



## Lab Testing Summary

January 2007  
Report 070116

Product Category:  
**Multi-WAN Switch**

Vendor Tested:  
**Radware**

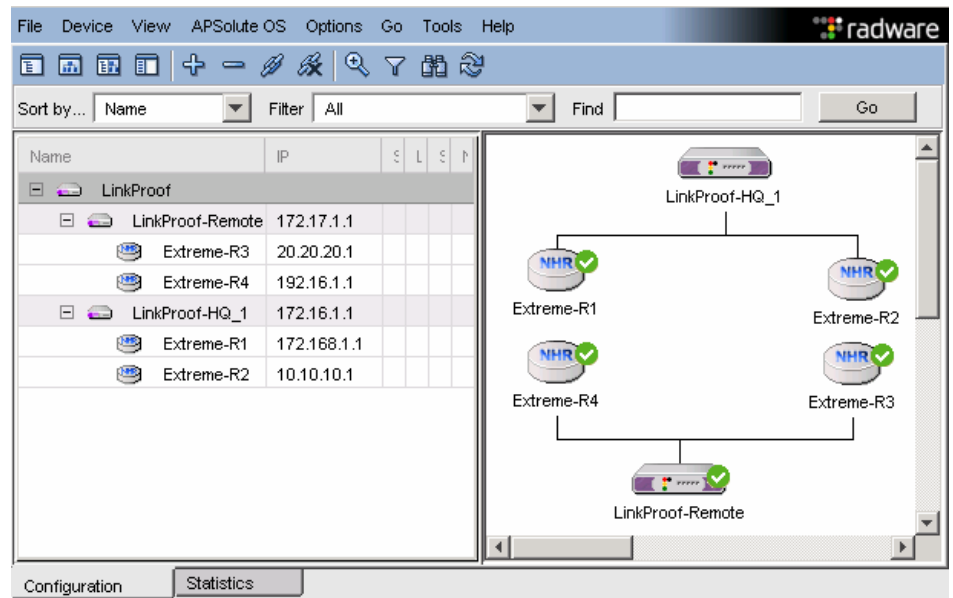
Product Tested:  
**LinkProof 1000  
ver 4.35.07**



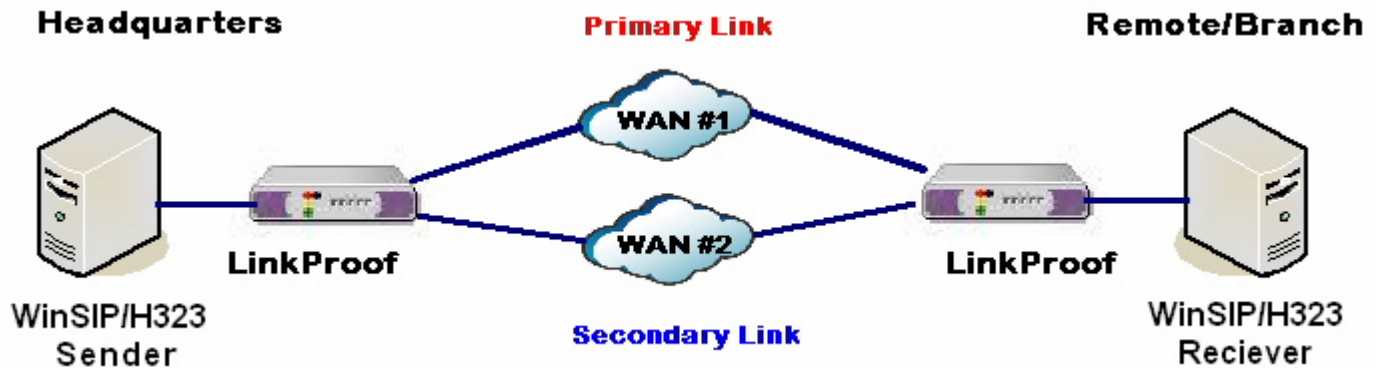
## Key findings and conclusions

- In VoIP traffic tests of 100 concurrent calls, LinkProof maintained 100% of VoIP connections when a simulated primary WAN outage automatically switched calls to a secondary WAN link
- The LinkProof WAN switch is able to automatically reroute current VoIP calls using preset thresholds to maintain highest quality available
- LinkProof provides bandwidth optimization and load balancing for VoIP and data traffic
- LinkProof features a large assortment of settable and tailorable QoS Policies for health monitoring of VoIP and data traffic
- LinkProof includes Intrusion Prevention System capabilities for Intrusions, DoS attacks and others

**R**adware engaged Miercom to independently verify the multi-homing, load balancing, VoIP handling, and security features and capabilities of their LinkProof 1000 Multi-WAN switch. We exercised two LinkProof 1000s in a simulated headquarters multi-WAN link to a remote branch environment in Miercom Labs. There were two paths simulating the LinkProof's connections to two different carriers so that failover, intelligent re-routing and load balancing capabilities could be tested and examined. We also evaluated the management and monitoring capabilities of the LinkProof 1000 APSolute Insite console to set and modify policies of network and VoIP traffic issues. In addition we examined the on board ISPs functionality.



**Radwares APSolute Insite console**—Screen shot showing the configuration information, current active devices, health of the load balancing or secondary link, and names with IP subnets of all devices being managed.



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### How we tested

The test bed consisted of two simulated sites: a headquarters and a remote branch site, connected by a primary IP WAN link and a load balancing or secondary link. The network infrastructure at both sites consisted of Extreme Networks Summit48 L2/L3 switch/routers, a LinkProof 1000 switch, a WinSIP and a WinH323 VoIP traffic generator.

A group of 100 G-711 ULAW simulated VoIP calls were generated and maintained from the headquarters side by Touchstone Technologies WinSIP ver. 2.4.8 and WinH323 ver. 1.4.4 ([www.touchstone-inc.com](http://www.touchstone-inc.com)) VoIP traffic generator through the LinkProof to the remote branch for 2 minutes then continually re-established for a total of 2 hours each.

After verifying all the VoIP sessions were established, a standard ping test was initiated to the primary link on the remote LinkProof. The primary IP link was physically removed from the LinkProof and the loss of connection was verified by the ping test. 100% of the SIP and H323 calls were automatically rerouted and maintained over the secondary IP link.

For consistency, all SIP and H323 calls from the headquarters had to traverse the LinkProof 1000s primary gigabit IP links and terminate to the WinSIP and WinH323 generators at the remote branch site. This was carefully verified by IP address using the command line interface on the LinkProof 1000.

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### VoIP Resiliency

The LinkProof 1000 offers a powerful capability for Enterprise customers that require 100% up time and reliability from their VoIP and Data networks. In the Miercom Lab we simulated VoIP traffic using WinSIP and WinH323. We generated a group of 100 simultaneous VoIP (both SIP and H323) calls from the headquarters site that went through a primary WAN IP route, load balancing was not used, and terminated at the remote branch site. The LinkProof 1000s at both locations were configured for our testing to intelligently route "all" VoIP traffic on the primary WAN link. In addition we configured it to automatically determine when the primary link was unreachable or out of service for more then 3

continuous seconds (this is the recommended Radware threshold setting). After this time period is detected, the VoIP traffic will re-route to the redundant back-up WAN link.

In our testing, the simulated VoIP calls from the WinSIP and WinH323 VoIP call generators maintained 100% of their current connections without disruption. All subsequently generated calls continued to be routed to the back-up WAN until our testers returned the primary WAN link to normal operational status, and the calls were automatically rerouted back to the primary link.

The Radware LinkProof 1000 is managed with their APSolute Insite Management console. We ran the management client from a Windows XP PC. We could connect to any of our LinkProof systems from anywhere in our network.

For VoIP specific features and settings, Radware offers 13 different default VoIP signatures that can be used for creating policies for VoIP traffic. These can be used to filter on different types of VoIP signalling and media packets. There is also the capability for VoIP managers to create their own distinct VoIP signatures. The LinkProof 1000 is not limited to VoIP but can also make traffic decisions based on any TCP/IP protocol, as well as source, destination, IP/subnet, VLANs, and additional criteria.

## Bandwidth Optimization

Using the GUI based APSolute Insite management console, WAN bandwidth can be shaped and managed by DiffServ, ToS, and other user-defined policies using the Bandwidth Management Module. Radware offers out-of-the-box definitions for hundreds of well known services, and has the ability to create custom protocol definitions by defining source/destination port and pattern inspection within the packet. We were able to create policies which were very granular to include the source, destination, direction, priority, and the guaranteed bandwidth in (kb/sec), and other parameters that automatically ensure quality of the VoIP connection. By using a policy, basic or custom services could be denied completely, routed on a specific WAN link or be designated as high priority traffic.

## Health Monitoring

Another powerful management feature is the ability to perform health checks on network links. From the Health Monitoring Module there are 19 different types of checks that can be created.

We configured some basic settings to include the destination IP address, next hop router, destination port, and interval to perform checks, successive failed retries, and timeout for check to

receive the expected response. Most of the checks have "Method Argument" which defines even further conditions the Health Checks Module will examine depending on application-layer protocols (like FTP, HTTP, LDAP, POP3, and others). Combined with the Bandwidth Management Module, we were able to configure and test that network traffic defined by a policy would be routed onto our simulated WAN link that the Health Checks Module determined was the "healthiest" WAN link available.

## Security

Separately licensed, the LinkProof 1000 offers an IPS (Intrusion Prevention System) adjunct module. We had an opportunity to look at the different functions and capabilities of the IPS.

The IPS has five signature modules which include: Intrusions, DoS/DDoS, SYN Floods, Anomalies, and Anti-Scanning. These include an assortment of backdoors, buffer-overflows, worms, and a variety of protocol-specific attacks. Radware's anomaly protection module is used to scan packets to check for deviations with the RFC standards.

We could configure the IPS scanning functionality to be applied to various network components. Packet scanning can be configured to examine both the input and output traffic of any specific interface on the LinkProof 1000. Additionally, security profiles can be defined narrowly enough for specific traffic protocols to specific servers (which help to prevent false positive detections).

## Conclusion

The LinkProof 1000 effectively demonstrated the ability to augment a VoIP deployment with failover and load balancing features. The management and monitoring functions allowed for fine tuning of SIP and H.323 VoIP traffic across multiple WAN links. The available IPS functionality for the Enterprise user is an added plus.

## Miercom Performance Report

Based on testing of the LinkProof and review of its configuration, deployment and operation as described herein – Miercom finds:

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## About Miercom's Product Testing Services...

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