Consistent VID to MSTID Allocation

A contribtion to the IEC/IEEE 60802 Joint Project for discussion

presenter: János Farkas

Background

- A former individual contribution on the subject
  - https://www.ieee802.org/1/files/public/docs2021/60802-farkas-consistent-VID-to-MSTID-allocation-0721-v01.pdf
  - Presented at the 2021 July IEEE 802 Plenary Session
  - None of the proposed solutions were accepted for progression at that Session
  - A further solution was proposed at that Session
    - Use MSTP such that only the support of TE-MSTID and MSTID 0 is mandatory,
    - Need to support only a single spanning tree instance
      - the Common and Internal Spanning Tree Instance (CIST), which can be used for non-engineered traffic

- The subject has not been discussed further until the 2022 May IEEE 802.1 Interim Session (other than checking corresponding YANG modules)

- Configuration details have been started to be developed in recent contribution, see 6.7.4.4 in https://www.ieee802.org/1/files/private/60802-drafts/d1/60802-Dorr-YANG-reconciled-0522-v01.pdf

Additional Background Presentations

- IEC/IEEE 60802 Loop Prevention in Required Topologies:
    - https://www.ieee802.org/1/files/public/docs2020/60802-dorr-MST-0820-v01.pdf

- Boundary Port Isolation Requirements and assigned features
    - https://www.ieee802.org/1/files/public/docs2022/60802-Steindl-Boundary-Port-Isolation-0322-v01.pdf

Recap:

- Caveats
  - (presented in https://www.ieee802.org/1/files/public/docs2021/60802-farkas-consistent-VID-to-MSTID-allocation-0721-v01.pdf)
  - MSTP specific features are not exposed to RSTP in 802.1Q, e.g.:
    - The capability of allocating different VIDs to different spanning tree instances was not of interest in case of a single spanning tree instance.
    - The configuration "knob" for allocating VIDs to the TE-MSTID was introduced for MSTP and is not exposed to RSTP.
    - MCID is not carried in RST BPDUs.

- Note
  - RSTP and MSTP provide connectivity
    - RSTP: single spanning tree instance
    - MSTP: fall back to CIST in case of mismatching MCIDs

RST, MST, SPT BPDU format

- Figure 14-1 from P802.1Q-Rev/D1.1 (March 24, 2022)

Octet

Protocol Identifier	1–2
Protocol Version Identifier	3
BPDU Type	4
CIST Flags	5
CIST Root Identifier	6–13
CIST External Path Cost	14–17
CIST Regional Root Identifier	18–25
CIST Port Identifier	26–27
Message Age	28–29
Max Age	30–31
Hello Time	32–33
Forward Delay	34–35
Version 1 Length = 0 (RST, MST, SPT BPDUs only)	36
Version 3 Length (MST, SPT BPDUs only)	37–38
MST Configuration Identifier	39–89
CIST Internal Root Path Cost	90–93
CIST Bridge Identifier	94–101
CIST Remaining Hops	102
MSTI Configuration Messages (may be absent)	103–39 + Version 3 Length
Version 4 Length (SPT BPDUs only)	(40 + Version 3 Length) – (41 + Version 3 Length)
Auxiliary MCID (SPT BPDUs only)	(42 + Version 3 Length) – (92 + Version 3 Length)
SPT Agreement Number, Discarded Agreement Number, Agreement Digest (SPT BPDUs only)	(93 + Version 3 Length) – (41 + Version 3 Length + Version 4 Length)

MCID → MST Configuration Identifier

for the spanning tree instances in use (out of the 64) *May be absent!*

only for the Shortest Path Trees (SPTs) of Shortest Path Bridging