IEC/IEEE 60802
Missing MSTP YANG

Josef Dorr, Siemens AG

MSTP Configuration

IEC/IEEE 60802 D1.4:

> "The MSTP configuration is either default or accomplished by IA-station specific means."
>
> *"Editor's Note: There is no MSTP YANG available yet."*

Is this a problem for IEC/IEEE 60802 ?

A look at writable objects in IEEE8021-MSTP-MIB should be helpful.

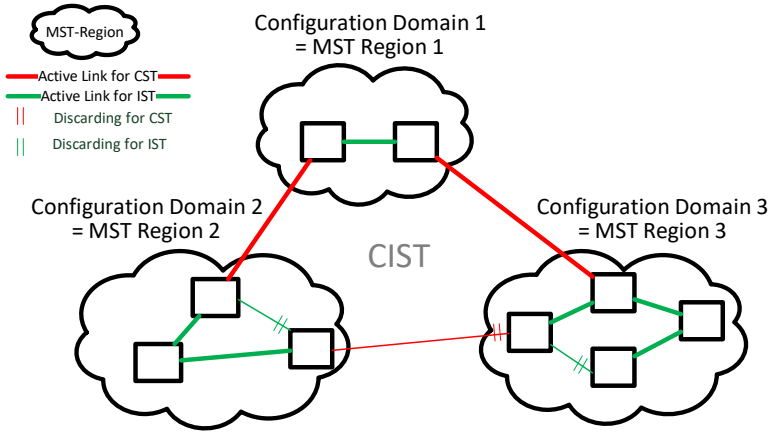
IEEE8021-MSTP-MIB: Structure

IEEE8021-MSTP-MIB

- includes 22 writeable objects (1 deprecated) in 7 tables:
  - ieee8021MstpCistTable - one row per Bridge component
  - ieee8021MstpCistPortTable / ieee8021MstpCistPortExtensionTable - one row per Bridge component and Port
  - ieee8021MstpTable - one row per Bridge component and MST-ID
  - ieee8021MstpPortTable: - one row per Bridge component and MST-ID and Port
  - ieee8021MstpFidToMstiV2Table - covered by ieee802-dot1q-bridge:fid-to-mstid
  - ieee8021MstpVlanV2Table - covered by ieee802-dot1q-bridge:vid-to-fid/fid-to-mstid
  - ieee8021MstpConfigIdTable - one row per Bridge component
- All tables are shown in UML-like notation in the following slides – with focus on rw objects

IEEE8021-MSTP-MIB: CistTable

```
+--rw Mstp
   +--rw Cist* [ComponentId]
      +ro-- ComponentId              Unsigned32
      +ro-- BriddgeIdentifier        OCTET STRING (SIZE (8))
      +ro-- TopologyChange           bool
      +ro-- RegionalRootIdentifier   OCTET STRING (SIZE (8))
      +ro-- PathCost                 Unsigned32
      +rw-- MaxHops                  Integer32[6..40]  // default 20
```



https://www.ieee802.org/1/files/public/docs2020/60802-dorr-MST-0820-v01.pdf

IEC/IEEE 60802 expected usage of CistTable parameters (per Bridge component)		
Parameter	**Value**	**Comment**
…CistMaxHops:	? 20 ?	Support of up to 64/100 hops is required for WorkingClock/GlobalTime domains.

IEEE8021-MSTP-MIB: CistPortTable

```
+--rw Mstp
   +--rw CistPort* [ComponentId, PortNum]
      +ro-- ComponentId          Unsigned32
      +ro-- PortNum              port-number
      +ro-- UpTime               time
      +rw-- AdminPathCost        Integer32[0..200000000]
      +ro-- DesignatedRoot       OCTET STRING (SIZE (8))
      +ro-- TopologyChangeAck    bool
      +ro-- HelloTime            Integer[100..1000]
      +rw-- AdminEdgePort        bool
      +ro-- OperEdgePort         bool
      +rw-- MacEnabled           bool
      +ro-- MacOperational       bool
      +rw-- RestrictedRole       bool
      +rw-- RestrictedTcn        bool
      +ro-- Role                 enum
      +ro-- Disputed             bool
      +ro-- CistRegionalRootId   OCTET STRING (SIZE (8))
      +ro-- CistPathCost         Unsigned32(0..2147483647)
      +rw-- ProtocolMigration    bool
      +rw-- EnableBPDURx         bool
      +rw-- EnableBPDUTx         bool
      +rw-- PseudoRootId         OCTET STRING (SIZE (8))
      +rw-- IsL2Gp               bool
   // port-extension-table
      +rw-- AutoEdgePort?        bool
      +ro-- AutoIsolatePort?     bool
```

IEC/IEEE 60802 expected usage of CistPortTable parameters (per Bridge component and Port)		
Parameter	**Value**	**Comment**
Fixed default configuration		
…AdminPathCost	0	automatically calculated default Path Cost values
…EnableBPDURx	TRUE	receive BPDUs
…EnableBPDUTx	TRUE	send BPDUs
…AutoEdgePort	TRUE	Bridge detection state machine is supported and active
Not supported		
…AdminEdgePort	n.a.	Management cannot set a port into Edge state
…MacEnabled	n.a.	Management cannot set the MAC in enabled state
…RestrictedRole	n.a.	Management cannot restrict port roles (i.e. influence spanning tree construction)
…RestrictedTcn	n.a.	topology change is propagated to all other Ports
…ProtocolMigration	n.a.	Port Protocol Migration state machine is not supported
…PseudoRootId	n.a.	L2GP (L2 Gateway Port) operation is not supported
…IsL2Gp	n.a.	L2GP (L2 Gateway Port) operation is not supported

IEEE8021-MSTP-MIB: MstpTable/MstpPortTable

```
+--rw Mstp
   +--rw Mstp* [ComponentId, MstId]
      +rc-- ComponentId          Unsigned32
      +rc-- MstId                Integer32[1..4094]
      +ro-- BriddgeId            OCTET STRING (SIZE (8))
      +ro-- TimeSinceTopoChange  time
      +ro-- TopoChanges          counter
      +ro-- TopoChange           bool
      +ro-- DesignatedRoot       OCTET STRING (SIZE (8))
      +ro-- RootPathCost         Unsigned32
      +ro-- RootPort             port-number
      +rc-- BridgePriority       integer32[0..61440]
      +ro-- Vids0                OCTET STRING (SIZE(128))
      +ro-- Vids1                OCTET STRING (SIZE(128))
      +ro-- Vids2                OCTET STRING (SIZE(128))
      +ro-- Vids3                OCTET STRING (SIZE(128))
      +rc-- RowStatus            row-status
```

```
+--rw Mstp
   +--rw MstpPort* [ComponentId, MstId, PortNum]
      +ro-- ComponentId       Unsigned32
      +ro-- MstId             Integer32[1..4094]
      +ro-- PortNum           port-number
      +ro-- UpTime            time
      +ro-- State             enum
      +rw-- Priority          integer32[0..240]
      +rw-- PathCost          Integer32[1..200000000]
      +ro-- DesignatedRoot    OCTET STRING (SIZE (8))
      +ro-- DesignatedCost    Integer32
      +ro-- DesignatedBridge  OCTET STRING (SIZE (8))
      +ro-- DesignatedPort    port-num
      +ro-- Role              enum
      +ro-- Disputed          bool
      +rw-- AdminPathCost     Integer32[1..200000000]
```

IEC/IEEE 60802 expected usage of MstpTable / MstpPortTable (per Bridge component / Spanning Tree / Port)		
Parameter	**Value**	**Comment**
- not used - **- IEC/IEEE 60802 makes only use of the CIST Spanning Tree and TE-MSTID –**		

IEEE8021-MSTP-MIB: FidToMstiV2/VlanV2

```
+--rw mstp
   +--rw FidToMsti* [ComponentId, Fid]
      +ro-- ComponentId       Unsigned32
      +ro-- Fid               Unsigned32
      +rw-- MstId             Unsigned32[0..4095]

   +--rw Vlan* [ComponentId, Vid]
      +ro-- Component-Id      Unsigned32
      +ro-- Vid               Unsigned32[1..4094]
      +ro-- MstId             Unsigned32[0..4095]
```

IEC/IEEE 60802 expected usage of FidTiMsti/Vlan tables (per Bridge component)		
Parameter	**Value**	**Comment**
	- available in YANG -	
…FidToMsti	**is already included in YANG module ieee802-dot1q-bridge**	
…Vlan	**can be derived from vid-to-fid and fid-to-mstid of YANG module ieee802-dot1q-bridge**	

IEEE8021-MSTP-MIB: ConfigIdTable

```
+--rw Mstp
   +--rw ConfigId* [ComponentId]
      +ro-- ComponentId       Unsigned32
      +rw-- FormatSelector    integer32[0..0]
      +rw-- ConfigName        string[32]
      +rw-- RevisionLevel     integer32[0..65355]
      +ro-- ConfigDigest      string[16]
```

MST Configuration Identifier (MCID)

IEC/IEEE 60802 expected usage of MstpConfigIdTable (per Bridge component)		
Parameter	**Value**	**Comment**
Fixed default configuration		
…FormatSelector	0	the format specified in IEEE Std 802.1Q
…RevisionLevel	0	only a single revision level is supported
CNC controlled		
…ConfigName	???	initially: own Bridge address as a text string; After provisioning: CNC station address as a text string;

IEEE8021-MSTP-MIB - SUMMARY

1. MSTP can be used for IEC/IEEE 60802 with default values

   OPEN ISSUEs:

   a) Max Hop Count
   b) Config Name
2. Having no configuration capability implies:
   a) CIST calculation cannot be influenced by management
   b) CIST calculation is based on protocol decisions only (MAC addresses, link speeds)
3. Having no diagnostics capability implies:
   a) CIST cannot be evaluated by CNC (root bridge, port states)

Thank You

Questions?