**MAKE SURE TO GATHER NOTES FROM THE PREVIOUS HALF OF MODULE 4**

Continuing Module 4:

**Show etherchannel** – Verify EtherChannel configurations

D – Down (WE DON’T WANT THIS)

S – Layer 2 EtherChannel

R – Layer 3 EtherChannel

U – Working properly

* EtherChannel interfaces must have the same configuration:
  + Speed and duplex mode
  + Same protocol and valid protocol combinations
  + Same Native and allowed VLAN range
* If these aren’t met EtherChannel will stay down.
* For a non-trunk L2 EtherChannel, interfaces must be in the same access VLAN

**EtherChannel Guard:**

* Can be enabled (if not) using the “spanning-tree etherchannel guard misconfig”
* Enabled by default
* Detects misconfigurations between connected devices
* You can find it in the “show spanning-tree summary” command

**Load Balancing:**

* Traffic that flows across a port-channel interface is NOT forwarded out member links in a round-robin basis per packet
* CONFIGURED ON EACH SWITCH SIDE
* Default load balancing mechanism uses “src-mac”
* Load-balancing algorithm is a system wide configuration that uses the following command
  + Switch(config)# port-channel load-balance <algorithm>

Options for load balancing algorithms:

1. Hash: Single parameter is used: source or destination (MAC for L2 and IP for L3)
2. Exclusive Or (XOR): For double parameters (source AND destination MAC for L2 and source AND destination IP for L3)

|  |  |
| --- | --- |
| * Dst-ip: Destination IP address * Dst-mac: Destination MAC address * Dst-port: Destination TCP/UDP port * Src-ip: Source IP address * Src-mac: Source MAC address * Src-port: Source TCP/UDP port | * Src-dst-ip: Source and destination IP addresses * Src-dst-mac: Source and destination MAC addresses * Src-dst-port: Source and destination TCP/UDP ports only |

**Hash Algorithm (Single parameter): src-mac**

Checks the last x amount of bits of the source MAC address broken down to binary to decide what link each host will be put on.

A screen shot of a computer

Description automatically generated

**NOT EXPECTED TO MEMORIZE THE TABLE – JUST MEMORIZE THE ALGORITHMS AND THEIR FACTORS**

Best practice when using this algorithm it is best to deploy 2, 4 or 8 links for maximum efficiency to ensure all links are being used to the max of their ability.

Q: Odd number of ports is efficient

A: FALSE

**XOR Algorithm: src-dst-mac**

The algorithm looks at the last 2 bits of each host in comparison to its destination. Based on the XOR operation it will decide what link any given host will go on.

If the links are unevenly distributed, changing the algorithm may provide different distribution ratio across member links.

Switch# show etherchannel load-balance

* Displays how a switch will load balance network traffic based on its type.