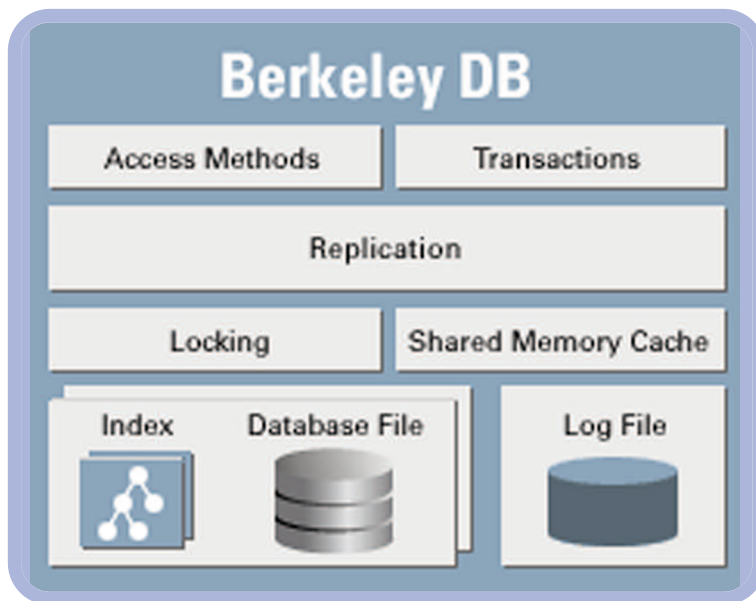


Oracle ports Berkeley DB to S60 Using Open C



Oracle has ported Berkeley DB, a key-value database with a huge following, to S60 3rd Edition using the Open C plug-in.

The challenge: Port Oracle Berkeley DB to S60

When Oracle acquired Sleepycat Software, the team that implemented Berkeley DB, the company knew that it was acquiring a database product that would be perfect for a wide range of applications on mobile devices. Oracle also knew that porting the thousands of lines of C code to a new operating system might be a formidable task.

“Before the Open C plug-in came along, we had already ported Oracle Database Lite to Symbian OS, so we had a good idea of what it would take to move a major application to that platform,” says Rex Wang, vice president of embedded systems marketing for Oracle. “When we actually did the Berkeley DB port using the Open C plug-in, we were pleasantly surprised.”

“Berkeley DB is a simpler, lighter-weight key-value database that avoids the overhead of SQL and gives developers direct access to the data instead. That makes it perfect for a wide range of embedded applications that are suited to mobile devices.” — Rex Wang, vice president, embedded systems marketing, Oracle

The solution: Open C plug-in for S60 SDK

“Our earlier port of Oracle Database Lite did not use the Open C plug-in,” says Wang. “In the process of porting, we needed to redesign several thousand lines of code, particularly in the wrappers for the API. For Berkeley DB, we were able to use the Open C plug-in to the SDK, and we calculate that we were able to save about one-third of porting development effort. This was because Open C gives us a standard interface with pthreads and key POSIX functions.” Using the Open C plug-in, says Wang, Oracle redesigned less than a thousand lines of code. The whole porting process took only 10 man-days.

The Open C plug-in for the S60 3rd Edition SDK forms a bridge between the vast C programming community and the more than 100 million S60 devices being used worldwide. It implements nine libraries built on open source projects, including five implemented by Nokia, and four that had previously been implemented by Symbian Limited. The five libraries implemented by Nokia in the Open C plug-in are the OpenSSL (libssl) for secure sockets; libz for compression; libcrypt and libcrypto for cryptography functions; and libglib, a general-purpose library of functions.

In January 2007, Symbian introduced four of the basic POSIX (Portable Operating System Interface) libraries on Symbian OS in P.I.P.S. (P.I.P.S. is POSIX on Symbian): the libc, libm, libpthread, and libdl libraries. The C standard

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Looking ahead:

“We encourage the large community of Berkeley DB and S60 developers to use Berkeley DB and Open C on the S60 platform to build compelling mobile applications and services,” says Wang. As Wang sees it, the number of S60 devices in the market will continue to grow rapidly. “Oracle seeks to serve the data management needs of all of its customers, including both enterprise and mobile, both relational and nonrelational, both complex and simple. That is why we focus on giving developers a broad range of choices and making it easy for them to use our products,” he says.

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library, libc has system APIs mapped to Symbian OS APIs for better performance; libm is a mathematical library; libpthread implements POSIX-style threading support using the terms of the underlying Symbian OS thread support; and libdl implements POSIX-style dynamic linking.

The benefits: An easier porting path to S60

Open C makes smartphone application-development teams more productive by enabling a common code base across multiple platforms and easing the task of porting existing and open source code to S60 devices. This is particularly productive when bringing services to mobile users in situations where substantial portions of the service implementation already exist in a desktop implementation or open source project. The Open C libraries make it easy for development teams to port the application logic or connectivity middleware from the existing implementation, while rewriting the user interface to serve the needs of the mobile user.

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Open C makes it easier for developers with no S60 experience to contribute to mobile projects. The large pool of developers experienced in C language work can now contribute immediate value to projects serving S60 users. Among other things, Open C makes it easy to create project modules on client/server management, 3D graphics using OpenGL ES, message queue management, and event-driven systems with little prior experience with mobile systems.

Oracle Berkeley DB as a platform for S60 3rd Edition applications

“After we did the port of Berkeley DB, we immediately set about creating two proof-of-concept demos,” says Wang. “One was a home expense tracker, and the other was an Internet Radio application that we created using open source code from Nokia. The latter has both streaming and local MP3 playback capabilities.” These demo applications illustrate how Berkeley DB is an easy-to-use embedded database for developers building S60 applications.

“Oracle Berkeley DB is very different from our Oracle Database Lite offering,” says Wang. “Whereas Oracle Lite is great for syncing up with enterprise relational databases, Berkeley DB is a simpler, lighter-weight key-value database that avoids the overhead of SQL and gives developers direct access to the data instead. That makes it perfect for a wide range of embedded applications that are suited to mobile devices.”

On a mobile device, Berkeley DB’s simple key-value structure can be used for a wide range of applications such as a message store for short message service (SMS), multimedia messaging service (MMS), and e-mail messages; a contact database or a calendar database; or a multimedia store. “Berkeley DB is suitable wherever data access patterns are static and predictable, or when the data does not inherently have a relational structure,” says Wang. “If the application requires ad hoc SQL queries or has an inherently relational data structure, then the developer is better off with a SQL database like Oracle Lite.”

More than 200 million deployments of Berkeley DB

Oracle Berkeley DB opens up the S60 3rd Edition community to a vast array of potential applications. Berkeley DB is already deployed in more than 200 million places, including the entire Linux, BSD Unix, OpenLDAP, and OpenOffice open-source communities. In commercial software, it has also been used extensively by Cisco Systems, Inc.; EMC Corporation; Sun Microsystems, Inc.; Google; and Amazon.com, Inc.

Oracle Berkeley DB is generally available under a dual license. A no-cost open-source license permits redistribution if the application using Oracle Berkeley DB is open source. A commercial license is available for redistribution of proprietary applications.

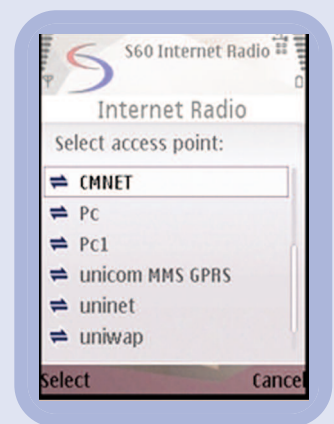
To download Oracle Berkeley DB, go to <http://www.oracle.com/technology/products/berkeley-db>. To download the Open C plug-in for the S60 3rd Edition SDK, visit http://www.forum.nokia.com/info/sw.nokia.com/id/91d89929-fb8c-4d66-bea0-227e42df9053/Open_C_SDK_Plug-In.html. To learn more about the open source project, visit <http://opensource.nokia.com/index.html>.

For more information, go to:

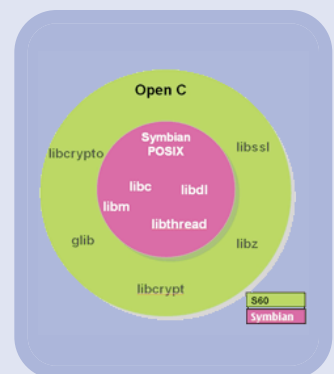
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After porting Oracle Berkeley DB to S60 3rd Edition, Oracle implemented this Internet Radio application to demonstrate the power of the Berkeley DB embedded database.



The Internet Radio application has both streaming and MP3 playback capabilities.



The Open C plug-in implements nine libraries built on open source projects.



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