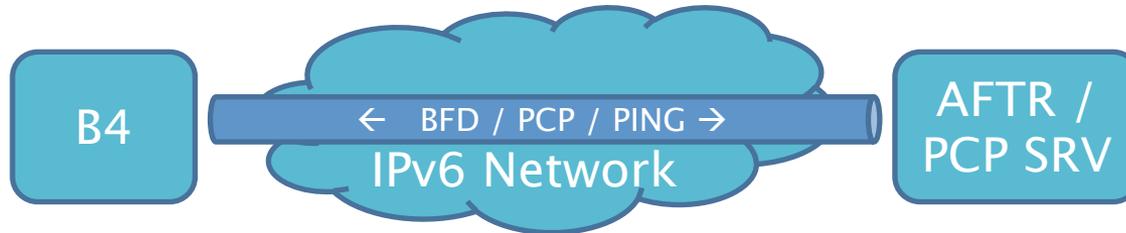# DS–Lite Failure Detection and Failover

draft–tsou–softwire–bfd–ds–lite–03

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Problem to Solve

- There is no status information of the DS–Lite tunnel, e.g., tunnel up or down, which brings difficulties for operations and maintenance.

- Protocols to resolve this problem: BFD, PCP, ICMP, …

BFD for DS-Lite Failure Detection

- BFD auto configuration
  - In DS-Lite, B4 has the AFTR address, which is sufficient to initiate a BFD session
  - Other parameters can be negotiated via signaling or static config, no manual configuration
- BFD packet rate
  - Long time period between BFD packets transmission, e.g., 10s or 30s

PCP for DS-Lite Failure Detection

- If PCP is available in a DS-Lite deployment, PCP can be used for keep alive testing, and to trigger failover if a failure is detected.

- PCP is used to create a mapping with short lifetime, updates are sent periodically.

- If the PCP client detects a failure, e.g., a NETWORK_FAILURE error code is returned, or there is no response from the PCP server, the client will switch to another PCP server or AFTR

ICMP for DS-Lite Failure Detection

- ICMP pings can be sent periodically, or triggered manually when necessary

- Since ICMP is an integral part of any IP stack, not extra implementation efforts are required on the B4 elements

Failover – Explicit

- The FQDN of the AFTR is sent to the B4 element via a DHCP option [RFC6334]

- The FQDN can be configured to resolve to multiple AFTR addresses

- Upon detecting a failure, the B4 element terminates the current DS-Lite tunnel and creates another tunnel to one of the other addresses

Failover – Anycast

- AFTR may use anycast address for receiving packets

- There might be issues with failures on the path if for example an ICMP error message fails to get delivered correctly (e.g., it is send to a different anycast server)