Any Level of Redundancy with Additional FCF(s) per Virtual Domain

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12-312v2 is two protocols in one document

- The first is a HA protocol state machine and related DS_ILS(s): Build-Dist-Sw (BDS), Exchange-Dist-Sw-Param (EDSP), VDS, and RHello

- The second is to allow ***additional FCF(s)*** to discover the virtual domain topology and forward traffic to FcDF(s)

  - Two DS_ILS(s) are used for this purpose: DSD & DSS

The **Distributed Switch Distribution** is used by the Primary Controlling Switch to distribute information (e.g., Virtual Domain_ID, Virtual Domain Switch_Name) to the Secondary Controlling Switch and additional FCF(s), if any

Table 19 – DSD DS_ILS request payload	
Item	Size [byte]
DS_ILS code = XX00 00XXh	4
Destination Controlling Switch Switch_Name	8
Originating Controlling Switch Switch_Name	8
Descriptor list length = variable	4
Distributed Switch Distribution descriptor	see 1.3.1.7

The **Distributed Switch Sync** DS_ILS is used to distribute the switch topology and allocated address info to other FCF(s)

Table 23 – DSS DS_ILS request payload	
Item	Size [byte]
DS_ILS code = XX00 00XXh	4
Destination Controlling Switch Switch_Name	8
Originating Controlling Switch Switch_Name	8
Descriptor list length = variable	4
FCDF Topology descriptor	see 1.3.1.5
FCDF Address Identifier Allocation descriptor	see 1.3.1.6

*These two protocols need not be tied together*

Additional FCF(s) for forwarding add value irrespective of HA

- Forwarding and trunking topology becomes more flexible

- This enables a topologically flatter network potentially saving on cost

- Fewer L3 hops reduce latency and remove potential choke points

- More options for FcDF connectivity and forwarding enhance load balancing (i.e. increase throughput and lower latency)

  - HA design with more than one FCF is optional

  - A customer with redundant service processors under the hood, may deploy a single highly reliable FCF per virtual domain, and a dual air gap fabric to avoid the HA complexity

  - However additional data path should be available for load balancing

- Load balancing reduces lost traffic in fail over events reducing negative impact on applications

  - During a switch over from primary to secondary FCF data traffic is black holed for duration of Down_Interval+

  - Load balancing using additional FCF(s) reduces the volume of lost data traffic and reduces impact on applications

Decouple redundancy from forwarding

- There is no reason for the level of redundancy to be tied to the number of FCF(s) in a virtual domain

- A customer should have a choice to configure redundancy and number of FCF(s) available for forwarding in a virtual domain independently
  - They each solve a different problem

- For example a customer should be able to chose to operate with:
  - No FCF redundancy and multiple FCF(s)
  - Dual redundancy, e.g. as in 12-035vx and two or more FCF(s)
  - Redundancy with more than two FCF(s), e.g. as attempted in 12-032v2, and multiple FCF(s) etc

New Proposal: Redundancy with additional FCF Set
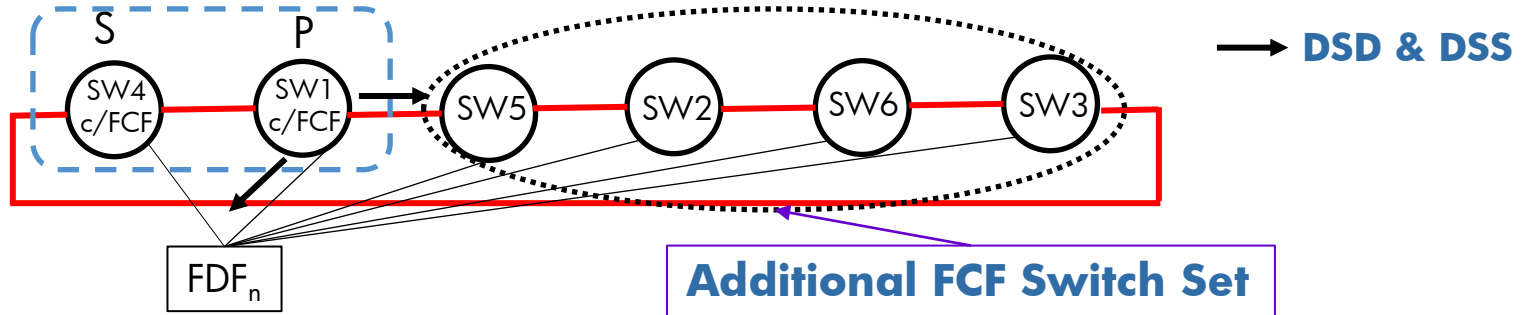
- Pick your desired redundancy level (& perhaps protocol), say dual redundancy as in 12-035vx

- Add a list of "**Additional FCF Switch Set**", e.g. SW5/2/6/3

- Add Dist-Sw-Dist (**DSD**) & Dist-SW-Sync (**DSS**) DS_ISL(s) to the existing VA_Port protocol in 12-036v2, & use them to keep the "additional FCF switch set" in sync for data path forwarding only

- For data plain purposes, decouple the new HA protocol in 12-032v2: state machine, Build-Dist-Sw (BDS), Exchange-Dist-Sw-Param (EDSP), etc as Primary/Secondary FCF(s) know the status of "Other FCF Switch Set" through FSPF

A New Proposal -- Recap

- The working group has included the following text: 12-034v2, 12-035v2, and 12-036v1 in FCF-SW-6

- 12-312v2 "Controlling Switch Redundancy Protocol (for three or more Controlling Switches)" remains as work in progress

- We can decouple the data plane flexibility of the above proposal, i.e. DS_ILS(s): DSD and DSS, from its HA protocol & move it forward

- *Technically there is no reason to tie these two mechanisms together*
  - *There is value add in separating them giving customer flexibility*

- We seem to have enough c/FCF redundancy for now:
  - Implementations of FCF(s) as datacenter switches may be redundant to begin with (x2),
  - We have added HA (12-035vx) with dual redundancy (x2) x2,
  - And there is the traditional air gap fabric redundancy ((x2) x2) x2 for x8 times redundancy

- What we need more of is data path flexibility – FCF by pass being a major goal of SW6

Thank You