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Multicast Distribution Reachability Signaling
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Abstract

This document describes a mechanism whereby a subscriber's Internet service provider may signal in BGP the ability of the subscriber network to receive content using multicast connectivity. This mechanism is called Multicast Distribution Reachability Signaling (MDRS).

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1. Introduction

Consider a content provider that wants to deliver a particular content to a set of customers/subscribers, where the provider and the subscribers are connected by an IP service provider. This content provider can deliver its content via unicast connectivity or, if supported by the subscriber network, multicast connectivity. A mechanism is required to determine if the subscriber network supports delivery of content to subscribers via multicast connectivity.

This document describes a mechanism whereby the subscriber's Internet service provider may signal in BGP the ability of the subscriber network to receive the content using multicast connectivity. This mechanism is called Multicast Distribution Reachability Signaling (MDRS).

For the purpose of this document we assume that a content provider consists of one or more Content Servers, and one or more Content Distribution Controllers. While this document assumes communication between Content Servers and Content Distribution Controllers, the procedures for implementing such communication is outside the scope of this document.

Content Servers are connected to one or more IP service providers (ISPs) that can offer both multicast and unicast connectivity service to the subscribers of the content provider. Content providers use these ISPs to deliver content to their subscribers.

Subscribers are connected to the Egress Routers (ERs) of the ISP. Note that the multicast connectivity service provided by the ISP extends all the way to the ERs. Such service could be provided by either deploying IP multicast natively, or with some tunneling mechanism like AMT, or by a combination of both within the ISP. However, between the ERs and the subscribers there may, or may not be multicast connectivity.

In the case where a particular subscriber of a given content provider does not have multicast connectivity to its ER, the content provider would use IP unicast service provided by the ISP to transmit the particular content to that subscriber.

2. Specification of Requirements

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 [RFC 2119](#) [[RFC2119](#)].

2.1. Multicast Distribution Reachability Signaling

Multicast distribution reachability signaling is responsible for giving a content provider, and specifically Content Distribution Controller(s) of the content provider the information of whether a particular subscriber of that content provider has multicast connectivity to an ER of an ISP that the content provider uses for distributing its content.

This document assumes that each ER can determine the multicast reachability status for each of the subscriber connected to that ER. Procedures by which an ER accomplishes this are outside the scope of this document.

To indicate whether a given ER has multicast reachability to a subscriber (be that either a native multicast or AMT) this document uses BGP as follows. An ER originates into IBGP routes for the subscribers connected to that ER for which the ER has multicast reachability. These routes are carried using BGP multi-protocol capabilities [[RFC4760](#)] with AFI 1 or 2, and the MCAST-REACH SAFI. The NLRI field in the MP_REACH_NLRI/MP_UNREACH_NLRI attribute of these routes contains subscribers' IP addresses encoded as IP address prefixes. The value of the AFI field in the MP_REACH_NLRI/MP_UNREACH_NLRI attribute of these routes determines whether subscribers' addresses are IPv4 or IPv6 (AFI 1 indicates IPv4 addresses, AFI 2 indicates IPv6 addresses).

A Content Distribution Controller, when it receives such routes, uses them to determine whether the content could be delivered to the subscribers via the ISP who owns the ERs using the multicast connectivity service provided by the ISP.

To constrain the flow of BGP routes that carry multicast distribution reachability information such routes carry a particular Route Target (RT) Extended Community [[RFC4360](#)], and Content Distribution Controller(s) are provisioned to import routes with such a RT.

RTs carried by routes with AFI 1 and MCAST-REACH SAFI SHOULD NOT be re-used by routes with any other AFI and/or SAFI. Likewise, RTs carried by routes with AFI 2 and MCAST-REACH SAFI SHOULD NOT be re-used by routes with any other AFI and/or SAFI.

To facilitate such constrained distribution of multicast distribution reachability information one MAY use Constrained Route Distribution [[RFC4684](#)].

3. IANA Considerations

This document defines a new BGP Subsequent Address Family Identifier (SAFI) value, MCAST-REACH. The authors request assignment of a value from the First Come, First Served portion of this registry.

4. Security Considerations

TBD

5. Acknowledgements

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6. Normative References

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