

# Router Modes

## User EXEC Mode

Limited examination of router. Remote access.

Router>

## Global Configuration Mode

Simple configuration commands.

Router(config)#

## Privileged EXEC Mode

Detailed examination of router. Debugging and testing. File manipulation. Remote Access.

Router#

## Other Configuration Modes

Complex and multiple-line configurations.

Router(config-mode)#

## Setup Mode

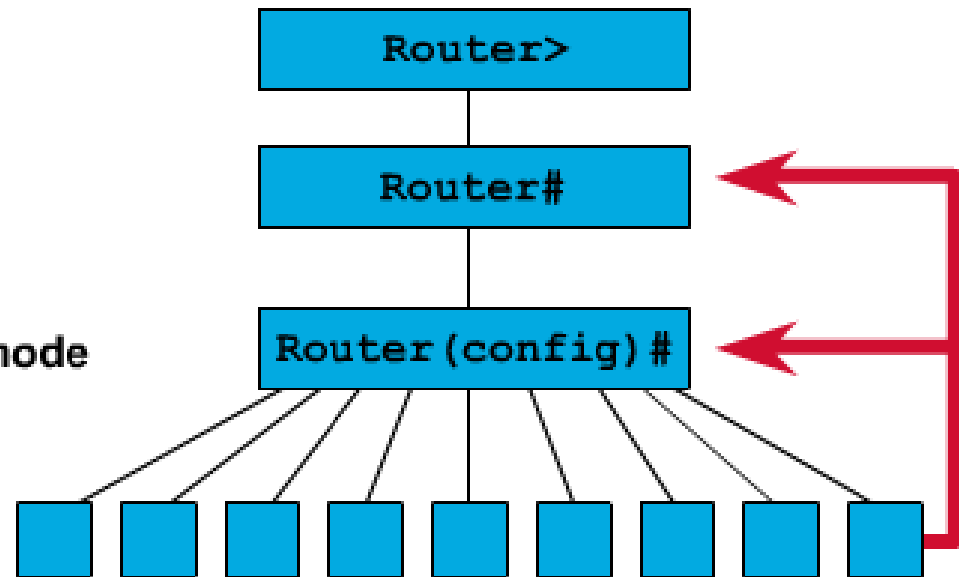
Prompted dialog used to establish an initial configuration.

## RXBoot Mode

Recovery from a catastrophe in the case of a lost password or the operating system being accidentally erased from Flash.

# Overview of Router Modes

- ◆ User Exec mode
- ◆ Privileged Exec mode
- ◆ Global configuration mode
- ◆ Specific Configuration modes



Configuration Mode	Prompt
Interface	<code>Router (config-if) #</code>
Subinterface	<code>Router (config-subif) #</code>
Controller	<code>Router (config-controller) #</code>
Map-list	<code>Router (config-map-list) #</code>
Map-class	<code>Router (config-map-class) #</code>
Line	<code>Router (config-line) #</code>
Router	<code>Router (config-router) #</code>
IPX-router	<code>Router (config-ipx-router) #</code>
Route-map	<code>Router (config-route-map) #</code>

# Configuration Modes

## Global Configuration Mode

Used for system-wide configurations requiring one command line. Includes commands to enter other configuration modes.

```
Router# configure terminal
Router(config)# (commands)
Router(config)# exit
Router#
```

## Other Configuration Modes

Used for other configurations requiring multiple command lines.

```
Router# configure terminal
Router(config)# router protocol
Router(config-router)# (commands)
Router(config-router)# exit
Router(config)# interface type port
Router(config-if)# (commands)
Router(config-if)# exit
Router(config)# exit
Router#
```

## Global Configuration Mode

Used for system-wide configurations requiring one command line. Includes commands to enter other configuration modes.

```
Router# configure terminal
```

```
Router(config)# router protocol
```

```
Router(config-router)# (commands)
```

```
Router(config-router)#
```

## Other Configuration Modes

Used for other configurations requiring multiple command lines.

```
Router# configure terminal
Router(config)# interface type port
Router(config-if)# (commands)
Router(config-if)# exit
```

# Password Configuration

## Console Password

```
Router(config)# line console 0  
Router(config-line)# login  
Router(config-line)# password cisco
```



## Virtual Terminal Password

```
Router(config)# line vty 0 4  
Router(config-line)# login  
Router(config-line)# password cisco
```



## Enable Password

```
Router(config)# enable password san-fran
```



## Perform Password Encryption

```
Router(config)# service password-encryption  
                  (set passwords here)  
Router(config)# no service password-encryption
```

## Login Banner

```
Tokyo (config) # banner motd #  
Welcome to router Tokyo  
Accounting Department  
3rd floor#
```

# Static Route Configuration

## Command

```
Router(config)# ip route [network] [mask] {address|interface} [distance]
```



# The `ip route` Command

<code>ip route</code> Command	Description
<code>network</code>	destination network or subnet
<code>mask</code>	subnet
<code>address</code>	ip address of the next-hop router
<code>interface</code>	name of the interface to use to get to the destination network
<code>distance</code>	administrative distance

# Using `ip route` Command

```
ip route 172.16.1.0  
255.255.255.0 172.16.2.1
```

Command

## Description

```
ip route 172.16.1.0
```

specifies a static route to the destination subnetwork

```
255.255.255.0
```

subnet mask indicates that 8 bits of subnetting are in effect

```
172.16.2.1
```

ip address of next-hop router in the path to the destination

# Default Route Configuration

## Command

```
Router(config)# ip default-network [network number]
```

# The `ip default-network` Command

<code>ip default network</code> Command	Description
<code>network-number</code>	IP network number or subnet number defined as the default

# Using the router and network Commands

## Command

```
Router(config)# router protocol [keyword] {options}
```

- ◆ Defines an IP routing protocol

## Command

```
Router(config-router)# network network-number
```

- ◆ The network subcommand is a mandatory configuration command for each IP routing process

# The router Command

router command	Description
<code>protocol</code>	either RIP, IGRP, OSPF, or Enhanced IGRP
<code>options</code>	such as autonomous system, which is used with protocols that require it, such as IGRP

# The network Command

<code>network command</code>	Description
<code>network-number</code>	specifies a directly-connected network

# RIP Configuration

## Command

```
Router(config)# router rip
```

- ◆ Starts the RIP routing process

## Command

```
Router(config-router)# network <network-number>
```

- ◆ Selects participating attached networks



# show ip protocol Command

## Command

```
Router> show ip protocol
```

```
Routing Protocol is rip
```

```
  Sending updates every 30 seconds, next due in 13 seconds
```

```
  Invalid after 180 seconds, hold down 180, flushed after 240
```

```
  Outgoing update filter list for all interface is not set
```

```
  Incoming update filter list for all interface is not set
```

```
  Redistributing: rip
```

```
  Routing for Networks:
```

```
    183.8.0.0
```

```
    144.253.0.0
```

```
  Routing Information Sources:
```

Gateway	Distance	Last Update
183.8.128.12	120	0:00:14
183.8.64.130	120	0:00:19
183.8.128.130	120	0:00:03

```
  Distance: (default is 120)
```

# show ip route Command

## Command

```
Router> show ip route
```

```
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP  
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area  
       E1 - OSPF external type 1, E2 - OSPF external type 2, E-EGP  
       i - IS-IS, L1 - IS-IS level 1, L2 - IS-IS level 2  
       * - candidate default
```

```
Gateway of last resort is not set
```

```
      144.253.0.0 is subnetted (mask is 255.255.255.0), 1 subnets  
C      144.253.100.0 is directly connected. Ethernet1  
R      133.3.0.0  
R      153.50.0.0 [120/1] via 183.8.128.12, 00:00:09, Ethernet0  
      183.8.0.0 is subnetted (mask is 255.255.255.128), 4 subnets  
R      183.8.0.128 [120/1] via 183.8.128.130.00, 00:00:17, Serial0  
          [120/1] via 183.8.64.130, 00:00:17, Serial1  
C      183.8.128.0 is directly connected, Ethernet0  
C      183.8.64.128 is directly connected, Serial1  
C      183.8.128.128 is directly connected, Ethernet0  
R      192.3.63.0
```

# Using the router IGRP and network Commands

## Command

```
Router(config)# router igrp <autonomous-system>
```

- ◆ Defines IGRP as an IP routing process

## Command

```
Router(config-router)# network <network-number>
```

- ◆ Selects participating attached networks

# The router IGRP Command

router igrp command	Description
autonomous-system	identifies the IGRP router processes that will share routing information

# The network Command

network command	Description
<code>network-number</code>	specifies a directly-connected network that describes a Class A, B, or C network address

# show ip protocols Command

## Command

```
Router> show ip protocol
Routing Protocol is igmp 300
  Sending updates every 90 seconds, next due in 55 seconds
  Invalid after 270 seconds, hold down 280, flushed after 360
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  IGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0
  IGRP maximum hopcount 100
  IGRP maximum metric variance 1
  Redistributing igmp 300
  Routing for Networks:
    183.8.0.0
    144.253.0.0
  Routing Information Sources
    Gateway                Distance      Last Update
    144.253.100.1          100          0:00:52
    183.8.128.12           100          0:00:43
    183.8.64.130           100          0:01:02
  Distance: (default is 100)
-- More --
```

# show ip interfaces Command

## Command

```
Router> show ip interfaces
Ethernet0 is up, line protocol is up
  Internet address is 183.8.128.2, subnet mask is 255.255.255.128
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is enabled
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching enabled
  IP fast switching on the same interface is disabled
  IP SSE switching is disabled
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  Probe proxy name replies are disabled
-- More --
```

# show ip route Command

## Command

```
Router> show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP  
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area  
       E1 - OSPF external type 1, E2 - OSPF external type 2, E-EGP  
       i - IS-IS, L1 - IS-IS level 1, L2 - IS-IS level 2  
       * - candidate default
```

```
Gateway of last resort is not set
```

```
    144.253.0.0 is subnetted (mask is 255.255.255.0). 1 subnets  
C   144.253.100.0 is directly connected, Ethernet1  
I   133.3.0.0 [100/1200] via 144.253.100.200, 00:00:57, Ethernet1  
I   153.50.0.0 [100/1200] via 183.8.128.12, 00:00:05, Ethernet0  
    183.8.0.0 is subnetted (mask is 255.255.255.128), 4 subnets  
I   183.8.0.128 [100/180671] via 183.8.64.130, 00:00:27, Serial1  
    [100/180671] via 183.8.128.130, 00:00:27, Serial0  
C   183.8.128.0 is directly connected, Ethernet0  
C   183.8.64.128 is directly connected, Serial1  
C   183.8.128.128 is directly connected, Serial0  
I   172.16.0.0 [100/1200] via 144.253.100.1, 00:00:55, Ethernet1  
I   192.3.63.0 [100/1300] via 144.253.100.200, 00:00:58, Ethernet1
```



# debug ip rip Command

## Command

```
Router# debug ip rip
RIP Protocol debugging is on
Router#
RIP: received update from 183.8.128.130 on Serial0
    183.8.0.128 in 1 hops
    183.8.64.128 in 1 hops
    0.0.0.0 in 16 hops (inaccessible)
RIP: received update from 183.8.64.140 on Serial1
    183.8.0.128 in 1 hops
    183.9.128.128 in 1 hops
    0.0.0.0 in 16 hops (inaccessible)
RIP: received update from 183.8.128.130 on Serial0
    183.8.0.128 in 1 hops
    183.8.64.128 in 1 hops
    0.0.0.0 in 16 hops (inaccessible)
RIP: sending update to 255.255.255.255 via Ethernet0 (183.8.128.2)
    subnet 183.8.0.128, metric 2
    subnet 183.8.64.128, metric 1
    subnet 183.8.128.128, metric 1
    default 0.0.0.0, metric 16
    network 144.253.0.0, metric 1
RIP: sending update to 255.255.255.255 via Ethernet1 (144.253.100.202)
    default 0.0.0.0, metric 16
    network 153.50.0.0, metric 2
    network 183.8.0.0, metric 1
```