Updates to the IPv6 Multicast Addressing Architecture

draft-boucadair-6man-multicast-addr-arch-update
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Background & Scope

• Discussion of draft-ietf-mboned-64-multicast-address-format
• Need to clarify multicast addressing architecture to harmonize its use and ease future extensions
  – Associate a meaning with reserved bits
  – Provide clarifications for the use of flag bits
• Update various RFCs
  – RFC3306, RFC3956, RFC4607 and RFC4291
Reminder

• IPv6 multicast address architecture defined in RFC4291 is as follows

| 8 | 4 | 4 | 112 bits |
+---+----+----+-----------------+
| flgs| scop| group ID         |

  – **flgs is a set of 4 flags**
  – T = 0 indicates a permanently-assigned ("well-known") multicast address, assigned by the Internet Assigned Numbers Authority (IANA).
  – T = 1 indicates a non-permanently-assigned ("transient" or "dynamically" assigned) multicast address.
  – The P flag's definition and usage can be found in [RFC3306].
  – The R flag's definition and usage can be found in [RFC3956].”

• RFC3956 states also:
  – “Instead of using flags bits ("FF70::/12"), one could have used the **leftmost reserved bits** instead ("FF3x:8000::/17").”
Flag Bits

• Some implementations and specification documents do not treat the flag bits as separate bits but tend to use their combined value as a 4-bit integer: e.g.,
  – The reading of [RFC4607] may lead to conclude that ff3x::/32 is the only allowed SSM IPv6 prefix block
  – [RFC3956] states only ff70::/12 applies to Embedded-RP. Particularly, implementations should not treat the fff0::/12 range as Embedded-RP

• **RECOMMENDATION:**
  – *Implementations MUST treat flag bits as separate bits.*
IANA Assigned SSM Block

• Per [RFC4607], ff3x::4000:0001 through ff3x::7fff:fff is the block for IANA assignments (http://www.iana.org/assignments/ipv6-multicast-addresses/ipv6-multicast-addresses.xml)

• However, IANA assignments are permanent addresses and should not have the transient bit set. Quoting from [RFC4607]:
  – “T = 1 indicates a non-permanently-assigned (“transient”) multicast address.”
Addressing Architecture Update

- Bits 17-20 of a multicast address are defined in [RFC3956] and [RFC3306] as reserved bits
- **This I-D defines these bits as generic flag bits so that they apply to any multicast address**
  - Addresses are treated in a more uniform and generic way
  - A meaning can be associated to these bits in the future for different purposes, irrespective of the specific type of multicast address
Next Step

• Adopt as a WG item?