Mobile Multicast Sender Support in PMIPv6 Domains with Base Multicast Deployment

draft-ietf-multimob-pmipv6-source-00

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**Objective of the Draft**

- Define Multicast Source Mobility for PMIP
- Three Basic Multicast Scenarios:
  1. Pragmatic base-line approach as for listeners:
     - Suboptimal routes are price for simplicity
  2. Direct Multicast
     - Based on Proxies, PIM-S(S)M or BIDIR PIM
  3. Optimized Source Mobility
     - Extended Proxies for traffic optimization
Document History

- Two initial approaches
  - Base solution for sources
draft-schmidt-multimob-pmipv6-base-source-01
  - Multiple upstream proxy for sources
draft-zhang-multimob-msm-03.txt

- Merged to
  - Mobile Multicast Sender Support in PMIPv6 Domains
draft-schmidt-multimob-pmipv6-source-00
  - Now draft-ietf-multimob-pmipv6-source-00
1. Base Solution

- Deployment as of RFC 6224
  - MLD Proxy at MAG (one instance per LMA-uplink)
  - Multicast router (or another proxy) a LMA
- At MAG multicast data from MN is forwarded
  - to all downstream interfaces with subscriptions
  - to the upstream LMA
- Transparent to ASM and SSM
- Supports IPv4 access/bindings (plain GRE tunneling)
- Caveat: Proxy should check subscriptions prior to forward downstream
Multicast Base Deployment with Mobile Source

DR or MLD Proxy

Unicast Tunnel

MLD Proxy forwards locally and per Uplink

Multicast Senders & Receivers
PIM-SM: Direct Connect Problem

Issue for LMAs running PIM-SM:
- PIM-SM requires sources to be directly connected
- Generic problem for Proxy-augmented PIM domains (proxy is intermediate router)
- Solution:
  Configure tunnel interface with Border bit that ends PIM domain → eliminates constraint
Efficiency Issues

- Routing is optimal for receivers at the sender’s MAG that belong to the same LMA, and for the fixed Internet
- Routing detours via LMAs, whenever
  - Mobile listener is attached to another MAG
  - Mobile listener is associated with a different LMA
- No way to suppress the forwarding uplink to LMA
- Admission control/rate limiting may be desirable to prevent flooding LMAs
2. Direct Multicast Routing

(a) Multicast Access at Proxy Uplink  (b) Multicast Routing at MAG
Alternative Approaches

- MLD Proxies connect MAGs to multicast cloud
  - Single instance uplinked (tunneled) to multicast domain

- PIM-SM deployed at MAGs
  - Problem: Use meaningful MRIB independent of PMIP unicast
  - Keep access network flat to avoid tardy re-routing

- BIDIR-PIM deployed at MAGs
  - Source mobility agnostic
  - Simplest, most transparent approach
3. Optimized Source Mobility

- Scenario: Proxies at MAGs
- Objective: avoid re-routing, when traffic is at local MAG (at different instances)

1. Multiple upstream proxy for sources (MUIMP)
   - Traffic forwarded to multiple LMAs

2. Proxy-Instance Interconnect (PII)
   - Traffic exchange between proxy instances
   - SSM: Route to source-specific instance (routing table at interface needed)
   - ASM: Distribute according to address ranges
Summary & Outcome

- This draft defines source mobility in the basic scenarios.
- In easy deployments traffic flows/aggregation may be optimal, but need not be.
- Direct routing and extended Proxy functions to optimize traffic flows.
Questions?