Department of Defense Cyber Range Relies on Tintri Storage for Modeling and Simulation Environment

Tintri Speeds VM Provisioning from Weeks to Minutes, Cuts Datacenter Footprint in Half, and Reduces Power and Consumption by 96%

The Department of Defense Cyber Range

The United States Department of Defense (DoD) Cyber Range is a realistic simulation and modeling network environment, used to safely test capabilities and train military personnel on how to prevent and defend against network intrusions. The DoD Cyber Range has been operating in Stafford, Virginia since October 2009. ManTech International is the civilian contractor agency that designed, engineered, built, and operates the DoD Cyber Range. Last year, the ManTech team managed over 125 separate customer events (IT projects) at the Cyber Range.

Existing Storage Platform Lacked Scalability

The Cyber Range facility had been relying on a traditional storage platform for many years. The LUN and volume approach to provisioning storage was adequate for managing event data, but not for scaling quickly. The Cyber Range needed the ability to provision hundreds or even thousands of VMs quickly, and then spin them down just as fast when the exercises were completed.

Due to a very dynamic operating environment, Cyber Range customers can't always predict the number of machines they'll need for their exercises in advance. They will design a test based on customer requirements, but frequently end up scaling the project on short notice. This used to be a significant challenge for the Cyber Range because It took days to roll out extra capacity using the old storage systems. Once the storage and the VMs were provisioned, system performance deteriorated, significantly impacting the customer events.

The ManTech IT team started looking for a new storage solution that would enable them to rapidly provision new environments for multiple, simultaneous customer events. They also wanted to reduce physical footprint, cooling requirements, and power consumption at the Cyber Security Research (CSR) datacenter. In addition to finding a solution that would enable rapid provisioning, they also needed a better way to track, monitor, and provide statistical data at the end of each exercise. And finally, the IT team needed a way to safely and efficiently backup all customer event data during the exercises.

Choosing Tintri

After evaluating everything from converged Google-like file systems, to brand new 100% flash based solutions, they decided to select Tintri because nothing came close to the flexibility, visibility, performance, and ease of use that Tintri offers.

Industry
- U.S. Military

Virtualization environment
- VMware vSphere version 5.1
- VMware vCenter

VM profile
- 3,000 + VMs

Key challenges
- Provisioning new customer environments took weeks
- Existing storage was difficult to manage
- Wanted to reduce physical footprint, cooling, and power consumption
- Needed to enhance backup/replication of VMs

Tintri solution
- Tintri VMstore™ T540 and T650
- Three networks of storage with corresponding backup arrays

Primary use case
- The Department of Defense Cyber Range is a closed laboratory that replicates real-world DoD networks as closely as possible for testing and simulation

Business Benefits
- Reduced time to deploy new VMs from two weeks to just minutes
- Increased storage performance
- Cut datacenter footprint from 3 racks to 1½
- Achieved reduction in heat output and power consumption
- Simplified storage management and reduced training overhead
- Increased backup functionality

After making a decision to standardize on Tintri for their virtual environment, the ManTech team has been able to satisfy another goal of reducing storage footprint as well as heat and power consumption. Due to Tintri's compact form factor, the ManTech team has been able to reduce the CSR datacenter storage footprint from 3 full racks to 1½, cutting power consumption by a factor of 25 to 1.

The Cyber Range is also using Tintri ReplicateVM™ for disaster recovery as well as Tintri Global Center™ to view multiple VMstore's in a single pane of glass. This allows them to quickly and easily view the end to end (Compute/Network/Storage) performance for every single VM in their environment on a per VM basis. The Tintri solution is so easy to use, it has eliminated the need for specialized training to manage and operate the Tintri storage systems.

Faster Scaling

The Tintri Storage solution has enabled the ManTech IT team to rapidly provision pre-configured VMs for all customer events. It used to take as long as two weeks to roll out hundreds of VMs for new customer events. With Tintri, it now only takes minutes. Plus, the additional VMs don't strain the system's ability to deliver high performance once provisioned.

The speed of Tintri provisioning still surprises the operation and admin team. For example, during a recent exercise, one of the lead system admins was asked to roll out 60 devices for an exercise. The admin went to his computer, ran the command, and before he could give a full report of the command being executed, the operation was complete. This occurred so quickly, he assumed the command had failed, since that process would have taken approximately 8 hours to complete on the previous storage platform. With Tintri, the function had finished in just a few seconds.

On the previous storage platform, the IT team constantly took on an immense management burden, planning to run ten+ different functions at the same time because each task took so long to complete. With Tintri, the admins now experience an unparalleled amount of flexibility as they can run one big task, wait for it to complete, and then quickly move along to the next one. In just ten seconds, Tintri can do what the legacy storage system did in eight hours.

Improved Backup Capabilities

The ManTech team is using Tintri replication between the Tintri at the production site and the Tintri as a backup repository at the DR site. The Tintri replication is very quick – it takes just minutes, compared to a full day or longer to back up an entire site on the previous platform.

Another benefit of Tintri is the non-disruptive replication. With Tintri, backups can be done behind the scenes without impacting the production environment. In the past, they had to stop all other functions – including rolling out other customer event areas – because it would effectively lock up the entire system and use all available resources for the backup.

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—Senior Program Manager, DoD Cyber Range