ITN 252 - ADVANCED SWITCHING – CISCO (4 CR.)

COURSE DESCRIPTION

ITN 252 - Provides in-depth instruction in switching as a core technology in today's networking environment. Course content includes VLANs, trunking protocols, spanning-tree protocol, HSRP, and multi-layer switching.

Lecture - 4 hours per week

RECOMMENDED CO-REQUISITES OR PRE-REQUISITES

Student should have completed one of the following:
- Cisco Certified Network Associate (CCNA),
- ITN 157 WAN Technologies – Cisco
- TEL 251 Internetworking 4
- CCNA semester 4 training at a Cisco Network Academy,
- Instructor permission.

COURSE OBJECTIVES

Upon completion of this course, the student will be able to:
- Design and implement VLANs.
- Implement and configure VTP.
- Implement and configure Spanning-Tree Protocol Inter-VLAN Routing.
- Implement and configure QoS.
- Design and implement redundancy.
- Design and implement security.

COURSE CONTENT

- Overview of the Campus Network Design Model
- LAN Media
- Configuring the Switch
- Introduction to VLANs and VLAN Configuration
- Spanning Tree Protocol (STP)
- Trunking and Redundant Links
- Routing between VLANs
- Multilayer Switching
- Hot Standby Routing Protocol (HSRP)
- Multicasting
- Restricting Network Access

STUDENT LEARNING OUTCOMES

Overview of the Campus Network Design Model
- Be able to identify key characteristics of various switching technologies
- Be able to describe LAN Switching as it relates to the Hierarchical Model of Network Design
- Be able to apply the Building-Block design approach to different switched network scenarios

LAN Media
- Be able to identify and describe various legacy media types
- Be able to describe the characteristics of Fast Ethernet
- Be able to describe the characteristics of Gigabit Ethernet
• Be able to identify bandwidth needs of various component sections of a campus network design and correctly identify appropriate media choices for those needs

Configuring the Switch
• Be able to provide physical connectivity between two devices within a switch block
• Be able to provide connectivity from an end user station to an access layer device
• Be able to provide connectivity between two network devices
• Be able to configure a switch for initial operation

Introduction to VLANs and VLAN Configuration
• Be able to describe LAN segmentation using switches
• Be able to configure a VLAN
• Be able to ensure broadcast domain integrity by establishing VLANs
• Be able to facilitate interVLAN routing in a network containing both switches and routers
• Be able to identify the network devices required to effect interVLAN routing

Spanning Tree Protocol (STP)
• Be able to describe the spanning tree protocol
• Be able to configure the switch devices to improve spanning tree convergence in the network
• Be able to identify Cisco enhancements that improve spanning tree convergence
• Be able to configure a switch device to distribute traffic on parallel links

Trunking and Redundant Links
• Be able to describe the different trunking protocols
• Be able to configure trunking on a switch
• Be able to maintain VLAN configuration consistency in a switched network
• Be able to describe the VLAN Trunking protocol
• Be able to configure VTP

Routing between VLANs
• Be able to demonstrate knowledge of basic VLAN routing issues
• Be able to describe the function of Route Switch Modules
• Be able to configure inter-VLAN routing through a Route Switch Module
• Be able to configure inter-VLAN routing through an external router
• Be able to configure trunking between an external router and a switch
• Be able to configure channels between a Route Switch Module and a Switch

Multilayer Switching
• Be able to identify the components necessary to effect multiplayer switching
• Be able to apply flow masks to influence the type of MLS cache
• Be able to describe layer 2, 3 and 4 switching
• Be able to verify existing flow entries in the MLS cache
• Be able to describe how MLS functions on a switch
• Be able to configure a switch to participate in multiplayer switching

Hot Standby Routing Protocol (HSRP)
• Be able to describe the benefit of using HSRP
• Be able to configure HSRP on two or more routing processes

Multicasting
• Be able to describe how switches facilitate multicast traffic
• Be able to translate multicast addresses into MAC addresses
• Be able to configure multicast routing using Cisco IOS
• Be able to configure multicast enhancements on Cisco switch devices
• Be able to describe TCP/IP related multicast protocols

Restricting Network Access
• Be able to identify appropriate access policies for each of the 3 layers in the Hierarchical Model
• Be able to identify various strategies for implementing security in a Network
• Be able to configure AAA to enhance Network security