ETSI TS 102 594 V1.2.0 (2008-04)

Technical Specification

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

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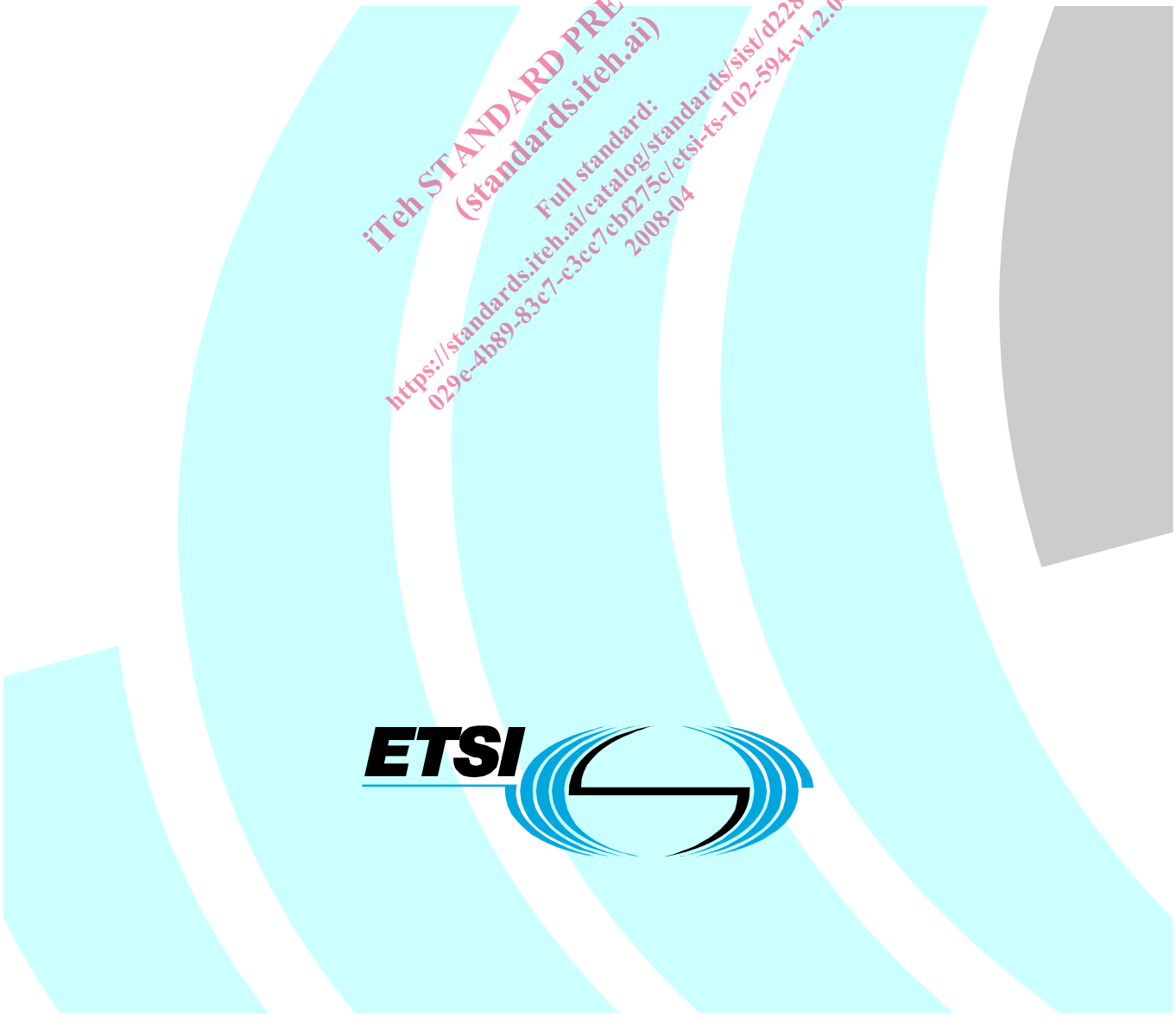

Reference
RTS/MTS-IPT-011[2]-IPv6-SecA

Keywords
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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 102 558 [2]) and the IPv6 test purposes (ETSI TS 102 593 [3]) and written according to the guidelines of TS 102 514 [16], 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 manufacturers' 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 security functions of IPv6. It is therefore necessary to also fill the core PIIXT 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.

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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 102 558: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT): IPv6 Security; Requirements Catalogue".

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[3] ETSI TS 102 593: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Security; 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 4301: "Security Architecture for the Internet Protocol".

[12] IETF RFC 4302: "IP Authentication Header".

[13] IETF RFC 4303: "IP Encapsulating Security Payload (ESP)".

[14] IETF RFC 4306: "Internet Key Exchange (IKEv2) Protocol".

[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".

[16] ETSI TS 102 514: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT): IPv6 Core Protocol; Requirements Catalogue".

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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].

Lower Tester (LT): 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:

AH	Authentication Header
ATM	Abstract Test Method
ATS	Abstract Test Suite
ESP	Encapsulating Security Payload
ETS	Executable Test Suite
IETF	Internet Engineering Task Force
IKE	Internet Key Exchange
IPv6	Internet Protocol version 6
IUT	Implementation Under Test
MOT	Means Of Testing
PCTR	Protocol Conformance Test Report
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SUT	System Under Test
TC	Test Case
TP	Test Purpose
TSS	Test Suite Structure
TTCN-3	Testing and Test Control Notation version 3
UDP	User Datagram Protocol

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4 Abstract Test Method (ATM)

The present clause describes the ATM used to test the IPv6 security functions as defined in the RFC specifications [11] through [14]. The two following configurations have been developed to test the two different modes for packet exchange, tunnel mode and transport mode.

4.1 IKEv2/AH/ESP Tunnel Mode

CF_CORE_01 (TS 102 516 [15], clause 4) is extended with HS02 and used for IKEv2/AH/ESP Tunnel Mode. PTC01 simulates HS02 and RT01. The endpoints of communication are HS02 and NUT. Tunnel Start is RT01, Tunnel End is NUT. In the case where security parameters are negotiated with IKEv2, it is RT01 which negotiates the IKE security association.

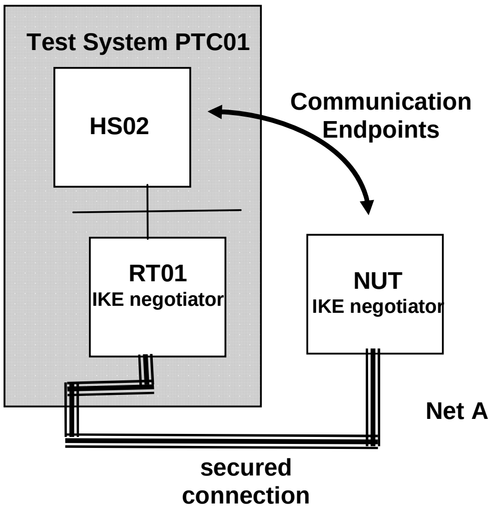

Figure 1: Tunnel Mode

4.2 IKEv2/AH/ESP Transport Mode

CF_CORE_01 (TS 102 516 [15], clause 4) is extended with HS02 and used for IKEv2/AH/ESP Transport Mode. PTC01 simulates HS02 and RT01. The endpoints of communication are HS02 and NUT. In the case where security parameters are negotiated with IKEv2, it is HS02 which negotiates the IKE security association. RT01 forwards all communication from and to HS02.

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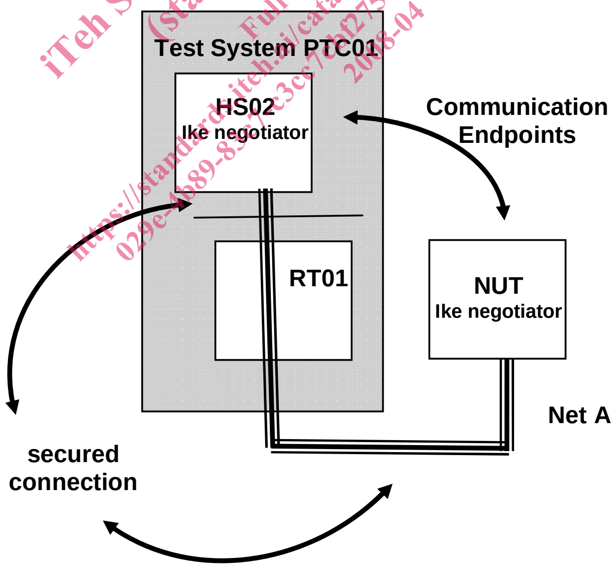

Figure 2: Transport Mode

5 Untestable Test Purposes (TP)

The ATS is comprised of 90 TC. Those were derived from a total of 103 TP.

The following 13 TP are not implemented in the ATS due to the chosen ATM or other restrictions:

TP_SEC_2042_01, TP_SEC_3059_01, TP_SEC_3107_01, TP_SEC_3107_02, TP_SEC_3108_01, TP_SEC_3108_02, TP_SEC_3077_01, TP_SEC_3078_01, TC_SEC_6153_01, TC_SEC_6161_01, TC_SEC_6162_01, TC_SEC_6164_01, TC_SEC_6164_02.

6 ATS implementation details

The following clauses describe 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].

6.1 Mobility Test Cleanup

6.1.1 Mobility Test Cleanup for MNUT

At the end of each MNUT test case, the MNUT is brought back home as shown in figure 3. In addition, the MNUT's neighbor cache regarding the HA is emptied with the Core Test Cleanup procedure.

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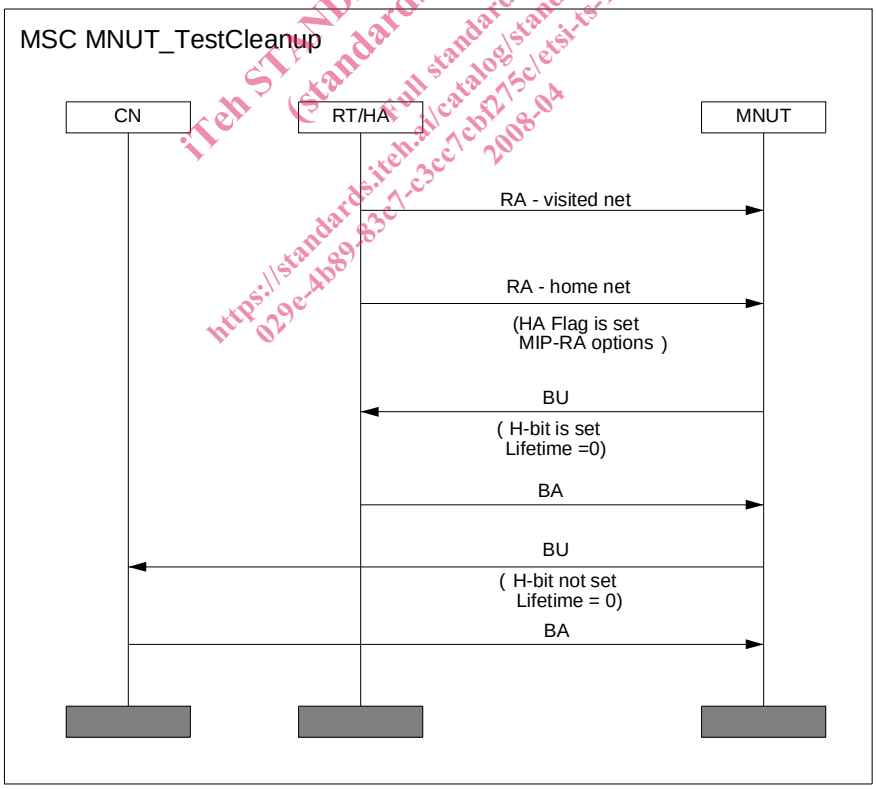

Figure 3: MNUT Test Cleanup