**CCNA Course Details**

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| Operation of IP Data Networks   * Functions of Routers, Switches, Bridges and Hubs * OSI and TCP/IP models * Data flow between two hosts across a network   LAN Switching Technologies   * Identify basic switching concepts -Types of Switching  -Collision / Broadcast Domains -CAM Table * Configure and verify initial switch configuration * Switch operation (ping, telnet and ssh) * Identify enhanced switching technologies -RSTP / PVSTP -Ether channels * Configure and verify VLANs / Trunking -DTP / Auto negotiation * Configure and verify PVSTP operation -Root bridge election / STP Modes   IP Routing Technologies   * Describe basic routing concepts - C E F - Packet forwarding - Router lookup process * Describe the boot process of Cisco IOS routers * Configure and verify basic Router configuration * Configure and verify interface (serial and Ethernet) * Configure and verify Static & Default routing * Manage Cisco IOS Files - Boot preferences / Cisco IOS image(s) - Licensing * Differentiate methods of routing and routing protocols - Static vs. Dynamic - Link state vs. Distance Vector - Administrative distance * Configure and verify OSPF (single area) - Benefit of single area - neighbor adjacencies - OSPF states, Multi area - Configure OSPF v2 & OSPF v3 - Router ID, Passive interface, LSA types * Configure and verify EIGRP (single AS) - Feasible Distance / Feasible Successors - Administrative distance - Feasibility condition - Metric composition - Router ID, Auto summary, Path selection - Load balancing (Equal & Unequal) - Passive interface * InterVLAN routing (Router on a stick) - sub interfaces, encapsulation * Configure SVI interfaces   IP Services   * Configure and verify DHCP (IOS Router) - Configuring router interfaces to use DHCP - DHCP options - Excluded addresses, Lease time * ACL (Types, Features & Applications of ACLs) - Standard, Extended, Named & Numbered - Log option * Configure and verify ACL * Identify the basic operation of NAT - Purpose, Pool, Static, 1 to 1 & Overloading - Source addressing & One way NAT * Configure and verify NAT * Configure and verify NTP as a client * Recognize High availability (FHRP, VRRP, HSRP & GLBP) * Configure and verify Syslog. * Describe SNMP v2 & v3 | IP addressing (IPv4 / IPv6)   * Private and public IP addresses for IPv4 * IPv6 addressing scheme * IPv4 addressing scheme using VLSM and summarization * IPv6 in conjunction with IPv4 such as (dual stack) * Describe IPv6 addresses - Global unicast - Multicast - Link local - Unique local - eui 64 - auto configuration   Network Device Security   * Configure and verify network device security - Enable secret vs enable - Disable telnet - SSH / VTYs - Physical security - Service password * Configure and verify Switch Port Security - Sticky MAC / MAC address limitation - Static / dynamic - Violation modes(Err disable/Shutdown) - Protect restrict - Err disable recovery   Troubleshooting   * Identify and correct common network problems * Utilize netflow data * Troubleshoot and Resolve VLAN problems - Identify that VLANs are configured - port membership correct - IP address configured * Troubleshoot and Resolve trunking problems - correct trunk states - correct encapsulation configured - correct vlans allowed * Troubleshoot and Resolve STP - Root switch - Priority - Mode is correct - Port states * Troubleshoot and Resolve routing issues - Routing is enabled - Routing table is correct - Correct path selection * Troubleshoot and Resolve OSPF problems - Neighbor advances - Hello and Dead timers - OSPF area - Interface MTU - Network types - Neighbor states - OSPF topology database * Troubleshoot and Resolve EIGRP problems - Neighbor adjancies - AS number - Load balancing * Troubleshoot and Resolve interVLAN - Connectivity - Encapsulation - Subnet - Native VLAN - Port mode trunk status * Troubleshoot and Resolve ACL issues - Statistics, Permitted networks, Direction * Troubleshoot and Resolve WAN implementation issues - Serial interfaces, PPP, Frame relay * Monitor NetFlow statistics * Troubleshoot etherchannel problems   WAN Technologies   * Identify different WAN Technologies  - Metro Ethernet, VSAT, Cellular 3G & 4G - ISDN, DSL, Frame relay, MPLS, VPN & Cable * Configure and verify Frame Relay on Cisco routers |

**CCNP Course Details**

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| ROUTE - (300-101)  **Introduction to Router and Routing Protocols:**   * Static Routing, Dynamic Routing, Default Routing * IP Addressing, Summarization (Auto and Manual)   **Enhanced Interior Gateway Routing Protocol**   * EIGRP Features, EIGRP Update Process * Configuration and Verification of EIGRP Tables * EQUAL and UNEQUAL Metric Route Load Sharing * Summarization, EIGRP Metric Tuning * Manipulating Hello and Hold Timer, Static Neighbor configuration * Passive Interfaces, Authentication , EIGRP Stub features * Default Route with EIGRP * Route Filtering by using ACL and Route-Map   **OPEN SHORTEST PATH FIRST**   * OSPF Link State Features, Packet Types * OSPF Neighbors and Adjacencies on LAN and WAN * LSA TYPES, OSPF Metric Calculation and Tuning * OSPF Network Types (Point-to-Point, BMA, NBMA) * OSPF Configuration and Verification, Route Filtering * Route Summarization, Default Route in OSPF * Special Areas (Stub, Totally Stubby, NSSA, Totally NSSA) * OSPF Virtual Link * Manipulating Hello and Dead Intervals   **Route Redistribution**   * Redistribution Concepts and Process * Redistributing into EIGRP / OSPF / RIP   **Advance Redistribution:**   * PBR function and configuration * Redistribution with Route-Map / Distribute-list * Issues with Multiple Redistribution Points * IP Service Level Agreement   **BORDER GATEWAY PROTOCOL**   * Basics of Internet Routing and Addressing * Internet Route Aggregation, BGP ASNs (Public and Private ASNs) * Single Homed, Dual Homed , Single Multi homed * Dual Multi homed , Peer Group * Internal BGP: Next-hop Issue with IBGP, Split-Horizon, IBGP Mesh * Clearing BGP Peers (Inbound and Outbound Filtering) * IBGP Neighbors with Loopback Address * External BGP: ebgp Neighbors with Loopback Address * BGP Update Messages and BGP States * Effect of Auto Summarization in BGP * BGP Path Attributes: Weight, Local Preference, As-path Pre-pend * Origin Codes, Multi Exit Discriminator   + BGP Route Filtering and BGP PATH Selection Process   **IP Version 6 Addressing**   * IPV6 Address Representation, Types of IPV6 Addresses * Global Route Aggregation * Static IPV6 Address Configuration * Stateful DHCP, Stateless Auto Configuration * Multicast and other Special IPV6 Addresses, DAD * IPV6 Routing Protocols and IGP Redistribution * IPV4 and IPV6 Co-existence: Dual Stack / Tunneling / NAT-PT * Static Point-to-Point IPV6 Tunneling * Dynamic Multipoint IPV6 Tunnel:   + Auto and Manual 6 to 4 Tunnel   + ISATAP Tunnel   **VPN Technologies**   * Virtual Private Network: Site-to-Site   + IPSEC Tunnel, GRE Tunnel , DMVPN | SWITCH - (300-115)  **Enterprise Campus Network Design**   * Hierarchical Network Design * Layer 2 Switch Operation * Multi Layer Switch Operation, Types of Multi Layer Switch * Switching Tables: CAM / TCAM * CDP ,LLDP * Ethernet Concepts: Ethernet / Fast Ethernet / Gigabit Ethernet / 10 Gigabit Ethernet / Metro Ethernet * Switch Port Cables and Connectors * Switch Port Configuration: Port Speed & Port Duplex Mode * VLAN and TRUNKS: VLAN Membership and Deployment * Trunk Encapsulation ,Native VLAN, Voice VLAN, DTP * VLAN Trunking Protocol: VTP Domain / Modes / Advertisement * VTP v1, v2, v3 and VTP Pruning   **Aggregating Switch Link**   * Switch Port Aggregating with Ether Channel * Ether Channel Load Balancing * Ether Channel Negotiation Protocol (PAgP, LACP)   **Spanning Tree Protocol**   * STP Concept, BPDU (CBPDU, TCN BPDU) * STP States, STP Timers * Types of STP: CST/PVST /PVST+ * STP Root Bridge Placement and Configuration * STP Customization, Modifying STP Timers * PORTFAST / UPLINKFAST / BACKBONEFAST * Protecting STP: ROOTGUARD/ BPDUGUARD/ LOOPGUARD/UDLD * BPDU Filter   **Advance Spanning Tree Protocol**   * Rapid Spanning Tree Protocol:   + BPDU & Convergence in RSTP * Multiple Spanning Tree Protocol:   + MST Region, Instances with MST   **MULTI LAYER SWITCH**   * Type of Interfaces in MLS * Inter VLAN Routing in MLS * Multi Layer Switching with CEF * DHCP within a MLS * Routing Configuration in MLS   **Layer 3 High Availability**   * HSRP / VRRP / GLBP * Supervisor and Route Processor Redundancy * Configuring Redundancy Modes & Supervisor Synchronization * Non Stop Forwarding * VSS(Virtual Switching System)   **Securing Switched Network**   * AAA with TACACS+ and RADIUS * Port Security / 802.1x Authentication, * 802.1x Port Based Authentication * Mitigating Spoofing Attacks, DHCP Snooping, IP Source Guard * Dynamic ARP Inspection, VLAN ACL, Securing VLAN Trunk, * VLAN Hopping, * Private-VLAN Concept, Configuring and Verifying * Storm Control   TSHOOT - (300-135)   * Introduction to Troubleshooting Process * Maintenance & Troubleshooting using Tools * Routing protocols Troubleshooting * Switch Troubleshooting * IP Services Troubleshooting * IPv6 Troubleshooting * Advanced Services Troubleshooting |