Maintenance items #226 and #227

Review

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Item #226

Item #226 - Introduction
6.6 Active Destination MAC and VLAN Stream identification

Use ***Active Destination MAC and VLAN Stream identification*** to identify a stream and replace its destination MAC/VLAN.

An example use within a bridge would be to receive a unicast stream from a Talker, then re-address it as a multicast AVB stream as it is forwarded on in the network, and finally restoring the Talker's original unicast destination addressing as it exits the last bridge on its final hop to the Listener.

Talker and Listener will have no idea that the stream was turned in to an "AVB Stream" within the bridged network.

Item #226 – How is a stream identified
6.6 Active Destination MAC and VLAN Stream identification

802.1CB can identify a stream's frames with two methods:

1. An input frame can have an internal stream_handle assigned to it by 6.4 *(Null Stream identification)*, 6.5 *(Source MAC and VLAN Stream identification)* or 6.7 (*IP Stream identification*). On the bridge's output side processing, if the frame's internal stream_handle matches the stream_handle defined by the Active Destination MAC/VLAN managed objects we have a match. See Figure C-5 for an example of this.
2. If an input frame has a MAC/VLAN that matches those defined by the parameters in 9.1.2 (as part of the 9.1.2 + 9.1.4 set) we have a match. An example of this usage is a Listener proxy or shim that wants to replace the incoming AVB related multicast MAC address with the Talker's original destination unicast MAC address; assuming a Talker proxy had already done the reverse unicast-to-multicast replacement to make it an AVB stream.

Item #226 – What's the problem?
6.6 Active Destination MAC and VLAN Stream identification

There are two places management parameters are needed:
- In the input direction for use in assigning an internal stream_handle,
- In the output direction for re-addressing frames as part of stream_handle matching.

The current text in the second paragraph of 6.6 incorrectly states that the output replacement values come from 9.1.2 (related problem text shown in red).

> "The replacement values for frames transmitted down the stack to the ActiveDestination MAC and VLAN Stream identification, and used to recognize frames passed up the stack to the Active Destination MAC and VLAN Stream identification function, are those listed in 9.1.2. The replacement values for frames passed up the stack (not including the priority parameter) are in 9.1.4."

9.1.2 only defines primitives to be used in *EISS indication primitives* (see that wording in 9.1.2.1 through 9.1.2.3). In other words, 9.1.2 is only used for identification.

9.1.4 defines replacement parameters for the both down (9.1.4.1 through 9.1.4.4) and up (9.1.4.5 through 9.1.4.8) direction, that are passed in *EISS request primitives*.

Therefore, 9.1.2 is used for stream identification and 9.1.4 is used for replacement values.

Item #226 – Suggested “corrected” text
6.6 Active Destination MAC and VLAN Stream identification

Replace this text:

> "The replacement values for frames transmitted down the stack to the ActiveDestination MAC and VLAN Stream identification, and used to recognize frames passed up the stack to the Active Destination MAC and VLAN Stream identification function, are those listed in 9.1.2. The replacement values for frames passed up the stack (not including the priority parameter) are in 9.1.4."

With these two sentences:

> "The managed objects for Active Destination MAC and VLAN Stream identification for frames passed up the stack are described in 9.1.2. The replacement values for frames passed up or down the stack are described in 9.1.4."

I crafted the first sentence to more closely match similar single sentence paragraphs found in 6.4, 6.5 and 6.7, the other Stream identification functions.

Note that I also removed the "(not including the priority parameter)" text since 9.1.4.4 and 9.1.4.8 define the down and up replacement priority values.

Item #226 – A second change
6.6 Active Destination MAC and VLAN Stream identification

I also suggest reworking the first paragraph of 9.1.2 since that only references 6.4. However, 9.1.2 is also used by 6.6 (what we have discussed on the previous slides).

Option 1: Replace the first paragraph in 9.1.2:

> "When instantiating an instance of the Null Stream identification function (6.4) for a particular input Stream, the managed objects in the following subclauses serve as the tsnStreamIdParameters managed object (9.1.1.7)."

With this paragraph:

> "When instantiating an instance of the Null Stream identification function (6.4), or the Active Destination MAC and VLAN Stream identification (6.6), for a particular input Stream, the managed objects in the following subclauses serve as the tsnStreamIdParameters managed object (9.1.1.7)."

Option 2: However, realizing that when 9.1.2 is used with Active MAC/VLAN (6.6) that the objects defined in 9.1.2 are only a subset of the required objects (since 9.1.4 objects are also required), it may be better to leave the first paragraph as-is and insert a new second paragraph:

> "When instantiating an instance of the Active Destination MAC and VLAN Stream identification function (6.6) for a particular input Stream, the managed objects in the following subclauses along with those described in 9.1.4, serve as the tsnStreamIdParameters managed object (9.1.1.7)."

Item #226 – A third change
6.6 Active Destination MAC and VLAN Stream identification

Table 9-1 (Stream identification types) associates the Stream identification functions with the Controlling parameters. The Active Destination MAC and VLAN Stream identification row references 9.1.4. It should also reference 9.1.2.

Table 9-1 – Stream Identification types

OUI/CID	Type number	Stream identification function	Controlling parameters
…	…	…	…
00-80-C2	3	Active Destination MAC and VLAN Stream identification (6.6)	9.1.2, 9.1.4
…	…	…	…

Item #226 – A fourth change
6.6 Active Destination MAC and VLAN Stream identification

Table 6-1 (Stream identification functions) has a similar change for the Active Destination MAC and VLAN Stream identification row. Change the "6.6, 9.1.4" reference to "6.6, 9.1.2, 9.1.4".

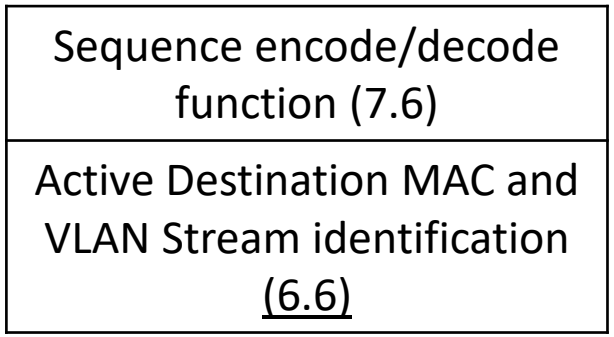
Table 6-1 – Stream identification functions

Stream Identification Function	Active/passive	Examines	Overwrites	Reference
...	...	...	...	
Active Destination MAC and VLAN Stream identification	Active	destination_address, vlan_identifier	destination_address, vlan_identifier, priority	6.6, 9.1.2, 9.1.4
...	...	...	...	

Item #226 – A fifth change
6.6 Active Destination MAC and VLAN Stream identification

See Figure C-5 (an excerpt is included on this slide). Note that the *Active Destination MAC and VLAN Stream identification* box in the middle of the diagram is missing "(6.6)"; this is similar to the use of "(6.7)" in the IP Stream identification box to the left of this box.

Add “(6.6)” to the box. Notice that depending on how this is done it may make the box a bit taller.



The only reason I found this is in Acrobat I got tired of typing in the search term "Active Destination MAC and VLAN Stream identification" and started searching for 6.6; which missed Figure C-5.

Item #227

Item #227 – What's the problem?

Informative NOTE is incorrect (or is it just how I am reading it?)

The NOTE on page 26 incorrectly states that all stream identification methods (i.e. 6.4, 6.5, 6.6, 6.7) are required:

> "NOTE—In principle, any number of different methods for identifying and encoding Streams can be defined. Several required methods are specified in the following subclauses (6.4, 6.5, 6.6, 6.7)."

Did the author intend that the note is a list of applicable subclauses, some required, some not?

What is the current status of MUST/SHOULD/MAY in clause 5 for the stream identification methods?

- 6.4 (NULL Stream) is required (**SHALL**) as per 5.3, 5.6, 5.9, and 5.12.
- 6.5 (Source MAC & VLAN) is not mentioned anywhere in clause 5 or its subclauses. Should it be?
- 6.6 (Active Destination MAC/VLAN) is recommended (**SHOULD**) as per 5.4, 5.7, 5.10, and 5.13.
- 6.7 (IP Stream) is optional (**MAY**) as per the end-station requirements in 5.5, 5.8, 5.11; but recommended in relay system requirements in 5.13.

Item #227 – My recommendation

Informative NOTE is incorrect

Focusing on clause 5, I would suggest that 6.4 (NULL Stream) is SHALL, 6.5 (Source MAC & VLAN) is SHOULD, 6.6 (Active Destination MAC/VLAN) is SHOULD, and 6.7 (IP Stream) is MAY/SHOULD.

The necessary changes would be:

1. Remove the word "required" from the NOTE on page 26.
2. Add 6.5 (now missing from clause 5) to the SHOULD sections, which are clause 5.4, 5.7, 5.10, 5.13 (recommended behavior for Stream ID components, Talkers, Listeners, Relay systems, respectively). Just look for everywhere 6.6 is referenced in clause 5 and add 6.5 there as well.

802.1CB is standalone and it is specifically written for routers and bridges. Therefore, I think having 6.7 (IP Stream identification) as optional for end stations and recommended for routers is correct. No changes required here.

Unreported issue

IP-based Stream identification (6.7)

Requires IP address and MAC address match

The IP-based Stream identification currently requires an IP address match and a MAC address match. I would suggest that replacement equipment that is going to be swapped in will likely have its IP address assigned to it before it is swapped in, but it’s MAC address will (almost) never match. Of course there is equipment that allows you to spoof another MAC address, but CB should not make that a necessary step in order to replace failed end stations.

Here's my justification: a Pro Audio system controller expects every device in that system to have a unique IP address. If a device fails, its replacement is assigned the same IP address so the controller can find and monitor it. Therefore, when using IP addressing, it is often the case that the IP address is as unique to a device as is the MAC DA. Forcing the bridges in this failure case to be reconfigured for the new MAC DA seems to put an unnecessary burden on system management.

IP-based Stream identification (6.7)

Here's the requirements from the standard and a suggested fix

IP-based Stream identification is configured via parameters from 9.1.5:

- **9.1.5.1 tsnCpeIpIdDestMac** – specified value **must be matched**.
- 9.1.5.2 tsnCpeIpIdTagged – a value of "All" matches everything (i.e. **ignore** the Tag).
- 9.1.5.3 tsnCpeIpIdVlan – **ignored** if 9.1.5.2 is "All".
- 9.1.5.4 tsnCpeIpIdIpSource – **ignored** if zero.
- 9.1.5.5 tsnCpeIpIdIpDestination – specified value **must be matched**.
- 9.1.5.6 tsnCpeIpIdDscp – **ignored** if value = 64.
- 9.1.5.7 tsnCpeIpIdNextProtocol – **ignored** if "none".
- 9.1.5.8 tsnCpeIpIdSourcePort – **ignored** if zero.
- 9.1.5.9 tsnCpeIpIdDestinationPort – **ignored** if zero.

The 9.1.5 subclause can be fixed by using similar language regarding "ignored if zero" that is used with the other parameters in this subclause. Suggested fix:

> 9.1.5.1 tsnCpeIpIdDestMac
>
> Specifies the destination_address parameter that identifies a packet in an EISS indication primitive. A value of 0 indicates that the destination_address of the packet is to be ignored on packets received from lower layers.

Questions?
Thank you!