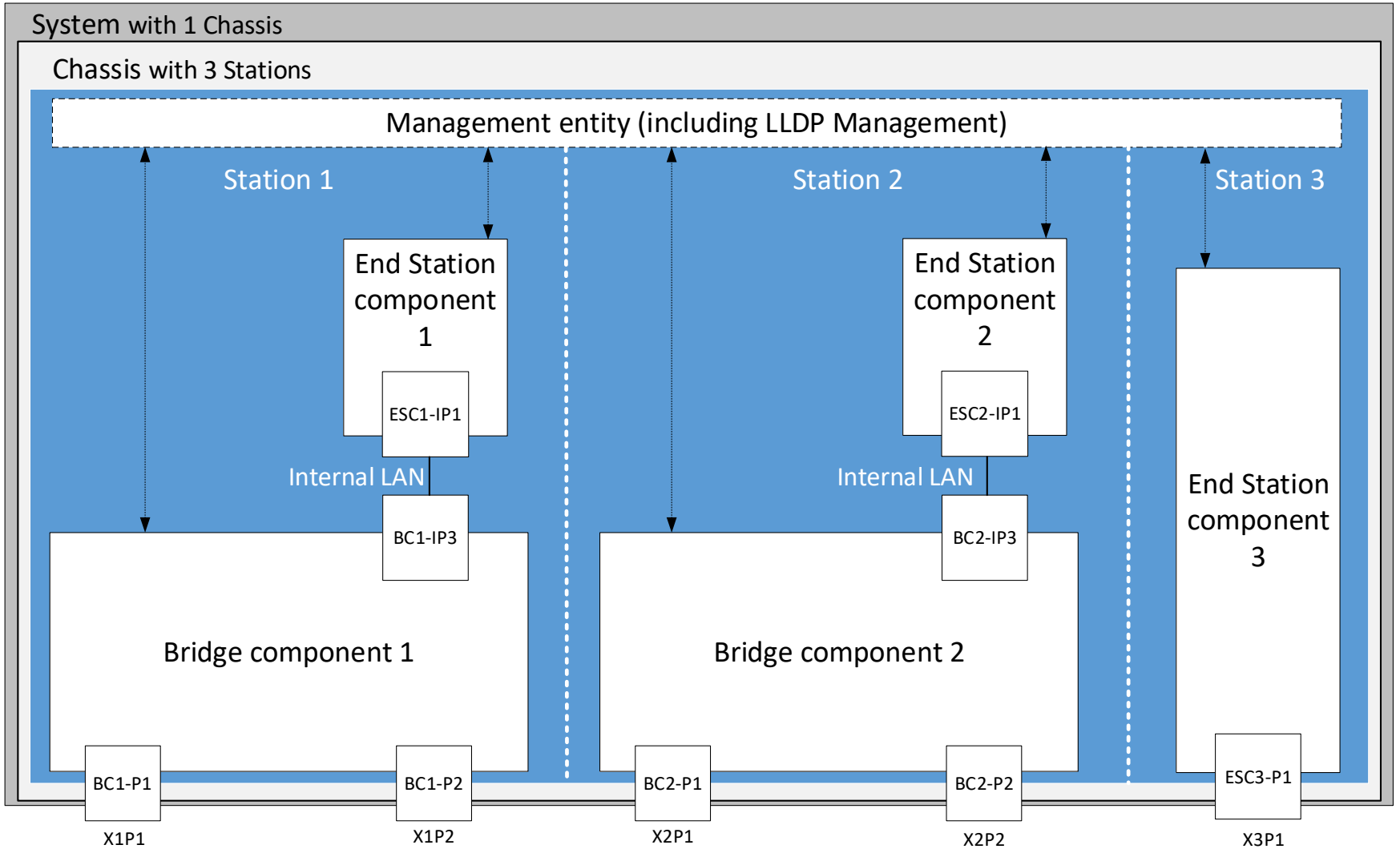
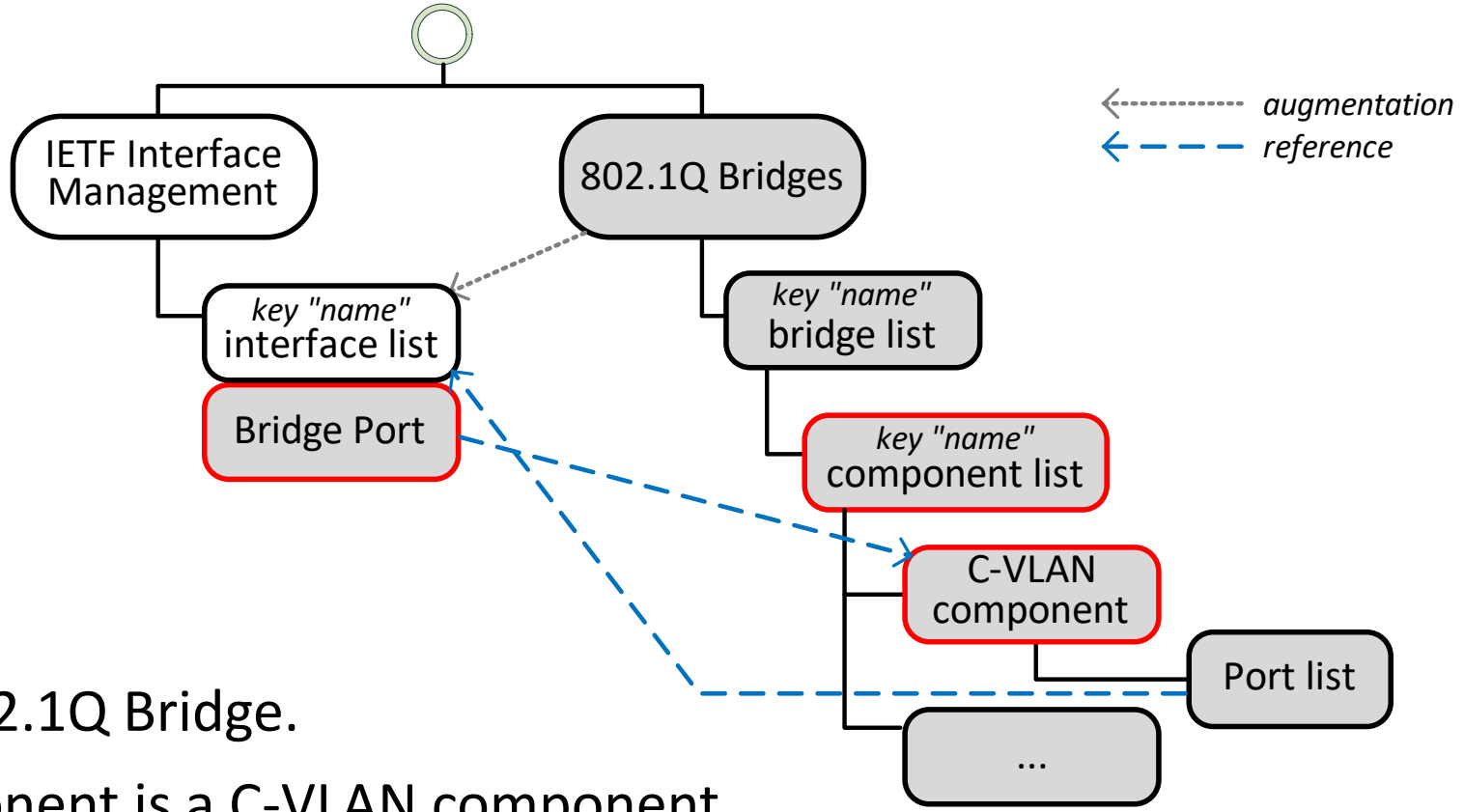
IA Device Management Model supporting “Bridged End Stations”

conformant to
IEEE 802.1Q
IEEE 802.1AB
IEEE 1588 / IEEE 802.1AS

Example IA Device

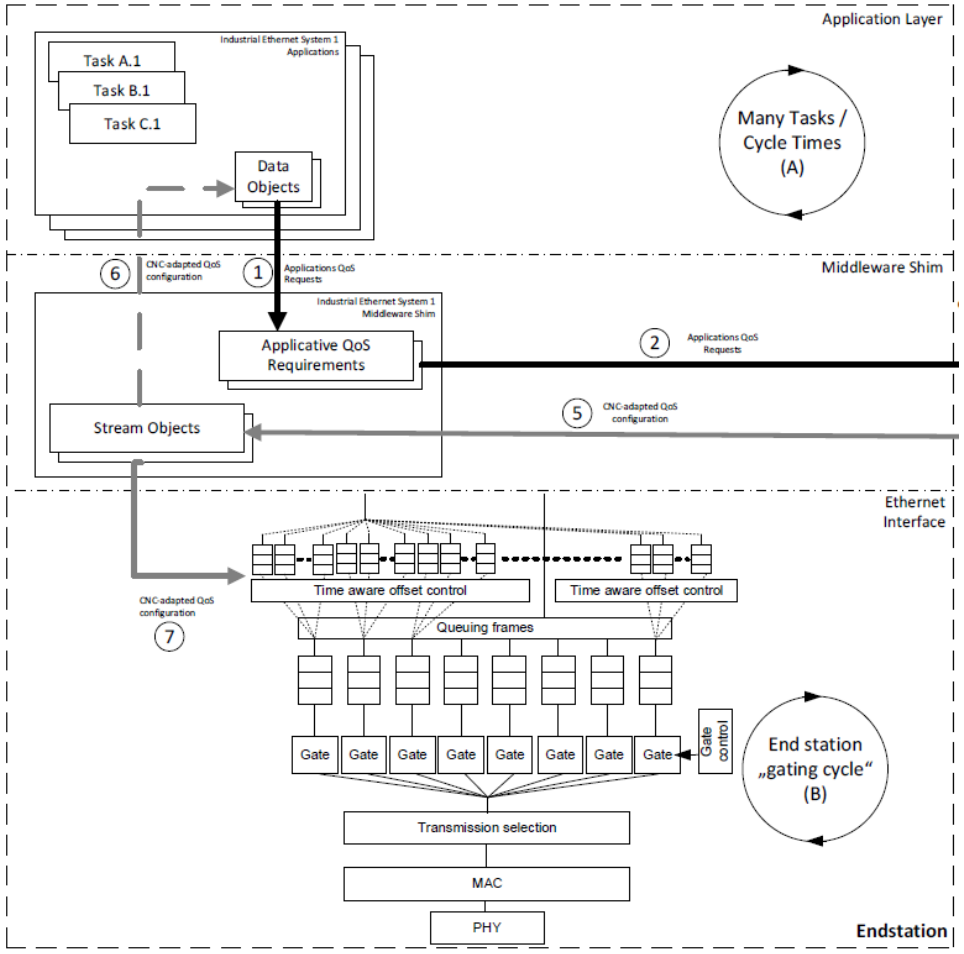


IEEE 802.1Q Bridge Model – YANG based



- Each IA Device is a 802.1Q Bridge.
- Each IA Device component is a C-VLAN component.
- Each IA Device port (external or internal) is a Bridge Port.

End station components are IEEE 802.1Q C-VLAN components



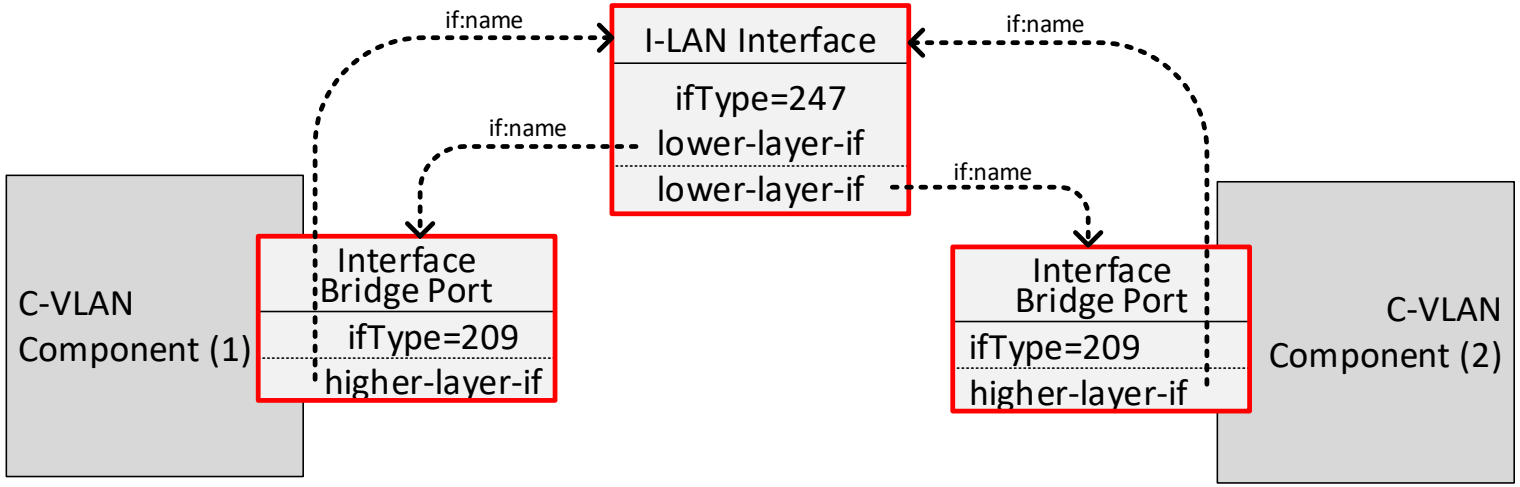
See https://www.ieee802.org/1/files/private/60802-drafts/d1/60802-Steindl-Clause4-0121-v17-redline.pdf:

IA Device end station components make use of IEEE 802.1Q defined mechanisms e.g.,

- traffic queues,
- gate control,
- transmission selection.

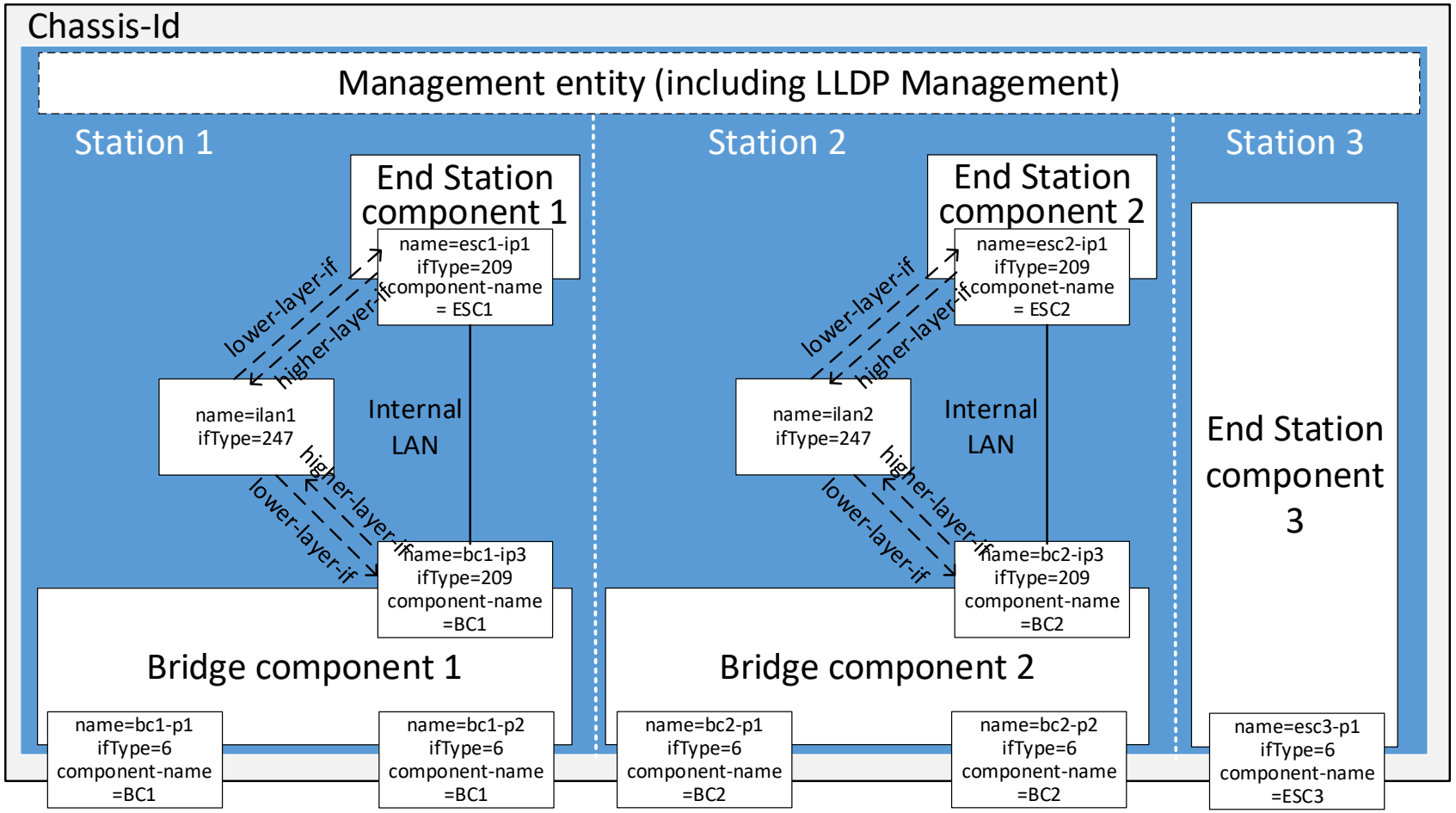
➢ The 802.1Q Bridge management model has to be applied to IA Device end station components!

IEEE 802.1Q - Internal LAN management

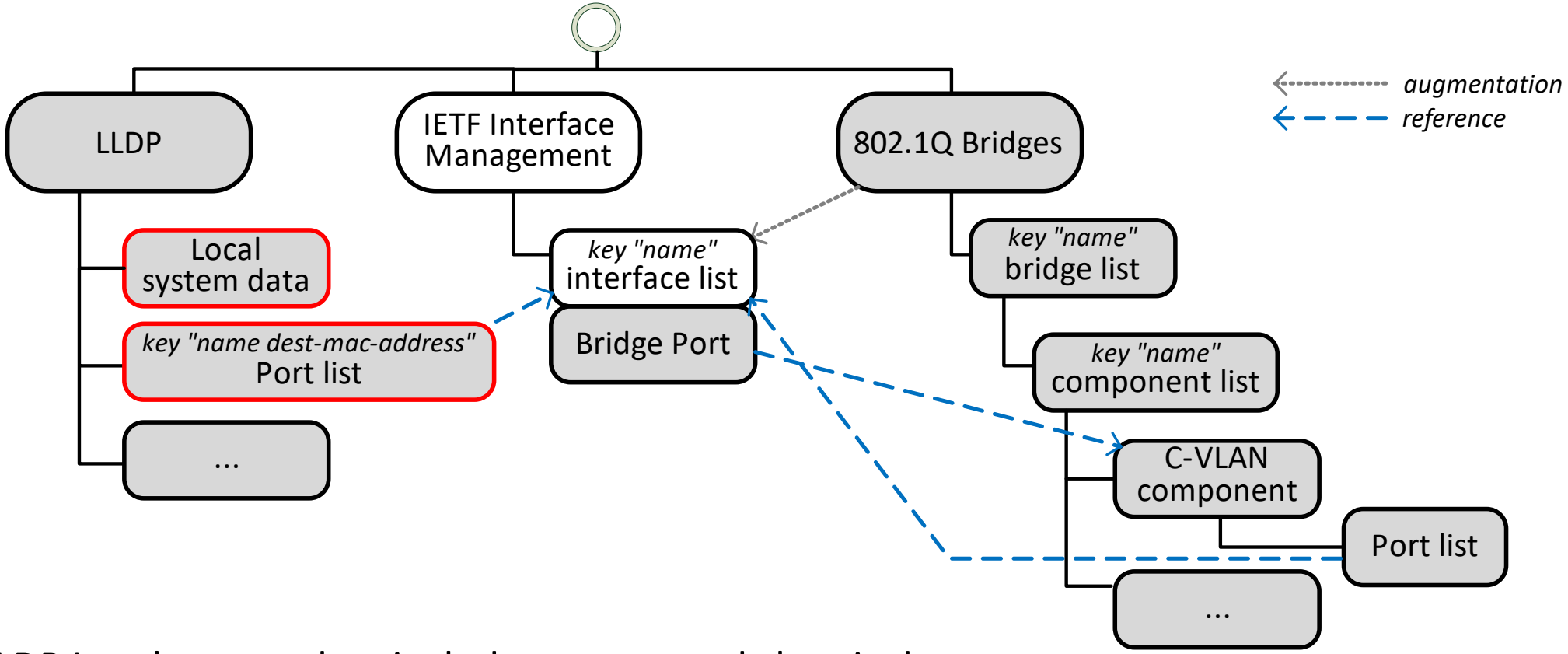


- Internal Ports are **Bridge Port Interfaces** of ifType 209 *(Transparent bridge interface)*
- **I-LAN Interfaces** of ifType 247 *(Internal LAN on a bridge interface)* describe the connectivity between the Bridge Port Interfaces

Example IA Device with internal connectivity in IEEE 802.1Q Model

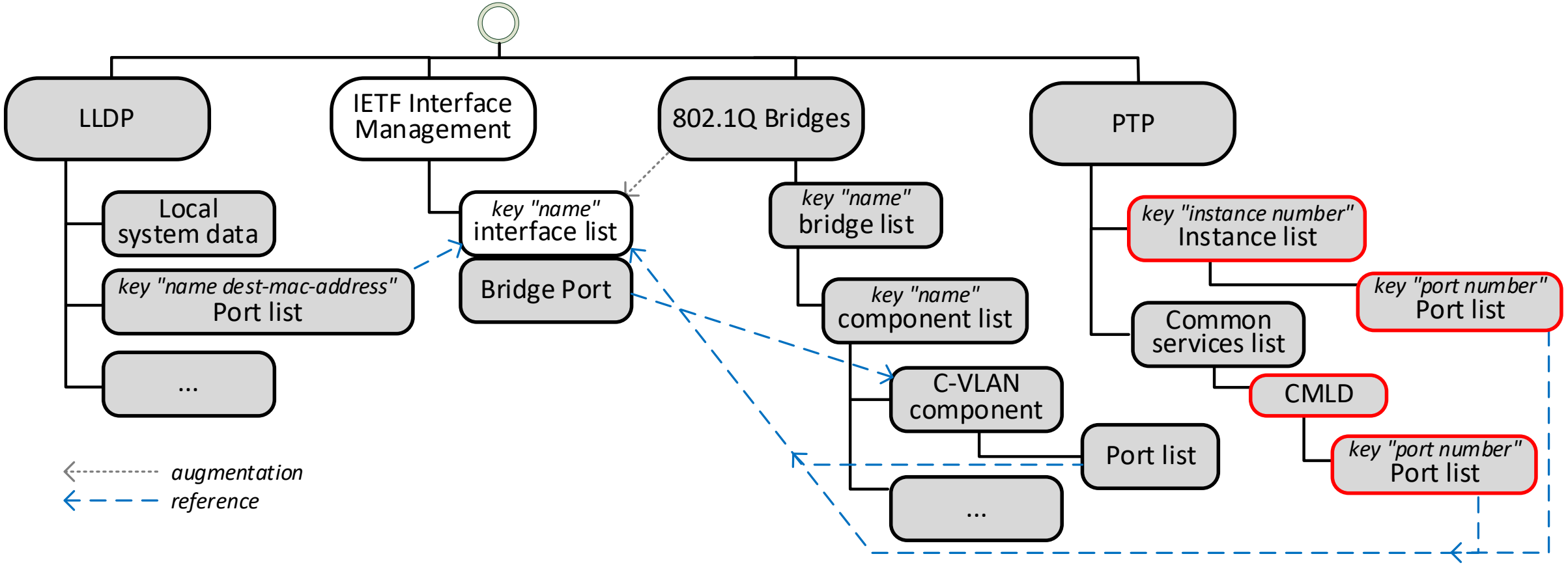


Device Discovery: IEEE 802.1AB (LLDP) - YANG



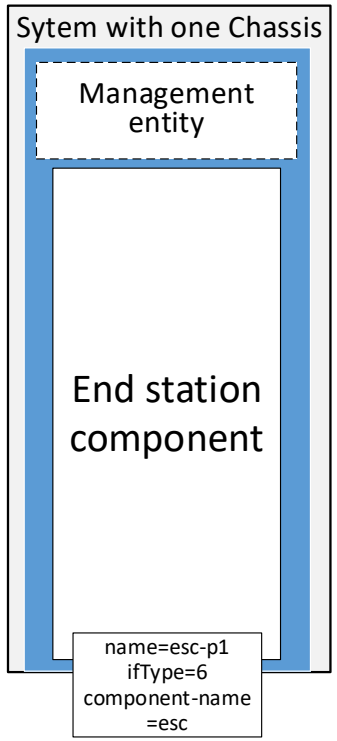
- LLDP Local system data includes system and chassis data.
- LLDP Port list includes the **external** ports of **all components**.

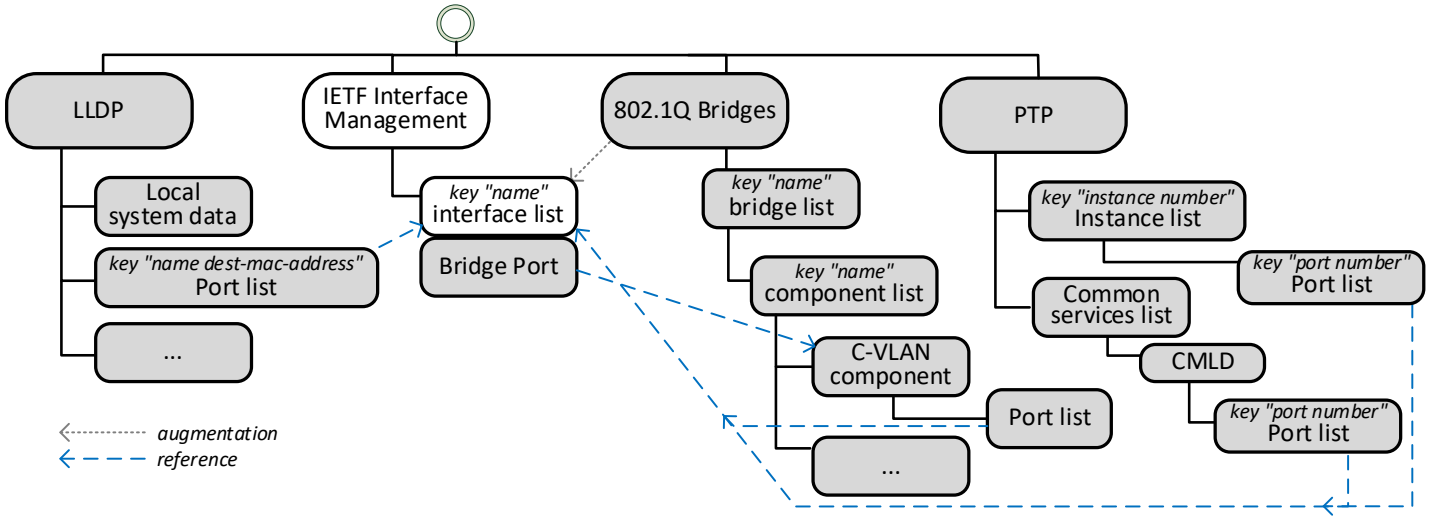
IEEE 1588 and 802.1AS (PTP) – YANG experimental



- PTP instances per component and clock domain (requires mapping: instance number ↔ component name).
- PTP Port list includes external and internal ports (requires mapping: port number ↔ port name).

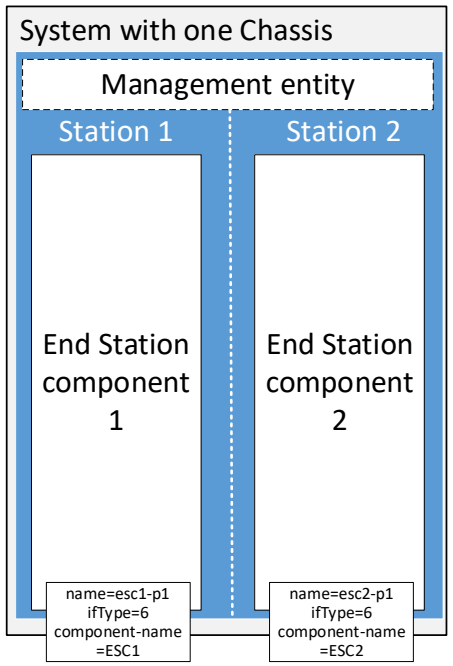
Case study (1): simple end station

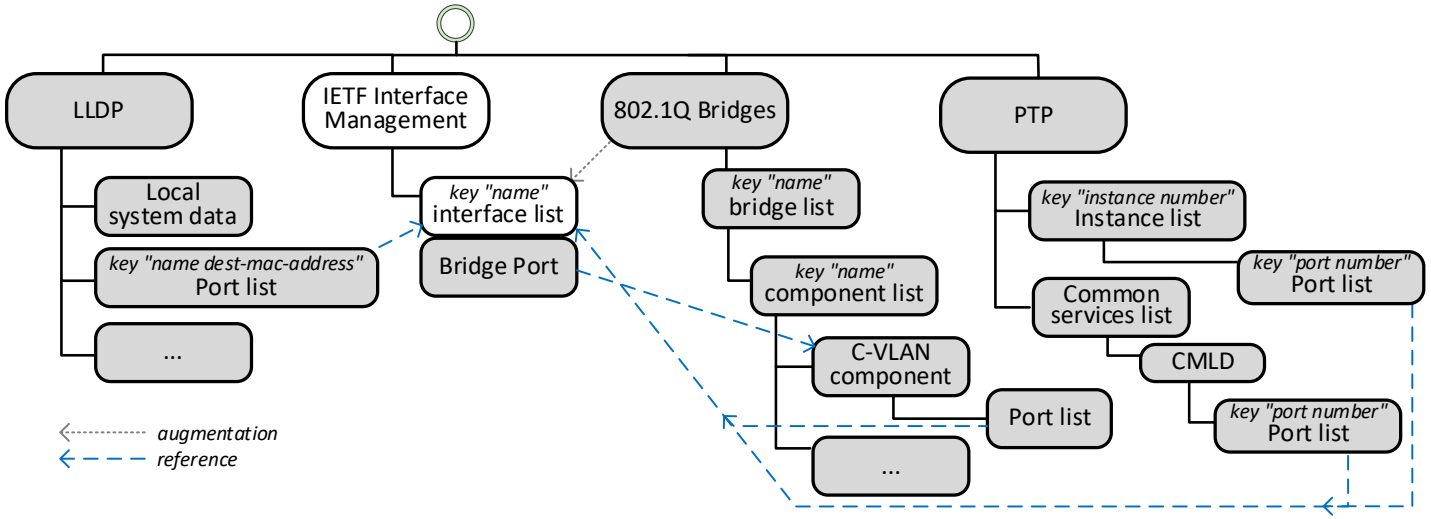




- Component list includes **one end station component** (esc).
- PTP Instance list entry **per clock domain**.
- All Port lists include **one port** (esc-p1).

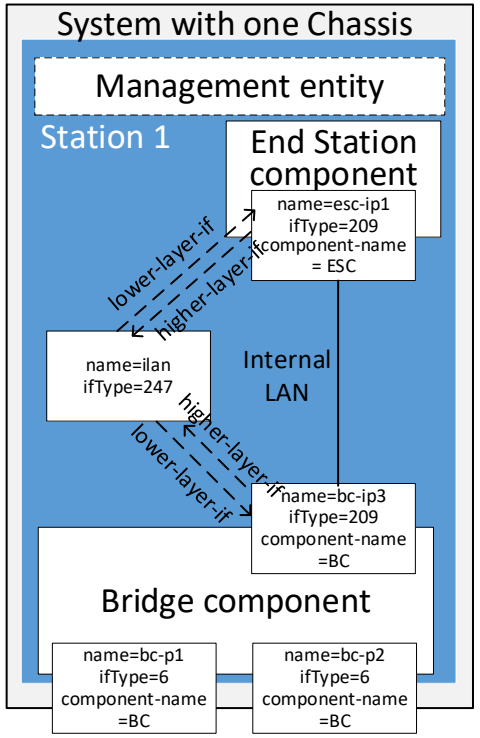
Case study (2): two end station components

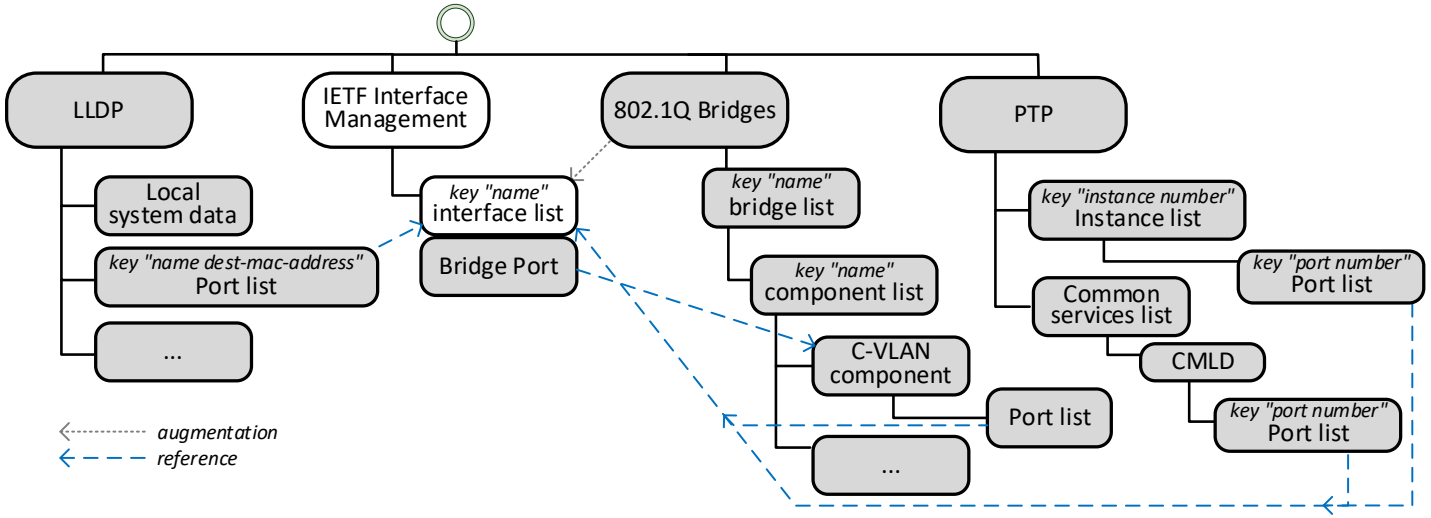




- Component list includes **two end station components** (esc1, esc2).
- PTP Instance list entry **per component and clock domain**.
- C-VLAN Component and PTP Instance Port lists with **one port** (esc1-p1 or esc2-p1).
- LLDP and Common services Port lists with **two ports** (esc1-p1 and esc2-p1).

Case study (3): bridged end station





- Component list includes **two components** (esc, bc).
- PTP Instance list entry **per component and clock domain**.
- C-VLAN component and PTP instance Port lists with **three ports** (bc-p1, bc-p2, bc-ip3).
- End station component and PTP instance Port lists with **one port** (esc-ip1).
- **ILAN interface** list entry with internal port connectivity information.
- LLDP Port list with **two ports** (bc-p1 and bc-p2).
- Common services Port lists with **four ports** (bc-p1, bc-p2, bc-ip3, esc-ip1).

Conclusion

End stations and bridges, even multiple instances in one housing, can be specified by using the existing YANG models.

Thus, an bridged end station is just an end station component and a bridge component in one housing.