THE TOLLY GROUP

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Ingate® Systems
SIParator™ 40
Functionality Evaluation

Test Summary

Premise: *The advent of Voice over IP (VoIP), instant messaging and other real-time communications is driving the proliferation of the Session Initiation Protocol (SIP). As real-time traffic traverses corporate networks, architects are challenged with regards to supporting SIP traffic. Traditional network firewalls lack the sophistication required to perform the deep packet translation required for SIP. As new SIP-enabled security solutions become available, users need to understand how such offerings can be deployed and their implications for handling SIP traffic.*

Ingate Systems commissioned The Tolly Group to conduct a functionality evaluation of its SIParator™ 40, a unique adjunct processor that works in conjunction with installed firewalls and enables the traversal of real-time SIP-based communications including presence, instant messaging, conferencing and VoIP without compromising existing firewall security.

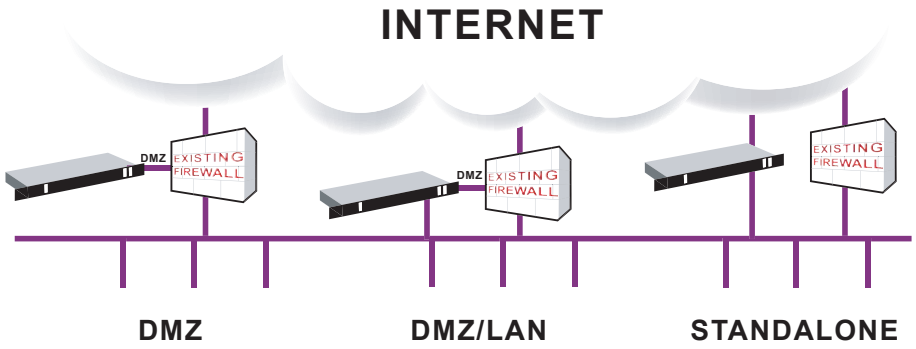
The Ingate SIParator 40 contains a SIP proxy and registrar which performs the functions necessary to achieve seamless traversal of the firewall for SIP signaling and media. Tolly Group engineers subjected the SIParator to 26 different SIP test scenarios representing common VoIP and instant messaging functions, in each of three different deployment configurations: DMZ mode, DMZ/LAN mode and Standalone mode.

The SIParator 40 passed each of the SIP tests and proved that users can support SIP traffic alongside traditional traffic types in a secure firewall environment. Moreover, the SIParator demonstrated interoperability with a commonly installed firewall from

Test Highlights

- Enables SIP-based communications such as voice, video, instant messaging and presence without the expense of replacing an existing firewall
- Affords users a choice of three operating deployment configurations: DMZ, DMZ/LAN and Standalone for maximum flexibility
- Interoperates with the installed base of firewalls, including NetScreen

SIParator Deployment Options



DMZ	DMZ/LAN	STANDALONE
Benefit	**Benefit**	**Benefit**
SIP available to all networks on the firewall.	**Decreases load on existing firewall.**	**Least taxing option on firewall. Requires no DMZ.**

Source: The Tolly Group, September 2003

Figure 1

NetScreen Technologies, proving that the product can operate amicably alongside traditional firewalls. Tests were conducted at The Tolly Group's Boca Raton, FL facilities in July/August 2003.

Results

SIP Functionality

Tolly Group engineers examined the Ingate SIParator 40's SIP capabilities to ensure that the device is capable of adequately supporting traffic based upon the SIP standard. In the case of SIP, packets require address translation that peers much deeper into a packet than typical Layer 3/Layer 4 network address translation (NAT) implemented in legacy firewalls. So, the SIP capabilities within the SIParator provide a level of deep packet translation where it converts inbound and outbound protocol addresses where appropriate to allow full SIP functionality while conforming to corporate security policies that may mandate the concealment of internal addresses from any external session partners.

Engineers subjected the SIParator 40 to 26 different SIP scenarios, including tests for basic calls, call hold, call transfer, conferencing, call waiting, presence and instant messaging (see Figure 2). Moreover, the SIParator was subjected to those tests across three different configurations.

In the DMZ configuration, the SIParator 40 was connected to the DMZ port of a NetScreen Technologies NetScreen-100 firewall. (See Figure 1.) All SIP-signaling and media was routed from the firewall via the SIParator to user agents on the LAN.

One advantage to this deployment approach is that the SIParator 40 features are available to all networks connected to the firewall. The logging of all traffic can also be maintained by the existing firewall when using the DMZ configuration option. However, since SIP traffic is routed through the firewall twice, there is the potential to tax the firewall processor, especially if the device operates near peak capacity. In such an instance, the DMZ/LAN and Standalone configurations may offer relief.

SIP, VoIP and Instant Messsaging Functionality Evaluation

SIP Test Cases	DMZ	DMZ/LAN	Standalone
Basic Calls			
1. Internal -> Internal	Pass	Pass	Pass
2. Internal -> External	Pass	Pass	Pass
3. External -> Internal	Pass	Pass	Pass
Call Hold			
4. Internal -> Internal	Pass	Pass	Pass
5. Internal -> External	Pass	Pass	Pass
6. External -> Internal	Pass	Pass	Pass
Call Transfer			
7. Internal -> Internal : Transfer to Internal	Pass	Pass	Pass
8. Internal -> Internal : Transfer to External	Pass	Pass	Pass
9. Internal -> External : Transfer to Internal	Pass	Pass	Pass
10. Internal -> External : Transfer to External	Pass	Pass	Pass
11. External -> Internal : Transfer to Internal	Pass	Pass	Pass
12. External -> Internal : Transfer to External	Pass	Pass	Pass
13. External -> External : Transfer to Internal	Pass	Pass	Pass
Conference			
14. Internal -> Internal : Conference Internal	Pass	Pass	Pass
15. Internal -> Internal : Conference External	Pass	Pass	Pass
16. Internal -> External : Conference Internal	Pass	Pass	Pass
17. Internal -> External : Conference External	Pass	Pass	Pass
18. External -> Internal : Conference Internal	Pass	Pass	Pass
19. External -> Internal : Conference External	Pass	Pass	Pass
20. External -> External : Conference Internal	Pass	Pass	Pass
Call Waiting			
21. Internal -> Internal : Call from Internal	Pass	Pass	Pass
22. Internal -> Internal : Call from External	Pass	Pass	Pass
23. Internal -> External : Call from Internal	Pass	Pass	Pass
24. Internal -> External : Call from External	Pass	Pass	Pass
Presence and Instant Messaging			
25. Presence support	Pass	Pass	Pass
26. Instant messaging (Text)	Pass	Pass	Pass

Source: The Tolly Group, September 2003

Figure 2

In Tolly Group tests, the SIParator 40 passed each of the 26 SIP tests for processing a variety of SIP-related traffic, from basic VoIP calls to more sophisticated conferencing, instant messaging and presence functions (See Figure 2).

Tolly Group engineers also tested the SIParator 40 in the DMZ/LAN configuration. In the DMZ-LAN configuration, the Ingate SIParator was connected through two interfaces: one to the DMZ interface on the existing firewall and the other to the internal LAN. In this configuration, the SIP-signaling and media pass through the firewall once on their way to and from the Internet.

Compared to the DMZ configuration, this SIParator deployment scenario decreases the load on an existing firewall. The logging of all traffic can still be maintained by the existing firewall when using the DMZ/LAN configuration option. As the SIParator 40 is directly connected to the LAN, it can provide the SIP capabilities to multiple networks connected to that interface. However, networks on other interfaces of the firewall cannot be handled.

In Tolly Group tests, the SIParator 40 passed each of the 26 SIP tests for processing a variety of SIP-related traffic, the same tests discussed in the

DMZ scenario. (See Figure 2.)

Lastly, engineers tested the SIParator 40 in the Standalone configuration. The Ingate SIParator was connected in parallel with the existing firewall, with one interface to the outside (Internet) and one interface to the LAN. No SIP-signaling traffic passed through the firewall. Therefore, this configuration option was the least taxing on the NetScreen firewall. Added, this scenario does not require a DMZ since it works independent of the firewall. However, the existing firewall loses the ability to log SIP-related traffic. The SIParator is designed to take over this critical function.

Here again, in the Standalone configuration, the SIParator 40 passed each of the 26 SIP tests for processing a variety of SIP-related traffic, the same tests discussed in the DMZ and DMZ/LAN scenarios. (See Figure 2.)

Analysis

The Ingate SIParator 40 is a unique device that SIP-enables existing firewalls installed at the Internet boundary within enterprise networks to lend support for a variety of real-time communications traffic.

The majority of firewalls currently in-place, as well as those available on the market today, do not support SIP. It is a common misunderstanding that older firewalls can be reconfigured to handle SIP traffic. That is simply untrue. Reconfiguring non-SIP-capable firewalls is not possible because such devices cannot conduct the deep packet processing required to handle SIP traffic.

Enterprise network managers have few real options. They can purchase new SIP-capable firewalls. However, this becomes an inhibiting choice since a single firewall installation can represent investments of tens of thousand of dollars. Alternatively, network administrators can retrofit existing firewalls with SIP-enablers, like the SIParator 40.

From cost and deployment flexibility standpoints, the SIParator 40 and its sister models are attractive options.

Test Configuration and Methodology

For performance tests, The Tolly Group tested an Ingate SIParator 40 equipped with two Fast Ethernet interfaces, plus a SIP proxy server and SIP registrar.

For the SIP tests, Tolly Group engineers intended to verify that the device does not adversely impact real-time voice traffic passing through the device. Pingtel Corp. xpressa IP-based SIP phones and Zultys Technologies' ZIP IP phones were used to established voice calls for SIP and voice-quality tests. Windows Messenger was used to establish presence and generate instant messages across the system under test. Tests were conducted on a pass/fail basis. (The Tolly Group thanks Broadband Telephony Systems for supplying Pingtel phones used in this project.)

In the DMZ mode test, the SIParator 40 was configured to run as the SIP proxy and registrar. The SIParator was connected to the DMZ port of the pre-configured NetScreen NS-100 (SW Ver. 4.0.0r4.0) firewall. Three Pingtel Corp. xpressa IP phones were connected to the private or internal network and two IP phones - one Pingtel xpresssa (ver. 2.1.8.6) and one Zultys Technologies ZIP 4x4 (ver 1.0.6) - were connected to the public or external network across the NetScreen firewall. Engineers performed the various SIP test cases as shown in Figure 2.

In the DMZ/LAN scenario, the SIParator 40 was configured to run as the SIP proxy and registrar. One port of the SIParator was connected to the DMZ port of the pre-configured NetScreen firewall. The other port of the SIParator was connected to the internal LAN. Three Pingtel xpressa IP phones were connected to the private or internal network and two IP phones (one Pingtel and one Zultys)

Ingate Systems

SIParator™ 40

SIP Firewall Functionality

TOLLY Up to Spec CERTIFIED

Ingate Systems
SIParator™ 40
Product Specifications*

Features
- Two 10/100 Fast Ethernet interfaces
- 160 Mbps maximum throughput
- Certifications: CE, FCC, UL

Management
- Automatic check for new release
- Web GUI
- SNMP support
- Mass configuration option
- Internal log to hard drive
- Syslog
- E-mail event notification

SIP Functionality
- SIP proxy
- SIP Registrar
- SIP traffic out and in without extra proxy
- SIP traffic to private IP addresses

(NAT/PAT)
- TLS encryption
- SIP connection set up (SIP & RTP) < .15s
- RTP data delay < .19/.08ms
- Support for 100 concurrent RTP sessions
- Registered SIP users included: 10

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*Vendor-supplied information not verified by The Tolly Group

were connected to the public or external network across the NetScreen firewall. Engineers performed the various SIP test cases as shown in the Figure 2.

In the Standalone scenario, the SIParator 40 was configured to run as the SIP proxy and registrar. This time, the SIParator was not connected to the firewall. Engineers performed the various SIP test cases as shown in the Figure 2.

The Tolly Group gratefully acknowledges the providers of test equipment used in this project.

Vendor	Product	Web address
Finisar Corp.	Surveyor 5.0	http://www.finisar.com
Broadband Telephony Systems	Pingtel xpressa IP Phone	http://www.bbtelsys.com
Raritan Computer, Inc.	MasterConsole II	http://www.raritan.com
Zultys Technologies	ZIP & ZIP 4x4 IP phones	http://www.zultys.com

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For info on the Fair Testing Charter, visit: www.tolly.com/About/ftc.asp

Project Profile

Sponsor: Ingate Systems

Document number: 203119

Product Class: SIP adjunct processor for firewalls

Products under test:
- SIParator™ 40

Testing window: : July/August 2003

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