Hierarchical Service Function Chaining (hSFC)
draft-dolson-sfc-hierarchical-06

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Overview of hSFC

• Separate control of SFP in each SFC domain
• IBN conceals sub-domain form upper level (IBN looks like an SF from upper-level)
Main Changes since Buenos Aires

1. Add a new paths-gluing mechanism of IBN (Hybrid Approach)
2. Discuss hSFC for NSH-unaware SFs
Paths-Gluing Mechanisms

• Packets exiting lower-level domains are returned to path in the higher levels.
• Current draft introduces 5 methods as follows:
  1. Flow-stateful IBN – remember which path flow information (E.g., 5-tuple)
  2. Encode upper-level paths as context metadata of lower-level
  3. Unique lower-level paths per upper level path
  4. Nesting upper-level NSH within lower-level NSH
  5. Stateful / Metadata Hybrid **New in -06**
Hybrid Approach

- IBN saves upper-level NSH with mapping to hSFC Flow ID and inserts the ID into context header 1 of lower-level NSH
- IBN retrieves the original upper-level NSH by referring the hSFC Flow ID

<table>
<thead>
<tr>
<th>Base Header</th>
<th>Lower-level SPI / SI</th>
<th>hSFC Flow ID: 0001</th>
<th>Context Header 2</th>
<th>Context Header 3</th>
<th>Context Header 4</th>
<th>Original Packet</th>
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IBN

<table>
<thead>
<tr>
<th>Base Header</th>
<th>SPI: 45 / SI: 254</th>
<th>100</th>
<th>2112</th>
<th>12345</th>
<th>7</th>
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Original Packet
Advantages of Hybrid Approach

- Does not require state based on 5-tuple
  -> Can be used for SFs changing original packets
- Does not require all domains to have the same metadata scheme
- Can be used to restore any upper-level NSH information including context headers
- Requires only a single context header in lower-level domain
- Does not require any special functionality from SFs, other than the usual ability to preserve metadata and to apply metadata to injected
hSFC for NSH-unaware SFs

- hSFC can be used for dividing networks into NSH-aware and NSH-unaware domains
- IBN converts NSH forwarding to other forwarding techniques (E.g., 5-tuple based routing with OpenFlow)
hSFC for NSH-unaware SFs (Cont’d)

• Following methods are required to glue higher-level and lower-level paths:
  – Saving NSH information with flow states
  – Using unique lower-level paths per upper-level NSH

• Additions:
  – Transforming packet to appropriate format
    (E.g., restore L2 information from metadata)
RECOMMENDED IBN Behavior?

• The document describes several methods to achieve the required behavior
  – Leave the choice of method to deployment (*our proposal*)
• Or should we recommend one or more of these?
  – If yes, based on which criteria?
Use Cases

• The document discusses some use cases in two appendices
  – Should that text be moved to core text?
  – Maintain the text as it is? *(Our proposal)*
  – Or, remove the appendices?

• Opinions?
Document Status & Next Steps

- Many reviews and contributions
- The document is currently under WG call for adoption
- Reviews are more than welcome
  - Any chance to get 3 volunteers to review from the audience?
- Proposed Milestone
  - If the document is adopted, the authors commit to prepare a stable version for a WGLC prior to the next IETF meeting