

## **Moonv6 Test Suite**

*Intermediate System to Intermediate System  
(IS-IS) Interoperability Test Suite*

**Technical Document**

Revision 0.1



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# MODIFICATION RECORD

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## **ACKNOWLEDGEMENTS**

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Tim Winters	University of New Hampshire
Sergio Catanzariti	France Telecom
Yann Adam	France Telecom

# INTRODUCTION

## Overview

The University of New Hampshire's InterOperability Laboratory (IOL) is an institution designed to improve the interoperability of standards-based products by providing an environment where a product can be tested against other implementations of a standard. This suite of tests has been developed to help implementers evaluate the functioning of their Internet Protocol, version 6 MPLS Provider Edge IPv6 capable products. The tests do not determine if a product conforms to the IPv6 or MPLS specifications, nor are they purely interoperability tests. Rather, they provide one method to isolate problems within a device. Successful completion of all tests contained in this suite does not guarantee that the tested device will interoperate with other IPv6 devices. However, combined with satisfactory operation in the IOL's semi-production environment, these tests provide a reasonable level of confidence that the Device Under Test will function well in many multi-vendor IPv6 environments.

## Acronyms

**RUT:** Router Under Test

**TR:** Testing Router

**G:** Traffic Generator

**RT:** Route Target

**RD:** Route Distinguisher

When several entities of the same type are present in a test configuration, a number is appended to the acronym to yield a label for each entity. For example, if there were three testing routers in the test configuration, they would be labeled G1, G2 and G3.

## TEST ORGANIZATION

This document organizes tests by group based on related test methodology or goals. Each group begins with a brief set of comments pertaining to all tests within that group. This is followed by a series of description blocks; each block describes a single test. The format of the description block is as follows:

- Test Label:** The test label and title comprise the first line of the test block. The test label is composed by concatenating the short test suite name, the group number, and the test number within the group, separated by periods. The Test Number is the group and test number, also separated by a period. So, test label ISIS.1.2 refers to the second test of the first test group in the IS-IS test suite. The test number is 1.2.
- Purpose:** The Purpose is a short statement describing what the test attempts to achieve. It is usually phrased as a simple assertion of the feature or capability to be tested.
- References:** The References section lists cross-references to the specifications and documentation that might be helpful in understanding and evaluating the test and results.
- Resource Requirements:** The Resource Requirements section specifies the software, hardware, and test equipment that will be needed to perform the test.
- Discussion:** The Discussion is a general discussion of the test and relevant section of the specification, including any assumptions made in the design or implementation of the test as well as known limitations.
- Test Setup:** The Test Setup section describes the configuration of all devices prior to the start of the test. Different parts of the procedure may involve configuration steps that deviate from what is given in the test setup. If a value is not provided for a protocol parameter, then the protocol's default is used for that parameter.
- Procedure:** This section of the test description contains the step-by-step instructions for carrying out the test. These steps include such things as enabling interfaces, unplugging devices from the network, or sending packet from a test station. The test procedure also cues the tester to make observations, which are interpreted in accordance with the observable results given for that test part.
- Observable Results:** This section lists observable results that can be examined by the tester to verify that the RUT is operating properly. When multiple observable results are possible, this section provides a short discussion on how to interpret them. The determination of a pass or fail for each test is usually based on how the RUT's behavior compares to the results described in this section.
- Possible Problems:** This section contains a description of known issues with the test procedure, which may affect test results in certain situations.

## REFERENCES

The following documents are referenced in this text:

- [IPv6-SPEC] Hinden, R., S. Deering, Internet Protocol, Version 6 (IPv6) Specification, RFC 2460, December 1998.
- [MTISIS] Przygienda, T., Naiming Shen, Nischal Sheth, "M-ISIS: Multi Topology (MT) Routing in IS-IS" draft-ietf-isis-wg-multi-topology-06.txt.

## Test ISIS.1.1: ISIS HELLO with Multi-Topology

**Purpose:** To verify that a router properly transmits ISIS Hello

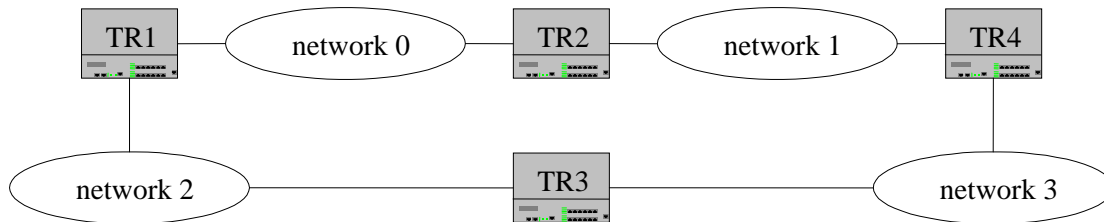
**References:**

- draft-ietf-isis-wg-multi-topology-02

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**Test Setup:**

- Network 0 has an IPV4 prefix of “X”.
- Network 0 has an IPV6 prefix of “A”.
- Network 1 has an IPV4 prefix of “Y”.
- Network 1 has an IPv6 prefix of “B”.
- Network 2 has an IPv4 prefix of “C”.
- Network 3 has an IPv4 prefix of “D”.
- TR1 has a metric of 20 to TR2 on network 0.
- TR2 has a metric of 10 to TR4 on network 1.
- TR1 has a metric of 10 to TR3 on network 2.
- TR3 has a metric of 10 to TR4 on network 3.



**Procedure:**

1. Enable ISIS on all routers.
2. Configure all the routers to use MT capability.
3. Observe all the packets transmitted on all networks.

**Observable Results:**

- All routers should transmit ISIS HELLO messages advertising MT capability using the MT TLV.

**Possible Problems:** Routers may not support Multi-Topology.

## Test ISIS.1.2: ISIS LSP with Multi-Topology

**Purpose:** To verify that a router properly transmits ISIS LSP with MT capability.

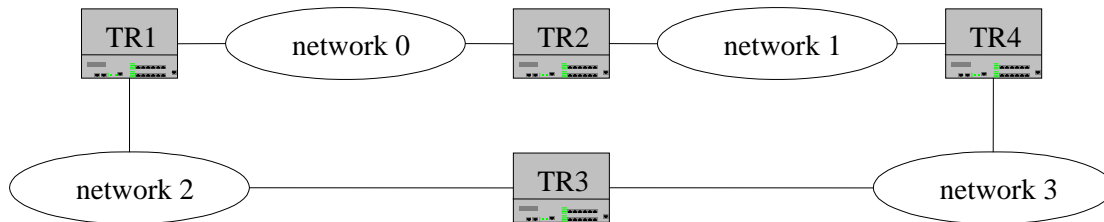
### References:

- draft-ietf-isis-wg-multi-topology-02

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### Test Setup:

- Network 0 has an IPV4 prefix of “X”.
- Network 0 has an IPV6 prefix of “A”.
- Network 1 has an IPV4 prefix of “Y”.
- Network 1 has an IPv6 prefix of “B”.
- Network 2 has an IPv4 prefix of “C”.
- Network 3 has an IPv4 prefix of “D”.
- TR1 has a metric of 20 to TR2 on network 0.
- TR2 has a metric of 10 to TR4 on network 1.
- TR1 has a metric of 10 to TR3 on network 2.
- TR3 has a metric of 10 to TR4 on network 3.



### Procedure:

1. Enable ISIS on all routers.
2. Configure all routers to use MT capability.
3. Configure all routers to have a MaximumLSPGenerationInterval of 5 minutes.
4. Observe all the packets transmitted on all networks.

### Observable Results:

- TR1, TR2, and TR4 should transmit LSP packets with MT TLV, MT reachability TLV and MT reachable IPV6 prefixes on network 0 and network 1.
- TR3 should transmit LSP packets with MT TLV and MT reachability TLV.

**Possible Problems:** Routers may not support Multi-Topology.

### Test ISIS.1.3: ISIS Multi-Topology

**Purpose:** To verify that a router properly routes IPv4 packets and IPv6 packets over ISIS.

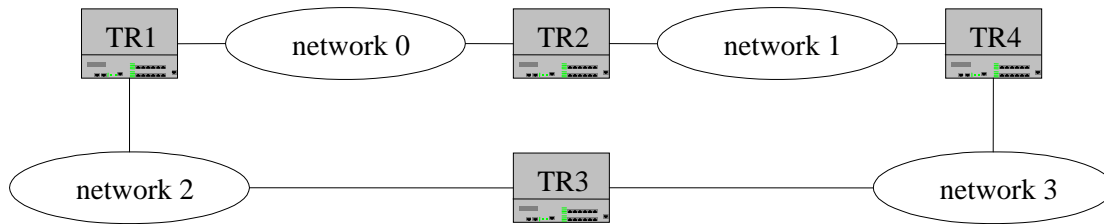
**References:**

- draft-ietf-isis-wg-multi-topology-02

**Last Modification:** February 27, 2004

**Test Setup:**

- Network 0 has an IPV4 prefix of “X”.
- Network 0 has an IPV6 prefix of “A”.
- Network 1 has an IPV4 prefix of “Y”.
- Network 1 has an IPV6 prefix of “B”.
- Network 2 has an IPV4 prefix of “C”.
- Network 3 has an IPV4 prefix of “D”.
- TR1 has a metric of 20 to TR2 on network 0.
- TR2 has a metric of 10 to TR4 on network 1.
- TR1 has a metric of 10 to TR3 on network 2.
- TR3 has a metric of 10 to TR4 on network 3.



**Procedure:**

1. Enable ISIS on all routers.
2. Configure all the routers to use MT capability.
3. TR1 tracesroutes TR4 using IPv4.
4. TR1 tracesroutes TR4 using IPv6.
5. Observe all the packets transmitted on all networks.

**Observable Results:**

- The IPv4 traceroute should travel on network 0 through TR2 onto network 1.
- The IPv6 traceroute should travel on network 2 through TR3 onto network 3.

**Possible Problems:** Routers may not support Multi-Topology.