

IS-IS Prefix Attributes for Extended IP and IPv6 Reachability

draft-ginsberg-isis-prefix-attributes-00.txt

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What prompted us to write this draft?

SR work demonstrated it is useful to know whether a prefix is directly connected to the advertising router.

Since introduction of “wide-metrics” (RFC 5305) IPv4 has lacked an indication that a prefix is external – while IPv6 (RFC 5308) has had such a flag.

Various use cases (SR, RLFA) for knowing what addresses a router wants to use as a node address.

Some of this has been defined in `draft-ietf-isis-segment-routing-extensions`, but as use cases are for more than just SR it makes sense to define as an independent protocol extension.

IPv4/IPv6 Extended Reachability Attributes sub-TLV

Prefix Attribute Flags

Type: 4 (suggested - to be assigned by IANA)

Length: Number of octets to follow

Value

(Length * 8) bits.

```
 0 1 2 3 4 5 6 7 . . .  
+--+--+--+--+--+--+--+ . . .  
|X|R|N| . . .  
+--+--+--+--+--+--+--+ . . .
```

(Applies to TLVs 135, 235, 236, 237)

IPv4/IPv6 Extended Reachability Attributes sub-TLV (2)

X-Flag

- **Indicates prefix is injected from an external source (redistributed)**
- **Ignored for TLVs 236, 237 (IPv6 already has such a flag)**
- **Preserved when leaked**

R-Flag

- **Set when prefix has been leaked from one level to another (UP or DOWN)**

N-Flag

- **Set when the prefix identifies the advertising router i.e., the prefix is a host prefix advertising a globally reachable address**
- **The advertising router MAY choose to NOT set this flag even when the above conditions are met.**
- **Preserved when leaked**

IPv4/IPv6 Source Router ID sub-TLV

When reachability advertisement is leaked the source of the advertisement is not known. When prefix has N-flag set source information is useful.

IPv4 Source Router ID

Type: 11 (suggested - to be assigned by IANA)

Length: 4

Value: IPv4 Router ID of the source of the advertisement

IPv6 Source Router ID

Type: 12 (suggested - to be assigned by IANA)

Length: 16

Value: IPv6 Router ID of the source of the advertisement

Preserved when leaked

IPv4/IPv6 Source Router ID sub-TLV(2)

Alternate proposal in `draft-xu-isis-routable-ip-address-01` to use router capability TLV to advertise source of node addresses.

Prefix attributes solution has advantages:

- **If the N flag is set and the R and X flags are NOT set then the advertisement is for a directly connected address local to the advertising router - there is no need to also include the source Router ID - which allows a more efficient encoding in these cases.**
- **The use of Reachability TLVs to carry this information also allows topology specific node addresses to be advertised if desired.**

Request to become WG Document

91st IETF, Honolulu, November 2014