CHM-A level

A7. 2: Networking with Advanced Components (Duration 70 Hours)

Subject Prerequisites:
Candidate should have knowledge about basic LAN and WAN technologies. Hands on practice for small LAN of 10-20 PC. Internet connectivity knowledge is added advantage.

Subject Outcome:
Candidate will be able to handle network 150-200 nodes and able to connect remote location branches or user location using WAN implementation. Candidate will be able to trouble shoot problems in LAN and WAN protocol implementation.

Section	Brief Contents	Duration (Hrs)
1. OSI Reference Model & TCP/IP Model	Explain both model individually and comparison. Identify services which generate data for network users. Data is generated using application. Same data used by subsequent layer and perform encryption or format in which it is expected, Multiple sessions, mode of communications, RPCs, Transporting data using reliable and unreliable transmission protocols like TCP and UDP. Network layer protocol IP and its characteristics, media independent feature, unreliable, for data forwarding, IP addressing topic like Classes, subnetting VLSM, FLSM and supernetting or route summarization. Routing process handled by router. Introduction to Layer3 protocols and devices like router and Multilayer switches. Describe data link and network addresses like MAC, switching techniques, Framing standards and WAN protocols. Physical layer, various types of media and their characteristics, various types of connectors for LAN and WAN implementation.	5
2. Routing Protocols	Various type network layer protocols IP, IPX, CLNS, etc. configuration Ip address to an interface, Static routing, default routing, IP packet Forwarding, structures of routing table, traversal of routing table and lookup process, Dynamic Routing protocols like RIP, EIGRP and OSPF configuration and verification. ARP, RARP and ICMP working principles.	5
3. LAN Switching	Types of switching methods like cut-through, fragment-free or Modified cut-through and store and forward. Prolems in switched network and its remedy, implementation of Port-security on switches. Introduction to VLANs, configuration of VLAN, VLAN Routing using IEEE802. 1Q OR ISL. Router on stick scenario, VTP and implementation and configuration, Introduction to Spanning-tree Protocol (STP). Redundancy in network	5

	and requirement of STP in switched network. various types of STP, PVST+, RSTP etc.	
4. WAN Protocols	Types of WAN link leased Line, Packet Switching, cell switching and circuit switching technologies and their Layer2 protocols. HDLC protocol configuration and verification, PPP WAN protocol its frame types, configuration for PAP and CHAP authentication and troubleshooting. Recognize key Frame Relay terms and features, List commands to configure Frame Relay LMIs, maps, and sub interfaces, List commands to monitor Frame Relay operation in the router.	5
5. Network Management using ACLs	Describe Access control Lists its types configuration on router and verification for standard ACL, extended ACL and Named ACLs. Introduction to complex ACL like time based, context based ACL or lock and key.	5
6. IOS Basics, versions, backup and restore of IOS and IOS modes	various component of router, Booting process of router, operating system IOS for router, its versions, various mode of IOS like usermode, privileged mode and Global execution mode, router mode, Router mode, Configuration Files like running-config, Startup-config, and IOS image. Control router passwords, banner, Identify the main IOS software commands for router startup, Log in to a router in both user and privilege modes, Check an initial, configuration using the setup command, Use the command history and editing features, List the commands to load IOS software from: Flash memory, a TFTP server, or ROM, Prepare to backup, upgrade, and load a backup IOS software image, List problems that each routing type encounters when dealing with topology changes, and describe techniques to reduce the number of these problems, Prepare the initial configuration of your router and enable IP.	15
List of Experiments	1. Select Router components & navigate within IOS Software. 2. Configure a terminal server to access routers. 3. Configure host names & set pass records. 4. Configure router interfaces like Ethernet /LoopBack /Serial. 5. Configure multiple routing protocols. 6. Troubleshoot of common network failures. 7. Configure IP Addresses. 8. Configure std. access list to figure IP traffic. 9. Monitor and verify selected access list operations on the router 10. Manage configuration files from the privilege	30

	exec mode. 11. Identify the main IOS Software commands for router start up. 12. Check initial configuration of router using the set up command. 13. Use the context sensitive help facility 14. Use the command history & editing features. 15. List the commands to load IOS Software from : flash memory; a TFTP server and ROM. 16. List various problems that each routing type encounters when dealing with topology change. 17. Prepare the initial configuration of your router & enable IP. 18. Configure a terminal server to access switches.	

List of Experiments   Hours: 30