Oracle Developer Studio 12.6

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DEVELOPER STUDIO

Oracle Developer Studio is the #1 development environment for building C, C++, Fortran and Java applications for Oracle Solaris and Linux operating systems running on premises or in the cloud. Oracle Developer Studio is optimized for Oracle Systems (SPARC and x86) and offers an integrated toolset that leverages system features, enabling developers to build highly performant, reliable and secure applications faster.

KEY FEATURES

- High performance C, C++ and Fortran compilers optimized for SPARC and x86 platforms
- Complete support for the latest standards, including C++14, C++11, C11 and the OpenMP 4.0 specification
- Performance analysis tools for Java, Scala, C, C++ and Fortran
- Code analysis tool for memory error detection, including real-time memory access checking on SPARC systems with Silicon Secured Memory
- Thread analysis tool for detecting race and deadlock conditions in parallel code
- IDE optimized for enterprise applications and cloud development

KEY BENEFITS

- Simplify cloud development
- Improve developer efficiency
- Maximize application performance
- Increase application security, quality and reliability
- Reduce time to market

Introduction

Oracle Developer Studio delivers a complete and comprehensive development platform, with high efficiency, high performance and high value. The tools are targeted towards making it as easy as possible to develop the best applications for Oracle Solaris and Linux operating systems. All of the components of Oracle Developer Studio are designed, tested, and integrated to work together to help maximize developer efficiency. The Oracle Developer Studio compilers are optimized to deliver the highest performance on the latest Oracle systems (SPARC and x86). In addition, with Oracle Developer Studio customers are able to leverage innovations across the Oracle technology stack, including SPARC Software in Silicon and custom extensions for Oracle Cloud, Oracle Database, and Oracle Tuxedo development.

Oracle Developer Studio includes tools for multi-language development and application analytics. The tools are designed to work together to provide an optimized development environment for the development of serial and parallel applications. Oracle Developer Studio also comes with an integrated development environment (IDE) tailored for use with the compilers and tools. Oracle Developer Studio provides a robust and reliable development environment with tools that are optimized for the underlying operating system and hardware to help you develop higher quality applications, in less time. In addition, Oracle Developer Studio enables developers to easily adopt a DevOps workflow with continuous integration and continuous deployment in combination with Oracle Cloud Services to create applications that leverage SPARC Cloud capabilities.
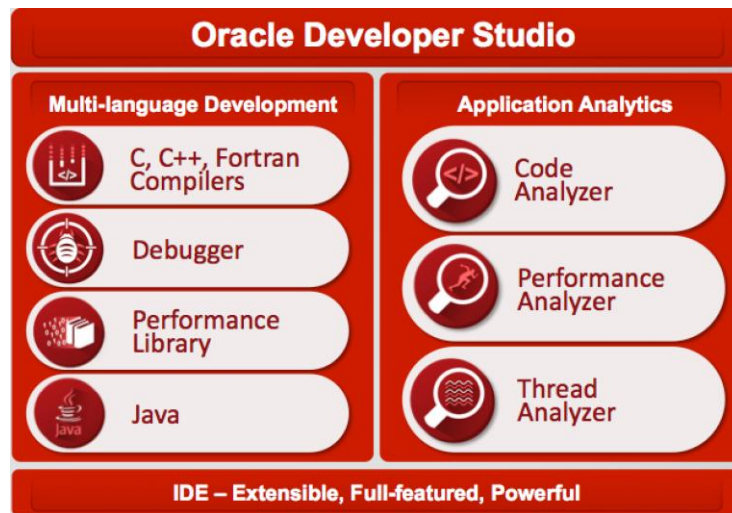
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Figure 1. Oracle Developer Studio Overview

Multi-language Development

Oracle Developer Studio delivers compilers and tools for multi-language development. It includes C, C++ and Fortran Compilers. In addition, support for Java is included in the Debugger, Performance Analyzer and IDE.

C, C++ Compilers

Oracle Developer Studio delivers compilers that produce record-setting application performance. The C and C++ compilers provide a solid foundation for building robust, high performance code for the latest generation of Oracle SPARC and x86-based Oracle systems.

Oracle Developer Studio includes complete support for the C++ 2014 and C++ 2011 language standards. It also has enhanced support for popular open source BOOST libraries and provides compatibility with GCC-generated shared libraries, making it easy to deliver feature-rich, portable applications. Oracle Developer Studio also includes support for C 2011, an update to the C programming language standard. In addition to supporting the latest language standards, Oracle Developer Studio software is compatible with prior releases.

To take advantage of hardware concurrency in multicore systems, the compilers simplify the creation of parallel applications with auto-parallelization features. These features enable the compiler to identify safe and profitable parallelization opportunities in single-threaded code and automatically convert those segments into multithreaded code. In addition, the compilers support the OpenMP 4.0 parallel programming specification for shared memory parallelism.

The compilers in Oracle Developer Studio include an array of optimization options for increasing application performance. For generating everything from microarchitecture-specific instructions and profile feedback to whole-program optimizations, the compilers provide both a wide selection of individual options and easy-to-use meta options for aggressively optimizing application performance. In addition, the compilers automatically expose security related errors and provide automatic stack overflow protection, allowing

you to compile more secure code.

Fortran Compiler

Oracle Developer Studio delivers a Fortran compiler that produces record-setting runtime performance. The compiler provides support for the Fortran77, Fortran90, and Fortran95 standards to support the existing base of codes in the technical market. It also delivers partial support for the Fortran 2003 standard. Support for the OpenMP 4.0 specification is also included. The Fortran compiler uses the same high-performance code generation technology as the C and C++ compilers, ensuring that the resulting application generates the highest-performance code for the newest SPARC and x86-based Oracle systems.

Debugger

The dbx debugger is an interactive, source-level, postmortem and real-time debugging tool available through both a command line and graphical interface. It is also integrated into the Oracle Developer Studio IDE. Ensuring application reliability, the dbx debugger is scriptable and multithread-aware.

Performance Library

The Oracle Developer Studio Performance Library includes a set of optimized mathematical subroutines for solving linear algebra and other numerically intensive problems. It provides a performance boost to high-performance computing, financial, and other compute-intensive applications. The Performance Library contains enhanced and newly added standard routines such as BLAS1/2/3, LAPACK, Sparse BLAS, SuperLU, FFTPACK, and VFFTPACK.

Java Support

Many enterprise customers have mixed-language Java and C/C++ applications. Oracle Developer Studio includes support for Java throughout the tools to simplify mixed-language development. The IDE supports mixed-language Java and C/C++ projects, the Debugger supports debugging of Java applications and the Performance Analyzer delivers great application profiling support for Java applications. In fact, the Performance Analyzer includes a dedicated API that correctly unwinds call stacks even if the Java code has been JIT'd or transformed by the HotSpot JVM, providing complete and accurate profiling data for Java applications.

Application Analytics

Oracle Developer Studio includes advanced tools to help developers gain increased observability into their applications.

Performance Analyzer

The Performance Analyzer is a powerful market leading performance analysis tool for optimizing application performance and scalability. It provides in-depth analysis that enables you to quickly understand your application's behavior, allowing you to easily eliminate hotspots and areas of high resource consumption.

The Performance Analyzer identifies application performance bottlenecks, by specifying not only which functions, code segments, and source lines are having an impact on

performance but by also providing the tools necessary to tune for optimal performance. From annotated listings showing what optimizations the compiler performed to optimization status and runtime thread performance, users can easily visualize performance hotspots. The Performance Analyzer can profile single-threaded as well as multithreaded applications. The Performance Analyzer also handles multiple concurrent processes to collect system-wide performance data, providing application insights down to the OS kernel, presenting a graphical identification of bottlenecks and helping improve application performance by orders of magnitude. In addition to supporting C, C++ and Fortran applications, the Performance Analyzer also includes support for Java and Scala code. Now, developers can use a single tool to seamlessly measure and tune their server and web-based application code. The Performance Analyzer also delivers cross-architecture and remote analysis support, helping increase overall developer efficiency.
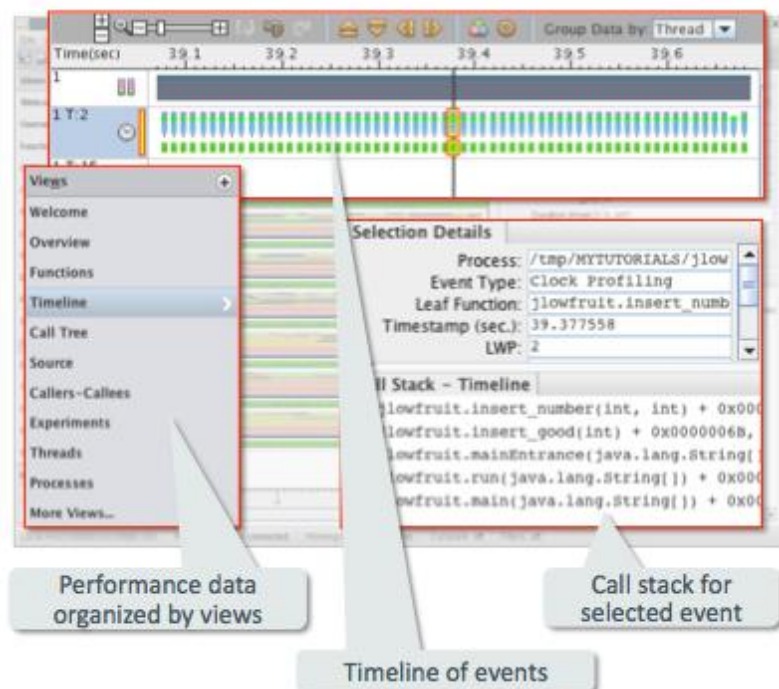
Figure 2. Performance Analyzer Timeline View, demonstrates where time is being spent across multiple threads

Code Analyzer

The Code Analyzer increases application reliability by utilizing dynamic, static and code coverage analysis to detect common coding errors, including memory leaks and memory access violations faster than competitive alternatives. The Code Analyzer utilizes static analysis at compilation and dynamic analysis from application runtime to identify code quality issues. The tool also incorporates code coverage data to provide information about functions that are not covered by your test suite and guidance on the type of benefit you could achieve by covering those functions. The Code Analyzer provides a comprehensive view of application vulnerabilities by synthesizing the data collected from these three types of analysis, enabling you to improve application

correctness and reliability. It also provides advanced error filtering and sorting capabilities, enabling you to track, detect, and fix issues faster. In addition, the Code Analyzer includes support for SPARC Silicon Secured Memory and provides developers with additional diagnostics that make it easy to find and fix Silicon Secured Memory run-time related errors. With support for SPARC Silicon Secured Memory, customers get a memory access checker that runs at real-time speeds.
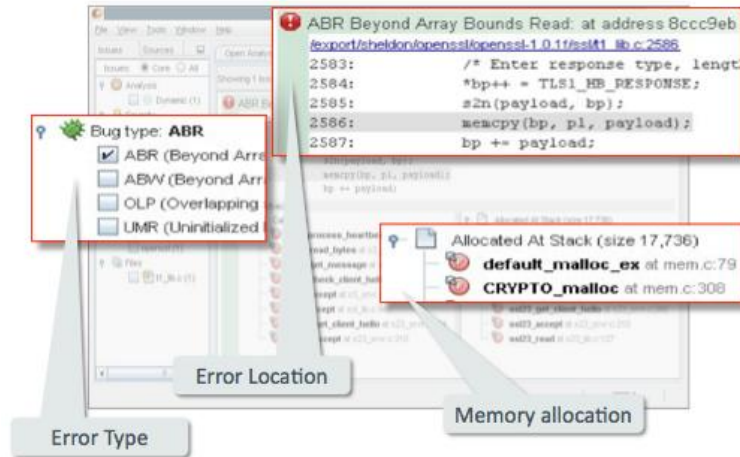

Figure 3. Code Analyzer GUI

Thread Analyzer

Improving developer productivity and software robustness, the Thread Analyzer identifies hard-to-detect threading errors before they occur. It can detect potential race and deadlock conditions at runtime, map them to source lines in the application, and then enable the user to view the results by using command-line or graphical user interface (GUI) options.
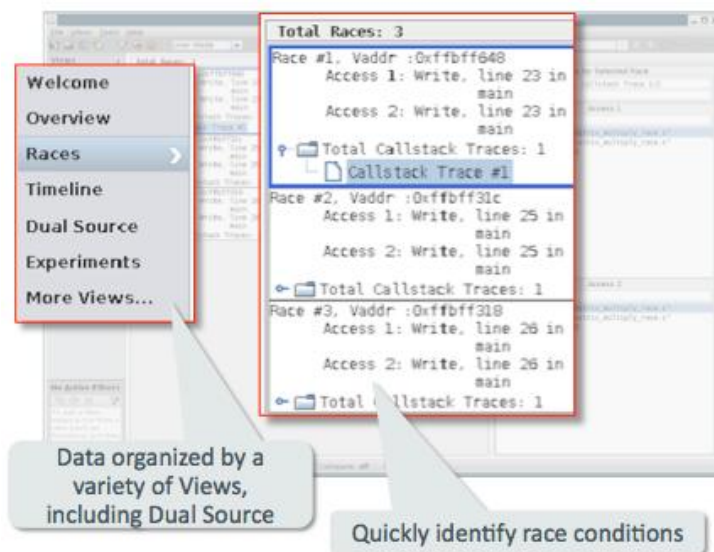
Figure 4. Thread Analyzer GUI Overview

Integrated Development Environment

Oracle Developer Studio also offers an integrated development environment (IDE) tailored for C, C++ and mixed-language Java and C/C++ development that helps increase developer productivity.

The Oracle Developer Studio IDE is built on the Net Beans platform and has a variety of advanced features that help increase developer productivity including an intelligent language aware code editor, code completion, code folding, syntax highlighting, secure coding hints, pinnable terminals, code refactoring and much more.

It also includes remote development features that enable the creation of Oracle Solaris or Linux applications from Microsoft Windows, Apple Mac or other Unix desktops, allowing you to leverage award-winning IDE features to remotely build, debug, run and analyze your applications. In addition, the Oracle Developer Cloud Service IDE plug-in allows developers to access the Oracle Cloud to pull, edit and push source code, launch builds, monitor build progress, and access Compute VMs.

The Oracle Developer Studio IDE supports Oracle Database application development on Oracle Solaris with Oracle Database connection management, database browsing, and Pro*C support. It also provides support for developing Oracle Tuxedo applications using ATMI and SCA programming models.
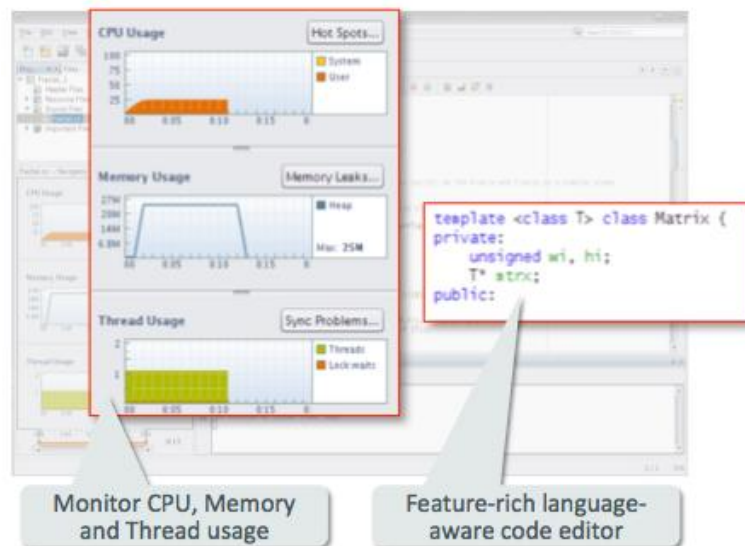

Figure 5. Oracle Developer Studio IDE

System Requirements

Oracle Developer Studio 12.6 is available for the following platforms:

- Oracle Solaris 10 & 11 (SPARC and x86)
- Oracle Linux 6 & 7 (x86)
- Oracle Unbreakable Enterprise Kernel 3 & 4 (x86)

- Red Hat Linux 6 & 7 (x86)

Licensing and Support

Oracle Developer Studio software is available for download for production use from the Oracle Technology Network (OTN). There you will find Oracle Developer Studio software in a variety of formats and instructions for acquiring Oracle Developer Studio via the Oracle Solaris Image Packaging System (IPS).
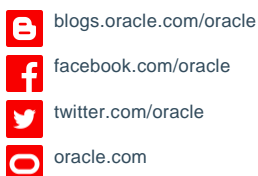
Support for Oracle Developer Studio is available with the Oracle Developer Studio Tools Support offering available through the Oracle Store to ensure high developer and team productivity.

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For more information about Oracle Developer Studio, visit oracle.com/goto/developerstudio or call +1.800.ORACLE1 to speak to an Oracle representative.

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Integrated Cloud Applications & Platform Services

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