Large BGP Communities

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NTT Communications
Current BGP communities: RFC 1997

Prefix: 94.142.240.0/21
Type: BGP unicast univ
BGP.origin: IGP
BGP.as_path: 2914 8283
BGP.next_hop: 38.103.8.1
BGP.local_pref: 100
RFC 1997 Community

32 bit value

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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                      Global Administrator                      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

2914 : 1200
The common design pattern

Customers wanting to alter their route announcements to selected peers.

NTT Communications BGP customers may choose to prepend to selected peers with the following communities with the peer's ASN:

<table>
<thead>
<tr>
<th>Community</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65400:nnn</td>
<td>do not advertise to peer nnn in North America</td>
</tr>
<tr>
<td>65401:nnn</td>
<td>prepends o/b to peer nnn 1x in North America</td>
</tr>
<tr>
<td>65402:nnn</td>
<td>prepends o/b to peer nnn 2x in North America</td>
</tr>
<tr>
<td>65403:nnn</td>
<td>prepends o/b to peer nnn 3x in North America</td>
</tr>
<tr>
<td>65410:nnn</td>
<td>announce to peer nnn in North America, disregards 2914:429 and 65500:nnn</td>
</tr>
<tr>
<td>65420:nnn</td>
<td>do not advertise to peer nnn in Europe</td>
</tr>
<tr>
<td>65421:nnn</td>
<td>prepends o/b to peer nnn 1x in Europe</td>
</tr>
<tr>
<td>65422:nnn</td>
<td>prepends o/b to peer nnn 2x in Europe</td>
</tr>
<tr>
<td>65423:nnn</td>
<td>prepends o/b to peer nnn 3x in Europe</td>
</tr>
<tr>
<td>65430:nnn</td>
<td>announce to peer nnn in Europe, disregards 2914:429 and 65500:nnn</td>
</tr>
</tbody>
</table>
The Problem

You can’t fit a 32 bit value in a 16 bit field

Thus:

• No clean namespace
• 4-byte ASN owners put private ASNs in the global field (collision risk)
• Can’t target 4-byte ASNs
Some Efforts so far

• Flexible BGP Communities (2002)
• 4-Octet AS Specific BGP Extended Community (2009)
• Wide BGP Communities (2010)

And now ..... Large BGP Communities!
The solution

Large BGP Community
draft-heitz-idr-large-community-04

Abstract

A new type of BGP community attribute that contains communities that each hold a 4-octet AS number and a 8-octet opaque field is defined.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", " SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.
Example: 2914:65400:1299

Each Large Community is encoded as a 12-octet quantity, as follows:

```
  0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+--------------------------+--------------------------+--------------------------+--------------------------+
| Autonomous System number |
+--------------------------+--------------------------+--------------------------+--------------------------+
| Local Data Part 1        |
+--------------------------+--------------------------+--------------------------+--------------------------+
| Local Data Part 2        |
+--------------------------+--------------------------+--------------------------+--------------------------+
```

Autonomous System Number: This field indicates the Autonomous System in which the Large Community has a meaning.

Local Data part 1: data set by network operator

Local Data part 2: data set by network operator
This provides us with:

• Unique namespace per ASN
• No collisions
• Enough bytes to target a 4 byte ASN and still have room for an action
• Something that is easy to implement for vendors
• Easy to remember and tell each other on the phone
What has been done so far?

- ExaBGP supports the attribute
- Cisco IOS XR has an engineering release (ultra ultra alpha code ;-))
- Got half a BIRD patch
- Got half an OpenBGPd patch
- Nokia committed to implement but timeline not available yet
- Tracking implementations here: http://largebgpcommunities.net/implementations/
- The Internet-Draft is going through IETF
  - Status: requested IDR WG to adopt the Internet-Draft
What can you do?

Everybody: Ask your routing vendor (Cisco, Juniper, Brocade, etc) to implement Large BGP Communities.

http://LargeBGPCommunities.net/