CCIE Data Center
Storage Networking

NPV & NPIV

Fibre Channel Switching Review

- FC forwards frames based on 3 byte Fibre Channel ID (FCID)
- FCID is subdivided into three fields
  - Domain ID
    - Each switch gets a Domain ID
  - Area ID
    - Group of ports on a switch have an Area ID
  - Port ID
    - End station connected to switch gets a Port ID

Fibre Channel Domain IDs

- Domain ID is first byte of the FCID
- Used to identify the Switch in the Fabric's SPT
  - FSPF uses Domain ID as SPF Node ID
- Implies that hard limit of switches per Fabric is 256
  - Some IDs are reserved so only 239 are usable
  - "Qualified" limit by OSMs is ~50
    - I.e. no vendor will support your large Fabric when it crashes
- Scaling the Fabric requires fixing this Domain ID limitation

Node Port Virtualization (NPV)

- NPV fixes the Domain ID problem by removing the need for a switch to participate in Fabric Services
  - I.e. no FSPF, FCNS, Zoning, etc.
- Switches running NPV appear to the rest of the fabric as an end host
  - I.e. a Node Port (N_Port)
- Upstream facing link on the NPV Switch is called the NP_Port
  - Proxy Node Port

Node Port ID Virtualization (NPIV)

- Switch upstream of NPV Switch is the NPV Core Switch
- NPV Core Switch runs Node Port ID Virtualization (NPIV)
- Allows multiple FLOGIs and FCID assignments on its F port facing downstream
- NPIV is also applicable in virtualization environments
  - E.g. VMware Host assigning separate pWWN/FCIDs to the VMware Guests

NPV/NPIV Configuration

- Enable NPV on NPV Switch (downstream switch)
  - **feature npv**
  - Forces a write erase & reload
    - Not all config, but most config
  - On 5500UP, reallocate ports as FC after reload
    - Now reload again ☺
- Configure NP Ports on NPV Switch
  - **switchport mode np**
- Enable NPIV on NPV Core Switch
  - **feature npiv**
- Configure previous E ports as F ports on NPV Core Switch
  - **switchport mode f**
- NPV switch does not participate in Fabric Services

Q & A