FC-SW-6
NPIV SWITCH

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NPIV Switch

• Reference Architecture

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Reference

Traditional NPIV
NPIV

Target Solutions

• Original Objective
  • “N_Port ID Virtualization (NPIV) provides a FC facility for sharing a single physical N_Port among multiple N_Port IDs, thereby allowing multiple initiators, each with its own N_Port ID, to share the N_Port.”

• Operational Objectives
  • Provides a common implementation methodology
  • Provides interoperability between devices
  • Provides backward compatibility with current implementations and legacy devices
**NPIV**

Examples of Implementations Today

- **Bridging**
  - Provides device connectivity as part of existing fabric
  - Leverages existing functional behavior
  - Localizes interoperability concerns to N_Port profile
  - Limits domain identifier consumption

- **Multiplexing**
  - Extends connectivity
  - Utilizes existing infrastructure
**NPIV Device**

**Login Sequence**

- **NPIV Device**
  - Performs fabric login for base N_Port
  - Performs FDISC login for each additional Fibre Channel Address desired
    - Number depends on supported device ports
  - Allocates FCA’s to device ports
  - Forwards all other requests to fabric F_Port

- **N_Port**
  - Performs normal Fabric Login
  - Receives FCA from NPIV Device
  - Processes remaining fabric service requests normally

> Repeat FLOGI/FDISC for each attached device
NPIV in the Standard

References (sort of ;-)  

• FC-LS  
  • 4.2.26 Discover F_Port Service Parameters (FDISC)  
    • 4.2.26.1 Description  
      • The FDISC ELS shall transfer Service Parameters from the initiating Nx_Port to the Fx_Port at wellknown F_Port_ID (i.e., FFFFFFe). This provides the means for the exchange of Service Parameters and the assignment of additional N_Port_IDs without changing service parameters.

• FC-GS  
  • 6.2.3.4.3 Platform Type  
    • The format of the Platform Type attribute, shall be as shown in table 122.  
    • 00 00 00 14 N_Port Virtualizer
NPIV Switch

Goals

• Define operation of existing implementations

• Include NPIV operation in current activities
Use Case

“Local Switching”
NPIV Switch

Switching is largely local to the POD

- Bladed servers accessing storage within its pod
- Server accessing storage in next pod
- Server accessing storage in same pod
- Server accessing storage in the FC Fabric

FC Fabric
Proposal

NPIV Switch
NPIV Switch

Operation

• Function
  • Fabric attachment is as a (V)N_Port
  • Device attachment appears as a (V)F_Port
  • NPIV protocol is utilized to allocate desired FC addresses

• Attributes
  • Forwarding efficiency of a Virtual Domain
  • Deployment simplicity of a single device
  • The NPIV Switch leverages FC services of the attached fabric
NPIV Switch

Characteristics

• All devices log into FC fabric
  • (V)N_Port to Fabric (V)F_Port link

• Name service provided by fabric

• Zoning service provided by fabric

• No additional domains consumed

• Routing and zoning extracted by swNPIV via proxy behavior

• “Local Switching” used to optimize data plane flow

• Simplified interoperability
NPIV Switch
Redundancy (possibly)

• Same characteristics as non-redundant configuration

• NPIV Switches at the fabric edge provide redundant access to the fabric

• All devices log into FC fabric via a Primary NPIV Switch
  • (V)N_Port to Fabric (V)F_Port link

• Non-primary NPIV Switches provide redundant access to the fabric in the event the primary NPIV Switch fails
NPIV Switch
Proposal

• Let’s complete the definition of NPIV Switch
  • Define what’s already available
  • Extend what was started in FC-GS as a Platform Type

• Let’s formally address NPIV in the current Distributed Switch effort
  • We can associate it with the current FC-SW-6 work

• Let’s provide a minimalist solution for interoperability
End of Frame

Thank You