Data Communication 3

Diploma in Computer Science, Year 2, Sem 1

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Course Description

- This course builds on data communication 2. The course focuses on in-depth exploration of concepts and configuration of local area networks (LAN), wide area networks (WAN), internet resources and systematic troubleshooting mechanism.

Learning Outcome

- By the end of the course, students will be able to;
- Design scalable networks
- Prepare for industrial certifications like CCNA and CCNP

LAN Design

- Campus Wired LAN Designs
- Expanding the Network
- Selecting Network Devices
- In-Band versus Out-of-Band Management
- Basic Router CLI Commands
- Basic Router Show Commands
- Basic Switch CLI Commands
- Basic Switch Show Commands

Scaling VLANs

- VTP, Extended VLANs, and DTP
- VTP Configuration
- Extended VLANs
- Creating a VLAN
- Dynamic Trunking Protocol
- Layer 3 Switching
- Inter-VLAN Routing with Switch Virtual Interfaces
- Inter-VLAN Routing with Routed Ports

Spanning Tree Protocol

- Spanning Tree Concepts
- STP Operation
- Varieties of Spanning Tree Protocols
- Types of Spanning Tree Protocols
- PVST+
- Rapid PVST+
- Spanning Tree Configuration
- PVST+ Configuration
- Catalyst 2960 Default Configuration
- Configuring and Verifying the Bridge ID
- PortFast and BPDU Guard
- Rapid PVST+ Configuration

EtherChannel and HSRP

- Link Aggregation Concepts
- EtherChannel Operation
- Configuring EtherChannel
- Verifying and Troubleshooting EtherChannel
- First Hop Redundancy Protocols
- HSRP Operations
- HSRP Configuration
- HSRP Troubleshooting

Dynamic Routing

- Classifying Routing Protocols
- IGP and EGP Routing Protocols
- Distance Vector Routing Protocols
- Link-State Routing Protocols
- Classful Routing Protocols
- Classless Routing Protocols
- Routing Protocol Characteristics
- Routing Protocol Metrics
- Distance Vector Dynamic Routing
- Link-State Dynamic Routing

EIGRP

- EIGRP Characteristics
- EIGRP Packet Types
- EIGRP Messages
- Implement EIGRP for IPv4
- Verify EIGRP with IPv4
- EIGRP Operation
- EIGRP Metrics
- DUAL and the Topology Table
- Implement EIGRP for IPv6

Single-Area OSPF

- OSPF Characteristics
- Open Shortest Path First
- OSPF Messages
- OSPF Operation
- OSPF Operational States
- Establish Neighbor Adjacencies
- OSPF DR and BDR
- Single-Area OSPFv2
- OSPF Router ID

Single-Area OSPF

- OSPF Router ID
- OSPF Network Topology
- Router OSPF Configuration
- Configure Single-Area OSPFv2
- Verify OSPF
- Single-Area OSPFv3
- Configuring OSPFv3

Multiarea OSPF

- Why Multiarea OSPF?
- Types of OSPF Routers
- OSPF LSA Types 1,2,3,4,5
- Configuring Multiarea OSPF
- Verifying Multiarea OSPF

Mode of Delivery, Assessment & Reading List

Mode of Delivery

- Lectures (face to face and online)
- Group and class discussions
- Tutorials

Mode of Assessment

- Course work 30%
- End of semester examination 70%

Reading List

- Cisco Press 2017: Scaling Networks v6 Companion Guide
- Odom, W., & Wilkins, S. (2017). CCNA Routing and Switching 200-125 Official Cert Guide and Network Simulator Library (1. ed), Cisco Press.
- Wallace, K. (2017). CCNP Routing and Switching ROUTE 300-101 Official Cert Guide (1. ed), Cisco Press
- Hucaby, D. (2015). CCNP Routing and Switching SWITCH 300-115 Official Cert Guide from Cisco Press
- Lacoste, R., & Wallace, K. (2017). CCNP Routing and Switching TSHOOT 300-135 Official Cert Guide (1. ed), Cisco Press.s

THANK YOU

Q & A