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**New definition of ISP internal eBGP border using BGP Roles  
draft-ymbk-idr-isp-border-02**

Abstract

This document proposes a new definition of ISP borders using BGP Roles. It may be used to improve the BGP best path selection algorithm for better support of hot-potato routing between different internal ASNs of an ISP. It may also be used to enable transmission of local attributes between different internal ASNs of an ISP.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)] only when they appear in all upper case. They may also appear in lower or mixed case as English words, without normative meaning.

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## [1.](#) Introduction

The BGP best path selection algorithm ([Section 9.1.2.2 of \[RFC4271\]](#)) has a very clear definition of a network border: different ASNs - different networks. It differs from some real world situations when two networks become one business entity and want to operate as one network.

Today BGP does not provide any robust or automated support for such merging networks:

- o There is no support for carrying local attributes through this border,
- o Hot-potato routing, implemented by eBGP being preferred to iBGP, does not work, and
- o Route Leak prevention inside such a united network can not be easily automated.

In [[I-D.ietf-idr-bgp-open-policy](#)] BGP Roles were introduced - a configuration option that strongly enforces agreement on real-world peering relations between two BGP speakers. This configuration option can accept values of: Peering, Customer, Provider and



Internal. These values could be used in a new ISP border definition: Internal vs. External. With this definition of network borders, it becomes easy to allow robust propagation of local attributes between different ASNs of one ISP. It could be also used to improve the hot-potato routing mechanism: where routes learned from External BGP connections should be preferred over Internal, even those which cross the ISP's internal AS/AS boundary.

## **2. Changes in BGP decision process**

To improve hot-potato routing for networks with multiple ASNs we propose to insert before d) in [Section 9.1.2.2 of \[RFC4271\]](#) next step:

If at least one of the candidate routes was received via a BGP session with External (Peer, Provider, Customer) role, remove from consideration all routes that were received via BGP sessions with an Internal role.

While this step will improve traffic control for ISPs with multiple ASNs it will have no affect on ISPs with single ASN.

## **3. Local Attributes Transmission**

Propagation of local attributes through an ISP's internal AS/AS border could be enabled only if both sides set Internal roles in their BGP Open negotiation. Different attributes may still have different transmission policy:

- o iOTC attribute from [\[I-D.ietf-idr-bgp-open-policy\]](#) MUST be sent to enforce route leak prevention,
- o LOCAL\_PREF attribute MAY be sent, and
- o MED attribute MAY be sent without changes.

## **4. IANA Considerations**

This document has no IANA actions.

## **5. Normative References**

[I-D.ietf-idr-bgp-open-policy]  
Azimov, A., Bogomazov, E., Bush, R., Patel, K., and K. Sriram, "Route Leak Prevention using Roles in Update and Open messages", [draft-ietf-idr-bgp-open-policy-01](#) (work in progress), July 2017.



[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.

[RFC4271] Rekhter, Y., Ed., Li, T., Ed., and S. Hares, Ed., "A Border Gateway Protocol 4 (BGP-4)", [RFC 4271](#), DOI 10.17487/RFC4271, January 2006, <<https://www.rfc-editor.org/info/rfc4271>>.

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