

## PS Series Storage Array - Configuration, Operation and Management

The **PS Series Storage Array - Configuration, Operation and Management** course provides the opportunity for you to gain an understanding of your customer's configuration and maintenance of the PS Series Storage arrays. This instructor led course allows the student to engage in a series of hands-on exercises that are designed to provide the skills required to perform basic operation, configuration and management along with configuration and usage of the advanced features that are included in PS Series Storage Arrays. Additional tasks include working with snapshots, replication, clones, thin clones, Synchronous Replication, and MPIO. You will also monitor the PS Series storage array group with the EqualLogic SAN Headquarters monitoring tool. By understanding and putting into practical use the features and components included with the PS Series Arrays it better enables you to provide support to the customers.

### **Course objectives:**

Upon completion of this course, the student will be able to:

- Describe where the PS Series Storage Array fits within the enterprise data center.
- Identify key characteristics and advantages of the PS Series Storage Array.
- Identify the PS Series Storage Array product family.
- Describe the PS Series Storage Array hardware components.
- Install the PS Series Storage Array chassis, associated Control Modules and Disk Drives.
- Describe the surrounding iSCSI SAN ecosystem and its components.
- Describe the PS Series Storage Array software components.
- Setup the PS Series Storage Array using CLI commands and Remote Setup Wizard.
- Manage the PS Series Storage Array using CLI commands and web GUI.
- Interpret LEDs, capture a Diagnostic report from the PS Series Storage Array.
- Create and use traditional volumes, volume folders and collections.
- Describe and configure Thin Provisioned volumes.
- Identify and perform key system troubleshooting steps.
- Configure a NIC and the software Initiator on a variety of operating system, such Linux and Windows
- Describe traditional asynchronous replication between 2 or more groups
- Configure and use traditional asynchronous replication
- Describe and configure Replication Failback and manual transfer replication
- Describe Synchronous Replication within a single group
- Configure and use Synchronous Replication

- Describe purpose of snapshots. Create a volume snapshot. Recover a single file from a snapshot. Recover a volume from a snapshot.
- Describe and configure Thin Clones and Templates
- Describe and configure clones of volumes, snapshots and replica
- Configure multi-member groups, storage pools and discuss Storage tiering and how tiering can be used with the array
- Review VSS and how it can be used in your storage environment and also how it integrates with. Auto Snapshot Manager
- Discuss and configure MPIO included in the Host Integration Tool Kits.
- Evaluate design considerations and best practices when using the PS Series Storage Array
- Update the firmware on the PS Series Storage Array.
- Capture a Diagnostic report from the PS Series Storage Array.
- Identify and perform key system troubleshooting steps.
- Install, configure and use SAN Headquarters

### ***Prerequisites:***

The following prerequisite knowledge is required before attending this course.

- Basic Operating System administration
- Storage Area Networks
- Storage Network Protocols – iSCSI, Fibre Channel, etc.
- Local Area Network Protocols – Gigabit Ethernet
- Internet Protocols
- Network Management

### ***Topical Outline:***

#### **Module 1 Dell EqualLogic Solution and Product Overview**

- Key characteristics of the PS Series Storage Array.
- PS Series Storage Array product family.
- Fit within the enterprise data center
- Overview of software components
- Key features and benefits
  - Single view management
  - Scalability
  - Terminology

#### **Module 2 Initial Configuration of the PS Series Storage Array**

- Initial configuration
  - Command line setup utility
  - Remote Setup Wizard
- Configure RAID
- Create volumes
- Connect and access a volume from a Windows Host

### Module 3 Working with EqualLogic Volumes

- Initial creation and connection from server
  - Access Control and Multi-host access
  - iSCSI initiator connection
- Thin Provisioned volumes
- Volume Folders
- Volume Recovery Bin and volume undelete

### Module 4 PS Series Storage Array Hardware – Architecture

- General PS Series Architecture
- Connection balancing through the network load balancer
- Hardware components
  - Chassis
  - Controllers
  - Power Supplies
- Compare the different PS Series Array chassis
- Identify the features included with the latest versions of the Control Modules
- Recognize the recommended network cabling methods for PS Series Arrays
- Describe Secure Encrypted Drives (SED)

### Module 5 Introduction to PS Series Storage Management Interfaces

- Required configuration settings for GUI
- Command Line Interface, CLI
- Web based Graphical User Interface, GUI.
- Administrator configuration
- Notification configuration
- Email Home
- Configure the group and member parameters
- Manage notifications and the event log
- Authenticate against a Microsoft Active Directory database

### Module 6 Hardware and Software iSCSI Initiators

- Software initiators, Windows, Linux, VMware
- Hardware initiators
  - Discuss Configuration
- Discuss Boot from SAN
- Discuss time out and other initiator settings that need to be configured

#### Module 7 PS Series Storage Firmware Upgrade

- Requirements for a Firmware update
- Firmware update process
- Describe volume cloning
- Describe and demonstrate clones
- Create a clone
- Describe Templates, Thin clones and their usage
- Describe and demonstrate Thin Clones
- Create Thin Clones

#### Module 9 Snapshots

- What are snapshots and how can they be used
- Snapshot reserve space and snapshot space borrowing
- Creating a snapshot both unscheduled and using a schedule
- Connecting to a snapshot
- Using a snapshot to recover a file or a full volume

#### Module 10 Overview of Gigabit Ethernet, TCP/IP and iSCSI Technology

- iSCSI SAN environment
- Targets and initiators
- Discovery process
- Login redirection process
- Network setting including Flow Control, Jumbo frames and Spanning tree
- 10GB Ethernet and DCB
- Integrating 10 GB with 1GB Ethernet

#### Module 11 Replication

- PS Series Replication and replication features
- Normal
- Fast Failback
- Manual Transfer
- Configure replication between groups

- Local reserve and Replica reserve space
- Replication considerations

#### Module 12 SAN Headquarters monitor tool

- Describe the SAN Headquarters tool
- Install and configure the SAN Headquarters tool
- Monitor your group with the SAN headquarters tool

#### Module 13 Multi-member Groups and Pools

- Storage Tiering
- Creating pools and managing pools
- Volume movement within a group, within a pool and between pools
- Explain the load balancing techniques in PS Series Storage pools

#### Module 14 Synchronous replication

- Define the Equallogig implementation of Synchronous Replication (SyncRep)
- Describe the pool roles, sync active and sync alternate
- Describe the different states that a SyncRep volume can be in
- Explain how to configure a volume to use Sync Rep
- Describe the difference between switching over and failing over a SyncRep volume

#### Module 15 Host Integration Tools

- What are the Equallogig Host Integration Tools
- Microsoft HIT
- VMware HIT
- LINUX HIT

#### Module 16 Troubleshooting and Tips

- Common problems and solutions in an Equallogig SAN
- How to capture a Diagnostic report
- Available support resources