BAKER COLLEGE
STUDENT LEARNING OUTCOMES

CSC 4310 CCNP Switch
3 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Examine Network Fundamentals.
    a. Identify basic switching terminology
    b. Describe specific layer 2 technologies
    c. Discuss basic switch functions

2. Examine Network Design Fundamentals.
    a. Identify campus network structure
    b. Discuss Cisco switches and their associated architecture

3. Examine Campus Network Architecture.
    a. Apply implementing VLANs and trunks in campus switched architecture
    b. Explain the concept of VTP and its limitation and configurations
    c. Identify how to implement and configure EtherChannel

4. Examine Spanning Tree in Depth.
    a. Identify data plane techniques to protect the network edge and core, including the different router interface types
    b. Discuss Spanning Tree Protocol (STP) overview, its operations, and history
    c. Describe Rapid Spanning Tree Protocol (RSTP) implementation
    d. Describe how and where to configure the following features: PortFast, UplinkFast, BackboneFast, BPDU Guard, BPDU Filter, Root Guard, Loop Guard, Unidirectional Link Detection, and FlexLinks
    e. Explain Multiple Spanning Tree (MST) and how to implement
    f. Define how to troubleshoot STP

5. Examine Inter-VLAN Routing.
    a. Explain the design, implementation, and verification of inter-VLAN routing using an external router or a multilayer switch, using either switch virtual interfaces or routed interfaces within the context of an enterprise network.
    b. Apply Layer 3 EtherChannel and its configuration
    c. Apply DHCP operation and its implementation and verification in a given enterprise network

6. Examine First-Hop Redundancy.
    a. Describe FHRP and HSRP
    b. Explain GLBP configuration
    c. Discuss VRRP verification

7. Examine Network Management.
    a. Apply AAA
    b. Explain Identity-based networking
    c. Identify 802.1x
    d. Define NTP, SNTP, and PTP
    e. Describe SNMPv3

8. Examine Switching Features and Technologies for the Campus Network.
    a. Describe Discovery protocols
    b. Explain Unidirectional Link Detection
    c. Identify Power of Ethernet
    d. Define SDM templates
    e. Discuss Monitoring features
    f. Apply IP SLA

9. Examine High Availability.
    a. Describe the need and basic idea behind switch stacking and VSS
    b. Define StackWise
    c. Understand the benefits of StackWise
    d. Explain StackWise verification
    e. Define VSS
    f. Explain VSS benefits
    g. Explain VSS verification
    h. Identify supervisor redundancy
    i. Recognize supervisor redundancy modes

10. Examine Campus Network Security.
    a. Describe switch security issues
    b. Discuss required best practices for basic security protection on Catalyst switches
    c. Identify campus network vulnerabilities
    d. Apply port security
    e. Define storm control
    f. Explain mitigating spoofing attacks
    g. Define Private VLANs
    h. Understand securing VLAN trunks
    i. Explain DHCP snooping, IP Source guard, and dynamic ARP inspection

Big Ideas and Essential Questions

Big Ideas

- Layer 2 technologies
- Infrastructure Security
- Infrastructure Services

Essential Questions

1. How do we configure and verify switch administration?
2. How do we configure and verify layer 2 protocols?
3. How do we configure and verify VLANs?
4. How do we configure and verify Trunking?
5. How do we configure and verify EtherChannels?
6. How do we configure and verify spanning tree?
7. How do we configure and verify other LAN switching technologies?
8. What are chassis virtualization and aggregation technologies?
9. How do we configure and verify switch security features?
10. How do we configure and verify first-hop redundancy protocols?

These SLOs are approved for experiential credit.

Effective: Fall 2017