draft-ietf-pim-eckert-rfc1112bis-03

PIM-WG, IETF122 Bangkok

Steve Deering, retired
Toerless Eckert, Futurewei USA (tte@cs.fau.de) (Editor)

Status update (1)

- -02 went into WGLC after IETF120.
- WGLC window closed around/before IETF121
  - Received one core feedback from Brian Haberman (many thanks)
  - Promised quick resolution @IETF121 PIM-WG
- -03 meant to fix all issues
  - Discovered by Brian and dependent

Changes (1)

- Changed / explained meaning of IP
  - Was „IPv4“ - because RFC1112 was written before IPv6 existed.
  - Now means „any version of IP“ (just as in RFC8200)
  - Lots of IPv4 occurances now. Several fixes resulting from going through references again („IPv6 hop-limit“ instead of „IP TTL“...), reference for IPv6 addressing RFC
- Expanded title / Introductory Summary:
  - "Host Extensions for IP Multicasting and "Any Source Multicasting" (ASM) IP service"
  - Explain „Host Extensions“ to apply to both service models
    - Reason: Most of the document (host stack extensions) apply to both ASM and SSM
    - Previously, there was no good explanation of terminology
    - „IP Multicast“ when referring to a hosts stack it implies possible ASM and/or SSM service
    - If „IP Multicast“ is meant as a service to an application – then ASM is meant
    - Aka: no change to what we do, but hopefully better clarified
- Updated references to IGMPv3/MLDv3 to the –bis versions
  - As discussed @IETF120

Changes (2.1)

- Brian Q: Why was following paragraph removed from ‚bis‘ ?
  „Special Treatment of all-hosts grop 224.0.0.1“

  (Datagrams addressed to the all-hosts group are recognized as a special case by the multicast routers and are never forwarded beyond a single network, regardless of their time-to-live. Thus, the all-hosts address may not be used as an internet-wide broadcast address. ***For the purpose of IGMP, membership in the all-hosts group is really necessary only while the host belongs to at least one other group. However, it is specified that the host shall remain a member of the all-hosts group at all times because (1) it is simpler, (2) the frequency of reception of unnecessary IGMP queries should be low enough that overhead is negligible, and (3) the all-hosts address may serve other routing-oriented purposes, such as advertising the presence of gateways or resolving local addresses****.)*

- A: Because test is repeated in IGMPv2/v3 and MLDv1/2
  - Let‘s consider this a choice of the protocol, not the host stack
- Added section 10.8 explaining this (section 10: changes from rfc1112)
- Note that IGMPv3lite RFC does not include this requirement
  - Which is fine. The only interop issue is that IGMP snooping is prepared to expect it. IGMP snooping RFC does this correctly.

Changes (2.2)

(Datagrams addressed to the ***all-hosts group are recognized as a special case by the multicast routers and are never forwarded beyond a single network, regardless of their time-to-live.*** *Thus, ...)*

- This is a router, not a host requirement *sigh*
- It evolved later as the behavior for all „link-local“ scope IPv4 multicast groups
  - Expanding on the special treatment of just 224.0.0.1
- There is no Stds Track RFC to define link-local IPv4 multicast groups
  - And which rfc1112bis could refer to. Only BCPs: RFC2365, RFC5771
- Let‘s introduce normatively link-local scope IPv4 multicast into rfc1112bis
  - To rectify this stds. spec gap
- Added definition for Link-Local IPv4 group-addresses (224.0.0.0/8)
  - and term „Local Network control block“ for it
  - Note: Do not introduce term „scope“ – seems not necessary, sufficient good later RFCs do that.
- New, short section 8 for routing requirements – non-forward link-local scope
  - Also pointer for pre-existing spec for IPv6 (RFC4921)

Changes (2.3)

- IGMPv1/IGMPv2/IGMPv3 also specify to not send IGMP membership reports for 224.0.0.1
  - This would not be complaint with RFC1112 text without IGMPv1. Text in (...) only said to always join the group.
- How to make RFC1112bis compliant with pre-existing IGMP RFCs ?
- This „not-sending of IGMP membership report“ was in implementations not limited to 224.0.0.1
  - But for all link-local group addresses 224.0.0.0/8
  - We (IETF) did not really liked that though – and removed it in IPv6 MLD
  - But we do not want to change any existing „industry standard“ behavior. Just document it best (no IPv4 behavior changes!)
- New requirement to make IGMP specs and industry implementation behavior compliant with -bis:
  - *Hosts and gateways **MAY omit the sending of IGMP messages to report membership for Link-Local IPv4 host group addresses**, especially on networks known not to (be able to) use any form of IGMP snooping. This does also apply for the IPv6 Link-Local host group all-hosts FF02::1, but not to other Link-Local IPv6 host groups. See Appendix A.3.*
  - Appendix A.3: History explanation of router devices implementing various protocols using 224.0.0.0/8 even before IP multicast or IGMP host stack was implemted.
  - And on subnets without snooping, there actually is no functional benefit of sending IGMP membership reports for link-local group addresses !

Changes (3)

- Found open question: Should this document call itself update to rfc791 ?
  - We can only get IETF/IESG provide useful feedback if we now claim it does update rfc791
  - Appendix B.3 explains why this should be logical
  - Reason: The treatment of IPv4 multicast packets is different from IPv4 unicast, and RFC791 assumes treatment of all of the 32 address space with unicast packet processing.
  - Author think this argument is sound, but if IESG prefers not to, that is fine as well.
- Also Declares itself Update to STD 5 (replace RFC1112 in STD 5)
  - STD 5 includes RFC791 and all core extensions to it (including RFC1112)
- Note: No need for any of this for IPv6 – RFC1112bis does not superceed any IPv6 multicast specs, it just references pre-existing RFCs wherever they match an IPv4 multicast function.
  - The whole „IP (IPv4/IPv6) host stack“ defined by rfc1112bis does of course go beyond RFC791/RFC8200 becuse both define only behior on the wire, but little/nothing of the host stack.
  - But in IP6, there was no „STD 5“ type approach coalescing multiple extension RFCs as in IPv4. IPv6 extensions are also also no „Updates“ (do not change pre-assumed behavior). And IPv6 multicast is included in RFC8200.

Changes (4)

- Longer texts for explanations of these complex issues added
  - In „explanatory“ sections
- 2.1 initial summary: „common host stack“ vs. ASM and SSM service models explained
- 10. Changes from RFC1112

  10.7 IPv4 Local Network Control Block

  10.8 Special treatment of 224.0.0.1 and FF02::1

  10.9 IGMP/MLD messages for Link-Local IPv4 host group addresses
- Link-local IP multicast and IGMP/MLD

Goals / Benefits of changes

- RFC1112bis now aligns BETTER with other RFCs and deployment practices than rfc1112
  - Important when asking to immediately get back to (full) “Internet Standard”
- More explanatory text outside core specification
- Better distinction between “host stack” and ASM / SSM service interface.

Questions ?