# Compaq Accredited Professional
## *Implementing SANworks Solutions, HP0-830*
### Exam Preparation Guide

## 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 the exam. In this guide, you will find recommended Compaq training courses, reference and study material, and sample test items to help you achieve a successful passing score.

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

## Audience

Examples of job roles:

- Selling Compaq SANworks Applications
- Support of Sales Specialists

General areas of content include installation and configuration of the following:

- Compaq SANworks Virtual Replicator
- Compaq SANworks Management Appliance
- Compaq SANworks Storage Resource Manger
- Compaq SANworks Enterprise Volume Manager
- Compaq SANworks Secure Path
- Compaq SANworks Data Replication Manager
- Compaq Open Systems Gateway

## Certification Requirements

The Implementing Compaq SANworks Solutions, HP0-830, exam is one of the core requirements to be certified as Master ASE, SAN Architect.

The Master ASE SAN Architect is a certification targeted at ASEs who design, deploy, configure and integrate SAN-based storage solutions for enterprise customers. Particular emphasis is placed on utilizing the SANworks solutions portfolio available from Compaq in conjunction with the Modular Array family of storage systems to solve customer business problems.

## Prerequisites:

Successful completion of "Compaq StorageWorks Full-Line Technical Training" and "Compaq SANworks and Solutions Full-Line Technical Training."

Successful completion of any one of the following courses:

- "Implementing HSx80 Storage Solutions on Windows and NetWare Platforms"

- "Implementing HSx80 Storage Solutions on OpenVMS Platforms"

- "Implementing HSx80 Storage Solutions on UNIX Platforms"

Students should be comfortable with the following before taking this class:

- Fibre Channel concepts including knowledge of Arbitrated-Loops, Switched Fabrics, and Fibre Channel hardware components

- Familiarity with a Windows-based server environment measured by comfort in navigating through Windows system management utilities

# Exam Details

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

The following are details about the exam:

- **Number of items:** 62

- **Item types:** Multiple Choice, Drag and Drop, Point and Click

- **Time commitment:** 75 minutes

- **Passing Score:** 66% (raw score of 41)

- **Reference Material:** No online or hard copy reference material will be allowed at the testing site.

## Exam Registration

The Compaq tests are delivered at Prometric Centers.

To register for the *Implementing SANworks Solutions* (Exam #HP0-830):

- Call :

  - NA - 800-366-EXAM (3926)

  - APD - 61-2-9414-3663

  - Latin America - 410-843-4300

  - Japan - 81-3-3269-9620

  - EMEA - 31-320-239-800 **OR**

- Register online at [Prometric Web Registration](#)

- Due to high call volume on Mondays, Prometric recommends scheduling test appointments on Tuesday through Friday.

▲ **Note**
Online registration cannot calculate discounted tests and is not available in all regions. To register for beta tests or to take advantage of discounts, you must register over the phone.

Have the following information ready when you register:

- Name

- Social security number, SSI number, or your assigned Compaq testing identification number [1]

- Compaq student or ASE ID number [2]

- Company or organization

- Mailing address (street, city, state, country, and ZIP)

- Test Series ID number — Implementing SANworks Solutions (Exam #HP0-830)

- Compaq Reseller ID number (if applicable)

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[1] If you cannot provide a social security number or SSI number, Prometric will assign a unique Compaq testing identification number to you. You are responsible for using this number in all future Prometric testing transactions.

[2] If the Student ID number is unknown or has never been assigned, please call Compaq Registration. In the U.S. call 800-732-5741, in Canada call 800-392-7024, or in Australia - 1300 305 014 or [mailto:AsiaPacificCAP@compaq.com](mailto:AsiaPacificCAP@compaq.com).

# Comments on the Exam and Survey

After the exam has been completed, there is additional 15 minutes allotted for the participant to make specific comments about the test or survey items (i.e., accuracy, appropriateness to audience, etc).  Compaq welcomes these comments as part of our continuous improvement process.

# Exam Content

The following outline represents the 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.  The approximate percentage of exam questions dedicated to each major content area is included in parenthesis.  The higher the percentage, the more questions will be on the exam.

### Implementing SANworks Solutions (HP0-830) Exam Content

| Module 1 | SANworks Application Suite |
|---|---|
| 1.1 | Explain the issues that must be considered during downtime. |
| 1.2 | Distinguish between disaster recovery and disaster tolerance. |
| 1.3 | Explain the principle of a point-in-time copy. |
| 1.4 | Define the terms snapshot and clone. |
| 1.5 | Explain how the SANworks applications supports disaster recovery, disaster tolerance, or SAN management. |
| **Module 2** | **SANworks Virtual Replicator** |
| 2.1 | Define the terms storage unit, storage pool, and virtual disk and explain how to create and manage each. |
| 2.2 | Define the term snapshot, describe its business value, and explain how to create and manage a Compaq SANworks Virtual Replicator snapshot. |
| 2.3 | Identify the business value of online volume growth and explain how it is implemented in a Windows 2000 environment. |
| 2.4 | Describe and identify the additional support provided by Virtual Replicator for clusters, SNMP, Performance Monitor, and Diskeeper. |
| 2.5 | Explain the relationship between Compaq SANworks Virtual Replicator works and other SANworks applications. |
| **Module 3** | **SANworks Enterprise Volume Manager - Concepts** |
| 3.1 | Identify the benefits and features of EVM. |
| 3.2 | Identify the replication methods used by EVM. |
| 3.3 | Distinguish between controller-based and host-based clone and snapshot operations. |
| 3.4 | Identify and describe the functions and characteristics of an EVM network: storage subsystem, EVM server, and EVM client. |
| 3.5 | Identify the steps required to create an EVM job. |
| 3.6 | Identify the rules for designing and running EVM jobs. |
| **Module 4** | **SANworks Enterprise Volume Manager - Planning and Installation** |
| 4.1 | Identify the operating systems supported by EVM server and agent software. |

| 4.2 | Identify and describe the configuration limitations of an EVM network. |
|---|---|
| 4.3 | Given a scenario, identify the following EVM network configurations: consolidated EVM and backup servers distributed EVM and backup servers, and clustered EVM configuration. |
| 4.4 | Identify the applications and software supported by EVM. |
| **Module 5** | **SANworks Secure Path** |
| 5.1 | Describe the purpose and benefits of Compaq SANworks Secure Path. |
| 5.2 | Explain the principle of Secure Path theory of operation. |
| 5.3 | Identify the software elements of Secure Path and explain how they work together to maintain path availability. |
| 5.4 | Explain how to configure Secure Path to support LUNs or paths, interpret path status, and explain how to distribute the load across paths. |
| **Module 6** | **SANworks Data Replication Manager - Concepts** |
| 6.1 | Describe the purpose of Data Replication Manager (DRM). |
| 6.2 | Identify the benefits of DRM. |
| 6.3 | Explain the principle of a remote copy set. |
| 6.4 | Using a graphic, distinguish between synchronous and asynchronous replication and identify the advantages and disadvantages of each mode. |
| 6.5 | Describe the procedure for managing replication I/O. |
| 6.6 | Describe what is meant by an association set. |
| 6.7 | Explain how log units and failure policies affect the behavior of an association set. |
| 6.8 | Identify how DRM operates in normal mode and explain the significance of write-history logging, mini-merge, and fast-failback. |
| 6.9 | Describe the functionality of failsafe mode. |
| **Module 7** | **SANworks Data Replication Manager - Installation and Configuration** |
| 7.1 | Identify and explain the steps required to plan for a Data Replication Manager (DRM) installation. |
| 7.2 | Describe DRM support for non-remote copy set LUNs, cloning and snapshots. |
| 7.3 | Explain how to configure HSG80 RAID Array Controllers to support DRM. |
| 7.4 | Given a scenario, distinguish between the DRM topologies: standard and firewall. |
| 7.5 | Identify and explain the correct power up and power down procedures for DRM configurations. |
| 7.6 | Explain how DRM handles planned and unplanned failures. |
| 7.7 | Using a scenario, distinguish between the failback procedures: simple, full failback, and full failback to new hardware. |
| **Module 8** | **SANworks Management Appliance** |
| 8.1 | Describe and explain the SANworks Management Appliance and the related software applications—Open SAN Manager, SANworks Resource Monitor, Storage Allocation Reporter, and HSG Element Manager. |
| 8.2 | Identify the hardware and software installation procedures for the Management Appliance. |
| 8.3 | Describe the purpose of the Appliance Manager. |
| 8.4 | Identify the benefits, monitoring, and notification methods of the SANworks Resource Monitor. |
| 8.5 | Identify the benefits of the SANworks Storage Allocation Reporter. |
| 8.6 | Identify the components and capabilities of SANworks HSG Element Manager. |
| **Module 9** | **SANworks Storage Resource Manager - Concepts** |
| 9.1 | Identify the SRM architecture and software components, state the function of each, and explain how they work together to manage storage resources. |

| 9.2 | Explain how SRM operates for the collection and display of managed resource information. |
|---|---|
| 9.3 | Describe the impact SRM has on system resources. |
| 9.4 | Define the SRM concepts; security, groups, filters, scans, report settings. |
| **Module 10** | **SANworks Storage Resource Manager - Installation and Configuration** |
| 10.1 | Identify the hardware and software that is supported by SANworks Storage Resource Manager (SRM) server and agent software. |
| 10.2 | Identify the function and configuration parameters for SRM user and service accounts. |
| 10.3 | Describe the use of plug-ins for monitoring NetWare servers, HSG80-based RAID systems, SAN switches, and SmartArray controllers. |

# 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, Compaq **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.

| Title | Course Number | How to Enroll |
|---|---|---|
| Implementing SANworks Solutions | 330 | http://www.compaq.com/training/330.html |

## Web-based Training

Self-paced training and technical documentation may provide appropriate learning alternatives to instructor-led training for more experienced candidates.

| Title | Course Number | How to Order/Obtain |
|-------|---------------|---------------------|
| N/A   |               |                     |

## Documentation

| Title | Section Title | Source/Order Number |
|-------|---------------|---------------------|
| DRM Operations Guides | | http://www.compaq.com/products/sanworks/drm/documentation.html#og |
| EVM Installation Guides | | http://www.compaq.com/products/sanworks/evm/documentation.html#install |
| VR Technical Guides | | http://www.compaq.com/products/sanworks/vr/documentation.html |

## Other Reference Material

| Title | Order Number | Source |
|-------|--------------|--------|
| N/A   |              |        |

# Sample Test Items

The sample test items give you a preview of what the actual test items will look like.  It is important to note that these items WILL NOT be on the exam itself. However, they are representative of the actual items, and they should help you become familiar you with the format and complexity of the test items.  These sample test items are not a check for readiness.

1. Disaster recovery techniques _____.  (Choose two.)
   A.   restore data after a disaster
   B.   minimize downtime after a disaster
   C.   are processes for surviving a disaster
   D.   attempt to keep systems operational after a disaster

2. Which SANworks Management Appliance application provides installation services?
   A.   Network View
   B.   Resource Monitor
   C.   Open SAN Manager

        D.    HSG Element Manager

3. What is the maximum size of a SANworks Virtual Replicator storage pool?
   - A.    6 TB
   - B.    8 TB
   - C.    10 TB
   - D.    12 TB

4. A SANworks Virtual Replicator virtual disk _____.
   - A.    can be part of a volume set
   - B.    can be used as a system disk
   - C.    must contain a single partition
   - D.    must be formatted as a FAT partition

5. Which business value does the SANworks Virtual Replicator snapshot provide?
   - A.    small virtual volumes
   - B.    continuous backup of data
   - C.    non-disruptive data backup
   - D.    automatic quiesce of an application

6. What is necessary for growing a basic disk using SANworks Virtual Replicator?
   - A.    Space must be FAT formatted.
   - B.    There must be adjacent space on the disk.
   - C.    Unused space must be equal to used space.
   - D.    A new storage unit must be added to basic disk.

7. Which two are automatically installed with SANworks Virtual Replicator? (Choose two.)
   - A.    MIB
   - B.    CIM
   - C.    ACU
   - D.    SCE agent
   - E.    DHCP agent
   - F.    SNMP agent

8. EVM snapshot and clone creation is performed by _____, which runs the storage subsystem.
   - A.    MIB
   - B.    ACS
   - C.    ACU
   - D.    MMC

9. EVM snapshots are supported in _____ environments only.
   - A.    SCSI hub
   - B.    fabric switch
   - C.    arbitrated loop hub
   - D.    switch port using quick loop

10. EVM uses _____ clone and snapshot operations.
   - A.    host-based
   - B.    client-based

    C.    agent-based

    D.    controller-based

11. What is a limitation of controller-based snapshots?
    A.    Each unit is allowed two snapshots.
    B.    Only 12 snapshots are allowed per controller pair.
    C.    A snapshot and the source unit must be on opposite controllers.
    D.    A snapshot and the source unit must be in the same unit number range.

12. How many StorageWorks subsystems can an EVM network have?
    A.    5
    B.    15
    C.    25
    D.    35

13. Which three are supported EVM configurations? (Choose three.)
    A.    Sun Solaris 7 or 8
    B.    Windows 2000 Professional
    C.    Windows 2000 Server or Advanced Server
    D.    Windows NT 4.0 Workstation - SP5 or later
    E.    Windows NT Server or Advanced Server - SP5 or later

14. What does Secure Path provide?
    A.    network file sharing
    B.    storage virtualization
    C.    multiple paths from host to storage for high availability
    D.    encryption of the Fibre Channel path to the disk subsystem

15. DRM is a disaster-tolerant storage solution that guarantees _____. (Choose two.)
    A.    data integrity
    B.    zero data loss
    C.    recovery from site failure
    D.    seamless application integration

16. Which statement about DRM is true?
    A.    Every remote copy set must have a unique log unit.
    B.    There are no limits to the number of remote copy sets.
    C.    All of the remote copy sets in an association set must reside on the same controller pair.
    D.    All of the remote copy sets in an association set must be configured for synchronous data replication.

17. What does the HSG command `SHOW REMOTE FULL` indicate?
    A.    that the remote copy set is past its capacity
    B.    remote copy set information only on the target storage subsystem
    C.    remote copy set information only on the initiator storage subsystem
    D.    the percentage of normalization completed between the initiator and the target remote copy sets

18. What is the maximum number of remote copy sets in a DRM association set?
    A.  1
    B.  5
    C.  12
    D.  20

19. Which CLI command places the HSG controller in DRM mode at SITEA?
    A.  `ENABLE DRM=SITEA`
    B.  `ENABLE REMOTE_COPY=SITEA`
    C.  `SET THIS_CONTROLLER DRM=SITEA`
    D.  `SET THIS_CONTROLLER REMOTE_COPY=SITEA`

20. What is the maximum distance between 2 HSG storage units in the DRM firewall configuration?
    A.  200m
    B.  500m
    C.  1000m
    D.  10000m

21. In an unplanned DRM failure, what is required to do a mini-merge on the failback?
    A.  a log file
    B.  a write-history file
    C.  an association set for the unit
    D.  an association set with a log file for the unit

22. What is the primary program used by the Management Appliance to install applications?
    A.  Resource Monitor
    B.  User Defined Links
    C.  Appliance Manager
    D.  Open SAN Manager
    E.  HSG Element Manager

23. Which Management Appliance software application identifies the amount of storage and quality of service reserved for customers in a SAN environment on a per gigabyte per day basis?
    A.  Resource Monitor
    B.  Appliance Manager
    C.  HSG Element Manager
    D.  Storage Allocation Reporter

24. What is the minimum amount of memory required for Compaq SRM server?
    A.  64 MB
    B.  96 MB
    C.  128 MB
    D.  256 MB

Answers:

| | | |
|---|---|---|
| 1. A, B | 9. B | 17. D |
| 2. C | 10. D | 18. C |
| 3. B | 11. D | 19. D |
| 4. C | 12. C | 20. B |
| 5. C | 13. A, C, E | 21. D |
| 6. B | 14. C | 22. D |
| 7. A, F | 15. A, C | 23. D |
| 8. B | 16. C | 24. C |

# Conclusion

HP wishes you success in the Compaq Accredited Professional Program and in passing the exam for which you are preparing. This exam and certification provide clear and undeniable evidence of your level of skills on HP systems and solutions and demonstrates your readiness to assume a greater technical role in support of these HP systems and solutions.