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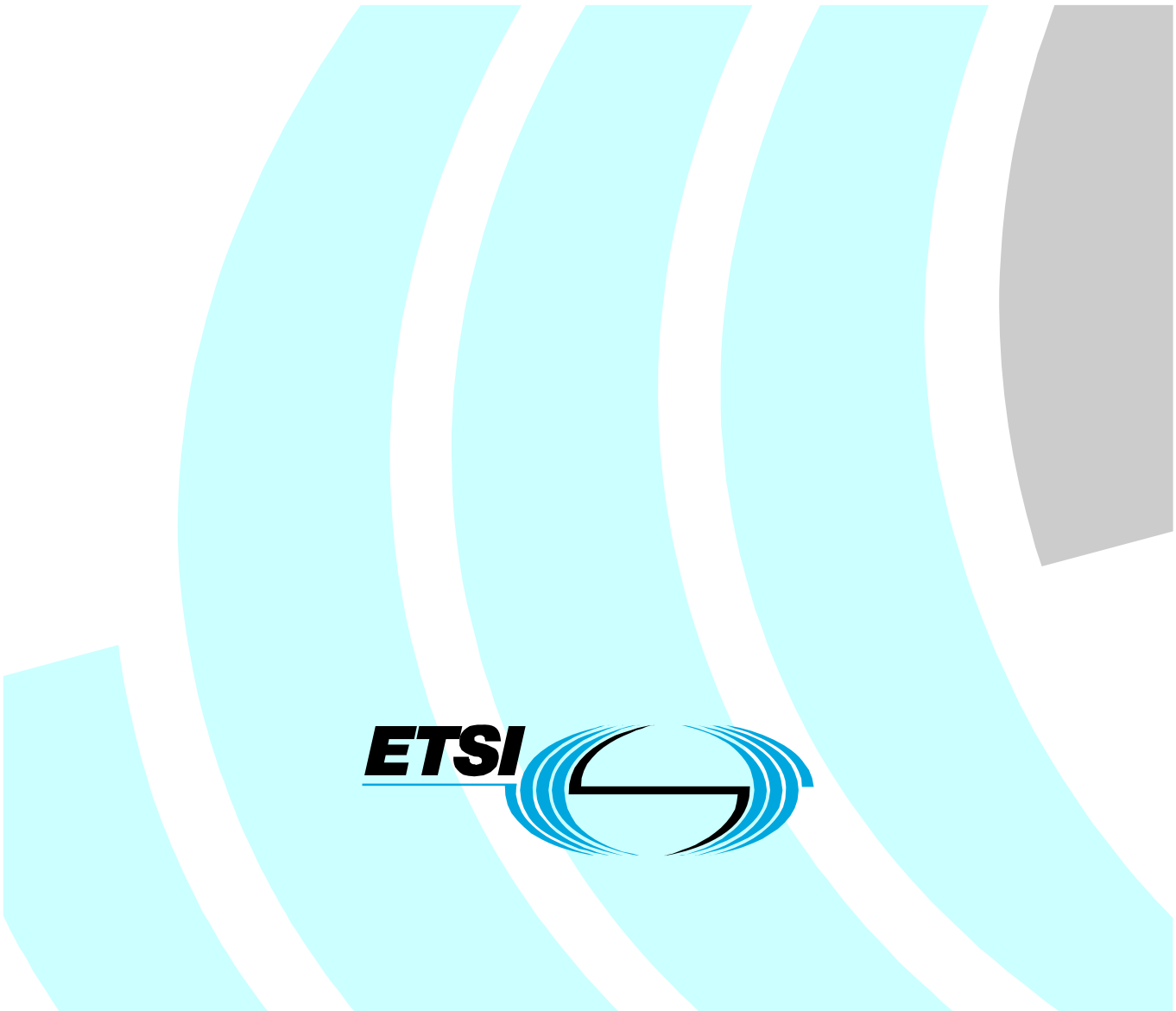
Technical Specification

Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv4 to IPv6 Transitioning; Conformance Test Suite Structure and Test Purposes (TSS&TP)



Reference
DTS/MTS-IPT-020-IPv6-TrsTSS_TP

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Contents

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Foreword

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

1 Scope

The purpose of the present document is to provide Test Suite Structure and Test Purposes (TSS&TP) for conformance tests of the IPv4 to IPv6 transitioning protocol based on the requirements defined in the IPv6 requirements catalogue (TS 102 599 [2]) and written according to the guidelines of TS 102 351 [1], ISO/IEC 9646-2 [4] and ETS 300 406 [5].

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 102 599: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT): IPv4 to IPV6 Transitioning; Requirements Catalogue".

[3] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[4] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".

[5] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[6] IETF RFC 2529: "Transmission of IPv6 over IPv4 Domains without Explicit Tunnels".

[7] IETF RFC 2765: "Stateless IP/ICMP Translation Algorithm (SIIT)".

[8] IETF RFC 3056: "Connection of IPv6 Domains via IPv4 Clouds".

[9] IETF RFC 4213: "Basic Transition Mechanisms for IPv6 Hosts and Routers".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions given in ISO/IEC 9646-1 [3] apply.

abstract test case

Abstract Test Method (ATM)

Abstract Test Suite (ATS)

Implementation Under Test (IUT)

Lower Tester (LT)

Test Purpose (TP)

3.2 Abbreviations

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

ATS	Abstract Test Suite
IETF	Internet Engineering Task Force
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IUT	Implementation Under Test
RC	Requirements Catalogue
RQ	Requirement
TP	Test Purpose
TSS	Test Suite Structure

4 Test Suite Structure (TSS)

Test Purposes have been written for 6to4-Nodes, 6to4-Routers, IP6/IP4_Nodes and IPtranslators according to the requirements (RQ) of the requirements catalogue (RC) in TS 102 599 [2]. Test purposes have been written for behaviours requested with "MUST", optional behaviour described with "SHOULD", "MAY" or similar wording indicating an option has not been turned into test purposes.

The test purposes have been divided into four groups:

Group 1: IPv6 Transitioning - RFC 2529 [6]

Group 2: IPv6 Transitioning - RFC 2765 [7]

Group 3: IPv6 Transitioning - RFC 3056 [8]

Group 4: IPv6 Transitioning - RFC 4213 [9]

The sub-grouping of these two groups follows the structure of the RC.

Group 1 RFC 2529 [6]

Group 1.1 Node Tests

Group 1.1.1 Encapsulating IPv4 Header frame format validation

Group 1.1.2 Stateless Auto-configuration and Link-local addresses on 6over4

Group 1.1.3 Source and Target Link layer address options

Group 1.1.4 IPv6 Multicast address mapping to IPv4 multicast address to support Neighbor Discovery

Group 1.2 Router Tests

Group 1.2.1 Boundary routers handling multicast IPv4 packets from 6over4 domain

Group 2 RFC 2765 [7]

Group 2.1 IPv4-to-IPv6 translation

Group 2.2 IPv6-to-IPv4 translation

Group 3 RFC 3056 [8]

Group 3.1 Node Tests

Group 3.1.1 Test IPv6 Prefix Allocation

Group 3.2 Encapsulation in IPv4

Group 3.2.1 Encapsulation of an IPv6Packet in an IPv4Packet

Group 3.3 6to4 Site Communication

Group 3.3.1 Unicast scenario

Group 3.4 Security Consideration

Group 3.4.1 Security consideration during Encapsulation of IPv6 packet in an IPv4 packet

Group 3.4.2 Security consideration during Decapsulation of IPv6 packet from IPv4 packet

Group 4 RFC 4213 [9]

Group 4.1 Node Tests

Group 4.1.1 Resolver libraries

Group 4.1.2 Configured tunneling - encapsulation

Group 4.1.2.1 Encapsulation of an IPv6Packet in an IPv4Packet

Group 4.1.3 Configured tunneling - decapsulation

Group 4.1.3.1 Decapsulation of IPv6Packet from IPv4Packet

Group 4.1.3.2 Handling errorneous packet while decapsulation

Group 4.1.3.3 Link-local address on tunnel interface

Group 4.1.4 Neighbor Discovery messages on tunnel interface

Group 4.1.4.1 Processing Probes packets on tunnel interface

Group 4.1.4.2 Processing Neighbor discovery packets on tunnel interface

Group 4.1.4.3 Sending Neighbor Discovery packets on tunnel interface

Annex A (normative): Test Purposes (TP)

The test purposes have been written in the formal notation TPlan as described in annex A of TS 102 351 [1]. This original textual output file is contained in an ASCII file (TRANS.tplan) (contained in archive "ts_102518v010101p0.zip") which accompanies the present document. The raw text file has been converted to a table format in this annex to allow better readability.

The two formats shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the textual TPlan representation takes precedence over the table format in this annex.

A.1 IPv6 Transitioning - RFC 2529

A.1.1 Node Tests

A.1.1.1 Encapsulating IPv4 Header frame format validation

Test Purpose			
Identifier:	**TP_TRA_1003_01**		
Summary:	Test Dont fragment bit in an encapsulating IPv4 header		
References:	RQ_003_1003		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1003_01

with { **IUT** ready **to send** IPv6Packet }
ensure that
{ **when** { **IUT generates** IPv6Packet }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing 'dont fragment bit'
set to 0
}
}

Test Purpose			
Identifier:	**TP_TRA_1004_01**		
Summary:	Test protocol field in an encapsulating IPv4 header		
References:	RQ_003_1004		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1004_01

with { **IUT** ready **to send** IPv6Packet }
ensure that
{ **when** { **IUT generates** IPv6Packet }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing protocol
set to 41
}
}

Test Purpose			
Identifier:	**TP_TRA_1007_01**		
Summary:	Test TTL field in an encapsulating IPv4 header		
References:	RQ_003_1007		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1007_01

with { **IUT** configured 'TTL value of 8'
and IUT ready **to send** IPv6Packet }
ensure that
{ **when** { **IUT generates** IPv6Packet }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing ttl
set to 8
}
}

A.1.1.2 Stateless Auto-configuration and Link-local addresses on 6over4

Test Purpose			
Identifier:	**TP_TRA_1009_01**		
Summary:	Test IPv6 Link-local address format		
References:	RQ_003_1009, RQ_003_1010, RQ_003_1011, RQ_003_1012		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1009_01

with { **IUT** ready **to** 'form IPv6 Link-local address' }
ensure that
{ **when** { **IUT generates** 'its Link-local address' }
then { **IUT** 'forms Link-local address'
containing 'universal or local bit set to zero'
and containing 'last 32 bits as hexadecimal representation of IPv4 address appended to the prefix FE80::/64'
}
}

A.1.1.3 Source and Target Link layer address options

Test Purpose			
Identifier:	**TP_TRA_1013_01**		
Summary:	Test Frame format of Target Link-layer address option in the Neighbor Advertisement		
References:	RQ_003_1013,RQ_003_1014, RQ_003_1015, RQ_003_1016		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1013_01

with { **IUT** ready **to send** 'Neighbor Advertisement' }
ensure that
{ **when** { **IUT generates** 'a Neighbor Advertisement'
containing 'Target Link-layer Address option'
}
then { **IUT sends** 'Neighbor Advertisement' **containing** Link_layer_Address_option
containing type
set to 2 'bit 1 to 8'
containing length
set to 1 'bit 9 to 16'
containing reserved
set to 0 'bit 17 to 32'
containing IPv4_address
set to '32 bit address of the interface in network byte order'
}
}

Test Purpose			
Identifier:	**TP_TRA_1013_02**		
Summary:	Test Frame format of Source Link-layer address option in the Neighbor Solicitation		
References:	RQ_003_1013,RQ_003_1014, RQ_003_1015, RQ_003_1016		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1013_02

with { **IUT** ready **to send** 'Neighbor Solicitation' }
ensure that
{ **when** { **IUT generates** 'a Neighbor Solicitation'
containing 'Source Link-layer Address option'
}
then { **IUT sends** 'Neighbor Solicitation' **containing** Link_layer_Address_option
containing type
set to 1 'bit 1 to 8'
containing length
set to 1 'bit 9 to 16'
containing reserved
set to 0 'bit 17 to 32'
containing IPv4_address
set to '32 bit address of the interface in network byte order'
}
}

Test Purpose			
Identifier:	**TP_TRA_1013_03**		
Summary:	Test Frame format of Source Link-layer address option in the Router Advertisement		
References:	RQ_003_1013,RQ_003_1014, RQ_003_1015, RQ_003_1016		
IUT Role	6over4-Router	**Test Case:**	TC_TRA_1013_03

with { **IUT** ready **to send** 'Router Advertisement' }
ensure that
{ **when** { **IUT generates** 'a Router Advertisement'
containing 'Source Link-layer Address option'
}
then { **IUT sends** 'Router Advertisement' **containing** Link_layer_Address_option
containing type
set to 1 'bit 1 to 8'
containing length
set to 1 'bit 9 to 16'
containing reserved
set to 0 'bit 17 to 32'
containing IPv4_address
set to '32 bit address of the interface in network byte order'
}
}

Test Purpose			
Identifier:	**TP_TRA_1013_04**		
Summary:	Test Frame format of Source Link-layer address option in the Router Solicitation		
References:	RQ_003_1013,RQ_003_1014, RQ_003_1015, RQ_003_1016		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1013_04

with { **IUT** ready **to send** 'Router Solicitation' }
ensure that
{ **when** { **IUT generates** 'a Router Solicitation'
containing 'Source Link-layer Address option'
}
then { **IUT sends** 'Router Solicitation' **containing** Link_layer_Address_option
containing type
set to 1 'bit 1 to 8'
containing length
set to 1 'bit 9 to 16'
containing reserved
set to 0 'bit 17 to 32'
containing IPv4_address
set to '32 bit address of the interface in network byte order'
}
}

A.1.1.4 IPv6 Multicast address mapping to IPv4 multicast address to support Neighbor Discovery

Test Purpose			
Identifier:	**TP_TRA_1017_01**		
Summary:	Test IPv6 all-node multicast address mapped to IPv4 multicast address		
References:	RQ_003_1017, RQ_003_1018, RQ_003_1020, RQ_003_1027		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1017_01

with { **IUT** configured 'organization local scope address block i.e: 192'
and IUT '6over4 interface is enabled'
}
ensure that
{ **when** { **IUT generates** IPv6Packet 'with IPv6 destination address set to all-nodes multicast address FF02::1' }
then { **IUT sends** IPv6Packet tunneled in IPv4Packet
containing ipv4_dst_addr
set to 'IPv4 multicast address 239.192.0.1'
}
}

Test Purpose			
Identifier:	**TP_TRA_1017_02**		
Summary:	Test IPv6 all-routers multicast address mapped to IPv4 multicast address		
References:	RQ_003_1017, RQ_003_1018, RQ_003_1020, RQ_003_1027		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1017_02

with { **IUT** configured 'organization local scope address block i.e: 192'
and IUT '6over4 interface is enabled'
}
ensure that
{ **when** { **IUT generates** IPv6Packet 'with IPv6 destination address set to all-routers multicast address FF02::2' }
then { **IUT sends** IPv6Packet tunneled in IPv4Packet
containing ipv4_dst_addr
set to 'IPv4 multicast address 239.192.0.2'
}
}

Test Purpose			
Identifier:	**TP_TRA_1017_03**		
Summary:	Test IPv6 solicited-node multicast address mapped to IPv4 multicast address		
References:	RQ_003_1017, RQ_003_1018, RQ_003_1020, RQ_003_1027		
IUT Role	6over4-Node	**Test Case:**	TC_TRA_1017_03
with { **IUT** configured 'organization local scope address block i.e: 192' **and IUT** '6over4 interface is enabled' } **ensure that** { **when** { **IUT generates** IPv6Packet 'with IPv6 destination address set to solicited-node multicast address FF02::1:FF28:9C5A' } **then** { **IUT sends** IPv6Packet tunneled in IPv4Packet **containing** ipv4_dst_addr **set to** 'IPv4 multicast address 239.192.156.90' } }			

A.1.2 Route Tests

A.1.2.1 Boundary routers handling multicast IPv4 packets from 6over4 domain

Test Purpose			
Identifier:	**TP_TRA_1024_02**		
Summary:	Test multicast IPv4 packets with unknown organization-local scope destination address		
References:	RQ_003_1024		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_1024_02
with { **IUT** configured 'organization local scope address block i.e: 192' } **ensure that** { **when** { **IUT** ready **to receive** IPv4Packet } **then** { **IUT discards** 'IPv4 multicast packets' **containing** 'destination address' **set to** 'unknown organization-local scope address block i.e: 50' } }			

A.2 IPv6 Transitioning - RFC 2765

A.2.1 IPv4-to-IPv6 translation

Test Purpose			
Identifier:	**TP_TRA_3003_01**		
Summary:	Test 4to6 packet translation where DF bit is not set and fragmentation is necessary		
References:	RQ_003_3003, RQ_003_3006, RQ_003_3007, RQ_003_3011,		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3003_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** IPv4Packet **with** 'data leading to overall size >1280 bytes' **containing** protocol **and containing** ip_identification **and containing** DF_bit **set to** 0 **and containing** ttl **and containing** ipv4_src_addr **and containing** ipv4_dst_addr } **then** { **IUT sends** IPv6Packet **containing** flow_Label **set to** 'all zero bits'			

and containing next_header **set to** 44
and containing hop_limit **set to** 'value received in IPv4 ttl field'
and containing ipv6_src_addr **set to** ipv4_src_addr **with** prefix_field '::ffff:0:0' **and** prefix_length 96
and containing ipv6_dst_addr **set to** ipv4_dst_addr **with** prefix_field '::ffff:0:0' **and** prefix_length 96
and containing Fragment_Header
containing next_header **set to** protocol
and containing offset **set to** 0
and containing M_flag **set to** 1
and containing ipv6_identification **set to** ip_identification 'padded with zeros'
and IUT sends IPv6Packet
containing flow_Label **set to** 'all zero bits'
and containing next_header **set to** 44
and containing hop_limit **set to** 'value received in IPv4 ttl field'
and containing ipv6_src_addr **set to** ipv4_src_addr **with** prefix_field '::ffff:0:0' **and** prefix_length 96
and containing ipv6_dst_addr **set to** ipv4_dst_addr **with** prefix_field '::ffff:0:0' **and** prefix_length 96
and containing Fragment_Header
containing next_header **set to** protocol
and containing M_flag **set to** 0
and containing ipv6_identification **set to** ip_identification 'padded with zeros'
}
}

Test Purpose			
Identifier:	**TP_TRA_3004_01**		
Summary:	Test 4to6 packet translation where DF bit is not set and fragmentation is not necessary		
References:	RQ_003_3004, RQ_003_3011, RQ_003_3014, RQ_003_3018,		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3004_01

with { **IUT** ready **to** translate IPv4Packet }
ensure that
{ **when** { **IUT receives** IPv4Packet **with** 'data leading to overall size <1280 bytes'
containing protocol
and containing ip_identification
and containing DF_bit **set to** 0
and containing ttl
and containing ipv4_src_addr
and containing ipv4_dst_addr
and not containing options }
then { **IUT sends** IPv6Packet
containing flow_Label **set to** 'all zero bits'
and containing payload_len **set to** 'IPv4 total_len + 8 (fragment header) - 20 (IPv4 header)'
and containing next_header **set to** 44
and containing hop_limit **set to** 'value received in IPv4 ttl field'
and containing ipv6_src_addr **set to** ipv4_src_addr **with** prefix_field '::ffff:0:0' **and** prefix_length 96
and containing ipv6_dst_addr **set to** ipv4_dst_addr **with** prefix_field '::ffff:0:0' **and** prefix_length 96
and containing Fragment_Header
containing next_header **set to** protocol
and containing offset **set to** 0
and containing M_flag **set to** 1
and containing ipv6_identification **set to** ip_identification 'padded with zeros'
}
}

Test Purpose			
Identifier:	**TP_TRA_3012_01**		
Summary:	Test 4to6 packet translation where DF bit is set		
References:	RQ_003_3004, RQ_003_3011, RQ_003_3014, RQ_003_3018, RQ_003_3019		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3012_01

with { **IUT** ready **to** translate IPv4Packet }
ensure that
{ **when** { **IUT receives** IPv4Packet **with** 'data leading to overall size <1280 bytes'
containing protocol
and containing ip_identification
and containing DF_bit **set to** 1
and containing ttl
and containing ipv4_src_addr
and containing ipv4_dst_addr
and not containing options }
then { **IUT sends** IPv6Packet
containing flow_Label **set to** 'all zero bits'
and containing payload_len **set to** 'IPv4 total_len - 20 (IPv4 header)'
and containing next_header **set to** protocol
and containing hop_limit **set to** 'value received in IPv4 ttl field'
and containing ipv6_src_addr **set to** ipv4_src_addr **with** prefix_field '::ffff:0:0' **and** prefix_length 96
and containing ipv6_dst_addr **set to** ipv4_dst_addr **with** prefix_field '::ffff:0:0' **and** prefix_length 96
and not containing Fragment_Header
}
}

Test Purpose			
Identifier:	**TP_TRA_3020_01**		
Summary:	Test that IPv4 options other than unexpired source route are ignored		
References:	RQ_003_3020		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3020_01

with { **IUT** ready **to** translate IPv4Packet }
ensure that
{ **when** { **IUT receives** IPv4Packet
containing options 'other than unexpired source route' }
then { **IUT ignores** options
and IUT sends IPv6Packet
}
}

Test Purpose			
Identifier:	**TP_TRA_3021_01**		
Summary:	Test that IPv4 with unexpired source route option is discarded		
References:	RQ_003_3021, RQ_003_3022		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3021_01

with { **IUT** ready **to** translate IPv4Packet }
ensure that
{ **when** { **IUT receives** IPv4Packet
containing options 'including unexpired source route' }
then { **IUT discards** IPv4Packet
and IUT optionally **sends** ICMPv4_Destination_Unreachable
containing code **set to** ipv4_source_route_failed
}
}

Test Purpose			
Identifier:	**TP_TRA_3037_01**		
Summary:	Test translation of Echo messages		
References:	RQ_003_3037, RQ_003_3038		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3037_01

with { **IUT** ready **to** translate IPv4Packet }
ensure that
{ **when** { **IUT receives** ICMPv4_Echo
containing type **set to** 8 }
then { **IUT sends** ICMPv6_Echo_Request
containing type **set to** 128
and containing valid checksum
}
}

Test Purpose			
Identifier:	**TP_TRA_3039_01**		
Summary:	Test translation of Echo Reply messages		
References:	RQ_003_3039, RQ_003_3040		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3039_01

with { **IUT** ready **to** translate IPv4Packet }
ensure that
{ **when** { **IUT receives** ICMPv4_Echo_Reply
containing type **set to** 8 }
then { **IUT sends** ICMPv6_Echo_Reply
containing type **set to** 128
and containing valid checksum
}
}

Test Purpose			
Identifier:	**TP_TRA_3041_01**		
Summary:	Test dropping of Information Request messages		
References:	RQ_003_3041		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3041_01

with { **IUT** ready **to** translate IPv4Packet }
ensure that
{ **when** { **IUT receives** ICMPv4_Information_Request }
then { **IUT discards** ICMPv4_Information_Request
}
}

Test Purpose			
Identifier:	**TP_TRA_3042_01**		
Summary:	Test dropping of Information Reply messages		
References:	RQ_003_3042		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3042_01

with { **IUT** ready **to** translate IPv4Packet }
ensure that
{ **when** { **IUT receives** ICMPv4_Information_Reply }
then { **IUT discards** ICMPv4_Information_Reply
}
}

Test Purpose			
Identifier:	**TP_TRA_3043_01**		
Summary:	Test dropping of Timestamp messages		
References:	RQ_003_3043		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3043_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Timestamp } **then** { **IUT discards** ICMPv4_Timestamp } }			

Test Purpose			
Identifier:	**TP_TRA_3044_01**		
Summary:	Test dropping of Timestamp Reply messages		
References:	RQ_003_3044		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3044_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Timestamp_Reply } **then** { **IUT discards** ICMPv4_Timestamp_Reply } }			

Test Purpose			
Identifier:	**TP_TRA_3045_01**		
Summary:	Test dropping of Mask Request messages		
References:	RQ_003_3045		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3045_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Mask_Request } **then** { **IUT discards** ICMPv4_Mask_Request } }			

Test Purpose			
Identifier:	**TP_TRA_3046_01**		
Summary:	Test dropping of Mask Reply messages		
References:	RQ_003_3046		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3046_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Mask_Reply } **then** { **IUT discards** ICMPv4_Mask_Reply } }			

Test Purpose			
Identifier:	**TP_TRA_3047_01**		
Summary:	Test dropping of Router Advertisement messages		
References:	RQ_003_3047		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3047_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Router_Advertisement } **then** { **IUT discards** ICMPv4_Router_Advertisement } }			

Test Purpose			
Identifier:	**TP_TRA_3048_01**		
Summary:	Test dropping of Router Solicitation messages		
References:	RQ_003_3048		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3048_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Router_Solicitation } **then** { **IUT discards** ICMPv4_Router_Solicitation } }			

Test Purpose			
Identifier:	**TP_TRA_3049_01**		
Summary:	Test dropping of unknown ICMPv4 messages		
References:	RQ_003_3049		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3049_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Unknown_Type } **then** { **IUT discards** ICMPv4_Unknown_Type } }			

Test Purpose			
Identifier:	**TP_TRA_3051_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3051		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3051_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_net_unreachable } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } }			

Test Purpose			
Identifier:	**TP_TRA_3052_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3052		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3052_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_protocol_unreachable } **then** { **IUT sends** ICMPv6_Parameter_Problem **containing** code **set to** ipv6_unrecognized_next_header_type_encountered } }			

Test Purpose			
Identifier:	**TP_TRA_3053_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3053		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3053_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_port_unreachable } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_port_unreachable } }			

Test Purpose			
Identifier:	**TP_TRA_3054_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3054		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3054_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_fragmentation_needed_and_DF_set } **then** { **IUT sends** ICMPv6_Packet_Too_Big **containing** code **set to** 0 } }			

Test Purpose			
Identifier:	**TP_TRA_3057_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3057		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3057_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_destination_network_administratively_prohibited } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_communication_with_destination_administratively_prohibited } }			

Test Purpose			
Identifier:	**TP_TRA_3057_02**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3057		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3057_02
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_destination_host_administratively_prohibited } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_communication_with_destination_administratively_prohibited } }			

Test Purpose			
Identifier:	**TP_TRA_3058_01**		
Summary:	Test dropping of Redirect messages		
References:	RQ_003_3058		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3058_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Redirect } **then** { **IUT discards** ICMPv4_Redirect } }			

Test Purpose			
Identifier:	**TP_TRA_3058_02**		
Summary:	Test dropping of Source Quench messages		
References:	RQ_003_3058		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3058_02
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Source_Quench } **then** { **IUT discards** ICMPv4_Source_Quench } }			

Test Purpose			
Identifier:	**TP_TRA_3059_01**		
Summary:	Test translation of Time Exceeded messages		
References:	RQ_003_3059, RQ_003_3060		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3059_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Time_Exceeded } **then** { **IUT sends** ICMPv6_Time_Exceeded } }			

Test Purpose			
Identifier:	**TP_TRA_3061_01**		
Summary:	Test translation of Parameter Problem messages		
References:	RQ_003_3061		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3061_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Parameter_Problem } **then** { **IUT sends** ICMPv6_Parameter_Problem } }			

Test Purpose			
Identifier:	**TP_TRA_3062_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3062		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3062_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** 'value other than 0 - 12' } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_communication_with_destination_administratively_prohibited } }			

Test Purpose			
Identifier:	**TP_TRA_3064_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3064		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3064_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_host_unreachable } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } }			

Test Purpose			
Identifier:	**TP_TRA_3065_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3065		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3065_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_source_route_failed } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } }			

Test Purpose			
Identifier:	**TP_TRA_3066_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3066		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3066_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_destination_network_unknown_error } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } }			

Test Purpose			
Identifier:	**TP_TRA_3067_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3067		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3067_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_destination_host_unknown_error } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } }			

Test Purpose			
Identifier:	**TP_TRA_3068_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3068		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3068_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_source_host_isolated_error } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } }			

Test Purpose			
Identifier:	**TP_TRA_3069_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3069		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3069_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_network_unreachable_for_TOS } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } }			

Test Purpose			
Identifier:	**TP_TRA_3070_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3070		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3070_01
with { **IUT** ready **to** translate IPv4Packet } **ensure that** { **when** { **IUT receives** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_host_unreachable_for_TOS } **then** { **IUT sends** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } }			

A.2.2 IPv6-to-IPv4 translation

Test Purpose			
Identifier:	**TP_TRA_3075_01**		
Summary:	Test 6to4 packet translation for IPv6 packet without fragmentation header		
References:	RQ_003_3075, RQ_003_3076, RQ_003_3077, RQ_003_3078,		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3075_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** IPv6Packet **containing** next_header **and containing** hop_limit **and containing** ipv6_src_addr **set to** 'IPv4-translated address' **and containing** ipv6_dst_addr **and not containing** Fragment_Header } **then** { **IUT sends** IPv4Packet **containing** total_len **set to** 'IPv6 payload_len + size IPv4 header'			

and containing ip_identification **set to** 'all zero bits'
and containing MF_bit **set to** 0
and containing DF_bit **set to** 1
and containing frag_offset **set to** 'all zero bits'
and containing ttl **set to** 'value received in IPv6 hop_limit field'
and containing protocol **set to** 'value received in IPv6 next_header field'
and containing valid hdr_chksum
and containing ipv4_src_addr **set to** 'lower 32 bits of ipv6_src_addr'
and containing ipv4_dst_addr **set to** 'lower 32 bits of ipv6_dst_addr'
}
}

Test Purpose			
Identifier:	**TP_TRA_3087_01**		
Summary:	Test 6to4 packet translation for IPv6 packet without IPv4-translated source address		
References:	RQ_003_3087		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3087_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv6Packet
containing ipv6_src_addr **not set to** 'IPv4-translated address' }

then { **IUT sends** IPv4Packet
containing ipv4_src_addr **set to** '0.0.0.0'
}
}

Test Purpose			
Identifier:	**TP_TRA_3089_01**		
Summary:	Test 6to4 packet translation for IPv6 packets headers that are not translatable		
References:	RQ_003_3089, RQ_003_3092		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3089_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv6Packet
containing hop_by_hop_options_header
containing next_header_field }

then { **IUT sends** IPv4Packet
containing total_len **set to** 'IPv6 payload_len - hop_by_hop_options_header length + size IPv4 header'
and containing protocol **set to** 'value received in IPv6 hop_by_hop_options_header next_header field'
}
}

Test Purpose			
Identifier:	**TP_TRA_3090_01**		
Summary:	Test 6to4 packet translation for IPv6 packets headers that are not translatable		
References:	RQ_003_3090, RQ_003_3092		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3090_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv6Packet
containing destination_options_header
containing next_header_field }

then { **IUT sends** IPv4Packet
containing total_len **set to** 'IPv6 payload_len - destination_options_header length + size IPv4 header'
and containing protocol **set to** 'value received in IPv6 destination_options_header next_header field'
}
}

Test Purpose			
Identifier:	**TP_TRA_3091_01**		
Summary:	Test 6to4 packet translation for IPv6 packets headers that are not translatable		
References:	RQ_003_3091, RQ_003_3092		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3091_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv6Packet
containing routing_header
containing next_header_field
and containing segments_left **set to** 0 }

then { **IUT sends** IPv4Packet
containing total_len **set to** 'IPv6 payload_len - routing_header length + size IPv4 header'
and containing protocol **set to** 'value received in IPv6 routing_header next_header field'
}
}

Test Purpose			
Identifier:	**TP_TRA_3093_01**		
Summary:	Test 6to4 packet translation for IPv6 packets headers that are not translatable		
References:	RQ_003_3093, RQ_003_3094		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3093_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv6Packet
containing routing_header
containing segments_left **not set to** 0 }

then { **IUT discards** IPv6Packet
and IUT optionally **sends** ICMPv6_Parameter_Problem
containing code **set to** ipv6_erroneous_header_field_encountered
}
}

Test Purpose			
Identifier:	**TP_TRA_3095_01**		
Summary:	Test 6to4 packet translation for IPv6 packet with fragmentation header		
References:	RQ_003_3080, RQ_003_3085, RQ_003_3086, RQ_003_3088,		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3095_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv6Packet
containing hop_limit
and containing ipv6_src_addr **set to** 'IPv4-translated address'
and containing ipv6_dst_addr
and containing Fragment_Header
containing next_header
and containing ipv6_identification
and containing M_flag
and containing offset }

then { **IUT sends** IPv4Packet
containing total_len **set to** 'IPv6 payload_len - 8 + size IPv4 header'
and containing ip_identification **set to** 'lower 32 bits of ipv6_identification'
and containing MF_bit **set to** 'value received in IPv6 M_flag'
and containing DF_bit **set to** 0
and containing frag_offset **set to** 'value received in IPv6 offset'
and containing ttl **set to** 'value received in IPv6 hop_limit field'
and containing protocol **set to** 'value received in IPv6 Fragment_Header next_header field'
and containing valid hdr_chksum

and containing ipv4_src_addr **set to** 'lower 32 bits of ipv6_src_addr'
and containing ipv4_dst_addr **set to** 'lower 32 bits of ipv6_dst_addr'
}
}

Test Purpose			
Identifier:	**TP_TRA_3104_01**		
Summary:	Test translation of Echo Request messages		
References:	RQ_003_3104, RQ_003_3105		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3104_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** ICMPv6_Echo_Request
containing type **set to** 128 }
then { **IUT sends** ICMPv4_Echo
containing type **set to** 8
and containing valid checksum
}
}

Test Purpose			
Identifier:	**TP_TRA_3106_01**		
Summary:	Test translation of Echo Reply messages		
References:	RQ_003_3106, RQ_003_3107		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3106_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** ICMPv6_Echo_Reply
containing type **set to** 129 }
then { **IUT sends** ICMPv4_Echo_Reply
containing type **set to** 0
and containing valid checksum
}
}

Test Purpose			
Identifier:	**TP_TRA_3108_01**		
Summary:	Test dropping of MLD Multicast Listener Query messages		
References:	RQ_003_3108		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3108_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** ICMPv6_MLD_Multicast_Listener_Query }
then { **IUT discards** ICMPv6_MLD_Multicast_Listener_Query
}
}

Test Purpose			
Identifier:	**TP_TRA_3109_01**		
Summary:	Test dropping of MLD Multicast Listener Report messages		
References:	RQ_003_3109		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3109_01

with { **IUT** ready **to** translate IPv6Packet }
ensure that
{ **when** { **IUT receives** ICMPv6_MLD_Multicast_Listener_Report }
then { **IUT discards** ICMPv6_MLD_Multicast_Listener_Report
}
}

Test Purpose			
Identifier:	**TP_TRA_3110_01**		
Summary:	Test dropping of MLD Multicast Listener Done messages		
References:	RQ_003_3110		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3110_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_MLD_Multicast_Listener_Done } **then** { **IUT discards** ICMPv6_MLD_Multicast_Listener_Done } }			

Test Purpose			
Identifier:	**TP_TRA_3111_01**		
Summary:	Test dropping of Router Solicitation messages		
References:	RQ_003_3111		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3111_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Router_Solicitation } **then** { **IUT discards** ICMPv6_Router_Solicitation } }			

Test Purpose			
Identifier:	**TP_TRA_3112_01**		
Summary:	Test dropping of Router Advertisement messages		
References:	RQ_003_3112		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3112_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Router_Advertisement } **then** { **IUT discards** ICMPv6_Router_Advertisement } }			

Test Purpose			
Identifier:	**TP_TRA_3113_01**		
Summary:	Test dropping of Neighbor Solicitation messages		
References:	RQ_003_3113		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3113_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Neighbor_Solicitation } **then** { **IUT discards** ICMPv6_Neighbor_Solicitation } }			

Test Purpose			
Identifier:	**TP_TRA_3114_01**		
Summary:	Test dropping of Neighbor Advertisement messages		
References:	RQ_003_3114		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3114_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Neighbor_Advertisement } **then** { **IUT discards** ICMPv6_Neighbor_Advertisement } }			

Test Purpose			
Identifier:	**TP_TRA_3115_01**		
Summary:	Test dropping of Redirect messages		
References:	RQ_003_3115		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3115_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Redirect } **then** { **IUT discards** ICMPv6_Redirect } }			

Test Purpose			
Identifier:	**TP_TRA_3116_01**		
Summary:	Test dropping of unknown ICMPv6 informational messages		
References:	RQ_003_3116		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3116_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Unknown_Informational } **then** { **IUT discards** ICMPv6_Unknown_Informational } }			

Test Purpose			
Identifier:	**TP_TRA_3118_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3118		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3118_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_no_route_to_destination } **then** { **IUT sends** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_host_unreachable } }			

Test Purpose			
Identifier:	**TP_TRA_3119_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3119		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3119_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_communication_with_destination_administratively_prohibited } **then** { **IUT sends** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_destination_host_administratively_prohibited } }			

Test Purpose			
Identifier:	**TP_TRA_3120_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3120		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3120_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_beyond_scope_of_source_address } **then** { **IUT sends** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_host_unreachable } }			

Test Purpose			
Identifier:	**TP_TRA_3121_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3121		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3121_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_address_unreachable } **then** { **IUT sends** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_host_unreachable } }			

Test Purpose			
Identifier:	**TP_TRA_3122_01**		
Summary:	Test translation of Destination Unreachable messages		
References:	RQ_003_3122		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3122_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Destination_Unreachable **containing** code **set to** ipv6_port_unreachable } **then** { **IUT sends** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_port_unreachable } }			

Test Purpose			
Identifier:	**TP_TRA_3123_01**		
Summary:	Test translation of Packet Too Big messages		
References:	RQ_003_3123		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3123_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Packet_Too_Big } **then** { **IUT sends** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_fragmentation_needed_and_DF_set } }			

Test Purpose			
Identifier:	**TP_TRA_3125_01**		
Summary:	Test translation of Time Exceeded messages		
References:	RQ_003_3125		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3125_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Time_Exceeded } **then** { **IUT sends** ICMPv4_Time_Exceeded } }			

Test Purpose			
Identifier:	**TP_TRA_3126_01**		
Summary:	Test translation of Parameter Problem messages		
References:	RQ_003_3126		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3126_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Parameter_Problem **containing** code **set to** ipv6_unrecognized_next_header_type_encountered } **then** { **IUT sends** ICMPv4_Destination_Unreachable **containing** code **set to** ipv4_protocol_unreachable } }			

Test Purpose			
Identifier:	**TP_TRA_3127_01**		
Summary:	Test translation of Parameter Problem messages		
References:	RQ_003_3127		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3127_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Parameter_Problem **containing** code **set to** ipv6_erroneous_header_field_encountered } **then** { **IUT sends** ICMPv4_Parameter_Problem **containing** code **set to** 0 } }			

Test Purpose			
Identifier:	**TP_TRA_3129_01**		
Summary:	Test dropping of unknown ICMPv6 error messages		
References:	RQ_003_3129		
IUT Role	IPtranslator	**Test Case:**	TC_TRA_3129_01
with { **IUT** ready **to** translate IPv6Packet } **ensure that** { **when** { **IUT receives** ICMPv6_Unknown_Error } **then** { **IUT discards** ICMPv6_Unknown_Error } }			

A.3 IPv6 Transitioning - RFC 3056

A.3.1 Node Tests

A.3.1.1 Test IPv6 Prefix Allocation

Test Purpose			
Identifier:	**TP_TRA_0001_01**		
Summary:	Test 6to4 address validation		
References:	RQ_003_0001, RQ_003_0002, RQ_003_0003, RQ_003_0004		
IUT Role	6to4-Node	**Test Case:**	TC_TRA_0001_01

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address' }
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT** 'IPv6 address prefix'
containing 'format prefix'
set to 001
containing 'TLA value'
set to '0x0002'
containing 'NLA value'
set to 'Global IPv4 address i.e V4ADDR'
containing 'Prefix Length'
set to 48
}
}

A.3.1.2 Encapsulation in IPv4

A.3.1.2.1 Encapsulation of an IPv6Packet in an IPv4Packet

Test Purpose			
Identifier:	**TP_TRA_0009_01**		
Summary:	Test 6to4 router communication with other 6to4 router		
References:	RQ_003_0009, RQ_003_0010, RQ_003_0011, RQ_003_0013, RQ_003_0014		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0009_01

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet'
and IUT configured '2002::/16 on-link route has nexthop address of 6to4 router'}
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing protocol
set to 41
and containing ipv4_src_addr
set to 'V4ADDR field of source IPv6 address'
and containing ipv4_dst_addr
set to 'V4ADDR field of destination IPv6 address'
and containing IPv6Packet
containing ipv6_src_addr
set to '2002:V4ADDR:: source 6to4 host'
containing ipv6_dst_addr
set to '2002:V4ADDR:: destination 6to4 host'
}
}

Test Purpose			
Identifier:	**TP_TRA_0009_02**		
Summary:	Test 6to4 router communication with 6to4 relay router		
References:	RQ_003_0009, RQ_003_0010, RQ_003_0011, RQ_003_0013, RQ_003_0014		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0009_02

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet'
and IUT configured 'default IPv6 route has nexthop address of 6to4 relay router'}
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing protocol
set to 41
and containing ipv4_src_addr
set to 'public IPv4 ADDR assigned to the router'
and containing ipv4_dst_addr
set to 'Anycast V4ADDR i.e 192.88.99.1 address'
and containing IPv6Packet
containing ipv6_src_addr
set to '2002:V4ADDR:: source 6to4 host'
containing ipv6_dst_addr
set to '2001::/16 native IPv6 address'
}
}

Test Purpose			
Identifier:	**TP_TRA_0012_01**		
Summary:	Test Dont fragment bit in an encapsulating IPv4 header		
References:	RQ_003_0012		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0012_01

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet'}
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing 'dont fragment bit'
set to 0
}
}

A.3.1.3 6to4 Site Communication

A.3.1.3.1 Unicast scenario

Test Purpose			
Identifier:	**TP_TRA_0027_01**		
Summary:	Test 6to4 router encapsulation of an IPv6 datagram in an IPv4 packet		
References:	RQ_003_0027, RQ_003_0028, RQ_003_0029		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0027_01

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet'
and IUT configured 'default IPv6 route has nexthop address of 6to4 relay router' }
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet
and IUT compares 'IPv6 destination address with 6to4 address'

```
      and 'IPv6 destination address with local site prefix'
       }
    then { IUT encapsulates IPv6Packet in IPv4Packet
      and IUT sends IPv4Packet
            containing protocol
               set to 41
          and containing ipv4_dst_addr
               set to 'V4ADDR field of IPv6 prefix'
       }
     }
```

Test Purpose			
Identifier:	**TP_TRA_0030_01**		
Summary:	Test 6to4 router decapsulation of an IPv6 datagram from an IPv4 packet		
References:	RQ_003_0030, RQ_003_0031, RQ_003_0032		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0030_01

```
with { IUT configured '6to4 pseudo-interface and V4ADDR is configured'
  and IUT configured '6to4 address'
  and IUT configured 'connection to global IPv4 internet'
  and IUT ready to receive IPv6Packet }
ensure that
   { when { IUT receives IPv4Packet
            containing protocol
               set to 41
       }
    then { IUT removes 'IPv4 header'
      and IUT submits IPv6Packet 'for local routing'
       }
     }
```

A.3.1.4 Security Consideration

A.3.1.4.1 Security consideration during Encapsulation of IPv6 packet in an IPv4 packet

Test Purpose			
Identifier:	**TP_TRA_0049_01**		
Summary:	Test 6to4 traffic validation by encapsulators		
References:	RQ_003_0049, RQ_003_0027, RQ_003_0028, RQ_003_0029		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0049_01

```
with { IUT configured '6to4 pseudo-interface and V4ADDR is configured'
  and IUT configured '6to4 address'
  and IUT configured 'connection to global IPv4 internet' }
ensure that
   { when { IUT ready to send IPv6Packet }
    then { IUT discards IPv6Packet
            containing ipv6_src_addr
               set to 'private internet address (RFC1918)'
       }
     }
```

Test Purpose			
Identifier:	**TP_TRA_0049_02**		
Summary:	Test 6to4 traffic validation by encapsulators		
References:	RQ_003_0049, RQ_003_0027, RQ_003_0028, RQ_003_0029		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0049_02

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet' }
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT discards** IPv6Packet
containing ipv6_dst_addr
set to 'V4ADDR field set to broadcast address'
}
}

Test Purpose			
Identifier:	**TP_TRA_0049_03**		
Summary:	Test 6to4 traffic validation by encapsulators		
References:	RQ_003_0049, RQ_003_0027, RQ_003_0028, RQ_003_0029		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0049_03

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet' }
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT discards** IPv6Packet
containing ipv6_dst_addr
set to 'V4ADDR field set to multicast address'
}
}

Test Purpose			
Identifier:	**TP_TRA_0049_04**		
Summary:	Test 6to4 traffic validation by encapsulators		
References:	RQ_003_0049, RQ_003_0027, RQ_003_0028, RQ_003_0029		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0049_04

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet' }
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT discards** IPv6Packet
containing ipv6_dst_addr
set to 'V4ADDR field set to loopback address'
}
}

Test Purpose			
Identifier:	**TP_TRA_0049_05**		
Summary:	Test 6to4 traffic validation by encapsulators		
References:	RQ_003_0049, RQ_003_0027, RQ_003_0028, RQ_003_0029		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0049_05
with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured' **and IUT** configured '6to4 address' **and IUT** configured 'connection to global IPv4 internet' } **ensure that** { **when** { **IUT** ready **to send** IPv6Packet } **then** { **IUT discards** IPv6Packet **containing** ipv6_dst_addr **set to** 'private internet address (RFC1918)' } }			

A.3.1.4.2 Security consideration during Decapsulation of IPv6 packet from IPv4 packet

Test Purpose			
Identifier:	**TP_TRA_0050_01**		
Summary:	Test 6to4 traffic validation by decapsulators		
References:	RQ_003_0050, RQ_003_0030, RQ_003_0031, RQ_003_0032		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0050_01
with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured' **and IUT** configured '6to4 address' **and IUT** configured 'connection to global IPv4 internet' **and IUT** ready **to receive** IPv6Packet } **ensure that** { **when** { **IUT receives** IPv4Packet **containing** protocol **set to** 41 } **then** { **IUT** removes 'IPv4 header' **and IUT discards** IPv6Packet **containing** ipv6_src_addr **set to** 'V4ADDR field set to private internet address (RFC1918)' } }			

Test Purpose			
Identifier:	**TP_TRA_0050_02**		
Summary:	Test 6to4 traffic validation by decapsulators		
References:	RQ_003_0050, RQ_003_0030, RQ_003_0031, RQ_003_0032		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0050_02
with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured' **and IUT** configured '6to4 address' **and IUT** configured 'connection to global IPv4 internet' **and IUT** ready **to receive** IPv6Packet } **ensure that** { **when** { **IUT receives** IPv4Packet **containing** protocol **set to** 41 } **then** { **IUT** removes 'IPv4 header' **and IUT discards** IPv6Packet **containing** ipv6_dst_addr **set to** 'V4ADDR field set to broadcast address' } }			

Test Purpose			
Identifier:	**TP_TRA_0050_03**		
Summary:	Test 6to4 traffic validation by decapsulators		
References:	RQ_003_0050, RQ_003_0030, RQ_003_0031, RQ_003_0032		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0050_03

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet'
and IUT ready **to receive** IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv4Packet
containing protocol
set to 41 }
then { **IUT** removes 'IPv4 header'
and IUT discards IPv6Packet
containing ipv6_dst_addr
set to 'V4ADDR field set to multicast address'

}
}

Test Purpose			
Identifier:	**TP_TRA_0050_04**		
Summary:	Test 6to4 traffic validation by decapsulators		
References:	RQ_003_0050, RQ_003_0030, RQ_003_0031, RQ_003_0032		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0050_04

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet'
and IUT ready **to receive** IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv4Packet
containing protocol
set to 41 }
then { **IUT** removes 'IPv4 header'
and IUT discards IPv6Packet
containing ipv6_dst_addr
set to 'V4ADDR field set to loopback address'

}
}

Test Purpose			
Identifier:	**TP_TRA_0050_05**		
Summary:	Test 6to4 traffic validation by decapsulators		
References:	RQ_003_0050, RQ_003_0030, RQ_003_0031, RQ_003_0032		
IUT Role	6to4-Router	**Test Case:**	TC_TRA_0050_05

with { **IUT** configured '6to4 pseudo-interface and V4ADDR is configured'
and IUT configured '6to4 address'
and IUT configured 'connection to global IPv4 internet'
and IUT ready **to receive** IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv4Packet
containing protocol
set to 41 }
then { **IUT** removes 'IPv4 header'
and IUT discards IPv6Packet
containing ipv6_dst_addr
set to 'V4ADDR field set to private internet address (RFC1918)'

}
}

A.4 IPv6 Transitioning - RFC 4213

A.4.1 Nodes Tests

A.4.1.1 Resolver libraries

Void

A.4.1.2 Configured tunneling - encapsulation

A.4.1.2.1 Encapsulation of an IPv6Packet in an IPv4Packet

Test Purpose			
Identifier:	**TP_TRA_4008_01**		
Summary:	Test encapsulation of an IPv6 datagram in an IPv4 packet		
References:	RQ_003_4008, RQ_003_4025, RQ_003_4032, RQ_003_4033, RQ_003_4034, RQ_003_4035, RQ_003_4036, RQ_003_4037, RQ_003_4038, RQ_003_4039, RQ_003_4040, RQ_003_4041, RQ_003_4042, RQ_003_4043, RQ_003_4044,RQ_003_4045		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4008_01

with { **IUT** configured 'tunnel end points'and 'ttl value of 64' }
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing ip_version
set to 4
and containing ip_header_len
set to 5
and containing ip_tos
set to 0
and containing total_len
set to payload_len
and containing ip_identification
and containing ip_flags
set to 0
and containing frag_offset

```
            set to 0
          and containing ttl
            set to 64
          and containing protocol
            set to 41
          and containing hdr_chksum
            set to 'valid IPv4 header checksum'
          and containing ipv4_src_addr
            set to 'tunnel source address i.e address of encapsulator'
          and containing ipv4_dst_addr
            set to 'tunnel destination address i.e address of decapsulator'
      }
    }
```

Test Purpose			
Identifier:	**TP_TRA_4009_01**		
Summary:	Test report ICMPv4 errors as ICMPv6 errors to the source		
References:	RQ_003_4009, RQ_003_4010		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4009_01

```
with { IUT configured 'tunnel end points' and IUT encapsulates IPv6Packet in IPv4Packet }
ensure that
  { when {
      IUT receives 'ICMPv4 error message'}
    then {
      IUT sends 'ICMPv6 error message to the source'
      }
    }
```

Test Purpose			
Identifier:	**TP_TRA_4018_01**		
Summary:	Test Decapsulator reassembly IPv6 fragments as large as 1500 bytes		
References:	RQ_003_4018		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4018_01

```
with { IUT configured 'tunnel end points' and 'MTU of 1480'
  and IUT configured 'Static tunnel MTU'}
ensure that
  { when { IUT receives IPv4Packet 'tunneled packet'
      and IUT decapsulates IPv6Packet from IPv4Packet
        containing ip_flags
          set to 'more fragments'
        containing frag_offset
          set to 'fragment offset'
      }
    then { IUT reassembles inner_IPv6Packet 'as large as 1500 bytes'
      }
    }
```

Test Purpose			
Identifier:	**TP_TRA_4020_01**		
Summary:	Test Dont fragment bit in an encapsulating IPv4 header		
References:	RQ_003_4020		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4020_01

with { **IUT** configured 'tunnel end points'
and IUT configured 'Static tunnel MTU' }
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing 'dont fragment bit'
set to 0
}
}

Test Purpose			
Identifier:	**TP_TRA_4029_01**		
Summary:	Test Encapsulator report ICMPv6 Packet Too Big message using recorded path MTU		
References:	RQ_003_4029		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4029_01

with { **IUT** configured 'tunnel end points'
and IUT 'has performed IPv4 path MTU discovery and recorded MTU of 1300'
}
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet 'greater then the 1300'}
then { **IUT sends** 'ICMPv6 packet too big error message to the source'
}
}

Test Purpose			
Identifier:	**TP_TRA_4038_01**		
Summary:	Test IPv4 fragmentation with encapsulated IPv6 datagram		
References:	RQ_003_4038, RQ_003_4039, RQ_003_4010		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4038_01

with { **IUT** configured 'tunnel end points'
and IUT configured 'mtu of interface is less than 1280'
}
ensure that
{ **when** { **IUT** ready **to send** IPv6Packet 'bigger than MTU' }
then { **IUT** encapsulates IPv6Packet **in** IPv4Packet
and IUT sends IPv4Packet
containing ip_version
set to 4
and containing ip_header_len
set to 5
and containing ip_tos
set to 0
and containing total_len
set to payload_len
and containing ip_identification
and containing ip_flags
set to 'more fragments'
and containing frag_offset
set to 'fragment offset'
and containing ttl
set to 64
and containing protocol
set to 41
and containing hdr_chksum
set to 'valid IPv4 header checksum'

```
            and containing ipv4_src_addr
               set to 'tunnel source address i.e address of encapsulator'
            and containing ipv4_dst_addr
               set to 'tunnel destination address i.e address of decapsulator'
      }
    }
```

A.4.1.3 Configured tunneling - decapsulation

A.4.1.3.1 Decapsulation of IPv6Packet from IPv4Packet

Test Purpose			
Identifier:	**TP_TRA_4061_01**		
Summary:	Test removal of IPv4 header after decapsulation of an IPv6 datagram from IPv4 packet		
References:	RQ_003_4061		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4061_01

```
with { IUT configured 'tunnel end points'
  and IUT ready to receive IPv6Packet
    }
ensure that
    { when { IUT receives IPv4Packet
             containing protocol
                 set to a 41
        }
      then { IUT decapsulates inner_IPv6Packet from IPv4Packet
        and IUT demultiplexes inner_IPv6Packet to IPv6Layer
        }
      }
```

Test Purpose			
Identifier:	**TP_TRA_4063_01**		
Summary:	Test IUT decrements hop limit field of IPv6Packet before forwarding		
References:	RQ_003_4063, RQ_003_4064		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4063_01

```
with { IUT ready to receive IPv6Packet }
ensure that
    { when { IUT receives IPv4Packet
             containing protocol
                set to a 41
        }
      then { IUT removes 'IPv4 header'
        and IUT decrements 'hop limit field in IPv6Packet'
        and IUT forwards IPv6Packet
        }
      }
```

Test Purpose			
Identifier:	**TP_TRA_4065_01**		
Summary:	Test determination of IPv6 packet length after discarding encapsulating IPv4 header		
References:	RQ_003_4065, RQ_003_4066		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4065_01

with { **IUT** ready **to receive** IPv6Packet }
ensure that
{ **when** { **IUT receives** IPv4Packet
containing protocol
set to a 41
}
then { **IUT** decapsulates inner_IPv6Packet **from** IPv4Packet
and IUT demultiplexes inner_IPv6Packet **to** IPv6Layer
containing 'IPv6 packet length'
set to 'value extracted from IPv6 payload length field'
}
}

Test Purpose			
Identifier:	**TP_TRA_4047_01**		
Summary:	Test receiving IPv6Packet for joined multicast address		
References:	RQ_003_4047		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4047_01

with { **IUT** configured 'tunnel end points'
and IUT 'joined multicast address'
and IUT ready **to receive** IPv6Packet
}
ensure that
{ **when** { **IUT receives** IPv4Packet
containing ipv4_dst_addr
set to 'joined multicast address'
and containing protocol
set to a 41
and containing ip_identification
and containing ip_flags
set to a 'more fragments'
and containing frag_offset
set to a 'fragment offset'
and containing ipv4_src_addr
set to 'configured encapsulator address'
}
then { **IUT** reassembles IPv4Packet
and IUT decapsulates inner_IPv6Packet **from** IPv4Packet
and IUT demultiplex inner_IPv6Packet **to** IPv6Layer
}
}

A.4.1.3.2 Handling errorneous packet while decapsulation

Test Purpose			
Identifier:	**TP_TRA_4048_01**		
Summary:	Test decapsulator verify the source address of received IPv4Packet		
References:	RQ_003_4048		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4048_01

with { **IUT** configured 'tunnel end points' }
ensure that
{ **when** { **IUT** ready **to receive** IPv4Packet with tunneled IPv6Packet }
then { **IUT discards** IPv4Packet with tunneled IPv6Packet
containing ipv4_src_addr
not set to 'configured encapsulator address'
and IUT not generates 'ICMPv4 message'
}
}

Test Purpose			
Identifier:	**TP_TRA_4048_02**		
Summary:	Test destination address of received IPv4Packet		
References:	RQ_003_4048		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4048_02

with { **IUT** configured 'tunnel end points' }
ensure that
{ **when** { **IUT** ready **to receive** IPv4Packet with tunneled IPv6Packet }
then { **IUT discards** IPv4Packet with tunneled IPv6Packet
containing ipv4_dst_addr
set to 'broadcast or directed broadcast address'
and IUT not generates 'ICMPv4 message'
}
}

Test Purpose			
Identifier:	**TP_TRA_4067_01**		
Summary:	Test IPv6 packets with an invalid IPv6 source address		
References:	RQ_003_4067		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4067_01

with { **IUT** configured 'tunnel end points' }
ensure that
{ **when** { **IUT receives** IPv4Packet
containing protocol
set to 41
}
then { **IUT** decapsulates inner_IPv6Packet **from** IPv4Packet
and IUT discards IPv6Packet
containing ipv6_src_addr
set to 'FF00::/8'
or containing ipv6_src_addr
set to '::1'
or containing ipv6_src_addr
set to '::/96'
or containing ipv6_src_addr
set to '::ffff:0:0/96'
}
}

Test Purpose			
Identifier:	**TP_TRA_4067_02**		
Summary:	Test IPv6 packets with unspecified IPv6 source address		
References:	RQ_003_4067		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4067_02
with { **IUT** configured 'tunnel end points' } **ensure that** { **when** { **IUT receives** IPv4Packet **containing** protocol **set to** 41 } **then** { **IUT** decapsulates inner_IPv6Packet **from** IPv4Packet **and IUT accepts** IPv6Packet **containing** ipv6_src_addr **set to** '::/128' } }			

A.4.1.3.3 Link-local address on tunnel interface

Test Purpose			
Identifier:	**TP_TRA_4071_01**		
Summary:	Test forming link-local address on tunnel interface		
References:	RQ_003_4071, RQ_003_4073, RQ_003_4074		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4071_01
with { **IUT** ready **to** 'form IPv6 Link-local address' } **ensure that** { **when** { **IUT generates** 'Link-local address' } **then** { **IUT** 'forms Link-local address' **containing** 'universal or local bit set to zero' **and containing** 'interface identifier as IPv4 address prepended with zeros, appended to the prefix FE80::/64' } }			

A.4.1.4 Neighbor Discovery messages on tunnel interface

A.4.1.4.1 Processing Probes packets on tunnel interface

Test Purpose			
Identifier:	**TP_TRA_4075_01**		
Summary:	Test receiving Neighbor Unreachability Detection packets on tunnel interface		
References:	RQ_003_4075		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4075_01
with { **IUT** configured 'tunnel end points' **and IUT** ready **to receive** 'Neighbor discovery messages' } **ensure that** { **when** { **IUT receives** 'Neighbor Solicitation message in inner_IPv6Packet' **containing** 'Destination address' **set to** 'the IUT address' } **then** { **IUT sends** 'Neighbor Advertisement' } }			

Test Purpose			
Identifier:	**TP_TRA_4075_02**		
Summary:	Test Sending Neighbor Unreachability Detection Packets on tunnel interface		
References:	RQ_003_4075		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4075_02
with { **IUT** configured 'tunnel end points' } **ensure that** { **when** { **IUT** 'determines that the path between it and a unicast neighbor appears to be failing' **or IUT** 'determines that the path between it and a anycast neighbor appears to be failing' } **then** { **IUT sends** 'Neighbor solicitation message' **containing** 'destination address' **set to** 'Neighbor address' } }			

A.4.1.4.2 Processing Neighbor discovery packets on tunnel interface

Test Purpose			
Identifier:	**TP_TRA_4078_01**		
Summary:	Test processing of target link layer options in Neighbor Advertisement		
References:	RQ_003_4078		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4078_01
with { **IUT** configured 'tunnel end points' **and IUT** decapsulated inner_IPv6Packet **from** IPv4Packet } **ensure that** { **when** { **IUT receives** 'Neighbor Advertisement in inner_IPv6Packet' **containing** 'a Target Link-layer Address option' } **then** { **IUT ignores** 'Target Link-layer Address option in Neighbor Advertisement' **and IUT** 'does not change the link-layer address associated with address in the Target Address field' } }			

Test Purpose			
Identifier:	**TP_TRA_4078_02**		
Summary:	Test processing of source link layer options in Neighbor Solicitation		
References:	RQ_003_4078		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4078_02
with { **IUT** configured 'tunnel end points' **and IUT** decapsulated inner_IPv6Packet **from** IPv4Packet } **ensure that** { **when** { **IUT receives** 'Neighbor Solicitation in inner_IPv6Packet' **containing** 'a Source Link-layer Address option' } **then** { **IUT ignores** 'the contents of Source Link-layer Address option' } }			

Test Purpose			
Identifier:	**TP_TRA_4078_03**		
Summary:	Test processing of source link layer options in Router Advertisement		
References:	RQ_003_4078		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4078_03
with { **IUT** configured 'tunnel end points' **and IUT** decapsulated inner_IPv6Packet **from** IPv4Packet } **ensure that** { **when** { **IUT receives** 'Router Advertisement in inner_IPv6Packet' **containing** 'a Source Link-layer Address option' } **then** { **IUT ignores** 'the contents of Source Link-layer Address option' } }			

Test Purpose			
Identifier:	**TP_TRA_4078_04**		
Summary:	Test processing of source link layer options in Router Solicitation		
References:	RQ_003_4078		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4078_04
with { **IUT** configured 'tunnel end points' **and IUT** decapsulated inner_IPv6Packet **from** IPv4Packet } **ensure that** { **when** { **IUT receives** 'Router Solicitation in inner_IPv6Packet' **containing** 'a Source Link-layer Address option' } **then** { **IUT ignores** 'the contents of Source Link-layer Address option' } }			

A.4.1.4.3 Sending Neighbor Discovery packets on tunnel interface

Test Purpose			
Identifier:	**TP_TRA_4078_05**		
Summary:	Test Sending Neighbor Advertisement on tunnel interface		
References:	RQ_003_4078		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4078_05
with { **IUT** configured 'tunnel end points' **and IUT** ready **to send** 'Neighbor Advertisement' } **ensure that** { **when** { **IUT generates** 'Neighbor Advertisement' } **then** { **IUT sends** 'Neighbor Advertisement without Target Link-layer Address option' } }			

Test Purpose			
Identifier:	**TP_TRA_4078_06**		
Summary:	Test Sending Neighbor Solicitation on tunnel interface		
References:	RQ_003_4078		
IUT Role	RFC4213-Node	**Test Case:**	TC_TRA_4078_06
with { **IUT** configured 'tunnel end points' **and IUT** ready **to send** 'Neighbor Solicitation' } **ensure that** { **when** { **IUT generates** 'Neighbor Solicitation' } **then** { **IUT sends** 'Neighbor Solicitation without Source Link-layer Address option' } }			

History

Document history		
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