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CASE STUDY

World Wide Technology Powers State-of-the-Art Lab for 10 Years with Infoblox at 100% Uptime

OVERVIEW

Headquartered in St. Louis, Missouri, World Wide Technology (WWT) is a premier information technology provider for organizations across the globe, including 80 of the Fortune 100.

The company is known for its deep expertise in AI, cloud, networking, cybersecurity, data analytics, and automation, and is on a mission to deliver groundbreaking solutions that redefine businesses, revolutionize industries, and transform communities.

Unique in the industry, WWT's Advanced Technology Center (ATC) is a key differentiator for the pioneering firm. It is a multi-data center, large-scale digital ecosystem hosted in St. Louis that enables holistic collaboration. Its thousands of customers include technology vanguards, industry partners, and more than 200 OEMs who innovate freely through private and on-demand labs, testing environments, and application simulations. "We can literally do anything and everything a customer can ever conceive of from a proof-of-concept standpoint," says Nathan Litz, lead network architect for the ATC core engineering group.

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>
> **Nathan Litz**
> **Lead Network Architect, WWT**

THE SITUATION

Achieving the Company Vision for the ATC

WWT puts tremendous store in the ATC's role as a test bed for technology discovery and solution validation. A primary function of the ATC is to facilitate proof-of-concept (PoC) projects. "We play host to a revolving door of customer engagements and solution showcases for all of our OEM partners," Litz notes. "We also provide long-term lab setups for some of our larger more strategic customers."

World Wide Technology

The lab is now embarking on the creation of its crown jewel, the AI Proving Ground, a massive, multi-vendor workspace for demoing AI-focused technology, networking fabric technology models, and OEM-validated designs. For the ATC to reach this stage of maturity, however, WWT had to overcome numerous obstacles over the past decade.

THE CHALLENGES

Taming Manual Complexity and Expanding Capacities

A critical function of the ATC involves the buildout and teardown of the PoC networks that the lab's customers require to pursue their technology explorations. These networks are ephemeral, often existing from just hours to only a few days, and yet, they must be fully functioning, cloud-connected, fast, and secure. On any given day, there may be anywhere from 10 to 20 PoCs operating in the lab. More than a 100 PoCs have come into being and been retired in just the first five months of 2024. The lab's PoC networks are often complex, comprised of multiple subnets and IP namespaces. Most also incorporate cloud and virtualization components, including virtual machines (VMs) and products, such as VMware's ESXi and VMware vCloud Suite, and those from other network virtualization and automation providers.

Provisioning and executing such intricate networks once entailed as many as ten separate steps for a single lab environment, eating up over two hours of time to complete. Those steps must then be repeated in reverse order during teardown. Each new PoC instance requires a clean slate with no traces left behind from a previous PoC. Consequently, once a PoC has concluded, its IP namespaces must be cleaned and all provisioned resources retired and removed. Depending on the rate of PoC turnover in the lab, this creation and decommissioning sequence may need to be repeated multiple times a day.

When Nathan Litz first began working in the ATC in 2015 and for years following, this sequence was done essentially by hand. "It required tons of little pieces of detail all of which were done manually every single time you instantiate a new network," he recalls. For example, fulfilling requests for new IP namespaces from WWT architects required substantial back and forth through ServiceNow tickets. Each PoC instance required several hours of Litz's time to build and subsequently remove, which left less time to oversee additional PoCs.

Manual processes were not the ATC's only technical limitation. At the time, the lab was only a shadow of its current incarnation, consisting of a single data center with a handful of racks confined to a small storage room in company headquarters. For WWT to achieve its strategic vision for the ATC, the lab needed to not only expand its capacity but also gain greater network management, resiliency, and security capabilities.

Customer: ***World Wide Technology (WWT)***
Industry: ***Information Technology & Related Consulting***
Location: ***St. Louis, Missouri***

OBJECTIVES:

- Improve resiliency and high availability by adding geographically dispersed data centers
- Simplify the rapid buildout and teardown of complex, ephemeral network instances
- Enable support for cloud and virtualization components in network instances
- Improve security for all network instances and their thousands of users

RESULTS:

- 10-year partnership without a single network outage
- 20x process acceleration to build and remove network instances
- Vital DNS protection for thousands of users
- Critical new capacity and resiliency through data center expansion on Infoblox Grid Masters and DNS servers
- Streamlined workflow for incorporating diverse network components

PRODUCTS:

- NIOS DDI
- Network Insight
- BloxOne Threat Defense

THE SOLUTION

Extending ATC's Footprint

Over several years, the ATC brought additional data centers online. For Litz, who had already been using Infoblox solutions for some time, there was never a question of which vendor to trust for the expansion. "It was, 'We're doing Infoblox, let's make it bigger and let's make it better,'" he says.

Today, the ATC's footprint spans five data centers in geographically dispersed locations. The data centers consist of two physical Infoblox Grid Masters: one at headquarters in St. Louis and the other in Culpepper, Virginia, managed by WWT partner Equinix, along with three on-premises, internal-facing DNS servers for managing 30+ zones for customer engagements. The ATC lab also leverages Network Insights, BloxOne Threat Defense, Advanced DNS Protection, and Infoblox's extensive API library.

The new data centers presented Litz and the ATC with more than added capacity and computational power. "Having that ability to rearchitect with additional servers from a physical standpoint allowed me to spread everything apart, which in turn increased the redundancy and resiliency that the Infoblox Grid inherently has." Active pairing of the Grid Masters in St. Louis and the Equinix facility gives the lab the high availability (HA) it lacked previously, ensuring that if one Master goes offline for any reason its synced counterpart maintains uninterrupted service.

Beyond HA, the Infoblox Grid also provides the DDI system that enables Litz to successfully deliver the diverse wish lists that the lab's customers demand in their PoC networks. "They need ESX, they need fault tolerance, they need VMotion, all those individual networks and subnets, all of those are built in Infoblox."

Moreover, Infoblox implementations support the ATC's fast-growing requirements for cloud networking and virtualization. To date, the lab's PoC networks have incorporated more than 70,000 virtual machines. In addition, the ATC is one of the largest users of VMware Cloud Director (VCD). All of the VCDs used in lab networks are independent deployments, each with their own VCD cells and NSX domains.

Threat protection was high on Litz's agenda during lab expansion. Prior to Infoblox, the ATC had no external DNS protection. "We were just sending recursive queries out to the Internet," Litz says. With the help of Infoblox Threat Defense and Advanced DNS Protection for external-facing DNS where additional public zones are hosted for customer engagements, ATC has fortified its security posture. Capability highlights include a DNS forwarding proxy, protection of recursive outbound queries, and automated security policy enforcement.

THE RESULTS

Boosting Productivity, Resilience, and Security with an Eye Toward What's Next

Since building up the lab's capacity with the help of Infoblox, the ATC now has the ability to meet the steep demands of lab engagements today and down the road. For example, with Network Insight, Litz is able to keep much better track of everything being used and deployed in the AI Proving Ground across a multitude of subnets. "All of those are defined in Infoblox," he observes.

In addition, Infoblox implementations have given the lab the resiliency and failover that Litz sought during its expansion. It's estimated that the lab has scaled up to managing more than one million IP addresses with NIOS DDI while experiencing zero downtime across thousands of PoC instances going back more than a decade. The ATC remains at the forefront of DDI innovation, testing Infoblox product prototypes for a more unified perspective of DNS services across multi-cloud environments.

Through BloxOne Threat Defense and Advanced DNS Protection, the ATC has comprehensive protection for its many users from pervasive network threats and DDoS attacks. These solutions give Litz and the ATC critical security visibility that had not been available before. "We now have network level tools that allow us to locate various endpoints and look at the historical communication of them in terms of what they talk to both internally and externally." For Litz, acquiring such clarity has been illuminating. "We are definitely seeing what should have been previously blocked but was not and now is." Litz has also reduced the time and effort involved in investigating security events when they do occur.

Those time savings have not been confined to security. With the aid of Infoblox's API library, Litz has dramatically slashed the time required to create and decommission a PoC network. Using the library, he built a homegrown IP Management Tool that transforms the ten-step, two-hour slog he previously endured into a pain-free, automated experience that involves only a handful of clicks and is completed in just minutes. Better still, the tool is available to WWT's architects, enabling rapid self-service when they wish to allocate new IP namespaces to a PoC network. The tool automatically associates the spaces with the appropriate data center and removes all assigned resources when a PoC concludes.

The API library has been a welcome addition to Litz's wheelhouse. "It has been absolutely invaluable," he notes. "Not only is this a time saver, but as the primary architect, this has allowed me to dedicate my time elsewhere to focus on longer term projects and larger goals." With Infoblox, Litz's goals, as well as those of ATC's many customers, are now easier to achieve.

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