



White Paper

NTAF Overview – Why Carriers Should Join

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Network Test Automation Forum

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ABSTRACT

Service providers face increasing pressure to deliver a higher quality of experience while increasing profit margins. The network lab is one area that is particularly suited for increasing efficiency and reducing capital and operational expenses. By embracing the standardization and automation work of member companies of the Network Test Automation Forum (NTAF), one prominent carrier, Verizon, has realized the benefits of reduced cost and increased efficiency in the areas of tool management, inventory management, and service testing. The focus of new NTAF working groups promises to extend the existing benefits of automation and standardization to new areas, including tool APIs and results and log file viewing and analysis.

WHY CARRIERS SHOULD JOIN

The service providers that are NTAF members realize reduced lab costs and increased efficiencies in network test automation through standardization. In NTAF, service providers collaborate with the world's largest network equipment vendors and leading test equipment vendors, to define standards according to their labs' needs. NTAF's standards form the basis for both in-house tools as well as commercial products that ultimately deliver the benefit of reduced capex and opex.

Carrier Challenges

Service provider labs are tasked with the job of validating networks consisting of routers, switches, firewalls, servers, handsets and a thousand other devices that contribute in delivery of the latest services that we as users tend to take for granted, and just expect to work, i.e. deliver a high quality of experience. Furthermore, the complexity of devices from multiple vendors, each trying to differentiate in the marketplace, causes the diversity to scale even further upwards. Lastly, test equipment, again from multiple vendors, must be used to validate the multifarious networks, contributing even further to the diversity explosion. Getting everything to work together is a daunting technical and logistical challenge.

To compound matters, service providers face additional pressures, such as:

- Lab consolidation, i.e. merging multiple lab sites into fewer sites, or often just one site. Note that test engineers may not always relocate to the consolidated sites, meaning there is an increased need for remote access
- Increased demand for more testing, based on the need for rapid service roll-out and stringent quality requirements
- Growing sophistication of products and services – consider what smartphones can do today versus just a few years ago
- The need to tie it all together, by testing end-to-end across a range of devices that together deliver a high-quality service across a network
- More sophisticated test tools that validate those sophisticated services, providing insight across the network, and up and down the protocol stack.

Valuable time is wasted integrating the diverse array of test equipment and network equipment. Even seemingly simple tasks such as keeping track of equipment inventory take time away from the primary goal of successful service delivery.

How NTAF Addresses these Challenges

Tool Management

NTAF cuts costs by reducing the coding effort used to communicate with test tools:

- NTAF allows for language diversity by expressing commands in language neutral harnesses. So regardless of whether uses Tcl, Perl, or a modern language (like Python), NTAF defines commands in XML, which can be accessed from a wide range of languages

- As tool APIs add new features, NTAF automatically broadcasts new capabilities, meaning new libraries are not required to take advantage of new features. NTAF manages library versioning through NTAF harnesses which are maintained on the device itself (or a proxy)
- NTAF tools that support record/playback allow for rapid and accurate test-case creation through user interaction with the native interface

Verizon estimates that it saves about **40 hours** per test interface for each test tool, or each new version of software for each test tool. Additional weeks and months of development effort are saved by converting CLI APIs into usable libraries. A further **30 minutes** of training effort is saved per function. Finally, an additional 40+ hours of development time is saved in test creation for NTAF-enabled tools which support record/replay.

Service Testing

NTAF also facilitates complex testing using the multiple tools required to validate end-to-end testing of services. As an example, testing VoIP services requires simulation of VoIP calls as well as background traffic generation. NTAF makes it easy for the test engineer to mix and match equipment and choose the best tool for the job. The standardized interfaces of NTAF-enabled tools make it easy to communicate with tools in a firewalled, multi-lab environment. This also allows Verizon to expose its services to external authenticated vendors/testers in a secure manner.

Verizon estimates that it saves about **40 hours** per each test interface it would have to add to accommodate vendor-specific interfaces. Moreover, the ability to easily mix and match equipment has allowed Verizon to avoid purchasing new test equipment (easily **a savings of tens of thousands of dollars**), and instead make better use of existing gear through the flexible nature of their NTAF-based environment.

Inventory Management

For the past year NTAF has created specifications that define lab resources and manage lab inventory. Verizon has developed in-house tools based on early versions of the specifications. The NTAF inventory specification in particular has great potential for saving, reducing human errors, and streamlining auditing by automating the entry of lab devices and internal hardware. Adding an NTAF-enabled device simply requires entering the NTAF server address and possibly a username/password. After that, Verizon's inventory tool automatically discovers the device and adds it to the inventory system. Non-NTAF resources must be added by hand, requiring the input of general parameters as well as the model type, cards, and topology. NTAF devices automatically advertise their identity, as well as the attributes of the cards/blades and interfaces in the device. This automatic discovery of topology is important because the level of effort to model a device in layer-1 topology programs is significant, and errors are commonly introduced as the same device models are entered differently by different users.

The inventory specification also automates tracking of equipment, a great benefit when, for example, line cards get moved from one chassis to another. Being able to find such moved equipment saves time by not having to manually track it down.

Verizon estimates it saves **one hour** per inventory device for entry and **two or more hours** per resource to model topology. Auditing has also become more efficient, and it has become easier to find cards that have been moved, removed, or misplaced.

THE NTAF FUTURE – LOOKING AHEAD

NTAF has recently formed three new working groups under its technical committee to extend its value proposition. One working group, spearheaded by a large network equipment manufacturer (and their service provider customer) is focused on standardizing the format of test results. This exciting development will allow users to select the best results-viewing tool, regardless of what tool generated the results. A second working group led by two large network equipment manufacturers is working to standardize higher-level APIs for test equipment. The results of the API working group will allow test engineers to author test cases rapidly and more concisely against an open, published specification, increasing coding efficiency by an order of magnitude, at least and improving code re-usability across projects. A third working group is forming to produce a standardized log file format. Beyond these three new working groups, NTAF has identified several other areas for potential standardization, such as topologies, activation, scheduling, and reservations, that are likely to become a focus in the future.

SUMMARY

Carriers face huge challenges in automating their diverse network test labs, resulting in wasted time and extra costs. NTAF ultimately delivers reduced costs in the service provider lab by defining specifications that enable more efficient lab management. The Verizon experience provides a clear example of the multiple benefits of joining NTAF for service providers facing similar challenges.

ABOUT NTAF

Our Mission

The mission of NTAF is to promote interoperability of commercial network testing tools and testing infrastructure, by defining and facilitating adoption of technical specifications.

Overview

The goal of NTAF is to facilitate and promote the interoperability of commercial testing tools and test infrastructure for the data communications and telecommunications industry. NTAF will bring together commercial testing vendors, test equipment vendors, and other industry experts to create interoperable testing solutions for service providers, network equipment manufacturers (NEMs), and other enterprise organizations with large network deployments.

The objectives of NTAF are:

- Build consensus and unite service providers, network equipment manufacturers, and test equipment vendors on network test automation technical specifications and interoperability
- Create, facilitate and enable the implementation of network test automation specifications.
- Enhance market awareness of the benefits of interoperable network test automation.

For more information

To learn more about the Network Test Automation Forum, visit www.ntaforum.org.

