Packetization Layer Path MTU Discovery for Datagram Transports

draft-fairhurst-tsvwg-datagram-plpmtud-01

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Effective PMTU for Datagrams

TCP can discover a Path MTU:
- ICMP-based Path Too Big Messages (PMTUD)
- MSS-Clamping (by middle boxes)
- PLPMTUD (RFC4821, verification by packet probes)
Effective PMTU for Datagrams

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Challenges for doing this for datagram transports:
- Blackhole problems…
- What is a good PMTU probe message?
- How to start with a “sensible” effective PMTU?
- How to react to a lost probe?
- How to know the current effective PMTU is too small? …
Path Layer Protocols

SCTP/UDP (RFC6951)
SCTP/DTLS (draft-ietf-tsvwg-sctp-dtls-encaps)
UDP-Options (draft-ietf-tsvwg-udp-options)

But more generic
… so may apply to other datagram transports
Protocol Independent Algorithm
Protocol Independent Algorithm

Not started yet

Connectivity confirmed

MAX_PMTU acked

PTB (>= BASE_PMTU)

PMTU_RAISE_TIMER
or reachability
(PROBE_COUNT = MAX_PROBES)

PTB (<= PROBED_SIZE)

Probe acked

PROBE_DONE

MAX_PMTU acked

PROBE_SEARCH

PROBE_ERROR

Reachability probe acked
or PROBE_TIMER expiry
(PROBE_COUNT = MAX_PROBES)

PROBE_TIMER expiry
(PROBE_COUNT < MAX_PROBES)
Protocol Independent Algorithm

- Not started yet
- Time to check
Protocol Independent Algorithm

- Time to check
- Not started yet
- Searching
Protocol Independent Algorithm

- **Not started yet**
- **Time to check**
- **Found the PMTU**
- **Searching**
Protocol Independent Algorithm

- **Not started yet**
- **Time to check**
- **Found the PMTU**
- **Whoops... the base did not work**
- **Searching**
Protocol Independent Algorithm

Not started yet

Time to check

Found the PMTU

Whoops... the base did not work

Is it **really** still working?

Searching
Current Problems

• Some constants and times do not yet have recommended values
• When do we set E_MTU?
• How to handle inconsistent results
  • How to handle PTB with a link MTU larger than probe size?
  • How to handle forwarding (path) inconsistency
• Dealing with middleboxes that change packets
• Off-path security considerations for probes and PTB messages
Next Steps

• Revise draft
  • Check latest algorithm against SCTP code
  • Implement using UDP Options
  • Interested in PMTU experience...

• We think this is useful work for TSVWG
Acknowledgment

This work was partially funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No. 644334 (NEAT).