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Interface Stack Table Definition for Point-to-Point (P2P) Interface over

LAN

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Abstract

The point-to-point circuit type is one of the mainly used circuit

types in link state routing protocols. It is important to identify

the correct circuit type when forming adjacencies, flooding link

state database packets, and monitoring the link state. This document

defines the point-to-point interface type and relevant stack tables to

provide benefits for operation, maintenance, and statistics.

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1. Introduction

Point-to-point (P2P) is the predominant circuit type used by link state

routing protocols such as IS-IS [RFC1195] [1] and OSPF [RFC2328] [2]

[RFC5340] [3]. Compare with broadcast interfaces, the point-to-point

Interface type is used differently when establishing neighbor adjacencies,

flooding link state information, representing the topology, etc.

To simplify configuration and operation, it is helpful to represent

that an interface is to be considered as a point-to-point

interface explicitly in the interface stack. This enables, for

example, routing protocols to automatically use the correct operating

mode without further configuration.

So it is necessary to abstract P2P as special sub-interface type and

define relevant interface stack table.

2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",

"SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and

"OPTIONAL" in this document are to be interpreted as described in [BCP](https://datatracker.ietf.org/doc/html/bcp14)

[14](https://datatracker.ietf.org/doc/html/bcp14) [[RFC2119](https://datatracker.ietf.org/doc/html/rfc2119" \o "\"Key words for use in RFCs to Indicate Requirement Levels\")] [[RFC8174](https://datatracker.ietf.org/doc/html/rfc8174" \o "\"Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words\")] when, and only when, they appear in all

capitals, as shown here.

3. Relationship to the IF-MIB and Interfaces YANG Module

As defined in [RFC8343] [5], if the device implements the IF-MIB

[RFC2863], each entry in the "/interfaces/interface" list in the

operational state is typically mapped to one ifEntry.

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So P2P as sub-interface type should also fully map to one ifEntry,

meanwhile define the "higher-layer-if" and "lower-layer-if" in the

YANG corresponding to "ifStackTable" in IF-MIB to setup a complete

interface stack table, then the P2P interface type can borrow all

existing items in interfaces YANG and IF-MIB to take the full

advantages from operation, statistic, etc.

The "higher-layer-if" should be a network layer interface type, and

the lower-layer-if should be a data link layer interface type.

+--------------------------------------+----------------------------+

| YANG data node in | IF-MIB object |

| /interfaces/interface | |

+--------------------------------------+----------------------------+

| name | ifName |

| type | ifType |

| description | ifAlias |

| admin-status | ifAdminStatus |

| oper-status | ifOperStatus |

| last-change | ifLastChange |

| if-index | ifIndex |

| link-up-down-trap-enable | ifLinkUpDownTrapEnable |

| phys-address | ifPhysAddress |

| higher-layer-if and lower-layer-if | ifStackTable |

| speed | ifSpeed and ifHighSpeed |

| discontinuity-time | ifCounterDiscontinuityTime |

| in-octets | ifHCInOctets |

| in-unicast-pkts | ifHCInUcastPkts |

| in-broadcast-pkts | ifHCInBroadcastPkts |

| in-multicast-pkts | ifHCInMulticastPkts |

| in-discards | ifInDiscards |

| in-errors | ifInErrors |

| in-unknown-protos | ifInUnknownProtos |

| out-octets | ifHCOutOctets |

| out-unicast-pkts | ifHCOutUcastPkts |

| out-broadcast-pkts | ifHCOutBroadcastPkts |

| out-multicast-pkts | ifHCOutMulticastPkts |

| out-discards | ifOutDiscards |

| out-errors | ifOutErrors |

+--------------------------------------+----------------------------+

Figure 1

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4. Interface Stack Table for P2P Interface Type

P2P interface type is a kind of point-to-point circuit type. P2P

interface higher layer should be network layer "ipForward" (defined

in IANA [6]) to run routing protocol, P2P interface lower layer is

link data layer "ethernetCsmacd" (defined in IANA).

P2P interface type ifStackTable should be defined as:

<interface>

<name>isis\_int</name>

<type>ianaift:ipForward</type>

</interface>

<interface>

<name>eth1</name>

<type>ianaift:ethernetCsmacd</type>

</interface>

<interface>

<name>p2p</name>

<type>ianaift:p2pOverLan</type>

<higher-layer-if>isis\_int</higher-layer-if>

<lower-layer-if>eth1</lower-layer-if>

<enabled>false</enabled>

<admin-status>down</admin-status>

<oper-status>down</oper-status>

<statistics>

<discontinuity-time>

2021-04-01T03:00:00+00:00

</discontinuity-time>

<!-- counters now shown here -->

</statistics>

</interface>

Figure 2

5. Security Considerations

The interface stack table specified in this document is read-only.

Read operations to this table without complete protection shouldn't

have a negative effect on network operations.

The interface stack table can be accessed via network

management protocols such as NETCONF [RFC6241], RESTCONF [RFC8040].

The NETCONF must run over a secure transport, and the mandatory

secure transport is Secure Shell (SSH) [RFC6242]. The lowest

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RESTCONF layer is HTTPS, and the mandatory-to-implement secure

transport is TLS [RFC5246].

6. IANA Considerations

IANA need to update the "Interface Types(ifType)" registry (available

at https://www.iana.org/assignments/smi-numbers/smi-

numbers.xhtml#smi-numbers-5) with the following status types:

+=========+==================+=======================================+

| Decimal | Name | Description |

+=========+==================+=======================================+

| 303 | p2pOverLan | Point to Point over LAN interface |

+---------+------------------+---------------------------------------+

Table xx

7. References

7.1. Normative references

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7.2. Informative References

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7.3. URIs

[1] https://datatracker.ietf.org/doc/html/rfc1195

[2] https://datatracker.ietf.org/doc/html/rfc2328

[3] https://datatracker.ietf.org/doc/html/rfc5340

[4] https://datatracker.ietf.org/doc/html/rfc2119

[5] https://datatracker.ietf.org/doc/html/rfc8343

[6] https://www.iana.org/assignments/iana-if-type/iana-if-type.xhtml

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