

Terraprova



VoIP Services Provider VoIP Test Engineering

Background

Our client has developed targeted service offerings in the Converged Network VoIP technology segment and currently operates several large scale Customer Facilities. They have recently acquired a number of VoIP service contracts from Level 3 and are actively looking to expand their operational support in the VoIP Service Area. Our client has been offering VoIP services for over 5 years and is a leader in the VoIP services in the US western region.

Business Challenges

- **Complex Network Environments**
- **Constant Software / Hardware Upgrades**
- **Insufficient test environments**
- **Responsible for External Customer Environments**

Managing new deployments and maintenance as part of an on-going software life-cycle is wrought with unexpected dependencies and unexpected performance considerations. NGT had the additional challenge of managing VoIP Services of external customer networks where administrative control of the environment was rightly distributed.

Additionally, there was a requirement in the test organization to understand and test new releases of the Broadworks SIP application server based upon standard call set up, connection and tear down functions. As a result NGT required a flexible method for testing VoIP Configurations internally as well as monitoring external customer production deployments. Terraprova LLC was contracted to construct a solution that address these needs in two specific ways. The first was to construct a testing module to support an imminent software upgrade due to affect all of their existing customer environment. Second was the installation of an operational support system (OSS) that uses a configurable VoIP workload to probe pre-determined network points. This monitoring solution identified faults in network connectivity, functional reliability and individual request performance. All of these technical features were aligned with the very real business value proposition of pro-actively monitoring customer VoIP services with emphasis on anecdotal SLA disruptions.

Technical Challenges

- **Limited documentation required code design based upon SIP RFC 2543,**
- **Network Systems programming performed directly to UDP interface.**

Our client had limited testing facilities and turned away from acquiring expensive load tools with costly and unnecessary features:

- Client needed a rapid deployment
- No existing skill set or experience within the corporate IT departments.
- Significant amounts of exception processing due to a large number of system components.

Terraprova LLC's Solution

- **Develop a flexible VoIP SIP test agent and SIP Library to mimic and measure production activity.**
- **Provide a flexible set of configuration options to access a variety of network end-points and external customers.**

Objectives

Deploy a flexible and configurable SIP testing component for both the Lab and Production environments, as an extension to existing VoIP Operational Support Systems (OSS) and Network Operations Center (NOC) management

- **Short Term** – Provided NGT with configurable SIP testing component that was designed to target various points within the VoIP network as well as exercise new SIP and Broadworks application features.

- **Long Term** – Deploy an operational monitoring tool that automatically probes multiple customer networks executing IP telephony requests across production networks. This SIP Testing component now tracks SIP request performance as well as component and system outages for production environments.

Approach

With limited customer technical requirements and industry adaptation of the SIP protocol, Terraprova LLC focused on the SIP Internet

Standards of RFC2543. With the quick absorption of this in-depth technical requirement, Terraprova proposed a number of SIP workload definitions to be used by the testing agent that would exercise key features of NGT's infrastructure and customer networks.

In addition, the SIP Test library needed to be developed for the UDP protocol and integrate directly to available network interfaces. This required low-level network programming that must be prepared for a large number potential network failures and conditions.

Value Proposition

- **Pro-active notification of production client failures and SLA interruptions.**
- **Configurable testing agent for Software Maintenance Life-Cycle activity.**

NGT Success

In 30 days NGT received a highly configurable testing agent that address both tactical customer support issues and a operational testing agent that probes production network IP phones for availability. This agent also represents the beginning of a Broadworks SIP server load testing agent for internal VoIP networks.

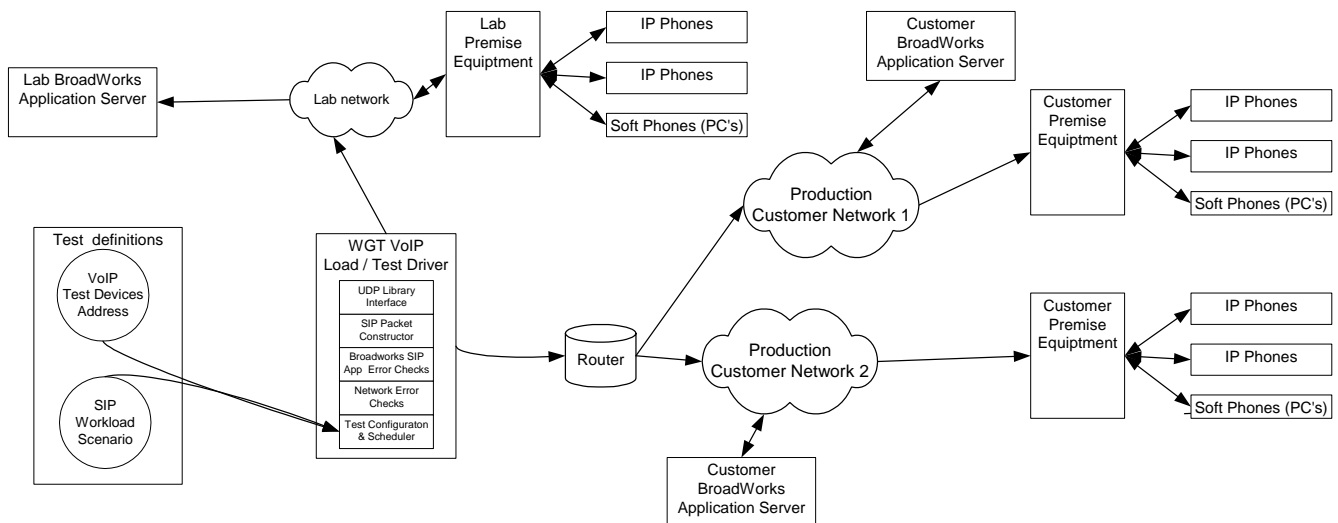


Figure 1 SIP Testing Solution