



Distributed FCF

Specification in T11/11-026v0

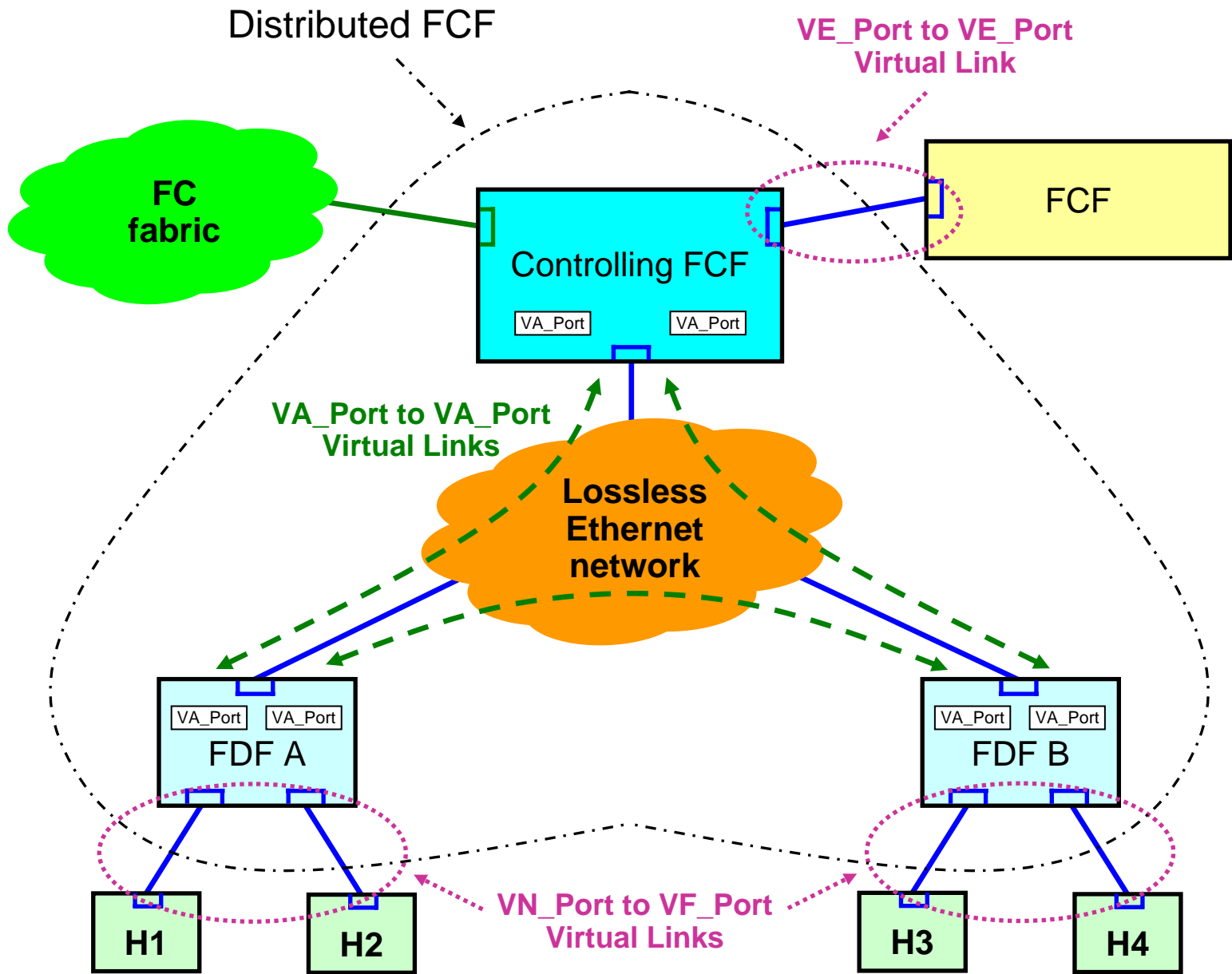


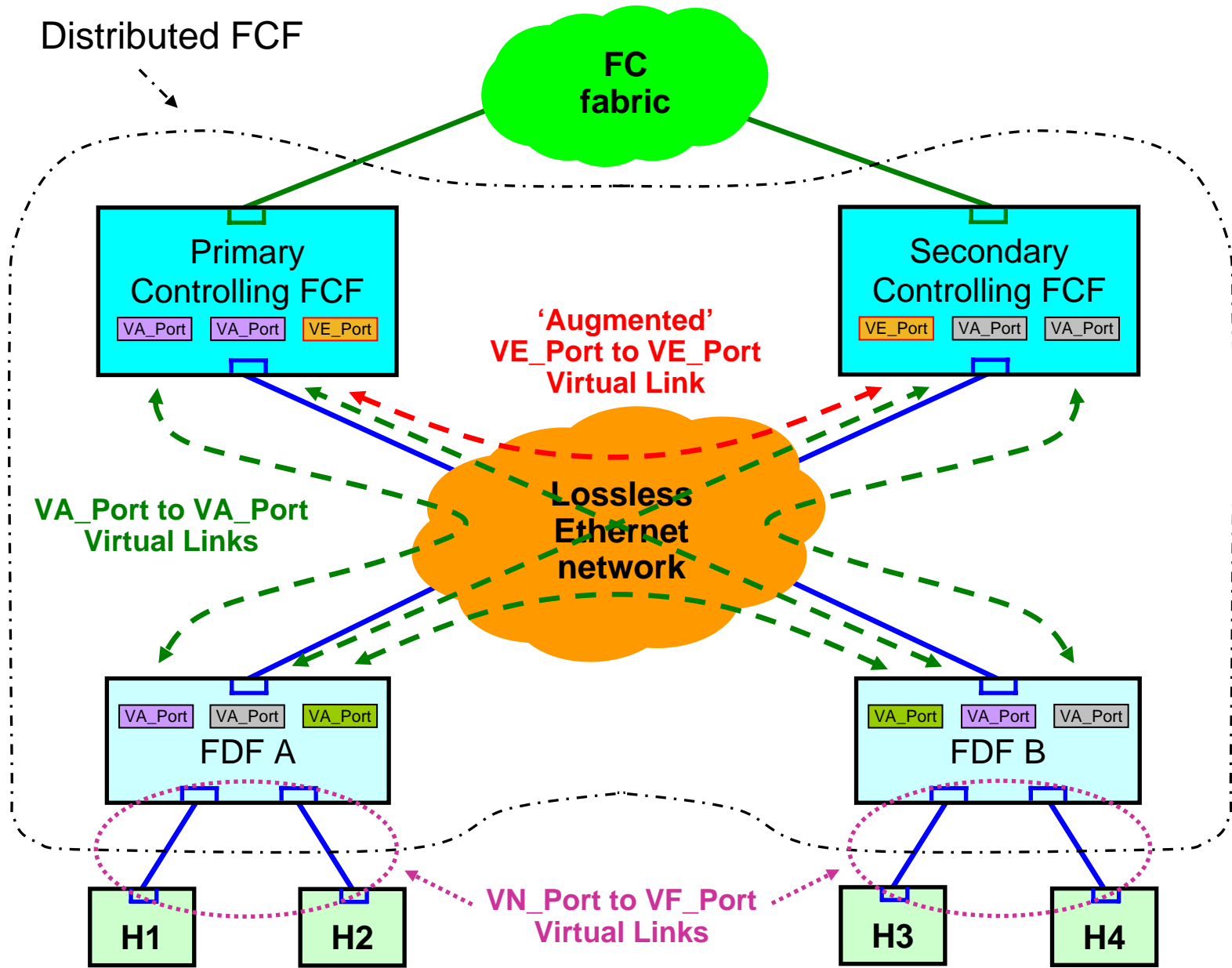
Claudio DeSanti

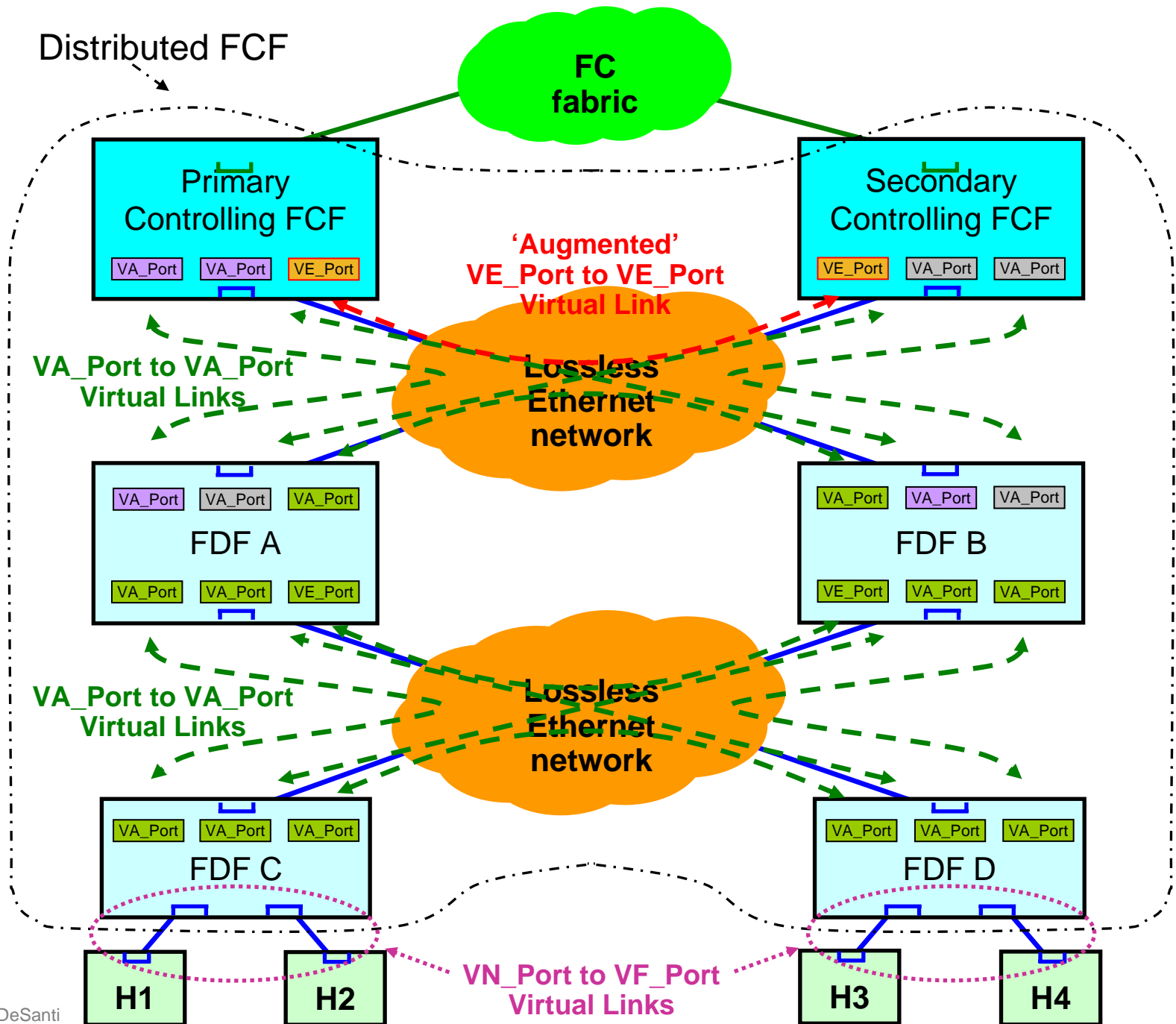
T11/11-070v0, February 2011

Image Credit:
Landon Curt Noll

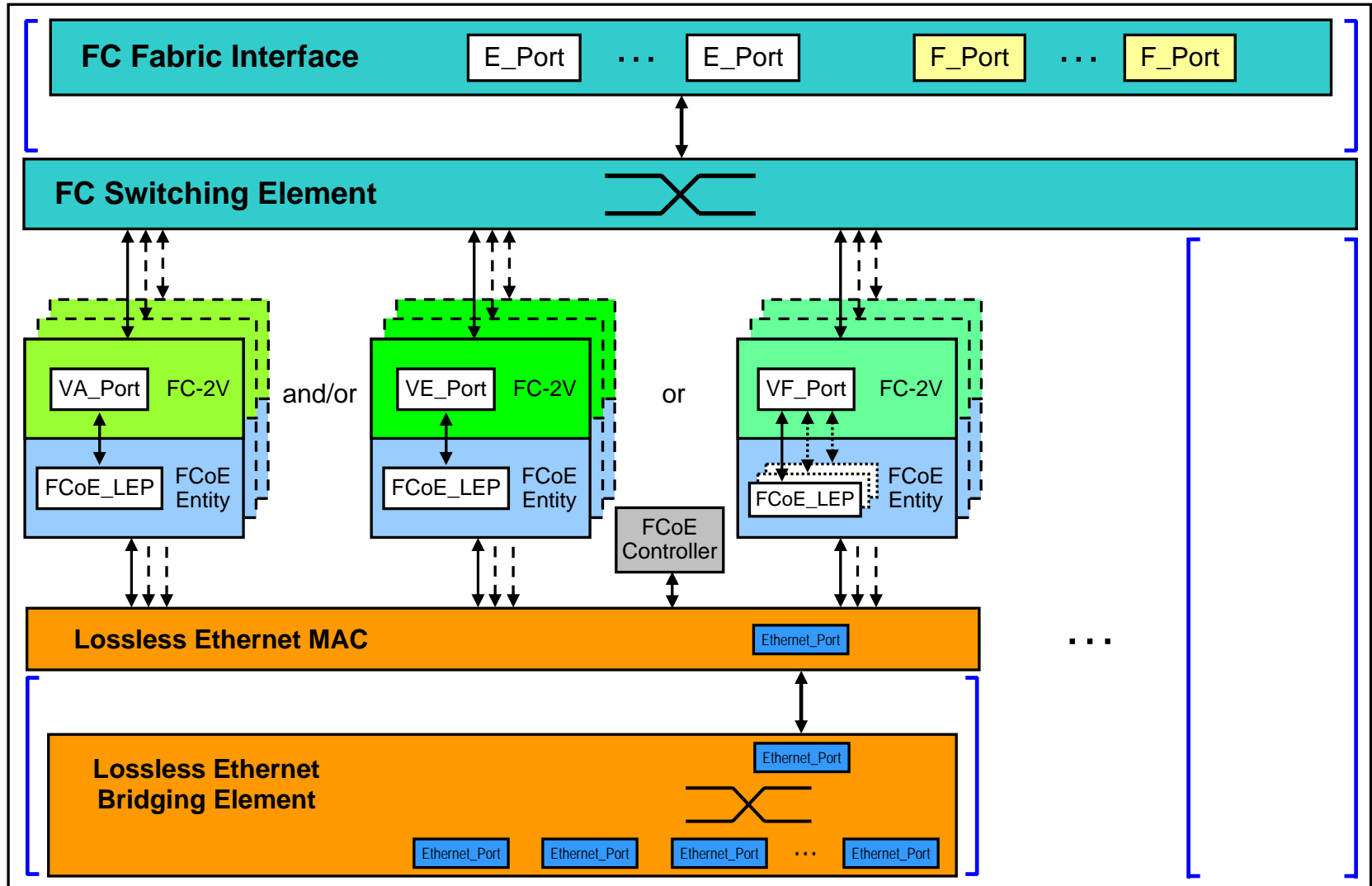




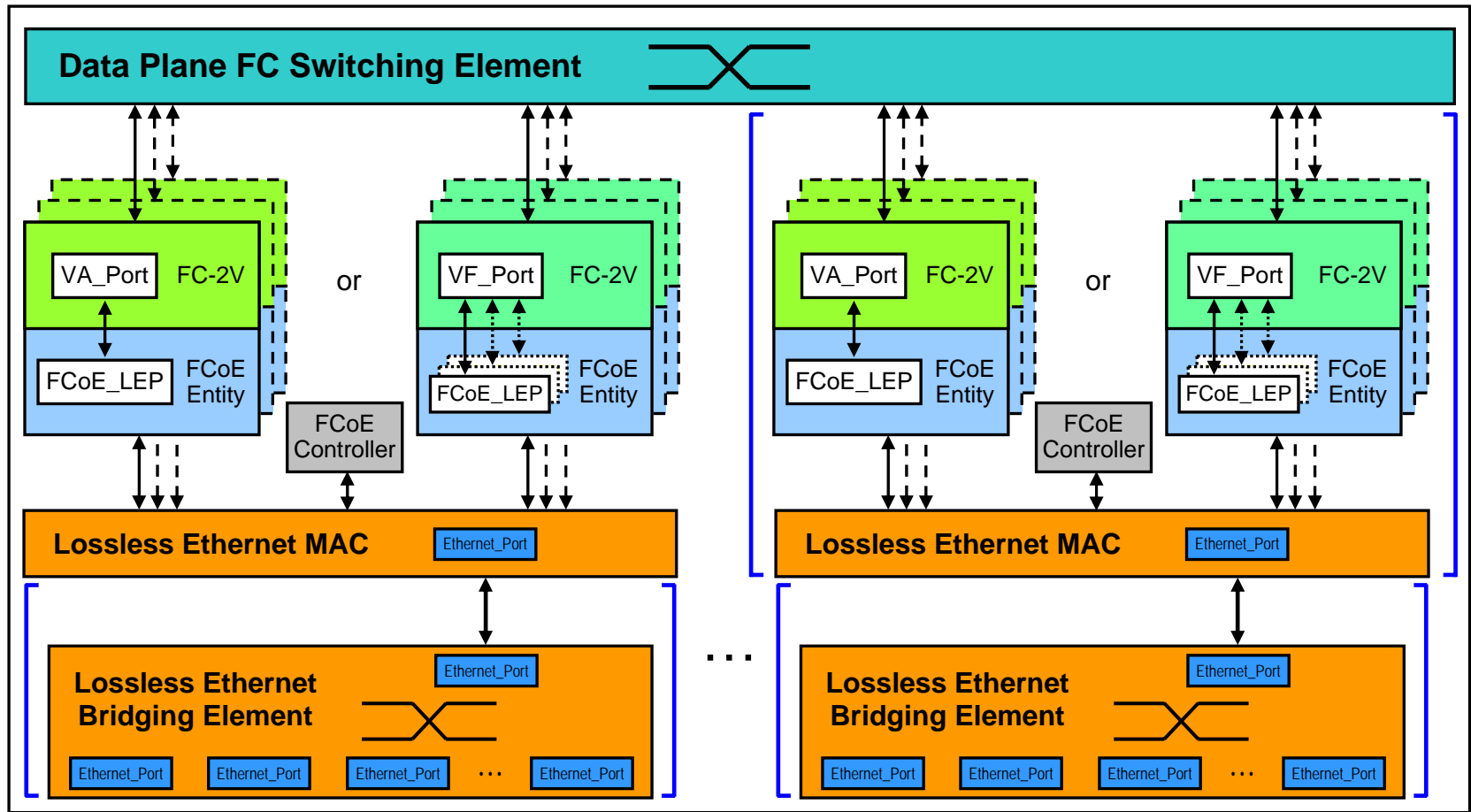




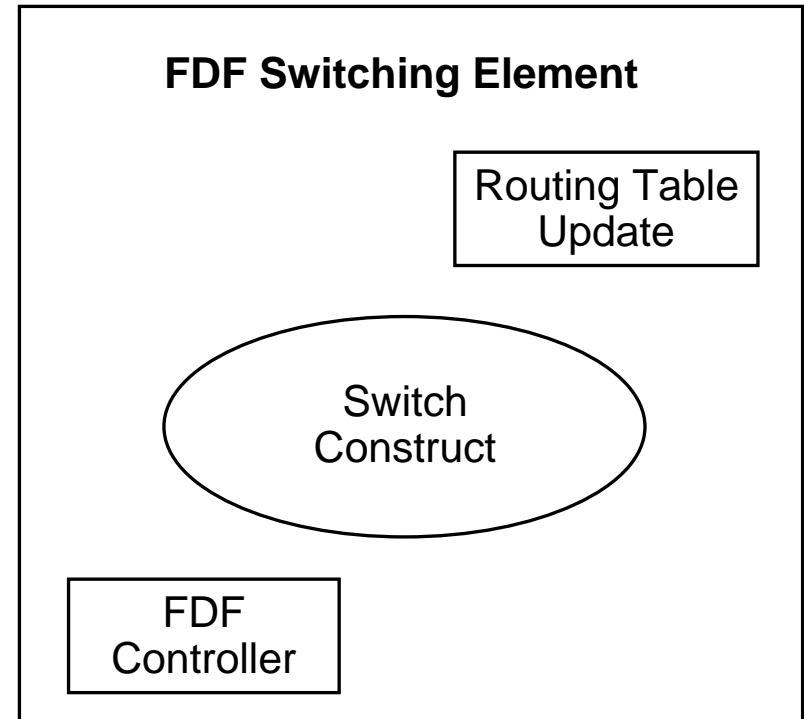
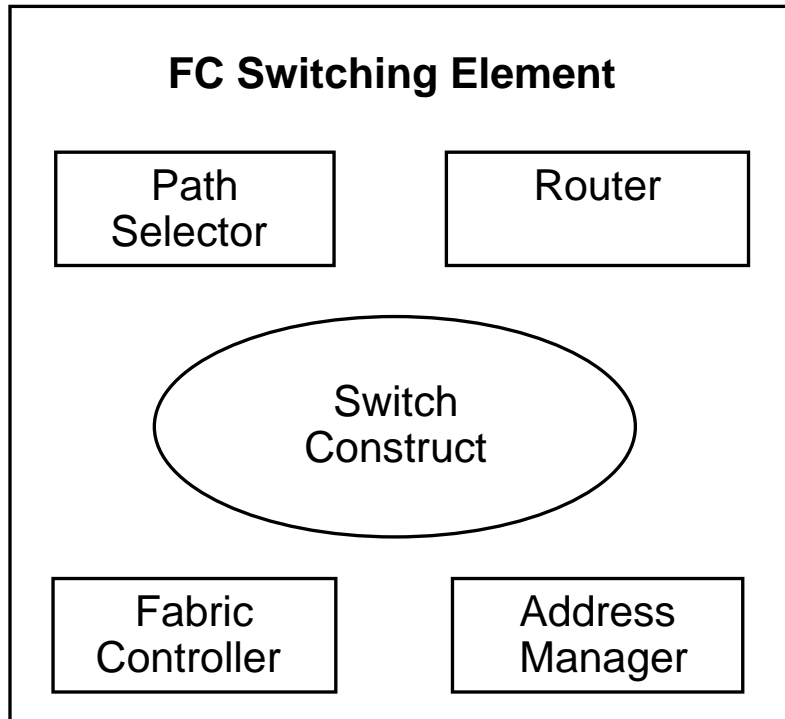
Controlling FCF Functional Model



FDF Functional Model



Data Plane FC Switching Element



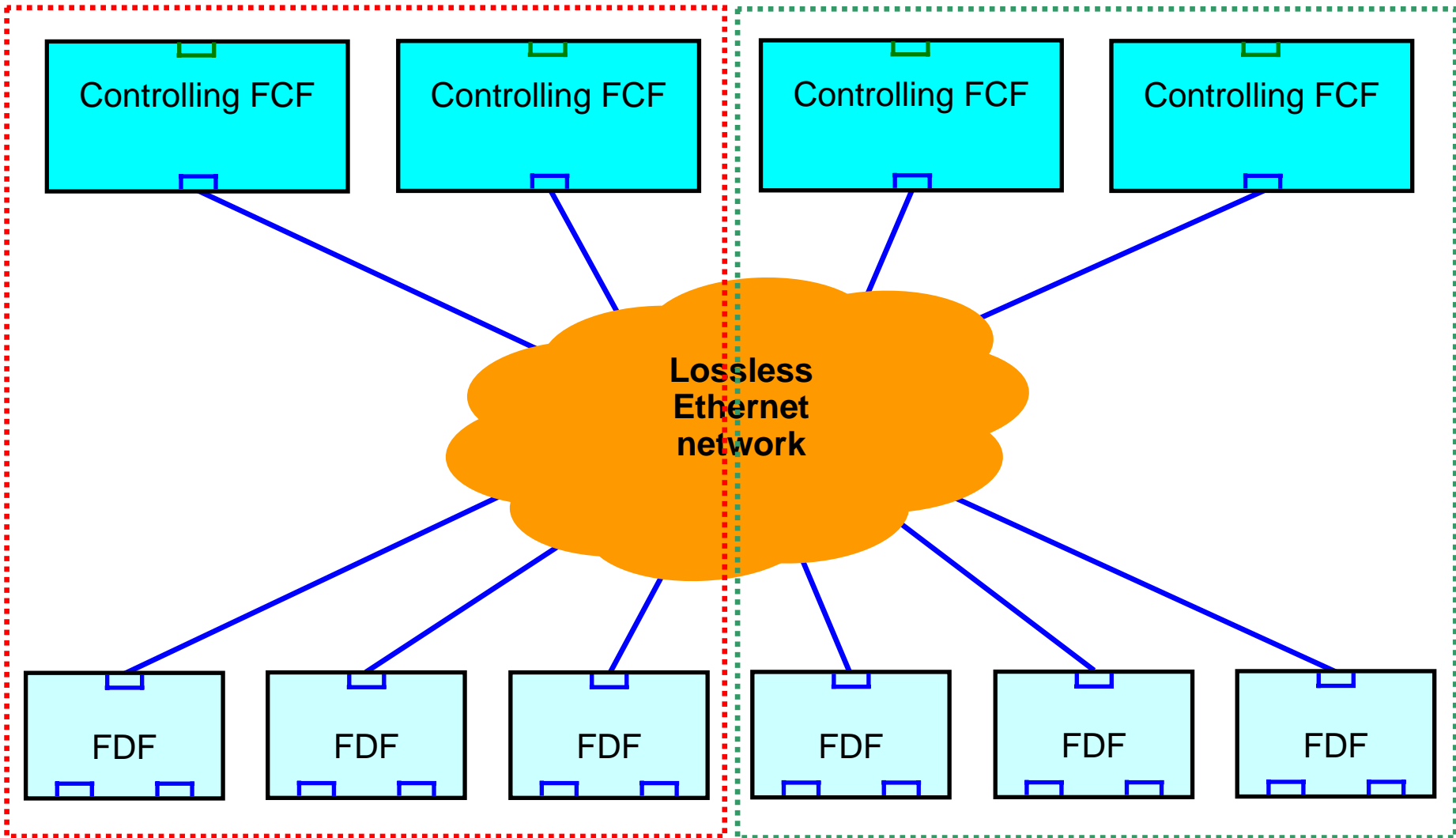
Distributed FCF

- A Controlling FCF is uniquely identified by its **Switch_Name Name_Identifier**, as an FCF
- An FDF is uniquely identified by its **Switch_Name Name_Identifier**
- A Distributed FCF is defined by an administrative configuration on the Controlling FCFs, listing:
 - the **Switch_Names** of the two Controlling FCFs that act as the **Primary/Secondary** pair for that Distributed FCF; and
 - the **Switch_Names** of the FDFs that are part of that Distributed FCF (i.e., the FDF Set)



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Distributed FCFs



VA to VA Virtual Link Instantiation

- **Instantiated from the root to the periphery**

An FDF waits for a Controlling FCF or another FDF to initiate a FIP ELP

A Controlling FCF initiates FIP ELP with the discovered FDFs belonging to the FDF Set

Upon establishing a Virtual Link with the Primary Controlling FCF and receiving the Distributed FCF membership information, an FDF initiates FIP ELPs with the discovered FDFs belonging to the FDF Set

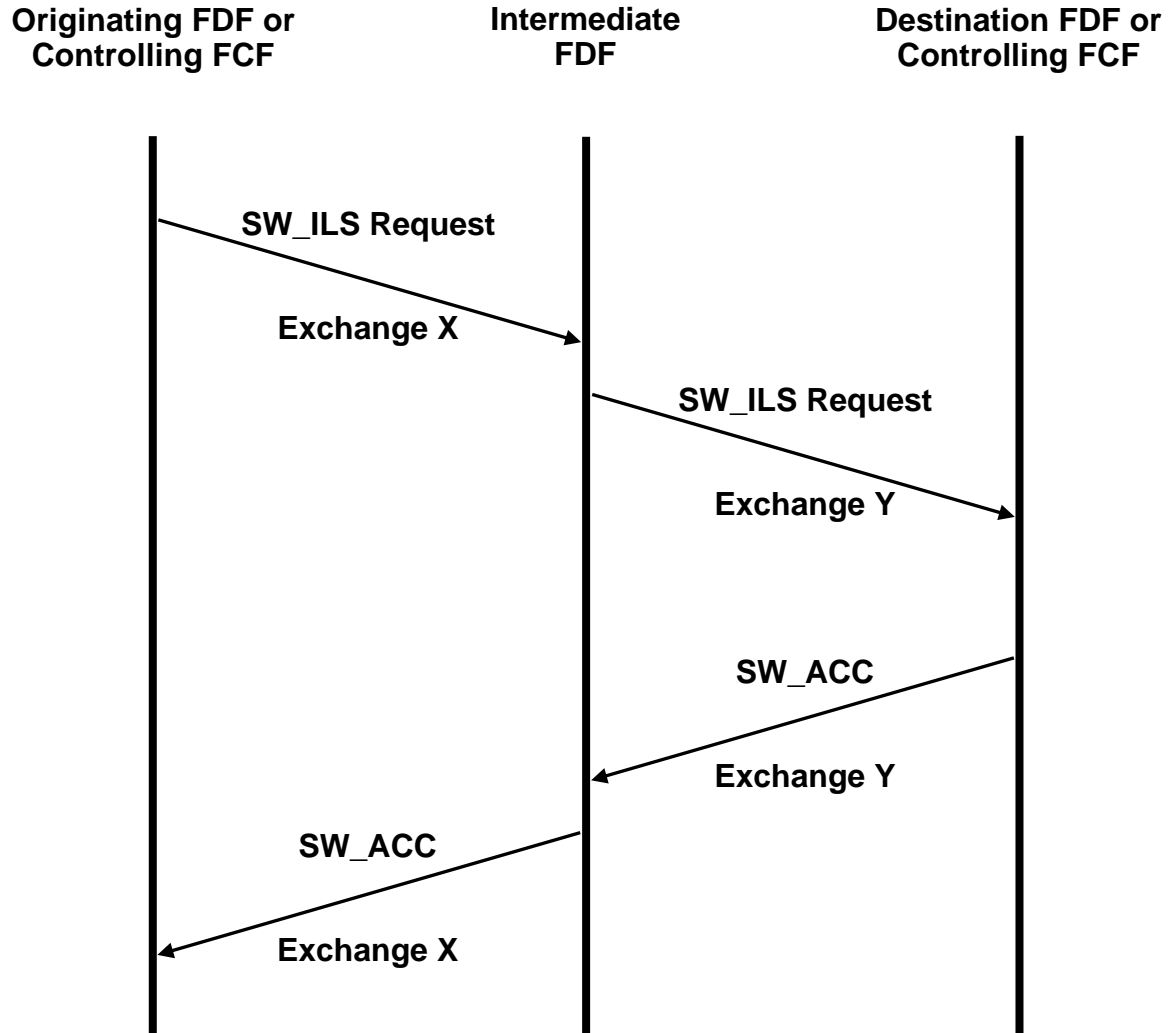
VA_Port

- An instance of the FC-2V sublevel of Fibre Channel
- Identified by an A_Port_Name Name_Identifier
- Addressed by the A_Port Controller address identifier (i.e., FFFF9h)
- Supports Class F service, the VA_Port SW_ILSs, and their operations

Table 2 – VA_Port SW_ILSs Command Codes

Encoded Value	Description	Abbreviation
XX00 0001h	VN_Port Reachability Notification	VNRN
XX00 0002h	VN_Port Unreachability Notification	VNUN
XX00 0003h	FDF Reachability Notification	FDRN
XX00 0004h	FDF Unreachability Notification	FDUN
XX00 0005h	N_Port_ID Route Distribution	NPRD
XX00 0006h	N_Port_ID and Zoning ACL Distribution	NPZD
XX00 0007h	Active Zoning ACL Distribution	AZAD
XX00 0008h	Distributed FCF Membership Distribution	DFMD

VA_Port SW_ILS Relay



VA_Port SW_ILSs (1)

Table 3 – VNRN Request Payload

Item	Size (bytes)
SW_ILS Code = XX00 0001h	4
Originating FDF Switch_Name	8
Destination Controlling FCF Switch_Name	8
F_Port_Name	8
FLOGI/NPIV FDISC Parameters	116

Table 5 – VNUN Request Payload

Item	Size (bytes)
SW_ILS Code = XX00 0002h	4
Originating FDF Switch_Name	8
Destination Controlling FCF Switch_Name	8
Unreachable N_Port_Name	8
Reserved	1
Unreachable N_Port_ID	3

VA_Port SW_ILSs (2)

Table 7 – FDRN Request Payload

Item	Size (bytes)
SW_ILS Code = XX00 0003h	4
Originating FDF Switch_Name	8
Destination Controlling FCF Switch_Name	8
Reachable FDF / Controlling FCF Switch_Name	8
Reserved	2
Virtual Link Cost	2

Table 9 – FDUN Request Payload

Item	Size (bytes)
SW_ILS Code = XX00 0004h	4
Originating FDF Switch_Name	8
Destination Controlling FCF Switch_Name	8
Unreachable FDF / Controlling FCF Switch_Name	8

VA_Port SW_ILSs (3)

Table 11 – NPRD Request Payload

Item	Size (bytes)
SW_ILS Code = XX00 0005h	4
Originating Controlling FCF Switch_Name	8
Destination FDF Switch_Name	8
Primary Controlling FCF Switch_Name	8
Next-hop Switch_Name to the Primary Controlling FCF [1]	8
Next-hop Switch_Name to the Primary Controlling FCF [2]	8
Secondary Controlling FCF Switch_Name	8
Next-hop Switch_Name to the Secondary Controlling FCF [1]	8
Next-hop Switch_Name to the Secondary Controlling FCF [2]	8
Number of N_Port_ID Range Entries (p)	4
N_Port_ID Range Entry #1	see table 12
N_Port_ID Range Entry #2	see table 12
...	
N_Port_ID Range Entry #p	see table 12
Number of Reachable Domain_ID Entries (r)	4
Reachable Domain_ID Entry #1	see table 13
Reachable Domain_ID Entry #2	see table 13
...	
Reachable Domain_ID Entry #r	see table 13

VA_Port SW_ILSs (4)

Table 12 – N_Port_ID Range Entry Format

Item	Size (bytes)
Destination FDF Switch_Name	8
Next-hop Switch_Name to the Destination FDF [1]	8
Next-hop Switch_Name to the Destination FDF [2]	8
Number of N_Port_ID Ranges (q)	4
N_Port_ID Range #1	4
N_Port_ID Range #2	4
...	
N_Port_ID Range #q	4

Table 13 – Reachable Domain_ID Entry Format

Item	Size (bytes)
Destination Domain_ID	4
Next-hop Switch_Name to the Destination Domain_ID [1]	8
Next-hop Switch_Name to the Destination Domain_ID [2]	8

VA_Port SW_ILSs (5)

Table 15 – NPZD Request Payload

Item	Size (bytes)
SW_ILS Code = XX00 0006h	4
Originating Controlling FCF Switch_Name	8
Destination FDF / Controlling FCF Switch_Name	8
Flags	4
Allocated / Deallocated N_Port_ID	4
N_Port_Name associated with the Allocated/Deallocated N_Port_ID	8
Switch_Name of the FDF associated with the Allocated/Deallocated N_Port_ID	8
FLOGI / NPIV FDISC LS_ACC Parameters	116
Number of Peering Entries (h)	4
Peering Entry #1	see table 16
Peering Entry #2	see table 16
...	
Peering Entry #h	see table 16

VA_Port SW_ILSs (6)

Table 16 – Peering Entry Format

Item	Size (bytes)
Peering N_Port_ID	8
Number of Allowed Peers (k)	4
Peer N_Port_ID #1	4
Peer N_Port_ID #2	4
...	
Peer N_Port_ID #q	4

VA_Port SW_ILSs (7)

Table 18 – AZAD Request Payload

Item	Size (bytes)
SW_ILS Code = XX00 0007h	4
Originating Controlling FCF Switch_Name	8
Destination FDF Switch_Name	8
Number of Peering Entries (m)	4
Peering Entry #1	see table 16
Peering Entry #2	see table 16
...	
Peering Entry #m	see table 16

VA_Port SW_ILSs (8)

Table 20 – DFMD Request Payload

Item	Size (bytes)
SW_ILS Code = XX00 0008h	4
Originating Controlling FCF Switch_Name	8
Destination FDF Switch_Name	8
Primary Controlling FCF Switch_Name	8
Secondary Controlling FCF Switch_Name	8
Number of FDFs (n)	4
FDF Switch_Name #1	8
FDF Switch_Name #2	8
...	
FDF Switch_Name #n	8

WKA and Domain Controller Addresses

- Forwarded to the primary Controlling FCF

- **The Fabric Controller WKA:**

Used by some ELSs (e.g., RSCN, SCR) and to identify VE_Ports

i.e., it is used by SW_ILSs exchanged between VE_Ports

The use of a different WKA to identify VA_Ports (i.e., FFFF9h, currently reserved) enables an unambiguous handling of the Fabric Controller WKA

i.e., FCoE frames with the Fabric Controller WKA as D_ID are forwarded to the primary Controlling FCF

- **The F_Port Controller WKA:**

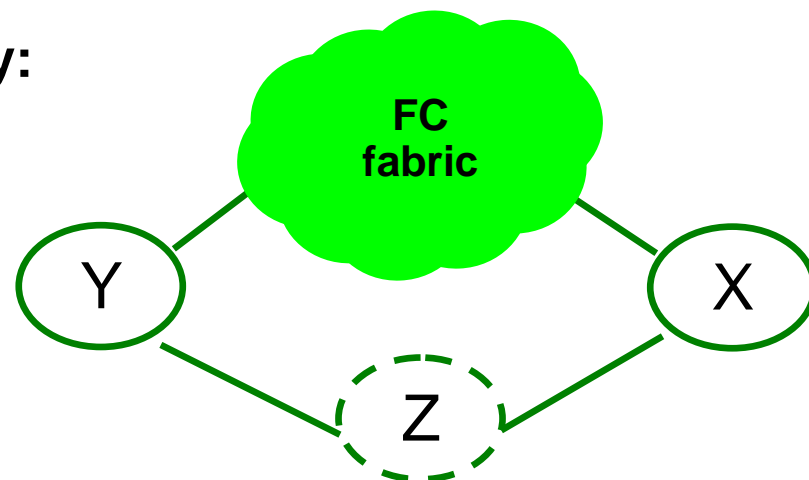
Used for login and logout purposes and by other ELSs (e.g., RLS)

Login and logout are performed through FIP and therefore handled locally by an FDF

Other ELSs using the F_Port Controller WKA are FCoE encapsulated and forwarded to the primary Controlling FCF

High Availability

- The Primary Controlling FCF obtains an additional Domain_ID from the Principal Switch
 - Used as Virtual Domain_ID to allocate N_Port_IDs to FDFs
- The Primary Controlling FCF communicates the Virtual Domain_ID to the Secondary Controlling FCF
 - Through a FCoE encapsulated SW_ILS
- Then the Primary Controlling FCF generates the LSR describing the Virtual Domain Z
- Resulting FSPF Topology:



Virtual Domain Announcement Request

Table 23 – VDA Request Payload

Item	Size (bytes)
SW_ILS Code	4
Primary Controlling FCF Switch_Name	8
Secondary Controlling FCF Switch_Name	8
Virtual Domain Switch_Name	8
Reserved	3
Virtual Domain Domain_ID	1

Thank You

Grappa
cantina