

Extending ICMP for IP-related Information Validation

draft-liu-6man-icmp-verification

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Backgroud and Motivation

IPv6 addresses, especially SRv6 SIDs, can be related with more and more extra information :

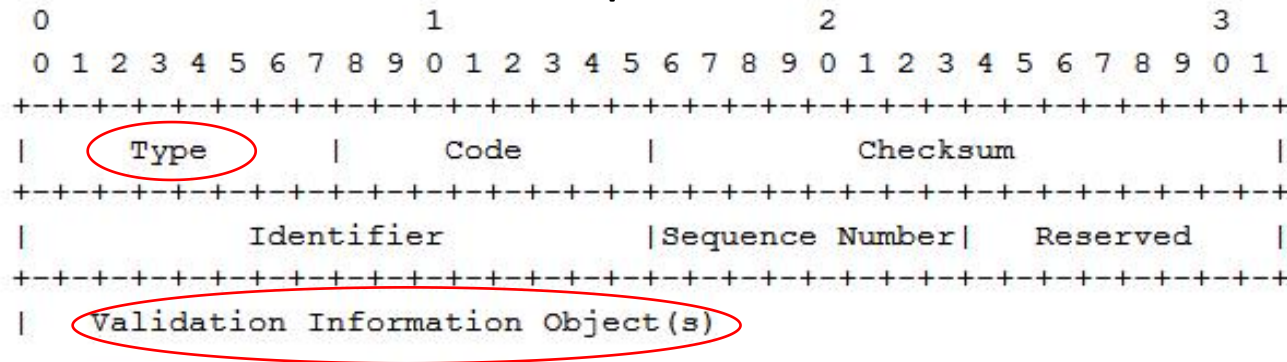
- VPN/EVPN Services
- SRv6 Endpoint Behaviors
- Flex Algorithms
- Service Functions
- ...

MPLS LSP Ping: new info related --> new FEC sub-TLV defined

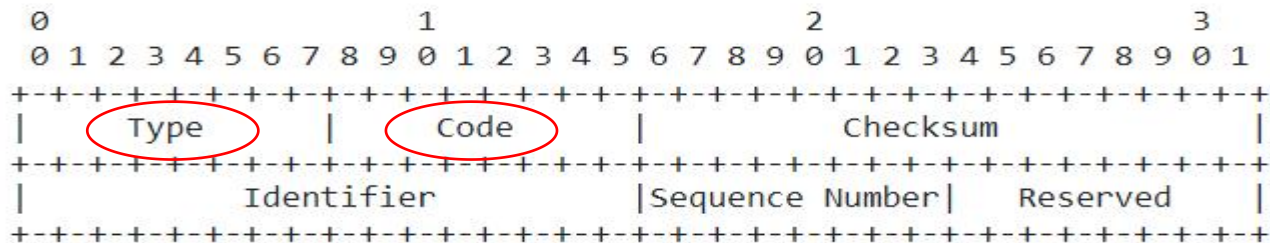
This draft defines new ICMPv6 messages to verify the data plane against the control plane in IPv6 networks.

New ICMPv6 Messages

ICMPv6 Validation Request



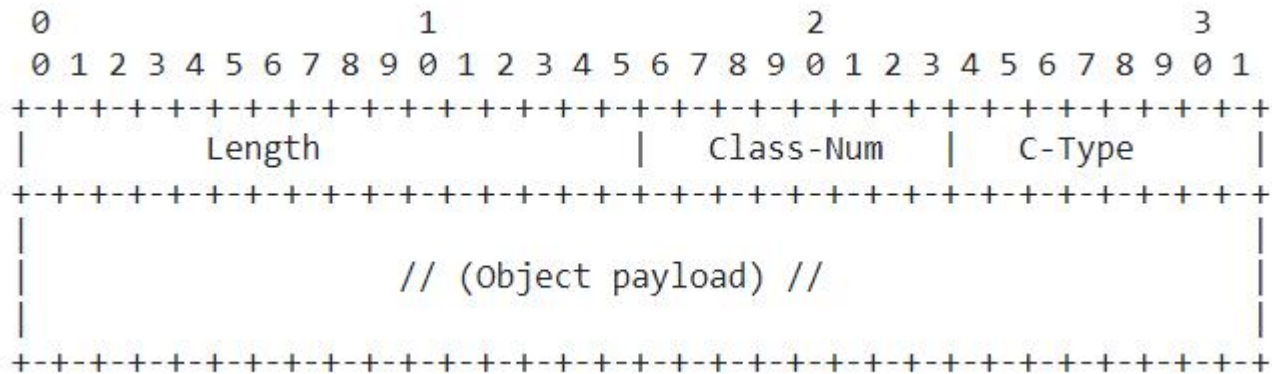
ICMPv6 Validation Reply



Code:

- | | |
|--|--------------------------------|
| (0) Validation passed | (1) Malformed request received |
| (2) One or more of the objects were not understood | (3) Information mismatch |

Validation Information Object



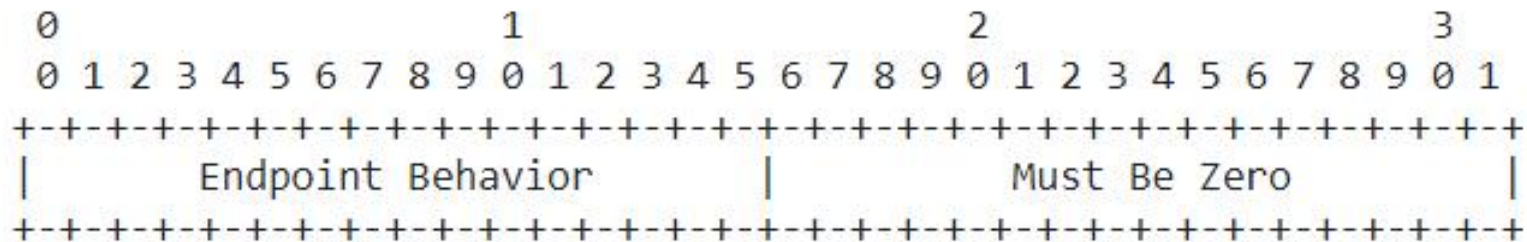
a New ICMP Extension Object

- Class-Num: TBA, indicates the Validation Information Object
- C-Type: indicates the type of the information that needs to be verified
- Object payload: C-Type-specific data

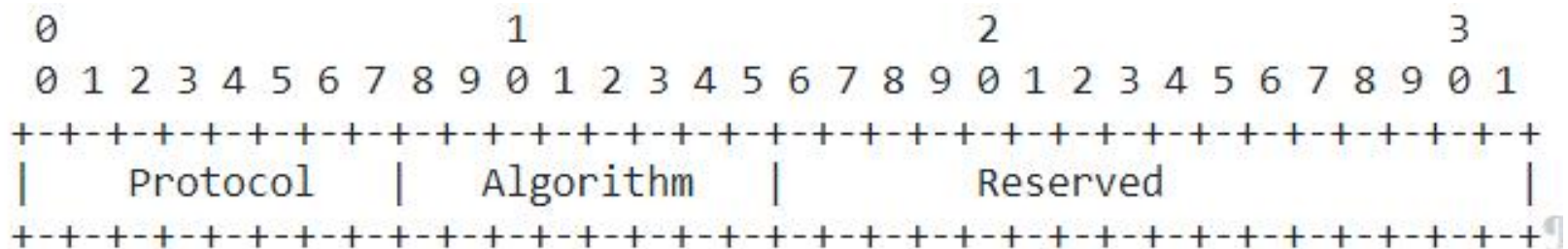
C-Type	Object Payload
-----	-----
1	Endpoint Behavior
2	IPv6 Prefix IGP Algorithm
3	SRv6 IGP-Adjacency Segment
4	VPN IPv4 Prefix
5	VPN IPv6 Prefix

Object Payload-1

SRv6 Endpoint Behavior



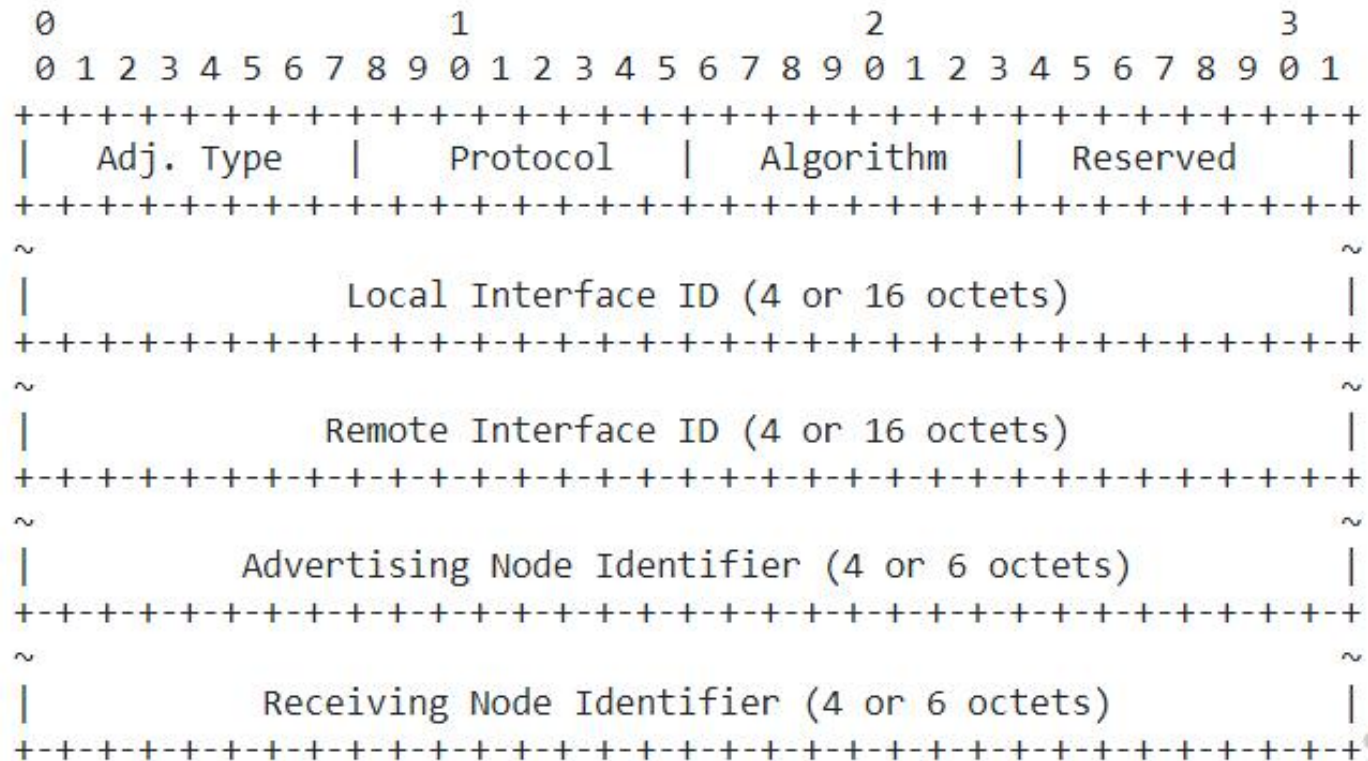
IPv6 Prefix IGP Algorithm



applicable for both SRv6[RFC9350] and regular IPv6 prefix [I-D.ietf-lsr-ip-flexalgo]

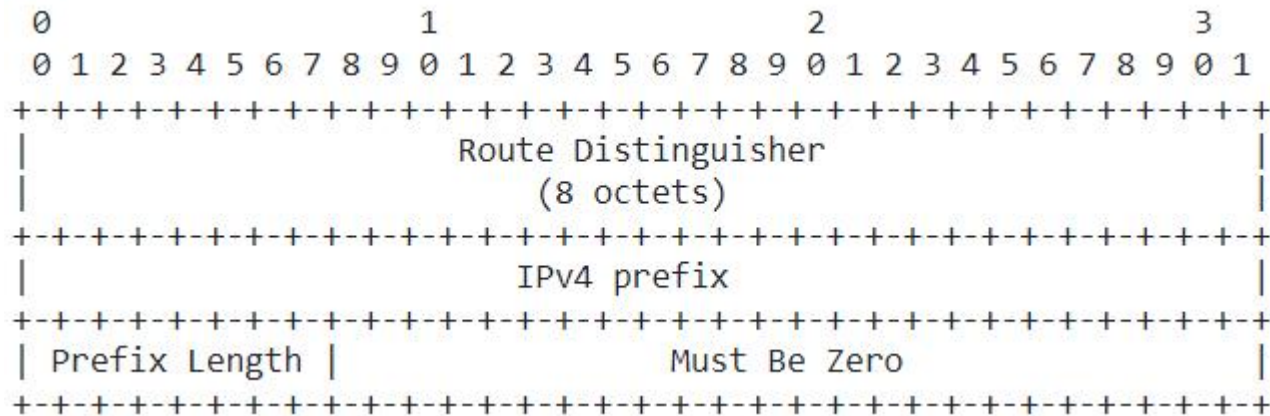
Object Payload-2

SRv6 IGP-Adjacency

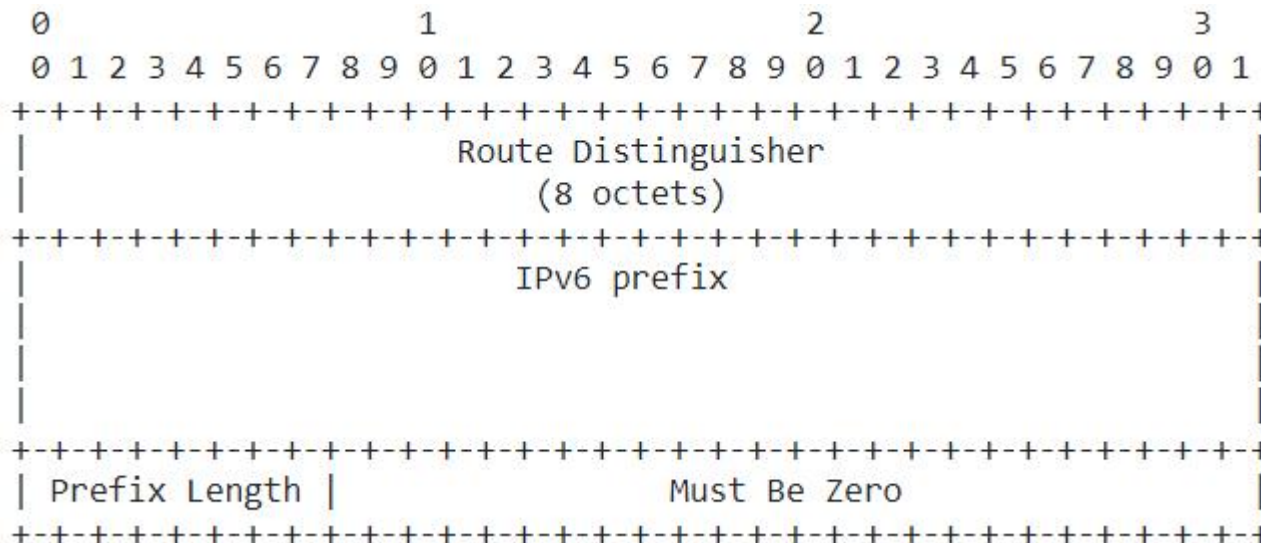


Object Payload-3

VPN IPv4 Prefix



VPN IPv6 Prefix



Main Processing Procedures

➤ Sending a Validation Request

- Validation Information object(s)
- Target IP: IP address/SRv6 SID to be verified, set as the destination address of the IP header field(without SRH), or set as the last segment(with SRH)

➤ Receiving a Validation Request

- DA is locally configured as a segment or local interface (SL=0)
- verify the information encoded in the Validation Information Object

➤ Sending a Validation Reply

- set the return code based on the verification result
- IP routed

➤ Receiving a Validation Reply

- match the reply with the request using the Identifier and Sequence Number

Next Steps

- Request feedback and comments

Thank You !