



HPE Digital Learner 3PAR Content Pack

HPE Content Pack number	CP004
Content Pack category	Category 1
Content Pack length	24 Hours
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*Realize Technology Value with Training, IDC Infographic 2017, Sponsored by HPE, October 2017

Managing HPE 3PAR StoreServ I course is designed for the new or entry-level HPE 3PAR administrator and is approximately 50% lecture and 50% hands-on practice using HPE 3PAR arrays. The goal of the class is to acquaint the 3PAR administrator with the concepts of the HPE 3PAR technology, together with most common day-to-day tasks and best practices associated with administration of the 3PAR array. The levels of provisioning storage are emphasized. This training reflects the release of the HPE 3PAR OS: 3.3.1.

NOTE: Managing HPE 3PAR StoreServ I self-paced training has two components:

1. Web-based training available online
2. Hands-on practice, available through the HPE Virtual Labs

With this self-paced course, you have options normally unavailable with an instructor-led course. You have a year of access to the web-based portion of the training, so that you may repeat sections for reinforcement. Take this training at your own pace and on your own schedule. Once you set your reservation, you have 60 sequential days of access to the HPE Virtual Labs to run the labs associated with this course using the HPE 3PAR simulator in a dedicated environment.

Audience

HPE 3PAR administrators who desire training on basic concepts and best practices needed to administer the array.

Recommended learning

- An understanding of general storage concepts, including fibre channel technology and RAID
- Operator level functionality in a Windows environment

Content Pack objectives

At the conclusion of this course, the student should be able to:

- Explain the numbering schemes for the HPE 3PAR hardware components: controllers, ports, and physical disks
- Use the StoreServ Management Console (SSMC) GUI and the CLI to perform administrative tasks
- Create and work with a Common Provisioning Group (CPG)
- Administer Virtual Volumes using the SSMC and the CLI
- Understand the advantages of Thin Provisioning and create a Thin Provisioned Virtual Volume (TPVV)
- Understand the advantages of Dedup and Compression for storage allocated from SSDs
- Export and un-export virtual volumes from hosts

- Use HPE 3PARinfo to analyze LUNs presented to hosts
- Use Host Explorer to simplify addition of hosts
- Use Host Sets and Volume Sets to simplify provisioning storage
- Create a Snapshot and promote (restore) from a Snapshot
- Create a Clone and promote a Clone
- Convert a Virtual Volume (i.e. from fully provisioned to thin provisioned or thin provisioned to thin dedup or vice versa)
- Use the SSMC reporting feature to monitor capacity and performance

Detailed Content Pack outline

Module 1: Course Introduction

- Course description
- Course menu
- How to take this course
- Learning tools
- Accessing the virtual labs

Module 2: Hardware Architecture

- Hardware models
- Array building blocks (7000/8000)
- Array building blocks (9000/20000)
- Learning check
- 7000/8000 port numbering
- 7000/8000 expansion cages
- 7000/8000 disk numbering
- 9000/20000 controllers, adapters, and port numbers
- 9000/20000 drive enclosures
- 9000/20000 disk numbering
- ASIC
- Storage architecture
- Connectivity
- Learning check
- Key takeaways

Module 3: Logical Architecture

- Virtual volume concept
- Chunklet concept
- More on chunklets
- How spare chunklets work
- Common provisioning groups (CPGs)
- Default CPGs
- Virtual volume overview
- Learning check
- Logical disk
- CPG: RAID 1
- CPG: RAID 5
- CPG: RAID 6
- High resiliency with RAID 6
- Set size and availability
- Thin provisioning advantages
- Learning check
- CPG examples
- RAID 5 set size and availability example
- RAID 5 enablement
- Growth settings
- Step size
- Subset
- Capacity allocation
- Learning check
- Key takeaways

Module 4: Management

- Management options
 - What is SSMC?
 - Logging in to SSMC
 - Touring the Dashboard
 - Accessing the main menu
 - Context areas and wizards
 - Accessing online help
 - Logging out of SSMC
 - Demo: SSMC walkaround
 - Lab: SSMC walkaround
 - Learning check
 - Installing SSMC
 - Accessing the administrator console
 - Adding an array
 - Performing searches
 - Area filtering
 - Detail maps
 - Performance view
 - SSMC settings
 - Activity screen
 - Lab: Explore SSMC
 - Learning check
 - CLI login
 - Useful CLI commands
 - Learning check
 - Key takeaways
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Module 5: Common Provisioning Groups

- Displaying CPGs in SSMC
- Creating CPGs in SSMC
- Deleting CPGs in SSMC
- Demo: Creating and deleting CPGs in SSMC
- Lab: Creating and deleting CPGs in SSMC
- Learning check
- Compaction of a CPG
- Compaction ratio
- Compacting a CPG in SSMC
- Demo: Capacity efficiency
- Learning check
- Lesson overview
- CLI commands for managing CPGs
- Levels of capacity reclaim
- Compaction
- Overprovisioning challenge
- Learning check
- Key takeaways

Module 6: Virtual Volumes

- Lesson overview
- Creating VVs in SSMC
- Creating multiple VVs
- Displaying VVs
- Deleting VVs
- Online volume conversion
- Converting VVs in SSMC
- Demo: Managing VVs in SSMC
- Lab: Managing VVs in SSMC
- Learning check
- VV policies
- Autonomic VV sets
- VV set features
- Creating VV sets in SSMC
- Managing VV sets in SSMC
- Zero-detect for TPVV
- Zero-detect example
- Thin persistence methods by OS
- Learning check
- Managing VVs using the CLI
- Managing VV sets using the CLI
- Learning check Key takeaways

Module 7: Hosts and Host Sets

- Hosts and ports
- Front-end configuration example
- Front-end configuration best practices
- Try it!
- WWN format of host ports
- Adding hosts in SSMC
- Demo: Adding hosts in SSMC
- Lab: Adding hosts in SSMC
- Port persistence
- Learning check
- Finding WWN for hosts
- Zoning overview
- Smart SAN
- Smart SAN information for ports
- Adding hosts in SSMC with Smart SAN enabled
- Performance view for hosts
- Host Explorer
- Host sets and VV sets
- Host set and VV set use cases
- Creating host sets in SSMC
- Lab: Creating host sets in SSMC
- Learning check
- Host persona
- Managing hosts from the CLI
- Managing host sets and VV sets from the CLIHPE 3PARInfo
- Learning check
- Key takeaways

Module 8: Providing Access to Storage

- The purpose of exporting VVs
- Exporting VVs in SSMC
- Demo: Exporting VVs in SSMC
- Lab: Exporting VVs in SSMC
- Unexporting VVs in SSMC
- Demo: Unexporting VVs in SSMC
- Lab: Unexporting VVs in SSMC
- Learning check
- Exporting and unexporting VVs using the CLI
- Making VLUNs visible to hosts
- Learning check
- Key takeaways

Module 9: Snapshots and Clones

- Replication types
- Snapshot introduction and functionality
- Copy space
- Creating a snapshot using SSMC
- Demo: Creating a snapshot using SSMC
- Lab: Creating a snapshot using SSMC
- Introduction to clones
- Working with clones in SSMC
- Demo: Working with clones in SSMC
- Lab: Working with clones in SSMC
- Learning check
- Snapshot characteristics
- Snapshot relationships
- Snapshot limits
- Snapshot: How it works
- Snapshot promotion
- Creating a snapshot of a VV set in SSMC
- Snapshot schedule
- Schedules page
- Stale snapshots
- Virtual lock
- Clone characteristics
- Resync clone
- Promote clone
- Learning check
- Managing snapshots from the CLI
- Managing clones from the CLI
- Learning check
- Key takeaways

Module 10: Deduplication and Compression

- HPE 3PAR Adaptive Data Reduction for Flash
 - Deduplication and compression in SSMC
 - Adaptive Data Reduction ratios
 - Learning check
 - Thin deduplication
 - Advanced inline, in-memory deduplication
 - Dedup Data Store (DDS)
 - Deduplication implementation
 - Garbage collection
 - Deduplication considerations
 - What to dedup
 - Compression
 - How compression works
 - Compression example
 - Compression considerations
 - Data Packing
 - What to compress
 - Deduplication and compression together (DECO)
 - Deduplication and compression in SSMC
 - Learning check
 - Creating VVs with data reduction
 - Obtaining data reduction information
 - Checking data reduction ratios
 - Estimating savings from deduplication and compression using SSMC
 - Estimating savings from deduplication and compression using the CLI
 - Online volume conversion
 - Learning check
 - Key takeaways
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Module 11: Reporting: Performance and Capacity

- Introduction to HPE 3PAR System Reporter
- SSMC on-node system reporter overview
- Reports breakdown
- Default reports
- Performance related templates
- Capacity reports
- Learning check
- Report controls
- Creating a real time report
- Creating a historical report
- Scheduling reports
- Examples
- Lab: System reporter
- Learning check
- On-node volume: .srdata
- Managing .srdata
- Stat commands
- Sr* commands
- Learning check
- Key takeaways

Module 12: Resources

Module 13: Certificate of Completion

Detailed lab outline

Lab 1: SSMC walkaround

Lab 2: Explore SSMC

Lab 3: Creating and deleting CPGs in SSMC

Lab 4: Managing VVs in SSMC

Lab 5: Adding hosts in SSMC

Lab 6: Creating host sets in SSMC

Lab 7: Unexporting VVs in SSMC

Lab 8: Creating a snapshot using SSMC

Lab 9: Working with clones in SSMC

Lab 10: System report

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