IETF YANG Routing Types
Update

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Recent Changes and History (1/2)

- February - YANG Doctor Review from Lada Lahotka.

- Addition of BGP Subsequent Address family types as per comment from Sue Hares.

- Addition of percentage and timeticks64 types as per comment from Rob Wilton.
  - From OpenConfig types – used in BGP Model

- April - Second YANG Doctor review from Radek Krejčí.
  - Use boilerplate for YANG model headers as per Appendix C of RFC 6087bis

- Split of IANA based types as per comment from Martin Bjorklund similar to RFC 7224
Recent Changes and History (2/2)

• May – Routing Directorate review from Stewart Bryant
• June 13th – Working Group Last Call
• Add ipv6-route-target, route-origin, and ipv6-route-orgin as per comments from Jeff Haas
• Add geo-coordinates type as per comments from Robert Razuk
  • Protocol encodings reviewed and discussed across LISP, OSPF, IS-IS and BGP drafts
  • However, significant risk of change since the protocol drafts are new and it is not clear all the experts have reviewed the encoding
  • Will be moved to a separate ietf-geo-location module in separate draft for further review and independent progression.
  • Should new draft go immediately to WG document?
Addition of BGP Subsequent Address Family (SAFI)(1/2)

- Includes all SAFIs from "IANA Subsequent Address Family Identities (SAFI) Parameters Registry"
- Uses Base identity and identity refs
- Following YANG snippet shows basic identity and a few specific SAFIs (iana-routing-types has them all)
Addition of BGP SAFI (2/2)

identity bgp-safi {
    description "Base identity from which identities describing BGP Subsequent Address Family Identifier (SAFI) - RFC 4760.";
}

identify unicast-afi {
    base bgp-safi;
    description "Unicast SAFI - IANA Registry Assigned Number: 1";
}

identify multicast-safi {
    base bgp-safi;
    description "Multicast SAFI - IANA Registry Assigned Number: 2";
}

identity labeled-unicast-safi {
    base bgp-safi;
    description "Labeled Unicast SAFI - IANA Registry Assigned Number: 4";
}
typedef percentage {
    type uint8 {
        range "0..100";
    }
    description "Integer indicating a percentage value";
}

typedef timeticks64 {
    type uint64;
    description "This type is based on the timeticks type defined in RFC 6991, but with 64-bit width. It represents the time, modulo 2^64, in hundredths of a second between two epochs."
    reference "RFC 6991 - Common YANG Data Types";
}
Separate Module for IANA Types

module iana-routing-types {
  namespace "urn:ietf:params:xml:ns:yang:iana-routing-types";
  prefix iana-rt-types;
  organization "IANA";
  contact " Internet Assigned Numbers Authority
       <snipped>
  identity address-family {
    description "Base identity from which identities describing address families are derived."
  }
  <snipped>
  Identity bgp-safi {
    description "Base identity from which identities describing BGP Subsequent Address Family Identifier (SAFI) - RFC 4760."
  }
  <snipped>
}
typedef ipv6-route-target {

type string {

  pattern
    '((:|[0-9a-fA-F]{0,4}):)[0-9a-fA-F]{0,4}:){1,5}'
  + '(((0-9a-fA-F){0,4}:)?(:[0-9a-fA-F]{0,4}))\.'
  + '(((25[0-5]|2[0-4]\[0-9]|[01]??\[0-9]{0,3})\.[0-9]{5}\.){3}'
  + '(25[0-5]|2[0-4]\[0-9]|0-9\?[0-9])\.)\.'
  + '[0-5]??\[0-9]{3}\[0-9]';

  pattern '((([^:]+:){6}(([^:]+:[^:]+)|(.*\..*)))|' 
  + '((([^:]+:)*[^:]+)?::(([^:]+:)*[^:]+)?)\.'
  + '[0-5]??\[0-9]{3}\[0-9]';

} description "<snipped>";

reference "RFC5701: IPv6 Address Specific BGP Extended Community Attribute";
}
Route Origin and IPv6 Route Origin

- Route Origin is an 8-octet BGP extended community identifying the set of sites where the BGP route originated (RFC 4364).
  - Same pattern as Route Target only it adds the 2-octet-other-hex-number:6-octet-hex-number option.

```
+ '(([3-9a-fA-F][1-9a-fA-F][da-fA-F]{1,3}):[da-fA-F]{1,12})';
```

- IPv6 Route Origin has same pattern as IPv6 Route Target
Pending comment from Jeff Haas that ES-Import Route Target from RFC 7432 not included

- Could add 2-octet-other-hex-number:6-octet-hex-number option.
  
```plaintext
+ '((\[3-9a-fA-F]([1-9a-fA-F][da-fA-F]{1,3}):' 
  + '\[da-fA-F]{1,12})');
```

- Or could add specific type 6 route target.
  
```plaintext
+ '(6:\[da-fA-F]{1,12})';
```
Pending Changes to Draft

- Route Target flexibility (as discussed in previous slide)
- Remove geo-location grouping (as discussed previously)
- Improve description of the label stack grouping semantics
- Issue new version for publication
When it comes to common routing types – everybody has an opinion and we all know the analogy.

It is time to progress this version of the model and limit further comments to the existing types as opposed to suggestions for new types.

- Exceptions may be made for reviewed YANG types provided as code snippets.

WG Co-chairs will request publication after IETF and progress the document.