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Generalized Routing Interface Switching Capability Descriptor Switching
Capability Specific Information
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Abstract

This document defines a generic information structure for information carried in routing protocol Interface Switching Capability Descriptor (ISCD) Switching Capability Specific Information (SCSI) fields. This "Generalized SCSI" can be used with routing protocols that define GMPLS ISCDs, and any specific technology. This document does not modify an existing technology specific formats and is defined for use in conjunction with new GMPLS Switching Capability types.

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1. Introduction

The Interface Switching Capability Descriptor (ISCD) [[RFC4202](#)] allows routing protocols such as OSPF and ISIS to carry technology specific information in the the Switching Capability-specific information (SCSI) field, see [[RFC4203](#)] and [[RFC5307](#)]. The format of an SCSI field is dictated by the specific technology being represented as indicated by the ISCD Switching Capability (SC) type field. Existing Switching Capabilities are managed by IANA in the Switching Types registry and the related "IANA-GMPLS-TC-MIB" definitions.

[RFC7138] introduced a "sub-TLV" structure to its technology specific SCSI field. The Sub-Type-Length-Value (TLV) based approach allows for greater flexibility in the structure, ordering, and ability to support extensions of the SC (technology) specific format. This Sub-TLV approach is also used in [[RFC7688](#)].

This document generalizes this approach and defines a new generalized SCSI field format for use by future specific technologies and Switching Capability types. The generalized SCSI carries SCSI-TLVs that may be defined within the scope of a specific technology, or shared across multiple technologies (e.g., [[I-D.ietf-ccamp-ospf-availability-extension](#)]). This document also establishes a registry for SCSI-TLV definitions that may be shared across multiple technologies.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

3. Generalized SCSI Formats

The Generalized SCSI is composed of zero or more variable length type-length-value fields which are each called a SCSI-TLV. There are no specific size restrictions on these SCSI-TLV. Size and other formatting restrictions may be imposed by the routing protocol ISCD field, refer to [[RFC4203](#)] and [[RFC5307](#)].

The SCSI-TLV format is:

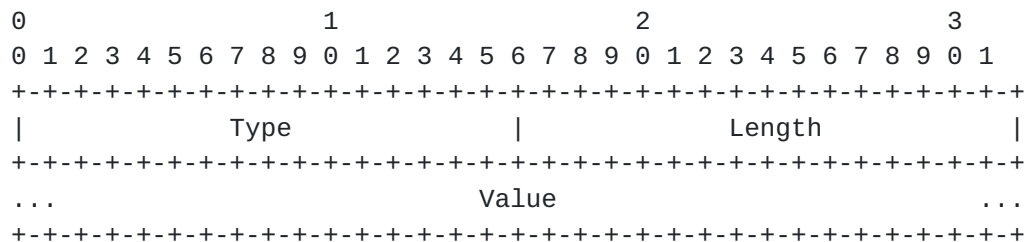


Figure 1: TLV format

Type (2 octets):

This field indicates the type and structure of the information contained in the Value field. Note that the value range of this field has been split in two. The lower range is used to indicated technology specific formats, while the higher range is reserved for formats that can be used with more than one technology. See [Section 6](#)

Length (2 octets):

This field MUST be set to the size, in octets (bytes), of the Value field. The value of the field MUST be zero or divisible by 4. Note that this implies that the Value field can be omitted or contain padding.

Value (variable):

A variable length field, formatted according to the value of the Type field. This field can be omitted for certain types.

4. Procedures

The Generalized SCSI is used with ISCDs (defined in [[RFC4203](#)] and [[RFC5307](#)]) of technologies whose Switching Capability definition reference this document. The corollary of this is that the Generalized SCSI MUST NOT be used for ISCDs of technologies whose Switching Capability definition do not reference this document.

The Generalized SCSI MAY contain a sequence of zero or more SCSI-TLVs. Sub-TLV parsing (format) errors, such as an underrun or overrun, MUST be treated as a malformed ISCD. SCSI-TLVs MUST be processed in the order received and, if re-originated, ordering MUST be preserved. Unknown SCSI-TLVs MUST be ignored and transparently processed, i.e., re-originated when appropriate. Processing related to multiple SCSI-TLVs of the same type may be further refined based

on the definition on the type.

5. Security Considerations

This document does not introduce any security issue beyond those discussed in [\[RFC4203\]](#) and [\[RFC5307\]](#). As discussed there, the information carried in ISCDs are not used for SPF computation or normal routing and the extensions here defined do not have direct effect on IP routing. Tampering with GMPLS TE LSAs may have an effect on the underlying transport network. Mechanisms such as [\[RFC2154\]](#) and [\[RFC5304\]](#) to protect the transmission of this information are suggested.

6. IANA Considerations

This document defines a new SCSI-TLV that is carried in the SCSI field of the ISCDs defined in [\[RFC4203\]](#) and [\[RFC5307\]](#). The SCSI-TLV includes a 16-bit type identifier (the Type field). The same Type field values are applicable to the new SCSI-TLV.

IANA is requested to create and maintain a new registry, the "Generalized SCSI (Switching Capability Specific Information) TLVs Types" registry under either the the "Generalized Multi-Protocol Label Switching (GMPLS) Signaling Parameters" registry or a new "Generalized Multi-Protocol Label Switching (GMPLS) Routing Parameters" registry.

The definition of the new registry is as follows:

Value	SCSI-TLV	SwitchCap	Reference
-----	-----	-----	-----
0	Reserved		[This ID]
1-32768	Unassigned, for use by specific technology	[per value]	[This ID]
32768-65535	Unassigned, for others	(Any, or value list)	[This ID]

New allocation requests to this registry SHALL indicate the value or values to be used in the SwitchCap column.

The registry should be established with registration policies of "Standards Action" for Standards Track documents, and "Specification Required" for other documents, see [\[RFC5226\]](#). The designated expert

is any current TEAS WG chair.

7. References

7.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/[RFC2119](#), March 1997, <<http://www.rfc-editor.org/info/rfc2119>>.
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7.2. Informative References

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- [RFC7138] Ceccarelli, D., Ed., Zhang, F., Belotti, S., Rao, R., and J. Drake, "Traffic Engineering Extensions to OSPF for GMPLS Control of Evolving G.709 Optical Transport Networks", [RFC 7138](#), DOI 10.17487/RFC7138, March 2014, <<http://www.rfc-editor.org/info/rfc7138>>.
- [RFC7688] Lee, Y., Ed. and G. Bernstein, Ed., "GMPLS OSPF Enhancement for Signal and Network Element Compatibility for Wavelength Switched Optical Networks", [RFC 7688](#), DOI 10.17487/RFC7688, November 2015, <<http://www.rfc-editor.org/info/rfc7688>>.

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