Chapter 1 Routing Concepts

Router Functions

Router Operation

Analyze the Routing Table
- The Routing Table
- Routing Table Entries
- Remote Network Routing Entries

Directly Connected Routes
- Directly Connected Interface
- Directly Connected Routing Table Entries
- Directly Connected IPv6 Example

Statically Learned Routes
- Static Routes
- Static IPv4 Route Examples
- Static IPv6 Route Examples

1.3.4 Dynamic Routing Protocols
- Dynamic Routing
- IPv4 Routing Protocols
- IPv6 Routing Protocols

Routing Decisions

Switching Packets Between Packets
- Router Switching Function
- Send a Packet
- Packet Routing

Path Determination
- Best Path
- Load Balancing
- Administrative Distance

Characteristics of a Network
- Topology — There are physical and logical topologies
- Speed
- Cost
- Security
- Availability
- Scalability
- Reliability

Why Routing?
- Routers Are a Component
- Routers Interconnect Networks
- Routers Choose Best Paths
- Router Functions

Packet Forwarding Mechanisms
- Cisco Express Forwarding (CEF)

Connect to a Network
- Default Gateways
- Connect to a Network
- Enable IP on a Host
- Device LEDs
- Console Access
- Enable IP on a Switch

Connect Devices

Connect devices
Device LEDs

Router Basic Settings
- Configure Basic Router Settings
- Name the Device
- Secure management access
- Configure a banner
- Save configuration

Configure an IPv4 Router Interface
Basic Settings on a Router
Configure an IPv4 Router Interface

To be available, a router interface must be:
- Configured with an address and subnet mask.
- Must be activated using no shutdown command. By default LAN and WAN interfaces are not activated.
- Serial cable end labeled DCE must be configured with the clock rate command.
- Optional description can be included.

Configure an IPv6 Router Interface
Basic Settings on a Router
Configure an IPv6 Router Interface

To configure interface with IPv6 address and subnet mask:
- Use the ipv6 address (ipv6-address/prefix-length [link-local | eui-64])interface configuration command.
- Activate using the no shutdown command.

IPv6 interfaces can support more than one address:
- Configure a specified global unicast — ipv6-address /prefix-length
- Configure a global IPv6 address with an interface identifier (ID) in the low-order 64 bits — ipv6-address (ipv6-length eui-64
- Configure a link-local address — ipv6-address (ipv6-length link-local

Configure an IPv6 Loopback Interface
Configuración de la interfaz Loopback0

```
R1(config)# interface loopback 0
R1(config-if)# ip address 10.0.0.1 255.255.255.0
R1(config-if)# exit
R1(config)#
*Jan 30 22:04:52.899: %LINK-3-UPDOWN: Interface Loopback0,
changed state to up
*Jan 30 22:04:53.899: %LINEPROTO-5-UPDOWN: Line protocol on
Interface Loopback0, changed state to up
```

Verify Interface Settings
- show interface brief
- show ip route
- show running-config interface
- show ip interface brief
- show ip interface

Verify Connectivity of Directly Connected Networks
- Verify IPv4 Interface Settings
- Verify Connectivity of Directly Connected Networks

Filter Show Command Output
- Filter Show Command Copy
- Command History Feature