

ETSI TS 102 596 V1.2.0 (2008-04)

Technical Specification

**Methods for Testing and Specification (MTS);
Internet Protocol Testing (IPT): IPv6 Mobility;
Conformance Abstract Test Suite (ATS)
and partial Protocol Implementation eXtra
Information for Testing (PIXIT) proforma**

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Reference

 RTS/MTS-IPT-016[2]-IPv6-MobATS

Keywords

 IP, IPv6, testing, TTCN, mobility

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Methods for Testing and Specification (MTS).

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1 Scope

The present document specifies the Abstract Test Suite (ATS) for the mobility functions of the Internet Protocol, Version 6, as defined in the specifications [11] through to [14]. The ATS is based on the requirements defined in the IPv6 requirements catalogue TS 102 559 [2], the IPv6 test purposes TS 102 595 [3] and written according to the guidelines of TS 102 351 [1], ISO/IEC 9646-2 [5] and ETS 300 406 [9].

The objective of the present document is to provide a basis for conformance tests for IPv6 equipment giving a high probability of inter-operability between different manufacturer's IPv6 equipments.

Annex A provides the Tree and Tabular Combined Notation (TTCN-3) part of the ATS.

Annex B provides the Partial Protocol Implementation Extra Information for Testing (PIXIT) Proforma of the ATS.

Annex C provides the Protocol Conformance Test Report (PCTR) Proforma of the ATS.

NOTE: Annex B provides only the PIXIT items relevant for the mobility functions of IPv6. It is therefore necessary to also fill the core PIXIT item in TS 102 516 [15] to gain all PIXIT values needed to run the mobility test campaign.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
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NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] ETSI TS 102 351: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Testing: Methodology and Framework".
- [2] ETSI TS 102 559: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Mobility; Requirements Catalogue".

- [3] ETSI TS 102 595: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Mobility; Conformance Test Suite Structure and Test Purposes (TSS&TP)".
- [4] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".
- [5] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".
- [6] ISO/IEC 9646-4: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".
- [7] ISO/IEC 9646-5: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process".
- [8] ISO/IEC 9646-6: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".
- [9] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [10] ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".
- [11] IETF RFC 2473: "Generic Packet Tunneling in IPv6 Specification".
- [12] IETF RFC 3775: "Mobility Support in IPv6".
- [13] IETF RFC 3776: "Using IPsec to Protect Mobile IPv6 Signaling Between Mobile Nodes and Home Agents".
- [14] IETF RFC 4068: "Fast Handovers for Mobile IPv6".
- [15] ETSI TS 102 516: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Core Protocol; Conformance Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Not applicable.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

abstract test case: Refer to ISO/IEC 9646-1 [4].

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1 [4].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [4].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [4].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [4].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ATM	Abstract Test Method
ATS	Abstract Test Suite
CN	Correspondent Node
ESP	Encapsulation Security Payload
ETS	Executable Test Suite
HA	Home Agent
IETF	Internet Engineering Task Force
IPSEC	Security Architecture for the Internet Protocol
IPv6	Internet Protocol version 6
IUT	Implementation Under Test
MAC	Medium Access Control
MN	Mobile Node
MNUT	Mobile Node Under Test
MOT	Means Of Testing
PCTR	Protocol Conformance Test Report
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
RT	Router
SUT	System Under Test
TC	Test Case
TP	Test Purpose
TSS	Test Suite Structure

4 Abstract Test Method (ATM)

This clause describes the ATM used to test the IPv6 mobility functions as defined in the RFC specifications [11] through to [14]. The three following configurations have been developed to test the three different types of IUT, home agents (HA), mobile nodes (MN) and correspondent nodes (CN).

4.1 CF_MOB_01 mobility config for HA under test

PTC01 simulates RT01, HS02 and MN. PTC02 simulates RT03 and HS03/CN. MNOffHome and MNAtHome are mutually exclusive. CF_MOB_01 is initialized with MNOffHome; this allows in the preamble to start to send Binding Update Off Home. In the postamble, in order to empty the HA Binding cache, MNOffHome is not used anymore and MNAtHome is created. MNAtHome empties then the HA Binding cache.

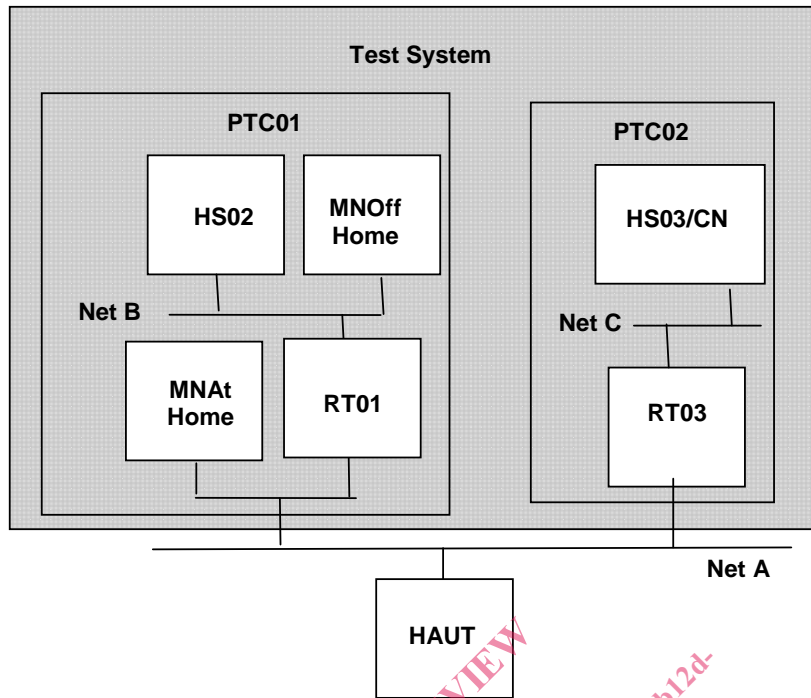


Figure 1: CF_MOB_01

4.2 CF_MOB_02 mobility config for MN under test

PTC01 simulates the home net. PTC02 simulates the visited net. PTC01 and PTC02 send messages mutually exclusive. In the case where MNUT is in the visited net, RT02 proxies all communication (the tunneled HOT/HOTI) between MNUT and its HA.

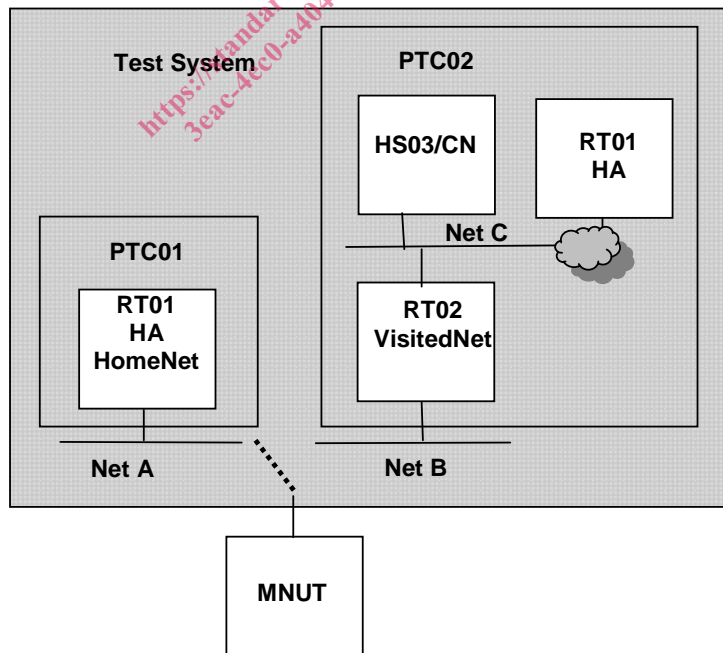


Figure 2: CF_MOB_02

4.3 CF_MOB_03 mobility config for CN under test

PTC04 simulates home net and visited net. Communication between MNAtHome and CNUT (e.g. HOTI, MNAtHome deregisters from CNUT in the postamble) passes through the HA. Communication between MNOffHome and CNUT passes through RT04.

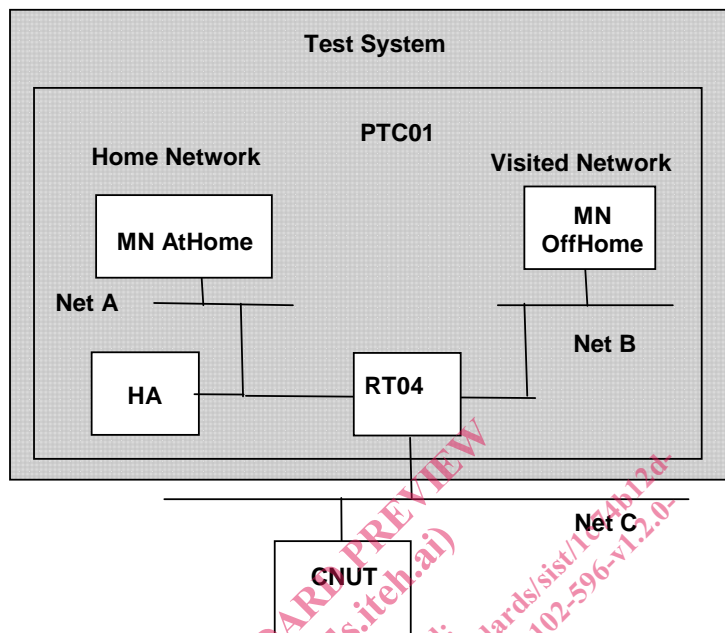


Figure 3: CF_MOB_03

5 Untestable and not implemented Test Purposes (TP)

The ATS comprises 141 TC. Those were derived from a total of 161 TP.

5.1 Untestable TP

This clause gives a list of 19 TP, which are not implemented in the ATS due to the chosen ATM or other restrictions:

TP_MOB_1315_01, TP_MOB_1483_01, TP_MOB_1562_01, TP_MOB_1634_01, TP_MOB_1636_01,
 TP_MOB_1638_01, TP_MOB_1639_01, TP_MOB_1645_01, TP_MOB_1661_01, TP_MOB_1674_01,
 TP_MOB_1674_02, TP_MOB_1764_01, TP_MOB_1764_02, TP_MOB_1764_03, TP_MOB_3021_01,
 TP_MOB_3029_01, TP_MOB_3053_01, TP_MOB_3053_02, TP_MOB_3058_01

5.2 Not implemented TP

TP TP_MOB_1631_01 has not been implemented, as the dynamic behaviour that validates its test purpose is already implemented in TC_MOB_1615_01.

6 ATS conventions

Clause 6.1 describes the cleanup procedures used in this ATS.

Descriptions of the ATS conventions are found in TS 102 351 [1]. The ATS implementation details for the IPv6 core test suite, including mapping procedures and ATS value conventions are found in TS 102 516 [15].