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**Multicasting Applications Across Inter-Domain Peering Points**
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Abstract

This document examines the process of transporting applications via multicast across inter-domain peering points. The objective is to describe the setup process for multicast-based delivery across administrative domains and document supporting functionality to enable this process.

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## 1. Introduction

Several types of applications (e.g., live video streaming) are well suited for delivery via multicast means. The use of multicast for delivering such applications offers significant savings for utilization of resources in any given administrative domain. End user demand for such applications is growing. Often, this requires transporting such applications across administrative domains via inter-domain peering points.

The objective of this Best Current Practices document is twofold:
- Describe the process and establish guidelines for setting up multicast-based delivery of applications across inter-domain peering points, and
- Catalog all required information exchange between the administrative domains to support multicast-based delivery.

While there are several multicast protocols available for use, this BCP will limit the discussion to the peering requirements of a select set of the newer and more popular protocols including:
- Protocol Independent Multicast - Source Specific Multicast (PIM-SSM) [RFC4607]
- Internet Group Management Protocol (IGMP) v3 [RFC4604]
- Multicast Listener Discovery (MLD) [RFC4604]

This document therefore serves the purpose of a "Gap Analysis" exercise for this process. The rectification of any gaps identified - whether they involve protocol extension development or otherwise - is beyond the scope of this document and is for further study.

## 2. Overview of Inter-domain Multicast Application Transport

A multicast-based application delivery scenario is as follows:
- Two independent administrative domains are interconnected via a peering point.
- The peering point is either multicast enabled (end-to-end native multicast across the two domains) or it is connected by one of two possible tunnel types:
  - A Generic Routing Encapsulation (GRE) Tunnel [RFC2784] allowing multicast tunneling across the peering point, or
  - An Automatic Multicast Tunnel (AMT) [IETF-ID-AMT].
- The application originates at a source in Domain A
- An End User associated with Domain B requests the application
- The request is communicated to the application source which commences the delivery via multicast

- Application is distributed via Multicast from the source in Domain A through the Peering Point interface and then to the End User through Domain B.

The setup of the delivery process along with associated requirements is described in section 3. A comprehensive list of required information that needs to be exchanged between the two domains to support various functions enabling the application transport is provided in section 4.

## 3. Inter-domain Peering Point Requirements for Multicast

The transport of applications using multicast requires that the inter-domain peering point is enabled to support such a process. There are three possible Use Cases for consideration.

### 3.1. Native Multicast

This Use Case involves end-to-end Native Multicast between the two administrative domains and the peering point is also native multicast enabled.

Interface requirements for this Use Case need to be described here.

### 3.2. Peering Point Enabled with GRE Tunnel

The peering point is not native multicast enabled in this Use Case. There is a Generic Routing Encapsulation Tunnel provisioned over the peering point.

Interface requirements for this Use Case need to be described here.

### 3.3. Peering Point Enabled with an AMT

The peering point in this Use Case is provisioned with an Automatic Multicast Tunnel.

Interface requirements for this Use Case need to be described here.

## 4. Supporting Functionality

Supporting functions and related interfaces over the peering point that enable the multicast transport of the application are listed in this section. Critical information parameters that need to be exchanged in support of these functions are enumerated along with guidelines as appropriate. Specific interface functions for consideration are as follows.

### 4.1. Network Transport and Security Guidelines

### 4.2. Routing Aspects and Related Guidelines

### 4.3. Back Office Functions - Billing and Logging Guidelines

### 4.4. Operations - Service Performance and Monitoring Guidelines

### 4.5. Reliability Models/Service Assurance Guidelines

### 4.6. Provisioning Guidelines

### 4.7. Client Models

### 4.8. Addressing Guidelines

## 5. Security Considerations

(Include discussion on DRM, AAA, Network Security)

## 6. IANA Considerations

## 7. Conclusions

## 8. References

### 8.1. Normative References

[RFC2784]  D. Farinacci, T. Li, S. Hanks, D. Meyer, P. Traina, "Generic Routing Encapsulation (GRE)", RFC 2784, March 2000

[IETF-ID-AMT] G. Bumgardner, "Automatic Multicast Tunneling", draft-ietf-mboned-auto-multicast-13, April 2012, Work in progress

[RFC4604] H. Holbrook, et al, "Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source Specific Multicast", RFC 4604, August 2006

[RFC4607] H. Holbrook, et al, "Source Specific Multicast", RFC 4607, August 2006

8.2. Informative References

9. Acknowledgments

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