P802.1CQ

Multicast and Local Address Assignment

History and status

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P802.1CQ history

- PAR & CSD created and prepared in DCB TG
  - PAR approval: 2016-02-05 (expiry: 2020-12-31)
- Transferred into OmniRAN TG after retirement of Pat Thaler and closure of DCB TG in March 2018
  - Status and transfer of topic call on March 28th
    - https://mentor.ieee.org/omniran/dcn/18/omniran-18-0036-00-00TG-mar-28th-1cq-confcall-minutes.docx
- Frequent discussions in OmniRAN TG the past year to clarify background and requirements, to socialize among IEEE 802 WGs, and to create the foundation for the technical solution.
  - Links to IEEE 802.11, IEEE 1722, and IETF DHC WG established.
- Transferred into TSN TG in July 2019 for completion.

PAR

Title:

Standard for Local and Metropolitan Area Networks: Multicast and Local Address Assignment

Scope:

This standard specifies protocols, procedures, and management objects for locally-unique assignment of 48-bit and 64-bit addresses in IEEE 802 networks. Peer-to-peer address claiming and address server capabilities are specified.

Purpose:

This document will not include a purpose clause.

Need for the Project:

Currently, global addresses are assigned to most IEEE 802 end station and bridge ports. Increasing use of virtual machines and Internet of Things (IoT) devices could exhaust the global address space. To provide a usable alternative to global addresses for such devices, this project will define a set of protocols that will allow ports to automatically obtain a locally-unique address in a range from a portion of the local address space. Multicast flows also need addresses to identify the flows. They will benefit from a set of protocols to distribute multicast addresses. Peer-to-peer address claiming and address server capabilities will be included to serve the needs of smaller (e.g. home) and larger (e.g. industrial plants and building control) networks.

Status

- Technical proposals
  - Protocol proposal of Antonio de la Oliva
    - https://mentor.ieee.org/omniran/dcn/19/omniran-19-0026-00-CQ00-multicast-and-unicast-mac-address-assignment-protocol-mumaap.pdf
  - Potential use of IETF draft-ietf-dhc-mac-assign-00 and draft-ietf-dhc-slap-quadrant-00
- P802.1CQ Draft
  - Initial document available
- Related activities in other standardization groups
  - IEEE 1722
  - IETF DHC WG
  - IEEE 802.11

Relation to IEEE 1722

- Early discovery that IEEE 1722 (IEEE Standard for a Transport Protocol for Time-Sensitive Applications in Bridge Local Area Network) has specified a MAC Address Assignment Protocol (MAAP) in its Annex B
- Don Pannell provided background of MAAP in IEEE 1722 at the March 2019 plenary meeting
  - Liaison prepared and send to IEEE 1722 to introduce P802.1CQ and ask for potential alignment
  - Liaison response received on July 3rd with offer of IEEE 1722 to build P802.1CQ on top of MAAP
    - For further discussions!

Relation to other standardization projects

- IETF
  - Two I-Ds on MAC address assignment through DHCPv6 (draft-ietf-dhc-mac-assign-00, draft-ietf-dhc-slap-quadrant-00) adopted as working group items of DHC after becoming vocal in IETF-IEEE802 coordination and DHC adoption call.
- IEEE 802.11
  - Presentation of P802.1CQ to 802.11 led to amendments in P802.11md to provide signaling for dynamic MAC address assignment.
  - Proposed solution for 802.11 based on IEEE 802.11aq (PAD) triggered big interest in 802.11 to enable dynamic MAC address assignment.
- IEEE 802.15
  - Presented to 802.15 at November 2018 plenary. While some interest was raised no further related activities so far.

Conclusion

- P802.1CQ found fresh momentum in the past year in OmniRAN
- Relations with several other projects determined and established
  - Cooperation with 802.11, IEEE 1722 and IETF DHC WG to be maintained and expanded
- Project requires now broader attention of TSN TG
  - Harmonization with MAAP of IEEE 1722