



PMTUD take #4

IPv6 HBH Record MTU

Retake on Path MTU discovery

Goal: Improve on / Add to: PMTUD (RFC8201) / PLPMTUD (RFC4821)

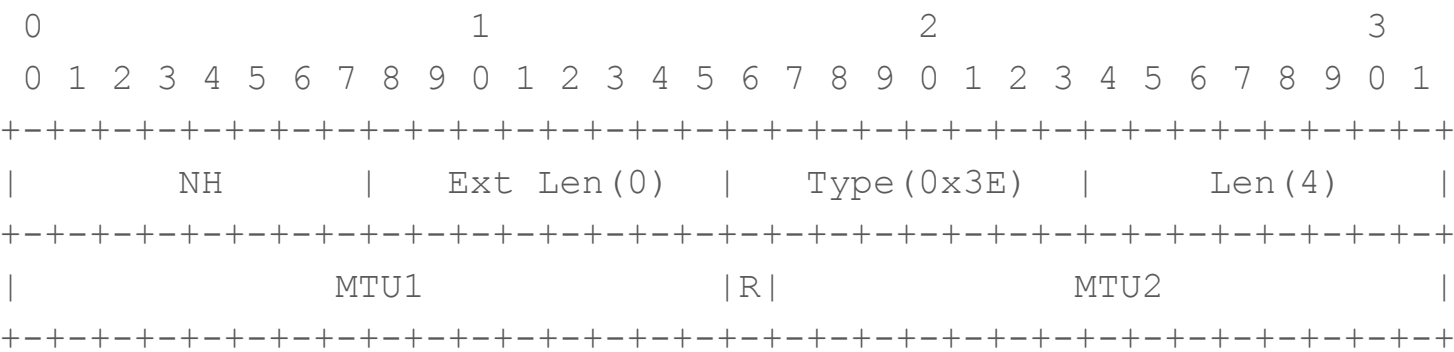
Lots of ideas:

- PMTUD session at IETF103 Friday session
- Packet truncation
- MTU recording by intermediate routers
- Alternatives to signaling MTU back with ICMP

Implement **RFC1063**, i.e. the IPv6 version of it: ***draft-hinden-6man-mtu-option***

Hosts sends packets with MTU record option, routers mark lower MTU in packet.
Second MTU fields is used to signal MTU back to host.

Redefined HBH Option format



No.	Time	Source	Destination	Protocol	Length	Info
10	2.003583	3::1111	3::1111	MTUOP...	94	
11	2.003902	3::1111	3::1111	MTUOP...	94	

▶ Frame 10: 94 bytes on wire (752 bits), 94 bytes captured (752 bits)

▶ Ethernet II, Src: SuperMic_5f:3c:c5 (00:25:90:5f:3c:c5), Dst: AsustekC_92:bc:ee (70:8b:cd:92:bc:ee)

▶ Internet Protocol Version 6, Src: 3::1111, Dst: 3::1111

▼ MTU Hop by Hop Option Data

Option Next Header: 17

Option Extension Length: 0

Option Type: 0x3e

Option Payload Length: 4

Minimum PMTU: 9000

1... = Respond Flag: True

Returned Minimum PMTU: 0

What did we do?

Redefined option format (draft to be updated, Bob)

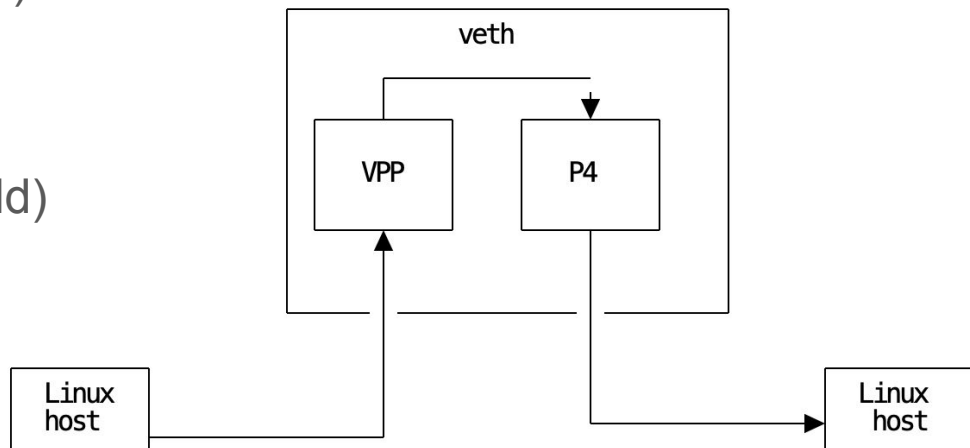
Initial Linux host implementation (Tom H, Vladimir)

Initial BSD host implementation (Tom J)

VPP Router implementation (Ole)

P4 router implementation (Luuk, Ronald)

Wireshark dissector (Bob)



What didn't we do?

- Performance tests
 - between HBH packet and non HBH packet
 - between HBH packet and packet resulting in ICMP PMTUD
- Integration with applications / host MTU cache

What did we learn?

30 year old ideas are as good as new!

- Worth continuing work on this idea
- MTU record has some interesting properties
 - Is incrementally deployable
 - Can signal MTU directly back to application
 - Discovers PMTU in a single 3-way TCP hand shake
- Deployable?
- Continue work on the 6man-icmp-limits draft
 - It's easy to get extension header parsing wrong