MITSUBISHI ELECTRIC
Changes for the Better

802.1CBdb
EISS-parameters-based Mask&Match Stream Identification Function

IEEE 802.1 Interim Hiroshima

January, 2019

Mitsubishi Electric R&D Centre Europe

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- Outcome of Bangkok meeting
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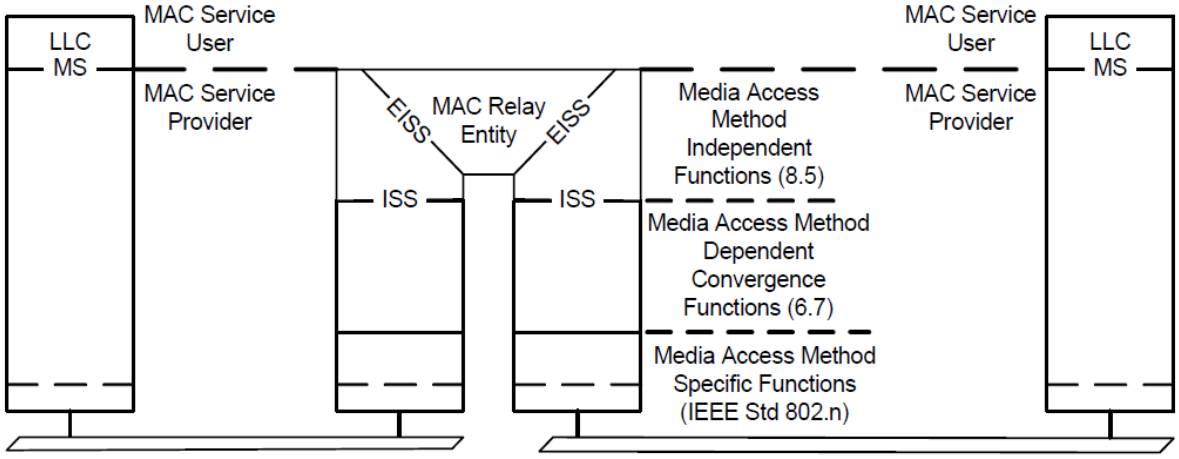
Context, proposal and issues

OUTCOME OF BANGKOK MEETING

The context

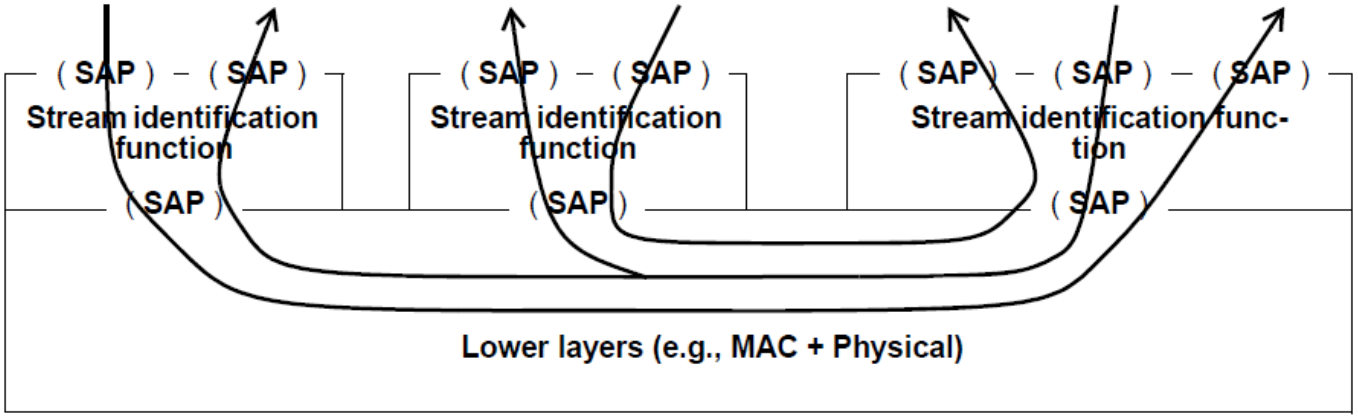
- Recall of the MAC sublayer internal organization, 802.1Q Cl. 6



  - The MAC Sublayer comprises:
    - a) Media access method-specific functions that realize transmission and reception of MAC Protocol Data Units (MPDUs).
    - b) Media access method-dependent convergence functions that use item a) to provide a media access method-independent service.
    - c) Media access method-independent functions that use a media-independent service to provide the same or another media-independent service.
  - A MAC Bridge's MAC Relay Entity forwards frames between the instances of the media-independent ISS (IEEE Std 802.1AC).
  - A VLAN Bridge's MAC Relay Entity forwards frames between the instances of the media-independent EISS (6.8). The EISS is provided by the functions specified in 6.9 using the media-independent ISS (IEEE Std 802.1AC). The convergence functions that provide the ISS using the media-specific functions for each IEEE 802 LAN MAC type are specified in IEEE Std 802.1AC.

The context

- What 802.1CB says about the stream identification functions' location in the 802.1 stack
  - "Stream identification utilizes a single Service Access Point (SAP) to a connectionless packet service offered by the layer below it [e.g., the Intermediate Sublayer Service (ISS) of Clause 11 of IEEE Std 802.1AC], and offers an array of SAPs to the layers above it, corresponding to different Streams."

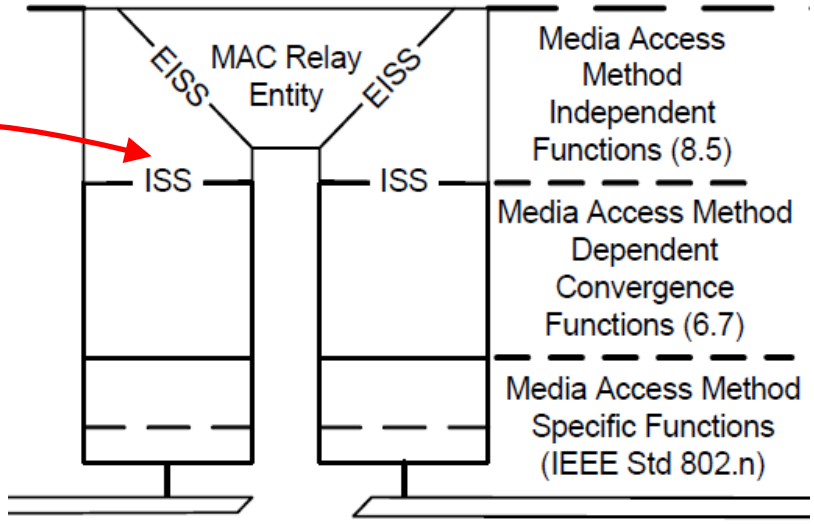


Bangkok proposal

- M&M stream identification on top of the ISS

M_UNITDATA.indication
M_UNITDATA.request

M_UNITDATA.indication (
destination_address,
source_address,
mac_service_data_unit,
priority,
drop_eligible,
frame_check_sequence,
service_access_point_identifier,
connection_identifier
)



  - M&M stream identification function using a subset of the ISS indication primitive parameters as inputs (up the stack):
    - destination_address
    - source_address
    - mac_service_msdu

Bangkok proposal

- Mask&Match stream identification function based on a union of 2 sets of parameters :
  - Address (source and/or destination) set
  - msdu bit field set
    - the mask of the fields that have to be matched within the *mac_service_msdu* in the form of list of offset-length couples:

      {(offset$_1$,length$_1$); (offset$_2$,length$_2$); …; (offset$_N$,length$_N$)}

      Offsets and lengths expressed in bits

      First bit of the *mac_service_msdu* at offset 0

Issues

- Possible incompatibility with the stream identification functions already defined in 802.1CB.
  - The 4 functions already defined in 802.1CB are located on top of the EISS (Enhanced Internal Sublayer Service)
    - their integration in the bridging stack is described in the context of VLAN-capable bridges.

Issues

- In addition, the approach taken in the Bangkok proposal was making the M&M stream identification function (kind of) part of the EISS
  - Ending up making it another function supporting the EISS in addition to the tagging and untagging functions.
  - This is not 802.1CB anymore...

M&M identification on top of the EISS

NEW PROPOSAL

New proposal

- M&M stream identification as passive stream identification function on top of the EISS
  - implemented only up the stack
  - using a subset of the *EM_UNITDATA.indication* primitive parameters as input

(
destination_address,
source_address,
mac_service_data_unit*,
priority,
drop_eligible,
vlan_identifier,
frame_check_sequence,
service_access_point_identifier,
connection_identifier,
flow_hash,
time_to_live
)

* If the frame is VLAN-tagged, the mac_service_data_unit is the mac_service_data_unit provided by the ISS, which VLAN-tag has been removed.

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New proposal

- Similar to the Bangkok proposal: a union of 2 sets of masks to be matched:
  - {da_mask, sa_mask, vlan_id_mask} U {msdu_mask}
    - with {msdu_mask} = {(offset1, length1), (offset2, length2), …, (offsetN, lengthN)} or Ø
  - with the following conditions:
    - offset = 0 points to the first bit of the mac_service_data_unit
    - The values of N, offsetN and lengthN are bounded.
    - If da_mask is NULL, the destination_address parameter is ignored.
    - If sa_mask is NULL, the source_address parameter is ignored.
    - If the frame is VLAN-tagged and vlan_id_mask is NULL, the vlan_identifier is ignored.

New proposal

- How to determine if a frame is tagged or untagged
  - The EISS indication primitive always provides a vlan_identifier parameter
  - In the case “Port-and-Protocol-based VLAN Classification” (802.1Q Cl. 6.12) is not used
    - Tagged frames can be identified by:
      - vlan_identifier in the range 001-FFE, excluding PVID
    - And untagged frames by:
      - vlan_identifier = PVID

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New proposal

- msdu_mask dimensioning:
  - Number of (offset, length) couples
  - Unit of offset and length: bits or bytes
  - Max offset value, max length value

- Would we really need any finer granularity in the definition of the da_, sa_ and vlan_id_ masks ?
  - i.e. use for each of these masks a definition similar to the msdu_mask's

Way Forward

ADDITIONS AND CHANGES TO 802.1CB

Changes in 802.1CB

- Addition of a new passive stream identification function in 802.1CB Clause 6
  - Sub-clause 6.8 “Bit field mask stream identification”*
    - Passive identification function that sits at the EISS interface with the uuper layers
    - Uses specific EISS’s indication primitive parameters as input:
      - source_address, destination_address, vlan_identifier, mac_service_msdu
    - The function defines a set of bit fields obtained by masking these input parameters
    - The *stream_handle* produced by the function is derived from the matching of the bit field(s) with values defined by network management or stream establishment signaling.

*: name proposal

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Changes in 802.1CB

- Clause 9 “Stream Identification Management”
  - Addition of a new *tsnStreamIdIdentificationType*
    - OUI: 00-80-C2, Type number: 5
  - Addition of managed objects (*tsnStreamIdParameters*) for bit field set identification
    - Sub-clause 9.1.6
    - See next slide
- Other clauses to be modified
  - 5 “Conformance”
  - Annex A “PICS”
- Additional clauses:
  - YANG model
  - Informative annex: example use of the function

Changes in 802.1CB

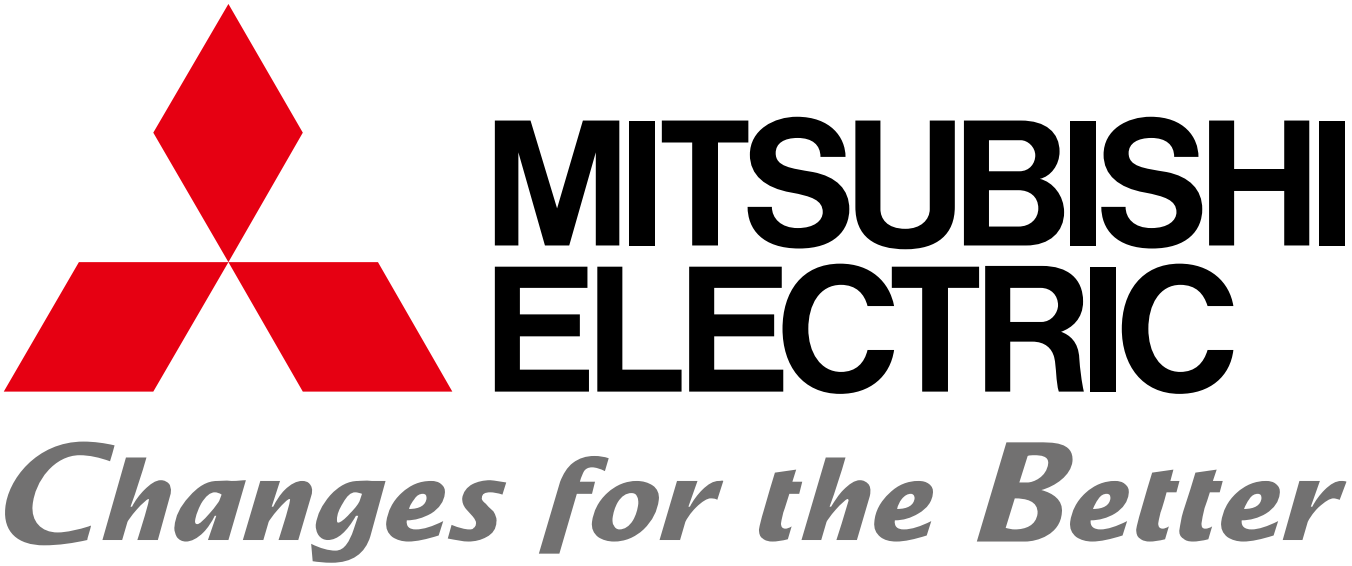
- tsnStreamIdParameters

Name	Description
tsnCpeMmIdDestAddMask	48-bit mask to be applied to the destination_address parameter passed up by the EM_UNITDATA.indication primitive
tsnCpeMmIdDestAddMatch	N-bit value to be matched with the masked destination_address parameter
tsnCpeMmIdSrcAddMask	48-bit mask to be applied to the source_address parameter passed up by the EM_UNITDATA.indication primitive
tsnCpeMmIdSrcAddMatch	N-bit value to be matched with the masked destinationource_address parameter
tsnCpeMmIdVlanIdMask	12-bit mask to be applied to the vlan_identifier parameter passed up by the EM_UNITDATA.indication primitive
tsnCpeMmIdVlanIdMatch	N-bit value to be matched with the masked vlan_identifier parameter
tsnCpeMmIdMsduFieldNb	Number of bit fields to be matched in the mac_service_data_unit parameter passed up by the EM_UNITDATA.indication primitive **(max value ?)**
tsnCpeMmIdMsduFieldMask1	Bit field mask, defined by the couple (Offset1, Length1), to be applied to the mac_service_data_unit parameter passed up by the EM_UNITDATA.indication primitive. Result of masking = MsduField1 **(Offset and Length max values ?)**
tsnCpeMmIdMsduFieldMatch1	Length1-bit value to be matched with MsduField1
…	
tsnCpeMmIdMsduFieldMaskN	Bit field mask, defined by the couple (OffsetN, LengthN), to be applied to the mac_service_data_unit parameter passed up by the EM_UNITDATA.indication primitive. Result of masking = MsduFieldN
tsnCpeMmIdMsduFieldMatchN	LengthN-bit value to be matched with MsduFieldN

What's next ?

- Is this new proposal acceptable from a technical content point of view ?
  - Any missing bits ?
  - Any switch / bridge implementer or user having issues with such an identification function ?
- Mature enough to start editing ?

Thank you for your attention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