Domain Subobjects for Resource ReserVation Protocol – Traffic Engineering (RSVP-TE)

draft-dhody-ccamp-rsvp-te-domain-subobjects-00

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85th IETF @ Atlanta

Motivation for this work

What's Existing?

- [RFC3209] (MPLS) and [RFC3473] (GMPLS) allow abstract nodes and resources to be explicitly included in a path setup using ERO.
- Exclude Routes Extension [RFC4874] allow abstract nodes and resources to be explicitly excluded using XRO and EXRS.
- Subobject for Autonomous Number (AS) (2-Byte)

What's Missing?

- New subobjects to include or exclude **domains** during path setup
  - Subobject for Autonomous Number (AS) (4-Byte)
  - Subobject for IGP (OSPF / ISIS) Area
- *These subobjects could be carried in ERO, XRO & EXRS.*

ERO Subobjects for Domains

An explicit route is a particular path in the network topology. An explicit route can also identify a group of nodes **(abstract nodes)** that must be traversed along the path.

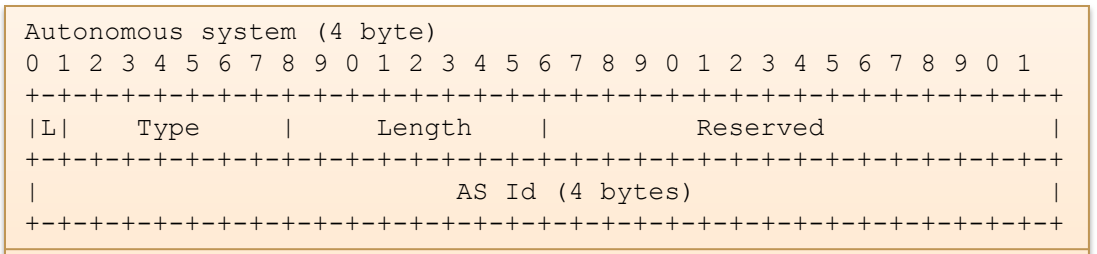
Existing Subobjects

Type	Subobject
1	IPv4 prefix
2	IPv6 prefix
3	Label
4	Unnumbered Interface ID
32	**Autonomous system number (2 Byte)**
33	Explicit Exclusion (EXRS)
34	SRLG
64	IPv4 Path Key
65	IPv6 Path Key

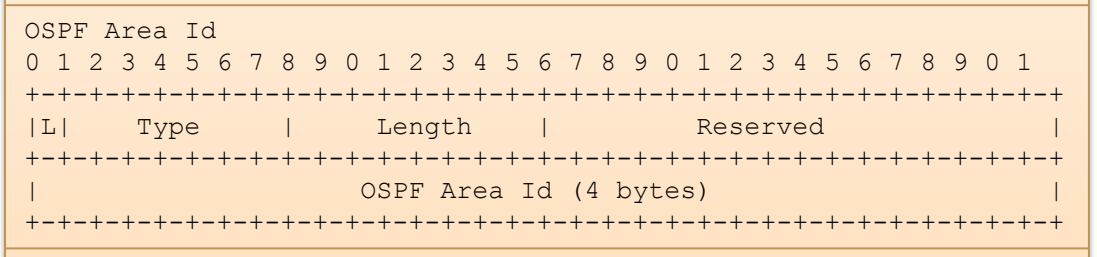
New Subobjects

Type	Subobject
TBD	**Autonomous system number (4 Byte)**
TBD	**OSPF Area id**
TBD	**ISIS Area id**

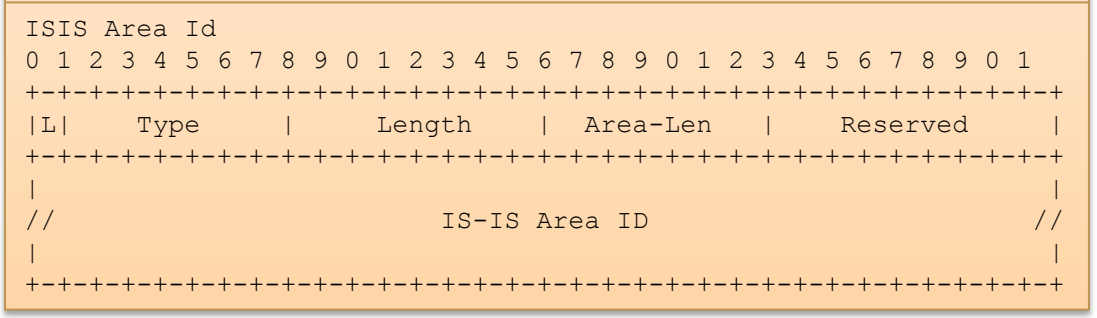
Autonomous system (4 byte)



OSPF Area Id



ISIS Area Id



The new subobjects to support 4-Byte AS and IGP (OSPF / ISIS) Area can also be used in the ERO to specify an abstract node (a group of nodes whose internal topology is opaque to the ingress node of the LSP).

XRO Subobjects for Domains

The exclude route identifies a list of abstract nodes that should not be traversed along the path of the LSP being established.

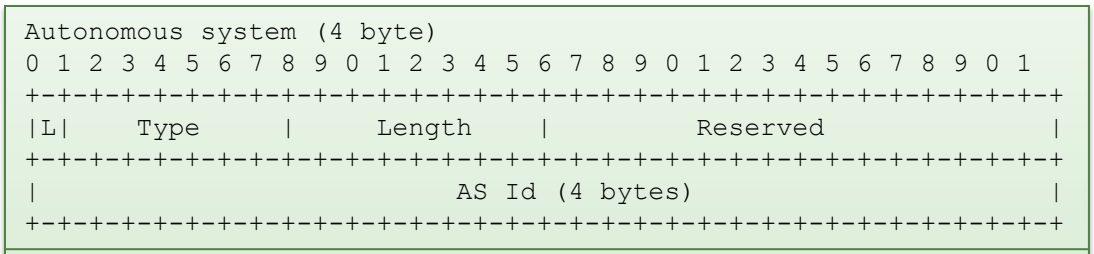
Existing Subobjects

Type	Subobject
1	IPv4 prefix
2	IPv6 prefix
3	Label
4	Unnumbered Interface ID
32	**Autonomous system number (2 Byte)**
34	SRLG

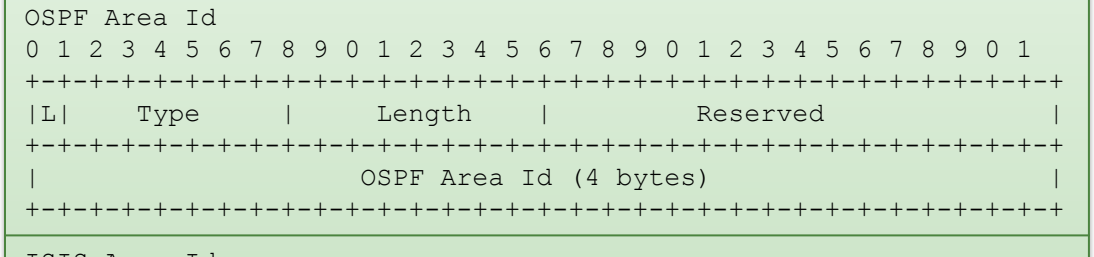
New Subobjects

Type	Subobject
TBD	**Autonomous system number (4 Byte)**
TBD	**OSPF Area id**
TBD	**ISIS Area id**

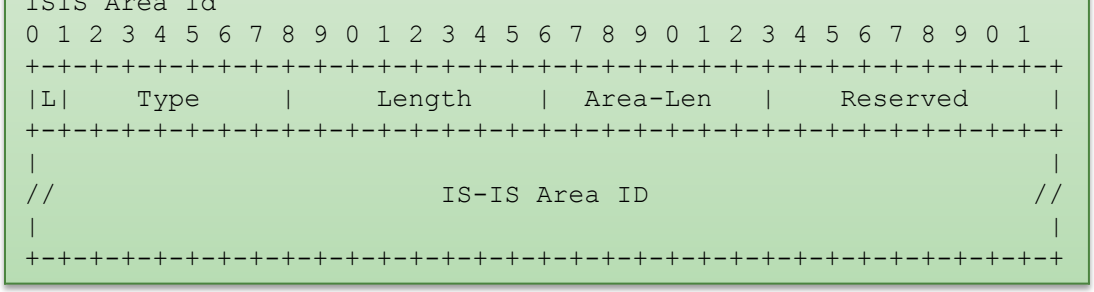
Autonomous system (4 byte)



OSPF Area Id



ISIS Area Id



The new subobjects to support 4-Byte AS and IGP (OSPF / ISIS) Area can also be used in the XRO to specify exclusion of an abstract node.

EXRS Subobjects for Domains

The Explicit Exclusion Route defines abstract nodes or resources that must not or should not be used on the path between two inclusive abstract nodes in the explicit route.

EXRS is an ERO subobject that contains one or more subobjects of its own, called EXRS subobjects.

EXRS subobject may carry any of the subobjects defined for XRO, thus the new subobjects to support 4-Byte AS and IGP (OSPF / ISIS) Area MAY also be used in the EXRS.

Relationship with PCE

The same subobjects used in Path Computation Element Protocol (PCEP) are referred to in [draft-ietf-pce-pcep-domain-sequence-01].

Note that the subobjects carried in RSVP Objects (ERO, XRO, EXRS) are similar to PCEP Objects (IRO, XRO, ERO, EXRS).

There could be situations (ex. per-domain signaling) where there will be an exchange of objects (back and forth) between PCEP and RSVP-TE in order to achieve control of the domain path.

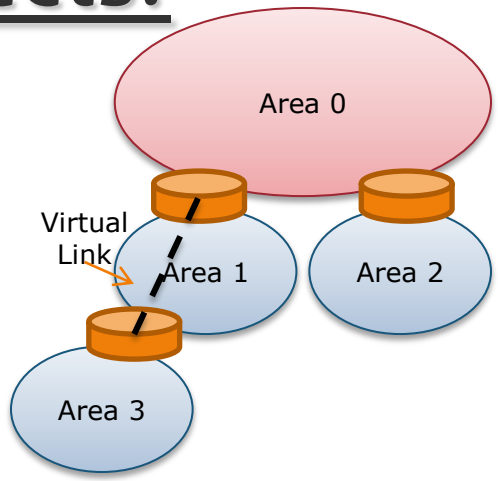
Questions & Comments?

Thanks!

Backup Slides

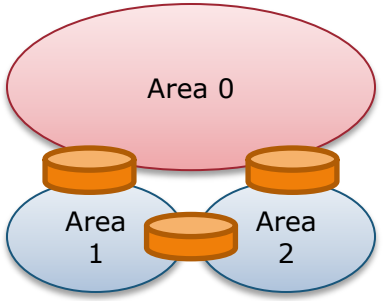
Why IGP Area Subobjects?

•OSPF and ISIS are hierarchical routing based on Backbone (Area 0), and most inter-area would be of type 1-0-2.



•There some scenario where this assumption fails –

- •OSPF Virtual Link
- •Alternative ABR
  - •ABR connectivity between Area 1 and Area 2 directly
- •Discontinuous Area 0
  - •Incase of network merge both running OSPF.



•Thus there is a need to explicitly include/exclude a particular area during signaling.