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Technical Specification

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

Reference

RTS/MTS-IPT-007[2]-IPv6-CorITS

Keywords

IP, IPv6, interoperability, testing

ETSI

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

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

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

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

1 Scope

The present document specifies the interoperability Test Descriptions (TDs) with integrated Test Purposes (TPs) for the IPv6 Core standards. The TDs are presented in the tabular form specified in TS 102 424 [1] and the TPs are defined using the TPLan notation also described in TS 102 424 [1]. The Test Suite Structure is based on the IETF RFCs which, together, form the IPv6 Core specification and is reflected in the use of "Group/End Group" statements in the TPLan code presented in annex A.

2 References

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2.1 Normative references

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

[1]   ETSI TS 102 424 (2005): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Requirements of the NGN network to support Emergency Communication from Citizen to Authority".

[2]   IETF RFC 1981: "Path MTU Discovery for IP version 6".

[3]   IETF RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[4]   IETF RFC 2461: "Neighbor Discovery for IP Version 6 (IPv6)".

[5]   IETF RFC 2462: "IPv6 Stateless Address Autoconfiguration".

[6]   IETF RFC 2463: "Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification".

[7]   IETF RFC 2675: "IPv6 Jumbograms".

[8]   IETF RFC 3513: "Internet Protocol Version 6 (IPv6) Addressing Architecture".

3   Abbreviations

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

EUT   Equipment Under Test
HS   Host
i/f   interface
LL   Link Local
M/cast   Multicast
MTU   Maximum Transmission Unit
PMTU   Path MTU
QE   Qualified Equipment
RT   RouTer
SL   Site Local
TP   Test Purpose
TD   Test Description
TPLan   Test Purpose Language
TSS   Test Suite Structure

4   IPv6 Core Interoperability Test Specification

4.1   Introduction

The IPv6 Core Interoperability Test Descriptions (TDs) defined in the following clauses are derived from the Test Purposes (TPs) specified in annex A.

4.2 Test Descriptions

4.2.1 Group 1 RFC 2460

4.2.1.1 Group 1.2 Process IPv6 Packet

4.2.1.1.1 Group 1.2.4 Process IPv6 Header

4.2.1.1.1.1 Group 1.2.4.4 Process Hop Limit

Test Description					
Identifier:	TD_COR_1002_01		**Test Purpose:**	TP_COR_1002_01	
Summary:	EUT decreases the Hop Limit field of a traversed IPv6 packet and forwards it				
Roles:	Router		**Configuration:**	CF_CORE_22	
References:	RQ_000_1002				

with { QE1 'configured with a unique global unicast address '
  and QE2 'configured with a unique global unicast address'
  and EUT 'configured with two unique global unicast addresses on the link
       connecting QE1 and EUT, and the link connecting QE2 and EUT, respectively' }
 	
ensure that {
  when { EUT **receives** 'a packet'
       containing 'QE1 as source address and QE2 as destination address'
    and containing 'Hop Limit > 1' }
  then { EUT **sends** 'the packet with the Hop Limit decremented' **to** QE2 }
       }					

Pre-test conditions:	EUT established as the default router for QE1				
Step	**Test Sequence**			**Verdict**	
				Pass	**Fail**
1	Cause QE1 to send an Echo Request with QE2 identified as the destination and hop limit larger than 1				
2	Check: Does protocol monitor on link2 show that the Echo Request was sent from QE1 to QE2, with a decremented hop limit?			Yes	No
3	Check: Does QE1 receive an Echo Reply from QE2?			Yes	No
Observations:					

Test Description					
Identifier:	TD_COR_1002_02		**Test Purpose:**	TP_COR_1002_02	
Summary:	EUT drops a traversed IPv6 packets with a zero Hop Limit and returns an ICMP error message to the source				
Roles:	Router		**Configuration:**	CF_CORE_22	
References:	RQ_000_1002				

with { QE1 'configured with a unique global unicast address '
  and QE2 'configured with a unique global unicast address'
  and EUT 'configured with two unique global unicast addresses on the link
       connecting QE1 and EUT, and on the link connecting QE2 and EUT, respectively' }
 	
ensure that {
  when { EUT **receives** 'a packet'
       containing 'QE1 as source address and QE2 as destination address'
    and containing 'Hop Limit = 0' }
  then { EUT **discards** 'the packet'
  and EUT **sends** 'an ICMP error message' **to** QE1 }
       }					

Pre-test conditions:	EUT established as the default router for QE1				
Step	**Test Sequence**			**Verdict**	
				Pass	**Fail**
1	Cause QE1 to send an Echo Request with QE2 identified as the destination and hop limit of 1				
2	Check: Does the protocol monitor on link2 show that the Echo Request was sent from QE1 to QE2?			No	Yes
3	Check: Does the protocol monitor on link1 show that an ICMP error message was sent from EUT to QE1?			Yes	No
Observations:					

Test Description			
Identifier:	TD_COR_1058_01	**Test Purpose:**	TP_COR_1058_01
Summary:	Discard packets if Hop Limit ≤ 1		
Roles:	Host, Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1058		

```
ensure that {
  when { QE1 is requested to 'send a packet to QE2'
                  containing 'Routing header Type = 0'
            and containing 'Segments Left value other than zero'
            and containing 'Segments Left value not greater than the number of addresses
                            in the Routing header'
            and containing 'an even "Hdr Ext Len" value'
        and not containing 'multicast address as next address to be visited or IPv6 Destination'
            and containing 'IPv6 hop limit ≤ 1'
            and containing 'EUT as next routing hop' }
  then { EUT sends 'ICMP "Time Exceeded" error message' to QE1
      and EUT discards 'the packet' }
        }
```

Pre-test conditions:	EUT established as the default router for QE1		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE1 to send an Echo Request with the following properties: - hop limit =1 - type 0 routing header - EUT as next routing hop - QE2 as final destination		
2	Check: Does the protocol monitor on link2 show that the Echo Request was sent from QE1 to QE2?	No	Yes
3	Check: Does the protocol monitor on link1 show that an ICMP 'Time Exceeded' error message was sent from EUT to QE1?	Yes	No
Observations:	A QE cannot send out any message with hop limit = 0, thus hop limit = 1 is chosen for this test.		

Test Description			
Identifier:	TD_COR_1059_01	**Test Purpose:**	TP_COR_1059_01
Summary:	Process packets if Hop Limit > 1		
Roles:	Host, Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1059		

```
ensure that {
  when { QE1 is requested to 'send a packet to QE2'
                  containing 'Routing header Type = 0'
            and containing 'Segments Left value other than zero'
            and containing 'Segments Left value not greater than the number of addresses in
                            the Routing header'
            and containing 'an even "Hdr Ext Len" value'
        and not containing 'multicast address as next address to be visited or IPv6 Destination'
            and containing 'IPv6 hop limit > 1'
            and containing 'EUT as next routing hop' }
  then { EUT sends 'the packet to QE2' }
        }
```

Pre-test conditions:	EUT established as the default router for QE1		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE1 to send an Echo Request with the following properties: - hop limit >1 - type 0 routing header - EUT as next routing hop - QE2 as final destination		
2	Check: Does the protocol monitor on link2 show that the Echo Request was sent from QE1 to QE2?	Yes	No
Observations:			

4.2.1.1.2 Group 1.2.6 Process Flow Label

Test Description			
Identifier:	TD_COR_1130_01	**Test Purpose:**	TP_COR_1130_01
Summary:	EUT detects two packets with different hop-by-hop option contents but the same source and destination addresses and the same flow label		
Roles:	Host, Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1130		

```
with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link connecting QE1 and
            EUT and, the link connecting QE2 and EUT, respectively' }

ensure that {
   when { EUT receives 'two packets'
           containing 'QE1 as source address and QE2 as destination address'
       and containing 'a same flow label'
       and containing 'different hop-by-hop options' }
   then { EUT sends 'an ICMP parameter problem message' to QE1
   and EUT discards 'the packets' }
          }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This IOP test is practically impossible. One router cannot guarantee the arrival and processing of two different packets at same time.		

Test Description			
Identifier:	TD_COR_1130_02	**Test Purpose:**	TP_COR_1130_02
Summary:	EUT detects two packets with different routing header contents but the same source and destination addresses and the same flow label		
Roles:	Host, Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1130		

```
with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link connecting QE1 and
            EUT and, the link connecting QE2 and EUT, respectively' }

ensure that {
   when { EUT receives 'two packets'
           containing 'QE1 as source address and QE2 as destination address'
       and containing 'a same flow label'
       and containing 'different hop-by-hop options' }
   then { EUT sends 'an ICMP parameter problem message' to QE1
   and EUT discards 'the packets'}
          }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This IOP test is practically impossible. One router cannot guarantee the arrival and processing of two different packets at same time.		

4.2.1.2 Group 1.4 Extension Headers

4.2.1.2.1 Group 1.4.2 Process Extension Headers

Test Description			
Identifier:	TD_COR_1004_01	**Test Purpose:**	TP_COR_1004_01
Summary:	EUT does NOT process (modify) a Routing Header contained in a packet NOT destined for the EUT		
Roles:	Host, Router	**Configuration:**	CF_CORE_31
References:	RQ_000_1004		

with { QE1 'configured with a unique non link-local unicast address'
  and QE2 'configured as a router with a unique non link-local unicast address'
  and QE3 'configured with a unique non link-local unicast address'
  and EUT 'configured with one unique non link-local unicast address on each link'
  and EUT 'established as the default Router for QE1' }
 	
ensure that {
  when { EUT **receives** 'a packet' **from** QE1
      containing 'an indication that QE2 is the destination'
     and containing 'a Routing Header'
      indicating 'QE2 as the first node to process the Routing Header
          and QE3 as the final destination of the packet' }
  then { EUT 'forwards the packet, with the Routing Header UNMODIFIED' **to** QE2}
    }			

Pre-test conditions:	QE2 is configured as a Router EUT established as the default router for QE1		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE1 to send an Echo Request with QE3 identified as the final destination, QE2 as an intermediate hop and normal routing tables bypassed (ping6 -r QE2 QE3)		
2	Check: Does protocol monitor show that the Echo Request was sent from QE1 to QE3?	Yes	No
3	Check: Does QE1 receive an Echo Reply fromQE3?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1004_02	**Test Purpose:**	TP_COR_1004_02
Summary:	EUT does NOT process(remove) a Fragmentation Header contained in a packet NOT destined for the EUT		
Roles:	Host, Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1004		

with { QE1 'configured with a non link-local unicast address'
  and EUT 'configured with a unique non link-local unicast address on each link' }
 	
ensure that {
  when { EUT **receives** 'a packet' **from** QE1
      containing 'an indication that QE2 is the destination'
     and containing 'a Fragmentation Header' }
  then { EUT 'forwards the packet with its Fragmentation Header' **to** QE2 }
    }			

Pre-test conditions:			

Step	Test Sequence	Verdict	
		Pass	**Fail**
Observations:			

Test Description			
Identifier:	TD_COR_1004_03	**Test Purpose:**	TP_COR_1004_03
Summary:	EUT does NOT process(modify or remove) a Destination Options Header in a packet NOT destined for the EUT		
Roles:	Host, Router	**Configuration:**	CF_CORE_31
References:	RQ_000_1004		

```
with { QE1 'configured with a unique non link-local unicast address'
   and QE2 'configured as a router with a unique non link-local unicast address'
   and QE3 'configured with a unique global unicast address'
   and EUT 'configured with a unique non link-local unicast address on each link' }

ensure that {
   when { EUT receives 'a packet' from QE1
          containing 'an indication that QE2 is the destination'
        and containing 'a Destination Options Header' }
   then { EUT 'forwards the packet, with the Destination Options Header UNMODIFIED'
          to QE2 }
        }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	In an interoperability testing environment it is almost (if not totally) impossible to reproduce the conditions that would reliably cause the Destination Options Header to be used.		

Test Description			
Identifier:	TD_COR_1005_01	**Test Purpose:**	TP_COR_1005_01
Summary:	EUT processes a Destination Options Header contained in a packet destined for the EUT		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1005		

```
with { QE  'configured with a unique link-local address'
   and EUT 'configured with a unique link-local address' }

ensure that {
   when { EUT receives 'fragment packets of a Request that requires a Reply' from QE
          containing 'a Fragmentaion Option in the Destination Options Header' }
     -- A Destination Options Header can carry a Fragmentation option that
     -- achieves the same results as a Fragmentation Header.--
     -- The usage choice depends on the processing resources consumed--
   then { EUT sends 'the expected Reply' to QE }
        }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	In an interoperability testing environment it is almost (if not totally) impossible to reproduce the conditions that would reliably cause the Destination Options Header to be used.		

4.2.1.2.2   Group 1.4.4 Routing Header

4.2.1.2.2.1   Group 1.4.4.2 Process Routing Header

Test Description			
Identifier:	TD_COR_1042_01	**Test Purpose:**	TP_COR_1042_01
Summary:	Discard packet and generate ICMP error message if packet size larger than MTU		
Roles:	Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1042		

with { 'Link2 configured with a smaller MTU than Link1' }
 	
ensure that {
  when { QE1 **is requested to** 'send a packet larger than Link2 MTU to QE2'
            containing 'EUT as next routing hop' }
  then { EUT **discards** 'the packet'
    and EUT **sends** 'ICMP "Packet too big" error message 'to QE1 }
          }			

Pre-test conditions:	PMTU of link1 is set to a value greater than PMTU of link2.		

Step	Test Sequence	Verdict	
		Pass	**Fail**

1	Cause QE1 to send an Echo Request with the following properties:
	  - (PMTU of link2) < Echo Request packet size < (PMTU of link1)
	  - EUT is the next routing hop.
	  - QE2 is the final destination.		

2	Check: Does the protocol monitor on Link2 show that the Echo Request has NOT been forwarded to QE2? (EUT has discarded the Echo Request)	Yes	No
3	Check: Does the protocol monitor on Link1 show that EUT has sent an ICMP 'Packet too big' error message to QE1?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1049_01	**Test Purpose:**	TP_COR_1049_01
Summary:	Routing Header NOT processed until IPv6 header Dest. Addr. reached		
Roles:	Host, Router	**Configuration:**	CF_CORE_31
References:	RQ_000_1004		

with { EUT 'not included in the Routing Header vector (hop) list' }
 	
ensure that {
  when { QE1 **is requested to** 'send a packet to QE3'
            containing 'QE2 as next routing hop'
    and EUT 'is on the path to QE2' }
  then { EUT **ignores** 'the routing header'
    and EUT 'routes the packet to QE2' }
         }			

Pre-test conditions:	EUT is established as default router for all nodes QE2 is a router		

Step	Test Sequence	Verdict	
		Pass	**Fail**

1	Cause QE1 to send an Echo Request with the following properties:
	  - QE2 is the next routing hop
	  - QE3 is the final destination		

2	Check: Does the protocol monitor on Link2 show that EUT forwarded the Echo Request message to QE2 without changing the routing header?	Yes	No
Observations:			

Test Description				
Identifier:	TD_COR_1050_01	**Test Purpose:**	TP_COR_1050_01	
Summary:	Routing Header IS processed when IPv6 header Dest. Addr. reached			
Roles:	Host, Router	**Configuration:**	CF_CORE_31	
References:	RQ_000_1050			

```
with { EUT 'included in the Routing Header vector (hop) list' }

ensure that {
   when { QE1 is requested to 'send a packet to QE3'
               containing 'EUT as next routing hop'
      and QE2 'as subsequent routing hop' }
   then { EUT 'processes the routing header'
      and EUT 'routes the packet' to QE2 }
      }
```

Pre-test conditions:	EUT is established as default router for all nodes QE2 is a router		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**

1	Cause QE1 to send an Echo Request with the following properties:
	  - EUT is the next routing hop
	  - QE2 is the subsequent routing hop
	  - QE3 is the final destination		

2	Use the protocol monitor on Link1 to record the original Echo Request sent by QE1		
3	Check: Does the protocol monitor on Link2 show that EUT forwarded the Echo Request message to QE2?	Yes	No
4	Check: Does the protocol monitor on Link2 show that EUT has correctly updated (*) the Headers (IPv6 header and Routing header) of the forwarded Echo Request?	Yes	No
Observations:	(*) EUT should have modified the original Echo Request packet as follow: Swap the IPv6 Destination Address and the address of the next hop to be visited. Decrement the segment left byte by 1		

Test Description				
Identifier:	TD_COR_1055_01	**Test Purpose:**	TP_COR_1055_01	
Summary:	Discard multicast packets			
Roles:	Host, Router	**Configuration:**	CF_CORE_31	
References:	RQ_000_1055			

```
ensure that {

   when { QE1 is requested to 'send a packet to QE3'
               containing 'Routing header Type 0'
           and containing 'a Segments Left Field value other than zero'
           and containing 'an even "Hdr Ext Len" value'
           and containing 'Segments Left Field not greater than the number of addresses
                    in the Routing header'
           and containing 'EUT as next routing hop'
           and containing 'QE2 multicast address as subsequent routing hop' }
   then { EUT discards 'the packet' }
      }
```

Pre-test conditions:	EUT is established as default router for all nodes QE2 is a router		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**

1	Cause QE1 to send an Echo Request with the following properties:
	  - EUT as next routing hop
	  - a multicast address of QE2 as subsequent routing hop
	  - QE3 as final destination		

2	Check: Does the protocol monitor on Link2 show that EUT forwarded the Echo Request message to QE2?	No	Yes
Observations:	If the next routing hop to be visited is a multicast address the node should discard the packet.		

Test Description			
Identifier:	TD_COR_1056_01	**Test Purpose:**	TP_COR_1056_01
Summary:	Discard multicast packets		
Roles:	Host, Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1056		

```
ensure that {
   when { QE1 is requested to 'send a packet to the multicast address of QE2'
                 containing 'Routing header Type 0'
             and containing 'a Segments Left Field value other than zero'
             and containing 'an even "Hdr Ext Len" value'
             and containing 'Segments Left Field not greater than the number of addresses
                           in the Routing header'
             and containing 'EUT as next hop in the routing header' }
   then { EUT discards 'the packet' }
        }
```

Pre-test conditions:	EUT is established as default router for all nodes QE2 has a routable multicast address		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE1 to send an Echo Request with the following properties: - EUT is the next routing hop - a multicast address of QE2 as final destination.		
2	Check: Does the protocol monitor on Link2 show that EUT forwarded the Echo Request message to QE2?	No	Yes
Observations:	The multicast address used to address QE2 should be a routable address (multicast scope should be site-local, organization-local, or global), not a link-local multicast address.		

4.2.1.2.3   Group 1.4.5 Fragment Header

4.2.1.2.3.1   Group 1.4.5.1 Generate Fragmented Packets

Test Description			
Identifier:	TD_COR_1064_01	**Test Purpose:**	TP_COR_1064_01
Summary:	EUT fragments a packet larger than the available PMTU before sending it		
Roles:	Host, Router	**Configuration:**	CF_CORE_23
References:	RQ_000_1064		

```
with { 'the MTU on Link1 set greater than the MTU on Link2' }

ensure that {
   when { EUT is requested to 'send a packet of greater length than
                       the MTU of Link2' to QE2 }
   then { QE2 indicates 'receipt of the same data without any
                    modification' }
        }
```

Pre-test conditions:	MTU on the link between QE1 and the EUT set to a value greater than that on the link between QE1 and QE2		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause EUT to send an Echo Request to QE2 with a packet size greater than the MTU between QE1 and QE2 but less than the PMTU between QE1 and EUT and with each octet set to the hexadecimal value 'F0'		
2	Check: Does protocol monitor show that the Echo Request was sent from EUT to QE2?	Yes	No
3	Check: Does EUT receive a Packet Too Big message from QE1	Yes	No
4	Cause EUT to send an Echo Request to QE2 with a packet size greater than the MTU between QE1 and QE2 but less than the PMTU between QE1 and EUT and with each octet set to the hexadecimal value 'F0'		
5	Check: Does protocol monitor show that the Echo Request was sent from EUT to QE2?	Yes	No
6	Check: Does QE1 receive an Echo Reply from QE2 with the packet length the same as the Echo Request and with each octet containing the hexadecimal value 'F0'?	Yes	No
Observations:			

4.2.1.2.3.2   Group 1.4.5.2 Process Fragmented Packets

Test Description			
Identifier:	TD_COR_1100_01	**Test Purpose:**	TP_COR_1100_01
Summary:	EUT reassembles a fragmented packet of an original length less than 1 500 octets		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1100		

with { 'the MTU on Link1 set to 1 400 octets' }
 	
ensure that {
  when { QE **is requested to** 'send data requiring a packet
                     length lesser than 1 500 octets' }
  then { EUT **indicates** 'receipt of the same data without
              modification' }
      }			

Pre-test conditions:	MTU set to 1 400 octets on link1		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an Echo Request to EUT with a packet size of 1 450 octets and with each octet set to the hexadecimal value 'F0'		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to EUT?	Yes	No
3	Check: Does QE receive an Echo Reply from EUT with the packet length the same as the Echo Request and with each octet containing the hexadecimal value 'F0'?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1100_02	**Test Purpose:**	TP_COR_1100_02
Summary:	EUT reassembles a fragmented packet of an original length equal to 1500 octets		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1100		

with { 'the MTU on Link1 set to 1 400 octets' }
 	
ensure that {
  when { QE **is requested to** 'send data requiring a packet
                     length equal to 1 500 octets' }
  then { EUT **indicates** 'receipt of the same data without
              modification' }
      }			

Pre-test conditions:	PMTU set to 1 400 octets on link1		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an Echo Request to EUT with a packet size of 1 500 octets and with each octet set to the hexadecimal value 'F0'		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to EUT?	Yes	No
3	Check: Does QE receive an Echo Reply from EUT with a packet length of 1 500 octets with each octet containing the hexadecimal value 'F0'?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1101_01	**Test Purpose:**	TP_COR_1101_01
Summary:	EUT reassembles a fragmented packet of an original length greater than 1 500 octets		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1101		

```
with { 'the MTU on Link1 set to 1 400 octets' }

ensure that {
  when { QE is requested to 'send data requiring a packet
                        length greater than 1 500 octets' }
  then { EUT indicates 'receipt of the same data without
                    modification' }
      }
```

Pre-test conditions:	PMTU set to 1 400 octets on link1		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an Echo Request to EUT with a packet size greater than 1 500 octets and with each octet set to the hexadecimal value 'F0'		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to EUT?	Yes	No
3	Check: Does QE receive an Echo Reply from EUT with a packet length the same as the Echo Request and with each octet containing the hexadecimal value 'F0'?	Yes	No
Observations:			

4.2.2   Group 2 RFC 2461

4.2.2.1   Group 2.1 Generate Neighbor Discovery Messages

4.2.2.1.1   Group 2.1.5 Generate Router Advertisement

Test Description			
Identifier:	TD_COR_8295_01	**Test Purpose:**	TP_COR_8295_01
Summary:	EUT (as a router) does not send Router Advertisements out any interface that is not an advertising interface		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8295		

```
with {  QE 'configured with a unicast address'
   and EUT 'configured with a multicast address'
   and EUT 'not configured to have any unicast address' }

ensure that {
   when { EUT 'is initializing' }
   then { EUT 'does not send Router Advertisement to QE' }
       }
```

Pre-test conditions:	EUT is a router with an advertising interface Configure EUT to have a multicast address and no unicast address		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause the EUT's advertising interface to disable its advertising function		
2	Check: Does the protocol monitor show that EUT sends a Router Advertisement over this interface?	No	Yes
Observations:			

4.2.2.1.1.1   Group 2.1.5.1 Router Advertisement Behaviour

4.2.2.1.1.1.1   Group 2.1.5.1.1 Router Advertisement Behaviour on Reconfiguration

Test Description			
Identifier:	TD_COR_8256_01	**Test Purpose:**	TP_COR_8256_01
Summary:	By default a router does not advertise its presence unless it has been explicitly configured to do so		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8256		

```
with {  QE 'configured with a unique global unicast address'
   and EUT 'configured as a router with a unique global unicast address'
   and EUT 'not configured to send router advertisements' }

ensure that {
   when { EUT 'is initializing' }
   then { EUT 'does not send Router Advertisement to QE'
      and EUT discards 'Router Solicitation sent by QE' }
         }
```

Pre-test conditions:	EUT configured as a router EUT configured not to send any router advertisement EUT power down		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Reconnect EUT to the network (power-up)		
2	Check: Does the protocol monitor show that a router advertisement is sent from EUT?		
3	Reconnect QE to the network (power-up)		
4	Check: Does the protocol monitor show that a router solicitation is sent from QE?	Yes	No
5	Check: Does the protocol monitor show that a router advertisement is sent from EUT to QE?	No	Yes
Observations:			

Test Description			
Identifier:	TD_COR_8297_01	**Test Purpose:**	TP_COR_8297_01
Summary:	A disabled EUT advertising interface returns to being an advertising interface when re-enabled		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8297		

```
with { EUT 'advertising interface disabled' }
       -- such that its network interfaces ceases to be an advertising interface --

ensure that {
   when { EUT 'network interface is administratively re-enabled' }
   then { EUT 'network interface returns to being an advertising interface' }
         }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This function is purely internal with no significant interoperability issues.		

Test Description			
Identifier:	TD_COR_8313_01	**Test Purpose:**	TP_COR_8313_01
Summary:	EUT transmits FINAL Router advertisement messages and departs from the all-routers IP multicast group on all interfaces on which the EUT supports IP multicast		
Roles:		**Configuration:**	CF_CORE_22
References:	RQ_000_8313		

with { EUT 'configured to support IP multicast on its two interfaces'
   and EUT 'configured to act as the default router for QE1' }
 	
ensure that {
   when { EUT 'network interface to QE1 is DISABLED from sending RA messages'
          -- but the interface is still up and operational --
      and EUT 'IP forwarding capability is DISABLED' }
   then { EUT **sends** 'a number of Router Advertisement messages onto the link to
                   which QE1 is attached'
          and EUT 'then leaves the all-routers IP multicast group on both interfaces' }
        }			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This function is purely internal with no significant interoperability issues.		

Test Description			
Identifier:	TD_COR_8314_01	**Test Purpose:**	TP_COR_8314_01
Summary:	When EUT becomes a Host, subsequent Neighbor Advertisements transmitted from a previously advertising interface indicate that EUT is no longer a Router		
Roles:		**Configuration:**	CF_CORE_22
References:	RQ_000_8314		

with { EUT 'Router Advertisements disabled on two previously advertising interfaces'
   and EUT 'has IP forwarding disabled'
   and EUT 'removed from all-routers IP multicast group on both interfaces'
   and EUT 'configured as a Host' }
 	
ensure that {
   when { EUT **is requested to** 'send a Neighbor Advertisement message(s) from any of
                          the previously advertising interfaces' }
   then { EUT **sends** 'Neighbor Advertisement message(s)'
      containing 'indication(s) that it is no longer a Router' }
        }			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This function is purely internal with no significant interoperability issues.		

Test Description			
Identifier:	TD_COR_8315_01	**Test Purpose:**	TP_COR_8315_01
Summary:	When the IP forwarding capability of EUT (as a router) is disabled, subsequent Router Advertisements set the Router Lifetime field to zero		
Roles:		**Configuration:**	CF_CORE_22
References:	RQ_000_8315		

```
with { QE1 'configured with a non link-local unicast address'
   and EUT 'configured with a unique non link-local unicast address on each link'
   and EUT 'configured with two advertising interfaces'
   and QE2 'configured with a non link-local unicast address' }

ensure that {
   when { EUT is requested to 'disable its IP forwarding capability but interfaces continue
                                advertising' }
   then { QE1 indicates 'receipt of Router Advertisements from EUT'
            containing 'Router Lifetime field as zero'
          and QE1 indicates 'receipt of Router Advertisements from EUT'
          containing 'Router Lifetime field as zero' }
   }
```

Pre-test conditions:	EUT configured with two advertising interfaces		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Disable EUT's IP forwarding capability in its advertising interfaces		
2	Check: Does the protocol monitor on Link1 show that a router advertisement was sent from EUT with router lifetime = 0	Yes	No
3	Check: Does the protocol monitor on Link2 show that a router advertisement was sent from EUT with router lifetime = 0	Yes	No
Observations:			

4.2.2.1.1.1.2   Group 2.1.5.1.2 Startup Router Advertisement Behaviour

Test Description			
Identifier:	TD_COR_8255_01	**Test Purpose:**	TP_COR_8255_01
Summary:	EUT is able to prohibit a multicast-capable interface from both sending periodic Router Advertisements and responding to Router Solicitations		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8255		

```
with { EUT 'configured with its network interface multicast-capable'
   and EUT 'configured to prohibit the interface from both sending Router Advertisements
             and responding to Router Solicitations'
   and  QE 'configured to send Router Solicitation messages during the (re-)initilisation
            of the network interface' }

ensure that {
   when { EUT receives 'a Router Solicitation message' from QE }
   then { EUT 'does not send any Router Advertisement messages onto the link' }
      }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This function is purely internal with no significant interoperability issues.		

Test Description			
Identifier:	TD_COR_8255_02	**Test Purpose:**	TP_COR_8255_02
Summary:	EUT re-enables a multicast-capable interface to send periodic Router Advertisements after previously being prohibited from doing so		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8255		

```
with { EUT 'configured with its network interface multicast-capable'
   and EUT 'configured to prohibit the interface from both sending Router Advertisements
          and responding to Router Solicitations'
   and  QE 'configured to send Router Solicitation messages during the (re-)initilisation
          of the network interface' }

ensure that {
   when { EUT is requested to 'enable the sending of periodic RAs' }
   then { EUT sends 'periodic Router Advertisement messages to the all-nodes
                 multicast address' }
       }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This function is purely internal with no significant interoperability issues.		

Test Description			
Identifier:	TD_COR_8255_03	**Test Purpose:**	TP_COR_8255_03
Summary:	EUT re-enables a multicast-capable interface to respond to Router Solicitations after previously being prohibited from doing so		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8255		

```
with { EUT 'configured with its network interface multicast-capable'
   and EUT 'configured to prohibit the interface from both sending Router Advertisements
          and responding to Router Solicitations'
   and  QE 'configured to send Router Solicitation messages during the (re-)initilisation
          of the network interface' }

ensure that {
   when { EUT is requested to 'respond to RSs'
          and EUT receives 'a Router Solicitation message' from QE
             containing 'the link-local address of QE as the source address' }
   then { EUT sends 'a Router Advertisement message' to QE }
       }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This function is purely internal with no significant interoperability issues.		

Test Description			
Identifier:	TD_COR_8257_01	**Test Purpose:**	TP_COR_8257_01
Summary:	an Advertising router generates periodic Router Advertisement		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8256		

```
with { EUT 'configured as an advertizing router' } -- AdvSendAdvertisements flag set to 'TRUE'

ensure that {
   when { EUT 'is initialized' }
   then { EUT sends 'periodic Router Advertisements'
      and EUT sends 'responses to Router Solicitations' }
      }
```

Pre-test conditions:	EUT configured as an advertising router QE configured as a host		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to initialize (restart the adapter, or the whole equipment)		
2	Check: Does the protocol analyzer on Link1 show that EUT sends unsolicited multicast router advertisements at initialization?	Yes	No
3	Continue to monitor the traffic on Link1 (no more than 1 800 s after the first router advertisement).		
4	Check: Does the protocol analyzer on Link1 show that EUT continuously sends regular unsolicited multicast router advertisements?	Yes	No
5	Cause QE to re-initialize (restart the adapter, or the whole equipment)		
6	Check: Does the protocol analyzer on Link1 show that EUT sends router advertisements in response to the Router Solicitations sent by QE?	Yes	No
Observations:			

4.2.2.1.1.1.3   Group 2.1.5.2 Form Router Advertisement Options

Test Description			
Identifier:	TD_COR_8305_01	**Test Purpose:**	TP_COR_8305_01
Summary:	During system initialization, the first few initial unsolicited advertisements sent by EUT (as a router) includes all prefix options		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8305		

```
with {  EUT 'configured as a router with a unicast address on link 1'
   and EUT 'configured with several network prefixes on link 1'
   and EUT 'configured with an advertising interface on link 1' }

ensure that {
   when { EUT 'is initializing'}
   then { EUT sends 'Router Advertisements'
           containing 'EUT as source address'
      and containing 'all prefixes of EUT on link 1' }
           }
```

Pre-test conditions:	EUT configured as an advertising router EUT powered down		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to power-up		
2	Check: Does the protocol monitor show that EUT sends one or more router advertisements, with all prefixes of EUT on link1	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8317_01	**Test Purpose:**	TP_COR_8317_01
Summary:	EUT unicasts a Router Advertisement message to a soliciting node		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8317		

```
with { EUT 'configured to advertise as a default router'
   and QE  'configured as a host' }

ensure that {
   when { EUT receives 'a Router Solicitation message' from QE
          containing 'a Source Address that is not the Unspecified Address' }
   then { EUT sends 'a Router Advertisement message' to QE }
         }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This function is purely internal with no significant interoperability issues.		

4.2.2.1.1.1.4   Group 2.1.5.2.2 Router Advertisement MTU Option

Test Description			
Identifier:	TD_COR_8142_01	**Test Purpose:**	TP_COR_8142_01
Summary:	Router includes MTU option in Router Advertisements		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8142		

```
with { QE 'connected to the same variable MTU link as EUT'
   and EUT 'configured as an advertizing router'
   and EUT 'configured with a valid prefix'
   and EUT 'configured with a specific MTU value' } -- greater than the IPv6 minimum MTU size

ensure that {
   when { EUT receives 'a Router Solicitation' from QE}
   then { EUT sends 'Router Advertisement'
        containing 'the MTU value' }
         }
```

Pre-test conditions:	EUT and QE are connected to a variable MTU link (e.g.: Ethernet)		
	EUT is configured as an advertising router		
	EUT if configured with a specific MTU value on link1 (greater than the IPv6 minimum value)		
	QE and EUT are up and running		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send Router Solicitation messages (Reset the network interface, restart QE, etc.)		
2	Check: Does the protocol monitor on Link1 show that the MTU option IS included in the Router Advertisement messages sent by EUT?	Yes	No
Observations:			

4.2.2.1.2   Group 2.1.6 Generate Router Solicitation

Test Description			
Identifier:	TD_COR_8375_01	**Test Purpose:**	TP_COR_8375_01
Summary:	Routers becoming Hosts send RS messages immediately		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_8371		

```
with { EUT 'operating as a router' }

ensure that {
   when { EUT 'has its forwarding capability turned off by system management'}
   then { EUT sends 'a Router Solicitation message immediately' }
            }
```

Pre-test conditions:	EUT established as a router		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause the System Management to change EUT from being a router to being a host by turning off the IP forwarding capability of EUT.		
2	Check: Does the protocol monitor on Link1 show that EUT (now a Host) sends out Router Solicitation messages?	Yes	No
Observations:			

4.2.2.1.3   Group 2.1.7 Generate Neighbor Advertisement

4.2.2.1.3.1   Group 2.1.7.1 Generate Unsolicited Neighbor Advertisements

Test Description			
Identifier:	TD_COR_8471_01	**Test Purpose:**	TP_COR_8471_01
Summary:	EUT announces change of link-layer address associated with a single IP address		
Roles:	Host, Router	**Configuration:**	CF_CORE_21
References:	RQ_000_8471		

```
with { EUT 'configured with a single IP address assigned to its interface to QE1 and QE2' }

ensure that {
   when { EUT is requested to 'change link-layer address on interface to QE1 and QE2' }
   then { EUT 'is able to address QE1'
      and EUT 'is able to address QE2'
      and QE1 'is able to address EUT'
      and QE2 'is able to address EUT' }
            }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:			

Test Description			
Identifier:	TD_COR_8476_01	**Test Purpose:**	TP_COR_8476_01
Summary:	EUT announces change of link-layer address associated with multiple IP addresses		
Roles:	Host, Router	**Configuration:**	CF_CORE_21
References:	RQ_000_8476		

```
with { EUT 'configured with two IP addresses assigned to its interface to QE1 and QE2' }

ensure that {
   when { EUT is requested to 'change link-layer address on interface to QE1 and QE2' }
   then { EUT 'is able to address QE1'
      and EUT 'is able to address QE2'
      and QE1 'is able to address EUT on both available IP addresses'
      and QE2 'is able to address EUT on both available IP addresses' }
            }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:			

4.2.2.1.4   Group 2.1.8 Generate Redirect Message

4.2.2.1.4.1   Group 2.1.8.1 Determine Redirect Target Address Field

Test Description			
Identifier:	TD_COR_8183_01	**Test Purpose:**	TP_COR_8183_01
Summary:	Router sends a Redirect message indicating that the destination of a packet is a neighbor		
Roles:		**Configuration:**	CF_CORE_21
References:	RQ_000_8183		

with { EUT 'configured as a non advertizing router'
 and EUT 'configured with global addresses on PREFIX1 and PREFIX2'
 and QE2 'configured as a host'
 and QE2 'configured manually with a global address on PREFIX2'
 and QE1 'configured as a host'
 and QE1 'configured manually with a global address on PREFIX1'
 and QE1 'configured manually with EUT as default route'
 and 'EUT and QE2 have finished to perform DAD before QE1 is started' }
 	
ensure that {
   when { EUT **receives** 'a packet' **from** QE1 **containing** 'QE2 as destination'}
   then { EUT **sends** 'a Redirect message' **to** QE1
        containing 'Target Address field equal to the address of QE2' }
        }			

Pre-test conditions:	EUT configured as a non advertising router. EUT is configured with global addresses on Prefix1 and on Prefix2 QE2 configured as a host QE2 is configured MANUALLY with a global address on Prefix2 (no stateless autoconfig) QE2 and EUT are on the same link and have performed Duplicate Address Detection QE1 configured as a host QE1 is configured MANUALLY with a global address on Prefix1 (no stateless autoconfig) QE1 is configured MANUALLY with EUT as default router QE1 is not Started/Connected to link1 (adapter is either disabled or physically disconnected)			

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE2 to send an Echo Request to EUT (this ensures that EUT 'knows' QE2 and has its address in its cache)		
2	Check: Does QE2 receive an Echo Reply from EUT?	Yes	No
3	Cause QE1 to connect to link1 (enable the adapter or connect it physically to Link1)		
4	Cause QE1 to send an Echo Request to QE2 using the QE2 address on Prefix2.		
5	Check: Does the protocol analyser on Link1 show that EUT sends an ICMP Redirect Message to QE1 with QE2 address as "ICMP Target Address" and "ICMP Destination Address"?	Yes	No
Observations:			

4.2.2.2 Group 2.2 Process Neighbor Discovery Messages

4.2.2.2.1 Group 2.2.5 Process Router Advertisement

Test Description			
Identifier:	TD_COR_8348_01	**Test Purpose:**	TP_COR_8348_01
Summary:	EUT sets corresponding invalidation timer as the non-zero Router Lifetime value indicated in a received Router Advertisement from a router		
Roles:	Host	**Configuration:**	CF_CORE_23
References:	RQ_000_8348		

with { EUT 'configured as a host with a unique link-local address'
   and QE2 'configured as a host with a unique link-local address'}
 	
ensure that {
   when { EUT **receives** 'Router Advertisement' **from** QE1
        containing 'a non-zero value in the Router Lifetime field'
           }
   then { EUT 'is able to communicate with QE2' **before** 'the advertized Router Lifetime expires'
      and EUT 'is unable to communicate with QE2' **after** 'the advertized Router Lifetime has expired' }
           }			

Pre-test conditions:	QE1 configured as a default router for EUT QE1 configured with a 30s router lifetime EUT configured as a host QE1 powered off		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	power on QE1		
2	Cause EUT to send an echo request to QE2		
3	Check: did EUT receive an Echo Reply from QE2?	Yes	No
4	Prevent QE1 from sending further router advertisements.		
5	Wait at least 30 s		
6	Cause EUT to send an echo request to QE2		
7	Check: Does EUT refuse to send the Echo Request?	Yes	No
Observations:			

4.2.2.2.1.1 Group 2.2.5.3 Host Processing of Router Advertisement

Test Description			
Identifier:	TD_COR_8231_01	**Test Purpose:**	TP_COR_8231_01
Summary:	EUT uses at least two of the connected routers as its default routers		
Roles:	Host	**Configuration:**	CF_CORE_33
References:	RQ_000_8231		

with { QE1 'configured with one unique unicast address on each link'
and QE2 'configured with one unique unicast address on each link'
and EUT 'able to communicate with QE3'
}
 	
ensure that {
when { QE1 'becomes unavailable as a router'
or QE2 'becomes unavailable as a router'
and EUT **is requested to** 'send a packet to QE3' }
then { QE3 **indicates** 'the receipt of the packet' }
           }			

Pre-test conditions:	EUT is able to communicate with QE3		

Step	Test Sequence	Verdict	
		Pass	**Fail**
Observations:			

Test Description				
Identifier:	TD_COR_8343_01	**Test Purpose:**	TP_COR_8343_01	
Summary:	EUT uses only latest advertised parameters and options from Router			
Roles:	Host	**Configuration:**	CF_CORE_33	
References:	RQ_000_8343			

```
with { QE1 'configured to advertise a MTU value of 1450 on Link1'
   and QE2 'configured to advertise a MTU value of 1400 on Link1'
   and EUT 'configured as a host' }

ensure that {
   when { EUT receives 'Router Advertisement'
         containing 'different MTU parameter values' }
   then { EUT 'uses the value of the most recently received Router Advertisement' }
        }
```

Pre-test conditions:	QE1 configured to advertise a MTU value of 1450 on Link1
	QE2 configured to advertise a MTU value of 1400 on Link1
	QE1 and QE2 disconnected of link1 and link2

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Connect QE1 to both links		
2	Check: Does protocol monitor show that a Router Advertisement was sent by QE1?	Yes	No
3	Cause EUT to send an echo request with a total size of 1425 to QE3		
4	Check: Does EUT receive an echo reply from QE3?	Yes	No
5	Configure QE1 to be a host		
6	Connect QE2 to both links		
7	Check: Does protocol monitor show that a Router Advertisement was sent by QE2?	Yes	No
8	Cause EUT to send an echo request with a total size of 1425 to QE3		
9	Check: Does EUT receive a Packet Too Big message from QE2?	No	Yes
10	Check: Does QE3 receive an echo reply from EUT?	Yes	No
Observations:			

Test Description				
Identifier:	TD_COR_8346_01	**Test Purpose:**	TP_COR_8346_01	
Summary:	Hosts accept at least 2 default routers			
Roles:	Host	**Configuration:**	CF_CORE_21	
References:	RQ_000_8346			

```
with { QE1 'configured as an advertising router with a valid prefix1'
   and QE2 'configured as an advertising router with a valid prefix2' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
     and EUT receives 'Router Advertisement' from QE2 }
   then { EUT 'adds QE1 and QE2 to its default router list' }
        }
```

Pre-test conditions:	QE1 is a router and advertises Prefix1
	QE2 is a router and advertises Prefix2
	EUT is a host

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause EUT to re-initialize		
2	Wait until the protocol monitor on Link1 shows that QE1 and QE2 have sent Router Advertisements (either solicited RA to EUT or unsolicited multicast RA).		
3	Check: Did EUT add QE1 and QE2 in its Default Router List?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8347_01	**Test Purpose:**	TP_COR_8347_01
Summary:	EUT adds newly advertised router to its default list		
Roles:	Host	**Configuration:**	CF_CORE_41
References:	RQ_000_8347		

```
with { QE1 'established as a default router for EUT'
   and QE2 'established as a default router for EUT'
   and QE3 'not established as a default router for EUT'
   and QE4 'configured with a global unicast address' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE3 }
        -- QE3 is now taken as a default router for EUT
   then { EUT 'is able to address QE4' }
        }
```

Pre-test conditions:	QE1 and QE2 both established as default routers for EUT QE3 not established as a default router for EUT		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause EUT to send an echo request to the Global address of QE4		
2	Check: Does EUT receive an echo reply from QE4?	No	Yes
3	Cause QE3 to send a Router Advertisement to EUT indicating that is now a default router for EUT		
4	Cause EUT to send an echo request to the Global address of QE4		
5	Check: Does protocol monitor show that an echo request was sent from EUT to QE4?	Yes	No
6	Check: Does EUT receive an echo reply from QE4?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8347_02	**Test Purpose:**	TP_COR_8347_02
Summary:	EUT removes router from its default list after Router Lifetime expires		
Roles:	Host	**Configuration:**	CF_CORE_41
References:	RQ_000_8347		

```
with { QE1 'established as a default router for EUT'
   and QE2 'established as a default router for EUT'
   and QE3 'not established as a default router for EUT'
   and QE4 'configured with a global unicast address' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE3
        -- QE3 is now taken as a default router for EUT
      and containing 'Router Lifetime parameter'
          indicating 'a specific short lifetime of QE3' } --suggest 2 minutes
   then { EUT 'is able to address QE4' within 'the specified router lifetime'
      and EUT 'is unable to address QE4' after 'the specified router lifetime' }
        }
```

Pre-test conditions:	QE1 and QE2 both established as default routers for EUT QE3 not established as a default router for EUT		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause EUT to send an echo request to the Global address of QE4		
2	Check: Does EUT receive an echo reply from QE4?	No	Yes
3	Cause QE3 to send a Router Advertisement to EUT indicating that is now a default router for EUT with a Router Lifetime of 2 minutes		
4	Immediately cause EUT to send an echo request to the Global address of QE4		
5	Check: Does protocol monitor show that an echo request was sent from EUT to QE4?	Yes	No
6	Check: Does EUT receive an echo reply from QE4?	Yes	No
7	Wait for 2 minutes		
8	Cause EUT to send an echo request to the Global address of QE4		
9	Check: Does EUT receive an echo reply from QE4?	No	Yes
Observations:			

Test Description			
Identifier:	TD_COR_8349_01	**Test Purpose:**	TP_COR_8349_01
Summary:	EUT removes router from default list when zero value Router Lifetime received		
Roles:	Host	**Configuration:**	CF_CORE_23
References:	RQ_000_8349		

```
with { QE1 'established as the only default router for EUT'
   and EUT 'is able to communicate with QE2' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
         containing 'Router Lifetime parameter'
         indicating 'zero lifetime of QE1' }
   then { EUT 'is unable to address QE2' }
      }
```

Pre-test conditions:	QE1 established as the only default router for EUT		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send an echo request to the Global address of QE2		
2	Check: Does protocol monitor show that an echo request was sent from EUT to QE2?	Yes	No
3	Check: Does EUT receive an echo reply from QE2?	Yes	No
4	Cause QE1 to send a Router Advertisement to EUT with a Router Lifetime of zero		
5	Cause EUT to send an echo request to the Global address of QE2		
6	Check: Does EUT receive an echo reply from QE2?	No	Yes
Observations:			

Test Description			
Identifier:	TD_COR_8360_01	**Test Purpose:**	TP_COR_8360_01
Summary:	EUT treats a known router-advertised prefix as on-link for the specified lifetime		
Roles:	Host	**Configuration:**	CF_CORE_23
References:	RQ_000_8360		

```
with { QE1 'configured with a specific prefix (Prefix-1) on the link to QE2'
   and QE1 'established as the default router for EUT'
   and QE1 'has advertised Prefix-1 as on-link to EUT with a long lifetime' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
         containing 'Prefix options'
         indicating 'Prefix-1 is on-link'
      and containing 'prefix options'
         indicating 'Prefix-1 has a Lifetime less than the existing value' } --suggest 2 minutes
   then { EUT 'is unable to address QE2' within 'the specified prefix lifetime'
      and EUT 'is able to address QE2' after 'the specified prefix lifetime' }
      }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	Conflicts with RQ_COR_1315 and RQ_COR_1317		

4.2.2.2.1.2   Group 2.2.5.4 Discover Neighbor by Router Advertisement

Test Description			
Identifier:	TD_COR_8359_01	**Test Purpose:**	TP_COR_8359_01
Summary:	EUT treats a new router-advertised prefix as on-link for the specified lifetime		
Roles:	Host	**Configuration:**	CF_CORE_23
References:	RQ_000_8359		

```
with { QE1 'configured with a specific prefix (Prefix-1) on the link to EUT'
   and EUT 'configured with Prefix-1 as off-link'
   and QE2 'manually configured with two global unicast addresses corresponding to Prefix-1' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
          containing 'Prefix options'
          indicating 'Prefix-1 is on-link'
      and containing 'prefix options'
          indicating 'Prefix-1 has a Lifetime of a specific short period' } --suggest 2 minutes
   then { EUT 'is unable to address QE2' within 'the specified prefix lifetime'
     and EUT 'is able to address QE2' after 'the specified prefix lifetime' }
        }
```

Pre-test conditions:	A valid global prefix (Prefix-1) is configured in QE1 for its link to EUT QE2 is configured with two global unicast addresses corresponding to Prefix-1 Prefix-1 configured as off-link in EUT		

Step	Test Sequence	Verdict	
		Pass	Fail
1	Cause EUT to send an echo request to the first global address of QE2		
2	Check: Does protocol monitor show that an echo request was sent from EUT to QE2?	Yes	No
3	Check: Does EUT receive an echo reply from QE2?	Yes	No
4	Cause QE1 to send a Router Advertisement to EUT indicating that Prefix-1 is 'on-link' with a lifetime of 2 minutes		
5	Immediately cause EUT to send an echo request to the second global address of QE2		
6	Check: Does EUT receive an echo reply from QE2?	No	Yes
7	Wait for 2 minutes		
8	Cause EUT to send an echo request to the second global address of QE2		
9	Check: Does protocol monitor show that an echo request was sent from EUT to QE2?	Yes	No
10	Check: Does EUT receive an echo reply from QE2?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8361_01	**Test Purpose:**	TP_COR_8361_01
Summary:	EUT times-out an exiting router-advertised prefix with a zero lifetime		
Roles:	Host	**Configuration:**	CF_CORE_23
References:	RQ_000_8361		

```
with { QE1 'configured with a specific prefix (Prefix-1) on the link to QE2'
   and EUT 'configured with Prefix-1 as on-link' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
          containing 'Prefix options'
          indicating 'Prefix-1 is on-link'
      and containing 'prefix options'
          indicating 'Prefix-1 has a Lifetime of zero' }
   then { EUT 'is able to address QE2' }
        }
```

Pre-test conditions:			

Step	Test Sequence	Verdict	
		Pass	Fail
Observations:	Conflicts with RQ_COR_1315 and RQ_COR_1317		

4.2.2.2.2   Group 2.2.6 Process Router Solicitation

Test Description			
Identifier:	TD_COR_8299_01	**Test Purpose:**	TP_COR_8299_01
Summary:	EUT does not send router advertisements out the functioning and enabled multicast interface		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8136, RQ_000_8299		

```
with {  EUT 'configured as an advertizing router with a unicast address on link 1'
and QE 'configured with a unicast address on link 1'
}

ensure that {
   when { QE is requested to 'send a Router Solicitation to all-routers multicast address'}
   then { QE indicates 'receipt of a Router Advertisement'
         containing 'EUT as source address' }
        }
```

Pre-test conditions:	EUT configured as an advertising router QE configured as a host Disconnect QE from the network		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Connect QE to the network		
2	Check: Does the protocol monitor show that a router solicitation was sent from QE to all-routers multicast address?	Yes	No
3	Check: Does the protocol monitor show that a router advertisement was sent from EUT to QE?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8328_01	**Test Purpose:**	TP_COR_8328_01
Summary:	Router Solicitation do update Neighbor Cache entries		
Roles:		**Configuration:**	CF_CORE_23
References:	RQ_000_8328		

```
with { QE1 'configured as an advertizing router on link1 and link2'
  and QE1 'configured with a global address on each link'
  and QE2 'a stateless autoconfiguration capable host on link2'
  and EUT 'configured as a non advertizing router on link1'
  and EUT 'configured with a global address on link1'
      and 'all nodes can communicate with each other' }

ensure that {
  when { EUT receives 'a valid Router Solicitation' from QE1
         containing 'a Source Link Layer option'
         indicating 'a Link-Layer address different to the cached Link-Layer
                     address for QE1'}
  then { EUT 'makes no attempt to verify the reachability of QE1 until traffic is
            sent to QE1'
      and EUT 'uses the new Link-Layer address for subsequent communication' }
           }
```

Pre-test conditions:	QE1 is configured as an advertising router on both links, and has a manually configured global address.
	QE2 is configured as a stateless auto configurable host.
	EUT is configured as a non advertising router (i.e. EUT does not send Router Advertisements), and has a global address configured manually.
	Every node can reach all other nodes

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Disconnect QE1 physically from Link1 (unplug/isolate QE1 from Link1).		
2	Once disconnected from Link1, re-configure QE1 as a host		
3	Change the link-layer address of the QE1 network interface that corresponds to Link1 (do not change the global address)		
4	Re-connect QE1 physically to Link1		
5	Cause the Network Interface of QE1 on Link1 to send Router Solicitations (initialize or re-enable the Network Interface).		
6	Check: Does the protocol analyser on Link1 show that NO unicast Neighbor Solicitation messages have been sent by EUT to QE1 (i.e. EUT makes no attempt to verify the reachability of QE1)?	Yes	No
7	Cause EUT to send several Echo Requests to QE1		
8	Check: Does the protocol analyser on Link1 show that EUT sent unicast Neighbor Solicitation to QE1 (i.e. EUT verified the reachability of QE1) before to send the first Echo Request?	Yes	No
9	Check: Does the protocol analyser on Link1 show that EUT uses the new Link-layer address of QE1 for the subsequent Echo-Requests?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8328_02	**Test Purpose:**	TP_COR_8328_02
Summary:	Router Solicitation are sent by hosts only		
Roles:		**Configuration:**	CF_CORE_23
References:	RQ_000_8328		

with { QE1 'configured as an advertizing router on link1 and link2'
  and QE1 'configured with a global address on each link'
  and QE2 'a stateless autoconfiguration capable host on link2'
  and EUT 'configured as a non advertizing router on link1'
  and EUT 'configured with a global address on link1'
     and 'all nodes can communicate with each other' }
 	
ensure that {
  when { EUT **receives** 'a valid Router Solicitation' **from** QE1
        containing 'a Source Link Layer option'
        indicating 'a Link-Layer address different to the cached Link-Layer
           address for QE1'}
  then { EUT 'no longer considers QE1 as a router' }
    }			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	it is impossible to specify an Interoperability test for this Test Purpose.		

Test Description			
Identifier:	TD_COR_8330_01	**Test Purpose:**	TP_COR_8330_01
Summary:	A node sending a Router Solicitation can be only considered as a host		
Roles:		**Configuration:**	CF_CORE_23
References:	RQ_000_8330		

with { QE2 'configured with a unique global unicast address'
  and QE1 'configured with one unique global unicast address on each link'
  and QE1 'able to communicate with QE2' }
 	
ensure that {
  when { EUT **receives** 'a valid Router Solicitation' **from** QE1
       containing 'a unicast address as source address'
  and not containing 'a source link-layer address option' }
  then { EUT 'no longer considers QE1 as a router' }
        }			

Pre-test conditions:	QE1 established as default router for EUT QE1 is able to communicate with QE2 Disable the forwarding capability of QE1 QE1 power down		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	Impossible to specify an interoperability test for this Test Purpose.		

4.2.2.2.2.1   Group 2.2.6.5 Discover Neighbor by RS

Test Description			
Identifier:	TD_COR_8329_01	**Test Purpose:**	TP_COR_8329_01
Summary:	EUT treats a (RS)soliciting NEW neighbor as a host and, makes no attempt to verify the reachability of this neighbor until traffic is sent to the neighbor		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_8329		

```
with { EUT 'configured to advertise as a default router'
   and EUT 'having NO entry for the link-layer address of QE in the Neighbor Cache'
   and  QE 'configured as a host' }

ensure that {
   when {EUT receives 'a Router Solicitation message' from QE }
   then { EUT 'does not perform Neighbor Unreachability Detection test on QE, until
            traffic is sent to QE' }
         }
```

Pre-test conditions:	EUT is configured as an advertising router, and has a manually configured global address. QE is a host configured to perform Stateless Autoconfiguration QE is disabled and unknown from EUT (i.e. QE has never been connected to Link1, or if it has then EUT has since been reset)		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Connect QE physically to Link1		
2	Initialize QE		
3	Check: Does the protocol analyser on Link1 show that QE sends Router Solicitation message(s)	Yes	No
4	Check: Does the protocol analyser on Link1 show that NO unicast Neighbor Solicitation messages have been sent by EUT to QE (i.e. EUT makes no attempt to verify the reachability of QE)?	Yes	No
5	Cause EUT to send an Echo Requests to QE1		
6	Check: Does the protocol analyser on Link1 show that EUT sent unicast Neighbor Solicitation to QE (i.e. EUT verified the reachability of QE1)?	Yes	No
Observations:			

4.2.2.2.3 Group 2.2.7 Process Neighbor Advertisement

Test Description			
Identifier:	TD_COR_8469_01	**Test Purpose:**	TP_COR_8469_01
Summary:	A host receiving a Neighbor Adv. from a machine it considers as a router, with the IsRouter flag set to FALSE, will remove that router from its Default Router list		
Roles:	Host, Router	**Configuration:**	CF_CORE_23
References:	RQ_000_8469		

```
with { EUT 'configured as a Host'
  and QE1 'configured as a Router'
  and QE2 'configured as a Host'
  and EUT 'can reach QE2' }

ensure that {
  when { QE1 'is physically disconnected from both links'
    and QE1 'is re-configured as a host'
--          this is done off-line, + IPv6 @ is configured manually (no autoconfig)
    and QE1 'is re-connected to both links'
    and EUT receives 'a Neighbor Advertisement' from QE1}
  then { EUT 'removes QE1 from its Default Router list' }
        }
```

Pre-test conditions:	EUT and QE2 are configured as hosts QE1 is configured as a router EUT can reach QE2		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Check: Does EUT receive an echo reply from QE2?	Yes	No
1	Cause QE1 to send an Echo Request to QE2		
2	Cause QE1 to be physically disconnected from both links		
3	Re-configure QE1 offline as a host, ensure that the IP addresses on both interface will remain identical as they were when QE1 was a router, these addresses will have to be configured manually (no auto-configuration).		
4	Cause QE1 to be physically re-connected to both links		
5	Wait a few seconds (until Duplicate Address Detection is finished)		
6	Cause QE1 to send an Echo Request to QE2		
7	Check: Does EUT receive an echo reply from QE2?	No	Yes
Observations:			

4.2.2.2.4 Group 2.2.8 Process Neighbor Solicitation

4.2.2.2.4.1 Group 2.2.8.2 Generate Solicited Neighbor Advertisement

Test Description			
Identifier:	TD_COR_8162_01	**Test Purpose:**	TP_COR_8162_01
Summary:	In response to a valid Neighbor Solicitation with a specified source address, EUT transmits a Neighbor Advertisement to that address		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_8162		

```
with { QE 'configured with a unique unicast address'
  and EUT 'configured with a unique unicast address' }

ensure that {
  when { EUT receives 'a valid Neighbor Solicitation'
        containing 'QE as source address' }
  then { EUT sends 'a Neighbor Advertisement' to QE}
        }
```

Pre-test conditions:	QE power down		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	QE power on		
2	Check: Does the protocol monitor show that a neighbor solicitation was sent from QE?	Yes	No
3	Check: Does the protocol monitor show that a neighbor advertisement was sent from EUT to QE?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8163_01	**Test Purpose:**	TP_COR_8163_01
Summary:	In response to a valid Neighbor Solicitation with an unspecified source address, EUT transmits a Neighbor Advertisement to all-node multicast address		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_8163		

```
with {  QE 'configured with the same unicast address as EUT'
      }
ensure that {
when { EUT receives 'a DAD Neighbor Solicitation' From QE

        containing 'the unspecified address as source address' }
   then { EUT sends 'a Neighbor Advertisement to the all-node multicast address' }
      }
```

Pre-test conditions:	QE is disconnected from the network		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Connect QE to link1		
2	Check: Does the protocol monitor show that a neighbor solicitation was sent with unspecified address as source address?	Yes	No
3	Check: Does the protocol monitor show that a neighbor advertisement was sent from EUT to the all-node multicast address?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8179_01	**Test Purpose:**	TP_COR_8179_01
Summary:	EUT responds to received Neighbor Solicitation with a multicast destination address		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_8179		

```
with {  QE 'configured with a unique global unicast address'
   and EUT 'configured with a unique global unicast address' }
ensure that {
   when { EUT receives 'a valid Neighbor Solicitation'
           containing 'a multicast address as destination address' }
   then { EUT sends 'a Neighbor Advertisement'
       containing 'a target link-layer address option' }
      }
```

Pre-test conditions:	QE is disconnected from the network		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Connect QE to the network and send an Echo Request to EUT		
2	Check: Does the protocol monitor show that a neighbor solicitation was sent from QE to the solicited node multicast address of EUT?	Yes	No
3	Check: Does the protocol monitor show that a neighbor advertisement was sent from EUT with a target link-layer address option?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8180_01	**Test Purpose:**	TP_COR_8180_01
Summary:	EUT processes valid unicast Neighbor Solicitations		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_8180		

```
with { QE 'configured with a unique global unicast address'
   and EUT 'configured with a unique global unicast address' }

ensure that {
   when { EUT receives 'a Neighbor Solicitation' from QE
         containing 'EUT as the destination' }
   then { QE indicates 'receipt of a Neighbor Advertisement'
         containing 'EUT as source address'
         and containing 'a target link-layer address option' }
         }
```

Pre-test conditions:	QE disconnected from the network		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Connect QE to the network, and immediately send an echo request to EUT		
2	Check: Does the protocol monitor show that a neighbor solicitation was sent by QE to EUT?	Yes	No
3	Check: Does the protocol monitor show that a neighbor advertisement was sent from EUT to QE, containing a target link-layer address option?	Yes	No
Observations:			

4.2.2.3   Group 2.5 Next Hop Determination

Test Description			
Identifier:	TD_COR_8232_01	**Test Purpose:**	TP_COR_8232_01
Summary:	EUT uses next-hop determination to select a new default router		
Roles:	Host	**Configuration:**	CF_CORE_33
References:	RQ_000_8232		

```
with { QE1 'configured with one unique unicast address on each link'
and QE2 'configured with one unique unicast address on each link'
and EUT 'able to communicate with QE3'
}

ensure that {
when { QE1 'becomes unavailable as a router'
or QE2 'becomes unavailable as a router'
and EUT is requested to 'send a packet to QE3' }
then { QE3 indicates 'the receipt of the packet' }
         }
```

Pre-test conditions:	QE1 established as a default router for EUT		
	QE2 established as a default router for EUT		
	QE1 is disconnected from link1		
	EUT is able to communicate with QE3		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause EUT to send an echo request to QE3		
2	Determine which router the traffic flows through (QE1 or QE2).		
3	Reconfigure the router identified in step 2 to be a host.		
4	Cause EUT to send an echo request to QE3		
5	Check: Does EUT received an Echo Reply from QE3	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8356_01	**Test Purpose:**	TP_COR_8356_01
Summary:	EUT knows how to treat an off-link prefix		
Roles:	Host	**Configuration:**	CF_CORE_23
References:	RQ_000_8356		

```
with { QE1 'configured as the default Router for EUT'
   and QE1 'configured to advertise an off-link prefix onto the link to which EUT
           is attached'
   and QE2 'configured with one unique non link-local address, whose prefix is the
           one QE1 advertises to EUT as an off-link prefix'
   and EUT 'configured as a host' }

ensure that {
   when { EUT receives 'a Router Advertisement message' from QE1
           containing 'the off-link prefix'
     and EUT is requested to 'send a packet to the non link-local address of QE2' }
   then { --EUT does not perform address resolution of the intended address of QE2--
          EUT sends 'the packet' to QE1 }
          }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	By default all prefixes are considered off-link, hence it is not possible to specify an interoperability test for this Test Description.		

4.2.2.4   Group 2.6 Neighbor Uneachability Detection

4.2.2.4.1   Group 2.6.6 Neighbor Reachability Determination

Test Description			
Identifier:	TD_COR_8147_01	**Test Purpose:**	TP_COR_8147_01
Summary:	EUT performs neighbor reachability test		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8147		

```
with {  QE 'configured with a unique unicast address'
   and EUT 'configured with a unique unicast address'
   and EUT 'unaware of the link layer address of QE' }

ensure that {
   when { EUT is requested to 'send a packet to QE' }
   then { EUT sends 'a Neighbor Solicitation' to QE}
          }
```

Pre-test conditions:	QE is not in EUT's neighbor list EUT disconnected from the network		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Connect EUT to the network and immediately cause it to send an echo request to QE		
2	Check: Does the protocol monitor show that a neighbor solicitation was sent from QE to EUT?	Yes	No
Observations:			

4.2.2.5   Group 2.7 Address Resolution

Test Description			
Identifier:	TD_COR_8415_01	**Test Purpose:**	TP_COR_8415_01
Summary:	Address Resolution for an on-link destination addresses, the destination Link-Layer address is unknown		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8415		

```
with { EUT 'manually configured with the same global prefix as QE' }

ensure that {
   when { EUT 'is initialized' -- i.e.: to ensure the EUT ignores link-layer address of QE
      and EUT 'tries to contact QE for the first time via its GLOBAL ADDRESS' }
   then { EUT sends 'Neighbor Solicitation messages'
             to 'the Solicited Node Multicast address of QE' }
         }
```

Pre-test conditions:	QE and EUT are configured each with one global address. Both addresses are on the same prefix. QE is up and running EUT is not started		

Step	Test Sequence	Verdict	
		Pass	Fail
1	Cause EUT to initialize		
2	Cause EUT to send an Echo Request to the global address of QE		
3	Check: Does the protocol monitor on Link1 show that EUT did send a Neighbor Solicitation message to the Solicited Node Multicast address of QE (i.e. EUT performed address resolution on the address of QE).	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8416_01	**Test Purpose:**	TP_COR_8416_01
Summary:	No address resolution for off-link addresses		
Roles:	Host, Router	**Configuration:**	CF_CORE_23
References:	RQ_000_8416		

```
with { QE1 'configured as an advertizing router'
   and QE1 'configured with a different prefix on each link'
   and QE2 'configured to perform stateless autoconfiguration'
   and EUT 'configured to perform stateless autoconfiguration' }

ensure that {
   when { EUT 'has initialized'
      and EUT 'starts communication with QE2'}
   then { EUT 'never sends Neighbor Solicitation messages to
            the Solicited Node Multicast address of QE2'}
         -- i.e.: does not process Address Resolution on the @ of QE2
         }
```

Pre-test conditions:	QE1 is configured as an advertising router QE1 advertises PREFIX1 on Link1 and PREFIX2 on Link2 QE2 and EUT configured as stateless auto configurable hosts QE1 and QE2 are up and running EUT is down		

Step	Test Sequence	Verdict	
		Pass	Fail
1	Cause EUT to initialize		
2	Wait until the protocol monitor on Link1 shows that EUT has sent Router Solicitation message(s) and that QE1 has sent Router Advertisement in response.		
3	Cause EUT to send an Echo Request to the Global Address of QE2		
4	Check: Does the protocol monitor on Link1 show that EUT DID NOT send Neighbor Solicitation messages to the Solicited Node Multicast address of QE2?	Yes	No
Observations:	As EUT detects that QE2 is not 'on-link' it must not try to perform address resolution on the address of QE2. And hence packets for QE2 are transmitted to QE1 (default router).		

Test Description		
Identifier:	TD_COR_8417_01	**Test Purpose:**	TP_COR_8417_01
Summary:	No Address Resolution for an on-link destination when the destination Link-Layer address is known		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8417		

Test Description			
Identifier:	TD_COR_8417_01	**Test Purpose:**	TP_COR_8417_01
Summary:	No Address Resolution for an on-link destination when the destination Link-Layer address is known		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8417		

```
with { EUT 'manually configured with the same global prefix as QE'
   and EUT 'has already established communication with QE'}

ensure that {
   when { EUT is requested to 'send a packet to QE' }
   then { EUT 'does not send Neighbor Solicitation messages to the Solicited Node
          Multicast address of QE' }
        }
```

Pre-test conditions:	EUT and QE have global addresses on the same prefix EUT and QE are up and running EUT and QE have already established communication (EUT has already exchanged ICMP Echo messages with QE using the global address of QE).		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send an Echo Request to the global address of QE		
2	Check: Does the protocol monitor on Link1 show that EUT DID NOT send Neighbor Solicitation messages to the Solicited Node Multicast address of QE?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8418_01	**Test Purpose:**	TP_COR_8418_01
Summary:	No Address Resolution for multicast destinations		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8418		

```
with { EUT 'manually configured with the same global prefix as QE'
   and  QE  'is subscribed to a global multicast group'}

ensure that {
   when { EUT 'is initialized' -- i.e.: to ensure the EUT ignores link-layer address of QE'
      and EUT is requested to 'send packets to the multicast group where QE is subscribed'}
   then { EUT 'does not process to Address Resolution on the multicast address' }
        }
```

Pre-test conditions:	EUT and QE have global addresses on the same prefix QE is subscribed to a global multicast group.		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send an Echo Request to the All Nodes Multicast address		
2	Check: Does the protocol monitor on Link1 show that EUT DID NOT send Neighbor Solicitation messages to resolve the targeted multicast address before to send out the Echo Request.	Yes	No
3	Cause EUT to send an Echo Request to the All Routers Multicast address		
4	Check: Does the protocol monitor on Link1 show that EUT DID NOT send Neighbor Solicitation messages to resolve the targeted multicast address before to send out the Echo Request.	Yes	No
5	Cause EUT to send an Echo Request to the Solicited Node Multicast address derived from the Global Address of QE.		
6	Check: Does the protocol monitor on Link1 show that EUT DID NOT send Neighbor Solicitation messages to resolve the targeted multicast address before to send out the Echo Request.	Yes	No
7	Cause EUT to send an Echo Request to the Solicited Node Multicast address derived from the Link-Local Address of QE.		
8	Check: Does the protocol monitor on Link1 show that EUT DID NOT send Neighbor Solicitation messages to resolve the targeted multicast address before to send out the Echo Request.	Yes	No
9	Cause EUT to send an Echo Request to the Multicast group to which QE is subscribed.		
10	Check: Does the protocol monitor on Link1 show that EUT DID NOT send Neighbor Solicitation messages to resolve the targeted multicast address before to send out the Echo Request.	Yes	No
Observations:			

4.2.2.5.1   Group 2.7.1 Interface Initialization

Test Description			
Identifier:	TD_COR_8419_01	**Test Purpose:**	TP_COR_8419_01
Summary:	A multicast-capable interface joins the all-nodes multicast address when initialized		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8419		

```
with { QE  'configured as a multicast capable host'
  and EUT 'configured as a multicast capable host' }

ensure that {
  when { QE is requested to 'send an echo request to the all-nodes multicast address'}
  then { EUT sends 'an echo reply' to QE }
        }
```

Pre-test conditions:	QE and EUT are configured as multicast capable hosts		
	QE and EUT are up and running and have link-local addresses (manually or auto configured)		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the all-nodes multicast address		
2	Check: Does the protocol monitor on Link1 show that EUT replied to the Echo Request?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8419_02	**Test Purpose:**	TP_COR_8419_02
Summary:	A multicast-capable interface joins the solicited-node address for each of its IP addresses		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8419		

```
with { QE  'configured as a multicast capable host'
  and EUT 'configured as a multicast capable host' }

ensure that {
  when { QE is requested to 'send an echo request to the solicited-nodes address of EUT'}
  then { EUT sends 'an echo reply' to QE }
        }
```

Pre-test conditions:	QE and EUT are configured as multicast capable hosts		
	QE and EUT are up and running and have link-local addresses (manually or auto configured)		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an Echo Request to solicited node multicast address of EUT		
2	Check: Does the protocol monitor on Link1 show that EUT replied to the Echo Request?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8420_01	**Test Purpose:**	TP_COR_8420_01
Summary:	When addresses are added/removed from a multicast-capable interface, the interface joins/leave the corresponding solicited-node addresses, respectively.		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8420		

```
with { QE  'configured as a multicast capable host'
  and EUT 'configured as a multicast capable host'
  and EUT 'responds to its solicited-node address' }

ensure that {
   when { EUT 'IP address is modified from "old" to "new"'
       and QE  is requested to 'send packets to the "old" IP solicited-node address of EUT'
       and QE  is requested to 'send packets to the "new" IP solicited-node address of EUT'}
   then { EUT 'does not respond to packets sent to its "old" IP solicited-node address'
        and EUT 'responds to packets sent to its "new" IP solicited-node address'}
        }
```

Pre-test conditions:	QE and EUT are configured as multicast capable hosts QE and EUT are up and running and have link-local addresses (manually or auto configured)		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Add a new link-local address to EUT		
2	Cause QE to send an Echo-Request to the solicited-node multicast address of the new link-local address of EUT.		
3	Check: Does the protocol monitor on Link1 show that EUT replied to the Echo Request?	Yes	No
4	Remove/delete the old link-local address from EUT		
5	Cause QE to send an Echo-Request to the solicited-node multicast address of the old link-local address of EUT.		
6	Check: Does the protocol monitor on Link1 show that EUT DID NOT reply to the Echo Request?	Yes	No
Observations:			

Test Description					
Identifier:	TD_COR_8421_01		**Test Purpose:**	TP_COR_8421_01	
Summary:	EUT leaves the solicited-node multicast address and the solicited-node multicast group corresponding to a removed unicast address				
Roles:	Host, Router		**Configuration:**	CF_CORE_11	
References:	RQ_000_8421				

`with { EUT 'network interface configured as a multicast-capable interface'`
`   and EUT 'configured with only one unicast address on the interface assigned`
`          to the solicited-node multicast address' }`
 	
`ensure that {`
`   when { EUT is requested to 'remove the unicast address' }`
`   then { EUT 'leaves the solicited-node multicast address and solicited-node`
`           multicast group corresponding to the removed address' }`
`        }`					

Pre-test conditions:	EUT is configured with a unique unicast address (UADR1) on its interface to Link1 EUT is configured with a second unique unicast address (UADR2) on its interface to Link1 having the same low-order 24 bits as UADR1 e.g. UADR1 set to 8888::0:0:0:FE:DCB:A987:6543 and UADR2 set to 7777::0:0:0:9A:BCD:EF87:6543 EUT is configured with a third unique unicast address (UADR3) on its interface to Link1 having different low-order 24 bits to UADR1 and UADR2				

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the solicited-node multicast address (MADR1) computed from UADR1 and UADR2 (in the example above MADR1 would be FF02::0:0:0:0:1:FF87:6543)		
2	Check: Does the monitor show that an Echo Request was sent from QE to the MADR1 multicast address?	Yes	No
3	Check: Does QE report the receipt of an Echo Reply from EUT?	Yes	No
4	Use the management interface on EUT to remove UADR2 from its interface to Link1		
5	Cause QE to send an Echo Request to the solicited-node multicast addressáMADR1		
6	Check: Does the monitor show that an Echo Request was sent from QE to the MADR1 multicast address?	Yes	No
7	Check: Does QE report the receipt of an Echo Reply from EUT?	Yes	No
8	Use the management interface on EUT to remove UADR2 from its interface to Link1		
9	Cause QE to send an Echo Request to the solicited-node multicast addressáMADR1		
10	Check: Does the monitor show that an Echo Request was sent from QE to the MADR1 multicast address?	Yes	No
11	Check: Does QE report the receipt of an Echo Reply from EUT?	No	Yes
Observations:			

4.2.3 Group 3 RFC 2462

4.2.3.1 Group 3.1 Initialize

4.2.3.1.1 Group 3.1.1 Configure Address

Test Description			
Identifier:	TD_COR_1246_01	**Test Purpose:**	TP_COR_1246_01
Summary:	EUT uses Router Advertisements to instruct hosts to use ONLY Stateless autoconfiguration		
Roles:	Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1246		

`with { EUT 'configured to send RAs when i/f enabled indicating ONLY`
`            Stateless Autoconfiguration' }`
 	
`ensure that {`
`   when { EUT 'network interface is enabled'`
`      and EUT 'has started transmitting the Router Advertisement messages' }`
`   then { QE1 'is able to address QE2' within 'a few minutes'`
`      and QE2 'is able to address QE1' within 'a few minutes' }`
`         }`			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	Without using conformance test methods, it would be very difficult to prove that the intercommunication between QE1 and QE2 is the result of stateless address autoconfiguration. Use conformance TC_1246_01.		

Test Description			
Identifier:	TD_COR_1246_02	**Test Purpose:**	TP_COR_1246_02
Summary:	EUT uses Router Advertisements to indicate use of Stateless and Stateful autoconfig		
Roles:	Router	**Configuration:**	CF_CORE_21
References:	RQ_000_1246		

`with { QE1 'configured as a Stateful Autoconfiguration Server'`
`   and QE1 'configured to provide stateful n/w config parameters other`
`            than addresses'`
`   and QE2 'configured as a host that supports Stateful Autoconfiguration'`
`   and EUT 'configured to send RAs when i/f enabled'`
`   and EUT 'configured to send RAs indicating use of Stateless and Stateful`
`            Autoconfiguration' }`
 	
`ensure that {`
`   when { EUT 'network interface is enabled'`
`      and EUT 'has started transmitting the Router Advertisement messages' }`
`   then { QE2 'sends a REQUEST message' to QE1 within 'a few minutes' }`
`         }`			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	Stateful autoconfiguration requires the presence of a DHCP server. DHCP is beyond the scope of ETSI's IPv6 testing project.		

Test Description			
Identifier:	TD_COR_1246_03	**Test Purpose:**	TP_COR_1246_03
Summary:	EUT uses Router Advertisements to indicate use of Stateful Autoconfiguration ONLY		
Roles:	Router	**Configuration:**	CF_CORE_21
References:	RQ_000_1246		

with { QE1 'configured as a Stateful Autoconfiguration Server'
  and QE1 'configured to provide stateful n/w config parameters other
       than addresses'
  and QE2 'configured as a host that supports Stateful Autoconfiguration'
  and EUT 'configured to send RAs when the interface enabled'
  and EUT 'configured to send RAs indicating use Stateful Autoconfiguration ONLY' }
 	
ensure that {
  when { EUT 'network interface is enabled'
    and EUT 'has started transmitting the Router Advertisement messages' }
  then { QE2 **sends** 'a REQUEST message' **to** QE1 **within** 'a few minutes' }
       }			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	Stateful autoconfiguration requires the presence of a DHCP server. DHCP is beyond the scope of ETSI's IPv6 testing project.		

4.2.3.1.1.1   Group 3.1.1.1 Simultaneous Stateless and Stateful Autoconfiguration

Test Description			
Identifier:	TD_COR_1200_01	**Test Purpose:**	TP_COR_1200_01
Summary:	EUT simultaneously executes stateful and stateless autoconfiguration		
Roles:	Host, Router	**Configuration:**	CF_CORE_32
References:	RQ_000_1200		

with { QE1 'configured as a Stateful Autoconfiguration Server'
  and QE1 'configured to provide stateful network configuration parameters
      other than addresses'
  and EUT 'configured to support Stateful Autoconfiguration' }
 	
ensure that {
  when { EUT **receives** 'a Router Advertisement message' **from** QE2
      containing 'an indication that both stateful and stateless autoconfig
         should be executed'
    and containing 'a network prefix for the link connecting QE2 and EUT' }
  then { EUT 'configures its unicast address using the network prefix'
  and EUT **sends** 'a REQUEST message' **to** QE1 }
      }			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	Stateful autoconfiguration requires the presence of a DHCP server. DHCP is beyond the scope of ETSI's IPv6 testing project.		

4.2.3.1.1.2 Group 3.1.1.2 Detect Duplicate Address (DAD)

Test Description			
Identifier:	TD_COR_1210_01	**Test Purpose:**	TP_COR_1210_01
Summary:	EUT accepts only DAD ND packets while its address is tentative		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1210		

```
with { EUT 'configured with a tentative address different from the unicast address of QE' }

ensure that {
   when { EUT receives 'a message that is not a DAD Neighbor Solicitation message' from QE }
   then { EUT 'is unable to communicate with QE' before 'DAD completes' }
        }
```

Pre-test conditions:	Configure EUT to transmit 2 Neighbor Solicitations (MAX_MULTICAST_SOLICIT = 2). Configure EUT to wait 2 minutes between each sent Neighbor Solicitation (RETRANS_TIMER = 120000). EUT configured with a tentative address different from the unicast address of QE EUT disconnected from the network (powered down)		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Reconnect EUT to the network (power-up)		
2	Cause QE to send an Echo Request to the tentative address of EUT		
3	Check: Does protocol monitor show that the Echo Request was sent from QE to EUT?	Yes	No
4	Check: Does QE receive an Echo Reply from EUT?	No	Yes
5	Wait 3 minutes		
6	Cause QE to send an Echo Request to the tentative address of EUT		
7	Check: Does protocol monitor show that the Echo Request was sent from QE to EUT?	Yes	No
8	Check: Does QE receive an Echo Reply from EUT?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1235_01	**Test Purpose:**	TP_COR_1235_01
Summary:	EUT indicates that it already uses the tentative address of another node		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1235		

```
with { EUT 'manually configured with a unicast address'
   and QE1 'manually configured with the same unicast address as EUT'
   and QE1 'is powered-down'
   and QE2 'manually configured with a unique unicast address'
   }

ensure that {
   when { EUT receives 'a DAD Neighbor Solicitation message' from QE1
        containing 'a target address the same as the unicast address of EUT' }
   then { QE1 'is unable to communicate with any node' }
        }
```

Pre-test conditions:	QE1 manually configured with the same address as EUT QE1 is powered down		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	power-up QE1		
2	Allow time for Address Autoconfiguration (DAD) to complete		
3	Cause QE1 to send an Echo Request to the address of QE2		
4	Check: Does protocol monitor show that the Echo Request was sent from QE1 to QE2?	No	Yes
5	Check: Does QE1 report that it is unable to send the Echo Request?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1239_01	**Test Purpose:**	TP_COR_1239_01
Summary:	EUT stops the autoconfiguration process when its tentative address is owned by another node		
Roles:	Host, Router	**Configuration:**	CF_CORE_21
References:	RQ_000_1239		

```
with { QE1 'manually configured with a unicast address'
   and EUT 'manually configured with the same unicast address as QE1'
   and EUT 'is powered-down'
   and QE2 'manually configured with a unique unicast address'
   }

ensure that {
   when { --EUT is performing a DAD test—
        EUT receives 'a Neighbor Advertisement message' from QE1
           containing 'a target address the same as the tentative address of EUT' }
   then { EUT 'stops sending DAD Neighbor Solicitation messages'
     and EUT 'stops using its tentative address'}
        }
```

Pre-test conditions:	EUT configured to use QE1's unicast address as its tentative address during DAD EUT disconnected from the network (powered down)		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Reconnect EUT to the network (power-up)		
2	Allow time for Address Autoconfiguration (DAD) to complete		
3	Cause EUT to send an Echo Request to the address of QE2		
4	Check: Does protocol monitor show that the Echo Request was sent from EUT to QE2?	No	Yes
5	Check: Does EUT report that it is unable to send the Echo Request?	Yes	No
Observations:			

4.2.3.1.1.3   Group 3.1.1.3 Assign Global Address

Test Description			
Identifier:	TD_COR_1228_01	**Test Purpose:**	TP_COR_1228_01
Summary:	EUT configures its global unicast address using the global network prefix advertised by a Router		
Roles:	Host	**Configuration:**	CF_CORE_23
References:	RQ_000_1228		

```
with { QE1 'configured as the default router for EUT'
   and EUT 'configured as a host' }

ensure that {
   when { EUT receives 'a Router Advertisement message' from QE1
         containing 'an indication that stateless autoconfiguration should be executed'
      and containing 'a global network prefix usable on the link to QE1 and EUT' }
   then { EUT 'configures its global unicast address using the prefix' }
        }
```

Pre-test conditions:	QE1 established as a default router for EUT EUT interface disabled (powered down)		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE1 to send a Router Advertisement to EUT with the global network prefix associated with the link between QE1 and EUT (power-up EUT)		
2	Cause QE2 to send Echo Request to EUT using its global unicast address		
3	Check: Does protocol monitor show that the Echo Request was sent from QE2 to EUT?	Yes	No
4	Check: Does QE2 receive Echo Reply from EUT?	Yes	No
Observations:			

4.2.3.1.1.4 Group 3.1.1.3.1 Use of O-Flag

Test Description			
Identifier:	TD_COR_1300_01	**Test Purpose:**	TP_COR_1300_01
Summary:	EUT invokes stateful autoconfiguration to obtain non-address information		
Roles:	Host	**Configuration:**	CF_CORE_32
References:	RQ_000_1300		

with { QE1 'configured as a Stateful Autoconfiguration Server'
  and QE1 'configured to provide stateful n/w config parameters other than addresses'
  and QE2 'configured as the default router for EUT'
  and EUT 'configured as a host supporting Stateful autoconfiguration'
  and EUT 'instructed by QE2 not to invoke Stateful Autoconfig for
       non-address parameters' }
 	
ensure that {
  when { EUT **receives** 'a Router Advertisement message' **from** QE2
       containing 'instruction to invoke Stateful autoconfig for
          non-address parameters' }
  then { EUT **sends** 'a REQUEST message' **to** QE1 }
      }			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	Stateful autoconfiguration requires the presence of a DHCP server. DHCP is beyond the scope of ETSI's IPv6 testing project.		

Test Description			
Identifier:	TD_COR_1301_01	**Test Purpose:**	TP_COR_1301_01
Summary:	EUT invokes stateful autoconfig to obtain address and other configuration parameters		
Roles:	Host	**Configuration:**	CF_CORE_32
References:	RQ_000_1301		

with { QE1 'configured as a Stateful Autoconfiguration Server'
  and QE1 'configured to provide stateful n/w config parameters other than addresses'
  and QE2 'established as the default router for EUT'
  and EUT 'configured as a host that supports Stateful Autoconfiguration'
  and EUT 'instructed by QE2 not to invoke Stateful Autoconfig for any parameters' }
 	
ensure that {
  when { EUT **receives** 'a Router Advertisement message' **from** QE2
       containing 'instruction to invoke Stateful autoconfig for address
          and non-address information' }
  then { EUT **sends** 'a REQUEST message' **to** QE1 }
      }			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	Stateful autoconfiguration requires the presence of a DHCP server. DHCP is beyond the scope of ETSI's IPv6 testing project.		

4.2.3.1.1.5 Group 3.1.1.4 Stateless Autoconfiguration

Test Description			
Identifier:	TD_COR_1229_01	**Test Purpose:**	TP_COR_1229_01
Summary:	EUT generates periodic Router Advertisements to the all-nodes multicast address		
Roles:	Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1229		

with { EUT 'configured as a default router'
  and EUT 'network interface disabled' }
 	
ensure that {
  when { EUT 'network interface is enabled' }
  then { EUT **sends** 'periodic Router Advertisement messages'
        to 'the all-nodes multicast address' }
        }			

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:	This test is not interoperability and is tested in Conformance TC_COR_1229_01		

4.2.4 Group 4 RFC 2463

4.2.4.1 Group 4.1 ICMPv6 Functions

4.2.4.1.1 Group 4.1.1 Determine ICMPv6 Message Source Address

Test Description			
Identifier:	TD_COR_1407_01	**Test Purpose:**	TP_COR_1407_01
Summary:	EUT chooses the right unicast address for the Source Address of an ICMPv6 Reply when responding to a Multicast message		
Roles:	Host, Router	**Configuration:**	CF_CORE_12
References:	RQ_000_1407		

with { EUT 'configured with a unique link-local unicast address on Interface-1'
  and EUT 'configured with a unique link-local unicast address on Interface-2'
  and EUT 'configured with a link-local Multicast address on Interface-1'
  and QE 'configured with a unique link-local unicast address' }
 	
ensure that {
  when { EUT **receives** 'a packet' **from** QE
       containing 'the Multicast address assigned to Interface-1 as the destination'
    and containing 'data which should provoke an ICMPv6 Reply as a response' }
  then { EUT **sends** 'an ICMPv6 Reply message' **to** QE
   containing 'the link-local unicast address of Interface-1
       as the source address' }
    }			

Pre-test conditions:	EUT configured with a known Link-Local Unicast address (UADR1) assigned to one of the interfaces (IF1) to Link 1. EUT configured with a different Link-Local Unicast address (UADR2) assigned to its other interface (IF2) to Link1. EUT configured with a known Link-Local Multicast address (MADR1) assigned to IF1 but not to IF2.		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request the Multicast address MADR1		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to MADR1?	Yes	No
3	Check: Does QE receive an Echo Reply from EUT indicating UADR1 as the source address?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1407_02	**Test Purpose:**	TP_COR_1407_02
Summary:	EUT chooses the right unicast address for the Source Address of an ICMPv6 Reply when responding to an Anycast message		
Roles:	Host, Router	**Configuration:**	CF_CORE_12
References:	RQ_000_1407		

```
with { EUT 'configured as a router'
   and EUT 'established as a default Router for QE'
   and EUT 'configured with a unique non link-local unicast address on Interface-1'
   and EUT 'configured with a unique non link-local unicast address on Interface-2'
   and EUT 'configured with an Anycast address on Interface-1'
   and  QE 'configured with a unique non link-local unicast address'
   and EUT 'subscribes to the same link-local unicast address subnet as QE' }

ensure that {
   when { EUT receives 'a packet' from QE
         containing 'the Anycast address assigned to Interface-One as the destination'
       and containing 'data which should provoke an ICMPv6 Reply as a response' }
   then { EUT sends 'an ICMPv6 Reply message' to QE
      containing 'the non link-local unicast address of Interface-1
                as the source address' }
         }
```

Pre-test conditions:	EUT is configured as a router EUT is established as a default router for QE EUT configured with a known global unicast address (UADR1) on its interface to QE EUT configured with an Anycast address (AADR1 ? UADR1) on its interface to QE		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the Anycast address AADR1		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to AADR1?	Yes	No
3	Check: Does QE receive an Echo Reply from EUT indicating UADR1 as the source address?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1408_01	**Test Purpose:**	TP_COR_1408_01
Summary:	EUT replies with an ICMPv6 message when it encounters a failure to forward a traversing packet, the ICMPv6 message's source is the unicast address that belongs to the interface on which the packet forwarding failed		
Roles:	Host, Router	**Configuration:**	CF_CORE_22
References:	RQ_000_1408		

```
with { QE1 'configured with a unique global unicast address'
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link connecting
        QE1 and EUT, and the link connecting QE2 and EUT, respectively'
   and EUT 'Unable to communicate with QE2' }

ensure that {
   when { EUT receives 'a packet' from QE1
         containing 'QE2 as the destination address' }
   then { EUT sends 'an ICMPv6 packet' to QE1
      containing 'source address as the unicast address on Link2' }
         }
```

Pre-test conditions:	EUT established as router QE2 disconnected from the network		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE1 to send an echo request to QE2		
2	Check: Does the protocol monitor on link1 show that the echo request was sent from QE1 to EUT?	Yes	No
3	Check: Does the protocol monitor on link2 show that the echo request was sent from EUT to QE2?	No	Yes
4	Check: Does the protocol monitor on link1 show that an ICMP message was sent from EUT to QE1, with source address being the EUT's address on link2?	Yes	No
Observations:			

4.2.4.1.2 Group 4.1.2 ICMPv6 Error Messages

4.2.4.1.2.1 Group 4.1.2.1 Destination Unreachable Message

Test Description				
Identifier:	TD_COR_1434_01	**Test Purpose:**	TP_COR_1434_01	
Summary:	EUT processes a traversed packet with its size equals to its incoming link MTU			
Roles:	Host, Router	**Configuration:**	CF_CORE_22	
References:	RQ_000_1097			

```
with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link connecting
         QE1 and EUT, and, the link connecting QE2 and EUT, respectively'
   and QE1 'has larger link MTU than EUT'
   and EUT 'has larger or equivalent link MTU than QE2' }

ensure that {
   when { EUT receives 'a packet with its size equals to its incoming link MTU'
         containing 'QE1 as source address and QE2 as destination address' }
   then { EUT sends 'the packet' to QE2 }
         }
```

Pre-test conditions:	EUT established as router QE1 configured a larger link MTU than EUT QE2 configured a smaller or equivalent link MTU than EUT		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send an echo request to QE2, of size equalling to EUT's MTU on link1		
2	Check: Does the protocol monitor on link 1 show that the echo request was sent from QE1?	Yes	No
3	Check: Does the protocol monitor on link 2 show that the echo request was sent to QE2?	Yes	No
4	Check: Does the protocol monitor on link 1 show that an echo response was sent from EUT to QE1?	Yes	No
Observations:			

Test Description				
Identifier:	TD_COR_1436_01	**Test Purpose:**	TP_COR_1436_01	
Summary:	EUT having no matching routing entry for a message will generates an ICMPv6 Destination Unreachable Message with the Code field 0			
Roles:	Host, Router	**Configuration:**	CF_CORE_22	
References:	RQ_000_1436			

```
with { QE1 'configured with a non link-local unicast address'
   and EUT 'configured with a unique non link-local unicast address on each link'
   and EUT 'configured to have no route entry for packets destined to QE2' }

ensure that {
   when { EUT receives 'a packet' from QE1
         containing 'an indication that QE2 is the destination' }
   then { EUT 'generates an ICMPv6 Destination Unreachable Message with Code field 0' }
         }
```

Pre-test conditions:	EUT established as router Remove the route entry in EUT for packets destined to QE2		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE1 to send an echo request to QE2		
2	Check: Does the protocol monitor on link 1 show that an echo request was sent from QE1 to EUT?	Yes	No
3	Check: Does the protocol monitor on link 2 show that the echo request was sent from EUT to QE2?	No	Yes
4	Check: Does the protocol monitor on link 1 show that an ICMP destination unreachable message was sent from EUT to QE1, with code field 0?	Yes	No
Observations:			

<table>
<tr><td colspan="6" align="center">**Test Description**</td></tr>
<tr><td>**Identifier:**</td><td colspan="2">TD_COR_1441_01</td><td>**Test Purpose:**</td><td colspan="2">TP_COR_1441_01</td></tr>
<tr><td>**Summary:**</td><td colspan="5">EUT generates an ICMPv6 Destination Unreachable message with code 4, if it does not have UDP listener corresponding to a UDP packet targeting at the EUT</td></tr>
<tr><td>**Roles:**</td><td colspan="2">Host, Router</td><td>**Configuration:**</td><td colspan="2">CF_CORE_11</td></tr>
<tr><td>**References:**</td><td colspan="5">RQ_000_1441</td></tr>
<tr><td colspan="6">

```
with { QE  'configured with a unique link-local address'
   and EUT 'configured with a unique link-local address'
   and EUT 'configured no supporting listening at a UDP port number XX' }

ensure that {
   when { EUT receives 'a UDP packet' from QE
            containing 'an indication that EUT is the destination'
        and containing 'an indication that the UDP port number XX is the destination port number' }
   then { EUT 'generates an ICMPv6 Destination Unreachable message with code 4' }
          }
```
</td></tr>
<tr><td>**Pre-test conditions:**</td><td colspan="5">EUT has no program listening on a specific UDP port xx</td></tr>
<tr><td align="center">**Step**</td><td colspan="3" align="center">**Test Sequence**</td><td colspan="2" align="center">**Verdict**</td></tr>
<tr><td></td><td colspan="3"></td><td align="center">**Pass**</td><td align="center">**Fail**</td></tr>
<tr><td align="center">1</td><td colspan="3">Cause QE to send a UDP message to EUT with port xx</td><td></td><td></td></tr>
<tr><td align="center">2</td><td colspan="3">Check: Does the protocol monitor show that the UDP message was sent from QE to EUT?</td><td align="center">Yes</td><td align="center">No</td></tr>
<tr><td align="center">3</td><td colspan="3">Check: Does the protocol monitor show that an ICMP destination unreachable message was sent from EUT to QE, with code field 4?</td><td align="center">Yes</td><td align="center">No</td></tr>
<tr><td>**Observations:**</td><td colspan="5"></td></tr>
</table>

4.2.4.1.2.2 Group 4.1.2.2 Packet Too Big Message

<table>
<tr><td colspan="6" align="center">**Test Description**</td></tr>
<tr><td>**Identifier:**</td><td colspan="2">TD_COR_1445_01</td><td>**Test Purpose:**</td><td colspan="2">TP_COR_1445_01</td></tr>
<tr><td>**Summary:**</td><td colspan="5">EUT (as a router) generates an ICMPv6 Packet Too Big Message, if it receives a traversed packet that is larger than the outgoing link MTU</td></tr>
<tr><td>**Roles:**</td><td colspan="2"></td><td>**Configuration:**</td><td colspan="2">CF_CORE_22</td></tr>
<tr><td>**References:**</td><td colspan="5">RQ_000_1445</td></tr>
<tr><td colspan="6">

```
with { QE1 'configured with a unique global unicast address'
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link
           connecting QE1 and EUT, and, the link connecting QE2 and EUT, respectively'
   and QE1 'has larger link MTU than EUT' }

ensure that {
   when { EUT receives 'a packet with its size larger than the MTU of the link
                     connecting EUT and QE2'
            containing 'QE1 as source address and QE2 as destination address' }
   then { EUT 'generates an ICMPv6 Packet Too Big Message' }
          }
```
</td></tr>
<tr><td>**Pre-test conditions:**</td><td colspan="5">EUT established as router
QE1 configured a larger link MTU than link2 MTU
QE2 configured a smaller link MTU than link1 MTU</td></tr>
<tr><td align="center">**Step**</td><td colspan="3" align="center">**Test Sequence**</td><td colspan="2" align="center">**Verdict**</td></tr>
<tr><td></td><td colspan="3"></td><td align="center">**Pass**</td><td align="center">**Fail**</td></tr>
<tr><td align="center">1</td><td colspan="3">Cause QE1 to send an echo request to QE2, of size larger than link2 MTU</td><td></td><td></td></tr>
<tr><td align="center">2</td><td colspan="3">Check: Does the protocol monitor on link 1 show that the echo request was sent from QE1 to EUT?</td><td align="center">Yes</td><td align="center">No</td></tr>
<tr><td align="center">3</td><td colspan="3">Check: Does the protocol monitor on link 2 show that the echo request was sent from EUT to QE2?</td><td align="center">No</td><td align="center">Yes</td></tr>
<tr><td align="center">4</td><td colspan="3">Check: Does the protocol monitor on link 1 show that an ICMP packet too big message was sent from EUT to QE1?</td><td align="center">Yes</td><td align="center">No</td></tr>
<tr><td>**Observations:**</td><td colspan="5"></td></tr>
</table>

4.2.4.1.2.3   Group 4.1.2.3 Time Exceeded Message

Test Description			
Identifier:	TD_COR_1449_01	Test Purpose:	TP_COR_1449_01
Summary:	EUT drops a traversed packet with a Hop Limit of zero and responds with an ICMPv6 Time Exceeded message with Code 0 to the source of the packet		
Roles:		Configuration:	CF_CORE_22
References:	RQ_000_1449		

`with { QE1 'configured with a unique global unicast address '`
`   and QE2 'configured with a unique global unicast address'`
`   and EUT 'configured with two unique global unicast addresses on the link`
`           connecting QE1 and EUT, and the link connecting QE2 and EUT, respectively' }`
 	
`ensure that {`
`   when { EUT receives 'a packet'`
`          containing 'QE1 as source address and QE2 as destination address'`
`      and containing  'Hop Limit = 0' }`
`   then { EUT discards 'the packet'`
`      and EUT 'generates an ICMPv6 Time Exceeded message with Code 0'`
`          containing 'QE1 as source address' }`
`        }`			

Pre-test conditions:			
Step	Test Sequence	Verdict	
		Pass	Fail
Observations:	Packets with hop limit = 0 cannot be sent over a legal device, thus this TP has no corresponding TD (or remove the TP completely?)		

Test Description			
Identifier:	TD_COR_1450_01	Test Purpose:	TP_COR_1450_01
Summary:	EUT drops a traversed packet with a Hop Limit of 1 and responds with an ICMPv6 Time Exceeded message with Code 0 to the source of the packet		
Roles:		Configuration:	CF_CORE_22
References:	RQ_000_1450		

`with { QE1 'configured with a unique global unicast address '`
`   and QE2 'configured with a unique global unicast address'`
`   and EUT 'configured with two unique global unicast addresses on the link`
`           connecting QE1 and EUT, and the link connecting QE2 and EUT, respectively' }`
 	
`ensure that {`
`   when { EUT receives 'a packet'`
`          containing 'QE1 as source address and QE2 as destination address'`
`      and containing  'Hop Limit = 1' }`
`   then { EUT discards 'the packet'`
`      and EUT 'generates an ICMPv6 Time Exceeded message with Code 0'`
`          containing 'QE1 as source address' }`
`        }`			

Pre-test conditions:	EUT established as router		
Step	Test Sequence	Verdict	
		Pass	Fail

1	Cause QE1 to send an Echo Request with the following properties:
	  - hop limit =1
	  - QE2 is the destination		

2	Check: Does the protocol monitor on link 1 show that the echo request was sent from QE to EUT?	Yes	No
3	Check: Does the protocol monitor on link 2 show that the echo request was sent from EUT to QE2?	No	Yes
4	Check: Does the protocol monitor on link 1 show that an ICMP time exceeded message was sent from EUT to QE1, with code 0?	Yes	No
Observations:			

4.2.4.1.3 Group 4.1.3 Information Messages

4.2.4.1.3.1 Group 4.1.3.1 Echo Request and Echo Reply

Test Description			
Identifier:	TD_COR_1460_01	**Test Purpose:**	TP_COR_1460_01
Summary:	EUT sends an Echo Reply in response to an Echo Request		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1460		

```
with { QE 'configured with a unique unicast address'
   and EUT 'configured with a unique unicast address' }

ensure that {
   when { QE is requested to 'send a Echo Request to EUT' }
   then { EUT sends 'an Echo Response' to QE }
      }
```

Pre-test conditions:	QE connected to EUT		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an echo request to EUT		
2	Check: Does the protocol monitor show that the echo request was sent from QE to EUT?	Yes	No
3	Check: Does the protocol monitor show that an echo response was sent from EUT to QE?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1464_01	**Test Purpose:**	TP_COR_1464_01
Summary:	EUT sends an Echo Reply in response to an Echo Request		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1464		

```
with { QE 'configured with a unique unicast address'
   and EUT 'configured with a unique unicast address' }

ensure that {
   when { EUT receives 'an Echo Request' from QE
       containing 'the unicast address of EUT as destination' }
   then { EUT sends 'an Echo Response' to QE
       containing 'unicast address of EUT as source address' }
         }
```

Pre-test conditions:	QE is connected to EUT		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an echo request to EUT's unicast address		
2	Check: Does the protocol monitor show that the echo request was sent from QE to EUT's unicast address?	Yes	No
3	Check: Does the protocol monitor show that the echo request was sent to QE, with EUT's unicast address as source address?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1466_01	**Test Purpose:**	TP_COR_1466_01
Summary:	EUT responds to a multicast Echo Request message with a unicast Echo Request		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1466		

```
with { EUT 'network interface configured as a multicast-capable interface'
   and EUT 'configured with a unicast address on the interface assigned
           to the multicast address' }

ensure that {
   when { QE is requested to 'send an Echo Request message'
           containing 'the multicast address of EUT as destination address' }
   then { EUT 'generates an Echo Response Message'
           containing 'source address as the unicast address for the interface on which the
                     multicast Echo Request message was received' }
         }
```

Pre-test conditions:	EUT configured with a multicast address and a unicast address		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an echo request to EUT's multicast address		
2	Check: Does the protocol monitor show that the echo request was sent from QE to EUT's multicast address?	Yes	No
3	Check: Does the protocol monitor show that the echo request was sent to QE, with EUT's unicast address as its source address?	Yes	No
Observations:			

4.2.5   Group 5 RFC 3513

4.2.5.1   Group 5.2 Address Architecture

Test Description			
Identifier:	TD_COR_1726_04	**Test Purpose:**	TP_COR_1726_04
Summary:	EUT with a single i/f receives a packet sent to the LL All-Nodes M/cast address		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_1726		

```
ensure that {
   when { QE is requested to 'send a packet to the link-local All-Nodes Multicast address' }
   then { EUT indicates 'receipt of the packet' }
         }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the Link-Local All-Nodes Multicast address (FF02:0:0:0:0:0:0:1)		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to FF02:0:0:0:0:0:0:1?	Yes	No
3	Check: Does QE receive an Echo Reply the EUT?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1726_05	**Test Purpose:**	TP_COR_1726_05
Summary:	EUT with multiple i/fs receives a packet sent to the LL All-Nodes M/cast address		
Roles:	Host	**Configuration:**	CF_CORE_12
References:	RQ_000_1726		

```
with { EUT 'configured with different link-local addresses on each of its interfaces' }

ensure that {
   when {  QE is requested to 'send a packet to the link-local All-Nodes Multicast address' }
   then { EUT indicates 'receipt of the packet on both of its interfaces' }
           }
```

Pre-test conditions:	EUT configured with different Link-Local addresses on each of its interfaces (IF1 and IF2)		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the Link-Local All-Nodes Multicast address (FF02:0:0:0:0:0:0:1)		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to FF02:0:0:0:0:0:0:1?	Yes	No
3	Check: Does QE receive an Echo Reply from the IF1 Link-Local address of the EUT?	Yes	No
4	Check: Does QE receive an Echo Reply from the IF2 Link-Local address of the EUT?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1726_06	**Test Purpose:**	TP_COR_1726_06
Summary:	EUT receives packet sent to the Solicited-Node M/cast address based on its unicast address		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_1726		

```
ensure that {
   when {  QE is requested to 'send a packet to the solicited-node multicast address
                          of EUT unicast address' }
   then { EUT indicates 'receipt of the packet' }
           }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the Solicited Node Multicast address computed from the EUT's Unicast address (FF02:0:0:0:0:1:FF + low order 3 octets from EUT's unicast address)		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to the computed Solicited Node Multicast address?	Yes	No
3	Check: Does QE receive an Echo Reply from the EUT?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1726_07	**Test Purpose:**	TP_COR_1726_07
Summary:	EUT receives packet sent to the Solicited-Node M/cast address based on its anycast address		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_1726		

```
with { EUT 'subscribed to an anycast group' }

ensure that {
   when {  QE is requested to 'send a packet to the solicited-node multicast address
                          of EUT anycast address' }
   then { EUT indicates 'receipt of the packet' }
           }
```

Pre-test conditions:	EUT is subscribed to an Anycast group		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the Solicited Node Multicast address computed from the EUT's subscribed Anycast address (FF02:0:0:0:0:1:FF + low order 3 octets from the Anycast address)		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to the computed Solicited Node Multicast address?	Yes	No
3	Check: Does QE receive an Echo Reply from the EUT?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1726_08	**Test Purpose:**	TP_COR_1726_08
Summary:	EUT receives packet sent to the M/cast address of a group to which EUT belongs		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_1726		

```
with { EUT 'subscribed to a multicast group' }

ensure that {
   when {  QE is requested to 'send a packet to the EUT multicast address' }
   then { EUT indicates 'receipt of the packet' }
           }
```

Pre-test conditions:	EUT is subscribed to a Multicast group		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the EUT's subscribed Multicast address		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to the specified Multicast address?	Yes	No
3	Check: Does QE receive an Echo Reply from the EUT?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1727_01	**Test Purpose:**	TP_COR_1727_01
Summary:	EUT (as a router) recognizes the Subnet-Router Anycast Address for interfaces for which it is configured to act as a router		
Roles:		**Configuration:**	CF_CORE_11
References:	RQ_000_1727		

```
with { EUT 'configured as a router'
   and EUT 'established as a default Router for QE'
   and EUT 'configured with a unique non link-local unicast address on Interface-1'
   and EUT 'configured with a unique non link-local unicast address on Interface-2'
   and EUT 'configured with an Subnet-Router Anycast address on Interface-1'
   and  QE 'configured with a unique non link-local unicast address'
   and EUT 'subscribes to the same link-local unicast address subnet as QE' }

ensure that {
   when { EUT receives 'a packet' from QE
           containing 'the Subnet-Router Anycast address assigned to Interface-1 as
                        the destination'
        and containing 'data which should provoke an ICMPv6 Reply as a response' }
       then { EUT sends 'an ICMPv6 Reply message' to QE }
            }
```

Pre-test conditions:	EUT configured as a default router for QE EUT configured with a subnet-router anycast address		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an echo request to the subnet-router anycast address of EUT		
2	Check: Does the protocol monitor show that the echo request was sent from QE to EUT?	Yes	No
3	Check: Does the protocol monitor show that an echo response was sent from EUT to QE?	Yes	No
Observations:			

4.2.5.2   Group 5.5 Unicast Addresses

Test Description			
Identifier:	TD_COR_1726_01	**Test Purpose:**	TP_COR_1726_01
Summary:	EUT with a single i/f receives a packet sent to its unicast address		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_1726		

```
ensure that {
   when {  QE is requested to 'send a packet to the unicast address of the EUT' }
   then { EUT indicates 'receipt of the packet' }
        }
```

Pre-test conditions:			

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the unicast address of EUT		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to EUT?	Yes	No
3	Check: Does QE receive an Echo Reply from EUT?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1726_02	**Test Purpose:**	TP_COR_1726_02
Summary:	EUT with multiple i/fs receives packet sent to one of its unicast addresses		
Roles:	Host	**Configuration:**	CF_CORE_12
References:	RQ_000_1726		

```
with { EUT 'configured with different link local addresses on each of its interfaces' }

ensure that {
  when {  QE is requested to 'send a packet to the unicast address of one of
                        the EUT interfaces' }
  then { EUT indicates 'receipt of the packet only on the addressed interface' }
      }
```

Pre-test conditions:	EUT configured with different link local addresses on each of its interfaces		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to one of the EUT's unicast addresses		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to EUT?	Yes	No
3	Check: Does QE receive an Echo Reply from the selected unicast address of the EUT?	Yes	No
Observations:			

4.2.5.2.1 Group 5.5.6 Link Local Unicast Addresses

Test Description			
Identifier:	TD_COR_1677_01	**Test Purpose:**	TP_COR_1677_01
Summary:	EUT does not forward packets with link-local source or destination addresses		
Roles:		**Configuration:**	CF_CORE_22
References:	RQ_000_1677		

```
with { QE1 'configured with a unique link-local unicast address'
  and EUT 'configured with a unique link-local unicast address on each link'
  and QE2 'configured with a unique link-local unicast address'
  and QE1 'configured to use EUT as the next-hop for the link-local address of QE2' }

ensure that {
  when {EUT receives 'a packet' from QE1
        containing 'the link-local address of QE2 as the destination' }
  then { EUT 'does not forward the packet' to QE2 }
      }
```

Pre-test conditions:	QE2 is configured with a unique link-local unicast address (UADR1) on its interface to LINK2 QE1 is configured to use EUT as the next-hop for the link-local address of QE2		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE1 to send an Echo Request the unicast address UADR1		
2	Check: Does protocol monitor show that the Echo Request was sent from QE1 to UADR1?	Yes	No
3	Check: Does QE1 receive an Echo Reply from QE2 indicating UADR1 as the source address?	No	Yes
Observations:			

4.2.5.3   Group 5.6 Anycast Addresses

Test Description			
Identifier:	TD_COR_1726_03	**Test Purpose:**	TP_COR_1726_03
Summary:	EUT receives a packet sent to its anycast address		
Roles:	Host	**Configuration:**	CF_CORE_11
References:	RQ_000_1726		

```
with { EUT 'subscribed to an anycast group' }

ensure that {
  when {  QE is requested to 'send a packet to the EUT anycast address' }
  then { EUT indicates 'receipt of the packet' }
        }
```

Pre-test conditions:	EUT is subscribed to an anycast group		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to the EUT's anycast address		
2	Check: Does protocol monitor show that the Echo Request was sent from QE to EUT?	Yes	No
3	Check: Does QE receive an Echo Reply from the anycast address of the EUT?	Yes	No
Observations:			

4.2.5.4   Group 5.7 Multicast Addresses

4.2.5.4.1   Group 5.7.1 Pre-defined Multicast Addresses

Test Description			
Identifier:	TD_COR_1719_01	**Test Purpose:**	TP_COR_1719_01
Summary:	EUT sends packet to All-RT LL M/cast address : 1 RT and 1 HS in scope		
Roles:	Host, Router	**Configuration:**	CF_CORE_21
References:	RQ_000_1719		

```
with { QE 'configured as a router'
  and EUT 'configured as a host' }

ensure that {
  when { EUT is requested to 'send a Router Solicitation message ' }
  then { EUT  'uses the All-Routers Link-Local Multicast address as destination' }
        }
```

Pre-test conditions:	QE configured as a Router EUT configured as a Host		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send a Router Solicitation		
2	Check: Does the protocol monitor show that the echo request was sent from EUT to the All-Routers Link-Local Multicast address?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1720_01	**Test Purpose:**	TP_COR_1720_01
Summary:	EUT sends packet to All-RT SL M/cast addr : 1 RT in LL scope and 1 in SL scope		
Roles:	Host, Router	**Configuration:**	CF_CORE_23
References:	RQ_000_1720		

```
with { QE2 'configured as a router'
  and QE1 'configured with the EUT and QE2 in the same site-local group'}

ensure that {
  when { EUT is requested to 'send a Router Solicitation message' }
  then { QE1 sends 'the appropriate Router Advertisement message' to EUT
    and QE2 sends 'the appropriate Router Advertisement message' to EUT }
        }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
Observations:			

4.2.5.4.2 Group 5.7.2 Node

Test Description			
Identifier:	TD_COR_1608_01	**Test Purpose:**	TP_COR_1608_01
Summary:	EUT receives packets sent to its multicast address		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_1608		

with { EUT 'subscribed to a multicast group' }
 	
ensure that {
   when { QE **is requested to** 'send a packet to the multicast address' }
   then { EUT **indicates** 'receipt of the packet' }
         }			

Pre-test conditions:	EUT subscribed to a multicast group		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE to send an echo request to EUT's multicast address		
2	Check: Does the protocol monitor show that the echo request was sent from QE to EUT?	Yes	No
3	Check: Does the protocol monitor show that an echo response was sent from EUT to QE?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1709_01	**Test Purpose:**	TP_COR_1709_01
Summary:	EUT (as a router) does not forward packets sent to a multicast address beyond the scope (= site-local) indicated by the scope field in the destination multicast address		
Roles:		**Configuration:**	CF_CORE_22
References:	RQ_000_1709		

with { EUT 'configured with a site-local address on link1 and a global address on link2'
     and QE1 'configured with a site-local address on link1'
     and QE2 'configured with a global address on link2'
     and QE1 'can communicate with QE2s global unicast address' }
 	
ensure that {
   when { QE1 **is requested to** 'send a packet to the all routers site-local multicast address' }
   then { EUT **indicates** 'receipt of the packet'
      and QE2 'does not indicate receipt of the packet' }
        }			

Pre-test conditions:	QE1, and EUT configured with a site local unicast address on link1 EUT and QE2 (on link2) configured with a global unicast address QE1 can communicate with QE2 global unicast address		

Step	Test Sequence	Verdict	
		Pass	**Fail**
1	Cause QE1 send an echo request to the all routers site-local multicast address (FF05::2)		
2	Check: Does the protocol monitor on link 1 show that the echo request was sent?	Yes	No
3	Check: Does QE1 receive an Echo Reply from EUT?	Yes	No
4	Check: Does QE1 receive an Echo Reply from QE2?	No	Yes
Observations:			

Test Description			
Identifier:	TD_COR_1709_02	**Test Purpose:**	TP_COR_1709_02
Summary:	EUT (as a router) does not forward packets sent to a multicast address beyond the scope (= link-local) indicated by the scope field in the destination multicast address		
Roles:		**Configuration:**	CF_CORE_22
References:	RQ_000_1709		

```
with { EUT 'configured with global addresses on link1 and link2'
       and QE1 'configured with a global address on link1'
       and QE2 'configured with a global address on link2'
       and 'QE1 and QE2 can communicate' }

ensure that {
   when { QE1 is requested to 'send a packet to the all nodes link-local multicast address' }
   then { EUT indicates 'receipt of the packet'
          and QE2 'does not indicate receipt of the packet' }
        }
```

Pre-test conditions:	QE1 and QE2 can communicate with each other		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE1 send an echo request to the all nodes link-local multicast address (FF02::1)		
2	Check: Does the protocol monitor on link 1 show that the echo request was sent?	Yes	No
3	Check: Does QE1 receive an Echo Reply from EUT?	Yes	No
4	Check: Does QE1 receive an Echo Reply from QE2?	No	Yes
Observations:			

4.2.6 Group 6 RFC 1981

4.2.6.1 Group 6.1 Discover PMTU

Test Description			
Identifier:	TD_COR_1802_01	**Test Purpose:**	TP_COR_1802_01
Summary:	The implementation implements Path MTU discovery		
Roles:	Host, Router	**Configuration:**	CF_CORE_23
References:	RQ_000_1802		

```
ensure that {
   when { EUT is requested to 'send data requiring a packet length greater than the link MTU to QE2' }
   then { QE2 indicates 'receipt of the same data without any modification' }
        }
```

Pre-test conditions:	QE1 established as the default router for EUT and QE2 Link2 MTU is set to a value smaller than Link1 MTU		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send several Echo Request messages to including a data size such that the resulting packet size will be smaller or equal to the MTU of Link1 AND bigger than the MTU of Link2		
2	Check: Does EUT receive Echo Replies from QE2?	Yes	No
Observations:	Note that 'receipt of the same data without any modification' does not mean that packets have not been fragmented, but that the data has been correctly transmitted.		

Test Description			
Identifier:	TD_COR_1808_01	**Test Purpose:**	TP_COR_1808_01
Summary:	The implementation receives a Packet Too Big message and reduces the PMTU		
Roles:	Host, Router	**Configuration:**	CF_CORE_23
References:	RQ_000_1818		

```
with { QE1 'configured such that Link2 has a smaller MTU than Link1' }

ensure that {
   when { -- EUT is attempting to communicate with QE2 using the MTU of Link1
          EUT receives 'a Packet Too Big message' from QE1}
   then { EUT 'reduces the MTU for the path to QE2 to the PMTU of Link2' }
        }
```

Pre-test conditions:	QE1 established as the default router for EUT and QE2 Link2 MTU is set to a value smaller than Link1 MTU		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send an Echo Request message to QE2 including a data size such that the resulting packet size will be smaller or equal to the MTU of Link1 AND bigger than the MTU of Link2		
2	Check: Does the protocol monitor on Link1 show that QE1 sends a Packet Too Big message to EUT after the first Echo Request?	Yes	No
3	Cause EUT to send other Echo Request messages identical to the one sent at Step1.		
4	Check: Does the protocol monitor on Link2 show that Echo Request messages are fragmented to meet the MTU of link2?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_1822_01	**Test Purpose:**	TP_COR_1822_01
Summary:	Handling PMTU smaller than the IPv6 minimum link MTU		
Roles:	Host, Router	**Configuration:**	CF_CORE_23
References:	RQ_000_1822		

```
with { QE1 'configured such that Link2 has an MTU smaller the minimum IPv6 link MTU' }

ensure that { -- EUT is attempting to communicate with QE2 using the MTU of Link1
   when { EUT receives 'a Packet Too Big message from QE1 indicating an MTU smaller than
                       the IPv6 minimum link MTU for Link2' }
   then { EUT 'sets the PMTU for the path to the IPv6 minimum link MTU'
      and EUT 'fragments subsequent packets' }
        }
```

Pre-test conditions:	QE1 established as the default router for EUT and QE2 Link2 MTU is set to a value smaller than the IPv6 minimum		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send several Echo Request messages to QE2 including a data size such that the resulting packet size will be smaller or equal to the MTU of Link1 AND bigger than the MTU of Link2		
2	Check: Does the protocol monitor on Link1 show that QE1 sends a Packet Too Big message to EUT after the first Echo Request?	Yes	No
3	Check: Does the protocol monitor on Link1 show that subsequent Echo Request messages are fragmented to meet the IPv6 minimum link MTU?	Yes	No
Observations:			

4.2.6.1.1 Group 6.1.1 Multicast PMTU Discovery

Test Description			
Identifier:	TD_COR_1814_01	**Test Purpose:**	TP_COR_1814_01
Summary:	Use of PMTU with Multicast		
Roles:	Host, Router	**Configuration:**	CF_CORE_31
References:	RQ_000_1814, RQ_000_1814		

```
with { QE1 'configured such that Link1 has a bigger MTU than Link2'
     and EUT 'configured as listener to a multicast group'
     and QE2 'subscribed to the same multicast group' }

ensure that {
   when { -- EUT sends multicast packets to the defined multicast group with a size bigger than
         -- the MTU of Link2
         EUT is requested to 'send multicast packets with an MTU size bigger than the PMTU
                             of Link2 to the QE2 listener group'
     and EUT is requested to 'reduce the size of its multicasted packets' }
   then { EUT 'reduces its MTU to the PMTU of Link2' }
         }
```

Pre-test conditions:			
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1			
2	Check:	Yes	No
Observations:	TD_COR_1815_01 covers the same topic with more accuracy.		

Test Description			
Identifier:	TD_COR_1815_01	**Test Purpose:**	TP_COR_1815_01
Summary:	Different MTUs on Multicast destinations		
Roles:	Host, Router	**Configuration:**	CF_CORE_35
References:	RQ_000_1815		

```
with { QE1 'configured such that the MTU of Link1 is greater than the MTU of Link2'
 and QE1 'configured such that the MTU of Link2 is greater than the MTU of Link3'
     and 'QE2 and QE3 configured as listeners to a common multicast group'
     and QE1 'subscribed to the same multicast group' }

ensure that {
   when { -- EUT sends multicast packets to the defined multicast group with a size bigger than
         -- the MTU of Link2
         EUT receives 'several Packet-Too-Big messages from QE1 indicating different
                      next-hop MTUs' }
   then { EUT 'reduces its assumed PMTU to the MTU of Link3' }
         }
```

Pre-test conditions:	QE2, and QE3 are configured as listeners to a defined common multicast group QE1 is 'subscribed' to the same defined common multicast group QE1 is established as default router for all nodes Link1 MTU greater than Link2 MTU, AND Link2 MTU greater than Link3 MTU		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send several Echo Request messages to the defined common multicast group, including a data size such that the resulting packet size will be smaller or equal to the MTU of Link1 AND bigger than the MTU of Link2		
2	Check: Does the protocol monitor on Link1 show that QE1 sends one (or more) Packet Too Big message to EUT after the first Echo Request?	Yes	No
3	Check: Does the protocol monitor on Link1 show that subsequent Echo Request messages are fragmented to meet the MTU of link3?	Yes	No
Observations:			

4.2.7   Group 7 RFC 2675

Test Description			
Identifier:	TD_COR_8800_01	**Test Purpose:**	TP_COR_8800_01
Summary:	EUT forwards Jumbograms		
Roles:	Host, Router	**Configuration:**	CF_CORE_22
References:	RQ_000_8800		

```
with { QE1 'configured with a unique non link-local unicast address'
  and  EUT 'configured with a unique non link-local unicast address on each link'
   and EUT 'configured to support the Jumbo Payload Option'
   and QE1 'configured to support the Jumbo Payload Option'
   and QE2 'configured to support the Jumbo Payload Option'
   and EUT 'configured to support Jumbograms on both its links' }

ensure that {
   when { EUT receives 'a packet' from QE1
         containing 'QE2 as the destination'
      and containing 'a Jumbo Payload Option' }
   then { EUT 'forwards the packet' to QE2 }
      }
```

Pre-test conditions:	EUT, QE1 and QE2 are all configured to support IPv6 Jumbo Payloads (Jumbograms) on all links (Link1 and Link2)		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE1 to send an Echo Request to QE2 with a payload size greater than 65 535 octets		
2	Check: Does the monitor show that an Echo Request was sent from QE1 to QE2?	Yes	No
3	Check: Does QE1 report the receipt of an Echo Reply from QE2?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8800_02	**Test Purpose:**	TP_COR_8800_02
Summary:	EUT sends a Jumbogram		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8800		

```
with { EUT 'configured with a unique unicast address'
   and  QE 'configured with a unique unicast address'
   and EUT 'configured to support the Jumbo Payload Option'
   and  QE 'configured to support the Jumbo Payload Option' }

ensure that {
   when { EUT is requested to 'send a packet to QE'
               containing 'a Jumbo Playload Option' }
   then { EUT sends 'the packet' to QE }
      }
```

Pre-test conditions:	EUT and QE are both configured to support IPv6 Jumbo Payloads (Jumbograms) on Link1		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause EUT to send an Echo Request to QE with a payload size greater than 65 535 octets		
2	Check: Does the monitor show that an Echo Request was sent from EUT to QE?	Yes	No
3	Check: Does EUT report the receipt of an Echo Reply from QE?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8800_03	**Test Purpose:**	TP_COR_8800_03
Summary:	EUT accepts a received Jumbogram		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8800		

```
with { EUT 'configured with a unique unicast address'
   and  QE 'configured with a unique unicast address'
   and EUT 'configured to support the Jumbo Payload Option'
   and  QE 'configured to support the Jumbo Payload Option' }

ensure that {
   when { EUT receives 'a packet' from QE
         containing 'a Jumbo Payload Option' }
   then { EUT accepts 'the packet' }
         }
```

Pre-test conditions:	EUT and QE are both configured to support IPv6 Jumbo Payloads (Jumbograms) on Link1		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to EUT with a payload size greater than 65 535 octets		
2	Check: Does the monitor show that an Echo Request was sent from QE to EUT?	Yes	No
3	Check: Does QE report the receipt of an Echo Reply from EUT?	Yes	No
Observations:			

Test Description			
Identifier:	TD_COR_8813_01	**Test Purpose:**	TP_COR_8813_01
Summary:	EUT does not support Jumbo Payload Option		
Roles:	Host, Router	**Configuration:**	CF_CORE_11
References:	RQ_000_8813		

```
with { QE 'configured with a unique unicast address'
        and QE 'configured to support the Jumbo Payload Option'
        and  EUT 'configured with a unique unicast address'
        and EUT 'does not support the Jumbo Payload Option' }

ensure that {
   when { EUT receives 'a packet' from QE
         containing 'a Jumbo Payload Option' }
   then {  EUT sends 'an ICMPv6 Parameter Problem message' to QE
        containing 'an indication that Jumbo Payload Option is not supported' }
         }
```

Pre-test conditions:	EUT is not configured to support IPv6 Jumbo Payloads (Jumbograms) QE is configured to support Jumbograms on Link1		
Step	**Test Sequence**	**Verdict**	
		Pass	**Fail**
1	Cause QE to send an Echo Request to EUT with a payload size greater than 65 535 octets		
2	Check: Does the monitor show that an Echo Request was sent from QE to EUT?	Yes	No
3	Check: Does QE report the receipt of an Echo Reply from EUT?	No	Yes
4	Check: Does QE report the receipt of an ICMPv6 'Parameter Problem' message with the Code set to the value '2' (unrecognized IPv6 option encountered)	Yes	No
Observations:			

Annex A (informative): IPv6 Interoperability Test Purposes

The Test Suite Structure is based on the IPv6 Core 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      : COR
Title    : 'Interoperability Test Purposes for IPv6 Core Specifications'
Version  : 1.1.0
Date     : 27.09.2005
Author   : 'ETSI TC-MTS'

def entity EUT
def entity QE
def entity QE1
def entity QE2
def entity QE3
def entity QE4

def word discards
def word requested
def word ignores
def word indicates
def word accepts

--*********************************--
--* RFC 2460 IPv6 Core Specification *--
--*********************************--
Group 1 'RFC 2460'
Group 1.1 'Generate IPv6 Packet'

End Group 1.1

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 1.2 'Process IPv6 Packet'
Group 1.2.4 'Process IPv6 Header'

TP id  : TP_COR_1097_01
Summary : 'EUT processes a packet with its size equals to its link MTU'
RQ ref  : RQ_000_1097
Config  : CF_CORE_11
TD ref  : TD_COR_1097_01

with { QE1 'configured with a unique global unicast address '
   and EUT 'configured with a unique global unicast address'
   and EUT 'has a link MTU smaller than the link MTU of QE1' }

ensure that {
   when { EUT receives 'a packet with its size equal to link MTU of EUT'
         containing 'QE1 as source address and EUT as destination address'
      and containing 'request for response' }
   then { EUT sends 'an appropriate response packet' to QE1 }
         }

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TP id  : TP_COR_1097_02
Summary : 'EUT processes a traversed packet with its size equals to its incoming link MTU'
RQ ref  : RQ_000_1097
Config  : CF_CORE_22
TD ref  : TD_COR_1097_02

with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link
           connecting QE1 and EUT, and, the link connecting QE2 and EUT, respectively'
   and QE1 'has larger link MTU than EUT'
   and EUT 'has larger or equivalent link MTU than QE2' }

ensure that {
   when { EUT receives 'a packet with its size equals to its incoming link MTU'
```

```
                    containing 'QE1 as source address and QE2 as destination address' }
        then { EUT sends 'the packet' to QE2}
                }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 1.2.4.4 'Process Hop Limit'

TP id   : TP_COR_1002_01
Summary : 'EUT decreases the Hop Limit field of a traversed IPv6 packet and forwards it'
RQ ref  : RQ_000_1002
Config  : CF_CORE_22
TD ref  : TD_COR_1002_01

with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link
            connecting QE1 and EUT, and the link connecting QE2 and EUT, respectively' }

ensure that {
   when { EUT receives 'a packet'
            containing 'QE1 as source address and QE2 as destination address'
         and containing 'Hop Limit > 1' }
   then { EUT sends 'the packet with the Hop Limit decremented' to QE2 }
                }

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TP id   : TP_COR_1002_02
Summary : 'EUT drops a traversed IPv6 packets with a zero Hop Limit and returns
           an ICMP error message to the source'
RQ ref  : RQ_000_1002
Config  : CF_CORE_22
TD ref  : TD_COR_1002_02

with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link
            connecting QE1 and EUT, and on the link connecting QE2 and EUT, respectively' }

ensure that {
   when { EUT receives 'a packet'
            containing 'QE1 as source address and QE2 as destination address'
         and containing 'Hop Limit = 0' }
   then { EUT discards 'the packet'
   and EUT sends 'an ICMP error message' to QE1 }
                }

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TP id   : TP_COR_1058_01
Summary : 'Discard packets if Hop Limit ≤ 1'
RQ ref  : RQ_000_1058
Config  : CF_CORE_22
TD ref  : TD_COR_1058_01

ensure that {
   when { QE1 is requested to 'send a packet to QE2'
                 containing 'Routing header Type = 0'
             and containing 'Segments Left value other than zero'
             and containing 'Segments Left value not greater than the number of addresses
                             in the Routing header'
             and containing 'an even "Hdr Ext Len" value'
         and not containing 'multicast address as next address to be visited or IPv6 Destination'
             and containing 'IPv6 hop limit ≤ 1'
             and containing 'EUT as next routing hop' }
   then { EUT sends 'ICMP "Time Exceeded" error message' to QE1
      and EUT discards 'the packet' }
                }

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TP id   : TP_COR_1059_01
Summary : 'Process packets if Hop Limit > 1'
RQ ref  : RQ_000_1059
Config  : CF_CORE_22
TD ref  : TD_COR_1059_01
```

```
ensure that {
   when { QE1 is requested to 'send a packet to QE2'
                  containing 'Routing header Type = 0'
             and containing 'Segments Left value other than zero'
             and containing 'Segments Left value not greater than the number of addresses in
                             the Routing header'
             and containing 'an even "Hdr Ext Len" value'
          and not containing 'multicast address as next address to be visited or IPv6 Destination'
             and containing 'IPv6 hop limit > 1'
             and containing 'EUT as next routing hop' }
   then { EUT sends 'the packet to QE2' }
            }

End Group 1.2.4.4
End Group 1.2.4

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 1.2.6 'Process Flow Label'

TP id   : TP_COR_1130_01
Summary : 'EUT detects two packets with different hop-by-hop option contents but the same source
           and destination addresses and the same flow label'
RQ ref  : RQ_000_1130
Config  : CF_CORE_22
TD ref  : TD_COR_1130_01

with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link connecting QE1 and
            EUT and, the link connecting QE2 and EUT, respectively' }

ensure that {
   when { EUT receives 'two packets'
            containing 'QE1 as source address and QE2 as destination address'
        and containing 'a same flow label'
        and containing 'different hop-by-hop options' }
   then { EUT sends 'an ICMP parameter problem message' to QE1
   and EUT discards 'the packets' }
            }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1130_02
Summary : 'EUT detects two packets with different routing header contents but the same source
           and destination addresses and the same flow label'
RQ ref  : RQ_000_1130
Config  : CF_CORE_22
TD ref  : TD_COR_1130_02

with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link connecting QE1 and
            EUT and, the link connecting QE2 and EUT, respectively' }

ensure that {
   when { EUT receives 'two packets'
            containing 'QE1 as source address and QE2 as destination address'
        and containing 'a same flow label'
        and containing 'different hop-by-hop options' }
   then { EUT sends 'an ICMP parameter problem message' to QE1
   and EUT discards 'the packets'}
            }

End Group 1.2.6
End Group 1.2

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 1.4 'Extension Headers'
Group 1.4.2 'Process Extension Headers'

TP id   : TP_COR_1004_01
Summary : 'EUT does NOT process (modify) a Routing Header contained in
           a packet NOT destined for the EUT'
RQ ref  : RQ_000_1004
Config  : CF_CORE_31
TD ref  : TD_COR_1004_01
```

```
with { QE1 'configured with a unique non link-local unicast address'
   and QE2 'configured as a router with a unique non link-local unicast address'
   and QE3 'configured with a unique non link-local unicast address'
   and EUT 'configured with one unique non link-local unicast address on each link'
   and EUT 'established as the default Router for QE1' }

ensure that {
   when { EUT receives 'a packet' from QE1
            containing 'an indication that QE2 is the destination'
        and containing 'a Routing Header'
            indicating 'QE2 as the first node to process the Routing Header
                        and QE3 as the final destination of the packet' }
   then { EUT 'forwards the packet, with the Routing Header UNMODIFIED' to QE2}
            }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id   : TP_COR_1004_02
Summary : 'EUT does NOT process(remove) a Fragmentation Header contained
           in a packet NOT destined for the EUT'
RQ ref  : RQ_000_1004
Config  : CF_CORE_22
TD ref  : TD_COR_1004_02

with { QE1 'configured with a non link-local unicast address'
   and EUT 'configured with a unique non link-local unicast address on each link' }

ensure that {
   when { EUT receives 'a packet' from QE1
            containing 'an indication that QE2 is the destination'
        and containing 'a Fragmentation Header' }
   then { EUT 'forwards the packet with its Fragmentation Header' to QE2 }
            }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id   : TP_COR_1004_03
Summary : 'EUT does NOT process(modify or remove) a Destination Options Header
           in a packet NOT destined for the EUT'
RQ ref  : RQ_000_1004
Config  : CF_CORE_31
TD ref  : TD_COR_1004_03

with { QE1 'configured with a unique non link-local unicast address'
   and QE2 'configured as a router with a unique non link-local unicast address'
   and QE3 'configured with a unique global unicast address'
   and EUT 'configured with a unique non link-local unicast address on each link' }

ensure that {
   when { EUT receives 'a packet' from QE1
            containing 'an indication that QE2 is the destination'
        and containing 'a Destination Options Header' }
   then { EUT 'forwards the packet, with the Destination Options Header UNMODIFIED'
            to QE2 }
            }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id   : TP_COR_1005_01
Summary : 'EUT processes a Destination Options Header contained in a packet
           destined for the EUT'
RQ ref  : RQ_000_1005
Config  : CF_CORE_11
TD ref  : TD_COR_1005_01

with { QE  'configured with a unique link-local address'
   and EUT 'configured with a unique link-local address' }

ensure that {
   when { EUT receives 'fragment packets of a Request that requires a Reply' from QE
            containing 'a Fragmentation Option in the Destination Options Header' }
      -- A Destination Options Header can carry a Fragmentation option that
      -- achieves the same results as a Fragmentation Header.--
         -- The usage choice depends on the processing resources consumed--
   then { EUT sends 'the expected Reply' to QE }
            }
```

End Group 1.4.2

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 1.4.4 'Routing Header'
Group 1.4.4.2 'Process Routing Header'

TP id   : TP_COR_1042_01
Summary : 'Discard packet and generate ICMP error message if packet size larger than MTU'
RQ ref : RQ_000_1042
Config : CF_CORE_22
TD ref : TD_COR_1042_01

with { 'Link2 configured with a smaller MTU than Link1' }

ensure that {
   when { QE1 **is requested to** 'send a packet larger than Link2 MTU to QE2'
                containing 'EUT as next routing hop' }
   then { EUT **discards** 'the packet'
      and EUT **sends** 'ICMP "Packet too big" error message 'to QE1 }
            }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1049_01
Summary : 'Routing Header NOT processed until IPv6 header Dest. Addr. reached'
RQ ref : RQ_000_1004
Config : CF_CORE_31
TD ref : TD_COR_1049_01

with { EUT 'not included in the Routing Header vector (hop) list' }

ensure that {
   when { QE1 **is requested to** 'send a packet to QE3'
               containing 'QE2 as next routing hop'
      and EUT 'is on the path to QE2' }
   then { EUT **ignores** 'the routing header'
      and EUT 'routes the packet to QE2' }
            }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1050_01
Summary : 'Routing Header IS processed when IPv6 header Dest. Addr. reached'
RQ ref : RQ_000_1050
Config : CF_CORE_31
TD ref : TD_COR_1050_01

with { EUT 'included in the Routing Header vector (hop) list' }

ensure that {
   when { QE1 **is requested to** 'send a packet to QE3'
                containing 'EUT as next routing hop'
      and QE2 'as subsequent routing hop' }
   then { EUT 'processes the routing header'
      and EUT 'routes the packet' **to** QE2 }
            }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1055_01
Summary : 'Discard multicast packets'
RQ ref : RQ_000_1055
Config : CF_CORE_31
TD ref : TD_COR_1055_01
ensure that {

   when { QE1 **is requested to** 'send a packet to QE3'
                containing 'Routing header Type 0'
              and containing 'a Segments Left Field value other than zero'
              and containing 'an even "Hdr Ext Len" value'
              and containing 'Segments Left Field not greater than the number of addresses
                              in the Routing header'
              and containing 'EUT as next routing hop'
              and containing 'QE2 multicast address as subsequent routing hop' }
   then { EUT **discards** 'the packet' }
            }

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1056_01
Summary : 'Discard multicast packets'
RQ ref  : RQ_000_1056
Config  : CF_CORE_22
TD ref  : TD_COR_1056_01

ensure that {
    when { QE1 is requested to 'send a packet to the multicast address of QE2'
                    containing 'Routing header Type 0'
                and containing 'a Segments Left Field value other than zero'
                and containing 'an even "Hdr Ext Len" value'
                and containing 'Segments Left Field not greater than the number of addresses
                                in the Routing header'
                and containing 'EUT as next hop in the routing header' }
    then { EUT discards 'the packet' }
            }

End Group 1.4.4.2
End Group 1.4.4

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 1.4.5 'Fragment Header'
Group 1.4.5.1 'Generate Fragmented Packets'


TP id   : TP_COR_1064_01
Summary : 'EUT fragments a packet larger than the available PMTU before sending it'
RQ ref  : RQ_000_1064
Config  : CF_CORE_23
TD ref  : TD_COR_1064_01

with { 'the MTU on Link1 set greater than the MTU on Link2' }

ensure that {
  when { EUT is requested to 'send a packet of greater length than
                              the MTU of Link2' to QE2 }
  then { QE2 indicates 'receipt of the same data without any
                        modification' }
            }

End Group 1.4.5.1

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 1.4.5.2 'Process Fragmented Packets'

TP id   : TP_COR_1100_01
Summary : 'EUT reassembles a fragmented packet of an original length less than 1 500 octets'
RQ ref  : RQ_000_1100
Config  : CF_CORE_11
TD ref  : TD_COR_1100_01

with { 'the MTU on Link1 set to 1 400 octets' }

ensure that {
  when { QE is requested to 'send data requiring a packet
                            length lesser than 1 500 octets' }
  then { EUT indicates 'receipt of the same data without
                        modification' }
          }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1100_02
Summary : 'EUT reassembles a fragmented packet of an original length equal to 1 500 octets'
RQ ref  : RQ_000_1100
Config  : CF_CORE_11
TD ref  : TD_COR_1100_02

with { 'the MTU on Link1 set to 1 400 octets' }

ensure that {
  when { QE is requested to 'send data requiring a packet
                            length equal to 1 500 octets' }
  then { EUT indicates 'receipt of the same data without
                        modification' }
```

```
        }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id    : TP_COR_1101_01
Summary  : 'EUT reassembles a fragmented packet of an original length greater than 1 500 octets'
RQ ref   : RQ_000_1101
Config   : CF_CORE_11
TD ref   : TD_COR_1101_01

with { 'the MTU on Link1 set to 1 400 octets' }

ensure that {
  when { QE is requested to 'send data requiring a packet
                           length greater than 1 500 octets' }
  then { EUT indicates 'receipt of the same data without
                        modification' }
    }

End Group 1.4.5.2
End Group 1.4.5
End Group 1.4
End Group 1


--*****************************************--
--* RFC 2461 Neighbor Discovery for IPv6 *--
--*****************************************--

Group 2 'RFC 2461'
Group 2.1 'Generate Neighbor Discovery Messages'
Group 2.1.5 'Generate Router Advertisement'

TP id    : TP_COR_8295_01
Summary  : 'EUT (as a router) does not send Router Advertisements out any interface that is not
            an advertising interface'
RQ ref   : RQ_000_8295
Config   : CF_CORE_11
TD ref   : TD_COR_8295_01

with {  QE 'configured with a unicast address'
   and EUT 'configured with a multicast address'
   and EUT 'not configured to have any unicast address' }

ensure that {
   when { EUT 'is initializing' }
   then { EUT 'does not send Router Advertisement to QE' }
          }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 2.1.5.1 'Router Advertisement Behaviour'
Group 2.1.5.1.1 'Router Advertisement Behaviour on Reconfiguration'

TP id    : TP_COR_8256_01
Summary  : 'By default a router does not advertise its presence unless it has been explicitly
            configured to do so'
RQ ref   : RQ_000_8256
Config   : CF_CORE_11
TD ref   : TD_COR_8256_01

with {  QE 'configured with a unique global unicast address'
   and EUT 'configured as a router with a unique global unicast address'
   and EUT 'not configured to send router advertisements' }

ensure that {
   when { EUT 'is initializing' }
   then { EUT 'does not send Router Advertisement to QE'
     and EUT discards 'Router Solicitation sent by QE' }
          }

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TP id    : TP_COR_8297_01
Summary  : 'A disabled EUT advertising interface returns to being an advertising
           interface when re-enabled'
RQ ref   : RQ_000_8297
Config   : CF_CORE_11
```

```
TD ref  : TD_COR_8297_01

with { EUT 'advertising interface disabled' }
        -- such that its network interfaces ceases to be an advertising interface --

ensure that {
    when { EUT 'network interface is administratively re-enabled' }
    then { EUT 'network interface returns to being an advertising interface' }
          }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id   : TP_COR_8313_01
Summary : 'EUT transmits FINAL Router advertisement messages and departs from the
           all-routers IP multicast group on all interfaces on which the EUT supports
           IP multicast'
RQ ref  : RQ_000_8313
Config  : CF_CORE_22
TD ref  : TD_COR_8313_01

with { EUT 'configured to support IP multicast on its two interfaces'
    and EUT 'configured to act as the default router for QE1' }

ensure that {
    when { EUT 'network interface to QE1 is DISABLED from sending RA messages'
            -- but the interface is still up and operational --
       and EUT 'IP forwarding capability is DISABLED' }
    then { EUT sends 'a number of Router Advertisement messages onto the link to
                    which QE1 is attached'
           and EUT 'then leaves the all-routers IP multicast group on both interfaces' }
          }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id   : TP_COR_8314_01
Summary : 'When EUT becomes a Host, subsequent Neighbor Advertisements transmitted
           from a previously advertising interface indicate that EUT is no longer a Router'
RQ ref  : RQ_000_8314
Config  : CF_CORE_22
TD ref  : TD_COR_8314_01

with { EUT 'Router Advertisements disabled on two previously advertising interfaces'
    and EUT 'has IP forwarding disabled'
    and EUT 'removed from all-routers IP multicast group on both interfaces'
    and EUT 'configured as a Host' }

ensure that {
    when { EUT is requested to 'send a Neighbor Advertisement message(s) from any of
                             the previously advertising interfaces' }
    then { EUT sends 'Neighbor Advertisement message(s)'
          containing 'indication(s) that it is no longer a Router' }
          }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id   : TP_COR_8315_01
Summary : 'When the IP forwarding capability of EUT (as a router) is disabled,
           subsequent Router Advertisements set the Router Lifetime field to zero'
RQ ref  : RQ_000_8315
Config  : CF_CORE_22
TD ref  : TD_COR_8315_01

with { QE1 'configured with a non link-local unicast address'
    and EUT 'configured with a unique non link-local unicast address on each link'
    and EUT 'configured with two advertising interfaces'
    and QE2 'configured with a non link-local unicast address' }

ensure that {
    when { EUT is requested to 'disable its IP forwarding capability but interfaces continue
                             advertising' }
    then { QE1 indicates 'receipt of Router Advertisements from EUT'
            containing 'Router Lifetime field as zero'
           and QE1 indicates 'receipt of Router Advertisements from EUT'
           containing 'Router Lifetime field as zero' }
          }
```

End Group 2.1.5.1.1

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxx--
```

Group 2.1.5.1.2 'Startup Router Advertisement Behaviour'

```
TP id    : TP_COR_8255_01
Summary  : 'EUT is able to prohibit a multicast-capable interface from both
            sending periodic Router Advertisements and responding to Router Solicitations'
RQ ref   : RQ_000_8255
Config   : CF_CORE_11
TD ref   : TD_COR_8255_01
```

with { EUT 'configured with its network interface multicast-capable'
   and EUT 'configured to prohibit the interface from both sending Router Advertisements
       and responding to Router Solicitations'
   and QE 'configured to send Router Solicitation messages during the (re-)initialisation
       of the network interface' }

ensure that {
   when { EUT **receives** 'a Router Solicitation message' **from** QE }
   then { EUT 'does not send any Router Advertisement messages onto the link' }
      }

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxx--
```

```
TP id    : TP_COR_8255_02
Summary  : 'EUT re-enables a multicast-capable interface to send periodic
            Router Advertisements after previously being prohibited from doing so'
RQ ref   : RQ_000_8255
Config   : CF_CORE_11
TD ref   : TD_COR_8255_02
```

with { EUT 'configured with its network interface multicast-capable'
   and EUT 'configured to prohibit the interface from both sending Router Advertisements
       and responding to Router Solicitations'
   and QE 'configured to send Router Solicitation messages during the (re-)initialisation
       of the network interface' }

ensure that {
   when { EUT **is requested to** 'enable the sending of periodic RAs' }
   then { EUT **sends** 'periodic Router Advertisement messages to the all-nodes
         multicast address' }
     }

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxx--
```

```
TP id    : TP_COR_8255_03
Summary  : 'EUT re-enables a multicast-capable interface to respond to
            Router Solicitations after previously being prohibited from doing so'
RQ ref   : RQ_000_8255
Config   : CF_CORE_11
TD ref   : TD_COR_8255_03
```

with { EUT 'configured with its network interface multicast-capable'
   and EUT 'configured to prohibit the interface from both sending Router Advertisements
       and responding to Router Solicitations'
   and QE 'configured to send Router Solicitation messages during the (re-)initialisation
       of the network interface' }

ensure that {
   when { EUT **is requested to** 'respond to RSs'
       and EUT **receives** 'a Router Solicitation message' **from** QE
          containing 'the link-local address of QE as the source address' }
   then { EUT **sends** 'a Router Advertisement message' **to** QE }
     }

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxx--
```

```
TP id    : TP_COR_8257_01
Summary  : 'an Advertizing router generates periodic Router Advertisement'
RQ ref   : RQ_000_8257
Config   : CF_CORE_11
TD ref   : TD_COR_8257_01
```

with { EUT 'configured as an advertizing router' } -- AdvSendAdvertisements flag set to 'TRUE'

ensure that {
   when { EUT 'is initialized' }
   then { EUT **sends** 'periodic Router Advertisements'

```
      and EUT sends 'responses to Router Solicitations' }
            }

End Group 2.1.5.1.2
End Group 2.1.5.1


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Group 2.1.5.2 'Form Router Advertisement Options'

TP id   : TP_COR_8305_01
Summary : 'During system initialization, the first few initial unsolicited advertisements
           sent by EUT (as a router) includes all prefix options'
RQ ref  : RQ_000_8305
Config  : CF_CORE_11
TD ref  : TD_COR_8305_01

with {  EUT 'configured as a router with a unicast address on link 1'
   and EUT 'configured with several network prefixes on link 1'
   and EUT 'configured with an advertising interface on link 1' }

ensure that {
   when { EUT 'is initializing'}
   then { EUT sends 'Router Advertisements'
            containing 'EUT as source address'
         and containing 'all prefixes of EUT on link 1' }
            }

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Group 2.1.5.2.1 'RA Source Link-Layer Address Option'

TP id   : TP_COR_8141_01
Summary : 'EUT enables inbound load sharing across multiple link-layer addresses'
RQ ref  : RQ_000_8141
Config  : CF_CORE_11
TD ref  : TD_COR_8141_01

with { EUT 'configured as a router'
   and EUT 'configured to support inbound load sharing'
   and QE  'configured as a host' }

ensure that {
   when { EUT is requested to 'enable Inbound Load balancing'
      and EUT is requested to 'establish its network interface as an advertising interface' }
   then { EUT sends 'periodic Router Advertisement messages'
         containing 'NO Source link-layer address Option' }
            }

End Group 2.1.5.2.1

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Group 2.1.5.2.2 'Router Advertisement MTU OPtion'

TP id   : TP_COR_8142_01
Summary : 'Router includes MTU option in Router Advertisements'
RQ ref  : RQ_000_8142
Config  : CF_CORE_11
TD ref  : TD_COR_8142_01

with { QE 'connected to the same variable MTU link as EUT'
  and EUT 'configured as an advertizing router'
  and EUT 'configured with a valid prefix'
  and EUT 'configured with a specific MTU value' } -- greater than the IPv6 minimum MTU size

ensure that {
   when { EUT receives 'a Router Solicitation' from QE}
   then { EUT sends 'Router Advertisement'
         containing 'the MTU value' }
            }

End Group 2.1.5.2.2
End Group 2.1.5.2

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TP id   : TP_COR_8317_01
```

Summary : 'EUT unicasts a Router Advertisement message to a soliciting node'
RQ ref : RQ_000_8317
Config : CF_CORE_11
TD ref : TD_COR_8317_01

with { EUT 'configured to advertise as a default router'
   and QE 'configured as a host' }

ensure that {
   when { EUT **receives** 'a Router Solicitation message' **from** QE
            containing 'a Source Address that is not the Unspecified Address' }
   then { EUT **sends** 'a Router Advertisement message' **to** QE }
            }

End Group 2.1.5

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Group 2.1.6 'Generate Router Solicitation'

TP id : TP_COR_8375_01
Summary : 'Routers becoming Hosts send RS messages immediately'
RQ ref : RQ_000_8375
Config : CF_CORE_11
TD ref : TD_COR_8375_01

with { EUT 'operating as a router' }

ensure that {
   when { EUT 'has its forwarding capability turned off by system management'}
   then { EUT **sends** 'a Router Solicitation message immediately' }
            }

End Group 2.1.6

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Group 2.1.7 'Generate Neighbor Advertisement'
Group 2.1.7.1 'Generate Unsolicited Neighbor Advertisements'

TP id : TP_COR_8471_01
Summary : 'EUT announces change of link-layer address associated with a single IP address'
RQ ref : RQ_000_8471
Config : CF_CORE_21
TD ref : TD_COR_8471_01

with { EUT 'configured with a single IP address assigned to its interface to QE1 and QE2' }

ensure that {
   when { EUT **is requested to** 'change link-layer address on interface to QE1 and QE2' }
   then { EUT 'is able to address QE1'
      and EUT 'is able to address QE2'
      and QE1 'is able to address EUT'
      and QE2 'is able to address EUT' }
            }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id : TP_COR_8476_01
Summary : 'EUT announces change of link-layer address associated with multiple IP addresses'
RQ ref : RQ_000_8476
Config : CF_CORE_21
TD ref : TD_COR_8476_01

with { EUT 'configured with two IP addresses assigned to its interface to QE1 and QE2' }

ensure that {
   when { EUT **is requested to** 'change link-layer address on interface to QE1 and QE2' }
   then { EUT 'is able to address QE1'
      and EUT 'is able to address QE2'
      and QE1 'is able to address EUT on both available IP addresses'
      and QE2 'is able to address EUT on both available IP addresses' }
            }

End Group 2.1.7.1
End Group 2.1.7

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Group 2.1.8 'Generate Redirect Message'
Group 2.1.8.1 'Determine Redirect Target Address Field'

TP id   : TP_COR_8183_01
Summary : 'Router sends a Redirect message indicating that the destination of a packet
            is a neighbor'
RQ ref : RQ_000_8183
Config : CF_CORE_21
TD ref : TD_COR_8183_01

with { EUT 'configured as a non advertizing router'
 and EUT 'configured with global addresses on PREFIX1 and PREFIX2'
 and QE2 'configured as a host'
 and QE2 'configured manually with a global address on PREFIX2'
 and QE1 'configured as a host'
 and QE1 'configured manually with a global address on PREFIX1'
 and QE1 'configured manually with EUT as default route'
 and 'EUT and QE2 have finished to perform DAD before QE1 is started' }

ensure that {
   when { EUT **receives** 'a packet' **from** QE1 **containing** 'QE2 as destination'}
   then { EUT **sends** 'a Redirect message' **to** QE1
        containing 'Target Address field equal to the address of QE2' }
             }

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TP id   : TP_COR_8546_01
Summary : 'EUT sends a Redirect message to indicate a better first-hop node'
RQ ref : RQ_000_8546
Config : CF_CORE_32
TD ref : TD_COR_8546_01

with { EUT 'configured as the default router for QE1'
   and EUT 'established as the only default Router available for QE1'
   and QE2 'established as the better first-hop node for traffic from EUT to QE3'
   and QE1 'configured as a host'
   and EUT 'established as the only default Router for QE1' }

ensure that {
   when { EUT **receives** 'a Packet' **from** QE1
           containing 'an indication that QE3 is the destination' }
   then { EUT **sends** 'a Redirect message' **to** QE1
        containing 'an indication that QE2 is the better first-hop' }
             }

End Group 2.1.8.1
End Group 2.1.8
End Group 2.1

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Group 2.2 'Process Neighbor Discovery Messages'
Group 2.2.5 'Process Router Advertisement'

TP id   : TP_COR_8348_01
Summary : 'EUT sets corresponding invalidation timer as the non-zero Router Lifetime value
            indicated in a received Router Advertisement from a router'
RQ ref : RQ_000_8348
Config : CF_CORE_23
TD ref : TD_COR_8348_01

with { EUT 'configured as a host with a unique link-local address'
   and QE2 'configured as a host with a unique link-local address'}

ensure that {
   when { EUT **receives** 'Router Advertisement' **from** QE1
           containing 'a non-zero value in the Router Lifetime field'
        }
   then { EUT 'is able to communicate with QE2' **before** 'the advertized Router Lifetime expires'
      and EUT 'is unable to communicate with QE2' **after** 'the advertized Router Lifetime has expired'
}
             }

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Group 2.2.5.3 'Host Processing of Router Advertisement'

```
TP id   : TP_COR_8231_01
Summary : 'EUT uses at least two of the connected routers as its default routers'
RQ ref  : RQ_000_8231
Config  : CF_CORE_33
TD ref  : TD_COR_8231_01

with { QE1 'configured with one unique unicast address on each link'
and QE2 'configured with one unique unicast address on each link'
and EUT 'able to communicate with QE3'
}

ensure that {
when { QE1 'becomes unavailable as a router'
or QE2 'becomes unavailable as a router'
and EUT is requested to 'send a packet to QE3' }
then { QE3 indicates 'the receipt of the packet' }
            }
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TP id   : TP_COR_8343_01
Summary : 'EUT uses only latest advertised parameters and options from Router'
RQ ref  : RQ_000_8343
Config  : CF_CORE_33
TD ref  : TD_COR_8343_01

with { QE1 'configured to advertise a MTU value of 1450 on Link1'
   and QE2 'configured to advertise a MTU value of 1400 on Link1'
   and EUT 'configured as a host' }

ensure that {
   when { EUT receives 'Router Advertisement'
           containing 'different MTU parameter values' }
   then { EUT 'uses the value of the most recently received Router Advertisement' }
             }

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TP id   : TP_COR_8346_01
Summary : 'Hosts accept at least 2 default routers'
RQ ref  : RQ_000_8346
Config  : CF_CORE_21
TD ref  : TD_COR_8346_01

with { QE1 'configured as an advertising router with a valid prefix1'
   and QE2 'configured as an advertising router with a valid prefix2' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
      and EUT receives 'Router Advertisement' from QE2 }
   then { EUT 'adds QE1 and QE2 to its default router list' }
             }

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TP id   : TP_COR_8347_01
Summary : 'EUT adds newly advertised router to its default list'
RQ ref  : RQ_000_8347
Config  : CF_CORE_41
TD ref  : TD_COR_8347_01

with { QE1 'established as a default router for EUT'
   and QE2 'established as a default router for EUT'
   and QE3 'not established as a default router for EUT'
   and QE4 'configured with a global unicast address' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE3 }
         -- QE3 is now taken as a default router for EUT
   then { EUT 'is able to address QE4' }
             }

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TP id   : TP_COR_8347_02
Summary : 'EUT removes router from its default list after Router Lifetime expires'
RQ ref  : RQ_000_8347
Config  : CF_CORE_41
```

```
TD ref  : TD_COR_8347_02

with { QE1 'established as a default router for EUT'
   and QE2 'established as a default router for EUT'
   and QE3 'not established as a default router for EUT'
   and QE4 'configured with a global unicast address' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE3
         -- QE3 is now taken as a default router for EUT
      and containing 'Router Lifetime parameter'
          indicating 'a specific short lifetime of QE3' } --suggest 2 minutes
   then { EUT 'is able to address QE4' within 'the specified router lifetime'
     and EUT 'is unable to address QE4' after 'the specified router lifetime' }
           }
```

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```
TP id   : TP_COR_8349_01
Summary : 'EUT removes router from default list when zero value Router Lifetime received'
RQ ref  : RQ_000_8349
Config  : CF_CORE_23
TD ref  : TD_COR_8349_01

with { QE1 'established as the only default router for EUT'
   and EUT 'is able to communicate with QE2' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
          containing 'Router Lifetime parameter'
          indicating 'zero lifetime of QE1' }
   then { EUT 'is unable to address QE2' }
          }
```

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```
TP id   : TP_COR_8360_01
Summary : 'EUT treats a known router-advertised prefix as on-link for the specified lifetime'
RQ ref  : RQ_000_8360
Config  : CF_CORE_23
TD ref  : TD_COR_8360_01

with { QE1 'configured with a specific prefix (Prefix-1) on the link to QE2'
   and QE1 'established as the default router for EUT'
   and QE1 'has advertised Prefix-1 as on-link to EUT with a long lifetime' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
          containing 'Prefix options'
          indicating 'Prefix-1 is on-link'
      and containing 'prefix options'
          indicating 'Prefix-1 has a Lifetime less than the existing value' } --suggest 2 minutes
   then { EUT 'is unable to address QE2' within 'the specified prefix lifetime'
     and EUT 'is able to address QE2' after 'the specified prefix lifetime' }
          }

End Group 2.2.5.3
```

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Group 2.2.5.4 'Discover Neighbor by Router Advertisement'

```
TP id   : TP_COR_8359_01
Summary : 'EUT treats a new router-advertised prefix as on-link for the specified lifetime'
RQ ref  : RQ_000_8359
Config  : CF_CORE_23
TD ref  : TD_COR_8359_01

with { QE1 'configured with a specific prefix (Prefix-1) on the link to EUT'
   and EUT 'configured with Prefix-1 as off-link'
   and QE2 'manually configured with two global unicast addresses corresponding to Prefix-1' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
          containing 'Prefix options'
          indicating 'Prefix-1 is on-link'
      and containing 'prefix options'
          indicating 'Prefix-1 has a Lifetime of a specific short period' } --suggest 2 minutes
```

```
    then { EUT 'is unable to address QE2' within 'the specified prefix lifetime'
       and EUT 'is able to address QE2' after 'the specified prefix lifetime' }
               }
```

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```
TP id   : TP_COR_8361_01
Summary : 'EUT times-out an exiting router-advertised prefix with a zero lifetime'
RQ ref  : RQ_000_8361
Config  : CF_CORE_23
TD ref  : TD_COR_8361_01

with { QE1 'configured with a specific prefix (Prefix-1) on the link to QE2'
   and EUT 'configured with Prefix-1 as on-link' }

ensure that {
   when { EUT receives 'Router Advertisement' from QE1
            containing 'Prefix options'
            indicating 'Prefix-1 is on-link'
        and containing 'prefix options'
            indicating 'Prefix-1 has a Lifetime of zero' }
   then { EUT 'is able to address QE2' }
               }
```

End Group 2.2.5.4
End Group 2.2.5

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Group 2.2.6 'Process Router Solicitation'

```
TP id   : TP_COR_8299_01
Summary : 'EUT does not send router advertisements out the functioning and enabled
           multicast interface'
RQ ref  : RQ_000_8299
Config  : CF_CORE_11
TD ref  : TD_COR_8299_01

with { EUT 'configured as an advertizing router with a unicast address on link 1'
and QE 'configured with a unicast address on link 1'
}

ensure that {
   when { QE is requested to 'send a Router Solicitation to all-routers multicast address'}
   then { QE indicates 'receipt of a Router Advertisement'
            containing 'EUT as source address' }
          }
```

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```
TP id   : TP_COR_8328_01
Summary : 'Router Solicitation do update Neighbor Cache entries'
RQ ref  : RQ_000_8328
Config  : CF_CORE_23
TD ref  : TD_COR_8328_01

with { QE1 'configured as an advertizing router on link1 and link2'
  and QE1 'configured with a global address on each link'
  and QE2 'a stateless autoconfiguration capable host on link2'
  and EUT 'configured as a non advertizing router on link1'
  and EUT 'configured with a global address on link1'
      and 'all nodes can communicate with each other' }

ensure that {
   when { EUT receives 'a valid Router Solicitation' from QE1
            containing 'a Source Link Layer option'
            indicating 'a Link-Layer address different to the cached Link-Layer
                        address for QE1'}
   then { EUT 'makes no attempt to verify the reachability of QE1 until traffic is
              sent to QE1'
      and EUT 'uses the new Link-Layer address for subsequent communication' }
               }
```

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```
TP id   : TP_COR_8328_02
Summary : 'Router Solicitation are sent by hosts only'
RQ ref  : RQ_000_8328
```

```
Config  : CF_CORE_23
TD ref  : TD_COR_8328_02

with { QE1 'configured as an advertizing router on link1 and link2'
  and QE1 'configured with a global address on each link'
  and QE2 'a stateless autoconfiguration capable host on link2'
  and EUT 'configured as a non advertizing router on link1'
  and EUT 'configured with a global address on link1'
      and 'all nodes can communicate with each other' }

ensure that {
   when { EUT receives 'a valid Router Solicitation' from QE1
            containing 'a Source Link Layer option'
            indicating 'a Link-Layer address different to the cached Link-Layer
                        address for QE1'}
   then { EUT 'no longer considers QE1 as a router' }
     }
```

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```
TP id   : TP_COR_8330_01
Summary : 'A node sending a Router Solicitation can be only considered as a host'
RQ ref  : RQ_000_8330
Config  : CF_CORE_23
TD ref  : TD_COR_8330_01

with { QE2 'configured with a unique global unicast address'
   and QE1 'configured with one unique global unicast address on each link'
   and QE1 'able to communicate with QE2' }

ensure that {
   when { EUT receives 'a valid Router Solicitation' from QE1
            containing 'a unicast address as source address'
    and not containing 'a source link-layer address option' }
   then { EUT 'no longer considers QE1 as a router' }
             }
```

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Group 2.2.6.5 'Discover Neighbor by RS'

```
TP id   : TP_COR_8329_01
Summary : 'EUT treats a (RS)soliciting NEW neighbor as a host and, makes no attempt to
           verify the reachability of this neighbor until traffic is sent to the neighbor'
RQ ref  : RQ_000_8329
Config  : CF_CORE_11
TD ref  : TD_COR_8329_01

with { EUT 'configured to advertise as a default router'
   and EUT 'having NO entry for the link-layer address of QE in the Neighbor Cache'
   and  QE 'configured as a host' }

ensure that {
   when {EUT receives 'a Router Solicitation message' from QE }
   then { EUT 'does not perform Neighbor Unreachability Detection test on QE, until
             traffic is sent to QE' }
             }
```

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```
TP id   : TP_COR_8329_02
Summary : 'EUT uses the link-layer address conveyed by a (RS)soliciting NEW neighbor
           for subsequent IP communication'
RQ ref  : RQ_000_8329
Config  : CF_CORE_11
TD ref  : TD_COR_8329_02

with { EUT 'configured to advertise as a default router'
   and EUT 'having NO entry for the link-layer address of QE in the Neighbor Cache'
   and  QE 'configured as a host' }

ensure that {
   when { EUT receives 'a Router Solicitation message' from QE
            containing 'a Source Link-layer Address Option'
            indicating 'the Link-layer address of QE'
      and EUT is requested to 'send a packet to QE' }
   then { EUT 'uses the link-layer address of QE to send the packet' }
             }
```

End Group 2.2.6.5
End Group 2.2.6

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Group 2.2.7 'Process Neighbor Advertisement'

TP id   : TP_COR_8469_01
Summary : 'A host receiving a Neighbor Adv. from a machine it considers as a router,
            with the IsRouter flag set to FALSE, will remove that router from its
            Default Router list'
RQ ref : RQ_000_8469
Config : CF_CORE_23
TD ref : TD_COR_8469_01

with { EUT 'configured as a Host'
  and QE1 'configured as a Router'
  and QE2 'configured as a Host'
  and EUT 'can reach QE2' }

ensure that {
   when { QE1 'is physically disconnected from both links'
      and QE1 'is re-configured as a host'
--   this is done off-line, + IPv6 @ is configured manually (no autoconfig)
      and QE1 'is re-connected to both links'
      and EUT **receives** 'a Neighbor Advertisement' **from** QE1}
   then { EUT 'removes QE1 from its Default Router list' }
              }

End Group 2.2.7

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Group 2.2.8 'Process Neighbor Solicitation'
Group 2.2.8.2 'Generate Solicited Neighbor Advertisement'

TP id   : TP_COR_8162_01
Summary : 'In response to a valid Neighbor Solicitation with a specified source address,
            EUT transmits a Neighbor Advertisement to that address'
RQ ref : RQ_000_8162
Config : CF_CORE_11
TD ref : TD_COR_8162_01

with { QE 'configured with a unique unicast address'
   and EUT 'configured with a unique unicast address' }

ensure that {
   when { EUT **receives** 'a valid Neighbor Solicitation'
            containing 'QE as source address' }
   then { EUT **sends** 'a Neighbor Advertisement' **to** QE}
              }

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TP id   : TP_COR_8163_01
Summary : 'In response to a valid Neighbor Solicitation with an unspecified source address,
            EUT transmits a Neighbor Advertisement to all-node multicast address'
RQ ref : RQ_000_8163
Config : CF_CORE_11
TD ref : TD_COR_8163_01

with { QE 'configured with the same unicast address as EUT'
   }
ensure that {
when { EUT **receives** 'a DAD Neighbor Solicitation' **From** QE

            containing 'the unspecified address as source address' }
   then { EUT **sends** 'a Neighbor Advertisement to the all-node multicast address' }
              }

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TP id   : TP_COR_8179_01
Summary : 'EUT responds to received Neighbor Solicitation with a multicast
            destination address'
RQ ref : RQ_000_8179
Config : CF_CORE_11

```
TD ref  : TD_COR_8179_01

with {  QE 'configured with a unique global unicast address'
    and EUT 'configured with a unique global unicast address' }
ensure that {
    when { EUT receives 'a valid Neighbor Solicitation'
            containing 'a multicast address as destination address' }
    then { EUT sends 'a Neighbor Advertisement'
          containing 'a target link-layer address option' }
             }
```

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```
TP id   : TP_COR_8180_01
Summary : 'EUT processes valid unicast Neighbor Solicitations '
RQ ref  : RQ_000_8180
Config  : CF_CORE_11
TD ref  : TD_COR_8180_01

with { QE 'configured with a unique global unicast address'
    and EUT 'configured with a unique global unicast address' }

ensure that {
    when { EUT receives 'a Neighbor Solicitation' from QE
            containing 'EUT as the destination' }
    then { QE indicates 'receipt of a Neighbor Advertisement'
           containing 'EUT as source address'
            and containing 'a target link-layer address option' }
              }
```

End Group 2.2.8.2

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Group 2.2.8.5 'Process Proxy NS'

```
TP id   : TP_COR_8174_01
Summary : 'EUT acts as an address Proxy'
RQ ref  : RQ_000_8174
Config  : CF_CORE_22
TD ref  : TD_COR_8174_01

with { EUT 'configured as an address Proxy for the unicast address of QE2'
    and EUT 'configured with two unique unicast addresses on each link'
    and QE1 'configured with a unique unicast address'
    and QE2 'configured with a unique unicast address'
    and EUT 'subscribes to the same unicast address subnet as QE1 and QE2' }

ensure that {
    when { -- for the first time, QE1 is attempting to send packets to the unicast --
          -- address of QE2 --
          EUT receives 'a Neighbor Solicitation message' from QE1 }
    then { EUT sends 'a Neighbor Advertisement message' to QE1
               containing 'the link-layer address of QE2'
             and containing 'an indication that the entry in the Neighbor Cache
                          should NOT be overridden' }
             }
```

End Group 2.2.8.5
End Group 2.2.8

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Group 2.2.9 'Process Redirect Message'
Group 2.2.9.1 'Host Processing of Redirect Message'

```
TP id   : TP_COR_8555_01
Summary : 'EUT updates the Neighbor Cache entry of a KNOWN neighbor, whose link-layer
           address conveyed by a Redirect message has not changed and, for packets whose
           next hop was changed by the Redirect message, EUT sends the packets to the
           specified target'
RQ ref  : RQ_000_8555
Config  : CF_CORE_32
TD ref  : TD_COR_8555_01

with { QE1 'established as the only default router for EUT'
    and EUT 'configured as a host'
    and EUT 'having the link-layer address of QE2 in the Neighbor Cache' }
```

```
ensure that {
   when {EUT is requested to 'send packets to QE3'
           and EUT receives 'a Redirect message' from QE1
                  containing 'an indication that QE2 is the better first-hop'
               and containing 'a Target Link-layer Address Option'
                    indicating 'the Link-layer address of QE2 interface attached to the
                                same link as EUT' }
     then { EUT 'does NOT perform address resolution of the link-local address of QE2'
        and EUT sends 'subsequent packets destined for QE3' to QE2 }
              }
```

End Group 2.2.9.1

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Group 2.2.9.2 'Discover Neighbor by Redirect Message'

TP id   : TP_COR_8554_01
Summary : 'EUT adds a neighbor specified by a Redirect message, to its neighbor list and,
            for packets whose next hop was changed by the Redirect message, EUT sends the
            packets to the specified target'
RQ ref   : RQ_000_8554
Config   : CF_CORE_21
TD ref   : TD_COR_8554_01

```
with { EUT 'configured as a host'
   and QE1 'configured to advertise a non global-scope prefix for autoconfiguration'
   and QE1 'configured with one unique global unicast address, whose prefix is not
            known to EUT as an on-link prefix'
   and QE2 'configured with one unique global unicast address, whose prefix is not
            known to EUT as an on-link prefix'
   and QE1 'subscribed to the same global unicast address subnet as EUT'
   and QE2 'subscribed to the same global unicast address subnet as EUT'
   and EUT 'configured with a unicast address using the prefix advertised by QE1'
   and QE2 'configured with a unicast address using the prefix advertised by QE1' }

ensure that {
   when { EUT is requested to 'send packets to the global unicast address of QE2
                           for the first time'
      and EUT receives 'a Redirect message' from QE1
                 containing 'the global unicast address of QE2 as the target' }
     then { EUT sends 'subsequent packets destined for the global unicast address of QE2
                   directly to QE2' }
              }
```

End Group 2.2.9.2
End Group 2.2.9
End Group 2.2

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Group 2.5 'Next Hop Determination'

TP id   : TP_COR_8232_01
Summary : 'EUT uses next-hop determination to select a new default router'
RQ ref   : RQ_000_8232
Config   : CF_CORE_33
TD ref   : TD_COR_8232_01

```
with { QE1 'configured with one unique unicast address on each link'
and QE2 'configured with one unique unicast address on each link'
and EUT 'able to communicate with QE3'
}

ensure that {
when { QE1 'becomes unavailable as a router'
or QE2 'becomes unavailable as a router'
and EUT is requested to 'send a packet to QE3' }
then { QE3 indicates 'the receipt of the packet' }
           }
```

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TP id   : TP_COR_8356_01
Summary : 'EUT knows how to treat an off-link prefix'
RQ ref   : RQ_000_8356
Config   : CF_CORE_23

```
TD ref  : TD_COR_8356_01

with { QE1 'configured as the default Router for EUT'
   and QE1 'configured to advertise an off-link prefix onto the link to which EUT
            is attached'
   and QE2 'configured with one unique non link-local address, whose prefix is the
            one QE1 advertises to EUT as an off-link prefix'
   and EUT 'configured as a host' }

ensure that {
   when { EUT receives 'a Router Advertisement message' from QE1
           containing 'the off-link prefix'
      and EUT is requested to 'send a packet to the non link-local address of QE2' }
   then { --EUT does not perform address resolution of the intended address of QE2--
          EUT sends 'the packet' to QE1 }
            }

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TP id   : TP_COR_8364_01
Summary : 'EUT stops using a Router whose Router Lifetime expired and performs next-hop
           determination for all the addresses which were using the now-deleted Router'
RQ ref  : RQ_000_8364
Config  : CF_CORE_33
TD ref  : TD_COR_8364_01

with { EUT 'configured as a host'
   and QE3 'configured with a number of unique global unicast addresses'
   and QE1 'established as a default router for EUT'
   and QE2 'established as a default Router for EUT'
   and EUT 'using QE1 as the default Router when sending packets to any of the
            global unicast addresses of QE3' }

ensure that {
   when { EUT receives 'a packet'
           containing 'any of the global unicast addresses of QE3 as the destination'
                after 'the Router Lifetime of QE1 has expired on EUT'
               before 'the Router Lifetime of QE2 has expired on EUT' }
   then { EUT sends 'the packet on to the indicated global unicast address of QE3' }
            }

End Group 2.5

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Group 2.6 'Neighbor Uneachability Detection'
Group 2.6.6 'Neighbor Reachability Determination'

TP id   : TP_COR_8147_01
Summary : 'EUT performs neighbor reachability test'
RQ ref  : RQ_000_8147
Config  : CF_CORE_11
TD ref  : TD_COR_8147_01

with {  QE 'configured with a unique unicast address'
   and EUT 'configured with a unique unicast address'
   and EUT 'unaware of the link layer address of QE' }

ensure that {
   when { EUT is requested to 'send a packet to QE' }
   then { EUT sends 'a Neighbor Solicitation' to QE}
            }

End Group 2.6.6
End Group 2.6

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Group 2.7 'Address Resolution'

TP id   : TP_COR_8415_01
Summary : 'Address Resolution for an on-link destination addresses, the destination
           Link-Layer address is unknown'
RQ ref  : RQ_000_8415
Config  : CF_CORE_11
TD ref  : TD_COR_8415_01

with { EUT 'manually configured with the same global prefix as QE' }
```

```
ensure that {
   when { EUT 'is initialized' -- i.e.: to ensure the EUT ignores link-layer address of QE
      and EUT 'tries to contact QE for the first time via its GLOBAL ADDRESS' }
   then { EUT sends 'Neighbor Solicitation messages'
               to 'the Solicited Node Multicast address of QE' }
            }
```

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```
TP id   : TP_COR_8363_01
Summary : 'EUT treats a prefix as on-link before its Valid Lifetime has expired'
RQ ref  : RQ_000_8363
Config  : CF_CORE_21
TD ref  : TD_COR_8363_01

with { QE1 'configured to send Router Advertisement messages with network a prefix
            for autoconfiguration'
   and QE1 'configured to continue operating as a default Router when the Valid
            Lifetime of the prefix expires'
   and QE2 'configured its non link-local unicast address using the prefix'
   and EUT 'configured its non link-local unicast address using the prefix'
   and EUT 'configured as a host'
   and QE2 'configured as a host' }

ensure that {
   when { EUT is requested to 'send a packet to the non link-local unicast address of QE2'
                     before 'the Valid Lifetime of the prefix has expired on EUT' }
   then { EUT 'sends the packet' to QE2 }
            }
```

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```
TP id   : TP_COR_8363_02
Summary : 'EUT treats as off-link, a prefix previously known to be on-link, when its
           Valid Lifetime has expired'
RQ ref  : RQ_000_8363
Config  : CF_CORE_21
TD ref  : TD_COR_8363_02

with { QE1 'configured to send Router Advertisement messages with network a prefix
            for autoconfiguration'
   and QE1 'configured to continue operating as a default Router when the Valid
            Lifetime of the prefix expires'
   and QE2 'configured its non link-local unicast address using the prefix'
   and EUT 'configured its non link-local unicast address using the prefix'
   and EUT 'configured as a host'
   and QE2 'configured as a host' }

ensure that {
   when { EUT is requested to 'send a packet to the non link-local unicast address of QE2'
                     after 'the Valid Lifetime of the prefix has expired on EUT' }
   then { EUT sends 'the packet' to QE1 }
            }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id   : TP_COR_8416_01
Summary : 'No address resolution for off-link addresses'
RQ ref  : RQ_000_8416
Config  : CF_CORE_23
TD ref  : TD_COR_8416_01

with { QE1 'configured as an advertizing router'
   and QE1 'configured with a different prefix on each link'
   and QE2 'configured to perform stateless autoconfiguration'
   and EUT 'configured to perform stateless autoconfiguration' }

ensure that {
   when { EUT 'has initialized'
      and EUT 'starts communication with QE2'}
   then { EUT 'never sends Neighbor Solicitation messages to
               the Solicited Node Multicast address of QE2'}
            -- i.e.: does not process Address Resolution on the @ of QE2
            }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_8417_01
Summary : 'No Address Resolution for an on-link destination when the destination
             Link-Layer address is known'
RQ ref : RQ_000_8417
Config : CF_CORE_11
TD ref : TD_COR_8417_01

with { EUT 'manually configured with the same global prefix as QE'
    and EUT 'has already established communication with QE'}

ensure that {
    when { EUT **is requested to** 'send a packet to QE' }
    then { EUT 'does not send Neighbor Solicitation messages to the Solicited Node
                Multicast address of QE' }
            }

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TP id   : TP_COR_8418_01
Summary : 'No Address Resolution for multicast destinations'
RQ ref : RQ_000_8418
Config : CF_CORE_11
TD ref : TD_COR_8418_01

with { EUT 'manually configured with the same global prefix as QE'
    and QE 'is subscribed to a global multicast group'}

ensure that {
    when { EUT 'is initialized' -- i.e.: to ensure the EUT ignores link-layer address of QE'
        and EUT **is requested to** 'send packets to the multicast group where QE is subscribed'}
    then { EUT 'does not process to Address Resolution on the multicast address' }
            }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 2.7.1 'Interface Initialization'

TP id   : TP_COR_8419_01
Summary : 'A multicast-capable interface joins the all-nodes multicast address when initialized'
RQ ref : RQ_000_8419
Config : CF_CORE_11
TD ref : TD_COR_8419_01

with { QE 'configured as a multicast capable host'
  and EUT 'configured as a multicast capable host' }

ensure that {
    when { QE **is requested to** 'send an echo request to the all-nodes multicast address'}
    then { EUT **sends** 'an echo reply' **to** QE }
            }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_8419_02
Summary : 'A multicast-capable interface joins the solicited-node address for each
             of its IP addresses'
RQ ref : RQ_000_8419
Config : CF_CORE_11
TD ref : TD_COR_8419_02

with { QE 'configured as a multicast capable host'
  and EUT 'configured as a multicast capable host' }

ensure that {
    when { QE **is requested to** 'send an echo request to the solicited-nodes address of EUT'}
    then { EUT **sends** 'an echo reply' **to** QE }
            }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_8420_01
Summary : 'When addresses are added/removed from a multicast-capable interface,
             the interface joins/leave the corresponding solicited-node addresses, respectively.'
RQ ref : RQ_000_8420
Config : CF_CORE_11
TD ref : TD_COR_8420_01

with { QE 'configured as a multicast capable host'

```
     and EUT 'configured as a multicast capable host'
     and EUT 'responds to its solicited-node address' }

  ensure that {
     when { EUT 'IP address is modified from "old" to "new"'
        and QE  is requested to 'send packets to the "old" IP solicited-node address of EUT'
        and QE  is requested to 'send packets to the "new" IP solicited-node address of EUT'}
     then { EUT 'does not respond to packets sent to its "old" IP solicited-node address'
          and EUT 'responds to packets sent to its "new" IP solicited-node address'}
              }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id  : TP_COR_8421_01
Summary : 'EUT leaves the solicited-node multicast address and the solicited-node
             multicast group corresponding to a removed unicast address'
RQ ref  : RQ_000_8421
Config  : CF_CORE_11
TD ref  : TD_COR_8421_01

with { EUT 'network interface configured as a multicast-capable interface'
   and EUT 'configured with only one unicast address on the interface assigned
             to the solicited-node multicast address' }

  ensure that {
     when { EUT is requested to 'remove the unicast address' }
     then { EUT 'leaves the solicited-node multicast address and solicited-node
               multicast group corresponding to the removed address' }
              }

End Group 2.7.1
End Group 2.7
End Group 2


--*******************************************************--
--* RFC 2462 - IPv6 Stateless Address Autoconfiguration *--
--*******************************************************--

Group 3 'RFC 2462'
Group 3.1 'Initialize'
Group 3.1.1 'Configure Address'
Group 3.1.1.1 'Simultaneous Stateless and Stateful Autoconfiguration'

TP id   : TP_COR_1200_01
Summary : 'EUT simultaneously executes stateful and stateless autoconfiguration'
RQ ref  : RQ_000_1200
Config  : CF_CORE_32
TD ref  : TD_COR_1200_01

with { QE1 'configured as a Stateful Autoconfiguration Server'
   and QE1 'configured to provide stateful network configuration parameters
             other than addresses'
   and EUT 'configured to support Stateful Autoconfiguration' }

  ensure that {
     when { EUT receives 'a Router Advertisement message' from QE2
            containing 'an indication that both stateful and stateless autoconfig
                        should be executed'
         and containing 'a network prefix for the link connecting QE2 and EUT' }
     then { EUT 'configures its unicast address using the network prefix'
      and EUT sends 'a REQUEST message' to QE1 }
              }

End Group 3.1.1.1

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 3.1.1.2 'Detect Duplicate Address (DAD)'

TP id   : TP_COR_1210_01
Summary : 'EUT accepts only DAD ND packets while its address is tentative'
RQ ref  : RQ_000_1210
Config  : CF_CORE_11
TD ref  : TD_COR_1210_01

with { EUT 'configured with a tentative address different from the unicast address of QE' }
```

```
ensure that {
   when { EUT receives 'a message that is not a DAD Neighbor Solicitation message' from QE }
   then { EUT 'is unable to communicate with QE' before 'DAD completes' }
             }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id  : TP_COR_1235_01
Summary : 'EUT indicates that it already uses the tentative address of another node'
RQ ref  : RQ_000_1235
Config  : CF_CORE_11
TD ref  : TD_COR_1235_01

with { EUT 'manually configured with a unicast address'
   and QE1  'manually configured with the same unicast address as EUT'
   and QE1  'is powered-down'
   and QE2  'manually configured with a unique unicast address'
   }

ensure that {
   when { EUT receives 'a DAD Neighbor Solicitation message' from QE1
           containing 'a target address the same as the unicast address of EUT' }
   then { QE1 'is unable to communicate with any node' }
             }
```

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```
TP id  : TP_COR_1239_01
Summary : 'EUT stops the autoconfiguration process when its tentative address is
           owned by another node'
RQ ref  : RQ_000_1239
Config  : CF_CORE_21
TD ref  : TD_COR_1239_01

with { QE1 'manually configured with a unicast address'
   and EUT 'manually configured with the same unicast address as QE1'
   and EUT 'is powered-down'
   and QE2 'manually configured with a unique unicast address'
   }

ensure that {
   when { --EUT is performing a DAD test—
          EUT receives 'a Neighbor Advertisement message' from QE1
           containing 'a target address the same as the tentative address of EUT' }
   then { EUT 'stops sending DAD Neighbor Solicitation messages'
      and EUT 'stops using its tentative address'}
             }
End Group 3.1.1.2
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 3.1.1.3 'Assign Global Address'

```
TP id  : TP_COR_1228_01
Summary : 'EUT configures its global unicast address using the global network prefix
           advertised by a Router'
RQ ref  : RQ_000_1228
Config  : CF_CORE_23
TD ref  : TD_COR_1228_01

with { QE1 'configured as the default router for EUT'
   and EUT 'configured as a host' }

ensure that {
   when { EUT receives 'a Router Advertisement message' from QE1
           containing 'an indication that stateless autoconfiguration should be executed'
       and containing 'a global network prefix usable on the link to QE1 and EUT' }
   then { EUT 'configures its global unicast address using the prefix' }
             }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 3.1.1.3.1 'Use of O-Flag'

```
TP id  : TP_COR_1300_01
Summary : 'EUT invokes stateful autoconfiguration to obtain non-address information'
RQ ref  : RQ_000_1300
Config  : CF_CORE_32
```

TD ref : TD_COR_1300_01

with { QE1 'configured as a Stateful Autoconfiguration Server'
    and QE1 'configured to provide stateful n/w config parameters other than addresses'
    and QE2 'configured as the default router for EUT'
    and EUT 'configured as a host supporting Stateful autoconfiguration'
    and EUT 'instructed by QE2 not to invoke Stateful Autoconfig for
            non-address parameters' }

ensure that {
    when { EUT **receives** 'a Router Advertisement message' **from** QE2
            containing 'instruction to invoke Stateful autoconfig for
                        non-address parameters' }
    then { EUT **sends** 'a REQUEST message' **to** QE1 }
            }

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TP id : TP_COR_1301_01
Summary : 'EUT invokes stateful autoconfig to obtain address and other
            configuration parameters'
RQ ref : RQ_000_1301
Config : CF_CORE_32
TD ref : TD_COR_1301_01

with { QE1 'configured as a Stateful Autoconfiguration Server'
    and QE1 'configured to provide stateful n/w config parameters other than addresses'
    and QE2 'established as the default router for EUT'
    and EUT 'configured as a host that supports Stateful Autoconfiguration'
    and EUT 'instructed by QE2 not to invoke Stateful Autoconfig for any parameters' }

ensure that {
    when { EUT **receives** 'a Router Advertisement message' **from** QE2
            containing 'instruction to invoke Stateful autoconfig for address
                        and non-address information' }
    then { EUT **sends** 'a REQUEST message' **to** QE1 }
            }

End Group 3.1.1.3.1
End Group 3.1.1.3

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 3.1.1.4 'Stateless Autoconfiguration'

TP id : TP_COR_1229_01
Summary : 'EUT generates periodic Router Advertisements to the all-nodes
           multicast address'
RQ ref : RQ_000_1229
Config : CF_CORE_11
TD ref : TD_COR_1229_01

with { EUT 'configured as a default router'
    and EUT 'network interface disabled' }

ensure that {
    when { EUT 'network interface is enabled' }
    then { EUT **sends** 'periodic Router Advertisement messages'
                to 'the all-nodes multicast address' }
            }

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End Group 3.1.1.4

TP id : TP_COR_1246_01
Summary : 'EUT uses Router Advertisements to instruct hosts to use ONLY
            Stateless autoconfiguration'
RQ ref : RQ_000_1246
Config : CF_CORE_22
TD ref : TD_COR_1246_01

with { EUT 'configured to send RAs when i/f enabled indicating ONLY
             Stateless Autoconfiguration' }

ensure that {
    when { EUT 'network interface is enabled'
        and EUT 'has started transmitting the Router Advertisement messages' }

```
      then { QE1 'is able to address QE2' within 'a few minutes'
         and QE2 'is able to address QE1' within 'a few minutes' }
                }
```

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```
TP id   : TP_COR_1246_02
Summary : 'EUT uses Router Advertisements to indicate use of Stateless
           and Stateful autoconfig'
RQ ref  : RQ_000_1246
Config  : CF_CORE_21
TD ref  : TD_COR_1246_02

with { QE1 'configured as a Stateful Autoconfiguration Server'
   and QE1 'configured to provide stateful n/w config parameters other
           than addresses'
   and QE2 'configured as a host that supports Stateful Autoconfiguration'
   and EUT 'configured to send RAs when i/f enabled'
   and EUT 'configured to send RAs indicating use of Stateless and Stateful
           Autoconfiguration' }

ensure that {
   when { EUT 'network interface is enabled'
      and EUT 'has started transmitting the Router Advertisement messages' }
   then { QE2 'sends a REQUEST message' to QE1 within 'a few minutes' }
                }
```

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```
TP id   : TP_COR_1246_03
Summary : 'EUT uses Router Advertisements to indicate use of Stateful
           Autoconfiguration ONLY'
RQ ref  : RQ_000_1246
Config  : CF_CORE_21
TD ref  : TD_COR_1246_03

with { QE1 'configured as a Stateful Autoconfiguration Server'
   and QE1 'configured to provide stateful n/w config parameters other
           than addresses'
   and QE2 'configured as a host that supports Stateful Autoconfiguration'
   and EUT 'configured to send RAs when the interface enabled'
   and EUT 'configured to send RAs indicating use Stateful Autoconfiguration ONLY' }

ensure that {
   when { EUT 'network interface is enabled'
      and EUT 'has started transmitting the Router Advertisement messages' }
   then { QE2 sends 'a REQUEST message' to QE1 within 'a few minutes' }
                }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

End Group 3.1.1
End Group 3.1
End Group 3

--*******************--
--* RFC 2463 ICMPv6 *--
--*******************--

Group 4 'RFC 2463'
Group 4.1 'ICMPv6 Functions'
Group 4.1.1 'Determine ICMPv6 Message Source Address'

```
TP id   : TP_COR_1407_01
Summary :  'EUT chooses the right unicast address for the Source Address of an
            ICMPv6 Reply when responding to a Multicast message'
RQ ref  : RQ_000_1407
Config  : CF_CORE_12
TD ref  : TD_COR_1407_01

with { EUT 'configured with a unique link-local unicast address on Interface-1'
   and EUT 'configured with a unique link-local unicast address on Interface-2'
   and EUT 'configured with a link-local Multicast address on Interface-1'
  and  QE 'configured with a unique link-local unicast address' }

ensure that {
   when { EUT receives 'a packet' from QE
```

```
            containing 'the Multicast address assigned to Interface-1 as the destination'
        and containing 'data which should provoke an ICMPv6 Reply as a response' }
    then { EUT sends 'an ICMPv6 Reply message' to QE
        containing 'the link-local unicast address of Interface-1
                    as the source address' }
        }
```

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```
TP id    : TP_COR_1407_02
Summary:  'EUT chooses the right unicast address for the Source Address of an
           ICMPv6 Reply when responding to an Anycast message'
RQ ref   : RQ_000_1407
Config   : CF_CORE_12
TD ref   : TD_COR_1407_02

with { EUT 'configured as a router'
   and EUT 'established as a default Router for QE'
   and EUT 'configured with a unique non link-local unicast address on Interface-1'
   and EUT 'configured with a unique non link-local unicast address on Interface-2'
   and EUT 'configured with an Anycast address on Interface-1'
   and  QE 'configured with a unique non link-local unicast address'
   and EUT 'subscribes to the same link-local unicast address subnet as QE' }

ensure that {
   when { EUT receives 'a packet' from QE
           containing 'the Anycast address assigned to Interface-One as the destination'
       and containing 'data which should provoke an ICMPv6 Reply as a response' }
   then { EUT sends 'an ICMPv6 Reply message' to QE
        containing 'the non link-local unicast address of Interface-1
                    as the source address' }
               }
```

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```
TP id    : TP_COR_1408_01
Summary : 'EUT replies with an ICMPv6 message when it encounters a failure to forward
           a traversing packet, the ICMPv6 message's source is the unicast address that
           belongs to the interface on which the packet forwarding failed'
RQ ref   : RQ_000_1408
Config   : CF_CORE_22
TD ref   : TD_COR_1408_01

with { QE1 'configured with a unique global unicast address'
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link connecting
           QE1 and EUT, and the link connecting QE2 and EUT, respectively'
   and EUT 'Unable to communicate with QE2' }

ensure that {
   when { EUT receives 'a packet' from QE1
           containing 'QE2 as the destination address' }
   then { EUT sends 'an ICMPv6 packet' to QE1
        containing 'source address as the unicast address on Link2' }
               }
End Group 4.1.1
```

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```
Group 4.1.2 'ICMPv6 Error Messages'
Group 4.1.2.1 'Destination Unreachable Message'

TP id    : TP_COR_1434_01
Summary : 'EUT processes a traversed packet with its size equals to its incoming link MTU'
RQ ref   : RQ_000_1097
Config   : CF_CORE_22
TD ref   : TD_COR_1434_01

with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link connecting
           QE1 and EUT, and, the link connecting QE2 and EUT, respectively'
   and QE1 'has larger link MTU than EUT'
   and EUT 'has larger or equivalent link MTU than QE2' }

ensure that {
   when { EUT receives 'a packet with its size equals to its incoming link MTU'
           containing 'QE1 as source address and QE2 as destination address' }
```

```
      then { EUT sends 'the packet' to QE2 }
            }
```

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```
TP id   : TP_COR_1436_01
Summary : 'EUT having no matching routing entry for a message will generates an
          ICMPv6 Destination Unreachable Message with the Code field 0'
RQ ref  : RQ_000_1436
Config  : CF_CORE_22
TD ref  : TD_COR_1436_01

with { QE1 'configured with a non link-local unicast address'
   and EUT 'configured with a unique non link-local unicast address on each link'
   and EUT 'configured to have no route entry for packets destined to QE2' }

ensure that {
   when { EUT receives 'a packet' from QE1
            containing 'an indication that QE2 is the destination' }
   then { EUT 'generates an ICMPv6 Destination Unreachable Message with Code field 0' }
            }
```

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```
TP id   : TP_COR_1441_01
Summary : 'EUT generates an ICMPv6 Destination Unreachable message with code 4, if it
           does not have UDP listener corresponding to a UDP packet targeting at the EUT'
RQ ref  : RQ_000_1441
Config  : CF_CORE_11
TD ref  : TD_COR_1441_01

with { QE  'configured with a unique link-local address'
   and EUT 'configured with a unique link-local address'
   and EUT 'configured no supporting listening at a UDP port number XX' }

ensure that {
   when { EUT receives 'a UDP packet' from QE
            containing 'an indication that EUT is the destination'
        and containing 'an indication that the UDP port number XX is the destination port number' }
   then { EUT 'generates an ICMPv6 Destination Unreachable message with code 4' }
            }
```

End Group 4.1.2.1

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Group 4.1.2.2 'Packet Too Big Message'

```
TP id   : TP_COR_1445_01
Summary : 'EUT (as a router) generates an ICMPv6 Packet Too Big Message, if it receives a
           traversed packet that is larger than the outgoing link MTU'
RQ ref  : RQ_000_1445
Config  : CF_CORE_22
TD ref  : TD_COR_1445_01

with { QE1 'configured with a unique global unicast address'
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link
           connecting QE1 and EUT, and, the link connecting QE2 and EUT, respectively'
   and QE1 'has larger link MTU than EUT' }

ensure that {
   when { EUT receives 'a packet with its size larger than the MTU of the link
                    connecting EUT and QE2'
            containing 'QE1 as source address and QE2 as destination address' }
   then { EUT 'generates an ICMPv6 Packet Too Big Message' }
            }
```

End Group 4.1.2.2

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Group 4.1.2.3 'Time Exceeded Message'

```
TP id   : TP_COR_1449_01
Summary : 'EUT drops a traversed packet with a Hop Limit of zero and responds with an
          ICMPv6 Time Exceeded message with Code 0 to the source of the packet'
RQ ref  : RQ_000_1449
```

```
Config  : CF_CORE_22
TD ref  : TD_COR_1449_01

with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link
            connecting QE1 and EUT, and the link connecting QE2 and EUT, respectively' }

ensure that {
   when { EUT receives 'a packet'
            containing 'QE1 as source address and QE2 as destination address'
        and containing  'Hop Limit = 0' }
   then { EUT discards 'the packet'
        and EUT 'generates an ICMPv6 Time Exceeded message with Code 0'
            containing 'QE1 as source address' }
            }
```

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```
TP id   : TP_COR_1450_01
Summary : 'EUT drops a traversed packet with a Hop Limit of 1 and responds with an
           ICMPv6 Time Exceeded message with Code 0 to the source of the packet'
RQ ref  : RQ_000_1450
Config  : CF_CORE_22
TD ref  : TD_COR_1450_01

with { QE1 'configured with a unique global unicast address '
   and QE2 'configured with a unique global unicast address'
   and EUT 'configured with two unique global unicast addresses on the link
            connecting QE1 and EUT, and the link connecting QE2 and EUT, respectively' }

ensure that {
   when { EUT receives 'a packet'
            containing 'QE1 as source address and QE2 as destination address'
        and containing  'Hop Limit = 1' }
   then { EUT discards 'the packet'
        and EUT 'generates an ICMPv6 Time Exceeded message with Code 0'
            containing 'QE1 as source address' }
            }

End Group 4.1.2.3
```

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```
Group 4.1.2.4 'Parameter Problem Message'

End Group 4.1.2.4
End Group 4.1.2
```

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```
Group 4.1.3 'Information Messages'
Group 4.1.3.1 'Echo Request and Echo Reply'

TP id   : TP_COR_1460_01
Summary : 'EUT sends an Echo Reply in response to an Echo Request'
RQ ref  : RQ_000_1460
Config  : CF_CORE_11
TD ref  : TD_COR_1460_01

with { QE 'configured with a unique unicast address'
   and EUT 'configured with a unique unicast address' }

ensure that {
   when { QE is requested to 'send a Echo Request to EUT' }
   then { EUT sends 'an Echo Response' to QE }
            }
```

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```
TP id   : TP_COR_1464_01
Summary : 'EUT sends an Echo Reply in response to an Echo Request'
RQ ref  : RQ_000_1464
Config  : CF_CORE_11
TD ref  : TD_COR_1464_01

with { QE 'configured with a unique unicast address'
   and EUT 'configured with a unique unicast address' }
```

```
ensure that {
   when { EUT receives 'an Echo Request' from QE
        containing 'the unicast address of EUT as destination' }
   then { EUT sends 'an Echo Response' to QE
       containing 'unicast address of EUT as source address' }
            }
```

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```
TP id   : TP_COR_1466_01
Summary : 'EUT responds to a multicast Echo Request message with a unicast Echo Request'
RQ ref  : RQ_000_1466
Config  : CF_CORE_11
TD ref  : TD_COR_1466_01

with { EUT 'network interface configured as a multicast-capable interface'
   and EUT 'configured with a unicast address on the interface assigned
            to the multicast address' }

ensure that {
   when { QE is requested to 'send an Echo Request message'
           containing 'the multicast address of EUT as destination address' }
   then { EUT 'generates an Echo Response Message'
           containing 'source address as the unicast address for the interface on which the
                      multicast Echo Request message was received' }
            }
```

End Group 4.1.3.1
End Group 4.1.3
End Group 4.1
End Group 4

--*****************************--
--* RFC 3513 IPv6 Architecture *--
--*****************************--

Group 5 'RFC 3513'
Group 5.2 'Address Architecture'

```
TP id   : TP_COR_1726_04
Summary : 'EUT with a single i/f receives a packet sent to the LL All-Nodes M/cast address'
RQ ref  : RQ_000_1726
Config  : CF_CORE_11
TD ref  : TD_COR_1726_04

ensure that {
   when {  QE is requested to 'send a packet to the link-local All-Nodes Multicast address' }
   then { EUT indicates 'receipt of the packet' }
            }
```

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```
TP id   : TP_COR_1726_05
Summary : 'EUT with multiple i/fs receives a packet sent to the LL All-Nodes M/cast address'
RQ ref  : RQ_000_1726
Config  : CF_CORE_12
TD ref  : TD_COR_1726_05

with { EUT 'configured with different link-local addresses on each of its interfaces' }

ensure that {
   when {  QE is requested to 'send a packet to the link-local All-Nodes Multicast address' }
   then { EUT indicates 'receipt of the packet on both of its interfaces' }
            }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id   : TP_COR_1726_06
Summary : 'EUT receives packet sent to the Solicited-Node M/cast address based on
           its unicast address'
RQ ref  : RQ_000_1726
Config  : CF_CORE_11
TD ref  : TD_COR_1726_06

ensure that {
   when {  QE is requested to 'send a packet to the solicited-node multicast address
```

```
                                    of EUT unicast address' }
      then { EUT indicates 'receipt of the packet' }
               }


--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1726_07
Summary : 'EUT receives packet sent to the Solicited-Node M/cast address based on
           its anycast address'
RQ ref  : RQ_000_1726
Config  : CF_CORE_11
TD ref  : TD_COR_1726_07

with { EUT 'subscribed to an anycast group' }

ensure that {
   when {  QE is requested to 'send a packet to the solicited-node multicast address
                              of EUT anycast address' }
      then { EUT indicates 'receipt of the packet' }
               }


--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1726_08
Summary : 'EUT receives packet sent to the M/cast address of a group to which EUT belongs'
RQ ref  : RQ_000_1726
Config  : CF_CORE_11
TD ref  : TD_COR_1726_08

with { EUT 'subscribed to a multicast group' }

ensure that {
   when {  QE is requested to 'send a packet to the EUT multicast address' }
      then { EUT indicates 'receipt of the packet' }
               }


--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1727_01
Summary : 'EUT (as a router) recognizes the Subnet-Router Anycast Address for interfaces for
           which it is configured to act as a router'
RQ ref  : RQ_000_1727
Config  : CF_CORE_11
TD ref  : TD_COR_1727_01

with { EUT 'configured as a router'
   and EUT 'established as a default Router for QE'
   and EUT 'configured with a unique non link-local unicast address on Interface-1'
   and EUT 'configured with a unique non link-local unicast address on Interface-2'
   and EUT 'configured with an Subnet-Router Anycast address on Interface-1'
   and  QE 'configured with a unique non link-local unicast address'
   and EUT 'subscribes to the same link-local unicast address subnet as QE' }

ensure that {
   when { EUT receives 'a packet' from QE
            containing 'the Subnet-Router Anycast address assigned to Interface-1 as
                        the destination'
        and containing 'data which should provoke an ICMPv6 Reply as a response' }
        then { EUT sends 'an ICMPv6 Reply message' to QE }
               }

End Group 5.2

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 5.5 'Unicast Addresses'

TP id   : TP_COR_1726_01
Summary : 'EUT with a single i/f receives a packet sent to its unicast address'
RQ ref  : RQ_000_1726
Config  : CF_CORE_11
TD ref  : TD_COR_1726_01

ensure that {
   when {  QE is requested to 'send a packet to the unicast address of the EUT' }
      then { EUT indicates 'receipt of the packet' }
               }
```

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--
```

TP id   : TP_COR_1726_02
Summary : 'EUT with multiple i/fs receives packet sent to one of its unicast addresses'
RQ ref : RQ_000_1726
Config : CF_CORE_12
TD ref : TD_COR_1726_02

with { EUT 'configured with different link local addresses on each of its interfaces' }

ensure that {
   when { QE **is requested to** 'send a packet to the unicast address of one of
                              the EUT interfaces' }
   then { EUT **indicates** 'receipt of the packet only on the addressed interface' }
            }

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--
```

Group 5.5.6 'Link-Local Unicast Addresses'

TP id   : TP_COR_1677_01
Summary : 'EUT does not forward packets with link-local source or destination addresses'
RQ ref : RQ_000_1677
Config : CF_CORE_22
TD ref : TD_COR_1677_01

with { QE1 'configured with a unique link-local unicast address'
   and EUT 'configured with a unique link-local unicast address on each link'
   and QE2 'configured with a unique link-local unicast address'
   and QE1 'configured to use EUT as the next-hop for the link-local address of QE2' }

ensure that {
   when {EUT **receives** 'a packet' **from** QE1
           containing 'the link-local address of QE2 as the destination' }
   then { EUT 'does not forward the packet' **to** QE2 }
            }

End Group 5.5.6
End Group 5.5

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--
```

Group 5.6 'Anycast Addresses'

TP id   : TP_COR_1726_03
Summary : 'EUT receives a packet sent to its anycast address'
RQ ref : RQ_000_1726
Config : CF_CORE_11
TD ref : TD_COR_1726_03

with { EUT 'subscribed to an anycast group' }

ensure that {
   when { QE **is requested to** 'send a packet to the EUT anycast address' }
   then { EUT **indicates** 'receipt of the packet' }
            }

End Group 5.6

```
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--
```

Group 5.7 'Multicast Addresses'
Group 5.7.1 'Pre-defined Multicast Addresses'

```
--++++++++++++++++++++++++++++--
--+ Key:                  +--
--+    HS    - Host        +--
--+    RT    - Router      +--
--+    LL    - Link Local  +--
--+    SL    - Site Local  +--
--+    M/cast - Multicast  +--
--+    i/f   - interface   +--
--++++++++++++++++++++++++++++--
```

TP id   : TP_COR_1719_01
Summary : 'EUT sends packet to All-RT LL M/cast address : 1 RT and 1 HS in scope'
RQ ref : RQ_000_1719

```
Config  : CF_CORE_21
TD ref  : TD_COR_1719_01

with { QE 'configured as a router'
   and EUT 'configured as a host' }

ensure that {
  when { EUT is requested to 'send a Router Solicitation message ' }
  then { EUT  'uses the All-Routers Link-Local Multicast address as destination' }
           }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1720_01
Summary : 'EUT sends packet to All-RT SL M/cast addr : 1 RT in LL scope and 1 in SL scope'
RQ ref  : RQ_000_1720
Config  : CF_CORE_23
TD ref  : TD_COR_1720_01

with { QE2 'configured as a router'
   and QE1 'configured with the EUT and QE2 in the same site-local group'}

ensure that {
   when { EUT is requested to 'send a Router Solicitation message' }
   then { QE1 sends 'the appropriate Router Advertisement message' to EUT
      and QE2 sends 'the appropriate Router Advertisement message' to EUT }
              }


End Group 5.7.1

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 5.7.2 'Node'

TP id   : TP_COR_1608_01
Summary : 'EUT receives packets sent to its multicast address'
RQ ref  : RQ_000_1608
Config  : CF_CORE_11
TD ref  : TD_COR_1608_01

with { EUT 'subscribed to a multicast group' }

ensure that {
   when { QE is requested to 'send a packet to the multicast address' }
   then { EUT indicates 'receipt of the packet' }
             }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1709_01
Summary : 'EUT (as a router) does not forward packets sent to a multicast address beyond
           the scope (= site-local) indicated by the scope field in the destination
           multicast address'
RQ ref  : RQ_000_1709
Config  : CF_CORE_22
TD ref  : TD_COR_1709_01

with { EUT 'configured with a site-local address on link1 and a global address on link2'
       and QE1 'configured with a site-local address on link1'
       and QE2 'configured with a global address on link2'
       and QE1 'can communicate with QE2s global unicast address' }

ensure that {
   when { QE1 is requested to 'send a packet to the all routers site-local multicast address' }
   then { EUT indicates 'receipt of the packet'
          and QE2 'does not indicate receipt of the packet' }
             }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1709_02
Summary : 'EUT (as a router) does not forward packets sent to a multicast address beyond
           the scope (= link-local) indicated by the scope field in the destination
           multicast address'
RQ ref  : RQ_000_1709
Config  : CF_CORE_22
TD ref  : TD_COR_1709_02
```

```
with { EUT 'configured with global addresses on link1 and link2'
        and QE1 'configured with a global address on link1'
        and QE2 'configured with a global address on link2'
        and 'QE1 and QE2 can communicate' }

ensure that {
   when { QE1 is requested to 'send a packet to the all nodes link-local multicast address' }
   then { EUT indicates 'receipt of the packet'
          and QE2 'does not indicate receipt of the packet' }
             }

End Group 5.7.2
End Group 5.7
End Group 5


--*******************************************--
--* RFC 1981 - Path MTU Discovery for IPv6 *--
--*******************************************--

Group 6 'RFC 1981'
Group 6.1 'Discover PMTU'

TP id   : TP_COR_1802_01
Summary : 'The implementation implements Path MTU discovery'
RQ ref  : RQ_000_1802
Config  : CF_CORE_23
TD ref  : TD_COR_1802_01

ensure that {
   when { EUT is requested to 'send data requiring a packet length greater than the link MTU to QE2'
}
   then { QE2 indicates 'receipt of the same data without any modification' }
             }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1808_01
Summary : 'The implementation receives a Packet Too Big message and reduces the PMTU'
RQ ref  : RQ_000_1818
Config  : CF_CORE_23
TD ref  : TD_COR_1808_01

with { QE1 'configured such that Link2 has a smaller MTU than Link1' }

ensure that {
   when { -- EUT is attempting to communicate with QE2 using the MTU of Link1
          EUT receives 'a Packet Too Big message' from QE1}
   then { EUT 'reduces the MTU for the path to QE2 to the PMTU of Link2' }
              }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1822_01
Summary : 'Handling PMTU smaller than the IPv6 minimum link MTU'
RQ ref  : RQ_000_1822
Config  : CF_CORE_23
TD ref  : TD_COR_1822_01

with { QE1 'configured such that Link2 has an MTU smaller the minimum IPv6 link MTU' }

ensure that { -- EUT is attempting to communicate with QE2 using the MTU of Link1
   when { EUT receives 'a Packet Too Big message from QE1 indicating an MTU smaller than
                        the IPv6 minimum link MTU for Link2' }
   then { EUT 'sets the PMTU for the path to the IPv6 minimum link MTU'
      and EUT 'fragments subsequent packets' }
              }

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

Group 6.1.1 'Multicast PMTU Discovery'

TP id   : TP_COR_1814_01
Summary : 'Use of PMTU with Multicast'
RQ ref  : RQ_000_1814
Config  : CF_CORE_31
TD ref  : TD_COR_1814_01
```

```
with { QE1 'configured such that Link1 has a bigger MTU than Link2'
     and EUT 'configured as listener to a multicast group'
     and QE2 'subscribed to the same multicast group' }


ensure that {
   when { -- EUT sends multicast packets to the defined multicast group with a size bigger than
         -- the MTU of Link2
         EUT is requested to 'send multicast packets with an MTU size bigger than the PMTU
                              of Link2 to the QE2 listener group'
      and EUT is requested to 'reduce the size of its multicasted packets' }
   then { EUT 'reduces its MTU to the PMTU of Link2' }
         }
--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_1815_01
Summary : 'Different MTUs on Multicast destinations'
RQ ref  : RQ_000_1815
Config  : CF_CORE_35
TD ref  : TD_COR_1815_01


with { QE1 'configured such that the MTU of Link1 is greater than the MTU of Link2'
  and QE1 'configured such that the MTU of Link2 is greater than the MTU of Link3'
     and 'QE2 and QE3 configured as listeners to a common multicast group'
     and QE1 'subscribed to the same multicast group' }


ensure that {
   when { -- EUT sends multicast packets to the defined multicast group with a size bigger than
         -- the MTU of Link2
         EUT receives 'several Packet-Too-Big messages from QE1 indicating different
                       next-hop MTUs' }
   then { EUT 'reduces its assumed PMTU to the MTU of Link3' }
         }

End Group 6.1.1
End Group 6.1
End Group 6


--*************************--
--* RFC 2675 - Jumbograms *--
--*************************--

Group 7 'RFC 2675'

TP id   : TP_COR_8800_01
Summary : 'EUT forwards Jumbograms'
RQ ref  : RQ_000_8800
Config  : CF_CORE_22
TD ref  : TD_COR_8800_01


with { QE1 'configured with a unique non link-local unicast address'
  and  EUT 'configured with a unique non link-local unicast address on each link'
   and EUT 'configured to support the Jumbo Payload Option'
   and QE1 'configured to support the Jumbo Payload Option'
   and QE2 'configured to support the Jumbo Payload Option'
   and EUT 'configured to support Jumbograms on both its links' }


ensure that {
   when { EUT receives 'a packet' from QE1
           containing 'QE2 as the destination'
        and containing 'a Jumbo Payload Option' }
   then { EUT 'forwards the packet' to QE2 }
         }


--xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

TP id   : TP_COR_8800_02
Summary : 'EUT sends a Jumbogram'
RQ ref  : RQ_000_8800
Config  : CF_CORE_11
TD ref  : TD_COR_8800_02


with { EUT 'configured with a unique unicast address'
   and  QE 'configured with a unique unicast address'
   and EUT 'configured to support the Jumbo Payload Option'
   and  QE 'configured to support the Jumbo Payload Option' }

ensure that {
```

```
   when { EUT is requested to 'send a packet to QE'
                    containing 'a Jumbo Playload Option' }
   then { EUT sends 'the packet' to QE }
             }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id    : TP_COR_8800_03
Summary : 'EUT accepts a received Jumbogram'
RQ ref  : RQ_000_8800
Config  : CF_CORE_11
TD ref  : TD_COR_8800_03

with { EUT 'configured with a unique unicast address'
   and  QE 'configured with a unique unicast address'
   and EUT 'configured to support the Jumbo Payload Option'
   and  QE 'configured to support the Jumbo Payload Option' }

ensure that {
   when { EUT receives 'a packet' from QE
          containing 'a Jumbo Payload Option' }
   then { EUT accepts 'the packet' }
             }
```

--xxxxxxxxxxxxxxxxxxxxxxxxxxxxx--

```
TP id    : TP_COR_8813_01
Summary : 'EUT does not support Jumbo Payload Option'
RQ ref  : RQ_000_8813
Config  : CF_CORE_11
TD ref  : TD_COR_8813_01

with { QE 'configured with a unique unicast address'
        and QE 'configured to support the Jumbo Payload Option'
        and  EUT 'configured with a unique unicast address'
        and EUT 'does not support the Jumbo Payload Option' }

ensure that {
   when { EUT receives 'a packet' from QE
           containing 'a Jumbo Payload Option' }
   then {  EUT sends 'an ICMPv6 Parameter Problem message' to QE
         containing 'an indication that Jumbo Payload Option is not supported' }
             }
```

End Group 7

Annex B (informative):
Interoperability Testing Configurations

The following architectural configurations are referenced in the IPv6 Core 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.
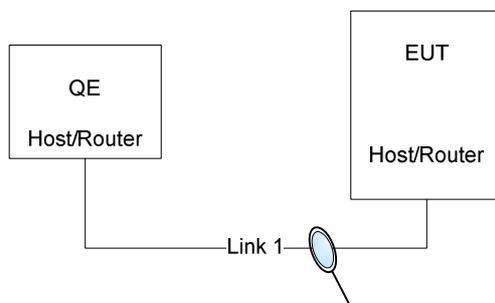
Figure B.1: CF_CORE_011
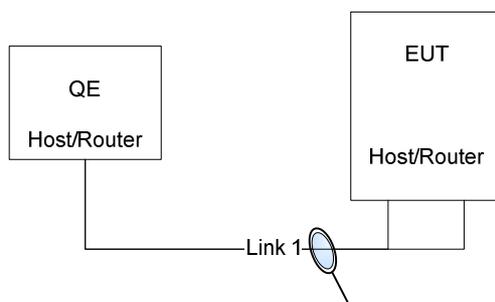
Figure B.2: CF_CORE_012
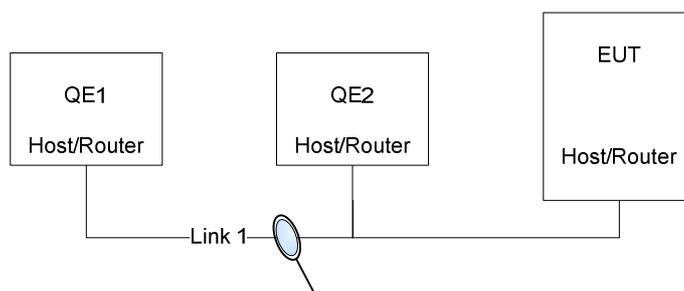
Figure B.3: CF_CORE_021
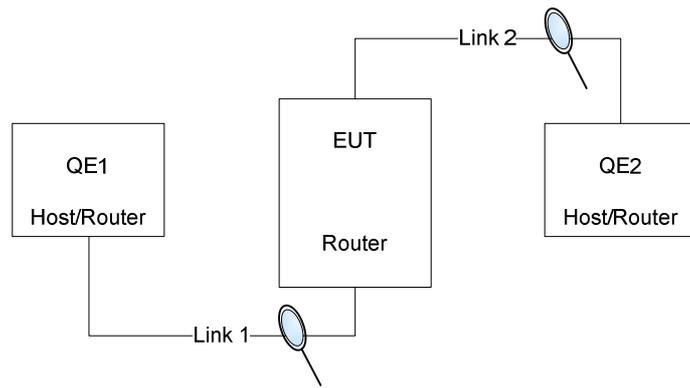
Figure B.4: CF_CORE_022
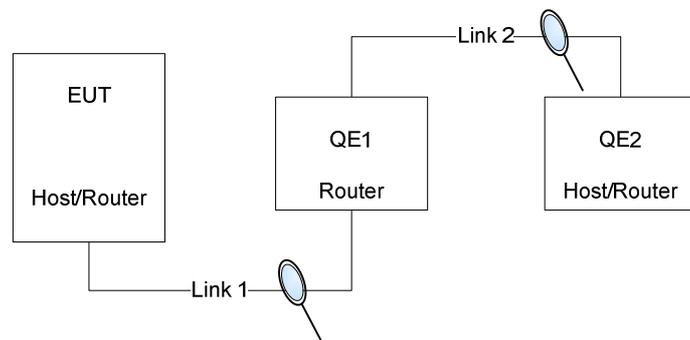
Figure B.5: CF_CORE_023
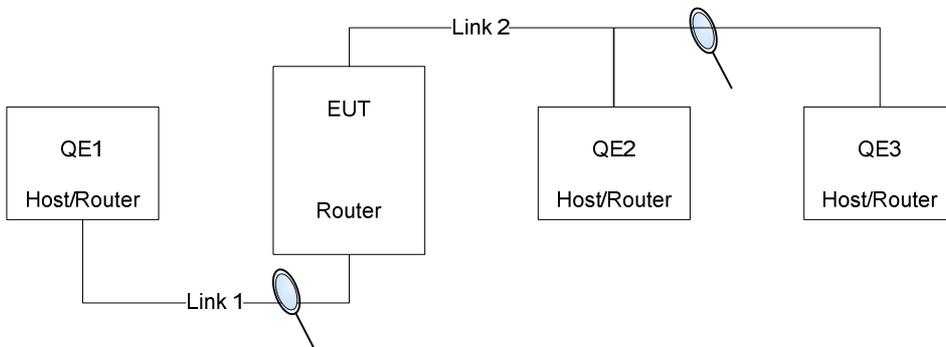
Figure B.6: CF_CORE_031
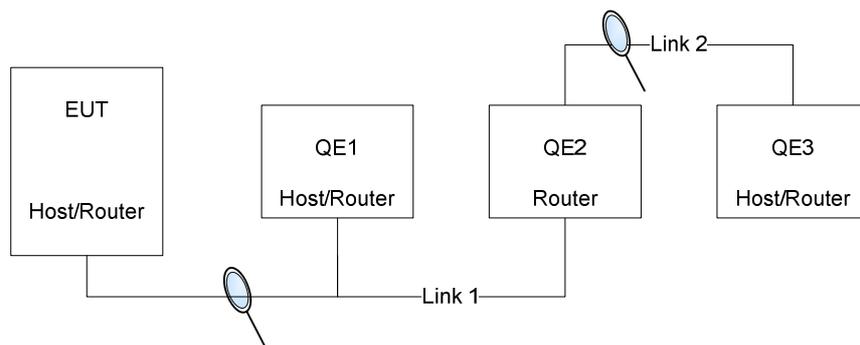

Figure B.7: CF_CORE_032
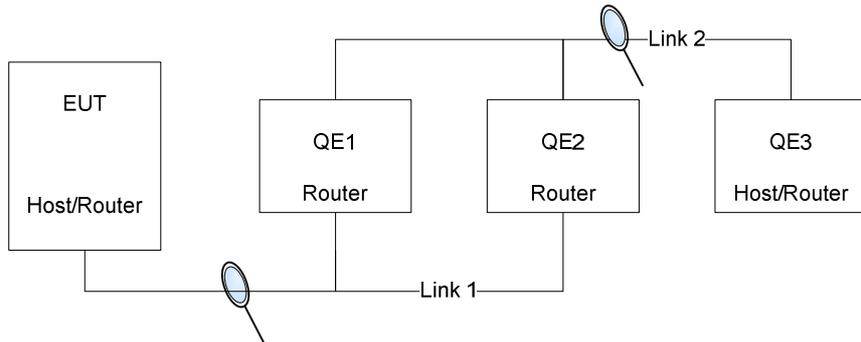
Figure B.8: CF_CORE_033
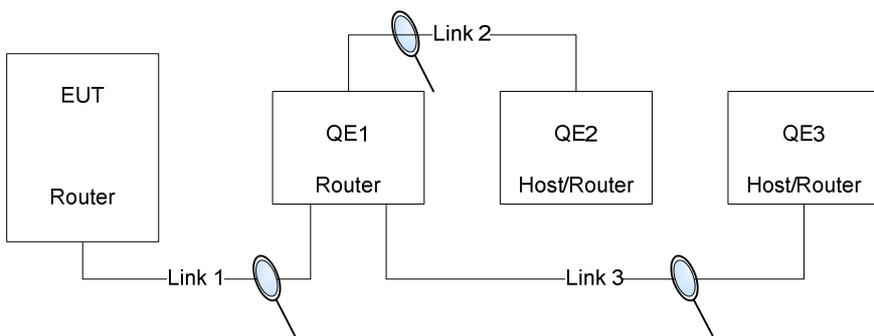


Figure B.9: CF_CORE_035
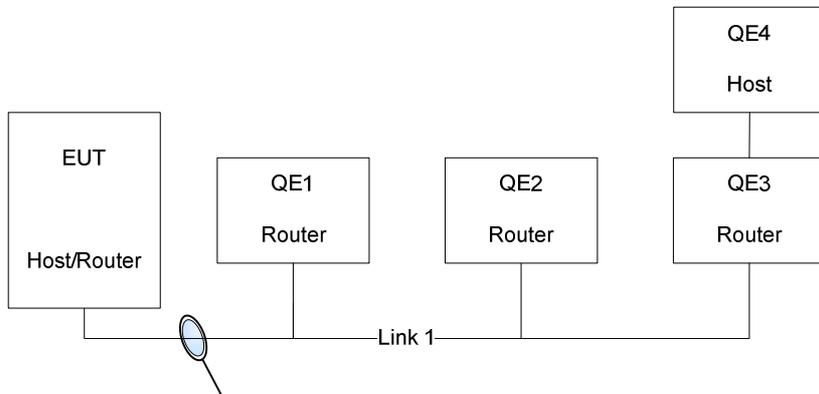
Figure B.10: CF_CORE_041
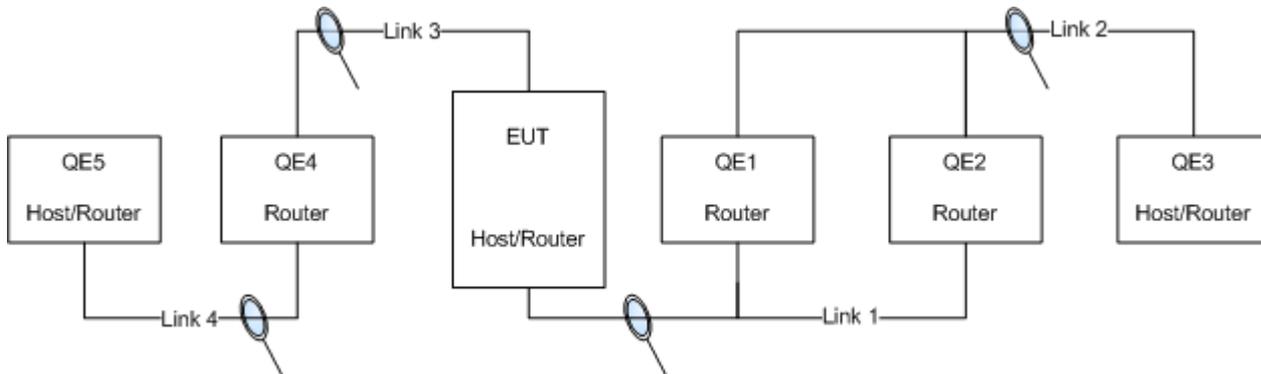
Figure B.11: CF_CORE_051

History

Document history		
V1.1.1	April 2006	Publication
V2.0.1	January 2008	Publication