

Assuring Voice Performance

for a High-Street Bank

A high-street bank needed a new firewall to improve VoIP performance and connection stability. Here's how we helped them test the new equipment—and optimise for a smooth deployment.

The Background

A leading high-street bank was struggling with inconsistent VoIP performance. While still functional, its VoIP connections would frequently drop out, or suffer from audio artefacts.

The bank chose to deploy a new firewall cluster with the aim of enhancing VoIP performance. But it needed to know if the new hardware would meet its stringent reliability requirements, and if any configurations or cabling would have to be modified before it went live.

The Challenge

For a financial institution in charge of millions of accounts, reliable, high-quality communication channels are essential.

The bank's systems integrator asked us to conduct a detailed analysis of how the new firewall would handle VoIP connections. Having engaged Spirent Professional Services previously, they knew they could trust us to deliver a thorough report on the firewall's performance and suitability.

Testing VoIP performance in line with the bank's requirements posed three main challenges:

9000 Concurrent Users

To fully test voice performance and reliability, the bank needed to know if its new firewall could support 9000 VoIP connections simultaneously.

Testing for so many users would be difficult using real VoIP devices—demanding a scalable emulation-based testing platform.

Supporting Multiple VoIP Protocols

To get a clear picture of the firewall's capability, tests would need to be run against a range of VoIP protocols.

The bank wanted to test concurrent VoIP calls across a range of control and network layer protocols - from TCP and UDP, to MGCP, SCCP and SIP.

Quick Testing Turnaround

Deadlines were already tight, and a delayed delivery of the firewall meant testing needed to be turned around rapidly.

Our testing plan would have to be flexible to ensure we could complete the project within agreed timelines.

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The Solution

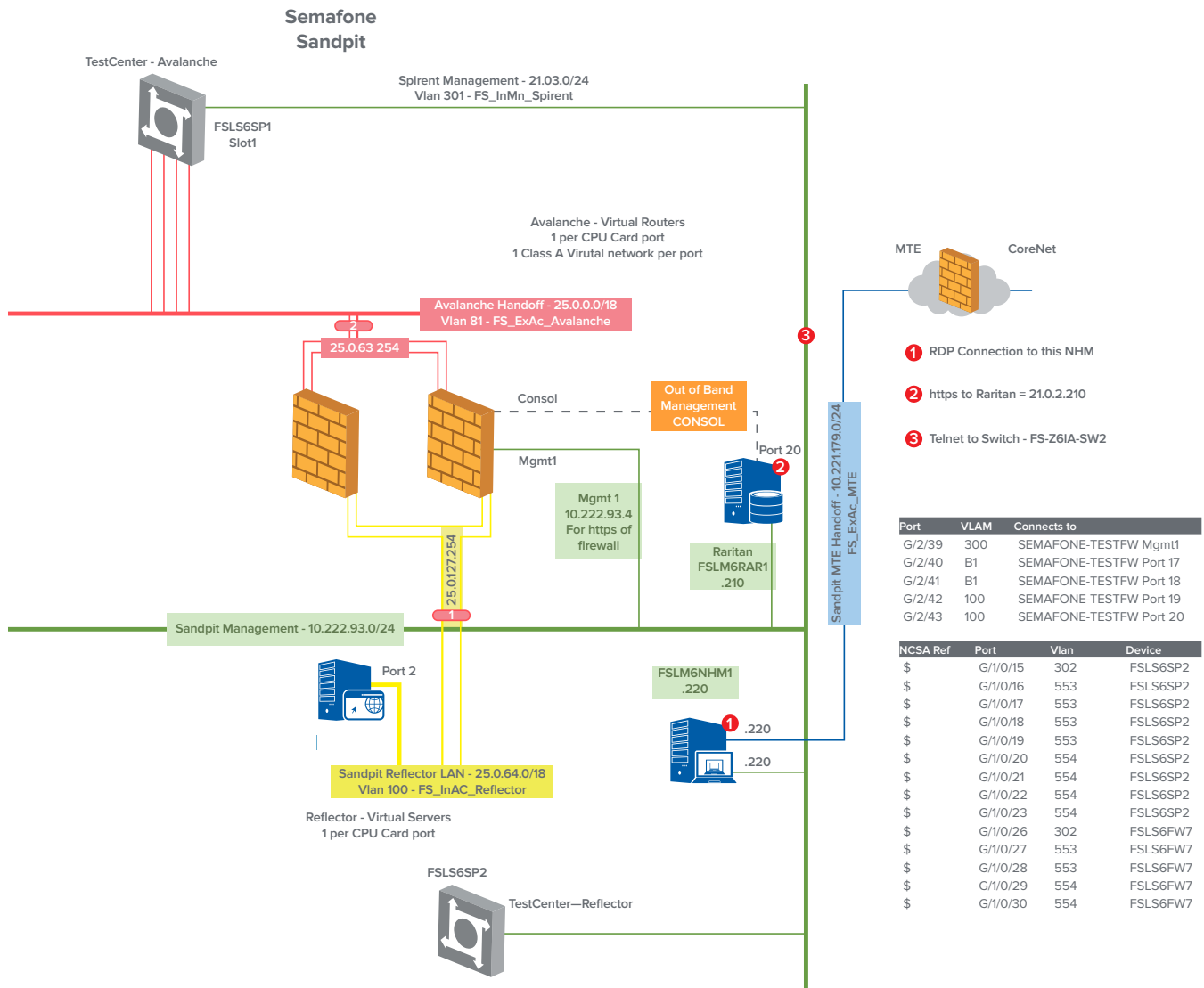
We worked with the bank and systems integrator to develop a comprehensive methodology for testing multiple concurrent VoIP connections—and a range of protocols—over time, using emulated devices.

Test Setup

We needed to prove the firewall could sustain 9000 concurrent VoIP calls, be stable under consistent high load, and tolerate network components faults and resets.

To this end, we established a test setup using Spirent's Abacus and Avalanche solutions—to test voice quality and networking performance respectively.

- Two Abacus 5000 systems were used to emulate MGCP and SCCP users
- A single Avalanche C100 system was used to emulate SIP users
- Both were controlled by two laptops running thick client software via a lab network



Test Configuration Schematic

The Testing Processes

Each emulated VoIP user repeatedly made VoIP calls, each one lasting 300 seconds.

For all the tests performed in this project, the same testing traffic profile applied:

- 1400 concurrent MGCP calls, with UDP-based signalling
- 1400 concurrent SCCP (SKINNY) calls, with |TCP-based signalling
- 6200 concurrent SIP calls, with UDP-based signalling
- G.711 A-law codec

We conducted a range of tests to thoroughly inspect VoIP performance and reliability using the new firewall, including:

Network baseline test: Helping verify the overall health of the customer's network infrastructure.

Performance test: A similar test, but with VoIP inspection turned on to assess voice quality and the firewall's ability to support multiple VoIP calls simultaneously.

Soak test: Putting the firewall under load over a 12-hour period to assess reliability over time.

Failover tests: Including a range of tests to assess logical reset, device behaviour and switch failure scenarios. This would help ensure that VoIP services continued, even in the event of a hardware reset or failure.

High-availability tests: Ranging from tests designed to reveal the impact on performance when VoIP inspection was turned on or off mid-call, to tests designed to show how convergence was affected when hardware acceleration was turned off.

The Results

Through the testing methodology set out above, we helped the bank and its system integrator ensure the new firewall was fit for purpose. We were also able to recommend ways to improve VoIP performance, and overcome the issues our tests had highlighted.

The power to minimize disconnects. Our soak test revealed checkpoint firewall incompatibilities as a cause of disconnects. The bank is now able to further investigate- and work with the firewall vendor to solve any incompatibilities.

The insight to boost performance. Our tests also revealed protocol performance problems, with the firewall showing very different performance profiles between UDP and TCP-based traffic. Using this insight, the bank is now improving TCP protocol performance across its network.

Next Steps

The testing methodology set out above was designed to help the bank meet specific, and very stringent performance and reliability requirements across new network components.

If you have your own concerns around a new network deployment and upgrade, our testing experts are here to help.

Just get in touch using the contact details below.

Contact Us

For more information, call your Spirent sales representative or visit us on the web at www.spirent.com/ContactSpirent.

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