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G.8031 Ethernet Linear Protection Switching

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Agenda

G.8031 Timeline
G.8031 (2006) Amd. 1 & Cor. 1
G.8031 (11/2009)
Future of G.8031

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G.8031/Y.1342 Ethernet Linear Protection Switching

- Defines the APS protocol and linear protection switching mechanisms for point-to-point VLAN-based ETH Sub Network Connection (SNC) in Ethernet transport networks
- v1 approved Jun 2006 (as discussed in Jun 2007)
- v2 approved Nov 2009
- v3 under study, up for potential consent in Feb 2011
Protected entity: point-to-point VLAN-based Ethernet SNC
- All other protection schemes including point-to-multipoint and multipoint-to-multipoint are for further study
- Disjoint Working and Protection transport entities
  - Using same or different VIDs
- SNC/S used for protection of a SNC
  - Can also be used to protect link or network connections

Sub-50ms Protection Switching (PS)
- 1-Phase APS (when needed)
- Revertive and non-revertive operation

G.8031:
- Defines 1:1 bi-directional PS
  - Using a Selector Bridge at head end
    (1:1 uni-directional PS not supported)
- Defines 1+1 uni/bi-directional PS
  - Using a Permanent Bridge at head end
- Uses a Selective Selector at tail end for both architectures

Prioritized switching triggers and requests
- SF, SF-P: upon CCM loss (w/ or w/o hold off)
- Local requests: LO, FS, MS, Clear
- Remote requests: rcvd via APS from far end

**Y.1731-defined APS PDU encapsulates G.8031-defined data (configurable MEL)**

<table>
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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<table>
<thead>
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<tbody>
<tr>
<td>Request/State</td>
<td>Prot Type</td>
<td>Requested Signal</td>
<td>Bridged Signal</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>D</td>
<td>R</td>
</tr>
</tbody>
</table>

**APS-Specific Information**

Request/State: top-priority global request as per switching algorithm
Protection Type: A (APS or not), B (1:1 or 1+1), D (bi or uni-directional), R (revertive or not)
Requested Signal: signal requested by near end to be carried over Protection
Bridged Signal: signal bridged by near end over Protection

**PS algorithm uses logic to**

- Prioritize local and (validated) remote requests vs PS triggers → Set local Bridge/Selector
- Detect mismatched Requested/Bridged Signals → Set Failure Of Protocol defect (dFOP – bridge/selector mismatch cleared by operator)
G.8031 (2006) Amd. 1 & Cor. 1

G.8031 (2006) Amd. 1
- Renamed to Ethernet "Linear" Protection Switching
  - No merging of G.8031 ELPS and G.8032 ERPS
- Added Management Information for configuration
- Specified Reverse Request (RR) in reply to Exercise (EXER)
  - No dFOP raised in the absence of RR
- Moved dFOP specification to G.8021
- Aligned modeling with G.8021

G.8031 (2006) Cor. 1
- Allowed activation of WTR timer even when both ends concurrently detect clearance of SF
- Specified DNR state is entered when in non-revertive mode and both ends are in NR state with protection active
G.8031 (11/2009)

- Added hold-off timer for SF-P
- Added MS-W operation (w/ MS>MS-W>WTR)
- Corrected text/figures for 1:1 bi-directional PS
- Added Appendix for state transition tables in SDL format
- Made various clarifications/corrections, e.g.:
  - Global priority logic calculates all state machine transitions
  - How equal-priority requests are handled
  - How “R” bit mismatch is handled to ensure interworking of revertive and non-revertive modes for both uni- and bi-directional failures (new WTR column in Tables A.4 & A.8)
  - PS algorithm updated and state transition tables augmented to avoid transient traffic loss and increase PS speed

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Future of G.8031

- G.8031 (11/2009) Cor. 1
  - Up for potential consent in Jun 2010
  - Further clarifies PS algorithm
  - Adds omitted state transition to avoid transient traffic loss

- Future G.8031 for potential consent in Feb 2011
  - Broadcast bridge to support SD-based PS, which:
    - Is recommended to be used in revertive mode
    - Could also be used for SF
    - Remains under study

- Current Study Points (SPs) on the Living List
  - Retained SP on DNI/MNI PS
  - Revived SP on SD as a PS trigger
  - Updated SP on extensions to support PBB-TE PS
  - Added SP for dFOP when no APS message is received

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Thank you
Backup
G.8031 and STP Interaction

Interaction with STP described in G.8031 as follows:

- No overlapping between protected domain and STP
- Overlapping between protected domain and STP

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