LSP Ping Relay Reply
<draft-ietf-mpls-lsp-ping-relay-reply-07>

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Changes in draft-07

- LSP Ping Relayed Echo Reply Stack Object: Added

  Source Address of Replying Router

  Destination Address Pointer

- LSP Ping Relayed Echo Reply Stack Entry

  Eliminated Address Length since it is implied by the type

- Relay Node Address Stack description

  Moved procedural information into Section 4, Procedures

- Generalized MTU exceeded error

  Generally useful, wider applicability

Changes in draft-07 (2)

- Procedures

  Updated text (both technical changes and clarifications)

  Changed many SHOULDs to MUSTs

- Section 4.7, Impact to Traceroute

  Updated to use Source Address of Replying Router

- Section 5, LSP Ping Relayed Echo Reply Example

  Updated example to use changed procedures
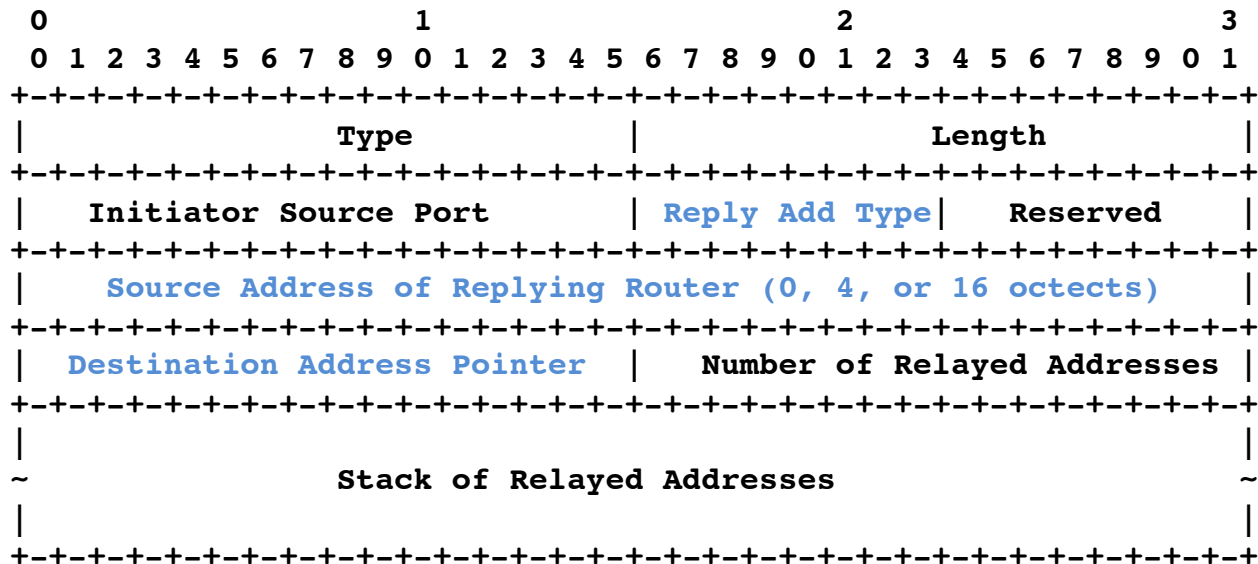
Relayed Echo Reply Stack Object

Source Address of Replying Router

Had been carried in Address stack

Confused semantics, often did not even belong there

Used for loop-detection and display

Destination Address Pointer

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|              Type             |             Length            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Initiator Source Port    | Reply Add Type|    Reserved   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Source Address of Replying Router (0, 4, or 16 octects)   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Destination Address Pointer   | Number of Relayed Addresses   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
~               Stack of Relayed Addresses                      ~
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Source Address of Replying Router

- ## Semantic Issue

  Procedures mandated adding the IF address of replying router at the bottom of the stack

  Adding other address optional

- In example below ASBR 2 MUST add 10.0.0.2 at BOS, but that address is not reachable from ASBR 4!

- Address needed for relaying must be reachable through the interface from which the LSP ping would have been forwarded if TTL had not expired
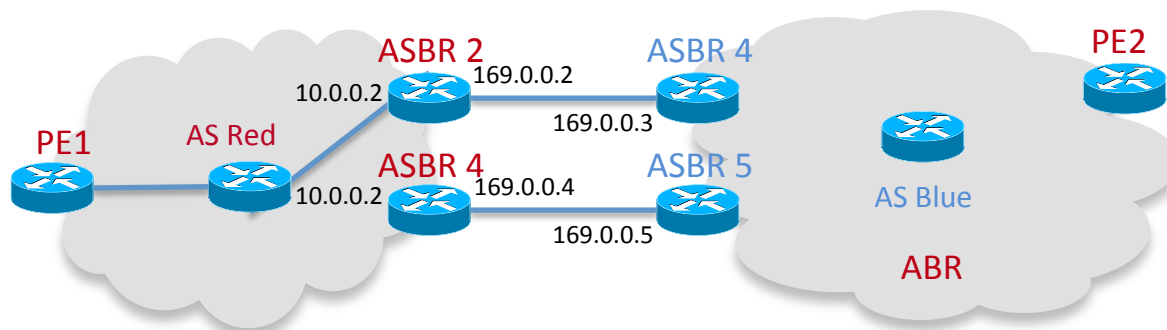
Loop Detection

- Procedures said a the next relay node address MUST be located before the source IP address of the received Relayed Echo Reply which MUST be also in the stack

- In example below address 10.0.0.1 is used in both ASes

- Added Destination Address Stack Pointer

  Points to address to which the message is being sent
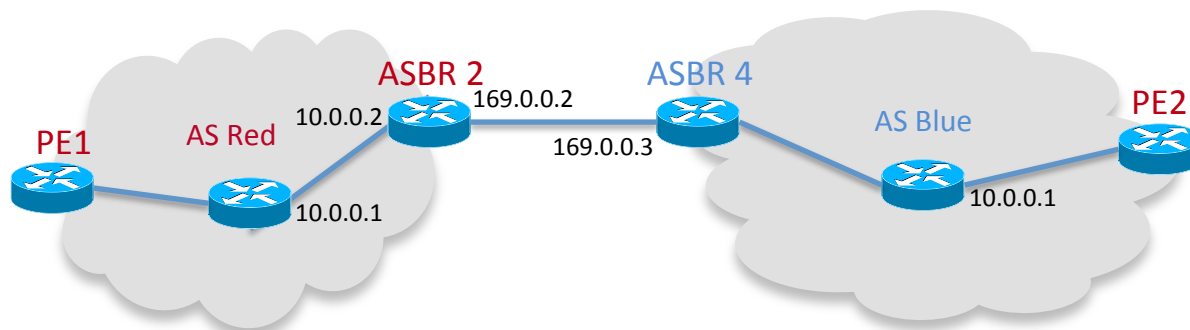
Mandatory address in stack

- Mandated adding an address reachable through the interface from which the LSP ping would have been forwarded at the BOS

- If a router is

  hiding its address

  located at an addressing domain boundary

    e.g. AS boundary or between areas using BGP-LU (RFC3107) vs IGP

  then a Null address MUST be added with the K bit set

Stack processing

- Procedures in two cases ignored the significance of the K bit

- When eliminating addresses, this can only be done from the last entry with the K bit set to the end

- When choosing the next relay router MUST not use one above the last entry with the K bit set

Next Steps

- Workgroup review (requested March 7)
- MPLS-RT review (in progress)
- Address comments
- Last call