IPv4 CONSORTIUM

RIPv2 Interoperability Test Report Revision 1.1

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Mr(s). Vendor,

Enclosed are the results from the Routing Information Protocol (RIP) testing performed on:

RUT HERE. Identified as “SHORT RUT HERE” MAC Address 01-02-03-04-05-06 s/n 1234567. Console “system” command reports software version 1.2.3.

This testing pertains to a set of RIP requirements, put forth in RFCs 2453 and 2082. The tests performed are part of the RIP Interoperability Test Suite, which can be found at:

ftp://public.iol.unh.edu/pub/ipv4/testsuites/RIP_Interop_Description.pdf

During the testing process, the following issues were uncovered:

Test #	Result
RIP_INTEROP 1.4 c:	The RUT did not learn new routes after being disconnected from a network.

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 techniciana@iol.unh.edu or by phone at +1-603-862-3941.

Regards,

Technicnan A

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The following table contains possible results and their meanings. If a test passes, the RUT passes with all test routers involved. If the test fails, the report will indicate the test router(s) that the failure involved.

Result	Interpretation
PASS	No Interoperability problems were discovered with any Test Routers.
FAIL	Interoperability problems were encountered with certain Test Routers. This resulted in undesirable behavior.
N/S	Not Supported. This test was not run due to features not implemented on the RUT.
N/T	Not tested. The specified behavior cannot be tested due to a(n) (un)related failure.
NOTE	Interoperability problems were encountered with certain Test Routers, which did not necessarily result in undesirable behavior being demonstrated.

The following devices were tested against:

TR1	TR2	TR3

Test #	
Test RIP_INTEROP.1.1	**Route Origination**
Purpose To verify that a router correctly communicates RIP routes to other routers on the link.	
Comments on Test Procedure	
a. Allow the RIP Protocol to configure. Check TR2's routing table. b. TN1 transmits a UDP Packet with destination equal to the IP address of TN4 to the hardware address of TR2. c. TN1 transmits a UDP Packet with destination equal to the IP address of TN3 to the hardware address of TR2. d. TN1 transmits a UDP Packet with destination equal to the IP address of TN2 to the hardware address of TR2. e. TN1 transmits a UDP Packet with destination equal to the IP address of TN2 to the hardware address of TR2. f. TN1 transmits a UDP Packet with destination equal to the IP address of TN2 to the hardware address of TR2.	
Comments on Test Results	RFC 2453 – Sections 3 and 4 RFC 1812 – Section 5.2
a. PASS: TR2 had the following routes: ▪ Default, NH TR1 (N2), Metric 3 ▪ N5/24, NH TR1 (N2), Metric 2 ▪ TN2/32, NH TR1 (N2), Metric 2 b. PASS: TR1 forwarded the UDP Packet to Station 3 (N3). c. PASS: TR1 forwarded the UDP Packet to Station 2 (N3). d. PASS: TR1 forwarded the UDP Packet to Station 1 (N2). e. PASS: TR1 forwarded the UDP Packet directly to Station 3 (N3). f. PASS: TR1 forwarded the UDP Packet to Station 2 (N3).	

Test #	
Test RIP_INTEROP.1.2	**Route Learning and Propagation**
Purpose To verify that a router correctly learns RIP routes from other routers and propagates them.	
Comments on Test Procedure	
a. Allow the RIP Protocol to configure. Check TR1's routing table. Observe the RIP packets sent by TR1 on N1. b. TN1 transmits a UDP Packet with destination equal to the IP address of TN4 to the hardware address of the TR1. c. TN1 transmits a UDP Packet with destination equal to the IP address of TN3 to the hardware address of the TR1. d. TN1 transmits a UDP Packet with destination equal to the IP address of TN2 to the hardware address of the TR1. e. TN1 transmits a UDP Packet with destination equal to the IP address of TN2 to the hardware address of the TR1.	
Comments on Test Results	RFC 2453 – Sections 3 and 4 RFC 1812 – Section 5.2
a. PASS: TR1 had the following routes: ▪ Default, NH TR2 (N2), Metric 3 ▪ N4/24, NH Station 1 (N2), Metric 2 ▪ N5/24, NH TR2 (N2), Metric 2 b. PASS: TR1 forwarded the UDP Packet to TR1 (N2). c. PASS: TR1 forwarded the UDP Packet to TR1 (N2). d. PASS: TR1 forwarded the UDP Packet to Station 1 (N2). e. PASS: TR1 forwarded the UDP Packet to TR1 (N2).	

Test #	
Test RIP_INTEROP.1.3	**Message Authentication**
Purpose To verify that a router correctly performs RIP simple text and MD5 message authentication.	
Comments on Test Procedure	

a. Configure TR1 to use simple text authentication, with password ABCDEFGH. Enable RIP on the TR1. TN2 and TN3 transmit Echo Requests destined for TN1 to the hardware address of TR2 and TR3 respectively. TN1 transmits Echo Requests destined for TN2 and TN3 to the hardware address of TR1.
b. Disable RIP on the TR1. Configure TR2 and TR3 to use simple text authentication, with password ABCDE-FGI. Enable RIP on the TR1. TN2 and TN3 transmit Echo Requests destined for TN1 to the hardware address of TR2 and TR3 respectively. TN1 transmits Echo Requests destined for TN2 and TN3 to the hardware address of TR1.
c. Disable RIP on TR1. Configure TR2 and TR3 to use simple text authentication, with password ABCDEFGH. Enable RIP on TR1. TN2 and TN3 transmit Echo Requests destined for TN1 to the hardware address of TR2 and TR3 respectively. TN1 transmits Echo Requests destined for TN2 and TN3 to the hardware address of TR1.
d. Disable RIP on TR1. Disable authentication on TR2 and TR3. Wait for any routes learned in Parts A through C to expire. Configure the TR1 to use MD5 authentication, with password ABCDEFGH. Enable RIP on the TR1. TN2 and TN3 transmit Echo Requests destined for TN1 to the hardware address of TR2 and TR3 respectively. TN1 transmits Echo Requests destined for TN2 and TN3 to the hardware address of TR1.
e. Disable RIP on TR1. Configure TR2 and TR3 to use MD5 authentication, with password ABCDEFGI. Enable RIP on TR1. TN2 and TN3 transmit Echo Requests destined for TN1 to the hardware address of TR2 and TR3 respectively. TN1 transmits Echo Requests destined for TN2 and TN3 to the hardware address of TR1.
f. Disable RIP on TR1. Configure TR2 and TR3 to use MD5 authentication, with password ABCDEFGH. Enable RIP on TR1. TN2 and TN3 transmit Echo Requests destined for TN1 to the hardware address of TR2 and TR3 respectively. TN1 transmits Echo Requests destined for TN2 and TN3 to the hardware address of TR1.
g. Disable RIP on TR1. Wait for any routes learned in Parts D through F to expire. Configure TR1 to use simple text authentication, with password ABCDEFGH. Enable RIP on TR1. TN2 and TN3 transmit Echo Requests destined for TN1 to the hardware address of TR2 and TR3 respectively. TN1 transmits Echo Requests destined for TN2 and TN3 to the hardware address of TR1.

Comments on Test Results	RFC 2453 – Sections 3 and 4 RFC 1812 – Section 5.2 RFC 2082 – Sections 3.2 and 5

a. PASS: The TR1, TR2, and TR3 did not learn routes from each other, with the exception that TR2 and TR3 learned each other's routes. The Echo Requests sent by TN2 and TN3 did not reach TN1, as TR2 and TR3 did not have valid route to those networks. Similarly, the Echo Requests sent by TN1 did not reach TN2 or TN3.
b. PASS: The TR1, TR2, and TR3 did not learn routes from each other, with the exception that TR2 and TR3 learned each other's routes. The Echo Requests sent by TN2 and TN3 did not reach TN1, as TR2 and TR3 did not have valid route to those networks. Similarly, the Echo Requests sent by TN1 did not reach TN2 or TN3.
c. PASS: TR1, TR2, and TR3 learned routes from each other. The Echo Requests sent by TN2 and TN3 reached TN1, and Echo Requests sent by TN1 should reach TN2 and TN3. The TTL of each packet was the same of the initial packet minus 2 when it arrived at its destination.
d. PASS: The TR1, TR2 and TR3 did not learn routes from each other, with the exception that TR2 and TR3 learned each other's routes. The Echo Requests sent by TN2 and TN3 did not reach TN1, as TR2 and TR3 did not have a valid route to those networks. Similarly, the Echo Requests sent by TN1 did not reach TN2 or TN3.
e. PASS: The TR1, TR2 and TR3 did not learn routes from each other, with the exception that TR2 and TR3 learned each other's routes. The Echo Requests sent by TN2 and TN3 did not reach TN1, as TR2 and TR3 did not have valid route to those networks. Similarly, the Echo Requests sent by TN1 did not reach TN2 or TN3.
f. PASS: TR1, TR2, and TR3 learned routes from each other. The Echo Requests sent by TN2 and TN3 reached TN1, and Echo Requests sent by TN1 reached TN2 and TN3. The TTL of each packet was the same of the ini-

tial packet minus 2 when it arrived at its destination.

g. PASS: The TR1, TR2, and TR3 did not learn routes from each other, with the exception that TR2 and TR3 learned each other's routes. The Echo Requests sent by TN2 and TN3 did not reach TN1, as TR2 and TR3 did not have a valid route to those networks. Similarly, the Echo Requests sent by TN1 did not reach TN2 or TN3.

Test #	
Test RIP_INTEROP.1.4	**Routing Convergence**
Purpose To verify that a router can interoperate with other RIP implementations.	
Comments on Test Procedure	

a. Allow the RIP Protocol to configure. Check TR1's routing table.
b. Configure TN2 to have the TR1 as its default gateway. TN1 transmits an Echo Request destined for TN2 to the hardware address of the TR1.
c. Configure TN2 to have TR3 as its default gateway. Disconnect TR1's interface to N2. Wait 200 seconds. TN1 transmits an Echo Request destined for TN2 to the hardware address of the TR1.
d. Configure TN2 to have TR1 as its default gateway. Reconnect TR1's interface to N2. Wait 40 seconds. TN1 transmits an Echo Request destined for TN2 to the hardware address of TR1.

Comments on Test Results	RFC 2453 – Sections 3 and 4 RFC 1812 – Section 5.2

a. PASS: TR1 had the following routes:
   - N4/24, NH TR3 (N2), Metric 2
   - N5/24, NH TR2 (N3), Metric 2
b. PASS: TR1 forwarded the Echo Request from TN1 to TN2. TN1 received an Echo Reply from TN2 in response to the Echo Request.
c. FAIL (TR1): The RUT did not learn new routes to N2, and did not forward the packet destined for TR2. According to RFC 1812, section 5.2.1.2 " *(10) The forwarder determines the Link Layer address of the packet's next hop. The mechanisms for doing this are Link-Layer dependant (see chapter 3). (11) The forwarder encapsulates the IP datagram (or each of the fragments thereof) in an appropriate Link Layer frame and queues it for output on the interface selected in step 5. (12) The forwarder sends an ICMP redirect if necessary, as described in Section [4.3.3.2].*" Therefore, the RUT should have forwarded the packet destined for TR2 with a next hop of TR1.
d. N/T: Due to the failure in part c, this was not tested.

Test #	
Test RIP_INTEROP.1.5	**Routing Calculation**
Purpose To verify that a router can interoperate with other RIP implementations.	
Comments on Test Procedure	
a. Allow the RIP Protocol to configure. Check TR1's routing table. b. Configure TN2 to have the TR1 as its default gateway. TN1 transmits an Echo Request destined for TN2 to the hardware address of the TR1. c. Configure TN2 to have TR1as its default gateway. Configure TR1 to have a metric of 10 on network 2. TN1 transmits an Echo Request destined for TN2 to the hardware address of TR1. d. Configure TN2 to have TR1as its default gateway. Configure TR1 to have a metric of 5 on network 2. TN1 transmits Echo Requests destined for TN2 to the hardware address of TR1 Configure TR3 to have a metric of 4 on network 3. TN1 transmits an Echo Request destined for TN2 to the hardware address of TR1.	
Comments on Test Results	RFC 2453 – Sections 3 and 4
a. PASS: TR1 had the following routes: ▪ N4/24, NH TR3 (N2), Metric 2 ▪ N5/24, NH TR2 (N3), Metric 2 b. PASS: TR1 forwarded the Echo Request from TN1 to TN2. TN1 received an Echo Reply from TN2 in response to the Echo Request. c. PASS: TR1 forwarded the Echo Request from TN1 to TR1. TN1 received an Echo Reply from TN2 in response to the Echo Request. d. PASS: TR1 forwarded the Echo Request from TN1 to TN2. TN1 received an Echo Reply from TN2 in response to the Echo Request.	