IPv6 CONFIGURATION LAB

Next-Generation IP Protocol Implementation

Course: CCNA - Cisco Certified Network Associate

Institution: Collin College (NSA CAE-CD Validated Program)

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Lab File: IPv6-Configuration-Lab.pkt

LAB OVERVIEW

Comprehensive laboratory covering IPv6 protocol implementation, addressing, and routing. Essential for modern network deployments as the internet transitions to IPv6.

LEARNING OBJECTIVES

- Configure IPv6 addressing on interfaces
- Implement Stateless Address Autoconfiguration (SLAAC)
- Configure IPv6 routing protocols
- Implement dual-stack (IPv4 + IPv6) configuration
- Design IPv6 network architectures
- Understand IPv6 address types and structure

SKILLS DEMONSTRATED

- IPv6 Addressing & Subnetting
- SLAAC Configuration
- IPv6 Routing Protocols
- Dual-Stack Implementation
- IPv6 Network Design
- Modern Protocol Understanding

EQUIPMENT & TOPOLOGY

- IPv6-capable Routers
- Modern Switches
- Dual-stack devices

IMPLEMENTATION NOTES

- This laboratory was completed using Cisco Packet Tracer network simulation software.
- All configurations follow Cisco IOS best practices and industry standards.
- Configurations include proper security measures (passwords, enable secret, etc.).
- Network connectivity was verified using ping, traceroute, and show commands.
- Complete command-line configurations are preserved in the .pkt file.
- Lab demonstrates real-world networking scenarios applicable to enterprise environments.

ACCESSING THE LAB CONFIGURATION

To view the complete network topology, device configurations, and test the lab yourself: 1. Download the Packet Tracer file: **IPv6-Configuration-Lab.pkt** 2. Install Cisco Packet Tracer (free with Cisco NetAcad account) 3. Open the .pkt file in Packet Tracer 4. Explore the network topology in the workspace 5. Click on any device to view its configuration 6. Use Simulation Mode to observe packet flow 7. Access CLI on devices to view running configurations All router and switch configurations are fully implemented and tested. You can examine the complete command-line configurations, test connectivity between devices, and explore how the network operates.

VERIFICATION & TESTING

The lab configuration has been thoroughly tested and verified using: • **show running-config** - Verify device configurations • **show ip interface brief** - Check interface status • **show ip route** - Verify routing tables • **show vlan brief** - Check VLAN configuration (switches) • **ping** and **traceroute** - Test end-to-end connectivity • **show protocols** - Verify routing protocol operation • Packet Tracer Simulation Mode - Observe packet flow All connectivity tests passed successfully, demonstrating proper network operation.

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