BROCADE

FC-BB-6

VN_Port to VN_Port Virtual Links

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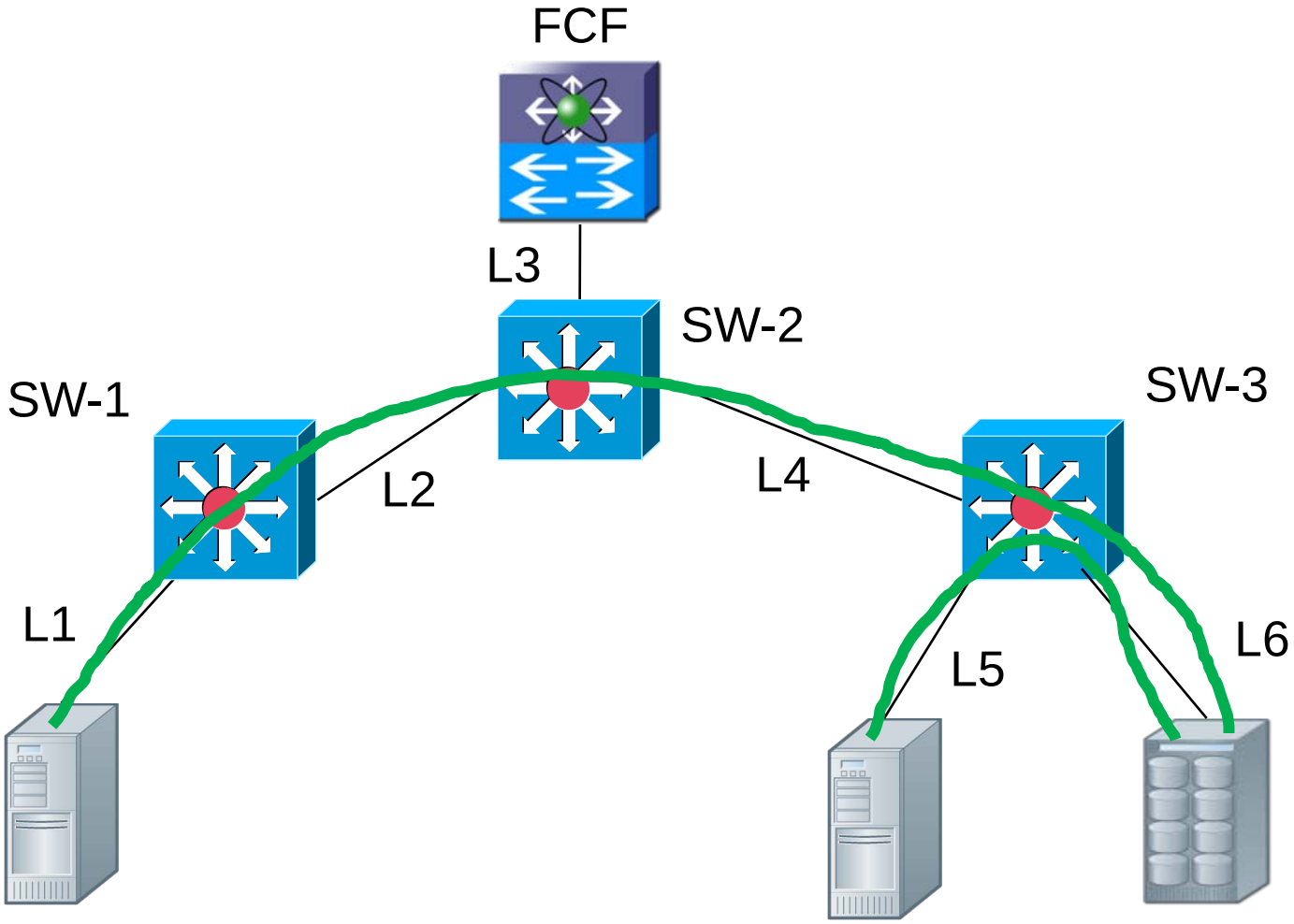
FC-BB-6 VN_Port <-> VN_Port Virtual Link

- Reuse current/existing functionality versus inventing new protocols
  - All FC services are utilized as is (SCN, zoning, authentication, etc..)
  - This benefits both switch (mainly) and ENode implementations
    - From an ENode perspective, all FC services like RSCN service, authentication, etc.. will continue to be available as they do today
    - Only change needed is (for ENodes) extra VN_Port discovery and “direct communication” mechanism

FC-BB-6 VN_Port <-> VN_Port Virtual Link



FC-BB-6 VN_Port to VN_Port Virtual Link

- VN_Port to VN_Port Virtual Link creation:
  - initiated by VN_Port/ENode
  - enabled by the FCF
  - path verification performed by the ENode/VN_Port
- All N_Port Login and N_Port Logout ELS's flow via FCF
  - Destination MAC address set to FCF MAC address
- All other traffic (e.g., FC-4 data, ELSs) flows through intermediate Ethernet bridges
  - Destination MAC address set to peer VN_Port MAC address

FC-BB-6 VN_Port to VN_Port Virtual Link

- ENode performs VLAN discovery, if needed (see FC-BB-5)
- ENode performs FIP discovery (see FC-BB-5)
- ENode performs FIP Fabric Login with FCF
  - Set the N (VN_Port) bit to one in FIP FLOGI descriptor (request) to indicate it supports VN_Port to VN_Port Virtual Links.
  - FCF responds with N bit set to one in FIP FLOGI descriptor (response) to indicate it supports VN_Port to VN_Port Virtual Links.
- VN_Port performs Login with Name Server via FCF

FC-BB-6 VN_Port to VN_Port Virtual Link

- VN_Port registers information with Name Server
  - VN_Port object (new) – (Note: FCoE attributes below may also be implicitly registered after FIP FLOGI)
    - VLAN ID
    - MAC address
    - Value of N bit in FIP FLOGI request descriptor (may not be needed as registering VN_Port object implies support for VN_Port to VN_Port Virtual Links)
  - FC-4 TYPEs object
  - FC-4 Features object
- VN_Port transmits (new) Gxx_xx query to the Name Server to obtain a list of VN_Ports that support VN_Port to VN_Port Virtual Links

FC-BB-6 VN_Port to VN_Port Virtual Link

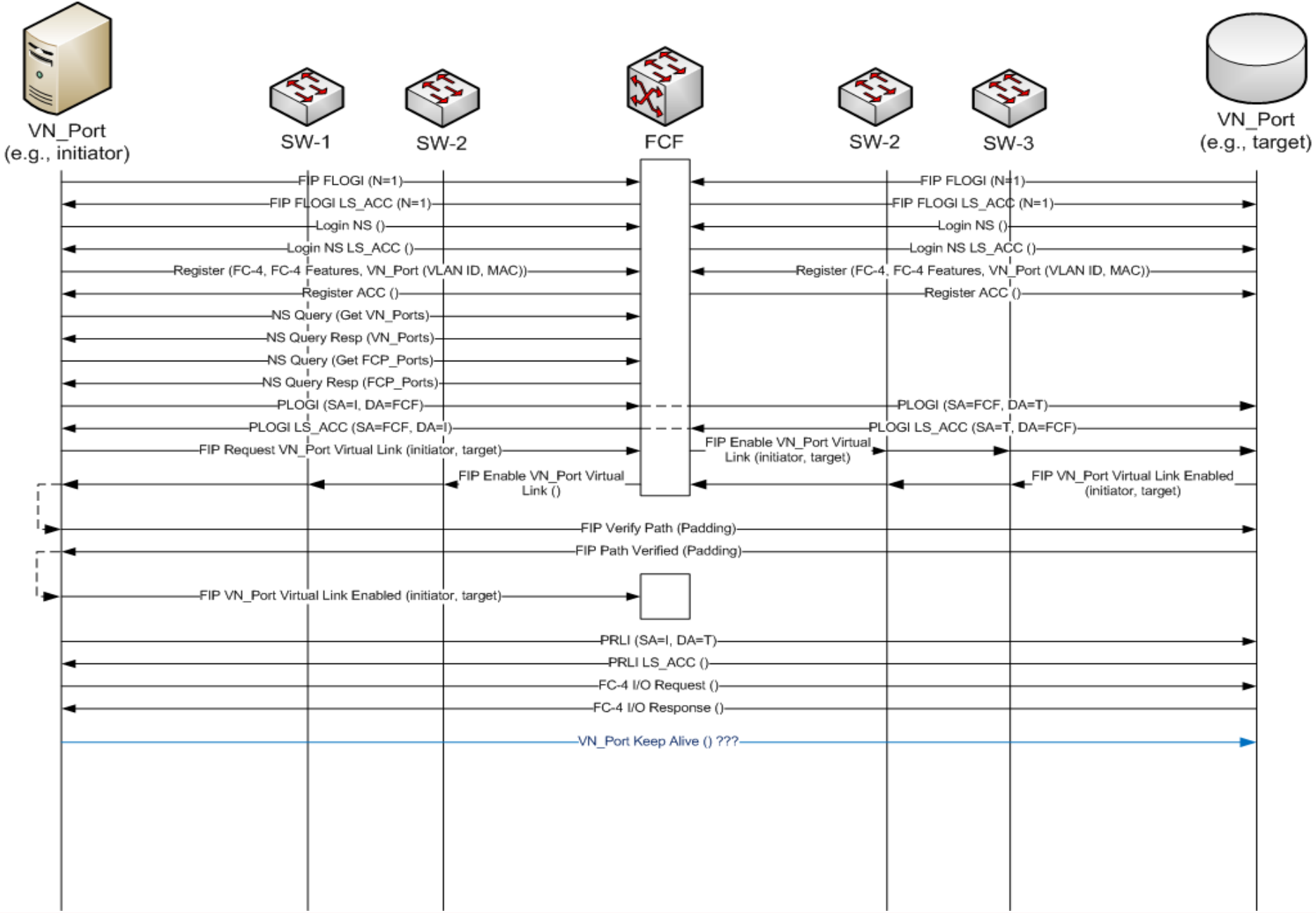
- VN_Port transmits GID_FF query to the Name Server to obtain a list of the Port Identifiers of devices that support the desired protocol (e.g., FCP) and function (e.g., FCP target)
- VN_Port transmits PLOGI to remote VN_Port via FCF
  - i.e., destination MAC = FCF
- VN_Port transmits FIP Request VN_Port Virtual Link (RVL) to the FCF
- FCF transmits FIP Enable VN_Port Virtual Link (EVL) to the VN_Ports identified in the RVL
  - Intermediate Enet bridge sets up appropriate ACE(s) to allow VN_Port to VN_Port traffic (FIP and FCoE)

FC-BB-6 VN_Port to VN_Port Virtual Link

- VN_Port transmits FIP Verify Path to peer VN_Port upon receiving EVL
  - Destination MAC address set to peer VN_Port MAC address
- Upon receiving FIP Verify Path, VN_Port transmits FIP Path Verified to peer VN_Port
  - Destination MAC address set to peer VN_Port MAC address
- Upon receiving FIP Path Verified, VN_Port transmits FIP VN_Port Virtual Link Enabled to the FCF

FC-BB-6 VN_Port to VN_Port Virtual Link

- VN_Port to VN_Port communication is now enabled!
  - VN_Port transmits FC-4 specific frames (e.g., PRLI, SCSI INQUIRY, REPORT LUNS, via VN_Port to VN_Port Virtual Link)



FC-BB-6 VN_Port to VN_Port Virtual Link Maintenance

- Working link keep alive, clean up, exception cases…stay tuned…

FC-BB-6 VN_Port to VN_Port Virtual Link Security

- No new Ethertype to identify VN_Port to VN_Port traffic
  - Use existing FIP Ethertype, FIP Protocol Code, and FIP Subcode to identify VN_Port to VN_Port traffic and create/modify ACLs

FC-BB-6 VN_Port to VN_Port Virtual Link Name Server Additions

- New Fabric object with attributes
  - VLAN ID
  - ENode MAC address
  - FCMAP
- Unique Fabric Name_Identifier
  - Not the Fabric Name/Principal Switch Name
- Specify Get and Register requests
- Specify switch-to-switch distribution

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THANK YOU