

Packetization Layer Path MTU Discovery for Datagram Transports

draft-fairhurst-tsvwg-datagram-plpmtud-01

Gorry Fairhurst, Tom Jones,
Michael Tüxen, Irene Rüngeler



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

TCP can discover a Path MTU:

- ICMP-based Path Too Big Messages (PMTUD)
- MSS-Clamping (by middle boxes)
- PLPMTUD (RFC4821, verification by packet probes)

We need a datagram-based path layer approach



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)

We need a datagram-based path layer approach

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)

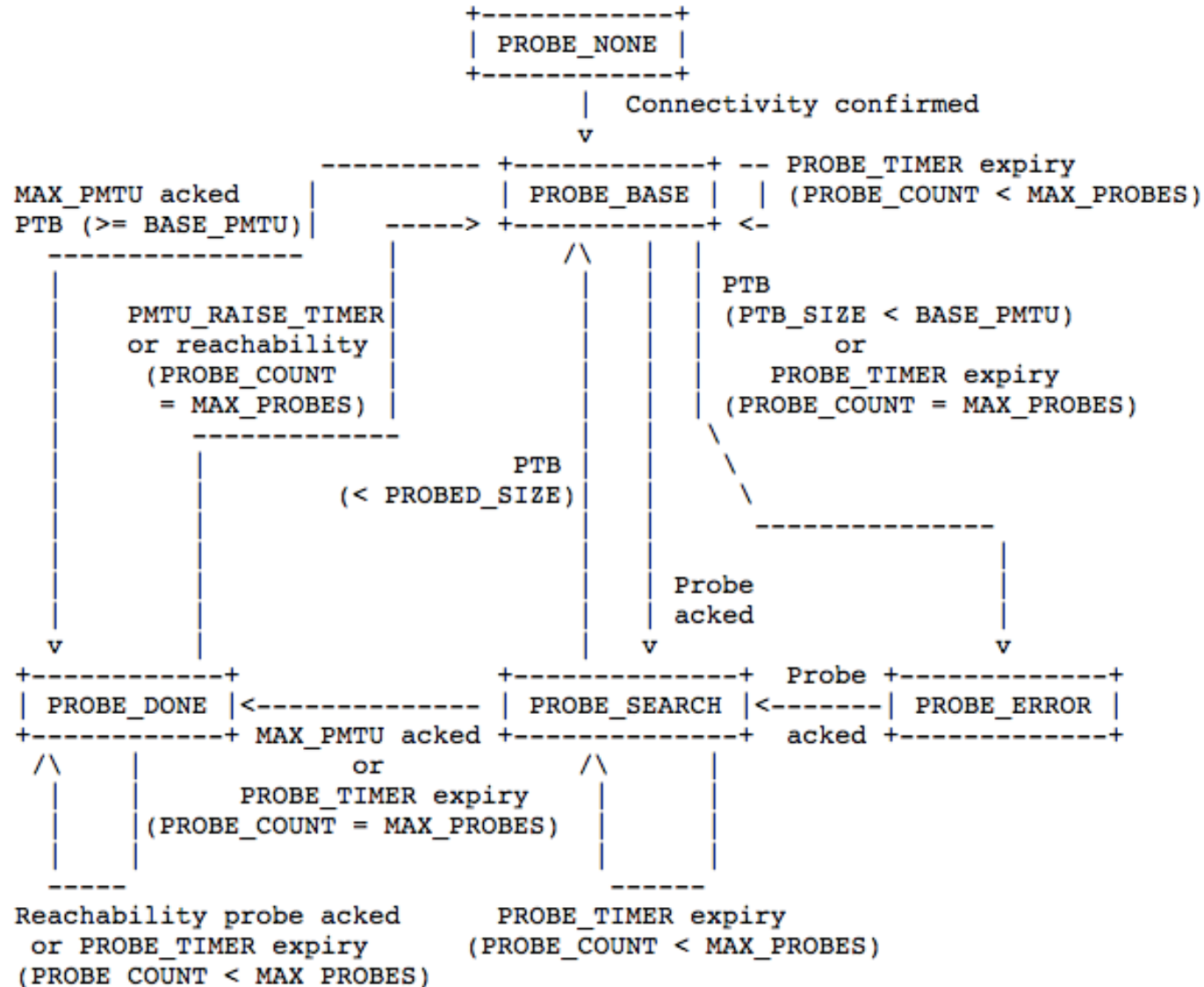
UDP-Options (draft-ietf-tsvwg-udp-options)

But more generic

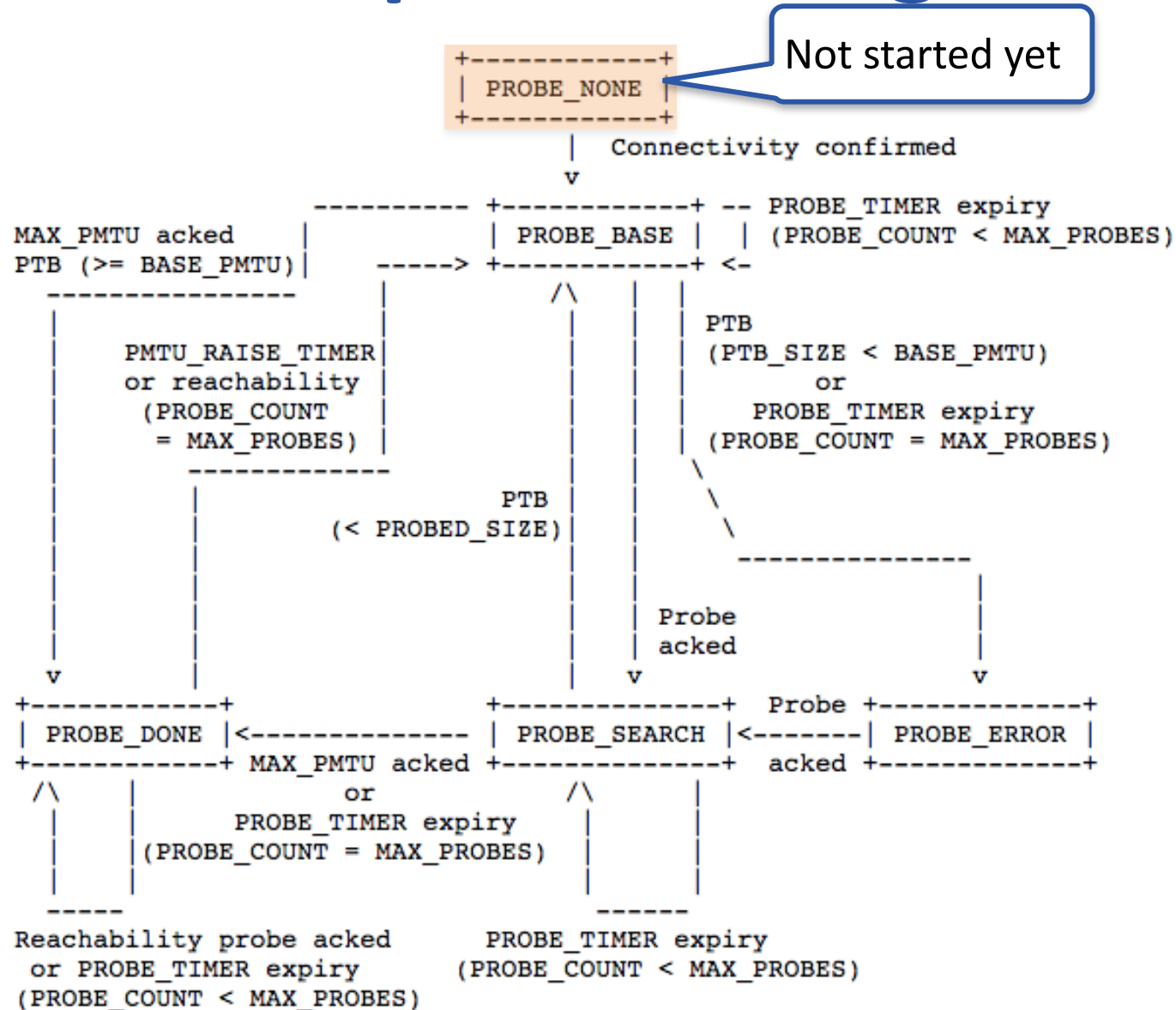
... so may apply to other datagram transports



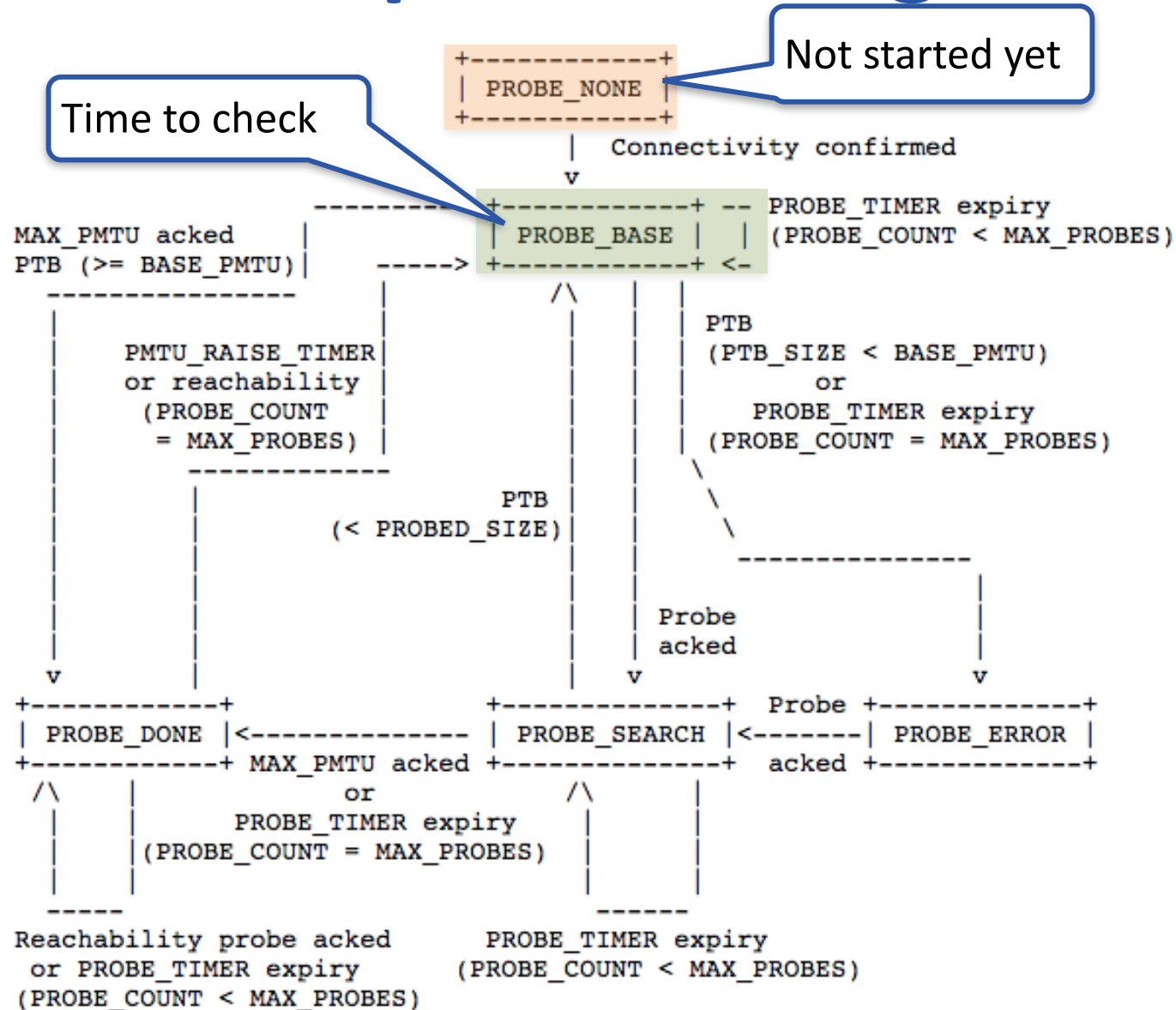
Protocol Independent Algorithm



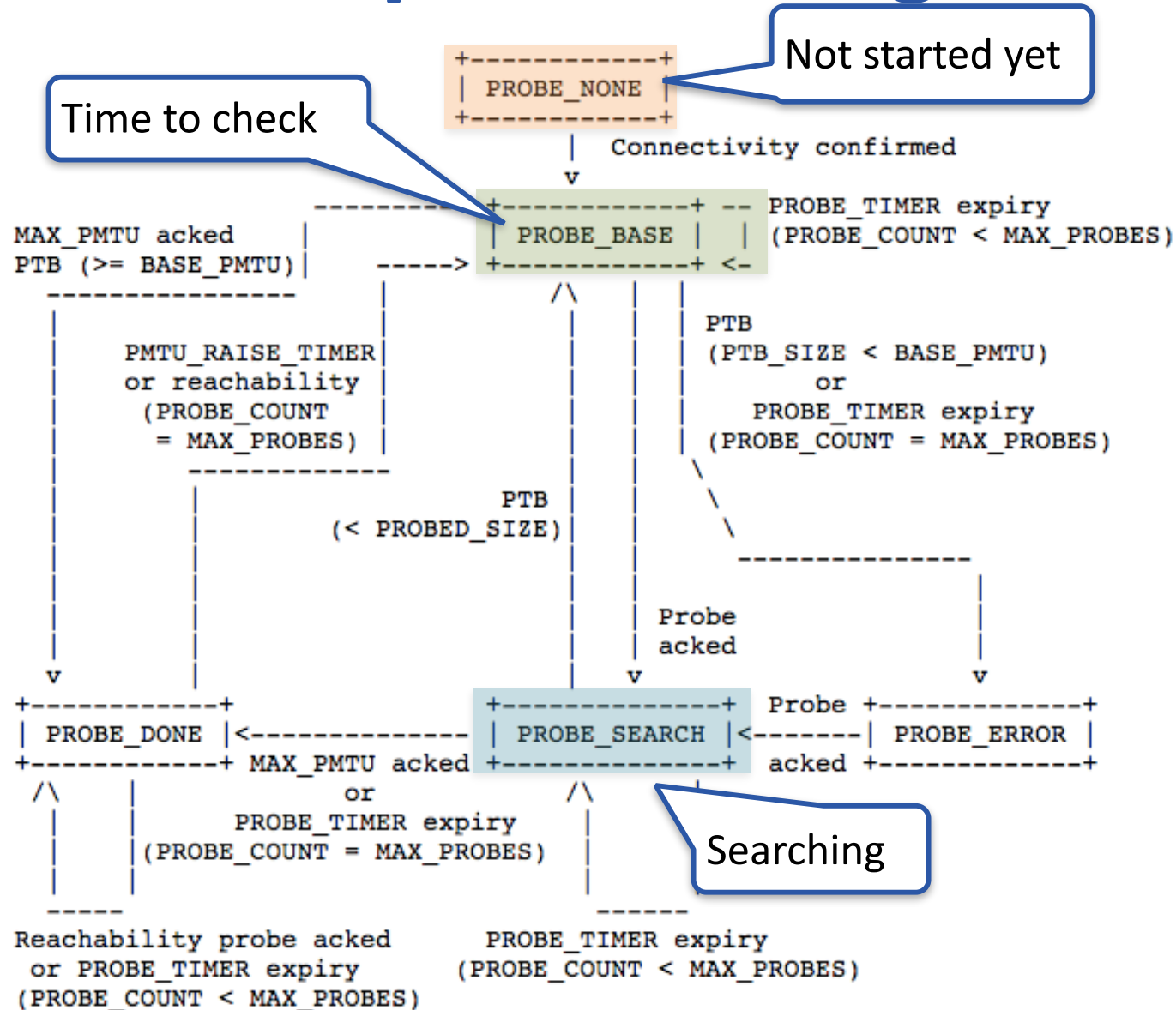
Protocol Independent Algorithm



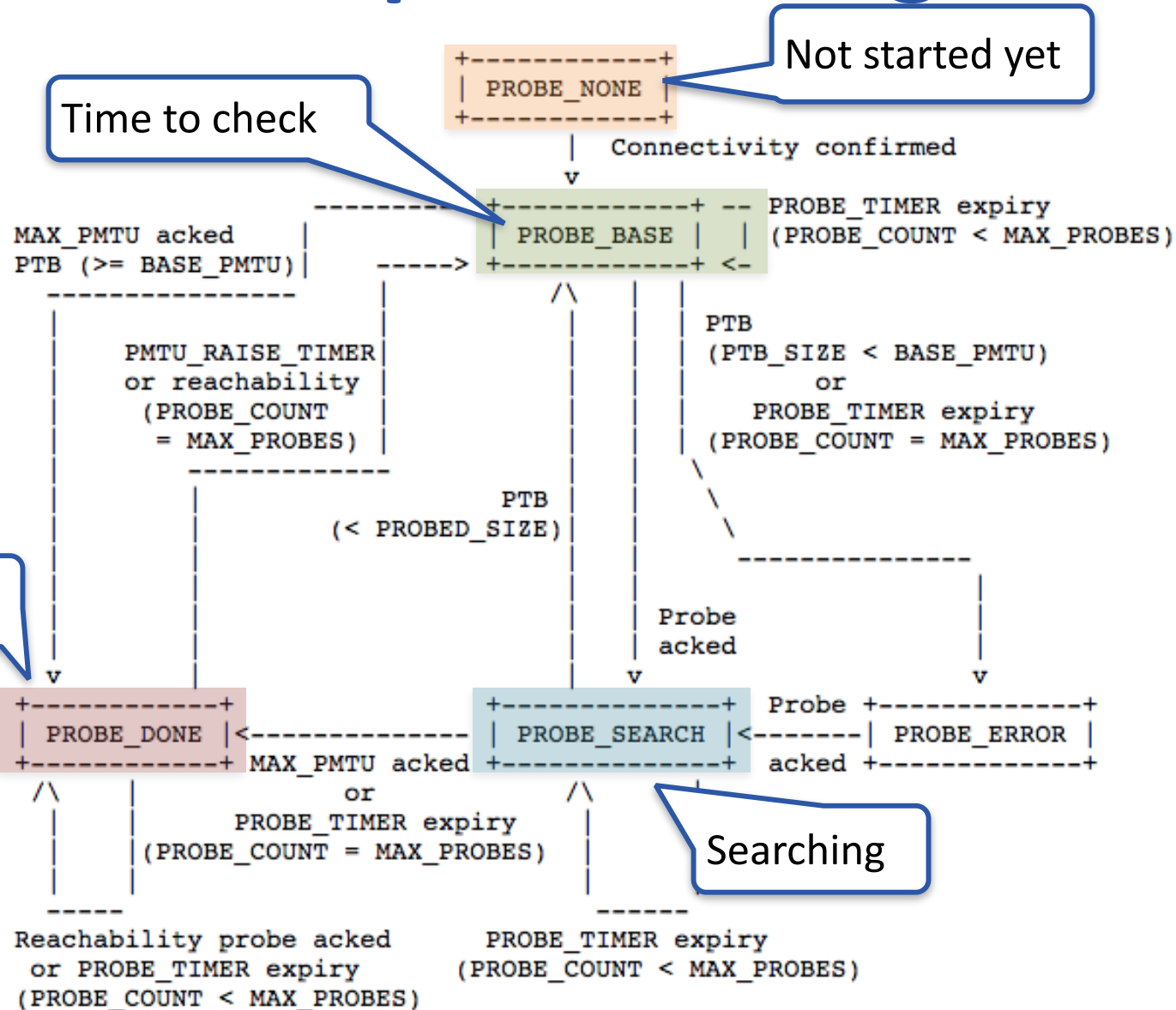
Protocol Independent Algorithm



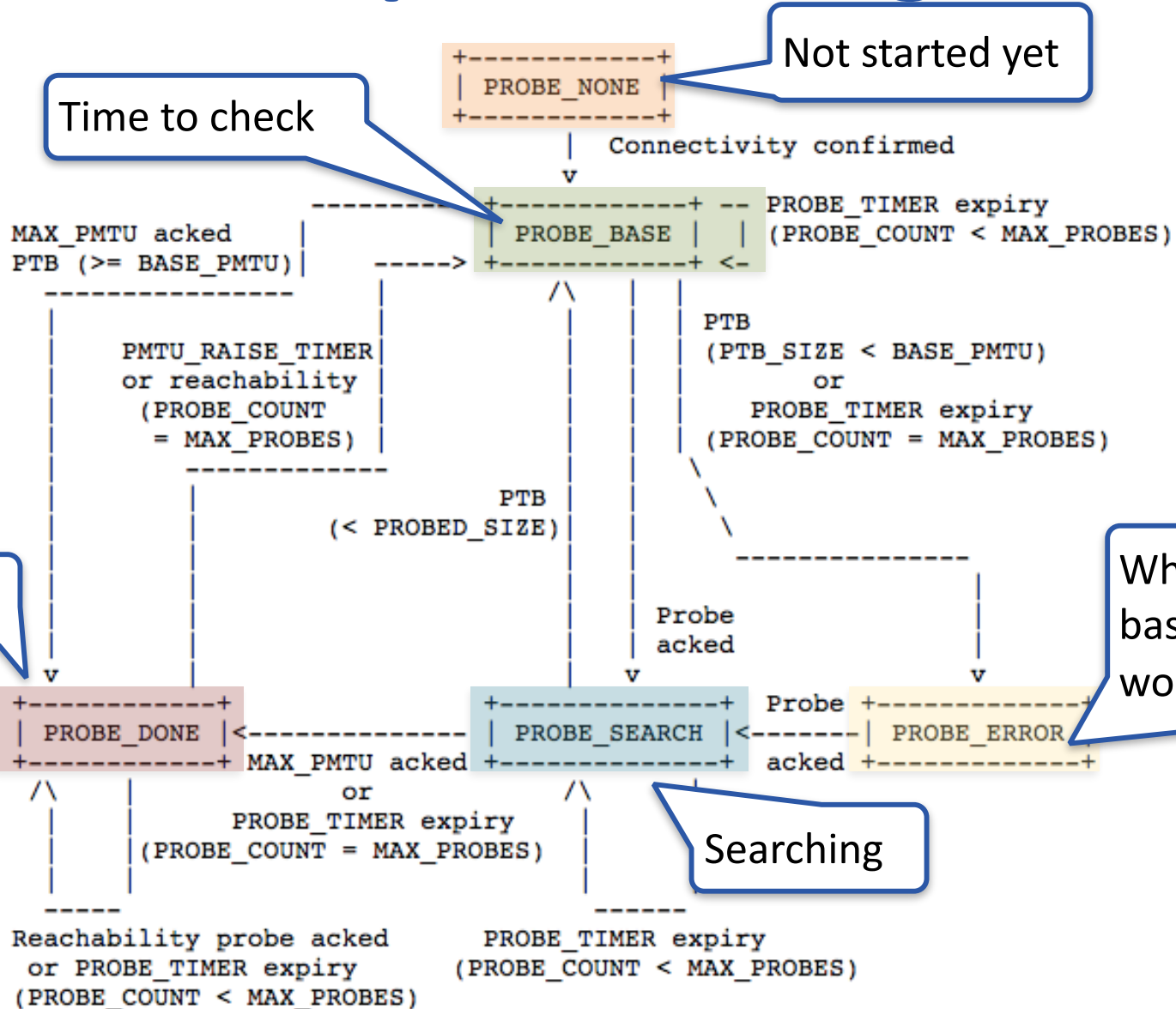
Protocol Independent Algorithm



Protocol Independent Algorithm



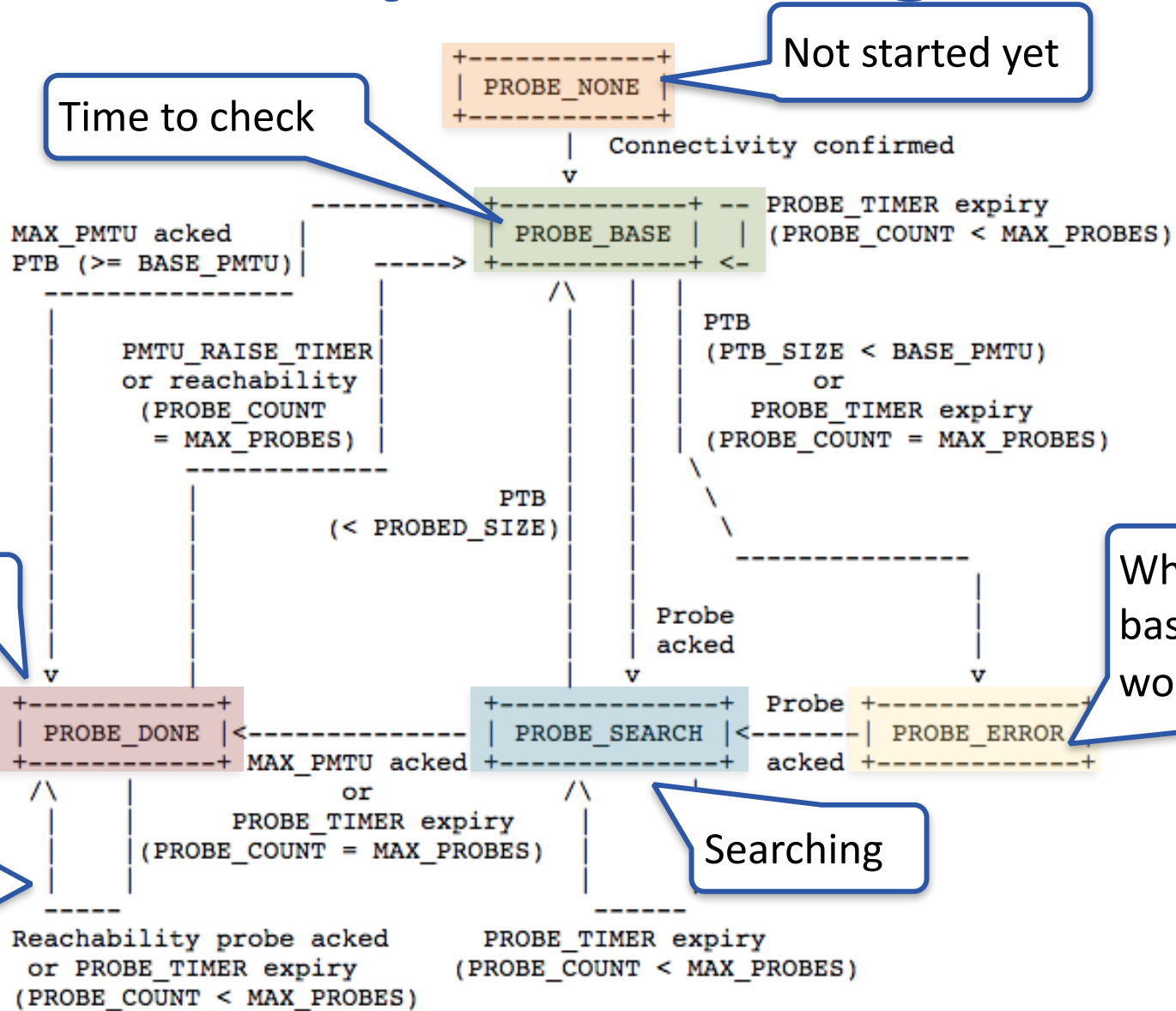
Protocol Independent Algorithm



neat



Protocol Independent Algorithm



neat



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).

