has completed installation of the WAN connection. Verify with your Internet Service Provider (ISP) that service is ready for use. Make a note of your current interface state and your current configuration before you contact your ISP.
Up	Down	<p>This interface status indicates that the interface is enabled and the router is physically connected to a remote WAN device but the interface cannot communicate properly with the remote WAN device.</p> <ul style="list-style-type: none"> Your configuration partially matches the settings used in the ISP network. Contact your ISP to verify that you have the correct settings. Check to ensure that you have the proper cable type attached to your WAN connection. Make a note of your current interface state and your current configuration before you contact your ISP. For more information about cable types refer to the Cable Descriptions document.
Up	Up (looped)	This interface status indicates that a device on the Internet Service Provider (ISP) network is in loopback mode. Contact your ISP for further assistance.

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Related Information

- [Cable Descriptions](#)
- [Configure Your Router with SDM](#)
- [Create a HyperTerminal Connection](#)
- [Set Up Internet Security on a Cisco Router](#)
- [Site Survey](#)

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Set Up Your Cisco Router

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Step 8: Set Up Internet Security on a Cisco Router

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- Step 2: [Set Up Your 800 or SB 100 Router Hardware](#)
[Set Up Your 1700 Series Router Hardware](#)
[Set Up Your 1800 Series Router Hardware](#)
[Set Up Your 2600 Series Router Hardware](#)
[Set Up Your 2800 Series Router Hardware](#)
[Set Up Your 3800 Series Router Hardware](#)
- Step 3: [Download and Install Security Device Manager](#)
- Step 4: [Configure Your Router with Security Device Manager](#)
- Step 5: [Configure Wireless Security on an Integrated Services Router \(ISR Only\)](#)
- Step 6: [Add or Remove a Wireless User on an Integrated Services Router \(ISR Only\)](#)
- Step 7: [Set Up an ADSL Internet Connection](#)
[Set Up an Ethernet Internet Connection](#)
[Set Up an ISDN Internet Connection](#)
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Step 8: Set Up Internet Security on a Cisco Router

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- [Requirements](#)
- [Configure Firewall Inspection Rules](#)
- [Add Access Control List Rules](#)
 - [Apply an ACL Rule to the Outgoing WAN Interface](#)
 - [Apply an ACL Rule to the Incoming LAN Interface](#)
- [Configure Network Address Translation](#)
 - [Set Up NAT with Dynamic WAN IP Address](#)
 - [Set Up NAT with Static WAN IP Address](#)
- [Next Step](#)
- [Troubleshoot the Procedure](#)
- [Related Information](#)

Service Requests

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- [Step 8: Set Up Internet Security on a Cisco Router](#)
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If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information.

Full Name:
E-mail:

Introduction

This document explains how to set up Internet Security on your router. The instructions demonstrate how to set up these security

measures:

- Dynamic firewall inspection rules for multimedia applications
- Access Control List (ACL) rules
- Network Address Translation (NAT)

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Requirements

- You must have completed the initial configuration in [Configure Your Router with Security Device Manager](#).
- Completed worksheets from the [Site Survey](#):
 - LAN Addressing Worksheet
 - Internet Worksheet
 - Internet Services Worksheet

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Configure Firewall Inspection Rules

To configure firewall inspection rules, follow these steps:

1. Open a web browser and type **http://router-IP-address** in the Address field. Use the IP address that you entered in the LAN Addressing Worksheet (field L6A). Press **Enter** to launch SDM.

Note: For further information about how to launch SDM, refer to [Configure Your Router with Security Device Manager](#).

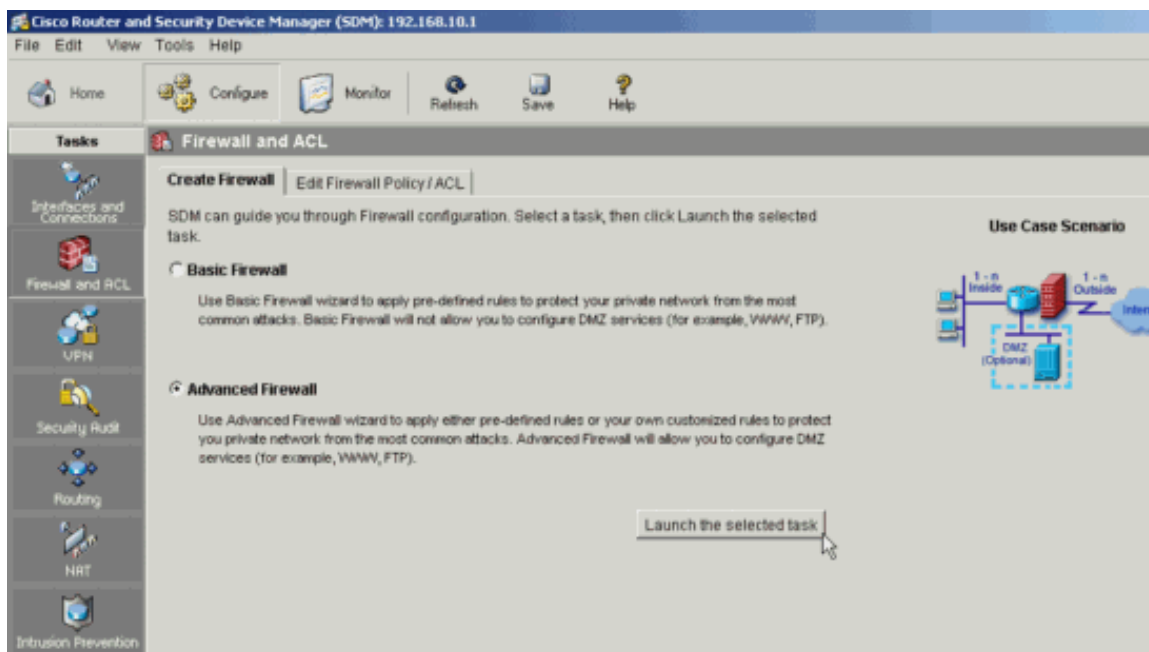
2. Click **Configure**.



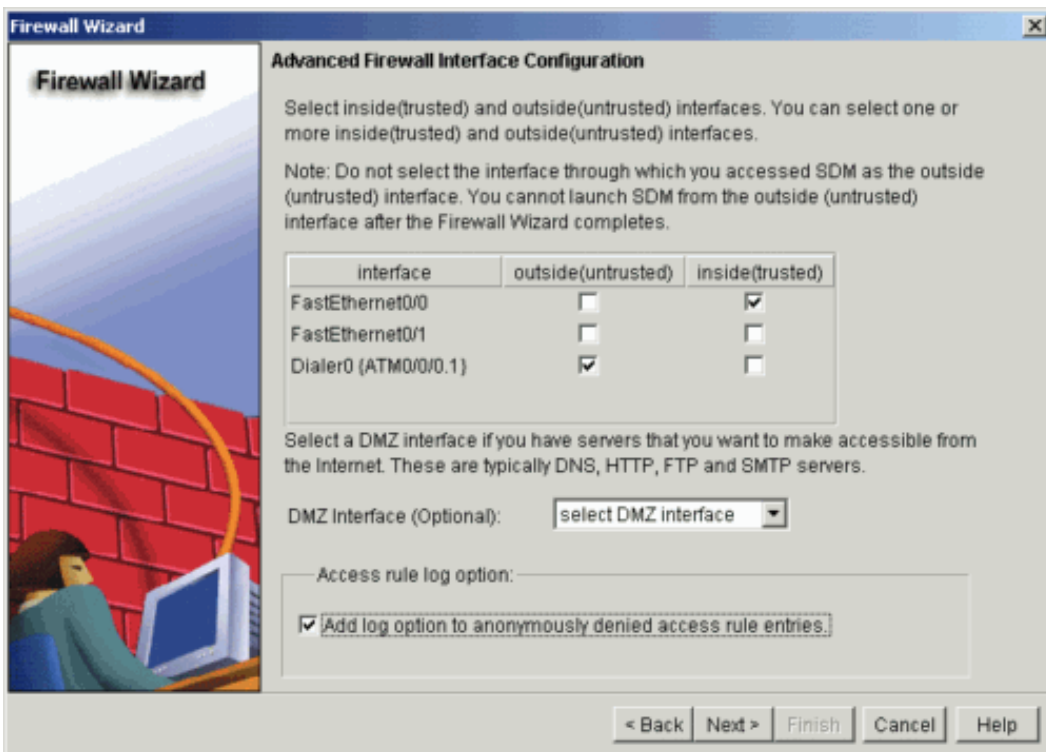
3. Click the **Firewall and ACL** tab.



4. Choose **Advanced Firewall** and click **Launch the Selected Task**.



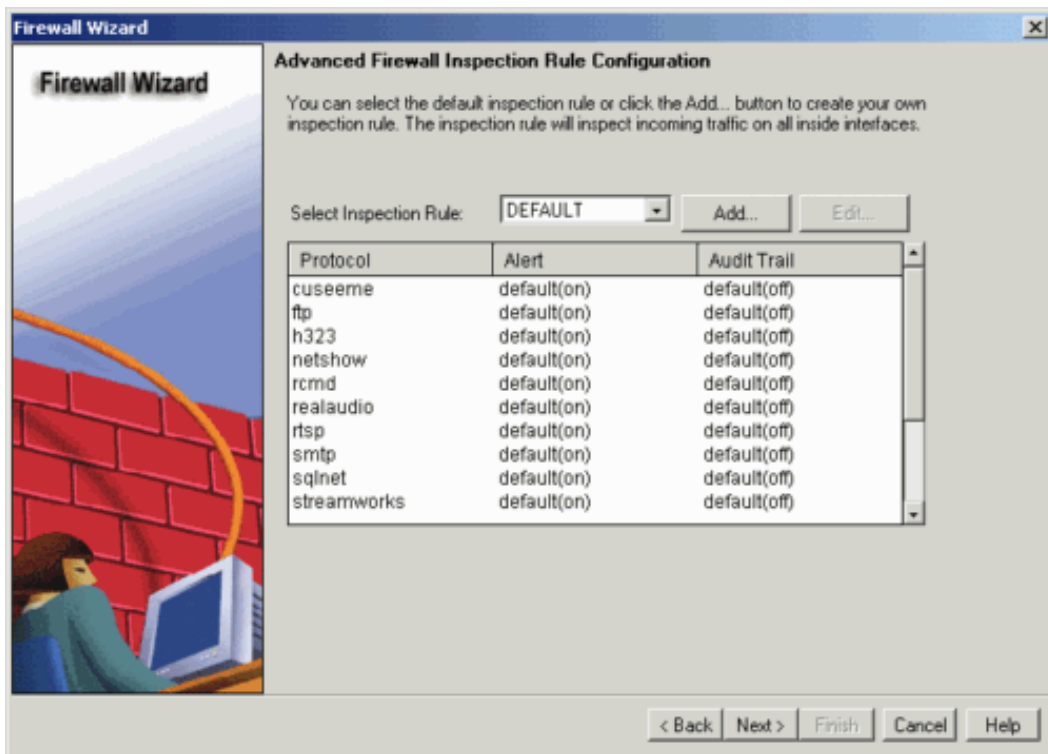
5. Click Next at the **Advanced Firewall Configuration Wizard** screen.
6. Select your inside (trusted) and outside (untrusted) interfaces. The outside (untrusted) interface is your Internet connection, and the inside (trusted) interface is your LAN interface. Do not select a DMZ interface.



Note: The Firewall Wizard automatically creates access control list (ACL) rules to block incoming traffic from IP non-public IP addresses such as 192.168.0.0, 172.0.0.0, and 10.0.0.0. If your Internet Service Provider (ISP) uses non-public IP address inside its network, you need to modify the router ACL rules to allow incoming traffic from private IP address ranges.

Note: To determine if your ISP uses non-public IP addresses, review the addresses in the ISP Address Assignments section of the Internet Worksheet or contact your ISP.

7. Click **OK** to confirm the SDM firewall warning message.
8. Click **Next** to use the default Firewall Inspection Rules.



- Review the summary of the Firewall inspection rules and click **Finish** to complete the Wizard. Click **OK** to confirm the Commands Delivery Status. Click **OK** again to exit the Wizard.

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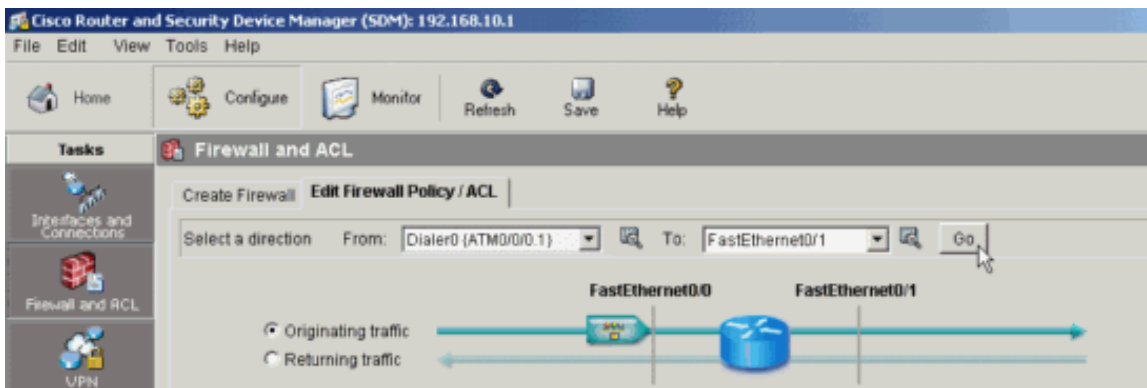
Add Access Control List Rules

To add Access Control List (ACL) rules to the router for additional security, follow these steps:

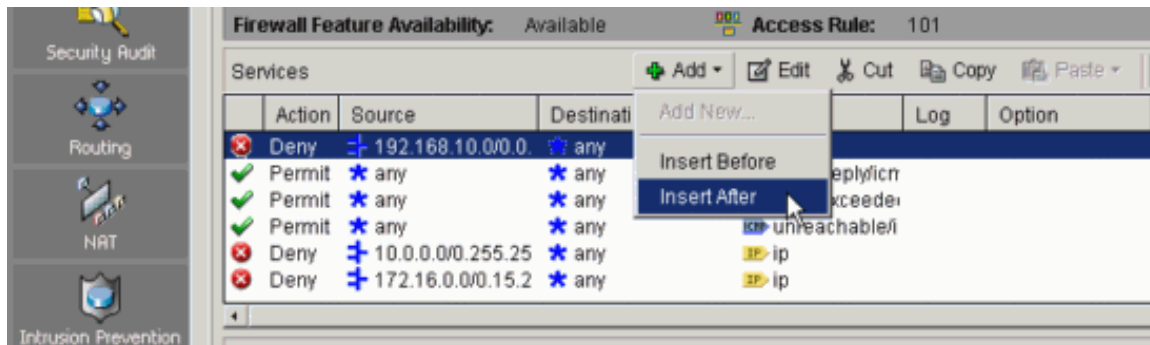
Apply an ACL Rule to the Outgoing WAN Interface

To apply an Access Control List (ACL) rule to the outgoing WAN interface, follow these steps:

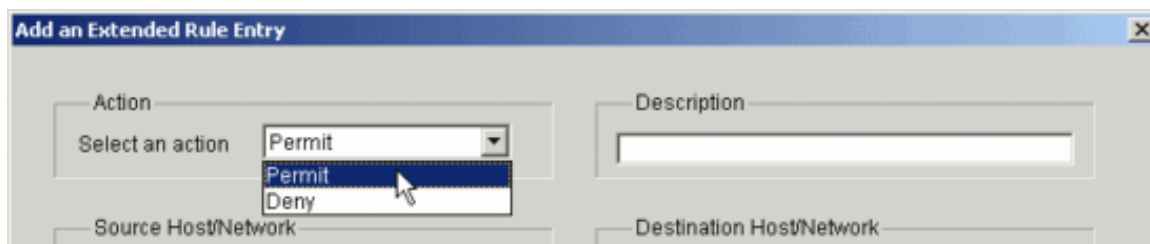
- Click **Edit Firewall Policy/ACL**.
- In the **From** interface, select your LAN interface and click **Go**. In the **To** interface select your WAN interface.



3. Click **Originating Traffic**.
4. Create an ACL rule to block outbound traffic that does not originate from the router WAN IP address.
 - a. Click **Edit Firewall Policy/ACL**.
 - b. Next to **Services**, click **Add > Insert After**.



- c. Next to **Select an action**, choose **Permit**.



- d. Under **Source Host/Network**, choose **A Host Name or IP Address**.

Add an Extended Rule Entry

Action: Select an action **Permit**

Description:

Source Host/Network: Type: **Any IP Address**

Destination Host/Network: Type: **Any IP Address**

- e. Next to Hostname/IP, enter the Router IP address you entered in the Internet Worksheet (B46).

Add an Extended Rule Entry

Action: Select an action **Permit**

Description:

Source Host/Network: Type: **A Host Name or IP Address**

Host Name/IP:

Destination Host/Network: Type: **Any IP Address**

- f. Under Destination Host/Network, choose **Any IP Address**.

Add an Extended Rule Entry

Action: Select an action **Deny**

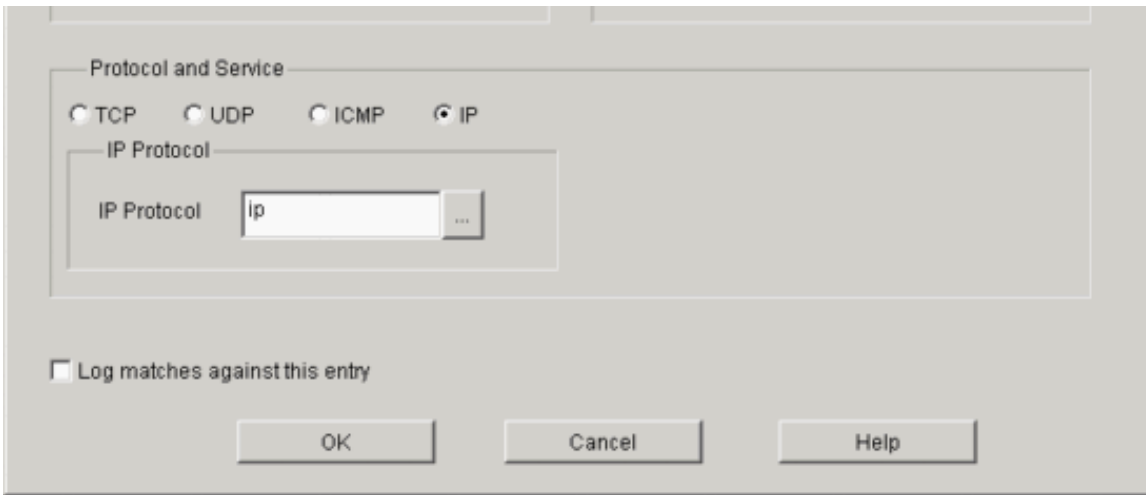
Description:

Source Host/Network: Type: **A Host Name or IP Address**

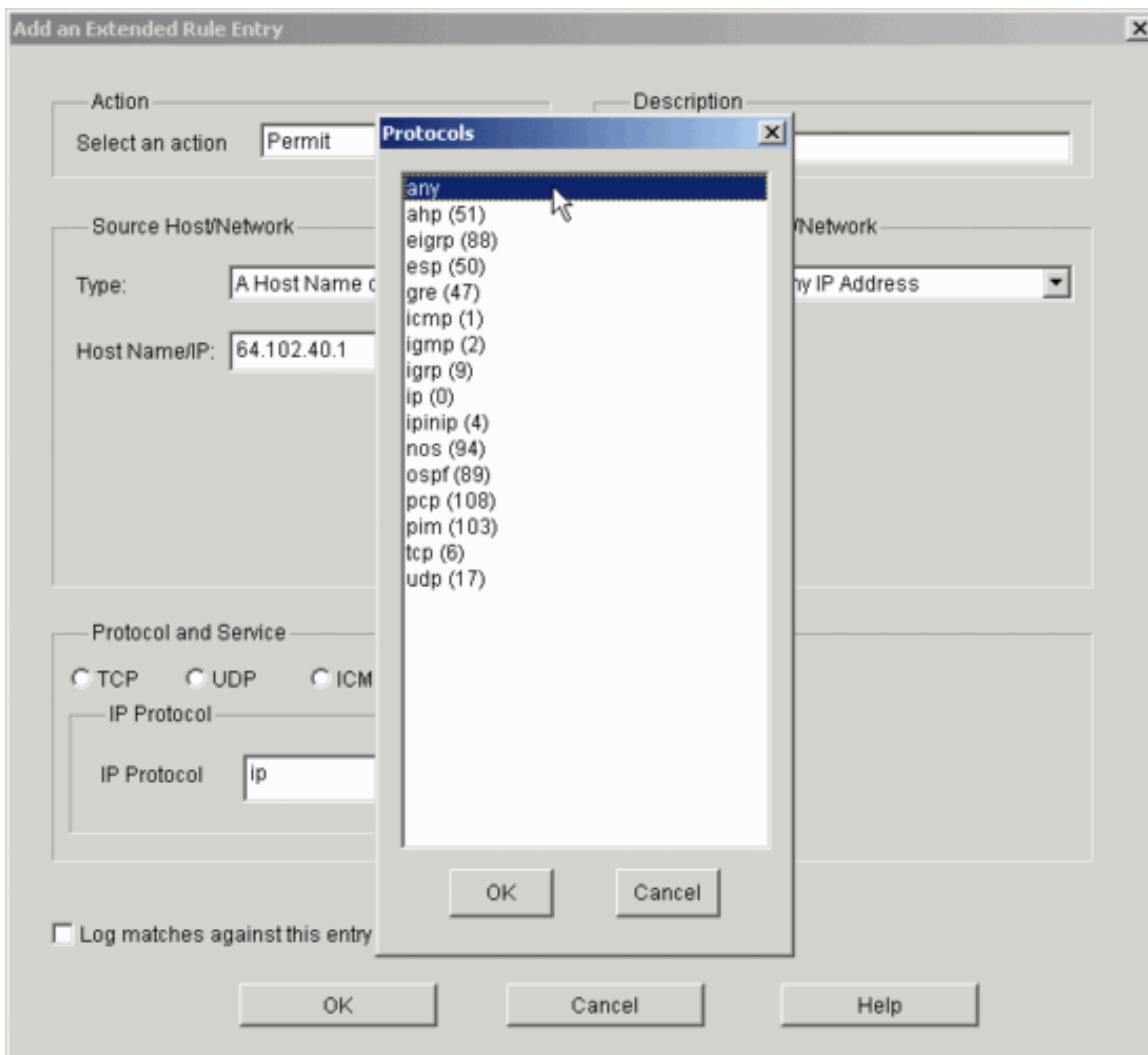
Host Name/IP: **64.102.40.1**

Destination Host/Network: Type: **Any IP Address**

- g. Under **Protocol and Service**, choose **IP**.



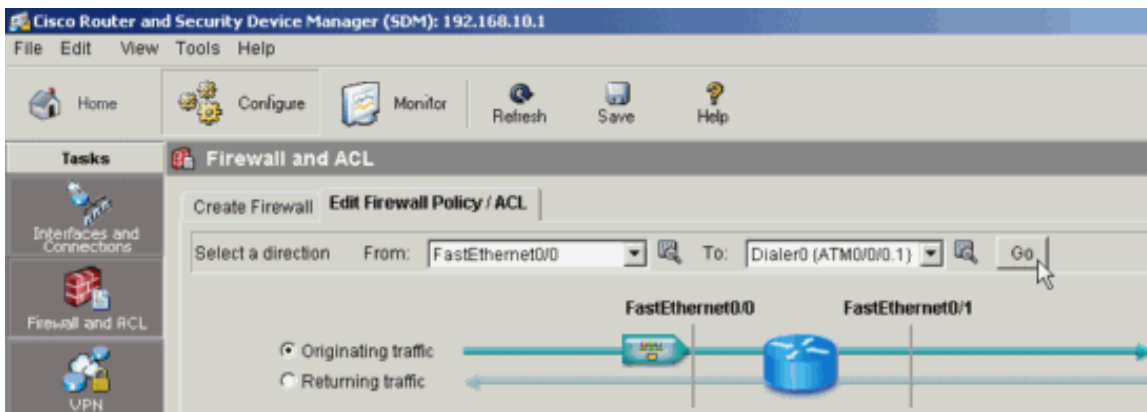
- h. Under **IP Protocol**, click the details button (...) and select **any**. Click **OK** to select the service, then click **OK** to confirm the rule.



Apply an ACL Rule to the Incoming LAN Interface

To apply an Access Control List (ACL) rule to the incoming WAN interface, follow these steps:

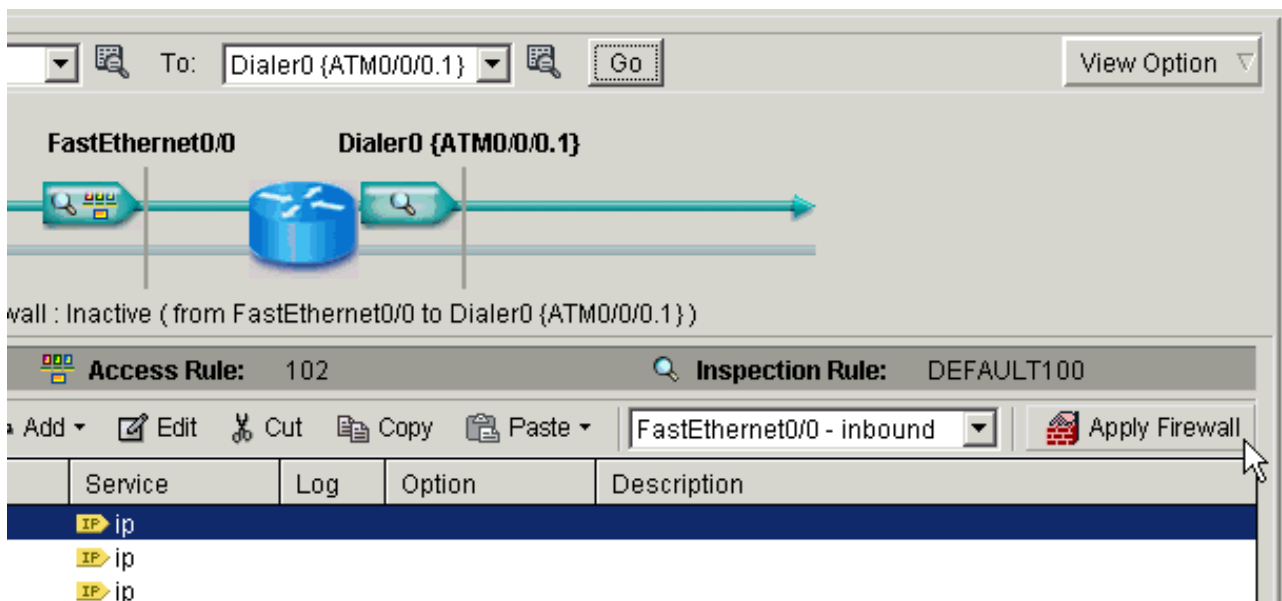
1. In the **From** interface, select your LAN interface and click **Go**. In the **To** interface select your WAN interface.



2. Click **Returning Traffic**.
3. Create an ACL rule to block traffic from LAN that does not have a valid LAN IP address.
 - a. Next to **Services**, click **Add > Insert After**.
 - b. Next to **Select an action**, choose **Permit**.
 - c. Under **Source Host/Network**, choose **A Network**.
 - d. Next to **IP Address**, enter the subnet that you entered in the LAN Addressing Worksheet (L1A), and next to **Wildcard Mask** choose **0.0.0.255**.
 - e. Under **Destination Host/Network**, choose **Any IP Address**.
 - f. Under **Protocol and Service**, choose **IP**.
 - g. Under **IP Protocol**, click the details button (...) and select **any**. Click **OK** to select the service, then click **OK** to confirm the rule.
4. Create an ACL rule to allow broadcast traffic from LAN in order to allow DHCP.
 - a. Next to **Services**, click **Add > Insert After**.
 - b. Next to **Select an action**, choose **Permit**.
 - c. Under **Source Host/Network**, choose **A Network**.
 - d. Next to **IP Address**, enter the subnet that you entered in the LAN Addressing Worksheet (L1A). Next to **Wildcard Mask** select **0.0.0.255**.
 - e. Under **Destination Host/Network**, choose **Any IP Address** and enter **255.255.255.255**.
 - f. Under **Protocol and Service**, choose **IP**.
 - g. Under **IP Protocol**, click the details button (...) and select **any**. Click **OK** to select the service, then click **OK** to confirm the rule.

confirm the rule.

5. Click **Apply Firewall**.



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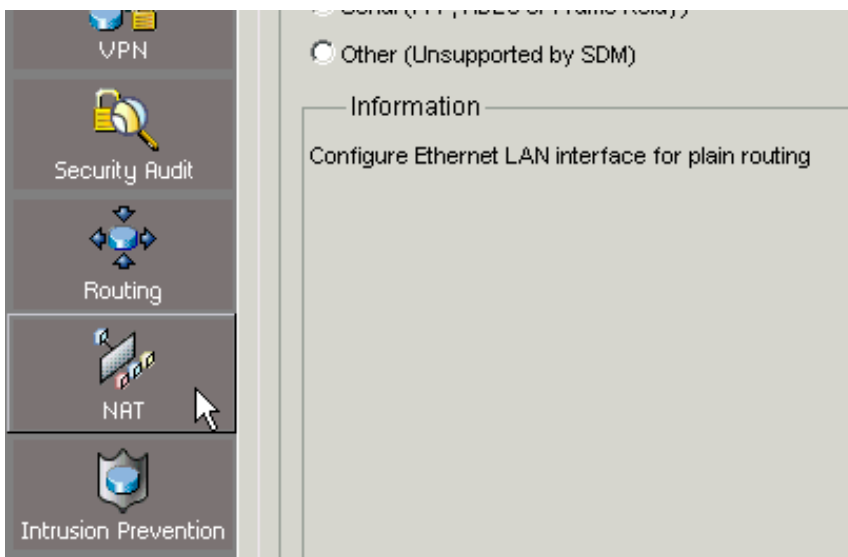
Configure Network Address Translation

Network Address Translation (NAT) uses an internal address scheme to provide additional security for your network. In order to set up NAT, you need to know whether your WAN connection uses a static or dynamic IP address. Refer to the Internet Worksheet (B45, B46) for more information.

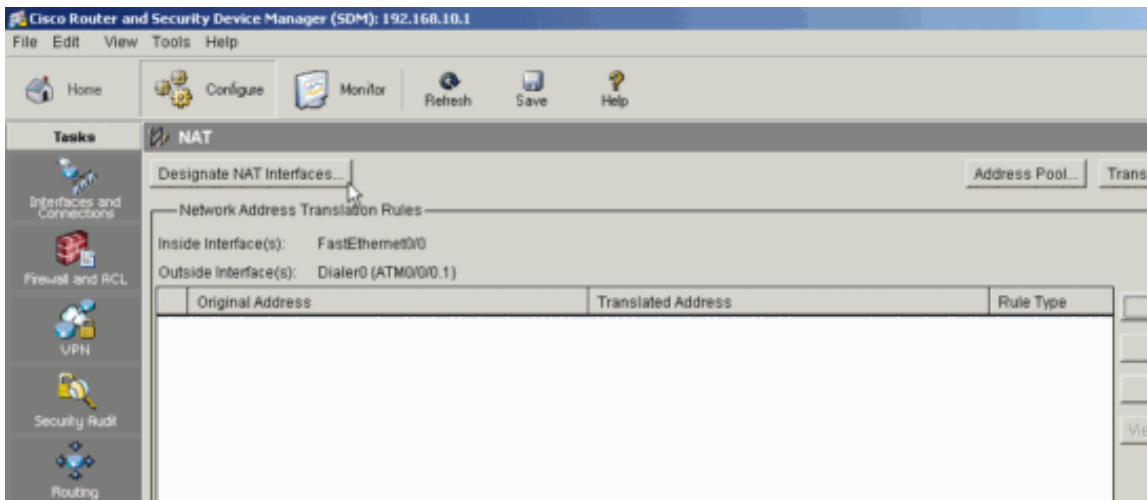
Set Up NAT with Dynamic WAN IP Address

To set up NAT with a dynamic WAN IP address, follow these steps:

1. Click the **NAT** tab.

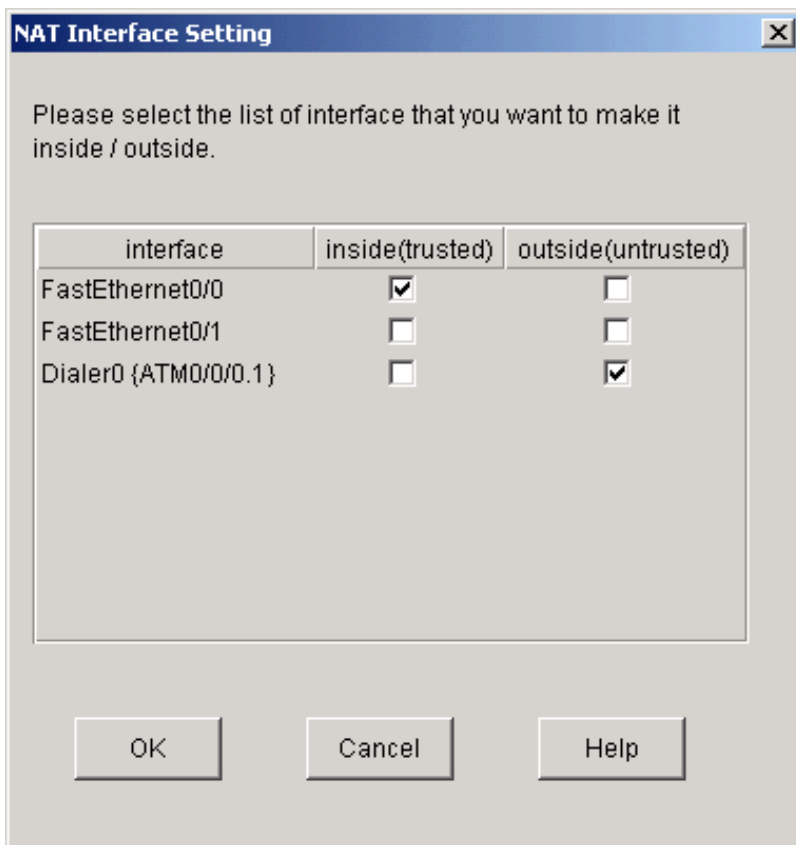


2. Click **Designate NAT Interfaces**.

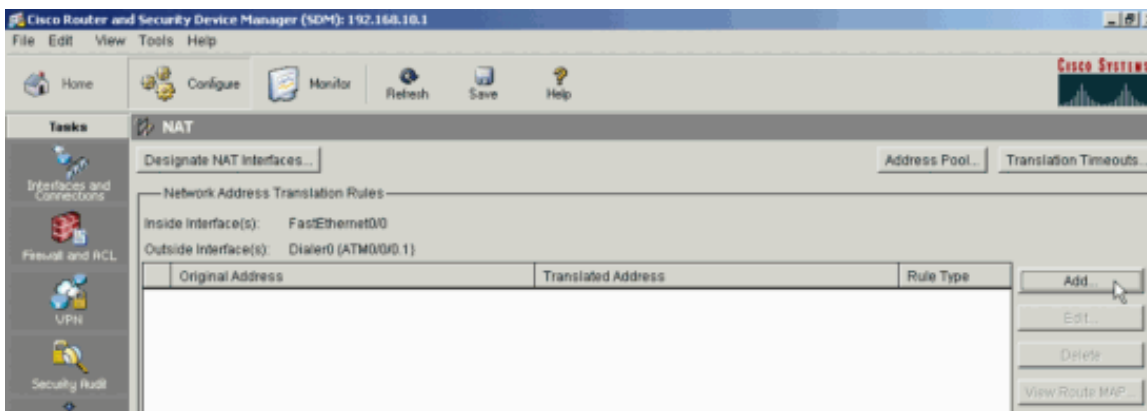


3. Check the Inside (Trusted) and Outside(Untrusted) interfaces and click **OK**.

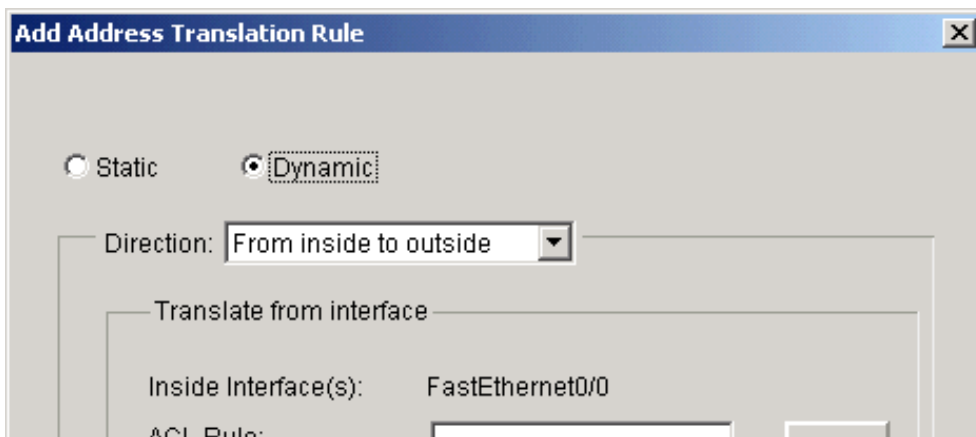
Note: Designate your WAN interface as the outside/untrusted interface.



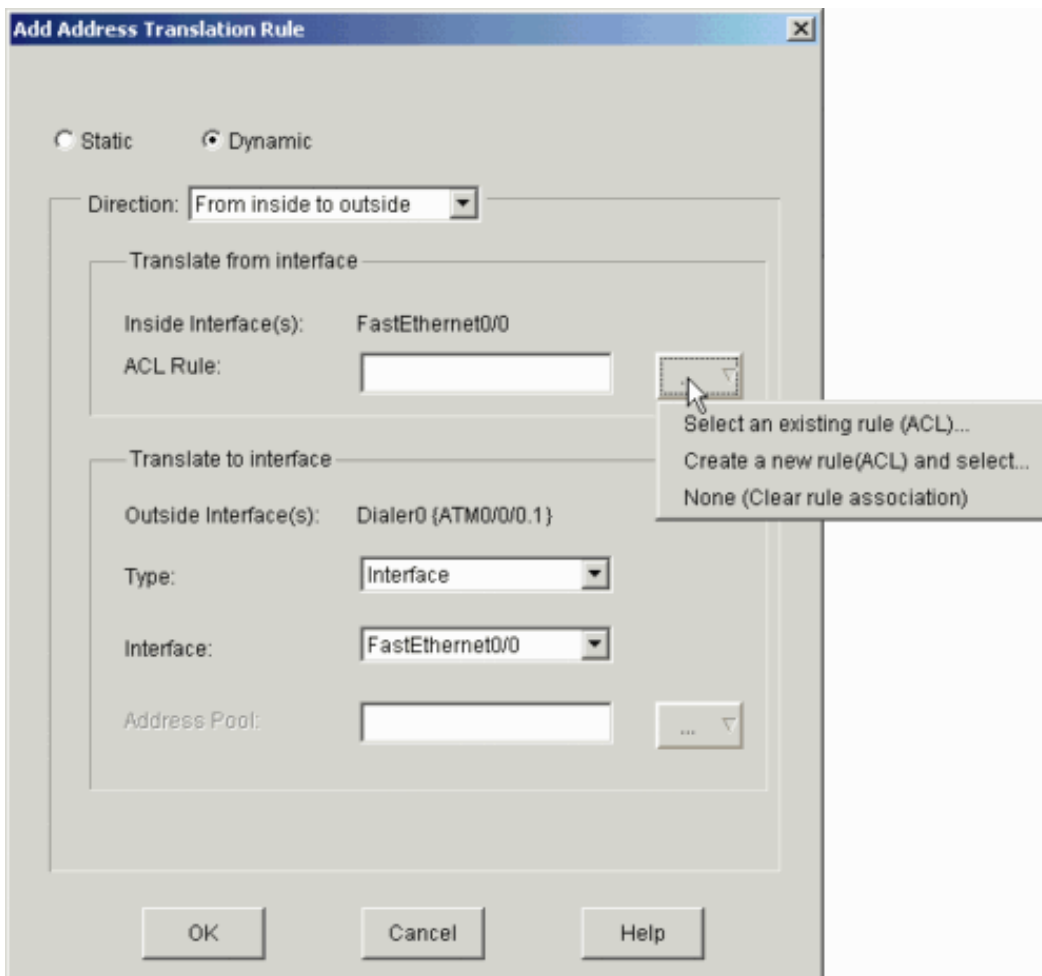
4. Click **Add** to add a new translation rule.



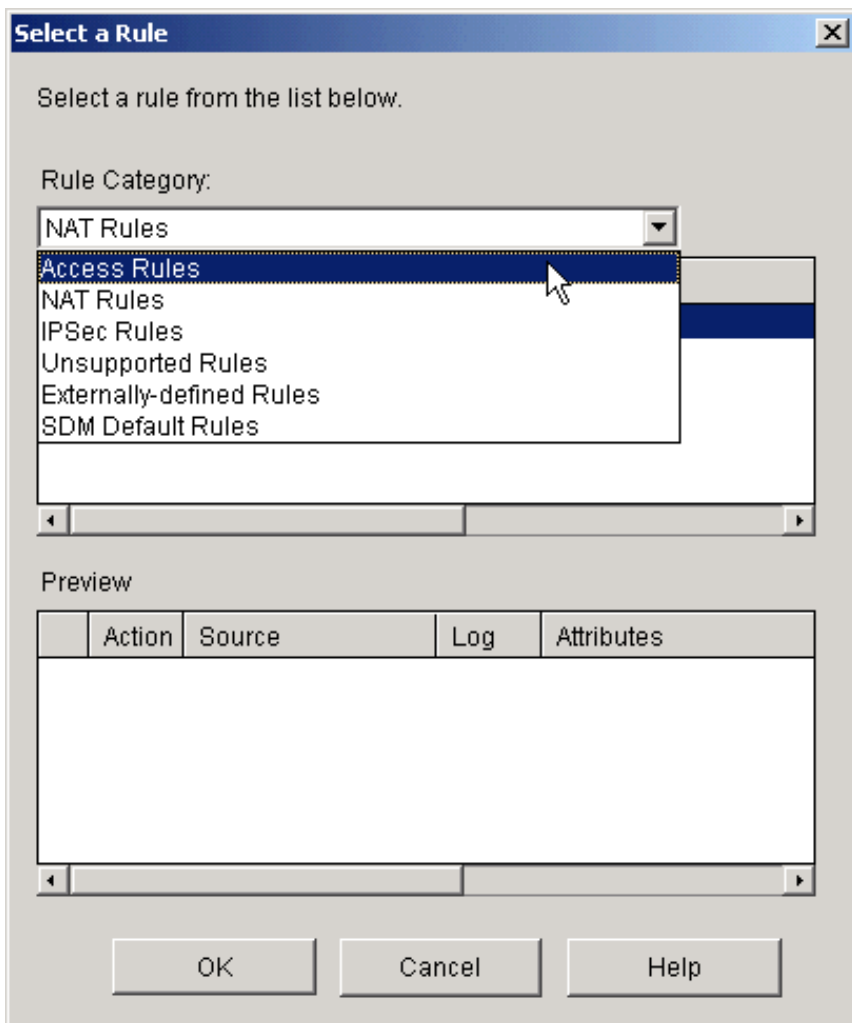
5. At the **Add Address Translation Rule** screen, choose **Dynamic**. Next to **Direction**, choose **From inside to outside**.



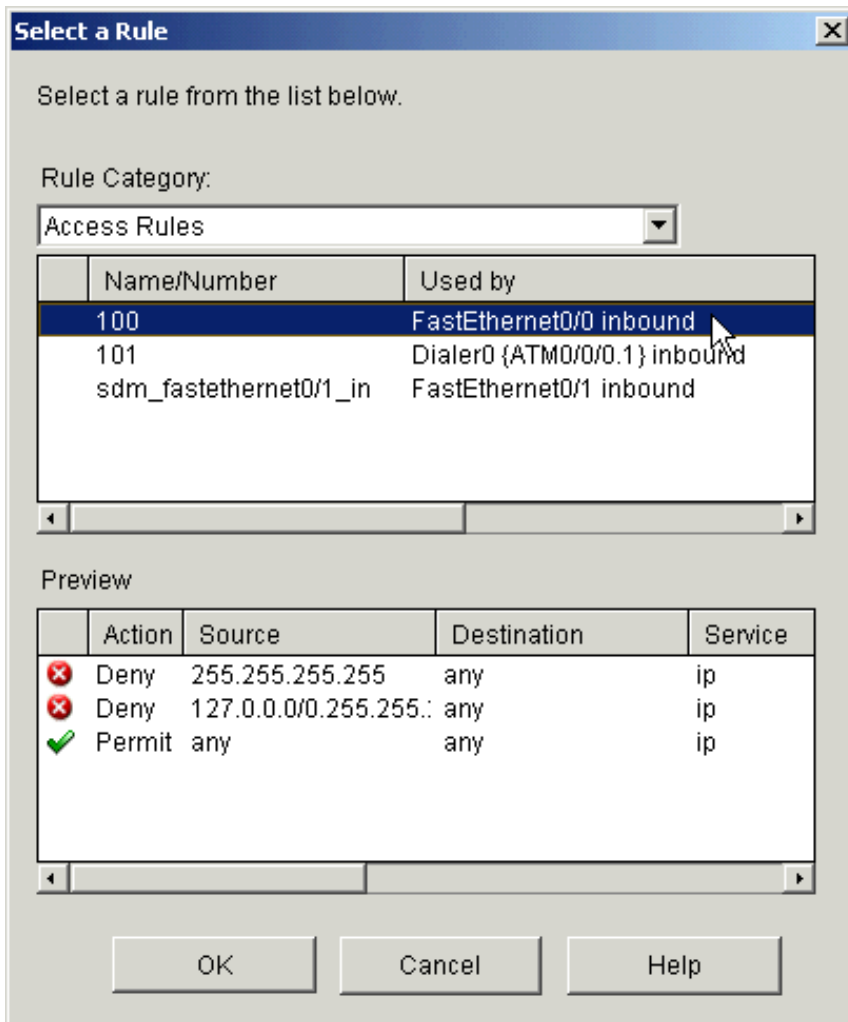
6. Click the **ACL Rule** details button and click **Select an existing rule (ACL)...**



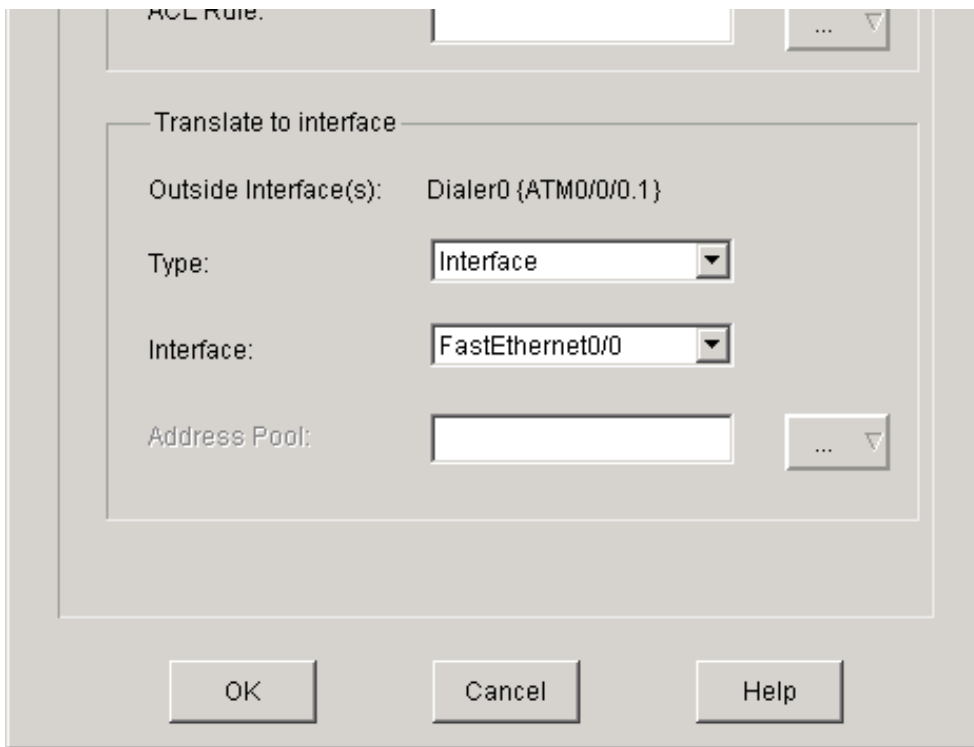
7. In the **Rules Category** box, choose **Access Rules**.



8. Select the Access Rule that is used by your FastEthernet or Ethernet interface and click **OK**.



- Go to the Translate to interface area and next to **Type** choose **Interface**. Next to **Interface** choose your WAN interface. Click **OK** to confirm.

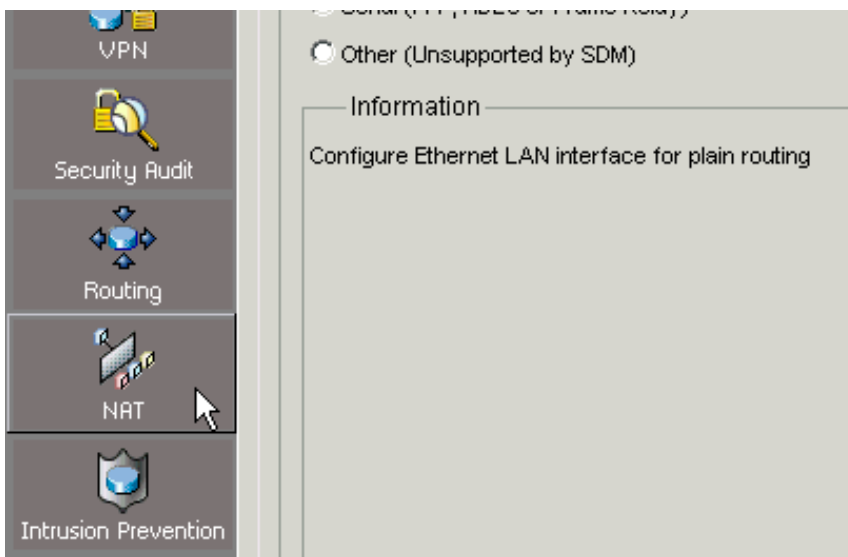


10. Click **File > Write to Startup Config** to save your configuration.

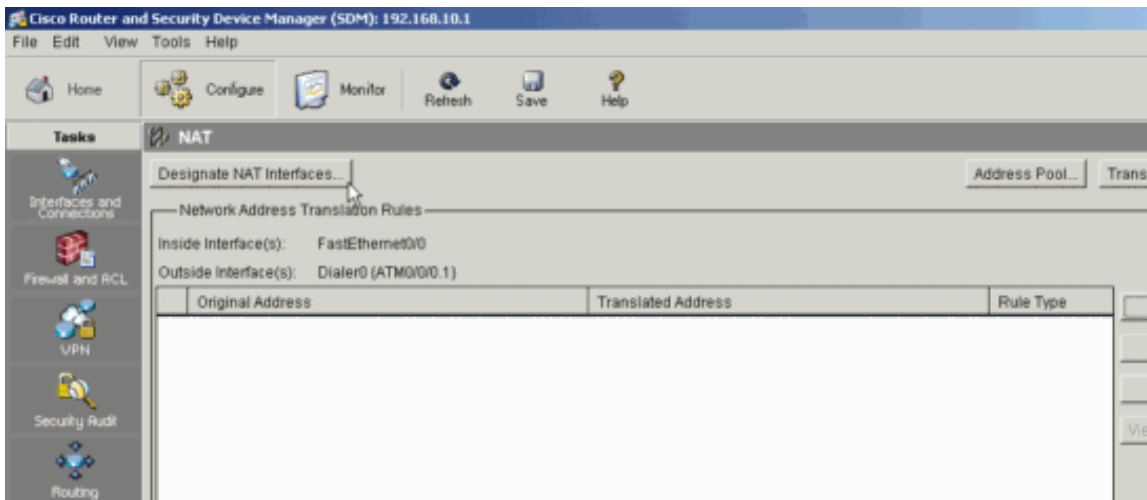
Set Up NAT with Static WAN IP Address

To set up NAT with a static WAN IP address, follow these steps:

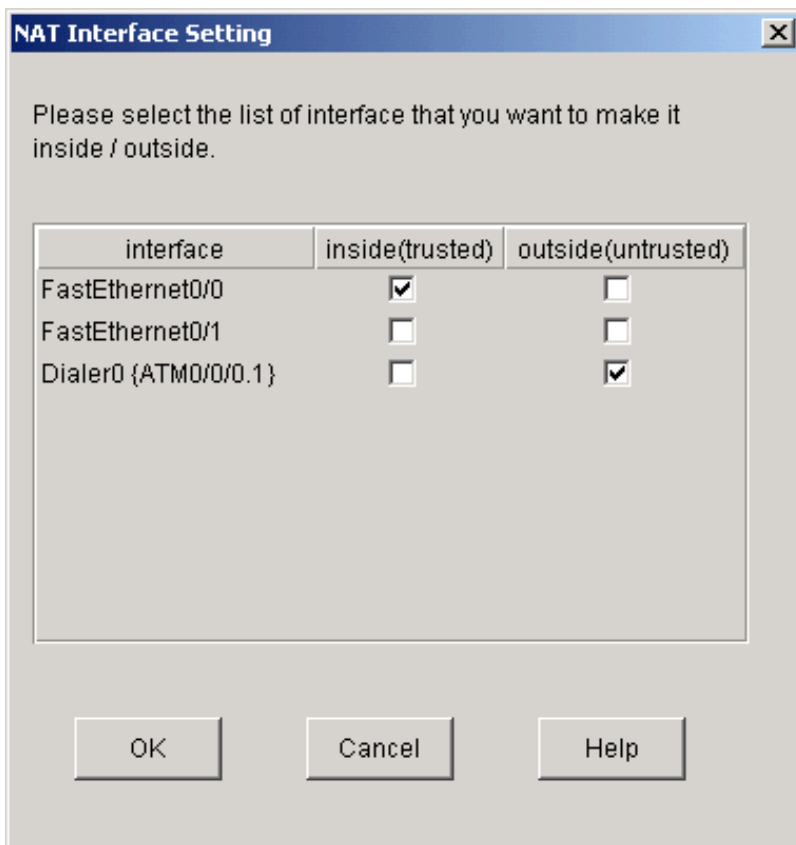
1. Click the **NAT** tab.



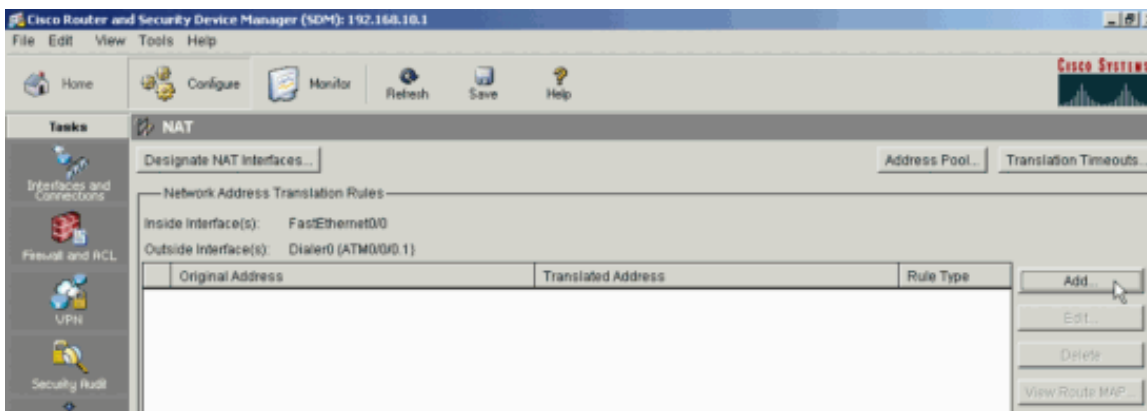
2. Click **Designate NAT Interfaces**.



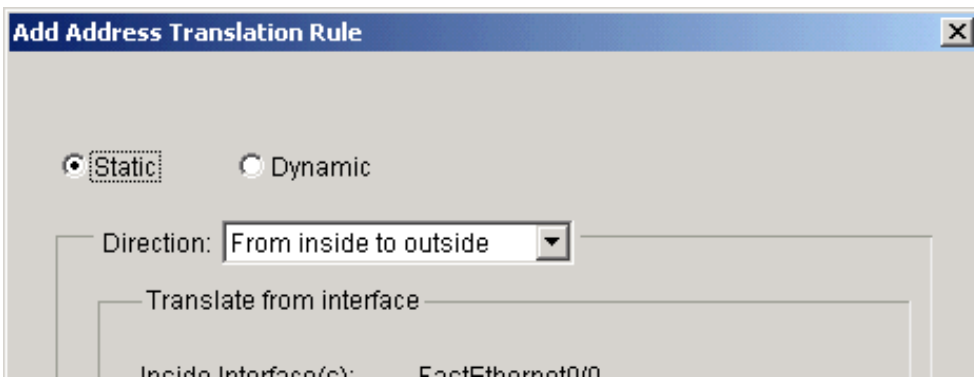
3. Check the Inside (Trusted) and Outside(Untrusted) interfaces and click **OK**.
Designate WAN interface you just set up as the outside/untrusted interface.



- Click **Add** to add a new translation rule.



- At the **Add Address Translation Rule** screen, choose **Static**. Next to **Direction**, choose **From inside to outside**.



Add Address Translation Rule

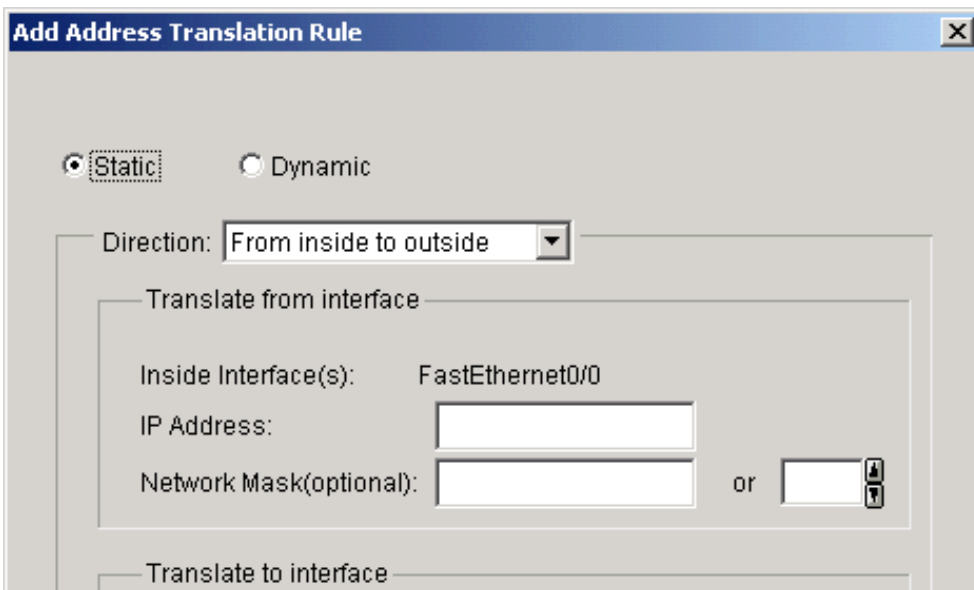
Static Dynamic

Direction: From inside to outside

Translate from interface

Inside Interface(s): FastEthernet0/0

- Under **Inside Interface(s)**, enter the Router IP Address that you entered in the LAN Addressing worksheet (L6A). Leave the **Network Mask** blank.



Add Address Translation Rule

Static Dynamic

Direction: From inside to outside

Translate from interface

Inside Interface(s): FastEthernet0/0

IP Address:

Network Mask(optional): or

Translate to interface

- Under **Outside Interface(s)**, enter the Router IP Address you entered in the Internet Worksheet (B46).

The image shows a configuration dialog box titled "Translate to interface". It contains the following fields and options:

- Outside Interface(s): Dialer0 {ATM0/0/0.1}
- IP Address: [Empty text box]
- Redirect Port
- TCP UDP
- Original Port: [Empty text box]
- Translated Port: [Empty text box]

At the bottom of the dialog are three buttons: OK, Cancel, and Help.

8. Click **OK** to confirm.
9. Click **File > Write to Startup Config** to save your configuration.

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Next Step

You have now configured a firewall on your router.

To make further changes to your router, refer to the [Router Support Page](#).

To configure other devices in your network, refer to the [Configuration Overview Page](#).

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Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your

problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
I added a new firewall rule and I cannot access the router.	Contact the SMB Technical Assistance Center (SMB TAC) for assistance.

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Related Information

- [Configure Your Router with Security Device Manager](#)
- [Site Survey](#)
- [Create a HyperTerminal Connection](#)
- [Cable Descriptions](#)