draft-ali-spring-srv6-oam-00.txt
SRv6 OAM

J. Leddy (Comcast)
S. Matsushim (Softbank)
R. Raszuk (Bloomberg LP)
B. Peirens (Proximus)
G. Naik (Drexel University)
Reference Topology

1. SRv6 Capable
2. classic IPv6 Node
3. classic IPv4 Node
4. Message Processing Node
ICMPv6 Ping
Via a SID list

• The originator node constructs an SRH using the segment list specified by the user and adds it to IPv6 packet.
• All other ICMPv6 related processing remains unchanged.
• No changes are required at the transit node.
• No changes are required at the destination node.
Traceroute
Via a SID list

• The originator node constructs an SRH using the segment list specified by the user and adds it to traceroute probe packet.

• All other IPv6 traceroute related processing remains unchanged.

• No changes are required at the transit node.

• No changes are required at the destination node.
ICMPv6 Ping to a SID Function

- This is the case of the use of IPv6 ping to ping a SID function.
- Forwarding chain on Egress will be incomplete; Egress cannot forward a packet with DA = A4::DC45 (e.g., there is no inner IP header).
- Ping to a SID function requires punting for OAM packets.
Pinging a SID Function

- An:OTP:: SID is instructed in front of the target SID where punt behavior needs to be programmed. E.g., A4::C45 in this example.
Tracing a SID Function (hop-by-hop)

- An::OTP:: SID is instructed in front of the target SID where punt behavior needs to be programmed. E.g., A4::C45 in this example.
  - Due to addition of the An::OTP:: OAM SID to SRH, no change to PSP behavior is required.

```
R2#traceroute sid A4::DC45
```

- **IPv6**
  - **SA = B2::**, **DA = A3::C41;** **HL=64**
  - **SRH** (A4::DC45, A4:OTP::, A3::C41, SL=2)
  - UDP Probe

- **IPv6**
  - **SA = B2::**, **DA = A4:OTP::;** **HL=63**
  - **SRH** (A4::DC45, A4:OTP::, A3::C41, SL=1)
  - UDP Probe

- **IPv6**
  - **SA = B4::**, **DA = B2::;** **HL=64**
  - UDP Probe
• Service provider wants to validate if a policy is visiting all segments in the sid-list.
• The ingress injects an out-of-band ping probe with O-bit set in the SRH.
Hop-by-Hop Traceroute

- **END.OTP SID** is inserted before the target SID to have packet
- Initiator monotonically increases the hop limit.
- HL expiry is exercised at Hop (including classical nodes).
- Each hop returns ICMPv6 Time Exceeded message with incoming interface information

**UDP Probe**

**SR Hdr**

1. A4::DC45, A4::OTP, A3::C41, HL: 1, SL = 2
2. A4::DC45, A4::OTP, A3::C41, HL: 2, SL = 2
3. A4::DC45, A4::OTP, A3::C41, HL: 3, SL = 1

**ICMP Time Exceeded** (99:1:2:2)

**ICMP Time Exceeded** (99:2:3:3)

**ICMP Port Unreachable** (99:3:4:41)
SRv6 Overlay Traceroute

As Hop Limit is set to 64, all classic transit and SRv6 pure transit nodes are skipped in the overlay traceroute.

O-bit is set and hop limit is set to 64.
- As Hop Limit is set to 64, the classic and SRv6 transit nodes does not respond.
- At each segment node, SRH.Flags.O=1 causes a time-stamped copy of the packet punted and processed.
- Each segment node returns ICMPv6 message with incoming interface information.
Next Steps

• Solicit WG review and comments/inputs/feedback.