Abstract

The existing VPN solutions [VR, RFC2547bis, L2VPN-Kompella] use in their control plane globally unique identifiers. This document describes the format of these identifiers (called GIDs). If any future VPN solutions require globally unique identifiers, they can re-use the format described in this document.

The GID is based on BGP extended community format. No assumption is made on the usage of the GID. It is up to the VPN solutions to describe the usage of the GID. However, it is important to stress that GIDs have to be unique only within the context of their particular application, but need not be unique across applications. An application can interpret the GID structure according to its own usage.

2. Global Identifier Format

Each GID is encoded as an eight octet quantity, as follows:

- Type Field : 1 or 2 octets
- Value Field : Remaining octets

Type Field:

The value of the high-order octet will determine if it is a regular type or extended type. The size of the Type Field for

All GID types must have a unique high-order octet.
The high-order octet of the Type Field is as shown below:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSB</td>
<td>IANA authority bit</td>
</tr>
<tr>
<td>Value 0</td>
<td>IANA assignable type</td>
</tr>
<tr>
<td>Value 1</td>
<td>Vendor-specific types</td>
</tr>
</tbody>
</table>

Second bit : Reserved

Remaining 6 bits : Indicates the structure of the GID

Value Field:

The encoding of the Value Field depends on the "type" of the GID as specified by the Type Field.

This document introduces a few types and defines the Value Field for those types.

- Type 0x00:
  This is an extended type with a Type Field comprising of 2 octets and Value Field of 6 octets.
  The value of the high-order octet of this extended type is O0 and the low-order octet of this extended type is used to indicate subtypes.

  The Value field is structured as follows:
  * Administrator sub-field: 2 octets
  * Assigned Number sub-field: 4 octets

  The Administrator sub-field must contain an Autonomous System number. If this ASN is from the public ASN space, it must have been assigned by the appropriate authority (use of ASN values from the private ASN space is strongly discouraged). The Assigned Number sub-field contains a number from a numbering space which is administered by the enterprise to which the ASN has been assigned by an appropriate authority.

- Type 0x01
  This is an extended type with a Type Field of 2 octets and a Value Field of 6 octets.

  The value of the high-order octet of this extended type is O1. The low-order octet of this extended type is used to indicate subtypes.

  The Value field consists of two sub-fields (6 octets):
  * Administrator sub-field: 4 octets
  * Assigned Number sub-field: 2 octets

  The Administrator sub-field must contain an IP address. If this IP address is from the public IP address space, it must have been assigned by an appropriate authority (use of addresses from the private IP address space is strongly discouraged). The Assigned Number sub-field contains a number from a numbering space which is administered by the enterprise to which the IP address has been assigned.

- Type 0x02
  This is an extended type with a Type Field of 2 octets and a Value Field of 6 octets.

  The value of the high-order octet of this extended type is O2. The low-order octet of this extended type is used to indicate subtypes.

  The Value Field consists of two sub-fields.
  * Administrator sub-field: 4 octets
  * Assigned Number sub-field: 2 octets

  The Administrator sub-field must contain a 4-octets Autonomous System number. If this ASN is from the public ASN space, it must have been assigned by the appropriate authority (use of ASN values from the private ASN space is strongly discouraged). The Assigned Number sub-field contains a number from a numbering space which is administered by the enterprise to which the ASN has been assigned by an appropriate authority.

- Type 0x04
  This is a regular type with a type field of 1 octet and a Value Field of 7 octets.

  The Value Field consists of two sub-fields:
  * Administrator sub-field: 3 octets
  * Assigned Number sub-field: 4 octets

  The Administrator sub-field must contain an Organizationally Unique Identifier, as defined in [OUI]. Assignment of OUIs is carried out by the IEEE [OUI-Registry]. The Assigned Number sub-field contains a number from a numbering space which is administered by the enterprise to which the OUI has been assigned.

3. IANA Considerations
We suggest that within the context of a particular application that uses GIDs, the GID Type Field space be partitioned as follows. The Type Field values 0x00-0x3f (0x0000-0x3fff when expressed as extended-types) be assigned by IANA using the "First Come First Served" policy defined in RFC 2434. Type values 0x80-0xbf (0x8000-0xbfff when expressed as extended-types) are for vendor-specific types, and values in this range are not to be assigned by IANA.

4. Security Considerations

This document defines the format for generating global identifier without specifying usage.

5. References

[BGP-COMM] Ramachandra, Tappan, et al., "BGP Extended Communities Attribute", draft-ramachandra-bgp-ext-communities-09.txt
June 2001, work in progress


[VR], Ould-Brahim, H., et al., "Network-based IP VPNs using Virtual Router architecture", draft-ietf-ppvpn-vr-01.txt,

[OUI] ANSI/IEEE, Std 802-1990 "IEEE Standards for Local and Metropolitan Area Networks".


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