

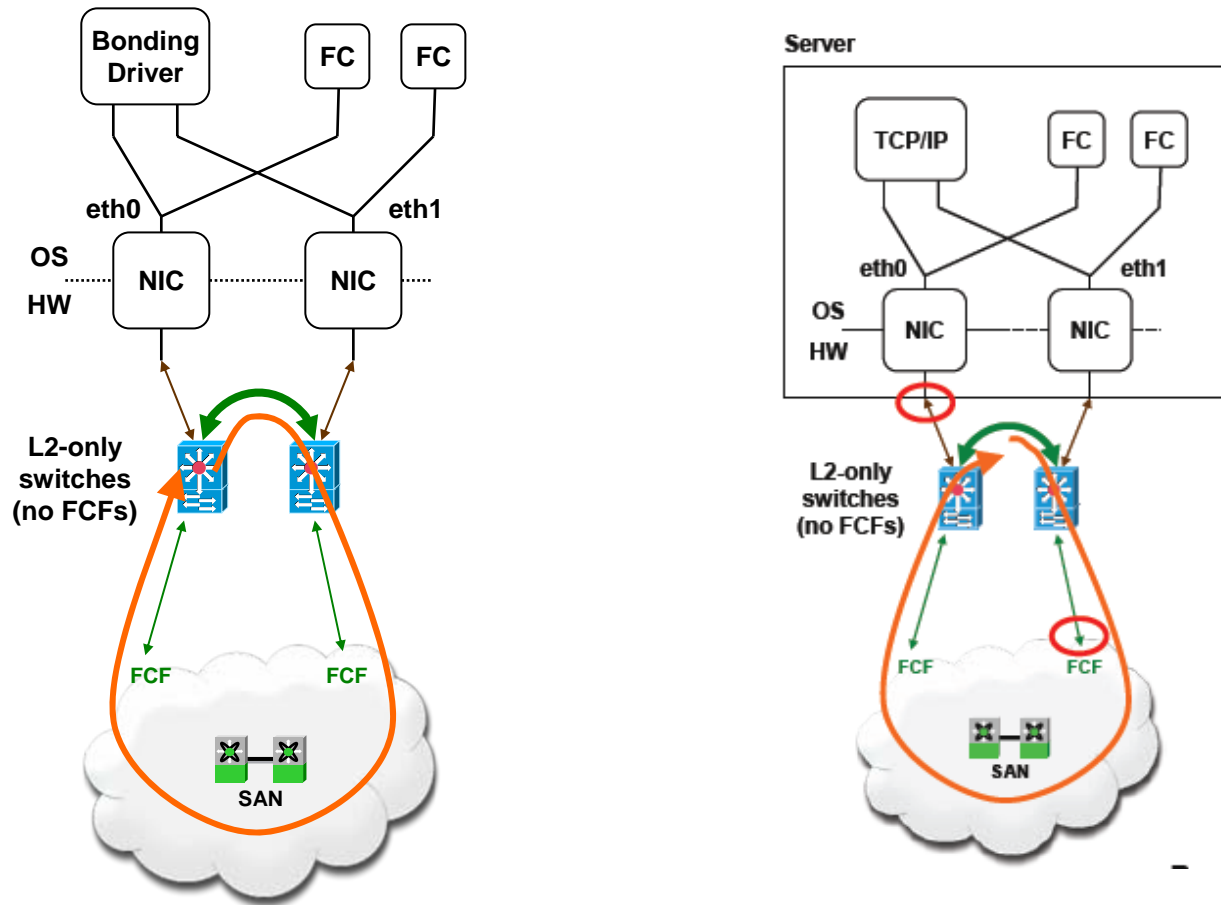
# FCoE: Forwarding Loop Solution Proposal

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# Forwarding Loop Problem Statement



- Details and associated discussion found in numerous presentations put forth by David Black in prior meetings and on the T11 e-mail reflector

# Proposal – Extracted from T11 E-mail Reflector

- The following communication “pairs” need to be prohibited
    - VN-to-VE
    - VF-to-VF\*\*
    - VF-to-VE\*\*
    - VE-to-VF\*\*
    - VE-to-VN
- \*\* indicates crosstalk prevention
- To prevent crosstalk communication, pick one of the following:
    - FCoE header indicates FCoE port type (VN, VF or VE) that is the intended receiver of the frame. The receiving FCoE port discards the frame if its actual port type does not match the intended receiver port type in the frame.
      - This discards all 5 PROHIBITED cases.
    - FCoE header indicates FC port type (VN, VF or VE) that is the sender of the frame. The receiving port checks the allowed combinations above and discards anything that's PROHIBITED, thereby also discarding all 5 PROHIBITED cases, but with a different check at the receiver.
    - FCoE header indicates whether a VN\_Port sent the frame and whether a VN\_Port is intended to receive the frame. This plus the recipient's port type identifies the four allowed cases:
      - VN-to-VN, VN-to-VF, VF-to-VN, VE-to-VE
      - This is somewhat subtle - the individual port checks are:
        - VN\_Port: VN sender and VN receiver (VN-to-VN) [11] or non-VN sender, VN receiver (VF-to-VN) [01]
        - VF\_Port: VN sender, non-VN receiver [10]
        - VE\_Port: non-VN sender, non-VN receiver [00]

# Current FC-2 Encapsulation in Ethernet (FCoE)

Word	31-24	23-16	15-8	7-0
0	Destination MAC Address (6 Bytes)			
1				
2	Source MAC Address (6 Bytes)			
3	ET=FCoE (16 bits)		Ver (4b)	Reserved (12 bits)
4	Reserved			
5	Reserved			
6	Reserved			SOF (8 bits)
7	Encapsulated FC Frame  FC Frame = Minimum 28 Bytes (7 Words) → Maximum 2180 Bytes (545 Words)  (including FC-CRC)			
...				
n				
n+1	EOF (8 bits)	Reserved		
n+2	Ethernet FCS			

Optional IEEE 802.1q  
4 Byte Tag goes here →

This field varies  
In size →

Ethernet frame  
size →  
Is 64Bytes to 2220Bytes

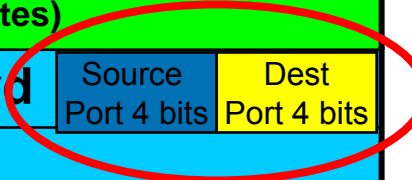
# Proposed Addition to FCoE Encapsulation

Word	31-24	23-16	15-8	7-0
0	Destination MAC Address (6 Bytes)			
1				
2	Source MAC Address (6 Bytes)			
3	ET=FCoE (16 bits)		Ver (4b)	Rsvd
4	Reserved			
5	Reserved			
6	Reserved			SOF (8 bits)
7	Encapsulated FC Frame			
...	FC Frame = Minimum 28 Bytes (7 Words) → Maximum 2180 Bytes (545 Words)			
n	(including FC-CRC)			
n+1	EOF (8 bits)	Reserved		
n+2	Ethernet FCS			

Optional IEEE 802.1q  
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# Proposed Addition to FCoE Encapsulation

- Define a 4-bit field FCoE Frame source port
  - Assign values for VN, VF, VE ports
  - Reserve remaining values for future use (VB ?)
- Define a 4-bit field FCoE frame destination port
  - Assign values for VN, VF, VE ports
  - Reserve remaining values for future use (VB ?)
- Fields to be located early in FCoE frame
  - Sufficient bits available with additional reserve to spare
  - Earlier may enable implementation optimizations
- Addressing implications
  - Server Provided: Fields required for loop prevention
  - Mapped Addresses: Equivalent checks possible
    - Mapped MAC structure indicates whether MAC is for a VN\_Port