Lab – Static and Default Routing

Lab Objectives:

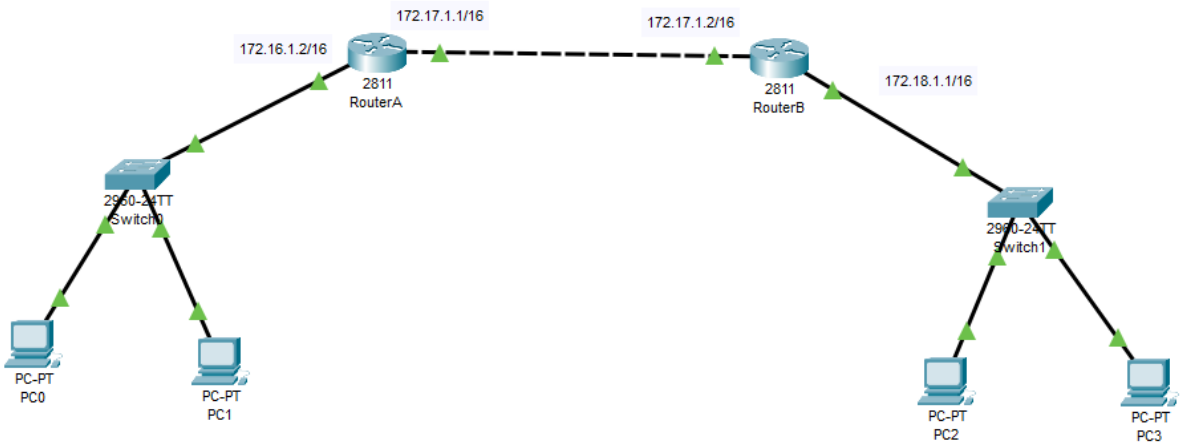
- Understand static and default routes.
- Implement static and default routes.
- Create floating and permanent static routes.
- Verify the connection between remote networks.

Configuring Static Routes

The basic syntax for a static route is as follows:

Router(config)# ip route [destination_network] [subnet_mask] [next-hop/exist interface]

Consider the following example (the packet tracer file provided):



RouterA will have the 172.16.0.0/16 and 172.17.0.0/16 networks in its routing table as directly connected routes. To add a static route on RouterA, pointing to the 172.18.0.0/16 network off of RouterB:

RouterA(config)# ip route 172.18.0.0 255.255.0.0 172.17.1.2

Notice that we point to the IP address on RouterB's fa0/0 interface as the next-hop address. Likewise, to add a static route on RouterB, pointing to the 172.16.0.0/16 network off of RouterA:

- Create the static route?
- Show the routing table and identify the difference between directly connected routes and static routes?
- Create static routes on RouterB?
- Verify the connection between remote networks

To remove a static route, simply type no in front of it:

RouterA(config)# no ip route 172.18.0.0 255.255.0.0 172.17.1.2

On point-to-point links, an exit interface can be specified instead of a next-hop address. Still using the previous diagram as an example:

RouterA(config)# ip route 172.18.0.0 255.255.0.0 fa0/1

Note: To see the effect of creating the static routes using the exit interface, you need to remove the routes created using the next hop address using no in front of it.

- Create the static route using the exit interface?
- What is the difference you can see in the routing table between creating a route using an exit interface or next hop address?
- Create static routes on RouterB?
- Verify the connection between remote networks.

A static route using an exit interface has an Administrative Distance of 0, as opposed to the default AD of 1 for static routes. An exit interface is only functional on a point-to-point link, as there is only one possible next-hop device.

Advanced Static Routes Parameters

The Administrative Distance of a static route can be changed to form a floating static route, which will only be used if there are no other routes with a lesser AD in the routing table. A **floating static route** is often used as a backup route to a dynamic routing protocol.

To change the Administrative Distance of a static route to 250:

RouterA(config)# ip route 172.18.0.0 255.255.0.0 172.17.1.2 250

- Creating the floating static route and inspecting the routing table to see the Administrative Distance?
- Create a floating static route on RouterB?
- Verify the connection.

Default Routes

Normally, if a specific route to a particular network does not exist, a router will drop all traffic destined for that network. A default route, or gateway of last resort, allows traffic to be forwarded, even without a specific route to a particular network.

The default route is identified by all zeros in both the network and subnet mask (0.0.0.0 0.0.0.0). It is the least specific route possible, and thus will only be used if a more specific route does not exist (hence “gateway of last resort”).

To configure a default route:

RouterA(config)# ip route 0.0.0.0 0.0.0.0 172.17.1.2

Task: Static Route configuration

Using the provided topology, perform the following tasks:

- Create the network on the Packet tracer.
- Add the IP addresses to routers and PCs according to the provided topology.
- Configure static routing on each router and show the routing table.
- Verify the connectivity between remote networks.