MAAP
Integration
in P802.1CQ

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Disclaimer

The views presented here are the personal views of the contributors rather than the formal position of IEEE or any other entity.

P802.1CQ status

- Multicast and Local Address Assignment
  - project in IEEE 802.1 TSN Task Group
  - https://1.ieee802.org/tsn/802-1cq
- First Task Group Ballot (D0.5) ended 2020-07-31
- Editor drafted resolutions to 77 comments
  - https://commentary.ethair.net
- TSN conducting comment resolution
- Incorporates MAAP, per prior 1722 discussions
  - in a normative Annex B, aligned with 1722 Annex B
  - new features are specified in a new protocol "PALMA"
    - "Protocol for Assignment of Local and Multicast Addresses"
- Several comments consider MAAP integration

New Features needed beyond MAAPv1

- More flexible address sets
  - multicast and local unicast assignment
    - including both assignments simultaneously
  - 64-bit addresses
  - mask-based address ranges
  - address claim blocks (not yet discussed in TSN)
- Assignment to devices that do not yet have an assigned unicast source address
- Server-based assignment
  - device makes a claim
  - server, if present, hears claim and may respond with offer
- These features can be included in PALMA
  - in D0.5, they were not added to MAAP, but they could be…

Directions in Comment Resolution

1. move Annex B into body of draft
2. replace PALMA with enhanced MAAP
   - AVTPDU format
   - AVTPDU Ethertype and MAAP subtype
   - new maap_version=2 features
   - additional MAAP message_types
3. PROBEv2 is heard by legacy MAAP devices
   - can defend with DEFENDv1
   - also heard by server; responds with offer

more details follow…

1. move Annex B into body of draft

- In P802.1CQ/D0.5, MAAP is in normative Annex B
  - preserves all subclause numbering in 1722 Annex B
  - with some corrections made by editor

- Moving it into the main body requires renumbering

- New version will entail major editing

- Reviewers will need to carefully confirm that legacy specifications are not broken.

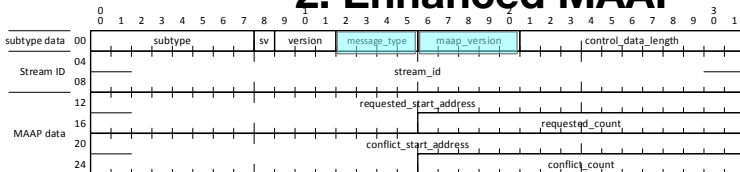- Editor's notes and marks will indicate key changes (prior to SA ballot).

2. Enhanced MAAP

Figure B.1—MAAP PDU Format

message_type	Name	maap_version
0	reserved	
1	PROBE	1
		2
2	DEFEND	1
		2
3	ANNOUNCE	1
		2

• MAAPv1 devices
– can send MAAPv1 (maap_version 1) messages
– can read MAAPv1 messages
– can read MAAPv2 message_type 1, 2, and 3
  – *MAAP AVTPDUs received that contain a higher version number and a message type that is defined in the implemented version of MAAP shall be interpreted using the implemented version of MAAP.*

2. Enhanced MAAP

Figure B.1—MAAP PDU Format

message_type	Name	maap_version
0	reserved	
1	PROBE	1
		2
2	DEFEND	1
		2
3	ANNOUNCE	1
		2
4	DISCOVER	2
5	ADVERTISE	2
6	OFFER	2
7	REQUEST	2
8	ACK	2
9	RELEASE	2
10-16	reserved	

- MAAPv1 devices
  - can send MAAPv1 (maap_version 1) messages
  - can read MAAPv1 messages
  - can read MAAPv2 message_type 1, 2, and 3
    - *MAAP AVTPDUs received that contain a higher version number and a message type that is defined in the implemented version of MAAP shall be interpreted using the implemented version of MAAP.*
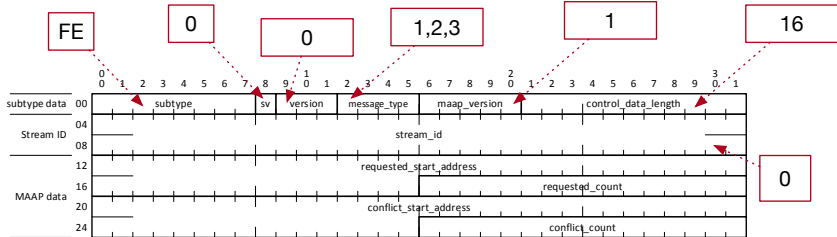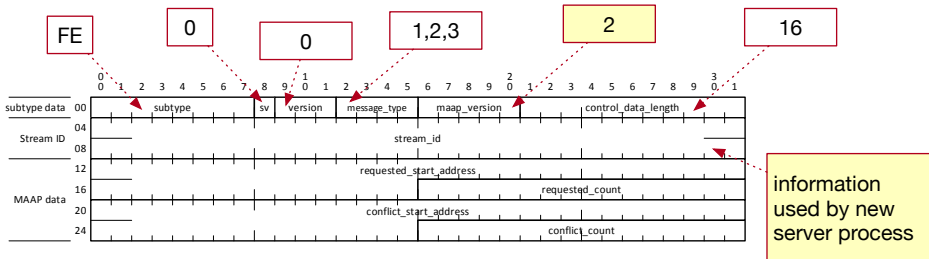 - ignore new MAAPv2 message_types
    - *All MAAP AVTPDUs received that contain a higher version number and a message type that is not defined in the implemented version of MAAP shall be ignored.*
    - *So MAAPv2 can use a new PDU format (but aligned with AVTPDU control header format).*
- MAAPv2 devices
  - can send all MAAPv2 messages
  - can read all MAAPv1 and MAAPv2 messages

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MAAPv1

FE | 0 | 0 | 1,2,3 | 1 | 16

				0 0 1 2 3 4 5 6 7	8	9 0 1 2	3 4 5 6 7 8 9	2 0 1 2 3 4 5 6 7 8 9	3 0 1

subtype data 00 | subtype | sv | version | message_type | maap_version | control_data_length

Stream ID 04
08 | stream_id

0

MAAP data 12 | requested_start_address
16 | requested_count
20 | conflict_start_address
24 | conflict_count

MAAPv2: Legacy message_types (1,2,3)

FE | 0 | 0 | 1,2,3 | 2 | 16

| | | | 0 0 1 2 3 4 5 6 7 | 8 | 9 0 1 2 | 3 4 5 | 6 7 8 9 | 2 0 1 2 3 4 5 6 7 8 9 | 3 0 1 |

subtype data 00 | subtype | sv | version | message_type | maap_version | control_data_length

Stream ID 04
08 | stream_id

MAAP data 12 | requested_start_address
16 | requested_count
20 | conflict_start_address
24 | conflict_count

information used by new server process

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MAAPv2: New message_types

FE 0 4,5,6... 2 >16

	0 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
subtype data 00	subtype	sv	version	message_type	maap_version	control_data_length
Stream ID 04 08	stream_id
MAAP data 12 16 20 24	requested_start_address
	requested_count
	conflict_start_address
	conflict_count
	address information, etc.

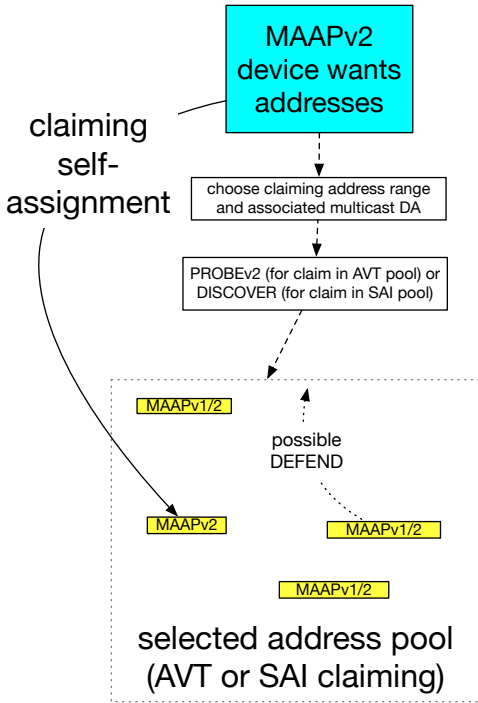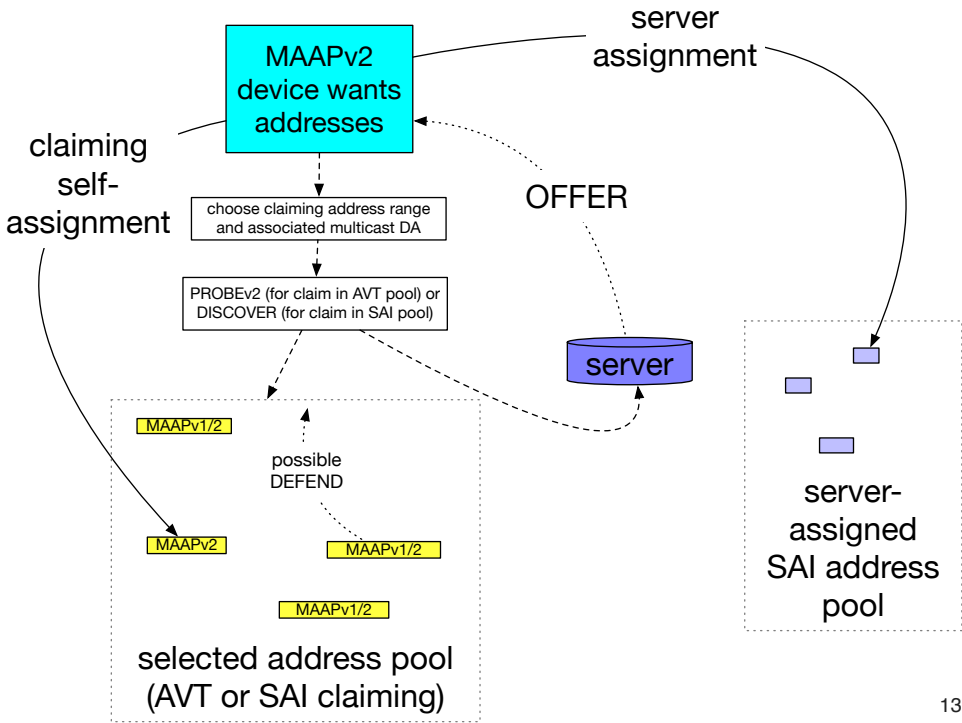information used by new process
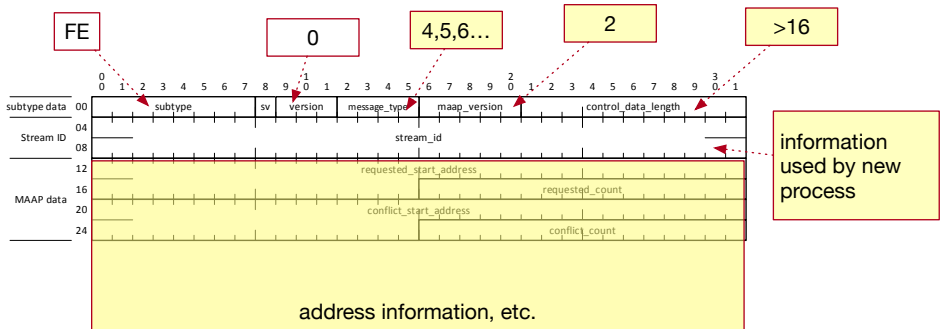
3. server responds to MAAPv2 PROBE

• Discussion during 802.1 TSN comment resolution led to:
Introduce text to allow new server to hear and respond to upgraded MAAP message from upgraded MAAP client, such that upgraded MAAP client is enabled to respond to server assignment with newly-specified MAAP message_type, and such that pre-existing MAAP client understands upgraded MAAP message.
• see figure…

MAAPv2 device wants addresses

claiming self-assignment

choose claiming address range and associated multicast DA

PROBEv2 (for claim in AVT pool) or DISCOVER (for claim in SAI pool)

MAAPv1/2

possible DEFEND

MAAPv2

MAAPv1/2

MAAPv1/2

selected address pool (AVT or SAI claiming)

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server assignment

MAAPv2 device wants addresses

claiming self-assignment

OFFER

choose claiming address range and associated multicast DA

PROBEv2 (for claim in AVT pool) or DISCOVER (for claim in SAI pool)

server

MAAPv1/2

possible DEFEND

MAAPv2

MAAPv1/2

MAAPv1/2

selected address pool (AVT or SAI claiming)

server-assigned SAI address pool

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The Way Forward

- Proposal here is a major change, proposing a MAAP-centric solution.

- Further comment resolution follows in TSN.

- Next draft will probably include major changes.

- Many more rounds of balloting in TSN, 802.1 WG, and IEEE SA

- Comments welcome now, or later.

- Can plan further presentations to 1722.