

UNI: An idea taken too far

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dj-finn-kill-the-UNI-0822-v02

Remote operation of MSRP

Origin of the TSN UNI

This author has been speaking, in the TSN meetings, to the point that the UNI should be taken out of IEEE Std 802.1Q. A brief perusal of the [archived project IEEE Std 802.1Qcc-2018](#) reveals some interesting presentations from the year 2014:

- First reference to “UNI”: [new-tsn-cummings-srp-planning-0713-v1](#).
- First picture of “UNI”: [cc-nfinn-control-flows-0414-v01](#).

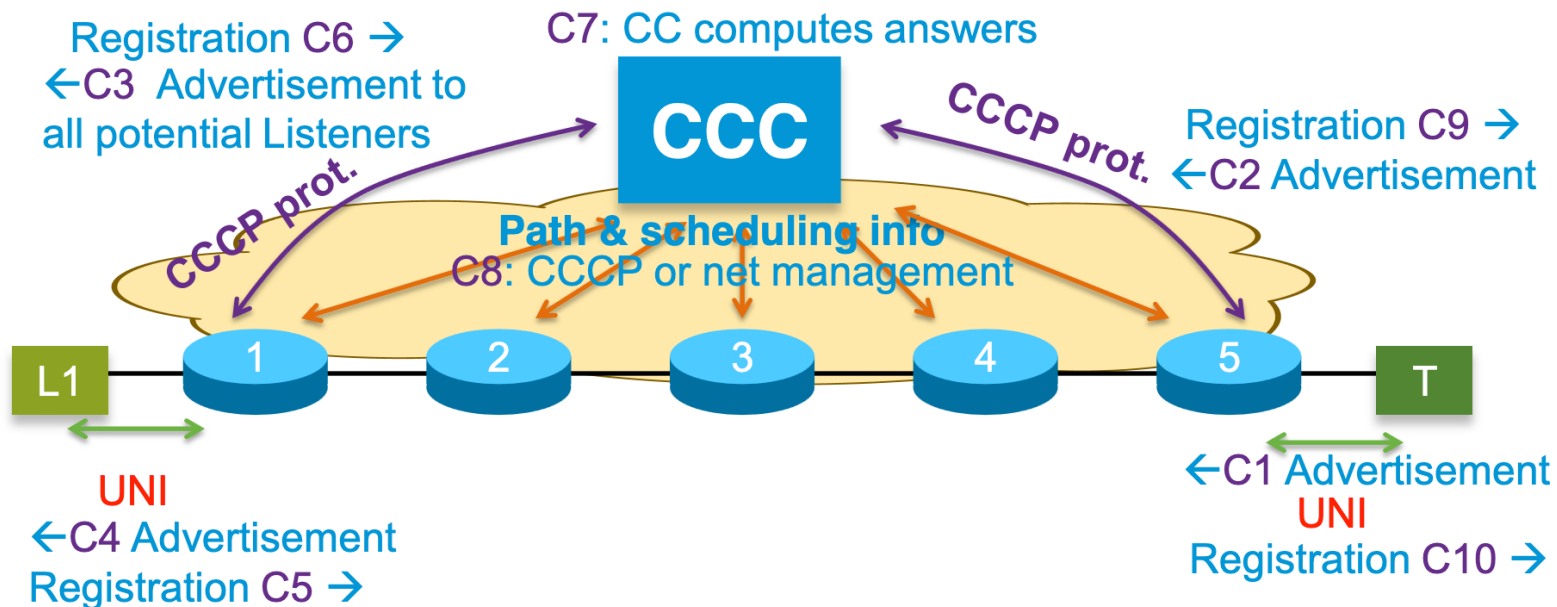
As one of these contributions bear my name, some explanation for wanting to “kill the UNI” seems in order.

cc-nfinn-Inputs-Outputs-0314-v01

“This deck will look only at the use of P802.1Qcc as a **“User Network Interface (UNI)”** protocol. That is, the interface between a **Talker or Listener** and the adjacent network node, whether a router or a bridge.”

The first instance of a familiar diagram: cc-nfinn-control-flows-0414-v01

C. Network built **with** Central Computation and Control function (CCC)



1. The UNI is **only** at the **edge** of the network.
2. It connects Talkers and Listeners to the edge Bridges.

Multiple Stream Registration Protocol

MSRP consists of:

- A registry (database) on every port in every Bridge.
- A registry on participating end stations' ports.
- A protocol for passing registry information from port to port over a medium (e.g. 802.3 link).
- Rules for propagating registry information from port to port on a bridge.
- Rules for generating configuration results (e.g. Stream reservations) from the registry.

I observed, then, that if we reduce MSRP:

Run MSRP only at the edge of the network:

- A registry (database) on every edge port in every Bridge.
- A registry on participating end stations' ports.
- A protocol for passing registry information from port to port over a medium (e.g. 802.3 link).
- ~~● Rules for propagating registry information from port to port on a bridge.~~
- ~~● Rules for generating configuration results (e.g. Stream reservations) from the registry.~~
- Put the MSRP registries in managed objects.
- *Then, we can replace MSRP, within the network, with network management.*

Quotes from Clause 46 defining the UNI

46.1 Overview of TSN configuration

46.1.1 User/Network Interface (UNI)

This clause specifies configuration information that is exchanged over a User/Network Interface (UNI). The user side of the interface represents **Talkers and Listeners**. The network side of the interface represents the **Bridges** that transfer frames of the Stream from each Talker to its Listeners.

46.1.3.1 Fully distributed model

the protocol that is used as the UNI for exchange of configuration information between **Talkers/Listeners (users)** and **Bridges**. The Stream Reservation Protocol (SRP) of Clause 35 can be used as the UNI and to propagate configuration information throughout the network of Bridges. **(Although no alternative to SRP is given.)**

46.1.3.2 Centralized network/distributed user model

the protocol that is used as the UNI for exchange of configuration information between **Talkers/Listeners (users)** and **Bridges**.

46.1.3.3 Fully centralized model

Therefore, the TSN UNI exists between the **CNC** and **CUC**. **← This contradicts the other definitions of the UNI.**

Half-defining the CUC and CNC has created confusion

- All of the information elements defined in clause 46 are also defined in clause 35. All are described as TLVs. The definitions are not perfectly redundant – they overlap, with some information in 35 and some in 46. There is no indication in clause 46 that the specific values for the Type field are defined in clause 35, table 35-7. There is no indication in clause 35 that Table 35-7 applies to clause 46.
- Aside from the fact that the overlapping information element descriptions sometime have information that is only in 46, but should be in 35, there is nothing in 802.1Q clause 46 that cannot be deleted.
- **SO: Delete 5.29 TSN CNC station requirements.**
- **Remove all references to CNC and CUC. CNC is simply an example of a network management system. CUC is none of our business.**
- **References to Stream Transformation in clause 35 are unnecessary.**
- **There seem to be more “if External Control do X, else Y” in clause 35 than I would have expected. Is it necessary? (OK, I admit. That’s rather a nebulous complaint.)**
- **P802.1Qdj adds elements that have no place in MSRP, have no implementation implications for an 802.1Q bridge or (non-CUC, non-CNC) station, and therefore no place in 802.1Q.**

Clearly, this duplication was intentional

- The duplication between clauses 35 and 46 appears to be intentional; clause 35 is relevant to the Bridge, and clause 46 to the CNC-CUC interface.
- This seems to be an example of good planning – it makes it relatively easy to excise clause 46 into a separate document that fully defines the CUC, the CNC, and the interface between them, without disturbing the clauses that are relevant to the purpose of IEEE Std 802.1Q.

New work?

- It is possible that a document defining a CUC and/or A CNC could be developed by IEEE 802.1.
- It would be perfectly acceptable for such a document to have implementation implications on 802.1Q bridges.
 - It could define managed objects that an 802.1Q bridge would want to implement, e.g. objects to help standard CNCs to avoid stepping on each others' toes.
- Such a document might get a head start by incorporating material now in 802.1Q and 802.1Qdj.
- It is also possible that this document would define such a small part of the overall management problem that it would be pointless to pursue it.

Thank you