

NETAPP ON NETAPP EBOOK

How NetApp IT's FinOps strategy helps contain costs, maximize resources



Content

01

FinOps helps NetApp optimize cost efficiencies

02

NetApp IT used Spot to open the public cloud

03

Getting to Know CloudCheckr

04

Spot Ocean offers scalability and cost savings for NetApp IT

Authors

FinOps helps NetApp optimize cost efficiencies

By Peter Kim
Manager, IT Infrastructure Operations

The accelerating shift to the hybrid cloud has forever changed the management of data-centric applications, and it's also turning the traditional IT spending model on its head. For decades, IT spending largely centered around balancing ongoing costs for things like licensing, energy, and maintenance with significant, cyclical investments, or capital expenditures (capex), every few years in IT enhancements and hardware and software upgrades. IT managers, finance leaders, and procurement struggled with the complicated, frustrating process of analyzing spreadsheets and reports in order to lay their bets on which hardware and infrastructure investments would deliver the best value in the years ahead.

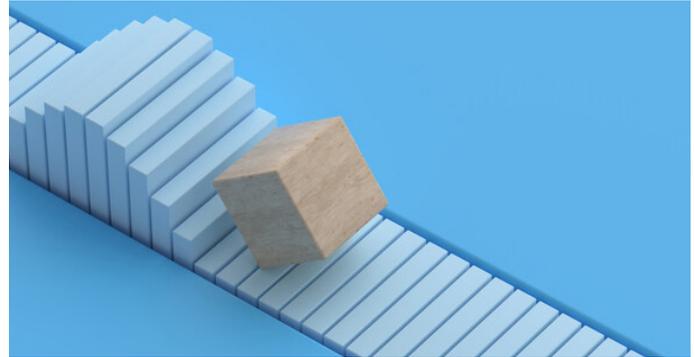
This model is starting to change. With the increasing move toward hybrid cloud and cloud-led serverless and storageless environments, many companies are now refocusing more of their IT dollars from capex to the ongoing operational expenditures (opex) associated with cloud. According to International Data Corporation (IDC), spending on public cloud IT infrastructure for the first time exceeded the level of spending on noncloud IT infrastructure in Q2 2020, increasing nearly 48% year over year,

reaching \$14.1 billion. During the same period, investments in noncloud IT infrastructure actually declined nearly 9%.

At NetApp, we believe that understanding our costs and their associated value helps us to strategically use our resources to fund digital transformation and ultimately to better serve our customers, partners, and investors. That's why NetApp IT is exploring FinOps, or cloud financial management, particularly as it relates to our all-in-one hybrid cloud platform for our software development and operations.

What is FinOps?

FinOps is the relatively new practice of driving visibility and bringing financial accountability to the variable spending model of cloud, per the FinOps Foundation. Essentially, finance and IT develop a series of best practices to measure, quantify, and provide insight into the associated cost of cloud usage behaviors. Just as it's important to measure hardware costs by total cost of ownership rather than raw purchase costs, these best practices center around three vectors: speed/performance, quality, and cost. The objective is to create a cloud allocation model to help application teams understand and right-size their cloud



usage, with the potential to bill back to individual teams.

Our cloud-led end-to-end solution as a service, seemed like the perfect place to begin our FinOps journey here at NetApp. In the environment, our developers build applications in containers, with automation, tools, and pipeline infrastructure all readily available in one central spot. It incorporates private cloud and public cloud technologies from companies like AWS with leading NetApp® technologies, like Spot by NetApp, which enables us to take AWS Spot Instance savings. We're working hard to ensure that our developers have a consistent experience, regardless of what is supporting their back-end data. At the same time, we saw value in better understanding how specific applications and application development practices were impacting our bottom line. The aim is to empower our development teams to make informed decisions about their cloud usage.

Putting FinOps to work at NetApp IT

With our scope established, finance and our IT Platform, Cloud, and Infrastructure teams have worked together over the past year to develop a methodology and set of best practices to measure and quantify cloud usage value and cost. We delved into reports from public cloud partners, analytics from NetApp Cloud Insights, NetApp ONTAP® Cloud Manager, and other NetApp technologies, as well as partner resources including Splunk App for NetApp Data ONTAP. We looked for commonalities by which to compare “apples to apples.” The FinOps Foundation provided a wealth of guidance and resources to help us create best practices, but we also fine-tuned our process based on our own unique considerations.

In creating our practices, it was important to our team to continue to ensure that our developers had the capacity and performance necessary to deliver exceptional applications. However, we also understood that, just as you may not need race car speed to go to the grocery store, the highest level of performance may not be needed 24/7 for every scenario. Accordingly, we created our best practices and methodology for our development environment centered around a few key

factors, including cost by compute and storage capacity.

From there, governance was the key. Changes in raw costs, the implementation of new technologies, and other considerations can cause costs to fluctuate. We built a regular cadence of review and assessments to ensure that our FinOps measurement stayed accurate and timely.

Then we rolled out the first phase of our FinOps program with a robust education campaign for our stakeholders. Over the course of several months, our application teams were able to see the impact of their development processes and practices from a cost perspective, realizing how simple changes can improve efficiencies and optimize costs.

Although it's still early days, empowering our developers to take a more active role in managing IT spending for the cloud has already had a meaningful impact. We are excited about the potential of FinOps and are working to further enhance the program. In the meantime, we'd like to hear from you. I invite you to share your thoughts and questions on FinOps.

NetApp IT used Spot to open the public cloud

By Eduardo Rivera
Director of IT

At NetApp IT, we're constantly looking for new ways to use all available resources. The public cloud has been a key subject of discussion here, as we investigate how to best accentuate the positives and eliminate the negatives.

Running on the public cloud comes with plenty of benefits—development and deployment are easier, and scaling is relatively simple. However, it comes with a cost. Public cloud expenses outpace a traditional data center, making it less of an option for enterprise organizations.

We had the same issues, until we deployed the Spot by NetApp® portfolio of services.

There are easy ways to decrease public cloud costs, but at significant cost to performance. Spot enables organizations to find these cost reductions, while avoiding the risks that come with them.

That's why NetApp acquired the company, formerly Spot.io, and why NetApp IT was eager to use their solutions. We saw up close the impact that Spot had on our own IT operations. After moving five applications to Spot, we saw savings of 49% to 75% compared with AWS on-demand compute services.

It was the proof point that we needed to include Spot in our portfolio and to enable customers to have the same experience.

The untapped market of spot instances

Spot takes advantage of spot instances, unused capacity in public cloud infrastructure. Providers like AWS and Azure reserve a large capacity to meet on-demand needs. However, when there's too much capacity, the excess that isn't used is wasted.

That extra capacity is available for use at a discounted rate—as much as 80%. That's good. That reduced rate also means that you could lose your instance, with just a 2-minute warning. That's bad. You have access to your instance for as long as it's available. If an on-demand customer needs it, you're out of luck and your instance is terminated, with only 2 minutes' notice.

So, for organizations that require 24/7 reliability, spot instances simply aren't a viable option.

Spot by NetApp removes that risk. The solution creates a snapshot of your application, and when a termination comes, Spot finds another spot instance that closely matches what you were previously using. You are reprovisioned onto the new instance automatically, requiring no overhead.

Spot works in the background with little impact on end users. Disruptions are reduced, work continues unabated, and costs associated with traditional data centers are displaced.

Spot Instances without Spot by NetApp

- High unreliability
- Quick terminations
- Aren't a realistic option for always-on applications

Spot Instances with Spot by NetApp

- Potentially significant cost savings
- Reduced Impact on the end user
- Can be used indefinitely

Spot works in the background with little impact on end users. Disruptions are reduced, work continues unabated, and costs associated with traditional data centers are displaced.

How Spot helped NetApp IT save 60% on public cloud costs

We did our due diligence on Spot by deploying it in our own operations. In our two test cases, the savings were significant. The first was our Common Test Lab, which provides testing environments for product development and quality assurance. The second was our corporate business applications, and Spot integrated easily with little impact on the existing infrastructure.

The savings were immediate, and the operational impact was minimal. We ran 11 compute instances, covering almost 1,500 hours, and we saved 60% for all workflows. Beyond the initial integration, it required no staff time or maintenance. The savings were significant and came right away.

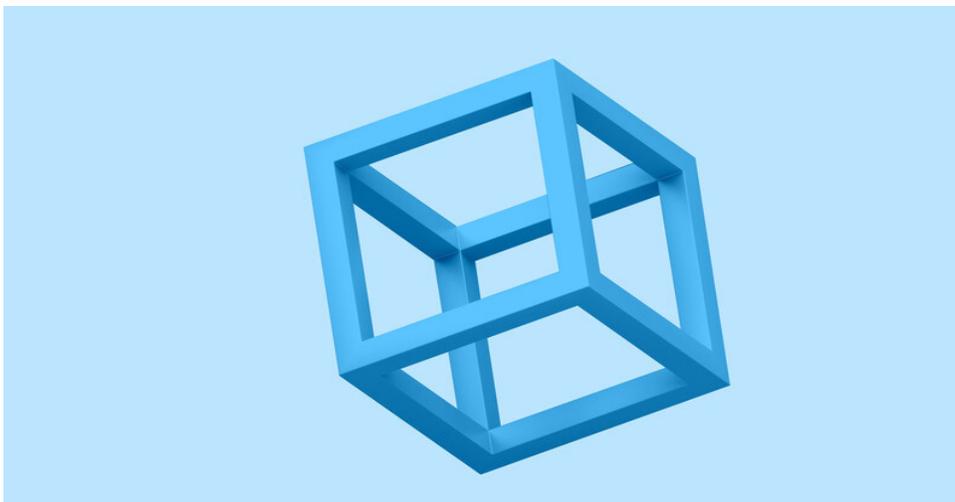
It was all we needed to see to make Spot part of the NetApp IT portfolio.

Making the public cloud an enterprise option

Many organizations are shut out from using the public cloud because of the cost, and they can't use spot instances because of the uncertainty. Applications that aren't reliable have little value. That level of unreliability is changing, however.

When we were performing this proof of concept, we had no idea that Spot would soon become part of our company. Even if we hadn't purchased the company, we still would use the product. The cost savings are just too great.

Spot is and will continue to be central to NetApp's internal strategy. We're looking to use a combination of hybrid cloud, automation, and Spot to eliminate a data center. That's savings on top of savings and a more attractive bottom line.



Getting to Know CloudCheckr

By Andy Kranjec
Senior Manager, Infrastructure Operations

In early November 2021, NetApp announced that it had acquired CloudCheckr, a cloud optimization platform that will extend our already robust FinOps offerings. Spot by NetApp has changed how public cloud users approach spot instances and CloudCheckr will enable our customers to further optimize their cloud use.

NetApp IT will benefit as well. We have begun our own due diligence on the platform to evaluate how we might use it to reduce our own cloud costs. This is of course very early in our evaluation process and we're approaching this as any other potential CloudCheckr client would.

So, we're light on what we know, but we have some things that we think.

On the surface, CloudCheckr is a cloud optimization platform that shows what's driving your expenses. It identifies where you can avoid waste and make better purchase decisions. That drives down your overall costs.

Weeks into what will be a several-month evaluation process, we've found the platform to have extensive potential uses. It's showing us where areas of opportunity are, in a lot of different ways. For example, it's showing us what our idle resources

are and identify high-cost resources that are not being utilized to their full potential. From there, it shows us what can be offloaded to a lower cost resource. It can be applied to a host of services, like elastic load balancers, provisioned IOPS storage, or reserved instances.

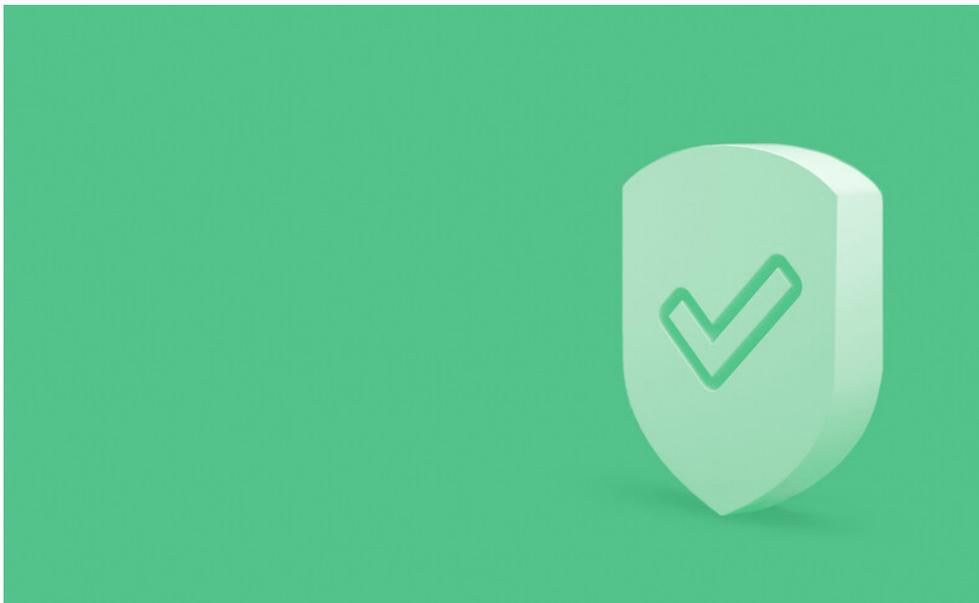
Exacts are still fuzzy, but we feel that CloudCheckr will be a definite benefit to NetApp IT.

For our FinOps strategy, we're going to feed the platform with data, deep dive into the recommendations it provides, and come up with sound metrics to justify decisions and show value to decision makers.

For our initial test, we connected it with our hybrid cloud environment

systems running on AWS, for which CloudCheckr has developed the most diverse feature set. It needs baseline historical data and knowledge of our own usage habits before it can make fully vetted recommendations.

This is all part of our wider FinOps strategy, which is designed to maximize the return on investment NetApp IT gets from its cloud spend. Our hybrid cloud environment is dependent on optimizing opex to reduce unnecessary spending. CloudCheckr, especially when combined with Spot by NetApp, has the potential of significantly changing this and empowering us to get the most power from the cloud for the least amount of funding.



Spot Ocean offers scalability and cost savings for NetApp IT

By Scott Stanford
Sr. Platform Automation Engineer

It seems like everyone talks about how cloud solutions reduce costs, increase efficiency, and make automation possible. However, when you drill into the available solutions, you find that many of them require significant ramp-up time or startup costs to achieve results. It makes you wonder about the real ROI.

When NetApp IT's automation and monitoring tools services team began exploring solutions for expanding into hyperscaler environments, we knew that we needed something that would be optimal for running in AWS and could deliver a similar user experience to what we have on our premises. However, we also wanted a solution that was cost effective and easy to automate. We were able to check all the boxes using Spot Ocean by NetApp® with Amazon Elastic Kubernetes Service.

As part of our cloud journey in AWS, NetApp IT started looking at solutions that don't require management of Amazon Elastic Compute Cloud instances (EC2s). Like most companies expanding to the cloud, our first iteration was to use EC2s to run Kubernetes clusters matching what we have on our premises.

Spot Ocean by NetApp is an application-scaling service that manages the worker nodes that are running as

Spot instances. AWS manages the control plane for the cluster and Spot Ocean manages everything else. By default, Ocean is configured to look at all instance types that are available in the region being used to determine which would be the most cost effective. It also right-sizes the instance types and sizes used by the worker nodes to meet what is being consumed in the cluster. For example, if the cluster has pods using 51 CPU cores, Ocean shrinks and adjusts the types of the worker nodes to be as close as possible to those 51 cores.

We have two clusters that that run 24/7: stage and production. Once these are set up, the only time that anyone needs to touch them is to upgrade the version of the cluster. The upgrades are also simple enough that they don't need to be automated. After the EKS upgrade is complete, all we need to do is update the Amazon Machine Image (AMI) used by Ocean and kick off a cluster roll. The Ocean cluster roll replaces all of the worker nodes, first by adding capacity with the new AMI and then by draining the workers being replaced, which replaces all the workers in the cluster at a pace specified by the user.

AWS Spot instances are often viewed as low-cost, easily disposable excess capacity. In 2 minutes you can lose the compute as well as the EBS volumes attached to it. In NetApp IT's use case, the storage is disposable because new workers are configured from the AMI used and the user data. The preventive replacement feature

of Spot.io replaces the workers with new instances when they are near the average replacement time for the instance type, size, and region. This allows the clusters to avoid spikes in capacity due to Spot replacements.

With multiple members on the team managing and testing with clusters, there are times when an isolated environment is needed. Typically, the EKS cluster would be created and then imported into Spot Ocean, which would then start creating worker nodes on Spot. To simplify this process, the Spot team forked the AWS eksctl codebase and added functionality to create the full deployment in one step, resulting in an EKS cluster managed by Spot Ocean. If a dedicated cluster is needed, we can just run the modified eksctl, do what we need to, and then delete the cluster with eksctl to prevent any unneeded charges.

This it doesn't require any automation to be created or monitoring of the workers, because that is all handled by Ocean. It's a turnkey solution that got us up and running quickly.

So far, we have seen AWS compute savings between approximately 60% and 70% for our two 24/7 clusters and an average of 70% in our smaller dev clusters. This savings allows us to have a similar spend to what we've seen in the past with OnDemand instances, with a lot more compute due to Spot savings.

Meet the NetApp IT experts



Peter Kim is the Manager for IT and Infrastructure Operations for NetApp IT. He is responsible for managing infrastructure operations and recovery management. He is also a member and certified practitioner of the FinOps Foundation.



Eduardo Rivera is the Director of IT at NetApp IT and leads teams responsible for IaaS, PaaS, CaaS, DevOps, infrastructure, site reliability, and FinOps.



Andy Kranjec is the Senior Manager for Infrastructure Operations for NetApp IT, overseeing the organization's FinOps operations.



Scott Stanford is a Senior Platform Automation Engineer with NetApp and works on optimizing systems and processes.

For more information on the NetApp on NetApp program and how NetApp IT uses our own products, check out [NetAppIT.com](https://www.netapp.com/netapp).