Flexible Candidate Path Selection of SR Policy

draft-liu-spring-sr-policy-flexible-path-selection-05

Yisong Liu (China Mobile) (Presenter)

Changwang Lin (New H3C Technologies)

Shuping Peng (Huawei Technologies)

Gyan S. Mishra (Verizon Inc.)

Yuanxiang Qiu (New H3C Technologies)

IETF-119

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

Invalid

- Requirement: Bandwidth > 150Mbps

The actual flow rate is about 120Mbps. When the actual bandwidth of CP1 is insufficient, even if CP2 with lower preference can meet the requirements, 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.

1) check whether the path meets the quality requirements. **Only the valid path that meets the forwarding quality requirements can be selected as the active path.**

2) 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 of segment list :

- **Jitter**
- **Latency**
- **Packet loss**

  When the jitter, delay, or packet loss of a valid segment list cannot meet the specified threshold requirement, the segment list will be treated as an invalid segment list and will no longer load share traffic.

The threshold of candidate path:

- **Available bandwidth**
- **Actual bandwidth**

  The sum of preset bandwidth or actual remaining bandwidth of all valid segment lists in the candidate path that meet the threshold requirements for latency, jitter, or packet loss.
- ……

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.

Example

Select the Best Path Based on End-to-End Delay

Requirement: The transmission delay of forwarding path must be less than 200ms.

If the delay of CP1 exceeds the threshold, 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
      Delay threshold 200ms
      Segment List 1 <SID11...SID1i> // Actual delay>1s
  Candidate Path CP2
      Preference 100
      Delay threshold 200ms
      Segment List 2 <SID21...SID2i> //Actual delay<100ms
```

Changes to Version 05 of the draft

According to the comments of IETF-117 meeting, the following contents have been updated:

- The principles for using thresholds at the segment list level and candidate path level have been clarified.
- Added use case based on delay.

Next Steps

- Welcome more questions or comments
- Seeking for more feedback from WG