

Intelligent Routing Method of SR Policy

draft-yang-sr-policy-intelligent-routing-01

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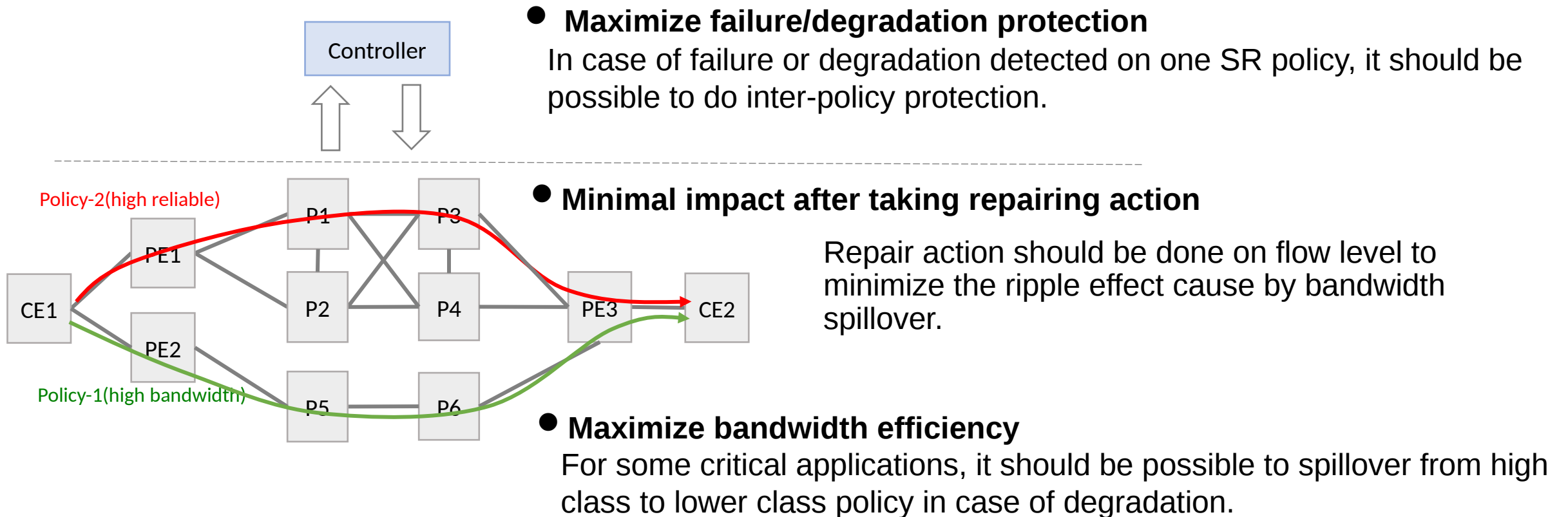
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Background

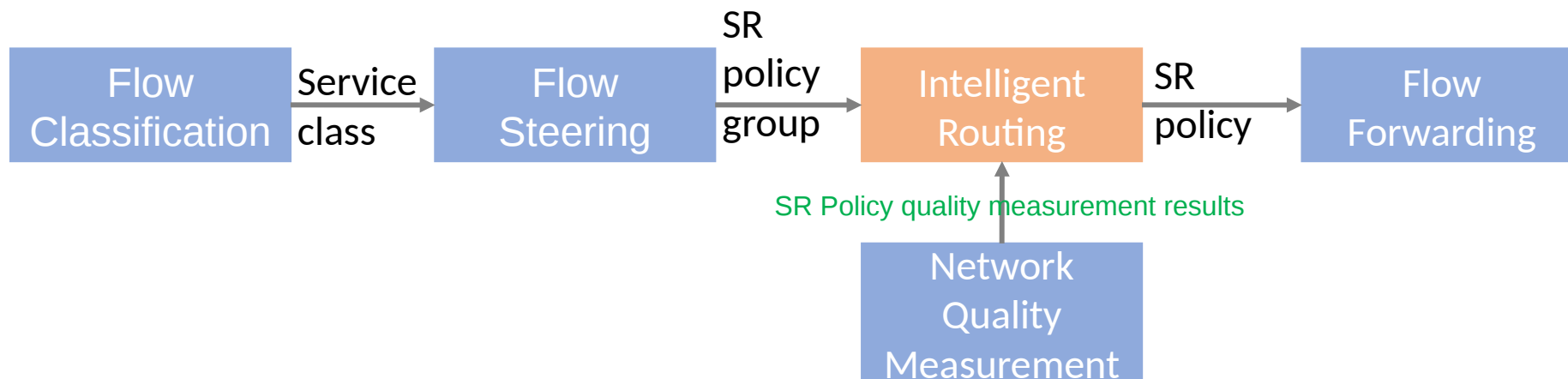
In single SR Policy, there are many mechanism provide failure/degrade protection, such as TILFA, VPN FRR. However, it is not clear how to handle failure or degradation between multiple SR policies.

e.g. OA and voice traffic have different SLA requirement, and were carried by different SR policies. When failure or degradation happened in OA traffic SR policy, there should be possible to assure basic communication for OA traffic by using voice bandwidth.



SR Policy Intelligent Routing

1. Those SR policies expect to be protected by each other can be grouped into a SR policy group share the bandwidth.
2. Each SR policy is associated with a service class and is **assigned a priority**. Priority is for indicating load sharing or backup forwarding strategy. SR policy group will inherit the highest priority of its SR policy member.
3. Each flow will be mapping to a SR policy by service class normally. However, in case of degradation or failure happened, the traffic will be spillover to the next higher priority in the same SR policy group.
4. If the quality of the high priority forwarding policy is restored, the traffic is switched to the original SR policy .



Flow Classification Unit

After receiving the traffic, the head node matches the flow characteristics and colors with service class, i.e. SR policy priority.

Flow characteristics:

- Ethernet destination/source address
- VLAN
- TOS
- IP destination/source address
- DSCP
- TCP/UDP port
- Application attribute
-

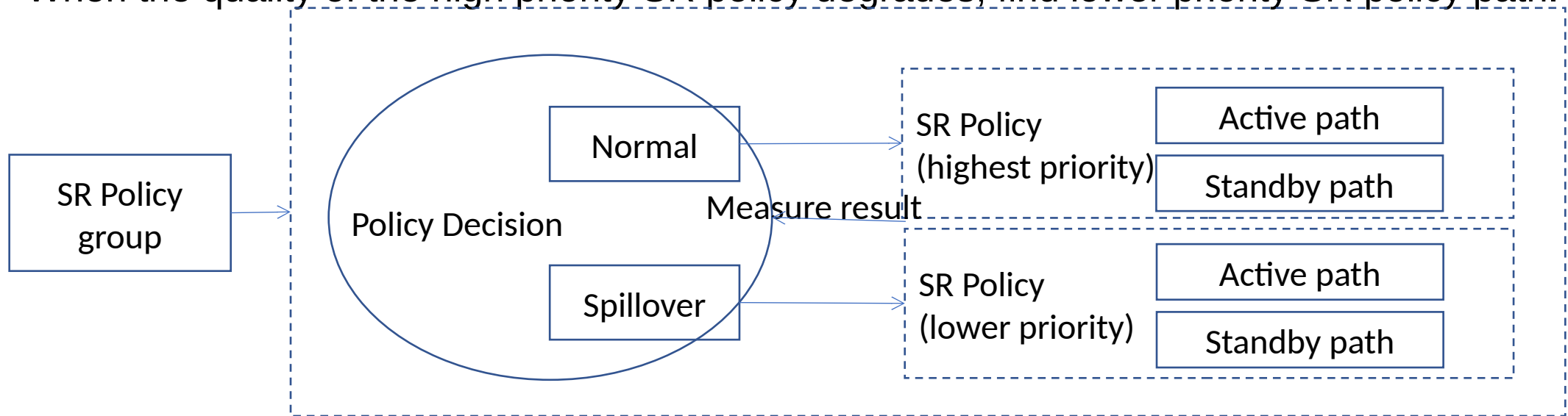
Flow Steering Unit

According to the forwarding class, the head node selects a matching SR policy group per priority.

If multiple SR policies groups are configured for the traffic with specified characteristics, the tie will be break by means of load sharing or other manual mapping configuration.

Intelligent Routing Unit

- Obtain the current quality of each active(not standby) SR policy path from the Network Quality Measurement Unit.
- Based on the current path quality, select the optimal forwarding path that has the highest priority for traffic and meets the quality requirements best.
- When the quality of the high priority SR policy degrades, find lower priority SR policy path.



If the quality of the high priority forwarding path gets better, the traffic can be restored from the low priority path to the high priority path.

To avoid frequent switching, configuration can be provided to control whether to failback and the waiting time for failback.

Network Quality Measurement Unit

- Regularly monitor the quality of all available forwarding paths.
- Record the current performance measurement data of the path.
- Report the measurement results to the Intelligent Routing Unit.

Network quality parameters of forwarding path:

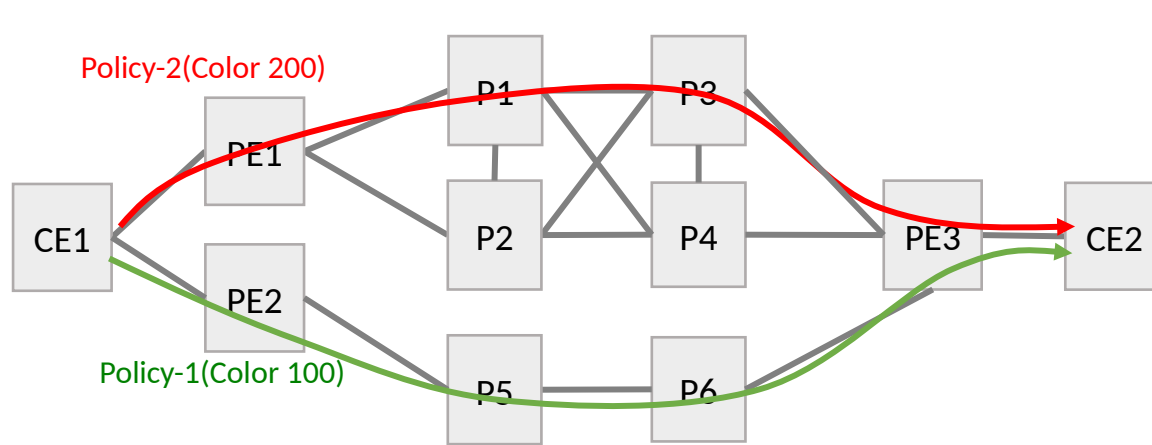
- Jitter
- Latency
- Packet loss
- Available bandwidth
- Bandwidth utilization
- Current traffic statistics
- Other forwarding performance parameters

Flow Forwarding Unit

Forward the service flow according to the path determined by the Intelligent Routing Unit.

When there are multiple paths with the same priority, the traffic will share the load among these SR policy paths with the same priority according to a weight value.

Use Case: L3VPN over TE scenarios



Service requirements

- Voice: Low delay
- OA: Guaranteed bandwidth

When failure or degradation happened in OA traffic SR policy, the basic communication for OA traffic should be assured by using voice bandwidth.

1. Forwarding Path:

```
sr-policy policy-1 (color 100, CE2_SID)
  segment-list <PE2, P5, P6, PE3, CE2>
sr-policy policy-2 (color 200, CE2_SID)
  segment-list <PE1, P1, P3, PE3, CE2>
```

2. Intelligent routing policies:

```
intelligent-routing-policy irp1 //Voice
  traffic-delay threshold 100ms
  priority 1 mapping-to color 100
  priority default mapping-to color 200
intelligent-routing-policy irp2 //OA
  remaining-bandwidth threshold 500M
  priority 1 mapping-to color 200
  priority default mapping-to color 100
```

3. Specify Intelligent routing policy for service flow:

```
parent-sr-policy sr-policy-1(color 10, CE2_SID)
  service voice use intelligent-routing-policy irp1
  service oa use intelligent-routing-policy irp2
```

Next Steps

- Any questions or comments are Welcomed
- Seeking for feedback