

Internet Engineering Task Force
Internet-Draft
Updates: [4007](#), [4291](#) (if approved)
Intended status: Standards Track
Expires: December 14, 2014

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June 12, 2014

IPv6 Multicast Address Scopes
draft-ietf-6man-multicast-scopes-07.txt

Abstract

This document updates the definitions of IPv6 multicast scopes. This document updates [RFC 4007](#) and [RFC 4291](#)

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1. Introduction

[RFC 4291](#) [[RFC4291](#)] defines "scop is a 4-bit multicast scope value used to limit the scope of the multicast group." scop 3 is defined as "reserved" in [RFC 4291](#). The multicast protocol specification in [draft-ietf-roll-trickle-mcast](#) [[I-D.ietf-roll-trickle-mcast](#)] desires to use multicast scop 3 for transport of multicast traffic scoped to a network of nodes connected in a mesh. The use of this scop value is to accommodate a multicast scope that is greater than Link-Local but is also automatically determined by the network architecture.

2. Definition of IPv6 Multicast Address Scopes (Updates [RFC 4291](#))

The following table updates the definitions in [RFC 4291](#):

scop	NAME	REFERENCE
0	Reserved	[RFC4291], [RFC-to-be]
1	Interface-Local	[RFC4291], [RFC-to-be]
2	Link-Local scope	[RFC4291], [RFC-to-be]
3	Realm-Local scope	[RFC4291], [RFC-to-be]
4	Admin-Local scope	[RFC4291], [RFC-to-be]
5	Site-Local scope	[RFC4291], [RFC-to-be]
6	Unassigned	
7	Unassigned	
8	Organization-Local scope	[RFC4291], [RFC-to-be]
9	Unassigned	
A	Unassigned	
B	Unassigned	
C	Unassigned	
D	Unassigned	
E	Global scope	[RFC4291], [RFC-to-be]
F	Reserved	[RFC4291], [RFC-to-be]

The following change is applied to [section 2.7 of RFC 4291](#):

OLD:

Admin-Local scope is the smallest scope that must be administratively configured, i.e., not automatically derived from physical connectivity or other, non-multicast-related configuration.

NEW:

Interface-Local, Link-Local, and Realm-Local scope boundaries are automatically derived from physical connectivity or other, non-multicast related configuration. Global scope has no boundary. The boundaries of all other non-reserved scopes of Admin-Local or larger are administratively configured. For reserved scopes, the way of configuring their boundaries will be defined when the semantics of the scope is defined.

According to [RFC 4007](#) [[RFC4007](#)], the zone of a Realm-Local scope must fall within zones of larger scope. Because the zone of a Realm-Local scope is configured automatically, while the zones of larger scopes are configured manually, care must be taken in the definition of those larger scopes to ensure that inclusion constraint is met.

Realm-Local scopes created by different network technologies are considered to be independent and will have different zone indices (see [RFC 4007, section 6](#)). A router with interfaces on links using different network technologies does not forward traffic between the Realm-Local multicast scopes defined by those technologies.

3. Definition of Realm-Local scopes

The definition of any Realm-Local scope for a particular network technology should be published in an RFC. For example, such a scope definition would be appropriate for publication in an "IPv6-over-foo" RFC.

Any RFCs that include the definition of a Realm-Local scope will be added to the IANA 'IPv6 Multicast Address Scopes' registry under the Realm-Local scope entry, and those specifications must include such a request in their IANA Considerations.

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[Section 5](#) of this document gives the definition of scop 3 for IEEE 802.15.4 [[IEEE802.15.4](#)] networks.

4. Definition of automatic and administratively configured scopes (updates [RFC 4007](#))

[Section 5 of RFC 4007](#) [[RFC4007](#)] and [section 2.7 of RFC 4291](#) disagree about the way in which multicast scope 3 is configured. To resolve that disagreement, change the last bullet in the list in [section 5 of RFC 4007](#) as follows:

OLD:

- o The boundaries of zones of a scope other than interface-local, link-local, and global must be defined and configured by network administrators.

NEW:

- o The boundaries of zones of a scope are defined by the IPv6 addressing architecture [[RFC4291](#)] and updated by [RFC-to-be].

5. Definition of Realm-Local Scope for IEEE 802.15.4

When used in an IP-over-IEEE802.15.4 network, "scop 3" is defined to include all interfaces sharing a PAN ID.

6. IANA Considerations

IANA is requested to establish a sub-registry titled "IPv6 Multicast Address Scopes" in the existing "Internet Protocol version 6 (IPv6) Multicast Address Allocations" registry. The new registry is to be populated with the scope values given in [Section 2](#). New definitions for scop values will be made with "IETF Review" policy.

IANA is requested to add a reference to the Realm-Local scope entry (scop 3) in the "IPv6 Multicast Address Scopes" registry for each future RFC that defines a Realm-Local scope for new network technologies. Such RFCs are expected to make an explicit request to IANA for inclusion in the registry.

IANA is requested to include a note to the top of the "IPv6 Multicast Address Scopes" registry:

The definition of any Realm-Local scope for a particular network technology should be published in an RFC. For example, such a scope definition would be appropriate for publication in an 'IPv6-over-foo' RFC.

Any RFCs that define a Realm-Local scope will be listed in this registry as an additional reference in the Realm-Local scope entry. Such RFCs are expected to make an explicit request to IANA for inclusion in this registry.

7. Acknowledgments

Robert Cragie, Kerry Lynn, Jinmei Tatuya, Dave Thaler and Stig Venaas all contributed text and/or review to ensure that the updates to [RFC 4007](#) and [RFC 4291](#) are correct.

8. Security Considerations

This document has no security considerations beyond those in [RFC 4007](#) [[RFC4007](#)] and [RFC 4291](#) [[RFC4291](#)].

9. References

9.1. Normative References

- [RFC4007] Deering, S., Haberman, B., Jinmei, T., Nordmark, E., and B. Zill, "IPv6 Scoped Address Architecture", [RFC 4007](#), March 2005.
- [RFC4291] Hinden, R. and S. Deering, "IP Version 6 Addressing Architecture", [RFC 4291](#), February 2006.

9.2. Informative References

- [I-D.ietf-roll-trickle-mcast]
Hui, J. and R. Kelsey, "Multicast Protocol for Low power and Lossy Networks (MPL)", [draft-ietf-roll-trickle-mcast-09](#) (work in progress), April 2014.

[IEEE802.15.4]

IEEE Std 802.15.4-2006, "IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements; Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs)", October 2006.

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