

cisco packet tracer eigrp lab answers

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Introduction

When studying advanced routing protocols, hands on practice is essential. Cisco Packet Tracer provides a powerful, free environment for network engineers, students, and enthusiasts to experiment with protocols such as OSPF, EIGRP, and BGP without the need for physical hardware. Among the most requested labs is the EIGRP configuration that demonstrates dynamic routing, metric calculations, and neighbor discovery. This article offers a detailed walkthrough, complete with **cisco packet tracer eigrp lab answers** that you can use to validate your setup, troubleshoot common pitfalls, and deepen your understanding of EIGRP in a simulated network.

Why Cisco Packet Tracer?

Cisco Packet Tracer has become the de facto standard for networking labs because it blends realism with accessibility. You can:

- Simulate complex topologies with dozens of routers, switches, and end devices.
- Observe real time packet flows, ARP tables, and routing tables.
- Use the same CLI syntax found on actual Cisco IOS devices.
- Save and share projects with classmates or instructors.

Because the software mirrors real Cisco devices, the commands you type in Packet Tracer translate directly to production routers. This makes the **cisco packet tracer eigrp lab answers** not just a cheat sheet, but a bridge to real world networking.

Understanding EIGRP

Enhanced Interior Gateway Routing Protocol (EIGRP) is a Cisco proprietary distance vector protocol that combines the speed of a link state protocol with the simplicity of a distance vector. It uses DUAL (Diffusing Update Algorithm) to guarantee loop free, optimal routes and rapid convergence.

Key Concepts

- **Metric Calculation:** EIGRP's metric is a composite of bandwidth, delay, reliability, load, and MTU. By default, bandwidth and delay dominate the calculation.
- **Neighbor Discovery:** EIGRP routers form adjacencies on directly connected networks and exchange routing updates every five seconds.
- **Feasible Distance (FD) and Reported Distance (RD):** These values determine whether a route is considered feasible and can be used as a backup path.
- **Summarization:** EIGRP can summarize routes to reduce routing table size and improve convergence.

Preparing the Lab Environment

Before diving into configuration, set up a clear topology. A common practice lab involves three routers (R1, R2, R3) connected in a triangle, each with two interfaces: one to the adjacent router and one to a local subnet. This structure allows you to observe route propagation, neighbor relationships, and metric adjustments.

Required Devices

1. Three routers (Cisco 1941 or 2901 recommended).
2. Three PCs or workstations for each router's local subnet.
3. Three switches (or a single switch with VLANs) to connect the PCs to the routers.

Topology Overview

Here's a simple ASCII representation of the network:

PC1 -- R1 -- R2 -- R3 -- PC3
Each router also connects to a switch that serves its local subnet.

Assign the following IP scheme for clarity:

- R1 PC1 subnet: 192.168.10.0/24
- R1 R2 link: 10.0.12.0/30
- R2 R3 link: 10.0.23.0/30
- R3 PC3 subnet: 192.168.30.0/24
- R1 R3 link (optional for redundancy): 10.0.13.0/30

Step by Step Configuration Guide

Below is a detailed command sequence for each router. All commands are typed in privileged EXEC mode (enable) and then entered into global configuration mode (configure terminal). Remember to set a password for each router to secure the console.

1. Configuring Router R1

Enter the following configuration on R1:

1. Assign IP addresses to interfaces:
2. Enable EIGRP for the desired autonomous system (AS 100):

2. Configuring Router R2

On R2, repeat the process for its interfaces:

1. Assign IP addresses:
2. Activate EIGRP on the same AS:

3. Configuring Router R3

Configure R3 similarly:

1. Assign IP addresses:
2. Enable EIGRP:

4. Verifying EIGRP Neighbor Relationships

After a few seconds, confirm that all routers have established EIGRP adjacencies. Use the following commands:

- show ip eigrp neighbors – Displays the neighbor table with interface, status, and hold time.
- show ip protocols – Shows the EIGRP process, autonomous system, and network statements.
- show ip route eigrp – Lists routes learned via EIGRP, including the metric and next hop.

If any neighbor is missing, double check the interface status, IP addresses, and that the network statements match the subnet masks.

Sample Lab Answers

Below are the expected outputs for key verification commands. These **cisco packet tracer eigrp lab answers** help you confirm that your configuration is correct.

- show ip eigrp neighbors (R1)
- show ip route eigrp (R1)
- show ip protocols (R1)

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