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

- IP CPE
- DSLAM
- L2 Network
- IP Edge DHCP server or relay
- IP Core

Internal or External DHCP server

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