

Oracle8i Appliance

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INTRODUCTION

With the proliferation of databases in nearly all corporations around the world, there is an increasing need to deploy database solutions quickly and easily on an operating system.

Typically, configuring and administering a database and operating system are complicated tasks requiring the services of database administrators (DBAs) and systems administrators with expert knowledge. Acquiring such services is difficult due to a shortage of trained DBAs. In addition, many small-to-medium-sized businesses cannot afford DBA expertise. Employing an experienced systems administrator is an additional expense and may not seem practical because many operating system features are not required for the database to run.

Thus, the need exists to provide an easily deployable, centrally manageable, and low-cost Oracle8i database solution for businesses with limited database or operating system administration expertise.

This paper targets small-to-large-sized businesses, workgroups, Lines of Business, branch offices, and Internet Service Providers that:

- Want a complete, ready-to-run, low-cost server platform that provides a dedicated solution to database management.
- Do not have database administration expertise within their workgroup and prefer a service provider to assume DBA responsibilities from a single, remote, centralized location.
- Want to deploy several database servers across their organization (possibly over a wide geographical area) and centrally manage the servers.
- Do not want to purchase and maintain a general-purpose operating system (such as Windows NT) that includes many features not required for an Oracle8i database to run.

Oracle8i Appliance offers a preconfigured, ready-to-run Oracle8i platform, a low total cost of ownership, remote administration capabilities from an integrated management console, and reliable, secure operations.

THE SOLUTION: ORACLE8i APPLIANCE

Oracle8i Appliance is the solution for these businesses. It is an integrated database appliance that simplifies the deployment of dedicated applications in hosted service or enterprise environments.

Oracle8i Appliance is shipped fully integrated with the following components:

- An Oracle8i database server that is preinstalled, preconfigured, and pretuned.
- A seamlessly integrated, slimmed-down operating system with a limited user interface. The operating system is dedicated to the Oracle8i database only, and not to maintaining additional applications.
- A standard hardware platform that has been optimally configured to run the Oracle8i database. The platform requires no additional peripherals and controllers (such as printers and sound cards) that are typically included with a general-purpose operating system.
- One or more Redundant Array of Independent Disks (RAID) subsystems.
- Oracle Enterprise Manager Console, a centralized management location from which remote database and operating system administration are performed.
- Oracle8i Appliance Console, which enables you to locally perform a limited set of administration tasks. This character-based console appears on the monitor attached to the Oracle8i Appliance.
- Oracle WebDB and Oracle JServer (included with the appliance), which enable Web-based and Java applications to run and be hosted from within the database.
- Oracle *inter*Media, which enables storage of multimedia data in the database.
- Additional third-party products—for example, Legato NetWorker Client, which enables network-based backup of the Oracle8i Appliance.

Appliance Computing: The New Technology Wave

Oracle8i Appliance is part of a growing trend in the computer industry to treat products as “appliances” that can be easily “plugged in” and can operate without requiring complex configuration or administration procedures.

Appliances run with slimmed-down software, making them simpler, faster, more accessible, and more reliable than traditional general-purpose products using a large-scale operating system such as Windows NT. This is the case with Oracle8i Appliance, which packages an Oracle8i database with a seamlessly integrated, slimmed-down operating system and an optimally configured hardware platform.

Because the Oracle8i Appliance is fully preconfigured and dedicated to just running the Oracle8i database, it can be thoroughly tested and tuned. This is in direct contrast to servers running general-purpose operating systems because of the uncertainty in their configuration and intended use.

Appliances are dedicated to performing a single job, making them easier to upgrade or replace without interfering with other services. With Oracle8i Appliance, the slimmed-down operating system kernel is totally dedicated to the Oracle8i database. In addition, nearly all access to operating system interfaces is disabled, thus ensuring better security and reliability.

For all of these reasons, system reliability and end-user performance are improved and costs are reduced.

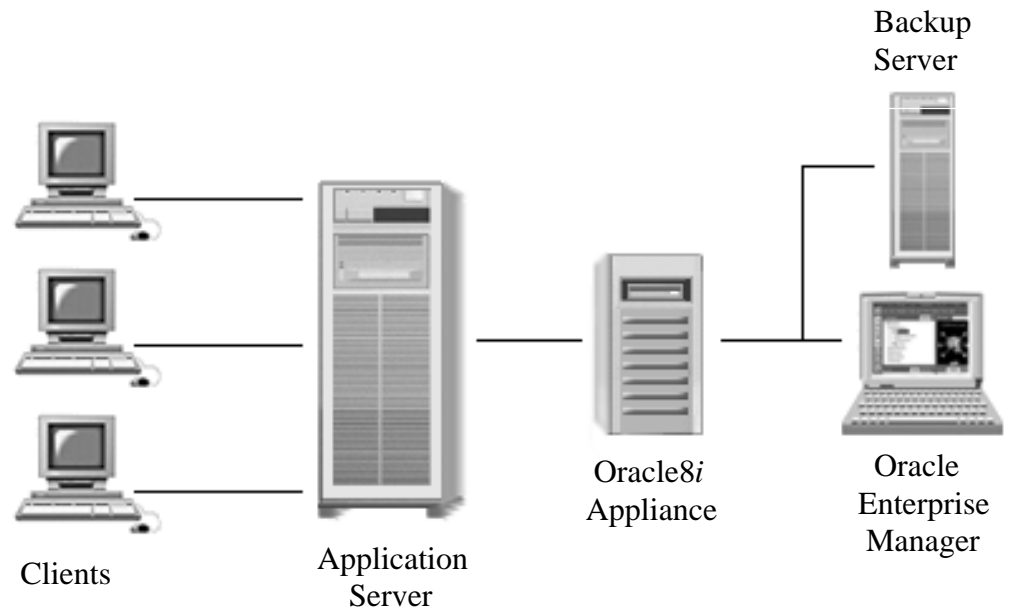
Lowering the Total Cost of Ownership

Integrating the Oracle8i database with a slimmed-down operating system lowers the total cost of ownership by:

- Eliminating the need to purchase an operating system or additional middleware
- Eliminating the need to employ professional services for integration, tuning, and software installation
- Eliminating the need to employ dedicated operators, DBAs, and systems administrators
- Reducing periods of downtime, because higher availability means a reduction in costs associated with downtime (loss of operation, servicing needs, and so on)

ORACLE8i APPLIANCE ARCHITECTURE

This illustration shows a typical deployment scenario for Oracle8i Appliance:



Note that:

- Client connections access Oracle8i Appliance through applications running on an application server.
- Oracle8i Appliance includes an Oracle8i database and a slimmed-down operating system kernel.
- Oracle Enterprise Manager is used to remotely administer one or more Oracle8i Appliances.
- Oracle8i Appliance data can be backed up to a local tape drive or across the network to a remote backup server.

You can also deploy traditional client-server applications and host Web-based applications with Oracle8i Appliance.

ORACLE8i APPLIANCE FEATURES

The following sections describe in more detail how Oracle8i Appliance meets the need for an easily deployable, centrally manageable, and low-cost Oracle8i database solution.

Preconfigured Oracle8i Database

Oracle8i Appliance comes packaged with an Oracle8i database that has been preinstalled and preconfigured to operate reliably and efficiently. This is achieved by making optimal use of disk space to store database objects and by configuring the database and operating system parameters to maximize system utilization. Oracle8i Appliance is available to users and applications through the following interfaces:

- Net8, which enables a variety of client connections to the database, including PL/SQL, ODBC, JDBC, and OCI.
- HTTP, which enables Web browser access to the database by connecting through Oracle WebDB.

In addition, Oracle8i Appliance is preconfigured so that the Oracle8i database is up and running at system startup time. The Intelligent Agent is also up and running to provide for remote administration capabilities and lights-out management features such as backups and fixit jobs.

Plug-and-Play Installation

Oracle8i Appliance software is purchased completely preinstalled, preconfigured, and predefined on Intel-architecture-based hardware, making it an “out-of-the-box,” ready-to-run business solution.

Oracle Corporation is partnering with several hardware vendors who will manufacture and sell the Oracle8i Appliance. The vendors will bundle their hardware with the Oracle8i Appliance software—database and operating system—fully integrated, tested, and tuned together. In so doing, compatibility and performance issues are eliminated, and the system is optimized to serve the functions for which it was designed: providing secure, reliable, and immediate database services.

Oracle Enterprise Manager Integrated for Centralized Administration

This section provides an overview of how Oracle Enterprise Manager is used to centrally manage Oracle8i Appliance.

Remote Administration Through Oracle Enterprise Manager

Database administration is performed from a centralized Oracle Enterprise Manager Console by your own systems administrator, or remotely by a service

provider. Multiple Oracle8i Appliances can be administered from this centralized Console.

Management of Oracle8i Appliance Operating System Services

Management of some operating system-related services is performed from the Oracle Enterprise Manager Console at a centralized location. These services manage Point-to-Point (PPP) network connections, Oracle WebDB configuration, and the Oracle8i Appliance internal clock connections (NTPD).

All services are automatically started when the Oracle8i Appliance is started. You can remotely view, configure, and manage configuration components for all Oracle8i Appliances.

Service management is protected by authentication methods that are integrated in Oracle Enterprise Manager for complete data security.

Management of Reports, Logs, and Configuration Files

The Oracle Enterprise Manager Console enables you to:

- Generate reports that detail key operating system, networking, and database performance information.
- View and delete log files such as trace files, syslog files, network files, and Intelligent Agent logs.
- View and edit key network, Intelligent Agent, and Oracle WebDB configuration files.

Remote Upgrades and Patch Installation

Upgrades of software components and installation of patches within software components can be remotely applied from the Oracle Enterprise Manager Console. This enables you to download and automatically install component upgrades and patches on an Oracle8i Appliance from a remote server.

Local or Remote Backup and Recovery

The Oracle Enterprise Manager Backup Management components consist of the Backup Wizard, Recovery Wizard, Catalog Maintenance Wizard, Backup Configuration Library, and Create Backup Configuration property sheets. You use these components to schedule and configure local tape drive backups or remote network backups to a separate server. Various Legato components are included with Oracle8i Appliance; however, you need to license an additional Legato component to perform remote backups.

Local recovery is performed from both the Oracle8i Appliance Console (which prompts you to insert tapes) and the Oracle Enterprise Manager Console. Remote recovery is performed from both the Oracle Enterprise Manager Console and the remote backup server.

System Management

The Oracle Enterprise Manager Console enables you to perform system management tasks, such as:

- Identify the amount of disk space occupied by currently mounted file systems, the amount of used and available space, and the total amount of file system capacity used on the Oracle8i Appliance. (Alerts are sent out when a file system is nearing full capacity.)
- View the amount of free and used physical and swap memory.
- Change Oracle8i Appliance user passwords.
- View and change the host name, domain name, and IP address.
- View the number of network packets transmitted and received.
- View and terminate active processes.

Lights-out Management

Oracle Enterprise Manager provides lights-out management of an Oracle8i Appliance. One method of providing lights-out management is through the use of predefined jobs and events.

Oracle8i Appliance provides a customized set of jobs and events for performing database administration. For example:

- The Sensitive File Monitor job checks the modification dates of key Oracle8i Appliance files. If these files have changed, then this job backs them up.
- The Index Rebuild event monitors indexes. When an index needs to be updated, a fixit job rebuilds the index.
- The Disk Full event monitors disk space. When disk space is nearly full, an alert message is sent.

Point-to-Point Connections

Support for Point-to-Point (PPP) connectivity is provided as a backup for administrators whose Ethernet network is down and, therefore, require a dial-up connection between the Oracle Enterprise Manager Console and the Oracle8i Appliance. Oracle Enterprise Manager provides a graphical user interface for configuring and starting a PPP connection.

Automatic and Adaptive Configuration When Scaling Up Hardware

As you add CPUs, RAM, and hard disks to respond to increasing system and user population demands, the Oracle8i Appliance adaptively reconfigures the database to reflect any scaled-up hardware.

For example, as you add hard disks, database tablespaces are automatically reconfigured across those disks. Also, adding CPUs and RAM adaptively reconfigures your system and database initialization parameters.

Backup Configurations

Two types of backup configurations are available:

Backups to a Local Tape Drive

With this configuration, backups are performed to a tape drive attached locally to the Oracle8i Appliance. The DBA must create a backup configuration and submit a backup job using the Oracle Enterprise Manager Backup Management components. Since backups are performed locally, the DBA must respond to prompts on the local Oracle8i Appliance Console to insert and remove backup tapes.

Backups to a Remote Legato Server

With this configuration, backups are performed to a remote Legato NetWorker Server on the network. The DBA must create a backup configuration and submit a backup job using the Oracle Enterprise Manager Backup Management components. The DBA must also specify the remote Legato NetWorker Server to which to back up the Oracle8i Appliance.

Data Recovery Methods

Oracle8i Appliance provides protection against loss of data by providing a fail-safe method for restoring lost data. The method of recovery for an Oracle8i Appliance is determined by the degree of failure in the system. Three types of failures and the recovery methods are described below:

System Disk Failure

The system disk contains the system distribution and configuration files, the redo logs, and the control files. If the system disk fails, you use the provided Oracle8i Appliance CD-ROM to recover the files. As part of this process, you may need to remove the disk and replace it with a new one.

Mirror Disk Failure

The mirror disk contains swap space, a duplicate copy of the redo logs, and a duplicate copy of the control files. If the mirror disk fails, you replace the disk and then run a job from the Oracle Enterprise Manager Console.

RAID Disk Failure

The RAID subsystem contains the SYSTEM tablespace, the database files, and the archive logs. If one RAID disk fails, the database continues to run. You can wait until a period of low database use to replace the disk.

No Operating System Administration Experience Required

There is limited need for users to interface with the slimmed-down operating system:

- The entire Oracle8i Appliance software solution and computer hardware are seamlessly integrated, tested together, and fully tuned prior to being shipped. This eliminates the need to manually tune the system application in anticipation of an Oracle8i database or any applications.
- Only the necessary components required to operate the platform are included in the software solution, thus enabling the system to be dedicated to secure, reliable database services.
- Manual operating system upgrades are not required because the operating system is packaged with the Oracle8i database and any application.

If a need arises for interfacing with the operating system, the Oracle Enterprise Manager Console enables you to manage the Oracle8i Appliance's essential services.

Slimmed-Down Operating System Performance

Over the years, operating systems have grown in size, requiring more and more memory, processing power, and maintenance to remain running. In many ways, the operating system has become the bottleneck that prevents quick and easy access to data.

All that is really required is the operating system kernel and a few essential services to provide basic functions such as CPU scheduling, memory management, hardware interaction, and security.

The Oracle8i Appliance strategy focuses on identifying which operating system-related capabilities are absolutely required to run the Oracle8i Appliance and on slimming down the operating system to get rid of everything else.

The Oracle8i Appliance solution is more open, more reliable, more efficient, simpler, and a faster way to store and access corporate data.

TYPICAL HARDWARE CONFIGURATION

A typical Oracle8i Appliance hardware configuration includes:

- One to four Pentium II or III Xeon processors
- 1-4 GB of memory
- 25-300 GB of disk space and a RAID controller
- Ethernet connections
- Floppy disk drive, CD-ROM drive, tape drive
- Monitor, video card, keyboard
- Network interface card, modem

FUTURE APPLIANCES

Oracle Corporation may expand the Oracle8i Appliance line to include the following capabilities:

- A directory appliance to provide an LDAP repository for organizing and storing lists in a standardized format for network-based environments.
- A file system appliance using *iFS*, which will enable users to store files easily into an Oracle8i database and will provide for easy IT management of those files.
- A messaging appliance using the IMAP4 protocol for hosting and storing e-mail content for delivery via the Internet.

CONCLUSION

Oracle8i Appliance is a preconfigured, dedicated, Internet-enabled database server device. It is the ideal means of deploying Oracle Corporation's Internet computing software platform to branch offices, remote locations, or small-to-medium-sized businesses or workgroups in a way that is low-cost, requires no on-site IT administration or management, and installs quickly and easily.

Oracle8i Appliance provides:

- A complete, preconfigured device ready for installation
- Plug-and-play deployment
- Centralized, network-based remote management
- Performance optimized for the hardware device
- Significant savings on total cost of ownership
- Built-in capabilities for Web-based application deployment

Oracle Corporation has partnered with several hardware vendors who will manufacture and sell Oracle8i Appliance.

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Authors: Arvind Jain, Mark Kennedy, and Jeff Stein

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ORACLE®

Oracle Corporation

World Headquarters

500 Oracle Parkway

Redwood Shores, CA 94065

U.S.A.

Worldwide Inquiries:

650.506.7000

Fax 650.506.7200

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