TIACC Update on the Common Test Specification for IEC/IEEE 60802

Authors:

- Dave Cavalcanti, Gary Stuebing (Avnu Alliance)
- Manabu Hamaguchi, Miwa Masahiro (CLPA)
- Mark Hantel, Al Beydoun (ODVA)
- Peter Lutz, David McCall (OPC Foundation)
- Raik Zachmann, Dietmar Bohn (PI)

March 10, 2025

Outline

- TIACC Introduction (Recap)
- Scope of the Common Test Specification for IEC/IEEE 60802
- Testing Strategies and Considerations
- Draft Common Test Specification Status
- Timeline

Motivation – A Common Test Spec for IEC/IEEE 60802

- Enables organizations to create testing or certification programs using a common test baseline
- A common set of tests helps ensure interoperability at the TSN level between devices that conform with 60802
- An important step towards convergence of multiple applications/industrial protocols over a common TSN-capable network

TIACC Introduction

TSN Industrial Automation Conformance Collaboration [TIACC]

- **Collaboration of organizations**: AVNU, CLPA, ODVA, OPC Foundation and PI
- **Goal**: Common test specification for the IEC/IEEE 60802 TSN Profile for Industrial Automation

Steering Committee [SC]

- Legal and finance
- Oversight of work groups
- Approval of final documents
- Contributor list for conformance test spec
- Public communication

Test Specification Working Group [TSWG]

- Define testing scope on IEC/IEEE 60802 IA station-level
- Considers mature and new capabilities
- Re-use of tests (e.g., Avnu), new tests, & updates of tests
- Consider feasibility/availability of test equipment

Participate in TIACC

TSN INDUSTRIAL AUTOMATION
TIACC
CONFORMANCE COLLABORATION

TIACC welcomes participation and contributions from the broad TSN community!

Staff / Officer of Participating Organisation

Direct Participation Agreement

Member Companies of Participating Organisations

Individuals upon Invitation

The deliverable:

TIACC Test Specification   – 1 –

TSN Industrial Automation Conformance Collaboration (TIACC) – Test Specification Working Group draft of:

TIACC Test Specification for the IEC/IEEE 60802 Time-Sensitive Networking Profile for Industrial Automation

Scope: IA-Station Requirements including components

IA-Station Common reqs:
- PHY/MAC reqs
- Topology discovery
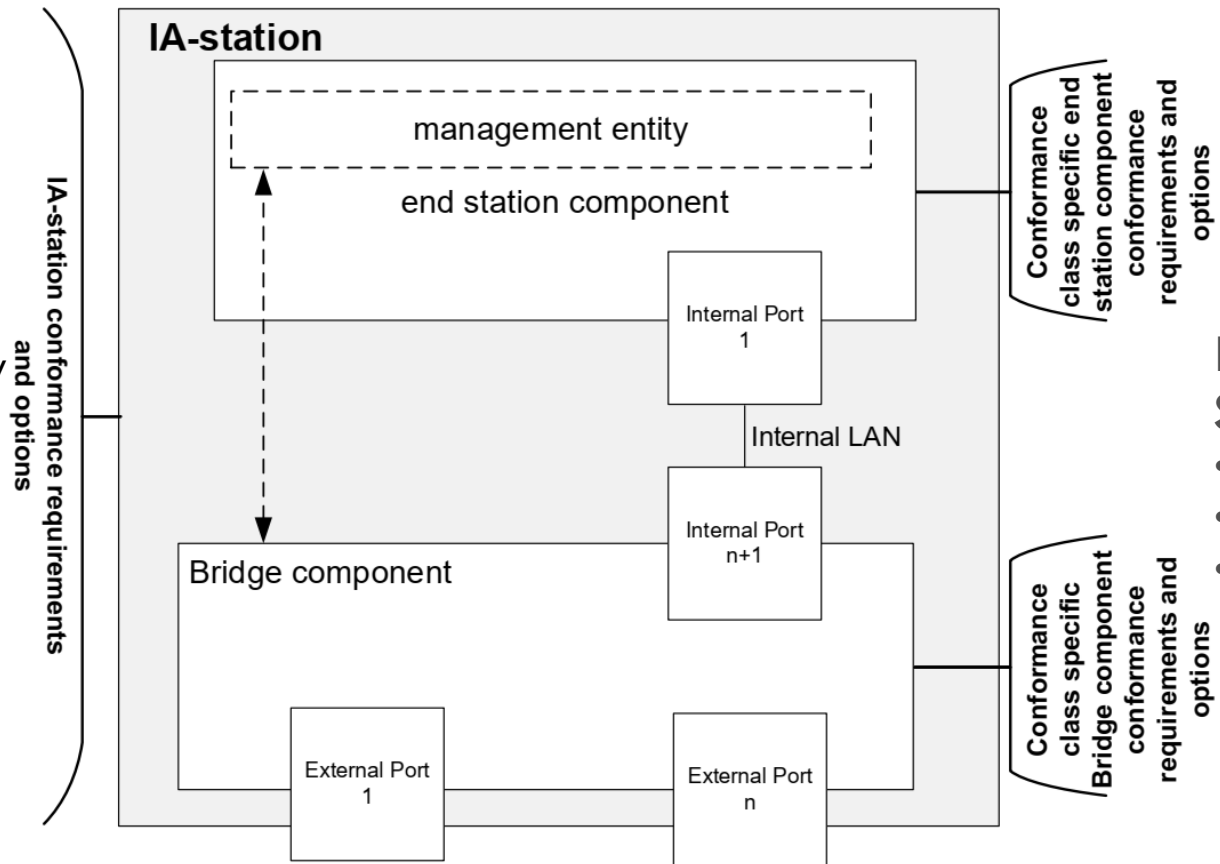- Time sync
- Secure management
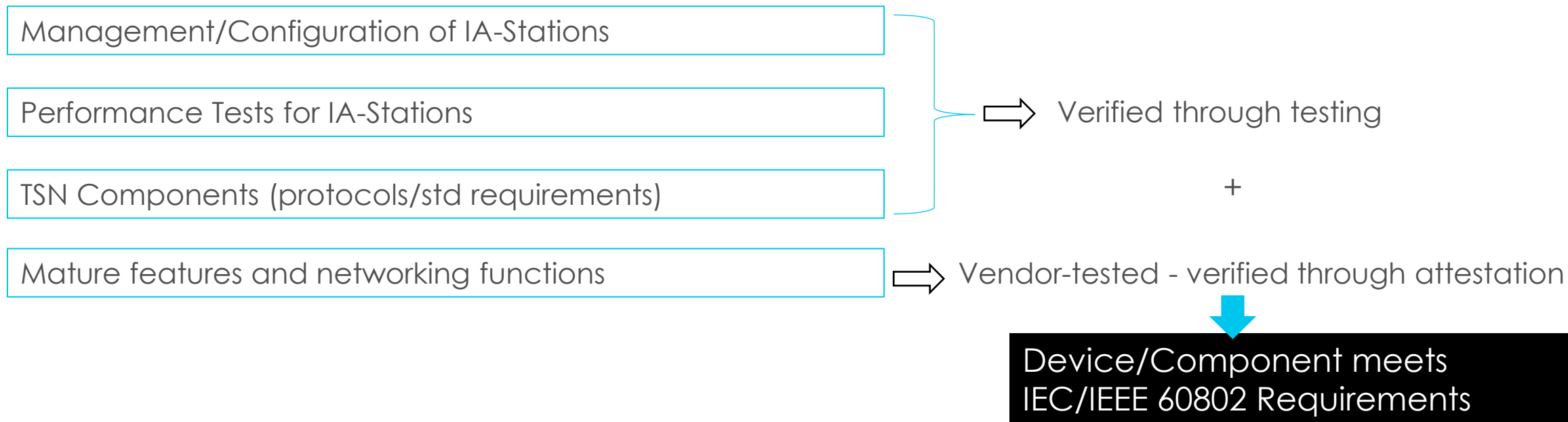- YANG

Figure 11 – IA-station conformance model

Requirements groups for End Station and Bridge components:
- Common (VLAN, queuing)
- TSN (time sync, EST, preemption, …)
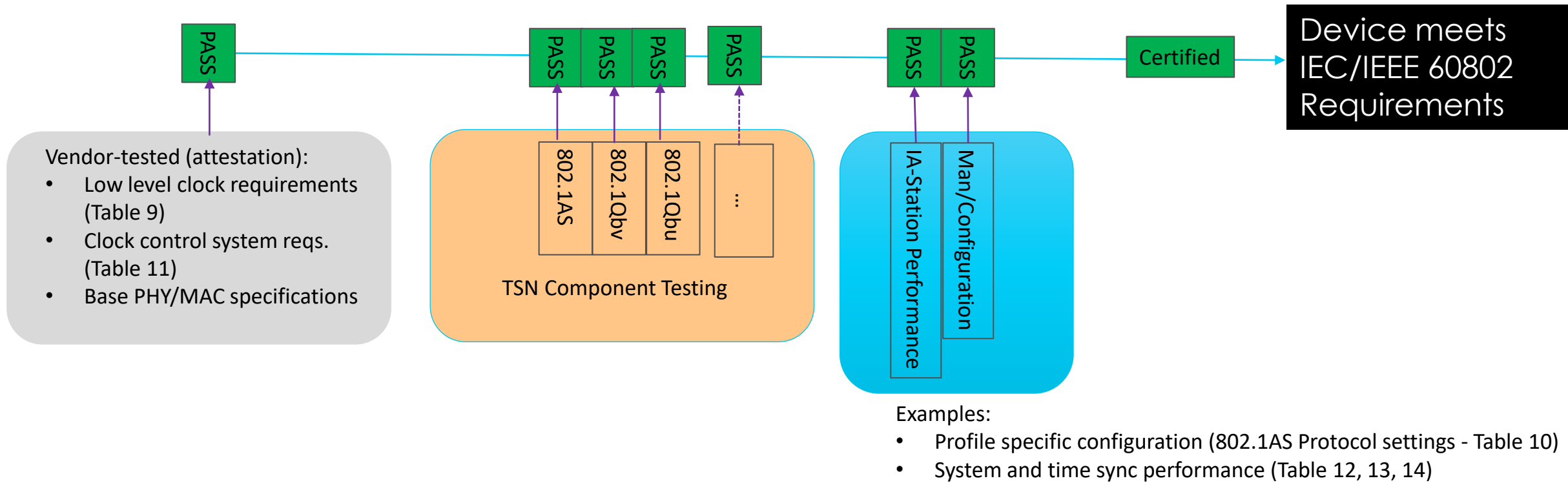- Secure Management

EST: Enhancements for scheduled traffic (802.1Qbv)

Testing Strategies and Considerations

- A practical model to ensure compliance with IEC/IEEE 60802 requirements

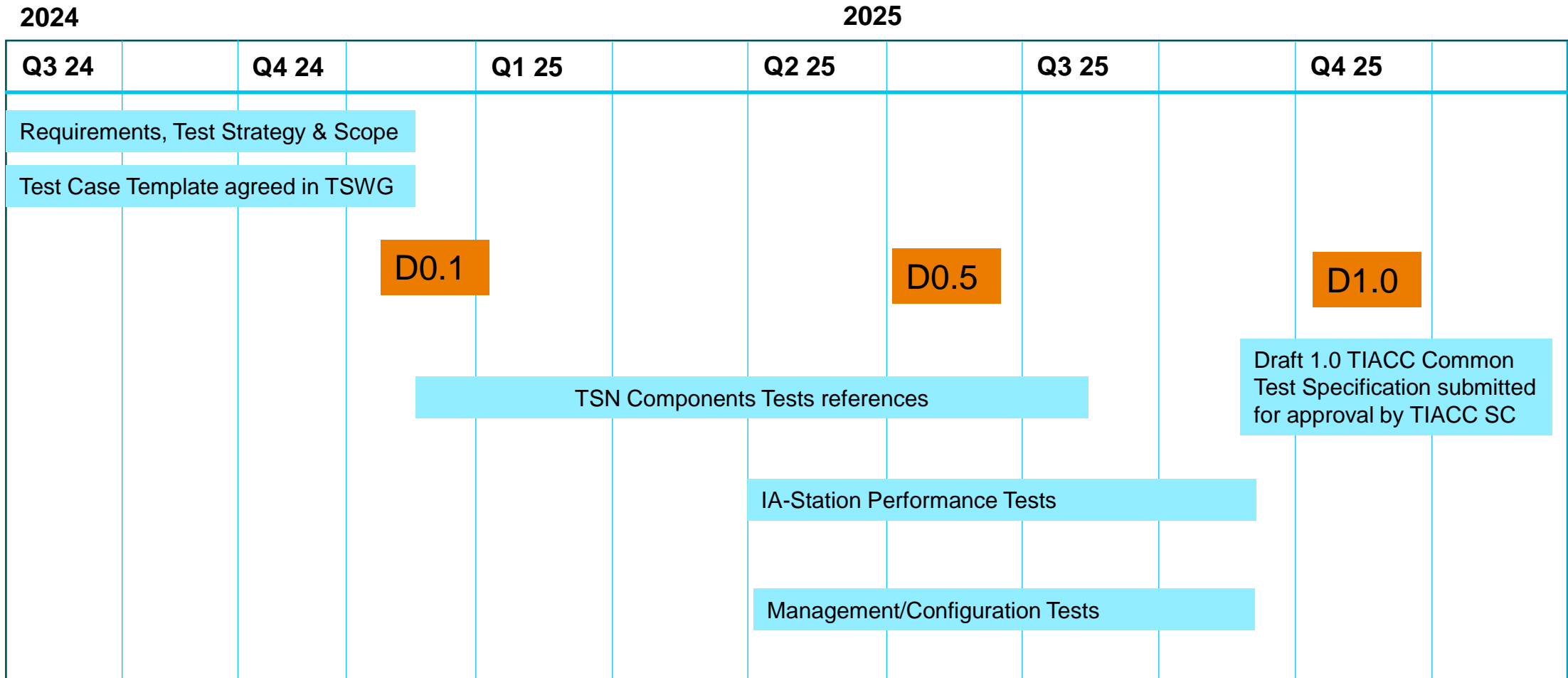| Management/Configuration of IA-Stations |
|---|

Performance Tests for IA-Stations	⟹ Verified through testing

TSN Components (protocols/std requirements)

+

Mature features and networking functions	⟹ Vendor-tested - verified through attestation

Device/Component meets IEC/IEEE 60802 Requirements

Testing strategy examples

PASS

Vendor-tested (attestation):
- Low level clock requirements (Table 9)
- Clock control system reqs. (Table 11)
- Base PHY/MAC specifications

PASS | PASS | PASS | PASS

802.1AS | 802.1Qbv | 802.1Qbu | ...

TSN Component Testing

PASS | PASS

IA-Station Performance | Man/Configuration

Examples:
- Profile specific configuration (802.1AS Protocol settings - Table 10)
- System and time sync performance (Table 12, 13, 14)

Certified

Device meets IEC/IEEE 60802 Requirements

TIACC Draft Common Test Specification Status

- First Draft under development
  - Focus on mandatory requirements and features
- Initial sections completed (Intro, scope, test strategy …)
- Main ongoing efforts
  - TSN Conformance: re-use existing Avnu profile-agnostic TSN tests (802.1AS, 802.1Qbv, 802.1Qbu, …)
  - Performance Tests (new)
  - Management/Configuration (new)

Timeline

	2024				2025				
	Q3 24		**Q4 24**		**Q1 25**		**Q2 25**	**Q3 25**	**Q4 25**

Requirements, Test Strategy & Scope

Test Case Template agreed in TSWG

D0.1

D0.5

D1.0

Draft 1.0 TIACC Common Test Specification submitted for approval by TIACC SC

TSN Components Tests references

IA-Station Performance Tests

Management/Configuration Tests

TSN INDUSTRIAL AUTOMATION

TIACC

CONFORMANCE COLLABORATION

Requirements and conformance classes

IA-Station (*)

PHY/MAC requirements

Topology discovery

Time sync (PTP Instance,…)

Secure Management

(*) Not a complete list

End Station Component (*)

Common (VID reqs)
Time sync (PTP Instance, …) } ccB

EST (802.1Qbv)
Preemption (802.1Qbu)
YANG node requirements } ccA

Bridge Component (*)

Common (VID, C-VLAN reqs, …)
Time sync (PTP Instance, …) } ccB

EST (802.1Qbv)
Preemption (802.1Qbu)
YANG nodes requirements } ccA

General