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Technical Specification

Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT): IPv6 Mobility; Interoperability Test Suite



Reference

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Foreword

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

Introduction

IPv6 is the next generation Internet. It gives vastly increased address space and true end-to-end communication. It has improved security and mobility features and allows "plug-and-play" connection to the network. The complexity of implementing IPv6 technology and the relative openness of IETF standards means that wide-ranging and effective testing of IPv6 products will be one of the key factors in ensuring the deployment, interoperability, security and reliability of the IPv6 infrastructure.

The present document specifies interoperability tests for IPv6 Mobility. The test suite results from and analysis of RFC 3775 and RFC 3776, the extraction of the requirements contained in these documents, and a selection of the requirements which could be tested by interoperability means.

The methodology and framework used to analyse the RFCs, to extract the requirements, write the Test Purposes, and the test descriptions is described in TS 102 351 [1]. The reader is strongly encouraged to read TS 102 351 [1] in order to make the best usage of the present document.

1 Scope

The present document specifies the interoperability Test Descriptions (TDs) with integrated Test Purposes (TPs) for the IPv6 Mobility standards. The TDs are presented in the tabular form specified in TS 102 424 (see Bibliography) and the TPs are defined using the TPLan notation also described in ES 202 553 (see Bibliography).

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- 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.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

- NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.
- [1] ETSI TS 102 351: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT)".
- [2] IETF RFC 3775: "Mobility Support in IPv6".
- [3] IETF RFC 3776: "Using IPsec to Protect Mobile IPv6 Signalling Between Mobile Nodes and Home Agents".
- [4] ETSI TS 102 559: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT): IPv6 Mobility; Requirements Catalogue".

3 Abbreviations

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

CoA	Care of address
CN	Correspondent Node
EUT	Equipment Under Test
HA	Home Agent
MN	Mobile Node
MTU	Maximum Transmission Unit
QE	Qualified Equipment
TD	Test Description
TP	Test Purpose
TPLan	Test Purpose Language
TSS	Test Suite Structure

4 IPv6 Mobility Interoperability Test Specification

4.1 Test Descriptions

Test Description presentation and concepts are explained in TS 102 351 [1].

Requirements referred to within the Test Description (example: RQ_001_1016) are all contained in TS 102 559 [4], the IPv6 Mobility "Requirements catalogue".

4.1.1 Index of test grouping

In the present document, tests have been grouped according to the original RFC clause numbers from which they were extracted.

In the table below, each close number (example: "5.1") refers to the clause number of the RFC from which the requirements covered by the Tests Descriptions were extracted.

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4.1.2 TDs extracted from RFC 3775 "Mobility Support in IPv6"

Test Description					
Identifier:	TD_MOB_1016_01	Test Purpose:	TP_MOB_10	016_01	
Summary:	'Home Agent supports tran	sport_mode_ESP protection of E	Binding Update m	nessages'	
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1016				
<pre>with { QE1 discor and QE1 conf } ensure that { when { Q and QE1 then { QE1 s }</pre>	inected igured to protect any E using t PE1 is connected to a for receives a packet from indicating that eends response directly	Binding_Update packet cransport_mode_ESP preign_network QE4 at a response is required } to QE4 }			
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is disconnected QE1 is configured to protect Binding Lindete packets using transport mode ESP					
Step	Test Sequence		<u></u>		dict
_	-			Pass	Fail
1	Connect QE1 to Foreign N	etwork 1			
2	Wait a few seconds				
3	Cause QE4 to send an Ech	no Request to the Home Address	of QE1		
4	Check: does QE4 receive a	an Echo Reply from QE1?		Yes	No
Observations:					

5.1	Binding Updates to Home Agents

Test Description						
Identifier:	TD_MOB_1017_01	Test Purpose:	TP_MOB_1	017_01		
Summary:	ummary: 'Mobile Node uses transport mode ESP to protect Binding Update messages'					
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3		
References:	RQ_001_1017					
<pre>with { QE1 configured to accept only a Binding_Update</pre>						
then { QE4 }	indicating that a respo indicates receipt of the response	nse is required } }				
Pre-test conditions:	The cleaning procedure has been run EUT connected to Home Network 1 QE1 configured to serve as Home Age	(see configuration co	omments)			
Step	Test Sec	quence		Ver	dict	
-				Pass	Fail	
1	Configure QE1 to accept only ESP pro	ptected binding upda	te messages			
2	Move EUT to foreign network 1					
3	3 Wait a few seconds to allow EUT to attempt to register with QE1					
4 Cause QE4 to send an Echo Request to the Home Address of EUT						
5	Check: does QE4 receive an Echo Re	ply from EUT?		Yes	No	
Observations:						

5.2.5 Return Routability Procedure

Test Description					
Identifier:	TD_MOB_1047_01	Test Purpose:	TP_MOB_1047_01		
Summary:	'Correspondent Node completes R	eturn Routability Proced	ure before accepting a Binding Update		
	from a mobile node'				
Roles:	Correspondent_Node	Configuration:	CF_MOB_04		
References:	RQ_001_1047				
with {	rom_home				
and QE4 regi	stered to QE1				
and QE4 conf	igured to perform route_optim	ization			
and EUT conf	igured to perform route_optim	ization			
and QE1 unre	achable from QE4 QE4 canno	t complete RRP			
}		_			
ensure that					
{ when { QE4 i	s requested to send a packet	to the EUT			
i	ndicating that a response is	required }			
then { EUT s	ends no response directly to	OE4 }			
}		~ ,			
, ,					
Pre-test conditions:	Not testable by interoperability mea	ans			
	Not possible for a QE to send a BL	J without completing the	RRP !		
Step	Test	Sequence	Verdict		
			Pass Fail		
Observations:					

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Authorizing Binding Management Messages

5.2.6

	Test De	scription	
Identifier:	TD_MOB_1068_01	Test Purpose:	TP_MOB_1068_01
Summary:	'Correspondent Node does not estab	lish any binding with a	lifetime greater than
	MAX_RR_BINDING_LIFETIME'		
Roles:	Correspondent_Node	Configuration:	CF_MOB_04
References:	RQ_001_1068		
with { EUT config	gured to perform route_optimizat	ion	
and QE4 cont	figured to perform route_optimiz	ation	
and QE4 away	/_from_home		
and QE4 reg	istered to QE1		
}			
ensure that			
{ when { I	EUT establishes a binding to QE4	}	
then { I	EUT and QE4 are able to communic	ate directly	
	within the binding_l	ifetime	
and I	EUT and QE4 are unable to commun	icate directly	
	after MAX_RR_BINDING	LIFETIME }	
}			
Due test sevelitienes		<i>c c</i>	
Pre-test conditions:	I he cleaning procedure has been run	n (see configuration co	omments)
	EUT is configured to perform Route C	Optimization	
	QE4 is configured to perform Route (Optimization	
	QE4 is connected to Foreign Network	< 1 and registered to it	s Home Agent QE1
	QE3 is configured with the same (hor	me) address as QE4	
	QE3 is disconnected from Home Net	work 1	

Step	Test Sequence	Ver	Verdict	
		Pass	Fail	
1	Cause EUT to send an Echo Request to the Home Address of QE4			
2	Check: does EUT receive an Echo Reply from QE4?	Yes	No	
3	Wait a few seconds (to let QE4 and EUT perform the Return Routability Procedure and establish Bindings)			
4	Disconnect QE1 from Home Network 1			
5	Cause EUT to send an Echo Request to the home address of QE4			
6	Check: does EUT receive an Echo Reply from QE4? (this ensures that EUT and QE4 have established a Binding)	Yes	No	
7	Connect QE3 to Home Network 1			
8	Disconnect QE4 from Foreign Network 1			
9	Cause EUT to send an Echo Request to the home address of QE4			
10	Check: does EUT receive an Echo Reply from QE4?	No	Yes	
11	Wait 420 seconds==MAX_RR_BINDING_LIFETIME (Binding between EUT and QE4 Bindings has expired)			
12	Cause EUT to send an Echo Request to the Home Address of QE4			
13 Check: does EUT receive an Echo Reply from QE3 (which is a clone of QE4)?		Yes	No	
Observations:	Once the Bindings have expired the Correspondent Node can no longer communicate directly with the Mobile Node and will send the Echo Request to the Home Address of the Mobile Node via the Home Agent. In our case, QE3 respond because it is configured with the same address as QE4			

	Test De	scription				
Identifier:	TD_MOB_1068_02	Test Purpose:	TP_MOB_10	68_02		
Summary:	'Mobile Node does not establish any	binding with a lifetime	greater than			
	MAX_RR_BINDING_LIFETIME'					
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3		
References:	RQ_001_1068					
NOT interop TESTABL	E					
==> there is no In	teroperability method to guaran	tee that a				
Mobile Node (on a	foreign network) will use its H	iome Address				
to send a new pack	et (instead of using its Care-o	i-Address).				
with { EUT conf	igured to perform route optimiz	ation				
and EUT away						
and EUT regi	stered to QE1					
and QE4 conf	igured to perform route_optimiz	ation				
}						
ensure that						
{ when { E	UT establishes a binding to QE4	}				
then { E	UT and QE4 are able to communic	ate directly				
	within the binding_1	itetime				
and E	of and QE4 are unable to commun	LICATE GIRECTLY				
1	alter MAA_RR_BINDING	LITERITWE }				
J						
Pre-test conditions:	NOT TESTABLE BY INTEROPERAE	BILITY MEANS				
	There is no Interoperability method to guarantee that a Mobile Node (on a foreign network) will use					
its Home address to send a new packet (instead of using its Care-of-Address)						
Step	Test Se	equence		Verdict		
				Pass	Fail	
Observations:						

IPv6 Home Agents

8.4

Test Description					
Identifier:	TD_MOB_1803_01	Test Purpose:	TP_MOB_18	303_01	
Summary:	'Home Agent discards packets receiv	ed from a non registere	ed mobile node'		
Roles:	Home_Agent	Configuration:	CF_MOB_0	5	
References: RQ_001_1803					
<pre>References: RQ_001_1803 with { EUT disconnected from home_network 1 and QE2 configured to use the same IP_address as EUT and QE1 away_from_home and QE1 registered to QE2 and QE1 configured to perform route_optimization and QE4 configured to perform route_optimization and QE4 configured to perform route_optimization } ensure that { when { QE2 is disconnected from home_network and EUT is connected to home_network and QE1 is requested to send a packet to QE4</pre>					
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is disconnected EUT is disconnected QE2 serves as Home Agent on Home Network 1 with the same address as E EUT is connected to Foreign Network 1 and registered to its Home Agent QE QE1 is configured to perform Route Optimization QE4 is configured to perform Route Optimization			EUT E2		
Step	lest Se	quence		Pass	liCt Fail
1	Disconnect QE2			r a 3 3	1 011
2	Connect EUT to Home Network 1				
3	Cause QE1 to send an Echo Reques	t to QE4			
4	Check: does QE1 receive an Echo Re	eply?		No	Yes
Observations:	Ensure that QE1 use its Home Addre packet).	ss when pinging QE4 (Home Address (Option preser	nt in IPv6

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8.5 IPv6 Mobile Nodes

	Test De	scription			
Identifier:	TD_MOB_1810_01	Test Purpose:	TP_MOB_18	310_01	
Summary:	'MN is able to receive tunnelled multicast packets from HA'				
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1810				
with { EUT subsc	ribed to a global_multicast_gro	up			
and EUT awa	y_from_home				
and EUT reg	istered to QE1				
}					
ensure that					
{ when { QE3 i	s requested to send a packet				
	to the global_mult	icast_group }			
then { QE3 i	ndicates no receipt of the resp	onse }			
}					
Pre-test conditions:	The cleaning procedure has been rur	n (see configuration co	mments)		
	EUT is connected to Home Network	1			
	EUT has registered to multicast grou	p FF1E:1			
Step	Test Se	equence		Vero	dict
				Pass	Fail
1	Move EUT to Foreign Network 1				
2	Cause QE3 to send an Echo Reply to	o multicast address FF	1E::1		
3	Check: does QE3 receive an Echo R	eply?		Yes	No
Observations:					

Correspondent Node Operation

	٢	Test Description				
Identifier:	TD_MOB_1013_01	Test Purpose:	TP_MOB_10	013_01		
Summary:	'Home Agent supports the pro	Home Agent supports the protection of Binding Update message'				
Roles:	Home_Agent	Configuration:	CF_MOB_02	2		
References:	RQ_001_1013					
<pre>with { QE1 at_h and QE1 conf } ensure that { when { Q and Q then { QE4 i }</pre>	nome igured to protect any Bir DE1 moves to a foreign_net DE4 is requested to send a indicatir ndicates receipt of the r	nding_Update work a packet to QE1 ng that a response is req response }	uired }			
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is connected to Home Network 1 QE1 is configured to protect Binding Update messages					
Step		Test Sequence		Vere	dict	
				Pass	Fail	
1	Move QE1 to Foreign Networ	k 1				
2	Wait a few seconds (for QE1	to establish a binding with EU	T)			
3	Cause QE4 to send an Echo	Request to the home address	of QE1			
4	Check: does QE4 receive an	Echo Reply?		Yes	No	
Observations:	If EUT does not support prote	ction of Binding Update, then	it is unable to acc	cept the bindi	ing.	

	Test	Description				
Identifier:	TD_MOB_1013_02	Test Purpose:	TP_MOB_1	013_02		
Summary:	'Mobile Node supports the protect	Mobile Node supports the protection of Binding Update message'				
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3		
References:	RQ_001_1013					
<pre>with { EUT at_hor and QE1 cont } ensure that { when { I and Q then { QE4 : }</pre>	ne Figured to accept only a secur CUT moves to a foreign_networ DE4 is requested to send a pa indicating t Indicates receipt of the resp	red Binding_Update k cket to EUT hat a response is req onse }	wired }			
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is connected to home network 1 QE1 is configured to accept only protected Binding Update messages					
Step	Tes	t Sequence	0	Vero	dict	
		-		Pass	Fail	
1	Move EUT to Foreign Network 1					
2	Wait a few seconds (for EUT to es	stablish a binding with QE	1)			
3	Cause QE4 to send an Echo Req	uest to the home address	s of EUT			
4	Check: does QE4 receive an Ech	o Reply?		Yes	No	
Observations:						

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	Test Des	scription				
Identifier:	TD_MOB_1082_01	Test Purpose: TP_MO	B_1082_01			
Summary:	'Home Agent uses a Security Associa	'Home Agent uses a Security Association to protect integrity and authenticity of				
	Mobile_Prefix_Solicitations and Adve	Mobile_Prefix_Solicitations and Advertisements'				
Roles:	Home_Agent	Configuration: CF_MO	B_02			
References:	RQ_001_1014, RQ_001_1082, RQ_001_1607					
with { QE1 at_hom	ne					
and QE1 conf	igured to protect					
and OF1 conf	Mobile_Prefix_Solicitati	ons				
	Mobile Prefix Advertisem	ente				
and OE1 conf	figured to have a short prefix 1	ifetime(suggest 30s)				
}		(445)				
ensure that						
{ when {	{ when { QE1 moves to a foreign_network					
befor	re its prefix_lifetime expires					
befor	e QE4 sends a packet to QE1					
then (indicating that a respons	e is required }				
	QE4 Indicates receipt of the	response from QEI }				
Pre-test conditions:	The cleaning procedure has been run	(see configuration comments)				
	QE1 is connected to Foreign Network	and registered to its Home Ager	nt EUT			
	QE1 is configured to protect Mobile F	Prefix Solicitation messages				
	QE1 is configured to only accept protected Mobile Prefix Advertisement messages					
	FIT is configured to advertise a preferred prefix lifetime of 20 sec					
	EUT is configured to advertise a valid prefix lifetime of 30 sec					
Step	Step Test Sequence Verdict			dict		
			Pass	Fail		
1	Wait 30 sec so that initial lifetime of th	he home address of QE1 has expire	ed			
2	Cause QE4 to send an Echo Reques	t to the Home Address of QE1				
3	Check: does QE4 receive an Echo Ro	eply from QE1?	Yes	No		
Observations:		· ·	•			

	Test Des	cription			
Identifier:	TD_MOB_1082_02	Test Purpose:	TP_MOB_10)82_02	
Summary:	'Mobile Node uses a Security Associa Solicitations and Advertisements'	Mobile Node uses a Security Association to protect integrity and authenticity of Mobile Prefix Solicitations and Advertisements			
Roles:	Aobile_Node Configuration: CF_MOB_03				
References:	RQ_001_1014, RQ_001_1082, RQ_0	01_1663, RQ_001_1664			
<pre>with { EUT at_how and QE1 conf and QE1 conf and EUT conf } ensure that { when { befor befor then { }</pre>	Me igured to accept only secured Mobile_Prefix_Solicitati igured to protect Mobile_Prefix_ igured to have a short prefix_li EUT moves to a foreign_network the its prefix_lifetime expires the QE4 sends a packet to the EUT indicating that response if QE4 indicates receipt of the n	ions Advertisements Ifetime (suggest 30: c is required } response from the EUT	5)'		
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is connected to Foreign Network 1 and is registered to its Home Agent QE1 QE1 is configured to only accept protected Mobile Prefix Solicitation messages QE1 is configured to protect Mobile Prefix Advertisement messages QE1 is configured to advertise a preferred prefix lifetime of 20 sec QE1 is configured to advertise a valid prefix lifetime of 30 sec.					
Step	Test Sequence Verdict				lict
				Pass	Fail
1	Wait 30 sec so that EUT has send a N and received a Mobile Prefix Advertise	Nobile Prefix Solicitation r ement message	nessage		
2	Cause QE4 to send an Echo Request	to the Home Address of	EUT		
3	Check: does QE4 receive an Echo Re	ply from EUT?		Yes	No
Observations:					

9.3.1	
-------	--

Receiving Packets with Home Address Option

	Test Description				
Identifier:	TD_MOB_1412_01	Test Purpose:	TP_MOB_14	12_01	
Summary:	'Correspondent Node receives packe	Correspondent Node receives packets directly from the Mobile Node when a binding exists or			
	Mobile Node believes in its existence	<u>)'</u>			
Roles:	Correspondent_Node	Configuration:	CF_MOB_04	l .	
References:	RQ_001_1412				
<pre>with { QE4 away_f and QE4 regi and EUT conf and QE4 conf and QE4 havi } ensure that { when { EUT i j then { EUT i } }</pre>	From_home stered to QE1 Figured to perform route_optimiz Figured to perform route_optimiz and established a binding with F s requested to send a packet to andicating that a response is re- andicates receipt of the response	cation cation CUT 0 QE4 equired } se directly from QE	4 }		
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE4 is connected to Foreign Network 1 and is registered to its Home Agent QE1 EUT is configured to support route optimization QE4 is configured to support route optimization QE4 is configured to support route optimization QE4 has established a binding with EUT Step Test Sequence Verdict					dict
				Pass	Fail
1	Disconnect QE1 from Home Network	<1			
2	Cause QE4 to send an Echo Reques	st to EUT			
3	Check: does QE4 receive an Echo R	eply from EUT?		Yes	No
Observations:	Actually it would be sufficient to chec However I don't know yet how we she	k whether EUT actual ould test that.	ly receives the EC	HO request	from QE4.

	Test Des	cription		
Identifier:	TD_MOB_1413_01	Test Purpose:	TP_MOB_1413_01	
Summary:	Summary: Correspondent Node drops packets containing Home Address option (but no Binding Update			
	there is no corresponding Binding Cache entry'			
Roles:	Correspondent_Node,	Configuration:	CF_MOB_04	
	Correspondent_Node			
References:	RQ_001_1413, RQ_001_1413, RQ_0	01_1427		
with { EUT confi	gured to perform route_optimizat	ion		
and QE4 con	figured to perform route_optimiz	zation		
and QE4 awa	y_from_home			
and QE4 reg	istered to QE1			
and EUT hav	ing no Binding_Cache_entry for (2E4		
and QE4 hav	ing a Binding_Cache_entry for El	J'I'		
}				
when STIT r	eceives a packet directly from (NF 4		
	ndicating that a response is rec	nired }		
then { EUT s	ends no response to OE4 }	arrea j		
}	chab ho response to ger j			
,				
Pre-test conditions:	The cleaning procedure has been run	(see configuration comm	ents)	
	EUT configured to perform route optin	nization		
	QE3 configured to perform route optin	nization		
	QE4 configured to perform route optin	nization		
	QE3 is connected to Home Network 2			
	OF3 is configured to have the same a	ddress as FLIT		
	OF4 connected to Foreign Network 1	and registered to its Hom	e Agent OE1	
	OE4 bas established a binding with O			
	la⊑4 has established a binuing with Q	E3		

Test Description					
Identifier:	TD_MOB_1413_02	Test Purpose:	TP_MOB_1413_02		
Summary:	'Correspondent Node drops packets of	ontaining Home Address	option (but no Binding Update) and		
-	send a Binding Error message to the	Mobile Node, when there	is no corresponding Binding Cache		
	entry'				
Roles:	Correspondent_Node	Configuration:	CF_MOB_04		
References:	RQ_001_1413	·			
with { EUT confi	gured to perform route_optimization	tion			
and QE4 con	figured to perform route_optimi:	zation			
and QE4 awa	y_from_home				
and QE4 reg	istered to QE1				
and EUT hav	ing no Binding_Cache_entry for (QE4			
and QE4 hav	ing a Binding_Cache_entry for E	JT			
}					
ensure that					
{ when { EUT r	eceives a packet directly from (QE4			
i	indicating that a response is required }				
then { E	EUT sends no response to QE4				
before E	UT and QE4 are able to communication	ate }			
}					
Pre-test conditions:	NOT TESTABLE BY INTEROPERAB	II ITY MEAN			
	Mobile Node may ignore the Rinding Error from Correspondent Node				
Step	Test Se	quence	Verdict		
•		•	Pass Fail		
Observations:			· · ·		

Test Description					
D_MOB_1414_01	Test Purpose:	TP_MOB_1414_01			
hen using Route Optimization, a Co	rrespondent Node drops	any packet in which the Home			
dress option (but not Binding Updat	e) does not match the Ho	ome Address recorded in its Binding			
ache'					
prrespondent_Node,	Configuration:	CF_MOB_04			
prrespondent_Node					
2_001_1414, RQ_001_1414, RQ_00	01_1427				
ed to perform route_optimizati	on				
ured to perform route_optimiza	tion				
rom_home					
ered to QE1					
established a binding with EU	Т				
{ when { EUT receives a packet from QE4					
containing a Home_Address_Option					
not set to the Home_Address of QE4 }					
cards the packet }					
Dhand and a contraction of the c	Test Des _MOB_1414_01 hen using Route Optimization, a Co dress option (but not Binding Updat che' rrespondent_Node, rrespondent_Node 2_001_1414, RQ_001_1414, RQ_00 d to perform route_optimizati red to perform route_optimizati red to perform route_optimizati red to QE1 established a binding with EU cives a packet from QE4 aining a Home_Address_Option set to the Home_Address of QE ards the packet }	Test Description _MOB_1414_01 Test Purpose: nen using Route Optimization, a Correspondent Node drops a dress option (but not Binding Update) does not match the Hoche' does not match the Hoche' rrespondent_Node, Configuration: rrespondent_Node Configuration: 001_1414, RQ_001_1414, RQ_001_1427 d to perform route_optimization red to perform route_optimization om_home red to QE1 established a binding with EUT dives a packet from QE4 aining a Home_Address_Option set to the Home_Address of QE4 } ards the packet }			

Pre-test conditions:	The cleaning procedure has been run (see configuration comments)		
	EUT is configured to perform route optimization		
	QE4 is configured to perform route optimization		
	QE3 is configured to perform route optimization		
	QE5 is configured to perform route optimization		
	QE4 is connected to Foreign Network 1 and registered with QE1		
	QE4 has established a binding with EUT		
	QE5 is disconnected		
	QE5 is configured with the same link-layer Address as QE4		
	QE5 is configured with a Home Address which is not the same as QE4		
	QE5 is configured to be a Mobile Node to Home Network 1		
	QE5 is configured to register with its Home Agent QE1		
	QE3 is disconnected		
	QE3 is configured with the same addresses as EUT		
Step	Test Sequence	Vere	dict
		Pass	Fail
1	Disconnect EUT		
2	Disconnect QE4		
3	Reboot QE1 (mobility support only)		
4	Connect QE3 on Home Network 2		
5	Connect QE5 on Foreign Network 1		
6	Wait a few seconds (for QE5 to register with its Home Agent QE1)		
7	Cause QE3 to send an Echo Request to the Home Address of QE5		
8	Check: does QE3 receive an Echo Reply from QE5	Yes	No
9	Disconnect QE3 from Home Network 2		
10	Reconnect EUT to Home Network 2		
11	Cause QE5 to send an Echo Request to EUT		
12	Check: does QE5 receive an Echo Reply from EUT?	No	Yes
Observations:	Step 7 causes QE5 to establish a binding with QE3.		
	QE3 and QE5 share the same Care-Of Address, but do not have the same h	Home Addres	S.

	Т	est Description		
Identifier:	TD_MOB_1414_02	Test Purpose:	TP_MOB_1414_02	
Summary:	When using Route Optimization, a Correspondent Node drops any packet in which the Hom Address option (but not Binding Update) does not match the Home Address recorded in its I Cache and send a Binding Error mess			
Roles:	Correspondent_Node	Configuration:	CF_MOB_04	
References:	RQ_001_1414			
with { EUF config and QE4 config and QE4 away and QE4 havi and QE4 havi } ensure that { when { then { befor }	EUT receives a packet f: containing a Home_A not set to the Home EUT raceives a packet f: containing a Home_A not set to the Home EUT discards the packet	Imization ptimization with EUT rom QE4 ddress_Option _Address of QE4 } communicate }		
Pre-test conditions:	NOT TESTABLE BY INTERO			
	Mobile Node may ignore the B	Binding Error from Correspond	lent Node	
Step		lest Sequence	Verdict	
			Pass Fail	
Observations:				

Test Description				
Identifier:	TD_MOB_1415_01	Test Purpose:	TP_MOB_1415_01	
Summary:	'A Correspondent Node drops packets address recorded in the corresponding	s in which the Source Add	ress does not match the	care-of
Roles:	Correspondent Node.	Configuration:	CF MOB 04	
	Correspondent_Node	J		
References:	RQ_001_1415, RQ_001_1415, RQ_0	01_1427		
<pre>with { EUT config and QE4 conf and QE4 away and QE4 regi and QE4 havi } ensure that { when { EUT r</pre>	<pre>gured to perform route_optimizati figured to perform route_optimizati r_from_home stered to QE1 ing established a binding with EU receives a packet from QE4 containing a Home Address Option</pre>	on Ation T		
and c s then { EUT c }	containing a Home_Address_Option set to the Home_Address of QE4 containing a Source_Address not set to the Care_Of_Address of discards the packet }	E QE4 }		
Pre-test conditions:	The cleaning procedure has been run EUT is configured to perform route op QE3 is configured to perform route op QE4 is configured to perform route op QE5 is configured to perform route op QE4 is connected to Foreign Network QE4 has established a binding with EI QE5 is disconnected QE5 is configured to be a Mobile Node QE5 is configured to use QE1 as Hom QE5 is configured with the same Hom QE5 is configured with the same Hom QE5 is configured with a Link-Layer ac QE3 is disconnected QE3 is configured with the same addr	(see configuration commo timization timization timization 1 and registered with QE UT e to Home Network 1 he Agent he Address address as QE ddress which is not the sa esses as EUT	ents) 1 :4 ime as QE4	
Step	Test Se	quence	Ver	dict
			Pass	Fail
1	Disconnect EUT			
2	Disconnect QE4			
3	Reboot QE1 (restart mobility support)			
4	Connect QE3 on Home Network 2			
5	Connect QE5 on Foreign Network 1			
6	Wait a few seconds (for QE5 to registe	er with its Home Agent QE	E1)	
7	Cause QE3 to send an Echo Request	to the Home Address of (QE5	
8	Check: does QE3 receive an Echo Re	ply from QE5?	Yes	No
9	Disconnect QE3 from Home Network	2		
10	Connect EUT to Home Network 2			
11	Cause QE5 to send an Echo Request	to EUT		
12	Check: does QE5 receive an Echo Re	ply from EUT?	No	Yes
Observations:	Step 7 causes QE5 to establish a bind QE3 and QE5 share the Home Care-O	ding with QE3. Df Address, but have diffe	rent Care-Of addresses.	

	T	est Description					
Identifier:	TD_MOB_1415_02	Test Purpose:	TP_MOB_14	15_02			
Summary:	'A Correspondent Node drops address recorded in the corres the Mobile Node'	A Correspondent Node drops packets in which the Source Address does not match the care-of address recorded in the corresponding Binding Cache Entry and sends a Binding Error message to the Mobile Node'					
Roles:	Correspondent_Node	Configuration:	CF_MOB_04	1			
References:	RQ_001_1415						
<pre>with { EUT config and QE4 conf and QE4 away and QE4 regi and QE4 regi and QE4 havi } ensure that { when {</pre>	<pre>ured to perform route_opt: igured to perform route_op _from_home stered to QE1 ng established a binding w EUT receives a packet fr containing a Home_Ad set to the Home_Addr and containing a Source not set to the Care EUT discards the packet e QE4 and the EUT are able ************************************</pre>	<pre>imization ptimization with EUT com QE4 ddress_Option cess of QE4 _Address _Of_Address of QE4 } e communicate } ************************************</pre>	** * ** dress home address' } dent Node				
Sten		est Sequence		Vard	ict		
otep		est Sequence		Pass	Fail		
Observations:				1 435	1 011		

9.3.2 Sending Packets to a Mobile Node

	Test De	escription	
Identifier:	TD_MOB_1423_01	Test Purpose:	TP_MOB_1423_01
Summary:	'Correspondent Node sends packets	directly to Mobile Node w	hen a binding already exists'
Roles:	Correspondent_Node	Configuration:	CF_MOB_04
References:	RQ_001_1423		
<pre>with { QE4 away_1 and QE4 reg: and EUT cond and QE4 cond and QE4 cond and QE4 hav: and EUT hav: } ensure that { when { QE4 s } </pre>	from_home istered to QE1 figured to perform route_optimi figured to perform route_optimi ing established a binding with ing established a binding with sends a packet to the EUT indicating that a response is re-	zation zation EUT QE4 equired }	
then { QE4 : } Pre-test conditions:	The cleaning procedure has been ru QE4 is connected to Foreign Networ EUT is configured to support route o QE4 is configured to support route o QE4 has established a binding with	se directly from EUT } n (see configuration comm k 1 and is registered to its ptimization FLIT	ents) Home Agent QE1

Step	Test Sequence		Verdict	
		Pass	Fail	
1	Disconnect QE1 from Home Network 1			
2	Cause QE4 to send an Echo Request to EUT			
3	Check: does QE4 receive an Echo Reply from EUT?	Yes	No	
Observations:				

9.3.4 Receiving ICMP Error Messages

	Test Description		
Identifier:	TD MOB 1429 01 Test Purpose: TP MOB 1	429 01	
Summary:	Correspondent Node deletes a binding cache entry if it receives persistent	ICMP Destin	ation
-	Unreachable messages'		
Roles:	Correspondent_Node Configuration: CF_MOB_C)4	
References:	RQ_001_1429		
EUT=CN2 QE1=HA1 QE4=MN1 with { QE4 'awa and EUT 'hav	ay from home and registered to QE1' ving established a binding with QE4'		
ensure that { when { QE4 and QE4 and EUT then { EUT and EUT }	<pre>'returns home' 'is unable to update its binding with EUT' is requested to 'send packets to QE4' } 'is temporarily unable to communicate with QE4' 'is able to communicate again with QE4 before the end of the bi</pre>	nding lifet	ime' }
Pre-test conditions:	QE4 is connected to Foreign Network 1 and is registered to its Home Agent EUT and QE4 have established binding QE4 is configured not to ask Binding Acknowledgements The tester is aware of the lifetime of these bindings and of the remaining bir starts this test	QE1	when he
Step	Test Sequence	Vero	dict
•		Pass	Fail
1	Disconnect QE4 from Foreign Network 1		
2	Cause router R1 to disable its interface connected to Foreign Network 1		
3	Connect QE4 to Home Network 1		
4	Wait a few seconds to let QE4 perform the "return home" procedure. (a protocol analyzer can be used to ensure that the "return home" procedure is finished) Note that EUT will not receive Binding Update messages from QE4 (because R1 is disconnected from Foreign Network 1) and still thinks that QE4 is in Foreign Network 1		
5	Cause R1 to enable its interface connected to Foreign Network 1		
6	Cause EUT to send an Echo Request message to the Home Address of QE4 (the IPv6 destination address of the Echo Request sent should still be the former care-of-address of QE4 in Foreign Network 1)		
7	Check: does EUT receive an Echo Reply from QE4? (EUT will receive an ICMP "Destination Unreachable" message from router R3)	No	Yes
8	Cause EUT to continuously send Echo Request messages to the Home Address of QE4 (EUT will receive persistent ICMP "Destination Unreachable" messages from router R3)		
9	Check: after several unsuccessful Echo Request messages, does EUT receive Echo Replies from QE4?	Yes	No
10	Check: when EUT receives the first Echo Reply from QE4, have the previous EUT <> QE4 Bindings expired?	No	Yes

Observations:	NOTE 1:	If EUT received no Binding Update message when EUT returned home, and EUT
		manages to re-establish communication with QE4 before the expiration of the EUT <>
		QE4 bindings, then this implies that the ICMP Destination Unreachable messages caused
		EUT to delete these bindings and to use the Home Address of QE4 instead its previous
		care-of-address as IPv6 destination address.
	NOTE 2:	RFC 3775 [2] states in clause 9.3.4 that "persistent ICMP messages lead to the deletion
		of the Binding", yet there is no detail about the amount of ICMP error messages that will
		cause the deletion to occur.
		Hence this TD might lead to inconclusive verdicts.
	NOTE 3:	Step 2: beware of interface buffers, which can keep and then retransmit packets emitted
		before the interface is disabled! Do not unplug, but use "ifconfig" or equivalent.

9.3 Packet Processing

		Test Des	cription			
Identifier:		TD_MOB_1344_01	Test Purpose:	TP_MOB_13	344_01	
Summary:		'Correspondent Node discard received	d packets containing Typ	e 2 Routing H	leaders'	
Roles:		Correspondent_Node	Configuration:	CF_MOB_04	1	
References:		RQ_001_1344				
with { EN and and and } ensure that { when { when } then	UT discon QE4 conf QE4 conn QE4 regi QE4 havi t n { Q and E and Q and Q and Q and Q	nected igured to have the same link_loc ected to Home_Network 2 stered to QE1 ng established a binding with QF E4 is disconnected UT is connected to Home_Network E3 is requested to send a packet indicating that a response is QE3 sends packets containi Routing Headers Type 2 E5 is requested to send a packet indicating that a response is QE5 sends packets not cont Routing Headers Type 2 E3 indicates no receipt of the r E5 indicates receipt of the resp	cal_address as EUT 1 1 to the EUT 5 required ing 1 to the EUT 5 required } caining 5 response from the EUT 5 ponse from the EUT }			
Pre-test cond	ditions:	The cleaning procedure has been run EUT is disconnected QE4 is configured with the same link-I QE4 is connected to Home Network 2 QE4 has established a binding with Q	(see configuration comm ayer address as EUT and registered with its H E3	eents) ome Agent QI	Ξ1	
Step		Test Se	quence		Vero	lict
					Pass	Fail
1		Disconnect QE4				
2		Connect EUT to Home Network 2				
3		Cause QE3 to send an Echo Request	to EUT			
4		Check: does QE3 receive an Echo Re	ply from EUT?		No	Yes
5		Cause QE5 to send an Echo Request	to EUT			
6		Check: does QE5 receive an Echo Re	ply from EUT?		Yes	No
Observations:	•					

	Test Description		
Identifier:	TD MOB 1348 01 Test Purpose: TP MOB 1	1348 01	
Summary:	Correspondent Node is able to participate in Return Routability Procedure	'	
Roles:	Correspondent_Node Configuration: CF_MOB_(04	
References:	RQ_001_1050, RQ_001_1051, RQ_001_1348		
with { QE4 away_	from_home		
and OE4 reg	figured to perform route optimization		
and EUT con	figured to perform route optimization		
}			
ensure that			
{ when { EUT	is requested to send a packet to QE4		
then { FIIT	indicating that a response is required }		
}			
,			
Pre-test conditions:	The cleaning procedure has been run (see configuration comments)		
	QE4 is connected to Foreign Network 1 and is registered to its Home Agent	t QE1	
	QE4 is configured to perform route optimization		
	EUT is configured to perform route optimization		
Step	Test Sequence	ence Verdic	
		Pass	Fail
1	Cause QE4 so sent an Echo Request to EUT		
2	Check: does QE4 receive a reply from EUT?	Yes	No
3	Wait a few seconds to allow QE4 and EUT to perform Return Routability		
	Procedure and establish Bindings.		
4	Disconnect QE1, the Home Agent of QE4		
5	Cause EUT to send an Echo Request to the Home Address of QE4		
6	Check: does EUT receive an Echo Reply from QE4?	Yes	No
Observations:	Disconnecting the Home Agent QE1 guarantees that traffic will not go throu	igh if Route C	Optimization
	didn't succeed.		
	Cannot send the Echo Request from QE4 because nothing guarantees that	t QE4 would	use its
	Home Address.		

9.4.1 Receiving Home Test Init Messages

9.4.2 Receiving Care-of Test Init Messages

	Test Des	cription	
Identifier:	TD_MOB_1348_01	Test Purpose:	TP_MOB_1348_01
Summary:	'Correspondent Node is able to partici	pate in Return Routability	Procedure'
Roles:	Correspondent_Node	Configuration:	CF_MOB_04
References:	RQ_001_1050, RQ_001_1051, RQ_0	01_1348	
with {	From_home		
and QE4 regi	stered to QE1		
and QE4 conf	igured to perform route_optimiza	ation	
and EUT conf	igured to perform route_optimiza	ation	
}			
ensure that			
{ when { EUT i	s requested to send a packet to	QE4	
i	indicating that a response is req	quired }	
then { EUT i	indicates receipt of the response	e directly from QE4 }	
}			
Pre-test conditions:	The cleaning procedure has been run	(see configuration comme	ents)
	QE4 is connected to Foreign Network	1 and is registered to its I	Home Agent QE1
	QE4 is configured to perform route op	timization	-
	EUT is configured to perform route op	timization	

Step	Test Sequence	Vere	dict
		Pass	Fail
1	Cause QE4 so sent an Echo Request to EUT		
2	Check: does QE4 receive a reply from EUT?	Yes	No
3	Wait a few seconds to allow QE4 and EUT to perform Return Routability Procedure and establish Bindings		
4	Disconnect QE1, the Home Agent of QE4		
5	Cause EUT to send an Echo Request to the Home Address of QE4		
6	Check: does EUT receive an Echo Reply from QE4?	Yes	No
Observations:	Disconnecting the Home Agent QE1 guarantees that traffic will not go throug didn't succeed. Cannot send the Echo Request from QE4 because nothing guarantees that Home Address.	gh if Route Of QE4 would u	ptimization se its

9.4 Return Routability Procedure

	Test Des	cription			
Identifier:	TD_MOB_1348_01	Test Purpose:	TP_MOB_1	348_01	
Summary:	'Correspondent Node is able to partici	pate in Return Routability	Procedure'		
Roles:	Correspondent_Node	Configuration:	CF_MOB_0)4	
References:	RQ_001_1050, RQ_001_1051, RQ_0	01_1348			
with {	rom_home				
and QE4 regi	stered to QE1				
and QE4 conf	and QE4 configured to perform route_optimization				
	igured to periorm route_optimiza				
ensure that					
{ when { EUT i	s requested to send a packet to	QE4			
i	ndicating that a response is req	quired }			
then { EUT i	ndicates receipt of the response	e directly from QE4 }			
}					
Pre-test conditions:	The cleaning procedure has been run	(see configuration comme	ents)		
	OF4 is connected to Foreign Network	1 and is registered to its H	Home Agent	OF1	
	QE4 is configured to perform route op	timization	ionio / igoni	Q	
	EUT is configured to perform route op	timization			
Step	Test Se	quence		Vero	lict
- · · •				Pass	Fail
1	Cause QE4 so sent an Echo Request	to EUT			
2	Check: does QE4 receive a reply from	EUT?		Yes	No
3	Wait a few seconds to allow QE4 and	EUT to perform Return Re	outability		
	Procedure and establish Bindings				
4	Disconnect QE1, the Home Agent of (QE4			
5	Cause EUT to send an Echo Request	to the Home Address of C	QE4		
6	Check: does EUT receive an Echo Re	ply from QE4?		Yes	No
Observations:	Disconnecting the Home Agent QE1 g	uarantees that traffic will	not go throu	gh if Route Op	otimization
	didn't succeed.	-	-	- '	
	Cannot send the Echo Request from (QE4 because nothing gua	rantees that	QE4 would us	se its
	Home Address.				

Receiving Binding Updates

9.5.1

	Test Des	scription			
Identifier:	TD_MOB_1817_01	Test Purpose:	TP_MOB_18	817_01	
Summary:	'Correspondent Node registers the bi	nding when it receives	a BU from Mob	le Node'	
Roles:	Correspondent_Node	Configuration:	CF_MOB_04	ļ	
References:	RQ_001_1817				
with { QE4 away_irom_ and QE4 register and QE4 conf and EUT conf } ensure that { when { QE4 i } then { QE4 i }	nome red to QE1 Figured to perform route_optimiz Figured to perform route_optimiz s requested to send a packet di indicating that a r .ndicates receipt of the respons	ation ation rectly to EUT esponse is require e }	d		
Pre-test conditions:	The cleaning procedure has been rur QE4 is connected to Foreign Network QE4 is configured to perform Route C EUT is configured to perform Route C	a (see configuration co and registered to it Optimization Dotimization	omments) s Home Agent QE	1	
Step	Test Se	quence		Ver	dict
		-		Pass	Fail
1	Cause EUT to send an Echo Reques	t to the Home address	s of QE4		
2	Check: does EUT receive an Echo R	eply from QE4?		Yes	No
3	Disconnect QE1 from Home Network	1			
4	Cause EUT to send an Echo Reques	t to the Home Addres	s of QE4		
5	Check: does EUT receive an Echo R	eply from QE4?		Yes	No
Observations:					

	Test Description					
Identifier:	TD_MOB_1065_01	Test Purpose:	TP_MOB_10	065_01		
Summary:	'Correspondent Node sends a Binding	_Acknowledgement me	ssage upon re	ceipt of a Bi	nding	
	Update message containing A-Flag se	et to 1'				
Roles:	Correspondent_Node	Configuration:	CF_MOB_04	4		
References:	RQ_001_1065, RQ_001_1350					
with { QE4 away_f	rom_home					
and QE4 regi	stered to QE1					
and QE4 cont	and QE4 configured 'to request Binding_AckNowledgements from					
and OE4 conf	igured to perform route optimiza	tion				
and EUT conf	igured to perform route optimiza	tion				
}						
ensure that						
{ when { EUT r	eceives a packet from QE4					
	ndicating that a response is req	[uired }				
	ends the response directly to QE	.4 }				
J						
Pre-test conditions:	The cleaning procedure has been run	(see configuration com	ments)			
	QE4 is connected to Foreign Network	1 and has registered to	its Home Ager	nt QE1		
	QE4 configured to perform route optim	nization	U			
	EUT is configured to perform route op	timization				
	QE4 is configured to ask Corresponde	ent Node for Binding Acl	knowledgemen	t		
	QE4 and EUT have never communica	ted yet and don't know	each other (no	binding esta	blished, no	
	cache entries)	-	-	-		
Step	Test Se	quence		Ver	dict	
				Pass	Fail	
1	Cause EUT to send an Echo Request	to the Home Address o	f QE4			
2	Check: does EUT receive an Echo Re	ply from QE4?		Yes	No	
3	Wait a few seconds to allow QE4 and	EUT to perform Return	Routing			
	Procedure and establish Bindings.		-			
4	Disconnect QE1 from Home Network	1				
5	Cause EUT to sent an Echo Request	to the Home Address of	QE4			
6	Check: does EUT receive an Echo Re	ply from QE4?		Yes	No	

Observations:	NOTE 1:	Configuring QE4 to ask Binding Acknowledgement from Correspondent Nodes ensures
		that its Binding Update message will have the A-Flag set to 1.
		Disconnecting the Home Agent QE1 guarantees that traffic will not go through if Route
		Optimization didn't succeed.
	NOTE 2:	Cannot send the Echo Request from QE4 (as described in Tesp Purpose) because
		nothing guarantees that QE4 would use its Home Address.

9.5.2 Requests to Cache a Binding

	Test D	escription			
Identifier:	TD_MOB_1457_01	Test Purpose:	TP_MOB_14	457_01	
Summary:	'Correspondent Node creates a nev Update'	v entry in its binding ca	che when receivir	ng a valid Bin	ding
Roles:	Correspondent_Node	Configuration:	CF_MOB_04	4	
References:	RQ_001_1457				
<pre>with { QE4 away_f and QE4 regi and QE4 conf and EUT conf } ensure that { when { EUT r then { EUT s } }</pre>	<pre>rith { QE4 away_from_home and QE4 registered to QE1 and QE4 configured to perform route_optimization and EUT configured to perform route_optimization } ensure that { when { EUT receives a packet from QE4</pre>				
Pre-test conditions:	The cleaning procedure has been ru QE4 is connected to Foreign Netwo QE4 is configured to perform route EUT is configured to perform route	un (see configuration c ork 1 and registered to i optimization optimization	omments) ts Home Agent QE	E1	
Step	Test S	Sequence		Vero	dict
				Pass	Fail
1	Cause EUT to send an Echo Reque	est to the Home Addres	s of QE4		
2	Check: does EUT receive a reply fro	om QE4?		Yes	No
3	Wait a few seconds to allow QE4 an Procedure and establish Bindings	nd EUT to perform Retu	urn Routing		
4	Disconnect QE1, the Home Agent of	of QE4			
5	Cause EUT to send an Echo Reque	est to the Home Addres	s of QE4		
6	Check: does EUT receive a reply free	om QE4?		Yes	No
Observations:	NOTE 1: Disconnecting the Home Optimization didn't succe NOTE 2: Cannot send the Echo R nothing guarantees that	Agent QE1 guarantees eed. equest from QE4 (as d QE4 would use its Horr	s that traffic will no escribed in Tesp F ne Address.	t go through Purpose) beca	if Route ause

	Test Description					
Identifier	:	TD_MOB_1458_01	Test Purpose:	TP_MOB_1458_01		
Summary	/:	'Correspondent Node updates a bindi	ng cache entry on receipt	of a valid Binding Update'		
Roles:		Correspondent_Node	Configuration:	CF_MOB_04		
Referenc	es:	RQ_001_1458				
with {	QE4 away_f	rom_home				
	and QE4 regi	stered to QE1				
	and EUT havi	ng established a binding with QH	64			
}						
ensure	that					
{	when { Q	E4 moves to another foreign_netw	vork			
	and E	UT is requested to send a packet	to QE4			
		indicating that a response is	s required }			
	then { EUT i	ndicates receipt of the response	e directly from QE4 }			
}			- ,			
Pre-test	conditions:	The cleaning procedure has been run	(see configuration comm	ents)		
		QE4 is connected to Foreign Network	1 and registered to its Ho	ome Ágent QE1		
		EUT and QE4 have established bindir	nas	- 3		

	Test Description					
Identifier:	TD_MOB_1486_01	Test Purpose:	TP_MOE	_1486_01		
Summary:	'Correspondent Node deletes any Bin	ding Cache entry	after the expiration	on of the binding	g lifetime'	
Roles:	Correspondent_Node	Configuration:	CF_MOE	3_04		
References:	RQ_001_1461, RQ_001_1486					
<pre>with { EUT configured to perform route_optimization and QE4 configured to perform route_optimization and QE4 away_from_home and QE4 registered to QE1 } ensure that { when { EUT establishes a binding to QE4} then { EUT establishes a binding to QE4} then { EUT and QE4 are able to communicate directly</pre>						
Pre-test conditions:	The cleaning procedure has been run EUT is configured to perform Route C QE4 is configured to perform Route C QE4 is connected to Foreign Network EUT is configured to have a lifetime a	(see configuration Optimization Optimization 1 and registered t one minute	n comments) to QE1			
Step	Test Se	quence		Ve	rdict	
				Pass	Fail	
1	Cause EUT to send an Echo Reques	to the Home Add	ress of QE4			
2	Check: does EUT receive an Echo Re	eply from QE4?		Yes	No	
3	QE1 is disconnected from Home Netv	vork 1				
4	Cause QE4 to send an Echo Reques	to EUT				
5	Check: does QE4 receive an Echo Re	eply from EUT?		Yes	No	
6	Wait a minute (to let the binding betw	een QE4 and EUT	expire)			
7	Cause QE4 to send an Echo Reques	t to EUT				
8	Check: does QE4 receive an Echo Re	eply from EUT?		No	Yes	
Observations:	Ensure that QE4 use its Home Addre packet).	ss when pinging E	UT (Home Addre	ss Option prese	ent in IPv6	

	Test De	scription			
Identifier:	TD_MOB_1465_01	Test Purpose:	TP_MOB_1465_01		
Summary:	Correspondent Node deletes any existing related bindings on receipt of a Binding Update				
_	requesting to delete a binding				
Roles:	Correspondent_Node, Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1465, RQ_001_1465, RQ_	001_1466, RQ_001_1	470		
with { EUT away_f	rom_home				
and EUT conf	igured to perform route_optimiz	zation			
and QE4 conf	igured to perform route_optimiz	zation			
and QE4 havi	ng established a binding with F	UT			
}					
ensure that					
{ when { EUT r	returns home }				
then { QE4 a	and the EUT are able to communic	cate with EUT }			
}		-			
-					
Pre-test conditions:	The cleaning procedure has been run	n (see configuration co	omments)		
	EUT is connected to Foreign Network 1 and registered to its Home Agent QE1				
	EUT is configured to perform route o	ptimization	0		
	OE4 is configured to perform route of	ntimization			
	OE4 has astablished a hinding to El				
	UC4 has established a binding to EU	1			

9.5.4 Sending Binding Acknowledgements

	Test Description					
Identifier:	TD_MOB_1065_01 T	est Purpose:	TP_MOB_10	065_01		
Summary:	'Correspondent Node sends a Binding_/	Acknowledgement mess	age upon re	ceipt of a Bin	ding	
	Update message containing A-Flag set	to 1'				
Roles:	Correspondent_Node C	Configuration:	CF_MOB_04	1		
References:	RQ_001_1065, RQ_001_1350					
with { QE4 away_f	rom_home					
and QE4 regi	stered to QE1	lodgomonta from				
and QE4 Cont	correspondent nodes!	reagements from				
and QE4 conf	igured to perform route_optimizat	ion				
and EUT conf	and EUT configured to perform route_optimization					
}	}					
ensure that	and the a market from OFA					
	ndicating that a response is requ	ired }				
then { EUT s	sends the response directly to QE4	}				
}		,				
Pre-test conditions:	The cleaning procedure has been run (s	see configuration comme	ents)			
	QE4 is connected to Foreign Network 1	and has registered to its	Home Agen	it QE1		
	QE4 configured to perform route optimiz	zation				
	EUT is configured to perform route optin	mization				
	QE4 is configured to ask Correspondent	it Node for Binding Ackno	owledgement	[hinding optob	liched no	
	C24 and EOT have never communicate	eu yet and don't know ea	ch other (no	binding estat	nisneu, no	
Sten	Tost Sou	uence		Verd	lict	
Step		uence		Pass	Fail	
1	Cause EUT to send an Echo Request to	o the Home Address of C	2E4	1 835	1 811	
2	Check: does EUT receive an Echo Repl	lv from QE4?	-	Yes	No	
3	Wait a few seconds to allow QE4 and E	UT to perform Return Ro	outing			
	Procedure and establish Bindings	·	0			
4	Disconnect QE1 from Home Network 1					
5	Cause EUT to sent an Echo Request to	the Home Address of Q	E4			
6	Check: does EUT receive an Echo Repl	ly from QE4?		Yes	No	
Observations:	NOTE 1: Configuring QE4 to ask Bindi	ing Acknowledgement fr	om Correspo	ndent Nodes	ensures	
	that its Binding Update message will have the A-Flag set to 1.					
	Disconnecting the Home Agent QE1 guarantees that traffic will not go through if Route					
	Optimization didn't succeed.					
	NOTE 2: Cannot send the Echo Reque	est from QE4 (as describ	ed in Tesp F	urpose) beca	ause	
	nothing guarantees that QE4	would use its Home Ad	dress.			

9.5.5 Sending Binding Refresh Requests

Test Description					
Identifier:	TD_MOB_1483_01	Test Purpose:	TP_MOB_14	183_01	
Summary:	'Correspondent Node tries to refresh a	a binding cache entry before	ore it expires'		
Roles:	Correspondent_Node,	Configuration:	CF_MOB_04	1	
	Correspondent_Node				
References:	RQ_001_1483, RQ_001_1483				
with {	rom_home				
and QE4 regi	stered to QE1				
and EUT havi	ng established a binding with QF	54			
and EUT esta	blished 'in continuous unbounded	l communication with Q	E4'		
}					
ensure that					
{ when { QE4 s	fends a packet to the EUT				
a i	ndigating that a response is re-	nirod l			
then { OF4 i	ndicates receipt of the response	directly from the FI	m }		
	indicates receipt of the response	directly from the Bo	±)		
ſ					
Pre-test conditions:	The cleaning procedure has been run	(see configuration comme	ents)		
	QE4 is connected to Foreign Network	1 and registered to QE1	,		
	EUT having established a binding with	n QE4			
	EUT is configured to have a binding lit	fetime at one minute			
Step	Test Se	quence		Verd	lict
- · · · •				Pass	Fail
1	wait 45 seconds after the registration	between EUT and QE4			
2	Cause QE4 to send an series of Echo	Request during 30 secon	ds to EUT		
3	After one minute and 5 seconds, disco	onnect QE1 from Home N	etwork 1		
4	Check: are more one Echo Request o	f the series dropped?		No	Yes
Observations:					

		Test Description	
Identifier:	TD_MOB_1485_01	Test Purpose:	TP_MOB_1485_01
Summary:	Correspondent Node stops r Binding Update	etransmitting Binding Refresh	Requests messages when it receives a
Roles:	Correspondent_Node	Configuration:	CF_MOB_04
References:	RQ_001_1485	·	
* However we wrap ***********************************	this up, it is a conform '-from_home istered to QE1 ing established a binding CUT 'tries to refresh its CUT receives 'a message i the refresh is 'stops sending refresh re	ance test, not interop ************************************	* *****
Pre-test conditions:	NOT TESTABLE BY INTERO depending of the implementa	DPERABILITY MEAN ation to reduce the handover	
Step		Test Sequence	Verdict
			Pass Fail
Observations:			

Binding Cache Management (was: 9.6 Cache Replacement Policy)

	1	Test Description		
Identifier:	TD_MOB_1390_01	Test Purpose:	TP_MOB_1	390_01
Summary:	Correspondent Node maintai	ns a separate binding cache	for each of its un	icast routable addresses
Roles:	Correspondent_Node	Configuration:	CF_MOB_0	4
References:	RQ_001_1390			
<pre>with { EUT config and QE4 away and QE4 regi and EUT havi usi and QE1 disc } ensure that { when { EUT i { when { EUT i construction then { QE4 do } TP id : TP_MOB_14 summary : 'Correspon persiste RQ ref : RQ_001_14</pre>	ured to have 2 global_add r_from_home .stered to QE1 .ng established a binding .ng its first global_addre connected from the network .s requested to send a pace containing a source_addres .et to its second global_a loes not indicate receipt .29_01 .ndent Node deletes a bind .nt ICMP Destination Unrea .29	to QE4 ess c cket to QE4 address } of the packet } ling cache entry if it r achable messages'	eceives	
Role : Correspon config : CF_MOB_04 TD ref : TD_MOB_14 ***********************************	dent_Node 29_01 	the lack of clear guidanc the deletion of the * solution to test by IOP test suite.	**** e * * * ****	
with { QE4 aw and QE4 re and EUT ha } ensure that { when { and QE and EU then { and EU }	way_from_home gistered to QE1 wing established a bindir QE4 returns home 4 is unable to update its 9T is requested to send pa EUT 'is temporarily unabl 9T is able to communicate before the binding_lifet	ng with QE4 s binding to the EUT ackets to QE4 } Le to communicate with Q with QE4 time expires }	E4'	
Pre-test conditions:	NOT TESTABLE BY INTERC	PERABILITY MEANS		
	That relates to internal operat	tions		
Step		Test Sequence		Verdict
				Pass Fail
Observations:				

	Test Description						
Identifier	:			TD_MOB_1486_01	Test Purpose:	TP_MOB_1486_01	
Summary	/:			'Correspondent Node deletes any Bin	ding Cache entry	/ after the expiration of the binding lifetime'	
Roles:				Correspondent_Node	Configuration:	CF_MOB_04	
Reference	es:			RQ_001_1461, RQ_001_1486			
with {	EU	Т со	onfig	jured to perform route_optimizat:	ion		
	and	QE4	conf	igured to perform route_optimization	ation		
	and	QE4	away	_from_home			
	and	QE4	regi	stered to QE1			
}			-				
ensure	that						
{	when	{	EU	T establishes a binding to QE4}			
	then	{	EU	/T and QE4 are able to communicat	te directly		
		•		within the binding_li:	Eetime		
		ar	nd EU	JT and QE4 are unable to communi	cate directly		
				after the binding life	etime }		
}					,		
,							

Pre-test conditions:	The cleaning procedure has been run (see configuration comments)			
	EUT is configured to perform Route Optimization			
	QE4 is configured to perform Route Optimization			
	QE4 is connected to Foreign Network 1 and registered to QE1			
	EUT is configured to have a lifetime at one minute			
Step	Test Sequence	Ver	Verdict	
		Pass	Fail	
1	Cause EUT to send an Echo Request to the Home Address of QE4			
2	Check: does EUT receive an Echo Reply from QE4?	Yes	No	
3	QE1 is disconnected from Home Network 1			
4	Cause QE4 to send an Echo Request to EUT			
5	Check: does QE4 receive an Echo Reply from EUT?	Yes	No	
6	Wait a minute (to let the binding between QE4 and EUT expire)			
7	Cause QE4 to send an Echo Request to EUT			
8	Check: does QE4 receive an Echo Reply from EUT?	No	Yes	
Observations:	Ensure that QE4 use its Home Address when pinging EUT (Home Address	ss Option prese	nt in IPv6	
	packet)			

Home Agent Operation

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	Test De	scription			
Identifier:	TD_MOB_1807_01	Test Purpose:	TP_MOB_18	807_01	
Summary:	'If HA support the multicast group me which multicast data packets to forwa	embership control protoco ard via the tunnel to MN'	ols, HA must be	e capable to c	letermine
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1561, RQ_001_1807				
Config-HA with { QE1 con and QE1 sub and QE3 sub } ensure that { when { Q and Q then { Q ***********************************	nected to home_network oscribed to a global_multicast_g oscribed to another global_multi DE1 moves to a foreign_network DE1 registers to EUT } DE1 receives packets from its gl	group .cast_group .obal_multicast_group ***	}		
Pre-test conditions:	NOT TESTABLE BY INTEROPERAE You do not know if the Home Agent of this packets	BILITY MEANS do not forward the multica	ast packets or i	if the Mobile N	Node drops
Step	Test Se	equence		Vero	lict
				Pass	Fail
Observations:					

	Test Des	cription	
Identifier:	TD_MOB_1557_01	Test Purpose:	TP_MOB_1557_01
Summary:	'HA tunnels multicast packets with a g	lobal scope to the mobile	node'
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_02
References:	RQ_001_1372, RQ_001_1557, RQ_0	01_1557	
with {	cribed to a global_multicast_grou	ıp	
and QE1 awa	ay_from_home		
and QE1 reg	gistered to EUT		
}			
ensure that			
{ when { QE3 i	s requested to send a packet to	the global_multicast_	_group
	indicating that a re	esponse is required }	
then { QE3 i	indicates receipt of the response	e }	
}		-	
-			
Pre-test conditions:	The cleaning procedure has been run	(see configuration comm	ents)
	QE1 is connected to Home Network 1		,
	OF1 has registered to multicast group	FF1F··1	
	Ge i nas registered to multicast group		

Step	Test Sequence		dict
		Pass	Fail
1	Move QE1 to Foreign Network 1		
2	Cause QE3 to send an Echo Request to the multicast address FF1E::1		
3	Check: does QE3 receives an Echo Reply	Yes	No
4	Disconnect EUT		
5	Cause QE3 to send an Echo Request to the multicast address FF1E::1		
6	Check: does QE3 receives an Echo Reply	No	Yes
Observations:	FF1E::1 is a global scope, non reserved, multicast group.		

10.5

Dynamic Home Agent Address Discovery

	Test De	scription			
Identifier:	TD_MOB_1804_01	Test Purpose:	TP_MOB_18	304_01	
Summary:	'Home Agent is able to participate in	Dynamic Home Agen	t Address Discove	ery'	
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1368, RQ_001_1804				
<pre>with { QE1 at_home and QE1 not configured to have its Home_Agent_address available } ensure that { when { QE1 moves to a foreign_network</pre>					
Pre-test conditions:	The cleaning procedure has been rur QE1 is disconnected from Home Net QE1 is unaware of the address of its	n (see configuration co work 1 Home Agent	mments)		
Step	Test Se	equence		Ver	dict
-		•		Pass	Fail
1	Move QE1 to Foreign Network 1				
2	Wait a few seconds				
3	Cause QE4 to send an Echo Reques	t to the Home Addres	s of QE1		
4	Check: does QE4 receive an Echo R	eply from QE1?		Yes	No
Observations:					

10.6 Sending Prefix Information to the Mobile Node

	Test Description			
Identifier:	TD_MOB_1592_01	Test Purpose:	TP_MOB_1592_01	
Summary:	'HA schedules the delivery of the pre	fix information when a new	prefix is added to its home subnet	
_	interface'			
Roles:	Home_Agent	Configuration:	CF_MOB_02	
References:	RQ_001_1370, RQ_001_1592, RQ_	001_1805		
with {	rom_home			
and QE1 regi	stered to EUT			
}				
ensure that				
{ when {	EUT generates a new prefix t	to the home_address of	QE1	
befor	e (QE4 sends a packet to QE1			
	using the new home_addre	SS		
	and indicating that a respon	use is required) }		
then {	OE4 indicates receipt of a r	esponse from OE1 }		
}	2	<u></u> ,		
ſ				
Pre-test conditions:	The cleaning procedure has been ru	n (see configuration comm	ents)	
	QE1 connected to Foreign Network 1			
	QE1 registered to EUT			

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10.6.2 Scheduling Prefix Deliveries

	Test Des	scription			
Identifier:	TD_MOB_1812_01	Test Purpose:	TP_MOB_18	812_01	
Summary:	'HA deliveries new prefix information prefix changes'	when lifetime information	(valid or pref	erred lifetime	e) of the
Roles:	Home Agent	Configuration:	CF MOB 02	2	
References:	RQ 001 1812				
<pre>kererences: with { QE1 away_f and QE1 regi and EUT conf } ensure that { when { EUT i f then { QE1 a { u f then { QE1 a vu a -TP id : TP_MOB_16 summary : 'If the b RQ ref : RQ_001_16 RQ ref : RQ_001_16 ROle : Home_Ager config : CF_MOB_02 TD ref : TD_MOB_16 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX</pre>	<pre>IRQ_001_1812 from_home stered to EUT Figured to have a short prefix_1 Home_Network of QE1(s sor QE1 } und QE4 are able to communicate using the new prefix fifter the original prefix_lifeting fo2_01 ondings of MN expire before BU 02 ut 502_01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx</pre>	ifetime on the uggest 30s) prefix_lifetime me expires } then HA stops sending XXXXXXXXXXXXXXXXXXXXXX 	MPAs'		
<pre> with { QE1 away_from_home and QE1 registered to EUT } ensure that { when { QE1 'is disconnected' from 'the foreign network' and EUT 'indicates the binding of QE1 expired' } then { EUT sends 'no other messages to QE1' before 'new registration' } }</pre>					
Pre-test conditions:	The cleaning procedure has been rur QE1 connected to Foreign Network 1 QE1 registered to EUT	(see configuration comm	ents)		
Step	Test Se	quence		Verd	lict
				Pass	Fail
1	Configure EUT with new, higher, valid	d lifetime			
2	Wait for expiration of the original pref	x lifetime			
3	Cause QE4 to send an Echo Reques	t to QE1			
4	Check: does QE4 receive an Echo Re	eply		Yes	No
Observations:					

	Test Des	scription			
Identifier:	TD_MOB_1592_01	Test Purpose:	TP_MOB_15	592_01	
Summary:	'HA schedules the delivery of the pref interface'	fix information when a ne	w prefix is add	ed to its hom	ne subnet
Roles:	Home_Agent	Configuration:	7		
References:	RQ_001_1370, RQ_001_1592, RQ_0	001_1805			
<pre>with { QE1 away_f</pre>	From_home Lstered to EUT EUT generates a new prefix t re (QE4 sends a packet to QE1 using the new home_addre and indicating that a respon QE4 indicates receipt of a r	o the home_address of ss se is required) } esponse from QE1 }	E QE1		
Pre-test conditions:	The cleaning procedure has been rur QE1 connected to Foreign Network 1 QE1 registered to EUT	n (see configuration comr	nents)		
Step	Test Se	equence		Vero	dict
				Pass	Fail
1	Cause EUT to generate a new prefix	added on its home subne	et interface		
2	Wait for at least 3.5 seconds				
3	Check: does QE1 indicate a new hom	ne address?		Yes	No
Observations:	MIN_DELAY_BETWEEN_RAS (3,0 s	s) + MAX_RA_DELAY_T	ME(0,5 s) = 3	,5 s (cf. RFC	2561).

	Test De	escription		
Identifier:	TD_MOB_1600_01	Test Purpose:	TP_MOB_1600_01	
Summary:	'HA retransmits periodically unsolicit	ed Advertisement unti	il the receipt of a	
	Mobile_Prefix_Solicitation from MN'			
Roles:	Home_Agent	Configuration:	CF_MOB_02	
References:	RQ_001_1600, RQ_001_1813			
with { QE1 away_f	rom_home			
and QE1 regi	stered to EUT }			
ensure that	OF1 is discoprosted from the	foroign notwork		
befor	re EUT generates a new prefix t	o the home address	of OE1	
befor	ce OE1 is connected to the fore	ign network after i	1 minute	
befor	e QE4 sends a packet to QE1			
	using the new home_addre	SS		
	and indicating that a respon	se is required }		
then {	QE4 indicates receipt of a r	esponse from QE1 }		
} TP id : TP MOB 15	591 01			
summary : 'HA delig	vers new prefix information whe	n the state of the	flags	
changes	for the prefix of the MN regis	tered'		
RQ ref : RQ_001_15	591			
Role : Home_Ager	ıt			
config : CF_MOB_02				
TD ref : TD_MOB_15	91_01			
		····	¥¥	
X Not interoperabil	itv		X	
xxxxxxxxxxxxxxxxxxx	****	*****	 XX	
with { QE1 av	vay_from_home			
and QE1 reg	gistered to EUT			
}				
{ when { FUT generates 'a new state of the flags on the prefix of its home subnet interface' }				
then { OE1 indicates 'a new state on its home address' }				
}				
Pre-test conditions:	The cleaning procedure has been ru	in (see configuration c	comments)	
	QE1 is connected in Foreign Networ	[.] k 1		
	QE1 is registered to EUT			

Step	Step Test Sequence		dict
		Pass	Fail
1	Disconnect EUT		
2	Cause EUT to generate a new prefix added on its home subnet interface		
3	Wait for one minute		
4	Reconnect EUT to home network		
5	Check: does QE1 indicate a new home address?	Yes	No
Observations:	It is not clear to me why a delay of 'one' minute is suggested here.		

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	Test Des	scription			
Identifier:	TD_MOB_1603_01	Test Purpose:	TP_MOB_1	603_01	
Summary:	'HA transmits again unsolicited Mobile of the Mobile Node'	e_Prefix_Advertiseme	ent after the prole	ongation of th	e binding
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1603				
and QEI IS and QEI an } ensure that { when { befo befo then { QE1 }	QE1 is disconnected from the re the binding_lifetime expires is connected to another f and QE4 are able to communicate	hort binding_lifet (Suggest 30s) foreign_network between QE1 and th oreign_network } }	ime e EUT		
Pre-test conditions:	The cleaning procedure has been rur QE1 connected to Foreign Network 1 QE1 registered to EUT	(see configuration co	omments)		
Step	Test Se	quence		Vere	dict
-		-		Pass	Fail
1	Disconnect QE1				
2	Wait until QE1's binding to EUT expir	es			
3	Cause EUT to generate a new prefix	added on its home su	bnet interface		
4	connect QE1 to foreign network 2				
5	Check: does QE1 indicate a new hom	ne address?		Yes	No
Observations:					

10.6.3 Sending Advertisements

	Test Des	scription	
Identifier:	TD_MOB_1082_01	Test Purpose:	TP_MOB_1082_01
Summary:	'Home Agent uses a Security Associa	ation to protect integrity ar	nd authenticity of
	Mobile_Prefix_Solicitations and Adve	rtisements'	
Roles:	Home_Agent	Configuration:	CF_MOB_02
References:	RQ_001_1014, RQ_001_1082, RQ_0	001_1607	
with {	ne		
and QE1 conf	igured to protect		
	Mobile_Prefix_Solicitati	ons	
and QE1 conf	igured to accept only secured		
	Mobile_Prefix_Advertisem	ents destatus (manual 20	
and QEI Conf	igured to have a short prefix_1	ifetime (suggest 30	S)
f ensure that			
{ when {	OEl moves to a foreign networ	k	
befor	re its prefix lifetime expires		
befor	ce OE4 sends a packet to OE1		
	indicating that a respons	e is required }	
then {	QE4 indicates receipt of the	response from QE1 }	
}			
Pre-test conditions:	The cleaning procedure has been rur	n (see configuration comm	nents)
	QE1 is connected to Foreign Network	and registered to its H	ome Agent EUT
	QE1 is configured to protect Mobile I	Prefix Solicitation messag	es
	QE1 is configured to only accept prot	ected Mobile Prefix Adver	rtisement messages
	EUT is configured to advertise a prefe	erred prefix lifetime of 20	sec
	EUT is configured to advertise a valid	prefix lifetime of 30 sec	

Step	Test Sequence Verdict		dict
		Pass	Fail
1	Wait 30 sec so that initial lifetime of the home address of QE1 has expired		
2	Cause QE4 to send an Echo Request to the Home Address of QE1		
3	Check: does QE4 receive an Echo Reply from QE1?	Yes	No
Observations:			

10.6

Sending Prefix Information to the Mobile Node

	Test De	scription			
Identifier:	TD_MOB_1592_01 Test Purpose: TP_MOB_1592_01				
Summary:	'HA schedules the delivery of the pre	fix information when a	new prefix is add	ded to its hom	ne subnet
	interface'				
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1370, RQ_001_1592, RQ_	001_1805			
with { QE1 away_f and QE1 regi } ensure that { when { befor	From_home Istered to EUT EUT generates a new prefix t re (QE4 sends a packet to QE1 using the new home addre	o the home_address	of QE1		
and indicating that a response is required) } then { QE4 indicates receipt of a response from QE1 } }					
Pre-test conditions:	The cleaning procedure has been run QE1 connected to Foreign Network 1 QE1 registered to EUT	n (see configuration co	mments)		
Step	Test Sequence Verdict			lict	
				Pass	Fail
1	Cause EUT to generate a new prefix	added on its home sul	onet interface		
2	Wait for at least 3.5 seconds				
3	Check: does QE1 indicate a new hor	ne address?		Yes	No
Observations:	MIN_DELAY_BETWEEN_RAS (3,0 s	s) + MAX_RA_DELAY_	_TIME (0,5 s) = 3	5,5 s (cf. RFC	2561).

10.3.2 Primary Care-of Address De-Registration

Test Description					
	Test Des		TO MOD (FOR OF		
Identifier:	TD_MOB_1526_01 [Test Purpose:]TP_MOB_1526_01				
Summary:	Jummary: Home Agent rejects De-Registration Binding Update if no entry exists in its Binding Cache fo				
-	Mobile Node'				
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_05		
References:	RQ_001_1526, RQ_001_1526, RQ_0	01_1527, RQ_001_1535			
with { EUT discon	nected from Home_Network				
and QE2 conf	igured to have the same IP_addre	ess as EUT			
and QE1 conn	ected to a foreign_network				
and QE1 regi	stered to QE2				
}					
ensure that					
{ when { Q	{ when { QE2 is disconnected from Home_Network				
and E	and EUT is connected to Home Network				
and Q	and QE1 returns home }				
then { QE4 and QE1 are unable to communicate }					
}					
Pre-test conditions:	The cleaning procedure has been run	(see configuration comm	ents)		
	QE2 is configured to serve the Home	Network 1			
	QE2 and EUT are configured with the	same IP address			
	ELL is disconnected from Home Network 1				
	OF t is associated to Farsian Network	A and registered to its Lle			
QE1 is connected to Foreign Network 1 and registered to its Home Agent QE2					
	QE2 is connected to Home Network 1				

		Test Description			
Identifier:	TD_MOB_1528_01	Test Purpose:	TP_MOB_1	528_01	
Summary:	When accepting Care of A entry in its Binding Cache	Address de-registration Binding for the Mobile Node'	Update, Home Ag	ent deletes a	any existing
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1528, RQ_001_1	1529			
and QE1 regi and QE4 able and QE1 conf } ensure that { when { QE1 r then { QE4 a }	stered to EUT to communicate with Q igured not to perform : returns home } nd QE1 are able to com	E1 Route_Optimization municate directly }			
Pre-test conditions:	The cleaning procedure ha QE1 is configured not to po QE1 is connected to Forei	as been run (see configuration c erform route optimization gn Network 1 and registered to	omments) its Home Agent E	UT	
Step	Test Sequence		Verdict		
				Pass	Fail
1	Move QE1 to Home Netwo	ork 1			
2	Wait a few seconds (to let	QE1 deregister to EUT)			
3	Disconnected EUT from H	ome Network 1			
4	Cause QE4 to send an Ec QE1	ho Request directly to the Hom	e Address of		
5	Check: does QE4 receive	an Echo Reply directly from QE	1?	Yes	No
Observations:					

	Test	Description			
Identifier:	TD_MOB_1528_01	Test Purpose:	TP_MOB_1	528_01	
Summary:	When accepting Care of Address	de-registration Binding	Update, Home Ag	ent deletes	any existing
	entry in its Binding Cache for the	Mobile Node'			
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1528, RQ_001_1529				
with {	from_home				
and QE1 reg	istered to EUT				
and QE4 able	e to communicate with QE1				
and QE1 cont	figured not to perform Route_(Optimization			
}					
ensure that	coturns home l				
then { OF4	and OF1 are able to communicat	te directly }			
	and get are abre to communicat	ce directly j			
J					
Pre-test conditions:	The cleaning procedure has been	run (see configuration of	comments)		
	QE1 is configured not to perform r	route optimization	,		
	QE1 is connected to Foreign Net	work 1 and registered to	its Home Agent E	UT	
Step	Step Test Sequence Verd			erdict	
-		-		Pass	Fail
1	Move QE1 to Home Network 1				
2	Wait a few seconds (to let QE1 de	eregister to EUT)			
3	Disconnected EUT from Home Ne	etwork 1			
4	Cause QE4 to send an Echo Requ	uest directly to the Hom	e Address of		
	QE1	-			
5	Check: does QE4 receive an Echo	o Reply directly from QE	1?	Yes	No
Observations:					

		Test Description			
Identifier:	TD_MOB_1534_01	Test Purpose:	TP_MOB_15	534_01	
Summary:	'Home Agent stops interc Address De-Registration	epting packets for the mobile noc Binding Update'	le on acceptance	of the Prima	ary Care of
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1534				
and QE1 reg } ensure that { when { and then { QE4 } Pre-test conditions:	istered to EUT QE1 returns home EUT is disconnected fr and QE1 are able to co The cleaning procedure h	om the home_network } mmunicate } nas been run (see configuration co	omments)		
	QE1 is connected to Fore	eign Network 1 and registered to it	s Home Agent EU	T	
Step	Test Sequence			Verdict	
				Pass	Fail
1	Move QE1 to Home Netv	vork 1			
2	Wait a few seconds (to le	et QE1 register to EUT)			
3	EUT is disconnected from	n Home Network 1			
4	Cause QE4 to send an E	cho Request to the Home Addres	s of QE1		
5	Check: does QE4 receive	e an Echo Reply from QE1?		Yes	No
Observations:					•

10.3.1

Primary Care-of Address Registration

Test Description					
Identifier:	TD_MOB_1818_01	Test Purpose:	TP_MOB_18	318_01	
Summary:	'A Binding Update contains a Home A	ddress destination option.	1		
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1818				
<pre>with { QE1 at_home } ensure that { when { QE1 moves to a foreign_network</pre>					
Pre-test conditions:	Not testable by interoperability means	8			
Step	Step Test Sequence Verdi			lict	
				Pass	Fail
Observations:	It is not possible to send a Binding Up	date containing no Home	Address!		

Test Description						
Identifier:	TD_MOB_1825_01	Test Purpose:	TP_	_MOB_1825_01		
Summary:	When Home Agent processes a Bind	ing Update secured by IP	sec,	the contents of Home Address		
	Option is not checked'	-				
Roles:	Home_Agent	Configuration:	CF	_MOB_05		
References:	RQ_001_1825					
with { QE1 config	gured not to perform Route_Optim:	ization				
and QE1 away	/_from_home					
and QE1 regi	istered to EUT					
and EUT conf	figured to accept any secured Bir	nding_Update from QE1				
and QE1 conf	figured to send only a secured B	inding_Update to EUT				
}						
ensure that						
$\{ when \{ QE1 s \}$	sends a Binding_Update secured by	/ IPsec				
	containing a Home Address Option					
	not indicating its H	Home_Address				
}	-					
then { EUT a	accepts the packet }					
}	,					
,						
	Test Description					
--	--	----------------------	--------------------	-----------	---------	--
Identifier:	TD_MOB_1826_01	Test Purpose:	TP_MOB_18	326_01		
Summary:	'Home Agent updates the entry in its I	Binding Cache upon r	eceipt of a Bindir	g Update'		
Roles:	Home_Agent	Configuration:	CF_MOB_02	2		
References:	RQ_001_1826					
<pre>with { QE1 away_f and QE1 regi and QE1 conf } ensure that { when { QE1 m then { QE3 a } }</pre>	From_home stered to EUT Figured not to perform Route_Opt: noves to another foreign_network and QE1 are able to communicate	imization } }				
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is connected to Foreign Network 1 and registered to its Home Agent EUT QE1 is configured not to perform Route Optimization						
Step	Test Se	quence		Ver	Verdict	
-		-		Pass	Fail	
1	Move QE1 to Foreign Network 2			_		
2	Cause QE3 to send an Echo request	to the Home Address	of QE1			
3	Check: does QE3 receive an Echo Re	eply from QE1?		Yes	No	
Observations:						

	Test Description				
Identifier:	TD MOB 1494 01	Test Purpose:	TP MOB 1494 01		
Summary:	Home Agent returns a type "132" E	Binding Acknowledgmen	t upon receipt of a Binding Update which		
-	Home Address is not on link'	v v			
Roles:	Home_Agent	Configuration:	CF_MOB_02		
References:	RQ_001_1494		· · · · · · · · · · · · · · · · · · ·		
<pre>with { QE1 disconr and QE1 confi } ensure that { when { Q and E then { Q</pre>	ected from the home_network gured not to perform Route_Op QE1 is connected to a foreign_: UT receives a Binding_Update containing a Home_Address : QE4 and QE1 are unable to comm	timization network not on_link } unicate }			
Pre-test conditions:	NOT TESTABLE BY INTEROPERA	ABILITY MEAN which is not on link			
Step	Test	Sequence	Verdict		
Observations:			Pass Fail		
UNSCI VALIUITS.					

	Test Description				
Identifier:	TD_MOB_1496_01	Test Purpose:	TP_MOB_1496_01		
Summary:	'Correspondent Node sends a type "1	31" Binding Acknowledgr	ment when receiving a Home		
	Registration Binding Update		-		
Roles:	Correspondent_Node,	Configuration:	CF_MOB_04		
	Correspondent_Node, Mobile_Node	_			
References:	RQ_001_1496, RQ_001_1496	-	·		
with { EUT at_how	me				
and QE5 at_1	home				
and QE5 con:	figured 'to use EUT as Home Agent	t'			
}					
ensure that					
{ when { QE5 1	moves to a foreign_network }				
then { QE3 a	and QE5 are unable to communicate	e }			
}					
-					

Pre-test conditions:	The cleaning procedure has been run (see configuration comments) EUT is connected to Home Network 2 QE5 is connected to Home Network 2 QE5 is configured to use EUT as Home Agent		
Step	Test Sequence	Ver	dict
		Pass	Fail
1	Move QE5 to Foreign Network 2		
2	Cause QE3 to send an Echo Request to the Home Address of QE5		
3	Check: does QE3 receive an Echo Reply from QE5?	No	Yes
Observations:			

	Те	st Description			
Identifier:	TD_MOB_1497_01	Test Purpose:	TP_MOB_14	497_01	
Summary:	'Home Agent creates a new ent	try in its Binding Cache upo	n receipt of a Bin	ding Update	
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1497				
with {	e wred not to perform Route_O noves to a foreign_network s able to communicate with	ptimization } QE1 }			
Pre-test conditions:	The cleaning procedure has be QE1 is connected to Home Net	en run (see configuration co work 1	mments)		
	QE1 is configured not to perform	m Route Optimization			
Step	T T	est Sequence		Verdict	
_		-		Pass	Fail
1	Move QE1 to Foreign Network	1			
2	Wait a few seconds (to let QE1	register to EUT)			
3	Cause QE4 to send an Echo R	equest to the Home Addres	s of QE1		
4	Check: does QE4 receive an E	cho Reply from QE1?		Yes	No
Observations:					

	Test Des	scription	
Identifier:	TD_MOB_1500_01	Test Purpose:	TP_MOB_1500_01
Summary:	'Home Agent maintains a Binding Ca	che entry from receipt of	of a Binding Update until the Binding
-	Lifetime expires'		<u> </u>
Roles:	Home_Agent	Configuration:	CF_MOB_02
References:	RQ_001_1497, RQ_001_1500, RQ_0)01_1522	
with {	1e		
<pre>} ensure that { when { QE1 n then { QE4 a } </pre>	Noves to a foreign_network } Ind QE1 are able to communicate within the Binding_Lifet	ime }	
Pre-test conditions:	QE1 is connected to Home Network 1 QE1 is configured not to perform Rou EUT is configured to set the binding I QE3 is disconnected from Home Netw QE3 is configured with the same Ethe	(see configuration con te Optimization ifetime to 2 minutes work 1 ernet address as QE1	nments)

Step	Test Sequence	Vere	dict
		Pass	Fail
1	Move QE1 to Foreign Network 1		
2	Wait a few seconds (to let QE1 register with its Home Agent)		
3	Cause QE4 to send an Echo Request to QE1		
4	Check: does QE4 receive en Echo Reply from QE1	Yes	No
5	Disconnect QE1 from Foreign Network 1		
6	Wait a period a little less long than the Binding Lifetime		
7	Connected QE3 to Home Network 1		
8	Wait for the expiration of the binding lifetime		
9	Cause QE4 to send an Echo Request to QE1		
10	Check: does QE4 receive en Echo Reply from QE1?	No	Yes
Observations:	DAD occurs at step 7		

		Test Description			
Identifier:	TD_MOB_1501_01	Test Purpose:	TP_MOB_	1501_01	
Summary:	'Home Agent performs Du Acknowledgment'	plicate Address Detection on hor	ne link before s	ending a Bind	ing
Roles:	Home_Agent	Configuration:	CF_MOB_	02	
References:	RQ_001_1501, RQ_001_	1502, RQ_001_1503			
and QE3 disc and QE3 hav: } ensure that { when { (and (and (then { QE4 a }	connected from home_net ing the same home_addre QE1 is disconnected fro QE3 is connected to the QE1 is connected to a f and QE1 are unable to c	work ss as QE1 m the home_network home_network oreign_network } ommunicate }			
Pre-test conditions:	The cleaning procedure ha QE1 is connected to Home QE3 is manually configure	as been run (see configuration co e Network 1 ed with the same Home Address a	omments) as QE1		
Step		Test Sequence		Verdict	
				Pass	Fail
1	Move QE1 to Foreign Net	work 1			
2	Wait a few seconds (to let	QE1 register to EUT)			
3	Disconnect QE3 from Hon	ne Network 1			
4	Cause QE4 to send an Ec	ho Request to the Home Addres	s of QE1		
5	Check: does QE4 receive	an Echo Reply from QE1?		No	Yes
Observations:					

	Test Description				
Identifier:	TD_MOB_1503_01	Test Purpose:	TP_MOB_1503_01		
Summary:	'Home Agent returns a type "134" Bind	ding Acknowledgeme	ent when Duplicate Address Detection for		
	the Home Address / Link Local Addre	ess fails'			
Roles:	Home_Agent	Configuration:	CF_MOB_02		
References:	RQ_001_1503				
with { QE1 discor	nected from home_network				
and QE3 conn	nected to home_network				
and QE3 conf	igured to have the same link_loo	cal_address as QE1			
}					
ensure that					
{ when { QE1 i	s connected to a foreign_network	s }			
then { QE4 a	and QE1 are unable to communicate	e }			
}					
Pre-test conditions:	The cleaning procedure has been run	(see configuration co	omments)		
	QE1 is disconnected from Home Netv	vork 1			
	QE3 is connected on Home Network				
	QE3 is manually configured with the	same link-local addre	ess as QE1		

Step Test Sequence		Ve	rdict
		Pass	Fail
1	QE1 is connected to Foreign Network 1		
2	Cause QE4 to send an Echo Request to QE1		
3	Check: does QE4 receive an Echo Reply from QE1?	No	Yes
Observations:			

Test Description					
Identifier:	TD_MOB_1507_01	Test Purpose:	TP_MOB_1	507_01	
Summary:	'Home Agent removes binding when t	Home Agent removes binding when the associated prefix valid lifetime expires'			
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1507				
<pre>with { QE1 away_f and QE1 regi and QE1 conf } ensure that { when { the p then { QE4 a }</pre>	rom_home stered to the EUT igured not to perform Route_Opt prefix_lifetime expires at the E and QE1 are unable to communicate	imization UT } e }			
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is configured to accept only secured Mobile Prefix Solicitations. QE1 is configured to send unsecured Mobile Prefix Solicitations. QE1 is configured not to perform Route Optimization QE1 is connected to Foreign Network 1 and registered to its Home Agent R1 is configured to advertise a valid prefix lifetime of 1 minute					
Step	Test Se	quence		Vero	lict
				Pass	Fail
1	Wait a minute (to let the prefix A becc	ome invalid)			
2	Cause QE4 to send an Echo Request	t to QE1			
3	Check: does QE4 receive an Echo Re	eply from QE1?		No	Yes
Observations:					

Test Description					
Identifier:	TD_MOB_1510_01	Test Purpose:	TP_MOB_15	10_01	
Summary:	'Home Agent returns a Binding Ackn	owledgment in response t	o a Binding U	pdate'	
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_02	-	
References:	RQ_001_1510, RQ_001_1501, RQ_ RQ_001_2002, RQ_001_2013, RQ_	001_1510, RQ_001_1511 001_2029	l, RQ_001_15′	6, RQ_001	_1517,
with { QE1 at_home }					
ensure that					
{ when { QE1 m	oves to a foreign_network }				
then { QE4 a	nd the EUT are able to communic	cate }			
}					
Pre-test conditions:	The cleaning procedure has been ru	n (see configuration comn	nents)		
	QE1 is connected to Home Network	1			
Step	Test S	equence		Ver	dict
-		-		Pass	Fail
1	Move QE1 to Foreign Network 1				
2	Wait a few seconds (to let the QE1 re	egister with its Home Age	nt)		
3	Cause QE4 to send an Echo Reques	st to the Home Address o	f QE1		
4	Check: does QE4 receive an Echo R	eply from QE1?		Yes	No
Observations:					

	1	est Description			
Identifier:	TD_MOB_1500_01	Test Purpose:	TP_MOB_1500	_01	
Summary:	'Home Agent maintains a Bind	ding Cache entry from receip	t of a Binding Update	until the	Binding
	Lifetime expires'		-		-
Roles:	Home_Agent	Configuration:	CF_MOB_02		
References:	RQ_001_1497, RQ_001_150	0, RQ_001_1522			
<pre>with { QE1 at_hc and QE1 con } ensure that { when { QE1 then { QE1 then { QE4 } Pre-test conditions:</pre>	me figured not to perform Rou moves to a foreign_network and QE1 are able to commun- within the Binding The cleaning procedure has to QE1 is connected to Home Ni QE1 is configured not to perfor EUT is configured to set the to QE3 is disconnected from Ho QE3 is configured with the sa	tte_Optimization ; } ticate _Lifetime } peen run (see configuration c etwork 1 orm Route Optimization pinding lifetime to 2 minutes me Network 1 me Ethernet address as OE1	omments)		
Step	Test Sequence			Verdict	
•		•		Pass	Fail
1	Move QE1 to Foreign Networ	k 1			
2	Wait a few seconds (to let QE	1 register with its Home Age	nt)		
3	Cause QE4 to send an Echo	Request to QE1			
4	Check: does QE4 receive en	Echo Reply from QE1?		Yes	No
5	Disconnect QE1 from Foreign	Network 1			
6	Wait a period a little less long	than the Binding Lifetime			
7	Connected QE3 to Home Net	work 1			
8	Wait for the expiration of the t	binding lifetime			
9	Cause QE4 to send an Echo	Request to QE1			
10	Check: does QE4 receive en	Echo Reply from QE1?		No	Yes
Observations:	DAD occurs at step 7				

10.3 Processing Bindings

Test Description							
Identifier:	TD MOR 1266 01	Test Purpose:		266 01			
	ID_WOB_1300_01	nding Asknowledgement messes		<u>o Dinding Ll</u>	ndata		
Summary:	Home Agent returns a Bi	nding_Acknowledgement messag	e in response to	a Binding U	pdate		
	message			_			
Roles:	Home_Agent	Configuration:	CF_MOB_0	2			
References:	RQ_001_1366						
<pre>with { QE1 at_home } ensure that { when { QE1 moves to a foreign_network</pre>							
Pre-test conditions: The cleaning procedure has been run (see configuration comments)							
Step		Test Sequence		Ver	dict		
				Pass	Fail		
1	Move QE1 to foreign netw	vork 1					
2	Wait a few seconds						
3	Cause QE4 to send an Ec	cho Request to the Home Address	s of QE1				
4	Check: does QE4 receive	an Echo Reply from QE1?		Yes	No		
Observations:							

10.4.1	Intercepting Packets for a Mobile Node				
	Te	est Description			
Identifier:	TD_MOB_1536_01 Test Purpose: TP_MOB_1536_01				
Summary:	'HA intercepts packets for regis encapsulation'	stered mobile node on the hor	ne network and	uses reverse	e tunnel
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1364, RQ_001_1536	, RQ_001_1551, RQ_001_15	68		
and QE1 confi } ensure that { when { QE3 i then { QE3 i }	igured not to perform Route is requested to send a pack indicating tha indicates receipt of the re	e_Optimization cet to QE1 at a response is required esponse }	}		
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is connected to Foreign Network 1 and has registered to its Home Agent EUT QE1 is configured NOT to perform route optimization					
Step	Т	est Sequence		Ver	dict
				Pass	Fail
1	Cause QE3 to send an Echo R	equest to the Home Address	of QE1		
2	Check: does QE3 receive an E	cho Reply from QE1?		Yes	No
Observations:	Very Similar to TD_MOBILITY	_1547_01.			

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Test Description					
Identifier:	TD_MOB_1537_01	Test Purpose:	TP_MOB_1	537_01	
Summary:	'HA multicasts Neighbour Advertisen	nent in Home network in o	rder to interc	cept packets f	or mobile
	node'		-		
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1537, RQ_001_1537, RQ_	_001_1539, RQ_001_1540	, RQ_001_15	41, RQ_001_	_1542,
	RQ_001_1543, RQ_001_1544				
with { QEL at he and QEL has }	ome ving established communication t	CO QE3			
ensure that					
{ when {	QE1 moves to a foreign_network				
then { QE3	updates its Neighbor_Discovery_c	cache_entry			
1	for the link_local_a	address of QE1 }			
}					
	QE1 is connected to Home Network 1 QE3 has already sent packets to the home address of QE1 QE4 is configured with the same link-layer address as QE1 and with the Home Address of QE1 Configure R2 to advertise Prefix A instead of Prefix C				
Step	Test S	equence	Verdict		dict
				Pass	Fail
1	Move QE1 to Foreign Network 1				
2	Wait a few seconds (for QE1 to regis	ster with its Home Agent E	UT)		
3	Disconnect EUT				
4	Connect Home Network 1 and Home	e Network 2 together			
5	Cause QE3 to send an Echo Reques	st to the home address of	QE1		
6	Check: does EUT receive an Echo R	Reply?		No	Yes
Observations:	Explanation: If EUT behaves correctly (i.e. sends a NA) then QE3 will send the Echo Request to the link-layer address of EUT and will not receive any Echo Reply. If EUT behaves incorrectly (i.e. sends no NA) then QE3 will send the Echo Request to the link-layer address of QE1, which is equal to QE4's one and will receive any Echo Reply. HN1 and HN2 are connected together to avoid QE4 performing DAD and advertising itself NOTE: Go through steps 1 to 5 quickly enough to avoid neighbour cache expire on QE3				

	Test Des	cription			
Identifier:	TD_MOB_1538_01	Test Purpose:	TP_MOB_15	538_01	
Summary:	'HA multicast Neighbour Advertisemer	nt to intercept the packets	to the link_lo	ocal_address	of a
	registered mobile node'				
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1538, RQ_001_1538, RQ_0	01_1539, RQ_001_1540,	RQ_001_154	41, RQ_001_	1542,
	RQ_001_1543, RQ_001_1544				
with { QE1 at_hc	me ng the game Interfage ID for its	link logal addrogg			
and QE1 usi	and its	home address			
and QE3 hav	ring established communication				
to	the link_local_address of QE1				
}					
ensure that $\int when \int OE1 m$	over to a foreign network }				
then { OE3 u	pdates the Neighbor Discovery ca	che entry			
f	or the link_local_address of QE1	}			
}					
D		<i>/ / // // // // // // // // // // // //</i>			
Pre-test conditions:	The cleaning procedure has been run	(see configuration comm	ents)		
	QE1 IS connected to Home Network 1		ad ita hama a		
	QE1 uses the same intenace ID for bo	oth its link-local address a	nd its nome a	address	
	QE3 has already sent packets to the li				
	Configure P2 to advertise Prefix A inst				
Sten	Test Sec			Verd	lict
Otop		quente		Pass	Fail
1	Move QE1 to Foreign Network 1				
2	Wait a few seconds (for QE1 to registe	er with its Home Agent EL	JT)		
3	Disconnect EUT	· ·			
4	Connect Home Network 1 and Home I	Network 2 together			
5	Cause QE3 to send an Echo Request	to the link-local address of	of QE1		
6	Check: does EUT receive an Echo Re	ply?		No	Yes
Observations:	Explanation:				
	QE1 sends Binding Updates with the I	_ flag activated (same inte	erface ID for li	nk-local and	home
addresses).					
	If EUT behaves correctly (i.e. sends a	NA) then QE3 will send the	ne Echo Requ	uest to the lin	k-layer
	address of EUT and will not receive ar	ny Echo Reply.			
	If EUT behaves incorrectly (i.e. sends	no NA) then QE3 will sen	d the Echo R	equest to the	e link-layer
	address of QE1, which is equal to QE4	4's one and will receive ar	ny Echo Reply	y.	-
	IHN1 and HN2 are connected together	to avoid QE4 performing	DAD and adv	vertisina itself	f.

	Г	Test Description				
Identifier:	TD_MOB_1547_01	Test Purpose:	TP_MOB_15	547_01		
Summary:	'HA act as proxy for a register it'	'HA act as proxy for a registered mobile node and reply to any received Neighbour Solicitations fo				
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_02	2		
References:	RQ_001_1547, RQ_001_154	7, RQ_001_1548, RQ_001_	1549			
<pre>with { QE3 'is disconnected' and QE1 away_from_home and QE1 registered to EUT } ensure that { when { QE3 is connected to its home_network and QE3 is requested to send a packet to QE1 indicating that a response is required } then { QE3 indicates receipt of the response } }</pre>						
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE3 is disconnected QE1 is connected to Exercise Network 1 and registered to its Home Agent QE1					
Step		Test Sequence		Ver	dict	
				Pass	Fail	
1	Connect QE3 to Home Netwo	ork 1				
2	Cause QE3 to send an Echo	Request to the Home Addres	ss of QE1			
3	Check: does QE3 receive an	Echo Reply?		Yes	No	
Observations:	Very Similar to TD_MOBILITY	/_1536_01.			•	

Test Description							
Identifier:	TD_MOB_1536_01	Test Purpose:	TP_MOB_15	536_01			
Summary:	'HA intercepts packets for registered r	mobile node on the home	network and	uses reverse	e tunnel		
Roles:	Home_Agent	Configuration:	CF_MOB_02	2			
References:	RQ_001_1364, RQ_001_1536, RQ_0	01_1551, RQ_001_1568	•				
and QEl regis and QEl confi } ensure that { when { QE3 i then { QE3 i }	<pre>and QE1 registered to EUT and QE1 configured not to perform Route_Optimization } ensure that { when { QE3 is requested to send a packet to QE1 indicating that a response is required } then { QE3 indicates receipt of the response } }</pre>						
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is connected to Foreign Network 1 and has registered to its Home Agent EUT QE1 is configured NQT to perform route optimization							
Step	Test Se	quence		Ver	dict		
				Pass	Fail		
1	Cause QE3 to send an Echo Request	to the Home Address of	QE1				
2	Check: does QE3 receive an Echo Re	eply from QE1?		Yes	No		
Observations:	Very Similar to TD_MOBILITY_1547_	01.					

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Test Description						
Identifier:	TD_MOB_1552_01	TD_MOB_1552_01 Test Purpose: TP_MOB_1552_01				
Summary:	'HA does not tunnel packets to the lin	nk_local_address of mobi	le node'			
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_02			
References:	RQ_001_1552, RQ_001_1552, RQ_	_001_1553				
<pre>with { QE1 away_from_home and QE1 registered to EUT } ensure that { when { QE3 is requested to send a packet</pre>						
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is connected to Foreign Network 1 and registered to its Home Agent QE1					
Step	Test Sequence			Ver	dict	
				Pass	Fail	
1	Cause QE3 to send an Echo Reply t	o the link-layer address of	QE1		1	
2	Check: does QE3 receive an Echo F	Reply?		No	Yes	
Observations:						

10.4.2

Processing Intercepted Packets

Test Description					
Identifier:	TD_MOB_1555_01	Test Purpose:	TP_MOB_1	555_01	
Summary:	'HA does not tunnel multicast packet	s with a scope smaller than	global to th	e mobile noo	de '
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1555, RQ_001_1556, RQ_	001_1555, RQ_001_1556			
with { QE1 subsc:	ribed to a link_local_multicast_	group			
and QE1 sub	scribed to a organization_local_	multicast_group			
and QE1 away	from_home				
and QE1 reg	istered to EUT				
}					
when {	DE3 is requested to send a packe	it.			
(to the link loca	l multicast group			
	indicating that	a response is required	l		
and Q	23 is requested to send a packet				
	to the organizat	ion_local_multicast_gr	roup		
	indicating that	a response is required	1}		
then { QE3	indicates no receipt of any resp	oonse }			
}					
Pre-test conditions:	The cleaning procedure has been ru	(see configuration comm	ents)		
	QE1 is connected to Foreign Network	< 1	0110)		
	OE1 has registered to multicast grou	n FF121			
	OE1 has registered to multicast grou	n FF18···1			
Sten	Test S			Vor	dict
Otep		equence		Pass	Fail
1	Cause OE3 to send an Echo Reques	t to the multicast address	FF12··1	1 433	T all
2	Chack: doos OE3 receive an Echo R	oply	1 121	No	Voc
2	Check. does QES leceive all Echo K	eply	FF101	INU	165
3	Cause QE3 to send an Echo Reques	a to the multicast address	FF 101	NI-	N
4	Check: does QE3 receive an Echo R	epiy?		INO	res
Observations:	FF12::1 is a link-local scope, non res	erved, multicast address			
	[FF18::1 is an organization-local scop	e, non reserved, multicast	address		

	Test Des	scription			
Identifier:	TD_MOB_1555_01	Test Purpose:	TP_MOB_15	55_01	
Summary:	'HA does not tunnel multicast packets	with a scope smaller thar	n global to the	e mobile node	e'
Roles:	Home_Agent, Home_Agent Configuration: CF_MOB_02				
References:	RQ_001_1555, RQ_001_1556, RQ_0	001_1555, RQ_001_1556			
with { QE1 subscr	ribed to a link_local_multicast_	group			
and QE1 subs	scribed to a organization_local_	multicast_group			
and QE1 away					
and QEI regi	stered to EUI				
ensure that					
{ when {	E3 is requested to send a packe	t			
	to the link_loca	l_multicast_group			
	indicating that	a response is required	l		
and QE	3 is requested to send a packet				
	to the organizat	lon_local_multicast_gr	l		
then { OE3 i	ndicates no receipt of any resp	onse }	L J		
}					
Pre-test conditions:	The cleaning procedure has been rur	(see configuration comm	ents)		
	QE1 is connected to Foreign Network	: 1			
	QE1 has registered to multicast group	o FF12::1			
	QE1 has registered to multicast group	o FF18::1			
Step		equence		Verd	lict
				Pass	Fail
1	Cause QE3 to send an Echo Reques	t to the multicast address	FF12::1		
2	Check: does QE3 receive an Echo Ro	eply?		No	Yes
3	Cause QE3 to send an Echo Reques	t to the multicast address	FF18::1		
4	Check: does QE3 receive an Echo Ro	eply?		No	Yes
Observations:	FF12::1 is a link-local scope, non rese	erved, multicast address.			
	FF18::1 is an organization-local scope	e, non reserved, multicast	address.		

	Test Description					
Identifier:	TD_MOB_1557_01	Test Purpose:	TP_MOB_	1557_01		
Summary:	'HA tunnels multicast packets with a	lobal scope to the mobile	node'			
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_	_02		
References:	RQ_001_1372, RQ_001_1557, RQ_0	001_1557				
with { QE1 subso	cribed to a global_multicast_gro	up				
and QE1 awa	ay_from_home					
and QE1 reg	gistered to EUT					
}						
when (OF3)	is requested to send a packet to	the global multicast	aroun			
	indicating that a r	esponse is required }	_group			
then { QE3 :	indicates receipt of the respons	e }				
}						
Pre-test conditions:	The cleaning procedure has been rur	(see configuration comm	ents)			
	QE1 is connected to Home Network '					
	QE1 has registered to multicast group	o FF1E::1		-		
Step	Test Sequence		Verdict			
				Pass	Fail	
1	Move QE1 to Foreign Network 1					
2	Cause QE3 to send an Echo Reques	t to the multicast address	FF1E::1			
3	Check: does QE3 receives an Echo F	Reply?		Yes	No	
4	Disconnect EUT					
5	Cause QE3 to send an Echo Reques	t to the multicast address	FF1E::1			
6	Check: does QE3 receives an Echo F	Reply?		No	Yes	
Observations:	FF1E::1 is a global scope, non reserv	ed, multicast group.				

10.4.3 Multicast Membership Control

	Test Description				
Identifier:	TD_MOB_1560_01	Test Purpose:	TP_MOB_15	560_01	
Summary:	'if multicast forwarding is not	supported, HA ignores multica	ast group member	ship control	messages'
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1560				
<pre>with { QE1 subscribed to a global_multicast_group and EUT unable to support multicast_data_packet_forwarding and QE1 away_from_home and QE1 registered to EUT } ensure that { when { QE3 is requested to send a packet</pre>					
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is connected to Foreign Network 1 QE1 has registered with its Home Agent EUT					
Step		Test Sequence		Ver	dict
_				Pass	Fail
1	Cause QE1 to register to mu	Iticast group FF1E::1			
2	Cause QE3 to send an Echo	Reply to multicast address FF	TE::1		
3	Check: does QE3 receive an	Echo Reply?		No	Yes
Observations:					

	Test De	escription	
Identifier:	TD_MOB_1807_01	Test Purpose:	TP_MOB_1807_01
Summary:	If HA support the multicast group me which multicast data packets to forw	embership control pro ard via the tunnel to N	tocols, HA must be capable to determine
Roles:	Home_Agent	Configuration:	CF_MOB_02
References:	RQ_001_1561, RQ_001_1807		
Config-HA			
<pre>with { QE1 con</pre>	nnected to home_network bscribed to a global_multicast_c bscribed to another global_mult: QE1 moves to a foreign_network QE1 registers to EUT } QE1 receives packets from its gi	group icast_group lobal_multicast_gr	pup }
Pre-test conditions:	NOT TESTABLE BY INTEROPERAL You do not know if the Home Agent this packets	BILITY MEANS do not forward the mu	lticast packets or if the Mobile Node drops
Step	Test S	equence	Verdict
			Pass Fail
Observations:			· · · · · ·

10.4.5 Handling ReverseTunnelled Packets

	Test Des	scription			
Identifier:	TD_MOB_1536_01	Test Purpose:	TP_MOB_15	536_01	
Summary:	'HA intercepts packets for registered r encapsulation'	mobile node on the home	network and	uses reverse	e tunnel
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1364, RQ_001_1536, RQ_0	01_1551, RQ_001_1568			
<pre>with { QE1 away_from_home and QE1 registered to EUT and QE1 configured not to perform Route_Optimization } ensure that { when { QE3 is requested to send a packet to QE1</pre>					
Pre-test conditions:	The cleaning procedure has been run	(see configuration comm	ents)		
	QE1 is connected to Foreign Network	1 and has registered to it	s Home Agen	t EUT	
-	QE1 is configured NOT to perform route optimization				
Step	Test Se	quence		Vere	dict
				Pass	Fail
1	Cause QE3 to send an Echo Request	to the Home Address of	QE1		
2	Check: does QE3 receive an Echo Re	eply from QE1?		Yes	No
Observations:	Very Similar to TD_MOBILITY_1547_	.01.			

Test Description				
Identifier:	TD_MOB_1536_01	Test Purpose:	TP_MOB_1536_01	
Summary:	'HA intercepts packets for registered r encapsulation'	nobile node on the home	network and uses reverse tunnel	
Roles:	Home_Agent	Configuration:	CF_MOB_02	
References:	RQ_001_1364, RQ_001_1536, RQ_0	01_1551, RQ_001_1568		
<pre>with { QE1 away_from_home and QE1 registered to EUT and QE1 configured not to perform Route_Optimization } ensure that { when { QE3 is requested to send a packet to QE1</pre>				

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10.4.6 Protecting Return Routability packets

	Test Description				
Identifier:	TD_MOB_1371_01	Test Purpose:	TP_MOB_13	371_01	
Summary:	'Home Agent supports ESP protection	n of Home Test and Hor	ne Test Init me	ssages'	
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1371				
<pre>with { QE4 config and QE1 conf and QE1 conf } ensure that { when { befor then { }</pre>	gured to perform route_optimizat: Figured to perform route_optimizat: Figured to protect return_routab: using ESP QE1 moves to a Foreign_Network re QE4 sends a packet to QE1 indicating that a response QE4 indicates receipt of the n	ion ation ility_packets k e is required } response directly fro	om QE1 }		
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE4 is configured to perform route optimization QE1 is configured to perform route optimization QE1 is configured to protect return routability packets using ESP OE1 connected to home Naturers 1				
Step	Test Se	quence		Ver	dict
				Pass	Fail
1	Move QE1 to Foreign Network 1				
2	Wait a few seconds				
3	Cause QE4 to send an Echo Request	t to QE1			
4	Check: does QE4 receive Echo Reply	/?		Yes	No
5	Disconnect EUT				
6	Cause QE4 to send an Echo Request	t to QE1			
7	Check: does QE4 receive Echo Reply	?		Yes	No
Observations:					

	T	est Description		
Identifier:	TD_MOB_2014_01	TD_MOB_2014_01 Test Purpose: TP_MOB_2014_01		
Summary:	'Home Agent supports Home 7	Test Init secured using tunne	ا_mode_ESP'	
Roles:	Home_Agent	Configuration:	CF_MOB_02	
References:	RQ_001_1571, RQ_001_2034	4, RQ_001_2035		
<pre>with { QE1 conf and EUT conf and QE1 conf and QE1 conf and QE4 conf and QE1 is and QE1 root } ensure that { when { and then { QE4 }</pre>	igured to protect any Home	<pre>Test_Init to EUT ESP e_Test_Init secured ESP from QE1 ptimization ptimization tablished between EUT an work } icate directly }</pre>	ıd QE1	

Pre-test conditions:	The cleaning procedure has been run (see configuration comments) QE1 is configured to protect Home Test Init sent to EUT using tunnel mode ESP EUT is configured to accept only Home Test Init protected using tunnel mode ESP from QE1 QE1 configured to perform Route Optimization		
	QE1 is away from Home and registered to its Home Agent EUT		
Step	Test Sequence Verdict		
		Pass	Fail
1	Cause QE4 to send an Echo Request to the Home Address of QE1		
2	Wait a few second (to let QE1 register to QE4)		
3	Disconnect EUT from Home Network 1		
4	Cause QE4 to send an Echo Request to the Home Address of QE1		
5	Check: does QE4 receive an Echo Reply from QE1?	Yes	No
Observations:			

	Test Des	cription			
Identifier:	TD_MOB_1574_01	Test Purpose:	TP_MOB_1	574_01	
Summary:	'Home Agent supports the protection of	of Home Test and Home	Test Init mes	sages'	
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_1574				
with { QE4 config	ured to perform route_optimizati	on			
and QE1 conf	igured to perform route_optimiza	ition			
and QE1 away	home				
and QE1 regi	stered to EUT	lity packata			
	igured to protect return_routabl	lity_packets			
ensure that					
{ when { QE1 r	eceives a packet from QE4				
i	ndicating that a response is req	<pre>{uired }</pre>			
then { QE1 s	ends the response directly to QE	:4 }			
}					
Due test see ditioner	1	<i>i i i</i>	()		
Pre-test conditions:	The cleaning procedure has been run	(see configuration comme	ents)		
	QE4 is configured to perform route op	timization			
	QE1 is configured to perform route op	timization			
	QE1 is away from home and registere	d to EUI			
a :	QE1 is configured to protect return rou	itability packets with QE1			
Step	lest Sec	quence		Verd	
				Pass	Fail
1	Cause QE4 to send an Echo Request	to the Home Address of	QE1		
2	Check: does QE4 receive an Echo Re	ply from QE1?		Yes	No
3	Wait a few seconds (to let QE4 and Q	E1 process the return rou	tability		
	procedure)				
4	Disconnect EUT from Home Network	1			0
5	Cause QE4 to send an Echo Request	to the Home Address of	QE1		
6	Check: does QE4 receive an Echo Re	ply from QE1?		Yes	No
Observations:	RRP is performed during first echo ex	change.			

11 Mobile Node Operation

	Test Description				
Identifier:	TD MOB 1003 01 Test Purpose: TP MOB 1003 01				
Summary:	'MN continues to communicate after r	noving to a new link'			
Roles:	Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1002, RQ_001_1003, RQ_0	001_1004			
with { EUT connect	cted in home_network				
and EUT regi	istered to QE1				
and EUT and	QE4 established in communication	n			
}					
ensure that					
{ when {	EUT moves to a foreign_network				
and	QE4 is requested to send a pack	et to EUT			
indicating that a response is required }					
then { QE4 indicates receipt of the response from the EUT }					
,					

Pre-test conditions:	The cleaning procedure has been run (see configuration comments) EUT is connected to Home Network 1		
Step	Test Sequence	Ver	dict
-		Pass	Fail
1	Cause EUT to send an Echo Request to QE4		
2	Check: does EUT receive an Echo Reply from QE4?	Yes	No
3	Move EUT to Foreign Network 1		
4	wait a few seconds (to let the EUT register with its Home Agent).		
5	Cause QE4 to send an Echo Request to the Home Address of EUT		
6	Check: does QE4 receive an Echo Reply from EUT?	Yes	No
Observations:			

11.3 Packet Processing

	Test De	escription			
Identifier:	TD_MOB_1003_01	Test Purpose:	P_MOB_1003_0		
Summary:	'MN continues to communicate after	moving to a new link'			
Roles:	Mobile_Node	Configuration: C	F_MOB_03		
References:	RQ_001_1002, RQ_001_1003, RQ_	_001_1004			
with { EUT connec	cted in home_network				
and EUT reg	istered to QE1				
and EUT and	QE4 established in communicati	on			
} ensure that					
{ when {	EUT moves to a foreign network				
and	QE4 is requested to send a pac	ket to EUT			
	indicating that a response	is required }			
then { QE4 :	indicates receipt of the respon	se from the EUT }			
}					
xxxxxxxxxxxxxxxxxx	*****				
Bro-tost conditions:	The cleaning procedure has been ru	n (acc configuration common	to)		
Fre-lest conditions.	ELIT is connected to Home Network		115)		
Sten	EOT IS connected to nome Network	equence		Verdict	
Step	Test e	equence	Pa	s Fail	
1	Cause EUT to send an Echo Reque	st to QE4			
2	Check: does EUT receive an Echo F	Reply from QE4?	Ye	s No	
3	Move EUT to Foreign Network 1				
4	wait a few seconds (to let the EUT r	egister with its Home Agent)			
5	Cause QE4 to send an Echo Reque	st to the Home Address of EL	ЛТ		
6	Check: does QE4 receive an Echo F	Reply from EUT?	Ye	s No	
Observations:			•	÷	

11.3.1 Sending Packets While Away From Home

Test Description				
Identifier:	TD_MOB_1820_01	Test Purpose:	TP_MOB_1820_01	
Summary:	When Home Agent receives a packe	t from Mobile Node us	sing reverse tunnelling, it forwards the	
	encapsulated packet to Corresponde	nt Node'		
Roles:	Home_Agent, Home_Agent	Configuration:	CF_MOB_02	
References:	RQ_001_1820, RQ_001_1820			
with {	com_home			
and QE1 regis	stered to EUT			
and QE1 confi	gured not to perform Route_Opti	mization		
}				
ensure that				
{ when { EUT i	s disconnected }			
then { QE1 a	and QE4 are unable to communicat	e with QE4 }		
}				
Pre-test conditions:	The cleaning procedure has been rur	n (see configuration co	omments)	
	QE1 is connected to Foreign Network	1 and registered to E	EUT	
	QE1 is configured NOT to perform Route Optimization			

Step	Test Sequence	Ver	Verdict	
		Pass	Fail	
1	Cause QE4 to send an Echo Request to the Home Address to QE1			
2	Check: does QE4 receive an Echo Reply from QE1?	Yes	No	
3	Disconnect EUT from Home Network 1			
4	Cause QE4 to send an Echo Request to the Home Address to QE1			
5	Check: does QE4 receive an Echo Reply from QE1?	No	Yes	
Observations:				

		Test Description			
Identifier:	TD_MOB_1003_01	Test Purpose:	TP_MOB_1	003_01	
Summary:	'MN continues to communication	ate after moving to a new link'	-		
Roles:	Mobile_Node	Configuration:	CF_MOB_0)3	
References:	RQ_001_1002, RQ_001_10	03, RQ_001_1004	-		
with { EUT connec	cted in home_network				
and EUT regi	istered to QE1				
and EUT and	QE4 established in commu	unication			
}					
ensure that					
{ when {	EUT moves to a foreign_r	network			
and	QE4 is requested to send	a packet to EUT			
then (OT (indicating that a re	esponse is required }			
Unen (QE4)	indicates receipt of the	response from the EUT }			
}					
Pre-test conditions:	The cleaning procedure has	been run (see configuration co	omments)		
	EUT is connected to Home	Network 1	,		
Step		Test Sequence		Verdict	
		•		Pass	Fail
1	Cause EUT to send an Echo	D Request to QE4			
2	Check: does EUT receive ar	n Echo Reply from QE4?		Yes	No
3	Move EUT to Foreign Netwo	ork 1			
4	wait a few seconds (to let th	e EUT register with its Home A	gent).		
5	Cause QE4 to send an Echo	Request to the Home Address	s of EUT		
6	Check: does QE4 receive ar	n Echo Reply from EUT?		Yes	No
Observations:					

		Test Description					
Identifier:	TD_MOB_1612_01	Test Purpose:	TP_MOB_16	612_01			
Summary:	'When MN starts a transp away_from_home'	When MN starts a transport-level connections at Home, it conserves that connection away from home'					
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3			
References:	RQ_001_1612						
<pre>and EUT having established a transport_connection to QE3 } ensure that { when { EUT moves to a foreign_network } then { EUT and QE3 are able to communicate using the transport_connection } }</pre>							
Pre-test conditions:	The cleaning procedure I EUT connected to Home	has been run (see configuration comr Network 1	nents)				
Step		Test Sequence		Vere	dict		
				Pass	Fail		
1	Cause EUT to establish a with QE3	a transport-level connection (telnet, ft	p, ssh, etc.)				
2	Move EUT to foreign net	work 1					
3	Check: Is the transport-le	evel connection established in step 1	still alive?	Yes	No		
Observations:							

	Те	st Description			
Identifier:	TD_MOB_1613_01	Test Purpose:	TP_MOB_16	613_01	
Summary:	When MN starts a transport-lev	el connections in Foreign r	network, it conser	ves this con	nection into
	another Foreign network'				
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1613				
with { EUT away_	_from_home				
and EUT reg	gistered to QE1				
and EUT hav	ving established a transpor	t_connection to QE3			
}					
ensure that	owed to enother foreign no	twork			
then frime	and OE3 are able to community	cate			
	using the transport connect	ion }			
}					
Pre-test conditions:	The cleaning procedure has be	en run (see configuration co	omments)		
	EUT connected to Foreign Netw	work 1 and registered to its	Home Agent QE1		
Step	Te	est Sequence		Ver	dict
				Pass	Fail
1	Cause EUT to establish a trans	port-level (telnet, ftp, ssh or	r similar)		
	connection with QE1		,		
2	Move EUT to foreign network 2				
3	Check: Is the transport level co	nnection established in step	o 1 still alive?	Yes	No
Observations:					

	Test Des	cription			
Identifier:	TD_MOB_1614_01	Test Purpose:	TP_MOB_16	14_01	
Summary:	'MN sends packets directly to the corr	espondent node when a	binding exists	5	
Roles:	Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1614				
<pre>with { EUT away_f and EUT regi and EUT conf and QE4 conf and EUT havi } ensure that { when { EUT r i then { EUT s } }</pre>	rom_home stered to QE1 igured to perform route_optimiza- igured to perform route_optimiza- ing established a binding to QE4 receives a packet from QE4 ndicating that a response is rec- sends the response directly to QE	ation ation quired } 54 }			
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT connected in Foreign Network 1 and registered to its Home Agent QE1 EUT configured to perform route optimization QE4 configured to perform route optimization EUT has established a binding to QE4					
Step	Test Se	quence		Ver	dict
				Pass	Fail
1	Disconnect QE1				
2	Cause QE4 to send an Echo Request	to the Home Address of I	EUT		
3	Check: does QE4 receive an Echo Re	ply from EUT?		Yes	No
Observations:					

	Test De	scription			
Identifier:	TD_MOB_1615_01	Test Purpose:	TP_MOB_	1615_01	
Summary:	'MN uses reverse tunnelling to the co	rrespondent node when	no binding e	xists'	
Roles:	Mobile_Node, Mobile_Node	Configuration:	CF_MOB_	03	
References:	RQ_001_1615, RQ_001_1615, RQ_0	001_1819			
with { EUT away_f	rom_home				
and EUT regi	stered to QE1				
and EUT conf	igured to perform route_optimiz	ation			
and QE4 conf	igured not to perform Route_Opt	imization			
}					
when { EUT r	receives a packet from OE4				
i i i i i i	ndicating that a response is re	quired }			
then { QE4 i	ndicates receipt of the respons	e from the EUT }			
}	1 1	,			
Pre-test conditions:	The cleaning procedure has been rur	n (see configuration comm	nents)		
	EUT connected in Foreign Network 1	and registered to its Hom	ne Agent QE	1	
	EUT configured to perform route opti	mization			
	QE4 configure NOT to perform route	optimization			
Step	Test Sequence		Vere	dict	
				Pass	Fail
1	Cause QE4 to send an Echo Reques	t to the Home Address of	EUT		
2	Check: does QE4 receive an Echo R	eply from EUT?		Yes	No
3	Disconnect QE1				
4	Cause QE4 to send an Echo Reques	t to the Home Address of	EUT		
5	Check: does QE4 receive an Echo R	eply from EUT?		No	Yes
Observations:					

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11.4

Home Agent and Prefix Management

	Test Des	scription			
Identifier:	TD_MOB_1082_01	Test Purpose: TP.	_MOB_10	82_01	
Summary:	Home Agent uses a Security Associa	tion to protect integrity and a	uthenticity	' of	
	Mobile_Prefix_Solicitations and Adve	tisements'			
Roles:	Home_Agent	Configuration: CF	_MOB_02	2	
References:	RQ_001_1014, RQ_001_1082, RQ_0	01_1607			
with { QE1 at_hom	ne				
and QE1 conf	igured to protect				
1 071	Mobile_Prefix_Solicitatio	ons			
and QE1 cont	igured to accept only secured				
and OF1 conf	MODILE_Prelix_Advertised	fetime(suggest 30s)			
	igured to have a short prefix_1.	lietime - (suggest 30s)			
ensure that					
{ when {	QE1 moves to a foreign_networl	5			
befor	e its prefix_lifetime expires				
befor	e QE4 sends a packet to QE1				
	indicating that a response	e is required }			
then {	QE4 indicates receipt of the r	response from QE1 }			
}	1				
Pre-test conditions:	The cleaning procedure has been run	(see configuration comments	5)		
	QE1 is connected to Foreign Network	1 and registered to its Home	Agent EU	Т	
	QE1 is configured to protect Mobile F	Prefix Solicitation messages			
	QE1 is configured to only accept prote	ected Mobile Prefix Advertiser	ment mess	sages	
	EUT is configured to advertise a prefe	erred prefix lifetime of 20 sec		•	
	EUT is configured to advertise a valid	prefix lifetime of 30 sec			
Step	Test Se	quence		Vere	dict
•		•	Ī	Pass	Fail
1	Wait 30 sec so that initial lifetime of th	e home address of QE1 has e	expired		
2	Cause QE4 to send an Echo Request	to the Home Address of QE1			
3	Check: does QE4 receive an Echo Re	ply from QE1?		Yes	No
Observations:					

	Test Des	scription			
Identifier:	TD_MOB_1082_02	Test Purpose:	TP_MOB_10	82_02	
Summary:	'Mobile Node uses a Security Associa Solicitations and Advertisements'	tion to protect integrity a	nd authenticity	of Mobile P	refix
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1014, RQ_001_1082, RQ_0	01_1663, RQ_001_1664	4		
<pre>with { EUT at_hom and QE1 conf and QE1 conf and EUT conf } ensure that { when { befor befor then { }</pre>	Me Figured to accept only secured Mobile_Prefix_Solicitat: Figured to protect Mobile_Prefix_S Figured to have a short prefix_1: EUT moves to a foreign_network re its prefix_lifetime expires re QE4 sends a packet to the EUT indicating that response to QE4 indicates receipt of the to	ions _Advertisements ifetime (suggest 30 k k is required } response from the EU1)s)' : }		
Pre-test conditions:	The cleaning procedure has been run EUT is connected to Foreign Network QE1 is configured to only accept prote QE1 is configured to protect Mobile P QE1 is configured to advertise a prefe QE1 is configured to advertise a valid	(see configuration comr 1 and is registered to its ected Mobile Prefix Solic refix Advertisement mes erred prefix lifetime of 20 prefix lifetime of 30 sec	nents) Home Agent (itation messag sages sec	QE1 es	
Step	Test Se	quence		Verd	lict
				Pass	Fail
1	Wait 30 sec so that EUT has send a l and received a Mobile Prefix Advertis	Mobile Prefix Solicitation ement message	message		
2	Cause QE4 to send an Echo Request	t to the Home Address of	EUT		
3	Check: does QE4 receive an Echo Re	eply from EUT?		Yes	No
Observations:					

11.4.1 Dynamic Home Agent Address Discovery

	Tes	st Description	
Identifier:	TD_MOB_1655_01	Test Purpose:	TP_MOB_1655_01
Summary:	'Mobile Node already registered	to a Home Agent uses that	at Home Agent for any new registrations'
Roles:	Mobile_Node, Mobile_Node	Configuration:	CF_MOB_06
References:	RQ_001_1655, RQ_001_1655		
<pre>with { EUT configu and EUT away_fr and EUT registed and QE2 disconr } ensure that { when { (and QE2 and QE2 and EUT then { QF EUT t and QE4 EUT r } </pre>	ared 'to use DHAAD' com_home ered to QE1 hected from Home_Network 1 QE1 is disconnected from Hom is connected to Home_Networ moves to another foreign_ne 24 and EUT are unable to com within MAX_BINDACK_TIMEOUT cries to register with QE1 is able to communicate afte registered to QE2	Ne_Network 1 :k 1 stwork } municate sr MAX_BINDACK_TIMEOUT	}
Pre-test conditions:	The cleaning procedure has been EUT is configured to use DHAAI QE2 is configured to serve as ho QE2 is disconnected	In run (see configuration of D ome agent for home netwo ork 1 and registered to OE	omments) prk 1 1

Step	Test Sequence	Verdict	
		Pass	Fail
1	Disconnect QE1		
2	Connect QE2 to Home Network 1		
3	Move EUT to foreign network 2		
4	Cause QE4 to continuously send ICMP ECHO requests to EUT		
5	Check: does QE4 receive ICMP ECHO replies from EUT?	No	Yes
6	Wait for MAX_BINDACK_TIMEOUT seconds or more (EUT should still be trying to register to QE1 until this delay expires)		
7	Check: does QE4 receive ICMP ECHO replies from EUT? (EUT should now have successfully registered to QE2)	Yes	No
Observations:		•	•

	Т	est Description			
Identifier:	TD_MOB_1657_01	Test Purpose:	TP_MOB_16	657_01	
Summary:	'Mobile Node attempts Dynam Home Agent'	ic Home Agent Address Disc	overy if it cannot	contact its c	urrent
Roles:	Mobile_Node	Configuration:	CF_MOB_0	6	
References:	RQ_001_1657				
<pre>with { EUT away_f</pre>	rom_home stered to QE1 DE1 is disconnected from t DUT moves to another forei DE4 and EUT are able to co The cleaning procedure has b QE2 is configured to be Home	he Home_Network gn_network } mmunicate } een run (see configuration co Agent on Home Network 1	omments)		
	EUT is connected to Foreign f	inding Lifetime at any minute	its Home Agent	QE1	
Sten	QET is conligured to have a Binding Lifetime at one minute		Ver	Verdict	
Otep				Pass	Fail
1	Disconnect QE1 from Home N	letwork 1			
2	Move EUT to Foreign Network	< 2			
3	Wait a few seconds (for EUT t	to try to bind to Home Agent)			
4	Cause QE3 to send an Echo I	Request to the Home Addres	s of EUT		
5	Check: does QE3 receive an I	Echo Reply from EUT?		Yes	No
Observations:					

	Test Description					
Identifier:		TD_MOB_1385_01	Test Purpose:	TP_MOB_1385_01		
Summary:		'Mobile Node supports D	ynamic Home Agent Address Disc	overy'		
Roles:		Mobile_Node	Configuration:	CF_MOB_03		
Reference	s:	RQ_001_1385				
with {	EUT regist	ered to QE1				
i	and EUT disc	connected				
;	and EUT conf	igured not to perform	n Route_Optimization			
;	and OE4 conf	igured not to perform	n Route Optimization			
}	~ ~ ~	J				
ensure	that					
, }	when {	OE1 is requeste	ed to modify its IP address			
L L	befor	e the EUT is connecte	ed to a foreign network }			
	then {	OE4 and the EUT	are able to communicate }			
}						
J						
Pre-test (conditions.	The cleaning procedure	has been run (see configuration co	mments)		
	contantions.	FUT is connected to Her	nas been run (see conngulation co	minento)		
Roles: References with { ensure { } Pre-test (S: EUT regist and EUT disc and EUT conf and QE4 conf that when { befor then { conditions:	Image: RQ_001_1385 .ered to QE1 :onnected igured not to perform .ge1 is requeste .ee the EUT is connected .QE4 and the EUT The cleaning procedure EUT is connected to Hor	a Route_Optimization a Route_Optimization ed to modify its IP_address ed to a foreign_network } C are able to communicate } has been run (see configuration co ne Network 1	CF_MOB_03		

Step	Test Sequence	Ver	Verdict	
		Pass	Fail	
1	Disconnect EUT from Home Network 1			
2	Configure QE1 with a new IP address on prefix_B			
3	Connect EUT to Foreign Network 1			
4	Cause QE4 to send an Echo Request to the Home Address of EUT			
5	Check: does QE4 receives an Echo Reply?	Yes	No	
Observations:				

11.4.2 Sending Mobile Prefix Solicitations

Test Description					
Identifier:	TD_MOB_1661_01	Test Purpose:	TP_MOB_16	61_01	
Summary:	'MN sends Mobil Prefix Solicitation to	HA when its home add	ress becomes i	nvalid'	
Roles:	Mobile_Node, Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1661, RQ_001_1661, RQ_0	001_1662, RQ_001_166	65		
<pre>with { EUT away_from_nome and EUT registered to QE1 } ensure that { when { EUT 'has its home address which becomes invalid' } then { EUT 'update the prefix lifetime information for its home address' } } }</pre>					
Pre-test conditions:	The cleaning procedure has been rur EUT is connected to Home Network	n (see configuration com 1	iments)		
Step	Test Se	equence		Ver	dict
				Pass	Fail
1	Move EUT to Foreign network 1				
2	Wait for original Home address lifetim	ne to expire			
3	Cause QE4 to send an Echo Reques	t to EUT			
4	Check: does QE4 receive an Echo R	eply?		Yes	No
Observations:					

	Test De	escription	
Identifier:	TD_MOB_1082_02	Test Purpose:	TP_MOB_1082_02
Summary:	'Mobile Node uses a Security Associ	ation to protect integrit	y and authenticity of Mobile Prefix
-	Solicitations and Advertisements'		
Roles:	Mobile_Node	Configuration:	CF_MOB_03
References:	RQ_001_1014, RQ_001_1082, RQ_	001_1663, RQ_001_1	664
with { EUT at_hom	ne		
and QE1 conf	igured to accept only secured		
	Mobile_Prefix_Solicitat	zions	
and QE1 conf	igured to protect Mobile_Prefix	Advertisements	
and EUT conf	igured to have a short prefix_l	lifetime (suggest	30s)'
}			
ensure that			
{ when {	EUT moves to a foreign_networ	rk	
befor	re its prefix_lifetime expires		
befor	e QE4 sends a packet to the EU1	ſ	
	indicating that response	is required }	
then {	QE4 indicates receipt of the	response from the	EUT }
}			
B	I	<i>/ / /</i>	
Pre-test conditions:	The cleaning procedure has been rul	n (see configuration co	omments)
	EUT is connected to Foreign Networ	k 1 and is registered to	o its Home Agent QE1
	QE1 is configured to only accept pro	tected Mobile Prefix Se	olicitation messages
	QE1 is configured to protect Mobile I	Prefix Advertisement m	nessages
	QE1 is configured to advertise a pref	ferred prefix lifetime of	20 sec
	QE1 is configured to advertise a valid	d prefix lifetime of 30 s	

Step	Test Sequence		Verdict	
		Pass	Fail	
1	Wait 30 sec so that EUT has send a Mobile Prefix Solicitation message and received a Mobile Prefix Advertisement message			
2	Cause QE4 to send an Echo Request to the Home Address of EUT			
3	Check: does QE4 receive an Echo Reply from EUT?	Yes	No	
Observations:				

	Test De	scription			
Identifier:	TD_MOB_1082_02	Test Purpose:	TP_MOB_10	82_02	
Summary:	'Mobile Node uses a Security Associa	ation to protect integrity a	and authenticity	/ of Mobile P	refix
-	Solicitations and Advertisements'		-		
Roles:	Mobile_Node	bile Node Configuration: CF MOB 03			
References:	RQ_001_1014, RQ_001_1082, RQ_0	001_1663, RQ_001_166	4		
with { EUT at_hom	ne				
and QE1 con:	figured to accept only secured				
	Mobile_Prefix_Solicitat	ions			
and QE1 con:	figured to protect Mobile_Prefix	_Advertisements			
and EUT cont	figured to have a short prefix_1	ifetime (suggest 3	0s)'		
}					
ensure that	FUT moved to a foreign networ	le.			
	to ita profix lifetimo evpired	ĸ			
befor	before its preix_interime expires				
Deroi	indicating that response	is required }			
then {	OE4 indicates receipt of the	response from the EU	т }		
}	~ -	-	,		
-					
Pre-test conditions:	The cleaning procedure has been run	n (see configuration com	ments)		
	EUT is connected to Foreign Network	< 1 and is registered to it	s Home Agent	QE1	
	QE1 is configured to only accept prot	ected Mobile Prefix Solid	citation messag	es	
	QE1 is configured to protect Mobile F	Prefix Advertisement mes	sages		
	QE1 is configured to advertise a pref	erred prefix lifetime of 20	sec		
	QE1 is configured to advertise a valid	prefix lifetime of 30 sec			
Sten Test Sequence Verdi			dict		
p		-4		Pass	Fail
1	Wait 30 sec so that EUT has send a	Mobile Prefix Solicitation	message		
	and received a Mobile Prefix Advertis	sement message			
2	Cause QE4 to send an Echo Regues	t to the Home Address of	f EUT		
3	Check: does QE4 receive an Echo R	eply from EUT?	• ·	Yes	No
Observations:					

11.4.3 Receiving Mobile Prefix Advertisements

Test Description			
Identifier:	TD_MOB_1384_01	Test Purpose:	TP_MOB_1384_01
Summary:	'MN reconfigures its home address a	ccording to the prefix info	ormation in a
	Mobile_Prefix_Advertisement'	-	
Roles:	Mobile_Node	Configuration:	CF_MOB_03
References:	RQ_001_1384		
<pre>with { EUT away_from_home and EUT registered to QE1 } ensure that { when { QE1 is requested to modify its home_network prefix } then { QE4 and the EUT are able to communicate using the new home_address } } }</pre>			
Pre-test conditions:	The cleaning procedure has been rur EUT connected to foreign network 1 EUT registered to QE1	n (see configuration com	ments)

Step	Step Test Sequence		Verdict	
		Pass	Fail	
1	Cause QE1 to change the prefix on its home subnet interface			
2	Wait for some seconds to allow EUT to retrieve new home address			
3	Check: does EUT indicate a new home address?	Yes	No	
Observations:				

11.5 Movement

Test Description					
Identifier:	TD_MOB_1809_01	Test Purpose:	TP_MOB_18	309_01	
Summary:	'Mobile Nodes support returning ho	me'			
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1808, RQ_001_1809				
<pre>with { EUT away_from_home and QE4 able to communicate with EUT } ensure that { when { EUT returns home } then { QE4 and the EUT are able to communicate } }</pre>					
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is connected to Foreign Network 1 and registered to its Home Agent QE1				
Step	Test	Sequence		Vero	dict
				Pass	Fail
1	Move EUT to Home Network 1				
2	Cause QE4 to send an Echo Reque	est to the Home Addres	s of EUT		
3	Check: does QE4 receive an Echo	Reply from EUT?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_1809_01	Test Purpose:	TP_MOB_18	09_01	
Summary:	'Mobile Nodes support returning h	obile Nodes support returning home'			
Roles:	Mobile_Node	Configuration:	CF_MOB_03	5	
References:	RQ_001_1808, RQ_001_1809				
<pre>with { EUT away_from_home</pre>					
Pre-test conditions:	it conditions: The cleaning procedure has been run (see configuration comments) EUT is connected to Foreign Network 1 and registered to its Home Agent QE1				
Step	Test	t Sequence		Ver	dict
				Pass	Fail
1	Move EUT to Home Network 1				
2	Cause QE4 to send an Echo Requ	uest to the Home Addres	s of EUT		
3	Check: does QE4 receive an Echo	o Reply from EUT?		Yes	No
Observations:					

		Test Description			
Identifier:	TD_MOB_1380_01	Test Purpose:	TP_MOB_1	380_01	
Summary:	'Mobile Node supports care	-of address formation'			
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3	
References:	RQ_001_1380				
<pre>with { EUT conne</pre>	cted to home_network e to communicate with EU moves to a foreign_netwo and the EUT are able to The cleaning procedure has EUT is connected to Home	rk } communicate } s been run (see configuration cc Network 1	omments)		
Step		Test Sequence		Verdict	
				Pass	Fail
1	Move EUT to Foreign Netwo	ork 1		_	
2	Wait a few seconds (to let the	ne EUT register with its Home A	gent)		
3	Cause QE4 to send an Ech	o Request to the Home Address	s of EUT		
4	Check: does QE4 receive a	n Echo Reply from EUT?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_1683_01	Test Purpose:	TP_MOB_16	83_01	
Summary:	'Mobile Node generates a new primar	y Care of Address after	having moved'		
Roles:	Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1380, RQ_001_1683, RQ_0	01_1690			
<pre>with { EUT away_from_home and QE4 able to communicate with EUT } ensure that { when { EUT moves to another foreign_network } then { QE4 and the EUT are able to communicate } } Pre-test conditions: The cleaning procedure has been run (see configuration comments)</pre>					
Step	Test Se	quence		Vere	dict
				Pass	Fail
1	Move EUT to Foreign Network 2				
2	Wait a few seconds (to let the EUT register with its Home Agent)				
3	Cause QE4 to send an Echo Request	to the Home Address of	of EUT		
4	Check: does QE4 receive an Echo Re	ply from EUT?		Yes	No
Observations:					

11.5.1 Movement Detection

Test Description				
Identifier:	TD_MOB_1678_01	Test Purpose:	TP_MOB_1678_01	
Summary:	' MN discover a new default router wh	nen it detects the default	router is no longer bi-directionally	
	reachable '			
Roles:	Mobile_Node	Configuration:	CF_MOB_03	
References:	RQ_001_1678			
<pre>with { EUT connec and QE1 disc } ensure that { when { E and F and F }</pre>	ted in home_network connected EUT moves to a foreign_network EUT receives a packet from QE3 indicating that a response i and containing a destination_add set to the Care_of_Address o indicates receipt of the respons	s required ress f the EUT } e from the EUT }		

Pre-test conditions:	The cleaning procedure has been run (see configuration comments) QE1 is disconnected EUT is connected to Home Network 1		
Step	Test Sequence	Vere	dict
		Pass	Fail
1	Move EUT to Foreign Network 1		
2	Cause QE3 to send an Echo Request to the new Care-of Address of EUT		
3	Check: does QE3 receive an Echo Reply from EUT?	Yes	No
Observations:			

Test Description					
Identifier:	TD_MOB_1824_01	Test Purpose:	TP_MOB_18	324_01	
Summary:	When Mobile Node detects a L3 ha	andover, it constructs a	new Care-of Add	ress, it select	t a new
	default router and register the new	address to its Home A	gent and the Corre	espondent No	odes which
	it is performing route optimization				
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1682, RQ_001_1824				
with { EUT away_fr	com_home				
and EUT regis	stered to QE1				
and EUT confi	gured to perform route_optimiz	zation			
and QE4 CONII	gured to perform route_optimiz	ation			
	ig established a binding to QE4	±			
ensure that					
{ when { EUT n	noves to another foreign_networ	ck }			
then { QE4 a	and EUT are able to communicate	e directly }			
}					
	I	<i>(</i>			
Pre-test conditions:	The cleaning procedure has been r	un (see configuration c	omments)		
	EUT is connected to Foreign Netwo	ork 1 and registered to	ts Home Agent QE	<u>-</u> 1	
	EUT is configured to perform Route	Optimization			
	QE4 is configured to perform Route	Optimization			
	EUT has established a binding with	the Correspondent No	de QE4		
Step	Test	Sequence		Verd	
				Pass	Fail
1	Moves EUT to Foreign Network 2				
2	Wait a few seconds (to let EUT upd	late its bindings to QE1	and QE4)		
3	Disconnect QE1 from Home Netwo	rk 1			
4	Cause QE4 to send an Echo Reque	est to the Home Addres	s to EUT		
5	Check: does QE4 receive an Echo	Reply from EUT?		Yes	No
Observations:					

	Test Description					
Identifier: TD_MOB_1824_01 Test Purpose: TP_MOB_1824_01			TP_MOB_1824_01			
Summary:	When Mobile Node detects a L3 han	dover, it constructs a ne	w Care-of Address, it select a new			
	default router and register the new a	ddress to its Home Ager	nt and the Correspondent Nodes which			
	it is performing route optimization					
Roles:	Mobile_Node	Configuration:	CF_MOB_03			
References:	RQ_001_1682, RQ_001_1824					
with { EUT away_fr	rom_home					
and EUT regis	stered to QE1					
and EUT confi	gured to perform route_optimiza	tion				
and QE4 confi	gured to perform route_optimiza	tion				
and EUT havin	ng established a binding to QE4					
}						
ensure that						
{ when { EUT moves to another foreign_network }						
then { QE4 a	then $\{$ QE4 and EUT are able to communicate directly $\}$					
}						

Pre-test conditions:	The cleaning procedure has been run (see configuration comments) EUT is connected to Foreign Network 1 and registered to its Home Agent QI EUT is configured to perform Route Optimization QE4 is configured to perform Route Optimization EUT has established a binding with the Correspondent Node QE4	Ξ1	
Step	Test Sequence	Ver	dict
-		Pass	Fail
1	Moves EUT to Foreign Network 2		
2	Wait a few seconds (to let EUT update its bindings to QE1 and QE4)		
3	Disconnect QE1 from Home Network 1		
4	Cause QE4 to send an Echo Request to the Home Address to EUT		
5	Check: does QE4 receive an Echo Reply from EUT?	Yes	No
Observations:			

11.5.2 Forming New Care-of Addresses

Test Description					
Identifier:	TD_MOB_1683_01	Test Purpose:	TP_MOB_16	683_01	
Summary:	'Mobile Node generates a new prir	mary Care of Address afte	r having moved		
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1380, RQ_001_1683, R0	ຊ_001_1690			
<pre>with { EUT away_from_home and QE4 able to communicate with EUT } ensure that { when { EUT moves to another foreign_network } then { QE4 and the EUT are able to communicate } } Pre-test conditions: The cleaning procedure has been run (see configuration comments)</pre>					
Step	Test	Sequence		Ver	dict
				Pass	Fail
1	Move EUT to Foreign Network 2				
2	Wait a few seconds (to let the EUT	register with its Home A	gent)		
3	Cause QE4 to send an Echo Requ	lest to the Home Address	of EUT		
4	Check: does QE4 receive an Echo	Reply from EUT?		Yes	No
Observations:					

	Т	est Description		
Identifier:	TD_MOB_1684_01	Test Purpose:	TP_MOB_1684_01	
Summary:	'Mobile Node generates a new	primary Care of Address wh	nen the current one is deprecated'	
Roles:	Mobile_Node	Configuration:	CF_MOB_07	
References:	RQ_001_1684			
<pre>with { EUT away_1 and QE3 coni and QE2 able } ensure that { when { befor befor then { } } }</pre>	Trom_home Figured as default_router so to communicate with EUT QE3 stops advertizing to re (QE3 starts advertizing re QE2 is requested to set indicating that a re QE2 indicates receipt of	for EUT the old prefix a new prefix nd a packet to the EUT esponse is required) } of the response from the	EUT }	
Pre-test conditions: NOT TESTABLE BY INTEROPERABILITY MEAN Impossible to know when the Care-of address registration will take p Depending of the implementation to reduce the handover		vill take place		
oreh			Pass Fail	
Observations:			1 435 1 41	

Test Description						
Identifier:	TD_MOB_1005_01	Test Purpose:	TP_MOB_10	005_01		
Summary:	When away, Mobile Node is address	able at one or more Care	of Addresses	5'		
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3		
References:	RQ_001_1005					
<pre>with { EUT at_home and QE6 'advertising a second prefix on Foreign Network 1' } ensure that { when { EUT moves to Foreign_Network 1 } then { QE4 and EUT are able to communicate</pre>						
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is connected to Home Network 1 Both R1 and R3 have two global addresses, one on Prefix B and one on Prefix E R3 advertises prefix B and prefix E on Foreign Network 1 QE1, QE4 and R2 have a static route for prefix E and are able to reach a node with a prefix E on Foreign Network 1					fix E on	
Step	Test Se	equence		Ver	dict	
				Pass	Fail	
1	Move EUT to Foreign Network 1					
2	Cause QE4 to send an Echo Reques	t to EUT on its care-of ad	dress			
	generated using prefix E			Maa	Nia	
3	Check: does QE4 receive an Echo R	eply from EUT?		Yes	NO	
4	Cause QE4 to send an Echo Reques	t to EUT on its care-of ad	aress			
5	Chock: doos OE4 rocoivo an Echo P	only from ELIT2		Voc	No	
Observations:	CHECK. GOES QE4 TECEIVE ATTECHO K			162	INU	

11.5.3 Using Multiple Care-of Addresses

	Те	st Description			
Identifier:	TD_MOB_1683_01	Test Purpose:	TP_MOB_16	83_01	
Summary:	'Mobile Node generates a new	primary Care of Address after	er having moved'		
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1380, RQ_001_1683,	, RQ_001_1690			
<pre>with { EUT away_from_home and QE4 able to communicate with EUT } ensure that { when { EUT moves to another foreign_network } then { QE4 and the EUT are able to communicate } } Pre-test conditions: The cleaning procedure has been run (see configuration comments) </pre>					
Step	Test Sequence			Verdict	
				Pass	Fail
1	Move EUT to Foreign Network	2			
2	Wait a few seconds (to let the E	EUT register with its Home A	gent)		
3	Cause QE4 to send an Echo R	equest to the Home Addres	s of EUT		
4	Check: does QE4 receive an E	cho Reply from EUT?		Yes	No
Observations:					

	Test	Description			
Identifier:	TD_MOB_1693_01	Test Purpose:	TP_MOB_16	393_01	
Summary:	' MN accepts packets at its previo	us CoA after registering	its new primary (CoA '	
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1693				
with { EUT away_f	from_home				
and EUT regi	stered to QE1				
and QE8 adve	ertizing a new prefix the	us causing a new care	e-of		
	ade	dress to be generated	1		
}					
ensure that					
{ when {	QE8 stops advertizing the	old prefix			
befor	e (QE8 starts advertizing a :	new prefix			
befor	e EUT receives a packet from	m QE3			
	indicating that a res	ponse is required			
	and containing a destinat	ion_address			
	set to the old Care_O	f_Address of the EUT)	}		
then { QE3 i	indicates receipt of the resp	onse from the EUT }			
}					
Pre-test conditions:	NOT TESTABLE BY INTEROPER	RABILITY MEAN			
	Impossible to know when the Care	e-of address registration	will take place		
	Depending of the implementation	to reduce the handover	·		
Step	Tes	t Sequence		Ver	dict
_				Pass	Fail
Observations:					- •

	Test Des	cription			
Identifier:	TD_MOB_1694_01	Test Purpose:	TP_MOB_16	694_01	
Summary:	'Mobile Node invalidates all associate unreachable'	d Care of Addresses	when the corresp	onding route	er is
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1694				
<pre>with { EUT away_from_home and EUT registered to QE1 } ensure that { when { EUT moves to another foreign_network } then { EUT moves to another foreign_network } then { QE1 and the EUT are unable to communicate</pre>					
Pre-test conditions:	The cleaning procedure has been run EUT is connected to Foreign Network	(see configuration contract of the second se	omments) s Home Agent QE	1	
Step	Test Se	quence		Ver	dict
				Pass	Fail
1	Move EUT to Foreign Network 2				
2	Cause QE4 to send an Echo Request the Foreign Network 1	to EUT on its old ca	re-of address of		
3	Check: does QE4 receive an Echo Re	ply from EUT?		No	Yes
Observations:					

11.5.4 Returning Home

	Test Desc	ription			
Identifier:	TD_MOB_1702_01 1	est Purpose:	TP_MOB_1702_	_01	
Summary: 'Mobile Node replies to Neighbour Solicitations for its Home Address after return having sent a Binding Update'					e and
Roles:	Mobile_Node, Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1695, RQ_001_1702, RQ_00	1_1702, RQ_001_17	03		
and EUT regi } ensure that { when { I and (then { QE4 a }	stered to QE1 OUT returns home DE1 is disconnected from the home_ Ind the EUT are unable to communic	network } ate }			
Pre-test conditions:	The cleaning procedure has been run (EUT is connected to Foreign Network 1	see configuration cor and registered to its	nments) Home Agent QE1		
Step	Test Sequence		J J	Verc	lict
			F	Pass	Fail
1	QE1 is disconnected from Home Netwo	ork 1			
2	Move EUT to Home Network 1				
3	Cause QE4 send an Echo Request to	the Home Address of	EUT		
4	Check: does QE4 receive an Echo Rep	ly from EUT?		No	Yes
Observations:			·		

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Test Description					
Identifier:	TD_MOB_1700_01	Test Purpose:	TP_MOB_17	700_01	
Summary:	'Mobile Node does not perform Dup	olicate Address Detection	on when returning	home before	e the expiry
	of its bindings'		-		
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1700				
with { EUT away_f	From_home				
and EUT regi	lstered to QEI				
and OE3 have	ing the same Home Address as E	TTT			
and QE3 have	ing the same ethernet_address	as QE1			
}					
ensure that					
{ wnen { }	SUT returns nome before the bi	nding_lifetime expir	es		
and	DE1 is connected to the Home N	etwork }			
then { H	EUT and QE4 are able to commun	icate }			
}					
Dro toot oon dition of					
Pre-test conditions:	The cleaning procedure has been r	fun (see configuration co	omments)	- 4	
	CE2 is disconnected to Foreign Netwo	ork 1 and registered to r	is Home Agent QE	- 1	
	QE3 is configured with the same a	dress as FUT and the	same Ethernet ad	dress as OF	1
Sten	Test	Sequence			dict
otop	1001	ocquente		Pass	Fail
1	Disconnected QE1 from Home Net	work 1			
2	Connected QE3 to Home Network	1			
3	Move EUT to Home Network 1				
4	Wait a very few seconds (two seco	nds, to let Mobile Node	send Binding		
	Update to its Home Agent)	,	5		
5	Disconnect QE3 to Home Network	1			
6	Connect QE1 to Home network 1				
7	Wait a few seconds (to let EUT de-	register with its Home A	gent QE1)		
8	Cause QE4 to send an Echo Requ	est to EUT			
9	Check: does QE4 receive an Echo	Reply from EUT?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_1701_01	Test Purpose:	TP_MOB_17	'01_01	
Summary:	'Mobile Node performs Duplicate Adc expired'	Iress Detection when	returning home at	ter its bindin	gs have
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1701				
<pre>with { EUT away_from_home and EUT registered to QE1 and EUT binding_lifetime expired at QE1 and QE4 connected to home_network using the same Home_Address as EUT } ensure that { when { EUT returns home } then { EUT returns home } then { EUT is unable to communicate } DAD fails } Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is configured to have a Binding Lifetime at one minute</pre>					
	QE4 is manually configured with the s QE4 is disconnected	same address as EUT			
Step	Test Se	equence		Vere	dict
	2			Pass	Fail
1	Disconnect QE1				
2	Wait one minute (to let the Binding of	EUI expire)			
3	Connect QE4 to Home Network 1				
4	Move EUT to Home Network 1				
5	QE4 is disconnected from Home Net	work 1			
6	Cause QE1 to send an Echo Reques	t to the Home Address	of EUT		
7	Check: does QE1 receive an Echo R	eply from EUT?		No	Yes
Observations:					

11.6.3 Protecting Return Routability Packets

	Test De	scription			
Identifier:	TD_MOB_1725_01	Test Purpose:	TP_MOB_17	25_01	
Summary:	'Mobile Node support the protection of	of Home Test and Hom	e Test Init mess	ages'	
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1725				
with { EUT away_t	from_home				
and EUT reg	istered to QE1				
and EUT cont	figured to perform route_optimiz	ation			
and QE4 cont	figured to perform route_optimiz	ation			
and QE1 cont	figured to protect return_routab	ility_packets			
}					
ensure that					
{ when { EUT 1	receives a packet from QE4				
	indicating that a response is re	quired }			
then { EUT s	sends a response directly to QE4	}			
}					
Pre-test conditions:	The cleaning procedure has been ru	n (see configuration con	nments)		
	ELIT is connected to Foreign Network	(1 and registered to its	Home Agent OF	1	
	ELIT is configured to perform route o		nomo / gont de	••	
	OE4 is configured to perform route o				
	QE4 is configured to perform route of				
<u> </u>	QET is conligured to protect return ro	butability packets by IPS	ec with EUT	N/	
Step Test Sequence			ver	dict	
				Pass	Fail
1	Cause QE4 to send an Echo Reques	t to the Home Address	of EUT		
2	Check: does QE4 receive an Echo R	eply from EUT		Yes	No
Observations:		•••			•

Return Routability Procedure

11.6

Test Description				
Identifier:	TD_MOB_1063_01 Test Purpose:	TP_MOB_10	63_01	
Summary:	'Mobile Node is able to participate in Return Routability Pro	cedure'		
Roles:	Mobile_Node, Mobile_Node Configuration:	CF_MOB_03	3	
References:	RQ_001_1048, RQ_001_1063, RQ_001_1709, RQ_001_10	063, RQ_001_106	64, RQ_001_	_1744,
	<u> RQ_001_1745, RQ_001_1750, RQ_001_1751, RQ_001_17</u>	754, RQ_001_175	59	
with { EUT away_f	rom_home			
and EUT regi	stered to QEI			
and OE4 conf	igured to perform route optimization			
}	IJaroa oo porrorm roado_opormination			
ensure that				
{ when { EUT r	eceives a packet from QE4			
i	ndicating that a response is required }			
then { QE4 i	ndicates receipt of the response directly from the	e EUT }		
}				
Pre-test conditions:	The cleaning procedure has been run (see configuration co	mments)		
	FUT is connected to Foreign Network 1 and is registered to	its Home Agent (DE1	
	EUT is configured to perform route optimization	ito Homo / gone v	×= :	
	QE4 is configured to perform route optimization			
Step	Test Sequence		Vero	dict
•		·	Pass	Fail
1	Cause QE4 to send an Echo Request message to the Home	e Address of		
	EUT			
2	Check: does QE4 receive Echo Replies from EUT?		Yes	No
3	Wait a few seconds to ensure that EUT and QE4 have had	time to		
	complete the Return Routability Procedure			
4	Disconnect QE1 from the network			
5	Cause QE4 to send an Echo Request to the Home Address	of EUT		
6	Check: does QE4 receive an Echo Reply from EUT?		Yes	No
Observations:	If the Mobile Node still manages to communicate with the C	Corresponding No	de once the	Home
	Agent is disconnected from the network, this shows that is u	ising Route Optin	nization and	hence that
	it managed to perform the Return Routability Procedure.			

11.6.1 Sending Test Init Messages

Test Description					
Identifier:	TD_MOB_1063_01	Test Purpose:	TP_MOB_1063_01		
Summary:	'Mobile Node is able to participate in	Return Routability Proced	lure'		
Roles:	Mobile_Node, Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1048, RQ_001_1063, RQ_	001_1709, RQ_001_1063	, RQ_001_1064, RQ_001_1744,		
	RQ_001_1745, RQ_001_1750, RQ_	001_1751, RQ_001_1754	, RQ_001_1759		
with { EUT away_f	rom_home				
and EUT regi	stered to QE1				
and EUT conf	igured to perform route_optimiz	zation			
and QE4 conf	igured to perform route_optimiz	zation			
}					
ensure that					
{ when { EUT r	eceives a packet from QE4				
i	ndicating that a response is re	equired }			
then { QE4 i	ndicates receipt of the respons	se directly from the EU	{ TL		
}					
Pre-test conditions:	The cleaning procedure has been ru	n (see configuration comm	ents)		
	EUT is connected to Foreign Networ	k 1 and is registered to its	Home Agent QE1		
	EUT is configured to perform route o	ptimization	-		
	QE4 is configured to perform route o	ptimization			

Step	Step Test Sequence		dict
		Pass	Fail
1	Cause QE4 to send an Echo Request message to the Home Address of EUT		
2	Check: does QE4 receive Echo Replies from EUT?	Yes	No
3	Wait a few seconds to ensure that EUT and QE4 have had time to complete the Return Routability Procedure		
4	Disconnect QE1 from the network		
5	Cause QE4 to send an Echo Request to the Home Address of EUT		
6	Check: does QE4 receive an Echo Reply from EUT?	Yes	No
Observations:	If the Mobile Node still manages to communicate with the Corresponding Node once the Home Agent is disconnected from the network, this shows that is using Route Optimization and hence that it managed to perform the Return Routability Procedure.		

11.6.2 Receiving Test Messages

Test Description					
Identifier:	TD_MOB_1724_01	Test Purpose:	TP_MOB_17	724_01	
Summary:	'Mobile Node falls back to tunnelling	f correspondent refuses	Route Optimiz	ation'	
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_1724				
<pre>with { EUT away_from_home and EUT registered to QE1 and EUT configured to perform route_optimization and QE4 configured not to perform Route_Optimization } ensure that { when { EUT receives a packet from QE4 indicating that a response is required } then { QE4 indicates receipt of the response from the EUT }</pre>					
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is connected to Foreign Network 1 and has registered to its Home Agent QE1 EUT is configured to perform route optimization OF4 is configured NOT to perform route optimization					
Step	Test Se	equence		Verd	lict
				Pass	Fail
1	Cause QE4 to send an Echo Reques	t to the Home Address of	f EUT		
2	Check: does QE4 receive an Echo R	eply from EUT?		Yes	No
Observations:	As QE4 is configured to refuse Route	Optimization, EUT can o	only fall back to	tunnelling.	

11.7.1 Sending Binding Updates To The Home Agent

	Test Des	scription	
Identifier:	TD_MOB_1727_01	Test Purpose:	TP_MOB_1727_01
Summary:	'Mobile Node registers its new primary	y Care-Of Address after c	hanging it'
Roles:	Mobile_Node	Configuration:	CF_MOB_03
References:	RQ_001_1727		
with { EUT away_f and EUT regi } ensure that { when { F and F then { QE4 i }	rom_home stered to QE1 CUT moves to another foreign_netr CUT receives a packet from QE4 indicating that a response is ndicates receipt of the response	work s required } e from the EUT }	
Pre-test conditions:	The cleaning procedure has been run EUT is connected to Foreign Network	(see configuration comme	ents) Home Agent QE1

Step	Test Sequence Ve		dict
		Pass	Fail
1	Move EUT to Foreign Network 2		
2	Cause QE4 to send an Echo Request to the Home Address of EUT		
3	Check: does QE4 receives an Echo Reply from EUT?	Yes	No
Observations:			

Test Description					
Identifier:	TD_MOB_1768_01	Test Purpose:	TP_MOB_1	768_01	
Summary:	'Mobile Node sends Binding Update b	efore expiry of the bind	ing lifetime'		
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3	
References:	RQ_001_1728, RQ_001_1768				
<pre>with { EUT away_from_home and EUT registered to QE1 and EUT able to communicate with QE4 } ensure that { when { QE4 (is requested to send a packet to the EUT</pre>					
Pre-test conditions:	The cleaning procedure has been run EUT is connected to Foreign Network	(see configuration comr 1 and registered to its H	nents) Iome Agent QI	≣1	
Step	Test Se	quence		Verd	dict
				Pass	Fail
1	Wait a period equal to the Binding Life	etime			
2	Cause QE4 to send an Echo Request	to the Home Address of	of EUT		
3	Check: does QE4 receive an Echo Re	ply from EUT?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_1733_01	Test Purpose:	TP_MOB_	1733_01	
Summary:	'Mobile Node sends Binding Upda	te messages to its Home Age	nt until it re	eceives a mato	hing
	Binding_Acknowledgement messa	age, before MAX_BINDACK_	TIMEOUT	seconds'	
Roles:	Mobile_Node	Configuration:	CF_MOB_	03	
References:	RQ_001_1733				
with { EUT at_hom					
and EUT conf	igured to have its Home_Agent	_address available			
	connected				
ensure that					
{ when { E	SUT moves to a foreign_networl	2			
and Q	2E1 is connected after 15 seco	onds			
,	~ MAX_BINDACK_TIMEOUT / 2				
} then ∫ ()F4 and FIIT are able to commu	nicate l			
	ter and bor are abre to commun	licate }			
,					
Pre-test conditions:	The cleaning procedure has been	run (see configuration comme	ents)		
	EUT is connected to Home Netwo	rk 1			
	EUT is aware of the address of its	Home Agent			
	QE1 is disconnected from Home	Network 1		•	
Step	Test	Sequence		Ver	dict
				Pass	Fail
1	Move EUT to Foreign Network 1				
2	Wait 20 seconds (EUT will try to b	ind to QE1)			
3	Connect QE1 to Home Network 1				
4	Wait a few seconds (to let EUTde-	register to QE1)			
5	Cause QE4 to send an Echo Requ	uest to the Home Address of	EUT		
6	Check: does QE4 receive an Echo	Reply from EUT?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_1734_01	Test Purpose:	TP_MOB_	1734_01	
Summary:	When Mobile Node knows several H	ome Agent (returned o	during DHAAD),	Mobile Node	tries to
	register with other Home Agents whe	n registration fails wit	h the first one'		
Roles:	Mobile_Node	Configuration:	CF_MOB_	06	
References:	RQ_001_1734				
with { EUT not co	nfigured to have its Home_Agent	_address available			
and QE1 conf	igured to have a Home_Agent_Pre	ference greater the	an QE2		
}					
when {	F1 is disconnected				
and E	UT moves to a foreign network }				
then { Q	E4 and EUT are able to communic	ate			
afte	r MAX_BINDACK_TIMEOUT				
}					
}					
Pre-test conditions:	The cleaning procedure has been run	(see configuration co	mments)		
	FUT is unaware the address of its Ho	me Agent	initionito)		
	QE2 is configured to serve as Home	Agent in the Home Ne	twork 1		
	QE1 is configured with a Home Agen	t Preference higher th	an QE2		
Step	Test Se	equence		Ver	dict
		•		Pass	Fail
1	Move EUT to Foreign Network 1				
2	Wait a few seconds				
3	Cause QE4 to send an Echo Reques	t to the Home Addres	s of EUT		
4	Check: does QE4 receive an Echo Re	eply from EUT?		No	Yes
5	Wait two minutes				
6	Cause QE4 to send an Echo Reques	t to the Home Addres	s of EUT		
7	Check: does QE4 receive an Echo R	eply from EUT?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_1740_01	Test Purpose:	TP_MOB_17	740_01	
Summary:	'Mobile Node attempts to register all	of its home addresses'	•		
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	References: RQ_001_1740				
<pre>with { EUT disconnected and EUT configured to have 2 home_addresses } ensure that { when { EUT is connected to a foreign_network and QE4 is requested to send a packet</pre>					
and QE4 then { Q and Q }	to the first home_address of EUT and QE4 is requested to send a packet indicating that a response is required to the second home_address of EUT } then { QE4 indicates receipt of the first response and QE4 indicates receipt of the second response } }				
Pre-test conditions:	The cleaning procedure has been rur EUT is connected to Home Network ⁴ EUT is configured to have two differe	n (see configuration comm 1 nt home addresses	ents)		
Step	Test Se	equence		Vero	dict
				Pass	Fail
1	Move EUT to Foreign Network 1				
2	Wait a few seconds (to let EUT regist	er to QE1)			
3	Cause QE4 to send an Echo Reques	t to the first home address	of EUT		
4	Check: does QE4 receive an Echo R	eply from EUT?		Yes	No
5	Cause QE4 to send an Echo Reques of EUT	t to EUT to the second hor	me address		
6	Check: does QE4 receive an Echo R	eply from EUT?		Yes	No
Observations:					

Test Description						
Identifier:	TD_MOB_1742_01	Test Purpose:	TP_MOB_17	42_01		
Summary:	Mobile Node does not attempt to use its home address if registration with Home Agent fails due to					
	DAD'			-		
Roles:	Mobile_Node, Mobile_Node	Configuration:	CF_MOB_03			
References:	RQ_001_1742, RQ_001_1742, RQ_0	01_1770				
with { QE3 configured	l to have the home_address of EU	г }				
ensure that						
{ when { EUT n	noves to a foreign_network }					
the r	egistering of EUT has failed					
then { EUT does	not use its Home_Address to co	mmunicate }				
}						
Pre-test conditions:	NOT TESTABLE BY INTEROPERAB	ILITY MEAN				
	It is not possible to control that Mobile	e Node doesn't use it	s Home Address			
Step	Test Se	quence		Ver	dict	
				Pass	Fail	
Observations:						

	Test Des	scription			
Identifier:	TD_MOB_1743_01	Test Purpose:	TP_MOB_174	43_01	
Summary:	'Mobile Node goes on registering hom	ne addresses when the re	egistration of or	ne of them f	iails'
Roles:	Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1743				
<pre>with { EUT discon and EUT conf and QE3 conf } ensure that { when { E and E and E }</pre>	nected Figured to have 2 home_addresses Figured to use the first home_add CUT is connected to a foreign_ner CUT receives a packet from QE4 containing a destination_add set to EUT home_address 2 and indicating that a response is DE4 indicates receipt of the resp	dress of EUT twork ress s required } ponse from the EUT }			
Pre-test conditions: Step	NOT TESTABLE BY INTEROPERAB You do not know how the Home Addr which failed is not the first or the last Test Se	ILITY MEAN esses are listed, so you c quence	can't guarantee	that the ac Vero	ldress dict
Observations:					

Test Description				
Identifier:	TD_MOB_1814_01 Test Purpose: TP_MOB_1814_01			
Summary:	ummary: 'Mobile Node sends Binding Update messages to its Home Agent until it receives a matching			
	Binding_Acknowledgement message, without time limit if it knows only one Home Agent			
Roles:	Mobile_Node	Configuration:	CF_MOB_03	
References:	RQ_001_1814			
with { EUT at_hom	ne			
and EUT conf	igured to have its Home_Agent_ad	ddress available		
and QE1 disc	connected			
}				
ensure that				
{ when { }	EUT moves to a foreign_network			
and Ç	El is connected after MAX_BIND	ACK_TIMEOUT		
and (2E4 is requested to send a packet	t to QE1	- >	
	indicating that	a response is requir	ed }	
then { Ç	2E4 indicates receipt of the resp	ponse }		
}				
Pre-test conditions:	The cleaning procedure has been run	(see configuration comm	nents)	
	ELIT is connected to Home Network 1	(See configuration confin		
	EUT is connected to nome Network i			
	EUT is aware of the address of its Ho	me Agent QE1		
	QE1 is disconnected			

Step	Step Test Sequence		Verdict	
		Pass	Fail	
1	Move EUT to Foreign Network 1			
2	Wait 2 minutes (more than MAX_BINDACK_TIMEOUT seconds)			
3	Connect QE1 to Home Network 1			
4	Wait a few seconds (to let EUT establish a binding with QE1)			
5	Cause QE4 to send an Echo Request to the home address of EUT			
6	Check: does QE4 receives an Echo reply from EUT?	Yes	No	
Observations:				

11.7.2 Correspondent registration

		Test Description			
Identifier:	TD_MOB_1744_01 Test Purpose: TP_MOB_1744_01				
Summary:	'Mobile Node updates its bir address'	Mobile Node updates its bindings with correspondent nodes after changing its primary care-of address'			
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3	
References:	RQ_001_1744				
and EUT regi and EUT havi } ensure that { when { F and (then { (<pre>and EUT registered to QE1 and EUT having established a binding to QE4 } nsure that { when { EUT moves to another foreign_network and QE4 is requested to send a packet to EUT indicating that a response is required } then { QE4 indicates receipt of the response from the EUT }</pre>				
Pre-test conditions:	e-test conditions: The cleaning procedure has been run (see configuration comments) EUT is connected to Foreign Network 1 and registered to its Home Agent QE1				
Step		Test Sequence		Ver	dict
		·		Pass	Fail
1	Move EUT to Foreign Netwo	ork 2			
2	Cause QE4 to send directly EUT	an Echo Request to the Hom	e Address of		
3	Check: does QE4 receive d	irectly an Echo Reply from EU	Τ?	Yes	No
Observations:					

	Test Des	scription			
Identifier:	TD_MOB_1753_01	Test Purpose:	TP_MOB_17	53_01	
Summary:	'Mobile Node is able to delete a binding with a correspondent node'				
Roles:	Mobile_Node	Configuration:	CF_MOB_03		
References:	RQ_001_1753				
<pre>with { EUT away_from_home and EUT registered to QE1 and EUT having established a binding with QE4 } ensure that { when { EUT returns home and QE4 is requested to send a packet to EUT indicating that a response is required }</pre>					
then {	E4 indicates receipt of the resp	ponse from the EUT}			
Pre-test conditions:	The cleaning procedure has been run EUT is connected to Foreign Network EUT having established a binding with	(see configuration comm 1 and registered to its Ho n QE4	ients) ome Agent QE	1	
Step	Test Se	quence		Vero	dict
				Pass	Fail
1	Move EUT to Home Network 1				
2	Cause QE4 to send an Echo Request	to the Home Address of	EUT		
3	Check: does QE4 receive an Echo Re	ply from EUT?		Yes	No
Observations:					

11.7.3 Receiving Binding Acknowledgements

Test Description					
Identifier:	TD_MOB_1768_01 Test Purpose: TP_MOB_1768_01				
Summary:	'Mobile Node sends Binding Update before expiry of the binding lifetime'				
Roles:	Mobile_Node C	Configuration:	CF_MOB_0	3	
References:	RQ_001_1728, RQ_001_1768				
with { EUT away_f	rom_home				
and EUT regi	stered to QE1				
and EUT able	to communicate with QE4				
}					
ensure that					
$\{ when \{ QE4 ($	is requested to send a packet to	the EUT			
	indicating that a response is req	quired)			
	after the binding_lifetime }				
then { QE4 i	ndicates receipt of the response	from the EUT }			
}					
-					
Pre-test conditions:	The cleaning procedure has been run (see configuration comme	ents)		
	EUT is connected to Foreign Network 1	and registered to its Ho	me Agent QI	Ξ1	
Step	Test Seq	uence		Verd	lict
				Pass	Fail
1	Wait a period equal to the Binding Lifeti	ime			
2	Cause QE4 to send an Echo Request to	o the Home Address of	EUT		
3	Check: does QE4 receive an Echo Rep	ly from EUT?		Yes	No
Observations:					

11.7.4 Receiving Binding Refresh Requests

	Test De	scription					
Identifier:	TD_MOB_1776_01	Test Purpose:	TP_MOB_17	776_01			
Summary:	'Mobile Node updates binding with co	orrespondent node upo	n receipt of a Bi	nding Refres	h Request'		
Roles:	Correspondent_Node	Configuration:	CF_MOB_04	4			
References:	RQ_001_1383, RQ_001_1776						
<pre>with { EUT away_: and EUT reg: and EUT hav: } ensure that { when { QE4 so then { QE4 an a: }</pre>	from_home istered to QE1 ing established a binding with Q ends a Binding_Refresh_Request } nd the EUT are able to communica fter the original binding_lifeti)E4 te directly me }					
Pre-test conditions:	NOT TESTABLE BY INTEROPERAN depending of the implementation to r	BILITY MEAN educe the handover					
Step	Test S	equence		Vere	dict		
				Pass	Fail		
Observations:							
Test Description							
-------------------------	----------------------------------	--------------------------	--	--	--	--	--
Identifier:	TD_MOB_1776_01	Test Purpose:	TP_MOB_1776_01				
Summary:	'Mobile Node updates binding wit	h correspondent node upo	n receipt of a Binding Refresh Request				
Roles:	Correspondent_Node	Configuration:	CF_MOB_04				
References:	RQ_001_1383, RQ_001_1776						
with { EUT away_f	From_home						
and EUT regi	stered to QE1						
and EUT have	ing established a binding wit	h QE4					
}							
ensure that							
$\{ when \{ QE4 set \}$	ends a Binding_Refresh_Reques	st }					
then { QE4 ar	nd the EUT are able to commun	icate directly					
af	ter the original binding_lif	etime }					
}							
Pre-test conditions:	NOT TESTABLE BY INTEROPE	RABILITY MEAN					
	depending of the implementation	to reduce the handover					
Step	Tes	t Sequence	Verdict				
			Pass Fail				
Observations:			· · ·				

4.1.3 TDs extracted from RFC 3776 "Using IPsec to Protect Mobile IPv6 Signalling Between Mobile Nodes and Home Agents"

4.1 Mandatory Support

	Test De	scription			
Identifier:	TD_MOB_2013_01	Test Purpose:	TP_MOB_20	013_01	
Summary:	'Mobile Node sends Binding Update	secured using transpor	t_mode_ESP to	its Home Age	ent'
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_2013, RQ_001_2031				
with { EUT config	gured to protect any Binding_Upd	ate to QE1			
	using transport_mode_ESF	•			
and QE1 conf	igured to accept only Binding_U	pdate secured			
1	using transport_mode_ESP	from EUT			
} ensure that					
{ when { a S	Security Association is establis	hed between EUT and	l OE1		
and E	TUT moves to a foreign_network }		~		
then { QE4 a	and EUT are able to communicate	}			
}					
B	I 	<i>. . .</i>	()		
Pre-test conditions:	The cleaning procedure has been rul	n (see configuration co	mments)		
	EUT is configured to protect Binding	Update sent to QE1 us	sing transport mo	de ESP	
	QE1 is configured to accept only Bind	ding Update protected	using transport m	node ESP fro	om EUT
	EUT is connected to Home Network	1			
Step	Test Se	equence		Verc	lict
				Pass	Fail
1	Move EUT to Foreign Network 1				
2	Wait a few seconds (to let EUT regis	ter to QE1)			
3	3 Cause QE4 to send an Echo Request to EUT				
4	Check: does QE4 receive an Echo R	eply from EUT?		Yes	No
Observations:					

		Test Description			
Identifier:	TD_MOB_2013_02	Test Purpose:	TP_MOB_20	013_02	
Summary:	'Home Agent sends Binding Node'	_Acknowledgement secured u	sing transport_mo	ode_ESP to a	a Mobile
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_2013, RQ_001_20)31			
<pre>with { EUT configured to protect any Binding_Acknowledgement to QE1</pre>					
Pre-test conditions:	ditions: The cleaning procedure has been run (see configuration comments) EUT is configured to protect Binding Acknowledgement sent to QE1 using transport mode ESP QE1 is configured to accept only Binding Acknowledgement protected using transport mode ESP from EUT				
Step		Test Sequence		Ver	dict
				Pass	Fail
1	Move QE1 to Foreign Netwo	ork 1			
2	Wait a few second (to let QB	E1 register to EUT)			
3	Cause QE4 to send an Eche	o Request to QE1			
4	Check: does QE4 receive a	n Echo Reply from QE1?		Yes	No
Observations:					

	Test Description				
Identifier:	TD_MOB_2016_01	Test Purpose:	TP_MOB_20	016_01	
Summary:	'Home Agent supports Mobile_Prefix_	Solicitation secured using	g transport_m	node_ESP'	
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_2016, RQ_001_2031				
<pre>with { QE1 configured to protect any Mobile_Prefix_Solicitation to EUT</pre>					
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is configured to protect Mobile Prefix Solicitation sent to EUT using transport mode ESP EUT is configured to accept only Mobile Prefix Solicitation protected using transport mode ESP from QE1 R1 is configured to have a valid prefix lifetime at 1 minute Optimized to accept only from bleme and prefix lifetime at 1 minute				
Step	Test Se	quence		Vero	lict
_		-		Pass	Fail
1	Wait a few minutes (to let the exchang	ge of MPA / MPS be carri	ed out)		
2	Cause QE4 send an Echo Request to	the Home Address of QE	1		
3	Check: does QE4 receive an Echo Re	eply from QE1?		Yes	No
Observations:		••			

	Test Des	scription				
Identifier:	TD_MOB_2016_02	Test Purpose:	TP_MOB_20	016_02		
Summary:	'Mobile Node supports Mobile_Prefix_	_Advertisement secured	l using transpo	rt_mode_ES	Ρ'	
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3		
References:	RQ_001_2016, RQ_001_2031					
with { QE1 config	gured to protect any Mobile_Pref.	ix_Advertisement to	EUT			
	using transport_mode_ESP					
and EUT con:	figured to accept only Mobile_Pr	efix_Advertisement				
	secured using transport	_mode_ESP from QE1				
and EUT away	y_trom_home					
and EUT reg	Istered to QEI figured to barro a profin lifetim	o of 1 minuto				
	rigured to have a prefix_fileting	e or i minute				
ensure that						
{ when { a Set	curity Association is established	d between EUT and OF	:1 }			
then { QE4 a	and EUT are able to communicate	after prefix_lifetir	ne }			
}			,			
Pre-test conditions:	The cleaning procedure has been run	(see configuration continuation continuation)	iments)			
	QE1 is configured to protect Mobile P	refix Advertisement ser	t to EUT using	transport mo	ode ESP	
	EUT is configured to accept only Mob	ile Prefix Advertisemen	t protected usin	g transport m	node ESP	
	from QE1					
	R1 is configured to have a valid prefix	lifetime at 1 minute				
	EUT is away from Home and register	ed to its Home Agent Q	E1			
Step	Step Test Sequence Verdict					
-		•		Pass	Fail	
1	Wait a few minutes (to let the exchar	ge of MPA / MPS be c	arried out)			
2	Cause QE4 send an Echo Request to	the Home Address of	EUT			
3	Check: does QE4 receive an Echo Re	eply from EUT?		Yes	No	
Observations:				•	•	

	Test Des	scription			
Identifier:	TD_MOB_2017_01	Test Purpose: TP	_MOB_20	17_01	
Summary:	'Mobile Node sends Mobile_Prefix_So	plicitation secured using trans	sport_mod	e_ESP to its	Home
	Agent'				
Roles:	Mobile_Node	Configuration: CF	_MOB_03	8	
References:	RQ_001_2017, RQ_001_2030				
with { EUT config	ured to protect any Mobile_Pref	ix_Solicitation to QE1			
	using transport_mode_ESP				
and QE1 conf	igured to accept only a Mobile_1	Prefix_Solicitation			
and OFE conf	secured using transport_	node_ESP from EUT			
and <u>FIT</u> away	from home	e of i minute			
and EUT regi	stered to OE1				
}	<u>x</u>				
ensure that					
{ when { a Sec	urity_Association is established	d between EUT and QE1 }			
then { QE4 a	and EUT are able to communicate a	after prefix_lifetime }			
}					
Pro tost conditions:	The cleaning procedure has been run	(and configuration commented			
Pre-lest conditions.	The cleaning procedure has been run	(See configuration comments	o) Joing trop	nort mode F	-00
	EUT is configured to protect Mobile P	ile Drefix Calisitation protocta	using trans	spon mode e	
	IGET is configured to accept only Mob	lie Prefix Solicitation protecte	ea using th	ansport mod	e ESP
	ITOM EUT	life time a set A verificants			
	R1 is configured to have a valid prefix				
	EUT is away from Home and register	ed to its Home Agent QE1			
Step	lest Se	quence	-	Verd	
				Pass	Fail
1	Wait a few more one minute (to let the	e exchange of MPA / MPS be	e carried		
	out)				
2	Cause QE4 to send an Echo Request	to the Home Address of EUT			
3	Check: does QE4 receive an Echo Re	ply from EUT?		Yes	No
Observations:					

Test Description						
Identifier:	TD_MOB_2017_02	Test Purpose:	TP_MOB_20)17_02		
Summary:	'Home Agent sends Mobile_Prefix_A	dvertisement secured usin	g transport_r	node_ESP'		
Roles:	Home_Agent	Configuration:	CF_MOB_02	2		
References:	RQ_001_2017, RQ_001_2030					
<pre>with { EUT configured to protect any Mobile_Prefix_Advertisement to QE1</pre>						
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is configured to protect Mobile Prefix Advertisement sent to QE1 using transport mode ESP QE1 is configured to accept only Mobile Prefix Advertisement protected using transport mode ESP from EUT R1 is configured to have a valid prefix lifetime at 1 minute OE1 is current from Light					
Step	Test S	equence		Vero	dict	
				Pass	Fail	
1	Wait a few more one minute (to let th out)	ne exchange of MPA / MPS	be carried			
2	Cause QE4 to send an Echo Reques	st to the Home Address of C	QE1			
3	Check: does QE4 receive an Echo R	teply from QE1?		Yes	No	
Observations:						

	Ta at Da				
	lest Des	scription	1		
Identifier:	TD_MOB_2018_01	Test Purpose:	TP_MOB_20	018_01	
Summary:	'Mobile Node sends payload_packet	tunnelled to its Home Age	nt secured us	ing tunnel_m	ode_ESP'
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_2018				
<pre>with { EUT config and QE1 conf and EUT conf and EUT away and EUT regi } ensure that { when { and E } then { QE4 a }</pre>	ured to protect any payload_pac using tunnel_mode_ESP igured to accept only a payload using tunnel_mode_ESP fr igured not to perform Route_Opt _from_home stered to QE1 a Security_Association is estab UT moves to a foreign_network nd EUT are able to communicate	ket to QE1 _packet secured om EUT imization lished between EUT and }	ł QE1		
Pre-test conditions:	The cleaning procedure has been rur EUT is configured to protect payload QE1 is configured to accept only payl EUT configured not to perform Route EUT is away from home and register	n (see configuration comm packets sent to QE1 using load packets protected usi Optimization ed to its Home Agent QE1	ents) g tunnel mode ng tunnel mod	e ESP de ESP from	EUT
Step	Step Test Sequence Verdict				
		-		Pass	Fail
1	Cause QE4 to send an Echo Reques	t to the Home Address of	EUT		
2	Check: does QE4 receive an Echo R	eply from EUT?		Yes	No
Observations:				•	

		Test Description			
Identifier:	TD_MOB_2018_02	Test Purpose:	TP_MOB_20)18_02	
Summary:	'Home Agent sends payload	_packet tunnelled to Mobile No	ode secured using	tunnel_mod	le_ESP'
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_2018				
with { EUT config and QE1 con and QE1 con and QE1 away and QE1 reg } ensure that { when { a and then { QE4 } }	gured to protect any payl using tunnel_mode figured to accept only a using tunnel_mode figured not to perform Rc y_from_home istered to EUT Security_Association is e QE1 moves to a foreign_ne and QE1 are able to commu	<pre>load_packet to QE1 e_ESP payload_packet secured e_ESP from EUT bute_Optimization established between EUT an etwork } unicate }</pre>	nd QE1		
Pre-test conditions:	The cleaning procedure has EUT is configured to protect QE1 is configured to accept QE1 configured not to perfor QE1 is away from home and	been run (see configuration co payload packets sent to QE1 only payload packets protecter rm Route Optimization registered to its Home Agent Test Sequence	omments) using tunnel mode d using tunnel mod EUT	ESP de ESP from Ver	dict
1	Course OE4 to sound on Fahr	Poquest to the Home Addres	a of the OE1	rass	Fall
1		Febe Deply from OF12		Vee	Na
2	Uneck: does QE4 receive ar	ECTIO REPLY FROM QE1?		res	INO

	Test De	scription			
Identifier:	er: TD_MOB_2018_03 Test Purpose: TP_MOB_2018_03				
Summary:	'Mobile Node supports payload_pack	ket secured using tunr	nel_mode_ESP'		
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3	
References:	RQ_001_2018				
<pre>with { QE1 configured to protect any payload_packet to EUT</pre>					
Pre-test conditions:	The cleaning procedure has been ru QE1 is configured to protect payload EUT is configured to accept only pay EUT configured not to perform Route EUT is away from home and register Test S	n (see configuration co packets sent to EUT of load packets protected Optimization red to its Home Agent equence	omments) using tunnel mode d using tunnel mo QE1	e ESP de ESP from Vero	QE1
1	Cause QE4 to send an Echo Reques	st to the Home Addres	s of FUT	F 855	T all
2	Check: does QE4 receive an Echo R	eply from FUT?		Ves	No
Observations:				105	

	Tes	st Description			
Identifier:	TD_MOB_2018_04	Test Purpose:	TP_MOB_2	018_04	
Summary:	'Home Agent supports payload_	packet tunnelled from Mob	ile Node and sec	ured using	
	tunnel_mode_ESP'				
Roles:	Home_Agent	Configuration:	CF_MOB_0	2	
References:	RQ_001_2018				
<pre>with { QE1 configured to protect any payload_packet to EUT</pre>					
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is configured to protect payload packets sent to EUT using tunnel mode ESP EUT is configured to accept only payload packets protected using tunnel mode ESP from QE1 QE1 configured not to perform Route Optimization QE1 is away from home and registered to its Home Agent EUT				QE1	
Step Test Sequence Ver				Verd	lict
				Pass	Fail
1	Cause QE4 to send an Echo Re	equest to the Home Addres	s of QE1		
2	Check: does QE4 receive an Ec	ho Reply from QE1?		Yes	No
Observations:					

	T. (D.				
	lest Des	scription			
Identifier:	TD_MOB_2019_01	Test Purpose: IP_MOB_2019_01			
Summary:	'Mobile Node supports multicast grou	p membership control pa	ckets tunnelle	d from its Ho	me Agent
	protected by ESP with the tunnel mod	de'			
Roles:	Mobile_Node	Configuration:	CF_MOB_0	3	
References:	RQ_001_2019				
with {	ured to protect any				
	multicast_group_membersh	ip_control_packet to	EUT		
	using tunnel_mode_ESP				
and EUT conf	igured to accept only a				
	multicast_group_membersh	ip_control_packet irc = FSD	om QE1		
and EUT conf	igured to subscribed to a globa	l multicast group			
and EUT away	from home				
and EUT regi	stered to QE1				
}					
ensure that					
$\{ when \{ QE3 s \}$	ends a packet to the global_mul	ticast_group			
	indicating that a	response is required	1 }		
then { QE3 i	ndicates receipt of the respons	e }			
}					
Dre test conditions:			n a nta \		
Pre-test conditions:	The cleaning procedure has been fur	(see configuration com	nents)		
	QET is configured to secured multica	st group membership cor	itrol packets tu	innelled to E	JI DY ESP
	with tunnel mode				
	EUT is configured to accept only prot	ected multicast group me	embership con	trol packets t	unnelled
	from QE1 by ESP with tunnel mode				
	EUT is configured to subscribed to a	multicast group MG1 with	n a global scop	e	
	EUT away from home and registered to its Home Agent QE1				
Step Test Sequence Verdict					dict
				Pass	Fail
1	Cause QE3 to send an Echo Reques	t to the Address of multic	ast group		
	MG1		.		
2	Check: does QE3 receive an Echo R	eply from EUT?		Yes	No
Observations:		· ·		-	

Test Description					
Identifier:	TD_MOB_2019_02	Test Purpose:	TP_MOB_20	019_02	
Summary:	Home Agent supports multicast grou	up membership control	packets tunnelled	d from Mobile	e Node
	protected by ESP with the tunnel mo	de'			
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_2019				
<pre>with { QE1 config and EUT conf and QE1 conf and QE1 away and QE1 regi } ensure that { when { EUT s then { QE3 i }</pre>	<pre>gured to protect any</pre>	hip_control_packet f hip_control_packet f ESP al_multicast_group tticast_group a response is reques se }	to EUT From QE1 sted }		
Pre-test conditions:	The cleaning procedure has been ru QE1 is configured to secured multica with tunnel mode EUT is configured to accept only pro from QE1 by ESP with tunnel mode QE1 is configured to subscribed to a QE1 away from home and registered	n (see configuration co ast group membership o tected multicast group multicast group MG1 v t to its Home Agent EU	mments) control packets tu membership cont vith a global scop T	innelled to El trol packets ti be	UT by ESP unnelled
Step Test Sequence Verdict				dict	
-		•		Pass	Fail
1	Cause QE3 to send an Echo Reques	st to the Address of mu	lticast group		
2	Check: does QE3 receive an Echo R	eply from QE1?		Yes	No
Observations:					

4.2 Policy Requirements

		Test Description	
Identifier:	TD_MOB_2026_01	Test Purpose:	TP_MOB_2026_01
Summary:	When Mobile Node return	s home and is configured with m	anually established Security
_	Associations, it makes ina	ctive security policies concerning	g tunnelled traffic with Home Agent
	without deleting Security	Associations'	
Roles:	Mobile_Node	Configuration:	CF_MOB_03
References:	RQ_001_2026	·	
with { EUT conf	igured 'with manually es	tablished Security Associat	ions
	and Policies'		
and EUT co	nfigured to protect pack	ets to QE1	
	using tunnel_mo	de_ESP	
and QE1 co:	nfigured to accept only	a packets secured	
	using tunnel_mo	de_ESP	
and EUT co	nfigured not to perform	Route_Optimization	
and EUT aw	ay_from_home		
and EUT re	gistered to QE1		
}			
ensure that			
{ when {	EUT moves to another	foreign_network	
ait	er EUT returns nome }		
then {	QE4 and EUT are able	to communicate }	
}			
Pre-test conditions:	The cleaning procedure b	as been run (see configuration of	omments)
Tre-test conditions.	ELIT is configured with ms	as been full (see configuration co	visitions and Policies
		inually established Security Asso	
		re packets tunnelled to QE1 USIN	
	QE1 is configured to acce	pt only packets protected using t	unnel mode ESP.
	EUT is configured not to p	erform Route Optimization.	
	EUT is away from home a	nd has registered to its Home Ag	jent QE1.

Test Description					
Identifier:	TD_MOB_2026_02	Test Purpose:	TP_MOB_20)26_02	
Summary:	When Mobile Node returns home and	is configured with m	anually establishe	ed Security	
	Associations, Home Agent makes inac	tive security policies	s concerning tunne	elled traffic w	ith Mobile
	Node without deleting Security Associ	ations			
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_2026	-			
with { EUT config	ured 'with manually established	Security Associat	ions		
and EUT conf	igured to protect packets to OE1				
	using tunnel_mode_ESP				
and QE1 conf	igured to accept only a packets	secured			
and OE1 conf	igured not to perform Route Optin	mization			
and QE1 away					
and QE1 regi	stered to EUT				
}					
ensure that	OF1 moved to enother foreign no	twork			
after	OE1 returns home }	CWOIK			
then {	QE4 is able to communicate with	QE1 }			
}		-			
	I <u></u>	/ //			
Pre-test conditions:	The cleaning procedure has been run	(see configuration co	omments		
	EUT is configured with manually estab	isned Security Asso	clations and Polic	les	
	EOT is configured to secure packets it		y lunnel mode ES	P	
	OE1 is configured to accept only pack	e Ontimization			
	OF1 is away from home and has regis	tered to its Home An	ent FLIT		
Step	Test Sec	uence		Vero	lict
0.06		1		Pass	Fail
1	Move QE1 to Home Network 1				
2	Wait a few seconds				
3	Move QE1 to Foreign Network 1				
4	Cause QE4 to send an Echo Request	to QE1			
5	Check: does QE4 receive an Echo Re	ply?		Yes	No
Observations:					

Identifier: TD_MOB_2017_01 Test Purpose: TF	P_MOB_2017_01	
Summary: 'Mobile Node sends Mobile_Prefix_Solicitation secured using tran	sport_mode_ESP to i	ts Home
Agent'		
Roles: Mobile_Node Configuration: CI	F_MOB_03	
References: RQ_001_2017, RQ_001_2030		
with { EUT configured to protect any Mobile_Prefix_Solicitation to QE1		
using transport_mode_ESP		
and QEI configured to accept only a Mobile_Prefix_Solicitation		
and OF6 configured to have a prefix lifetime of 1 minute		
and EUT away from home		
and EUT registered to QE1		
}		
ensure that		
{ when { a Security_Association is established between EUT and QE1 }		
then { QE4 and EUT are able to communicate after prefix_lifetime }		
}		
Pre-test conditions: The cleaning procedure has been run (see configuration comment	s)	
FILT is configured to protect Mobile Prefix Solicitation sent to OF1	using transport mode	ESP
OF Lis configured to accent only Mobile Prefix Solicitation, protect	ed using transport mode	do FSP
from FLIT	cu using nansport me	
R1 is configured to have a valid prefix lifetime at 1 minute		
FUT is away from Home and registered to its Home Agent OF1		
Sten Test Sequence	Ve	rdict
	Pass	Fail
1 Wait a few more one minute (to let the exchange of MPA / MPS h	e carried	1 an
	o damoa	
2 Cause QE4 to send an Echo Request to the Home Address of EU	T	
3 Check: does QE4 receive an Echo Reply from EUT?	Yes	No
Observations:		

Test Description					
Identifier:	TD_MOB_2017_02	Test Purpose:	TP_MOB_20)17_02	
Summary:	'Home Agent sends Mobile_Prefix_Ac	Ivertisement secured usin	g transport_r	node_ESP'	
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_2017, RQ_001_2030				
with { EUT config	with { EUT configured to protect any Mobile_Prefix_Advertisement to QE1				
using transport_mode_ESP					
and QE1 conf	igured to accept only a Mobile_H	Prefix_Advertisement			
	secured using transport_	_mode_ESP from EUT			
and QEI away	stored to FUT				
and OF6 conf	igured to have a prefix lifetime	of 1 minute			
	igarea co nave a prerix_rifeeime				
ensure that					
{ when { a Sec	urity_Association is established	l between EUT and QE1	}		
then { QE4 i	s able to communicate with QE1 a	after prefix_lifetime	}		
}					
-	I				
Pre-test conditions:	The cleaning procedure has been run	(see configuration comme	ents)		
	EUT is configured to protect Mobile P	refix Advertisement sent to	o QE1 using t	ransport mod	de ESP
	QE1 is configured to accept only Mob	ile Prefix Advertisement pr	otected using	g transport m	ode ESP
	from EUT				
	R1 is configured to have a valid prefix	lifetime at 1 minute			
	QE1 is away from Home and registere	ed to its Home Agent EUT			
Step	Test Se	quence		Vero	dict
				Pass	Fail
1	Wait a few more one minute (to let the	e exchange of MPA / MPS	be carried		
	out)				
2	Cause QE4 to send an Echo Request	to the Home Address of C	QE1		
3	Check: does QE4 receive an Echo Re	ply from QE1?		Yes	No
Observations:					

4.3

	Test Description				
Identifier:	TD_MOB_2013_01	Test Purpose:	TP_MOB_20	013_01	
Summary:	'Mobile Node sends Binding	Update secured using transp	ort_mode_ESP to	its Home Ag	jent'
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_2013, RQ_001_20	31			
with { EUT conf: and QE1 con	with { EUT configured to protect any Binding_Update to QE1 using transport_mode_ESP and QE1 configured to accept only Binding_Update secured using transport mode ESP from EUT				
<pre>} ensure that { when { a and then { QE4 }</pre>	<pre> } ensure that { when { a Security_Association is established between EUT and QE1</pre>				
Pre-test conditions:	Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is configured to protect Binding Update sent to QE1 using transport mode ESP QE1 is configured to accept only Binding Update protected using transport mode ESP from EUT				om EUT
Step		Test Sequence		Ver	dict
				Pass	Fail
1	Move EUT to Foreign Netwo	ork 1			
2	Wait a few seconds (to let E	UT register to QE1)			
3	Cause QE4 to send an Echo	Request to EUT			
4	Check: does QE4 receive ar	n Echo Reply from EUT?		Yes	No
Observations:					

	Test Description				
Identifier:	TD_MOB_2013_02	Test Purpose:	TP_MOB_20	013_02	
Summary:	'Home Agent sends Binding_Acknowl	ledgement secured ι	using transport_mo	ode_ESP to a	a Mobile
	Node'				
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_2013, RQ_001_2031				
<pre>with { EUT configured to protect any Binding_Acknowledgement to QE1</pre>					
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is configured to protect Binding Acknowledgement sent to QE1 using transport mode ESP QE1 is configured to accept only Binding Acknowledgement protected using transport mode ESP from EUT OE1 is connected to Home Network 1				e ESP de ESP	
Step	Test Se	equence		Vero	dict
-		-		Pass	Fail
1	Move QE1 to Foreign Network 1				
2	Wait a few second (to let QE1 registe	r to EUT)			
3	Cause QE4 to send an Echo Request	t to QE1			
4	Check: does QE4 receive an Echo Re	eply from QE1?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_2016_01	Test Purpose:	TP_MOB_20	016_01	
Summary:	'Home Agent supports Mobile_Prefix	_Solicitation secured usi	ng transport_m	node_ESP'	
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_2016, RQ_001_2031				
<pre>with { QE1 config and EUT config and QE6 con and QE1 away and QE1 reg: } ensure that { when { a Sec then { QE4 : }</pre>	gured to protect any Mobile_Pref using transport_mode_ESP figured to accept only a Mobile_ using transport_mode_ESP nfigured to have a prefix_lifeti y_from_home istered to EUT curity_Association is establishe is able to communicate with QE1	<pre>ix_Solicitation to ET Prefix_Solicitation s from QE1 me of 1 minute d between EUT and QE2 after the prefix_life</pre>	JT secured L } etime }		
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is configured to protect Mobile Prefix Solicitation sent to EUT using transport mode ESP EUT is configured to accept only Mobile Prefix Solicitation protected using transport mode ESP from QE1 R1 is configured to have a valid prefix lifetime at 1 minute QE1 is away from Home and registered to its Home Agent FUT					ESP ≩ ESP from
Step	Test Sequence Verdict				
				Pass	Fail
1	Wait a few minutes (to let the exchan	ge of MPA / MPS be car	ried out)		
2	Cause QE4 send an Echo Request to	the Home Address of Q	E1		
3	Check: does QE4 receive an Echo R	eply from QE1?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_2016_02	Test Purpose: TP_MOB	3_2016_02		
Summary:	'Mobile Node supports Mobile_Prefix_	_Advertisement secured using tran	sport_mode_ES	P'	
Roles:	Mobile_Node	Configuration: CF_MO	B_03		
References:	RQ_001_2016, RQ_001_2031				
with {	ured to protect any Mobile_Pref.	ix_Advertisement to EUT			
	using transport_mode_ESP				
and EUT conf	igured to accept only Mobile_Pr	efix_Advertisement			
	secured using transport	_mode_ESP from QE1			
and EUT regi	stered to OE1				
and OE6 conf	igured to have a prefix lifetime	e of 1 minute			
}	5				
ensure that					
{ when { a Sec	urity_Association is established	d between EUT and QE1 }			
then { QE4 a	nd EUT are able to communicate a	after prefix_lifetime }			
}					
Pre-test conditions:	The cleaning procedure has been run	(see configuration comments)			
	OF1 is configured to protect Mobile P	refix Advertisement sent to FLIT us	ing transport mo	de ESP	
	ELIT is configured to accept only Moh	ile Prefix Advertisement protected	using transport ne	nde ESP	
	from OF1		doing transport in		
	R1 is configured to have a valid prefix	lifetime at 1 minute			
	FLIT is away from Home and register	ed to its Home Agent OE1			
Sten	Stan Stan Vordiat				
otop		queille	Pass	Fail	
1	Wait a few minutes (to let the exchan	ge of MPA / MPS be carried out)	1 400	- un	
2	Cause OE4 send an Echo Request to	the Home Address of ELIT			
2	Cause QE4 seriu ari Ecrito Request lu		No.	NI-	
3	Check: does QE4 receive an Echo Re	PPIY from EUT?	Yes	NO	
Observations:					

Test Description					
Identifier:	TD_MOB_2014_01	Test Purpose:	TP_MOB_20	014_01	
Summary:	'Home Agent supports Home Test Ini	t secured using tunnel_m	ode_ESP'		
Roles:	Home_Agent	Configuration:	CF_MOB_02	2	
References:	RQ_001_1571, RQ_001_2034, RQ_0	001_2035			
<pre>with { QE1 configured to protect any Home_Test_Init to EUT</pre>					
ensure that { when { a s and Q then { QE4 a }	<pre>ensure that { when { a Security_Association is established between EUT and QE1</pre>				
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is configured to protect Home Test Init sent to EUT using tunnel mode ESP EUT is configured to accept only Home Test Init protected using tunnel mode ESP from QE1 QE1 configured to perform Route Optimization QE4 configured to perform Route Optimization QE4 configured to perform Route Optimization				₽E1	
Step	Test Se	equence		Verc	lict
				Pass	Fail
1	Cause QE4 to send an Echo Reques	t to the Home Address of	QE1		
2	Wait a few second (to let QE1 registe	r to QE4)			
3	Disconnect EUT from Home Network	1			
4	Cause QE4 to send an Echo Reques	t to the Home Address of	QE1		
5	Check: does QE4 receive an Echo Ro	eply from QE1?		Yes	No
Observations:					

	Test Description				
Identifier:	TD_MOB_2014_02	Test Purpose:	TP_MOB_20	014_02	
Summary:	'Mobile Node supports Home Test se	cured using tunnel_mode	ESP'		
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_2034, RQ_001_2035				
<pre>with { QE1 configured to protect any Home_Test to EUT</pre>					
Pre-test conditions: The cleaning procedure has been run (see configuration comments) QE1 is configured to protect Home Test sent to EUT using tunnel mode ESP EUT is configured to accept only Home Test protected using tunnel mode ESP from QE1 EUT configured to perform Route Optimization QE4 configured to perform Route Optimization EUT is away from Home and has registered to its Home Agent QE1					
Step	Test Se	quence		Verc	lict
				Pass	Fail
1	Cause QE4 to send an Echo Reques	t to the Home Address of	EUT		
2	Wait a few second (to let EUT registe	r to QE4)			
3	Disconnect QE1 from Home Network				
4	Cause QE4 to send an Echo Reques	t to the Home Address of	EUT		
5	Check: does QE4 receive an Echo Re	eply from EUT?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_2015_01	Test Purpose:	TP_MOB_20	015_01	
Summary:	'Mobile Node sends Home Test Init	secured using tunnel_m	ode_ESP to its I	Home Agent	
Roles:	Mobile_Node	Configuration:	CF_MOB_03	3	
References:	RQ_001_2034				
<pre>with { EUT configured to protect any Home_Test_Init to QE1</pre>					
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is configured to protect Home Test Init sent to QE1 using tunnel mode ESP QE1 is configured to accept only Home Test Init protected using tunnel mode ESP from EUT EUT configured to perform Route Optimization QE4 configured to perform Route Optimization EUT is away from Home and registered to its Home Agent QE1					
Step	Test Sequence		Verdict		
				Pass	Fail
1	Cause QE4 to send an Echo Reque	st to the Home Address	to EUT		
2	Wait a few second (to let QE4 regist	er to EUT)			
3	Disconnect QE1 from Home Networ	k 1			
4	Cause QE4 to send an Echo Reque	st to the Home Address	to EUT		
5	Check: does QE4 receive an Echo F	Reply from EUT?		Yes	No
Observations:					

Test Description					
Identifier:	TD_MOB_2015_02	Test Purpose:	TP_MOB_2015_02		
Summary:	'Home Agent sends Home Test secured using tunnel_mode_ESP'				
Roles:	Home_Agent	Configuration:	CF_MOB_02		
References:	RQ_001_2034				
<pre>with { EUT configured to protect any Home_Test to QE1</pre>					
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is configured to protect Home Test sent to QE1 using tunnel mode ESP QE1 is configured to accept only Home Test protected using tunnel mode ESP from EUT QE1 configured to perform Route Optimization QE4 configured to perform Route Optimization QE1 is away from Home and registered to be home Agent EUT					
Step	Test Sequence			Verdict	
		4		Pass	Fail
1	Cause QE4 to send an Echo Reques	t to the Home Address of (QE1		
2	2 Wait a few second (to let QE4 register to QE1)				
3	Disconnect EUT from Home Network	1	1		
4	Cause QE4 to send an Echo Reques	t to the Home Address of (QE1		
5	Check: does QE4 receive an Echo Ro	eply from QE4?		Yes	No
Observations:			•		

Test Description						
Identifier:	TD_MOB_2039_01	Test Purpose:	TP_MOB_2039_01			
Summary:	Home Agent update its security association entries when the Mobile Node change of foreign					
	network'					
Roles:	Home_Agent	Configuration:	CF_MOB_02	2		
References:	RQ_001_2039					
<pre>with { EUT configured to protect any Binding_Acknowledgement to QE1</pre>						
Pre-test conditions: The cleaning procedure has been run (see configuration comments) EUT is configured to secure Binding Acknowledgement using ESP transport mode QE1 is configured to accept only Binding Acknowledgement protected by ESP transport mode QE1 is connected to Foreign Network 1 and has registered to its Home Agent EUT						
Step	Test Sequence		Verdict			
				Pass	Fail	
1	Move QE1 to Foreign Network 2					
2	Cause QE4 to send an Echo Reques	t to QE1				
3	Check: does QE4 receive an Echo R	eply?		Yes	No	
Observations:						

Test Description						
Identifier:	TD_MOB_2040_01	Test Purpose:	TP_MOB_20	040_01		
Summary:	Home Agent does not take into account a Binding Update not secured					
Roles:	Home_Agent	Configuration:	CF_MOB_02	2		
References:	RQ_001_2040					
<pre>with { and but configured to accept only a Binding_opdate</pre>						
Pre-test conditions:	The cleaning procedure has been run (see configuration comments) EUT is configured to accept only Binding Update protected by ESP with transport mode QE1 is configured to send unprotected Binding Update					
Step	Test Sequence		Verdict			
				Pass	Fail	
1	Move QE1 to Foreign Network 1					
2	Cause QE4 to send an Echo Reques	t to QE1				
3	Check: does QE4 receive an Echo R	eply?		No	Yes	
Observations:						

Annex A (informative): Interoperability Testing Configurations

The following architectural configurations are referenced in the IPv6 *Mobility* Interoperability Test Descriptions specified in the present document. They are intended to give a general rather than specific view of the possible roles of the EUT and its associated QE(s) and the relationships between them.

The CF_Mob-Basic_01 configuration is not referenced in any of the Test Description, however all other configurations are subset of the architecture described in CF_Mob-Basic_01. Hence, replicating CF_Mob-Basic_01 in a test bed will save a lot of time to a tester willing to test all the Test Descriptions of the present document.







Figure A.2: CF_MOB_02











Figure A.5: CF_MOB_05



Figure A.6: CF_MOB_06





Figure A.7: CF_MOB_07



Figure A.8: CF_MOB_08

Annex B (informative): IPv6 Interoperability Test Purposes

The Test Suite Structure is based on the IPv6 Mobility RFCs and the IPv6 Requirements Catalogue nodes. It is defined by the groups within the following TPLan specification of test purposes. The numbering is not contiguous so that new TPs can be added at a later date without the need to completely renumber the TSS groups.

```
TSS
        : MOB
Title
       : 'IOP - Mobility'
Version : 1.0.0
Date : 29.11.2006
Author : 'STF276 - Task 4'
-- Last $Rev: 430 $
-- Last $Author: vreck $
-- $Date: 2007-03-15 16:25:18 +0100 (Thu, 15 Mar 2007) $
--***Cross references***
xref RQ_001 {RFC3775,
             RFC3776 }
xref CF_MOB_02 {Configs_IOP_SEC.pdf}
                {Configs_IOP_SEC.pdf
xref CF_MOB_03
xref CF_MOB_04 {Configs_IOP_SEC.pdf}
xref CF_MOB_05 {Configs_IOP_SEC.pdf
xref CF_MOB_06 {Configs_IOP_SEC.pdf
xref CF_MOB_07 {Configs_IOP_SEC.pdf}
--**Definitions***
-- Entities
---- Primary Configuration entities
def entity EUT
def entity QE1
def entity QE2
def entity QE3
def entity QE4
def entity QE5
def entity QE6
def entity QE7
def entity QE8
---- Supplementary entities
def entity binding
def entity Binding_Cache_entry
def entity default_router
def entity foreign_network
def entity global_multicast_group
def entity home
def entity home_network
def entity link_local_multicast_group
def entity Neighbor_Discovery_cache_entry
def entity network
def entity organization_local_multicast_group
def entity Security_Association
def entity Security_Policy
def entity transport_connection
 - Messages
def event Binding_Acknowledgement
def event Binding_Refresh_Request
def event Binding_Update
         { Home_Address,
           Home_Address_Destination_Option }
def event Home_Test
def event Home_Test_Init
def event Mobile_Prefix_Advertisements {Mobile_Prefix_Advertisement}
def event Mobile_Prefix_Solicitations {Mobile_Prefix_Solicitation}
def event multicast_group_membership_control_packet
def event packets {packet}
```

def event payload_packet def event return_routability_packets -- Procedures def event IKEv2 def event multicast_data_packet_forwarding def event route_optimization -- Values def value accept def value binding_lifetime def value care_of_address def value ESP def value ethernet_address def value global_address def value global_addresses def value home_address def value home_addresses def value Home_Agent_address def value Home_Agent_Preference def value Interface_ID def value IP_address def value IPsec def value lifetime def value link_local_address def value MAX_BINDACK_TIMEOUT def value MAX_RR_BINDING_LIFETIME def value on_link def value packet {Authentication_Header, destination_address, ESP_Header, Home_Address_Option, sequence_number, source_address} def value prefix def value prefix_lifetime def value transport_mode_ESP def value tunnel_mode_ESP -- Units def unit minute def unit seconds -- Conditions def condition at_home def condition available def condition away_from_home def condition connected def context {~connected [to]} def condition configured def condition disconnected def context {~disconnected [from]} def condition registered def context {~registered to} def condition required def condition subscribed def context {~subscribed to} def condition unreachable def context {~unreachable from} -- Keywords - Preconditions def word communication def word established def word implement def word perform def word protect def word use -- Keywords - Stimuli def word advertizing def word communicate def word configure def word detects def word expired def word generates def word modify def word moves def word reboot

def word registers def word requested def context {is ~requested to} def context { is ~requested to ~configure }
def context { is ~requested to ~modify} def word returns def context {~returns ~home} def word send def context {is requested to ~send} def word set def context {~set to} def word starts def context {~starts advertizing} def word stops def context {~stops advertizing} def word support -- Keywords - Responses def word accepts def word deletes def word discards def word establishes def word expires def word implemented def word indicate def word indicates def word only def word receipt def context {~indicates ~receipt of} def word response def context {sends no ~response} def word secured def word updates def word using - Keywords - Glue def word able def word another def word any def word are def word at def word between def word by def word directly def word does def word even def word first def word for def word greater def word have def word having def word its def word least def word more def word new def word offered def word old def word on def word original def word own def context {~its ~own} def word previously def word same def word second def word short def word than def word unable def word used

TP id : TP_MOB_1724_01

summary : 'Mobile Node falls back to tunnelling if correspondent refuses Route Optimization' **RQ ref** : RQ_001_1724 : Mobile_Node Role config : CF_MOB_03 **TD ref** : TD_MOB_1724_01 EUT away_from_home with { and EUT registered to QE1 and EUT configured to perform route_optimization and QE4 configured not to perform Route_Optimization } ensure that { when { EUT receives a packet from QE4 indicating that a response is required } then { QE4 indicates receipt of the response from the EUT } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1744_01 summary : 'Mobile Node updates its bindings with correspondent nodes after changing its primary care-of address' **RQ ref** : RQ_001_1744 : Mobile Node Role config : CF_MOB_03 **TD ref** : TD_MOB_1744_01 EUT away_from_home with { and EUT registered to QE1 and EUT having established a binding to QE4 } ensure that $\{ \text{ when } \{$ EUT moves to another foreign_network and QE4 is requested to send a packet to EUT indicating that a response is required } then { QE4 indicates receipt of the response from the EUT } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1457_01 summary : 'Correspondent Node creates a new entry in its binding cache when receiving a valid Binding Update' **RQ ref** : RQ_001_1457 Role : Correspondent_Node config : CF MOB 04 **TD ref** : TD_MOB_1457_01 with { QE4 away_from_home and QE4 registered to QE1 and QE4 configured to perform route_optimization and EUT configured to perform route_optimization ensure that { when { EUT receives a packet from QE4 indicating that a response is required } then { EUT sends response directly to QE4 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1753_01 summary : 'Mobile Node is able to delete a binding with a correspondent node' **RQ ref** : RQ_001_1753 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_1753_01 with { EUT away_from_home and EUT registered to QE1 and EUT having established a binding with QE4 } ensure that $\{ \text{ when } \{$ EUT returns home and QE4 is requested to send a packet to EUT indicating that a response is required } then { QE4 indicates receipt of the response from the EUT}

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1486_01 summary : 'Correspondent Node deletes any Binding Cache entry after the expiration of the binding lifetime' RQ ref : RQ_001_1486 ,RQ_001_1461 : Correspondent_Node Role config : CF_MOB_04 **TD ref** : TD_MOB_1486_01 EUT configured to perform route_optimization with { and QE4 configured to perform route_optimization and QE4 away_from_home and QE4 registered to QE1 } ensure that $\{ when \}$ EUT establishes a binding to QE4} then { EUT and QE4 are able to communicate directly within the binding_lifetime and EUT and QE4 are unable to communicate directly after the binding_lifetime } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1068_01 summary : 'Correspondent Node does not establish any binding with a lifetime greater than MAX_RR_BINDING_LIFETIME' **RQ ref** : RQ_001_1068 : Correspondent_Node Role config : CF_MOB_04 **TD ref** : TD_MOB_1068_01 with { EUT configured to perform route_optimization and QE4 configured to perform route_optimization and QE4 away_from_home and QE4 registered to QE1 } ensure that $\{ when \}$ EUT establishes a binding to QE4} EUT and QE4 are able to communicate directly then { within the binding_lifetime and EUT and QE4 are unable to communicate directly **after** MAX_RR_BINDING_LIFETIME } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1068_02 summary : 'Mobile Node does not establish any binding with a lifetime greater than MAX_RR_BINDING_LIFETIME' **RQ ref** : RQ_001_1068 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_1068_02 --NOT interop TESTABLE -- ==> there is no Interoperability method to guarantee that a -- Mobile Node (on a foreign network) will use its Home Address -- to send a new packet (instead of using its Care-of-Address). with { EUT configured to perform route_optimization and EUT away_from_home and EUT registered to QE1 and QE4 configured to perform route_optimization ensure that $\{ \text{ when } \{$ EUT establishes a binding to QE4 } then { EUT and QE4 are able to communicate directly within the binding_lifetime and EUT and QE4 are unable to communicate directly after MAX_RR_BINDING_LIFETIME } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

TP id : TP_MOB_1483_01

}

```
summary : 'Correspondent Node tries to refresh a binding cache entry
           before it expires'
RQ ref : RQ_001_1483
        : Correspondent_Node
Role
config : CF_MOB_04
TD ref : TD_MOB_1483_01
             QE4 away_from_home
  with {
         and QE4 registered to QE1 % \left( {\left( {{{\mathbf{T}}_{{\mathbf{T}}}} \right)} \right)
         and EUT having established a binding with QE4
         and EUT established 'in continuous unbounded communication with QE4'
       }
  ensure that
       { when { QE4 sends a packet to the EUT
                     after the binding_lifetime
                     indicating that a response is required }
         then { QE4 indicates receipt of the response directly from the EUT }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1390_01
summary : 'Correspondent Node maintains a separate binding cache for each
           of its unicast routable addresses'
RQ ref : RO 001 1390
        : Correspondent_Node
Role
config : CF_MOB_04
TD ref : TD_MOB_1390_01
  with {
             EUT configured to have 2 global_addresses
         and QE4 away_from_home
         and QE4 registered to QE1
         and EUT having established a binding to QE4
                   using its first global_address
         and QE1 disconnected \ensuremath{\textit{from the}} network
       }
  ensure that
       \{ \mbox{ when } \{ \mbox{ EUT is requested to send a packet to QE4 }
                     containing a source_address
                     set to its second global_address }
         then { QE4 does not indicate receipt of the packet }
       }
TP id : TP_MOB_1458_01
summary : 'Correspondent Node updates a binding cache entry on receipt
           of a valid Binding Update'
RQ ref : RQ_001_1458
Role
        : Correspondent_Node
config : CF_MOB_04
TD ref : TD_MOB_1458_01
  with {
             QE4 away_from_home
         and QE4 registered to QE1
         and EUT having established a binding with QE4
       }
  ensure that
                    QE4 moves to another foreign_network
       \{ \text{ when } \{
                 and EUT is requested to send a packet to QE4
                         indicating that a response is required }
         then \{ \mbox{ EUT indicates receipt of the response directly from QE4 } \}
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1776_01
summary : 'Mobile Node updates binding with correspondent node upon receipt
           of a Binding Refresh Request'
RQ ref : RQ_001_1776 , RQ_001_1383
Role
        : Correspondent_Node
config : CF_MOB_04
TD ref : TD_MOB_1776_01
  with {
            EUT away_from_home
         and EUT registered to QE1
         and EUT having established a binding with QE4
  ensure that
```

```
{ when { QE4 sends a Binding_Refresh_Request }
        then { QE4 and the EUT are able to communicate directly
                    after the original binding_lifetime }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1348_01
summary : 'Correspondent Node is able to participate in Return
           Routability Procedure'
RO ref
       : RQ_001_1348 , RQ_001_1050, RQ_001_1051
        : Correspondent_Node
Role
config : CF_MOB_04
TD ref : TD_MOB_1348_01
  with {
             QE4 away_from_home
         and QE4 registered to QE1 % \left( {{{\mathbf{T}}_{{\mathbf{T}}}} \right)
         and QE4 configured to perform route_optimization
         and EUT configured to perform route_optimization
       }
  ensure that
       \{ \mbox{ when } \{ \mbox{ EUT is requested to send a packet to QE4 }
                     indicating that a response is required }
         then { EUT indicates receipt of the response directly from QE4 }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1063_01
summary : 'Mobile Node is able to participate in Return Routability
           Procedure'
RQ ref : RQ_001_1063 , RQ_001_1048 , RQ_001_1709,
          RQ_001_1007, RQ_001_1723, RQ_001_1750
        : Mobile_Node
Role
config : CF_MOB_03
TD ref : TD_MOB_1063_01
            EUT away_from_home
  with {
         and EUT registered to QE1
         and EUT configured to perform route_optimization
         and QE4 configured to perform route_optimization
       ļ
  ensure that
       { when { EUT receives a packet from QE4
                     indicating that a response is required }
         then { QE4 indicates receipt of the response directly from the EUT }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1047_01
summary : 'Correspondent Node completes Return Routability Procedure
           before accepting a Binding Update from a mobile node'
RQ ref : RQ_001_1047
Role
       : Correspondent_Node
config : CF_MOB_04
TD ref : TD_MOB_1047_01
  with {
             QE4 away_from_home
         and QE4 registered to QE1
         and QE4 configured to perform route_optimization
         and EUT configured to perform route_optimization
         and QE1 unreachable from QE4 -- QE4 cannot complete RRP
       )
  ensure that
       { when { QE4 is requested to send a packet to the EUT
                     indicating that a response is required }
         then { EUT sends no response directly to QE4 }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1485_01
summary : 'Correspondent Node stops retransmitting Binding Refresh Requests
           messages when it receives a Binding Update'
RQ ref : RQ_001_1485
Role
        : Correspondent_Node
config : CF_MOB_04
```

```
TD ref : TD_MOB_1485_01
--* However we wrap this up, it is a conformance test, not interop *--
                     ******
                             * * * * * * * * * * * *
                                                       * * * * * * * * * *
         QE4 away_from_home
  with {
         and QE4 registered to QE1
        and EUT having established a binding with QE4
       }
  ensure that
               EUT 'tries to refresh its binding with QE4' and EUT {\bf receives} 'a message indicating that
       \{ \text{ when } \{
                             the refresh is successful' }
         then { EUT 'stops sending refresh requests to QE4' }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id
      : TP_MOB_1725_01
summary : 'Mobile Node support the protection of Home Test and
          Home Test Init messages'
RQ ref : RQ_001_1725
Role
     : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1725_01
  with {     EUT away_from_home
         and EUT registered to QE1
         and EUT configured to perform route_optimization
         and QE4 configured to perform route_optimization
         and QE1 configured to protect return_routability_packets
      }
  ensure that
      { when { EUT receives a packet from QE4
                   indicating that a response is required }
         then { EUT sends a response directly to QE4 }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1065_01
summary : 'Correspondent Node sends a Binding_Acknowledgement message upon
          receipt of a Binding Update message containing A-Flag set to 1'
RQ ref : RQ_001_1065, RQ_001_1350
Role
       : Correspondent_Node
config : CF MOB 04
TD ref : TD_MOB_1065_01
            QE4 away_from_home
  with {
         and QE4 registered to QE1
         and QE4 configured 'to request Binding_Acknowledgements from
                            correspondent nodes'
         and QE4 configured to perform route_optimization
        and EUT configured to perform route_optimization
      }
  ensure that
      { when { EUT receives a packet from QE4
                   indicating that a response is required }
         then { EUT sends the response directly to QE4 }
       }
End Group -- Group A
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Group 1.2 'Group B'
TP id : TP_MOB_1382_01
summary : 'Mobile Node is able to receive and process Binding Acknowledgements'
RQ ref : RQ_001_1382
Role
        : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1382_01
            EUT away_from_home
  with {
         and EUT registered to QE1
         and OE1 disconnected
```

```
and QE3 having the same Home_Address as EUT
         and QE3 having the same ethernet_address as QE1
      }
  ensure that
       { when {
                   EUT returns home before the binding_lifetime expires
                and QE3 is disconnected
               and QE1 is connected to the Home_Network }
         then {
                  EUT and QE4 are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1700_01
summary : 'Mobile Node does not perform Duplicate Address Detection
          when returning home before the expiry of its bindings'
RQ ref : RQ_001_1700
Role : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1700_01
            EUT away_from_home
 with {
        and EUT registered to QE1
         and QE1 is disconnected
         and QE3 having the same Home_Address as EUT
         and QE3 having the same ethernet_address as QE1
      }
  ensure that
                 EUT returns home before the binding_lifetime expires
       { when {
               and QE3 is disconnected
                and OE1 is connected to the Home Network }
         then {
                   EUT and QE4 are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1693_01
summary : ' MN accepts packets at its previous CoA after registering
           its new primary CoA '
RQ ref : RQ_001_1693
Role
      : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1693_01
           EUT away_from_home
  with {
         and EUT registered to QE1
         and QE8 advertizing a new prefix -- thus causing a new care-of
                                            -- address to be generated
       }
  ensure that
                      QE8 stops advertizing the old prefix
      \{ when \}
                before (QE8 starts advertizing a new prefix
                before EUT receives a packet from QE3
                            indicating that a response is required
                        and containing a destination_address
                           set to the old Care_Of_Address of the EUT) }
         then { QE3 indicates receipt of the response from the EUT }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP MOB 1678 01
summary : ' MN discover a new default router when it detects the default
           router is no longer bi-directionally reachable '
RQ ref : RQ_001_1678
       : Mobile_Node
Role
config : CF_MOB_03
TD ref : TD_MOB_1678_01
            EUT connected in home_network
  with {
        and QE1 disconnected
      }
  ensure that
      \{ \text{ when } \{
                   EUT moves to a foreign_network
                and EUT receives a packet from QE3
                        indicating that a response is required
                    and containing a destination_address
                        set to the Care_of_Address of the EUT }
         then { QE3 indicates receipt of the response from the EUT }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1507_01 summary : 'Home Agent removes binding when the associated prefix valid lifetime expires' **RQ ref** : RQ_001_1507 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1507_01 with { QE1 away_from_home and QE1 registered to the EUT and QE1 configured not to perform Route_Optimization } ensure that { when { the prefix_lifetime expires at the EUT } then { QE4 and QE1 are unable to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1501_01 summary : 'Home Agent performs Duplicate Address Detection on home link before sending a Binding Acknowledgment' **RQ ref** : RQ_001_1501 , RQ_001_1502 , RQ_001_1503 : Home_Agent Role config : CF_MOB_02 **TD ref** : TD_MOB_1501_01 with { QE1 at_home and QE3 disconnected from home_network and QE3 having the same <code>home_address</code> as <code>QE1</code> } ensure that $\{ \text{ when } \{$ QE1 is disconnected from the home_network and QE3 is connected to the home_network and QE1 is connected to a foreign_network } then { QE4 and QE1 are unable to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1500_01 summary : 'Home Agent maintains a Binding Cache entry from receipt of a Binding Update until the Binding Lifetime expires' **RQ ref** : RQ_001_1497, RQ_001_1500 , RQ_001_1522 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1500_01 with { QE1 at_home and QE1 configured not to perform Route_Optimization } ensure that { when { QE1 moves to a foreign_network } then { QE4 and QE1 are able to communicate within the Binding_Lifetime } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1497_01 summary : 'Home Agent creates a new entry in its Binding Cache upon receipt of a Binding Update' **RQ ref** : RQ_001_1497 Role : Home_Agent config : CF_MOB_02
TD ref : TD_MOB_1497_01 with { QE1 at_home and QE1 configured not to perform Route_Optimization } ensure that { when { QE1 moves to a foreign_network }

}

```
then { QE4 is able to communicate with QE1 }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1826_01
summary : 'Home Agent updates the entry in its Binding Cache
          upon receipt of a Binding Update'
RQ ref : RQ_001_1826
Role
        : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1826_01
  with {
            QE1 away_from_home
         and QE1 registered to EUT
         and QE1 configured not to perform Route_Optimization
       }
  ensure that
       { when { QE1 moves to another foreign_network }
         then { QE3 and QE1 are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP MOB 1494 01
summary : 'Home Agent returns a type "132" Binding Acknowledgment
           upon receipt of a Binding Update which Home Address
           is not on link'
RQ ref : RQ_001_1494
Role : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1494_01
  with {            QE1 disconnected from the home_network
        and QE1 configured not to perform Route_Optimization
       }
  ensure that
                  QE1 is connected to a foreign_network
       \{ \text{ when } \{
                and EUT receives a Binding_Update
                       containing a Home_Address not on_link }
         then {
                    QE4 and QE1 are unable to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id
       : TP_MOB_1503_01
summary : 'Home Agent returns a type "134" Binding Acknowledgement when
          Duplicate Address Detection for the Home Address / Link
           Local Address fails'
RQ ref : RQ_001_1503
Role
       : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1503_01
            QE1 disconnected from home_network
  with {
         and QE3 connected to home_network
         and QE3 configured to have the same link_local_address as QE1
       }
  ensure that
       { when { QE1 is connected to a foreign_network }
         then { QE4 and QE1 are unable to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1684_01
summary : 'Mobile Node generates a new primary Care of Address
           when the current one is deprecated'
RQ ref : RQ_001_1684
Role
       : Mobile_Node
config : CF_MOB_07
TD ref : TD_MOB_1684_01
  with {
           EUT away_from_home
         and QE3 configured as default_router for EUT
         and QE2 able to communicate with EUT
  ensure that
```

 $\{ \text{ when } \{$ QE3 stops advertizing the old prefix before (QE3 starts advertizing a new prefix before QE2 is requested to send a packet to the EUT indicating that a response is required) } QE2 indicates receipt of the response from the EUT } then { } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx TP id : TP_MOB_1683_01 summary : 'Mobile Node generates a new primary Care of Address after having moved **RQ ref** : RQ_001_1683 , RQ_001_1380 , RQ_001_1690 Role : Mobile_Node config : CF_MOB_03
TD ref : TD_MOB_1683_01 with { EUT away_from_home and QE4 able to communicate with EUT } ensure that { when { EUT moves to another foreign_network } then { QE4 and the EUT are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1465_01 summary : 'Correspondent Node deletes any existing related bindings on receipt of a Binding Update requesting to delete a binding' **RQ ref** : RQ_001_1465 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_1465_01 with { EUT away_from_home and EUT configured to perform route_optimization and QE4 configured to perform route_optimization and QE4 having established a binding with EUT ensure that { when { EUT returns home }
 then { QE4 and the EUT are able to communicate with EUT } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1496_01 summary : 'Correspondent Node sends a type "131" Binding Acknowledgment when receiving a Home Registration Binding Update' **RQ ref** : RQ_001_1496 Role : Correspondent_Node config : CF_MOB_04 **TD ref** : TD_MOB_1496_01 with { EUT at_home and QE5 at_home and QE5 configured 'to use EUT as Home Agent' } ensure that { when { QE5 moves to a foreign_network } then { QE3 and QE5 are unable to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1528_01 summary : 'When accepting Care of Address de-registration Binding Update, Home Agent deletes any existing entry in its Binding Cache for the Mobile Node' **RQ ref** : RQ_001_1528 , RQ_001_1529 : Home_Agent Role config : CF_MOB_02
TD ref : TD_MOB_1528_01 with { QE1 away_from_home and QE1 registered to EUT

```
and QE4 able to communicate with QE1
         and QE1 configured not to perform Route_Optimization
       }
  ensure that
       { when { QE1 returns home }
         then { QE4 and QE1 are able to communicate directly }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1526_01
summary : 'Home Agent rejects De-Registration Binding Update if no
           entry exists in its Binding Cache for the Mobile Node'
RQ ref : RQ_001_1526
Role
        : Home_Agent
config : CF_MOB_05
TD ref : TD_MOB_1526_01
            EUT disconnected from Home_Network
  with {
         and QE2 configured to have the same IP_address as EUT
         and QE1 connected to a foreign_network
         and QE1 registered to QE2
       }
  ensure that
                   OE2 is disconnected from Home Network
       \{ when \}
               and EUT is connected to Home_Network
               and QE1 returns home }
         then { QE4 and QE1 are unable to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1380_01
summary : 'Mobile Node supports care-of address formation'
RQ ref : RQ_001_1380
Role
        : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1380_01
  with {
           EUT connected to home_network
        and QE4 able to communicate with EUT
       ļ
  ensure that
       { when { EUT moves to a foreign_network }
         then { QE4 and the EUT are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1809_01
summary : 'Mobile Nodes support returning home'
RQ ref : RQ_001_1809 , RQ_001_1808
Role
       : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1809_01
  with {
            EUT away_from_home
        and QE4 able to communicate with EUT
       }
  ensure that
       { when { EUT returns home }
         then { QE4 and the EUT are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1005_01
summary : 'When away, Mobile Node is addressable at one or
          more Care of Addresses'
RQ ref : RQ_001_1005
Role
       : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1005_01
  with
   {
          EUT at home
      and QE6 'advertising a second prefix on Foreign Network 1'
```
} ensure that { when { EUT moves to Foreign_Network 1 } then { QE4 and EUT are able to communicate using first and second Care_of_address } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1702_01 summary : 'Mobile Node replies to Neighbour Solicitations for its Home Address after returning home and having sent a Binding Update' **RQ ref** : RQ_001_1702 , RQ_001_1695 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_1702_01 EUT away_from_home with { and EUT registered to QE1 } ensure that EUT returns home $\{ \text{ when } \{$ and QE1 is disconnected from the home_network } then { QE4 and the EUT are unable to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1701_01 summary : 'Mobile Node performs Duplicate Address Detection when returning home after its bindings have expired' **RQ ref** : RQ_001_1701 : Mobile_Node Role config : CF_MOB_03
TD ref : TD_MOB_1701_01 with { EUT away_from_home and EUT registered to QE1 and EUT binding_lifetime expired at QE1 and QE4 connected to home_network using the same Home_Address as EUT } ensure that { when { EUT returns home } then { EUT is unable to communicate } -- DAD fails } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1768_01 summary : 'Mobile Node sends Binding Update before expiry of the binding lifetime' **RQ ref** : RQ_001_1768 , RQ_001_1728 Role : Mobile_Node config : CF_MOB_03
TD ref : TD_MOB_1768_01 with { EUT away_from_home and EUT registered to OE1 and EUT able to communicate with $\ensuremath{\mathsf{QE4}}$ } ensure that $\{$ when $\{$ QE4 (is requested to send a packet to the EUT indicating that a response is required) **after the** binding_lifetime } then { QE4 indicates receipt of the response from the EUT } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1694_01 summary : 'Mobile Node invalidates all associated Care of Addresses when the corresponding router is unreachable' **RQ ref** : RQ_001_1694 Role : Mobile_Node

config : CF_MOB_03
TD ref : TD_MOB_1694_01 EUT away_from_home with { and EUT registered to QE1 } ensure that { when { EUT moves to another foreign_network } then { QE1 and the EUT are unable to communicate using the old Care_of_Address } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx TP id : TP_MOB_1510_01 summary : 'Home Agent returns a Binding Acknowledgment in response to a Binding Update' **RQ ref** : RQ_001_1510 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1510_01 with { QE1 at_home } ensure that { when { QE1 moves to a foreign_network } then { QE4 and the EUT are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1534_01 summary : 'Home Agent stops intercepting packets for the mobile node on acceptance of the Primary Care of Address De-Registration Binding Update' **RQ ref** : RQ_001_1534 Role : Home_Agent config : CF_MOB_02 TD ref : TD_MOB_1534_01 with { QE1 away_from_home and QE1 registered to EUT } ensure that $\{ \text{ when } \{$ QE1 returns home and EUT is disconnected from the home_network } then { QE4 and QE1 are able to communicate } } End Group -- Group B --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx Group 1.3 'Group C' **TP id** : TP_MOB_1344_01 summary : 'Correspondent Node discard received packets containing Type 2 Routing Headers' **RQ ref** : RQ_001_1344 Role : Correspondent_Node config : CF MOB 04 **TD ref** : TD_MOB_1344_01 with { EUT disconnected and QE4 configured to have the same link_local_address as EUT and QE4 connected to Home_Network 2 and QE4 registered to QE1 and QE4 having established a binding with QE3 } ensure that { when { QE4 is disconnected and EUT is connected to Home_Network 1 and QE3 is requested to send a packet to the EUT indicating that a response is required -- QE3 sends packets containing -- Routing Headers Type 2 and QE5 is requested to send a packet to the EUT indicating that a response is required } -- QE5 sends packets not containing

-- Routing Headers Type 2 QE3 indicates no receipt of the response from the EUT then { and QE5 indicates receipt of the response from the EUT } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP MOB 1003 01 summary : 'MN continues to communicate after moving to a new link' **RQ ref** : RQ_001_1003 , RQ_001_1004 , RQ_001_1002 : Mobile_Node Role config : CF_MOB_03
TD ref : TD_MOB_1003_01 with { EUT connected in home_network and EUT registered to QE1 and EUT and QE4 established in communication ensure that $\{ \text{ when } \}$ EUT moves to a foreign_network and QE4 is requested to send a packet to EUT indicating that a response is required } then { QE4 indicates receipt of the response from the EUT } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1614_01 summary : 'MN sends packets directly to the correspondent node when a binding exists' **RQ ref** : RQ_001_1614 : Mobile_Node Role config : CF_MOB_03 **TD ref** : TD_MOB_1614_01 with { EUT away_from_home and EUT registered to QE1 and EUT configured to perform route_optimization and QE4 configured to perform route_optimization and EUT having established a binding to QE4 ensure that { when { EUT receives a packet from QE4 indicating that a response is required } then { EUT sends the response directly to QE4 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1412_01 summary : 'Correspondent Node receives packets directly from the Mobile Node when a binding exists or Mobile Node believes in its existence' **RQ ref** : RQ_001_1412 : Correspondent_Node Role config : CF_MOB_04 **TD ref** : TD_MOB_1412_01 with { QE4 away_from_home and QE4 registered to QE1 and EUT configured to perform route_optimization and QE4 configured to perform route_optimization and QE4 having established a binding with EUT } ensure that $\{ \mbox{ when } \{ \mbox{ EUT is requested to send a packet to QE4 }$ indicating that a response is required } then { EUT indicates receipt of the response directly from QE4 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1423_01 summary : 'Correspondent Node sends packets directly to Mobile Node when a binding already exists' **RQ ref** : RQ_001_1423 Role : Correspondent_Node

```
config : CF_MOB_04
TD ref : TD_MOB_1423_01
            QE4 away_from_home
  with {
         and QE4 registered to QE1
         and EUT configured to perform route_optimization
         and QE4 configured to perform route_optimization
         and QE4 having established a binding with EUT
         and EUT having established a binding with QE4
       }
  ensure that
       \{ \mbox{ when } \{ \mbox{ QE4 sends a packet to the EUT }
                    indicating that a response is required }
         then { QE4 indicates receipt of the response directly from EUT }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1615_01
summary : 'MN uses reverse tunnelling to the correspondent node when
          no binding exists'
RQ ref : RQ_001_1615
        : Mobile_Node
Role
config : CF_MOB_03
TD ref : TD_MOB_1615_01
  with {
            EUT away_from_home
         and EUT registered to QE1
         and EUT configured to perform route_optimization
         and QE4 configured not to perform Route_Optimization
  ensure that
      { when { EUT receives a packet from QE4
                    indicating that a response is required }
         then { QE4 indicates receipt of the response from the EUT }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1592_01
summary : 'HA schedules the delivery of the prefix information when a new
          prefix is added to its home subnet interface'
RQ ref : RQ_001_1592 , RQ_001_1370 , RQ_001_1805
Role
       : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1592_01
  and QE1 registered to EUT
      }
  ensure that
                       EUT generates a new prefix to the home_address of QE1
      \{ \text{ when } \{
                before (QE4 sends a packet to QE1
                            using the new home_address
                        and indicating that a response is required) }
                        QE4 indicates receipt of a response from QE1 }
         then {
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP MOB 1600 01
summary : 'HA retransmits heroically unsolicited Advertisement until
           the receipt of a Mobile_Prefix_Solicitation from MN'
RQ ref : RQ_001_1600 , RQ_001_1813
       : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_1600_01
            QE1 away_from_home
  with {
        and QE1 registered to EUT }
  ensure that
      { when {
                       QE1 is disconnected from the foreign_network
                before EUT generates a new prefix to the home_address of QE1
                before QE1 is connected to the foreign_network after 1 minute
                before QE4 sends a packet to QE1
                          using the new home_address
                       and indicating that a response is required }
         then {
                       QE4 indicates receipt of a response from QE1 }
```

}

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1812_01 summary : 'HA deliveries new prefix information when lifetime information (valid or preferred lifetime) of the prefix changes' **RQ ref** : RQ_001_1812 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1812_01 with { QE1 away_from_home and QE1 registered to EUT and EUT configured to have a short prefix_lifetime on the Home_Network of QE1 -- (suggest 30s) ensure that { when { EUT is requested to configure a new prefix_lifetime for QE1 } then { QE1 and QE4 are able to communicate using the new prefix after the original prefix_lifetime expires } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1603_01 summary : 'HA transmits again unsolicited Mobile_Prefix_Advertisement after the prolongation of the binding of the Mobile Node' **RQ ref** : RQ_001_1603 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1603_01 with { QE1 away_from_home and QE1 is registered to the EUT and QE1 and the EUT configured to have a short binding_lifetime -- (Suggest 30s) } ensure that QE1 is disconnected from the foreign_network $\{ \text{ when } \{$ before the binding_lifetime expires between QE1 and the EUT before QE1 is connected to another foreign_network } then { QE1 and QE4 are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1612_01 summary : 'When MN starts a transport-level connections at Home, it conserves that connection away_from_home' **RQ ref** : RQ_001_1612 : Mobile_Node Role config : CF_MOB_03 **TD ref** : TD_MOB_1612_01 EUT connected in home_network with { and EUT having established a transport_connection to QE3 } ensure that { when { EUT moves to a foreign_network } then { EUT and QE3 are able to communicate using the transport_connection } } -xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1613_01 summary : 'When MN starts a transport-level connections in Foreign network, it conserves this connection into another Foreign network' **RQ ref** : RQ_001_1613 : Mobile_Node Role config : CF_MOB_03
TD ref : TD_MOB_1613_01 with { EUT away_from_home and EUT registered to QE1

```
and EUT having established a transport_connection to QE3
       }
  ensure that
         when { EUT moves to another foreign_network }
       {
         then { EUT and QE3 are able to communicate
                   using the transport_connection }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1413_01
summary : 'Correspondent Node drops packets containing Home Address
           option (but no Binding Update) when there is no corresponding
           Binding Cache entry'
RQ ref : RQ_001_1413
       : Correspondent_Node
Role
config : CF_MOB_04
TD ref : TD_MOB_1413_01
  with {
              EUT configured to perform route_optimization
          and QE4 configured to perform route_optimization
          and QE4 away_from_home
          and QE4 registered to QE1
          and EUT having no Binding_Cache_entry for QE4
          and QE4 having a Binding_Cache_entry for EUT
       }
  ensure that
       { when { EUT receives a packet directly from QE4
                    indicating that a response is required }
         then { EUT sends no response to QE4 }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id
      : TP MOB 1413 02
summary : 'Correspondent Node drops packets containing Home Address
           option (but no Binding Update) and send a Binding Error
           message to the Mobile Node, when there is no corresponding
          Binding Cache entry'
RQ ref : RQ_001_1413
Role
        : Correspondent_Node
config : CF_MOB_04
TD ref : TD_MOB_1413_02
  with {
              EUT configured to perform route_optimization
          and QE4 configured to perform route_optimization
          and QE4 away_from_home
          and QE4 registered to QE1
          and EUT having no Binding_Cache_entry for QE4
          and QE4 having a Binding_Cache_entry for EUT
                }
  ensure that
       \{ \mbox{ when } \{ \mbox{ EUT receives a packet directly from QE4}
                    indicating that a response is required }
                    EUT sends no response to QE4
      then {
             before EUT and QE4 are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP MOB 1414 01
summary : 'When using Route Optimization, a Correspondent Node drops any
          packet in which the Home Address option (but not Binding Update)
           does not match the Home Address recorded in its Binding Cache
RQ ref : RQ_001_1414
Role
       : Correspondent_Node
config : CF_MOB_04
TD ref : TD_MOB_1414_01
  with {
            EUT configured to perform route_optimization
         and QE4 configured to perform route_optimization
         and QE4 away_from_home
         and QE4 registered to QE1
         and QE4 having established a binding with EUT
  ensure that
       { when { EUT receives a packet from QE4
                    containing a Home_Address_Option
```

not set to the Home_Address of QE4 } then { EUT discards the packet } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx TP id : TP_MOB_1414_02 summary : 'When using Route Optimization, a Correspondent Node drops any packet in which the Home Address option (but not Binding Update) does not match the Home Address recorded in its Binding Cache and send a Binding Error message to the Mobile Node' **RQ ref** : RQ_001_1414 Role : Correspondent_Node config : CF_MOB_04 **TD ref** : TD_MOB_1414_02 with { EUT configured to perform route_optimization and QE4 configured to perform route_optimization and QE4 away_from_home and QE4 registered to QE1 and QE4 having established a binding with EUT } ensure that $\{ when \}$ EUT receives a packet from QE4 containing a Home_Address_Option not set to the Home_Address of QE4 } EUT discards the packet then { before EUT and QE4 are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1415_01 summary : 'A Correspondent Node drops packets in which the Source Address does not match the care-of address recorded in the corresponding Binding Cache Entry' **RQ ref** : RQ_001_1415 : Correspondent_Node Role config : CF_MOB_04 **TD ref** : TD_MOB_1415_01 EUT configured to perform route_optimization with { and QE4 configured to perform route_optimization and QE4 away_from_home and QE4 registered to QE1 and QE4 having established a binding with EUT } ensure that { when { EUT receives a packet from QE4 containing a Home_Address_Option set to the Home_Address of QE4 and containing a Source_Address not set to the Care_Of_Address of QE4 } then { EUT discards the packet } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP MOB 1415 02 summary : 'A Correspondent Node drops packets in which the Source Address does not match the care-of address recorded in the corresponding Binding Cache Entry and sends a Binding Error message to the Mobile Node **RQ ref** : RQ_001_1415 Role : Correspondent_Node config : CF_MOB_04 **TD ref** : TD_MOB_1415_02 with { EUT configured to perform route_optimization and QE4 configured to perform route_optimization and OE4 away from home and QE4 registered to QE1 and QE4 having established a binding with EUT } ensure that $\{ \text{ when } \}$ EUT receives a packet from QE4

```
containing a Home_Address_Option
                           set to the Home_Address of QE4
                       and containing a Source_Address
                           not set to the Care_Of_Address of QE4 }
         then \{
                       EUT discards the packet
                before QE4 and the EUT are able communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1384_01
summary : 'MN reconfigures its home address according to the prefix information
            in a Mobile_Prefix_Advertisement'
RQ ref : RQ_001_1384
Role
        : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1384_01
  with { EUT away_from_home
          and EUT registered to QE1
       }
  ensure that
       { when { QE1 is requested to modify its home_network prefix }
         then { QE4 and the EUT are able to communicate
                    using the new home_address }
       }
End Group -- Group C
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Group 1.4 'Group D'
Group 1.4.2
TP id : TP_MOB_1574_01
summary : 'Home Agent supports the protection of Home Test and
          Home Test Init messages'
RQ ref : RQ_001_1574
       : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_1574_01
  with {
             QE4 configured to perform route_optimization
         and QE1 configured to perform route_optimization
         and QE1 away_from_home
         and QE1 registered to EUT
         and QE1 configured to protect return_routability_packets
       }
  ensure that
       { when { QE1 receives a packet from QE4
                    indicating that a response is required }
         then { QE1 sends the response directly to QE4 }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP MOB 1371 01
summary : 'Home Agent supports ESP protection of Home Test and
          Home Test Init messages'
RQ ref : RQ_001_1371
       : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_1371_01
  with {
            QE4 configured to perform route_optimization
         and QE1 configured to perform route_optimization
         and QE1 configured to protect return_routability_packets
                             using ESP
       }
  ensure that
       \{ \text{ when } \{
                      QE1 moves to a Foreign_Network
                before QE4 sends a packet to QE1
                           indicating that a response is required }
```

then { QE4 indicates receipt of the response directly from QE1 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1082_01 summary : 'Home Agent uses a Security Association to protect integrity and authenticity of Mobile_Prefix_Solicitations and Advertisements' **RQ ref** : RQ_001_1082 , RQ_001_1014 , RQ_001_1607 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1082_01 with { QE1 at_home and QE1 configured to protect Mobile_Prefix_Solicitations and QE1 configured to accept only secured Mobile_Prefix_Advertisements and QE1 configured to have a short prefix_lifetime --(suggest 30s) } ensure that $\{ when \}$ QE1 moves to a foreign_network before its prefix_lifetime expires before QE4 sends a packet to QE1 indicating that a response is required } QE4 indicates receipt of the response from QE1 } then { } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP MOB 1082 02 summary : 'Mobile Node uses a Security Association to protect integrity and authenticity of Mobile Prefix Solicitations and Advertisements' **RQ ref** : RQ_001_1082 , RQ_001_1014 , RQ_001_1663 , RQ_001_1664 : Mobile Node Role config : CF_MOB_03
TD ref : TD_MOB_1082_02 with { EUT at_home and QE1 configured to accept only secured Mobile_Prefix_Solicitations and QE1 configured to protect Mobile_Prefix_Advertisements and EUT configured to have a short prefix_lifetime (--suggest 30s)' } ensure that $\{ when \}$ EUT moves to a foreign_network before its prefix_lifetime expires before QE4 sends a packet to the EUT indicating that response is required } QE4 indicates receipt of the response from the EUT } then { } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1385_01 summary : 'Mobile Node supports Dynamic Home Agent Address Discovery' **RQ ref** : RQ_001_1385 Role : Mobile_Node config : CF_MOB_03
TD ref : TD_MOB_1385_01 EUT registered to QE1 with { and EUT disconnected and EUT configured not to perform Route_Optimization and QE4 configured not to perform Route_Optimization } ensure that QE1 is requested to modify its IP_address $\{ \text{ when } \{$ before the EUT is connected to a foreign_network } QE4 and the EUT are able to communicate } then { } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1657_01 summary : 'Mobile Node attempts Dynamic Home Agent Address Discovery if it cannot contact its current Home Agent' **RQ ref** : RQ_001_1657

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Role : Mobile_Node
```

config : CF_MOB_06
TD ref : TD_MOB_1657_01 EUT away_from_home with { and EUT registered to QE1 } ensure that $\{ \text{ when } \{$ QE1 is disconnected from the Home_Network and EUT moves to another foreign_network } then { QE4 and EUT are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx TP id : TP_MOB_1743_01 summary : 'Mobile Node goes on registering home addresses when the registration of one of them fails' **RQ ref** : RQ_001_1743 Role : Mobile_Node config : CF_MOB_03 TD ref : TD_MOB_1743_01 with { EUT disconnected and EUT configured to have 2 home_addresses and QE3 configured to use the first home_address of EUT } ensure that EUT **is** connected **to a** foreign_network $\{ \text{ when } \{$ and EUT receives a packet from QE4 containing a destination_address set to EUT home_address 2 and indicating that a response is required } then { QE4 indicates receipt of the response from the EUT } } -xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1727_01 summary : 'Mobile Node registers its new primary Care-Of Address after changing it' **RQ ref** : RQ_001_1727 Role : Mobile_Node config : CF_MOB_03 TD ref : TD_MOB_1727_01 EUT away_from_home with { and EUT registered to QE1 } ensure that $\{ \text{ when } \{$ EUT moves to another foreign_network and EUT receives a packet from QE4 indicating that a response is required } then { QE4 indicates receipt of the response from the EUT } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1742_01 summary : 'Mobile Node does not attempt to use its home address if registration with Home Agent fails due to DAD' **RQ ref** : RQ_001_1742 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_1742_01 with { QE3 configured to have the home_address of EUT } ensure that { when { EUT moves to a foreign_network } -- the registering of EUT has failed then { EUT does not use its Home_Address to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1740_01 summary : 'Mobile Node attempts to register all of its home addresses' RQ ref : RQ_001_1740 Role : Mobile_Node

config : CF_MOB_03
TD ref : TD_MOB_1740_01 EUT disconnected with { and EUT configured to have 2 home_addresses } ensure that $\{ \text{ when } \}$ EUT is connected to a foreign_network and QE4 is requested to send a packet indicating that a response is required to the first home_address of EUT and QE4 is requested to send a packet indicating that a response is required to the second home_address of EUT } then { QE4 indicates receipt of the first response and QE4 indicates receipt of the second response } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1016_01 summary : 'Home Agent supports transport_mode_ESP protection of Binding Update messages' **RQ ref** : RQ_001_1016 Role : Home_Agent config : CF_MOB_02 : Home Agent **TD ref** : TD_MOB_1016_01 with { QE1 disconnected and QE1 configured to protect any Binding_Update packet using transport_mode_ESP } ensure that and QE1 receives a packet from QE4 $\,$ indicating that a response is required } then { QE1 sends response directly to QE4 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1017_01 summary : 'Mobile Node uses transport_mode_ESP to protect Binding Update messages' **RQ ref** : RQ_001_1017 Role : Mobile_Node config : CF MOB 03 **TD ref** : TD_MOB_1017_01 with { QE1 configured to accept only a Binding_Update secured using transport_mode_ESP } ensure that { when { EUT moves to a foreign_network and QE4 is requested to send a packet to EUT indicating that a response is required } then { QE4 indicates receipt of the response } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1655_01 summary : 'Mobile Node already registered to a Home Agent uses that Home Agent for any new registrations' **RQ ref** : RQ_001_1655 Role : Mobile_Node config : CF_MOB_06 **TD ref** : TD_MOB_1655_01 with EUT configured 'to use DHAAD' { and EUT away_from_home and EUT registered to QE1 and QE2 disconnected from Home_Network 1 } ensure that $\{ \text{ when } \{$ QE1 is disconnected from Home_Network 1 and QE2 is connected to Home_Network 1

```
and EUT moves to another foreign_network }
         then { QE4 and EUT are unable to communicate
                    within MAX_BINDACK_TIMEOUT
             -- EUT tries to register with QE1
             and QE4 is able to communicate after MAX_BINDACK_TIMEOUT }
             -- EUT registered to QE2
    }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1366_01
summary : 'Home Agent returns a Binding_Acknowledgement message in response
           to a Binding Update message'
RQ ref : RQ_001_1366
Role
        : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1366_01
             QE1 at_home
  with {
  ensure that
                    QE1 moves to a foreign_network
       \{ \text{ when } \{
                and QE1 receives a packet from QE4
                                 indicating that a response is required }
                    QE4 indicates receipt of the response }
         then {
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1804_01
summary : 'Home Agent is able to participate in
          Dynamic Home Agent Address Discovery'
RQ ref : RQ_001_1804 , RQ_001_1368
       : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_1804_01
  with {        QE1 at_home
         and QE1 not configured to have its Home_Agent_address available
       }
  ensure that
       \{ \text{ when } \{
                    QE1 moves to a foreign_network
               and QE4 is requested to send a packet to QE1
                                     indicating that a response is required }
         then {
                   QE4 indicates receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1733_01
summary : 'Mobile Node sends Binding Update messages to its Home Agent
           until it receives a matching Binding_Acknowledgement message,
           before MAX_BINDACK_TIMEOUT seconds'
RQ ref : RQ_001_1733
Role : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_1733_01
  with {
            EUT at_home
         and EUT configured to have its Home_Agent_address available
         and QE1 disconnected
       }
  ensure that
                   EUT moves to a foreign_network
       \{ \text{ when } \{
                and QE1 is connected after 15 seconds
                     -- ~ MAX_BINDACK_TIMEOUT / 2
           }
         then {
                    QE4 and EUT are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1733_02
summary : 'If the Mobile Node knows just one Home Agent (no DHAAD),
          it continues to send Binding Update messages to its
         Home Agent after MAX_BINDACK_TIMEOUT seconds'
RQ ref : RQ_001_1733
Role : Mobile_Node
```

config : CF_MOB_03
TD ref : TD_MOB_1733_02 EUT at home with { and EUT configured to have its Home_Agent_address available and QE1 disconnected } ensure that EUT moves to a foreign_network $\{ when \}$ and QE1 is connected after MAX_BINDACK_TIMEOUT } then { OE4 and EUT are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1734_01 summary : 'When Mobile Node knows several Home Agent (returned during DHAAD), Mobile Node tries to register with other Home Agents when registration fails with the first one' **RQ ref** : RQ_001_1734 Role : Mobile_Node config : CF_MOB_06 **TD ref** : TD_MOB_1734_01 EUT not configured to have its Home_Agent_address available with { and QE1 configured to have a Home_Agent_Preference greater than QE2 } ensure that QE1 **is** disconnected $\{ \text{ when } \{$ and EUT moves to a foreign_network } then { QE4 and EUT are able to communicate after MAX_BINDACK_TIMEOUT } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1814_01 summary : 'Mobile Node sends Binding Update messages to its Home Agent until it receives a matching Binding_Acknowledgement message, without time limit if it knows only one Home Agent' **RQ ref** : RQ_001_1814 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_1814_01 with { EUT at_home and EUT configured to have its Home_Agent_address available and QE1 disconnected } ensure that $\{ \text{ when } \{$ EUT moves to a foreign_network and QE1 is connected after MAX_BINDACK_TIMEOUT and QE4 is requested to send a packet to QE1 indicating that a response is required } then { QE4 indicates receipt of the response } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1013_01 summary : 'Home Agent supports the protection of Binding Update message' RQ ref : RQ_001_1013 Role : Home_Agent config : CF_MOB_02
TD ref : TD_MOB_1013_01 with QE1 at_home { and QE1 configured to protect any Binding_Update } ensure that $\{ \text{ when } \{$ QE1 moves to a foreign_network and QE4 is requested to send a packet to QE1 indicating that a response is required }

then { QE4 indicates receipt of the response } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1013_02 summary : 'Mobile Node supports the protection of Binding Update message' **RQ ref** : RQ_001_1013 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_1013_02 with { EUT at_home and QE1 configured to accept only a secured Binding_Update } ensure that EUT moves to a foreign_network $\{ when \}$ and QE4 is requested to send a packet to EUT indicating that a response is required } then { QE4 indicates receipt of the response } } End Group End Group Group 1.5 'Group E' **TP id** : TP_MOB_1376_01 summary : 'Mobile Node is able to perform IPv6 encapsulation' -- miss decapsulation **RQ ref** : RQ_001_1376 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_1376_01 with { EUT away_from_home and EUT registered to QE1 and EUT configured not to perform Route_Optimization } ensure that { when { QE4 is requested to send a packet to EUT indicating that a response is required } then { QE4 indicates receipt of the response } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1536_01 summary : 'HA intercepts packets for registered mobile node on the home network and uses reverse tunnel encapsulation' **RQ ref** : RQ_001_1536 , RQ_001_1551 , RQ_001_1568 , RQ_001_1364 : Home_Agent Role config : CF_MOB_02
TD ref : TD_MOB_1536_01 QE1 away_from_home with { and QE1 registered to EUT and QE1 configured not to perform Route_Optimization } ensure that { when { QE3 is requested to send a packet to QE1 indicating that a response is required } then { QE3 indicates receipt of the response } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1537_01 summary : 'HA multicasts Neighbour Advertisement in Home network in order to intercept packets for mobile node' **RQ ref** : RQ_001_1537 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1537_01 with { OE1 at home and QE1 having established communication to QE3 }

```
ensure that
                    QE1 moves to a foreign_network
       { when {
           }
         then { QE3 updates its Neighbor_Discovery_cache_entry
                                for the link_local_address of QE1 }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1547_01
summary : 'HA act as proxy for a registered mobile node and reply to any
          received Neighbour Solicitations for it'
RQ ref : RQ_001_1547
Role
      : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1547_01
            QE3 'is disconnected'
  with {
          and QE1 away_from_home
        and QE1 registered to EUT
       }
  ensure that
       { when { QE3 is connected to its home_network
             and QE3 is requested to send a packet to QE1
                                   indicating that a response is required }
         then { QE3 indicates receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1557_01
summary : 'HA tunnels multicast packets with a global scope to the mobile node'
RQ ref : RQ_001_1557 , RQ_001_1372
       : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_1557_01
            QE1 subscribed to a global_multicast_group
  with {
          and QE1 away_from_home
          and QE1 registered to EUT
       }
  ensure that
       { when { QE3 is requested to send a packet to the global_multicast_group
                                 indicating that a response is required }
         then { QE3 indicates receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1552_01
summary : 'HA does not tunnel packets to the link_local_address of
          mobile node
RQ ref : RQ_001_1552
Role : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1552_01
            QE1 away_from_home
  with {
        and QE1 registered to EUT
       }
  ensure that
       { when { QE3 is requested to send a packet
                                 to the link_local_address of QE1
                                 indicating that a response is required }
         then { QE3 indicates no receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1803_01
summary : 'Home Agent discards packets received from
          a non registered mobile node'
RQ ref : RQ_001_1803
Role : Home_Agent
config : CF_MOB_05
TD ref : TD_MOB_1803_01
  with
```

{ EUT disconnected **from** home_network 1 and QE2 configured to use the same IP_address as EUT and QE1 away_from_home and QE1 registered to QE2 and QE1 configured to perform route_optimization and QE4 configured to perform route_optimization ensure that $\{ \text{ when } \{$ QE2 is disconnected from home_network and EUT is connected to home_network and QE1 is requested to send a packet to QE4 indicating that a response is required } QE3 indicates no receipt of the response } then { } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_1538_01 summary : 'HA multicast Neighbour Advertisement to intercept the packets to the link_local_address of a registered mobile node' **RQ ref** : RQ_001_1538 : Home_Agent Role config : CF_MOB_02 **TD ref** : TD_MOB_1538_01 with { QE1 at_home and QE1 using the same Interface_ID for its link_local_address and its home_address and QE3 having established communication to the link_local_address of QE1 } ensure that { when { QE1 moves to a foreign_network } then { QE3 updates the Neighbor_Discovery_cache_entry for the link_local_address of QE1 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx TP id : TP_MOB_1555_01 summary : 'HA does not tunnel multicast packets with a scope smaller than global to the mobile node **RQ ref** : RQ_001_1555 , RQ_001_1556 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1555_01 with { QE1 subscribed to a link_local_multicast_group and QE1 subscribed to a organization_local_multicast_group and QE1 away_from_home and QE1 registered to EUT ensure that $\{ \text{ when } \}$ QE3 is requested to send a packet to the link_local_multicast_group indicating that a response is required and QE3 is requested to send a packet to the organization_local_multicast_group indicating that a response is required } then { QE3 indicates no receipt of any response } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP MOB 1560 01 summary : 'if multicast forwarding is not supported, HA ignores multicast group membership control messages' **RQ ref** : RQ_001_1560 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_1560_01 QE1 subscribed to a global_multicast_group with { and EUT unable to support multicast_data_packet_forwarding and QE1 away_from_home and QE1 registered to EUT }

```
ensure that
       { when { QE3 is requested to send a packet
                                to the global_multicast_group }
         then { QE3 indicates no receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1810_01
summary : 'MN is able to receive tunnelled multicast packets from HA'
RQ ref : RQ_001_1810
       : Mobile_Node
Role
config : CF_MOB_03
TD ref : TD_MOB_1810_01
  with {
             EUT subscribed to a global_multicast_group
          and EUT away_from_home
          and EUT registered to QE1
       }
  ensure that
       { when { QE3 is requested to send a packet
                                  to the global_multicast_group }
         then { QE3 indicates no receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1817_01
summary : 'Correspondent Node registers the binding when it receives a BU
          from Mobile Node'
RQ ref : RQ_001_1817
Role : Correspondent_Node
config : CF_MOB_04
TD ref : TD_MOB_1817_01
  with { QE4 away_from_home
     and QE4 registered to QE1
         and QE4 configured to perform route_optimization
         and EUT configured to perform route_optimization
       }
  ensure that
       { when { QE4 is requested to send a packet directly to EUT
                                 indicating that a response is required
         then { QE4 indicates receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1818_01
summary : 'A Binding Update contains a Home Address destination option.'
RQ ref : RQ_001_1818
Role
       : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1818_01
  with
   { QE1 at_home
  ensure that
                   QE1 moves to a foreign_network
       \{ when \}
                and QE1 sends a Binding_Update
                    containing no Home_Address_Destination_Option }
         then { QE4 and QE1 are unable to communicate }
       }
 -xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1820_01
summary : 'When Home Agent receives a packet from Mobile Node using reverse
           tunnelling, it forwards the encapsulated packet to Correspondent Node'
RQ ref : RQ_001_1820
       : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_1820_01
  with {
         QE1 away_from_home
        and QE1 registered to EUT
```

```
and QE1 configured not to perform Route_Optimization
       }
  ensure that
       { when { EUT is disconnected }
         then { QE1 and QE4 are unable to communicate with QE4 }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id
      : TP_MOB_1824_01
summary : 'When Mobile Node detects a L3 handover, it constructs a new
           Care-of Address, it select a new default router and register
           the new address to its Home Agent and the Correspondent Nodes
           which it is performing route optimization'
RQ ref : RQ_001_1824, RQ_001_1682
       : Mobile_Node
Role
config : CF_MOB_03
TD ref : TD_MOB_1824_01
  with {
            EUT away_from_home
        and EUT registered to QE1
        and EUT configured to perform route_optimization
        and QE4 configured to perform route_optimization
        and EUT having established a binding to QE4
       }
  ensure that
       { when { EUT moves to another foreign_network }
         then { QE4 and EUT are able to communicate directly }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1825_01
summary : 'When Home Agent processes a Binding Update secured by IPsec,
           the contents of Home Address Option is not checked'
RQ ref : RQ_001_1825
Role
       : Home_Agent
config : CF_MOB_05
TD ref : TD_MOB_1825_01
  with {
             QE1 configured not to perform Route_Optimization
         and QE1 away_from_home
         and QE1 registered to EUT
         and EUT configured to accept any secured Binding_Update from QE1
         and QE1 configured to send only a secured Binding_Update to EUT
       }
  ensure that
       { when { QE1 sends a Binding_Update secured by IPsec
                          containing a Home_Address_Option
                                 not indicating its Home_Address
         then { EUT accepts the packet }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_1807_01
summary : 'If HA support the multicast group membership control protocols,
          HA must be capable to determine which multicast data packets to
          forward via the tunnel to MN'
RQ ref : RQ_001_1807 , RQ_001_1561
Role
        : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_1807_01
-- Config-HA
             QE1 connected to home_network
  with {
          and QE1 subscribed to a global_multicast_group
          and QE3 subscribed to another global_multicast_group
       }
  ensure that
       \{ when \}
                    QE1 moves to a foreign_network
                and QE1 registers to EUT }
         then {
                    QE1 receives packets from its global_multicast_group }
       }
```

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

End Group -- Group E End Group -- Group 1 --* RFC3776 - Security for Mobility ****** Group 5 **TP id** : TP_MOB_2013_01 summary : 'Mobile Node sends Binding Update secured using transport_mode_ESP to its Home Agent' **RQ ref** : RQ_001_2013 , RQ_001_2031 Role : Mobile_Node config : CF_MOB_03
TD ref : TD_MOB_2013_01 with { EUT configured to protect any Binding_Update to QE1 **using** transport_mode_ESP and QE1 configured to accept only Binding_Update secured using transport_mode_ESP from EUT } ensure that $\{ \mbox{ when } \{ \mbox{ a Security_Association is established between EUT and QE1 }$ and EUT moves to a foreign_network } then { QE4 and EUT are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_2013_02 summary : 'Home Agent sends Binding_Acknowledgement secured using transport_mode_ESP to a Mobile Node' **RQ ref** : RQ_001_2013 , RQ_001_2031 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_2013_02 with { EUT configured to protect any Binding_Acknowledgement to QE1 using transport_mode_ESP and QE1 configured to accept only a Binding_Acknowledgement secured using transport_mode_ESP from EUT } ensure that a Security_Association is established between EUT and QE1 $\{ \text{ when } \}$ and QE1 moves to a foreign_network } then { QE4 is able to communicate with QE1 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_2014_01 summary : 'Home Agent supports Home Test Init secured using tunnel_mode_ESP'
RQ ref : RQ_001_2034, RQ_001_2035, RQ_001_1571 : Home_Agent Role config : CF_MOB_02 **TD ref** : TD MOB 2014 01 with { QE1 configured to protect any Home_Test_Init to EUT using tunnel_mode_ESP and EUT configured to accept only Home_Test_Init secured using tunnel_mode_ESP from QE1 and QE1 configured to perform route_optimization and QE4 configured to perform route_optimization and QE1 is away_from_home and QE1 registered to EUT } ensure that $\{ \text{ when } \{$ a Security_Association is established between EUT and QE1 and QE1 moves to a foreign_network } then { QE4 and QE1 are able to communicate directly } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

```
TP id : TP_MOB_2014_02
summary : 'Mobile Node supports Home Test secured using tunnel_mode_ESP'
RQ ref : RQ_001_2034 , RQ_001_2035
Role : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_2014_02
  with {
            QE1 configured to protect any Home_Test to EUT
                            using tunnel_mode_ESP
         and EUT configured to accept only a Home_Test secured
                           using tunnel_mode_ESP from QE1
         and EUT configured to perform Route_Optimization
         and QE4 configured to perform route_optimization
         and EUT is away_from_home
         and EUT registered to QE1
       }
  ensure that
       { when { a Security_Association is established between EUT and QE1
               and EUT moves to a foreign_network }
         then { QE4 and EUT are able to communicate directly }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP MOB 2015 01
summary : 'Mobile Node sends Home Test Init secured
           using tunnel_mode_ESP to its Home Agent'
RQ ref : RQ_001_2034
Role
      : Mobile_Node
config : CF_MOB_03
TD ref : TD_MOB_2015_01
  with {
           EUT configured to protect any Home_Test_Init to QE1
                            using tunnel_mode_ESP
         and QE1 configured to accept only Home_Test_Init secured
                            using tunnel_mode_ESP from EUT
         and EUT configured to perform route_optimization
         and QE4 configured to perform route_optimization
       }
  ensure that
       \{ when \}
                     a Security_Association is established between EUT and QE1
             and EUT moves to a foreign_network }
         then { QE4 and EUT are able to communicate directly }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_2015_02
summary : 'Home Agent sends Home Test secured using tunnel_mode_ESP'
RQ ref : RQ_001_2034
       : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_2015_02
  with {
           EUT configured to protect any Home_Test to QE1
                            using tunnel_mode_ESP
         and QE1 configured to accept only Home_Test secured
                           using tunnel_mode_ESP from EUT
         and QE1 configured to perform Route_Optimization
         and QE4 configured to perform Route_Optimization
       }
  ensure that
       { when { a Security_Association is established between EUT and QE1
                and QE1 moves to a foreign_network }
         then { QE4 and QE1 are able to communicate directly }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_2016_01
summary : 'Home Agent supports Mobile_Prefix_Solicitation secured
          using transport_mode_ESP
RQ ref : RQ_001_2016 , RQ_001_2031
Role : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_2016_01
  with {
            QE1 configured to protect any Mobile_Prefix_Solicitation to EUT
```

```
using transport_mode_ESP
         and EUT configured to accept only a Mobile_Prefix_Solicitation secured
                            using transport_mode_ESP from QE1
         and QE6 configured to have a prefix_lifetime of 1 minute
         and QE1 away_from_home
         and QE1 registered to EUT
  ensure that
       \{ \mbox{ when } \{ \mbox{ a Security_Association is established between EUT and QE1 } \}
         then { QE4 is able to communicate with QE1 after the prefix_lifetime }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id
       : TP_MOB_2016_02
summary : 'Mobile Node supports Mobile_Prefix_Advertisement secured
          using transport_mode_ESP'
RQ ref : RQ_001_2016 , RQ_001_2031
       : Mobile_Node
Role
config : CF_MOB_03
TD ref : TD_MOB_2016_02
  with {
             QE1 configured to protect any Mobile_Prefix_Advertisement to EUT
                            using transport_mode_ESP
         and EUT configured to accept only Mobile_Prefix_Advertisement
                             secured using transport_mode_ESP from QE1
         and EUT away_from_home
         and EUT registered to QE1
         and QE6 configured to have a prefix_lifetime of 1 minute
  ensure that
       \{ when \{ a Security_Association is established between EUT and QE1 \}
         then { QE4 and EUT are able to communicate after prefix_lifetime }
       }
 -xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_2017_01
summary : 'Mobile Node sends Mobile_Prefix_Solicitation secured
          using transport_mode_ESP to its Home Agent'
RQ ref : RQ_001_2017 , RQ_001_2030
       : Mobile_Node
Role
config : CF_MOB_03
TD ref : TD_MOB_2017_01
             EUT configured to protect any Mobile_Prefix_Solicitation to QE1
  with {
                            using transport_mode_ESP
         and QE1 configured to accept only a Mobile_Prefix_Solicitation
                            secured using transport_mode_ESP from EUT
         and QE6 configured to have a prefix_lifetime of 1 minute
         and EUT away_from_home
         and EUT registered to QE1
  ensure that
      { when { a Security_Association is established between EUT and QE1 }
         then { QE4 and EUT are able to communicate after prefix_lifetime }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_2017_02
summary : 'Home Agent sends Mobile_Prefix_Advertisement secured
          using transport_mode_ESP'
RQ ref : RQ_001_2017 , RQ_001_2030
       : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_2017_02
  with {
             EUT configured to protect any Mobile_Prefix_Advertisement to QE1
                            using transport_mode_ESP
         and QE1 configured to accept only a Mobile_Prefix_Advertisement
                             secured using transport_mode_ESP from EUT
         and OE1 away from home
         and QE1 registered to EUT
         and QE6 configured to have a prefix_lifetime of 1 minute
       }
  ensure that
       { when { a Security_Association is established between EUT and QE1 }
```

then { QE4 is able to communicate with QE1 after prefix_lifetime } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_2018_01 summary : 'Mobile Node sends payload_packet tunnelled to its Home Agent secured using tunnel_mode_ESP' **RQ ref** : RQ_001_2018 Role : Mobile_Node config : CF_MOB_03 **TD ref** : TD_MOB_2018_01 with { EUT configured to protect any payload_packet to QE1 using tunnel_mode_ESP and QE1 configured to accept only a payload_packet secured using tunnel_mode_ESP from EUT and EUT configured not to perform Route_Optimization and EUT away_from_home and EUT registered to QE1 } ensure that a Security_Association is established between EUT and QE1 { when { and EUT moves to a foreign_network then { QE4 and EUT are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx TP id : TP_MOB_2018_02 summary : 'Home Agent sends payload_packet tunnelled to Mobile Node secured using tunnel_mode_ESP' **RQ ref** : RQ_001_2018 Role : Home_Agent config : CF_MOB_02 **TD ref** : TD_MOB_2018_02 with { EUT configured to protect any payload_packet to QE1 using tunnel_mode_ESP and QE1 configured to accept only a payload_packet secured using tunnel_mode_ESP from EUT and QE1 configured not to perform Route_Optimization and QE1 away_from_home and QE1 registered to EUT } ensure that $\{ \mbox{ when } \{ \mbox{ a Security} \mbox{Association is established between EUT and QE1 }$ and QE1 moves to a foreign_network } then { QE4 and QE1 are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_2018_03 summary : 'Mobile Node supports payload_packet secured using tunnel_mode_ESP' **RQ ref** : RQ_001_2018 : Mobile_Node Role config : CF MOB 03 **TD ref** : TD_MOB_2018_03 with { QE1 configured to protect any payload_packet to EUT using tunnel_mode_ESP and EUT configured to accept only a payload_packet secured using tunnel_mode_ESP from QE1 and EUT configured not to perform Route_Optimization and EUT away_from_home and EUT registered to QE1 } ensure that $\{ \text{ when } \{$ a Security_Association is established between EUT and QE1 and EUT moves to a foreign_network } then { QE4 and EUT are able to communicate } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

TP id : TP_MOB_2018_04 summary : 'Home Agent supports payload_packet tunnelled from Mobile Node and secured using tunnel_mode_ESP' **RQ ref** : RQ_001_2018 Role : Home_Agent config : CF_MOB_02
TD ref : TD_MOB_2018_04 with { QE1 configured to protect any payload_packet to EUT using tunnel_mode_ESP and EUT configured to accept only a payload_packet secured using tunnel_mode_ESP from QE1 and QE1 configured not to perform Route_Optimization and QE1 away_from_home and QE1 registered to EUT } ensure that a Security_Association is established between EUT and QE1 { when { and QE1 moves to a foreign_network } then { QE4 is able to communicate with QE1 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_2025_01 summary : 'When Mobile Node returns home and uses Internet Key Exchange, it makes inactive its Security_Policy protecting tunnelled traffic with its Home Agent **RQ ref** : RQ_001_2025 Role : Mobile Node config : CF_MOB_03
TD ref : TD_MOB_2025_01 EUT configured to use IKEv2 to implement its Security_Policy with { and EUT configured to protect any payload_packet to QE1 using tunnel_mode_ESP and QE1 configured to accept only a payload_packet secured using tunnel_mode_ESP from EUT and EUT configured not to perform Route_Optimization and EUT away_from_home and EUT registered to QE1 and EUT having established communication to QE4 ensure that { when { EUT returns home } then { QE4 and EUT are able to communicate } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **TP id** : TP_MOB_2025_02 summary : 'When Mobile Node returns home and uses Internet Key Exchange, it makes inactive its Security_Policy protecting tunnelled traffic with its Home Agent **RQ ref** : RQ_001_2025 Role : Home_Agent config : CF_MOB_02
TD ref : TD_MOB_2025_02 with { QE1 configured to use IKEv2 to implement its Security_Policy and EUT configured to protect any payload_packet to QE1 using tunnel_mode_ESP and QE1 configured to accept only a payload_packet secured using tunnel_mode_ESP from EUT by ESP and QE1 configured not to perform Route_Optimization and QE1 away_from_home and QE1 registered to EUT and QE1 having established communication to QE4 ensure that { when { QE1 returns home } then { QE4 is able to communicate with QE1 } } --xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

TP id : TP_MOB_2026_01

```
summary : 'When Mobile Node returns home and is configured with manually
           established Security Associations, it makes inactive security
           policies concerning tunnelled traffic with Home Agent without
           deleting Security Associations'
RQ ref : RQ_001_2026
       : Mobile_Node
Role
config : CF_MOB_03
TD ref : TD_MOB_2026_01
  with {
             EUT configured 'with manually established Security Associations
                             and Policies'
         and EUT configured to protect packets to QE1
                            using tunnel_mode_ESP
         and QE1 configured to accept only a packets secured
                            using tunnel_mode_ESP
         and EUT configured not to perform Route_Optimization
         and EUT away_from_home
         and EUT registered to QE1
       }
  ensure that
                     EUT moves to another foreign_network
       \{ \text{ when } \{
                after EUT returns home }
         then {
                     QE4 and EUT are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_2026_02
summary : 'When Mobile Node returns home and is configured with manually
           established Security Associations, Home Agent makes inactive
           security policies concerning tunnelled traffic with Mobile Node
           without deleting Security Associations'
RQ ref : RQ_001_2026
        : Home_Agent
Role
config : CF_MOB_02
TD ref : TD_MOB_2026_02
  with {
             EUT configured 'with manually established Security Associations
                             and Policies'
         and EUT configured to protect packets to QE1
                            using tunnel_mode_ESP
         and QE1 configured to accept only a packets secured
                            using tunnel_mode_ESP
         and QE1 configured not to perform Route_Optimization
         and QE1 away_from_home
         and QE1 registered to EUT
       }
  ensure that
                     QE1 moves to another foreign_network
       { when {
                after QE1 returns home }
         then {
                     QE4 is able to communicate with QE1 }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP MOB 2019 01
summary : 'Mobile Node supports multicast group membership control packets
         tunnelled from its Home Agent protected by ESP with the tunnel mode'
RQ ref : RQ_001_2019
       : Mobile Node
Role
config : CF_MOB_03
TD ref : TD_MOB_2019_01
  with {
             QE1 configured to protect any
                            multicast_group_membership_control_packet to EUT
                            using tunnel_mode_ESP
         and EUT configured to accept only a
                            multicast_group_membership_control_packet from QE1
                            secured using tunnel_mode_ESP
         and EUT configured to subscribed to a global_multicast_group
         and EUT away_from_home
         and EUT registered to QE1
       }
  ensure that
       { when { QE3 sends a packet to the global_multicast_group
                                   indicating that a response is required }
```

```
then { QE3 indicates receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_2019_02
summary : 'Home Agent supports multicast group membership control packets
          tunnelled from Mobile Node protected by ESP with the tunnel mode'
RQ ref : RQ_001_2019
Role
        : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_2019_02
  with {
             QE1 configured to protect any
                            multicast_group_membership_control_packet to EUT
                            using tunnel_mode_ESP
         and EUT configured to accept only
                          a multicast_group_membership_control_packet from QE1
                          secured using tunnel_mode_ESP
         and QE1 configured to subscribed to a global_multicast_group
         and QE1 away_from_home
         and QE1 registered to EUT
       }
  ensure that
       { when { EUT sends a packet to the global_multicast_group
                                    indicating that a response is requested }
         then { QE3 indicates receipt of the response }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_2039_01
summary : 'Home Agent update its security association entries when the
         Mobile Node change of foreign network'
RQ ref : RQ_001_2039
Role
        : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_2039_01
  with {
             EUT configured to protect any Binding_Acknowledgement to QE1
                             using tunnel_mode_ESP
         and QE1 configured to accept only a Binding_Acknowledgement
                            secured using tunnel_mode_ESP from EUT
         and QE1 away_from_home
         and QE1 registered to EUT
       }
  ensure that
       { when { QE1 moves to another foreign_network }
  then { QE4 and QE1 are able to communicate }
       }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
TP id : TP_MOB_2040_01
summary : 'Home Agent does not take into account a Binding Update not
         secured'
RQ ref : RQ_001_2040
Role : Home_Agent
config : CF_MOB_02
TD ref : TD_MOB_2040_01
  with { and EUT configured to accept only a Binding_Update
                            secured using tunnel_mode_ESP
         and QE1 configured to send any Binding_Update not secured
       }
  ensure that
       { when { QE1 moves to a foreign_network }
         then { QE4 and QE1 are unable to communicate }
       }
End Group 5
```

Annex C (informative): Bibliography

- ETSI TS 102 424: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Requirements of the NGN network to support Emergency Communication from Citizen to Authority".
- ETSI ES 202 553: "Methods for testing and Specification (MTS); TPLan: A notation for expressing test Purposes".

History

Document history		
V1.1.1	June 2007	Publication

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