



Case Study

Testing SIP Signaling Compliance with TTCN-3 Tools of Testing Technologies

Company Description

VeriSign operates the systems that manage .com and .net, handling as many as 21-billion Web and email look-ups every day.

VeriSign runs one of the largest telecommunications signaling networks in the world, enabling services such as cellular roaming, text messaging, caller ID, multimedia messaging, and mobile media management. VeriSign also provides managed security services, security consulting, strong authentication solutions, anti-phishing services and commerce security services to organizations all over the world - and secures over 700,000 Web servers worldwide.

By leveraging its world-class infrastructure and robust platform set to deliver services in a managed services business model, VeriSign's intelligent infrastructure services provide customers with unmatched operational efficiencies, increased intelligence, and greater visibility into key data trends that drive their business.

As next-generation networks emerge, VeriSign deploys the intelligent infrastructure services necessary for everything from RFID-enabled supply chains, to inter-enterprise voice-over-Internet Protocol (VoIP), to the seamless delivery of mobile content.

Project Description

VeriSign has developed a SIP and ENUM-based centralized routing directory, called VeriSign® Network Routing Directory (NRD). This engine is based on VeriSign's Advanced Transaction Lookup And Signaling (ATLASSM) platform – the same platform that runs the .com/.net registries on the internet.

The NRD is logically layered upon a service provider's core network as a registry that enables the centralization of inter- and intra-domain route discovery. NRD may function as a common interconnect registry and as a central routing server to discover the location of endpoints.

Equipped with SIP and ENUM interfaces, the NRD is capable of simultaneously functioning as a SIP Proxy Server, Redirect Server or SIP/ENUM Registry. Through callouts to network elements, both internal and external to the core network, NRD supports interoperability between the SIP and ENUM protocols.

Testing Technologies provided VeriSign with a solution for testing protocol compliance of the NRD product that includes SIP standards. This solution contains a fully standardized conformance test suite with over 600 ready-to-use test cases.

Requirements on a Test Tool

VeriSign needed a solution that enables test development and execution within one test tool.

This tool had to be robust, flexible and extensible. It had to provide support for the protocols VeriSign desired immediately, but also had to be capable of integrating other protocols with little effort in the future. This tool had definitely to be user-friendly to ensure fast and easy handling.

Reasons for Choosing Tools of Testing Technologies

We selected Testing Tech's all-in-one tools, as they met most of our requirements while using an industry standard language (TTCN-3). That greatly eases the learning curve for anyone beginning to use this product.

The tools are delivered with an extensive set of pre-built test cases, a TTCN-3 compiler and an easy to use GUI. Additionally, the tools support the protocols we were initially interested in (SIP over UDP and TCP), and Testing Tech indicated that their roadmap included other protocols which we would need in the future – such as new transport stacks like TCP/TLS for SIP, TCAP, IS41/MAP and SIGTRAN.

Kinds of Systems Tested

VeriSign is utilizing the Testing Tech tools to test our own home-grown SIP stack with a focus towards testing SIP Proxy and Redirect server functionality.

Inhouse Creation of Test Cases

At this point, VeriSign has utilized the GFT Editor for viewing the pre-built test cases. As the test suite provided by Testing Tech was quite exhaustive, we have not felt the need to supplement this with our own test cases. As soon as we extend our system (IUT) we might be approaching the possibility to prepare new test case skeletons in TTCN-3 using the development editor (CL Editor) of TTworbench.

Testing Technologies' Reaction Time, Support and Quality

One of the biggest pain points with any new protocol is the ability of a vendor to quickly understand and acknowledge the problem being reported and to provide a fast solution to it. With a bleeding edge protocol such as SIP, this problem is further compounded by the fact that the definition and interpretation of the protocol widely varies.

On these fronts, VeriSign's experience in dealing with Testing Tech has been very positive. During the initial phase of usage of the toolset, the support from Testing Tech was very good and questions to the support mailing list were answered very quickly. Support personnel from Testing Tech, such as Dirk Borowski, were pleasant to deal with, their understanding of the protocol was thorough, and they were eager to help us using the tool. Not only this, we also received example cases for new SIP methods concerning IMS.

As could be expected from any new product, there were teething troubles – the very first release VeriSign received had some java/eclipse related performance, compilation time and memory issues. Testing Tech has been very responsive to these issues and they turned around with patches and workarounds to help resolve these issues within a short timeframe.

Future Plans

SIP Protocol Engine on VeriSign's NRD product already supports UDP and TCP as the transport protocols. In the future, we will use Testing Tech's provided TLS support in the toolset of TTworbench. Another protocol we are considering is TCAP. For this, we are also looking to integrate with SIGTRAN at the transport layer.