IEC/IEEE 60802

IA-station Model

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Josef Dorr (Siemens AG)
IA-controllers and IA-devices in IA-stations

Motivation

- The term and concept of “IA-station” was newly introduced in D1.3 – and slightly changed during D1.3 comment resolution:
  
  **IA-station**
  
  material element or assembly of one or more end station components, and none, one or more bridge components

- The terms IA-controller and IA-device have been adopted in D1.3 from the IEC Electropedia:

  **IA-controller**
  
  functional unit, consisting of comparing element and controlling element, that performs a specified control function

  **IA-device**
  
  material element or assembly of such elements intended to perform a required function

- The relation between IA-stations and IA-controllers / IA-devices is not described in D1.3 – only a Note indicates:

  Note 1 to entry: IA-controllers and IA-devices contain an IA-station

- The IA-station example in D1.3 (Figure 2) shows only a management view - without any IA-controller / IA-device instance.

  → This led to confusion and discussions!
60802 D1.3 IA-station model

Status quo (see Figure 2 – IA-station example): Management view

See D1.3 comments #127 and #140:

the relationship between **IA-stations** and **IA-controllers / IA-devices** should be described
IA-controllers and IA-devices in IA-stations

Rationale

- Talkers and Listeners are by definition located in end stations (see IEEE 802.1Q-2018).
  
  **end station:** A functional unit in an IEEE 802® network that acts as a source of, and/or destination for, link layer data traffic carried on the network.
  
  **Listener:** The end station that is the destination, receiver, or consumer of a stream.
  
  **Talker:** The end station that is the source or producer of a stream.

- IA-controllers and IA-devices implement Talkers and Listeners.
  
  → **IA-controllers and IA-devices are end stations.**
Management in IA-stations

Rationale

**end station**: A functional unit in an IEEE 802® network that acts as a source of, and/or destination for, link layer data traffic carried on the network.

- Management entity acts as “a source of, and/or destination for, link layer data traffic carried on the network” (see IEEE 802-2014).
  - Management entity is an **end station**.
Industrial Applications in IA-stations
Proposal for enhanced Figure 2 (aligned to Figure 3 – Industrial Application)

- IA-station applications can
  - be assigned to a single end station component, or
  - encompass multiple end station components.

- Management entity is an IA-station application encompassing all end station components.

- IA-controller/-device and middleware shim(s) are out-of-scope for IEC/IEEE 60802.
Industrial Applications in IA-stations

impact on Term Definitions: proposal (2)

1. Change **IA-controller** definition:
   functional unit industrial automation function, consisting of comparing element and controlling element, that performs a specified control function

2. Change **IA-device** definition:
   material element or assembly of such elements intended to performs a required function industrial automation function, using sensor and/or actuator elements to read and/or write process data

3. Change **IA-station** definition:
   material element or assembly of one or more end station components, and none, one or more bridge components that supports a claim of conformance to the TSN-IA profile
   Note 1 to entry: IA-controller and IA-device contain an IA-station are industrial automation functions of IA-stations.
   Note 2 to entry: IA-stations are often colloquially called “IA-controller” or “IA-device” based on their primary function, for example “IA-controller” for IA-stations including an IA-controller function and an IA-device function.

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Industrial Applications in IA-stations
impact on Conformance specification: proposal (1)

Align conformance specifications to IEEE 802.1Q-2018:

**Common IA-station** requirements / options (5.5 – 5.6)
- PHY and MAC (external ports)
- Topology Discovery (IA-station as a whole)
- Security (IA-station as a whole)
- Synchronization (PTP Instances)

**IA-station** bridge component requirements / options (5.7 – 5.8)

**IA-station** end station component requirements / options (5.9 – 5.10)

IEEE 802.1Q-2018

- C-VLAN Bridge conformance (5.9)
- C-VLAN Component conformance (5.5)
- End station implementation requirements (5.25 – 5.28)

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Questions ?