

# IETF88 Vancouver

Immediate options for Multrans avoiding NAT ?

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# Multrans challenge

- Multrans proposals all include in-network multicast NAT
  - Or else just tunneling == mostly config options of existing tunneling methods.
- Multicast NAT == new router platform work
  - The further into the core, the more work == more expensive/slow to adopt.
  - If customers can find a solution to make use cases work without this (or further towards the edge) we should strongly consider to concentrate on those first.
    - Faster to adopt
    - Nothing new to configure in network == easier to operate ?!
    - “good enough” / equally good ?!
    - Might invalidate investment made into the more complex solution.

# Concept

- Architecturally...
  - IP multicast receivers do not need global routed IP address.
    - IGMPv3 memberships can be sent with source-IP address 0.0.0.0
    - MLD membership reports are sent with link-local-scope IPv6 address (or ::)
- Tentative summary::
  - Use-case 1:
    - We likely can leverage this to avoid NAT for v4 multicast->v6 in routers
    - Reason: no (global) v4 addresses in clients, but possible v4 stacks.
  - Use-case 2:
    - Less likely we can avoid NAT for v6 multicast -> v4
    - Reason: no v6 support because client devices are legacy. MUST use IPv4 on them.

# Use-case 1: IPv4 only multicast in network, IPv6 only host

- Most important short-term use-case ?!  
Existing IPv4 deployments running out of IPv4 addresses.
- Assumptions:
  - No NAT done for unicast. Application uses IPv6 unicast for eg; IPTV EPG retrieval etc.
    - Aka: Introducing NAT just for IP multicast is undesirable complexity.
  - Hosts will have an IPv4 host stack – but no global IPv4 address.
    - Target approach: use IPv4 host stack to receive multicast. No NAT needed.
  - Details on later slide.

# Use-case 2:

## IPv6 only multicast in network, IPv4 only host

- Somewhat longer term use-case ?
  - New v6 centric network designs.
- Assumptions
  - IPv4 services expected to be tunneled across IPv6 core.
  - Tunneling of IPv4 multicast over IPv6 multicast complex (“MVPN like”).
    - Many widely options for unicast, no simple / widely used one for multicast ?!
  - IPv4 only host will not be able to use IPv6. Neither unicast nor multicast.
    - Host/Apps are legacy. Even if OS supports IPv6, App/OS can not be upgraded..
- Solution
  - Likely best/necessary to do NAT for multicast (tunneled IPv4 for unicast).
  - But NAT can be simple static v6->v4 multicast group adress mapping.
  - And this NAT can/should be implemented as far on the edge as possible: Home-gateway. – Otherwise there is duplicate traffic on eg: DOCSIS DS.

# Use-case 1 details/questions:

- If SP only offers IPv6, how will home support non-IPv6 equipment ?

## Case 1:

RFC1918/RFC3330 in home.

Easy: No need to have hosts use source-IP 0.0.0.0

Home Gateway has no outside IPv4 address.

Give Home Gateway outside “local” IPv4 address

Or: persuade Home Gateway to send IGMPv3 with 0.0.0.0 source IP address.

DHCP option to indicate v4 multicast only to Home Gateway ?!.

## Case 2:

No IPv4 whatsoever in home (homenet target network ?).

How short term is this as a real business case ?

Need to make host send IGMPv3 with source-IP address 0.0.0.0

Experiment with existing OS required to know if this is easy...impossible.

# Summary ?

- Now:
  - Experiment with Host/Home-Gateway behavior for Use-Case 1.
  - Identify if fixups in Home Gateway / hosts are needed or just identify working configs.
- Step 1 Multran candidate:
  - v6only client getting IPv4 multicast without NAT via 0.0.0.0/local-IPv4
- Step 2 Multran candidate:
  - Requirements for Home Gateways v6->v4 multicast NAT (static mapping)
    - Takes a while to proliferate to commercial products ?
    - DD-WRT/OpenWRT work to demonstrate ... ?
  - ... Could then also include other direction v4-v6 if Step 1 ws not sufficient.