

Flexible Candidate Path Selection of SR Policy

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Background

Per [RFC9256], as long as there is a valid segment list in the active candidate path, the active candidate path is valid.

But the paths of remaining segment lists may not meet the SR policy forwarding performance requirements, such as:

- Insufficient bandwidth.
- Excessive delay
- Too high packet loss rate
-

```
SR Policy POL1
Candidate Path CP1
Preference 200
Segment List 1 <SID11...SID1i>, Weight 1 //100M
Segment List 2 <SID21...SID2j>, Weight 1 //100M
Segment List 3 <SID31...SID3k>, Weight 1 //100M
Candidate Path CP2
Preference 100
Segment List 4 <SID41...SID4i>, Weight 1 //100M
Segment List 5 <SID51...SID5j>, Weight 1 //100M
Segment List 6 <SID61...SID6k>, Weight 1 //100M
```

○ Requirement: Bandwidth $\geq 150M$
When segment lists 1 and 2 become invalid, even if there are CP2 with lower preference that can meet the bandwidth requirements in the SR policy, the traffic will continue to be forwarded along CP1.

Flexible Candidate Path Selection Mechanism

Take the forwarding quality requirements and resource requirements of candidate paths as the selection criteria of candidate paths.

Firstly, check whether the path meets the quality requirements. **Only the valid path that meets the quality requirements can be selected as the active path.**

Then, if multiple candidate paths meet the quality requirements at the same time, or if all candidate paths fail to meet the requirements, select active path according to the Preference per RFC9256 section 2.9

Threshold Parameters of Candidate Paths

The threshold parameters of candidate :

- **Available bandwidth**

A threshold can be specified separately for each segment list .

The threshold of the candidate path is the sum of the thresholds of the segment list calculated based on the weight.

- **Bandwidth utilization**

- **Jitter**

- **Latency**

- **Packet loss**

As long as the jitter, delay, or packet loss rate of any valid segment list in the candidate path does not meet the specified threshold, it is considered that the candidate path does not meet the performance requirements.

- **Current flow rate**

The sum of the current rates of all segment list paths within the candidate path.

- **Ratio of valid segment lists in candidate path**

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When multiple threshold parameters are specified on the candidate path at the same time, **the candidate path is considered to meet threshold requirements only if all threshold requirements are met.**

Flexible Candidate Path Selection Process

The process of selecting the best path for SR policy through the threshold parameter of the path:

1. Configure the threshold parameters on the candidate path of head node.
2. **The head node monitors whether the available resources and forwarding quality of the SR policy candidate path exceed the thresholds.**
3. **when the available resources are less than the threshold, or the forwarding quality cannot meet threshold requirements, select a new active candidate path.**

After the old active candidate path eliminates the fault or improves the forwarding quality, whether to recover can be specified by the configuration.

For avoiding path switching frequently, both over-threshold switching and fault recovery should be delayed.

Example

Requirement: The available bandwidth must not be less than 150M.

If Segment List 1 and 2 become invalid, CP2 is selected as the new active candidate path of POL1. The traffic forwarded by POL1 is switched to the path of CP2 for forwarding.

```
SR Policy POL1
Candidate Path CP1
  Preference 200
  Available bandwidth threshold 150 //150M
  Segment List 1 <SID11...SID1i>, Weight 1 //100M
  Segment List 2 <SID21...SID2j>, Weight 1 //100M
  Segment List 3 <SID31...SID3k>, Weight 1 //100M
Candidate Path CP2
  Preference 100
  Available bandwidth threshold 150 //150M
  Segment List 4 <SID41...SID4i>, Weight 1 //100M
  Segment List 5 <SID51...SID5j>, Weight 1 //100M
  Segment List 6 <SID61...SID6k>, Weight 1 //100M
```

Next Steps

- Welcome questions or comments
- Seeking for feedback from WG