# BGP Destination Preference Attribute Extension to Ripe-181

#### Status of this Memo

This document extends Ripe-181 to enable the setting of the DPA attribute during route announcements.

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#### **<u>1</u>** Introduction

Ripe-181 [2] is a language to specify routing policy constraints for inter-domain routing in the Internet. Ripe-181 allows the specification of both import policy constraints (by specifying as-in and interas-in attributes) and export policy constraints (by specifying as-out and interas-out attributes).

The Destination Preference Attribute (DPA)  $[\underline{3}]$  is recently added to the BGP  $[\underline{4}]$  routing protocol. This attribute can be used by an autonomous system (AS) to specify a globally transitive preference in its routing announcement via BGP so that the upstream BGP speakers can use this preference to favor certain path for return traffic.

This document extends Ripe-181 to enable the setting of the DPA attribute during route announcements. It is assumed that the reader is familiar with BGP, DPA and Ripe-181. Internet Draft BGP DPA Extension to Ripe-181 November, 1995

# **<u>2</u>** Extended Attributes

In  $[\underline{1}]$ , we introduced four new policy attributes for the aut-num object,

extended-as-in, extended-as-out, extended-interas-in, and extended-interas-out to augment the as-in, as-out, interas-in, and interas-out attributes respectively. We use extended-interas-out attributes to describe the DPA attribute processing in Ripe-181.

The extended-interas-out attributes have the following syntax (please refer to RIPE-181 [2] and Reference [1] for the details of their syntax and semantics):

### 2.1 Setting the DPA Attribute

In the extended-interas-out attribute, <metric> is optional and is defined as follows:

(<metric-type>=<value>)

Currently, there is only one metric-type defined which is "metric-out". We add another metric-type, "DPA". The valid values for the "DPA" metric-type is non-negative integers where smaller integers represents higher preferences. The semantics of "(DPA=<value>)" is that the resulting route announcement contains a DPA attribute, where the AS number of the DPA attribute equals the AS number of the aut-num object and the preference of the DPA attribute equals <value>.

If more than one metric-type needs to be set for a route announcement, for example both metric-out and DPA, it can be done placing a semicolon between them.

Here are some examples:

The routes that are announced to AS2 have a DPA attribute with AS AS1 and preference 5, whereas routes that are announced to AS3 have a DPA attribute with preference 6. If an AS, say AS4, receives both of these routes from both AS2 and AS3 it may use the value of the DPA attribute and prefer the routes through AS2.

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Note that we do not allow specification of a DPA attribute in extended-as-out. This is because the Ripe-181 does not allow specification of any action in an as-out attribute.

### **<u>3</u>** Concluding Remarks

In this document, we have presented extensions to Ripe-181 which allows setting the DPA attribute on route announcements. Our solution is similar to how the MUTLI\_EXIT\_DISCRIMINATOR attribute is handled in Ripe-181.

DPA attribute is an optional transitive attribute which means that not all the routers need to understand it. Our extension does not allow the specification of whether the routers of an AS understands and uses the DPA attribute in route selection. This information may be useful for routing policy analysis tools to mimic the Internet's routing more closely. A general solution may be for an AS to list the optional attributes it does not understand. RPS working group may consider a solution to this.

# 4 Acknowledgments

I thank Ramesh Govindan and Tony Bates for various discussions and suggestions.

# References

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- [3] E. Chen and T. Bates. Destination Preference Attribute for BGP. Internet Draft <u>draft-ietf-idr-bgp-dpa-02.txt</u>, July 1995.
- [4] Y. Rekhter and T. Li. A Border Gateway Protocol 4 (BGP-4). Request for Comment <u>RFC-1654</u>, Network Information Center, July 1994.

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