Extreme Fabric

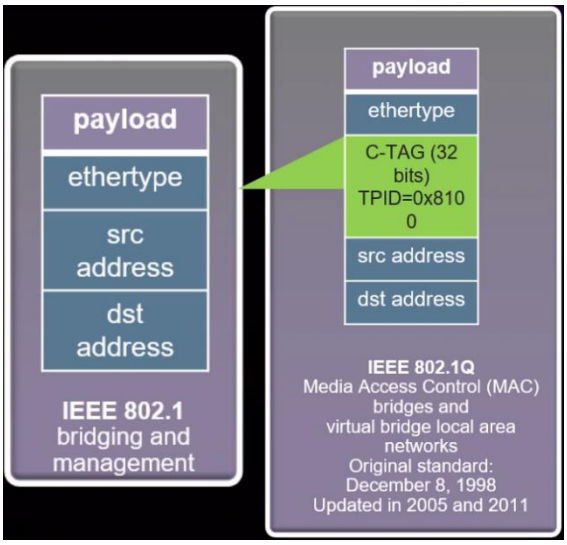
Contenidos

IEEE L2 Virtualization Technologies

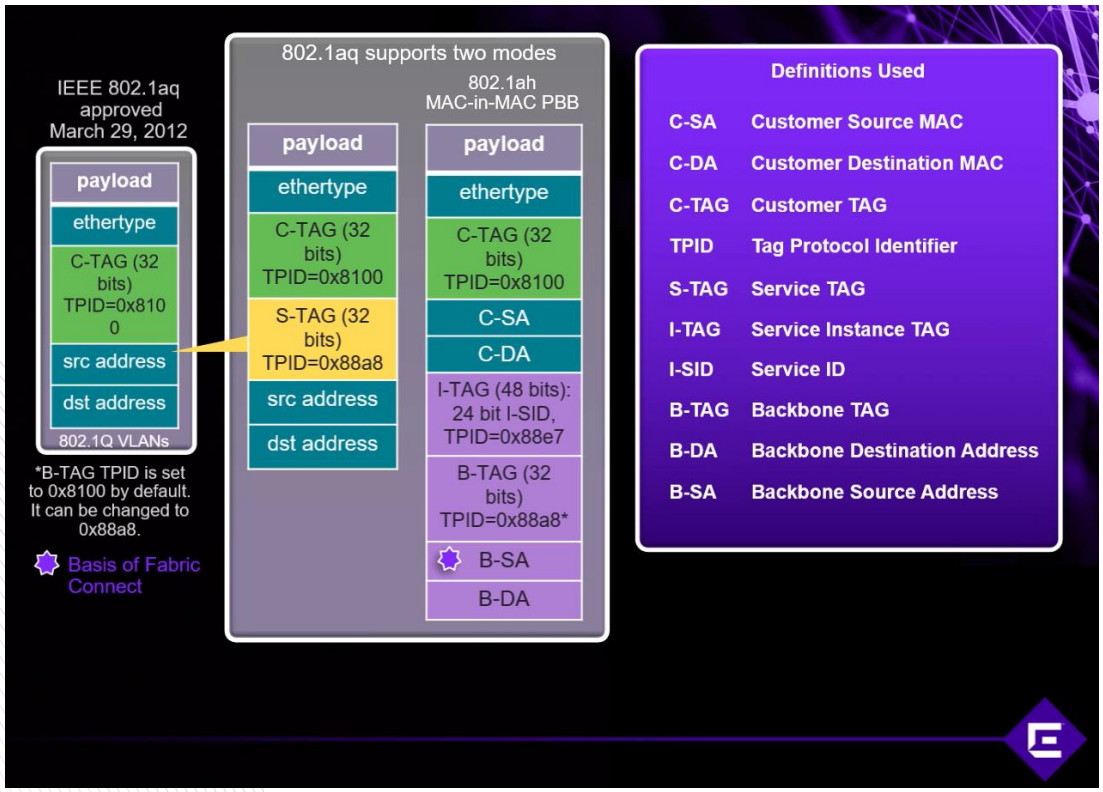
Standart	Year	Name	Loopfree topology by	Service Ids	Provisioning	Virtualization of
IEEE 802.1Q	1998	Virtual Lans (VLAN Tagging)	Spanning Tree SMLT	4096	Edge and core	Layer 2
IEEE 802.1ad	2005	Provider Bridging (QinQ)	Spanning Tree SMLT	4096	Edge and core	Layer 2
IEEE 802.1ah	2008	Provider Backbone Bridging (MAC-in-MAC)	Spanning Tree SMLT	4096	Edge and core	Layer 2
IEEE 802.1aq	2012	Shortest Path Bridging (SPBV & SPBM)	Spanning Tree SMLT	4096	Edge and core	Layer 2
IEEE 802.1ag	2007	Connectivity Fault Management	Discovery and verification of path through IEEE bridged network			

Most vendors who are implementing SPB are implementing SPBM

Fabric Frame Headers



- C-TAG is added within the payload from 802.1 to 802.1Q vlan tagging

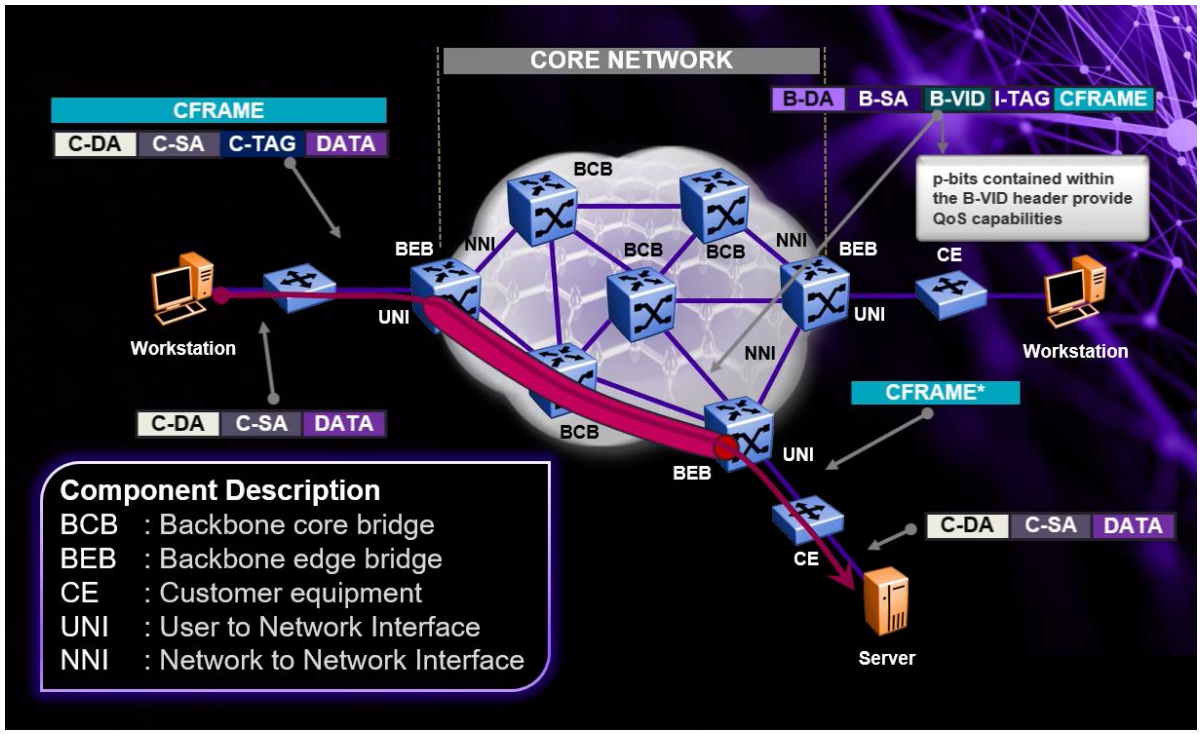


Fabric Connect Terms

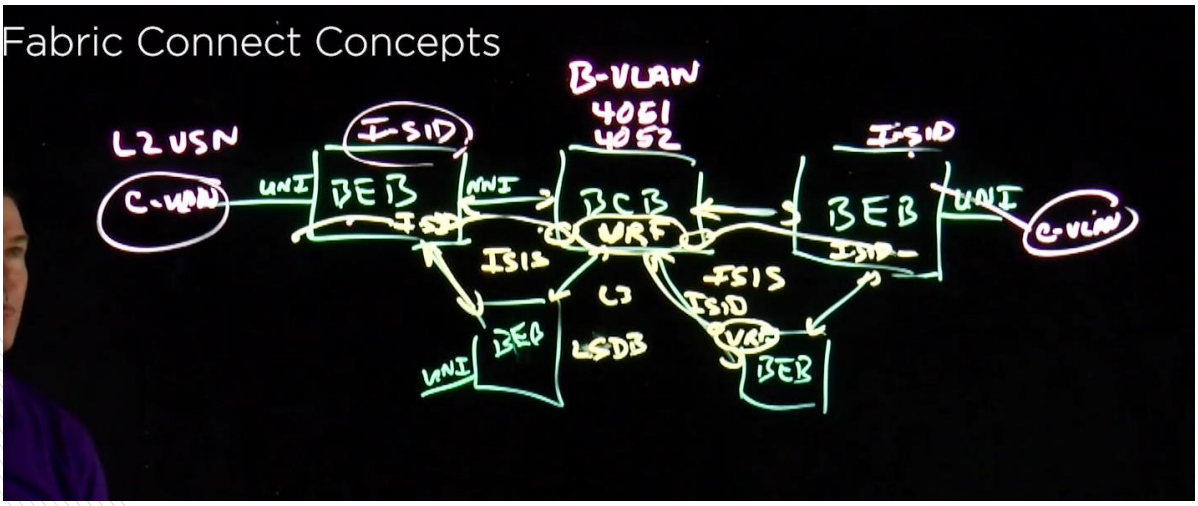
- Virtual Service Network (VSN)
- Service Identifier (I-SID)
- User to Network Interface (UNI)
  - Port connecting to user VLAN
  - untagged or Q-tagged
- Network to Network Interface (NNI)
  - Port connected to SPBM network tagged with only Backbone VLANs

- Backbone Core Bridge (BCB)
  - Fabric Switch with only NNI interfaces
- Backbone Edge Bridge (BEB)
  - Fabric Switch with UNI and NNI interfaces
  - Performs Mac-in-Mac Encapsulation
- Customer VLAN (C-VLAN)
  - A VLAN containing user devices attached to a UNI port of BEBs.

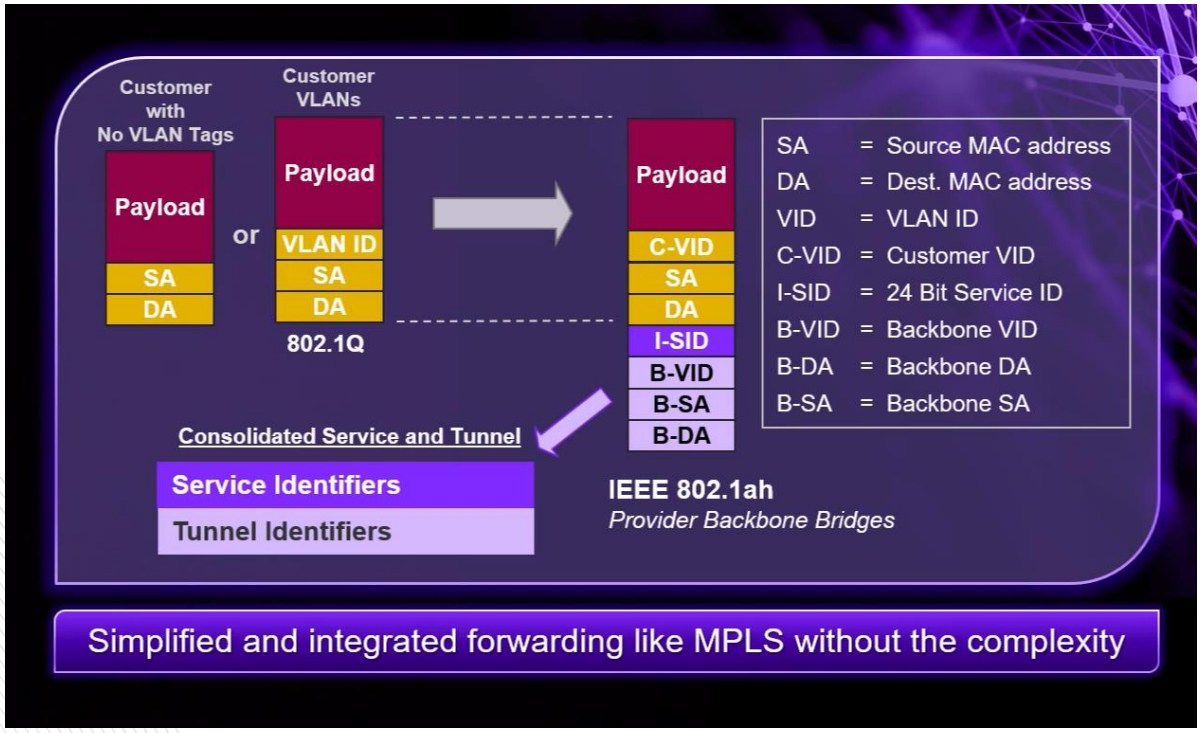

VSN (I-SID)
BEB
BCB
BEB
CVLAN
CVLAN
UNI
NNI
NNI
UNI
B-VLAN

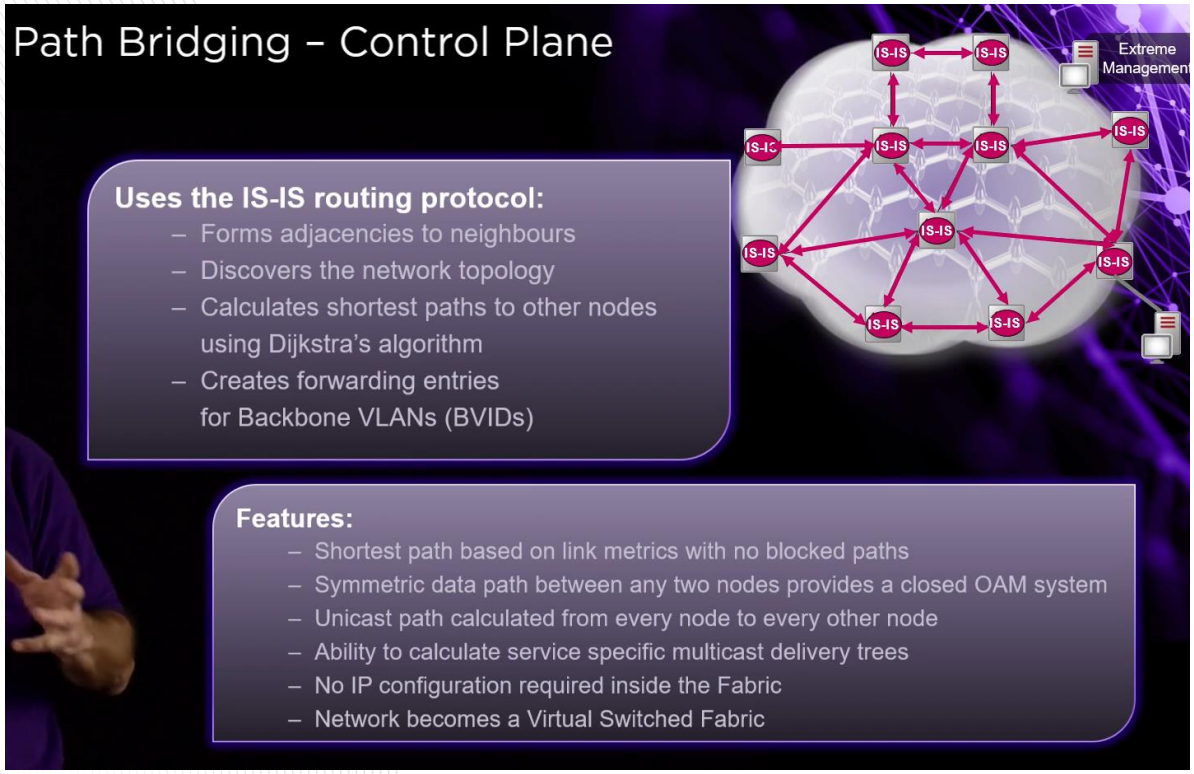

CORE NETWORK
CFRAME
C-DA C-SA C-TAG DATA
B-DA B-SA B-VID I-TAG CFRAME
p-bits contained within the B-VID header provide QoS capabilities
BCB
BEB
NNI
BCB
BCB
NNI
BEB
CE
UNI
UNI
Workstation
Workstation
NNI
CFRAME*
C-DA C-SA DATA
BCB
UNI
BEB
C-DA C-SA DATA
CE
Server
Component Description
BCB : Backbone core bridge
BEB : Backbone edge bridge
CE : Customer equipment
UNI : User to Network Interface
NNI : Network to Network Interface

Fabric Connect L2VSN and L3VSN deployments

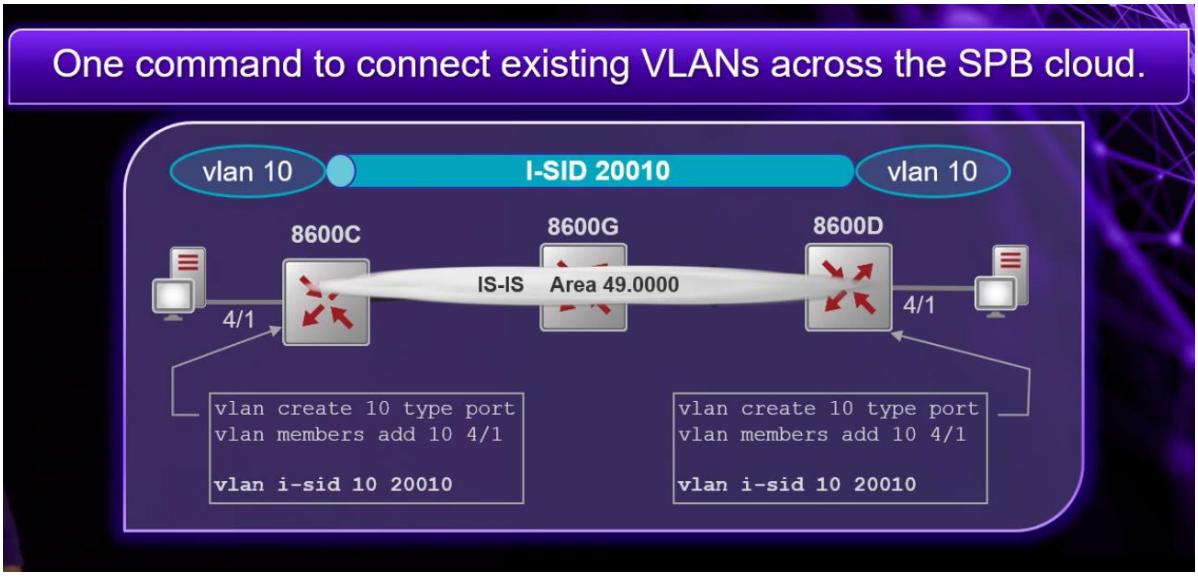


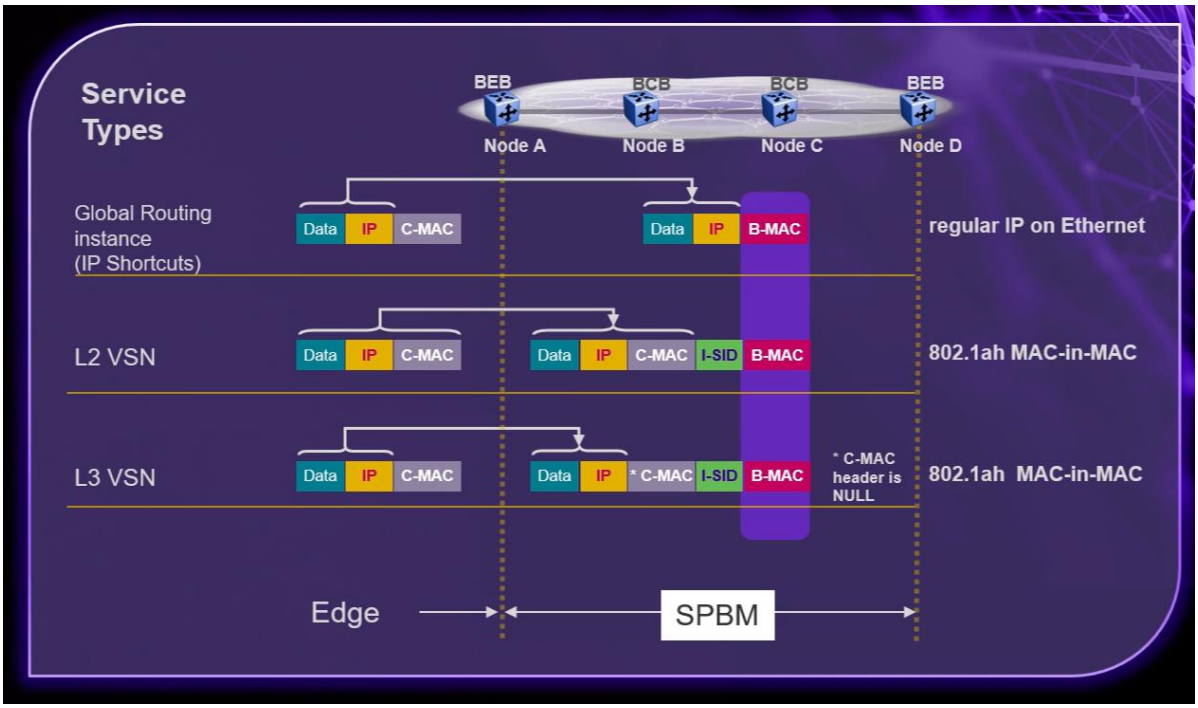
- SPB uses Backbone VLANs to carry user traffic across the Fabric
  - Minimum one B-VLAN (not recommended)
  - Recommended two B-VLANs (for load balancing)
  - Extreme Recommends using 4051 and 4052 as BVID's
- B-VLANs are a special type of VLAN (vlan create xxx type spbm-bvlan).
  - Ports are added to B-VLAN automatically when SPB is enabled on a port
  - The MAC address table for a backbone VLAN is programmed by IS-IS
  - Backbone VLAN DO NOT flood
  - BVLAN's DO NOT learn MAC addresses transparently like a traditional VLAN
  - The switch nodes' BMAC addresses are learned through IS-IS
  - All traffic inside B-VLANs are encapsulated using the switches' own MAC address (mac-in-mac)
- B-VLANs can pass through traditional "non-SPB" switches. For such requirements:
  - Ensure the network can handle the increase frame size
  - Ensure links are tagged with B-VLAN vids.





Extreme networks


One command to connect existing VLANs across the SPB cloud.
vlan 10
I-SID 20010
vlan 10
8600C
8600G
8600D
IS-IS Area 49.0000
4/1
4/1
vlan create 10 type port
vlan members add 10 4/1
vlan i-sid 10 20010
vlan create 10 type port
vlan members add 10 4/1
vlan i-sid 10 20010

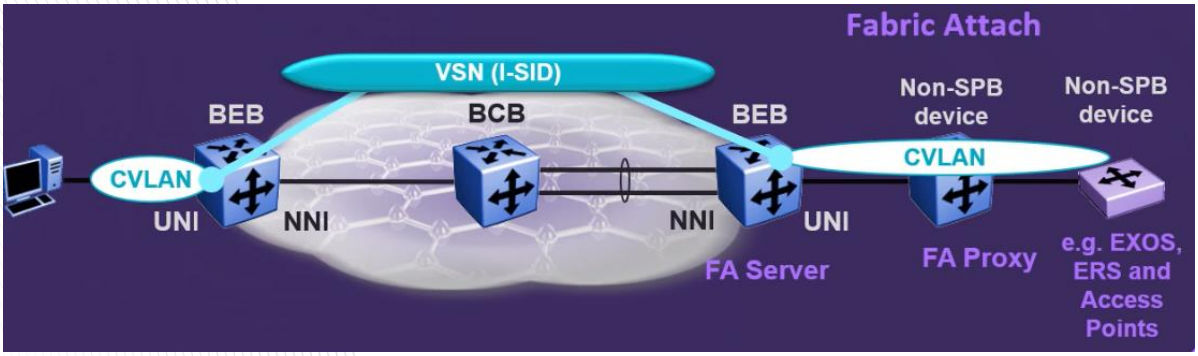

Service Types
BEB
BCB
BCB
BEB
Node A
Node B
Node C
Node D
Global Routing instance (IP Shortcuts)
Data
IP
C-MAC
Data
IP
B-MAC
regular IP on Ethernet
L2 VSN
Data
IP
C-MAC
Data
IP
C-MAC
I-SID
B-MAC
802.1ah MAC-in-MAC
L3 VSN
Data
IP
C-MAC
Data
IP
* C-MAC
I-SID
B-MAC
* C-MAC header is NULL
802.1ah MAC-in-MAC
Edge
SPBM

Fabric Attach

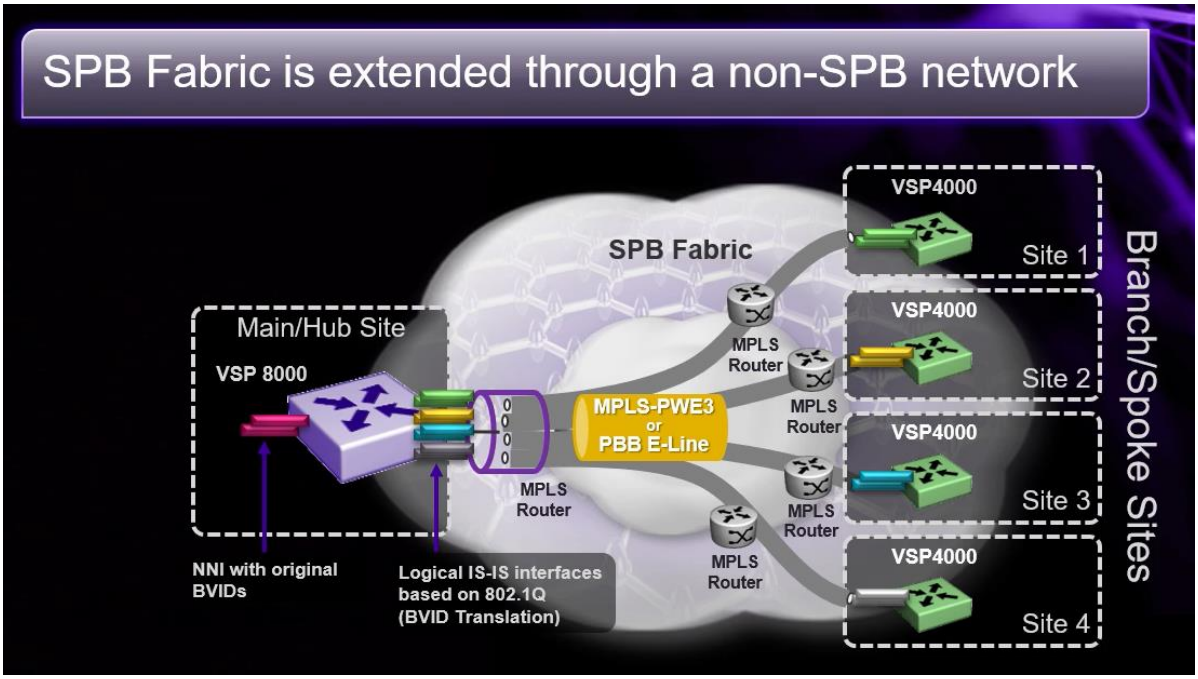
Fabric Attach
- IEEE 8021Qcj Automatic Attachment to Provider Backbone Bridging.
- Ability to end-point provision I-SID service to a non-SPB capable device.

FA Server
- SPB Capable device (BEB) also able to handle FA signalling from FA Proxy and FA client devices

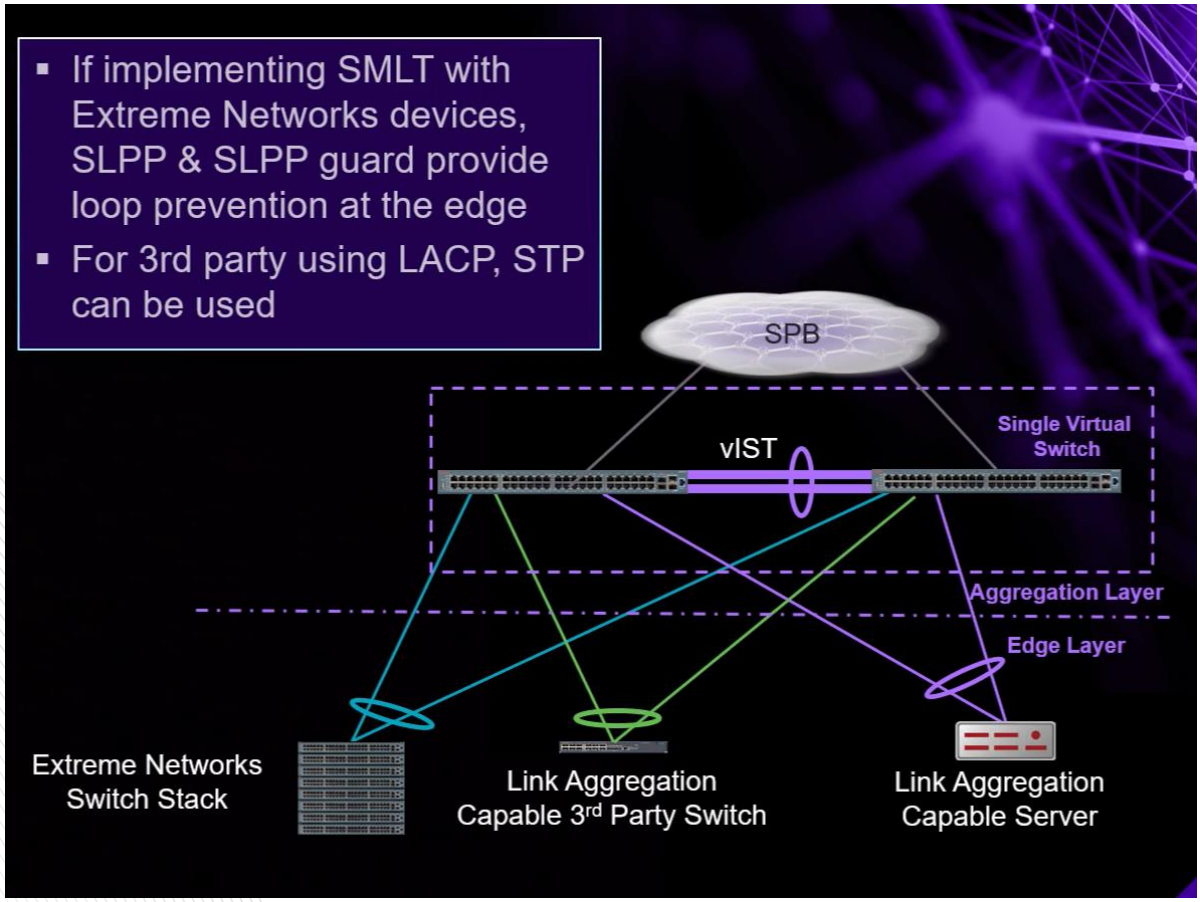
FA Proxy
- Non-SPB capable device to which I-SID based VSNs can be extended (end-point provisioned).
- Also able to extend same I-SID based VSNs to any locally attached clients.



Fabric Extend



V-IST Single Virtual Switch


If implementing SMLT with Extreme Networks devices, SLPP & SLPP guard provide loop prevention at the edge
For 3rd party using LACP, STP can be used
SPB
vIST
Single Virtual Switch
Aggregation Layer
Edge Layer
Extreme Networks Switch Stack
Link Aggregation Capable 3rd Party Switch
Link Aggregation Capable Server

System-id's and Nick Names can be created by adopting a simple formula as shown below

Sys Id format : **020x.0yy0.zzzz**

- 02 - locally administered
- x = a,b,c,d,e (access, backbone, campus, datacenter, edge)
- yy = country code, device type etc
- zzzz – device number
- e.g: 020c.0650.0001, 020c.0840.0003

Nick Name format: **x.yy.zz**

- e.g **c.65.01**

I-SID format : **1xttxxxx**

- x = 0,2,3 (vIST service, Layer 2 VSN, Layer3 VSN)
- tt = tenant number (00-99)
- xxxx = VLAN ID, VRF ID
- Example : 12990020 , 13990050

Overview of the VOSS Procedures

SPBM	1. Enable SPBM globally. 2. On the IS-IS router, configure SPBM: Add the backbone VLANs to the SPBM instance. Configure the SPBM nickname. Configure IS-IS System ID. Configure IS-IS Area.
B-VLAN	3. Create the backbone VLANs.
IS-IS	4. On NNI (and MLT) Interfaces, Configure IS-IS and SPBM. 5. Configure the Circuitless IP as IP source address. 6. Enable IS-IS globally. 7. Display IS-IS and SPB information.

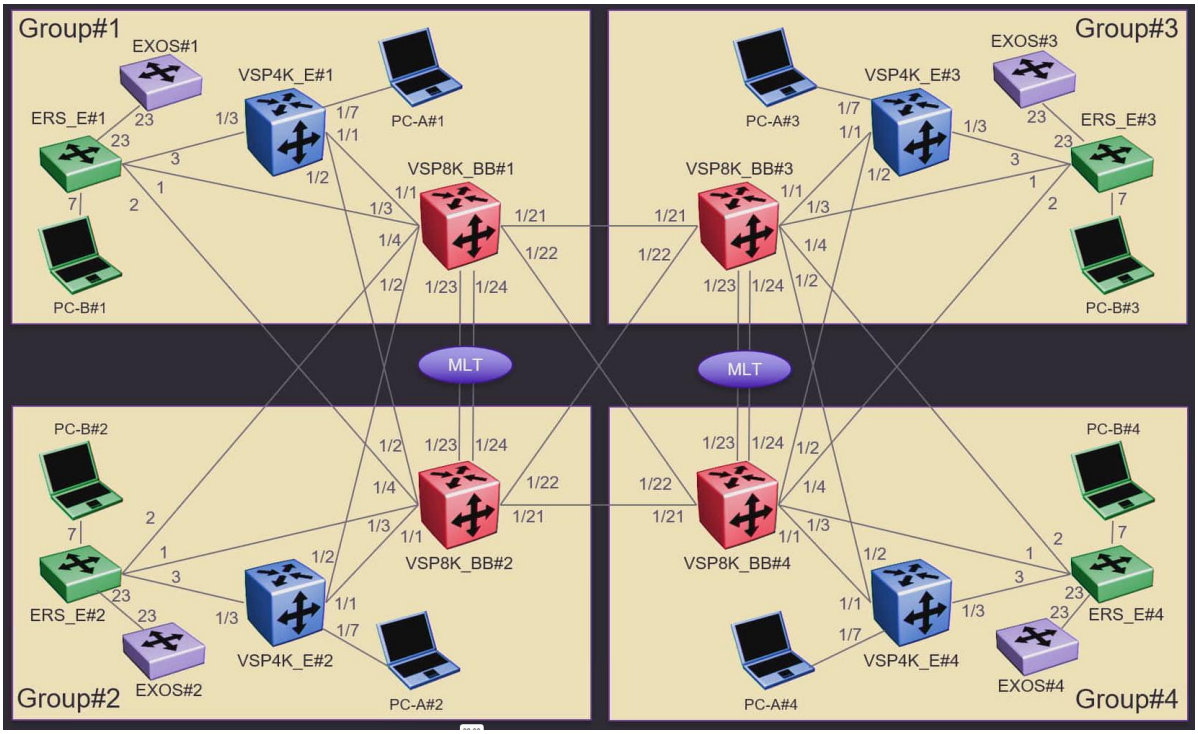
####### Enable SPBM Globally ########

config# show spbm
config# spbm

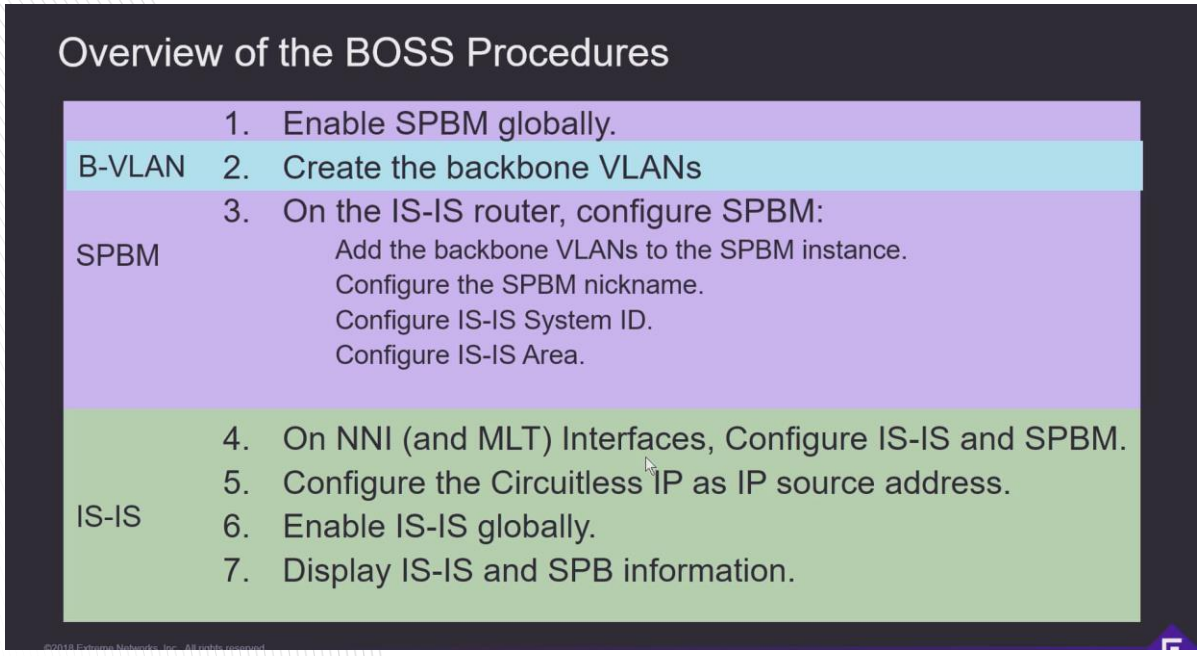
```
####### Add the B-VLANs to the SPBM instance #####
config# router isis
config-isis# spbm 1
config-isis# spbm 1 b-vid 4051, 4052 pri 4051

####### Configure SPBM nickname #########
config-isis# spbm 1 nick-name b.81.00

####### Configure IS-IS system ID #######
config-isis# system-id 00bb.0801.0000

####### Configure IS-IS Area ########
config-isis# manual-area 49.0001

####### Show IS-IS Information ######
config-isis# show isis

####### Create B-VLANs #####
config# vlan create 4051 type spbm-bvlan
config# vlan create 4052 type spbm-bvlan

####### Show VLAN information ######
config# show vlan basic
config# show vlan mem

####### Configure IS-IS and SPBM into NNI and MLT interfaces #####
config# inter gigabitEthernet 1/1-1/4,1/21-1/24
config-if# no spanning-tree mstp force-port-state enable
are you sure want to continue (y/n) ? Y
config# ex
config# inter gigabitEthernet 1/1-1/4,1/21-1/22
config-if# isis
config-if# isis spbm 1
config-if# isis enable
config-if# no shutdown
config-if# show isis interface
config-if# ex

config# inter mlt 32
config-if# isis
config-if# isis spbm 1
config-if# isis enable
config-if# show mlt 32
config-if# ex
config# show isis interface
config# inter gig 1/23,1/24
```

config-if# no shut
config-if# exit

config# interface loopback 1
config-if# ip address x.x.x.x/32
config-if# ex
config# router isis
config-if# ip-source-address x.x.x.x/32
config-if# ex
config# router isis en
config# show isis
config# show isis adj
config# show isis lsdb



Parameter	VSP8K
Prompt/Sys Name	VSP8K_BB#1
Switch IP Address	10.10.1.1/24
Switch Gateway	-
IS-IS SRC IP (CLIP)	10.0.0.81/32
IS-IS System ID	00bb.0801.0000
SPBM Nick-name	b.81.00
MEPID	801
SPBM NNI Interfaces	1/1-1/4, 1/21, 1/22, MLT 32
MLT Interfaces	MLT32, 1/23,1/24



####### Enable SPBM Globally ########

config# show spbm
config# spbm

####### Remove ports from VLAN default ######
config#vlan mem remove 1 all

####### add mgmt. vlan ############

```
config#vlan create 250 type port
config#vlan mem add 250 7
config#vlan mgmt. 250
config#sho vlan

####### Show spaning-tree mode ####
config#show spanning-tree mode
Current STP Operation Mode: MSTP
Next STP Operation Mode: MSTP
config#sho sys-info
config#show lice
config#show spbm

###### Cambiar hostname  ######
config#snmp-server name ERS-E#1

####### Create B-VLANs #####
config# vlan create 4051 type spbm-bvlan
config# vlan create 4052 type spbm-bvlan

####### Show VLAN information ######
config# show vlan basic
config# show vlan mem


####### Add the B-VLANs to the SPBM instance #####
config# router isis
config-isis# spbm 1
config-isis# spbm 1 b-vid 4051, 4052 pri 4051

####### Configure SPBM nickname #########
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####### Configure IS-IS system ID #######
config-isis# system-id 00bb.0801.0000

####### Configure IS-IS Area ########
config-isis# manual-area 49.0001

####### Show IS-IS Information ######
config-isis# show isis


####### Configure IS-IS and SPBM into NNI and MLT interfaces #####
config# inter gigabitEthernet 1/1-1/4,1/21-1/24
config-if# no spanning-tree mstp force-port-state enable
```

```
are you sure want to continue (y/n) ? Y
config# ex
config# inter gigabitEthernet 1/1-1/4,1/21-1/22
config-if# isis
config-if# isis spbm 1
config-if# isis enable
config-if# no shutdown
config-if# show isis interface
config-if# ex

config# inter mlt 32
config-if# isis
config-if# isis spbm 1
config-if# isis enable
config-if# show mlt 32
config-if# ex
config# show isis interface
config# inter gig 1/23,1/24
config-if# no shut
config-if# exit


config# interface loopback 1
config-if# ip address x.x.x.x/32
config-if# ex
config# router isis
config-if# ip-source-address x.x.x.x/32
config-if# ex
config# router isis en
config# show isis
config# show isis adj
config# show isis lsdb
```