

Designing HPE Nimble Solutions

OFFICIAL CERTIFICATION STUDY GUIDE

(EXAM HPE2-K42)

First Edition

Adrian Witlib

HPE Press
660 4th Street, #802
San Francisco, CA 94107

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Official Certification Study Guide (Exam HPE2-K42)
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Published by:

Hewlett Packard Enterprise Press
660 4th Street, #802
San Francisco, CA 94107

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ISBN: 978-1-942741-90-9

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Publisher: Hewlett Packard Enterprise Press

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Introduction

This study guide helps you prepare for the Designing HPE Nimble Solutions certification exam (HPE2-K42). Organized along the lines of exam topics and objectives, chapters can be studied independently when preparing for the certification.

This guide explains how to design and implement HPE Nimble Solutions. With a focus on meeting the customer's business and technical needs, the guide will enable you to position and recommend HPE Nimble storage solutions. It covers the HPE Nimble hardware and software, initial configuration, and the use of features such as HPE Nimble storage volumes, snapshots, and replication. Learn how to:

- Describe and explain HPE Nimble storage solutions
- Install, configure, and set up HPE Nimble solutions
- Manage, monitor, and maintain HPE Nimble solutions

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Audience

The typical audience for this topic are storage or data center IT professionals, who are responsible for improving the availability and manageability of the data center.

Assumed Knowledge

Designing HPE Nimble Solutions is an entry level book

Minimum Qualifications

There are no pre-requisites to take the Designing HPE Nimble Solutions certification exam. For more information about this exam and other certifications, visit the HPE Partner Ready Certification and Learning website.

Relevant Certifications

After you pass these exams, your achievement may be applicable toward more than one certification. To determine which certifications can be credited with this achievement, log in to The Learning Center and view the certifications listed on the exam's More Details tab. You might be on your way to achieving additional certifications.

Preparing for Exam HPE2-K42

This self-study guide does not guarantee that you will have all the knowledge you need to pass the Designing HPE Nimble Solutions (HPE2-K42) exam. It is expected that you will also draw on real-world experience and would benefit from completing the hands-on lab activities provided in the instructor-led training.

Recommended HPE Training

Recommended training to prepare for each exam is accessible from the exam's page in The Learning Center. See the exam attachment, "Supporting courses," to view and register for the courses.

Obtain Hands-on Experience

You are not required to take the recommended, supported courses, and completion of training does not guarantee that you will pass the exams. Hewlett Packard Enterprise strongly recommends a combination of training, thorough review of courseware and additional study references, and sufficient on-the-job experience prior to taking an exam.

Exam Registration

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1 Study Guide Overview

LEARNING OBJECTIVES

After completing this chapter, you should be able to:

- ✓ Locate Nimble documentation
 - ✓ Describe usage of capacity units
 - ✓ Introduce Nimble technologies
-

Prelearning check

1. You are in a meeting with a customer, and they ask you the question: “I want to make sure that technology will not impact my business. I have heard that Nimble Storage arrays stand out in that category. Can you tell me what their secret is?”

How should you respond?



Note

For recommended responses to this and the Learning Check questions in each chapter, refer to the Learning Check Answers near the back of the guide.

Documentation location

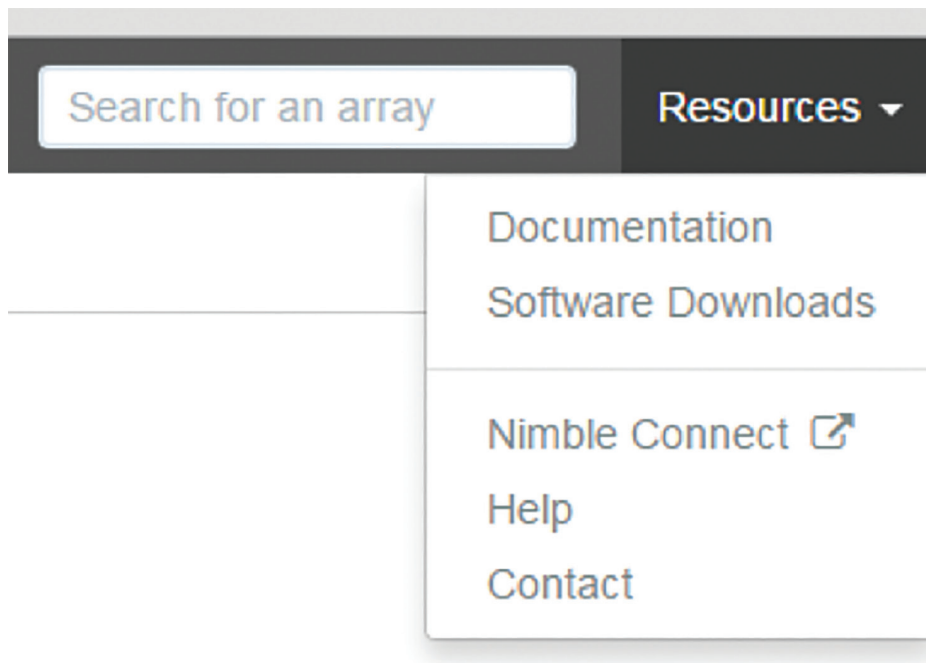


Figure 1-1 Nimble documentation

All array documentation and software downloads are located in InfoSight. To access them, locate the Resources drop down in the array UI and then select the desired category, as shown in Figure 1-1.

1. Log into InfoSight.
2. Click **Resources** and then **Documentation**.

Documentation categories include:

- Release Notes
- Product User Guides
- Solution and Integration Guides
- Support and Knowledge Base Articles

Searches can be refined by:

- Document type
- Nimble Software and Solutions
- NimbleOS Version
- Integration
- Platform

Units of measure defined

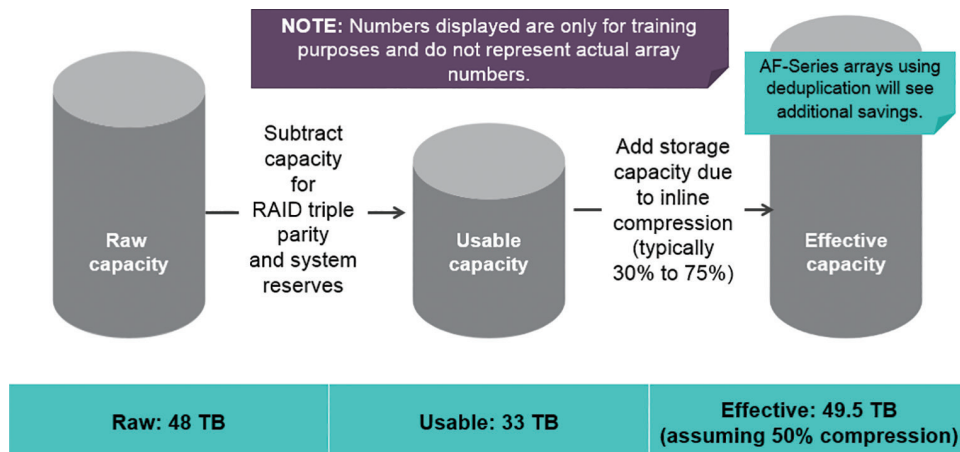


Figure 1-2 How raw, usable, and effective capacities compare to each other

Before discussing the Nimble family of products, let us discuss some capacity terms used in this study guide: raw, usable, and effective capacity.

Capacity terminology

Typically, there are two measurements used with primary storage arrays, raw space, and usable space.

The amount of raw capacity is calculated by taking the sum of each drives raw capacity, and this does not include any overhead. Thus, if you have twelve 4 TB drives installed into an array, the raw space is 48 TB ($12 \text{ TB} \times 4 = 48 \text{ TB}$).

Usable capacity equates to the amount of storage remaining after RAID and other overhead have been subtracted from the raw capacity. In this example, we have 48 TB of raw capacity. From that, we subtract all overhead associated with RAID parity, volume reservations, system spares, and so forth. The end result is a usable capacity of 33 TB, as shown in Figure 1-2.

Nimble adds a measurement that is more applicable to the architecture, and we refer to this measurement as effective capacity. Effective capacity is calculated by adding storage space gained by compression and deduplication engines to the total usable capacity. Oftentimes, you will see a range of effective capacity numbers on Nimble Storage's data sheets. The ability to compress data depends on the application in question.

The recommended approach is to assume 42% compression rate. This is a conservative number and is roughly equal to the raw capacity number. In this example, with a usable capacity of 33 TB and an average compression rate of 42%, the effective capacity available is approximately 47 TB ($33 \text{ TB} + 42\% [14 \text{ TB}] = 47 \text{ TB}$). To be even more conservative, you can use the raw capacity number.

Tebibyte (TiB) and terabyte TB

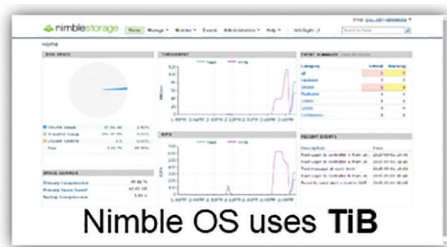


Figure 1-3 Where TiB and TB are being used

Tebibyte (TiB) and terabyte (TB) are related. They just use different bases:

- TB is base 10 (that is, $1 \text{ TB} = 1,000,000,000,000$ bytes).
- Ti, or tebi, represents multiplication by 1024^4 . So the math using Ti is more accurate:
 - $1 \text{ TiB} = 2^{40}$ bytes or 1,099,511,627,776 bytes or more commonly stated as 1024 gigabytes.

This may be confusing, especially when the capacity displayed in Nimble OS shows you something different than what the datasheet states. The difference between these numbers is due to the fact that

marketing materials use TBs and Nimble OS uses TiBs, as shown in Figure 1-3. These nomenclatures are related, though TB is used more commonly in outward-facing documentation.

As you know, a TB is base 10, so 1 TB equals one trillion bytes. This is generally accurate enough for most uses. However, it is more accurate to use TiBs since one TiB equals two to the 40th power bytes or more commonly stated as 1024 gigabytes.

The right flash storage can help business accelerate time to value



Figure 1-4 Relationships in modern IT-connected businesses

To succeed in business today, your number one priority must be speeding time to value. The new generation of apps and data—the world of “hybrid IT”—requires a technology foundation that is different from those of the past. It must meet **two** important criteria as shown in Figure 1-4:

- It must be **fast, flexible, scalable, and “composable”** to meet the realities of today’s **hybrid IT** environments. Whether your apps and data are in your data center, private and/or public clouds, multiple clouds, or at the edge of the network, your technology platform must have the flexibility to operate seamlessly across these different environments.
- It must be able to **take advantage of intelligence gathered at the edge**—the “intelligent edge”—by taking advantage of information gathered from apps and data gathered from your customers, employees, users, and transactions. These connections must be reliable and secure, but data collection and analytics must also be built in. This provides context and insights that generate value from data.

HPE believes enterprises must excel in both of these areas—across all apps (old and new) and data (wherever that data exist).

To ensure that technology slowdowns do not impact the business...



Figure 1-5 Slowdowns business impact

To understand how Nimble is radically simple, you have to understand the origins of the Nimble platform.

Nimble was founded in 2007, which is relatively new for a storage company. From the beginning, Nimble set out to develop a storage technology that would be radically different: one that was built around how people use technology **today** and what they need from that technology.

Think about how much we rely on technology in our daily lives—for personal access to information, to keep our businesses running, and even to save lives.

With all of this reliance on IT, any slowdowns or outages—and we have all experienced them once in a while waiting for web page to load up or application to return data—can have a severe impact. Nimble calls this the “app-data gap,” and Figure 1-5 shows it.

Technology slowdowns impact IT as well

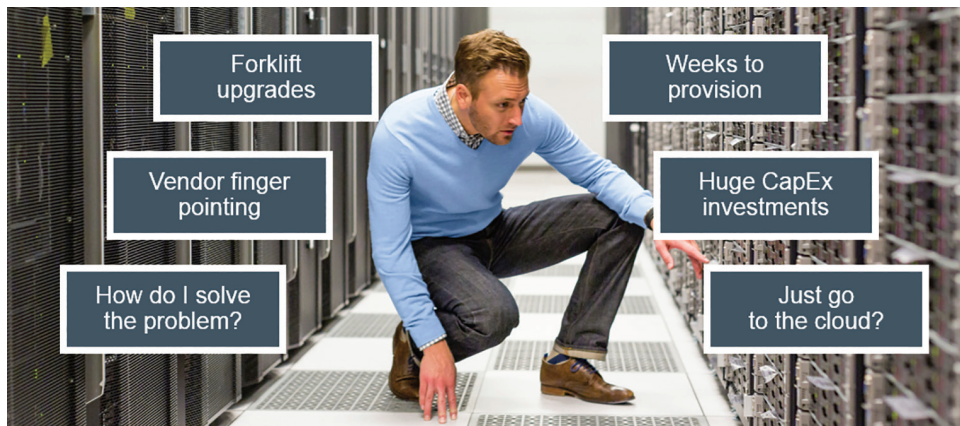


Figure 1-6 Slowdowns IT impact

This “app-data gap” does not just impact customers, users, and patients. Technology slowdowns can have a severe impact on IT and support teams too, as shown in Figure 1-6. When a problem occurs, how does IT solve it? Sometimes it is simple, but other times it is not. In the worst-cases, problem resolution can lead to long, sleepless nights of troubleshooting and vendor finger-pointing. When uncovering the root cause of the issue is not possible, forklift upgrades may be needed, meaning downtime and weeks to provision new systems.

Under this model, the CapEx is required to keep everything up and working keeps growing. The question becomes “why not just go to the cloud?” However, going to the cloud brings its own cost issues and other challenges. So what is the solution to this dilemma?