

# NEMO Multihoming Issues: Status Report

**Prepared for 62<sup>nd</sup> IETF NEMO WG**

*By*

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draft-ietf-nemo-multihoming-02.txt

# Change-Log

- ❑ **Changes to** `draft-ietf-nemo-multihoming-issues-02.txt`
  - ❖ Added recommendations on which WG(s) should address the problems identified in Sect 4 of draft
  - ❖ These are still too coarse, and we need to identify further the specific multihoming issues NEMO WG should address

## Change-Log: Recommendations

- Path Survival (Generic IPv6/Multi6)
- Path Selection (Generic IPv6/Multi6)
- Ingress Filtering (NEMO for specific issue)
- Failure Detection (DNA, MIP6)
- Media Detection (DNA)
- HA Synchronization (MIP6/NEMO)
- MR Synchronization (Generic IPv6/multi6)
- Prefix Delegation (NEMO)
  - ❖ Current proposal should have multihoming considerations in mind
- Multiple Bindings Registration (MIP6/NEMO)
- Source Address Selection (Generic IPv6)
- Impact on Routing Infrastructure (Multi6)
- Nested Mobile Networks (NEMO – Tree Discovery?)
- Split Mobile Networks (NEMO)

# Draft Issues

## □ Issues List:

<http://www.mobilenetworks.org/nemo/draft-ietf-nemo-multihoming-issues/>

## □ 22 Issues

- ❖ 11 Closed (Accepted or Rejected)
- ❖ 11 Open
- ❖ 9 new issues since Washington

## Draft Issue #14 (Partly Accepted)

### □ [Section 2]: Relevance of Multiple Prefixes Announced on Visited Link

- ❖ The concerns here would be the same if the MR is replaced by a mobile node

### □ Resolution:

- ❖ Text in Section 2 was modified.

As described in the sub-sections below, a total of 8 possible configurations can be identified. One thing the reader has to keep in mind is that in each of the following 8 cases, the MR may be multihomed if either (i) multiple prefixes are advertised (on the home link, or on the visited link), or (ii) the MR is equipped with multiple interfaces. In such a case, the MR would have a combination of Home Address / Care-of Address pairs. Issues pertaining to a multihomed MR are also addressed in the companion document [7].

## Draft Issue #15 (Open)

### □ [Section 4.3]: Source Routing as an Approach for Overcoming Ingress Filtering

- ❖ Suggestion of MNNs setting default router as the router that advertise the prefix the MNNs configure their address from is not complete, and do not address the more complex issues with respect to source-address routing

### □ Resolution:

- ❖ Re-write text to better reflect the complexity of a source-based routing approach to overcome ingress filtering
  - *[TBD: in -03]*

## Draft Issue #16 (On-Going)

### □ [Section 4.3]: More Details in Ingress Filtering

- ❖ Issues related to ingress filtering are very complex in nature
- ❖ Text in the draft seems to over-simplify

### □ Resolution:

- ❖ Re-write text to reference work done in multi6
  - More discussions will be needed
  - *[TBD: in -03]*

# Draft Issue #17 (On-Going)

## □ [Section 4.4]: Recovery in Routing Infrastructure

- ❖ Text in draft suggest that fault in the routing infrastructure can be recovered by the routing infrastructure itself
- ❖ Comment that it is slow (180s for BGP)
- ❖ An end-to-end multihoming mechanism may be able to recover such fault faster

## □ Resolution:

- ❖ Unclear, most likely some text need to be inserted to explain the disadvantage of relying on routing infrastructure to recover itself

## Draft Issue #18 (On-Going)

### □ [Section 4.10]: Source Address Selection & Fault Tolerance

- ❖ Source Address Selection has impact on the fault tolerance capabilities

### □ Resolution:

- ❖ Re-write the text in Sect. 4.10 to describe the considerations of fault tolerance capabilities in source address selection
  - *[TBD: in -03]*

## Draft Issue #19 (Open)

### ❑ Remove Sect 4.11

- ❖ Practicality of multiple routes to NEMO being inserted in DFZ

## Draft Issue #20 (Open)

### □ Reference: Normative/Informative

- ❖ Sort references into normative/informative

### □ Resolution:

- ❖ Open
- ❖ Is it necessary as the draft is Informational?

## Draft Issue #21 (On-Going)

### □ Reference: Applicability of Appendix B

- ❖ Approach outlined in Appendix B is only applicable to certain configurations of multihomed NEMO

### □ Resolution:

- ❖ Add text to clarify that the approach is only applicable to some of the (\*,\*,n) networks in both Sect 4.and Appendix B
  - *[TBD: in -03]*

## Draft Issue #22 (Open)

### ❑ Applicability of Multi6 Solution to NEMO

- ❖ Concern raised over the applicability of multi6 solution for multihoming in NEMO context.
- ❖ Need a more in-depth analysis of the work done in multi6, and how it applies to NEMO
- ❖ See `draft-bagnulo-nemo-multi6-00.txt`

# Moving Forward

## □ Identify which classifications we should focus on:

- ❖ Are all 8 configurations useful to people in the industries?
- ❖ Or is there some that are particularly important or useless?

## □ Which multihoming issues should be worked on by WG

- ❖ Which of the issues should the WG work on?

# Which Classifications are Useful?

- ❑ Recap: (# of MR, # of HA, # of Prefix)
- ❑ (1,1,1) (useful: dual-mode MR)
- ❑ (1,1,n) (useful: isolate nodes with different functions, eg car with different prefix for customer data and statistics collection)
- ❑ (1,n,1) (useful: 1 service provider providing two HAs, eg. Trans-Atlantic flight)
- ❑ (1,n,n) (useful: 1 MR subscribe to multiple service providers)
- ❑ (n,1,1) (useful: train with one MR per cabin)
- ❑ (n,1,n) (useful: train with different prefix for passengers & sensors))
- ❑ (n,n,1) (useful ??)
- ❑ (n,n,n) (useful: two MRs with different service providers)

## Which Multihoming Issues Should be Solved

- Path Survival (Generic IPv6/Multi6)
- Path Selection (Generic IPv6/Multi6)
- Ingress Filtering (NEMO for specific issue)
- Failure Detection (DNA, MIP6)
- Media Detection (DNA)
- HA Synchronization (MIP6/NEMO)
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