Global Routing Operations Working	T. Manderson	
Group	ICANN	
Internet-Draft	December 14, 2010	
Intended status: Informational		
Expires: June 17, 2011		

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MRT BGP routing information export format with geo-location extensions
draft-ietf-grow-geomrt-01.txt

Abstract

This document extends the Border Gateway Protocol (BGP) MRT export format for routing information to include terrestrial coordinates.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.
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This Internet-Draft will expire on June 17, 2011.

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1. Requirements notation

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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 [RFC2119] (Bradner, S., “Key words for use in RFCs to Indicate Requirement Levels,” March 1997.).

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2. Introduction

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Research is underway that analyzes the network behavior of routing protocol transactions from routing information base snapshots in relation to geographical coordinates. Specifically the BGP routing protocol is the subject of study and the analysis has been significantly aided by the availability and extension of the "MRT format" (Blunk, L., Karir, M., and C. Labovitz, “MRT routing information export format,” September 2010.) [I-D.ietf-grow-mrt] originally defined in the MRT Programmer's Guide (Labovitz, C., “MRT Programmer's Guide,” November 1999.) [MRT PROG GUIDE].
This memo documents an extension to the "MRT format" (Blunk, L., Karir, M., and C. Labovitz, “MRT routing information export format,” September 2010.) [I-D.ietf-grow-mrt] and introduces an additional definition of a MRT Subtype field.

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3. Geo-location aware MRT Routing Information Subtype

The additional Subtype is defined for the TABLE_DUMP_v format, which extends the TABLE_DUMP_V2 type.

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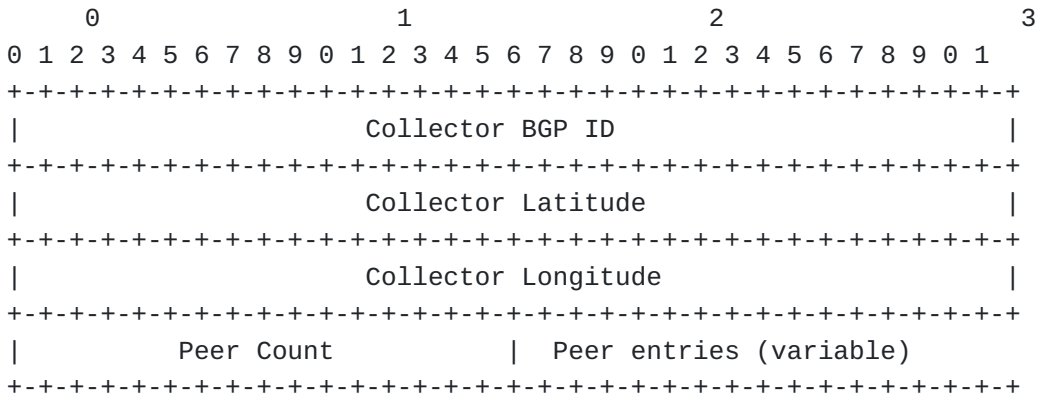
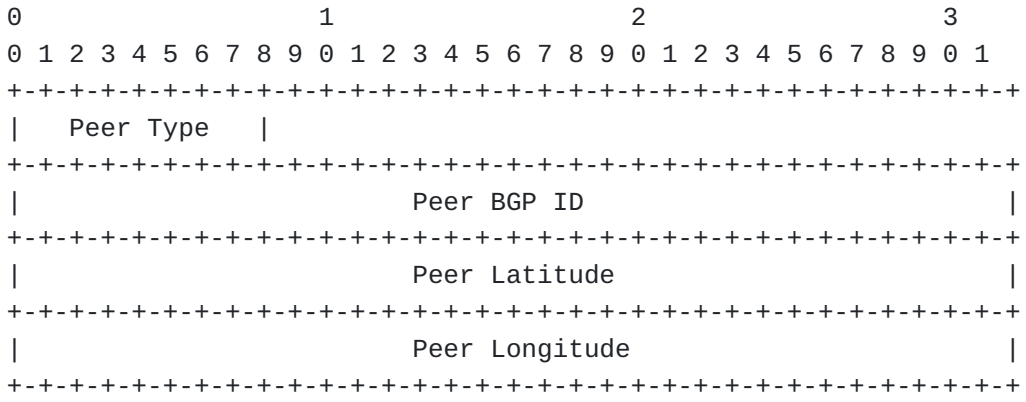
The GEO_PEER_TABLE Subtype updates the TABLE_DUMP_v2 Types to include Geo-location information in the form of WGS84 (Geodesy and Geophysics Department, DoD., "World Geodetic System 1984," January 2000.) [WGS 84] formatted coordinates. The MRT subtypes would be as follows.

1	PEER_INDEX_TABLE
2	RIB_IPV4_UNICAST
3	RIB_IPV4_MULTICAST
4	RIB_IPV6_UNICAST
5	RIB_IPV6_MULTICAST
6	RIB_GENERIC
7	GEO_PEER_TABLE

The GEO_PEER_TABLE MRT record provides the BGP ID of the collector, Its latitude and longitude in WGS84 (Geodesy and Geophysics Department, DoD., "World Geodetic System 1984," January 2000.) [WGS 84] format, and a list of indexed peers.
The format and function of the Collector BGP ID, Peer Count are as defined by the TABLE_DUMP_V2 MRT PEER_INDEX_TABLE format. (Blunk, L., Karir, M., and C. Labovitz, "MRT routing information export format," September 2010.) [I-D.ietf-grow-mrt].
The Collector Latitude and Collector Longitude are the geographical coordinates of the collector in WGS84 (Geodesy and Geophysics Department, DoD., "World Geodetic System 1984," January 2000.) [WGS 84] datum decimal degrees format stored as a single precision float in the 32 bits allocated to the Collector Latitude and Collector Longitude. The latitude and longitude may be a Not A Number (NAN) for situations where the geo-location of the collector is considered private. The Collector Latitude and Collector Longitude MUST NOT be a mix of WGS84 (Geodesy and Geophysics Department, DoD., "World Geodetic System 1984," January 2000.) [WGS 84] datum coordinate and NAN values.



The format of the peer entries is shown below. The Peer Type and the Peer BGP ID is as defined in the TABLE_DUMP_V2 MRT (Blunk, L., Karir, M., and C. Labovitz, "MRT routing information export format," September 2010.) [I-D.ietf-grow-mrt] PEER_INDEX_TABLE format. The order of the Peer entries in GEO_PEER_TABLE MUST match the order and number as existing in the PEER_INDEX_TABLE.



The Peer Latitude and Peer Longitude are the geographical coordinates of the peer in WGS84 (Geodesy and Geophysics Department, DoD., "World Geodetic System 1984," January 2000.) [WGS 84] datum decimal degrees format stored as a single precision float in the 32 bits allocated to the Peer Latitude and Peer Longitude. The latitude and longitude may be a Not A Number (NAN) for situations where the geo-location of the peer is considered private. The Peer Latitude and Peer Longitude MUST NOT be a mix of WGS84 (Geodesy and Geophysics Department, DoD., "World Geodetic System 1984," January 2000.) [WGS 84] datum coordinate and NAN values for a single Peer.

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4. Acknowledgements

Thanks to Andrew Clark, Ernest Foo, Dave Meyer, Larry Bluck, Richard Barnes, and Jeffrey Haas for reviewing this document.
This document describes a small portion of the research towards the author's PhD.

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5. IANA Considerations

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This section requests the Internet Assigned Numbers Authority (IANA) register the additional Subtype code value as:

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        7    GEO_PEER_TABLE
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in the "MRT format" (Blunk, L., Karir, M., and C. Labovitz, “MRT routing information export format,” September 2010.) [I-D.ietf-grow-mrt] and Subtype code values related to the TABLE_DUMP_v2 type in the MRT namespace, in accordance with BCP 26, RFC 5226 (Narten, T. and H. Alvestrand, “Guidelines for Writing an IANA Considerations Section in RFCs,” May 2008.) [RFC5226].

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6. Security Considerations

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This extension to the "MRT format" (Blunk, L., Karir, M., and C. Labovitz, “MRT routing information export format,” September 2010.) [I-D.ietf-grow-mrt] defines fields that are of a descriptive nature and provide information that is useful in the analysis of routing systems. As such, the author believes that they do not constitute an additional security risk. It is recommended that the operators of the BGP collector and Peers consider their own privacy concerns before supplying geographical coordinates in MRT dumps.

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7.1. Normative References

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[I-D.ietf-grow-mrt]	Blunk, L., Karir, M., and C. Labovitz, “MRT routing information export format,” draft-ietf-grow-mrt-13 (work in progress), September 2010 (TXT).

[RFC2119]	Bradner, S., “Key words for use in RFCs to Indicate Requirement Levels,” BCP 14, RFC 2119, March 1997 (TXT, HTML, XML).
[RFC4271]	Rekhter, Y., Li, T., and S. Hares, “A Border Gateway Protocol 4 (BGP-4),” RFC 4271, January 2006 (TXT).
[RFC4760]	Bates, T., Chandra, R., Katz, D., and Y. Rekhter, “Multiprotocol Extensions for BGP-4,” RFC 4760, January 2007 (TXT).
[RFC5226]	Narten, T. and H. Alvestrand, “Guidelines for Writing an IANA Considerations Section in RFCs,” BCP 26, RFC 5226, May 2008 (TXT).

7.2. Informative References

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[MRT PROG GUIDE]	Labovitz, C., “MRT Programmer's Guide,” November 1999 (HTML).
[WGS 84]	Geodesy and Geophysics Department, DoD., “World Geodetic System 1984,” January 2000 (HTML).

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