

BGP FlowSpec with Time Constraints

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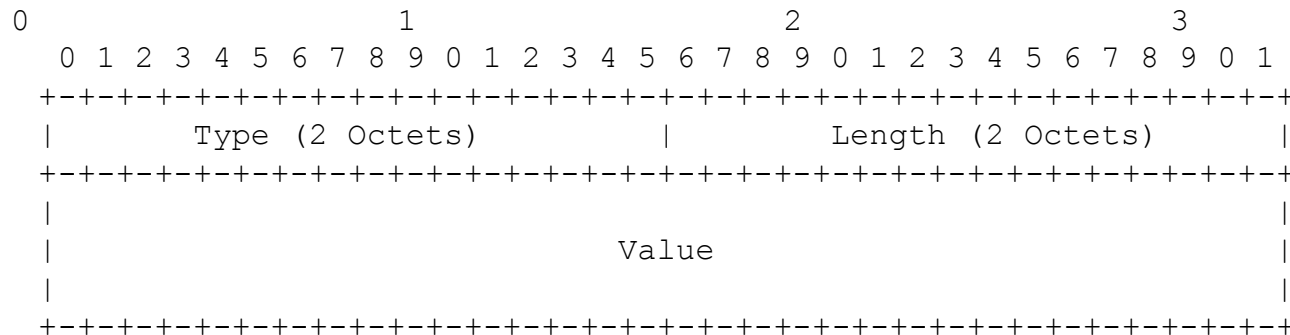
Motivation

- DDoS attacks are dynamic
 - Filtering of a flow may only be necessary for some specified time
- Require second-level precision
 - Current BGP FlowSpec protocol cannot support to control the valid period of a FlowSpec rule precisely in the network
- Deploy ACLs dynamically and flexibly

FlowSpec Extended Attribute

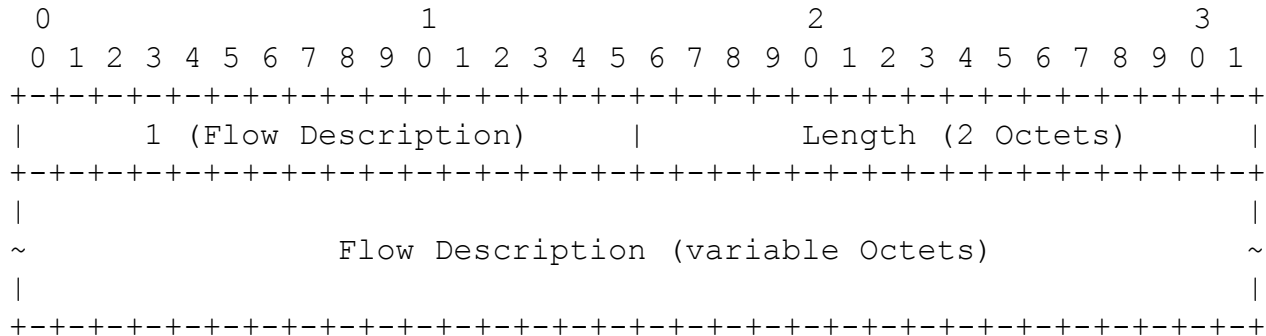
A new BGP path attribute called “Flow Extended Attribute” is defined; it carries expected valid period information for a FlowSpec rule.

This “Flow Extended Attribute” is an optional transitive attribute that is composed of a set of Type-Length-Value (TLV) encodings, including Flow Description sub-TLV and Flow Validation Period sub-TLV.



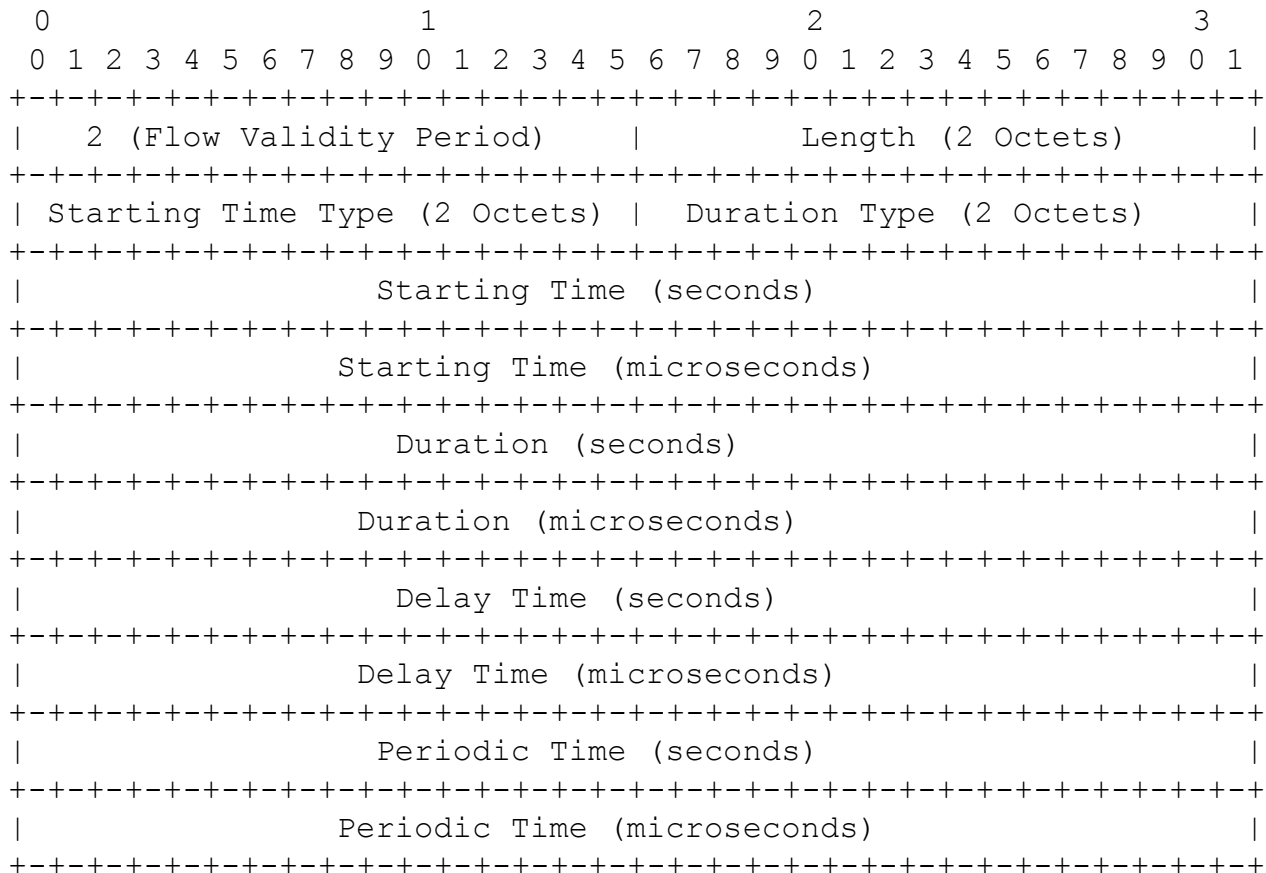
Flow Description sub-TLV

The Flow Description sub-TLV is usually used as a flow name or flow function description, in order to make the FlowSpec rule more readable in diagnosing and logging.



Flow Validity Period sub-TLV

The Flow Description sub-TLV is the expected valid period information for a FlowSpec rule.



Flow Validity Period sub-TLV

- Starting Time:

Expressed in seconds and microseconds since midnight (zero hour), January 1, 1970 (UTC).

- Starting Time Type:

Type Code	Function Description
0	Immediate validation
1	Delayed validation
2	Timing validation
else codes	Reserved

Flow Validity Period sub-TLV

- Duration:

Expressed in seconds and microseconds since midnight (zero hour), January 1, 1970 (UTC).

- “Duration Type” = 0, the corresponding FlowSpec rule is always valid until it is withdrawn by BGP signaling.
- “Duration Type” = 1, the corresponding FlowSpec rule is only valid in a specified duration defined by the “Duration” field.
- “Duration Type” = 2, the corresponding FlowSpec rule is valid until no traffic has matched it for a duration defined by the "Duration" field.

- Duration Type:

Type Code	Function Description
0	Permanent validation
1	Hard invalidation
2	Idle invalidation
else codes	Reserved

Flow Validity Period sub-TLV

- Delay Time:

Only when the “Starting Time Type” is set to 1, this field is valid. If the “Starting Time” is set to a valid value, the first valid period of the FlowSpec rule bound with this “Flow Extended Attribute” is [Starting Time + Delay, Starting Time + Delay + Duration];

- Periodic Time:

If zero, the value is unavailable. The FlowSpec rule bound with this “Flow Extended Attribute” would be valid periodically.

Next Step

- Solicit more comments and suggestions on the mailing list

Thank You!