Document History/Status

- Was making good progress, but then stalled
- This revision
  - Injects new momentum
  - Updates the mechanism
    - No new messages
  - Retains the purpose and functionality
Objectives

• When a PCE is in control of an LSP, how does it tell the head end what traffic to put on the LSP?
  – Applies to PCE-initiated LSPs and delegated LSPs
• When a PCE does load balancing TE, how does it know what traffic is on which LSP?
  – Applies to PCC-initiated LSPs
  – Also applies at the moment of delegation
• Don’t re-invent wheels
  – Use existing BGP Flowspec encodings
  – **BUT** this is nothing to do with IDR
Mechanism (1/2)

• Capability advertisement in IGP and OPEN message
• New PCEP object
  – Flow Spec Object
  – 0, 1, or more instances on PCReq, PCRep, PCErr, PCInitiate, PCRpt, and PCUpd
  – Each instance describes a traffic flow using TLVs
• New PCEP TLV
  – Flow Filter TLV
  – Exactly one per Flow Spec Object
  – Comprised of sub-TLVs (next slide)
  – This TLV is only present to enable sub-TLV codepoint management
Mechanism (2/2)

• Sub-TLVs
  – Flow Specification TLVs
  – Combined to describe the flow
  – TLV types as follows

<table>
<thead>
<tr>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reserved - must not be allocated.</td>
</tr>
<tr>
<td>1 .. 255</td>
<td>Per BGP registry defined by [RFC5575].</td>
</tr>
<tr>
<td></td>
<td>Not to be allocated in this registry.</td>
</tr>
<tr>
<td>256 .. 65535</td>
<td>New PCEP Flow Specs allocated according to the registry defined in this document.</td>
</tr>
</tbody>
</table>

– TLV value fields encoded as BGP specifications or as defined in this or new PCEP specs
– Additional TLVs defined for...
  • VPN Route Distinguisher
  • Multicast flows (for P2MP LSPs)
For Example

- PCE initiates a new P2P LSP and wants it to be used for all traffic destined to 198.51.100.0/24 and all traffic destined to 203.0.113.0/24
- It sends a PCInitiate message for the LSP and includes a Flow Spec Object containing a Flow Filter TLV
- It includes two Flow Specification TLVs
  - Type = 0x0001 (IPv4 destination prefix)
    Length = 0x0004
    Value = prefix length in bits (1 octet) + prefix
    0x18C63364
  - Type = 0x0001 (IPv4 destination prefix)
    Length = 0x0004
    Value = prefix length in bits (1 octet) + prefix
    0x18CB0071
Work Still to be Done

• Push on with implementations
• Include examples
• Simplify / streamline main use cases
  – Consider removing some BGP Flowspecs that are “too complicated”
  – Special consideration of forwarding capabilities
• Consider ordering issues
  – This remains a challenge for Flowspec in BGP
  – It is even an issue for static routes
  – Need clear an unambiguous rules
• Understand from WG if this is:
  – In scope
  – Something they want to work on