

# CCIE Routing & Switching Outline

## 1. 3550/3560 Switching

Interface names, Banner, Interface range, Regular Macros, Smart ports macros, VTP domains (Server, Client and Transparent), VTP updater, passwords, Pruning, STP (PVST, MST, Rapid STP), Optimization of STP, BPDU Guards, BPDU Filters, Root guard, SPAN, RSPAN, SNMP, QOS (SRR, WRR, Mutation, IP-Prec, CoS and DSCP mapping), NTP, HSRP, Logging, Controlling Telnet, Port Security (Shutdown, Protected, Restricted), DAI, DHCP snooping, Source guard, static drops, DoS mitigation, Private-Vlans, Storm control, Protected Ports, Blocked, 802.1x authentication (Basic configuration, Guest Vlans, Single and Multi-host modes), Trunking (ISL, 802.1q, Auto, nonegotiate, desired, on, active, passive, Allowed Vlans), VLAN access-lists, ARP access-lists, Mac access-lists, UDLD, Ether Channels (Active, Passive, On, Auto, Desired, Load Balancing, L2 and L3), IP Phones and 3550/3560, router on a stick, SVIs, Traps, SDM, Running IPv6, VMPS, Native VLAN, Routing protocols, Fallback bridging and Advanced configurations.

## 2. HDLC

HDLC configuration, Compression

## 3. PPP

PPP – LQM, Compression, PAP, CHAP, Multilink

## 4. Frame-Relay

Point-to-point, Multipoint, Mixture of point-to-point and Multipoint, Inverse-arp, Frame-relay maps, Hub & Spokes, PBR, PPP over Frame-relay, Authentication, FREEK and Tricky configs.

## 5. RIPv2

Multicasting, Unicast and Broadcasting Updates, and Route Filtering, Authentication (Plain and MD5), Manipulation of Rip's Metric, Summarization command and Auto-Summary, Offset-list, Advanced Configurations.

## 6. EIGRP

Basic Configuration, Passive-interface, Authentication, Unequal cost load balancing, Offset-lists, Summarization, Eigrp/Frame-relay, Adjusting the timers, SIA, default-gateway injection, Stub and Advanced Configurations.

## **7. OSPF**

DR/BDR, Mixed Topology, Authentication (Plain and MD5), Per-Interface Authentication, Area Authentication, Filtering Routes (Based on cost, Administrative distance, per neighbor, per interface, LSA1, 3, 5 and 7) , Injecting Default Routes, STUB, Totally Stub, NSSA (Three different configurations), Virtual-Links VS Tunnels, Administrative Distance, OSPF/NBMA, New features, redirection, Fast Neighbor Down detection, and Advanced Configurations .

## **8. PBR & ODR**

Basic configs, Per protocol, packet size, ODR & Frame-relay and Advanced Configurations

## **9. BGP**

Connection of 2 & 4 ASes, Restricting the number of Prefixes, BGP Fast External-fallover, Default Routes, Authentication, IBGP Behavior, Multihop config, Network statement, Origin, Order of Attributes, Backdoor Option, Conditional Advertisement, Administrative Distance, Distance Manipulation in BGP, Route and Path Filtering using regular expressions, Dampening, Route Reflectors, Confederations, Weight, Local-Pref, MED, AS-Path, Peer-Groups, Communities, Templates (Session and Policy, Private ASes, Local-AS, Prefix-lists, Aggregation and Advanced Configurations.

## **10.Multicasting**

IGMP, CGMP, PIM-DM, PIM-SM, PIM-SDM, Tunneling to DVMRP, Stub configuration, broadcast to Multicast, MSDP, PIM-BIDIR, MSDP & Anycast RP, Rate limiting, SSM and Advanced Configurations.

## **11.QOS**

PQ, CQ, WFQ, CBWFQ, RED, WRED, CBWRED, LLQ, RSVP, CAR, Policing, NBAR, FRTS, DE-Lists, GTS, Marking (IP-Prec, DSCP), Compression, Shaping, CB-Shaping and Advanced Configurations.

## **12.IP Services**

IP Services – NAT (PAT, PAR, HSRP & NAT and Advanced Configurations), HSRP, VRRP, GLBP, NTP, Accounting, AAA (Configuration on the routers and Switches), Accounting, Privilege levels, Menus, GRE-Tunnel, IP-SLA, Auto Install and Advanced Configurations.

## **13.Security**

Standard and Extended regular, named Access-lists, Time-Based, Dynamic, Reflexive, CBAC, Guarding against Attacks.

## **14.IPv6**

IPv6 address, neighbor discovery, Site local, Link Local, Access-lists, Route-maps, Debugs, Pinging, RIPng, OSPFv3, Route redistribution, Tunneling (IPv6, 6to4, ISATAP and Advanced Configurations.

## **15.Prefix-lists**

Basic and advanced prefix-list configurations and testing

.