NetApp HCI for DevOps

HCI

Kevin Hoke
March 12, 2020

This PDF was generated from https://docs.netapp.com/us-en/hci/solutions/nhci_devops_cicd.html on August 10, 2020. Always check docs.netapp.com for the latest.

Table of Contents

NetApp HCI for DevOps 1
What is DevOps? 1
What is a CI/CD Pipeline? 1
Addressing the CI/CD Pipeline with NetApp HCI 1

NetApp HCI for DevOps

Building an End-to-End CI/CD Pipeline

This series of blogs and videos will explore how *NetApp HCI* satisfies the requirements of the ***DevOps Continuous Integration (CI)*** and ***Continuous Delivery (CD)*** pipeline.

Learn more about NetApp HCI.

What is DevOps?

DevOps is a set of software development practices that combine software development (*Dev*) and information-technology operations (*Ops*) to shorten the systems-development life cycle while delivering features, fixes, and updates frequently in close alignment with business objectives.

As DevOps is intended to be a cross-functional mode of working, those that practice the methodology use different sets of tools—referred to as "toolchains"—rather than a single one.

What is a CI/CD Pipeline?

Continuous Integration (CI) and ***Continuous Delivery (CD)*** embody a culture, set of operating principles, and collection of practices that enable application development teams to deliver code changes more frequently and reliably. The implementation is also known as the *CI/CD pipeline* and is one of the best practices for DevOps teams to implement.

Addressing the CI/CD Pipeline with NetApp HCI

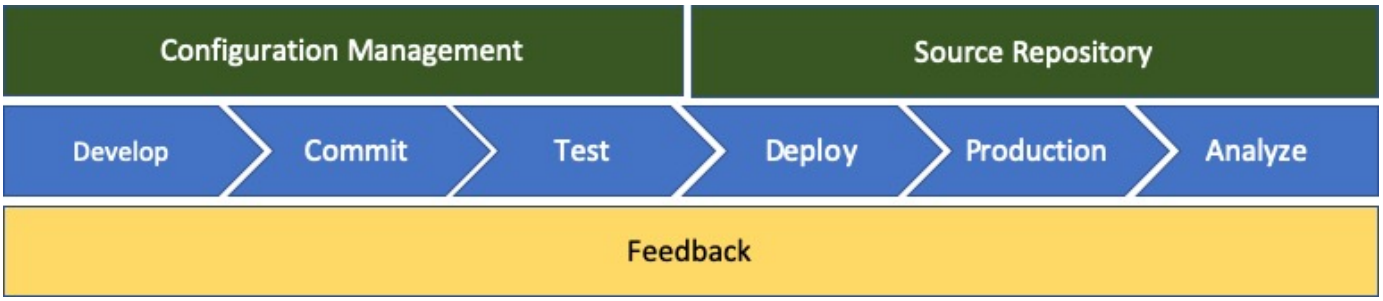


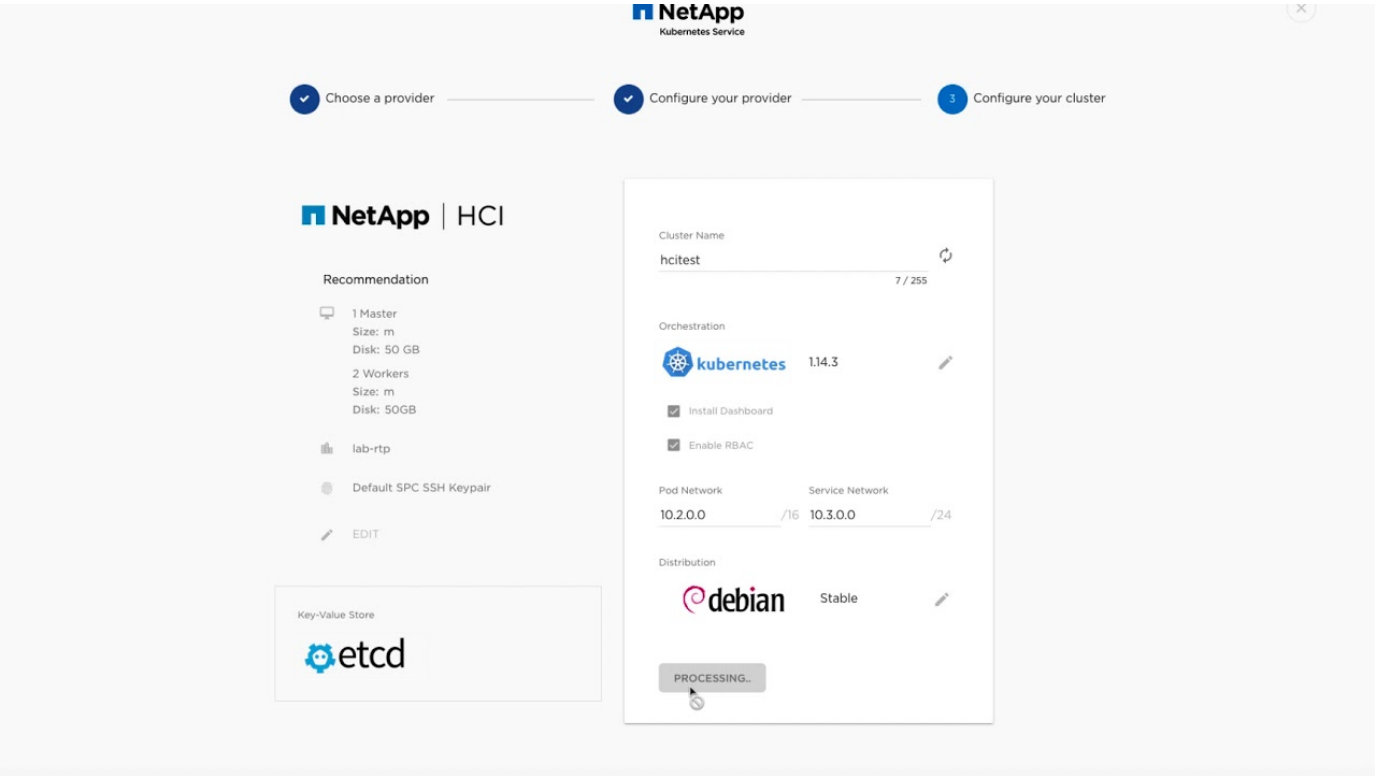
Figure 1: *DevOps CI/CD Pipeline - Use the navigation panel (at the right) to learn more about each of the components of the CI/CD pipeline.*

Configuration Management

Configuration management refers to the process of setting up the virtual infrastructure for a DevOps CI/CD pipeline. Automation of the infrastructure configuration is a key tenant in DevOps where automation tools such as Ansible and Puppet are widely used to perform the required automation steps.

Automate configuration on your Virtual Infrastructure:

- Deploy Kubernetes on NetApp HCI with NKS: ***Blog***

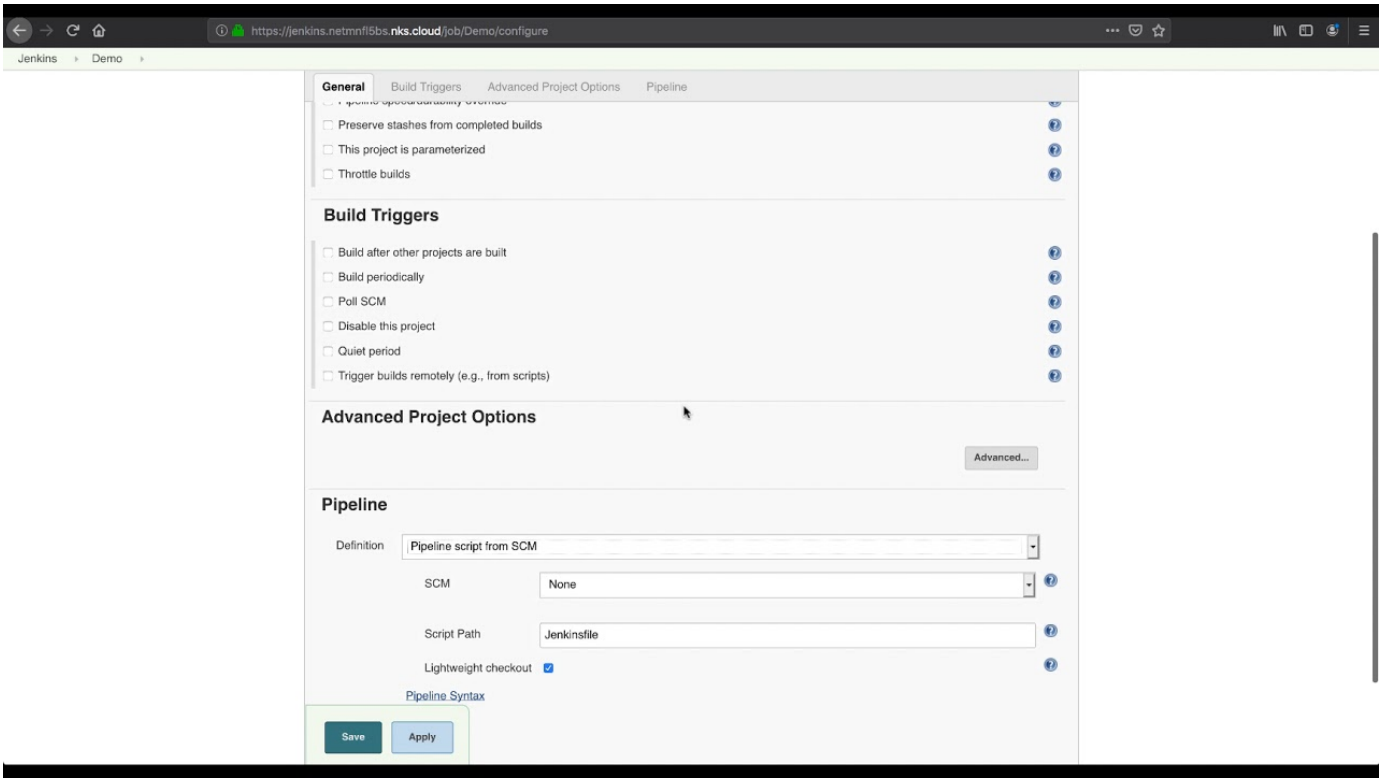


Source Repository

A source repository is where the “code” is stored throughout the CI/CD pipeline. Developers “check-out” code to make changes, test the changes and “check-in” the code to be built and deployed. Examples of source repositories that will be referenced in the DevOps video/blog series include jFrog and Bitbucket.

Choose and setup a Source Repository:

- Configuring Jenkins with a new pipeline to run jobs in Kubernetes: ***Blog***



Develop

In order to develop code in a CI/CD pipeline, a code and binary management system must be defined. The management system defines the practices for developing and introducing code into the pipeline. Tools such as Artifactory help in managing this process for DevOps.

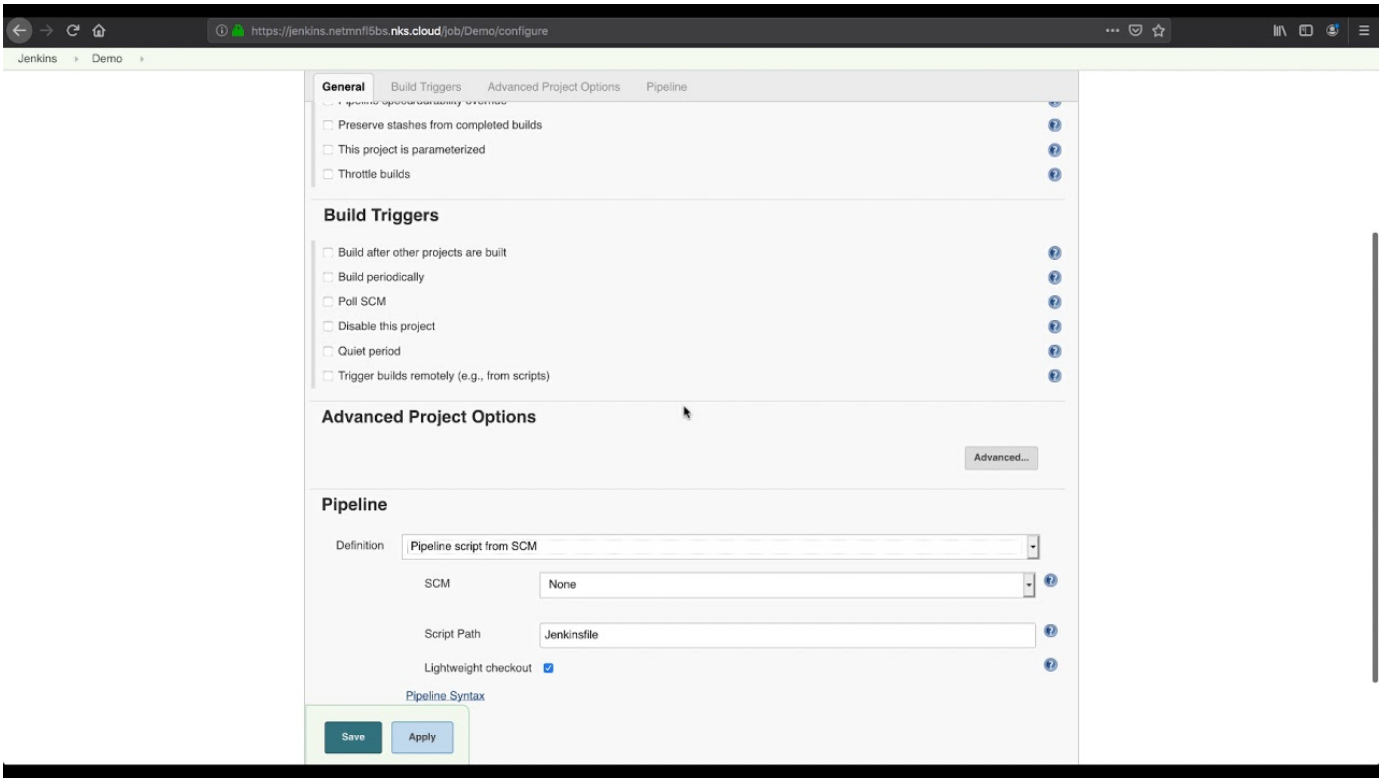
Behind the scenes of Artifactory and HCI:

Commit

Once code is developed and tested, it must be built before it can be deployed. The commit phase of the CI/CD pipeline addresses how the code it committed into the code management system and built so that it can be deployed.

Setup your CI pipeline and Run your first builds:

- Configuring Jenkins with a new pipeline to run jobs in Kubernetes: ***Blog***



Test

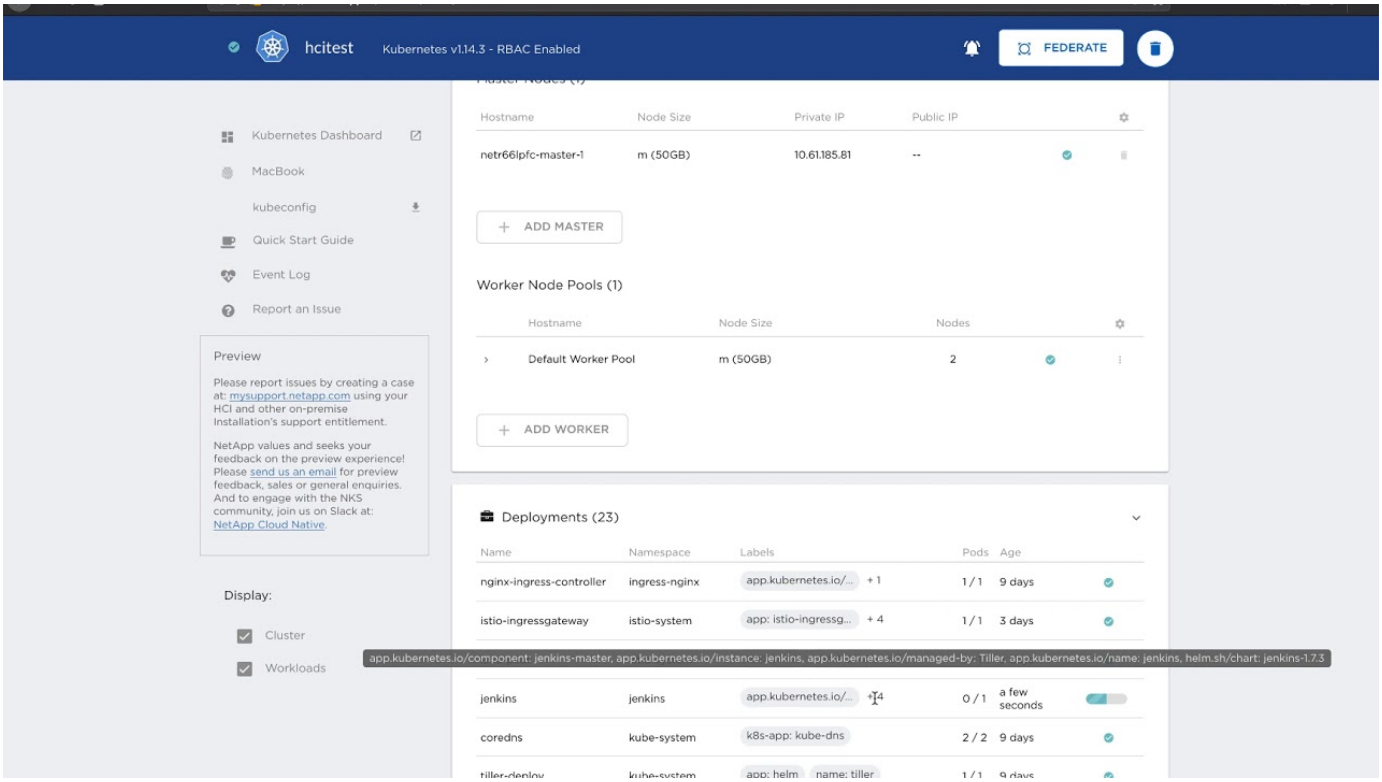
Testing is a critical component in any development process. In a CI/CD pipeline, testing is performed at the development phase as well as part of the “acceptance” of code prior to deployment.

Deploy

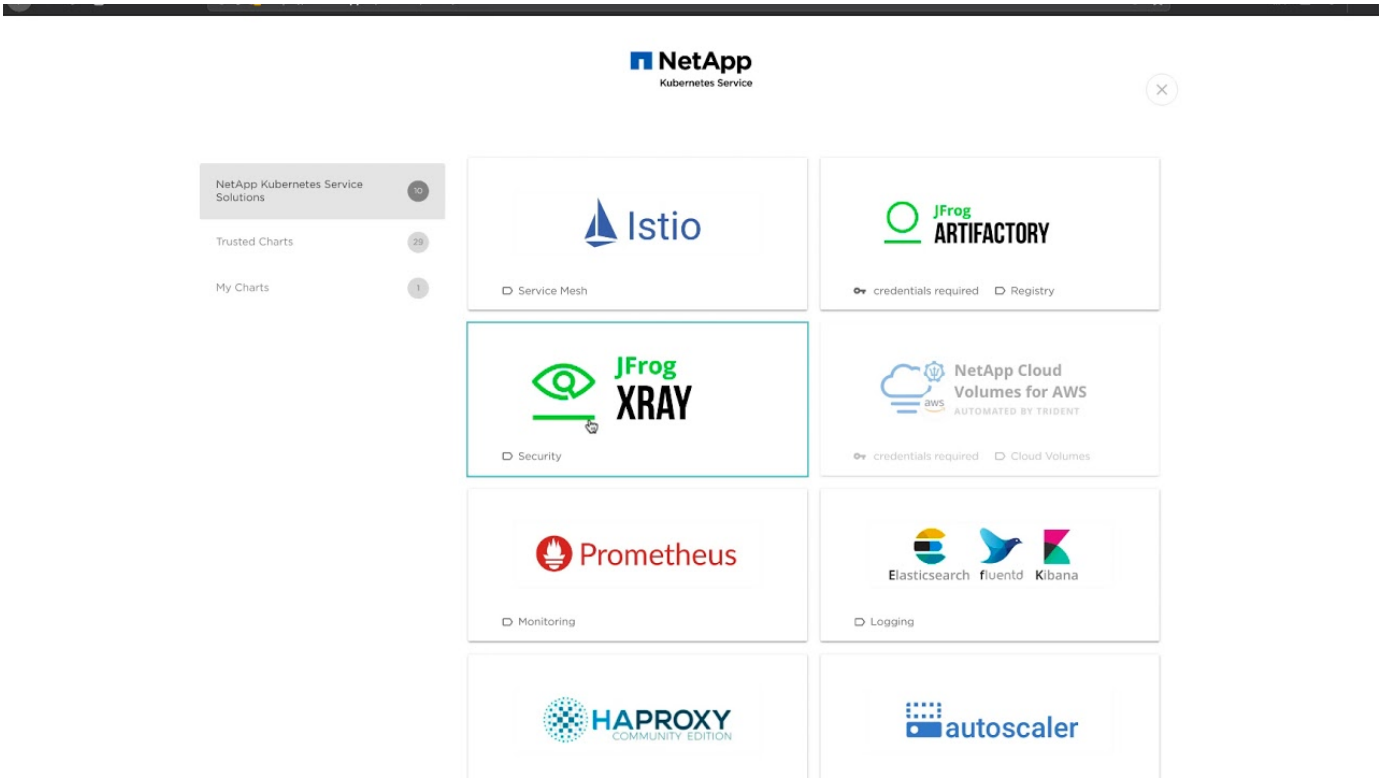
Deployment of code occurs once the code has been developed, tested and built. Once built and verified, code can be deployed into a production or pre-production environment.

Deploy blue/green environments with Kubernetes:

- Deploy an application on a NetApp HCI cluster using curated NKS Helm charts: ***Blog***



- Deploy a custom application on a NetApp HCI cluster using a custom helm chart: ***Blog***



Production

Once code is deployed into the production environment, it can be utilized to meet a customer use case. This topic will touch on how the DevOps CI/CD pipeline introduces code into production to solve a

business need.

Data Protection, and DR to any place: on premise, off premise and the Cloud:

Analyze

Throughout the lifecycle of a CI/CD pipeline, analysis and metrics surrounding the code provide an effective means of evaluating the performance and effectiveness in meeting a business need. This section will touch on metrics and analytics using tools such as ServiceNow (as a self-service portal) and Cloud Insights.

Metrics are king:

ServiceNow for a self-service Portal:

Using Cloud Insights:

Feedback

Feedback is a fundamental tenant of a successful CI/CD pipeline. At every point in the pipeline, feedback is given to ensure that the code is meeting the expectations. There are a variety of feedback options including, but not limited to, email, reports, blogs, source management notifications and execution logs.

Communicate status to your developers:

Copyright Information

Copyright © 2020 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark Information

NETAPP, the NETAPP logo, and the marks listed at http://www.netapp.com/TM are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.