Configuring BFD with DHCP and Other Musings

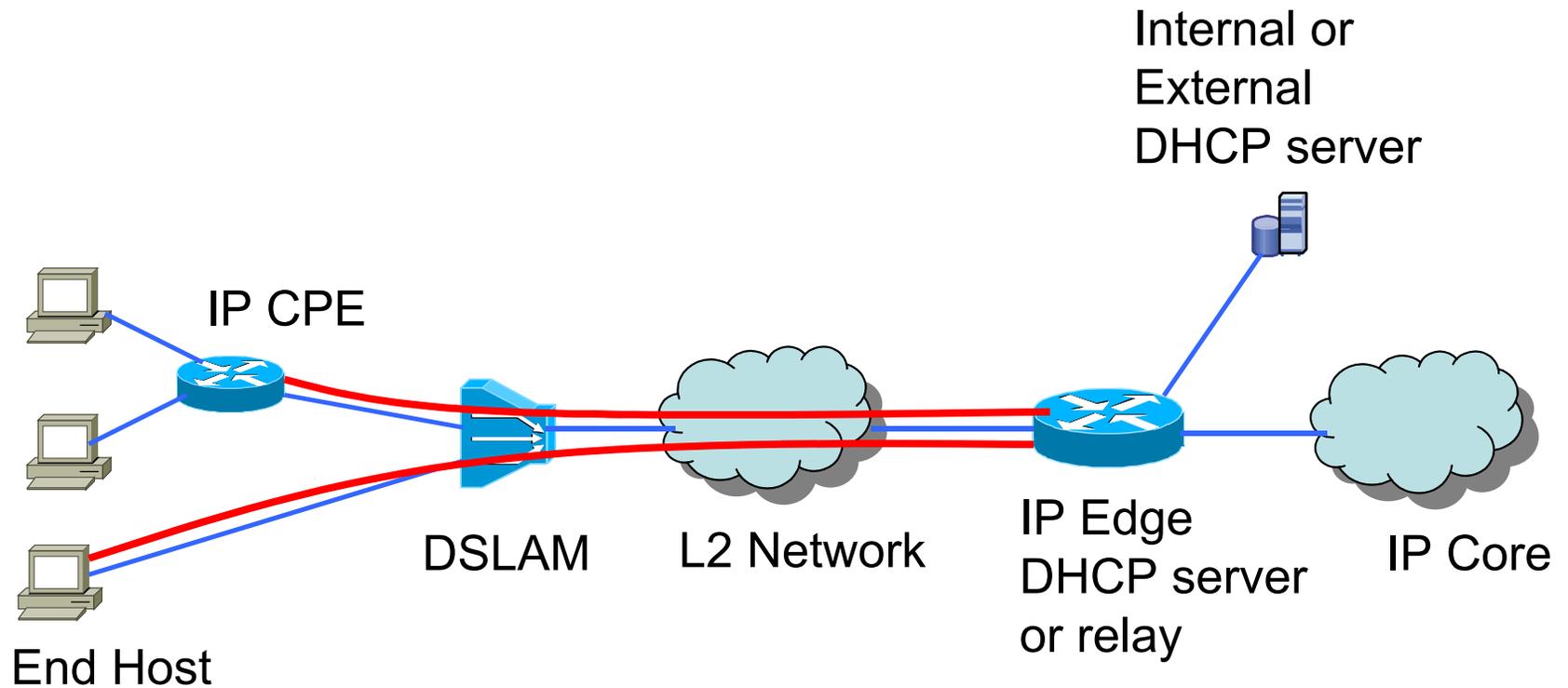**`draft-vinokour-bfd-dhcp-00`**

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Introduction or Why BFD to the home?

- With Access network migration to Ethernet, Service Providers move from PPP to IP based subscriber management on IP Edge
- IP sessions require liveness detection similar to PPP keep-alive
- BFD is considered a prime candidate for IP session keep-alive because BFD is
  - Light-weight (scalable)
  - IP-based (access technology agnostic)
  - Dynamically adjustable and
  - Provides coordinated unidirectional streams for bidirectional failure detection
- Requirements from DSL Forum

IP Subscriber Access Network Model

Internal or
External
DHCP server

IP CPE

DSLAM   L2 Network   IP Edge
DHCP server
or relay

IP Core

End Host

Why configure BFD with DHCP?

- When BFD is used as a keep-alive between IP Edge (BRAS) and IP endpoint (CPE, host, etc), BFD configuration becomes part of endpoint IP configuration

- Configuring BFD with DHCP consolidates endpoint configuration relevant to maintaining an IP connection on DHCP server

- DHCP is the most natural agent to supply IP Edge peer IP address and other bootstrapping configuration to BFD on an endpoint

Proposal: New DHCP Options

- Define new DHCP options (bfd-support-v4, bfd-support-v6) to allow IP endpoint advertise BFD support to server

- Define new options (bfd-config-v4 and bfd-config-v6) for server to deliver BFD configuration to client

- Allow IP Edge configured as DHCP Relay Agent to supply BFD configuration to the server
  – Using new sub-option of relay-agent-info option for DHCPv4
  – Re-using the new proposed bfd-config-v6 option for DHCPv6

Proposal: New Options Use

- DHCP client includes bfd-support option containing supported version of BFD and supported BFD Authentication types with DHCPDISCOVER, DHCPREQUEST or equivalent DHCPv6 packet

- If the server receives bfd-support option and supports client BFD version it MAY include bfd-config option containing BFD configuration with DHCPOFFER and DHCPACK or equivalent DHCPv6 packets

Reporting BFD Failures to DHCP Client

- DHCP is a bootstrapping/management application for BFD on the endpoint
  - BFD normally reports state changes to its client applications

- Allows DHCP client to react to IP – not just L2 – connectivity failures
  - This may be very useful for service downtime reduction to subscribers

Next Steps

- Adopt the draft as bfd WG item
- Approve new DHCP options