Bosch accelerates engineering innovation with DevOps

■ NetApp

Building a cutting-edge DevOps solution with infrastructure-as-code

Maintaining a leading edge in today's fast-paced world requires an infrastructure that can grow and respond quickly to developers' needs—one that allows developers to build software quickly and efficiently, without any hassle.

Bosch raised the bar for its DevOps teams with an infrastructure-as-code solution that enables a continuous integration pipeline. This solution helps developers innovate faster to keep the company at the front of the pack.

⊕ BOSCH

3,500
VMs per building
block cloned daily

<1 second
cloning time

Helps achieve
**carbon-
neutral goals**

The backstory

To help fuel innovation and speed time to market, Bosch knew it needed to provide a more agile development infrastructure. Public cloud solutions were not an option due to the company's stringent security requirements and the size and customized nature of the environment.

In 2017, Bosch developed a private cloud solution that allowed developers to clone a running template VM and use it immediately without having to run Sysprep. This helped to significantly streamline development. Teams could purchase the service and scale as needed. They could start 100 clones in parallel, with each clone taking just a couple of minutes to complete.

Within a year, the infrastructure had grown exponentially by duplicating itself every six months. This growth put a huge strain on the system, forcing IT to slow down onboarding of internal customers. In efforts to expand the environment, Bosch realized that the storage systems the solution was built on were not created for this particular use case and were unable to deliver the functionality required.

Bosch then turned to NetApp. The NetApp REST API could allow control of the solution from the outside and enable near-instant cloning.

The solution

The new solution uses building blocks for easier expansion. Each building block contains 4 NetApp® AFF A300 nodes and 34 compute servers, each running as a KVM host.

There are four building blocks currently in place. When developers need to clone a VM, the platform simply calls the REST API of the NetApp system. With the help of NetApp FlexClone® technology, their cloned VM is instantly available. Each time a developer commits a new feature, the platform provides them with a unique virtual machine and a fully automated build pipeline. When the build process is done, it gets destroyed.

While the NetApp storage systems sit quietly in the background, they are more than just storage boxes. They enable developers to work in a cloud-like infrastructure to create better products, faster.

The benefits

With 3,500 VMs per building block created daily, the new solution allows developers to perform their builds on a fresh VM without a lot of client administration. Developers can easily adjust for a multitude of OEM variants, for example, the number of cylinders or amount of horsepower in a vehicle. They can create a VM in less than one second and run builds in parallel. This allows developers to spend more time developing, and ultimately, speed time to market.

Cloning helps the company reduce storage costs. Making 100 copies of a 500GB file requires around 50TB on SSD drives—a costly investment. However, thin cloning with NetApp FlexClone requires just 550GB. And because developers destroy the clones after they are done using them, space for new clones is continually freed up. With less storage needed, Bosch is also reducing power, cooling, and space requirements, which in turn helps them to achieve their carbon-neutral goals.

What's next
This infrastructure-as-code solution exemplifies the value of a continuous integration pipeline for developers. Bosch is looking at expanding the solution so that its 14,000 developers worldwide have access to the streamlined services the platform offers.

Organizations around the world hoping to benefit from this type of technological transformation will need help to fit the vision into their environments. For more information about NetApp solutions, visit www.netapp.com.

Solution components
- 4 NetApp AFF A300 systems
- FlexClone thin-cloning technology
- NetApp REST API