






Advanced Diploma in Routing & Switching (112) – Switching

Prerequisites: Networking knowledge.	Corequisites: A pass or higher in Diploma in IP Routing or equivalence.
<p>Aim: This course covers an in-depth study of “campus networks” and multilayer switching technologies over high speed Ethernet. Subject areas such as VLANs, STP, MLS, HSRP, IGMP and multicasting are covered in detail. Upon completion of this course, candidates will be able to perform multilayer switching tasks including: Fast Ethernet, Gigabit Ethernet; VLAN basics, types, identification and trunking protocol; Spanning Tree Protocol; MLS processes and configuration; Multicasting protocols, routing and minimizing service loss and data theft in a Campus Network. The course also focuses on the selection and implementation of the appropriate Cisco IOS services to build reliable, scalable multilayer-switched LANs.</p>	
Required Materials: Recommended Learning Resources.	Supplementary Materials: Lecture notes and tutor extra reading recommendations.
Special Requirements: The course requires a combination of lectures, demonstrations, discussions, and hands-on labs.	
<p>Intended Learning Outcomes:</p> <ol style="list-style-type: none"> 1. Describe the events and forces that shape the enterprise networks using the multilayer model. 2. Explore the physical wiring, switch elements and the process of connecting the switch block. 3. Review the disadvantages of a flat networks and analyse the implementation of VLANs. 4. Describe the techniques and technologies used to increase network reliability 5. Outline multilayer switching and describe how to configure multilayer switch on both cisco switch and router. 	<p>Assessment Criteria:</p> <ol style="list-style-type: none"> 1.1 Describe a campus network 1.2 Describe switching multilayer switching functions 1.3 Identify different Cisco switch equipments 1.4 Define a building block 2.1 Discuss cable media, switch block devices and the connectivity 2.2 Demonstrate how to assign IP addresses to switches 2.3 List the steps required to configure fast Ethernet connection 3.1 Define a VLAN 3.2 Describe VLAN Trunking Protocol (VTP) 3.3 Discuss VLAN membership 3.4 Define VTP modes of operation 3.5 Describe the use of VTP pruning 4.1 Describe spanning tree protocols 4.2 Describe STP port states 4.3 Identify problems caused by STP 4.4 Discuss the purpose of PBDUs 4.5 Identify the purpose of portfast 4.6 Explain the difference between backbone fast and uplink fast 5.1 Define interVLAN routing 5.2 Describe inter-switch link protocol 5.3 Analyse communication problems between VLANs 5.4 Describe the steps in configuring

<p>6. Analyse the ways of improving IP routing performance using Multilayer switching.</p>	<p>interVLAN routing</p> <p>6.1 Define multiplayer switching</p> <p>6.2 Discuss the configuration of multilayer switch route processor</p> <p>6.3 Describe flow masks</p> <p>6.4 Demonstrate how to configure multilayer switch switching engine</p>
<p>7. Describe fault tolerance and identify the importance of router backup.</p>	<p>7.1 Describe the advantages of redundant paths</p> <p>7.2 Describe the tasks required to configure HSRP</p> <p>7.3 Explain the purpose for active and standby routers</p> <p>7.4 Describe the HSRP router states</p>
<p>8. Describe multicast routing protocols, algorithms and the IP multicast the implementation.</p>	<p>8.1 Discuss the different methods of transmission and its effect on bandwidth</p> <p>8.2 Analyse multicast addressing techniques</p> <p>8.3 Define how routers and switches handle multicast routing</p> <p>8.4 Describe the different multicast routing protocols</p>
<p>9. Outline how to configure IP multicast routing and describe protocols supported by Cisco IOS software.</p>	<p>9.1 Discuss the tasks required to set up multicast session</p> <p>9.2 Describe PIM modes</p> <p>9.3 Describe the purpose of RP</p>
<p>10. Analyse the requirements for controlling user access to network devices and describe user and device Network Access control authentication.</p>	<p>10.1 Define an access policy</p> <p>10.2 List and define the different methods of login</p> <p>10.3 Describe the policies at different levels</p> <p>10.4 Describe port security</p>

**Recommended Learning Resources:
Switching**

<p>Text Books</p>	<ul style="list-style-type: none"> • Cisco LAN Switching Fundamentals by David Barnes and Basir Sakandar. ISBN-10: 1587050897 • Multilayer Switching Lab Companion. ISBN-10: 1587131447
<p>Study Manuals</p> 	<p>BCE produced study packs</p>
<p>CD ROM</p> 	<p>Power-point slides</p>
<p>Software</p> 	<p>Cisco IOS</p>