



SUCCESS STORY  
Telecommunications



#### BANDWIDTH | PROBLEM SOLVED

To accelerate product development and delivery, Bandwidth implemented a cloud-native container orchestration platform by using Kubernetes and Trident.

# Bandwidth Accelerates Its DevOps Journey with Trident

Bandwidth, an API platform provider, delivers voice, messaging, and 911 services that touch millions of people every day. Bandwidth's developers innovate relentlessly to evolve the company's platform and bring new services to market faster. To meet developers' expectations for cloud agility, the operations team began a DevOps journey with NetApp, deploying OpenShift Container Platform for Kubernetes container orchestration. Trident from NetApp enables persistent storage and automates storage provisioning, helping Bandwidth accelerate deployment and reduce friction between application owners and infrastructure teams.



Cut time to provision storage and compute from days to seconds



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Jeff Spahr  
Infrastructure Architect, Bandwidth

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Bandwidth is changing how the world communicates. Some of the largest brands in the world, including Google, Microsoft, Zoom, and GoDaddy, depend on Bandwidth’s API platform to help them grow and differentiate their businesses. Bandwidth’s voice network provides the highest levels of quality and reliability to millions of numbers nationwide. Industry-leading APIs enable customers to easily integrate powerful voice, text, and 911 capabilities into their offerings with just a few lines of code.

“At our core, we’re a telecommunications company that provides a communication platform as a service (CPaaS),” explains Jeff Spahr, systems infrastructure architect at Bandwidth. “We specialize in enabling customers to send messages and phone calls over APIs without having to understand the complexity of traditional telco networks.”

For example, home security camera giant Arlo uses Bandwidth 911 Access to connect app users with local 911 dispatch and rapidly provide location information to first responders. In an emergency, instant number provisioning and address

validation enable dispatchers to send first responders directly to the right building, floor, or room—saving precious seconds.

For customers like Arlo, downtime isn’t just inconvenient; it can be catastrophic. Across the board, Bandwidth’s customers demand maximum quality and reliability. They also want innovative features that can provide differentiation and help them grow their business. To meet changing customer needs, Bandwidth’s development team works nonstop to update existing products and services and bring new services to market faster.

### **STEP 1: CONTAINER ORCHESTRATION**

On the operations side of the business, a small team of infrastructure engineers supports a much larger team of developers and application owners. Previous manual provisioning workflows were time consuming and didn’t scale with the needs of the business. The infrastructure team needed to enable infrastructure automation and self-service to provide a fast, consistent, and repeatable experience to its internal customers.

In 2017, Spahr and his team began a project to deliver a cloud-native infrastructure to end users by implementing a container orchestration platform. “One of the primary goals of DevOps is to reduce or eliminate the friction between developers and operations,” says Spahr. “Our goal was to get out of the provisioning world, so we could focus on more interesting problems and prevent our internal customers from having to sit around waiting for resources.”

For Spahr, the first step toward DevOps was to enable infrastructure automation and abstraction through a container orchestration platform. For this step, his team chose OpenShift Container Platform as its distribution of Kubernetes. OpenShift enabled Bandwidth to deploy containerized applications consistently on the premises or in the cloud.

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There was just one problem: Even with Kubernetes, Spahr and his team still had to provision storage manually. To provide persistent storage to applications deployed using Kubernetes, volumes had to be pre-provisioned and introduced by the Kubernetes administrator before they could be used by developers.

“Out of the box, Kubernetes solves your compute and load-balancing automation,” explains Spahr.

“Storage can be more difficult. Storage automation is not solved by Kubernetes alone. That’s where Trident comes in.”

## **STEP 2: STORAGE AUTOMATION**

Trident is an open-source storage provisioner and orchestrator for the NetApp® portfolio. With Trident, Spahr and his team seamlessly integrated their existing NetApp all-flash storage into their Kubernetes container orchestration system.

“Initially, we had planned to address storage automation in Phase 2 of the project,” says Spahr. “With Trident, we were able to solve for persistent storage quickly and painlessly. We scheduled an afternoon to get Trident up and running, and we were done in less than an hour. We used that extra time to grab a beer to celebrate the quick win.”

## **STEP 3: INNOVATION**

Today, with OpenShift and Trident, Bandwidth’s operations team has fully automated the provisioning of compute, storage, and load balancing for its container environments. The team can now spend less time on provisioning tickets and focus instead on the next step in its DevOps journey.

“People were able to start consuming containers immediately with little effort,” says Spahr. “It was really exciting for us on the operations side. But, to our developers, it was so easy that it was boring. It just worked.”

Developers are happier now that they can deploy resources faster and more consistently, iterate more quickly, and speed up development cycles. Lab environments are entirely self-service. Tickets are a thing of the past. With the click of a button, developers can create a project or namespace and start deploying their workload.

Instead of taking weeks to begin work, developers can access containers in minutes and accelerate time to market for new products, services, and features. They can also quickly push their projects live to production and self-manage the lifecycle of their containers. The result? “We’re seeing more collaboration and everyone working toward the same goal of reducing the friction between development and operations,” says Spahr. “We can now enable developers to deliver new products faster and provide value to our customers.”

NetApp AFF all-flash storage provides unmatched speed, efficiency, and reliability for Bandwidth's container platform, which means that the infrastructure team no longer spends time troubleshooting storage performance and latency. Nondisruptive operations eliminate planned and unplanned downtime, so customer-facing applications can run with maximum availability. This is critical for customers who depend on Bandwidth's services for timely communications and critical emergency services.

"Storage is the foundation of our infrastructure—of anybody's infrastructure, really. If your storage fails, your application availability is impacted. NetApp's reliability and uptime directly correlates to our reliability and uptime," says Spahr.

Next up, Bandwidth has already begun deploying Trident with NetApp Cloud Volumes Service for AWS to provide the same experience to developers regardless of where the data actually lives—in the cloud or on the premises. With Cloud Volumes Service, the operations team can take advantage of enterprise data management features, such as NetApp Snapshot™ copies and clones, while choosing a storage environment that provides the best balance of speed, security, and cost to the organization.

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## SOLUTION COMPONENTS

### NETAPP PRODUCTS

Trident

NetApp modules for Ansible

NetApp AFF all-flash storage systems

NetApp Cloud Volumes Service

### THIRD-PARTY PRODUCTS

Red Hat OpenShift

Red Hat Ansible

Kubernetes

[LEARN MORE](#)

<https://github.com/NetApp/trident>

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