Goals

• Part of updating PIM core standards IETF status (IGMP, MLD,...)

• Attempts to solve major problem:
  • RFC1112 is (full) Internet standard. It includes specification of IGMPv1.
  • IGMPv1 should be obsolete.
    • And there where IP multicast hosts confused about which IGMP version is best to implement
  • If we “just” obsolete RFC1112 to obsolete IGMPv1, we loose the rest of RFC1112

• RFC112 beyond IGMPv1: IP Multicast host stack:
  • How to send/receive IP Multicast packets
  • Including how to map them to ethernet multicast on the wire

• Proposed solution:
  • RFC1112bis: Remove IGMPv1 text (appendix), carefully enhance the rest
    • No functional changes, just update text to capture what we already do – and where this is the right place to write it!
  • Adopt immediately to same status as RFC1112 (internet standard)
2021: draft-eckert-pim-rfc1112bis-00

• Removed IGMPv1 section and text referring to it
  • This gets us rid of IGMPv1
  • Replaced with references to IGMPv3, MLDv2
    • TBD: replace with references to draft-ietf-pim-3376bis, draft-ietf-pim-3810bis

• NEW: Added text to make rfc1112 bis apply equally to IPv6
  • RFC1112 only specified for IPv4, not IPv6 (from 1989!)
  • Quite annoying how IPv6 was specified without updating this work for IPv6!
    • There is no IPv6 Host Stack specification in the IETF!
    • Only IPv6 multicast over ethernet mapping specified in RFC2462
  • Makes RFC1112bis become IP/IPv6 “IP Multicast” (ASM) common spec

• NEW: Terms ASM / SSM added
  • What is specified in rfc1112(bis) here is called ASM
  • SSM with references to according RFCs

• -00 written as text delta over RFC1112 to allow easy rfcdiff / iddiff comparison
2023: draft-eckert-pim-rfc1112bis-01

• Had suspended work on rfc1112bis (for finishing e.g. rfc9262)

• Converted to kramdown-rfc2629 format
  • github.com/toerless/rfc1112bis

• Updated/improved section on changes over rfc1112

• Picked up admin discuss with IETF Trust.
What still needs to be done?

• Add reference to RFC2462?
  • Downrev – may need to ask 6MAN to “bump up” RFC2462 to full Internet standard too.

• Add section for IANA asks
  • IANA sent me last week long list of references to rfc1112 that we would need to be updated to RFC1112bis

• Non-use of ‘RFC2119’ language (like RFC8200)
  • RFC1112 predates this language. IMHO: See no need to make unnecessary changes.
  • Every host/router managed to implement IP Multicast without it! RFC8200 also without it!
  • This will be an IESG review topic

• Understand what IESG wants to see to re-adopt immediately as full Internet Standard
  • No functional changes – but scope change to include IPv6
  • Proof of complete cross-industry adoption? both IPv4 and IPv6 should be self-evident.
    • Challenge IESG to find a current host not supporting IP Multicast?
Update to RFC791 / RFC8200?

• RFC1112bis could/should be an update to rfc791 / rfc8200
  • To be discussed with IESG / 6man (for rfc8200 update):

• Core issue
  • DDoS attack: Send packet with multicast source address and unicast destination
    • Creates ICMP unreachable replies to an IP Multicast destination address (IPv4 / IPv6)
    • Perfectly legal for IP hosts not supporting RFC1112 and any IPv6 host!
  • Making rfc1112bis an update to rfc791 / rfc8200 solves this issue
    • RFC1112 specifies to discard these packets – whether IP multicast is supported or not

• Practical relevance?
  • Involved in fixing issue in implementations as late as 2005 (rfc1112 was 15 years old)
  • Not sure if this is still an active attack vector anywhere
  • But having correct IETF standards would be nice anyhow
Possible update to RFC8504

• (TBD) RFC8504 Section 5.11 problematic:
  • Says MUST support MLv2 (good)
  • But MLDv2 does NOT specify host stack behavior, just signaling. Host stack behavior specified in RFC1112 (+ RFC2462 – ethernet-mapping, also not referenced).
  • RFC8504 has dependencies against IP Multicast host stack in other places, e.g.: basic IPv6 protocols like ND, SLAAC – these really are unresolved
  • All IPv6 core IP Multicast dependencies are against ASM IP Multicast
  • Section mentions SSM is preferred over ASM. Sure, for routed multicast, but SSM will NOT work the core IP6 link-local use of ASM IP multicast.
  • Maybe start with a separate section in rfc1112bis “Update to RFC8504” writing this up.

• Should be decided based on feedback/interest from 6man
• Steve Deering (original rfc1112 author) not actively involved, but supportive of the work.
  • Propose to keep as much of rfc1112 text as possible!
  • This implies keeping him as main author
• Already same practice with RFC8200
  • Rfc8200 changes over prior rfc2460 done by Bob Hinden (co-author), Steve not involved.

• Original author email address
  • Will forward any communications requiring his replies (AUTH48 etc..) – same as RFC8200
  • After rfc8200, datatracker was changed to not permit authors without email
  • For time being using “deering@noreply.ietf.org” to overcome this new policy

• Transfer of copyright from rfc1112 author to IETF Trust ?!
  • Not done for rfc2460 (for rfc8200)
  • IETF/Trust would really like to get this from old RFC authors, but will have to leave it to Steve
    • Not enough time to discuss details here.
  • Would have (IMHO only) an impact on administrative text of rfc1112bis
    • E.g.: template text from rfc8200 or from todays standard IETF template text.
The End

• Asking PIM-WG chairs to ask WG for adoption,
  • So this work can continue

• Please read and comment on pim@ietf.org
Backup Slides
About Adoption of RFC1112

• RFC112 specifies:
  ASM IP Multicast host stack – sending/receiving IP multicast packets
  • Level 0 – no support for IP multicast packet sending/receiving as a host
  • Level 1 – just allow sending of IP Multicast packets as a host
  • Level 2 – sending and receiving IP multicast packets as a host

• This is normative “on-the-wire” behavior

• Not explained in any other RFC

• AFAIK: All router/host stacks today implement Level 2
  • But not worth to remove Level 1 text IMHO
Outside scope !! ?

• There is AFAIK no place raising common requirements for IP Multicast routers in RFCs.

• Have not identified a crucial reason why to bother about it.

• Maybe the discard packets with multicast-group-address-source is a requirement that could also be raised against multicast forwarders !
  • To prohibit any forwarding of these nasties.