

Talker Requirements

Contribution to IEEE 802.1Qdj

Astrit Ademaj

TTTech Industrial Automation AG Internal

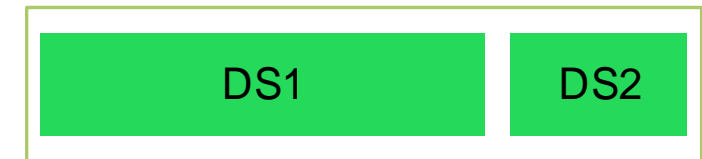
February 22, 2021

1. Bytes per transmission Interval - for streams consisting of more than one frame

- Use case where the payload of a stream does not fit in 1 (one) Ethernet frame
 - Currently **max-frame-size** and **max-frames-per-interval** are available
 - In case of e.g., stream with 1800 payload bytes
 - `max-frame-size = 1522 (1500 Payload)`
 - `max-frames-per-interval = 2`
 - With current parameters it will results on a reservation of 3000 bytes , which is a waste of bandwidth for 1200 Bytes
($2 \times 1500 - 1800 = 1200$ Bytes)

OPC UA PubSub example

Data Sets per WriterGroup



← MaxNetworkMessageSize →

Network-Msg 1



Network-Msg 2



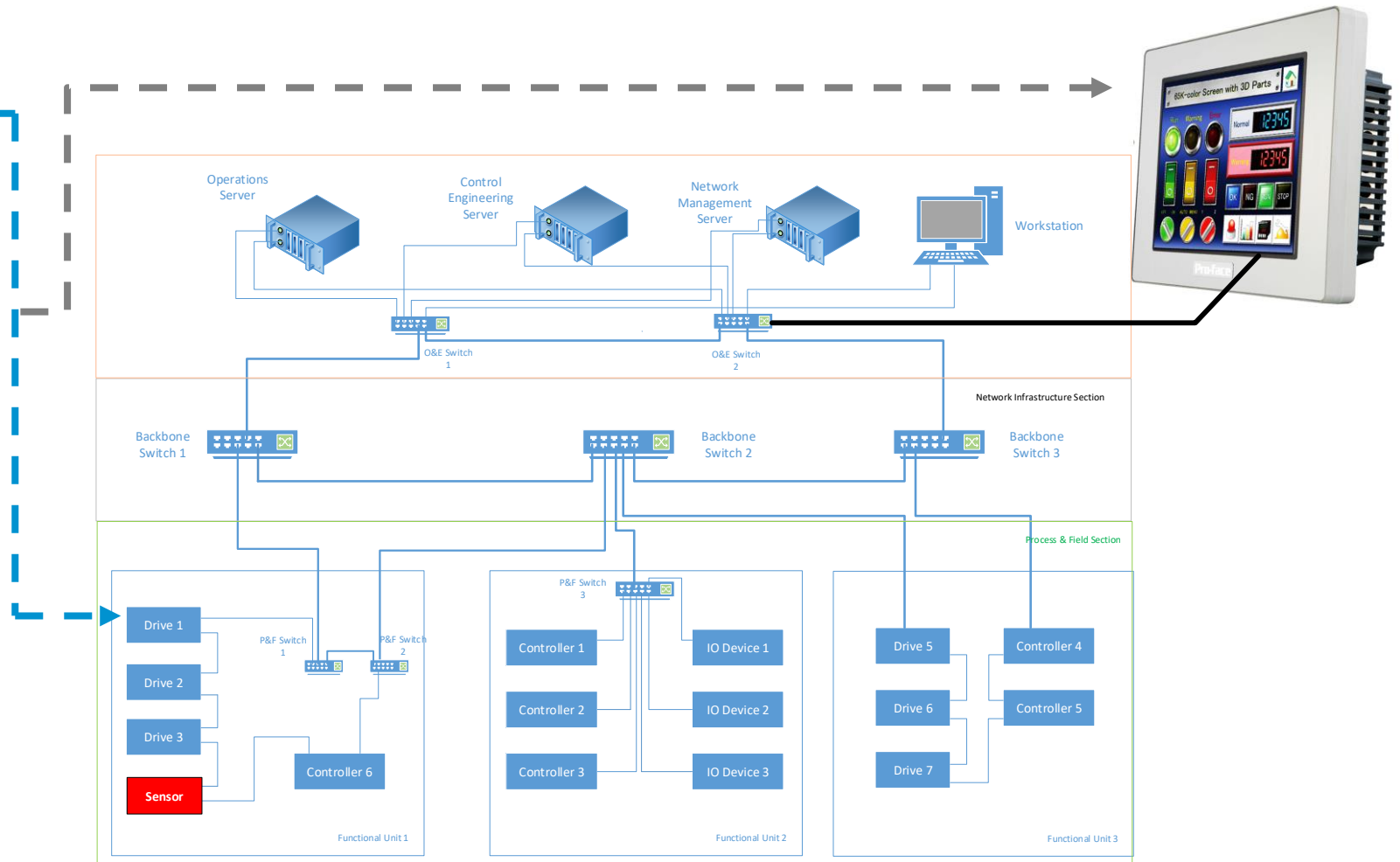
Proposal 1: Introduce additional parameter indicating the exact number of Bytes per interval (period): ***bytes-per-interval***

1. Bytes per transmission Interval - for streams consisting of more than one frame (2)

- For the sake of having backwards compatibility this parameter shall be considered optional
 - If it is not defined, then **max-frame-size × max-frames-per-interval = bytes-per-interval**
- If the value is provided, then:
 - **bytes-per-interval < max-frame-size × max-frames-per-interval**

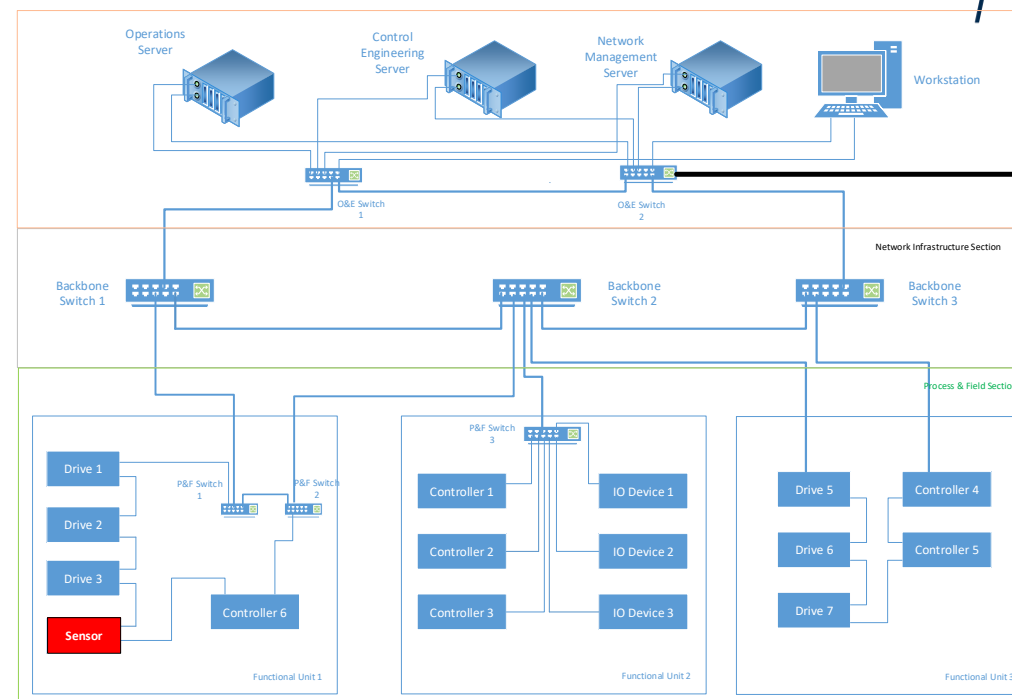
2. “MaxLatency” definition for time aware talkers (1)

- MaxLatency is the “relation” between a talker and one listener
- In a single Network there may be different MaxLatency values (one for each listener)
 - some listeners may have “tight” latency for the same stream
 - e.g. Drive 1 receiving data from the red Sensor
 - other listeners may have very relaxed ones or not at all
 - e.g., a monitoring HMI device



Issue 2: “MaxLatency” definition for time aware talkers (2)

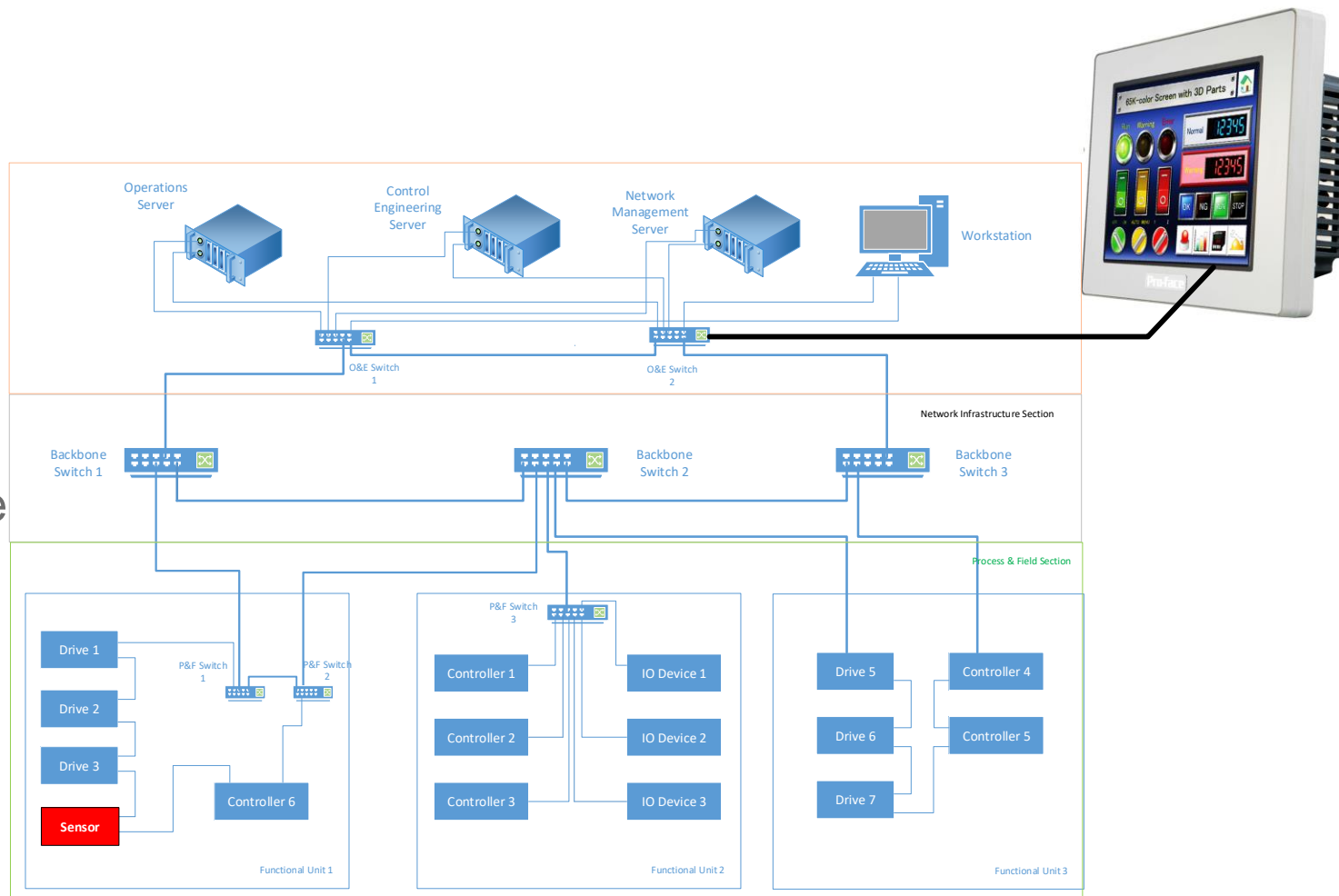
- In the CNC-CUC UNI there is a MaxLatency for each listener
- MaxLatency can be specified at the talker (35.2.2.10.7). In that case the MaxLatency applies to all listeners
- The only use case in industrial where the MaxLatency makes sense is if it represents the validity of the data send with this stream
 - however, this is an application-level semantics and shall not be represented in the
- In some use cases setting the latency requirements at the talker may cause conflicts with the “fare away” listeners, specially in the case of converged networks
 - If the MaxLatency at the talker is set higher - that would invalidate the MaxLatency requirement for the listeners
 - If the MaxLatency at the talker is set lower - that would lead to some listeners not being able to receive the stream



Proposal 2: Remove the latency requirement at the talker

3. Redundancy requirements for talkers

- Number of Seamless Trees at talker(s)
 - Some listeners may have same redundancy requirements some not (e.g., a monitoring HMI device)
 - In some use cases setting the redundancy requirements at the talker may cause conflicts with the listener requests



3. Redundancy requirements for talkers

46.2.3.6.1 NumSeamlessTrees

NumSeamlessTrees specifies the number of trees that the network will configure to deliver seamless redundancy for the Stream.

This requirement is provided from the Talker only. Listeners shall set this element to one.

Proposal 3.a: Remove the Number of Seamless Trees from the talker
Proposal 3.b: Add the Number of Seamless Trees for the listener