Purpose of the exam prep guide

The intent of this guide is to set expectations about the content and the context of the exam and to help candidates prepare for it. In this guide, you will find recommended HP training courses, reference and study material to help you achieve a successful passing score.

Studies conducted by HP and Prometric show that a combination of course attendance and self-study maximizes the likelihood of passing the exam on the first attempt.

Audience

The Supporting the Enterprise Virtual Array Storage (EVA) Family exam is for engineers who support, from a Services perspective, the Enterprise Virtual Array product line.

Examples of job roles:

- HP ASE engineer
- HP Services field engineers, call center personnel, and other field personnel who provide installation and/or operational support assistance
- HP Channel Partners supporting the EVA product line (e.g., engineers who perform warranty, break-fix, and installation services)

General areas of content include:

- EVA Storage Technologies & Second Generation Improvements
- EVA Product & Solution Sets
- EVA Upgrade Procedures
- Troubleshooting & Repair/Replacement Procedures
- Administrative & Operational Tasks

Certification requirements

The Supporting the Enterprise Virtual Array (EVA) Storage Family (HP0-461) exam is an Accredited Systems Engineer (ASE) core elective exam. This exam is for individuals who, in addition to configuration, design, start-up, and implementation services, will also deliver warranty and break-fix services for the EVA family of arrays. Individuals who provide EVA start-up and
implementation services only for the EVA arrays should consider the “less services-focused” HP0-690 exam instead of HP0-461.

**Prerequisites**

- AIS StorageWorks certification
- Knowledge of/completion of prerequisite Web-based and Instructor Led Training Courses specified in the **Recommended Training and Study References** section of this exam preparation guide.
- Knowledge of OpenView and SANworks software products through appropriate training courses

**Exam details**

At the beginning of the exam, you will be asked to answer several survey questions. The survey has been designed to assist the exam development team in accurately profiling test results and to improve future exams.

- **Number of items**: 62
- **Item types**: Multiple choice, drag and drop
- **Passing Score**: 72% (raw score of 45)
- **Time commitment**: 90 minutes
- **Reference Material**: No on-line or hard copy reference material will be allowed at the testing site.

**Comments on the exam**

During the exam, participants can make specific comments about the items (i.e., accuracy, appropriateness to audience, etc). HP welcomes these comments as part of our continuous improvement process.

**Exam Registration**

This exam is available at Prometric.

**Exam content**

The following information represents specific areas of content covered in the exam. Use this outline to guide your study and to check your readiness for the exam. The exam measures your understanding of these areas.
Supporting the Enterprise Virtual Array (EVA) Storage Family (HP0-461) Exam Preparation Guide

Supporting the Enterprise Virtual Array (EVA) Storage Family (HP0-461) Exam Content

1.0 EVA Storage Technologies & Second Generation Improvements
   - EVA storage virtualization concepts
   - VRAID
   - disk leveling
   - disk loss in disk groups configured for double protection
   - Distributed Virtual RAID characteristics
   - Technological capabilities of the different EVA models
   - maximum number of disk groups supported
   - host connection topologies
   - demand-allocated snapshot
   - Command View EVA functions
   - Entering license information
   - speed and connection types used by EVA device-side Fibre Channel ports

2.0 EVA Product & Solution Sets
   - speed and connection types used by EVA device-side Fibre Channel ports
   - disk enclosure Fibre Channel topologies
   - connecting HSV controller pairs to physical disk drive enclosures
   - EVA loop switch features
   - enclosure address assignments
   - powering off HSV2x0 controller power switches

3.0 EVA Upgrade Procedures
   - upgrading from one EVA model to another
   - hot-swapping controllers with newer firmware versions
   - upgrading EMU firmware
   - Command View EVA versions
   - battery life conditions
   - Fibre Channel loop switch firmware conditions
   - installation sequence for various EVA products
- upgrading HSV arrays
- use of Secure Path failover software

4.0 Troubleshooting & Repair/Replacement Procedures
- Controller Event Log report conditions and implications
- Instant Support Enterprise Edition (ISEE) functionality
- Mirror port connection failures between HSV controllers
- Environmental Monitoring Unit (EMU) functionality
- using Command View EVA
- Storage Management Appliance (SMA) tools and use with EVA
- environmental temperature effect on EVA storage systems
- cabling considerations and effects
- HSV controller characteristics
- Customer Self Repair components
- HBA topologies
- Connection state display messages

5.0 Administrative & Operational Tasks
- disk group configuration recommendations
- failover modes and implications
- using EVAPerf
- Command View EVA host wizard functionality
- Command View EVA storage system password requirements
- Adding physical disk drives in an EVA storage system
- Storage System Scripting Utility (SSSU) functionality
- FC-AL switch model functional characteristics
- baud rates for backend loop switch connections using Telnet
- management interfaces for Fibre Channel loop switches
- Fast Recovery Solution and Volume Shadow Services functionality
- Using the local replication feature, e.g., cache modes, three phase snapclones
- “snapclone replica resync” restrictions
Recommended training and study references

This section lists training courses and documents that can help you acquire a majority of the knowledge and skills needed to pass the exam. You must also gain the practical experience outlined in this guide.

You are not required to take the courses listed in this section. However, HP strongly recommends that you attend the classes, participate in class labs, and thoroughly review all course material and documents before taking the exam, even if you believe you have sufficient on-the-job experience.

Instructor-led Training

Use the information in this guide and the practical experience you have gained to determine your need for the instructor-led training.

<table>
<thead>
<tr>
<th>Title</th>
<th>Course Number</th>
<th>How to Enroll</th>
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<td>HP StorageWorks 4000/6000/8000 Series Enterprise Virtual Array Service and Support</td>
<td>23462</td>
<td>Americas: <a href="http://www.hp.com/go/training">www.hp.com/go/training</a></td>
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Web-based Training

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<td>Storage Technologies Web-based Training (WBT)</td>
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<td>HP StorageWorks Full-Line Technical WBT</td>
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<tr>
<td>Introduction to Storage Area Networks Computer Based Training (CBT)</td>
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<td>Storage Area Network Fundamentals</td>
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<tr>
<td>Compaq StorageWorks Virtualization Concepts WBT</td>
<td>6066</td>
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Sample Test Items

1. Which statements about switched and non-switched EVA5000 configurations are correct? Select TWO.
   
   A. Non-switched configurations use daisy-chained loops.
   B. Non-switched configurations use hubs on the host-side fabric.
   C. Non-switched configurations use hubs on the device-side loops.
   D. Switched configurations use two Fibre Channel loop switches on the four device side loops.
   E. Switched configurations use four Fibre Channel loop switches on the four device side loops.

2. The HSV2x0 controller's Operator Control Panel (OCP) display is turned off. What are possible causes? Select TWO.
   
   A. OCP LCD display is damaged.
   B. Controller entered the Passive Failover mode.
   C. OCP buttons have not been pressed for more than 1 hour.
   D. LUNs owned by this controller were not accessed for more than 1 hour.
   E. Controller is in standby mode.

3. What is best practice for data migration from an HSV1x0 to an HSV2x0-based array controller?
   
   A. coexistence of both EVAs in the same SAN
   B. CA-EVA license on both EVAs
   C. identical disk group size
   D. identical firmware versions

4. What does the sequence number in the Controller Event Log represent?
   
   A. timestamp entry
   B. order in which events occurred
   C. order in which events were logged
   D. order of severity, with the critical errors appearing first
5. Which alarm type causes the EMU audible alert to sound continuously?
   A. Critical
   B. Noncritical
   C. Unrecoverable
   D. Informational

6. Where are the cache batteries located on the HSV110 controller?
   A. in the battery shelf
   B. behind the Operator Control Panel
   C. below the controller shelf
   D. at the rear of the HSV controller

7. To avoid an unplanned outage on an EVA, do not disconnect an I/O module transceiver or fibre optic cable on ____.
   A. both loops at the same time
   B. a disk enclosure at any time
   C. loop C and D at the same time
   D. ports FP1 and FP2 at the same time

8. What do you start to display EVA performance metrics?
   A. EVAPerf GUI
   B. Windows Perfmon
   C. Internet Explorer
   D. SSSU

9. What is the default value for the disk failure protection level in a disk group created from Command View EVA?
   A. none
   B. single
   C. double
   D. 8
10. What do you check to ensure that the devices in the Fibre Channel arbitrated loop are operating at 2 Gb/s?

A. one of the loop switch system LEDs
B. loop switch port status LEDs
C. one of the EMU LEDs
D. Fibre Channel I/O module status LEDs

ANSWERS:

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Conclusion

HP wishes you success in the HP Certified Professional Program and in passing the exam for which you are preparing.