Purpose of the Exam Preparation Guide

The intent of this guide is to set expectations about the content and the context of the exam and to help you prepare for the exam. In this guide, you will find references to resources that will 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.

Intended Audience for the Exam

The Integrating Oracle9i with HP Platforms-Linux exam, HP1-851 is intended for technical audiences with four or more years of industry experience. Examples of job roles include:

- HP partner presales technical solutions architects and consultants
- HP partner implementation engineers
- Customer IT staff
- Field technical presales
- Customer services personnel
- Compaq technical instructors

Certification Requirements

The Integrating Oracle9i with HP Platforms-Linux exam is one of the core requirements to be certified as an Accredited Systems Engineer (ASE) or as Accredited Integration Specialist (AIS).
Exam Content Overview

General areas of content include:

- Relational Database Fundamentals WBT
- Oracle9i Architecture
- Platform Planning: Processors, Memory, and Network
- Platform Planning: Disk
- Operating System Monitoring and Tuning for Red Hat Linux Advanced Server 2.1
- Introduction to Oracle9i Monitoring and Tuning
- Wait Event-Based Tuning Using StatsPack
- Troubleshooting

Exam Registration

- Register online at www.2test.com
- Locate local testing sites at www.Prometric.com
Exam Details

This Integrating Oracle9i with HP Platforms-Linux HP1-851 is a beta exam. This means that you will see all the questions in the exam pool. During the final “live” exam, you will see only those items that remain after the beta test.

You will receive a score report with your results after beta testing is complete. If you do not pass the beta, you can use the report to identify areas of strength and learn about areas to improve upon for the live exam.

Please allow 2 to 3 months, after you have taken the beta exam, to receive your score report. If the beta is extended beyond 6 weeks, you will receive your score report after the beta is closed.

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 define the final exam forms and set the passing score. Your honest responses will assist the exam team in properly tailoring this exam to the appropriate audience.

- **Number of items:** 192
- **Item types:** multiple choice, exhibits
- **Time commitment:** 4 hours
- **Reference Material:** No on-line or hard copy reference material will be allowed at the testing site.

Comments on the Exam:

During the exam, you will be able 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.
Exam Objectives

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

Relational Database Fundamentals WBT (Self-Study Prerequisite)

- Describe how a relational database management system (RDBMS) stores and retrieves data.
- Discuss how to access data stored in the database.
- Explain the aspects of an RDBMS that enable its high-performance capabilities—indexing, hashing, caching, query optimization, and data clustering.
- Identify various aspects of security and data protection.
- Explain database concurrency and list concurrency control mechanisms.
- List the properties of a database that ensure data integrity.
- Define two primary database environments: OLTP and data warehousing.
- Describe each database environment, and list and explain their:
  - Predominant activities
  - Characteristics
  - Tuning goals

Module 1: Oracle9i Architecture

- Describe the Oracle9i architecture.
- List the Oracle9i database files and define their purpose.
- Explain the purpose of the system global area and identify its components.
- List background processes and explain their function.
- Compare server process modes used with Oracle9i.
Module 2: Platform Planning: Processors, Memory, and Network

- Describe processor-planning concepts: different types of transaction execution.
- Describe processor-planning concepts: database environment impact on processor planning.
- Describe processor-planning concepts: processor performance analysis.
- Explain memory-planning competencies: when to size memory.
- Explain memory-planning competencies: initial memory recommendations.
- Explain memory-planning competencies: operating system, third-party applications, and Oracle memory requirements.
- Describe network planning.

Module 3: Platform Planning: Disk

- Explain how the application I/O workload affects disk subsystem planning.
- Describe RAID and disk caching and their impact on disk performance.
- Provide an overview of storage subsystem performance planning.
- Explain what is involved in individual storage subsystem component performance planning.
- Describe how the different planning and performance monitors are used.
- Describe techniques that improve performance at the logical disk design level.

Module 5b: Operating System Monitoring and Tuning for Red Hat Linux Advanced Server 2.1

- Define semaphores and describe how they are tuned in Linux.
- Demonstrate how to tune shared memory in Linux.
- Explain how to set file limits and set process limits.
- Explain how to enable asynchronous I/O support.
- Identify the tuning tools used to monitor the operating system.
- Describe the most relevant operating system counters used to tune the operating system.
Module 7: Introduction to Oracle9i Monitoring and Tuning

- Explain how to monitor and tune Oracle9i memory structures.
- Describe how to monitor and tune Oracle9i instance recovery and I/O.
- List and describe StatsPack and Oracle Enterprise Manager Diagnostics Pack.

Module 8: Wait Event-Based Tuning Using StatsPack

- Outline and discuss the tuning process.
- Discuss the system performance and the focus of performance tuning.
- Define a bottleneck and explain what system components are likely to become bottlenecks.
- Differentiate between system snapshot tools and time span tools.
- Explain typical observations from collected data.
- Contrast ratio-based tuning with wait event-based tuning.
- Describe Oracle wait events.
- Describe BSTAT/ESTAT and StatsPack.
- Explain StatsPack installation, usage, and reporting.

Troubleshooting:

Demonstrate competencies learned in the hands-on labs.
Recommended Training and Study References

This section lists training courses, resources, 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 the 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.

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**Important**

HP does not guarantee or represent that all items on the exam are taken from the instructor-led course or course materials. Some items require understanding of several interrelated topics to answer correctly. Other items rely on assumed industry experience and prerequisites as identified in this exam preparation guide. Some items are referenced in materials other than course materials, as indicated in this document.

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**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 #</th>
<th>Enrollment Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrating Oracle9i with Compaq Platforms</td>
<td>Oracle9i Integration with HP Platforms - Linux</td>
<td>Refer to the certification requirements website for your region for course registration information.</td>
</tr>
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</table>

The following materials included with the instructor-led training course will help you prepare for the exam:

- Student guide
- Lab guide
- Lab scripts (included on the course Companion CD-ROM)
- Related articles (included on the course Companion CD-ROM)
Prerequisites

The following list of prerequisites or equivalent knowledge is highly recommended to complete the course and successfully pass the certification exam.


Web-Based Training

The Relational Database Fundamentals WBT or equivalent knowledge is required for this course.

HP Documentation

- Articles included on the course Companion CD-ROM
- Documentation available with products, tools and utilities discussed in the course

Other Reference Material

- Articles included on the course Companion CD-ROM
- Oracle9i Enterprise Edition documentation, available from Oracle Corporation
Sample Exam Item Types

The items in this section are intended to help you understand the various types of items you will see during the exams. These items are not intended to be used as a measurement of your ability to pass the exam.

Sample Item 1: Single-Answer Multiple Choice

What is another name for the system catalog?

a. Data dictionary
b. Bitmap index
c. Page header
d. Data cluster

Answer: a

Sample Item 2: Multiple-Answer Multiple Choice

Which two instance architecture features are associated with an Oracle instance running in the Linux environment? (Choose two.)

a. Single process per instance
b. Multiple threads per instance
c. Single thread per instance
d. Multiple processes per instance
e. Dedicated memory per instance
f. Shared memory per instance

Answer: d and f
Sample Exam Questions

This set of sample exam questions will help you become familiar with the types of questions on the exam. Because the questions do not cover every test objective, they are not intended to test your readiness for the exam.

None of these questions is contained on the actual exam. The actual exam questions could be more or less difficult than this set of questions.

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

1. How is Very Large Memory (VLM) implemented in Red Hat Linux Advanced Server 2.1?
   a. By using 36-bit non-paged addressing
   b. By using address-windowing extensions (AWE)
   c. By using 32-bit paged addressing
   d. By using Intel physical address extensions (PAE)

2. Which step is required to enable Very Large Memory (VLM) within Linux?
   a. Mount a shared memory file system by executing the command ‘mount –t shm shmfs –o nr_blocks=x /dev/shm’, where x equals the number of nr_blocks required.
   b. Mount a shared memory file system by executing the ‘mount –t shm shmfs –o nr_blocks=x /proc/$pid/shm’ command, where x equals the number of nr_blocks required.
   c. Enable address-windowing extension (AWE) support by adding the /pae parameter to the boot.ini file.
   d. Increase the value of the db_block_buffers initialization parameter.
   e. Set the parameter ‘use_indirect_data_buffers=true’ within the init.ora file.
   f. Set the parameter ‘use_direct_data_buffers=true’ within the start.ora file.

3. What is required to take advantage of the larger memory size of Very Large Memory (VLM) support within Red Hat Linux Advanced Server 2.1?
   a. 64GB physical memory
   b. 32GB physical memory
   c. An in-memory file system mounted by the root user on /dev/shm equal to or larger than the amount of memory that will be used for the database buffer cache
   d. An in-memory file system mounted by the root user on /dev/shm smaller than or equal to the amount of memory that will be used for the database buffer cache
4. What are the characteristics of the Linux operating system environment?
   a. Single-process, multithreaded environment
   b. Multiprocess, shared-memory environment
   c. Single-threaded, single-process environment
   d. Multithreaded, multiprocess environment
   e. Multithreaded, dedicated-memory environment

5. What step is required within Oracle9i to take advantage of the shared memory file system, which enables Very Large Memory support?
   a. Mount a shared memory file system by executing the command `mount -t shm shmfs -o nr_blocks=x /proc/$pid/shm`, where `x` equals the number of nr_blocks required.
   b. Mount a shared memory file system by executing the command `mount -t shm shmfs -o nr_blocks=x /dev/shm`, where `x` equals the number of nr_blocks required.
   c. Enable address-windowing extension support by adding the `/pae` parameter to the boot.ini file.
   d. Increase the value of the `db_block_buffers` initialization parameter.
   e. Set the parameter `use_indirect_data_buffers=true` within the init.ora file.
   f. Set the parameter `use_direct_data_buffers=true` within the start.ora file.

6. Which statement correctly describes the process for lowering the memory-mapped base?
   a. Lowering the memory-mapped base involves increasing from two-level page tables to three-level page tables to increase the memory that is addressable by the Linux kernel.
   b. Lowering the memory-mapped base means increasing from a two-page table system used to address memory to a three-page table system to increase the amount of memory available to Oracle processes.
   c. To lower the memory-mapped base, you must reset the base memory address at which the enterprise Linux kernel can begin to acquire memory.
   d. To lower the memory-mapped base, you must reset the base memory address at which Oracle processes can begin to acquire memory.
   e. To lower the memory-mapped base, you must reset the base memory address at which the default Linux kernel can begin to acquire memory.
7. What is the maximum amount of memory that Very Large Memory supports without modification to the Red Hat Linux Advanced Server 2.1 enterprise kernel?
   a. 32GB
   b. 36GB
   c. 48GB
   d. 64GB
   e. 128GB

8. What swap space size does Oracle recommend allocating for a Linux environment?
   a. Half the size of physical memory or 1GB, whichever is greater
   b. Half the size of physical memory or 2GB, whichever is greater
   c. The same size as physical memory or 1GB, whichever is greater
   d. The same size as physical memory or 2GB, whichever is greater
   e. Half the size of physical memory or 1GB, whichever is less
   f. The same size as physical memory or 2GB, whichever is less

9. What is the greatest advantage of the raw file system used with Linux?
   a. Increased security
   b. Improved I/O performance
   c. Easy management
   d. Formatted disk partitions
   e. Compatibility with the FAT file system

10. If the value of SEMMNI times SEMMSL exceeds the value of SEMMNS, which value controls the maximum number of semaphores used?
    a. The value of SEMMNS
    b. The value of SEMMSL
    c. The value of SEMMNI
    d. The value of SEMMAX
11. Which kernel parameter controls the maximum number of shared memory segments allowed to exist on a system?
   a. SEMMAX
   b. SEMMNI
   c. SHMALL
   d. SHMMAX
   e. SHMMNI

12. Which command can be used to set the file handle limit and process limit parameters?
   a. make
   b. mount
   c. set
   d. ulimit

13. What is the minimum recommended process limit parameter setting?
   a. 16384
   b. 32768
   c. 65536
   d. 196608

14. Which feature is disabled by default within Oracle9i?
   a. FAT file systems
   b. Raw device support
   c. Asynchronous I/O support
   d. Shared memory support

15. Which equivalent sar flag can be used instead of specifying the `-bBcdqruvwWy -I SUM -I PROC -n FULL -U ALL` flags to receive the same information?
   a. -o
   b. -ALL
   c. -A
   d. -FUL
16. Which utility is used to obtain processor activity in real time?
   a. Iostat
   b. Sar
   c. Top
   d. Vmstat

17. Which program is used to obtain disk statistics?
   a. Top
   b. SHMMNI
   c. Vmstat
   d. Iostat

18. When monitoring a system using vmstat, which key statistic should be used to diagnose a system suspected of lacking sufficient physical memory?
   a. CPU system time
   b. CPU idle time
   c. Disk statistics
   d. CPU user time
   e. Memory statistics

19. What is one of the most relevant performance counters for tuning the processor system on Linux for Oracle9i?
   a. %idle
   b. breads/s
   c. bwrtn/s
   d. pswpin/s

20. Where is the maximum I/O size setting for Linux located?
   a. In the /usr/src/linux/etc/linux/iobuf.h file as the KIO_MAX_IO value
   b. In the /usr/src/linux/include/linux/iobuf.h file as the KIO_MAX_ATOMIC_IO value
   c. In the proc/sys/kernel/sem/etc/io.c file as the KIO_MAX_ATOMIC_IO value
   d. In the proc/sys/kernel/etc/io.c file as the MAX_IO value

21. In Linux, what script must be run to install StatsPack?
   a. Spcreate.sql
   b. Spinstall.sql
   c. Spsetup.sql
   d. Spuntar.sql
Conclusion

HP wishes you success in the HP Certified Professional program and in passing the exam for which you are preparing.
Appendix A: Answers to Sample Exam Questions

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