draft-haddad-homenet-multihomed

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• This draft aimed to start the discussion about homenet and multihoming

• we just gave a rough idea of the concept and solution but are open to any comment, solution, rejection...

• We do not ask for new standards, we just provide a use case [Rply to Ray Hunter]
A homenet may be multihomed to multiple providers [...] where the connectivity selection needs to be dynamic.

 [...] homenet architecture should [...] minimise the complexity of any multihoming support. [...] the homenet architecture [...] should prefer to support scenarios for which solutions exist today.

In the general homenet architecture, hosts should be multi-addressed with globally unique prefixes from each ISP [...].

 [...] hosts need some way to pick source and destination address pairs for connections.

Given a packet with a source address on the network, the packet must be routed to the proper egress. [...] the minimum requirement is that the packet is not dropped [...] highly desirable that the packet is routed [...] to the correct exit.

Methods such as Shim6 have been defined, but [...] require support in the hosts. There are also application-oriented approaches [...] homenet architecture should not preclude use of such tools [...].
Motivation

- Target: SOHO networks
- not device mobility (e.g., 4G)
- Enable multihoming in SOHO network without
  - device/host modification,
  - homenet’s protocol modification,
  - homenet’s ISPs involvement,
  - management for the homenet.
Requirements

• (1) zero configuration
• (2) home network's ISPs independence
• (3) policies capabilities
• (4) Quality of Service
Proposition

- Outsource multihoming to a *Multihoming Service Provider* (MSP)
- Homenet is PI, prefix is advertised by the MSP, not by homenet’s ISPs
  - MSP receives every packet sent *to/from* the homenet
- A middlebox (MSPMB) is installed in the homenet
  - the MSPMB is connected to all homenet’s ISPs
  - every packet goes through this middlebox
  - the MSP manages the MSPMB to control the way packets enter and leave the homenet
MSP in a nutshell

- **Internet**
- **ISP1**
- **ISP2**
- **Homenet hosts in 2001:db8:cafe::/56**
- **BGP: 2001:db8::/32**
- **NaaS Provider 2001:db8::/32**

- **Gw1**
- **Gw2**

**Corresponding network**

**Native IP forwarding** ↔ **Tunnels**
A day in the life of an application layer session

• Nothing changes for the hosts!
• Failures are handled by MSP and MSPMB with BGP and the tunneling protocol
• MSPMB is a single point of failure
  • are middlebox failures more frequent than link/route failures?
Why not Shim6 (MPTCP) directly on the hosts?

- Hosts in the homenet must implement Shim6 (MPTCP)
- Corresponding nodes must also implement Shim6 (MPTCP)
- No solution for central management (but draft-wr-mptcp-single-homed might help)
  - how to chose wisely the egress point?
  - how to chose wisely the ingress point?
- MPTCP limited to TCP
- However, the MSPMB could be implemented by a Shim6 (MPTCP) proxy
Who to be a MSP?

• MSPs do not exist so far
  • but some commercial networks are very well connected, peer everywhere, and could have incentive catching traffic
  • e.g., Google, Facebook, Amazon, Apple, Microsoft
Questions to the WG

• Do we need session continuity?
• Would LISP be an acceptable solution for the WG?
  • LISP has both the control-plane and the data-plane to enable MSP
  • or Shim6/MPTCP?
  • but they don’t have the necessary control-plane to enable MSP