Revised Definition of The GMPLS Switching Capability and Type Fields

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Background

- GMPLS supports
  1. Multiple switching types (e.g., packets and TDM)
  2. Multiple technologies within each type (e.g., SDH and OTN)
  3. Multiple levels of switching/multiplexing within a technology (e.g., PSC1-N, ODUs, Ethernet/PBB)
- Representation of above is a bit haphazard
  - Common *Switching Type* values used in signaling and routing
    - Routing caries values in the *Switching Capability* (or *Switching Cap*) field
    - See http://www.iana.org/assignments/gmpls-sig-parameters/gmpls-sig-parameters.xml#gmpls-sig-parameters-3
    - Always represents 1, sometimes 2 and 3
  - 2 sometimes must be inferred
  - 3 has multiple solutions
    - PSC/MPLS signals via hierarchy and separate routing instances
      - Note PSC-2 → N are **not** used!
    - SDH / OTN (pre v3) signals via label+traffic parameters, and **lacks** standardized representation of technology-specific routing information

Value	Name
1	Packet-Switch Capable-1 (PSC-1)
2	Packet-Switch Capable-2 (PSC-2)
3	Packet-Switch Capable-3 (PSC-3)
4	Packet-Switch Capable-4 (PSC-4)
30	Ethernet Virtual Private Line (EVPL)
40	802_1 PBB-TE
51	Layer-2 Switch Capable (L2SC)
100	Time-Division-Multiplex Capable (TDM)
125	Data Channel Switching Capable (DCSC)
150	Lambda-Switch Capable (LSC)
200	Fiber-Switch Capable (FSC)

Background (Continued)

- The *Switching Capability* (or *Switching Cap*) field serves an additional purpose in routing
  - It also indicates ISCD SCSI field format

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Switching Cap |    Encoding       |             Reserved        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
                                              ...
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Switching Capability-specific information                |
|                          (variable)                             |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Interface Switching
Capability Descriptor

  - When technology is inferred, SCSI format must also be inferred
- Current discussion triggered by OTNv3 SCSI format discussions
  - Reminder: Current SDH or OTN RFCs do not include SCSI formats

Objective of Draft

- Address two issues for future definitions:

  (i.e., no impact to existing RFC-based implementations)

  A. Current representation of (1) switching types, (2) technologies, and (3) multiplexing is inconsistent
  B. Current definition of Switching Capability (and types) is overloaded

- Alternatives considered – two extremes:

  Selected Approach

  – Assign Switching Type per *potential* SCSI format
    - i.e., different switching type per switching technology
  – Switching Type represents (1), (2) and (3)
    - i.e., type per technology & multiplexing level (ala PSC-N)

Main Proposal

- Simplify definition of *Switching Capability*
  - Only indicate switching technology
  - Remove overload – no intra-technology significance
  - Remove SCSI format ambiguity
    - Different SCSI formats MUST use different values
- Deprecate unused PSC values
  - PSC 2→4
- Keep values used in routing and signaling aligned
  - No change: keep using IANA Switching Type registry
- No substantive change for signaling
- *Matches discussion on list*
  - Aligned with current OTN drafts
  - Any comments?

Open Question

- Should there be a *Generalized* indicator in routing of intra-technology hierarchy/multiplexing?
- Some reminders:
  - this draft only applies to future CCAMP work, not current (OTN) RFCs or drafts
  - the purpose of GMPLS (and CCAMP) is to define common control plane mechanisms for different technologies
  - multiple technologies support intra-technology hierarchy/multiplexing

→Authors' conclusion is: "yes"

- We propose a specific solution, but want WG input on objective before focusing on specifics.
- Any comments?

Specific Proposal

- Introduce *Intra-Technology Hierarchy* field into ISCD
  - Note: planed name change ILH → ITH
  - Using 4 previously reserved bits

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Switching Cap |   Encoding    |           Reserved    |  ITH  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Interface Switching
Capability Descriptor

    - 0 = ignore field
    - Other values are to have technology-specific values
- Some open questions:
  - Is there any impact on MLN?
    - We think no
  - Are there crankback implications?
    - If need SwCap-based XRO, yes
      - Is same for per-technology specific (SCSI-based) solutions
    - If only label-based XRO, no

Next steps

- Solicit feedback
- Update draft based on discussion & comments
- Progress document