

The Missing Piece

(FCoE Data Transfer End to End with FCF
assistance)

T11/10-339v0

John L. Hufferd
Hufferd Enterprises
Michael Ko
Huawei Symantec

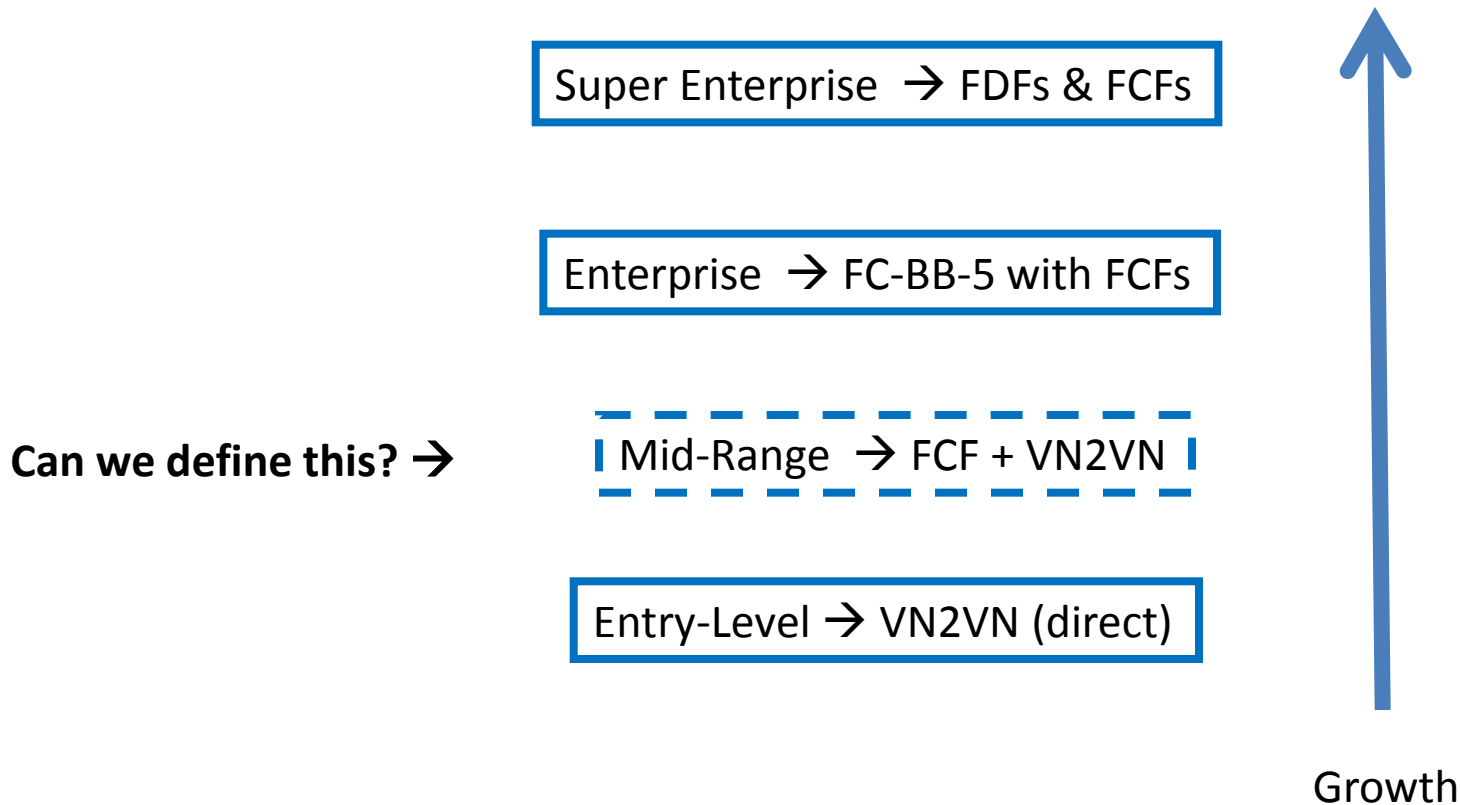


FCoE Environment Picture Today

- FCoE for the **Enterprise** IT Environment
 - FC-BB-5
- Accepted approach for FCoE to address the **Low—End/Entry Level** IT Environment (VN2VN)
- Current work & proposals for FDF
 - To address the **Supper Enterprise** IT Environment
- But what about the **Mid-Range** IT Environment?



Should Provide a Natural Growth Path from Entry through Super Enterprise



But 1st Lets Talk About the Low-End/Entry Environment

Belief:

1. The industry will provide 1Gig Lossless Ethernet Switches – CEE/DCB (as well as 10G and above)
2. VN2VN may be competitive with iSCSI at 1G and 10G
 - Without the overhead of TCP/IP → FCoE software may out-perform iSCSI software, given the same equipment
 - FCoE 10G Adapter (CNA) may out-perform iSCSI 10G Adapters and may have lower Cost of Materials
3. Software FCoE (VN2VN) could become the IT favorite in the Entry (Low-End) Environment



Low-End (Entry) Needs to Feed the Enterprise

- The Enterprise (& Super Enterprise) FC/FCoE environments needs to have lower level “Feeder” Environments that grow, over-time, into the higher end environments
- If low-end (Entry) IT environments chose simple FCoE VN2VN over iSCSI then → these IT environments must be able to easily able to grow into:
 - IT environments that have FCoE with simple and minimum priced FCFs (with centrally administered zoning)
 - Which in turn can easily grow into:
 - FCoE (FC-BB-5) Enterprise Environments which can then evolve into:
 - » FCoE Super Enterprise Environments (with FDFs)



The missing piece in this IT evolution

- We need to have the right stuff for a simple growth path into the Mid-Range
- So we need to define a way for the growing Entry Level (low-end) to get a “taste” of FCF with the least cost and complexity as possible
- The following slides show a possible way to permit such a growth and “Taste” of a minimum cost FCF



Proposal Goals/Constraints

- Bring a FCF into the VN2VN Environment's picture with:
 - A **Standard** FCF with, perhaps, a small # of ports
 - No changes to the FCF concept or operation
 - Perhaps only 1 or 2 FCFs in the Environment
 - Admin ability to gain Zoning administration at a single point
- Changes should only be needed in the CNA, but these changes should be kept as small as possible



Changes Needed To CNA – part 1

- Issue a Normal FLOGI to an FCF
 - following FC-BB-5 FCF discovery protocol
- Use the Name Server as is usual in FC-BB-5
 - To register yourself and your own FC-4 capabilities
 - To obtain valid partner VN_Ports (zoned in) & their FC-4 capabilities
- Use the FC-ID and Mac Address returned by the FCF and issue the FIP **N_Port_ID Claim Notification Multicast** (like VN2VN)
 - But without FC-4 information
- Use the FC FIP **N_Port_ID Claim Response** (like VN2VN) to build the Neighbor set
 - Filter out any VN_Ports not returned by name server
 - But no FC-4 information returned with the response



Alternate FC-4 Information Handling

- Let the FC-4 information occur on the Claim and Response per VN2VN
- Do not need to extract FC-4 information from the name server
 - But may want to do it anyway for compatibility with normal FC-BB-5 FCF interaction reasons
 - This is an implementation issue
- This alternate may be more compatible with VN2VN and hence less new unique microcode



Changes Needed To CNA – part 2

- PLOGI/PLOGI ACC, PRLI/PRLI ACC will be issued per the normal VN2VN processes
- Other FCoE Frames will be issued and handled like VN2VN
- The N_Port ID Beacon will be used as in VN2VN
 - For Keep-Alives
 - For detection of invalid Network Joins



Changes Needed To CNA – part 3

- If N_Port ID Beacon FIP frame is not received within the expected time
 - Perform implicit Process and Port logouts
- Attempt to continue operations by using normal FC-BB-5 mode
 - Issue PLOGI etc through the FCF only



Value

- With the Data being sent directly VN2VN
 - The load on the FCF is greatly reduced
 - Only the Control Path (Discovery & FLOGI, Name Server etc.) need be done through the FCF
- Therefore, a fewer number of FCFs (& FCF ports) are needed to handle Low to Mid-Range IT environments
- Soft-zoning is handled via a single management interface (competitive with iSCSI's iSNS)
- Easy upgrade from VN2VN Low End Environments
- Easy subsequent upgrade to full Enterprise (FC-BB-5) Environments
- Everything compatible with FC protocols and Devices



Thank You

The following slides will show additional details

- 1. Security**
- 2. ACE/ACLs**



Security

- Zoning is “Soft-Zoning” for direct VN2VN operations
 - Nodes not in the VN Port’s Zone is not seen in transaction with Name Server
 - Does permit the setting of the soft-zone via normal FC Zoning processes
- Admin can setup appropriate ACLs/ACEs
 - Dynamic ACEs can add additional protection on Initiator ports
 - See “Additional ACLs in the Lossless Ethernet Switch” slide below
- Adapters can perform checks which limit exposure
 - Make sure that PLOGI request comes from VN port within its zone
 - Make sure that other FCoE frames come from established (PLOGIed VN peer) connections
- FC-SP can be used if supported by Initiator & Target
- If customer wants more control they should
 - Use FCFs and only FC-BB-5 processes
 - Which will also provide HARD Zoning



Additional ACLs in the Lossless Ethernet Switch

- The current (FC-BB-5) Dynamic ACL
 - SA = FCF assigned MAC address, DA = FCF MAC address, Type = FCoE, permit;
- May be supplemented with the following Dynamic ACLs
 - SA = FCF assigned MAC address, DApre = FC-MAP address, Type = FCoE, permit; For Normal FCoE
 - SA = FCF assigned MAC address, DApre = FC-MAP address, Type = FIP, permit; For Keep-Alives
- Static ACE (if Dynamic ACEs not possible)
 - SApre = FC-MAP, DApre = FC-MAP, Type = FCoE, permit; (for all FCoE operations)
 - SApre = FC-MAP, DApre = FC-MAP, Type = FIP, permit; (for all Keep-Alive operations)

