

BGP Flow Specification Extensions for Scheduling

draft-zzd-idr-flowspec-scheduling-02

Li Zhang, Tianran Zhou, Jie Dong, @Huawei

Zhenqiang Li @China Mobile

Updates

- Add extensions to FSv2.
- Add Zhenqian Li as co-author.
- Some editorial modification.

Background

- Traffic Diversion in Tidal Network.
 - The traffic in network usually changes periodically(e.g. IP carrier backbone network);
 - For the rush hours(typically 20-22'oclock), the increase of traffic may lead to congestion.
- **Solution:** Divert some traffic to other paths or limit the bandwidth of some flows to reduce the congestion in rush hours(e.g. some links will congested from 20-22'oclock everyday, then a flowspec which can steer some flows to other links is required to be enabled at 20'oclock and disabled at 22'oclock)



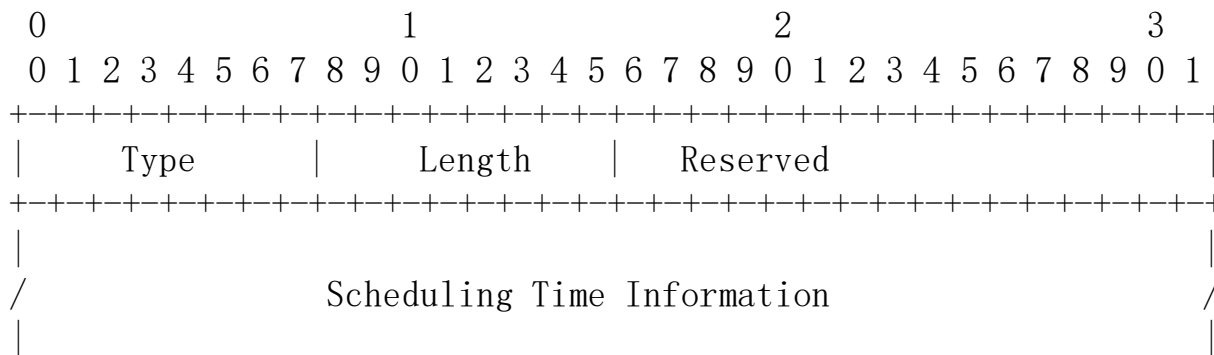
Extensions to FlowSpec

● Extensions to FSv1:

New Component : Encoding: <**type** (1 octet), **length** (1 octet), **scheduling time information** (variable)]+>

● Extensions to FSv2:

- L3 filters: reuse the new component extended to FSv1;
- L2 traffic filters: define a new scheduling sub-TLV:



Schedules Time information:
includes one or more schedules,
each schedule indicates when one
or more time slots.

Extensions to FlowSpec

● Scheduling time information:

| 0 | | | | | | | | | | 1 | | | | | | | | | | 2 | | | | | | | | | | 3 | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|-----------------------------|---|---|---|---|---|---|---|---|---|---------------------|---|---|---|---|---|---|---|---|---|---------------------|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Schedule-id | | | | | | | | | | Priority | | | | | | | | | | Reserved | | | | | | | | | | Flags P S | | | | | | | | | |
| Start Time | | | | | | | | | | Start Time | | | | | | | | | | End Time (Duration) | | | | | | | | | | End Time (Duration) | | | | | | | | | |
| Frequency (Optional) | | | | | | | | | | Recurrence count (Optional) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

- **Schedule-id:** the unique identifier to distinguish each schedule within a FlowSpec.
- **Priority:** the priority of each schedule.
- **P (Period format):** indicates the format of a period. 0: start time + duration; 1: start time + end time;
- **S (Schedule type):** indicates the type of a schedule. 0: single instance; 1: multiple instances.
- **Frequency(optional):** the numbers of seconds since the Start Time of an instance to the Start Time of next instance.
- **Recurrence Count(optional):** indicates the number of occurrences.

Procedures & Examples

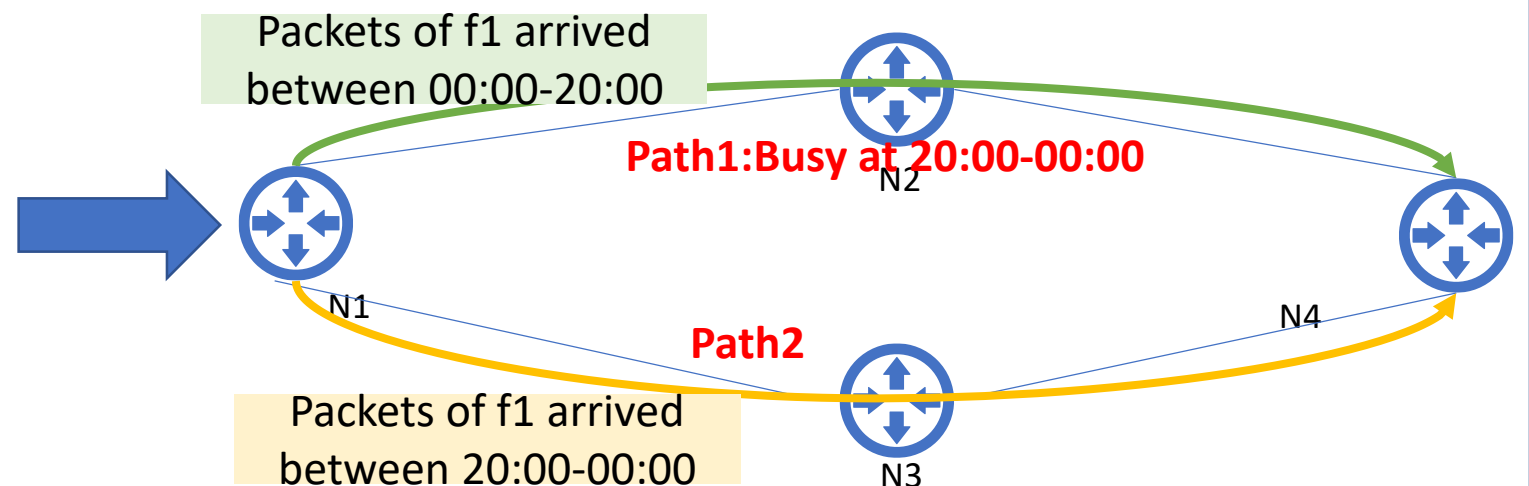
Controller/Node: Create a FlowSpec with scheduling time information, and advertise it to headend.

Headend:

1. **Parses and stores Flowspec's scheduling time information**, when received a FlowSpec with scheduling time rules.
2. When a packet arrives, **steer it into an specific Policy, VPN or tunnel based on the arrival time and scheduling time rules in the FlowSpec.**

Example of diverting traffic in rush hours

| Flowspec | filters | Action |
|------------|-------------------------|-------------------|
| flowspec 1 | Flow:f1 00:00-20:00 | Redirect to Path1 |
| flowspec 2 | Flow: f1 20:00-00:00 | Redirect to Path2 |



Any comments and opinions are welcome!
WG Adoption?

Thank You