



IPv4 CONSORTIUM

IS-IS Operations Test Report Revision 4.4

InterOperability Lab – 121 Technology Drive, Suite 2 – Durham NH, 03824 – +1-603-862-3941

Consortium Manager: Erica Williamsen ericaw@iol.unh.edu

Technician: Technician A technicana@iol.unh.edu

Month Date, Year

Member Contact Name
COMPANY NAME
ADDRESS

Mr./Mrs. VENDOR,

Enclosed are the results from the Intermediate System to Intermediate System (IS-IS) testing performed on:

SUT HERE. Identified as “SHORT SUT HERE” MAC Address 00-00-CA-02-38-38 s/n 0002493. Console “system” command reports software version 1.2.3.

This testing pertains to a set of standard requirements, put forth in ISO/IEC 10589, RFC 1195, RFC 2966, RFC 3719 and RFC 3567. The tests performed are part of the IS-IS Test Suite, which is available on the UNH InterOperability Lab’s website:

ftp://ftp.iol.unh.edu/pub/ipv4/testsuites/IS-IS_Description.pdf

During the testing process, the following issues were uncovered:

Test #	Result
IS-IS 2.2c	The SUT allows the maximumGenerationInterval to be greater than MaxAge
IS-IS 3.12c	The SUT installs the path to the external network in its routing table.

As always, we welcome any comments regarding this Test Suite. If you have any questions about the test procedures or results, please feel free to contact me via e-mail at technicana@iol.unh.edu or by phone at +1-603-862-3941.

Regards,

Technician A



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The following table contains the test results and their meanings.

Result	Interpretation
PASS	The SUT was observed to exhibit conformant behavior.
FAIL	The SUT was observed to exhibit non-compliant behavior.
PASS with Comments	The SUT was observed to exhibit conformant behavior, however this behavior deviated from previous compliant results. An additional explanation of the situation is included.
Warning	The SUT was observed to exhibit behavior that is not recommended.
NOTE	From the observations, a valid pass or fail could not be determined. An additional explanation of the situation is included.
N/S	Not Supported: The specified behavior is optional and is applicable but not implemented.
N/T	Not Tested: The specified behavior cannot be tested due to a(n) (un)related failure.

Group 1: INTERMEDIATE SYSTEM to INTERMEDIATE SYSTEM PROTOCOL DATA UNIT (IIH PDUs)

The following tests verify that a system properly handles the transmitting and receiving IIH PDUs as defined in ISO/IEC 10589.

Test #		Result	
IS-IS.1.1	Hello Timer	a	PASS
		b	PASS
Purpose: To verify that an Intermediate System properly transmits an IIH PDU every Hello Interval seconds.			
Comments on Test Procedure			
a. The SUT is configured as a Level 1-2 IS-IS system with a Hello Timer of 10 seconds. IS-IS is started on the systems. Traffic is observed on network 0. b. The Hello Interval is configured to be 20 seconds on the SUT. IS-IS is restarted on the systems. Traffic is observed on network 0.			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.4	
a. The SUT transmits a Level 1 Hello PDU and a Level 2 PDU every 10 seconds (Allowing for Jitter). b. The SUT transmits a Level 1 Hello PDU and a Level 2 PDU every 20 seconds (Allowing for Jitter).			

Test #		Result	
IS-IS.1.2	Area Address	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that a Level 1 Intermediate System properly forms adjacencies based on Area ID.			
Comments on Test Procedure			
a. The SUT is configured as a Level 1 IS-IS system in Area 49.0001. IS-IS is started on the SUT. TS1 transmits a Level 1 IIH PDU on network 0 in area 49.0001. Traffic is observed on network 0. b. The SUT is configured so that it is in area 49.0002. IS-IS is restarted on the SUT. TS1 transmits a Level 1 IIH PDU on network 0 in area 49.001. Traffic is observed on network 0. c. The SUT is configured so that it is no longer in area 49.0001. IS-IS is restarted on the SUT. TS1 transmits a Level 1 IIH PDU on network 0 in area 49.0001. Traffic is observed on network 0.			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.2.2	
a. The SUT transmits Level 1 Hello PDUs listing area 49.0001. The SUT lists TS1 as a neighbor. b. The SUT transmits Level 1 Hello PDUs listing area 49.0001 and 49.0002. The SUT lists TS1 as a neighbor. c. The SUT transmits Level 1 Hello PDUs listing area 49.0002. The SUT does not list TS1 as a neighbor.			

Test #	Level 2 Adjacency	Result	
		a	PASS
IS-IS.1.3		b	PASS
Purpose To verify that a Level 2 system will form adjacencies with other Level 2 systems regardless of Area-ID.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 2 IS-IS system in area 49.0001. IS-IS is started on the SUT. TS1 transmits a level 2 IIH PDU on network 0 in area 49.0001. Traffic is observed on network 0.</p> <p>b. IS-IS is restarted on the SUT. TS1 transmits a level 2 IIH PDU on network 0 in area 49.0002. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.2.3	
<p>a. The SUT lists TS1 as a neighbor.</p> <p>b. The SUT lists TS1 as a neighbor.</p>			

Test #	Same Level Adjacency	Result	
		a	PASS
IS-IS.1.4		b	PASS
Purpose: To verify that a system will only form adjacencies with other systems of the same level.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 IS-IS system in area 49.0001. IS-IS is started on the SUT. TS1 transmits a level 2 IIH PDU on network 0 in area 49.0001. Traffic is observed on network 0.</p> <p>b. The SUT is configured as a Level 2 IS-IS system. IS-IS is restarted on the SUT. TS1 transmits a level 1 IIH PDU on network 0 in area 49.0001. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.2	
<p>a. The SUT does not list TS1 as a neighbor.</p> <p>b. The SUT does not list TS1 as a neighbor.</p>			

Test #		Result	
IS-IS.1.5	Level 1-2 System Adjacency	a	PASS
		b	PASS
		c	PASS
Purpose: To verify a Level 1-2 system properly forms adjacencies with Level 1, Level 2, and other Level 1-2 systems.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1-2 IS-IS system in area 49.0001. IS-IS is started on the SUT. TS1 transmits a level 1 IIH PDU on network 0 in area 49.0001. Traffic is observed on network 0.</p> <p>b. IS-IS is restarted on the SUT. TS1 transmits a level 2 IIH PDU on network 0 in area 49.0001. Traffic is observed on network 0.</p> <p>c. IS-IS is restarted on the SUT. TS1 transmits level 1 and level 2 IIH PDUs on network 0 in area 49.0001. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.2	
<p>a. The SUT lists TS1 as a neighbor on Level 1, but not on Level 2.</p> <p>b. The SUT lists TS1 as a neighbor on Level 2, but not on Level 1.</p> <p>c. The SUT lists TS1 as a neighbor on Level 1 and Level 2.</p>			

Test #		Result	
IS-IS.1.6	Maximum Area Address	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that a Level 1 system properly forms adjacencies with other Level 1 systems based on Maximum Area Addresses.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 IS-IS system in area 49.0001. The Maximum Area Addresses field is set to 3 on the SUT. IS-IS is started on the SUT. TS1 transmits a level 1 IIH PDU on network 0 in area 49.0001, with the Maximum Area Addresses field set to 3. Traffic is observed on network 0.</p> <p>b. IS-IS is restarted on the systems. TS1 transmits a level 1 IIH PDU on network 0 in area 49.0001, with the Maximum Area Addresses field set to 5. Traffic is observed on network 0.</p> <p>c. The SUT is configured as a Level 2 IS-IS system. IS-IS is restarted on the SUT. TS1 transmits a level 2 IIH PDU on network 0 in area 49.0001, with the Maximum Area Addresses field set to 5. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.2.2 RFC 3719 – Section 3.2	
<p>a. The SUT lists TS1 as a neighbor.</p> <p>b. The SUT does not list TS1 as a neighbor.</p> <p>c. The SUT does not list TS1 as a neighbor.</p>			

Test #		Result	
IS-IS.1.7	IIH PDU Fields	a	PASS
		b	PASS
		c	PASS
		d	PASS
Purpose: To verify that a system's IIH PDUs contain the appropriate fields.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 IS-IS system in area 49.0001 with a System ID of 1111.2222.3333, a priority of 5, a maximum-area-address of 5, a hello-interval of 10 and a hello-multiplier of 4. IS-IS is started on the SUT. Traffic is observed on network 0.</p> <p>b. The SUT is configured as a Level 2 system, with a priority of 5, hello interval 10 and hello-multiplier 10. IS-IS is restarted on the SUT. Traffic is observed on network 0.</p> <p>c. The SUT is configured as a Level 1-2 system with priority 5, hello-multiplier 4 and hello interval 10 for levels 1 and 2. IS-IS is restarted on the SUT. Traffic is observed on network 0.</p> <p>d. TS1 transmits level 1 and level2 IIH PDUs on network 0, in area 49.0001 with the Maximum Area Addresses fields set to 5. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.2	
<p>a. The SUT's IIH PDU includes the following fields: the Circuit type set to Level 1 only, maximum-area-addresses set to 5, System ID set to 1111.2222.3333, Hold Timer set to 40, priority set to 5 and area address(es) set to 49.0001.</p> <p>b. The SUT's IIH PDU includes the following fields: the Circuit type set to Level 2 only, maximum-area-addresses set to 5, System ID set to 1111.2222.3333, Hold Timer set to 40, priority set to 5 and area address(es) set to 49.0001.</p> <p>c. The SUT's IIH PDUs includes the following fields: the Circuit type set to Level 1-2, maximum-area-addresses set to 5, System ID set to 1111.2222.3333, Hold Timer set to 40, priority set to 5 and area address(es) set to 49.0001.</p> <p>d. The SUT lists TS1 as a neighbor in the IS Neighbor field of all IIH PDUs.</p>			

Test #		Result	
IS-IS.1.8	ManualL2OnlyMode	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that a system properly sets the manualL2OnlyMode.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1-2 IS-IS system. Network 0's circuit type is set to Level 2 only. IS-IS is started on the SUT. Traffic is observed on network 0.</p> <p>b. Network 0's circuit type is set to Level 1-2. IS-IS is restarted on the SUT. Traffic is observed on network 0.</p> <p>c. The SUT is configured as a Level 1 IS-IS system. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Section 6.1	
<p>a. The SUT transmits Level 2 IIH PDUs, but not Level 1 IIH PDUs.</p> <p>b. The SUT transmits Level 1 and Level 2 IIH PDUs.</p> <p>c. The SUT transmits Level 1 IIH PDUS, but not Level 2 IIH PDUs</p>			

Test #		Result	
IS-IS.1.9	LAN IIH PDU Multi-Destination Address	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that an Intermediate System transmits its LAN IIH PDU to the correct multi-destination address, depending on the system's Level.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 IS-IS system. IS-IS is enabled on the SUT. TS1 transmits a level 1 IIH PDU on network 0 in area 49.0001. The MAC destination SNPA address in the SUT's LSP is observed.</p> <p>b. The SUT is configured as a Level 2 IS-IS system. IS-IS is restarted on the SUT. TS1 transmits a level 2 IIH PDU on network 0 in area 49.0001. The MAC destination SNPA address in the SUT's LSP is observed.</p> <p>c. The SUT is configured as a Level 1-2 IS-IS system. IS-IS is enabled on the SUT. TS1 transmits level 1 and level 2 IIH PDUs on network 0 in area 49.0001. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.2	
<p>a. The AllL1IS MAC destination SNPA address is 01:80:c2:00:00:14.</p> <p>b. The AllL1IS MAC destination SNPA address is 01:80:c2:00:00:15.</p> <p>c. The SUT transmits Level 1 LAN IIH PDUs to the AllL1IS address 01:80:c2:00:00:14 and Level 2 LAN IIH PDUs to the AllL2IS address 01:80:c2:00:00:15.</p>			

Test #		Result	
IS-IS.1.10	Reserved Circuit Type	a	PASS
		b	PASS
Purpose: To verify that an Intermediate System ignores IIH PDUs with reserved value circuit type.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 IS-IS system in area 49.0001. IS-IS is enabled on the SUT. TS1 transmits a level 1 IIH PDU on network 0 in area 49.0001, with the reserved bit specified. Traffic is observed on network 0.</p> <p>b. The SUT is configured as a Level 2 IS-IS system. IS-IS is restarted on the SUT. TS1 transmits a level 2 IIH PDU on network 0 in area 49.0001, with the reserved bit specified. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Sections 9.5 and 9.6	
<p>a. The SUT ignores the IIH PDU from TS1 and does not list TS1 as its adjacent neighbor.</p> <p>b. The SUT ignores the IIH PDU from TS1 and does not list TS1 as its adjacent neighbor.</p>			

Group 2: Timers

The following tests verify that an intermediate system properly sets timers defined in the ISO/IEC 10589.

Test #		Result	
IS-IS.2.1	ZeroAgeLifetime	a	PASS
Purpose: To verify that a system properly sets its ZeroAgeLifetime.			
Comments on Test Procedure			
a. Configure the SUT to have a priority of 1. IS-IS is enabled on the SUT. TS1 transmits PDUs to become DIS on network 0 and an LSP with remaining lifetime set to 49 seconds. Traffic is observed on network 0.			
Comments on Test Results		ISO/IEC 10589 - Section 7.3.21	
a. 1 minute (ZeroAgeLifetime) after the LSP with an expired header was transmitted by TS1, the SUT deletes the expired LSP from its database.			

Test #		Result	
IS-IS.2.2	MaximumLSPGenerationInterval	a	PASS
		b	PASS
		c	FAIL
Purpose: To verify that a system properly sets its MaximumLSPGenerationInterval.			
Comments on Test Procedure			
a. The SUT is configured as a Level 1 system with a minimumLSPGenerationInterval of 30 seconds and a maximumLSPGenerationInterval of 2 minutes. IS-IS is started on the SUT. TS1 transmits Level 1 PDUs to become adjacent with the SUT. Traffic is observed on network 0.			
b. The SUT is configured with a minimumLSPGenerationInterval of 25 seconds and a maximumLSPGenerationInterval of 1 minute. IS-IS is restarted on the SUT. TS1 transmits Level 2 PDUs to become adjacent with the SUT. Traffic is observed on network 0.			
c. The SUT is configured with a maximumLSPGenerationInterval of 25 minutes and a MaxAge of 20 minutes. Traffic is observed on network 0.			
Comments on Test Results		ISO/IEC 10589 – Sections 7.3.5 and 7.3.21	
a. The SUT transmits Link State PDUs at a rate of no less than 30 seconds and no more than 2 minutes.			
b. The SUT transmits Link State PDUs at a rate of no less than 25 seconds and no more than 1 minute.			
c. The SUT allows the maximumGenerationInterval to be greater than MaxAge.			
<p>According to Section 7.3.21 of ISO 10589, "MaxAge shall be larger than maximumLSPGenerationInterval, so that a system is not purged merely because of lack of events for reporting Link State PDUs."</p> <p>Therefore, the SUT should not have allowed the maximumGenerationInterval to be greater than MaxAge.</p>			

Test #		Result	
IS-IS.2.3	MinimumLSPGenerationInterval	a	PASS
Purpose: To verify that a system properly sets its MinimumLSPGenerationInterval.			
Comments on Test Procedure			
a. The SUT is configured as the Level 1 DIS on network 0 with a maximumLSPGenerationInterval of 30 seconds and a minimumLSPGenerationInterval of 5 seconds. IS-IS is started on the SUT. TS1 transmits Level 1 PDUs to become adjacent with the SUT. Traffic is observed on network 0.			
Comments on Test Results		ISO/IEC 10589 – Sections 7.3.15.5 and 7.3.21	
a. The SUT transmits Link State PDUs at a rate of no less than 5 seconds.			

Test #		Result	
IS-IS.2.4	CompleteSNPIInterval	a	PASS
Purpose: To verify that a system properly sets its CompleteSNPIInterval.			
Comments on Test Procedure			
a. The SUT is configured as the Level 1 DIS on network 0 with a CompleteSNPIInterval of 10 seconds. IS-IS is started on the SUT. TS1 transmits Level 1 PDUs to become adjacent with the SUT. Traffic is observed on network 0.			
Comments on Test Results		ISO/IEC 10589 – Section 7.3.21	
a. The SUT transmits periodic transmissions of a complete set of Sequence number PDUs every 10 seconds.			

Sample Report

Test #		Result	
IS-IS.2.5	Level n Intermediate System HoldingTime	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that a system properly purges a neighbor from its database and generates an adjacencyState-Change event when it does not hear from its neighbor within holding time.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 IS-IS system in area 49.0001, with an iSISHelloTimer interval of 10 seconds, ISISHoldingMultiplier of 10 and priority of 1. IS-IS is started on the SUT. TS1 transmits level 1 IIH PDUs with a holding time of 100 seconds and priority of 100, and level 1 LSPs to become DIS on network 0 and adjacent with the SUT. Traffic is observed on network 0.</p> <p>b. TS1 is disabled. Traffic is observed on network 0.</p> <p>c. The SUT is configured as a Level 2 IS-IS system in area 49.0002, with an iSISHelloTimer interval of 10 seconds, ISISHoldingMultiplier of 10 and priority of 1. IS-IS is started on the SUT. TS1 transmits level 2 IIH PDUs with a holding time of 100 seconds and priority of 100 and level 1 LSPs to become DIS on network 0 and adjacent with the SUT. Traffic is observed on network 0. IS-IS is disabled on TS1. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 - Section 8.4.2.5.2	
<p>a. The SUT transmits a Level 1 LAN IIH PDU with a Holding Time value of 100 seconds.</p> <p>b. Approximately 100 seconds after the SUT does not hear from TS1, the SUT purges TS1 from its database.</p> <p>c. The SUT transmits a Level 2 LAN IIH PDU with a value of 100 seconds. Approximately 100 seconds after the SUT does not hear from TS1, the SUT purges TS1 from its database.</p>			

Test #		Result	
IS-IS.2.6	Change in topology on the LAN	a	PASS
		Purpose: To verify that a system properly acquires proper information when a system is disabled on a LAN.	
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 IS-IS system in area 49.0001 with a Hello Timer of 10 seconds. The SUT is DIS on network 0. IS-IS is started on the SUT. TS1 and TS2 transmit level 1 IIH PDUs at 10 second intervals, and level 1 LSPs to become adjacent with the SUT. Traffic is observed on network 0. TS1 is disabled on network 0. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 – Section 8.4.6	
<p>a. After TS2 is disabled, the SUT sends a LSP to TS2 which does not include TS1 as a neighbor.</p>			

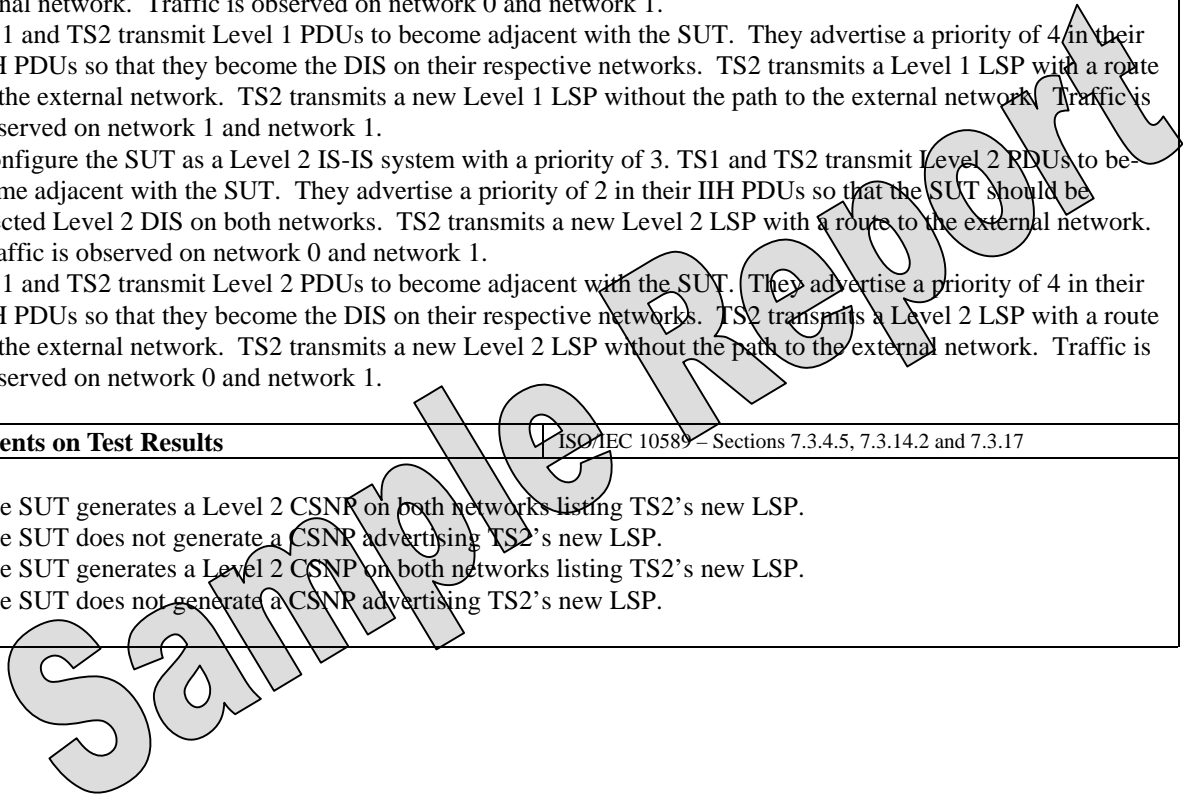
Group 3: PROTOCOL DATA UNIT

The following tests verify that a given system properly handles the receiving and transmitting of IS-IS Protocol Data Units (PDUs).

Test #	Result	
IS-IS.3.1	L1LSPBufferSize Mismatch	
	a	PASS
	b	PASS
	c	PASS
<p>Purpose: To verify that a system properly sets the ReceivedLSPBufferSize for its own interfaces allows proper setting of the originatingL1LSPBufferSize and drops any incoming packets with originatingL1LSPBufferSize greater than ReceivedLSPBufferSize.</p>		
<p>Comments on Test Procedure</p>		
<p>a. The SUT is a Level 1 IS-IS system with originatingL1LSPBufferSize 1492. IS-IS is started on the SUT. TS1 transmits PDUs to become adjacent with the SUT. TS1 transmits an LSP smaller in length than 1492. Traffic is observed on network 0.</p> <p>b. TS1 transmits an LSP with length equal to 1492. Traffic is observed on network 0.</p> <p>c. TS1 transmits an LSP with length greater than 1492. Traffic is observed on network 0.</p>		
<p>Comments on Test Results</p>		<p>ISO/IEC 10589 – Sections 7.3.4.2/7.3.14.2 and 7.3.15.1 RFC 3719 – Sections 5 (4)-(6) and 6</p>
<p>a. The SUT accepts the LSP from TS1</p> <p>b. The SUT accepts the LSP from TS1.</p> <p>c. The SUT discards the LSP from TS1.</p>		

Sample Report

Test #		Result	
IS-IS.3.2	Acknowledging LSPs	a	PASS
		b	PASS
		c	PASS
		d	PASS
Purpose: To verify that an Intermediate System properly acknowledges an incoming LSP.			
Comments on Test Procedure			
<p>a. The SUT is a Level 1 IS-IS system with a priority of 3. IS-IS is enabled on the systems. TS1 and TS2 transmit Level 1 PDUs to become adjacent with the SUT. They advertise a priority of 2 in their IIH PDUs so that the SUT should be elected Level 1 DIS on both networks. TS2 transmits a new Level 1 LSP with a route to an external network. Traffic is observed on network 0 and network 1.</p> <p>b. TS1 and TS2 transmit Level 1 PDUs to become adjacent with the SUT. They advertise a priority of 4 in their IIH PDUs so that they become the DIS on their respective networks. TS2 transmits a Level 1 LSP with a route to the external network. TS2 transmits a new Level 1 LSP without the path to the external network. Traffic is observed on network 1 and network 1.</p> <p>c. Configure the SUT as a Level 2 IS-IS system with a priority of 3. TS1 and TS2 transmit Level 2 PDUs to become adjacent with the SUT. They advertise a priority of 2 in their IIH PDUs so that the SUT should be elected Level 2 DIS on both networks. TS2 transmits a new Level 2 LSP with a route to the external network. Traffic is observed on network 0 and network 1.</p> <p>d. TS1 and TS2 transmit Level 2 PDUs to become adjacent with the SUT. They advertise a priority of 4 in their IIH PDUs so that they become the DIS on their respective networks. TS2 transmits a Level 2 LSP with a route to the external network. TS2 transmits a new Level 2 LSP without the path to the external network. Traffic is observed on network 0 and network 1.</p>			
Comments on Test Results			
ISO/IEC 10589 – Sections 7.3.4.5, 7.3.14.2 and 7.3.17			
<p>a. The SUT generates a Level 2 CSNP on both networks listing TS2's new LSP.</p> <p>b. The SUT does not generate a CSNP advertising TS2's new LSP.</p> <p>c. The SUT generates a Level 2 CSNP on both networks listing TS2's new LSP.</p> <p>d. The SUT does not generate a CSNP advertising TS2's new LSP.</p>			



Test #		Result	
IS-IS.3.3	Election of LAN Level 1 Level 2 Designated Intermediate System	a	PASS
		b	PASS
		c	PASS
		d	PASS
		e	PASS
		f	PASS
		g	PASS
		h	PASS
		i	PASS
Purpose: To verify that at system properly elects Level 1 and Level 2 systems.			
Comments on Test Procedure			
<p>a. The SUT a Level 1-2 IS-IS system with a hello interval of 5 seconds. IS-IS is enabled on the SUT. Traffic is observed on network 0.</p> <p>b. The SUT is configured with a priority of 3. TS1 transmits Level 1 IIH PDUs with a priority of 2. TS2 transmits Level 2 IIH PDUs with a priority of 2. Traffic is observed on network 0.</p> <p>c. The SUT is disabled. Traffic is observed on network 0.</p> <p>d. TS1 stops sending Level 1 IIH PDUs and begins sending Level 2 IIH PDUs with a priority of 1. TS1 and TS2 list TS2 as the DIS in their IIH PDUs. IS-IS is restarted on the SUT (still with a priority of 3). Traffic is observed on network 0.</p> <p>e. The SUT is disabled. TS1 and TS2 begin sending Level 1 IIH PDUs. TS1 lists a priority of 1 and TS2 lists a priority of 2. Both list TS2 as the DIS. IS-IS is restarted on the SUT. Traffic is observed on network 0.</p> <p>f. The SUT is configured with a priority of 1. IS-IS is restarted on the SUT. TS2 begins sending Level 2 IIH PDUs with a priority of 2. Traffic is observed on network 0.</p> <p>g. The SUT is configured with a priority of 3. IS-IS is restarted on the SUT. TS1 and TS2 begin transmitting Level 1 and Level 2 IIH PDUs respectively with priorities of 3 and a MAC source SNPA addresses lowering than the SUT. Traffic is observed on network 0.</p> <p>h. TS1 begins transmitting Level 1 IIH PDUs with a priority of 3 and MAC source SNPA address lower than the SUT. TS2 begins transmitting Level 1 IIH PDUs a priority of 3 and MAC source SNPA addresses higher than the SUT. Traffic is observed on network 0.</p> <p>i. TS1 begins transmitting Level 2 IIH PDUs with a priority of 3 and MAC source SNPA address lower than the SUT. TS2 begins transmitting Level 2 IIH PDUs a priority of 3 and MAC source SNPA addresses higher than the SUT. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 – Sections 7.2.3, 8.4.1 and 8.4.5	
<p>a. The SUT does not claim itself to be the LAN Level 1 or Level 2 DIS.</p> <p>b. The SUT becomes the Level 1 and Level 2 DIS after waiting for HelloTimer x 2 seconds. The SUT generates a Level 1 and a Level 2 pseudonode LSP containing neighbor adjacency information. A value of zero is used for all supported routing metrics.</p> <p>c. The SUT purges both of its Level 1 and Level 2 pseudonode LSPs with the Remaining Lifetime set to zero.</p> <p>d. The SUT is elected Level 2 DIS. The SUT generates Level 2 pseudonode LSPs containing neighbor adjacency information. A value of zero is used for all supporting routing metrics.</p> <p>e. The SUT is elected Level 1 DIS. The SUT generates a Level 1 pseudonode LSP containing neighbor adjacency information. A value of zero is used for all supporting routing metrics.</p> <p>f. TS1 is elected Level 1 DIS and TS2 is elected Level 2 DIS.</p> <p>g. The SUT is elected Level 1 and Level 2 DIS. The SUT generates Level 1 and Level 2 pseudonode LSPs containing neighbor adjacency information. A value of zero is used for all supported routing metrics.</p> <p>h. TS2 is elected Level 1 DIS. The SUT purges its Level 1 pseudonode LSPs with the Remaining Lifetime set to zero.</p> <p>i. TS2 is elected Level 2 DIS. The SUT purges its Level 2 pseudonode LSPs with the Remaining Lifetime set to zero.</p>			

Test #			Result
IS-IS.3.4	Multiple LSPs and LSPBufferSize		a PASS
Purpose: To verify that a system properly sets the ReceivedLSPBufferSize for its own interfaces, allows the proper setting of originatingL1LSPBufferSize and drops any incoming packets with originatingL1LSPBufferSize greater than ReceivedLSPBufferSize.			
Comments on Test Procedure			
a. The SUT is a Level 1-2 IS-IS system with an originatingL1LSPBufferSize set to 512, on both circuits, and advertising Level 2 routes into Level 1. IS-IS is started on the SUT. TS1 transmits Level 2 PDUs to become adjacent with the SUT on Network 0. TS2 transmits Level 1 PDUs to become adjacent with the SUT on Network 1. TS1 transmits a Level 2 LSP with a length greater than 512. Traffic is observed on network 0.			
Comments on Test Results		ISO/IEC 10589 – Sections 7.3.4.1 and 7.3.14.2	
a. The SUT sends two LSPs, to network 0, smaller in length than 512 to TS2 containing the routes advertised by TS1.			

Test #			Result
IS-IS.3.5	Neighbor not yet Adjacent		a PASS
			b PASS
			c PASS
			d PASS
Purpose: To verify that a system discards an LSP or SNP from a neighbor with which it has not exchanged hello packets and formed an adjacency.			
Comments on Test Procedure			
a. The SUT is a Level 1 IS-IS system. IS-IS is enabled on the SUT. TS1 transmits a Level 1 LSP to the network declaring itself as DIS and listing the SUT as an adjacent neighbor. Traffic is observed on network 0.			
b. TS1 transmits a Level 1 PSNP. Traffic is observed on network 0.			
c. The SUT is configured to be a Level 2 only IS-IS system. TS1 is a Level 2 only IS-IS system. IS-IS is enabled on the SUT. TS1 transmits an LSP declaring itself as DIS and listing the SUT as an adjacent neighbor. Traffic is observed on network 0.			
d. The SUT is configured to be a Level 1-2 IS-IS system. IS-IS is enabled on the SUT. TS1 transmits a Level 2 PSNP. Traffic is observed on network 0.			
Comments on Test Results		ISO/IEC 10589 – Sections 8.4.1 and 8.4.5	
a. The SUT does not acknowledge the LSP and does not list TS1 as an adjacent neighbor.			
b. The SUT does not respond to the PSNP transmitted by TS1.			
c. The SUT does not acknowledge the LSP and does not list TS1 as an adjacent neighbor.			
d. The SUT does not respond to the PSNP transmitted by TS1.			

Test #		Result	
IS-IS.3.6	Basic LSP Propagation	a	PASS
		b	PASS
Purpose: To verify that a system properly propagates Link State PDUs (LSPs) from within its Level 1 area.			
Comments on Test Procedure			
<p>a. The SUT configured as a Level 1-2 system with a priority of 3 on network 2, a priority of 2 on network 1 and a priority of 2 on network 0. The SUT's interfaces on networks 0 and 1 are configured as level 1 circuits and it's interface to network 2 as a level 2 only circuit. IS-IS is enabled on the SUT. TS2 transmits Level 1 PDUs on Network 1 and Level 2 PDUs on Network 2 to become adjacent with the SUT. TS2 has a priority of 1 in its IIH PDUs on Network 1 a priority of 2 on Network 2. Once the SUT has become adjacent with TS2, TS1 sends Level 1 PDUs as to become adjacent with the SUT on Network 0. TS1 has a priority of 3 in its IIH PDUs. Traffic is observed on all networks.</p> <p>b. IS-IS is restarted on the SUT. TS1 now has a priority of 1 in its IIH PDUs. After the SUT becomes adjacent with TS1 and TS2, TS1 stops sending IIH PDUs. Traffic is observed on all networks.</p>			
Comments on Test Results		ISO/IEC 10589 – Sections 7.3.2 and 7.3.15.1	
<p>a. The SUT transmits TS1's new LSP to network 1 but not to network 2.</p> <p>b. The SUT transmits a new pseudonode LSP no longer listing TS1 as a neighbor on network 0 to network 1, but not network 2.</p>			

Test #		Result	
IS-IS.3.7	Propagating Reachable Addresses	a	PASS
		b	PASS
Purpose: To verify that a system properly generates LSPs containing Reachable Address prefixes throughout the IS-IS domain.			
Comments on Test Procedure			
<p>a. The SUT is a Level 1-2 system as are all of its circuits. IS-IS is enabled on the SUT with a priority of 3 on all circuits. TS1, TS2, and TS3 transmit PDUs to become adjacent with the SUT on their respective networks. TS1 and TS2 advertise a priority of 4 in their Level 1 IIH PDUs and TS3 advertises a priority of 3 in its Level 2 IIH PDUs. TS1 and TS2 should become the DIS on Networks 0 and 1, respectively, and the SUT should become the DIS on Network 2. TS1 advertises a route to an external network. Once the systems have become adjacent, TS1 transmits a Level 1 LSP advertising the external network, but with a different cost. Traffic is observed on all networks.</p> <p>b. IS-IS is restarted on the SUT. TS1 now has a priority of 1 in its IIH PDUs. The SUT should become the DIS on Network 0. Once the systems have become adjacent, TS1 transmits a Level 1 LSP advertising the external network, but with a different cost. Traffic is observed on all networks.</p>			
Comments on Test Results		ISO/IEC 10589 – Sections 7.3.3.2 and 7.3.6 RFC 296 – Section 2.2 RFC 1195 – Section 3.2	
<p>a. After TS1 has transmitted a new LSP for the new metric to its reachable Address to network 0, the SUT transmits the LSP on networks 1 and 2.</p> <p>b. After TS1 has transmitted a new LSP for the new metric to its reachable Address to network 0, the SUT transmits the LSP on networks 1 and 2.</p>			

Test #		Result	
IS-IS.3.8	Level 1 Designated Intermediate System	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that a system properly behaves when declaring or resigning itself as Designated Intermediate System.			
Comments on Test Procedure			
<p>a. The SUT is a Level 1 IS-IS system with a priority of 5 on network 0. IS-IS is enabled on the SUT. TS1, TS2 and TS3 transmit Level 1 PDUs to become adjacent with the SUT. TS1, TS2, and TS3 advertise priorities of 4, 3, and 2 respectively in their IIH PDUs. Traffic is observed on network 0.</p> <p>b. The SUT is shutdown. Traffic is observed on network 0.</p> <p>c. IS-IS is restarted on the SUT. The SUT becomes the DIS. The SUT's priority is configured to be 1. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 – Sections 7.2.3, 7.2.8 and 8.4.5	
<p>a. The SUT becomes the Level 1 DIS after waiting 20 seconds. The SUT generates Level 1 pseudonode LSPs for the link to TS1, TS2 and TS3. A value of zero is used for all supported metrics.</p> <p>b. The SUT withdraws Level 1 pseudonode LSPs with Remaining Lifetime set to zero.</p> <p>c. The SUT withdraws Level 1 pseudonode LSPs with Remaining Lifetime set to zero.</p>			

Test #		Result	
IS-IS.3.9	Level 2 Only Designated Intermediate System	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that a system properly behaves when declaring or resigning itself as Designated Intermediate System.			
Comments on Test Procedure			
<p>a. The SUT is a Level 2 only IS-IS system with a priority of 5 on network 0. IS-IS is enabled on the SUT. TS1, TS2 and TS3 transmit Level 2 PDUs to become adjacent with the SUT. TS1, TS2, and TS3 advertise priorities of 4, 3, and 2 respectively in their IIH PDUs. Traffic is observed on network 0.</p> <p>b. The SUT is shutdown. Traffic is observed on network 0.</p> <p>c. IS-IS is restarted on the SUT. The SUT becomes the DIS. The SUT's priority is configured to be 1. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 – Sections 7.2.3, 7.3.10 and 8.4.5	
<p>a. The SUT becomes the Level 2 DIS after waiting for 40 seconds. The SUT generates Level 2 pseudonode LSPs for the link to TS1, TS2 and TS3. A value of zero is used for all supported routing metrics.</p> <p>b. The SUT withdraws Level 2 pseudonode LSPs with the Remaining Lifetime set to zero.</p> <p>c. The SUT withdraws Level 2 pseudonode LSPs with the Remaining Lifetime set to zero.</p>			

Test #	Result	
IS-IS.3.10	Link Failure on Level 1 Broadcast Subnetwork	a PASS
Purpose: Level 1 Designated Intermediate System detects a link failure.		
Comments on Test Procedure		
a. The SUT is a Level 1 Is-Is system., with a higher priority than TS1 and TS2.. IS-IS is enabled on the SUT. TS1 transmits Level 1 PDUs to become adjacent with the SUT. TS2 transmits Level 1 PDUs listing the SUT as a neighbor, but with in area 49.0003. Traffic is observed on network 0.		
Comments on Test Results		ISO/IEC 10589 – Section 7.2.4
a. The SUT does not list TS2 as a neighbor and only lists TS1 as a neighbor in its pseudonode LSP.		

Test #	Result	
IS-IS.3.11	Link Failure on Level 2 Only Broadcast subnetwork	a PASS
Purpose: Level 2 Designated Intermediate System detects a link failure.		
Comments on Test Procedure		
a. The SUT is a Level 2 only IS-IS system with a higher priority than TS1. IS-IS is enabled on the SUT. TS1 transmits Level 2 PDUs to become adjacent with the SUT. TS1 has a lower priority than the SUT in its IIIH PDUs. TS2 transmits Level 1 PDUs listing the SUT as a neighbor. Traffic is observed on network 0.		
Comments on Test Results		ISO/IEC 10589 – Section 7.2.4
a. The SUT does not list TS2 as a neighbor and only lists TS1 as the IS neighbor in its pseudonode LSPs.		

Sample Report

Test #		Result	
IS-IS.3.12	Multiple LSPs for the System	a	PASS
		b	FAIL
Purpose: To verify that a system does not process any LSPs in absence of LSPs with LSP Number zero and remaining lifetime >0.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 IS-IS system in area 49.0001. IS-IS is enabled on the SUT. TS1 transmits Level 1 PDUs to become adjacent with SUT. After the SUT and TS1 are neighbors, TS1 transmits multiple LSPs, none of which with LSP number 0. One of these LSPs contains a route to an external network. Traffic is observed on network 0.</p> <p>b. IS-IS is restarted on the SUT. After the SUT and TS1 become neighbors, TS1 transmits multiple Level 1 LSPs, one of which has an LSP number of 0 but with the remaining lifetime set to zero. One of these LSPs contains a route to an external network. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 – Section 7.2.5	
<p>a. The SUT does not install the path to the external network in its routing table.</p> <p>b. The SUT installs the path to the external network in its routing table.</p> <p>According to Section 7.2.5 of ISO 10589, <i>“If the LSP with LSP Number zero and remaining lifetime > 0 is not present for a particular system then the Decision Process shall not process any LSPs with non-zero LSP Number which may be stored for that system.”</i></p> <p>Therefore, the SUT should not have installed the route to the external network.</p>			

Sample Report

Group 4: ROUTE SELECTION AND DOMAIN WIDE PREFIX DISTRIBUTION

The following tests verify that a system properly calculates and selects routes internal and external to the IS-IS domain.

Test #		Result	
IS-IS.4.1	Internal and External Metrics	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that an Intermediate System correctly chooses between multiple routes to one network based on internal and external metrics.			
Comments on Test Procedure			
<p>a. The SUT is a Level 1 IS-IS system in area 49.0001. IS-IS is started on the SUT. TS1 and TS2 transmit Level 1 PDUs to become adjacent with the SUT. TS1 transmits an LSP with a path to an external network with an internal metric of 10. TS2 transmits an LSP with a path to the same external network with an external metric of 10. The SUT's routing table is observed.</p> <p>b. TS2 transmits a Level 1 LSP with a path to the external network with an external metric of 0. The SUT's routing table is observed.</p> <p>c. TS2 transmits a Level 1 LSP with a path to the external network with an internal metric of 0. The SUT's routing table is observed.</p>			
Comments on Test Results		ISO/IEC 10589 – Section 7.2.2	
<p>a. The SUT has a path to the external network with TS1 as the next hop.</p> <p>b. The SUT has a path to the external network with TS1 as the next hop.</p> <p>c. The SUT has a path to the external network with TS2 as the next hop.</p>			

Sample Report

Test #		Result	
IS-IS.4.2	Intra-Area Level 1 Routing	a	PASS
		b	PASS
Purpose: To verify that an Intermediate System taking part in level 1 routing, correctly chooses between multiple paths to a network within its area.			
Comments on Test Procedure			
<p>a. The SUT is a Level 1 IS-IS system in area 49.0001. IS-IS is started on the SUT. TS1 and TS2 transmit Level 1 PDUs to become adjacent with the SUT. TS1 and TS2 both transmit Level 1 LSPs advertising an internal path to Network 1 with metrics of 5 and 10 respectively. The SUT's routing table is observed.</p> <p>b. TS1 transmits a Level 1 LSP advertising its path to Network 1 with a metric of 15. The SUT's routing table is observed.</p>			
Comments on Test Results		ISO/IEC 10589 – Section 7.2.2	
<p>a. The SUT has a path to the external network with TS1 as the next hop.</p> <p>b. The SUT has a path to the external network with TS2 as the next hop.</p>			

Test #		Result	
IS-IS.4.3	Intra-Area Level 2 Routing	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that an Intermediate System taking part in level 2 routing, correctly chooses between multiple paths to a network within its area.			
Comments on Test Procedure			
<p>a. The SUT is a Level 1-2 IS-IS system. IS-IS is started on the SUT. TS1 transmits Level 1 PDUs to become adjacent with the SUT on Level 1. TS1 transmits a Level 1 LSP with advertising an internal path to Network 1 with a metric of 5. TS2 transmits PDUs to become adjacent with the SUT on Level 2. TS2 transmits a Level 2 LSP with advertising an internal path to Network 1 with a metric of 10. The SUT's routing table is observed.</p> <p>b. TS1 transmits a Level 1 LSP advertising its path to Network 1 with a metric of 15. The SUT's routing table is observed.</p> <p>c. IS-IS is restarted on the SUT. TS1 stops sending Level 1 PDUs and transmits Level 2 PDUs to become adjacent with the SUT. TS1 transmits a Level 2 LSP advertising its path to Network 1 with a metric of 15. The SUT's routing table is observed.</p>			
Comments on Test Results		ISO/IEC 10589 – Section 7.2.12.3	
<p>a. The SUT has a path to network 1 with TS1 as the next hop.</p> <p>b. The SUT has a path to network 1 with TS1 as the next hop.</p> <p>c. The SUT has a path to network 1 with TS2 as the next hop.</p>			

Test #		Result	
IS-IS.4.4	Equal Cost Routes	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that an Intermediate System properly handles equal cost paths to an external network.			
Comments on Test Procedure			
<p>a. The SUT is a Level 1 IS-IS system. IS-IS is started on the SUT. TS1 and TS2 transmit Level 1 PDUs to become adjacent with the SUT. TS1 and TS2 transmit Level 1 LSPs advertising an external network with an internal metric of 10. The SUT's routing table is observed.</p> <p>b. TS1 and TS2 transmit Level 1 LSPs with a path to the external network with an external metric set to 10. The SUT's routing table is observed.</p> <p>c. TS1 and TS2 transmit Level 1 LSPs advertising an internal path to network 1 with a cost of 10. The SUT's routing table is observed.</p>			
Comments on Test Results		ISO/IEC 10589 – Appendix C.2	
<p>a. The SUT has two paths to the external network with TS1 and TS2 as next hops.</p> <p>b. The SUT has two paths to the external network with TS1 and TS2 as next hops.</p> <p>c. The SUT has two paths to network 1 with TS1 and TS2 as the next hops.</p>			

Test #		Result	
IS-IS.4.5	Level 1 to Level 2 PDU Transmission	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that a system properly transmits internal and external Level 1 PDUs into the Level 2 area.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 2 IS-IS system in area 49.0002 with metric 2 on network 1. IS-IS is started on the systems. TS1 transmits Level 2 PDUs to become adjacent with the SUT on Network 0. TS2 transmits Level 1 PDUs to become adjacent with the SUT on Network 1. TS2 transmits an LSP advertising a path to Network 2 with a metric of 1. Traffic is observed on network 0.</p> <p>b. TS2 stops transmitting PDUs on Network 1. Traffic is observed on network 0.</p> <p>c. TS2 transmits Level 1 PDUs to become adjacent with the SUT on Network 1 once again. TS2 transmits an LSP advertising a path to an external network (2.2.2.0/24). Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 – Appendix C.2	
<p>a. The SUT transmits an LSP to network 0, with the up/down bit set to 0 (up) for all routes, advertising routes to network 1 and network 2, with metrics of 2 and 3 respectively. These are advertised in Internal Reachability (TLV 128).</p> <p>b. The SUT transmits an LSP to network 0 with the up/down bit set to 0 (up) for its route to network 1 but without a route to network 2.</p> <p>c. The SUT transmits an LSP to network 0, advertising an external route to network 2.2.2.0 with the up/down bit set to 0 (up). This is advertised in External Reachability (TLV130).</p>			

Test #	Result	
IS-IS.4.6	Level 2 to Level 1 PDU Transmission	a PASS
		b PASS
		c PASS
Purpose: To verify that an Intermediate System properly transmits internal and external Level 2 PDUs into the Level 1 area.		
Comments on Test Procedure		
<p>a. The SUT is a Level 1-2 IS-IS system with a metric of 2 on network 1. The SUT is configured to advertise Level 2 routes into Level 1. IS-IS is started on the SUT. TS1 transmits Level 1 PDUs to become adjacent with the SUT on Network 0. TS2 transmits Level 2 PDUs to become adjacent with the SUT on Network 1. TS2 transmits a Level 2 LSP advertising a path to Network 2 with a metric of 1. Traffic is observed on network 0.</p> <p>b. TS2 stops transmitting PDUs on Network 1. Traffic is observed on network 0.</p> <p>c. TS2 transmits Level 2 PDUs to become adjacent with the SUT on Network 1 once again. TS2 transmits a Level 2 LSP advertising a path to an external network (2.2.2.0/24). Traffic is observed on network 0.</p>		
Comments on Test Results	RFC 2966 – Sections 2 and 3.1 ISO/IEC 10589 – Sections 7.3.3.2 and 7.3.4.5	
<p>a. The SUT transmits LSPs to network 0, with the up/down bit set to 1 (down), advertising routes to network 1 and network 2, with metrics of 2 and 3 respectively. These are advertised in Internal Reachability (TLV 128)</p> <p>b. The SUT transmits LSPs to network 0 with the up/down bit set to 1 (down), with a route to network 1, but without a route to network 2, unless the SUT originated a separate LSP for Network 2. In that case, that LSP is reissued with a remaining lifetime of 0.</p> <p>c. The SUT transmits an LSP to network 0 with the up/down bit set to 1 (down), advertising an external route to network 2.2.2.0. This is advertised in External Reachability.</p>		

Test #	Result	
IS-IS.4.7	Level 2 to Level 1 Route Calculation	a PASS
		b PASS
Purpose: To verify that an Intermediate System properly transmits internal Level 2 PDUs into the Level 1 area, and calculates the shortest path through the IS-IS domain.		
Comments on Test Procedure		
<p>a. The SUT is a Level 1 IS-IS system with metric 1 on network 1. IS-IS is started on the SUT. TS1 and TS2 transmit Level 1 PDUs to become adjacent with the SUT on Network 1. TS1 and TS2 transmit Level 1 LSPs advertising a path to Network 0 with the up/down bit set to 1(down) and metrics of 2 and 3 respectively. The SUT's routing table is observed.</p> <p>b. TS1 transmits a Level 1 LSP with a path to Network 0 with the up/down bit set to 1(down) and a metric of 6. The SUT's routing table is observed.</p>		
Comments on Test Results	RFC 2966 – Section 3.1 (5), RFC 1195 – Section 3.10.1 and ISO/IEC 10589 – Section 7.2.12.2	
<p>a. The SUT has a route to network 0 through TS1.</p> <p>b. The SUT has a route to network 0 through TS2.</p>		

Test #		Result	
IS-IS.4.8	External vs. Internal Route Preference	a	PASS
		b	PASS
Purpose: To verify that an Intermediate System properly chooses between external and internal route types to the same destination.			
Comments on Test Procedure			
<p>a. The SUT is a Level 1 IS-IS system with metric 1 on network 0. IS-IS is started on the SUT. TS1 and TS2 transmit Level 1 PDUs to the SUT to become adjacent on Network 0. TS1 transmits a Level 1 LSP with a path to external network 2.2.2.0/24 with an internal metric of 3 and the up/down bit set to down. TS2 transmits a Level 1 LSP with a path to external network 2.2.2.0/24 with an internal metric of 5 and the up/down bit set to up. The SUT's routing table is observed.</p> <p>b. The SUT is a Level 2 IS-IS system with metric 1 and priority of 1, on network 0. IS-IS is restarted on the SUT. TS1 and TS2 transmit Level 2 PDUs to become adjacent with the SUT on Network 0. TS1 transmits a Level 2 LSP with a path to external network 2.2.2.0/24 with an internal metric of 3 and the up/down bit set to up. TS2 advertises a path to transmits a Level 2 LSP with a path to external network 2.2.2.0/24 with an internal metric of 5 and the up/down bit set to up. The SUT's routing table is observed.</p>			
Comments on Test Results		RFC 2966 – Section 3.2	
<p>a. The SUT has a route to the external network through TS2.</p> <p>b. The SUT has a route to the external network through TS1.</p>			

Test #		Result	
IS-IS.4.9	Up/Down Bit	a	PASS
Purpose: To verify that a Level 2 system properly handles LSPs advertising routes with the up/down bit set to down.			
Comments on Test Procedure			
<p>a. The SUT is a Level 2 IS-IS system in area 49.0002. IS-IS is started on the SUT. TS1 transmits PDUs to become adjacent with the SUT. TS1 transmits a Level 2 LSP advertising a route with the up/down bit set to down. Traffic is observed on network 0.</p>			
Comments on Test Results		RFC 2966 – Sections 3.1 and 3.3	
<p>a. The SUT ignores the up/down bit and accepts the prefixes advertised in the Level 2 LSP.</p>			

Group 5: AUTHENTICATION, CONFIGURATION AND FORMATTING

The following tests verify that a system properly implements HMAC-MD5 authentication and allows for the proper configuration of administrative values.

Test #		Result	
IS-IS.5.1	HMAC-MD5 Authentication	a	PASS
		b	PASS
		c	PASS
		d	PASS
Purpose: To verify that an Intermediate System properly transmits HMAC-MD5 authentication.			
Comments on Test Procedure			
<ul style="list-style-type: none"> a. The SUT is a Level 1-2 only IS-IS system using HMAC-MD5 authentication. TS1 is a Level 1-2 IS-IS system. IS-IS is enabled on the SUT. Traffic is observed on network 0. b. TS1 is enabled and using HMAC-MD5 with the same key and text password as the SUT. Traffic is observed on network 0. c. The SUT is configured with a different HMAC-MD5 key and text than those for TS1. IS-IS is restarted on the systems. Traffic is observed on network 0. d. Authentication is disabled on the SUT. IS-IS is restarted on the systems. Traffic is observed on network 0. 			
Comments on Test Results			
<ul style="list-style-type: none"> a. The SUT should send an LSP with the TLV set to 10 and length field in the TLV set to 17, authentication type set to 54 and the length set to 16. b. The SUT and TS1 should become neighbors. c. The SUT and TS1 should not become neighbors. d. The SUT and TS1 should not become neighbors. 			

Sample Report

Test #	Cleartext Authentication	Result	
		a	PASS
		b	PASS
		c	PASS
Purpose: To verify that an intermediate system properly implements cleartext authentication.			
Comments on Test Procedure			
<p>a. The SUT is configured as a level 1-2 system using cleartext authentication with the same key as TS1. TS1 is a Level 1-2 system using cleartext authentication. IS-IS is enabled on the systems. Traffic is observed on network 0.</p> <p>b. The SUT is configured with a different key than TS1. IS-IS is restarted on the systems. Traffic is observed on network 0.</p> <p>c. Authentication is disabled on TS1. IS-IS is restarted on the systems. Traffic is observed on network 0.</p>			
Comments on Test Results		ISO/IEC 10589 – Section 8.4.2.1	
<p>a. The SUT and TS1 become neighbors.</p> <p>b. The SUT and TS1 do not become neighbors.</p> <p>c. The SUT and TS1 do not become neighbors.</p>			

Test #	Area-wide Authentication	Result	
		a	PASS
		b	PASS
		c	PASS
Purpose: To verify that an intermediate system properly implements area-wide authentication.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 1 system with area-wide authentication. TS1 is a Level 1 system without area-wide authentication enabled. IS-IS is started on the systems. TS1 advertises a route to an external network. The SUT's routing table is observed.</p> <p>b. Area-wide authentication is enabled on TS1 with the same authentication type and key as the SUT. IS-IS is restarted on the systems. TS1 re-advertises its route to the external network. The SUT's routing table is observed.</p> <p>c. TS1 has a different authentication key than the SUT. IS-IS is restarted on the systems. TS1 re-advertises its route to the external network. The SUT's routing table is observed.</p>			
Comments on Test Results		ISO/IEC 10589 – Section 7.3.15.1	
<p>a. The SUT should not install the route from TS1.</p> <p>b. The SUT should install the route from TS1.</p> <p>c. The SUT should not install the route from TS1.</p>			

Test #		Result	
IS-IS.5.4	Domain-Wide Authentication	a	PASS
		b	PASS
		c	PASS
Purpose: To verify that an Intermediate System properly implements domain-wide authentication.			
Comments on Test Procedure			
<p>a. The SUT is configured as a Level 2 system with domain-wide authentication. TS1 is a Level 2 system without domain-wide authentication enabled. IS-IS is started on the systems. TS1 advertises a route to an external network. The SUT's routing table is observed.</p> <p>b. Domain-wide authentication is enabled on TS1 with the same authentication type and key as the SUT. IS-IS is restarted on the systems. TS1 re-advertises its route to the external network. The SUT's routing table is observed.</p> <p>c. TS1 has a different authentication key than the SUT. IS-IS is restarted on the systems. TS1 re-advertises its route to the external network. The SUT's routing table is observed.</p>			
Comments on Test Results		ISO/IEC 10589 – Section 7.3.15.1	
<p>a. The SUT should not install the route from TS1.</p> <p>b. The SUT should install the route from TS1.</p> <p>c. The SUT should no install the route from TS1.</p>			

Test #		Result	
IS-IS.5.5	Global Parameters	a	PASS
		b	PASS
		c	PASS
		d	PASS
Purpose: To verify that the global parameters listed below are configurable.			
Comments on Test Procedure			
a-d. All tests in this section are implicitly tested by other tests. They are here only as a checklist.			
Comments on Test Results		ISO/IEC 10589 – Sections 7.2.10 and 7.2.10.1 RFC 3719 – Section 3.2	
<p>a. The Area(s) are configurable on the SUT.</p> <p>b. The IS-Type is configurable on the SUT.</p> <p>c. The LSP Buffer Size is configurable on the SUT.</p> <p>d. The Maximum Area Addresses is configurable on the SUT.</p>			

Test #		Result	
IS-IS.5.6	Interface Parameters	a	PASS
		b	PASS
		c	PASS
		d	PASS
		e	PASS
Purpose: To verify that the interface parameters listed below are configurable.			
Comments on Test Procedure			
a-e. All tests in this section are implicitly tested by other tests. They are here only as a checklist.			
Comments on Test Results		ISO/IEC 10589 – Sections 7.2.10 and 7.2.10.1	
<ul style="list-style-type: none"> a. The Interface output cost is configurable on the SUT. b. The Priority is configurable on the SUT. c. The Hello Time is configurable on the SUT. d. The Hello Multiplier is configurable on the SUT. e. The Circuit Type is configurable on the SUT. 			

Sample Report