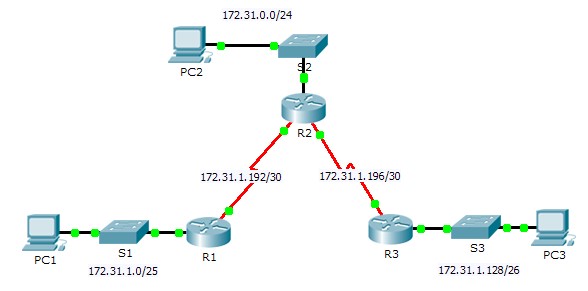
**Packet Tracer - Configuring IPv4 Static and Default Routes**

# Topology



# Addressing Table



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **Interface** | **IPv4 Address** | **Subnet Mask** | **Default Gateway** |
| R1 | G0/0 | 172.31.1.1 | 255.255.255.128 | N/A |
| S0/0/0 | 172.31.1.194 | 255.255.255.252 | N/A |
| R2 | G0/0 | 172.31.0.1 | 255.255.255.0 | N/A |
| S0/0/0 | 172.31.1.193 | 255.255.255.252 | N/A |
| S0/0/1 | 172.31.1.197 | 255.255.255.252 | N/A |
| R3 | G0/0 | 172.31.1.129 | 255.255.255.192 | N/A |
| S0/0/1 | 172.31.1.198 | 255.255.255.252 | N/A |
| PC1 | NIC | 172.31.1.126 | 255.255.255.128 | 172.31.1.1 |
| PC2 | NIC | 172.31.0.254 | 255.255.255.0 | 172.31.0.1 |
| PC3 | NIC | 172.31.1.190 | 255.255.255.192 | 172.31.1.129 |

# Objectives

**Part 1: Examine the Network and Evaluate the Need for Static Routing**

**Part 2: Configure Static and Default Routes Part 3: Verify Connectivity**

© 2013 Cisco and/or its affiliates. All rights reserved. This document is Cisco Public.

# Background

In this activity, you will configure static and default routes. A static route is a route that is entered manually by the network administrator to create a reliable and safe route. There are four different static routes that are used in this activity: a recursive static route, a directly attached static route, a fully specified static route, and a default route.

# Part 1: Examine the Network and Evaluate the Need for Static Routing

1. Looking at the topology diagram, how many networks are there in total?

Ans : 5

1. How many networks are directly connected to R1, R2, and R3?

Ans : R1 = 2 networks, R2 = 3 networks and R3 = 2 networks

1. How many static routes are required by each router to reach networks that are not directly connected?

Ans : R1 = 3 static routes, R2 = 2 static routes, R3 = 3 static routes.

1. Test connectivity to the R2 and R3 LANs by pinging PC2 and PC3 from PC1.

Why were you unsuccessful?

Ans : The routers have not been configured yet.

# Part 2: Configure Static and Default Routes

**Step 1: Configure recursive static routes on R1.**

1. What is recursive static route?

Ans : A recursive static route relies on the next hop router for sending packets to its destination and a recursive static route needs two routing table lookups.

1. Why does a recursive static route require two routing table lookups?

Ans : It must first look in the routing table for the destination network and after that look up the exit interface/direction of the network for the next hop router.

1. Configure a recursive static route to every network not directly connected to R1, including the WAN link between R2 and R3.
2. Test connectivity to the R2 LAN and ping the IP addresses of PC2 and PC3.

Why were you unsuccessful?

Ans R1 has a route to the R2 and R3 LANs, but R2 and R3 do not have routes to R1

**Step 2: Configure directly attached static routes on R2.**

1. How does a directly attached static route differ from a recursive static route?

Ans : A directly attached static route relies on its exit interface in order for sending packets to its destination while a recursive static route uses the IP address of the next hop router.

1. Configure a directly attached static route from R2 to every network not directly connected.
2. Which command only displays directly connected networks?

Ans show ip route connected.

1. Which command only displays the static routes listed in the routing table?

Ans : show ip route static.

1. When viewing the entire routing table, how can you distinguish between a directly attached static route and a directly connected network?

Ans : The static route has a S and a directly connected network has a C

**Step 3: Configure a default route on R3.**

1. How does a default route differ from a regular static route?

Ans : A default route is used when no other known route exists for a destination network. On the other hand, a static route is used for a specific network. It is used to route traffic to a specific network.

1. Configure a default route on R3 so that every network not directly connected is reachable.
2. How is a static route displayed in the routing table?

Ans : S\* 0.0.0.0/0.

**Step 4: Document the commands for fully specified routes.**

**Note**: Packet Tracer does not currently support configuring fully specified static routes. Therefore, in this step, document the configuration for fully specified routes.

a. Explain a fully specified route.

Ans : Both the output interface and the next-hop IP address are specified in a fully specified static route.

1. Which command provides a fully specified static route from R3 to the R2 LAN?

Ans : R3(config)# ip route 172.31.0.0 255.255.255.0 s0/0/1 172.31.1.197.

1. Write a fully specified route from R3 to the network between R2 and R1. Do not configure the route; just calculate it.

Ans : R3(config)# ip route 172.31.1.192 255.255.255.252 s0/0/1 172.31.1.197

1. Write a fully specified static route from R3 to the R1 LAN. Do not configure the route; just calculate it.

Ans : R3(config)# ip route 172.31.1.0 255.255.255.128 s0/0/1 172.31.1.197.

**Step 5: Verify static route configurations.**

Use the appropriate **show** commands to verify correct configurations.

Which **show** commands can you use to verify that the static routes are configured correctly?

Ans : show ip route, show ip route static, show ip route connected and show ip route network

# Part 3: Verify Connectivity

Every device should now be able to ping every other device. If not, review your static and default route configurations.

## Suggested Scoring Rubric

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity Section** | **Question Location** | **Possible Points** | **Earned Points** |
| Part 1: Examine the Network and  Evaluate the Need for Static  Routing | a - d | 10 |  |
|  | **Part 1 Total** | **10** |  |
| Part 2: Configure Static and Default Routes | Step 1 | 7 |  |
| Step 2 | 7 |  |
| Step 3 | 3 |  |
| Step 4 | 10 |  |
| Step 5 | 3 |  |
|  | **Part 2 Total** | **30** |  |
| **P** | **acket Tracer Score** | **60** |  |
|  | **Total Score** | **100** |  |