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ENCOR (350-401) Quick Reference Sheets

ARCHITECTURE

3 Tier Network Design

- **Access layer:** Provides workgroup/user access to the network; as a result, this layer is sometimes called the workstation layer
- **Distribution layer:** Provides policy-based connectivity and controls the boundary between the access and core layers
- **Core layer:** Provides fast transport between distribution switches within the enterprise campus; this is sometimes called the backbone layer

2 Tier Spine-Leaf Design

This simple 2 tier model is featured in Cisco ACI topologies. It features a spine layer where these core devices connect in a full mesh to every single leaf node.

Wireless LAN Controller Deployment Models

Centralized
Distributed
Controller-less (Autonomous APs)
Controller-based
Cloud
Remote branch

SD-WAN Components

vManage – single pane of glass GUI solution for management
vSmart – the controller engine of the SD-WAN
vBond – key component that ensures successful authentication of components and also handles orchestration functions

vEdge – the WAN routers that make up the solution
vAnalytics – optional analytics component of the SD-WAN solution

SD-Access Key Components

The network layer overlay consists of the following elements:

Policy Plane – Cisco TrustSec (CTS)
Data Plane – VXLAN
Control Plane – LISP

Cisco DNA Center is the GUI for the management plane.

DiffServ QoS Components

Classification and marking
Congestion management
Congestion avoidance
Policing and shaping
Link efficiency tools

The Wireless Precious Metal Classifications

Platinum – Voice - 46 (EF)

Gold – Video - 34 (AF41)

Silver - BE (Default) - 0

Bronze – Background - 10 (AF11)

Cisco Express Forwarding Components

RIB – Routing Information Base
FIB – Forwarding Information Base
Adjacency Table – hardware-based copy of ARP cache

VIRTUALIZATION

Hypervisors

Type 1 – bare metal
Type 2 – must be installed in OS

Path Virtualization Technologies

VRF
GRE
IPsec

Network Virtualization Concepts

LISP
VXLAN

INFRASTRUCTURE

802.1Q Trunking

Mode – trunk – on
Mode – dynamic desirable – actively try and for trunk
Mode – dynamic auto – willing to for trunk

Native VLAN – untagged VLAN; default is VLAN 1

EtherChannels

Two options for dynamic EtherChannel formation:

LACP – modes are active and passive
PAgP – modes are desirable and auto

RSTP

Alternate port – a fast converging alternate to the root port
Backup port – a fast converging backup for a designated port that fails

MST

Configure instances that map to VLAN ranges

Deterministic number of RSTP topologies applied

Compare EIGRP to OSPF

- EIGRP offers unequal cost load balancing

- EIGRP is a hybrid protocol – part distance vector, part link state
- EIGRP does not use areas
- EIGRP uses DUAL
- EIGRP uses a composite metric – bandwidth and delay by default

OSPF

LSA Types
Type 1 – interfaces of local router
Type 2 – sent by DR to describe nodes on segment
Type 3 – used for inter-area prefix advertisement
Type 4 – location of the ASBR
Type 5 – used for the external prefixes
Type 7 – used for the NSSA external prefixes

eBGP

Peering between loopbacks:

```
neighbor 10.1.1.1 remote-as 65001
neighbor 10.1.1.1 update-source lo0
neighbor 10.1.1.1 ebgp-multihop 2
```

Best Path Selection Algorithm

Step 1 – highest WEIGHT
Step 2 – highest LOCAL_PREF
Step 3 – locally originated
Step 4 – prefer the path with the shortest AS_PATH
Step 5 – prefer the lowest origin type
Step 6 – lowest MED
Step 7 – eBGP over iBGP
Step 8 – lowest IGP metric
Step 9 – consider installation of multiple paths
Step 10 - prefer the oldest path
Step 11 – lowest router ID of sender
Step 12 – minimum cluster list length
Step 13 – lowest neighbor address

Wireless

AP Modes

- Local
- Monitor
- FlexConnect
- Sniffer

- Rogue Detector
- Bridge/Mesh
- Flex plus Bridge

IP Services

- NTP
- NAT/PAT
- HSRP
- VRRP
- PIM, IGMP v2/v3

NETWORK ASSURANCE

IP Services

Network issue diagnosis tools:

- Debugs
- Conditional debugs
- Trace route
- ping
- SNMP
- syslog

NetFlow Components

- **Flow records** – define what to capture
- **Flow monitor** – applied to the interface to perform the monitoring
- **Flow exporter** – send the traffic to remote collector
- **Flow sampler** – used to limit the load on the router gathering data

SECURITY

Wireless Security

- WEP
- WPA
- WPA2
- WPA3

Wireless Security Options

- EAP
- WebAuth

- PSK

Variations of EAP

- LEAP
- EAP-FAST
- PEAP
- EAP-TLS
- EAP-TTLS
- EAP SIM

Components in the Modern Security Design

- Firepower NGIPS or NGFW
- AMP
- ASA w/ Firepower
- Firepower Management Center (FMC)
- Talos – shared security intelligence
- Cisco TrustSec
- MACsec
- NAC

802.1X

Three components:

Supplicant, Authenticator, Authentication Server

AUTOMATION

Sample JSON

```
{
 "ident":"myident"
 "routers":["ISR","CSR","BR"]
}
```

Sample EEM

```
event manager applet CPU75
event snmp oid
1.3.6.1.4.1.9.9.109.1.1.1.3.1
  get-type exact entry-op ge
  entry-val 75
poll-interval 10
action 1.0 cli command "enable"
action 2.0 cli command "show
process cpu"
action 3.0 mail server …
```