

— WRED — Weighted random early detection  
Used where TCP is used.

↳ is configured to set random tail drop  
for packages to prevent congestion to  
occur again.

2. Percentage of overlap that is okay in  
AP → 10 to 15 percent

Every	Emergency	0
Awesome	Alert	1
cisco	Critical	2
Engg will	Error	3
need	Notification	4
Ice-cream	Information	5
Daily	Debugg	6

3. Autonomous AP does not need WLC to  
provide BSS However, light-weight AP  
will need can provide BSS but need WLC.

- Lightweight AP works in local mode by default which is capable of providing multiple BSS on single channel.
  - The connection betn lightweight AP and WLC is created using CAPWAP tunneling
- \* if lightweight AP is operating in flexconnect mode then it provides failover for lightweight tunnel goes down

4. On DHCP usually we use  
# ip dhcp pool

# Network ~

but if we use host command that means we are manually binding. after this we have to run client-identifier MAC cmd.

## 5. DAI — Works on arp inspection

(config) # ip arp inspection vlan 2-4

DAI configured directly on vlan

## 6. Lightweight AP functions

- ① Handles real-time processing of data
- ② Sends management info to the WLC

- WLC Handles task which are not time-sensitive
- In split-MAC deployment a lightweight AP is responsible.

LACP — Active / Passive

PAgP — Auto | desirable | Cisco priority. |

10.0.0.0 — 10.255.255.255 — A

172.16.0.0 — 172.31.255.255 — B

192.168.0.0 — 192.168.255.255 — C

8. WLAN config tab has VPN Pass-through
9. default routes are shown ip route cmd is denoted by \*

- 10. if Router is in DROTHER state it can only establish adjacency with DR & BDR - 2 routers
- DR & BDR are not elected in point-to-multipoint or point-to-point N/W

9. HSRP v1 → group 0 - 255  
MAC - 0000.0C07.ACXX  
↑ group no.

HSRP v2 - 255 - 4095  
MAC - 0000.0CGF.FXXX  
↑ group no.

10. TFTP uses eg UDP.

11. OSPF to have load balancing  
maximum-paths 8

\* by default max-path is set to 4

- if multiple path exist in ospf with same cost
  - same bandwidth, OSPF will load balance by default it is set to 4.

- EIGRP load balancing over equal-cost and unequal-cost paths.

- spanning-tree portfast default  
enables portfast on all access ports.

- Dynamic-interface on WLC

- Dynamic-interface are typically used for client data
  - Dynamic interfaces are user-defined

- WLC can contain upto 512 dynamic interface.

- Dynamic interface used to segment traffic on WLC.

trust — 64 bytes

giant — 1518 bytes

baby giant — 1600 bytes

jumbo — 9216 bytes

- cdp which of the following doesn't send from ip phone to catalyst switch
  - device voice vlan ID

- A fully specified Internet protocol static route is when you issue in which destination network, outbound interface, & next hop are all directly connected.

- A floating static route usually has AD
- recursive static route only has nlw & nex-hop

- DSL → copper wire infra better than 1.54
- T1 → 1T — but 1.54 mbps max

Syslog - 514 UDP is used by syslog

SNMP - UDP 161 & 162

NTP - 123 UDP

Hypervisor = vMM

- To find the OSPF cost we do

$$\text{cost} = \frac{\text{reference bandwidth}}{\text{interface bandwidth}}$$

- LLDP - Advertisement every - 30 s  
hold time - 120 s

delay - 2 s

CDP - Ads every 60 s  
hold time - 180 s

- FE80::/10 → Used to automatically config IPv6 Address for itself.

- ff00::/8 → Multicast Address

2000::/3 → Global aggregatable unicast addresses

- Puppet uses TCP 8140
- To make ip phone trust the cos priority
  - switchport priority extended
- To move switch boundary
  - mls qos trust cos
- overlay - creates vxlan tunnels bet" SDA switches
- underlay - collection of devices which has IP
- fabric - entirety of underlay & overlay
- Multicast MAC address is shown
  - 01-00-5E-0F-0F-0F

- Loopback MAC - CF-00-00-00-00-00

- EIGRP components to calc metrics

- Bandwidth
  - Delay

- SSH —

- ① Hostname

- ② domain name — ip domain-name

- ③ crypto key generate rsa

- ④ transport input ssh

- By default OSPF broadcast network is enabled on — FDDI, Ethernet

IPsec two types

- ① Transport — only IP packet's payload is encrypted

- ② Tunnel — all is encrypted so needs additional header

- MST allows single spanning-tree to be used for multiple VLANs

## Switchport port-security violation

① Restrict - if more than maximum devices learned it will → link stays up, traffic drops & log entry generated

② Protect - traffic drops, NO log

③ shutdown - shuts down

# switchport port-security maximum

To set the max mac to learn before violation.

API's - OpenPK - cisco proprietary

openflow - imperative SON model

OPflex - uses a declarative SON

NETCONF - uses XML and RPL's to config.

- OSPF won't show directly connected routes in show ip ospf route command.
- Cisco Network Assistant - Java based desktop solution.
- The function of neither SNMP or SSH can be moved to centralized location. also for Telnet and syslog.
- Asymmetric Algo -
  - RSA
  - DH
  - ECDH
- Overlay Network creates VXLAN.

- WEP uses RC4 for encryption.
- WPA2 & WPA3 uses AES & CCMP for MIC's
- Auto configuration to set IPV6 using EUI-64 by Adding FFFE then appending last half of host MAC.
- 802.1x + CCKM → As Auth key mgmt to minimize the amount of time wireless clients take to roam betn access points.
- CCKM - cisco - proprietary typically used to reduce delay
- 802.1x - default method for WPA & WPA2.
- PSK - WPA or WPA2 , requires Admin to config.
- REST API are typically used to communicate with SDN Application plane
  - XML or JSON
- WLC interfaces controls all L3 comm<sup>n</sup> betn WLC & Lightweight AP
  - The AP-manager interface.

- Service port interface is used for maintenance purpose
  - Management interface is used for in-band management
  - Virtual — specific IP that is same across controller
- 
- Beacons are management frame that contains SSID.
- 
- Probe request are sent by wireless client to request network information
- 
- EIGRP routing table contains successors
  - topology table contains successors and feasible successors
- 
- Learn NAT
  - learn subnetting questions again
- 
- default-information originate will make
    - Router OSPF ASBR
    - OSPF will advertise routers gateway of last resort.
- 
- Silver is the default QoS.
- 
- RED & WRED are congestion avoidance that addresses tail drop.
- 
- CAT 5e — 1000 mbps
  - CAT 6 — 10,000

• fc OUR ADD1 ADD2 ADD3 SEQ ADD4  
DATA FCS

- HSRP Hello messages are sent only by routers in the active, standby or speak states.
  - Only routers in standby monitor Hello messages from the active router.
  - Hello messages are sent every 3 sec by default.
- 1000Base LX → Single mode fiber cable.
- In HSRP single virtual IP & single virtual MAC
- To support load balancing over equal-cost and unequal cost path with OSPF use EIGRP
- EIGR supports load balancing over equal & unequal cost
- OSPF supports equal cost LB only.
- IPv6 loopback addresses are ::1  
ff01::1 is multicast address
- Link-local multicast address → ff02::2

- OSPF nonbroadcast network type is enabled on frame relay and x.25 by default.
- if we run crypto key generate then we get Hostname not defined but if we run `ip ssh time-out 60` then we will get please create RSA keys to enable ssh.
- GLBP is the Cisco-proprietary FHRP protocol that elects AVG (Active virtual gateway) & upto four AVFs.
- When portfast & BPDU guard is enabled & switch connects there it goes to err-disabled mode.
- ip route { interface | next-hop } { AD } network
- crypto key generate rsa → will automatically enable ssh
- FE80::/10 → is used to automatically set IP address to itself. — Unicast link-local addresses
- FlexConnect ACL's are supported on native VLAN.

- 802.1x — Default key management method on WLAN  
required RADIUS
- CCKM - Cisco centralized key management →  
allows wireless client to roam freely typically  
used to reduce delay.
- PSK - Auth key management      WPA or WPA2
- Class A - 10.0.0.0 — 10.255.255.255
- B - 172.16.0.0 — 172.31.255.255
- C - 192.168.0.0 — 192.168.255.255

HSRP v1 — 0C07.ACXX

HSRP v2 — 0C9F.FXX

GLBP — 0007.B400

- MAC Address for multicast  
~~01-00-5E-00-00-0D- 01-00-5E-7F-FF-FF~~
- for WPA2 Mics and encryption is provided with  
AES and CCMP.
- TKIP — provides security and encryption for WPA

- DHCP syntax

```
# ip dhcp pool poolname
```

```
# network mask
```

# Host ip mask → This command in dhcp is used for binding the same ip address

- Split-Mac deployment →

functionality is divided betn L AP & WLC where

LAP → handles real-time tasks

WLC → handles non-real time tasks

### OSPF Network types

① Broadcast —

Hello - 30, Dead - 120s

② Non-Broadcast —

No DR & BDR election

③ point-to-point —

Hello - 10, Dead - 40

④ Point-to-multipoint Broadcast —

Hello 30, Dead 120

⑤ Point-to-multipoint non-broadcast —

Hello - 30, Dead - 120

Do not allow multicast packets

To sent packets in unicast they must be configured with neighbour command.

Allows multicast packets so no manual config is required.

To configure any of these network type we can use command.

# ip ospf network ?

# ip ospf inspection vlan 2-3

DAI is configured globally they don't need to be

- EIGRP uses bandwidth and delay to calculate the composite metric
- OSPF & IS-IS use cost to calculate the best path.
- WRED is useful
  - ① TCP packets that are dropped must be retransmitted
  - ② TCP sources reduces traffic flow .
- If full state in ospf routers that means they are DR & BDR
- 2way I DR OTHER means not DR or BDR

- dynamic Interfaces are user-defined
- ~~—~~ are typically used for client data
- 802.11k → provides assisted roaming in wireless network.
- 802.11w - provides management frame protection
- 802.11r - support for fast transition (FT) roaming
- 802.11v - Network-assisted power savings.
- IP phone does not provide voice VLAN ID to switch using CDP.
- VRRP - one master router & one or more backup routers.

VRRP MAC -

GLBP MAC - ...B40...

HSRP MAC - 07AC of OCGF. F00A  
v1 v2

- Autonomous AP - are used to
- We cannot config L2 settings for WLAN on Guest WLAN.
- To route traffic the command is  
ipvs route nexthop from int
- WEP provides RC4 for encryption.
- WPA2 & WPA3 - AES is used.
- EIGRP supports unequal cost load balancing
- OSPF supports equal cost load balancing
- OSPF nonbroadcast is enabled on x.25 & frame relay by default.
- Point-to-point network is on by default
  - on ① PPP - point to point
  - ② HDLC - High level data link control
- broadcast aspf by default on
  - ① Ethernet
  - ② FDDI

① non broadcast is enabled by default on  
② frame relay.

• enable password support 0 & 7 not s

• When its directly connected network there is no next-hop.

• recursive-static route doesn't have interface in command.

• Floating-static route has AD.

• Fully specified has interface & next hop.

• single mode fiber cable — 1000BaseLX

• Multicast address → 01-00-5E-0F-0F-0F  
<sup>MAC</sup>

# show cdp neighbour — doesn't show the ip address of neighbour & no info soft version running

- DR OTHER routers can only set adjacency with DR & BDR.
- FF02::/16 → used for link-local multicast add.
- 2000::/3 → global aggregatable unicast add.
- FC00::/8 & FD00::/8 → Unique local unicast

- FF01::/16 – node-local
- FF02::/16 – link-local
- FF05::/16 – site-local
- FF08::/16 – organization-local
- FF0E::/16 – global

IP see two mode

- ① Transport
- ② Tunnel

- ① Transport –  
Not required for NAT

② Tunnel mode → encrypts the entire packet

- New IP header required.

- can be used for NAT

- FC field is used to indicate whether the frame is management frame

- GLBP elects AVG And upto 4 hvf's

- Beacons contain management frames

- mls qos trust cos command on to move the trust boundaries.

- OnePK - cisco proprietary API

- Opflex - declarative API

- Openflow - imperative

- NETCONF - XML4RPC to config