

## Oracle Database Lite Overview

Oracle Database Lite 10<sub>g</sub> is an integrated and complete solution for rapid development and deployment of high impact, mission critical applications for mobile and lightweight environments. Oracle Database Lite is an addition to Oracle Database 10<sub>g</sub> for enterprises wanting to increase employee productivity, reduce operation costs, or improve customer satisfaction. It extends the grid environment to mobile and embedded devices, allowing mobile workers to access enterprise data even in the absence of a network connection. Additionally, Oracle Database Lite uses data synchronization to allow these workers to reliably and securely exchange data with a corporate Oracle Database.

Corporations can leverage Oracle Database Lite 10<sub>g</sub> to increase employee productivity, reduce operation costs, or improve customer satisfaction. Oracle Database Lite has delivered demonstrable savings and improved customer satisfaction in sales force automation, data collection, customer relationship management (CRM), and field service applications in a range of industries including financial services, healthcare, transportation, logistics, government and retail.

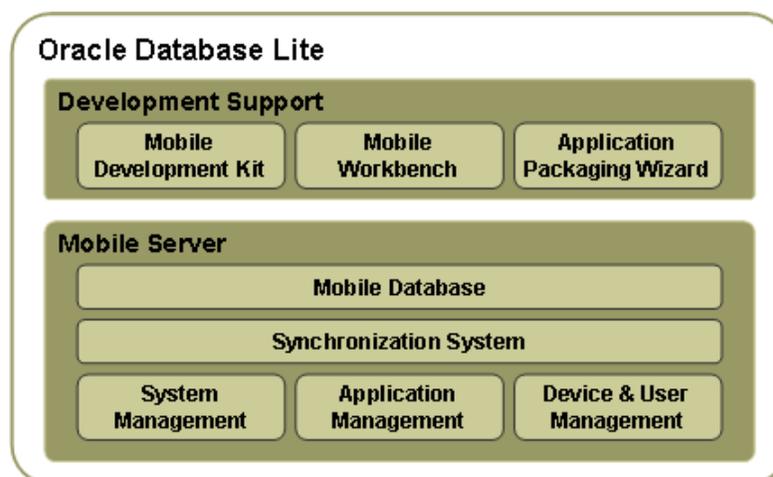


Figure 1: Oracle Database Lite Components

Figure 1 displays the components of the Oracle Database Lite solution. The two main areas of Oracle Database Lite are 1) developer tools to quickly and efficiently get applications into production and 2) mobile server for scalable deployment and management of applications, users, and devices.

### **Small Footprint Database**

Data needs to be stored reliably and securely, especially in a mobile environment. Oracle Database Lite includes a small footprint, powerful database server optimized for handhelds, laptops and small business environments, supporting single or multiple user deployments. Oracle Database Lite is a Java-enabled, secure, relational database management system that is self-administering and self-tuning, requiring no DBA involvement. It provides JDBC, ODBC, ADO.NET programming interfaces and an object-oriented interface called SODA (Stateless Object Database Access). This flexibility allows developers to build database applications from a variety of programming languages such as Java, C/C++, and Visual Basic.

### **Synchronization System**

Productivity is increased and costs are reduced whenever workers have timely and accurate access to corporate information. Workers must be able to send updates and receive new information whenever they are online. A secure and reliable solution is necessary to ensure data and applications are synchronized between workers and the corporate database. Oracle Database Lite includes a reliable, bi-directional synchronization server with a publication and subscription-based model allowing data and services to be synchronized between thousands of mobile users and the Oracle Database in your business. The Synchronization server does not require additional middleware and it can easily integrate with existing corporate systems.

Networks are never 100% reliable. Oracle Database Lite includes advanced systems to recover from any network failure. For example, Oracle Database Lite maintains a point-in-time recovery marker in case of network errors. If a user experiences a network failure during synchronization, Oracle Database Lite will resume the function (e.g. upload/download) from the last marker. This improves overall application performance and reduces communication costs.

Traditionally, the creation of server side synchronization logic in offline mobile applications requires extensive knowledge of "database replication" technology. Oracle Database Lite introduces revolutionary new features that automate the creation of this synchronization logic. Mobile Server analyzes information contained in the mobile application to automatically create the application's server-side synchronization logic. Conflicts occur when the same data item has been modified on the server and on the client or by multiple clients. Oracle Database Lite automatically detects such conflicts

and resolves them based on rapidly configurable standard resolution rules. Custom rules can also be created to match your business needs.

## Management System

Oracle Database Lite includes a complete management system for distributing, installing and managing software, data and files on mobile devices and remote systems. It enables a central IT support team to manage distributions to an entire workforce from a single management console. A web-based administration interface enables 100% server-side management of all mobile applications, devices, users and mobile servers.

Administrators use intuitive tools to publish the mobile application to the production system. After publishing the application, the administrator may control application access privileges to users or groups. Administrators have complete control to view, monitor and manage the full mobile chain.

## Development Support

The Oracle Database Lite Mobile Development Kit (MDK) is a set of tools, APIs, and code samples that accelerate the development of mobile applications using your favorite mobile development tools for Microsoft Windows CE, Pocket PC, Windows 2000/XP/2003 and Linux.

Oracle Database Lite includes a Packaging Wizard to bundle all application components (JSP/servlets, executables, DLLs, images, etc.) into a unique self-executable file for simple deployment to mobile or lightweight business environments.

The Mobile Database Workbench is a visual development tool to build replicated databases. This Wizard-based GUI application makes it easy for the developer to create a high-performance replicated database. Snapshots are created dynamically, further accelerating the development process.

O/S	ODBC	JDBC	SODA <sup>1</sup>	ADOCE	ADO.NET
Windows 32	Yes	Yes	Yes	-	Yes
Windows CE	Yes	Yes <sup>2</sup>	Yes	Yes <sup>3</sup>	Yes <sup>4</sup>
Linux	Yes	Yes	Yes	-	-
Symbian OS	Yes <sup>5</sup>	-	-	-	-

**Table 1 Database Access API**

<sup>1</sup> Simple Object Data Access (C++ database access library)

<sup>2</sup> No Java Stored Procedures & Triggers. Certified for Crème VM, IBM J9.

<sup>3</sup> Windows CE 3.0 for PPC (also known as Pocket PC 2002) only

<sup>4</sup> Only Microsoft .Net Compact Framework

<sup>5</sup> Versions 7.0 and 8.0 with UIQ 2.0

O/S	EVC 3.0	EVC 4.0	VS 6.0	VS.NET 2003
Windows 32	-	-	Yes	Yes
Windows CE 3.0 for PPC <sup>6</sup>	Yes	-	-	-
Windows CE 4.2	-	Yes	-	Yes

**Table 2 Supported Windows Development Tools**

O/S	ARM	XScale	X86 emulator
Windows CE 3.0 for PPC	Yes	-	Yes
Windows CE 4.2 <sup>7</sup>	Yes	Yes	Yes

**Table 3 Supported Windows CE/CPU Configuration**

O/S	Windows 32 - Web	Windows 32 - Native	Windows CE	Linux
JDBC	Yes <sup>8</sup>	Yes	Yes <sup>9</sup>	Yes
Java SP/Trigger	Yes <sup>10</sup>	Yes	-	Yes
Java Server Pages	1.1	-	-	-
Java Servlets	1.2	-	-	-
BC4J	Yes <sup>11</sup>	-	-	-
Struts	Yes	-	-	-

**Table 4 Supported Java Development**

## Highest Performance and Scalability

Oracle Database Lite delivers out-of-the-box performance, enabling users of your application to access information quickly and efficiently. A high performance query optimizer determines the most effective way to access information, improving

<sup>6</sup> Windows CE 3.0 for H/PC no longer supported

<sup>7</sup> Also known as Pocket PC 2003 or Windows Mobile 2003

<sup>8</sup> Oracle Lite offers three different JDBC drivers:

a) Embedded (native) JDBC driver- JDBC 1.2.2 compliant. Supports Java applications to communicate directly with Oracle Lite's database. Oracle Lite provides a limited number of extensions specified by JDBC 2.0. These extensions are compatible with the Oracle Database JDBC implementation

b) Type 2 driver

c) Type 4 driver - 100% Java implementation. Requires the multi-user database version

<sup>9</sup> See Developer's Guide for Windows CE for a complete list of JDBC functions

<sup>10</sup> Java SP/Triggers are not supported in the Web-to-Go application model. However Java SP can be replicated using the Consolidator API

<sup>11</sup> Latest version of Oracle JDeveloper 10g (10.1.3)

performance and eliminating the need for expert tuning as data distributions change over time. Multiprocessor and dynamic cache sizing support ensures top performance for larger databases and greater numbers of connected users. In addition, support for both single-user and multi-user implementations guarantees your Oracle Database Lite applications can adapt to the demands of ever-changing environments. Oracle Database Lite provides tools to tune the performance of data synchronization. It also provides benchmark data that can be used for capacity and scalability planning.

## End-to-End Security

Security measures such as authentication, authorization, and encryption are at the top of Oracle's concerns. Oracle Database Lite includes comprehensive 128-bit strong encryption features that guarantee end-to-end security. Utilities are provided to encrypt/decrypt Oracle Database Lite to protect your business information if the device is lost. Strong FIPS-140 compliant AES and SSL based encryption prevent any interception and protect data integrity while data is in transit between the device and the enterprise database.

## Key Features

### Synchronization System

- Flexible & reliable bi-directional synchronization
- Publication\Subscription model
- Asynchronous architecture ensures high scalability
- Multi-threaded architecture
- Custom synchronization invocation
- Push Synchronization
- Synchronization and network protocols: TCP/IP, HTTP, 802.11b, PPP Dial-up<sup>12</sup>, GPRS, ActiveSync
- Open Transport APIs to support any wireless network
- Network failure recovery
- System and custom conflict detection and resolution
- SSL encryption & data compression
- Virtual primary key
- File-based & queue-based replication
- Schema evolution
- DML callout customization
- Map table partitioning

### Mobile Database

- Small footprint starting around 1MB
- Databases size: 4 GB
- Multi user version up to 32 simultaneous connections
- Java Stored Procedures & Triggers
- Compatible with Oracle Database 10g
- Fast Native JDBC interface
  - Type-4 JDBC
- ODBC available on all platforms
  - V2.0-3.5 for Windows
- ADO.NET
- Object-oriented C++ interface
- Mobile SQL Utility
- Data integrity constraints
- Full transactional processing
- SQL-92
- Row-level locking
- Built-in referential integrity
- Binary Large Object (BLOB) support
- Data encryption control

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<sup>12</sup> For file-based replication

- C, Java and COM interface
- Compete synchronization monitor
- Replication of Java procedures and SQL scripts
- Automatic recovery

### **Management System**

- EM compliant “Mobile Manager”
- Integrated server architecture
- Secure, centralized Repository
- Software distribution and asset management
- Application deployment
- Data replication management
- User management/Single-Sign-On
- Remote device diagnostic
- Configurable with Oracle AS<sup>13</sup>
- Extension APIs available
- Scripting language for batch administration

### **Development Tools Support**

- Oracle JDeveloper 10g
- Microsoft Visual C++ 6.0
- Metrowerks CodeWarrior 8+
- Microsoft Visual Studio.NET 2003
- Microsoft EVC 3.0/4.0
- Sybase PowerBuilder
- Borland Delphi
- Rapid Software Formation<sup>14</sup>
- JDBC, C, C++, ADO.NET, Object API

### **Server Platform Support**

- Windows 2000/XP/Server 2003
- Linux x86 (Red Hat AS/ES 3.0/4.0, SuSE SLES 8)
- Sun Microsystems SPARC® Solaris 8.0, 9.0, 10.0<sup>15</sup>
- HP/UX
- AIX 5

### **Client Support**

- Windows CE 3.0 for PPC (Pocket PC 2002), Windows CE 4.2 (Pocket PC 2003)
- Windows 2000/XP/Tablet PC/ XP Embedded Edition
- Linux RedHat 7.3, RedHat Workstation 3.0 x86 (Database only)
- Symbian OS (Versions 7.0 and 8.0)

### **Server Hardware Requirements**

- CPU: Pentium III 1 GHz
- Disk Space: 500 MB
- RAM: 256 MB
- JDK: 1.4

### **Client Hardware Requirements**

- Windows
  - CPU: Pentium III
  - Disk Space: 140 MB
  - RAM: 32 MB
- Pocket PC
  - CPU: ARM, x86<sup>16</sup>, XScale
  - Disk/RAM: 32 MB

<sup>13</sup> See Installation & Configuration Guide for all configuration options

<sup>14</sup> Mobile RAD tool for Palm O/S and Pocket PC. Requires C-Compiler

<sup>15</sup> Mobile Server runs as a 32-bit application in a 64-bit O/S

<sup>16</sup> Pocket PC Emulator



Oracle Database Lite 10gR2 Feature Overview

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