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Thursday, January 24, 2019 11:13 PM

SWITCH CONFIG ISSUES/INTER-VLAN ROUTING P2

Common misconfigs when routing between multiple VLANs

Legacy	Switch ports that connect to router ints config'd w/correct VLANs? switchport access vlan [*int config*]
Router-on-stick	Is switch config'd as trunk? switchport mode trunk [*int config*]
Verify cmds	show int *interface-id* switchport show running-config

L3 Switching

Enterprise	Multilayer switches: Higher packet processing rates using HW based switching L3 switches: Packet-switching throughputs in millions of packets per second (pps) Routers: Usually provide pps in the 100k-over 1mill range

Catalyst multilayer switches:

1. **Routed port:** Pure L3 int similar to physical int on Cisco IOS router
2. **SVI (Switch Virtual Int):** Virtual VLAN int for inter-vlan routing
    - ALL L3 Cisco Catalysts: Support routing protocols: Diff default settings for ints
    - switchport/no switchport cmds may be in running/startup-config

6500/4500 Series	Almost every function involving OSI L3/higher based on CEF (Cisco Express Forwarding) 6500: IOS L3 ints by default
2960 Series	Supports static routing: IOS 12.2(55)/later
3560/4500 Series	L2 ints by default

Inter-Vlan Routing w/SVI's

History	▪ Early days: Fast switching: HW speed ▪ **HW speed:** Speed was equivalent to time to physically receive/fwd frames on ports ▪ Routing slow: SW based ▪ Changes extended switched portions of networks: Much as possible ▪ Access/distribution/core layers: Often config'd at L2 [loop issues] Spanning-tree tech used to: ○ Prevent loops/enable flexibility/reduce redundancy on inter-switch connections
Today	○ **Routing:** Faster/cheaper/done at wire speed ○ Can be transferred to core/distribution layers w/out impacting performance ○ Each VLAN separate subnet: Logical: Config distribution switches at L3 as gateways for usrs ○ L3 routed ports normally implemented between distribution/core

SVI (Switch Virtual Int): Config'd w/in a multiplayer switch: Can be created for any existing VLAN on switch

- No physical port dedicated to int: performs same functions for VLAN as router int would
- Provides L3 processing for packets to/from all switch ports associated w/VLAN
- SVI created for VLAN1 [default] for remote switch administration
- VLAN # corresponds to VLAN tag associated w/data frames on 802.1Q encapsulated trunk/VID for access port

Reasons to config SVI: Provides gateway for VLAN: Traffic can be routed into/out of: L3 IP connectivity

to switch

- Supports routing protocol/bridging configs

Disadvantages: Multilayer switches: Expensive
Advantages: Faster than router-on-stick: Everything HW switched/routed: No external links from switch to router for routing

- Not limited to one link: L2 EtherChannels can be used bet switches to get more BW: Lower latency

Routed/Access Ports on Switch	○ Acts similarly to int on router ○ Routed port not associated w/particular VLAN: Regular route int ○ L2 functionality removed: L2 protocols (STP): Don't function on routed int ○ L3 functionality: LACP/EtherChannel ○ Routed ports: Used for P2P links (Point-to-Point) ○ Not supported on Catalyst 2960 series switches

Static Routes: Catalyst 2960: Can function as L3 device/route bet VLANs/limited # of static routes

- **Cisco Switch Database Manager (SDM)**: Multiple templates for 2960
- Templates: Enable to support roles depending on how switch used

Example: SDM lanbase-routing template: Enabled to allow switch to route bet VLANs/support static routing: Up to 750 routes

show sdm prefer [*global config*]

- 2960 default: Doesn't support static routing: If IPv6 enabled: Template dual IPv4/IPv6

do Execute usr/priv EXEC cmds from other router config modes
ip routing [*global config*] Auto enabled on Cisco routers
ipv6 unicast-routing Disabled by default: Cisco routers/switches
show ip route
L3 Switch Config Issues: Also common to legacy/router-on-stick: Exist in L3 switching: To troubleshoot

VLANs	Be defined across all switches: Enabled on trunk ports: Ports in right VLANs
SVIs	Have correct IP/mask: SVI is up: SVI matches VLAN #
Routing	Enabled: Each int/network should added to routing protocol
Hosts	Has correct IP/mask: Hosts have gateway associated w/an SVI/routed port