



CHAPTER 1

Basic Router Configuration

The Cisco Secure Router 520 Series routers are designed for small businesses with up to 50 users and teleworkers who want secure connectivity to corporate LANs and to the Internet. These routers provide advanced security features that include secure Virtual Private Network (VPN) access and comprehensive threat defense with Cisco IOS Firewall, Intrusion Prevention Solution (IPS), and URL filtering. The Cisco Secure Router 520 Series routers also provide dynamic routing and advanced quality of service (QoS) features.

The Cisco Secure Router 520 Series routers complement the Cisco Unified Communications 500 Series router and the Cisco Smart Business Communications System (SBCS) portfolio. As part of the SBCS portfolio, the Cisco Secure Router 520 Series routers deliver a common user experience through integration with the Cisco Configuration Assistant, Cisco Smart Assist, Cisco Monitor Manager, and Cisco Monitor Director.

This chapter provides procedures for configuring the basic parameters of your Cisco router, including global parameter settings, routing protocols, interfaces, and command-line access using the CLI. It also describes the default configuration at startup.



Note

Individual router models may not support every feature described throughout this guide. Features not supported by a particular router are indicated whenever possible.

This chapter contains the following sections:

- [Viewing the Default Configuration](#)
- [Information Needed for Customizing the Default Parameters](#)
- [Interface Port Labels](#)
- [Configuring Basic Parameters](#)
- [Configuring Static Routes](#)
- [Configuring Dynamic Routes](#)

Each section includes a configuration example and verification steps, as available.

For complete information on how to access global configuration mode, see the “[Entering Global Configuration Mode](#)” section in Appendix A, “Cisco IOS Basic Skills.” For more information on the commands used in the following tables, see the Cisco IOS Release 12.3 documentation set.

Viewing the Default Configuration

When the router first boots up, some basic configuration has already been performed. All of the LAN and WAN interfaces have been created, console and VTY ports are configured, and the inside interface for Network Address Translation has been assigned.

To view the default configuration, follow these steps:

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- Step 1** Use the default username **cisco** and the default password **cisco** to enter the privileged EXEC mode.
- Step 2** Use the **show running-config** command to view the initial configuration.
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Information Needed for Customizing the Default Parameters

You need to gather some or all of the following information, depending on your planned network scenario, prior to configuring your network.

- If you are setting up an Internet connection, gather the following information:
 - Point-to-Point Protocol (PPP) client name that is assigned as your login name
 - PPP authentication type: Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP)
 - PPP password to access your Internet service provider (ISP) account
 - DNS server IP address and default gateways
- If you are setting up a connection to a corporate network, you and the network administrator must generate and share the following information for the WAN interfaces of the routers:
 - PPP authentication type: CHAP or PAP
 - PPP client name to access the router
 - PPP password to access the router
- If you are setting up IP routing:
 - Generate the addressing scheme for your IP network.
 - Determine the IP routing parameter information, including IP address, and ATM permanent virtual circuits (PVCs). These PVC parameters are typically virtual path identifier (VPI), virtual circuit identifier (VCI), and traffic shaping parameters.
 - Determine the number of PVCs that your service provider has given you, along with their VPIs and VCIs.
 - For each PVC determine the type of AAL5 encapsulation supported. It can be one of the following:
 - AAL5SNAP—This can be either routed RFC 1483 or bridged RFC 1483. For routed RFC 1483, the service provider must provide you with a static IP address. For bridged RFC 1483, you may use DHCP to obtain your IP address, or you may obtain a static IP address from your service provider.
 - AAL5MUX PPP—With this type of encapsulation, you need to determine the PPP-related configuration items.
- If you plan to connect over an ADSL line:

- Order the appropriate line from your public telephone service provider. Ensure that the ADSL signaling type is DMT (also called ANSI T1.413) or DMT Issue 2.
- Once you have collected the appropriate information, you can perform a full configuration on your router, beginning with the tasks in the “[Configuring Basic Parameters](#)” section.

Interface Port Labels

Table 1-1 lists the interfaces supported for each router and their associated port labels on the equipment.

Table 1-1 Supported Interfaces and Associated Port Labels by Router

Router	Interface	Port Label
Cisco Secure Router 520 Ethernet-to-Ethernet routers	Fast Ethernet LAN	FE0–FE3
	Fast Ethernet WAN	FE4
	Wireless LAN	None (antenna is not labeled)
Cisco Secure Router 520 ADSL-over-POTS routers	Fast Ethernet LAN	LAN (top), FE0–FE3 (bottom)
	ATM WAN	ADSLoPOTS
	Wireless LAN	None (antenna is not labeled)
Cisco Secure Router 520 ADSL-over-ISDN routers	Fast Ethernet LAN	LAN (top), FE0–FE3 (bottom)
	ATM WAN	ADSLoISDN
	Wireless LAN	None (antenna is not labeled)

Configuring Basic Parameters

To configure the router, perform one or more of these tasks:

- [Configure Global Parameters](#)
- [Configure Fast Ethernet LAN Interfaces](#)
- [Configure WAN Interfaces](#)
- [Configuring a Loopback Interface](#)
- [Configuring Command-Line Access to the Router](#)

A configuration example is presented with each task to show the network configuration following completion of that task.

Configure Global Parameters

Perform these steps to configure selected global parameters for your router:

	Command	Purpose
Step 1	<p>configure terminal</p> <p>Example:</p> <pre>Router> enable Router# configure terminal Router(config)#</pre>	<p>Enters global configuration mode, when using the console port.</p> <p>If you are connecting to the router using a remote terminal, use the following:</p> <pre>telnet router name or address Login: login id Password: ***** Router> enable</pre>
Step 2	<p>hostname name</p> <p>Example:</p> <pre>Router(config)# hostname Router Router(config)#</pre>	<p>Specifies the name for the router.</p>
Step 3	<p>enable secret password</p> <p>Example:</p> <pre>Router(config)# enable secret cr1ny5ho Router(config)#</pre>	<p>Specifies an encrypted password to prevent unauthorized access to the router.</p>
Step 4	<p>no ip domain-lookup</p> <p>Example:</p> <pre>Router(config)# no ip domain-lookup Router(config)#</pre>	<p>Disables the router from translating unfamiliar words (typos) into IP addresses.</p>

For complete information on the global parameter commands, see the Cisco IOS Release 12.3 documentation set.

Configure Fast Ethernet LAN Interfaces

The Fast Ethernet LAN interfaces on your router are automatically configured as part of the default VLAN and as such, they are not configured with individual addresses. Access is afforded through the VLAN. You may assign the interfaces to other VLANs if desired. For more information about creating VLANs, see [Chapter 5, “Configuring a LAN with DHCP and VLANs.”](#)

Configure WAN Interfaces

The Cisco Secure Router 520 Ethernet-to-Ethernet routers have one Fast Ethernet interface for WAN connection. The Cisco Secure Router 520 ADSL-over-POTS and Cisco Secure Router 520 ADSL-over-ISDN routers have one ATM interface for WAN connection.

Based on the router you have, configure the WAN interface(s) by using one of the following procedures:

- [Configure the Fast Ethernet WAN Interface](#)
- [Configure the ATM WAN Interface](#)

Configure the Fast Ethernet WAN Interface

This procedure applies only to the Cisco Secure Router 520 Ethernet-to-Ethernet routers. Perform these steps to configure the Fast Ethernet interface, beginning in global configuration mode:

	Command	Purpose
Step 1	<p>interface <i>type number</i></p> <p>Example:</p> <pre>Router(config)# interface fastethernet 4 Router(config-if)#</pre>	Enters the configuration mode for a Fast Ethernet WAN interface on the router.
Step 2	<p>ip address <i>ip-address mask</i></p> <p>Example:</p> <pre>Router(config-if)# ip address 192.1.12.2 255.255.255.0 Router(config-if)#</pre>	Sets the IP address and subnet mask for the specified Fast Ethernet interface.
Step 3	<p>no shutdown</p> <p>Example:</p> <pre>Router(config-if)# no shutdown Router(config-if)#</pre>	Enables the Ethernet interface, changing its state from administratively down to administratively up.
Step 4	<p>exit</p> <p>Example:</p> <pre>Router(config-if)# exit Router(config)#</pre>	Exits configuration mode for the Fast Ethernet interface and returns to global configuration mode.

Configure the ATM WAN Interface

This procedure applies only to the Cisco Secure Router 520 ADSL-over-POTS and Cisco Secure Router 520 ADSL-over-ISDN routers.

Perform these steps to configure the ATM interface, beginning in global configuration mode:

	Command	Purpose
Step 1	interface <i>type number</i> Example: Router(config)# interface atm0 Router(config-if)#	Identifies and enters the configuration mode for an ATM interface.
Step 2	ip address <i>ip-address mask</i> Example: Router(config-if)# ip address 200.200.100.1 255.255.255.0 Router(config-if)#	Sets the IP address and subnet mask for the ATM interface.
Step 3	no shutdown Example: Router(config-if)# no shutdown Router(config-if)#	Enables the ATM 0 interface.
Step 4	exit Example: Router(config-if)# exit Router(config)#	Exits configuration mode for the ATM interface and returns to global configuration mode.

Configure the Wireless Interface

The wireless interface enables connection to the router through a wireless LAN connection. For more information about configuring a wireless connection, see [Chapter 9, “Configuring a Wireless LAN Connection,”](#) and the *Cisco Access Router Wireless Configuration Guide*.

Configuring a Loopback Interface

The loopback interface acts as a placeholder for the static IP address and provides default routing information.

For complete information on the loopback commands, see the Cisco IOS Release 12.3 documentation set.

Perform these steps to configure a loopback interface, beginning in global configuration mode:

	Command	Purpose
Step 1	interface <i>type number</i> Example: Router(config)# interface Loopback 0 Router(config-if)#	Enters configuration mode for the loopback interface.
Step 2	ip address <i>ip-address mask</i> Example: Router(config-if)# ip address 10.108.1.1 255.255.255.0 Router(config-if)#	Sets the IP address and subnet mask for the loopback interface.
Step 3	exit Example: Router(config-if)# exit Router(config)#	Exits configuration mode for the loopback interface and returns to global configuration mode.

Configuration Example

The loopback interface in this sample configuration is used to support Network Address Translation (NAT) on the virtual-template interface. This configuration example shows the loopback interface configured on the Fast Ethernet interface with an IP address of 200.200.100.1/24, which acts as a static IP address. The loopback interface points back to virtual-template1, which has a negotiated IP address.

```
!
interface loopback 0
ip address 200.200.100.1 255.255.255.0 (static IP address)
ip nat outside
!
interface Virtual-Template1
ip unnumbered loopback0
no ip directed-broadcast
ip nat outside
!
```

Verifying Your Configuration

To verify that you have properly configured the loopback interface, enter the **show interface loopback** command. You should see verification output similar to the following example.

```
Router# show interface loopback 0
Loopback0 is up, line protocol is up
  Hardware is Loopback
  Internet address is 200.200.100.1/24
  MTU 1514 bytes, BW 8000000 Kbit, DLY 5000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation LOOPBACK, loopback not set
  Last input never, output never, output hang never
```

```

Last clearing of "show interface" counters never
Queuing strategy: fifo
Output queue 0/0, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
  0 packets input, 0 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 collisions, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out

```

Another way to verify the loopback interface is to ping it:

```

Router# ping 200.200.100.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 200.200.100.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

```

Configuring Command-Line Access to the Router

Perform these steps to configure parameters to control access to the router, beginning in global configuration mode:

	Command	Purpose
Step 1	line <i>[aux console tty vty] line-number</i> Example: Router(config)# line console 0 Router(config-line)#	Enters line configuration mode, and specifies the type of line. This example specifies a console terminal for access.
Step 2	password <i>password</i> Example: Router(config-line)# password 5dr4Hepw3 Router(config-line)#	Specifies a unique password for the console terminal line.
Step 3	login Example: Router(config-line)# login Router(config-line)#	Enables password checking at terminal session login.
Step 4	exec-timeout <i>minutes [seconds]</i> Example: Router(config-line)# exec-timeout 5 30 Router(config-line)#	Sets the interval that the EXEC command interpreter waits until user input is detected. The default is 10 minutes. Optionally, add seconds to the interval value. This example shows a timeout of 5 minutes and 30 seconds. Entering a timeout of 0 0 specifies never to time out.

	Command	Purpose
Step 5	<p>exit</p> <p>Example:</p> <pre>Router(config-line)# exit Router (config)#</pre>	Exits line configuration mode, and returns to global configuration mode.
Step 6	<p>line [aux console tty vty] line-number</p> <p>Example:</p> <pre>Router(config)# line vty 0 4 Router(config-line)#</pre>	Specifies a virtual terminal for remote console access.
Step 7	<p>password password</p> <p>Example:</p> <pre>Router(config-line)# password aldf2ad1 Router(config-line)#</pre>	Specifies a unique password for the virtual terminal line.
Step 8	<p>login</p> <p>Example:</p> <pre>Router(config-line)# login Router(config-line)#</pre>	Enables password checking at the virtual terminal session login.
Step 9	<p>end</p> <p>Example:</p> <pre>Router(config-line)# end Router#</pre>	Exits line configuration mode, and returns to privileged EXEC mode.

For complete information about the command line commands, see the Cisco IOS Release 12.3 documentation set.

Configuration Example

The following configuration shows the command-line access commands.

You do not need to input the commands marked “default.” These commands appear automatically in the configuration file generated when you use the **show running-config** command.

```
!
line con 0
exec-timeout 10 0
password 4youreyesonly
login
transport input none (default)
stopbits 1 (default)
line vty 0 4
password secret
login
!
```

Configuring Static Routes

Static routes provide fixed routing paths through the network. They are manually configured on the router. If the network topology changes, the static route must be updated with a new route. Static routes are private routes unless they are redistributed by a routing protocol. Configuring static routes on the Cisco Secure Router 520 Series router is optional.

Perform these steps to configure static routes, beginning in global configuration mode:

	Command	Purpose
Step 1	<p>ip route <i>prefix mask {ip-address interface-type interface-number [ip-address]}</i></p> <p>Example:</p> <pre>Router(config)# ip route 192.168.0.0 255.255.0.0 10.10.10.2 Router(config)#</pre>	<p>Specifies the static route for the IP packets.</p> <p>For details about this command and additional parameters that can be set, see the Cisco IOS IP Command Reference, Volume 2 of 4: Routing Protocols.</p>
Step 2	<p>end</p> <p>Example:</p> <pre>Router(config)# end Router#</pre>	<p>Exits router configuration mode, and enters privileged EXEC mode.</p>

For complete information on the static routing commands, see the Cisco IOS Release 12.3 documentation set. For more general information on static routing, see [Appendix B, “Concepts.”](#)

Configuration Example

In the following configuration example, the static route sends out all IP packets with a destination IP address of 192.168.1.0 and a subnet mask of 255.255.255.0 on the Fast Ethernet interface to another device with an IP address of 10.10.10.2. Specifically, the packets are sent to the configured PVC.

You do not need to enter the commands marked “(default).” These commands appear automatically in the configuration file generated when you use the **show running-config** command.

```
!
ip classless (default)
ip route 192.168.1.0 255.255.255.0 10.10.10.2
!
```

Verifying Your Configuration

To verify that you have properly configured static routing, enter the **show ip route** command and look for static routes signified by the “S.”

You should see verification output similar to the following example.

```
Router# show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external,
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
```

```

ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route

```

Gateway of last resort is not set

```

10.0.0.0/24 is subnetted, 1 subnets
C    10.108.1.0 is directly connected, Loopback0
S*  0.0.0.0/0 is directly connected, FastEthernet0

```

Configuring Dynamic Routes

In dynamic routing, the network protocol adjusts the path automatically, based on network traffic or topology. Changes in dynamic routes are shared with other routers in the network.

The Cisco routers can use IP routing protocols, such as Routing Information Protocol (RIP), to learn routes dynamically. You can configure either of these routing protocols on your router.

Configuring RIP

Perform these steps to configure the RIP routing protocol on the router, beginning in global configuration mode:

	Command	Task
Step 1	router rip Example: Router# configure terminal Router(config)# router rip Router(config-router)#	Enters router configuration mode, and enables RIP on the router.
Step 2	version {1 2} Example: Router(config-router)# version 2 Router(config-router)#	Specifies use of RIP version 1 or 2.
Step 3	network ip-address Example: Router(config-router)# network 192.168.1.1 Router(config-router)# network 10.10.7.1 Router(config-router)#	Specifies a list of networks on which RIP is to be applied, using the address of the network of directly connected networks.

	Command	Task
Step 4	no auto-summary Example: Router(config-router)# no auto-summary Router(config-router)#	Disables automatic summarization of subnet routes into network-level routes. This allows subprefix routing information to pass across classful network boundaries.
Step 5	end Example: Router(config-router)# end Router#	Exits router configuration mode, and enters privileged EXEC mode.

For complete information on the dynamic routing commands, see the Cisco IOS Release 12.3 documentation set. For more general information on RIP, see [Appendix B, “Concepts.”](#)

Configuration Example

The following configuration example shows RIP version 2 enabled in IP network 10.0.0.0 and 192.168.1.0.

Execute the **show running-config** command from privileged EXEC mode to see this configuration.

```
!
router rip
  version 2
  network 10.0.0.0
  network 192.168.1.0
  no auto-summary
!
```

Verifying Your Configuration

To verify that you have properly configured RIP, enter the **show ip route** command and look for RIP routes signified by “R.” You should see verification output like the example shown below.

```
Router# show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external,
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route
```

```
Gateway of last resort is not set

  10.0.0.0/24 is subnetted, 1 subnets
C       10.108.1.0 is directly connected, Loopback0
R       3.0.0.0/8 [120/1] via 2.2.2.1, 00:00:02, Ethernet0/0
```