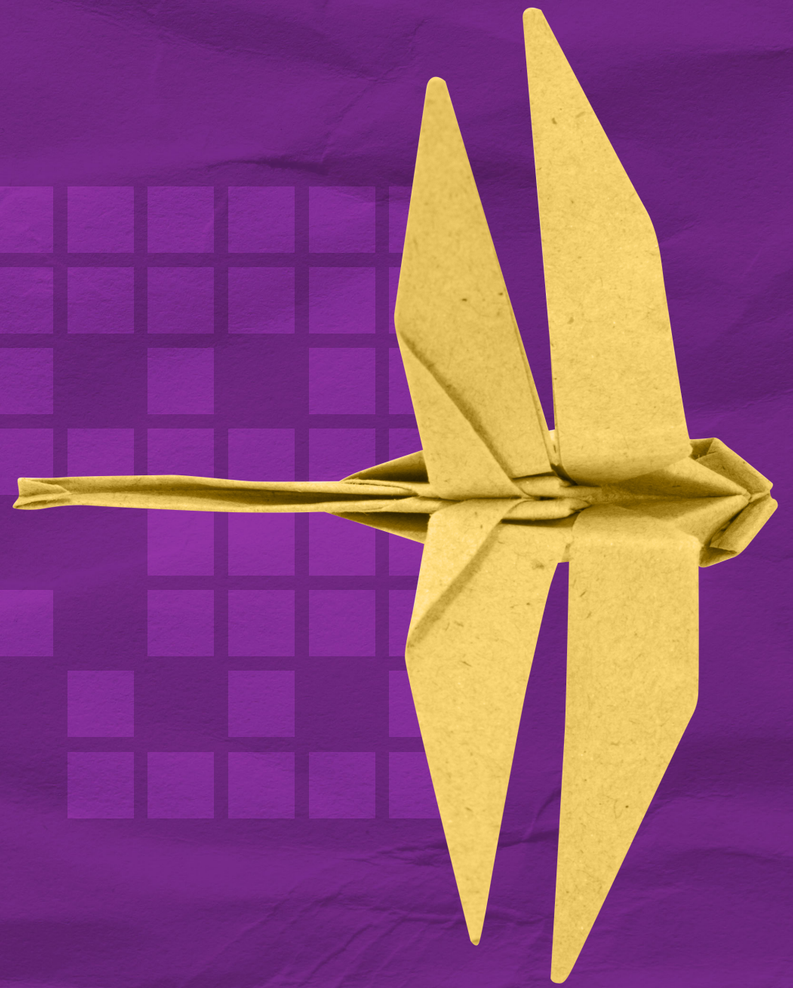
NetApp

ACCELERATE
YOUR DEVOPS JOURNEY



Introduction

Most companies know it. Traditional development and deployment frameworks can no longer deliver applications at the speed that organizations need to innovate. Mega internet businesses and SaaS providers have reset the bar, releasing software at hyperspeed—opening eyes and forcing everyone else to rethink how they develop and deploy applications.

100%
of enterprises world-wide are investing in or evaluating DevOps to achieve faster business innovation and agility.[1]

How do they do it? By adopting DevOps. DevOps is part culture, part process, part tooling, and part cloud. It means finding a new way to manage and deploy infrastructure that supports the new, agile way of developing software.

DevOps can be complex. But with the right toolset, Ops can deliver a better way for developers to access their applications and the data that fuels them. We have identified six key capabilities that you need. With these capabilities, you can deliver the right service levels across disparate data sources, clouds, and on-premises environments.

THIS E-BOOK EXPLORES THOSE **SIX CAPABILITIES** AND HOW NETAPP CAN HELP YOU ADOPT THEM TO ACCELERATE YOUR DEVOPS JOURNEY:

Continuous integration and continuous delivery (CI/CD)

Code and binary management

Containers

Automation

Cloud and PaaS

Observability and analytics

Continuous Integration and Continuous Delivery

PROVIDE A **BETTER EXPERIENCE** FOR DEV AND OPS

Successful implementation of continuous integration and continuous delivery (CI/CD) is a major step in the journey to DevOps maturity. Typically deployed together, CI and CD are both designed to improve code quality and to enable rapid delivery of software features and business benefits.

30%
of companies use continuous integration tools.[2]

Largely open source, pipeline tools that employ automation to remove workload constraints on both developers and IT ops are critical to success. However, a CI/CD pipeline without storage automation puts extra work on both developers, who must then understand data infrastructure, and on the architects who provision data for deployment.

NetApp® CI/CD integrations add storage solutions and data management capabilities to DevOps workflows, making self-help provisioning simple and providing developers and deployed apps alike with clean, current, and efficiently stored data.

TOOL INTEGRATIONS

Jenkins integration with NetApp technology delivers zero-touch storage to your development pipeline.

CloudBees Jenkins Enterprise integration with **NetApp ONTAP® software** enables instantaneous user workspaces and dev/test environments for databases without putting the production database at risk.

Code and Binary Management

SPEED CODE DELIVERY WITH AN EFFICIENT, COST-EFFECTIVE SYSTEM OF RECORD

Software development is a team sport in the DevOps universe, with team members in multiple locations around the globe. While the scrum masters manage the developers and the agile process, Ops is charged with making sure that code and binary artifacts are available at the right place and the right time.

80%

With our integrations, gain a storage infrastructure that is 80% more efficient at storing and managing code.[3]

The iterative approach and reuse principles of CI/CD produce massive amounts of data at every location. This data must be stored, managed, modified, protected, and analyzed, and the latest version must be accessible. The Ops challenge is to provide a stable storage platform that can be provisioned on demand to support data scalability and multisite collaboration.

NetApp integrations add data and storage management capabilities to open source code and artifact repositories for greater efficiency, on-demand provisioning, and global data synchronization and sharing.

TOOL INTEGRATIONS

JFrog Artifactory integration with NetApp StorageGRID® object storage management software gives you fast, reliable, and cost-effective distributed file sharing of artifacts and binary packages that are updated in near real time.

Atlassian Bitbucket integration with NetApp ONTAP data management software gives you vertical and horizontal scalability, high availability, and accessibility of data while optimizing infrastructure costs.

Containers

SIMPLIFY CONTAINER MANAGEMENT AND PERSISTENT STORAGE

Agile development, containers, and cloud go hand in hand, but successful deployment depends on effective container management. Today, Kubernetes is the platform of choice for container orchestration, but managing Kubernetes on your own can be complex and resource intensive.

42%
of convention attendees surveyed said that storage management is a key container adoption challenge.[4]

Most clouds offer Kubernetes as a service, but each cloud provider does it slightly differently, posing the risk of platform lock-in rather than realizing the portability that containers offer. Moreover, provisioning storage natively in Kubernetes remains largely manual, static, and repetitive for both the Dev and Ops sides of the team.

NetApp has tackled this twofold problem with a flexible, simple, cross-cloud Kubernetes service and an open source solution for provisioning the persistent storage for containers that enterprise production apps require. With NetApp Kubernetes Service, you can deploy containers on virtually any public cloud in just three clicks. And with NetApp Trident, developers can dynamically provision persistent volumes just by requesting a storage class from a virtual pool of underlying NetApp storage that's already built and managed by Ops.

TOOL INTEGRATIONS

NetApp Kubernetes Service. Run and manage cloud infrastructure at scale with a single dashboard for all your clusters, on any provider.

NetApp Trident. Give developers on-demand access to the persistent volumes of NetApp storage that they need for containerized apps.

Automation

ACCELERATE PROVISIONING WITH INFRASTRUCTURE AS CODE

Managing a few servers used to be a full-time job. Now Ops is expected to spin up hundreds of instances in mere minutes…because without agile infrastructure provisioning, agile development comes to a standstill.

85%
of respondents in an IDC global study said that automation is mission critical or very important for a DevOps strategy.[1]

That's why automation and configuration management are indispensable for a DevOps-driven environment. Putting the two together enables you to deliver infrastructure as code and to implement self-service access by developers, banishing forever the ticket-based approach to infrastructure delivery.

Turning infrastructure as code from theory into practice requires choosing the right open source tools for your IT shop. NetApp integrations let you configure storage as code along with the servers, load balancers, queue managers, and other components of application environments, whether for development, testing, or production.

TOOL INTEGRATIONS

Ansible integration provides supported modules for NetApp ONTAP and NetApp Element® storage management software and for NetApp E-Series hybrid flash SAN storage, so you can provision the entire infrastructure stack with one tool.

Cloud and PaaS

YOUR CLOUDS. YOUR WAY. EASIER AND FASTER THAN YOU IMAGINE

Without cloud, public or private, Ops would be hard pressed to deliver the catalogs and self-service infrastructure that make agile development and continuous testing possible.

Create up to a
100TB
volume in 8 seconds on the cloud of your choice.[5]

The challenge? Having the flexibility to move from one cloud vendor to another as your needs dictate. Or the ability to sync across multiple clouds so developers and testers are always working with the current data. NetApp cloud integrations, cloud services, and PaaS solutions offer a fast path to automation and CI/CD while giving you application and data portability.

CLOUD INTEGRATIONS

Azure. Streamline DevOps and deployment with Azure NetApp File technology hardwired into the Azure cloud.

AWS. Move, deploy, manage, and back up apps and data with the NetApp cloud portfolio for AWS.

Google Cloud. Migrate 10 times faster with NetApp cloud workload and storage management for Google Cloud Platform.

On premises. Bring cloudlike capabilities and unified multicloud access to the data center with **NetApp HCI**.

NETAPP CLOUD SERVICES

NetApp Kubernetes Service. Accelerate automation across the premises and public cloud.

Cloud Volumes. Get high-performance scalable storage for public cloud and hybrid IT with enterprise-grade features and single-pane management.

Cloud Insights. Achieve observability for your cloud estate and on-premises storage, with NetApp and multivendor integrations.

Fabric Orchestrator. Compose and deploy your data fabric over a hybrid multicloud environment.

Observability and Analytics

ITERATE FASTER WITH INSIGHTS ACROSS YOUR HYBRID INFRASTRUCTURE

You can't manage what you can't see, and you can't see things that aren't observable. Monitoring is what makes observability possible, and it enables the feedback loop in CI/CD that drives future iterations. But monitoring without analysis fails to deliver both insight for developers and the real-time, noise-free information that Ops needs to keep application infrastructure always on—for development, testing, and production.

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Enterprises expect to use an average of 5 clouds (public and private) by 2020.[1]

Of course, monitoring IT infrastructure is nothing new, but doing it for DevOps requires deep, correlated visibility for your entire environment, on the premises and across multiple clouds. Getting that visibility through a single, unified view—with uniform data, automated correlations, and analytical tools such as machine learning to spot patterns and anomalies—can help you keep small glitches from becoming outages. Great visualizations can also help Dev to understand the impact of code on performance.

NetApp offers two approaches to help you monitor your hybrid IT NetApp HCI environment. NetApp supports your use of open source tools for do-it-yourself, or you can choose the NetApp SaaS monitoring service.

TOOL INTEGRATIONS

Grafana, Docker, Trident, and Graphite can be used together to gather and visualize performance statistics for NetApp SolidFire®, VMware, and NetApp HCI systems.

NetApp Cloud Insights is a monitoring service that uses lightweight collectors to consolidate visibility across multivendor on-premises, NetApp HCI, Azure, AWS, and Google Cloud infrastructure, including containers and apps.

Turn Private Cloud into a Deployable Region of Your Multicloud with NetApp HCI

DEVELOP ANYWHERE, ON ANY CLOUD, WITH ONE EXPERIENCE

Delivering a scalable, high-performing, and highly reliable DevOps environment that enables continuous development, testing, and deployment is a challenge. And delivering it across a hybrid environment that bridges on-premises infrastructure and public clouds is even more difficult.

47%
of enterprise apps are cloud native, running in VMs or containers on public or private clouds.[1]

NetApp HCI is an open and scalable on-premises hybrid cloud infrastructure that makes private cloud into a deployable region of your multicloud, delivering frictionless consumption, self-service, automation, and infrastructure independence. No more "walled gardens" that inhibit portability. Consistent management and a common set of tools make it easy for Dev and Ops to use any cloud and to deploy cloud-native apps in house.

Compute and storage scale independently, so data can be anywhere and everywhere, in multiple forms. You get a **data fabric** powered by NetApp that simplifies data services orchestration across hybrid multicloud and delivers data center resources that perform at cloud speed.

TOOL INTEGRATIONS

NetApp Kubernetes Service. Create a cluster in three clicks.

Cloud Volumes. Get high-performance, scalable storage.

Cloud Insights. Gain visibility across your hybrid multicloud infrastructure.

NetApp Trident. Achieve fully automated, scalable persistent storage for containers.

OpenStack. Provision the full stack: compute, storage, and networking.

Red Hat. Set up a rapid design and deployment environment that's engineered by Red Hat and NetApp.

VMware. Accelerate VMware private cloud deployments.

Ansible. Automate to easily configure, deploy, and manage NetApp storage systems.

Next Steps

LEARN MORE ABOUT HOW YOU CAN **PUT DEVOPS PRINCIPLES INTO PRACTICE** TO AUTOMATE AND CLOUDIFY YOUR OPERATIONS.

Take advantage of these resources:

thePub
Check out this discussion and collaboration platform that's built by and for developers and operators.

Slack
Join the discussion on our Slack channel.

Events
Browse upcoming events that are live, online, and on demand.

Solution demonstration
Contact NetApp to schedule a customized demo.

DevOps Master Class webinar series
Watch curated content that covers the essentials of DevOps success.

Why Code Is Driving Infrastructure Investment
Read the NetApp white paper about the rise of DevOps.

REFERENCES

[1] IDC. Automation, DevOps, and the Demands of a Multicloud World. IDC InfoBrief, March 2018.
[2] InformationWeek. 2019 State of DevOps. May 31, 2019.
[3] NetApp analysis.
[4] S. Conway. Meeting Challenges in Using and Deploying Containers. Cloud Native Computing Foundation, April 27, 2017.
[5] NetApp analysis.

ABOUT NETAPP

NetApp is the data authority for hybrid cloud. We provide a full range of hybrid cloud data services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation. Together with our partners, we empower global organizations to unleash the full potential of their data to expand customer touchpoints, foster greater innovation, and optimize their operations. For more information, visit www.netapp.com. #DataDriven

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