Multicast to the Browser

IETF 108 mboned, 2020-07-31, status update
Jake Holland
draft-ietf-mboned-dorms
draft-ietf-mboned-cbacc
draft-ietf-mboned-ambi
Outline

● Updates since 2020 interim
  ○ Implementation
  ○ Outreach

● Feedback
  ○ Issues raised
  ○ Solution proposal (preview, no draft yet)

● Next Steps
  ○ Trials
  ○ Implementation & Draft priorities
Implementation/Deployment Progress (@2020-07)

- Chromium Intent to Prototype posted:
  https://groups.google.com/a/chromium.org/forum/#!topic/blink-dev/JVKSTHFiDzo

- Refactors completed:
  - ReadableStreams in API (like webtransport)
  - Command-line flag guarded (early experimental-stage requirement)

- Internal POC successful (basic native receive, no AMBI/CBACC yet)
  - Plays video from LMS* sender via WebAssembly SDK+MSE
  - Needs improvements on CPU utilization

- DORMS server running and discoverable (CZ.NIC’s jetconf):
  dig -t SRV _dorms._tcp.4.185.212.23.in-addr.arpa

Operator Community Outreach

- ~30 ISP meetings with architecture walkthrough
- NANOG 79 presentation “IP Multicast: Next steps to make it real”: https://www.youtube.com/watch?v=2aihLUb1elg
- Game/Software delivery recognized as a key use case

Mostly supportive, trials likely (negotiations ongoing)
Content Owner Outreach

- ~30 Content owner meetings with arch walkthrough
- Content owners generally supportive
  - Hybrid unicast + opportunistic multicast
  - Open standards
  - SDK a minus but not usually a stopper (b/c hybrid unicast)
- Stretch goal: production A/B video test (no promises)
  - Using Android SDK, not browser
- Game/Software delivery talks still ongoing
  - Prototype running
Feedback: Early Notes from Operators

- Operators are seeing the need
  - Mostly supportive
  - Cautiously optimistic on feasibility of multicast ingest

- Issues raised

- Common theme: challenges with dynamic global (S,G)s
  - 6-10 max groups across some deployed CMTS gear
  - Existing services use statically pinned groups
  - Source IP MUST come from internally ISP-assigned pool
    - Conflicts with sender-managed Source-IP-based global auth/ingest/meta
Proposed Solution Preview

**Group Network Address Translation Service (GNATS)**

1. Subscribe (Sg,Gg)

2. On Join from Access: ?Global2Local((Sg,Gg)): ->(Sn,Gn)

3. Subscribe (Sn,Gn)

4. On Join Propagation: ?Local2Global((Sn,Gn)) -> (Sg,Gg)

5. Subscribe (Sg,Gg)

6+. Push on change

**Ingest Point**

- Receive (Sg,Gg)
- Forward (Sn,Gn)

**Access Point**

- Receive (Sn,Gn)
- Forward (Sg,Gg)

**Client Device**

- Joins (Sg,Gg)

**(Sg,Gg): Global (S,G) Multicast**

**(Sn,Gn): Local Network-mapped (S,G) Multicast**

**Purple:** HTTPS Control Messages

**Thick lines:** Data

**Thin lines:** Control/Signaling
Proposed Solution Preview

**Group Network Address Translation Service (GNATS)**

1. **On Join from App:**
   
   \[ ?Global2Local((Sg,Gg)): (Sn,Gn) \]

2. **Subscribe (Sn,Gn):**

3. **Subscribe (Sn,Gn):**

4. **On Join Propagation:**

   \[ ?Local2Global((Sn,Gn)): (Sg,Gg) \]

5. **Subscribe (Sg,Gg):**

6. **Push on change:**

   \[ 6+: \]

- **Ingest Point**
  - Receive (Sg,Gg)
  - Forward (Sn,Gn)

- **Access Point w/ Dumb Forwarding**

- **GNATS service (HTTPS API):**
  - Manage mappings

- **OS or Browser:**
  - Discover GNATS (DNS-SD)
  - Translate to (Sn,Gn)
  - App Joins (Sg,Gg)

---

(Sg,Gg): Global (S,G) Multicast

(Sn,Gn): Local Network-mapped (S,G) Multicast

Purple: HTTPS Control Messages

**Thick lines:** Data

**Thin lines:** Control/Signaling
GNATS-addressable Issues

Immediate:

- Specific local IP assignments (static groups, sender IPs, etc)
- ASM-only networks
- V4 over V6 network and V6 over V4 network
- Population count without RFC 6807 (PIM experimental)

Future possible extensions:

- Local broadcast channel assignment? (PON/Cable/5G/ATSC)
- BIER signaling applicability?
Next Steps

● Trials, trials, trials (3-6 to start this year, hopefully)
  ○ multicast-ingest-platform for ingest prototype
  ○ CBACC prototype integrated with ingest-platform
  ○ Stretch goal: CBACC external implementation
    ■ Drive ACL API on existing router hardware
  ○ At least 1 probably includes GNATS prototype
    ■ (maybe before writing spec, depending)

● Draft updates incorporating feedback so far
● Get chromium experimental API checked in
● Later: get moving on AMBI (maybe fix and add ALTA)