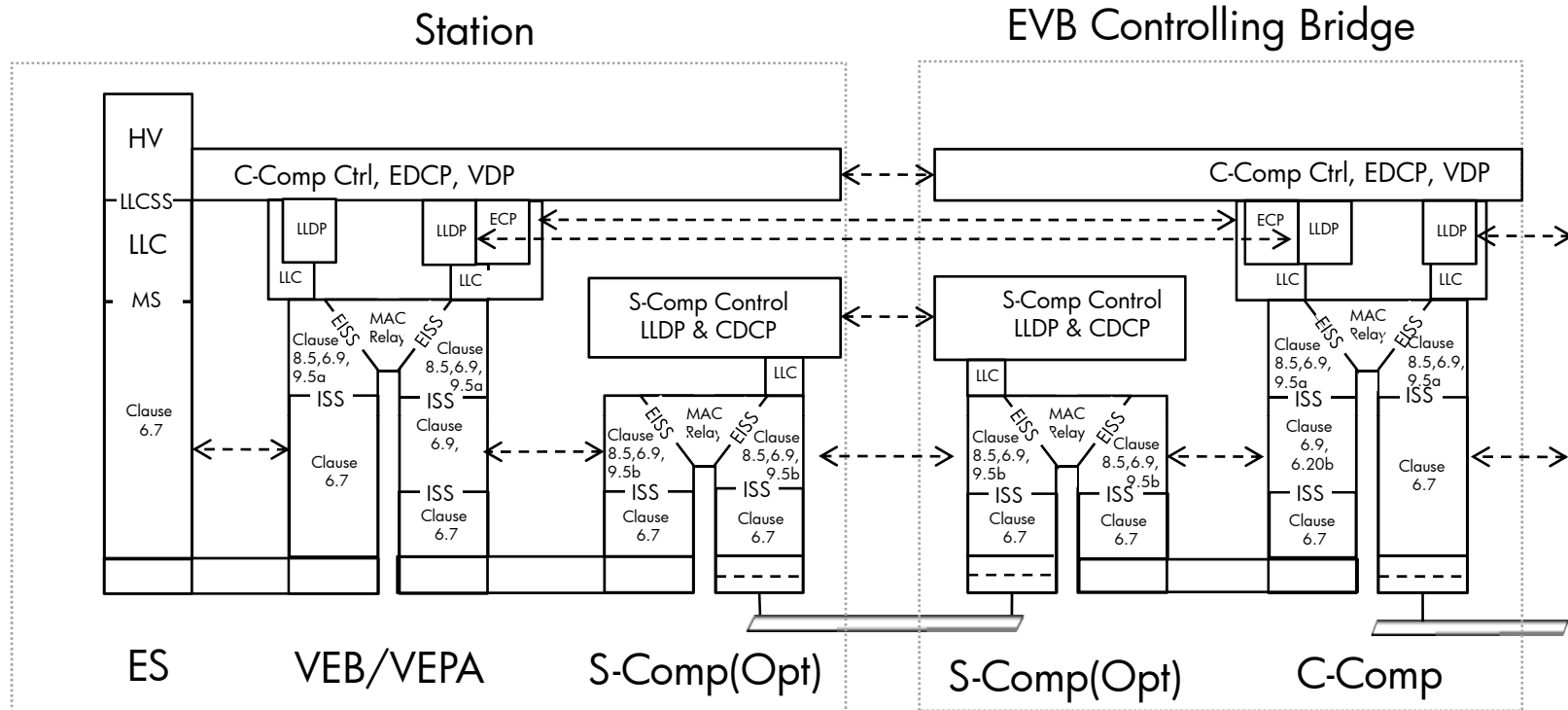


Default Station Interface

V1

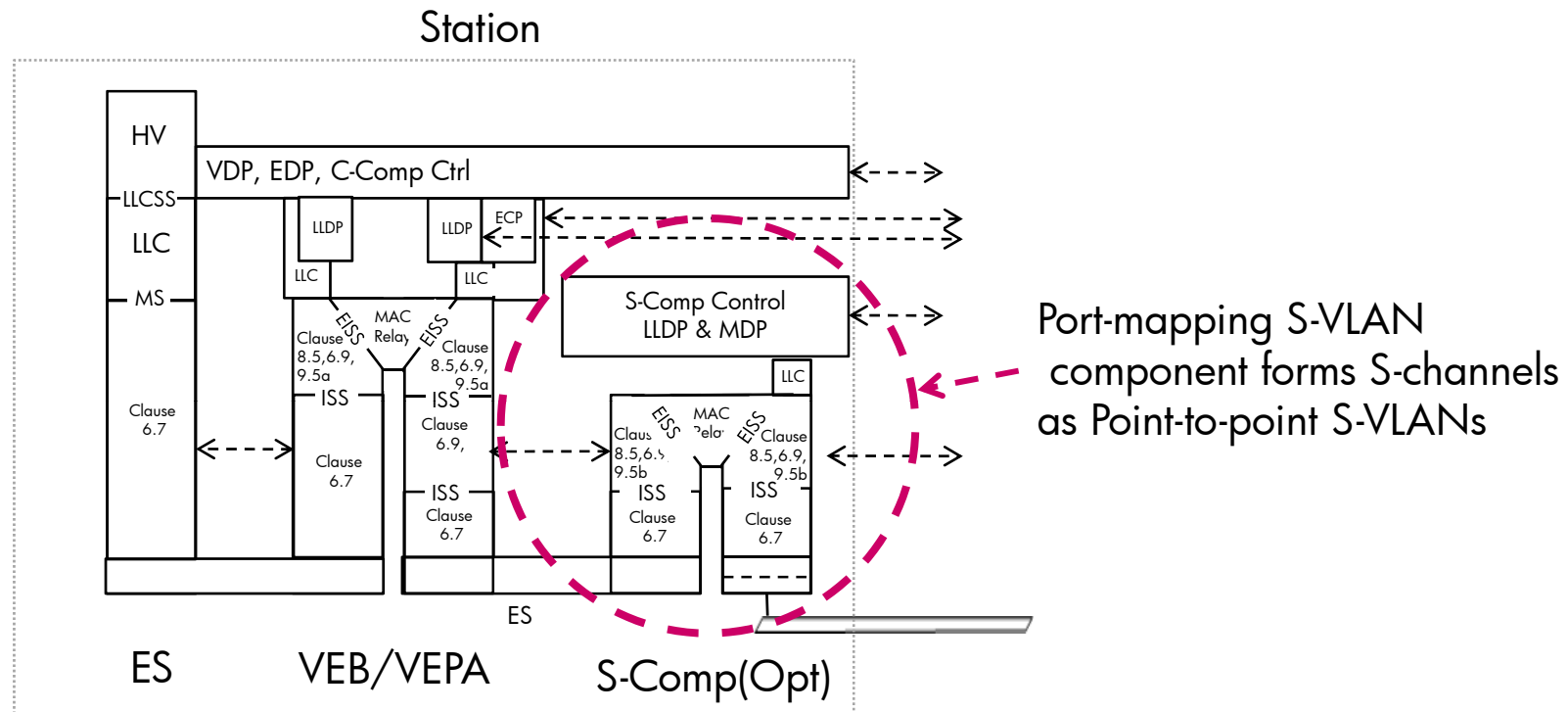
August 24, 2010

Bridge “Baggy Pants” Model



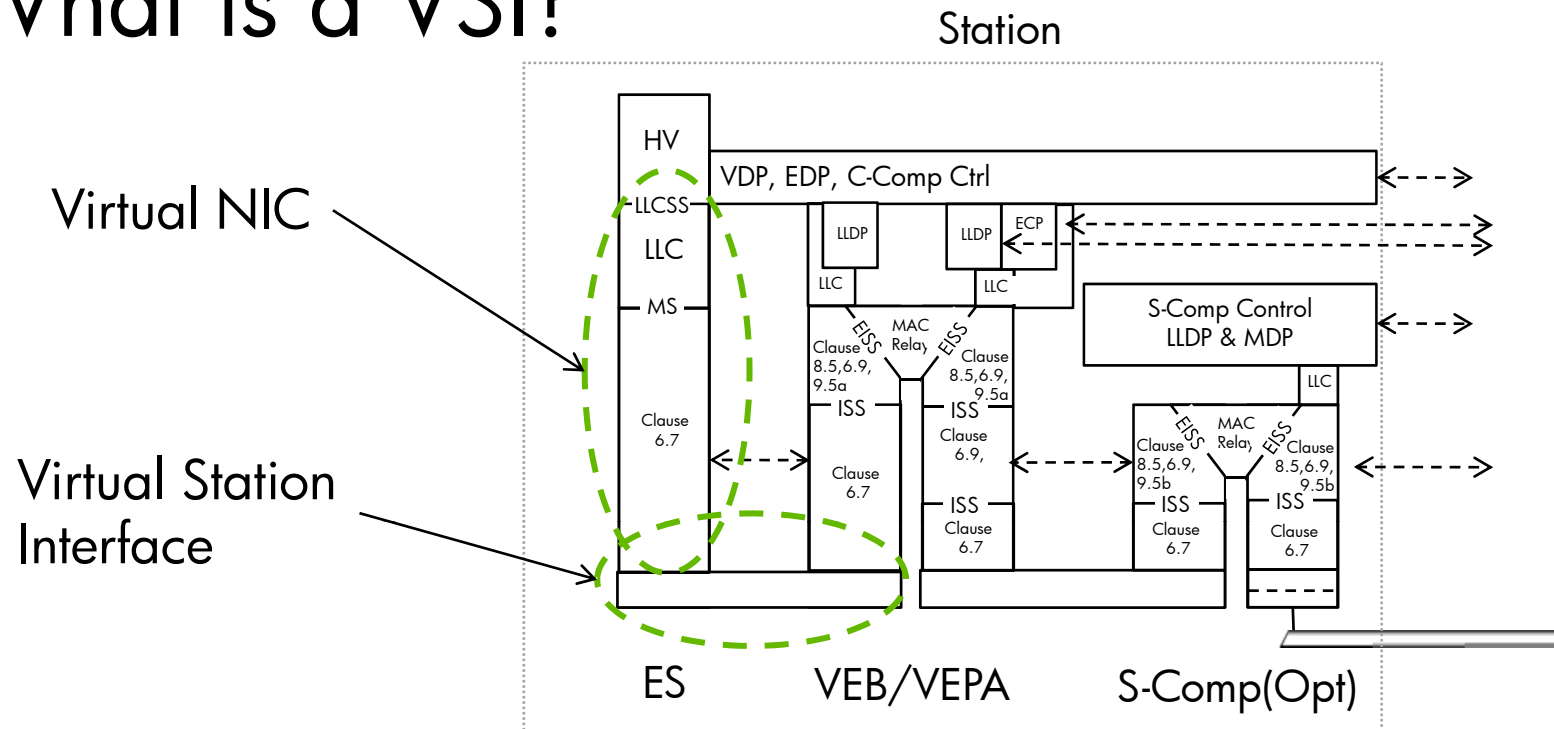
- A station uses a dual relay. The outside relay is an S-VLAN aware component. The inside relay is a VEB or VEPA. Stations also have an ES layer providing LLC service to the Hypervisor and VMs.
- The S-Comp relay is optional. When an S-channel is connected to a single ES a 2-port VEB is used which provides C-tag functions for the VM or hypervisor.
- An S-channel is implemented using the peered Port-mapping S-Comps (803.1Qbc). An LLDP database exists on each exterior facing leg of the S-Comp
- Each VEB, VEPA or 2-Port VEB has an LLDP database on it's exterior facing legs
- Each VEB VEPA or 2-Port VEB may have an LLDP database facing at the Bridge Port facing the VM. It also will filter all LLDP multicast addresses.

The S-channel Component



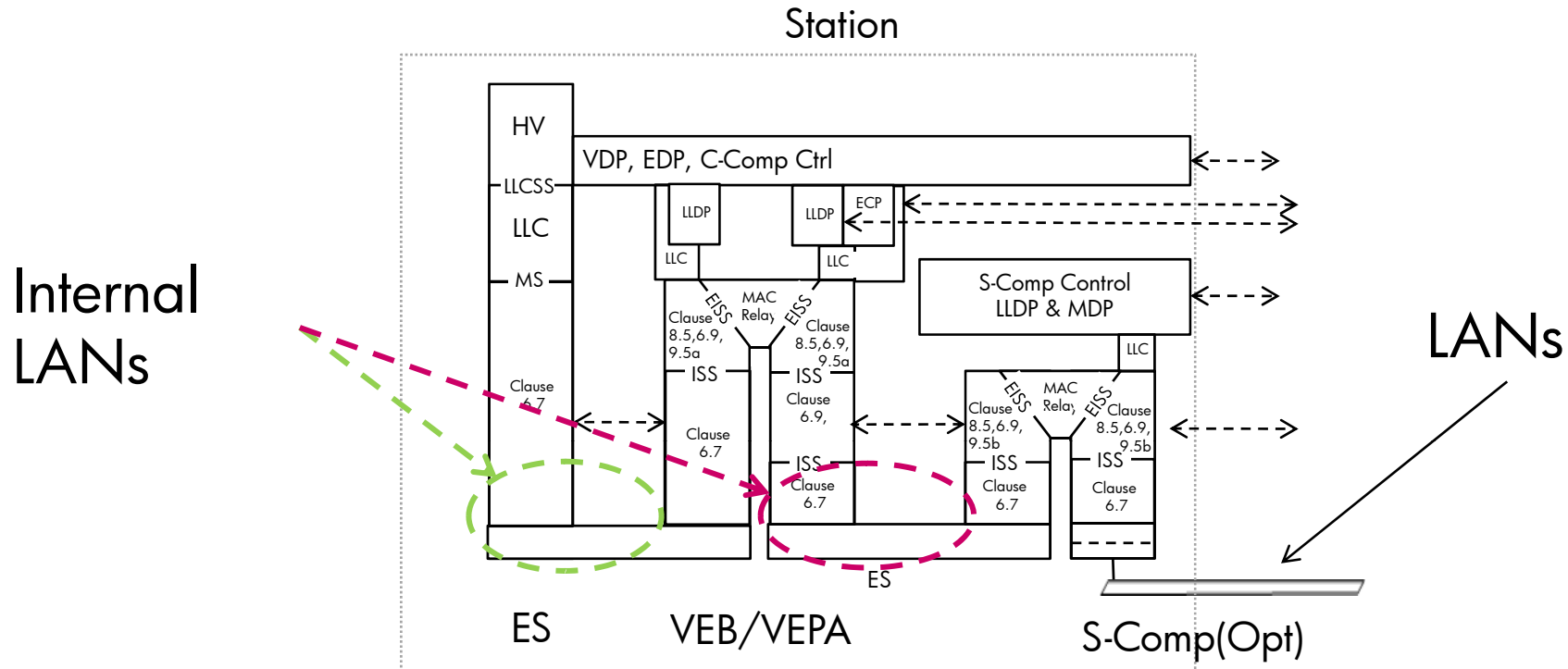
- S-channels:
 - 1) are pt-pt S-VLANs formed by Port-mapping S-VLAN components
 - 2) begin and end at an S-channel Access Port (CAP)
 - 3) frames are always S-tagged in the channel and always un-S-tagged by the CAP
 - 4) Only a single S-channel may terminate (or begin) at a each CAP
 - 5) Multiple S-channels pass through the Station Bridge Access Port to the external LAN

What is a VSI?



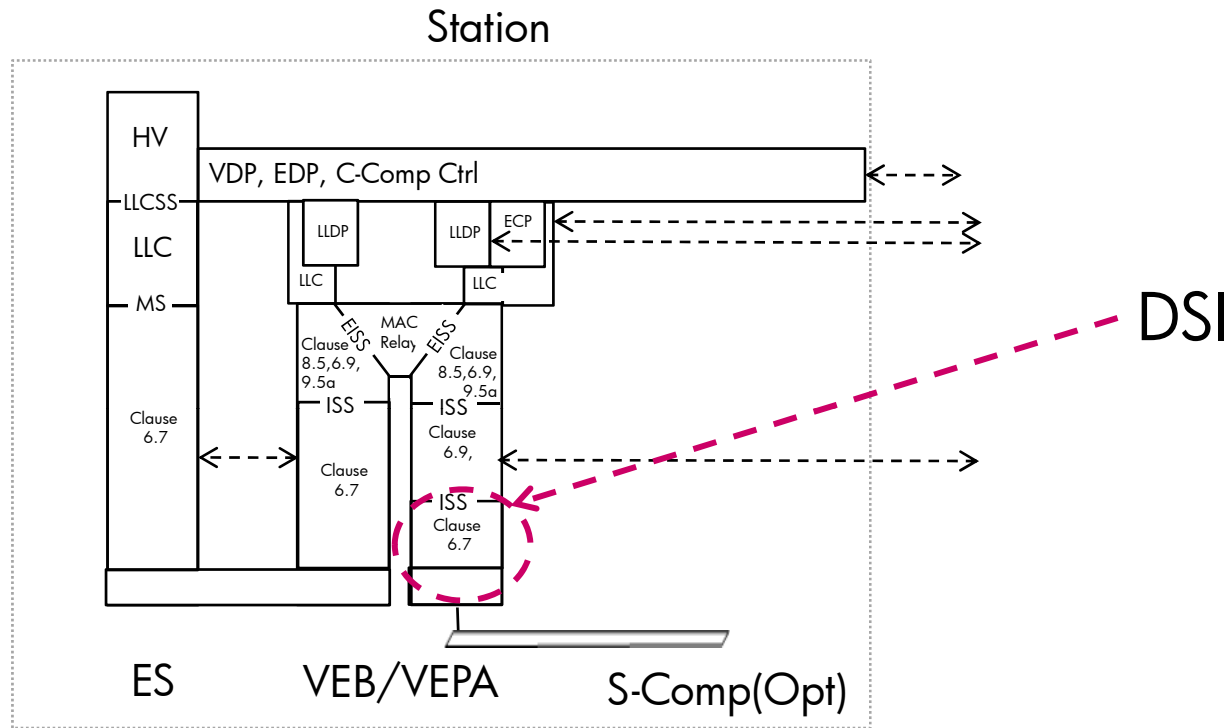
- A Virtual Station Interface (VSI) is an internal LAN which connects between a virtual NIC and a Bridge Port of a VEB, VEPA, or 2-Port VEB. A VSI carries a single MAC service instance. The term VSI is also used to reference a point where a Bridge Port of a VEB or VEPA attaches to a vNIC.
- vNIC
 - Source and Sink for a single instance of 802.3 MAC service
 - Includes functions:
 - 1)ES LLC used to form the SAP for attaching the VM
 - 2)ES MAC address filter for an station and group addresses
 - 4)VDP control
 - 5)Management for VSI functions

What is the internal LAN on an S-channel?



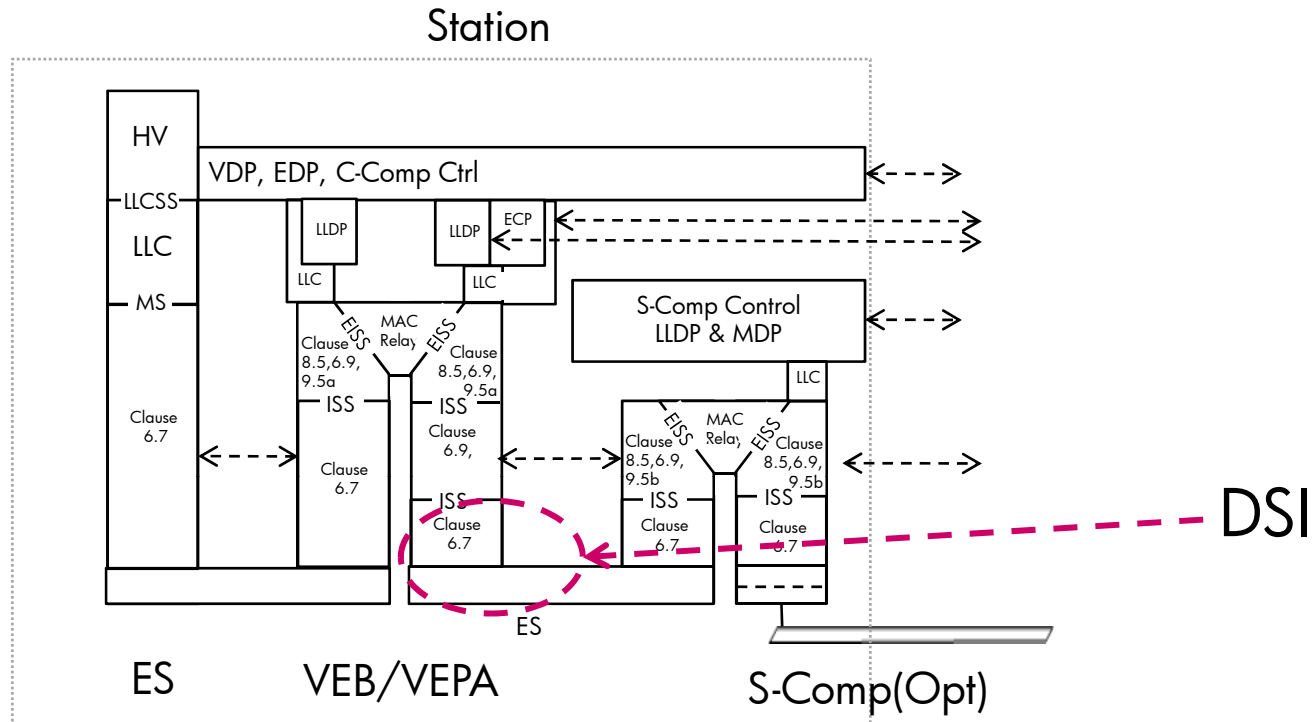
- Two internal LANs
 - 1) Internal LAN between the interior facing VLAN Bridge Ports or VEB/VEPA and the vNIC
 - The ISS where the internal LAN attaches is the Virtual Station Interface
 - 2) Internal LAN between the CAPs and the exterior facing VLAN Bridge Ports of the VEB/VEPA
 - This could be called the Default Station Interface (or DSI)
 - DSI identifies the vSwitch (VEB, VEPA, etc. attached) or attached application
 - A DSI also exists for the default S-channel (no S-comp)
 - A DSI can have MAC addresses, VLAN assignments, and other application specific parts
 - A DSI can have as many characteristics as a VM

Case 1: No S-channels



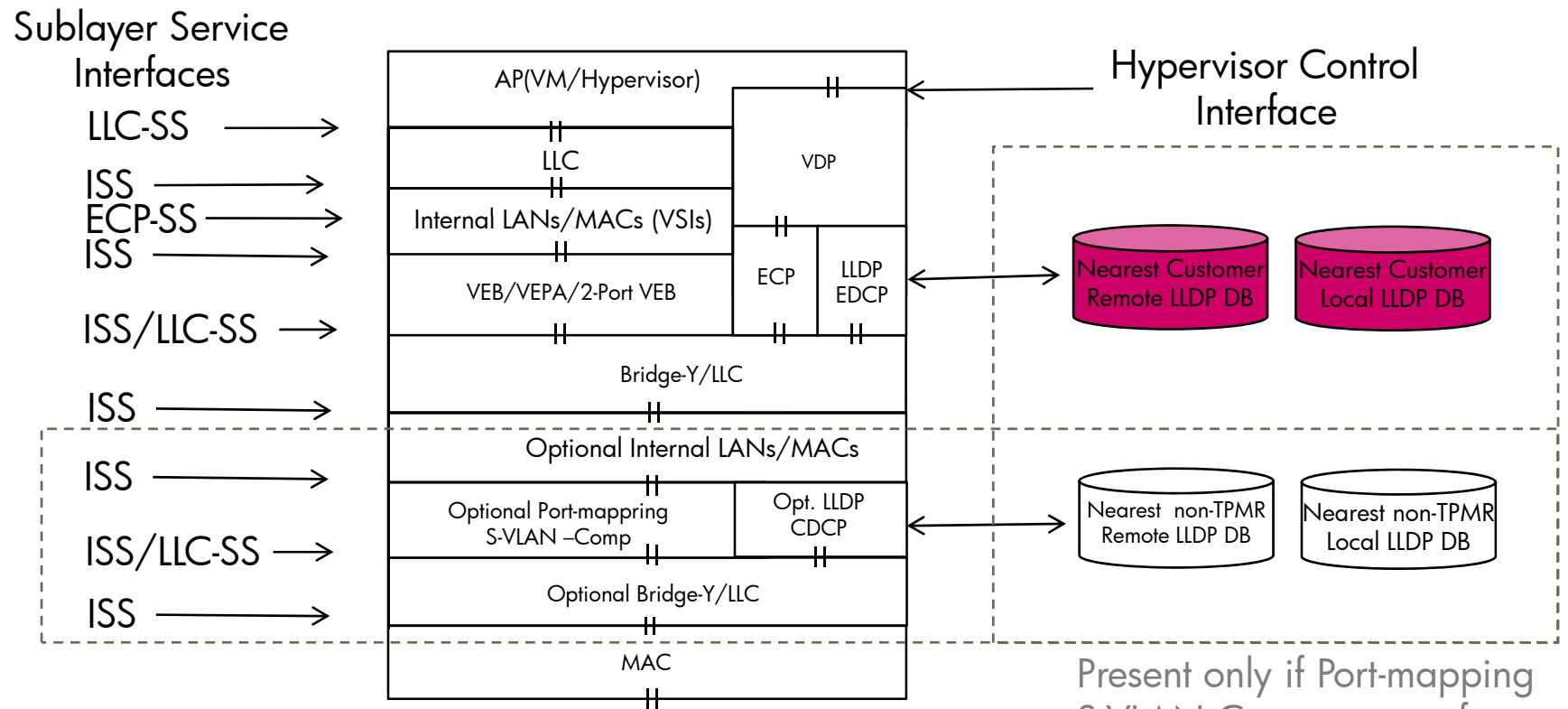
- Default S-channel terminates on VEPA, VEB, 2-Port VEB, etc.
- Same characteristics as the normal S-channel case
- Though no internal LAN we still have the ISS reference point

Case 2: S-channels enabled



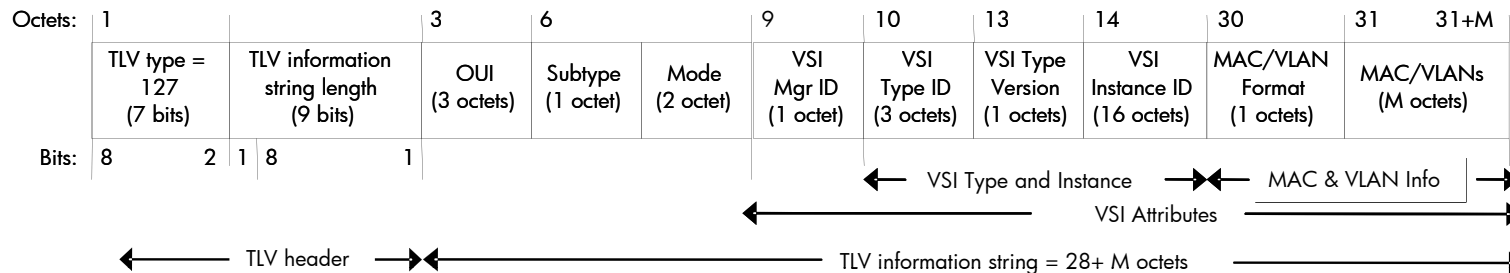
- S-channel terminates at a VEB, VEPA, 2-Port EVB, etc
- DSI may have MAC and VLAN for management access

LLDP Databases - Station



- DSI TLV added to Nearest Customer DBs
- Default S-channel uses NC-DB as only database
- TLV same as VDP ASSOC/RESP TLV, in LLDP format
- TLV sent by Station with a Bridge response
- *Note: When only a default S-channel exists then only single NCDB?*

DSI TLV For LLDP Database



- Station sets mode field = ASSOC + SUCCESS
- Bridge sets TLV to UNASSOC until it sees station's DSI TLV
- On seeing station's TLV Bridge either successfully associates echoing the station TLV
- On seeing station's TLV Bridge rejects the association by echoing the station TLV with a FAIL condition code in mode2.

Basic Success Scenario



Basic Fail Scenario



- Bridge does not put a DSI TLV in it's LLDP database until it sees a TLV from the Station.
- The Bridge TLV is either an echo of the Station TLV with a SUCCESS response code or with a FAIL response code.
- The Bridge rejects the association by echoing a fail response code.
- The only time the Bridge does not respond is when it does not process DSI TLV

DSI Summary

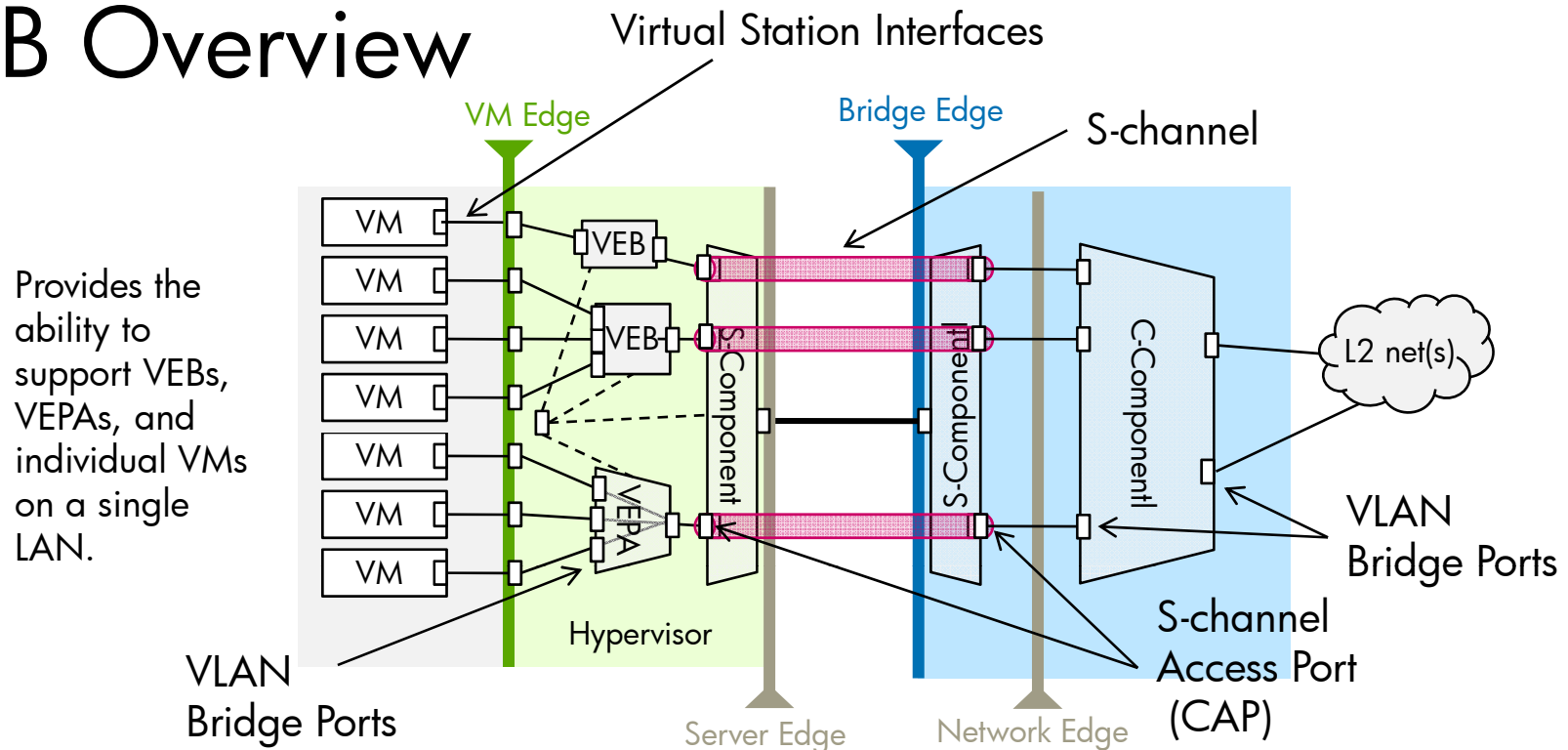
- Each S-channel (including the default S-channel) has a Default Station Interface
- This interface typically attaches to a vSwitch
- The characteristic of the communication path are profiled with the DSI
- The DSI is created by an LLDP exchange of DSI TLVs in the NC-DB

BACKUP SLIDES

Startup-No Sch → Startup-Sch

- LAN (Default S-Channel) → • LAN (with S-Channels)
 - LLDP
 - PFC
 - ETS
 - EDCP (Default S-Channel)?
 - Default ASSOC TLV?
 - ECP
 - VDP
- Transition between No Sch and Sch facilitated by default S-channel (the un-S-tagged set).
- Per Channel
 - LLDP
 - EDCP
 - Default ASSOC TLV
 - ECP
 - VDP

EVB Overview



Provides the ability to support VEBs, VEPAs, and individual VMs on a single LAN.

- Virtual NIC (vNIC)** the entity used to implement the End Station functions of the attachment point. The vNIC sources one or more instances of 802.3 MAC service

- Virtual Station Interface (VSI)** is an internal LAN which connects between a virtual NIC and a Bridge Port of a VEB or VEPA. A VSI sources a single instance of MAC service. The term VSI is also used to reference a point where a Bridge Port of a VEB or VEPA attaches to a vNIC.

- Virtual Ethernet Bridges (VEB):** a specialized 802.1Q bridge within the station used for bridging between multiple virtual stations interfaces and an external network

- Virtual Ethernet Port Aggregator (VEPA):** a entity within a end station that knows the MAC addresses for each VSI and operates in conjunction with reflective relay in an adjacent bridge to provide bridging between multiple virtual stations interfaces and an external network

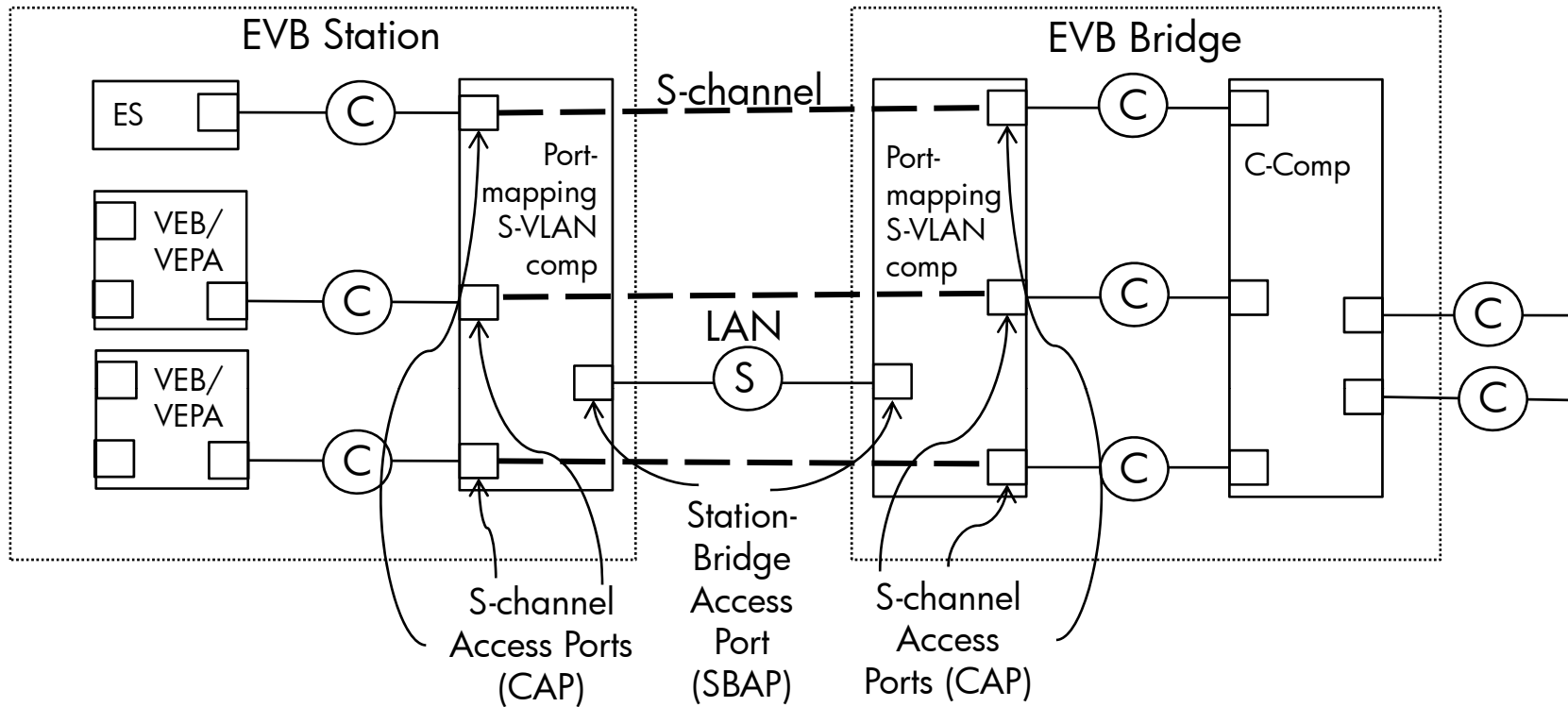
- S-channel** is a Point-to-point S-VLANs which spans over Port-mapping S-VLAN components(802.1Qbc) or M-components(802.1Qbh) and between S-channel Access Port (CAP). Only a single S-channel on a particular CAP

- **S-channel Access Port (CAP)** is the name for the un-S-tagging Bridge Port (Provider Access Port of a Port-mapping S-VLAN component (802.1Qbc)) that terminates an S-channel

Address Choices for LLDP

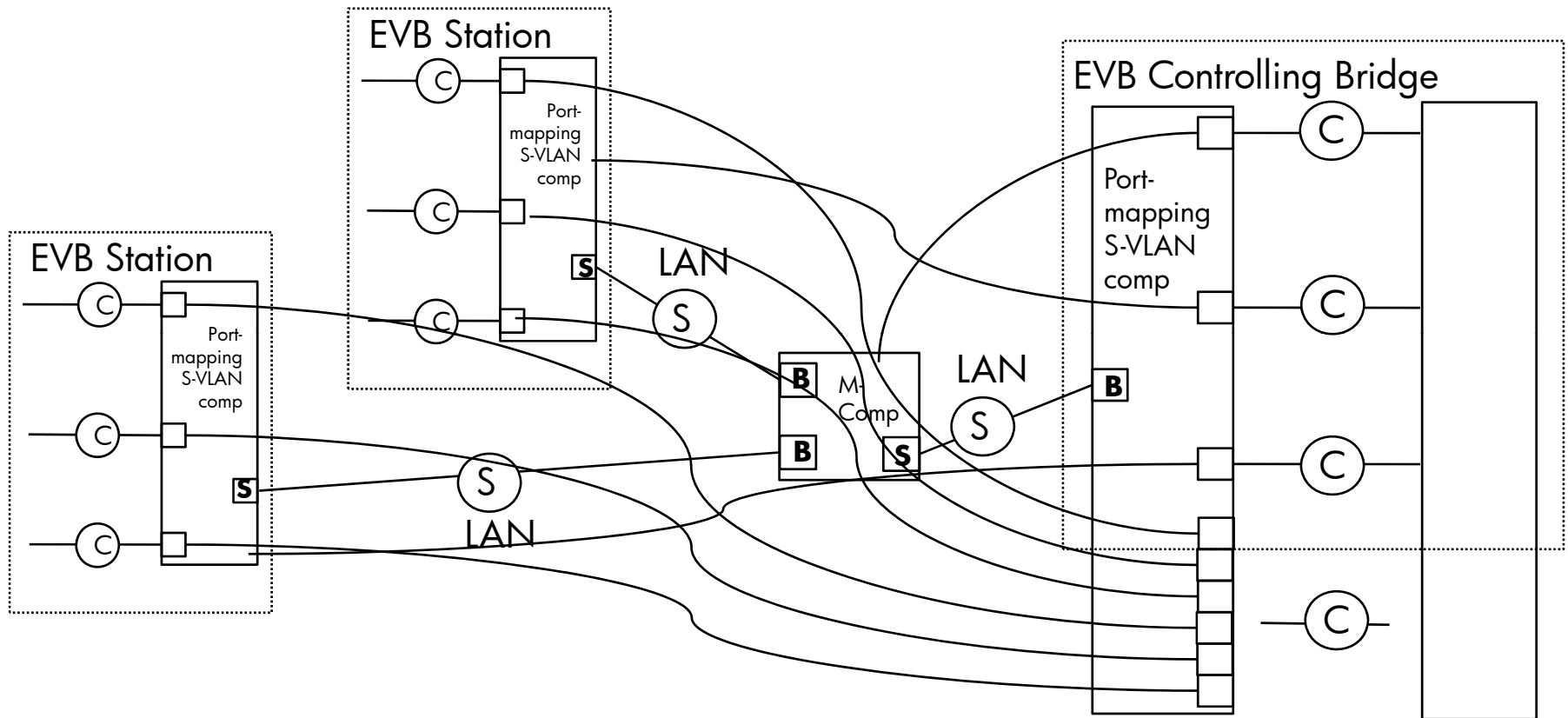
- The Port-mapping S-VLAN component used to implement S-channels is a conformant S-Comp and therefore we use Nearest non-TPMR bridge address (01-80-C2-00-00-03) for LLDP at CDCP.
- The second LLDP database is at an LLC SAP of the ES/VEB/VEPA. Both of these are addresses by the Nearest Customer Address: 01-80-C2-00-00-00.
- If we don't have an S-Comp then (see LLDP clause 7.4)
 - we only send and receive on the nearest customer bridge address
 - we discard any nearest non-TPMR bridge addressed frames
 - we discard any nearest bridge addressed frames
- If we have both S-Comp and ES/VEB/VEPA then we
 - send on both nearest customer bridge and nearest non-TPMR bridge
 - we discard any nearest bridge addressed frames

S-channel Components



- CAP and SBAP are same definitions as PAP and RCAP
- S-TAG remains unchanged and with same name
- S-channel is a point-to-point S-VLAN terminating at a CAP

Cascade of Port-mapping S-VLAN Comps



- LLDP from S-B hop-by-hop through cascade.