

Compliments of



NetApp

NetApp Special Edition

# Hybrid Cloud

FOR  
**DUMMIES**<sup>®</sup>  
A Wiley Brand

## *Learn to:*

- Address inhibitors to cloud adoption
- Recognize data challenges in the cloud
- Seamlessly move data in the cloud

Lawrence C. Miller, CISSP



# About NetApp

Leading organizations worldwide count on NetApp for software, systems, and services to manage and store their data. Customers value NetApp's teamwork, expertise, and passion for helping them succeed now and into the future. Visit [www.netapp.com](http://www.netapp.com).

*Hybrid Cloud*  
FOR  
**DUMMIES**<sup>®</sup>  
A Wiley Brand

*NetApp Special Edition*

by **Lawrence C. Miller, CISSP**

FOR  
**DUMMIES**<sup>®</sup>  
A Wiley Brand

## Hybrid Cloud For Dummies®, NetApp Special Edition

Published by

**John Wiley & Sons, Inc.** 111 River St. Hoboken, NJ 07030-5774 [www.wiley.com](http://www.wiley.com)

Copyright © 2014 by John Wiley & Sons, Inc., Hoboken, New Jersey

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without the prior written permission of the Publisher. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at <http://www.wiley.com/go/permissions>.

**Trademarks:** Wiley, the Wiley logo, For Dummies, the Dummies Man logo, A Reference for the Rest of Us!, The Dummies Way, Dummies.com, Making Everything Easier, and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates in the United States and other countries, and may not be used without written permission. NetApp, the NetApp logo, Go further, faster, Data ONTAP, FlexPod, and SnapMirror are trademarks or registered trademarks of NetApp, Inc. in the United States and/or other countries. All other trademarks are the property of their respective owners. John Wiley & Sons, Inc., is not associated with any product or vendor mentioned in this book.

**LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: THE PUBLISHER AND THE AUTHOR MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZATION OR WEBSITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUBLISHER ENDORSES THE INFORMATION THE ORGANIZATION OR WEBSITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTERNET WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.**

For general information on our other products and services, or how to create a custom *For Dummies* book for your business or organization, please contact our Business Development Department in the U.S. at 877-409-4177, contact [info@dummies.biz](mailto:info@dummies.biz), or visit [www.wiley.com/go/custompub](http://www.wiley.com/go/custompub). For information about licensing the *For Dummies* brand for products or services, contact [BrandedRights&Licenses@Wiley.com](mailto:BrandedRights&Licenses@Wiley.com).

ISBN 978-1-118-99212-8 (pbk); ISBN 978-1-118-99263-0 (ebk)

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1

---

## Publisher's Acknowledgments

**Senior Project Editor:** Zoë Wykes

**Acquisitions Editor:** KyleLooper

**Business Development Representative:** Karen L. Hattan

**Project Coordinator:** Melissa Cossell

**Special Help from NetApp:** Pamela Kerman, Eleanor Lorenzo-Roxas, Brad Nisbet, Maria Gillies, Stacey Pang

# Contents at a Glance

---

<b>Introduction .....</b>	<b>1</b>
About This Book .....	1
Foolish Assumptions .....	1
Icons Used in This Book.....	2
Beyond the Book.....	2
Where to Go from Here .....	2
<b>Chapter 1: Moving to a Hybrid Cloud</b>	
<b>Business Model .....</b>	<b>3</b>
Recognizing the Need.....	3
Understanding the Inhibitors .....	4
The Changing Role of IT .....	6
Differentiating Cloud Models.....	8
<b>Chapter 2: Data Management in the Hybrid Cloud .....</b>	<b>9</b>
Addressing the Need for Seamless Cloud Services .....	9
Acknowledging the Difficult Nature of Data .....	10
Managing and Controlling Data.....	11
<b>Chapter 3: Connecting Hybrid Clouds with NetApp.....</b>	<b>13</b>
Extensive Customer Choice.....	14
Universal Data Platform .....	16
Dynamic Data Portability.....	19

<b>Chapter 4: Ten Benefits of a NetApp Hybrid Cloud .....</b>	<b>21</b>
Accessibility .....	21
Scalability.....	22
Innovation .....	22
Efficiency.....	23
Agility .....	24
Reliability .....	24
Security .....	25
Performance .....	25
Savings .....	26
Flexibility.....	27

# Introduction



**A**s cloud deployments evolve and fragment into an era of interconnected clouds, the changing role of information technology (IT) as the architect and broker of services is more critical than ever before. To harness the hybrid cloud, IT organizations need the right tools and technologies to make hybrid cloud strategies a flexible and efficient reality for their organizations.

## *About This Book*

*Hybrid Cloud For Dummies*, NetApp Special Edition, consists of four short chapters that explore data challenges in the hybrid cloud model and innovative solutions to those challenges.

## *Foolish Assumptions*

It's been said that most assumptions have outlived their usefulness, but I assume a few things nonetheless! First, I assume that you know a little something about cloud computing trends and models. As such, this book is written primarily for IT executives and managers such as Chief Information Officers (CIOs), Chief Technology Officers (CTOs), IT directors, and technical managers.

## Icons Used in This Book

Throughout this book, you occasionally see icons that call attention to important information that's particularly worth noting. Here's what to expect:



This icon points out information that may well be worth committing to your nonvolatile memory, your gray matter, or your noggin — along with anniversaries and birthdays.



Thank you for reading, hope you enjoy the book, please take care of your writers. Seriously, this icon points out helpful suggestions and useful nuggets of information.



Proceed at your own risk . . . *well, okay* — it's actually nothing *that* hazardous. These helpful alerts offer practical advice to help you avoid making potentially costly mistakes.

## Beyond the Book

You can learn more about NetApp's hybrid cloud solutions at [www.netapp.com/us/solutions/cloud/index.aspx](http://www.netapp.com/us/solutions/cloud/index.aspx).

## Where to Go from Here

It's been said that a journey of a thousand miles begins with a single step. Your journey to the cloud probably isn't quite a thousand miles, and it begins with a turn of the page.

## Chapter 1

# Moving to a Hybrid Cloud Business Model



### *In This Chapter*

- ▶ Looking to the cloud for business solutions
  - ▶ Getting past cloud adoption hurdles
  - ▶ Transforming IT into a service broker
  - ▶ Defining public, private, and hybrid clouds
- 

**T**his chapter explores some of the business challenges that CIOs are addressing with cloud computing models, some of the barriers to adoption, the evolving role of IT as a service broker, and the different cloud models.

### *Recognizing the Need*

Today, Chief Information Officers (CIOs) must address a range of challenges to meet increasingly demanding business and operational objectives, as businesses strive to remain competitive and look for new market opportunities. CIOs are looking to new IT service

delivery models like hybrid cloud (I explain the different cloud models later in this chapter) to do the following:

- ✓ Keep up with technology and innovation changes while driving down the costs of relentless data growth and aligning capabilities across the company.
- ✓ Reduce overhead costs while growing the business and attracting and retaining skilled employees.
- ✓ Lower risk when deploying new mission-critical applications by ensuring that data is kept secure and business disruptions are minimized.
- ✓ Manage complexity across the data center.
- ✓ Improve IT responsiveness and increase service levels for business applications to meet rapidly evolving business demands.
- ✓ Achieve regulatory compliance to avoid stiff penalties and maintain public trust and confidence.



A cloud-based IT delivery model can speed up application deployment and provide flexible environments to accommodate the dynamic and unpredictable needs of organizations and customers.

## *Understanding the Inhibitors*

Why are CIOs looking to the cloud to help solve complex business and technology challenges? The cloud promises to create better operational efficiencies, speed application deployment, and provide the flexibility that you need to respond quickly to changing business requirements.

However, when it comes to moving to a cloud model, many risks are perceived.

Deploying a cloud model can be very challenging. At the top of the list, keeping your data secure is a key concern. For example, can you protect your vital data from getting into the wrong hands, and also protect it from viruses? But security isn't the only inhibitor to deploying to the cloud. Other inhibitors include the following:

- ✔ **Complexity:** With the explosion of web services, mobile devices, and new technologies to reach more customers anywhere and across various channels, managing the complexity of your expanding data center environment across multiple clouds is a significant challenge. Selecting the right service offerings at the right service levels on different data management frameworks across a blend of cloud resources can be a daunting task.
- ✔ **IT agility:** IT service delivery is about meeting the needs of the business. As those needs change, IT must adapt and respond quickly. For years, IT organizations have been working toward delivering agility within the data center. And now, as the public cloud is folded into IT strategy, the ability to move applications, workloads, and data among cloud resources requires connections between those resources — a cloud data fabric — to extend this agility to the cloud.
- ✔ **Data control:** Building your own virtualized data centers and private cloud means that your organization can retain control of its data. Extending your environment to the public cloud necessitates giving up some control of infrastructure and

applications, but you can never give up the responsibility you have to control your business data. Your hybrid cloud strategy must support the business and provide the right levels of data performance, cost, security, access, protection, and governance.



If a skills gap exists in your IT organization, you might be reluctant to move to the cloud. Selecting the right consulting services partner to help you design, deploy, and manage your cloud environment can help you address such a gap.



Although choosing a cloud service provider to complement a set of IT services is indeed a means to deliver a flexible, dynamic environment, it doesn't necessarily mean ongoing flexibility among different cloud providers. For many organizations, cloud provider lock-in can be a significant hurdle to adopting a public cloud strategy, but the right set of management tools can help address this hurdle.

## *The Changing Role of IT*

In the past, CIOs have viewed their IT organizations as builders of services for the business. But CIOs are dealing with more complexity than ever before, and this complexity is driving them to rethink the role of IT.

Today, CIOs are moving from being builders of apps and operators of data centers to becoming *brokers* of information services to the business. They are embracing

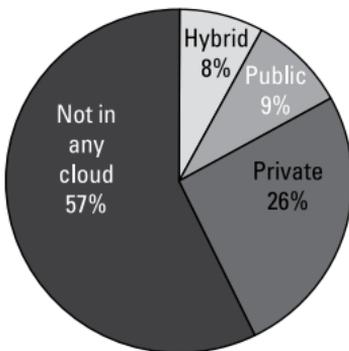
new technologies and new service models that allow them to deliver IT faster, cheaper, and smarter, and to make their companies more competitive.



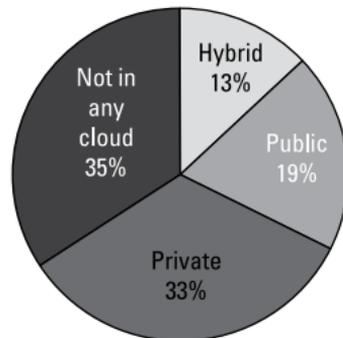
Enterprise IT organizations don't want to build and run data centers. Instead, they are transforming into brokers of services that span on- and off-premise resources with a cloud-first strategy to manage data, not data centers.

The rapid transformation to service broker is evidenced by a September 2013 IDG Research survey that shows only 43 percent of total organizational data resides in the cloud today. But within 18 months, almost two-thirds of all organizational data is expected to reside in the cloud (see Figure 1-1).

**Current Distribution of Total Data**



**Expected Distribution of Total Data in 18 Months**



Source: *Market Pulse: Moving from IT Service Builder to IT Service Broker*, IDG Research, Sept 2013.

**Figure 1-1: Organizational data is moving to the cloud.**

## Differentiating Cloud Models

Cloud computing models are broadly defined as public, private, and hybrid.

A *public* cloud is an on-demand IT service in which computing resources are delivered over the Internet by an external cloud service provider. These resources (such as infrastructure, platform, and software) are shared by the service provider's various customers. The public cloud includes hundreds of cloud service providers, as well as hyperscale cloud providers such as Amazon Web Services (AWS) and Microsoft Azure.



A *hyperscale* cloud provider offers a distributed computing environment that can scale exponentially in terms of compute and storage.

A *private* cloud is one in which a single (or extended) enterprise provides on-demand IT services as an internal resource pool that is shared within the organization.

A *hybrid* cloud leverages both public and private cloud models, and potentially traditional data center infrastructure, operations, and applications as well, to provide an enterprise with an efficient, customized solution to meet its particular business needs. Hybrid cloud requires significant integration and/or coordination among the organization's internal and external environments to properly address data, process, management, and security requirements.

## Chapter 2

# Data Management in the Hybrid Cloud

.....

### *In This Chapter*

- ▶ Connecting cloud resources
  - ▶ Dealing with data challenges
  - ▶ Maintaining data stewardship
- .....

**T**his chapter talks about the need for seamless cloud services, the difficult nature of data, and the importance of managing and controlling your organization's data assets.

### *Addressing the Need for Seamless Cloud Services*

The attraction of the cloud — infinite, flexible, and inexpensive compute and storage — is too great to ignore. Inevitably, organizations are moving toward a cloud strategy that consists of private, public (including hyperscale) cloud, or some hybrid combination of these cloud models.

At the same time, organizations must be able to choose where their data resides while maintaining data stewardship with control over how their data is used. Organizations need control and flexibility. Moving to the cloud therefore requires the ability to seamlessly connect multiple cloud resources that span public and private cloud architectures. Managing these cloud resources is critical for organizations.



Hyperscale cloud computing might seem like a distant panacea, but the reality is that most organizations will soon be consuming IT from all three cloud resources — private, public (including hyperscale), and hybrid — for the foreseeable future.

## ***Acknowledging the Difficult Nature of Data***

By its nature, data is persistent and stateful. Data must be stored continuously and made rapidly accessible to compute to support business applications and analytics — but it doesn't move easily. In comparison, compute is stateless and can be dialed up or completely turned off, as needed.

The distance between compute and data also creates latency, which lowers performance. Thus, for many applications, having the data close to the compute is

important. Compute resources can be leveraged from many sources in the cloud, but to effectively use these resources, data must be moved close to compute.

But data doesn't like to be moved. Migrating data can take days for anything but the smallest moves, and every move risks data corruption. The most reliable and efficient way to move large amounts of data is still via a USB drive or tape. Sending data over a network takes much more time and requires expensive network bandwidth connections. And many cloud providers charge for network usage, further increasing the costs of data movement.

Finally, data services that are common in the enterprise, such as data protection, QoS (Quality of Service), deduplication, and cloning, frequently aren't available or easily managed across disparate cloud services. This limits the types of applications that can move to these resources.



Most importantly, data has significant value — to both the organization and potential attackers. Data protection — the confidentiality, integrity, and availability of data — is a constant challenge for all organizations.

## *Managing and Controlling Data*

Data is the most complex, critical, and valuable element of all the components in any data center. And for an IT service broker, managing and controlling data across a hybrid cloud model isn't easy.

Hybrid data center inhibitors include the following:

- ✓ Inconsistent data containers
- ✓ Inefficient transport
- ✓ Inability to address data governance

Although enterprise organizations are embracing a hybrid data center model that spans private and public cloud resources, they still need to maintain control of data governance, access, performance, availability, protection, and security, while maintaining or improving operational efficiency.

## Chapter 3

# Connecting Hybrid Clouds with NetApp



### *In This Chapter*

- ▶ Recognizing the value of choice
  - ▶ Leveraging a universal data platform
  - ▶ Moving data seamlessly in a hybrid cloud
- 

**N**etApp's approach to hybrid cloud facilitates the seamless connection of cloud resources, with a highly efficient transport between systems and clouds and a single purview of data management over a cloud data fabric. This chapter takes a look at NetApp's data management vision, which combines breakthrough technologies to deliver cloud solutions based on three key elements (or components): extensive customer choice, a universal data platform, and dynamic data portability.

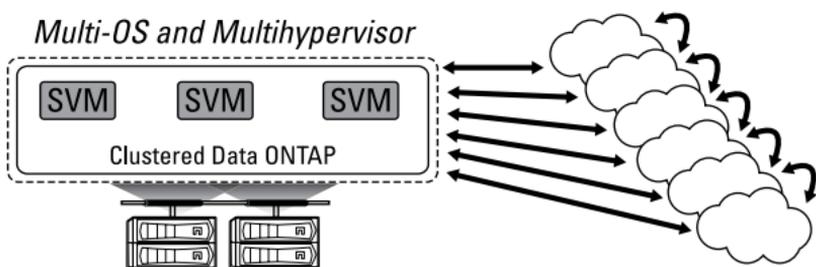
## Extensive Customer Choice

NetApp has a broad ecosystem of cloud provider, application, and technology partner options to support diverse customer needs.



Organizations can leverage seamless data management across their own data center, near the cloud, or in the cloud with a blend of procurement options, and adjust easily and efficiently to align with changing business needs.

Organizations can build the foundation of their private cloud environments with any of the leading virtualization frameworks including those from VMware, Microsoft, Citrix, Oracle, and Red Hat (see Figure 3-1).



**Figure 3-1:** Data ONTAP supports all major virtualization and cloud management platforms.

From a cloud management perspective, NetApp partners with all the leading orchestration and automation providers, including VMware, Microsoft, Citrix, HP, IBM, BMC, CA, and Cisco, and works with open source initiatives including OpenStack and CloudStack. As

organizations consider where and with whom to leverage Data ONTAP in the public cloud, they can choose from more than 400 NetApp-based cloud services delivered by more than 300 service providers around the globe. NetApp further extends choice in the public cloud by partnering with hyperscale cloud providers such as AWS and Microsoft Azure to offer private storage solutions for industry-leading public clouds.

With the versatility of Data ONTAP, organizations get the elasticity and savings of public cloud compute while retaining control of their data on dedicated enterprise storage. By keeping their data on NetApp storage in select tier-one data centers next to rather than in the public cloud, organizations also get a cloud infrastructure that performs as though it resides on premises. The NetApp seamless data portability and services, such as Equinix Cloud Exchange, make it easy for organizations to switch clouds.

Organizations can choose how to deploy the universal data platform among multiple clouds, including Data ONTAP running on optimized NetApp storage and on third-party storage, and as a virtual storage appliance in a cloud. All of these options, when combined, create a powerful framework for IT organizations to create innovative solutions among multiple, otherwise disparate, cloud resources. They also allow best-in-class functionality for seamless data management and preservation of control in a hybrid cloud environment.

Finally, organizations can team with NetApp Professional Services and a wide choice of partners to realize more quickly the benefits of Data ONTAP and to increase the return on their storage and cloud investments. Benefits include the following:

- ✓ Architecting infrastructures that enable IT as a service
- ✓ Accelerating the path to nondisruptive operations
- ✓ Driving greater operational and cost efficiencies by leveraging industry expertise and proven methodologies
- ✓ Deploying validated architectures based on best practices
- ✓ Speeding return on investment
- ✓ Freeing up internal IT resources to take you from strategic planning and IT transformation to managing and continually optimizing your operations



NetApp allows you to confidently manage and maintain control of your data across any cloud, accelerating innovation and IT responsiveness.

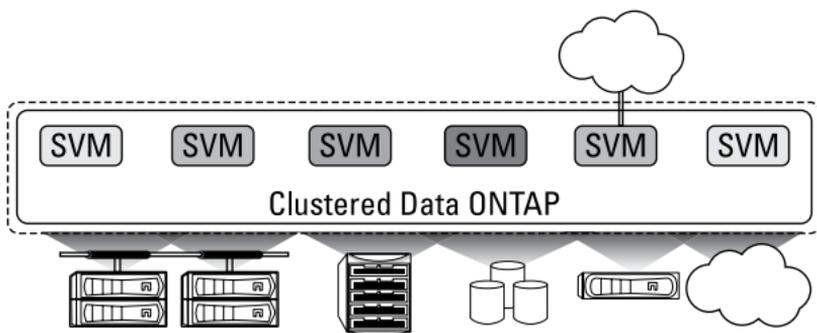
## *Universal Data Platform*

NetApp's universal data platform enables you to start with a private cloud and evolve to a hybrid cloud environment. You retain the storage efficiency, availability, and scalability of NetApp's clustered Data ONTAP

operating system, which provides standardized data services including

- ✓ Data protection
- ✓ Provisioning
- ✓ Efficiency
- ✓ Replication
- ✓ Quality of Service (QoS)

NetApp simplifies data management and provides consistent data services across clouds with clustered Data ONTAP, delivering secure multitenancy, proven storage efficiency, seamless scalability, and nondisruptive operations. NetApp Storage Virtual Machine (SVM) technology breaks down the physical barriers that bind data to specific hardware. This allows organizations to deploy Data ONTAP across cloud resources in a variety of forms, including on the NetApp unified and optimized FAS platform, within the FlexPod converged infrastructure, on third-party storage arrays with V-Series, or as a virtual storage appliance running Data ONTAP in the cloud within a software-defined storage framework (see Figure 3-2).



**Figure 3-2:** NetApp's universal data platform.

NetApp's versatile single-storage platform can be deployed across all types of private and public cloud resources on a variety of vendor hardware platforms to eliminate format and compatibility barriers to data movement. With management that they are familiar with across all instances of Data ONTAP, organizations can confidently leverage Data ONTAP performance to improve operational efficiency, lower cost, and reduce risk in their enterprise cloud environments.

Organizations have multiple choices for deploying ONTAP, including on FAS systems in their own data center, on FAS systems with service providers, or running as software on service provider infrastructure, with a variety of buying options.

Cloud ONTAP allows organizations to run ONTAP software directly in the cloud with on-demand access to meet changing business needs. Cloud ONTAP extends the capabilities of Data ONTAP to the cloud, further enabling a common set of data services across the organization's cloud resources. Data ONTAP facilitates movement of data between private and public clouds via the provisioning capabilities of the Cloud OnCommand Manager customer portal.

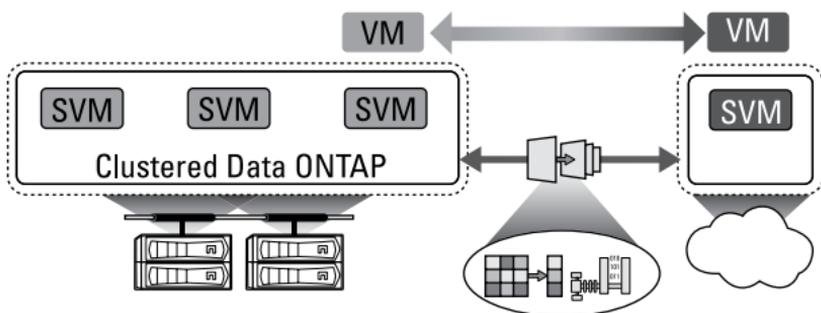


The universal data platform works across NetApp solutions, third-party arrays, and commodity disk — next to the cloud and in the cloud.

## Dynamic Data Portability

*Built-in data portability* means that data is free to move dynamically across all private and public (including hyperscale) cloud resources. Businesses realize greater efficiencies by balancing workloads and resources in real time.

NetApp's integrated, multiprotocol asynchronous storage replication technologies enable connectivity to any environment and highly efficient data transport between systems and between clouds (see Figure 3-3).



**Figure 3-3:** NetApp dynamic data portability efficiently moves data.

With Data ONTAP as the universal data platform across their clouds, organizations will be able to respond instantly to ever-changing demands with NetApp's integrated data portability technologies, which dynamically move data and applications among cloud resources and

providers. By leveraging NetApp SnapMirror technology, and other innovative technologies for on-the-fly translation between hypervisor environments, users can quickly and efficiently move data between cloud resources. This gives them the flexibility to maintain choice among best-in-class cloud providers and to balance workloads across any cloud resource.

NetApp gives customers the ability to quickly and reliably shift between capital and operating expenditures (CAPEX and OPEX). With NetApp, organizations can use on-premises private cloud storage in a CAPEX model and easily shift to and from an OPEX model as data is moved, leveraging the flexibility and economics of public cloud compute and applications. NetApp's data portability capabilities also allow organizations to easily replicate data between private or public cloud resources for integrated data protection and innovative disaster recovery.



With NetApp's universal data platform and dynamic data portability, organizations can remove barriers between private and public clouds, creating a reliable data fabric that enables data stewardship to be maintained across all resources.

## Chapter 4

# Ten Benefits of a NetApp Hybrid Cloud

---

### *In This Chapter*

- ▶ Benefitting business-wise with NetApp hybrid cloud solutions

---

**H**ere are ten real-world examples of how NetApp customers are enjoying significant business benefits using NetApp technology.

### *Accessibility*

NetApp infrastructure helped Revlon simplify its existing environment by building a cloud architecture to transform big data from a burden to a competitive advantage — even while cutting costs — with more than \$70 million in cost savings and cost avoidance in two years. Revlon employees now enjoy a new relationship with data. From anywhere and at any time, they can connect to the information they need to do their jobs more efficiently and effectively.

Find out more about how Revlon uses NetApp solutions to manage 3.6 petabytes of data and 800 virtual servers

that process an average of 14,000 transactions per second at <http://www.netapp.com/us/media/cs-revlon-na-168-0213.pdf>.

## *Scalability*

As an enterprise-class cloud services provider, Peak requires a flexible, cost-effective storage solution and robust storage management capabilities to stay more nimble than its competitors. According to Chief Executive Officer (CEO) Luke Norris, “NetApp clustered Data ONTAP helps us optimize our storage environment, securely host multiple customers on individual storage systems, and easily scale to support 400 percent growth over the past three years.”

See how Peak facilitates 100 percent uptime service-level agreements (SLAs) and reliable performance across secure, dedicated, and multi-tenant environments using NetApp, VMware, and Cisco technology at <http://www.netapp.com/us/media/peak-success-story.pdf>.

## *Innovation*

Melrose, a small city near Boston, decided to create a new regional IT center that could deliver value-added services to several nearby towns and cities using shared computing and storage resources. With technology that included the NetApp FlexPod data center platform, Jorge Pazos, Chief Information Officer (CIO) of the City of Melrose, said, “We are reinventing the way local government does business in the state of Massachusetts.

This will enable us to speed the delivery of IT services, generate new revenue streams, and reinvest profit in programs for the citizens of Massachusetts.”

Take a look at how the city of Melrose achieved a 40 percent reduction in cost with a public cloud infrastructure at <http://www.netapp.com/us/media/cs-na-142.pdf>.

## *Efficiency*

Prairie Health Ventures, an alliance of hospitals and healthcare organizations, chose to simplify its increasingly complex healthcare information system, electronic medical record/electronic health record system, and hospital medical images environments with VMware backed by NetApp storage. Prairie Health Ventures’ Prairie Vault solution is a flexible, secure, cloud-based backup service created for its alliance members and powered by NetApp. According to Chad Jeffrey, the CIO at Prairie Health Ventures, “NetApp was a much cleaner, more scalable, and fully integrated solution with absolutely everything we needed to provide the level of fast service our members require. When we built in all the ‘extras’ needed from the other vendors, NetApp came out far ahead on price as well.”

Find out how Prairie Health Ventures achieved up to 90 percent storage space savings with cloud-based backup service powered by NetApp at <http://www.netapp.com/us/system/pdf-reader.aspx?pdfuri=tcm:10-108108-16&m=css-6623.pdf>.

## *Agility*

BBM Canada (Sondages BBM in Québec) is a not-for-profit member-owned tripartite industry organization that leveraged NetApp storage as the cornerstone of the IT infrastructure that BBM uses to collect, analyze, and distribute television and radio ratings data to its members in the broadcast industry. Said CIO Tom Saint, “The landscape changes quickly in our business. With a cloud-based offering built on NetApp storage, we’re able to change just as quickly. Whether it’s developing new products, making business decisions, or addressing customer requests, we’re responding faster and more dynamically than ever before.”

See how BBM slashed provisioning time from 2 weeks to 15 minutes at <http://www.netapp.com/us/system/pdf-reader.aspx?pdfuri=tcm:10-61014-16&m=bbm-canada-cloud.pdf>.

## *Reliability*

Sayers is an industry-leading IT services and solutions provider that needed to respond quickly to market demands and stay ahead of the competition. With its commitment to excellence, teamwork, and trust, Sayers turned to NetApp to help build a robust cloud infrastructure to serve more than 400 customers. Stated Chief Architect Bill Tohtz, “When you have varying workloads in the cloud, it’s critical and traditionally difficult to commit small subsets of resources and ensure

that they're performing well. Clustered Data ONTAP enables us to do this easily from a management perspective.”

Find out how cloud infrastructure built on clustered Data ONTAP yields 100 percent uptime for Sayers at <http://www.netapp.com/us/media/css-6647.pdf>.

## *Security*

King County, located in Puget Sound, Washington, is nearly twice as large as other counties in the United States. In order to serve more than 1.9 million people in the county, King County selected the NetApp FlexPod platform with Microsoft Private Cloud, a shared infrastructure solution, to help them migrate departments and standardize on a virtualized environment to enhance service delivery. Bill Kehoe, CIO of King County, said, “FlexPod with Microsoft Private Cloud allows us to extend services to taxpayers in a more reliable, secure, and scalable way. As public servants, that’s what we are all about.”

Check out how King County delivers a secure, shared infrastructure on FlexPod with Microsoft Private Cloud and saves \$700,000 annually at <http://www.netapp.com/us/media/cs-6643.pdf>.

## *Performance*

With a comprehensive portfolio of software solutions and managed and professional services, Virtustream partners with customers that span industries and

geographies to deliver cloud solutions tailored to their unique requirements. Virtustream leveraged its deep virtualization and cloud computing expertise, as well as its own proprietary cloud management solution, to deliver flexible private, public, and hybrid cloud solutions. These solutions are based on NetApp technology with dynamic IT services that enhance performance by 50 percent. According to Simon Aspinall, Chief of Vertical Markets, “The NetApp FAS6210 is extremely well suited to the requirements of cloud service providers and the enterprise cloud requirements of customers. Teamed with clustered Data ONTAP 8.1, we can provide the highly flexible, scalable, and manageable storage platform needed to support our on-demand cloud model.”

Discover how Virtustream enhances performance by 50 percent with dynamic IT services for public and private clouds at <http://www.netapp.com/us/media/virtustream.pdf>.

## *Savings*

The University of Loughborough, one of the United Kingdom’s largest universities, has more than 13,000 students, 21 academic departments, and 40 research centers. The university administration was challenged with delivering highly available systems to researchers and students anywhere and anytime. The university worked with NetApp and its partners Logicalis and Cisco to build a platform for innovation. Said IT Director Dr. Phil Richards, “The FlexPod solution based on NetApp and

Cisco technologies helped save us \$3.6 million in data center costs. We're able to allocate that budget to world-class research and to providing the educational programs that can make a difference in the lives of our students today and tomorrow.”

Learn how the University of Loughborough saves \$3.6 million and accelerates research with hybrid cloud built on NetApp at <http://www.netapp.com/us/media/loughborough.pdf>.

## ***Flexibility***

As a globally recognized, top-level research institute, the University of Bonn in Germany needed more flexibility for its computing resources to serve more than 30,000 students because of increasing computationally intense research projects. In addition, it was looking for an IT environment that allowed faculty and doctoral candidates to access their files on their own end-user devices or from home. To accomplish this goal, the University of Bonn adopted a private cloud environment based on high-performance Fujitsu PRIMERGY servers, NetApp storage systems, and virtualized PCs. Peter Middelhaue, CIO of the Department of Economics, stated, “The private cloud environment from Fujitsu and NetApp gives us a high degree of flexibility. Whereas in the past new hardware constantly had to be acquired for a special project, now we can use the same hardware for a variety of research projects.”

Check out how the University of Bonn provides a flexible and secure private cloud solution to more than 30,000 students at <http://www.netapp.com/us/media/cs-fujitsu-uni-bonn.pdf>.



# Maintain control over your data in the cloud

Hybrid clouds that leverage the benefits of both public and private cloud models are becoming increasingly popular. This book shows you how to manage your data across these different cloud models.

- *Transform your organization — become a broker of information services to the business*
- *Manage and maintain data — control data with confidence across any cloud, whether public, private, or hybrid*
- *Choose where your data resides — maintain data stewardship in the cloud*

**Lawrence C. Miller, CISSP**, has worked in information security and technology management for more than 15 years. He has written more than 50 *For Dummies* books on numerous topics, including *CISSP For Dummies*.



## Open the book and find:

- Why it's important to consider vendors that offer best-in-class technologies, applications, and partners
- How a universal data platform enables you to evolve to a hybrid cloud
- How dynamic data portability efficiently moves data

*Making Everything Easier!*<sup>™</sup>

Go to [Dummies.com](http://Dummies.com)<sup>®</sup> for videos, step-by-step examples, how-to articles or to shop!

FOR  
**DUMMIES**<sup>®</sup>  
A Wiley Brand

ISBN 978-1-118-99212-8  
Book not for resale

# **WILEY END USER LICENSE AGREEMENT**

Go to [www.wiley.com/go/eula](http://www.wiley.com/go/eula) to  
access Wiley's ebook EULA.