



Selecting the Correct Intel® VTune™ Tools

Executive Summary

The Intel® VTune™ Performance Analyzer helps developers analyze and optimize their software performance. It helps to identify faulty algorithms and take full advantage of the latest Intel® processors, including Intel® Itanium® 2, Intel® Pentium® 4, and Intel® Xeon™ processors.

Recently Intel introduced new versions of the VTune analyzer for different environments. The VTune analyzer product line includes:

- VTune Performance Analyzer
- VTune Performance Analyzer for Linux*
- VTune Enterprise Analyzer
- Intel® Thread Checker

This paper differentiates these products and clarifies which ones are applicable to specific environments. See Table 1 for a summary of the VTune analyzer products.

Table 1. Which VTune Analyzer Is Right for You?

What You Want to Tune:		What to Use:
Hardware Platform:	Software Environment:	Solution:
Single Desktop or Server System	Windows* only with or without Visual Studio*	VTune™ Performance Analyzer 7.0
	Windows and Linux*	VTune Performance Analyzer 7.0 includes remote agents for Linux
	Linux only	VTune Performance Analyzer 1.1 for Linux
	Multi-threaded applications Windows and OpenMP*	Intel® Thread Checker with Thread Profiler**
Intel® XScale™ Technology	Windows CE	VTune Performance Analyzer 7.0 includes Intel® PXA255 and PXA262 processor support
Multiple Servers	Windows .NET multi-server, multi-tier, web applications	VTune Enterprise Analyzer 2.0, .NET Edition**
	Java* multi-tier web applications on WebLogic* or WebSphere*	VTune Enterprise Analyzer 2.0, Java Edition**

** Bundled with VTune Performance Analyzer 7.0

VTune™ Performance Analyzer

The VTune Performance Analyzer is used primarily to gather and analyze the performance of software running on one specific system and helps identify faulty algorithms to improve your software performance. The tool supports the latest IA-32, Itanium 2, and Intel® PXA250 and PXA262 processors running on Windows* and Linux operating systems. This tool offers the ability to gather performance data from an application running on a remote system with the Linux OS or a system based on an Intel® XScale™ processor. The host system is still used to analyze and display the performance data.

The extensive graphical user interface (GUI) of the VTune Performance Analyzer runs on Windows and displays all of the performance results. See Figures 1 through 3 for samples of the screens and functionality.

Performance graphs display system-wide data with the ability to drill down and analyze annotated source code. Other performance graphs show thread-by-thread performance information, in addition to providing the ability to easily compare the results between two different performance runs.

Because the analysis and display only occur on the Windows OS, a Windows system is always required — even when gathering data on a Linux system.

Version 7.0 provides the following key features:

- Full integration with the Microsoft Visual Studio* .NET development environment
- Windows command line interface for sampling
- Enhanced multi-threaded application and hyper-threaded processor analysis
- Direct, multiple run comparisons
- Simultaneous sampling of multiple events

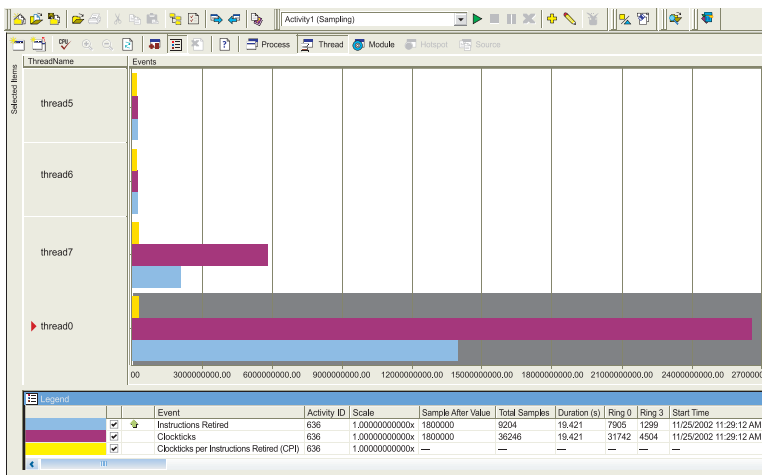


Figure 1. Time and Event Sampling

View performance of time or processor events (cache misses, branch mispredictions, and so on)

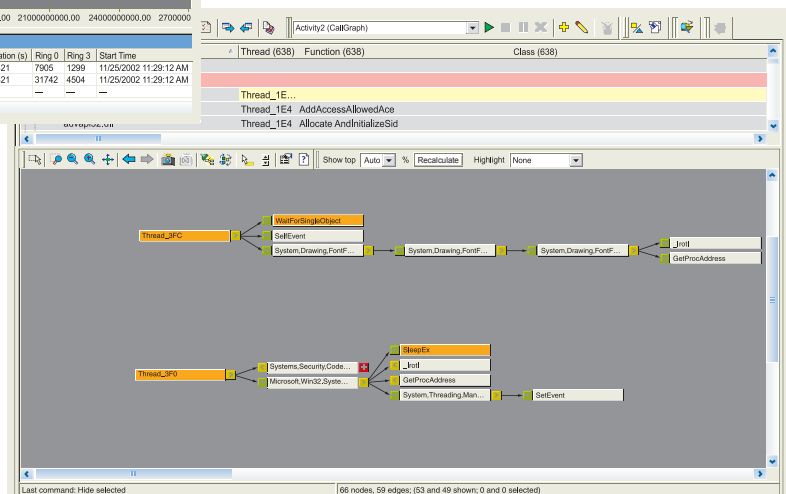
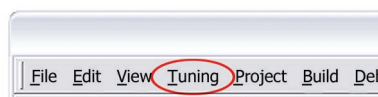


Figure 2. Call Graph Profiling

View call paths, the number of times a function is called, time spent in each function, and more

Figure 3. Clean Tuning Integration

Integrates cleanly into Microsoft Visual Studio development environment*



VTune Performance Analyzer for Linux*

The VTune Performance Analyzer for Linux is a text-based command line tool that runs “native” on Linux systems without requiring another system for analysis and display. The text-based output (see Figure 4) allows Linux developers to write scripts, populate a database, or write to other types of viewers to organize and display the resulting performance data in any way the developer wants.

The GUI-based graphs available to VTune Performance Analyzer on Windows systems are not available on the Linux system. However, you can pack the performance data generated on Linux into one file, unpack it on a Windows system with the VTune Performance Analyzer, and display the data in the extensive, GUI-based graphs.

The latest version of the VTune analyzer for Linux provides the following features:

- Supports the latest 32-bit Intel® processor families including Intel Xeon, Pentium 4 processor, and the Mobile Intel Pentium 4 Processor-M
- Provides local sampling and call graph support
- Provides scripting capability
- Includes the VTune analyzer driver kit, which enables the VTune analyzer for customized kernels for the supported Linux OS distributions

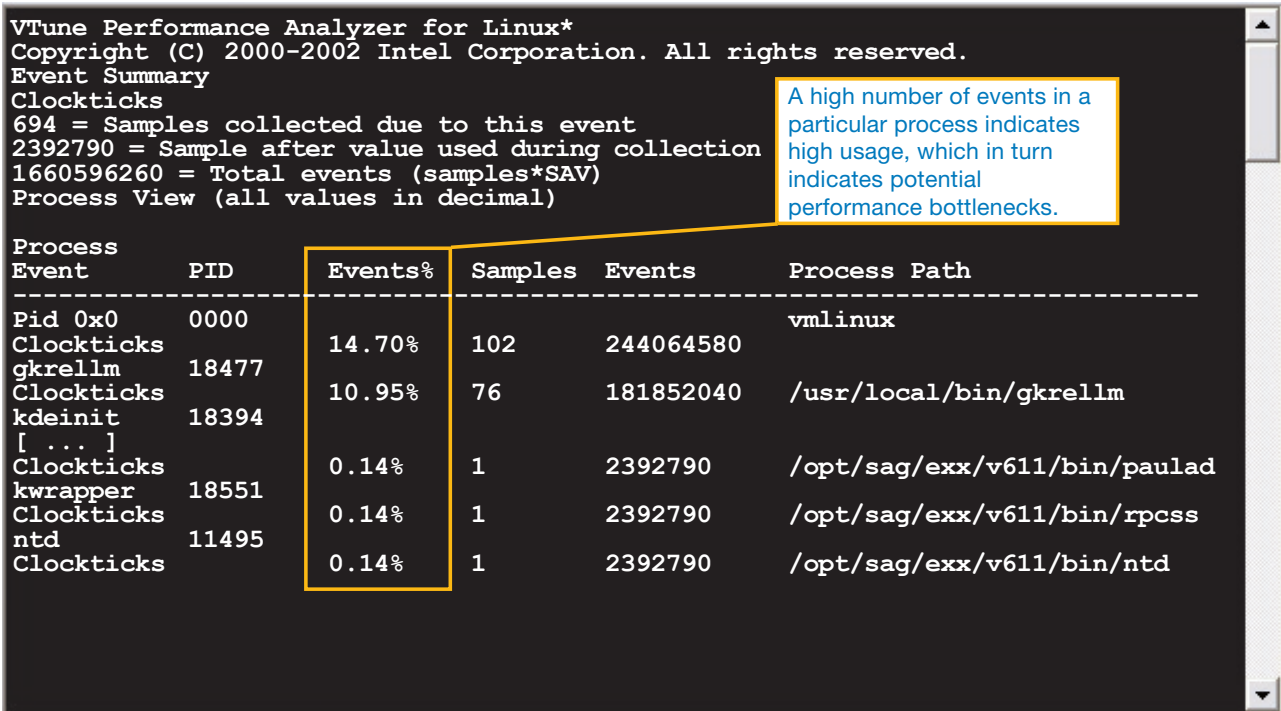


Figure 4. Linux Screen

Sample command to create an activity and run a sampling data collection with default settings: `$ vtl activity TestMyApp -duration 30 -csampling -app./vtunedemo run`

VTune Enterprise Analyzer

The VTune Enterprise Analyzer, used across several networked systems, is specifically designed for Web application and Web service performance tuning. This tool provides insights into how the Web infrastructure is utilized while serving the client's request. It offers the developer a view into an n-tier Web application that exposes "bottlenecks" within tiers, machines, tasks, objects, and application levels (see Figure 5).

The VTune Enterprise Analyzer complements existing load tools and the existing VTune Performance Analyzer. The VTune Enterprise Analyzer is offered in two editions:

- VTune Enterprise Analyzer for .NET
- VTune Enterprise Analyzer for Java*

Table 2 highlights the data collected for both product editions for each tier. Table 3 shows the views available in both editions of the VTune Enterprise Analyzer.

Table 2. Data Collected by VTune Enterprise Analyzer

Tier	.NET Edition	Java* Edition
Web	HTTP and ASP requests, Web Service Description Language (WSDL) accesses	JSP*, Servlets
Application	COM+*, .NET objects, Simple Object Access Protocol (SOAP), and .NET binary protocol calls	EJB*, JDBC*
Database	SQL queries, stored procedures	SQL queries, stored procedures

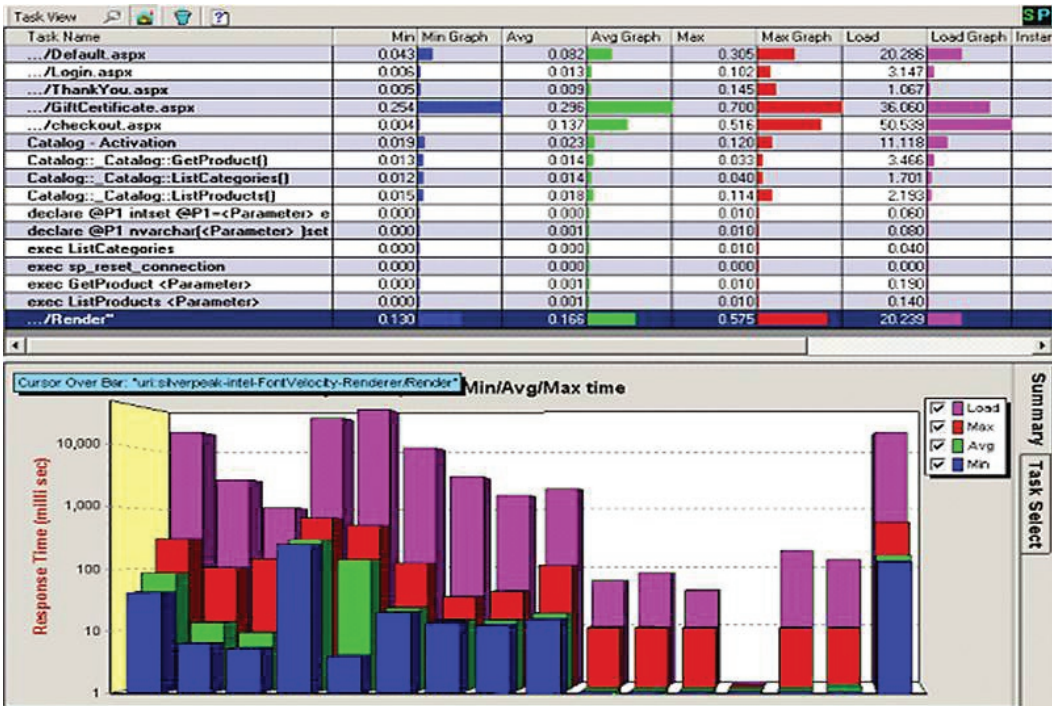


Figure 5. Call Graph Profiling

VTune™ Enterprise Analyzer provides detailed information on inter-tier and object activities to help you identify bottlenecks

Table 3. VTune Enterprise Analyzer Views

Both VTune Enterprise Analyzers Provide These Views:	
Tier view	Provides a bird's eye view of the response times across multiple tiers as your Web application executes. This view breaks down response time by tier, allowing you to zoom into a particular time segment, and works in both real-time and post-collection modes.
Machine view	Enables you to see specific machines in each tier and the resource utilization for each machine at every point in time. This view can be used to correlate response times to machine performance counters in the .NET edition, whereas in the Java* edition, it is used to correlate Java Virtual Machine (JVM) response time to JVMs and JVM counters. It also can filter the information based on performance counters and specific tiers.
Task view	Provides a horizontal analysis of the Web site performance, enabling you to locate performance problems by identifying tasks with high response times. A task is a request to a server (for example, HTML page access).
Object view	Provides a graphical view of the physical topology of the server machines and inter-machine activity. This view enables you to examine inter-component relationships and their deployment configuration.
Sampling Hotspots view	If you have also installed the VTune Performance Analyzer, you can collect sampling data on critical machines and objects you identify in the Enterprise views. From the sampling views, you can identify system-wide software performance and drill down to your application source code for a particular hotspot.

Intel® Thread Checker

The Intel Thread Checker for Windows is a new tool that helps you quickly find and fix bugs in Win32*- and OpenMP*-threaded applications. Intel Thread Checker uses an error detection engine that locates hard-to-find threading errors within hours that would otherwise take you days or weeks to find or that you may not find at all using traditional tools and methods. When you purchase Intel Thread Checker, you also receive the Thread Profiler plug-in and the VTune Performance Analyzer as separately installable components.

This release of the Intel Thread Checker provides the following key features:

- Automatically detects most threading errors, such as data race conditions, thread deadlocks and stalls, improperly synchronized I/O, and incorrect threading library calls
- Locates specific source code lines that are causing errors, and classifies these issues into six levels that range in severity from errors to warnings
- Lists context, source line, variable, and call stack for easy analysis

Summary

The VTune Performance Analyzer has grown into several products for different environments. These different versions are represented by:

- The full GUI display capability, through the VTune Performance Analyzer
- The text-based command line version for Linux, through the VTune Performance Analyzer for Linux
- The Web- and network-oriented, VTune Enterprise Analyzer with two editions — one for .NET and the other for the J2EE* application environments
- The new Intel Thread Checker bundled with the Thread Profiler

Related Links

General Information

VTune analyzer product line:

www.intel.com/software/products/vtune/

Intel® Software Development Products:

www.intel.com/software/products/

Intel Thread Checker:

www.intel.com/software/products/threading/

Intel Software Training:

www.intel.com/software/college/

VTune Performance Analyzer

General Information:

www.intel.com/software/products/vtune/vpa

Supported Environments:

www.intel.com/software/products/vtune/vpa/sysreq.htm

Flash demo:

www.intel.com/software/products/vtune/downloads/VTune_V6.htm

VTune Performance Analyzer for Linux

General Information:

www.intel.com/software/products/vtune/vlin/

Supported Environments:

www.intel.com/software/products/vtune/vlin/sysreq.htm

VTune Enterprise Analyzer, .NET Edition

General Information:

www.intel.com/software/products/vtune/enterprise/

Supported Environments:

www.intel.com/software/products/vtune/enterprise/relnotes.htm#sysreq

VTune Enterprise Analyzer, Java* Edition

General Information:

www.intel.com/software/products/vtune/vte_java10/

Supported Environments:

www.intel.com/software/products/vtune/vte_java10/relnotes.htm#sysreq



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www.intel.com/software/products

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