

Segment Routing Conflict Resolution

draft-ginsberg-spring-conflict-resolution-00

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WHY?

For identifiers w global scope/usage conflicts may occur due to misconfiguration. This will cause forwarding issues (drops, loops).

Consistent (network-wide) and deterministic conflict resolution policy is needed to minimize the damage.

Prior discussions have not reached consensus.

Draft is the vehicle to drive discussions to consensus and document the agreed upon policies.

Problem is cross-protocol – therefore SPRING is the right working group.

Handling Invalid SRGB Entries

Example:

Range 1: (100, 199]

Range 2: (1000, 1099)

Range 3: (100, 599) !Overlaps w Range #1

Range 4: (2000, 2099)

Draft Proposal: Use ranges preceding the first conflicting range.

Presumes the most common case is misconfiguring a new range placed at the end of the advertisement.

Alternate Proposal: Reject the entire advertisement

Places burden on the source to detect/prevent misconfigurations

Represents a bug in the config validation – any sort of error is possible

Mapping Entry

A generalized mapping entry can be represented using the following definitions:

Pi - Initial prefix

Pe - End prefix

L - Prefix length

Lx - Maximum prefix length (32 for IPv4, 128 for IPv6)

Si - Initial SID value

Se - End SID value

R - Range value

Mapping Entry is then the tuple: (Pi/L, Si, R)

$Pe = (Pi + ((R-1) \ll (Lx-L))$

$Se = Si + (R-1)$

Terminology: Conflict Types

PREFIX CONFLICT

When different SIDs are assigned to the same prefix

(192.0.2.120/32, 200, 1)

(192.0.2.120/32, 30, 1)

SID CONFLICT:

When the same SID has been assigned to multiple prefixes

(192.0.2.1/32, 200, 1)

(192.0.2.222/32, 200,1)

Mapping Entry Conflict Resolution

Policy	Advantages	Disadvantages
Ignore	Simple and predictable Easy to diagnose No unintended traffic flow	Delivery to all destinations in conflict is compromised
Preference Rule	Traffic to some of the destinations in conflict may continue to be forwarded successfully	Harder to diagnose based on forwarding behavior Introduction of new conflicts may cause other entries in conflict to be used

(Draft is currently agnostic)

Preference Rule Exclusions

Source (e.g. originating router-id) should NOT be used
– not known consistently when advertisements are leaked between areas

Route type (e.g. intra-area vs inter-area) should NOT be used as it is not consistent network-wide

Prefix advertisements vs SRMS advertisements:

- Equally vulnerable to misconfiguration
- Could be configured in a similar manner

Context

When conflicts occur it is impossible to know which advertisement is the one intended by the operator.

No matter what policy is chosen we cannot guarantee all traffic will be delivered correctly.

Caused by a misconfiguration – network is broken!!

Any choice will be optimal in some deployments and sub-optimal in other deployments

Any choice will be optimal in some types of misconfigurations and sub-optimal in other types of misconfigurations

Priorities

Detect the problem

Report the problem

Define consistent behavior

Don't overengineer

Choose the resolution behavior

Next Steps

Open discussion

Come to consensus quickly ☺

WG adoption Requested