

Customer Education Course Overview

Managing HP StorageWorks Enterprise Virtual Array (5-day) (U4879S)



This 5-day course combines theory and practical labs to teach users how to manage the HP StorageWorks Enterprise Virtual Array. The concepts and terminology are covered in-depth followed by configuration tasks which include Command View EVA 7.x, Local and Remote replication including Business Copy and Continuous Access via the Replication Solutions Manager version 3.x, Multi-path management with HP MPIO DSM on Windows, Secure Path (autopath) Management on UNIX, scripting with SSSU v 7.x and an introduction to EVAperf 7.

Audience

System administrators responsible for the configuration and day-to-day management of the Enterprise Virtual Array EVA environment.

Prerequisites

- SAN and Storage Technologies training/experience.
- SAN Fundamentals (U5527aae)
- HP Accelerated SAN Essentials (UC434S)

Course Objective

- Describe the features of the EVA solution.
- Identify and describe the features and functions of the HSV controllers and disk drive enclosures.
- Define the basic terminology and concepts associated with the EVA and storage virtualization.
- Use Command View EVA to initialize, configure, and manage the EVA and connected hosts.
- Describe and perform host path management activities using the multi-pathing software.
- Describe the EVA local replication capabilities and concepts of Business Copy EVA.
- Describe and perform the installation and configuration of Replication Solutions Manager and agents for local replication tasks.
- Describe how to set up and use the Storage System Scripting Utility.
- Describe how to configure and use EVAPerf for monitoring the performance of the EVA.
- Understand how to monitor and manage the health of the EVA.
- Describe Best Practices for EVA configuration.

Benefits to You

This 4-day theory and lab-based course explores the technology of the Enterprise Virtual Array focusing on configuration and management. The product concepts and terminology are initially presented to ensure a grasp of the key elements of the array. The configuration is then performed through the Command View GUI. More detailed topics are then presented such as snapshots and snapclones, scripting utility, and EvaPert are also provided as an overview

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Course Title: Managing HP StorageWorks Enterprise Virtual Array (5-day)

HP Product Number: U4879S

Category/Subcategory: Storage

Course Length: 4 days

Level: Intermediate

Delivery Language: English

To Order: You can order this course online at <http://www.hp.com/learn>. At the site, select a country, then choose "registration" or "Book a course" and fill out the online registration form.

Next Steps: Students wishing a more in-depth study on Continuous Access EVA are encouraged to also take Implementing HP StorageWorks Continuous Access EVA (U8569S)

Detailed Course Outline

Solution Overview

- Product Features
- Virtualization technology
- Functional and physical layout of the EVA solution
- iSCSI Solutions
- EVA4x00 Configurations
- EVA6x00 Configurations
- EVA8x00 Configurations
- Rack Row Capacity
- HSV racked components including controller enclosures, drive enclosures, loop switches
- Enclosure address bus (EAB)
- Controller Software
- HP EVA Management software
- Command View EVA 7.x
- Storage management server (SMS)
- Storage System Scripting Utility (SSSU)
- HP Command View EVA Perf
- Licensing

HSV Controllers

- Controller features and redundancy
- Operator control panel (OCP)
- Storage system menu tree
- World Wide Name and checksum
- Setting a Password on the OCP
- Rear connections for the EVA4x00, EVA6x00 and EVA8x00.
- Enclosure port identification
- Host port numbers
- Customer Self Repair (CSR) – HSV controller
- Mirrored cache battery policy
- EVA Power Up Procedure

Disk Drive Enclosures

- Drive enclosure model overview
- Customer self repair for the drive enclosure
- Drive suspect list
- EMU functions display and pushbuttons
- Enclosure Address Bus
- EMU display groups — audible alarm (Au)
- EMU display groups — error reports (Er)
- FC I/O modules A and B

HP StorageWorks Command View EVA Introduction

- Command View EVA overview
- Command View EVA 7.0 Media Kit
- EVA Management Server
- Command View EVA version 6.x-7.x installation and usage
- Command View EVA interface layout
- Server options
- Command View EVA rules and limitations

Basic Concepts and Terminology

- Virtual storage terminology overview
- Power on sequence (initial)
- Storage system metadata
- Disk group and default
- Disk group metadata and capacity
- Virtual disk properties, expansion and reduction
- Distributed virtual RAID (VRAID) technology
- Hosts and LUNs

Storage System Configuration

- Configuration guidelines
- Perform storage discovery
- Controller code load
- Initializing an EVA storage system
- Disk group creation
- Creating a vertical disk group
- Deleting disk groups
- Creating a virtual disk
- Cache Policies
- Vdisk Presentation Properties

Host System Configuration

- Terminology
- Operating system support
- Supported multi-path solutions
- Co-existence with other EVA models
- Other Connectivity Options
- Installing and configuring hosts
- FC Host to EVA Cabling
- Collecting Windows port WWN
- Presenting storage (LUN mask/map)

HP StorageWorks Multi-Path Solutions

- Concepts
- Automatic Path Failover
- Load Balancing
- Supported multi-path solutions
- HP MPIO DSM (Windows only)
- Installing MPIO Framework and HP DSM
- HPDSM CLI (hpdsm.exe)
- Path states (DSM)
- Installing SP 3.0F on HP-UX (11iv1, 11iv2)
- Secure Path/Autopath management CLI (HP-UX 3.0F)

Active-Active Failover

- Overview of active-passive failover mode
- Active-active failover features
- Active-active performance paths
- Virtual disk ownership and transitions
- Active-passive failover model
- Active-active failover model

Advanced Concepts and Terminology

- Virtual storage terminology overview
- Redundant Storage Sets (RSS)
- Redundant store (RSTORE)
- Virtual disk data location and leveling
- Distributed Sparing
- Data reconstruction
- Disk failure protection levels
- Disk failures with VRAID1 and VRAID5

Storage System Scripting Utility

- SSSU description, architecture and terms
- Installing and starting the SSSU (6.x/7.x)
- Command Structure
- File paths and naming conventions
- SSSU password authentication file

Local Replication

- Array-based data replication
- Traditional Snapshot Features, Operation and Properties
- Vsnap Operation and Properties
- Snapshot Instant Restore (snapback)
- Snapclone Properties, Creation and Management
- Three phase snapclone
- Snapclone replica resync
- Mirrorclone Operations, guidelines and Properties

Business Copy Operations using Replication Solutions Manager

- Business Copy Network Components
- RSM jobs
- Launching RSM from the CV Server
- Access RSM from a remote client
- Replication Solutions Manager
- Getting Started with RSM
- Enable Host Agents
- Refresh Server Database
- View/Manage Storage Resources
- View Managed Host Volumes
- Round Robin Replicas (repository)
- Instant Restore from Replica Repository
- Create a New Replication Job
- Configure Command Parameters
- Create a New Replication Job (Template)
- Job control components
- Job Language
- Event log
- RSM Database
- Advanced Features

Performance Monitor

- EVA Performance Components
- EVA Perf Perfmon Counters
- EVA Perf CLI Counters
- Friendly Names and Short Names
- EVA Perf – Perfmon Objects, Logging and Instances
- Viewing Logged Data
- EVA Perf CLI
- Viewing Collected Data

Event Management

- Event Processing
- Events within Command View EVA
- Windows Application Event Log
- Windows Log Management
- Automated Event Management
- Configuring event notification
- HP Services Automated Monitoring
- HP Remote Monitoring Installation (EVA)
- HP WEBES/SEA Architecture
- Remote hardware event management
- ISEE security

Configuration Best Practices Summary

- Disk group configuration overview
- Best practices for optimizing availability
- Robust Availability Configuration rules
- Maximizing availability
- Adding or removing drives
- Best practices for optimizing availability, performance and cost
- Mixing FC drive types
- Snapshot working space
- Disk Space Calculations

Continuous Access EVA Overview

- Defining business continuity requirements
- High availability and Disaster tolerance
- Continuous Access EVA Concepts, Features and Requirements
- Planning a Continuous Access EVA solution

Continuous Access EVA Concepts

- Copy set characteristics
- Bidirectional replication
- Fan-out and Fan-in replication
- Cascaded replication
- DR group characteristics
- DR group properties
- Synchronous write mode vs Enhanced Asynchronous Copy Operations
- Failsafe mode vs normal mode
- DR Logging, log space and operations
- DR group states and flow
- Continuous Access EVA failover
- Failover principles and considerations
- Failover decision – when failover is appropriate
- Planned and Unplanned failover
- Failover using RSM interface
- Recovery from failsafe-locked condition

Continuous Access Operations

- Pre-Continuous Access EVA configuration tasks
- RSM remote replication functions
- Failover using RSM or Command View EVA
- Activating standby storage management server
- Managed sets, lists and members

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(U4879S G.00)

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