OSI (Open System Interconnection) & TCP/IP

Introduction to OSI or Layered Structure model
Data encapsulation & De-encapsulation Process
PDU form of Data at each layer

Role of OSI layers
Application
Presentation
Session
Transport
Network
Data link
Physical
Protocols & Network Devices per layer
OSI Vs TCP/IP
TCP/IP Layers
Flow Control
Buffer
Windowing

INTRODUCION

Introduction to Cisco Router
General port diagram of Cisco Routers
Connectivity diagram of Cisco Routers with Network Devices
Booting Process of Routers
How to access Cisco Router Console
Basic Management mode & Commands of Cisco Router

How to Configure :-
Hostname
Enable Password
Enable secret
Console password
Telnet Password
Banner Motd
Exec-timeout
Etc…….

IPv4 ADDRESSING

IP address
IP Addressing
Version of IP Address
Characteristics of IPV4
Public & Private IP Address
Network ID or Network Address
Broadcast ID or Broadcast Address
ANDing Process
No. of Network ID's & Valid IP Address
Class A , Class B , Class Class D,Class E
Reason to Exhaust IPV4
Design & Implementation of Network Scenario with Classfull Network

IPV4 Saving Techniques

Subnetting
VLSM
NAT
Default Zero , IP Unnumbered
Subnetting& its advantages
Design & Implementation of Network Scenario with Subnetted Network & VLSM
Summarization & how to calculate Summary address
Supernetting& how to calculate Supernet Address
CIDR
Finding out Network Address, Broadcast Address
First Valid IP address,
Last valid IP address,
Valid range of IP address,
Subnetmask,Blocksize,Next Network Address,

IP ROUTING

what is Routing?
Routed & Routing Protocols
Classfull& Classless Routing Protocols

Static Routing

Static Route
Default route

DYNAMIC PROTOCOLS & DYNAMIC ROUTING

Types of dynamic protocols
IGP vs. EGP protocols
DVRP (Distance Vector Routing Protocol)
Introduction to Distance Vector
Formation of Routing table in DVRP
Update timer
Invalid Timer
Flush Timer
Loop eliminate technique and how it works
Hop count
Split Horizon
Route Poison
Poison reverse
How to provide fast conversion in DVRP
How to prevent bad metrics in DVRP
RIP (Routing Information Protocol)
Characteristics of Rip
Difference between RIPv1 and RIPv2

EIGRP

(Enhanced Interior Gateway Routing Protocol)
Characteristics of EIGRP
Types of table
Neighbor Table
Topology Table
Routing Table
Neighbor adjacency Parameter
RTP
DUAL
Neighbor discovery and recovery
Auto summary feature
PDM

OSPF (Open Shortest Path First)

Link-states Advertisement
RID
Loopback Interface & Loopback Interface

Hello Timer & Dead Timer
Concept of Area in OSPF & its Advantages
Types of Area's in OSPF
Priority DR & BDR Concept
Process ID
Concept of Wild Card Mask
Boarder Routers
ABR & ASBR
Types of Routers in OSPF
Internal router & Backbone router
Neighbor Table
Topology Table
Routing Table

HOW TO MANAGE CISCO DEVICES

Cisco Discovery Protocol (CDP)
Introduction
How to enable & disable CDP on Router & Interface
CDP update & Hold Timers
Gathering Neighbor Information
Gathering Interface traffic & Port Information
Resolving hostname
Build a host table
Configure DNS to resolve host name
Advance Telnet
Telnetting into multiple devices simultaneously
Suspended key
Checking telnet connection ,users
Password recovery procedure
Backup & Up gradation of IOS
Backup & Up gradation of Configuration File
Check network connectivity& troubleshooting
Ping
Traceroute
Tracert
Debug IP Packet
Debug IP ICMP

NETWORK SECURITY

Packet Filtering

ACL & its Types

- Standard
- Extended
- Named standard
- Named Extended,
- Time base
- Dynamic & lock etc……)

Inbound & Outbound ACL

Drawback of Standard & Extended ACL

How to overcome Drawback of Standard &Extended ACL

ACL Implementation Rules

How to Secure Router & Switches

SWITCHING & BRIDGING

Introduction of Cisco Switches

Collision Domain & Broadcast Domain

Repeater & Hub

Bridge & its Function

- Forwarding
- Filtering
- Flooding

Formation of MAC Table

VLAN & TRUNK

- VLAN & its Advantage
- How to creates VLAN
- Types of VLAN membership
- Access port & Access link
- Trunk port & Trunk link
- How to form trunk & its requirements

Trunking Protocols ISL & dot1q

- Frame Forwarding Techniques in Switch

VTP& its Advantages

VTP operational mode of Switch

Require to Implement VTP

Inter-Vlan Routing

Spanning tree protocol

STP Overview

RSTP

PVSTP

PVSTP+

STP advance Feature
Uplinkfast
Portfast
Backbonefast
Basic concept of RSTP
Drawback of STP

WIDE AREA NETWORK

WAN Connection types
WAN Protocols
Introduction of HDLC
Introduction of PPP & its feature
PPP sub Protocols
PPP session establishment
PPP authentication methods
Understanding Frame-Relay Fundamentals
How to make Router as a FRAME_RELAY Switch
Frame-Relay logical Topologies
Hub & Spoke
Full Mesh
Partial Mesh
Virtual Private Network
Basic fundamentals of VPN
Network Address Translation
Types of NAT

Static NAT
Dynamic NAT
Advantages of NAT
LAB 1: Configuration, Implementation and Troubleshooting of PPP Authentication Lab
LAB 2: Configuration, Implementation and Troubleshooting of Frame-Relay Hub & Spoke.
LAB 3: Configuration, Implementation and Troubleshooting of Static NAT
LAB 4: Configuration, Implementation and Troubleshooting of Dynamic NAT

IPv6

Introduction of IPv6
Need of IPv6

IPv6 addressing

Link Local address
Site local address
Global Unicast Address
Multicast Address

IPv6 packet type

Unicast
Multicast
Anycast

NEWLY ADDED SYLLABUS TOPICS Effect from Sept'13

Understanding IPv6 Routing and configuration
Configuration of Etherchannel(Link Aggregation)
Understanding Layer 3 redundancy Protocol
Multiarea OSPF
Network Management:-SYSLOG, SNMP etc.

Note:-After every class student have to practice on real devices