12.4.3 Routing Facts

A router is a device that sends packets from one network to another network. Routers receive packets, read their headers to find addressing information, and send the packets on to their correct destination on the network or Internet.

This lesson covers the following topics:

- Routing tables
- Default router
- Commands to configure routing

Routing Tables

Routers can forward packets through an internetwork by maintaining routing information in a database called a routing table. Every Linux system maintains a routing table in RAM that it uses to determine where to send data on a network.

The routing table typically contains the following information:

- The address of a known network
- The interface or next hop router used to reach the destination network
- A cost value (also called a metric) that identifies the desirability of the route to the destination network (using distance, delay, or cost)
- A timeout value that identifies when the route expires

Default Router

The default router (also known as gateway router and default gateway router) is the router that hosts forward packets to when:

- The IP address of the destination host does not reside on the local network segment.
- A route to the network where the destination host resides is not in the routing table of the sending host.

The default router IP address:

- Must be configured on each host to allow inter-network communication. Without the default router, hosts will only be able to communicate with devices within the same subnet.

- Must be on the same subnet as the host computer. Routers have multiple network interface cards attached to multiple networks. When configuring the default router, choose the address on the local subnet.
- Is stored in the **/etc/sysconfig/network/routes** or the **/etc/sysconfig/network-scripts/route-*interface*** file, depending upon the distribution. Changes to this file will not take effect until the network interface is restarted.

Commands to Configure Routing

The table below shows common commands for configuring routing:

Command	Function	Example
route add	Adds a static route in the routing table. Use the following options: • **default gw** creates a route for the default router. • **-net** specifies a network address. • **-host** specifies a single host on the network. • **reject** installs a blocking route.	**route add default gw 192.168.1.1** adds the default router 192.168.1.1. **route add -net 15.0.0.0 netmask 255.0.0.0 dev eth0** adds a route to the 15.0.0.0/8 network. **route add -host 15.0.0.1 gw 10.0.20.1** adds a static route to the 15.0.0.1 host. **route add -net 10.0.0.0 netmask 255.0.0.0 reject** installs a rejecting route for the 10.0.0.0/8 network.
route del	Deletes a static route in the routing table.	**route del -net 172.18.0.0 netmask 255.255.0.0** deletes a route to the 17.18.0.0/16 network.
route	Views the routing table, including the default gateway address.	
ip route show	Views routes in the routing table.	**ip route show** displays the current routing table.
ip route add	Adds a route to the routing table. Use the following options: • *network* specifies the address of the remote network. Be sure to include the prefix of the network using CIDR notation. • **via** *router_IP* specifies the router to which packets addressed to the remote route should be sent.	**ip route add 192.168.1.0/24 via 10.0.0.1 dev ens32** adds a static route to the 192.168.1.0/24 network through a router with an IP address of 10.0.0.1. The route applies to traffic going through the ens32 network interface.

	• **dev** *interface* specifies the network interface to which the new route will be applied.	
ip route del *network*	Removes a route from the routing table. Replace *network* with the network address of the route to be removed. Be sure to include the prefix of the network using CIDR notation.	**ip route del 192.168.1.0/24** removes the route to the 192.168.1.0/24 network from the routing table.