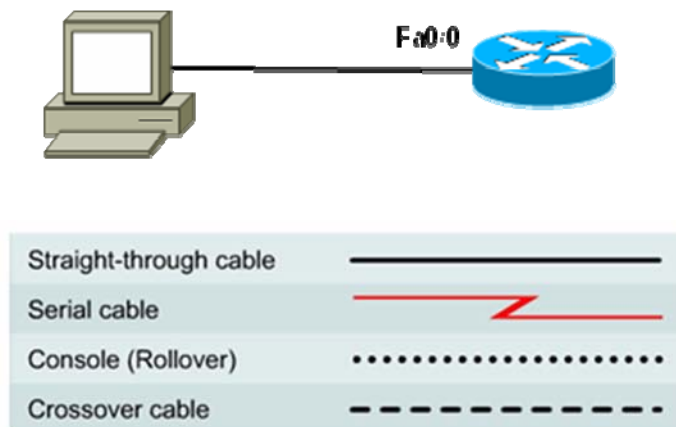


Lab 5.2.3 Configuring an ISR with SDM Express



Objectives

- Configure basic router global settings – router name, users, and login passwords – using Cisco SDM Express.
- Configure LAN and Internet connections on a Cisco ISR using Cisco SDM Express.

Background / Preparation

Cisco Router and Security Device Manager (SDM) is a Java-based web application and a device-management tool for Cisco IOS Software-based routers. The Cisco SDM simplifies router and security configuration through the use of smart wizards, which allows you to deploy, configure, and monitor a Cisco router without requiring knowledge of the command-line interface (CLI). The Cisco SDM is supported on a wide range of Cisco routers and Cisco IOS Software releases. Many newer Cisco routers come with SDM preinstalled. If you are using an 1841 router, SDM (and SDM Express) is pre-installed.

This lab assumes the use of a Cisco 1841 router. You can use another router model as long as it is capable of supporting SDM. If you are using a supported router that does not have SDM installed, you can download the latest version free of charge from the following location: <http://www.cisco.com/cgi-bin/tablebuild.pl/sdm>

From the URL shown above, view or download the document “Downloading and Installing Cisco Router and Security Device Manager.” This document provides instructions for installing SDM on your router. It lists specific model numbers and IOS versions that can support SDM, and the amount of memory required.

To get access to the SDM express application the instructor needs to logon to cisco.com with a CCO account. If you do not have a CCO account go to <http://www.cisco.com/cgi-bin/login> Under "Not Registered" select "Register now" to create an account.

Cisco SDM Express is a component of SDM. SDM Express automatically runs a GUI wizard that allows you to perform an initial basic configuration of a Cisco router using a browser and the web interface of the router. SDM Express will only be activated when the router is in its factory-default state. In this lab, you will use Cisco SDM Express to configure LAN and Internet connections on a Cisco ISR.

The following resources are required:

- Cisco 1841 ISR router with SDM version 2.4 installed (critical – see Note 2 in Step 1)
- Cisco 1841 ISR router configured with factory default settings and with a serial port add-in module (critical – see Notes 1 and 3 in Step 1)
- (Optional) Other Cisco router model with SDM installed
- Windows XP computer with Internet Explorer 5.5 or higher and SUN Java Runtime Environment (JRE) version 1.4.2_05 or later (or Java Virtual Machine (JVM) 5.0.0.3810). (See Note 3 in Step 1)
- Straight-through or crossover category 5 Ethernet cable
- Access to PC network TCP/IP configuration

Step 1: Configure the PC to connect to the router and then launch Cisco SDM

- a. Power up the router.
- b. Power up the PC.
- c. Disable any popup blocker programs. Popup blockers prevent SDM Express windows from displaying.
- d. Connect the PC NIC to the FastEthernet 0/0 port on the Cisco 1841 ISR router with the Ethernet cable.

NOTE: An SDM router other than the 1841 may require connection to different port in order to access SDM.

- e. Configure the IP address of the PC to be 10.10.10.2 with a subnet mask of 255.255.255.248.
- f. SDM does not load automatically on the router. You must open the web browser to reach the SDM. Open the web browser on the PC and connect to the following URL: <http://10.10.10.1>

NOTE 1 – If browser connection to router fails: If you cannot connect and see the login screen, check your cabling and connections and make sure the IP configuration of the PC is correct. The router may have been previously configured to an address of 192.168.1.1 on the Fa0/0 interface. Try setting the IP address of the PC to 192.168.1.2 with a subnet mask of 255.255.255.0 and connect to <http://192.168.1.1> using the browser. If you have difficulty with this procedure, contact your instructor for assistance.

If the startup-config is erased in an SDM router, SDM will no longer come up by default when the router is restarted. It will be necessary to build a basic router configuration using IOS commands. Refer to the procedure at the end of this lab or contact your instructor.

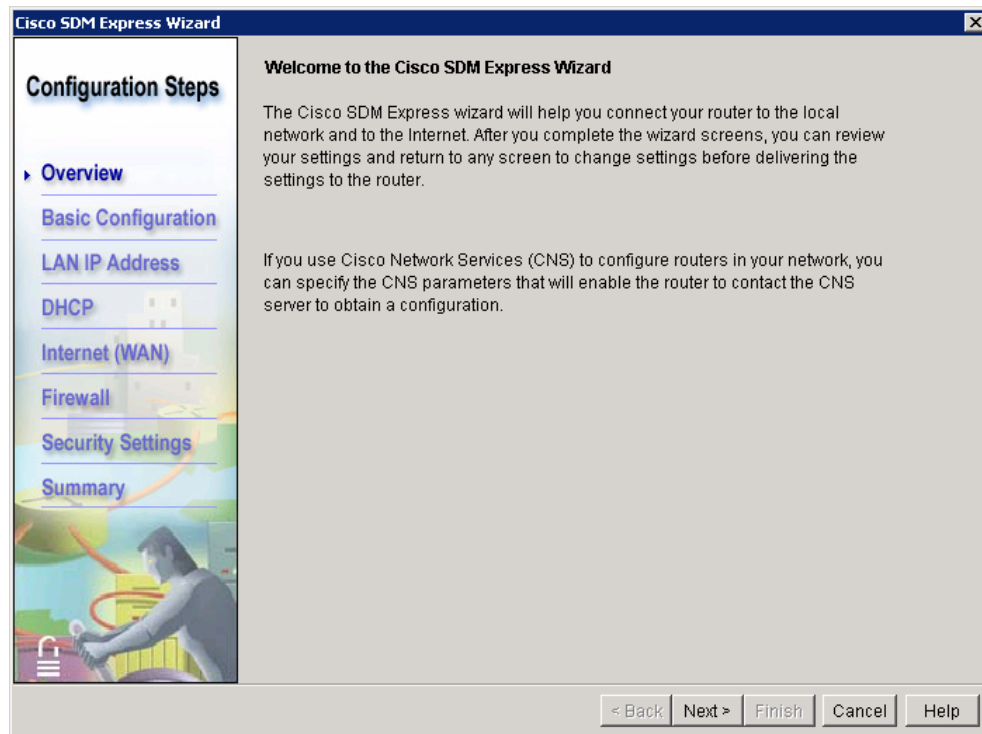


- g. In the **Connect to** dialog box, enter **cisco** for the username and **cisco** for the password. Click **OK**. The main SDM web application will start and you will be prompted to use HTTPS. Click **Cancel**. In the Security Warning window, click **Yes** to trust the Cisco application.



- h. In the Welcome to the Cisco SDM Express Wizard window, read the message and then click **Next**.
- i. Verify that you are using the latest version of SDM. The initial SDM screen that displays immediately after the login shows the current version number. It is also displayed on the main SDM screen shown below, along with IOS version.

NOTE 2: If the current version is not 2.4 or higher, notify your instructor before continuing with this lab. You will need to download the latest zip file from the URL listed above and save it to the PC. From the Tools menu of the SDM GUI, use the **Update SDM** option to specify the location of the zip file and start the update.



NOTE 3 – If SDM Express Wizard fails to start: If you connect to the router and SDM Express starts but the SDM Express Setup Wizard shown above does not start automatically, the router may be partially configured and needs to be reset to its factory defaults. If the SDM Express main screen is displayed, choose the **Reset to Factory Defaults** option, repeat Steps 1a through 1e, and log in again. If the full SDM application starts (not SMD Express), choose the **Reset to Factory Defaults** option from the **File** menu on the main SDM screen, repeat Steps 1a through 1e, and log in again. If you have difficulty with this procedure, contact your instructor for assistance.

Also note that the Windows XP computer you are using must have Internet Explorer 5.5 or higher and SUN Java Runtime Environment (JRE) version 1.4.2_05 or later (or Java Virtual Machine (JVM) 5.0.0.3810). If it does not, SDM will not start. You will need to download and install JRE on the PC before continuing with the lab.

Step 2: Perform initial basic configuration

- a. In the Basic Configuration window, enter the following information. When you complete the basic configuration, click **Next** to continue.
- In the Host Name field, enter **CustomerRouter**.
 - In the Domain Name field, enter the domain name **customer.com**.
 - Enter the username **admin** and the password **cisco123** for SDM Express users and Telnet users. This password gives access to SDM locally, through the console connection, or remotely using Telnet.
 - Enter the **enable secret password** of **cisco123**. This entry creates an encrypted password that prevents casual users from entering privileged mode and modifying the configuration of the router using the CLI.

The screenshot shows the 'Cisco SDM Express Wizard' window. On the left is a 'Configuration Steps' sidebar with links: Overview, Basic Configuration (selected), LAN IP Address, DHCP, Internet (WAN), Firewall, Security Settings, and Summary. The main area is titled 'Basic Configuration'. It contains two sections: 'Username and Password' and 'Enable Secret Password'. The 'Username and Password' section has a text box for 'Host Name' containing 'CustomerRouter' and a text box for 'Domain Name' containing 'customer.com'. Below this, it explains that the router has a factory default login and that the user must change these values. It then prompts for a new username (admin) and a new password (cisco123), with a note that the password must be at least 6 characters. The 'Enable Secret Password' section explains that this password is used to administer the router via the CLI and prompts for a new password (cisco123) and a reenter password. A note at the bottom states that an asterisk indicates mandatory fields. At the bottom right are buttons for '< Back', 'Next >', 'Finish', 'Cancel', and 'Help'.

Cisco SDM Express Wizard

Configuration Steps

- Overview
- ▶ **Basic Configuration**
- LAN IP Address
- DHCP
- Internet (WAN)
- Firewall
- Security Settings
- Summary

Basic Configuration

Host Name: Domain Name:

Username and Password

Your router comes with a factory default login username and password. You must change these values to make your router secure.

After you complete the Cisco SDM Express Wizard, enter this new login username and password to reconnect to the router.

* Enter new username:

* Enter new password: (minimum 6 characters)

* Reenter new password:

Enable Secret Password

This password is used to administer the router when using the command-line interface (CLI).

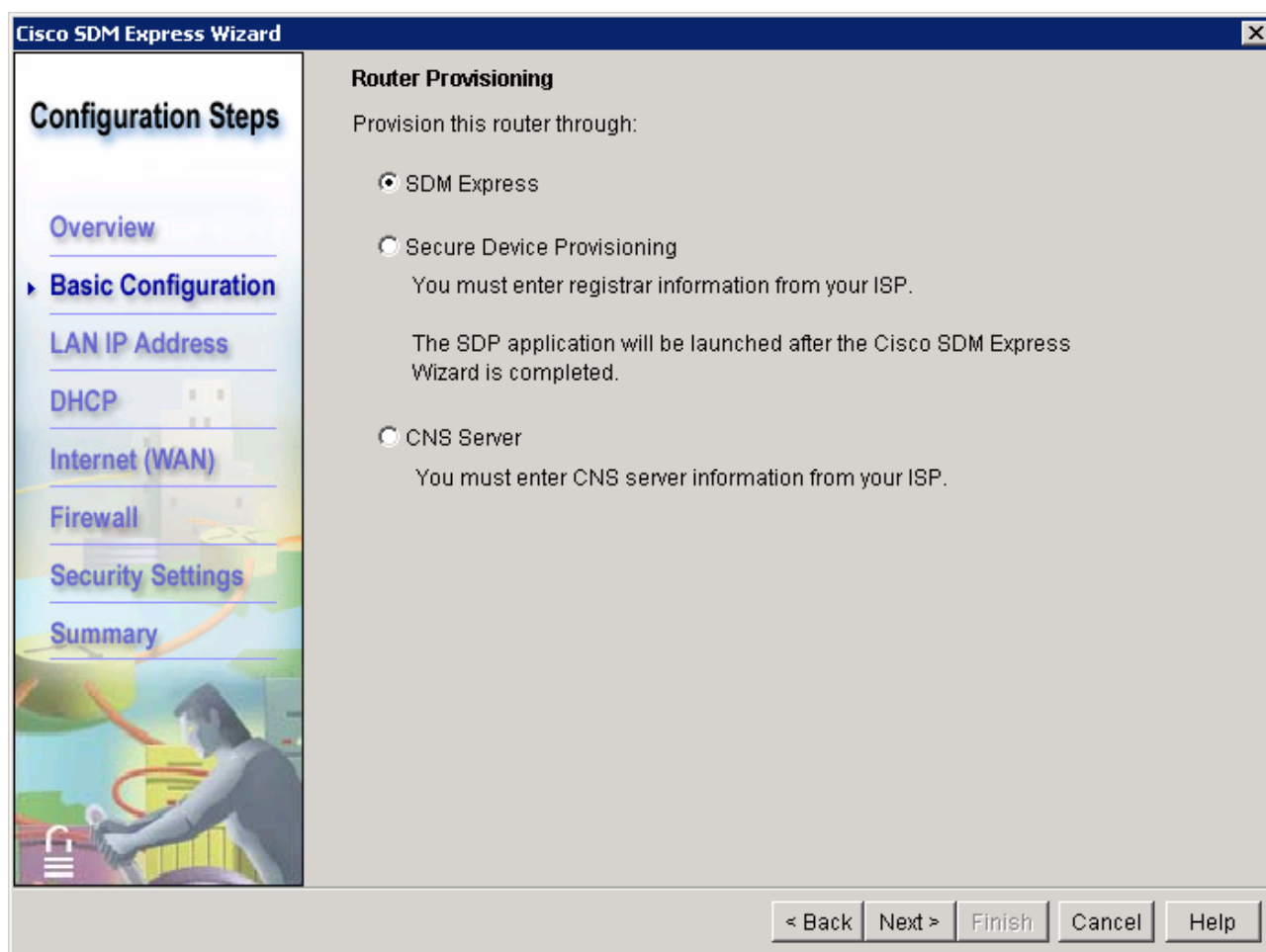
* Enter new password: (minimum 6 characters)

* Reenter new password:

* indicates mandatory fields.

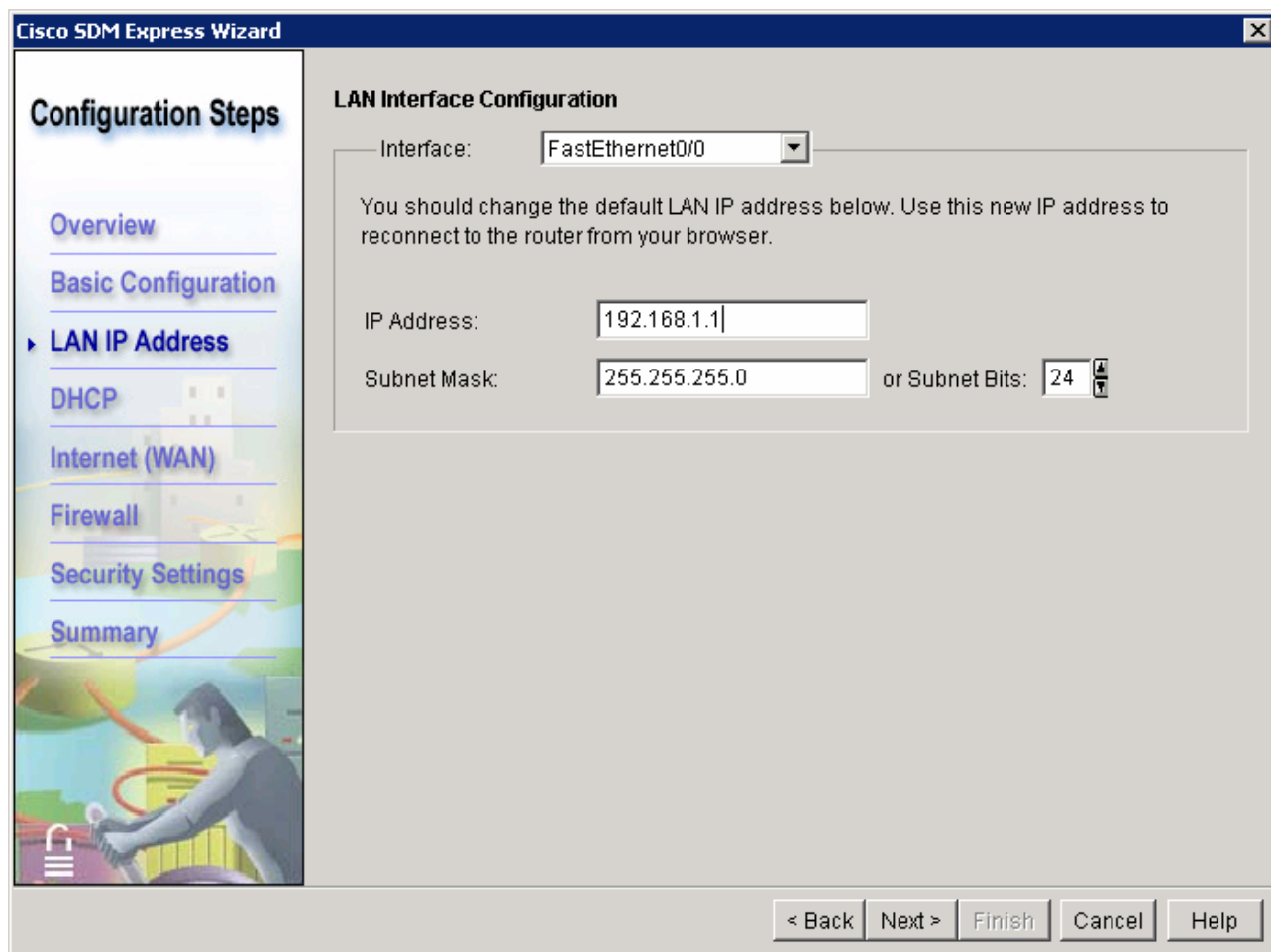
< Back Next > Finish Cancel Help

- b. From the Router Provisioning window, click the radio button next to SDM Express and then click **Next**.



Step 3: Configure the LAN IP address

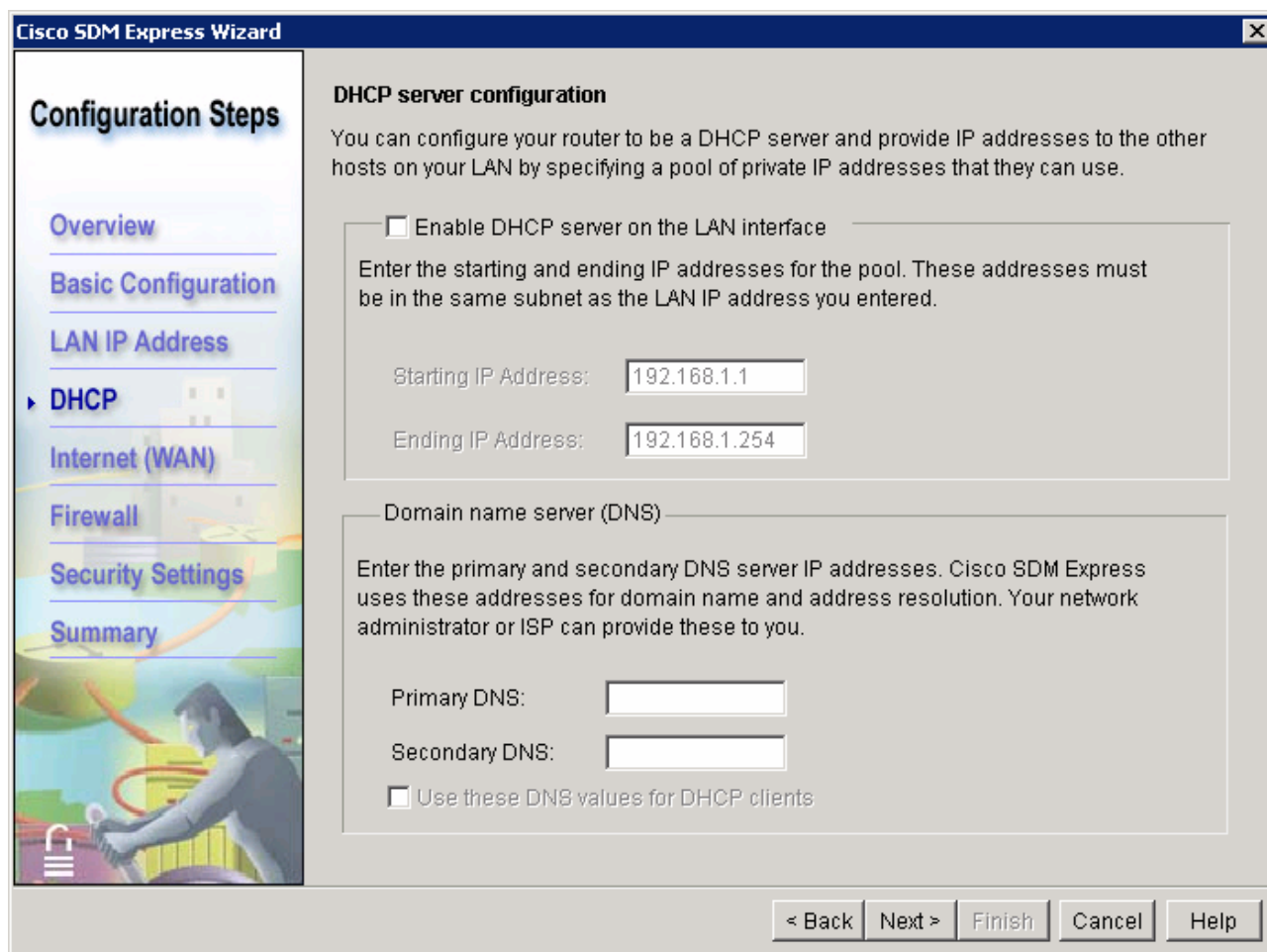
In the LAN Interface Configuration window, choose **FastEthernet0/0** from the Interface list. For interface FastEthernet 0/0, enter the IP address of 192.168.1.1 and subnet mask of 255.255.255.0. You can also enter the subnet mask information in a different format: entering a count of the number of binary digits or bits in the subnet mask, such as 255.255.255.0 or 24 subnet bits.



The screenshot shows the 'Cisco SDM Express Wizard' window. On the left is a 'Configuration Steps' sidebar with links: Overview, Basic Configuration, LAN IP Address (highlighted with a blue arrow), DHCP, Internet (WAN), Firewall, Security Settings, and Summary. The main area is titled 'LAN Interface Configuration'. It features a dropdown menu for 'Interface:' set to 'FastEthernet0/0'. Below this is a text box stating: 'You should change the default LAN IP address below. Use this new IP address to reconnect to the router from your browser.' There are two input fields: 'IP Address:' containing '192.168.1.1' and 'Subnet Mask:' containing '255.255.255.0'. To the right of the Subnet Mask field is the text 'or Subnet Bits:' followed by a spinner box set to '24'. At the bottom right are five buttons: '< Back', 'Next >', 'Finish', 'Cancel', and 'Help'.

Step 4: De-select DHCP server

At this point, do not enable the DHCP server. This procedure is covered in a later section of this course. In the DHCP server configuration window, ensure that the Enable DHCP server on the LAN interface check box is cleared before proceeding. Click **Next** to continue.

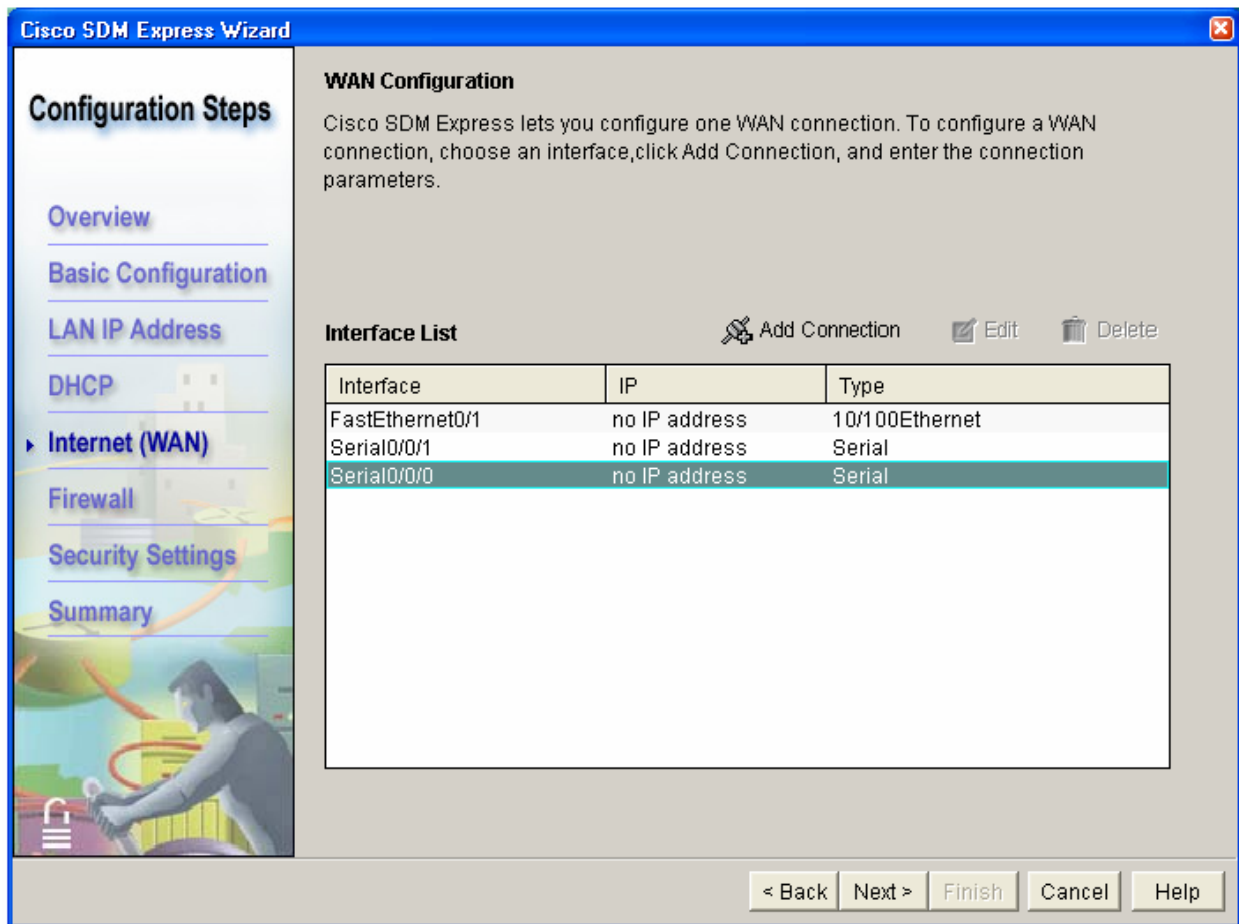


The screenshot shows the 'Cisco SDM Express Wizard' window. On the left is a 'Configuration Steps' sidebar with links: Overview, Basic Configuration, LAN IP Address, DHCP (selected with a blue arrow), Internet (WAN), Firewall, Security Settings, and Summary. The main area is titled 'DHCP server configuration' 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 is a checkbox labeled 'Enable DHCP server on the LAN interface' which is unchecked. Underneath is a text box: '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.' This is followed by two input fields: 'Starting IP Address:' with the value '192.168.1.1' and 'Ending IP Address:' with the value '192.168.1.254'. Below these is another section titled '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.' This section has two input fields: 'Primary DNS:' and 'Secondary DNS:'. At the bottom of this section is a checkbox labeled 'Use these DNS values for DHCP clients' which is also unchecked. At the bottom right of the window are five buttons: '< Back', 'Next >', 'Finish', 'Cancel', and 'Help'.

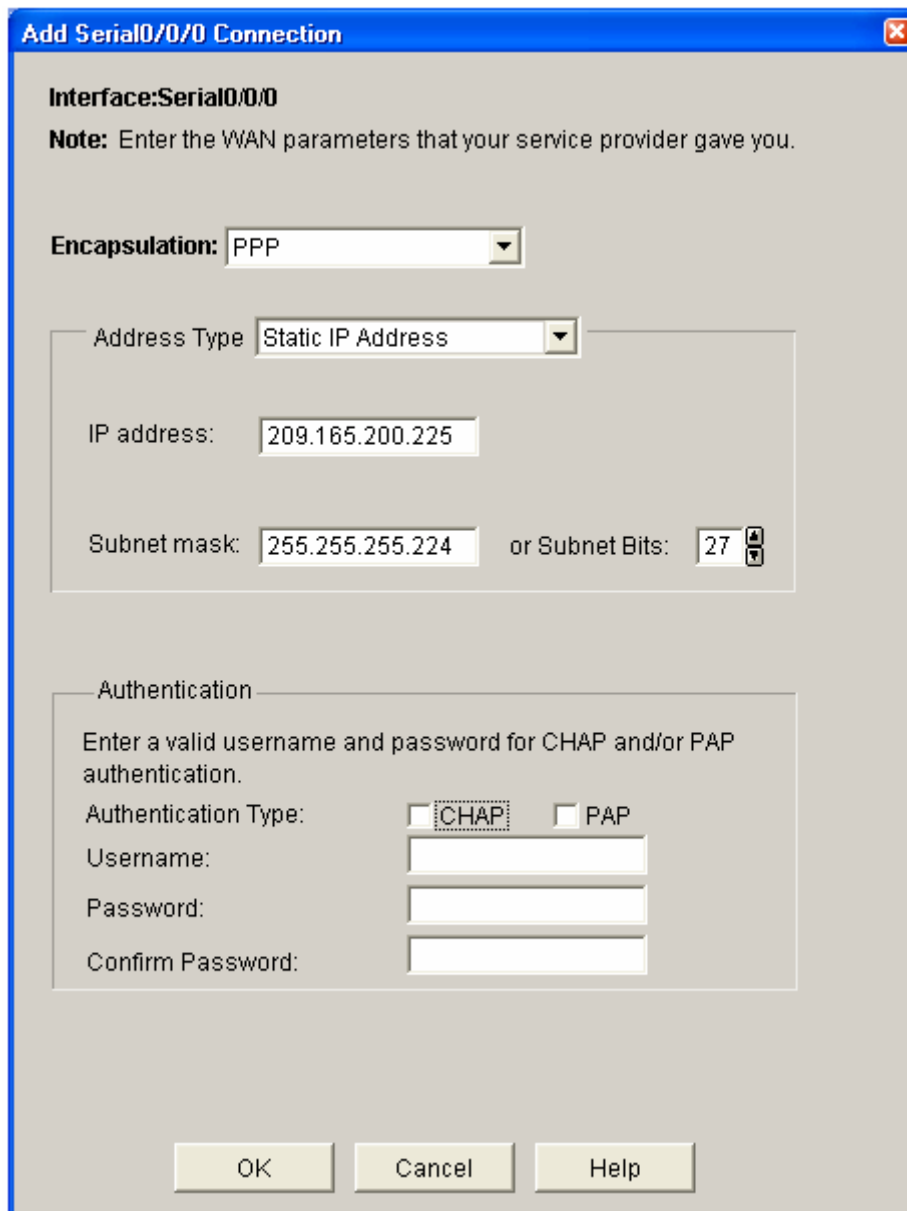
Step 5: Configure the WAN interface

- a. In the WAN Configuration window, choose **Serial0/0/0** interface from the list and click the **Add Connection** button. The Add Connection window appears.

NOTE: With the 1841 router, the serial interface is designated by 3 digits – C/S/P, where C=Controller#, S=Slot# and P=Port#. The 1841 has two modular slots. The designation Serial0/0/0 indicates that the serial interface module is on controller 0, in slot 0, and that the interface to be used is the first one (0). The second interface is Serial0/0/1. The serial module is normally installed in slot 0 but may be installed in slot 1. If this is the case, the designation for the first serial interface on the module would be Serial0/1/0 and the second would be Serial0/1/1.

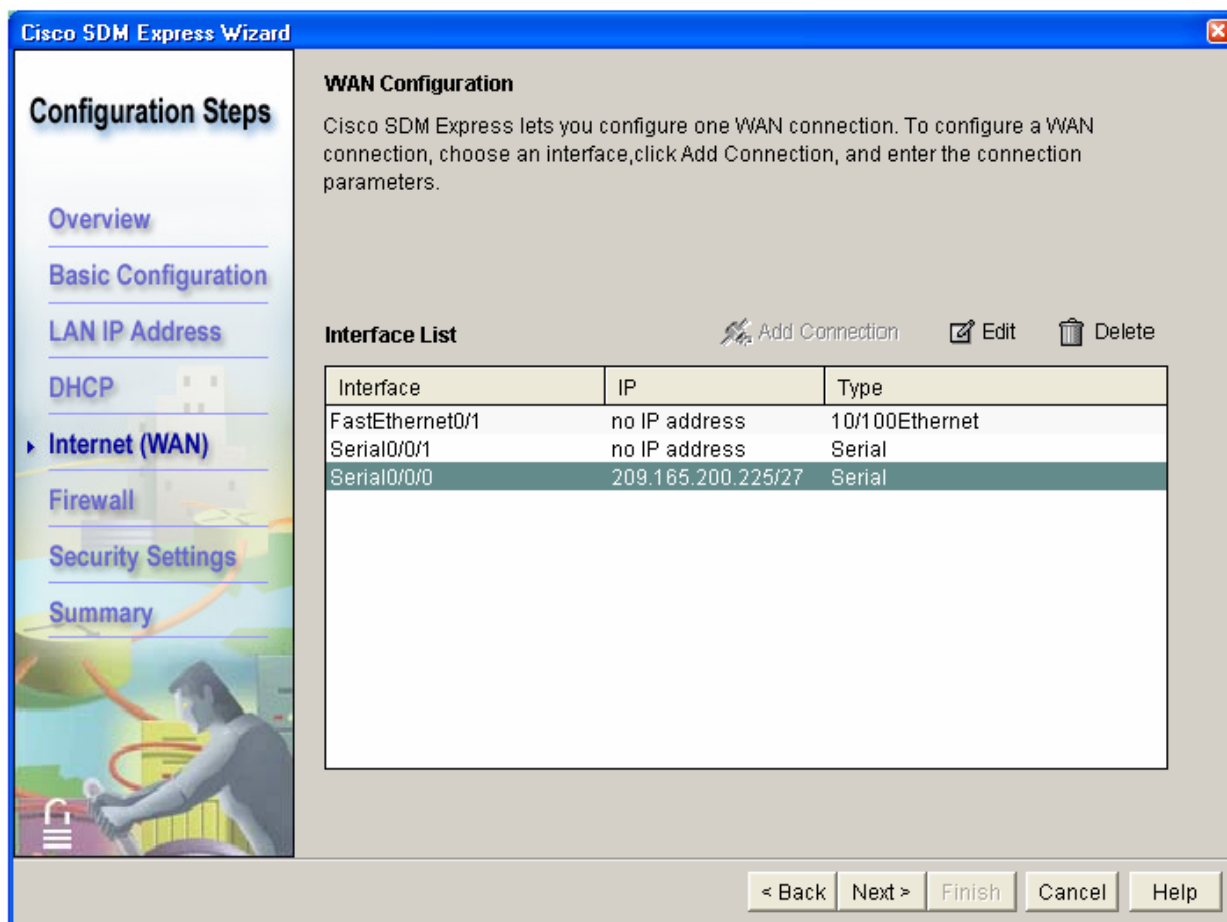


- b. From the Add Serial0/0/0 Connection dialog box, choose **PPP** from the Encapsulation list. From the Address Type list, choose **Static IP Address**. Enter **209.165.200.225** for the IP address and **255.255.255.224** for the Subnet mask. Click **OK** to continue. Notice that this subnet mask translates to a /27, or 27 bits for the mask.

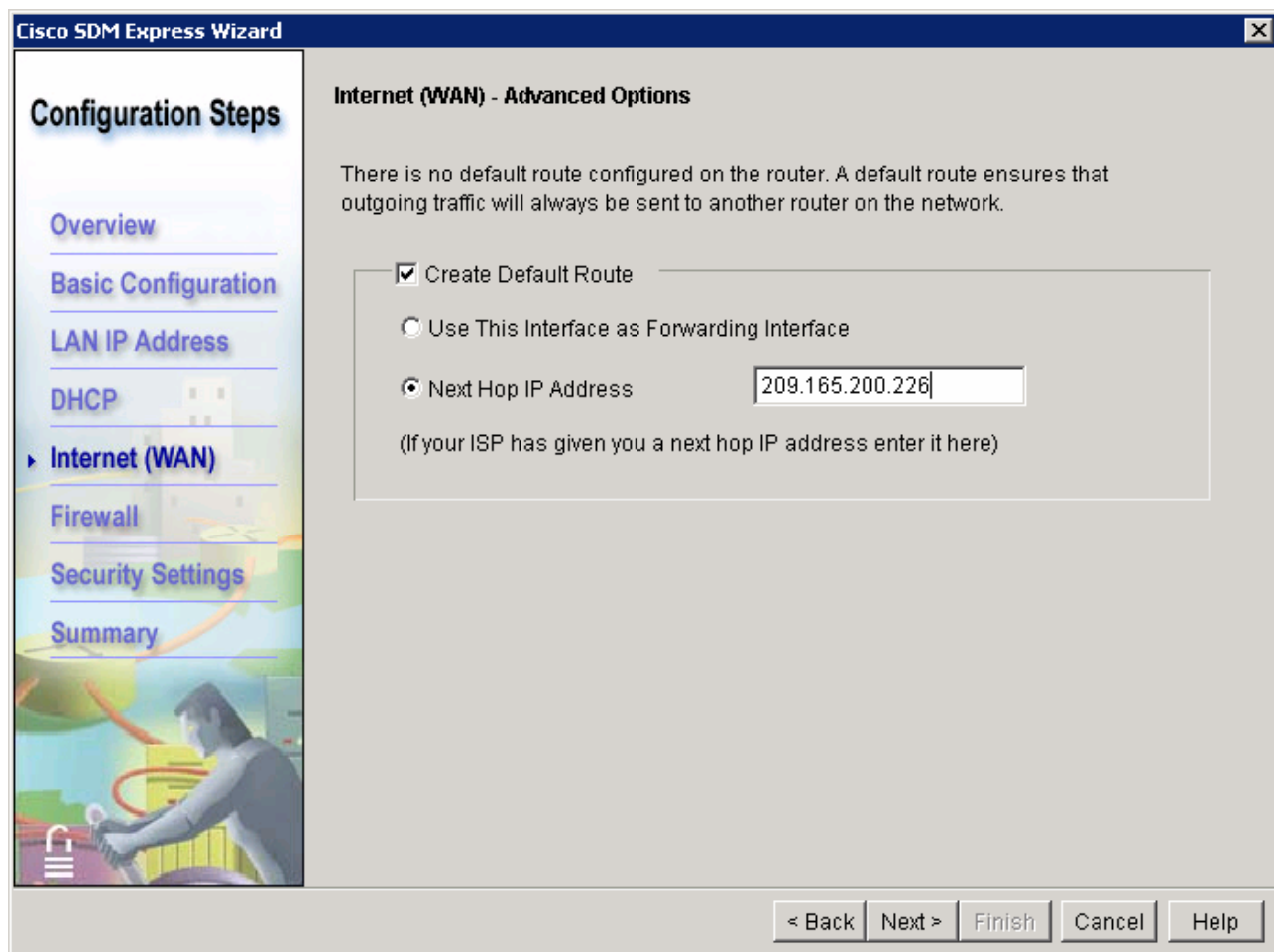


The image shows a Windows-style dialog box titled "Add Serial0/0/0 Connection". It has a blue title bar with a close button in the top right corner. The main area is light gray. At the top, it says "Interface: Serial0/0/0" and a "Note: Enter the WAN parameters that your service provider gave you." Below this, there's a section for "Encapsulation:" with a dropdown menu set to "PPP". Underneath is a section for "Address Type" with a dropdown menu set to "Static IP Address". This section contains three input fields: "IP address:" with the value "209.165.200.225", "Subnet mask:" with the value "255.255.255.224", and "or Subnet Bits:" with the value "27" and a small icon to its right. Below the address section is an "Authentication" section with the instruction "Enter a valid username and password for CHAP and/or PAP authentication." It includes "Authentication Type:" with radio buttons for "CHAP" (which is selected) and "PAP", followed by "Username:", "Password:", and "Confirm Password:" labels, each with an empty text input field. At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

- c. Notice that the IP address that you just set for the serial WAN interface now appears in the Interface List. Click **Next** to continue.



- d. Enter the IP address **209.165.200.226** as the Next Hop IP Address for the Default Route. Click **Next** to continue.



The screenshot shows the Cisco SDM Express Wizard window. On the left is a 'Configuration Steps' sidebar with links: Overview, Basic Configuration, LAN IP Address, DHCP, Internet (WAN) (highlighted with a blue arrow), Firewall, Security Settings, and Summary. The main area is titled 'Internet (WAN) - Advanced Options'. It contains a text box stating: 'There is no default route configured on the router. A default route ensures that outgoing traffic will always be sent to another router on the network.' Below this is a section with three radio buttons: 'Create Default Route' (checked), 'Use This Interface as Forwarding Interface', and 'Next Hop IP Address' (selected). The 'Next Hop IP Address' option has a text input field containing '209.165.200.226'. A note below the input field says: '(If your ISP has given you a next hop IP address enter it here)'. At the bottom right are five buttons: '< Back', 'Next >', 'Finish', 'Cancel', and 'Help'.

- e. Ensure that the check box next to Enable NAT is cleared. This procedure is covered in a later section of this course. Click **Next** to continue.

Cisco SDM Express Wizard

Configuration Steps

- Overview
- Basic Configuration
- LAN IP Address
- DHCP
- Internet (WAN)
- Firewall
- Security Settings
- Summary

Internet (WAN) - Private IP Address

☐ Enable NAT

Configuring NAT allows multiple devices on the LAN to share this WAN connection.

Configure port address mapping to associate public IP addresses (which outside users can use) with the private IP addresses of the servers in the LAN.

Private IP Address	Public IP Address	Protocol
--------------------	-------------------	----------

Add... Edit... Delete

PC with private IP address

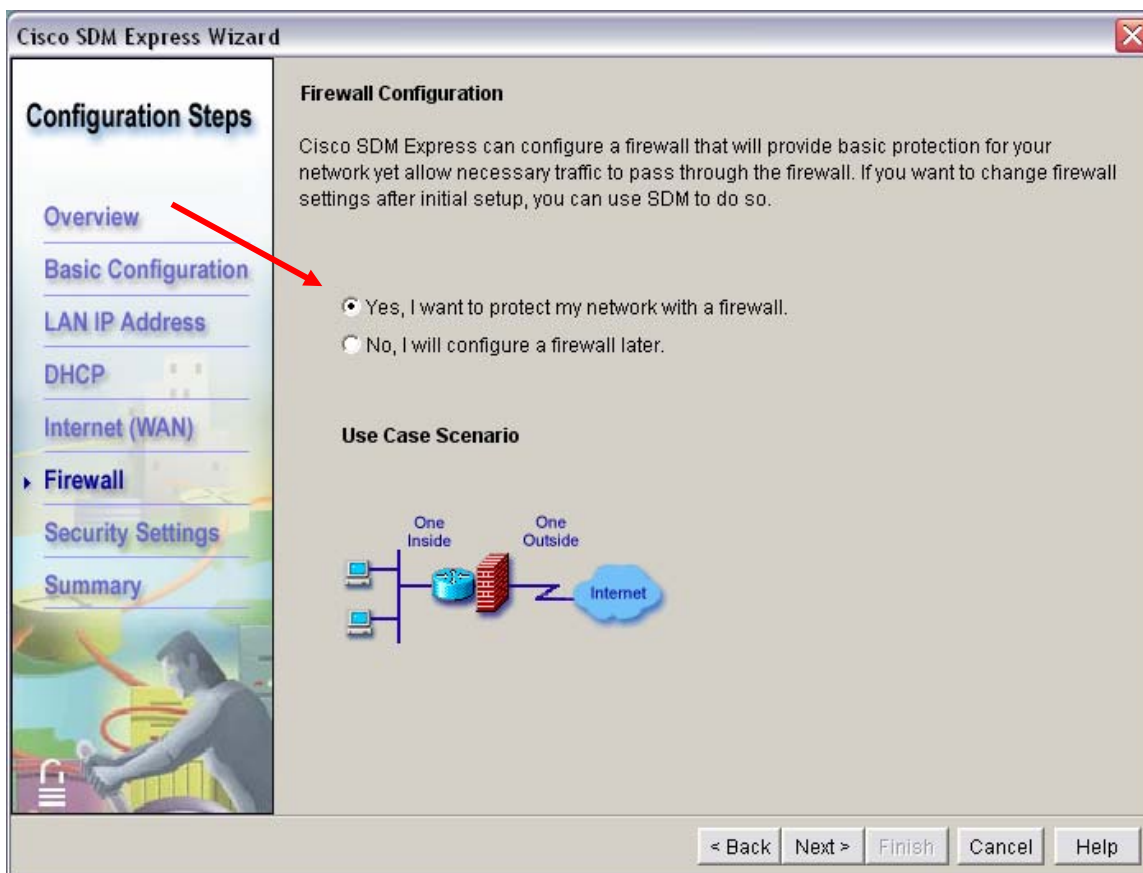
Internet

Email / Web server

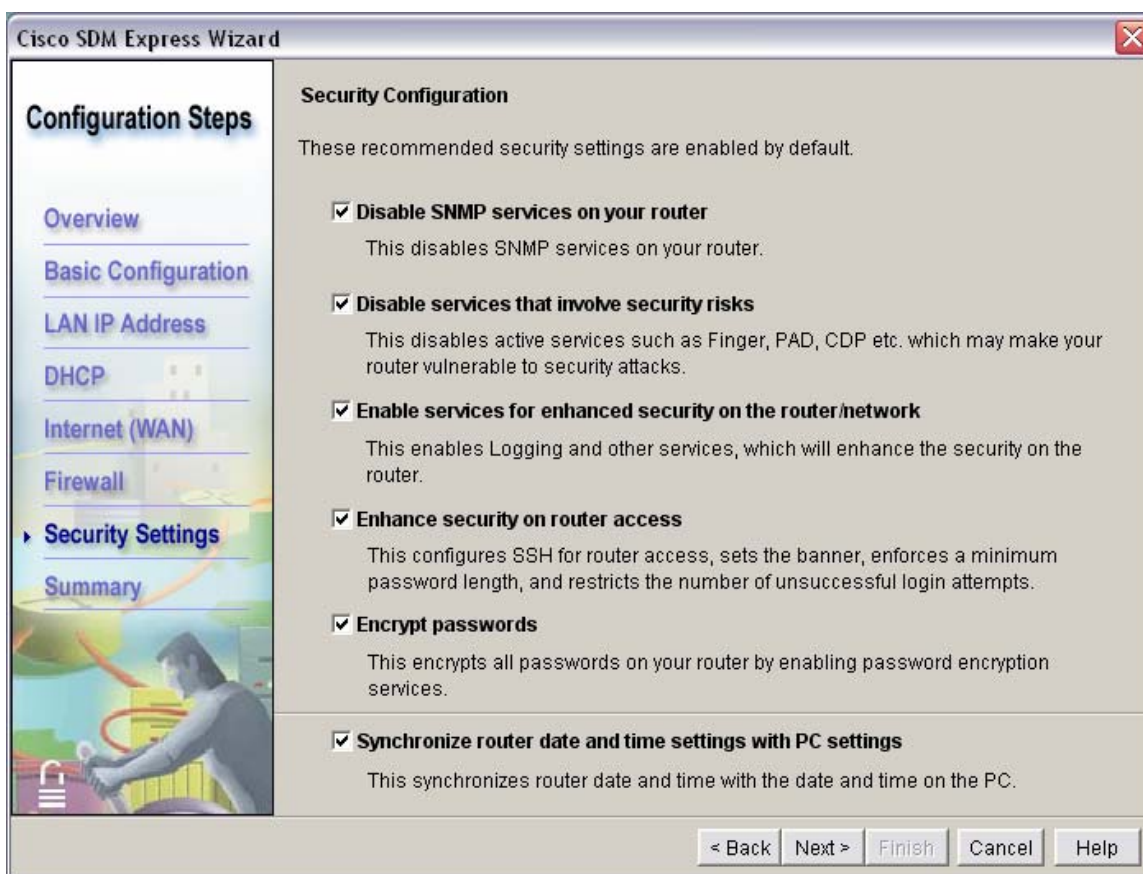
< Back Next > Finish Cancel Help

Step 6: Enable the firewall and security settings

- a. Depending on the router IOS version, the next step may be Firewall Configuration. In the Firewall Configuration window, click the radio button that enables the firewall and then click **Next**. The Security Configuration window appears.



- b. Leave all the default security options checked in the Security Configuration window and then click **Next**.



Step 7: Review and complete the configuration

- a. If you are not satisfied with the Cisco SDM Express Summary, click **Back** to fix any changes and then click **Finish** to commit the changes to the router.

Cisco SDM Express Wizard

Configuration Steps

- Overview
- Basic Configuration
- LAN IP Address
- DHCP
- Internet (WAN)
- Firewall
- Security Settings
- Summary

Cisco SDM Express Summary

Summary of changes you have made:

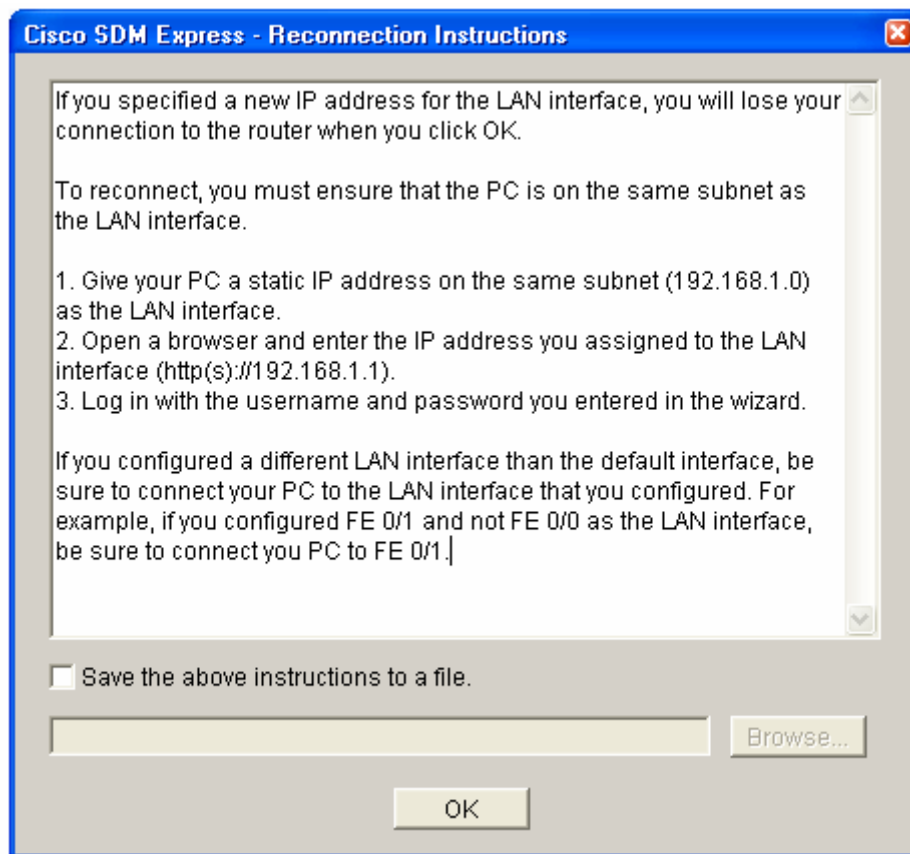
Basic Configuration	
Host Name:	CustomerRouter
Domain Name:	customer.com
Username:	admin
Password:	*****
Enable Secret Password:	*****
LAN Configuration	
Interface:	FastEthernet0/0
IP Address:	192.168.1.1
Subnet Mask:	255.255.255.0
DHCP Configuration	
DHCP Server Configuration:	DHCP server not enabled
Primary DNS:	Not set
Secondary DNS:	Not set
WAN Configuration	
Interface:	Serial0/0/0
Encapsulation:	Point-to-Point
IP Address:	Static
IP Address:	209.165.200.225

If you are satisfied with the configuration, click Finish. Otherwise, click Back to make changes.

< Back Next > Finish Cancel Help

- b. Click **OK** after reading the Reconnection Instructions. Save these instructions to a file for future reference, if desired.

NOTE: Before the next time you connect, you will need to change the IP address of the PC to be compatible with the new address that you configured to FastEthernet 0/0. The Reconnection instructions are shown below.



- c. When the delivery of the configuration to the router is complete. Click **OK** to close Cisco SDM Express.



Step 8: Reflection

- a. What feature makes configuring the router easy? _____

- b. Summarize the steps that are configured by the Cisco SDM Express

SDM router basic IOS configuration to bring up SDM

If the startup-config is erased in an SDM router, SDM will no longer come up by default when the router is restarted. It will be necessary to build a basic config as follows. Further details regarding the setup and use of SDM are can be found in the SDM Quick Start Guide:

http://www.cisco.com/en/US/products/sw/secursw/ps5318/products_quick_start09186a0080511c89.html#wp44788

- 1) Set the router Fa0/0 IP address

(This is the interface that a PC will connect to using a browser to bring up SDM. The PC IP address should be set to 10.10.10.2 255.255.255.248)

NOTE: An SDM router other than the 1841 may require connection to different port in order to access SDM.

```
Router(config)# interface Fa0/0
Router(config-if)# ip address 10.10.10.1 255.255.255.248
Router(config-if)# no shutdown
```

- 2) Enable the HTTP/HTTPS server of the router, using the following Cisco IOS commands:

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

- 3) Create a user account with privilege level 15 (enable privileges).

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

Replace <username> and <password> with the username and password that you want to configure.

```
4) Configure SSH and Telnet for local login and privilege level 15:
Router(config)# line vty 0 4
Router(config-line)# privilege level 15
Router(config-line)# login local
Router(config-line)# transport input telnet
Router(config-line)# transport input telnet ssh
Router(config-line)# exit
```