BFD

IETF 68

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Agenda

- Chairs: Intro, administrivia - 3 mins
- Dave Ward: Changes to base and corollary specs - 11 mins
  - Doc status
- Dave Ward: New draft point-2-multipoint BFD - 13 mins
Presentations

- Base and corollary spec update
BFD Base Spec Changes

• Demand Mode
  – It was broken (could hang when coming up)
  – Now independent in each direction
    (multipoint uses it asymmetrically)
  – D bit now means "I'm up, you're up, don't send periodic packets"
  – Periodic transmission resumes if session goes down
BFD Base Spec Changes.2

- **Session State Maintenance**
  - Session state must be maintained as long as you receive packets from remote side, even when session is down
  - If no packets are received, state must be maintained for a detection time after session failure
- **Gives systems control of remote transmission rate, even for down/admindown**
- **Allows systems to control session establishment rate**
BFD Base Spec Changes.3

- Down/AdminDown Semantics
  - AdminDown means "down on purpose, please ignore"
  - Down means "forwarding path probably doesn't work"
    - Leveraged in Generic spec

- Receive pseudocode tweaked a little
- Some text was clarified or expanded based on implementor feedback
- Plenty of editorial corrections
Doc Status

• Base and corollary docs
  – Rev-06 has had extensive comments and review from providers and implementors
    • Multiple interoperable implementations known
    • 2 known complete implementations of all modes

• Go to WG LC (taken to mailing list, 2 week timeout):
  – draft-ietf-bfd-base-06.txt
  – draft-ietf-bfd-multihop-05.txt
  – draft-ietf-bfd-v4v6-1hop-06.txt
  – draft-ietf-bfd-generic-03.txt

• Rev needed to make compliant w/ changes:
  – draft-ietf-bfd-mpls-04.txt
  – draft-ietf-bfd-mib-03.txt
Presentations

• Point-2-multipoint
Multipoint BFD Overview

- Verifies connectivity of head->tail multipoint path
- Technology independent (IP mcast, MPLS P2MP, etc.)
- Does not verify tail->head return path
- Does not verify unicast head->tail path
- Optional notification to head of tail status
- Protocol timing/scalability driven entirely from head
- Runs next to Classic Unicast BFD
- Falls out of existing Unicast BFD spec (pretty much)
Service Definition

• Service defined as a base function plus a number of options
• Options may be enabled in any combination

• Base function: Unidirectional Transmission
  – Head sends periodic packets along MP tree
  – Tails detect BFD timeout, do "the right thing" (e.g. listen to another head)
  – Head ignorant of tails, no BFD packets sent to head
  – Simple, extremely scalable
Service Definition - option 1

• Option: Solicit Membership
  – Head sets Poll bit in MP transmission
  – Tails send unicast Final in reply
  – Tail transmission smeared across time specified by head
  – Head gets a Pretty Good idea of tails listening (unreliable)
Service Definition - option 2

• Option: Tails notify head of session failure
  – Head directs tails to send periodic packets to head when tail detects session failure
  – Upon session failure, tail sends bfd.DetectMult packets (smeared across time) and then quiesces
  – Semi-reliable (multiple packets are sent)
Service Definition - option 3

• Option: Verify Connectivity of Specific Tail
  – Head sends unicast Poll Sequence to specific tail (learned by solicitation or outside means)
  – Tail replies with Final (and without smear, so it's quick)
  – Head reliably learns tail state (if tail ever replies)
Service Definition - option 4

• Option: Some Tails are More Equal Than Others
  – Side effect of unicast Poll Sequence is that intervals carried therein override multipoint values
  – Head can thus raise transmission rate of individual tails for failure notification
Service Definition - option 5

• Option: Silent Tails
  – Tails may be provisioned to never reply to BFD even when head sends Polls
  – Allows for large numbers of second-class citizens in class-conscious tail population
Session Types

- Operation modeled as distinct session types:
  - PointToPoint: Classic BFD
  - MultipointHead: Session on head sending multipoint packets
  - MultipointClient: Optional session on head tracking individual tail
  - MultipointTail: Session on tail tracking head
Demultiplexing

- Multipoint (M) bit flags multipoint packets
- Packet demuxing rules select session
- Session type determines elements of procedure
Protocol Tricks and Hackery

- Multipoint packets all sent with Demand (D) bit set, tails cannot send periodic packets while session is up
- Required Min RX value set to zero means "no periodic transmission ever" (controls failure notification)
- Silent Tail = 1 means "no transmission ever" (no reply to polls)
Environmental Assumptions

- Tail needs to be able to differentiate between packets received on different MP trees if same head is going to be heard from on multiple trees
- Head is identified by source address (which cannot change)
Required changes to base spec

• Base Spec Changes
  – Add M bit
  – Define session types
  – Modify send/receive procedures for non-PointToPoint sessions
Next Steps

- LC all base and corollary docs
  - MPLS and MIB to be rev’ed
- Point to multipoint to WG doc immediately upon charter update
  - discuss on list
  - Edit

- By next IETF non-multipoint docs will be WG LC and marching forward
- No WG meeting at next IETF
- Very close to “done”