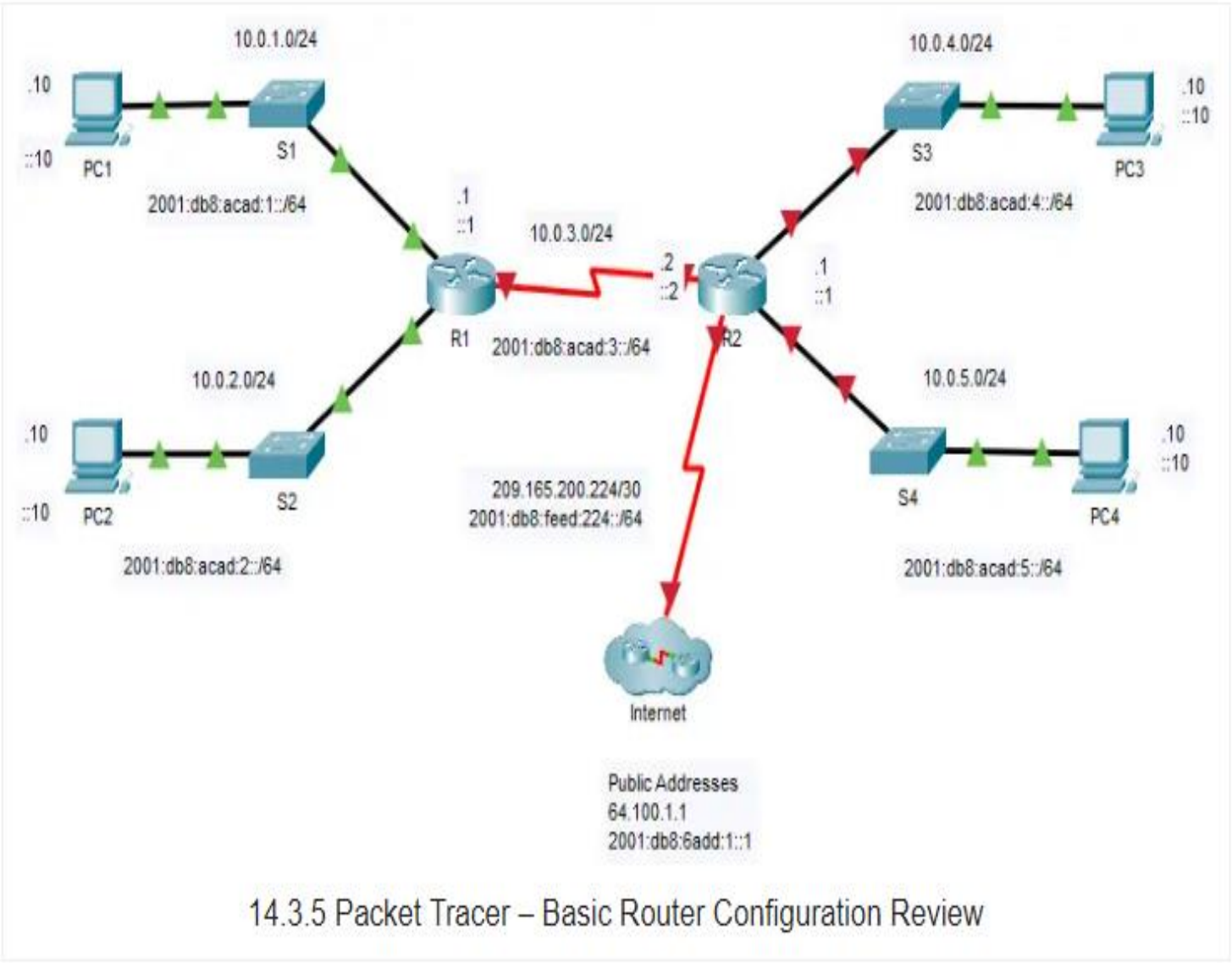

Basic Router Configuration

Chapter Contents

This module provides basic configuration procedures for the Cisco 800M Series ISR and contains the following sections.

- Configuring Global Parameters
- Configuring Gigabit Ethernet WAN Interfaces
- Configuring a Loopback Interface
- Configuring Command-Line Access
- Configuring Gigabit Ethernet LAN Interfaces
- Configuring Static Routes
- Configuring Dynamic Routes

- Configuring Image and Configuration Recovery Using the Push Button
- Configuring 800M Series ISR using Zero Touch Deployment

Configuring Global Parameters

To configure the global parameters for your router, follow these steps.

SUMMARY STEPS

1. **configure terminal**
2. **hostname** *name*
3. **enable secret** *password*
4. **no ip domain-lookup**

DETAILED STEPS

	Command	Purpose

Step 1	**configure terminal**
	Example:
	`Router> enable`
	`Router# configure terminal`
		Enters global configuration mode, when using the console port.

Step 2	**hostname** *name* **Example:** `Router(config)# hostname Router`	Specifies the name for the router.
Step 3	**enable secret** *password* **Example:** `Router(config)# enable secret cr1ny5ho`	Specifies an encrypted password to prevent unauthorized access to the router.
Step 4	**no ip domain-lookup** **Example:** `Router(config)# no ip domain-lookup`	Disables the router from translating unfamiliar words (typos) into IP addresses.

Configuring Gigabit Ethernet WAN Interfaces

You can connect WAN interfaces either by using straight polarity connectors or reversed polarity connectors.

- Straight Polarity: If Mag-jack RJ45 connector has a dot or digit marked on front housing, it can be used with any type of cables.
- Reversed Polarity: If Mag-jack RJ45 connector has no dots or digit marked on front housing, it can be used with coupler and short cable (Cat5E UTP cable) to connect other devices which doesn't support auto polarity correction.

To configure Gigabit Ethernet (GE) WAN interfaces, follow these steps, beginning in global configuration mode.

SUMMARY STEPS

1. **configure terminal**
2. **interface gigabitethernet** slot/port
3. **ip address ip-address mask**

4. **no shutdown**
5. **exit**

DETAILED STEPS

	Command	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**interface gigabitethernet** slot/port **Example:** `Router(config)# interface gigabitethernet 0/8`	Enters the configuration mode for a Gigabit Ethernet interface on the router. GigabitEthernet WAN Interfaces are 0/8 and 0/9 for Cisco C841M-8X ISR and 0/4 to 0/5 for Cisco C841M-4X
Step 3	**ip address ip-address mask** **Example:** `Router(config-if)#` **ip address** `192.168.12.2 255.255.255.0`	Sets the IP address and subnet mask for the specified GE interface.
Step 4	**no shutdown** **Example:** `Router(config-if)#` **no shutdown**	Enables the GE interface, changing its state from administratively down to administratively up.
Step 5	**exit** **Example:** `Router(config-if)#` **exit**	Exits configuration mode for the GE interface and returns to global configuration mode.

Configuring a Loopback Interface

The loopback interface acts as a placeholder for the static IP address and provides default routing information. To configure a loopback interface, follow these steps, beginning in global configuration mode.

SUMMARY STEPS

1. **configure terminal**
2. **interface** *type number*
3. **ip address ip-address mask**
4. **exit**

DETAILED STEPS

	Command	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.

Step 2	**interface** *type number* **Example:** `Router(config)# interface Loopback 0`	Enters configuration mode for the loopback interface.
Step 3	**ip address** *ip-address mask* **Example:** `Router(config-if)# ip address 10.108.1.1 255.255.255.0`	Sets the IP address and subnet mask for the loopback interface.
Step 4	**exit** **Example:** `Router(config-if)# exit`	Exits configuration mode for the loopback interface and returns to global configuration mode.

Example: Configuring the Loopback Interface

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 gigabit 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 0ip address 200.200.100.1 255.255.255.0ip nat outside!interface Virtual-Template1ip unnumbered loopback0no ip directed-broadcastip nat outside!

Verifying the Loopback Interface Configuration

To verify that you have properly configured the loopback interface, enter the show interface loopback command as shown in the following example.

Router# show interface loopback 0Loopback0 is up, line protocol is upHardware is LoopbackInternet address is 200.200.100.1/24MTU 1514 bytes, BW 8000000 Kbit, DLY 5000 usec,reliability 255/255, txload 1/255, rxload 1/255Encapsulation LOOPBACK, loopback not setLast input never, output never, output hang neverLast clearing of "show interface" counters neverQueueing strategy: fifoOutput queue 0/0, 0 drops; input queue 0/75, 0 drops5 minute input rate 0 bits/sec, 0 packets/sec5 minute output rate 0 bits/sec, 0 packets/sec0 packets input, 0 bytes, 0 no bufferReceived 0 broadcasts, 0 runts, 0 giants, 0 throttles0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort0 packets output, 0 bytes, 0 underruns0 output errors, 0 collisions, 0 interface resets0 output buffer failures, 0 output buffers swapped out

You can lso verify the loopback interface by using the **ping** command as shown in the following example.

Router# ping 200.200.100.1Type 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 configure parameters to control access to the router, perform the following steps.

SUMMARY STEPS

1. **configure terminal**
2. **line** [**aux** | **console** | **tty** | **vty**] *line-number*
3. **password** *password*

4. **login**
5. **exec-timeout** *minutes* [*seconds*]
6. **line** [**aux** | **console** | **tty** | **vty**] *line-number*
7. **password** *password*
8. **login**
9. **end**

DETAILED STEPS

	Command	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**line** [**aux**	**console**	**tty**	**vty**] *line-number* **Example:** `Router(config)# line console 0`	Enters line configuration mode, and specifies the type of line.
Step 3	**password** *password* **Example:** `Router(config)# password 5dr4Hepw3`	Specifies a unique password for the console terminal line.
Step 4	**login** **Example:** `Router(config-line)# login`	Enables password verification at the terminal login session.
Step 5	**exec-timeout** *minutes* [*seconds*] **Example:** `Router(config-line)# exec-timeout 5 30`	Sets the interval that the EXEC command interpreter waits until user input is detected. The default is 10 minutes. You can also optionally add seconds to the interval value.
Step 6	**line** [**aux**	**console**	**tty**	**vty**] *line-number* **Example:** `Router(config-line)# line vty 0 4`	Specifies a virtual terminal for remote console access.
Step 7	**password** *password* **Example:** `Router(config-line)# password aldf2ad1`	Specifies a unique password for the virtual terminal line.
Step 8	**login** **Example:** `Router(config-line)# login`	Enables password verifiation at the virtual terminal login session.

Step 9	**end** **Example:** `Router(config-line)# endRouter#`	Exits line configuration mode, and returns to privileged EXEC mode.

Configuring Gigabit Ethernet LAN Interfaces

To manually configure Gigabit Ethernet (GE) LAN interfaces, follow these steps, beginning in global configuration mode.

SUMMARY STEPS

1. **configure terminal**
2. **interface gigabitethernet** slot/port
3. **ip address ip-address mask**
4. **no shutdown**
5. **exit**

DETAILED STEPS

	Command	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**interface gigabitethernet** slot/port **Example:** `Router(config)# interface gigabitethernet 0/1`	Enters the configuration mode for a Gigabit Ethernet interface on the router. GigabitEthernet LAN Interfaces are 0/0 to 0/7 for Cisco C841M-8X ISR and 0/0 to 0/3 for Cisco C841M-4X ISR.
Step 3	**ip address ip-address mask** **Example:** `Router(config-if)# ip address 192.168.12.2 255.255.255.0`	Sets the IP address and subnet mask for the specified GE interface.
Step 4	**no shutdown** **Example:** `Router(config-if)# no shutdown`	Enables the GE interface, changing its state from administratively down to administratively up.
Step 5	**exit** **Example:** `Router(config-if)# exit`	Exits configuration mode for the GE interface and returns to global configuration mode.

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.

To configure static routes, perform these steps in global configuration mode.

SUMMARY STEPS

1. **configure terminal**
2. **ip route** *prefix mask* { *ip-address* | *interface-type interface-number* [*ip-address*]}
3. **end**

DETAILED STEPS

	Command	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**ip route** *prefix mask* { *ip-address* | *interface-type interface-number* [*ip-address*]} **Example:** `Router(config)# ip route 192.168.1.0 255.255.0.0 10.10.10.2`	Specifies the static route for the IP packets.
Step 3	**end** **Example:** `Router(config)# end`	Exits router configuration mode, and enters privileged EXEC mode.

Example: Configuring Static Routes

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 Gigabit 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 command marked “(default).” This command appears 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 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:

Router# show ip routeCodes: C - connected, S - static, R - RIP, M - mobile, B - BGPD - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter areaN1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2E1 - OSPF external type 1, E2 - OSPF external type 2i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2ia - IS-IS inter area, * - candidate default, U - per-user static routeo - ODR, P - periodic downloaded static route Gateway of last resort is not set 10.0.0.0/24 is subnetted, 1 subnetsC 10.108.1.0 is directly connected, Loopback0S* 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) or Enhanced Interior Gateway Routing Protocol (EIGRP), to learn routes dynamically. You can configure either of these routing protocols on your router.

- "Configuring Routing Information Protocol" section
- "Configuring Enhanced Interior Gateway Routing Protocol" section

Configuring Routing Information Protocol

To configure the RIP routing protocol on the router, follow these steps, beginning in global configuration mode.

SUMMARY STEPS

1. configure terminal
2. **router rip**
3. **version** { **1** | **2** }
4. **network** *ip-address*
5. **no auto-summary**
6. **end**

DETAILED STEPS

	Command	Task
Step 1	configure terminal **Example:** Router> configure terminal	Enters global configuration mode.
Step 2	**router rip** **Example:** `Router(config)# router rip`	Enters router configuration mode, and enables RIP on the router.
Step 3	**version** { **1**	**2** } **Example:** `Router(config-router)# version 2`	Specifies use of RIP version 1 or 2.
Step 4	**network** *ip-address* **Example:** `Router(config-router)# network 192.168.1.1`	Specifies a list of networks on which RIP is to be applied, using the address of the network of each directly connected network.
Step 5	**no auto-summary** **Example:** `Router(config-router)# no auto-summary`	Disables automatic summarization of subnet routes into network-level routes. This allows subprefix routing information to pass across classful network boundaries.

Step 6	**end** **Example:** `Router(config-router)# end`	Exits router configuration mode, and enters privileged EXEC mode.

Example: RIP Configuration

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

To see this configuration, use the **show running-config** command from privileged EXEC mode.

Router# show running-configrouter ripversion 2network 10.0.0.0network 192.168.1.0no auto-summary!

Verifying RIP Configuration

To verify that you have properly configured RIP, enter the show ip route command and look for RIP routes signified by "R" as shown in this example.

Router# show ip routeCodes: C - connected, S - static, R - RIP, M - mobile, B - BGPD - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter areaN1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2E1 - OSPF external type 1, E2 - OSPF external type 2i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2ia - IS-IS inter area, * - candidate default, U - per-user static routeo - ODR, P - periodic downloaded static route Gateway of last resort is not set 10.0.0.0/24 is subnetted, 1 subnetsC 10.108.1.0 is directly connected, Loopback0R 3.0.0.0/8 [120/1] via 2.2.2.1, 00:00:02, Ethernet0/0

Configuring Enhanced Interior Gateway Routing Protocol

To configure Enhanced Interior Gateway Routing Protocol (EGRP), perform these steps.

SUMMARY STEPS

1. **configure terminal**
2. **router eigrp** *as-number*
3. **network** *ip-address*
4. **end**

DETAILED STEPS

	Command	Purpose
Step 1	**configure terminal** **Example:** Router> configure terminal	Enters global configuration mode.
Step 2	**router eigrp** *as-number* **Example:** `Router(config)# router eigrp 109`	Enters router configuration mode, and enables EIGRP on the router. The autonomous-system number identifies the route to other EIGRP routers and is used to tag the EIGRP information.
Step 3	**network** *ip-address* **Example:** `Router(config)# network 192.145.1.0`	Specifies a list of networks on which EIGRP is to be applied, using the IP address of the network of directly connected networks.

Step 4	**end**
	Example:
	`Router(config-router)# end`
	`Router#`
		Exits router configuration mode, and enters privileged EXEC mode.

Example: Configuring EIGRP

This configuration example shows the EIGRP routing protocol enabled in IP networks 192.145.1.0 and 10.10.12.115. The EIGRP autonomous system number is 109.

To see this configuration use the **show running-config** command, beginning in privileged EXEC mode.

Router# show running-config...!router eigrp 109network 192.145.1.0network 10.10.12.115!...

Verifying EIGRP Configuration

To verify that you have properly configured EIGRP, enter the show ip route command, and look for EIGRP routes indicated by “D “ as shown in the following example:

Router# show ip routeCodes: C - connected, S - static, R - RIP, M - mobile, B - BGPD - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter areaN1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2E1 - OSPF external type 1, E2 - OSPF external type 2i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2ia - IS-IS inter area, * - candidate default, U - per-user static routeo - ODR, P - periodic downloaded static route Gateway of last resort is not set 10.0.0.0/24 is subnetted, 1 subnetsC 10.108.1.0 is directly connected, Loopback0D 3.0.0.0/8 [90/409600] via 2.2.2.1, 00:00:02, Ethernet0/0

Configuring Image and Configuration Recovery Using the Push Button

A push or reset button is available on the rear side of the Cisco 800M Series ISR and it is designed to provide a disaster recovery method for the router.

Push button can be useful for recovery during one of the two scenarios:

- During ROMMON initialization
- For loading a specific configuration file without accessing the router IOS prompt after IOS is up and running.

Push Button Behavior During ROMMON Initialization

Table 2-1 shows the high level functionality when the push button is pressed during ROMMON initialization.

Table 2-1 Push Button Functionality During ROMMON Initialization

ROMMON Behavior	IOS Behavior
Boots using default baud rate. Performs auto-boot. Loads the *.default image if available on compact flash	If the configuration named *.cfg is available in NVRAM storage or flash storage, IOS will perform a backup of the original configuration and boots up using this configuration.

Push Button Behavior When IOS is up and Running

If you press the push button for more than three seconds and then release the push button after IOS is up and running, IOS detects this event and looks for configuration files in the order of priority.If the IOS finds the configuration file, it copies the configuration file to the startup configuration file. Then the router reloads itself and the new configuration takes effect. If the configuration files cannot be found, pressing reset button has no effect.

The order of priority in which the router looks for configuration file is given as follows:

1. usbflash0:customer-config. *SN*
2. usbflash0:customer-config

3. flash:customer-config. *SN*
4. flash:customer-config