IPv6 READY Phase-2

Network Mobility Basic Support Protocol

Policy Document

Version 1.1.0

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- Major revision up.

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- Major revision up to cover RFC4877 and add "Fine-grain selectors" as an Advanced Function.

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- First release.

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- IPv6 Promotion Council, Certification Working Group, Mobile IPv6 Sub Working Group

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1. Requirements for the "IPv6-Ready" Logo

- To be given the right to bear the logo indicating capability of Network Mobility (NEMO), equipment must satisfy each logo program for IPv6 Core Protocols and NEMO.

    (1) To obtain the logo of NEMO HA (home agent), equipment must pass IPv6 Core Protocols (Router) and NEMO HA tests.

    (2) To obtain the logo of NEMO MR, equipment must pass IPv6 Core Protocols (Router) and NEMO MR tests.

- NEMO is an expansion of Mobile IPv6, so NEMO equipment needs to support some functions that are equivalent to those of Mobile IPv6. The requirements of those necessary functions are also specified in the NEMO-Ready Logo Program.

- Although NEMO may extend the concept of Home so that it is not only a flat subnet composed of Home Addresses but an aggregation that is itself subnetted in mobile and Home Networks, IPv6 READY Logo Phase 2 NEMO currently assumes Extended Home Network Model as a basic home network model supposed by RFC3963.

- In addition, IPv6 READY Logo Phase 2 NEMO supports Home Address of Mobile Router derived from the prefix on the Home Link. Home Address of Mobile Router derived from one of its Mobile Network Prefixes is currently out of scope, as shown in Table 1.

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Table 1: The coverage of IPv6 READY Logo Phase 2 NEMO

Home Network Model	HoA(from HNP) [Home Address derived from Home Network Prefix]	HoA(from MNP) [Home Address derived from Mobile Network Prefix]
NEMO Extended Home Network	Target	N/A
NEMO Aggregated Home Network	N/A	N/A

- Fulfill the following requirements for Basic Functions specified as having Priority A1* in the *Guidelines for Implementation and Priorities in Testing* (http://www.ipv6ready.org/) concerning NEMO, taking into account various fields of application and forms of implementation.

(1) Pass a Conformity inspection in which a Self Tester (e.g. Test Suite (http://www.tahi.orgnemo/phase2/)) is used and cover all test items to which Priority A1 in the *Test Specifications* (http://www.ipv6ready.org/) applies.

(2) In an interoperability test scenario with at least two kinds of implementation, perform the minimum number of interoperability tests that cover items to which Priority A1 applies, thus checking for interoperability with other NEMO equipment.

- In addition to the above implementation and testing of Priority A1 items, specify the attempted implementation of any Advanced Functions (functions at Priority A2*) so that confirming the interoperability of such functions is possible, with the objectives of both accreditation and the implementation of more Advanced Functions (Priority A2 functions include, Real Home Link, MPD, and DHAAD).

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*Keywords

Priority A1: The item is specified as having Test Priority 1 (minimum functions that must be checked in interoperability testing of NEMO equipment) and Functional Rank A (equivalent to the specifications: "MUST", "SHOULD", "MUST NOT", and "SHOULD NOT" in IETF RFCs), as defined in the "Guidelines for Implementation and Priorities in Testing."

Priority A2: The item is specified as having Test Priority 2 (functions for which interoperability testing may be required according to the

target field of application or form of implementation) and Functional Rank A (equivalent to the specifications: "MUST", "SHOULD", "MUST NOT", and "SHOULD NOT" in IETF RFCs) as defined in the "Guidelines for Implementation and Priorities in Testing".

2. Policy for Basic and Advanced Functions

The view of required functions belonging to Basic Function (Priority A1) and Advanced Function (Priority A2) for Home Agent and Mobile Router is shown here.

- HA (Home Agent)
  - Router functions defined in "Test Specifications for the IPv6 Core Protocols" MUST be supported.
  - Mobile network prefix registration, in which Home Address of Mobile Router is derived from the prefix on the Home Link, supporting explicit mode, implicit mode is a Basic Function (A1).
  - IPv6 encapsulation and decapsulation is a Basic Function (A1).
  - IPsec ESP for protection of Binding Update messages and Binding Acknowledge messages is a Basic Function (A1).
  - Real Home Link is an Advanced Function (A2).
  - MPD (MPS/MPA) is an Advanced Function (A2).
    Maintenance of IPsec SA for MPS/MPA (*) and functionality for the exchange of MPS/MPA in IPsec operations that require this are Advanced Functions.
      * With regard to IPsec SA for MPS/MPA, IPsec SA can be maintained specifically for MPS/MPA or for common use by MPA/MPA and BU/BA. However, considering the interoperability, in the case of executing "Interoperability test scenario for IPv6-Ready Logo Phase 2 program", IPsec SAs must be divided by BU/BA and MPD. (see Section 2.3.3 in Guidelines for Implementation)
  - DHAAD is an Advanced Function (A2).
  - Nested mobility is a Basic Function (A1)
  - Fine-Grain Selectors for MH message type and ICMPv6 message type is an Advanced Function (A2)

- MR（Mobile Router）
  - Router functions defined in "Test specification for IPv6 Core Protocols" MUST be supported.

- Mobile network prefix registration, in which Home Address of Mobile Router is derived from the prefix on the Home Link, supporting any one of the explicit mode or implicit mode is a Basic Function (A1).

- Mobile network prefix registration supporting explicit mode and implicit mode is an Advanced Function (A2).

- IPv6 encapsulation and decapsulation is a Basic Function (A1).

- Movement detection, care-of address formation, and visiting of foreign links is a Basic Function (A1).

- IPsec ESP for the protection of Binding Update and Binding Acknowledge messages is a Basic Function (A1).

- Real Home Link is an Advanced Function (A2).

- MPD (MPS/MPA) is an Advanced Function (A2).

  With regard to IPsec SA for MPS/MPA, IPsec SA can be maintained specifically for MPS/MPA or for common use by MPA/MPA and BU/BA. However, considering the interoperability, in the case of executing "Interoperability test scenario for IPv6-Ready Logo Phase 2 program", IPsec SAs must be divided by BU/BA and MPD. (see Section 2.3.3 in Guidelines for Implementation)

- DHAAD is an Advanced Function (A2)

- Nested mobility is a Basic Function (A1)

- Fine-Grain Selectors for MH message type and ICMPv6 message type is an Advanced Function(A2)

3. Test specifications and interoperability test scenario

Test numbers found in Tables 1, 2, and 3 of the Appendix are to be covered in *Test Specifications* for Mobile IPv6 equipment (i.e. HAs, and MRs) to check the implementation of Basic and Advanced Functions.

The interoperability test scenario refers to *Interoperability Test Scenario* (http://www.ipv6ready.org/).

For reference, the Test Suite is a single module that may also include Advanced Functions. Advanced Functions are selected for testing by setting a flag during configuration, so the consecutive execution of any combination of tests is possible.

In the self tester, select and test an Advanced Function to apply the logo.

In the interoperability test scenario, test the other implementations with the same Advanced Function to apply the logo. Advanced Functions that are not used must not work.

NEMO equipment (HA and MR) must execute the "Interoperability test scenario for IPv6-Ready Logo Phase 2 program" with two or more different types (i.e. different vendors) of equipment to acquire IPv6-Ready Logo Phase 2 program Logo. For details, refer to section 2.6 in "Interoperability test scenario for IPv6-Ready Logo Phase 2 program"

IKEv1 for NEMO is out of the scope of requirements for "IPv6-Ready Logo Phase 2", and the test specification and test scenario are not available.

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4. References

Refer to the following RFC documents.

[NEMO]

(1) RFC3963: Network Mobility (NEMO) Basic Support Protocol
 (http://www.ietf.org/rfc/rfc3963.txt)

[Mobile IPv6]

(1) RFC3775: Mobility Support in IPv6 (http://www.ietf.org/rfc/rfc3775.txt)

(2) RFC3776: Using IPsec to Protect Mobile IPv6 Signaling between Mobile
 Nodes and Home Agents (http://www.ietf.org/rfc/rfc3776.txt)

(3) RFC4877: Mobile IPv6 Operation with IKEv2 and the revised IPsec
 Architecture (http://www.ietf.org/rfc/rfc4877.txt)

[IPsec]

(1) RFC2401 Security Architecture for the Internet Protocol
 (http://www.ietf.org/rfc/rfc2401.txt)

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