Resource Guarantee for SRv6 Policies

draft-cheng-spring-srv6-policy-resource-gurantee-02

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Introduction

- The concept of Network Resource Partition (NRP) is introduced in [I-D.ietf-teas-ietf-network-slices]:
  - An NRP consists of a subset of the buffer/queuing/scheduling resources on each of a connected set of links in the underlay network.

- RFC8986 has defined a set of well-known SRv6 Endpoint behaviors that are not associated with a set of NRP of the links for slices/slice aggregate.
  - e.g. End.X just forwards to an endpoint with cross-connect to a ‘layer-3 adjacency’

- Define a new SRv6 Endpoint behavior which can be used to associate with a set of NRP (e.g. dedicated queues resources, Layer-2 logical sub-interfaces), called End.NRP

- By using the End.NRP SID to build its segment list, the SRv6 policy has the capability to program network resources and achieve strict SLA guarantees.
Changes of the Draft

draft-cheng-spring-srv6-policy-resource-gurantee-02 changes:
• Add the Implementation status

draft-cheng-spring-srv6-policy-resource-gurantee-01 changes:
• Add Security Considerations
• Run idnits and clean up the document

draft-cheng-spring-srv6-policy-resource-gurantee-00 changes:
• Name changes to draft-cheng-spring-srv6-policy-resource-gurantee (Resource Guarantee for SRv6 Policies)
• Addressed review comments from several WG participants

draft-cheng-spring-srv6-resource-programming-01 changes:
• Improve Use Cases for End.NRP behavior section
  – Update to leased line as use case.
• Add reference: ietf-spring-resource-aware-segments
• Addressed review comments from several WG participants
Processing of End.NRP Behavior

• The End.NRP behavior is a variant of the End.X behavior defined in [RFC8986].

Any SID instance of End.NRP behavior is associated with two sets: J1 and J2.
- J1: one or more L3 adjacencies or L2 bundles
- J2: NRP of J1

When N receives a packet destined to S and S is a local End.NRP SID, the line S15 of the End.X processing defined in RFC8986:

S15. Submit the packet to the IPv6 module for transmission to the new destination via a member of J

is replaced by the following:

S15. Submit the packet to the IPv6 module for transmission to the new destination via a member of J1, using the NRP identified by J2
Use Cases for End.NRP behavior

- As shown in picture 1, there are two customers with different leased line requirements from PE1 to PE2:
  - leased line1: 1G BandWidth with strict SLA guarantee.
  - leased line2: 2G BandWidth with strict SLA guarantee.
- For one IGP link, multiple End.NRP SID should be allocated, each of which is associated with a subset of link resources, such as dedicated queues, Layer-2 logical sub-interfaces, etc.

<table>
<thead>
<tr>
<th>OutBound</th>
<th>End.NRP SID</th>
<th>NRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE1/0/0</td>
<td>End.NRP11</td>
<td>GE1/0/0.Queue1: 1G BW</td>
</tr>
<tr>
<td>GE1/0/0</td>
<td>End.NRP21</td>
<td>GE1/0/0.Queue2: 2G BW</td>
</tr>
</tbody>
</table>

- End.NRP11 is associated with NRP(GE1/0/0.Queue1), indicates PE1 to forward traffic to P1 via this NRP.
- End.NRP21 is associated with NRP(GE1/0/0.Queue2), indicates PE1 to forward traffic to P1 via this NRP.

- Customer1’s leased line:
  - SRv6 Policy1: <End.NRP11, End.NRP12, End.NRP13>
- Customer2’s leased line:
  - SRv6 Policy2: <End.NRP21, End.NRP22, End.NRP23>
Implementation Status

• The SRv6 END.NRP Function mechanism has been implemented by ZTE & H3C.
• China Mobile has successfully completed the basic verification.
Discussion in Mailing List

• Relationship between draft-cheng-spring-srv6-policy-resource-gurantee and draft-ietf-spring-resource-aware-segments
  – Recently, the mailing list reached a consensus:
    • draft-ietf-spring-resource-aware-segments is a very useful framework document, and it does not define any specific solution but provides common architectural ground for development of such solutions. In addition we need the specific solutions.
    • draft-cheng-spring-srv6-policy-resource-gurantee further proposed specific solutions. It defines the specific behaviors- End.NRP behavior, and actual application scenarios. This draft can provide guidance when deploying. The SRv6 END.NRP functional mechanism has a running code, and China Mobile has completed the verification of this function.
• The Mailing list discussion link
  – https://mailarchive.ietf.org/arch/msg/spring/K4-yldPkaKOMiChxf3CrvwCrHko/
  – https://mailarchive.ietf.org/arch/msg/spring/q91kDe7AfKgx9RhQUL76BwhN8dQ/
  – https://mailarchive.ietf.org/arch/msg/spring/uJHMRdi1MIxozjw7wqZkKVJKYtw/
Next Step

• Comments welcome.

• 2023-09-28 Authors sent request for WG adoption
  https://wiki.ietf.org/en/group/spring

• WG adoption 😊

Thank you!