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Networking concepts

- Components of network – router, switch, hub, bridge etc
- Types of Network – LAN, MAN, WAN, VPN, PAN & Content Network
- Defining Network requirements – NIC- Ethernet (CSMA/CD)
- 10/100/1000 mbps DUPLEX (Half/Full/Auto) – Connecting Media – Coax.
- 10 base 2T – UTP/STP – CAT 1/2/3..
- Straight through/cross crimping (only details no practical)
- Fiber optics – Single/Multimedia
- 100 Base TX/FX etc – wireless communication.
- Ethernet cabling Standard.
- Connecting Devices
- Repeater – Hub – Switch – Bridge – Topology – Bus/Star/Ring

OSI – Model

- 7 Layers – Communication between the Layers (Encapsulation & De-encapsulation) – PDU.
- Layer 2 – MAC/LLC – 802.3/802.2 (SAP/SNAP) /Ethernet II – Frames
- Broadcast/Collision domain – point of -Hub/Switch/Router
- L4 – 3way handshake – windowing – and about – Connectionless
- Packet size [64B (mini) to 1518B (Max)]

TCP/IP Model & Ipv4 Addressing

- All Layers of TCP/IP Compound with – OS
- Application Layer – TFTP/FTP/SMTP/TELNET/SNMP/DNS
- Transport Layer – TCP/UDP – TCP Segment Format
- 3 way handshake/windowing – UDP segment Format
- Internet Layer



- IP datagram format – Protocol No. – TCP 6 – UDP 17
- ICMP – ARP – RARP
- Introduction to IP addressing – Class A/B/C/D/E
- Private IP address – First OCTET range etc.

Subnetting

- Default Subnet Mask
- Class C Subnetting & Practice no. given
- Class B Subnetting & problems
- Class A Subnetting & problems

Introduction to IPV6

- Introduction
- Host Address Assignment
- Unicast, Multicast and other Special ipV6 Addresses
- Configuring ipV6 Routing and Routing Protocols
- Translations between ipV4 and ipV6
- Summary

Basic of Router & Configuration

- Selection of Router & Cabling a Route
- When Router used – LAN with WAN connect – to connect networks of different IP
- Different interface of Router – AUI /S0/S1/AUX – console / BRI etc.
- Cables used in different interfaces/purpose of interfaces
- WAN interface cable – EIA/TIA – 232/449/530 – V.35 – X.21 Different CISCO series – modular/fixed – 10mbps/100 etc
- Straight through between DTE & DCE





Different modes of operation & basic commands

Internal Components:

- ROM – POST – BSL – ROM-MONITOR PRG – MINIOS
- Different interface of Router – AUI /S0/S1/AUX – console / BRI etc.
- DRAM -Running Config
- NVRAM – Startup Config
- Flash MEM – IOS

Different Modes:

- ROM Monitor – Reboot Mode – Setup – Exec Model

Exec Mode

- User -Privilege – Global – Sub-configuration mode
- Syntax/command to switch between modes
- Assigning IP address for -E0-S0-S1
- Enabling/disabling – console/privilege / vty password
- Mod – command
- Show Config / start / run / version / flash

Basic commands practice

- Changing between modes – (user-privilege- Global-etc)
- IP address configuration-E0-S0-S1
- Password – enabling – encrypting it
- Practice – motd – show commands – editing commands
- Assigning host name (for Router)

Advanced Commands

- Register value – X2102 – boot field value/purpose ROM monitor made – password breaking 8th/6th/13th bit of register value importance
- Boot system flash/network/ROM – config-register (Changing register value) – etc command purpose Booting sequence – Backup & Recovery – CDP
- Practice an above commands as well as following
- Telnet – [ctrl+shift+6]x – disconnect – sh users /Sessions





- Clear lines resume – [hostname resolving in telnet domain Enabling/disabling etc - no practical for this alone]
- Overview of Cisco SDM (Security Device Manager)

IP Routing

- IP Routing, Static Routing & Default Routing
- IP routing – static routing – default- dynamic routing
- Providing clock rate to up the link after identifying DCE by “Sh controllers” command
- Commands/syntax – Static/default routing
- Static Routing & Default Routing
- Practical-session for Static & default routing
-

Dynamic Routing and RIP

- Dynamic Routing – IGP & EGP
- IGP – RIP-OSPF – EGRP – EIGRP
- Classes of Routing Protocol – Distance vector – Link State – Balanced hybrid O Role of Routing Protocol – builds/updates/selects & Routes the packet
- Soluting for Routing loops – Max. loop count – split horizon – Route poison Reverse
- – Hold down Timer
- Features of RIP – distance vector algorithm – RIP V1/V2 – load sharing – metric (depends – loop count)
- Metric value depends – loop count – Ticks – delay – Reliability – cost – MTU – Bandwidth
- Command – Router RIP Network O Sh IP route
- Timer value for RIP– Update/Invalid/ hold down/flush Timer
- RIP
- Dynamic Routing – RIP Practical





Dynamic Routing EIGRP & OSPF

- Limitations of distance vector algorithm
- Features of EIGRP and its operations
- Configuring EIGRP – “Auto-redistribution”
- Verify and troubleshooting EIGRP
- Features of OSPF and its operation
- Configuring single area OSPF
- Verify and troubleshoot OSPF

Access List

- Purpose/advantage of Access-list
- IP [-for a host – for a network/sub network].
- Std IP access-list – wild card calculation
- Extd IP access list
- Switch port ACL
- Step involved in creating access list
- Applying access list at the interface – (inbound/outbound)
- Named access-list for IP
- Access-list in Telnet session

IP standard Access List

- Practical on
- IP Std access-list

IP Extended Access List

- IP Extd access-list, named access lists
- **NAT**
- Implement, Verify & Troubleshoot NAT





- Explain the Basic Operation Of NAT Using (including CLI/SDM)
- Practicals on Static NAT, Dynamic NAT and PAT Troubleshoot NAT issues

WAN Technologies

- WAN Technologies- Leased Line Leased line
- P to P communication
- HDLC & PPP protocol-features Enabling HDLC & PPP

PPP Link

- PPP layer & its explanation/role PAP/CHAP role
- Configuring PAP/CHAP using commands

VPN

- Describe VPN technology Importance Of VPN
- Benefits & Role
- Impact & Components

Frame-Relay

- Packet Switched Network
- Virtual circuit – DLCI – Access-link – CRI – FECN – BECN – LMI
- Enabling Frame-relay
- Inverse ARP
- Configuring frame-relay for Mesh Network
- Star Network
- Combination of above two Switching
- Switching Operation and Configuration
- Function –add-learning / Forward-filters the Frame / loop avoidance
- Redundant path and its problems





- Spanning Tree Protocol – purpose – its different state (blocking/listening/learning/forwarding)
- Modes of operation of switch/Bridge Port duplexing
- Switch & hub – half duplex
- Switch & Server – full duplex
- CISCO catalyst switch 1912 & 1924 interface details M/K/I modes
- Basic and advanced commands
- Enabling & configuring MAC address table

VLAN Configuration

- VLAN – ISL – Trunking Enabling Trunking
- Assigning VLAN No. & name
- Configuring ports to a specific VLAN VTP purpose
- VTP domain
- VTP modes of operation
- Switching Technologies (including VTP , RSTP , PVSTP, 802.1q)
- Implement Basic Switch Security (including Port Security , Trunk access .etc)

Wireless LAN

- Wireless Intro & Operation
- Standards associated with Wireless Media (including WI-FI Alliance, ITU/FCC)-hoc mode, infrastructure mode SSID,BSS,ESS
- Basic Parameters to configure on a Wireless Network Wireless Security Feature's (WEP, WPA 1 / 2)
- Implementing Wireless Networks





The Application Object

- Globals
- The Active Properties
- Display Alerts
- Screen Updating
- Evaluate
- Statusbar
- Send Keys
- OnTime & On Key

*syllabus can modify based on your requirement

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Assessments

- Objective Assessments

- Syntactical based

- Scenario based

Note: At least 2 objective based assessments in each module

- Hands On – Practical Assessments

- Scenario based

Note: At least 2 Hands on assessments in each module

Assignments

- Hands On – Practical Assignments

Note: At least 4 Hands on assignments in each module

Tasks – Home Work

- Regular tasks on each module

Note: Tasks are focused more to improve self learning

Resume Support & Interview Preparation

- Work on one or two mini projects

- Discuss and convert the current working project into

Networking project to add in resume & to explain Networking experience in interviews

