P802.1CQ Update of 2020-03-19

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P802.1CQ Administrative Status

- P802.1CQ Multicast and Local Address Assignment
  [https://1.ieee802.org/tns/802-1cq/](https://1.ieee802.org/tns/802-1cq/)

- 802.1 WG Motion (approved 2020-07-18): *802.1 authorizes Roger Marks, the Editor of P802.1CQ Multicast and Local Address Assignment to prepare drafts for and conduct Task Group balloting still not quite ready, but close*

- **PAR** approved 2016-02-05 (expires 2020-12-21) both peer-to-peer address claiming and address server

- **Draft PAR extension** request reviewed by IEEE 802 no comments submitted could be agreed by 802.1 WG in ePoll
Key Points

• Integrate MAC Address Acquisition Protocol (MAAP) from IEEE Std 1722-2016 into draft, with minor error corrections, as one method
  - claiming (peer-to-peer)
  - backward compatible with existing MAAP
• new Protocol for Assignment of Local and Multicast Addresses (PALMA)
  - Supports both claiming (peer-to-peer) and client/server assignment
  - Messaging begins with DISCOVER (multicast from client; seeks server or peer)
    - may require client to adopt a source address chosen randomly from a specified range
    - note that we are calling it a “client” even when there is no server
  - If server hears DISCOVER
    - OFFER (server to client)
    - REQUEST (client to server)
    - ACKNOWLEDGE (server to client)
  - If peer hears DISCOVER claiming address already in use
    - DEFEND (peer to client to defend address)
    - ANNOUNCE (multicast announcement by client of claimed addresses)
Address Pools and Reboots

- Each server needs a disjoint address pool
- Claiming operation needs a disjoint address pool.
- MAAP specifies that addresses can be saved in persistent storage; at bootup, a device may issue a multicast DISCOVER with the prior self-assigned address; or a unicast DISCOVER to the server.
- A server may offer an address in response to the multicast DISCOVER.
- Devices should prefer server-assigned addresses, because self-assigned addresses result in a lot of multicast noise.
PALMA Claiming Message Exchange

Legend: MESSAGE [SA, DA] (parameters)

Client 1

DISCOVER [random1, mcast1] (rangeX)  random1 $\not\in$ rangeX

DISCOVER [random2, mcast1] (rangeX)  random2 $\not\in$ rangeX

DISCOVER [random3, mcast1] (rangeX)  random3 $\not\in$ rangeX

ANNOUNCE [client1, mcast1] (rangeX)

ANNOUNCE [client1, mcast1] (rangeX)  client1 $\in$ rangeX

DISCOVER [random4, mcast1] (rangeY)  rangeY overlaps rangeX

DEFEND [client1, random4] (rangeY)

Client 2
PALMA Client/Server Message Exchange

Legend: MESSAGE [SA, DA] (parameters)

Client 1  
- DISCOVER [random1, mcast1] (rangeX)
- DISCOVER [random2, mcast1] (rangeX)
- OFFER [server1, random1] (rangeY1)
- OFFER [server2, random2] (rangeY2)
- REQUEST [unicast1, server1] (rangeY1)
- ACK [server1, unicast1] (rangeY1)
- ANNOUNCE and DEFEND deactivated since address is in server-assigned range

Server 1  
- random1 \not\in rangeX
- random2 \not\in rangeX

Client 2

Server 2

Note: If client address is from the random range, then rangeY includes at least one unicast address, for the client address.
Updated PALMA flowcharts

- Client Discovery
- Client Listening State, Self-assigned Client
- Server

- Have presented and discussed versions before
- New versions follow
Self-assigned addresses and server-assigned addresses will be restricted by the standard to separate address blocks.

Server-assigned addresses need no defense since only a server can assign them. Therefore, clients with server-assigned addresses need not send or receive ANNOUNCE messages.

Server address blocks need to be independent from those of other servers.

A client sends a DISCOVER to a known server with unicast; otherwise, it uses multicast.
Client Listening State, Self-assigned Client

Note: Self-assigned addresses and server assigned addresses will be restricted by the standard to separate address blocks.

Server-assigned addresses need no defense since only a server can assign them. Therefore, clients with server-assigned addresses need not receive or respond to DISCOVER or ANNOUNCE messages or send DEFENDs.

Server address blocks need to be independent from those of other servers.
Start

REQUEST

Receive DISCOVER, ANNOUNCE, or REQUEST message

ANOUNCE

address range objection

Yes

Issue OFFER with alternate range

Note: Should servers periodically announce themselves and listen for other servers, in case two networks, with separate servers, become joined?

ADDRESS range unavailable?*

Yes

Issue OFFER with alternate range

No

Receive DISCOVER, ANNOUNCE, or REQUEST message

DISCOVER

Issue OFFER per requested range

Send ACK (error)

valid range request

Yes

Send ACK

No

Address range unavailable?*

Includes case in which address range is in the self-assigned address range.
Next Steps

• Incorporate these processes into the P802.1CQ draft
• Open TG ballot soon