Hewlett Packard Enterprise

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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Why HPE Education Services?

- IDC MarketScape leader 5 years running for IT education and training*

- Recognized by IDC for leading with global coverage, unmatched technical expertise, and targeted education consulting services*

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- Complete continuum of training delivery options—self-paced eLearning, custom education consulting, traditional classroom, video on-demand instruction, live virtual instructor-led with hands-on lab, dedicated onsite training

- Simplified purchase option with HPE Training Credits

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 newest release of HPE StoreServ Management Console.

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

Module 5: Common Provisioning Groups	• Displaying CPGs in SSMC	• Learning check
	• Creating CPGs in SSMC	• Lesson overview
	• Deleting CPGs in SSMC	• CLI commands for managing CPGs
	• Demo: Creating and deleting CPGs in SSMC	• Levels of capacity reclaim
	• Lab: Creating and deleting CPGs in SSMC	• Compaction
	• Learning check	• Overprovisioning challenge
	• Compaction of a CPG	• Learning check
	• Compaction ratio	• Key takeaways
	• Compacting a CPG in SSMC	
	• Demo: Capacity efficiency	
Module 6: Virtual Volumes	• Lesson overview	• Autonomic VV sets
	• Creating VVs in SSMC	• VV set features
	• Creating multiple VVs	• Creating VV sets in SSMC
	• Displaying VVs	• Managing VV sets in SSMC
	• Deleting VVs	• Zero-detect for TPVV
	• Online volume conversion	• Zero-detect example
	• Converting VVs in SSMC	• Thin persistence methods by OS
	• Demo: Managing VVs in SSMC	• Learning check
	• Lab: Managing VVs in SSMC	• Managing VVs using the CLI
	• Learning check	• Managing VV sets using the CLI
	• VV policies	• Learning check Key takeaways
Module 7: Hosts and Host Sets	• Hosts and ports	• Adding hosts in SSMC with Smart SAN enabled
	• Front-end configuration example	• Performance view for hosts
	• Front-end configuration best practices	• Host Explorer
	• Try it!	• Host sets and VV sets
	• WWN format of host ports	• Host set and VV set use cases
	• Adding hosts in SSMC	• Creating host sets in SSMC
	• Demo: Adding hosts in SSMC	• Lab: Creating host sets in SSMC
	• Lab: Adding hosts in SSMC	• Learning check
	• Port persistence	• Host persona
	• Learning check	• Managing hosts from the CLI
	• Finding WWN for hosts	• Managing host sets and VV sets from the CLIHPE 3PARInfo
	• Zoning overview	• Learning check
	• Smart SAN	• Key takeaways
	• Smart SAN information for ports	

Module 8: Providing Access to Storage	• The purpose of exporting VVs	• Lab: Unexporting VVs in SSMC
	• Exporting VVs in SSMC	• Learning check
	• Demo: Exporting VVs in SSMC	• Exporting and unexporting VVs using the CLI
	• Lab: Exporting VVs in SSMC	• Making VLUNs visible to hosts
	• Unexporting VVs in SSMC	• Learning check
	• Demo: Unexporting VVs in SSMC	• Key takeaways
Module 9: Snapshots and Clones	• Replication types	• Snapshot relationships
	• Snapshot introduction and functionality	• Snapshot limits
	• Copy space	• Snapshot: How it works
	• Creating a snapshot using SSMC	• Snapshot promotion
	• Demo: Creating a snapshot using SSMC	• Creating a snapshot of a VV set in SSMC
	• Lab: Creating a snapshot using SSMC	• Snapshot schedule
	• Introduction to clones	• Schedules page
	• Working with clones in SSMC	• Stale snapshots
	• Demo: Working with clones in SSMC	• Virtual lock
	• Lab: Working with clones in SSMC	• Clone characteristics
	• Learning check	• Resync clone
	• Snapshot characteristics	• 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	• Data Packing
	• Deduplication and compression in SSMC	• What to compress
	• Adaptive Data Reduction ratios	• Deduplication and compression together (DECO)
	• Learning check	• Deduplication and compression in SSMC
	• Thin deduplication	• Learning check
	• Advanced inline, in-memory deduplication	• Creating VVs with data reduction
	• Dedup Data Store (DDS)	• Obtaining data reduction information
	• Deduplication implementation	• Checking data reduction ratios
	• Garbage collection	• Estimating savings from deduplication and compression using SSMC
	• Deduplication considerations	• Estimating savings from deduplication and compression using the CLI
	• What to dedup	• Online volume conversion
	• Compression	• Learning check
	• How compression works	• Key takeaways
	• Compression example	
	• Compression considerations	

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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