RCA = ELCv3 + NHC

draft-ietf-idr-entropy-label-01
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Background

- For certain applications, we need to know something about what a remote BGP speaker can do. (In particular, in the forwarding plane.)
- Use case: Entropy Label processing, Covered in detail at IETF-114 meeting.
- “Remote BGP speaker” can be identified with a BGP next hop.
  - Note, “next hop” in the title doesn’t imply changes to BGP next hop processing!
  - Instead, it means that if the next hop changes, the attribute doesn’t apply any more. It depends on the next hop.
During the adoption process for ELCv3, it was suggested that:
- ELCv3 should be a Next Hop Capability
- Next Hop Capability should be transitive

The authors of ELCv3 and NHC worked together to produce a merged draft:
- draft-ietf-idr-entropy-label-01, BGP Router Capabilities Attribute or “RCA”
● From ELCv3 — Strategy for transitivity while still coupling capabilities to next hop.
  ○ The IP address of the original next hop is placed in the RCA’s header. The receiver compares the header to the next hop of the route.
    ○ If they match, process the TLVs.
    ○ If they don’t, it was a leak and is discarded.
● From NHC — TLVs and rules for attribute propagation.
  ○ 16 bit type code, 16 bit length, type-dependent value.
  ○ ELCv3 becomes the first TLV defined, type = 1, length = 0.
**Previous Proposal (ELCv3 draft 00)**

- **ELCv3 would have looked like:**

```
 0  1  2  3  4  5  6  7  8  9  0  1
0  1  2  3  4  5  6  7  8  9  0  1
+----------------------------------------+
| Address Family Identifier | SAFI | Next Hop Len |
+----------------------------------------+
~ Network Address of Next Hop (variable) ~
+----------------------------------------+
```
Previous Proposal (NHC draft 08)

- NHC would have looked like (assuming only Entropy Label is advertised):

```
+----------------------------------------+
<table>
<thead>
<tr>
<th>Capability Code = 0x01</th>
<th>Capability Length = 0x00</th>
</tr>
</thead>
</table>
+----------------------------------------+
```

```
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
```

Juniper Business Use Only
## Current Proposal (RCA draft 01)

- RCA would look like (assuming only Entropy Label is advertised):

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
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<td>0</td>
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<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address Family Identifier</th>
<th>SAFI</th>
<th>Next Hop Len</th>
</tr>
</thead>
<tbody>
<tr>
<td>~</td>
<td></td>
<td>~</td>
</tr>
</tbody>
</table>

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<tr>
<th>Network Address of Next Hop (variable)</th>
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<td>~</td>
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</table>

<table>
<thead>
<tr>
<th>Capability Code = 0x01</th>
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</tr>
</thead>
</table>
Discussion Points (so far)

- Why encode the AFI/SAFI?
  - Isn’t it redundant with AFI/SAFI from NLRI?
  - A: Perhaps, but it seems better for parsing.
- What about RLD (readable label depth)?
  - It was in NHC after all...
  - A: Maintained close parity with ELCv3 syntax and semantics. If needed, one option is to add it using a second code point.
Unimportant yet important

- Naming things matters.
- Current working name is “Router Capabilities Attribute” (RCA). Other candidates include
  - Next-Hop Dependent Capabilities (NHC)
  - Next-Hop Capabilities Attribute (NHC)
  - Transitive BGP Router Capabilities (TBRC)
  - Forwarding (Plane) Capabilities Attribute (F[P]CA)
  - … your idea here
- And by the way, is it a problem we call these “Capabilities” when we already have RFC 5492 Capabilities?
  - … your idea here
Early Allocation

RFC 7120:

c. The specifications of these code points must be stable; i.e., if there is a change, implementations based on the earlier and later specifications must be seamlessly interoperable.

- We think this condition is met.
  - Any changes to entropy label capability encoding could be handled by — worst case! — allocating a new capability code.
Next steps

- Early allocation of a path attribute code
- Implementation
- WGLC