Suggested text for 1.3 of P802.1Qdj

Mick Seaman

This note provides detail for a comment on 1.3 of P802.1Qdj/D1.1.

The editing instructions and the text currently shown for 1.3 do not provide sufficient context either for those voting on the amendment (who often do not consult the base text that is to be amended) or for the eventual users of the amendment (who rarely wish to undertake the mental exercise of combining it with the base text of IEEE Std 802.1Q-2022 while reading).

The P802.1Qdj/D1.1 editing instructions are shown below, followed by the text that would be obtained by specifying the instructions as changes to the introductory paragraph and subsequent bullet items. All this text is necessary if the effect of the changes is to be appreciated.

Unfortunately the D1.3 base text is itself dated and introduces ideas in a somewhat random order. It often describes aspiration, what was hoped for at the beginning of a project, not what is actually in the standard. The D1.1 changes do not improve that, and add to future maintenance. That maintenance might well occur at a time when the current voting members are no longer participating, so in addition to creating work for others it should be appreciated that the long term result may not be that presently desired.

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1. Overview

1.3 Introduction

    a)

The following are the editing instructions specified for 1.3, in P802.1Qdj/D1.1:

Insert the following items after item cq) in 1.3 and renumber the items in the lettered list, as necessary:

    a)   Defines the Centralized User Configuration (CUC) (46.1.5), and the CNC (46.1.6).
    b)   Specifies a Configuration Domain (46.1.7).
    c)   Defines YANG configuration and operational state models (48.6.23) in support of the UNI (Clause 46).

The next page shows the current text in 1.3, starting with the introductory paragraph that precedes item cq) and including listed items up to the next introductory paragraph, with the changes specified in P802.1Qdj/D1.1 shown as Change add and Change remove instructions for clarity. The footnotes are comments, not part of this text.

1 This standard specifies enhancements to [1] protocols, procedures, and managed objects for the configuration
2 of network resources for time-sensitive (i.e., bounded latency [2]) applications. The enhancements address
3 Time-Sensitive Networking (TSN) application requirements beyond audio/video (AV) traffic [3]. To this end,
4 it:

5 cm) Specifies a software interface [4] between the user (i.e., time-sensitive application) and network
6   components, such that the user provides Stream requirements (e.g., for bounded latency), and the
7   network configures resources from Talker to Listeners to meet those requirements. This
8   user/network interface (UNI) is specified as an information model that can be applied to any
9   protocol. [5]

10 cn) Specifies three models for the UNI: fully distributed, centralized network/distributed user, and fully
11   centralized. [6]

12 co) Specifies enhancements to the Stream Reservation Protocol (SRP), using a new [7] application version,
13   MSRPv1. MSRPv1 integrates the UNI TLVs [8] for the benefits of enhanced configuration. For
14   compatibility, MSRPv1 translates to the previous version (MSRPv0). [9]

15 cp) Specifies enhancements to [10] the managed objects for forwarding and queuing enhancements for
16   time-sensitive streams (FQTSS).

17 cq) Specifies enhancements to the managed objects for SRP. [11]

18 cr) Defines the Centralized User Configuration (CUC) (46.1.5), and the CNC [11] (46.1.6). [12]

19 cs) Specifies a Configuration Domain (46.1.7). [13]

20 ct) Defines YANG configuration and operational state models (48.6.23) in support of the UNI (Clause
21   46). [14]

22 cu) Specifies managed objects for configuration of Bridges by a Centralized Network Configuration
23   (CNC) component.

24 cs) Defines YANG configuration and operational state models (Clause 48) in support of Scheduled
25   Traffic, Frame Preemption and Per-Stream Filtering and Policing.

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[1] The "enhancements" mentioned are just additional or alternative protocol, procedures, etc. There is no point in describing something as an enhancement unless it is (a) very clear what is being "enhanced" (b) that clarity is persistent over time, within the very broad context of the complete standard (not just an amendment, which is a temporary thing. Different ways of doing things does not necessarily qualify—one persons enhancement is another's unnecessary complication.

[2] All applications require bounded latency, those using LLC Type 2 won't work if frames arrive on the order of LLC retransmissions times. The distinguishing feature of TSN (it appears) is providing reliable delivery with delays that are so low as to make end station loss detectio9n and/or retransmission infeasible.

[3] This sentence is historic at best, and needs to be removed, it conveys nothing to someone not examining historic attitudes and assumptions, not just constraints in the standard. SRP was always capable of supporting traffic other than AVB. The audio/video parameters in Table 35-5 are specified as example, and do not constrain SRP/MSRP use to audio/video.

[4] It does not specify "a software interface", a least not in any commonly understood sense (API). 802.1Q has never specified APIs, since they are internal to a system.

[5] It doesn't. There is no such generic 'software interface specified (search for occurrences of 'UNI' throughout the standard, there are none between 1.3 and Clause 46, and specifically none in MSRP Clause 35). Clause 46 claims that certain parts of various ways of operation can be thought to be instantiations of a common UNI. This is a misrepresentation of MSRP, particularly with regard to MAP.

[6] But see Qdj/D1.1 "protocols CUC uses [for end station discovery, requirements, configuration] are... outside the scope of this standard, i.e., do not use the hypothetical UNI. These are not models for a UNI, they are models for network configuration.

[7] The use of "new" is only relevant when an amendment is first publishes, and should be restricted (when referring to features) to the Introduction in the frontmatter (not that in 1.3, which can be expected to survive for many years, possibly for decades, during which the addition will become "old". see pg19 of the 802.1Q+802.1Qcj roll up for examples of retention of this Introduction for various amendments before they are subsumed by a Revision.

[8] There is no mention of UNI TLVs anywhere but here in the whole of 802.1Q. The notion that there are generic UNI TLVs (an encoding) is at odds with protocol independence. A protocol is more than packet formats. MSRPv1 just used a compact encoding?

[9] 1.3 Introduction is not and should not be a historical account. In any case the attempts at a historical account here are not useful long after changes have been made. If an amendment is to describe what changes it makes, that should be in the frontmatter Introduction.

[10] Unspecified enhancements to enhancements here. The historical layering of changes is irrelevant, what is important is that the standard specifies forwarding and queuing support for time-sensitive streams and managed objects for their control. See 5.4.1.5. Note lack of YANG reference in 5.4.1.5.

[11] This is an odd place in the text to announce definition of definition of the CUC and CNC, since one of the models at least is dependent on their existence, and they were already used prior to this amendment. Having bullet items for other aspects intervene between the description of the three models and this one does not help the flow of the above description.

The following is suggested text for P802.1Qdj, replacing current text in 1.3, including the amendment's editing instruction:

Change the paragraph beginning "This standard specifies enhancements to protocols, procedures, and managed objects for the configuration of network resources " as follows:

This standard specifies enhancements to protocols, procedures, and managed objects for the configuration of network resources for time-sensitive ~~(i.e., bounded latency)~~ applications that require timely, high probability, delivery of frames without end station retransmission. ~~The enhancements address Time-Sensitive Networking (TSN) application requirements beyond audio/video (AV) traffic.~~ To this end, it:

cm) ~~Specifies a software interface between the user (i.e., time-sensitive application) and network components, such that the user provides Stream requirements (e.g., for bounded latency), and the network configures resources from Talker to Listeners to meet those requirements. This user/network interface (UNI) is specified as an information model that can be applied to any protocol.~~

cn) Describes three approaches to network configuration: ~~Specifies three models for the UNI:~~ fully distributed, centralized network/distributed user, and fully centralized.

co) ~~Specifies enhancements to the Stream Reservation Protocol (SRP), using a new application version, MSRPv1. MSRPv1 integrates the UNI TLVs for the benefits of enhanced configuration. For compatibility, MSRPv1 translates to the previous version (MSRPv0).~~

cp) Specifies ~~enhancements to the~~ managed objects for forwarding and queuing ~~enhancements~~ for time-sensitive streams (FQTSS).

cq) ~~Specifies enhancements to the managed objects for SRP.~~

cr) Describes Centralized User Configuration (CUC) and Centralized Network Configuration (CNC) entities.

cs) Specifies managed objects for configuration of Bridges by a ~~Centralized Network Configuration~~ (CNC~~) component~~.

cs) Defines YANG configuration and operational state models (Clause 48) in support of Scheduled Traffic, Frame Preemption, ~~and~~ Per-Stream Filtering and Policing, and CUC configuration.

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[12] In the whole of the rest of 1.3 there are very few cross-references, and ideally there should be none. They should be removed from this text. 1.3 is not an alternative clickable table of contents. Management of the number of cross-references in 802.1Q has been a significant headache and they must not be casually multiplied.

[13] Task Group discussion stated that this was explicitly a generic term. Its inclusion here adds no value beyond inclusion in Clause 3.

[14] "YANG .. models already present as a bullet below".

The following shows text in 1.3 of 802.1Q as it would appear after the application of the suggested text above:

This standard specifies enhancements to protocols, procedures, and managed objects for the configuration of network resources for time-sensitive applications that require timely, high probability, delivery of frames without end station retransmission. To this end, it:

cm) Describes three approaches to network configuration: fully distributed, centralized network/distributed user, and fully centralized.

cn) Specifies managed objects for forwarding and queuing for time-sensitive streams (FQTSS).

co) Describes Centralized User Configuration (CUC) and Centralized Network Configuration (CNC) entities.

cp) Specifies managed objects for configuration of Bridges by a CNC.

cs) Defines YANG configuration and operational state models (Clause 48) in support of Scheduled Traffic, Frame Preemption, Per-Stream Filtering and Policing, and CUC configuration.