

NETAPP ON NETAPP EBOOK

# Modernizing the NetApp IT Tech Stack

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# What NetApp IT gains from the hybrid cloud

By Umesh Manathkar  
CIO

With the challenges of serving a complex, global enterprise, NetApp IT is a strong proponent of the hybrid cloud. It is the best – and realistically only – option for giving the organization what it needs to run and grow the business.

Why do we believe this? What is our rationale? The business case for embracing the hybrid cloud is strong, but what are we looking to gain from the cloud, now and in the future?

## **More Flexibility, Reasonable Costs**

Enterprise needs change daily and it is our responsibility to give our teams what they need, when they need it. For quick scaling and resource delivery, the cloud (either public or private) is the only reasonable option. It is incumbent on us to respond to business needs as quickly as possible. The cloud does this for us.

With a robust FinOps strategy, we are avoiding the biggest drawback to a full embrace of the cloud – spiraling costs. We have been able to avoid shocking bills from hyperscalers by leveraging our own products, like Spot, and a system of

governance that ensures that we maximize the return on investment in our cloud spend.

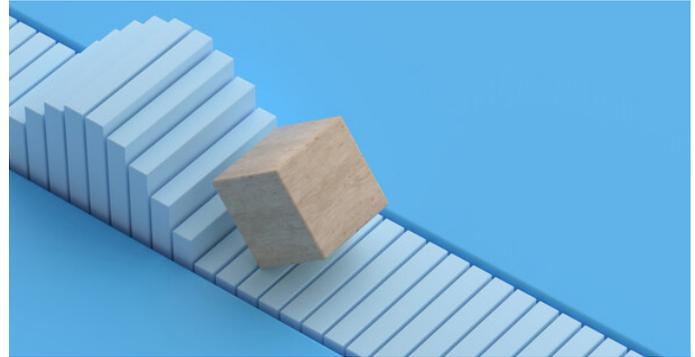
### **Better Security and Resilience**

With an increasingly remote workforce, there has never been a more challenging time for security teams. More touchpoints outside office walls means more opportunities for bad actors to take advantage of security flaws. Identity management, misconfiguration, and change control are all concerns.

In our hybrid cloud environment, however, we have full visibility into what is happening and where it is happening. Cloud Insights enables us to identify risks before they turn into breaches. Related, there is also concerns about ransomware, which we mitigate with OnTap SNAP technology that protect us should the worst happen.

### **Better Insights**

Related to the above, having eyes on our entire ecosystem at all times is a challenge—and blind spots can happen. Between on-prem resources, cloud environments across multiple vendors, and countless virtual machines, there are multiple threats to an efficient operation.



Idle resources are wasted dollars and knowing where these are happening and how much they are costing us enables us to run a lean, streamlined operation. Full monitoring of our stack from top to bottom uncovers trouble spots before they become, well, troublesome.

Ultimately our goals in the hybrid cloud are to provide the most for the least. NetApp is doing amazing things, but the company cannot do this without an IT operation that is delivering every day.

# Webinar: NetApp IT's Evolving Hybrid Cloud Strategy and Architecture

By Rajesh Shriyan  
IT Director

Building NetApp's IT ecosystem is never ending. Our embrace of the hybrid cloud means that we're constantly looking for new ways to embrace automation, optimize operations, and reduce costs.

In this webinar, NetApp IT Director Rajesh Shriyan will discuss our strategy for maximizing the value of the cloud and what's next for the enterprise.

## Why Transform and Why Cloud?

Real business value of cloud transformation



### Business Drivers:

- Digital transformation
- Faster go to market for new capabilities
- Minimize customization & drive business with OOB capabilities



### Advanced Capabilities

- Advanced analytics
- Cloud DevOps
- AI/ML



Cloud is the platform and data is the currency for digital



### Efficiencies

- IT Operations efficiencies
- Consumption driven spending / flexibility
- Tackle elastic demand easily
- Omni present cloud across all geos

# Storage automation is key for NetApp innovation

By Eduardo Rivera  
IT Director

The next step in storage infrastructure management is automation. Modern IT operations must be able to deliver storage at the speed of code, easily integrate the storage asset into other platforms, and must be configured correctly. This is NetApp IT's approach to automated storage delivery and how we keep the enterprise moving.

NetApp IT is not dissimilar to the customers we serve. We must account for over a massive amount of storage, enterprise applications, and SaaS platforms, spread globally, in line with other large enterprise organizations. However, we are unique in that we are users of NetApp products and consider ourselves the company's Customer 1.

That is of course doubly true on the storage side. Application and infrastructure needs are steadily increasing. For storage, there is a definite growing need, at all levels. There is an acceleration of application development and needs that must be met. It's the new speed of business and it's on us to deliver on what developers need, when they need it.

That need has created what we call the "new storage consumer." Much like regular consumers, there's now an

expectation of self-service that has replaced the old “file-a-ticket” approach. We have a new environment of portals that give them access to the infrastructure they want to consume. We make it simple to ensure that they get the capacity, amount, and type of storage that they need. For us, the infrastructure team is fairly hands off.

### IaaS powers it all

For NetApp IT, this means an Infrastructure as a Service (IaaS) approach. We’ve set up storage and virtual machine portals for developers to self-service and easily and quickly, through embracing focused automation. The process involves ServiceNow and Ansible Playbooks on our end, but for the user, it’s just a few clicks and they’ve got what they need.

Our storage automation program

is made up of several distinct components:

- A source control system, such as Git
- A development platform, such as Ansible
- An orchestration and deployment system, such as Azure DevOps pipelines
- A feature request and but reporting function, such as ServiceNow

From this, we’re able to provision infrastructure and manage configurations to ensure a smooth customer experience. Our strategy of deploying Infrastructure as Code, automating and simplifying service experiences, and embracing automation makes for an agile and malleable IT environment that supports NetApp’s own work to develop and innovate.



# Infrastructure as code empowers us to meet business needs

By Ed Wang  
Senior IT Manager

For modern enterprise IT organizations, it's becoming crucial to automate the provisioning and management of infrastructure. With hundreds of deployments and changes, it is increasingly difficult to maintain a consistent infrastructure without variations across systems. Inevitably, trying to manage such an environment creates a massive burden on IT operation, and it is not reasonable to expect this work to be done using traditional methods.

That's the basis for our approach to CloudOne DevOps, NetApp IT's container based (Kubernetes), hybrid cloud platform for application development and operations. It's a dynamic platform that requires us to adopt and embrace Infrastructure as Code (IaC).

IaC enables us to react quicker to changing needs by embracing automation. This approach enables us to take a more agile approach to meeting business needs while providing consistency across the board in the everchanging platform. For example, if we need to quickly deploy additional capacity for CloudOne, we can do so quickly. Adding a new compute blade, managing blade failures are all automated and can be

done with the click of a button. Because it's code-based and doesn't require manual configuration, it minimizes human errors, and every new blade is configured identically to all the other blades. Since all the configuration is driven by version-controlled code, it can be easily rolled back to previous configurations if there are any issues.

### **Immutable infrastructure helps avoid unexpected alterations**

With the IaC approach, we are also able to manage our Kubernetes platform with immutable infrastructure. The CloudOne servers are never edited or updated, they're replaced with a completely new image. Immutable infrastructure ensures that all servers remain identical. When an update is needed across servers, there's a chance of failure in the update process that could lead to a permanent alteration. The more the systems are patched after that, the higher the probability of the unexpected change impacting the system.

With an immutable infrastructure approach, this doesn't happen. NetApp IT doesn't patch CloudOne's containerized platform. Instead, we create a new, updated image of the server, tests for quality, and then new systems with the updated image are created to replace the older servers.

With this approach, the old images are never updated eliminating configuration drift. If there were any issues with the new image, we can easily roll back to an old image without disruptions.

### **How we use FlexPod**

We manage our on-prem Kubernetes clusters running on NetApp's own FlexPod in a "bare metal" configuration using Terraform by HashiCorp. Terraform uses providers as building blocks that makes its operation much simpler. In our journey to IaC and immutable infrastructure, we developed a Terraform provider for Flexpod called "flexbot" which enabled our team to easily manage our own FlexPod infrastructure.

If you're working in FlexPod as well, we've uploaded the provider to the Terraform providers registry. If you are interested in leveraging the automation we created for your FlexPod infrastructure, take a look at the provider and see if you can take advantage of it as well. The flexbot provider has eliminated a significant amount of manual work for us and may be able to do the same for you.

## Meet the NetApp IT experts



**Umesh Manathkar** is SVP and CIO for NetApp and is responsible for leading NetApp IT's continuing digital transformation and delivering business value throughout the organization. He leads NetApp IT's efforts to solve business challenges with technology, reduce costs, and managing enterprise-wide security.



As Chief IT Architect at NetApp, **Rajesh Shriyan** and his team provide expertise in data and analytics, enterprise planning, sequencing, and industry knowledge to build enterprise roadmaps and data services. In close collaboration with business leaders, they ensure the enterprise technology portfolio achieves current and future business objectives for NetApp.



As the Director of NetApp IT's CloudOne product line, **Eduardo Rivera** leads NetApp IT's hybrid cloud and DevOps platform strategy —orchestrated and managed by an automation ecosystem— to create a holistic environment for cloud-aware enterprise applications.



**David Tanigawa** is a Sr. Storage Engineer with NetApp IT and manages all aspects of NetApp storage. He also serves as the lead subject matter expert for NetApp IT's on-premise Data ONTAP infrastructure.