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 HP training courses, reference and study material to assist you in preparing for the exam.

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

General areas of content include:

- Clustering Concepts
- Hardware Planning
- Compaq ProLiant Cluster Solutions for NetWare 6
- Shared Storage Systems for Novell Cluster Services
- Network Configuration
- Novell Cluster Services
- Cluster Monitoring and Management
- Application Deployment
- Cluster Maintenance and Troubleshooting
- Configuring the Shared Storage System
- Installing SANworks Secure Path by Compaq Without Clustering
- Installing Novell Cluster Services
- Using ConsoleOne to Manage Novell Cluster Services
- Configuring NSS Shared Storage
- Creating Cluster-Enabled Volumes
Certification Requirements

This Implementing Compaq ProLiant Cluster Solutions for NetWare 6 exam #HP0-876 is one of the core requirements to be certified as Master ASE for High Availability and Clustering.

Prerequisites

The following requirements are prerequisites for the Master ASE for High Availability and Clustering:

- HP Accredited Systems Engineer for NetWare or equivalent experience
- Compaq Entry Level SAN Solutions

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:** 50
- **Item types:** Multiple choice
- **Time commitment:** 60 minutes
- **Passing Score:** 84
- **Reference Material:** No on-line or hard copy reference material will be allowed at the testing site.

Exam Registration

This exam is available at [Prometric](http://www.prometric.com).
This exam is available at [Promissor](http://www.promissor.com).
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.

<table>
<thead>
<tr>
<th>Title</th>
<th>Course Number</th>
<th>How to Enroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster Services for NetWare</td>
<td></td>
<td><a href="http://www.novell.com/">http://www.novell.com/</a></td>
</tr>
<tr>
<td>Compaq Entry Level SAN Solutions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Web-Based Training

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

<table>
<thead>
<tr>
<th>Title</th>
<th>Course Number</th>
<th>How to Order/Obtain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compaq High Availability Full Line Technical WBT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compaq StorageWorks Full Line Technical WBT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other Reference Material

<table>
<thead>
<tr>
<th>Title</th>
<th>Part Number</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compaq ProLiant Cluster for NetWare 6 with MA8000/EMA1200 0 Storage Subsystem</td>
<td>252350-001</td>
<td><a href="http://www.compaq.com/support/techpubs/qr">http://www.compaq.com/support/techpubs/qr</a> g/index.html</td>
</tr>
</tbody>
</table>

Exam Objectives

This section provides the exam objectives that will be represented on the exam. Use this information to guide your study and to check your readiness for the exam. 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.

Clustering Concepts (9%)

- Discuss the need for availability and how it affects client/server applications.
- Given specific company needs, identify the appropriate availability level required.
- Describe how clustering fits within Intelligent Fault Resilience to help achieve high availability.
- Define the characteristics of clusters, the two critical application classes, and the three cluster models.
- List the advantages of clustering.
- Describe factors involved in choosing a high-availability solution.
- Describe the cluster solutions available from Compaq.

**Hardware Planning (8.2%)**
- Plan hardware requirements for Novell Cluster Services (NCS).
- Plan NCS intracluster connections.
- Plan an NCS cluster backup and restore strategy.

**Compaq ProLiant Cluster Solutions for NetWare 6 (13.1%)**
- Describe an overview of Compaq ProLiant Cluster Solutions for NetWare hardware components.
- Describe the Compaq ProLiant DL380 Generation 2 (G2) Packaged Cluster Solution for NetWare.
- Describe the high-availability Fibre Channel solutions for NetWare.
- Identify Compaq ProLiant Cluster Solutions for NetWare software components.

**Shared Storage Systems for Novell Cluster Services (12.3%)**
- Describe how shared storage is used with NCS.
- Describe configuration utilities and processes used to configure Fibre Channel storage components.
- Describe how to configure the ProLiant DL380 G2 Packaged Cluster.
- Plan, identify, and describe how to eliminate shared storage single points of failure.

**Network Configuration (3.3%)**
- Identify supported network interface adapters.
- Describe the methods used to maintain high availability in network subsystems.
- List supported transport protocols.
- Explain the effect of failover on network I/O bandwidth.

**Novell Cluster Services (13.9%)**
- Describe NCS.
List components and define the functions of the eDirectory Cluster Schema.

Identify the hardware and software requirements and the major steps required to install or upgrade NCS.

List and define the functions of the cluster system architecture and NCS Loadable Modules (NLMs).

Identify NetWare 6 client configuration parameters for NCS.

Cluster Monitoring and Management (4.9%)
- Describe how to monitor NCS using utilities from Compaq and Novell.
- Describe how to manage NCS using utilities from Novell.
- Describe tuning techniques for improved cluster performance.

Application Deployment (2.5%)
- Describe how cluster-aware and non-cluster-aware applications communicate with NCS.
- Explain what happens to directly connected devices in a clustered environment.

Cluster Maintenance and Troubleshooting (8.2%)
- Describe how to add and troubleshoot shared storage to an NCS cluster.
- Describe how to replace a cluster node.
- List and describe the troubleshooting tools included with NetWare for use with NCS.
- Describe the troubleshooting tools available from Compaq for use with NCS.

Configuring the Shared Storage System (3.3%)
- Configure the shared storage subsystem with appropriate RAID levels.
- Establish disk partitions used for cluster resources.

Installing Compaq SANworks Secure Path Without Clustering (1.6%)
- Create redundant Fibre Channel I/O links.
- Describe the raw multipath driver functionality to using SANworks Secure Path for Netware by Compaq.

Installing Novell Cluster Services (4.9%)
- Install NCS 1.6.
Using ConsoleOne to Manage NCS (4.1%)
- Use ConsoleOne views to manage NCS.
- Configure cluster properties using ConsoleOne.
- View the Split-Brain Detection Process.

Configuring NSS Shared Storage (2.5%)
- Create shared disk partitions.
- Create Novell Storage Services (NSS) pools.
- Create NSS volumes.

Creating Cluster-Enabled Volumes (2.5%)
- Create cluster-enabled volumes.
- Verify cluster operation.

Establishing Storage Data Path Redundancy with SANworks Secure Path (1.6%)
- Create redundant Fibre Channel I/O links.
- Use Secure Path to manage data paths within a clustered environment.

Changing a Cluster’s Master IP Address (0.8%)
- Change the Master IP address of an NCS cluster.

Configuring the Compaq StorageWorks RA4x00 Storage Array (1.6%)
- Configure the RAID Array (RA) 4000/RA4100 storage subsystem.

Configuring the Compaq StorageWorks MA8000/EMA12000 Storage Array (1.6%)
- Configure HSG80 controller parameters and the Modular Array (MA) 8000 storage array.
Sample Exam Items

The sample items included in this section represent the types of questions you will encounter on the actual exam. This sample set of test items does not reflect every objective that is tested on the exam. Together with the exam objectives listed previously, these questions will help you determine your readiness to take the exam.

After answering these questions, check your responses using the answer key at the end of this section.

Important

These questions are not found in the current exam. However, if you can answer these questions, have in-depth understanding of the material covered in the Implementing Compaq ProLiant Cluster Solutions on NetWare 6 course, and have completed the lab exercises, you will be better prepared to achieve a passing score.

Module 1 — Clustering Concepts

1. What is a cluster node?
   a. A server that is a member of a cluster
   b. A cluster client
   c. A group of servers
   d. The master server in a cluster

   Answer: a (Page 1-8)

2. What is a benefit of software load balancing?
   a. Easier to manage than hardware load balancing
   b. No processor load on the application server farms
   c. Scalability
   d. Low cost

   Answer: d (Page 1-13)

Module 2 — Hardware Planning

1. What should you add to increase availability for resources and data?
   a. Logical drives
   b. Shared storage
   c. Host bus adapters
   d. RAID technology
Answer: b (Page 2-6)

3. Which RAID level yields a lower performance than other RAID levels?
   a. 4
   b. 1
   c. 1 + 0
   d. ADG

Answer: d (Page 2-10)

Module 3 — Compaq ProLiant Cluster Solutions for NetWare 6

1. Which utility is used to troubleshoot Compaq cluster solutions?
   a. ConsoleOne
   b. Remote Manager
   c. Fibre Channel Fault Isolation Utility
   d. StorageWorks Command Console

Answer: c (Page 3-5)

4. What should you use to expand storage capacity for multinode ProLiant HA/N100 or HA/N200 clusters to nine storage boxes?
   a. A Fibre Channel switch connected to one host bus adapter (HBA) in each node
   b. Optional StorageWorks FC-AL Switch 3-port Expansion Module in place of the 12-port hub
   c. Smart Array Cluster Storage enclosure with SCSI shared storage
   d. An external Very High Density Cable Interconnect (VHDCI) connected to the Smart Array Cluster Storage controller through a SCSI cable
   e. Smart Array 5i (SA-5i) controller in each node

Answer: b (Page 3-13)

Module 4 — Shared Storage Systems for Novell Cluster Services

1. What is the maximum number of nodes supported by ProLiant Cluster Solutions for NetWare?
   a. 4
   b. 12
   c. 24
   d. 32

Answer: b (Page 4-2)
5. If a host continues to run after it loses its host connection, in which component could the problem be located?
   a. I/O path
   b. Cluster member
   c. Network connection
   d. Secure Path Manager

   Answer: c (Page 4-15)

Module 5 — Network Configuration

1. Which devices does the private interconnect use to join cluster nodes?
   a. Ethernet hub
   b. Array controller
   c. Host bus adapter
   d. Fibre Channel switch

   Answer: a (Page 5-9)

6. Which component provides automatic redundancy for the network controller by creating a team of NICs?
   a. Network fault tolerance
   b. Adaptive load balancing
   c. Network adapter teaming
   d. Switch-assisted load balancing

   Answer: a (Page 5-4)

Module 6 — Novell Cluster Services

1. Which component maintains cluster status information?
   a. Master node
   b. Cluster heartbeat statistics
   c. Cluster resource
   d. Resource partition

   Answer: a (Page 6-5)

7. NetWare Cluster Services 1.6 provides resource templates for:
   a. Mail server
   b. HTTP Server
   c. DHCP Server
d. Virtual NetWare Core Protocol server

*Answer: c (Page 6-18)*

**Module 7 — Clustering Monitoring and Management**

1. Compaq Insight Manager 7 provides system management for the following, **except:**
   a. Clients
   b. Servers
   c. Storage
   d. Workstations

*Answer: c (Page 7-3)*

8. What should you do before servicing a degrading cluster?
   a. Back up the failed cluster node.
   b. Take the failed server offline and repair the problem immediately.
   c. Shut down and power off all servers in the cluster.
   d. Fail over all resources and applications to another node.

*Answer: d (Page 7-18)*

**Module 8 — Application Deployment**

1. Why is it a good idea to configure DHCP with NCS?
   a. To take advantage of shared storage and to achieve high availability
   b. To take advantage of the cluster software application programming interfaces (APIs)
   c. To run separate instances of a database on multiple nodes in a symmetric configuration with shared logical volumes
   d. To ensure that the IP address range required by users to connect to the network is highly available

*Answer: d (Page 8-3)*

9. What degree of stress does an application server place on the network?
   a. Low
   b. Medium
   c. High
   d. Very high

*Answer: b (Page 8-8)*
Module 9 — Cluster Maintenance and Troubleshooting

1. Which tool should you use to add disks to a MA8000 configuration?
   a. ConsoleOne
   b. Run Config utility
   c. Command line interface
   d. Array configuration utility

   Answer: b (Page 9-4)

10. When troubleshooting the network using Secure Path, what should you consider? (Select all that apply.)
    a. Clients
    b. Servers
    c. Agents
    d. Switches
    e. Network connections

   Answer: a, c (Page 9-25, 26)

Answer Key

Module 1 — Clustering Concepts

1. a
2. d

Module 2 — Hardware Planning

1. b
2. d

Module 3 — Compaq ProLiant Cluster Solutions for NetWare 6

1. c
2. b

Module 4 — Shared Storage Systems for Novell Cluster Services

1. b
2. c

Module 5 — Network Configuration

1. a
2.  a

Module 6 — Novell Cluster Services
1.  a
2.  c

Module 7 — Clustering Monitoring and Management
1.  c
2.  d

Module 8 — Application Deployment
1.  d
2.  b

Module 9 — Cluster Maintenance and Troubleshooting
1.  b
2.  a, c

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

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