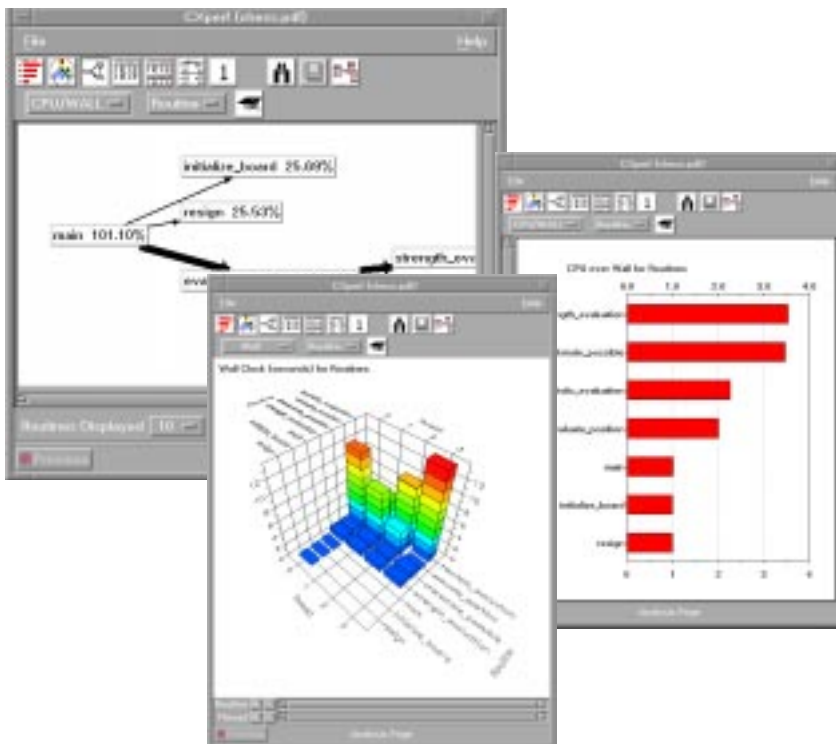

HP CXperf Application Analyzer

Product Brief



Exemplar Programming Environment

- Analyzes parallel applications
- Supports multiple parallel models
- Interprets results visually

High-performance computer architectures are becoming more and more sophisticated. Parallel processors, multiple levels of memory and complex I/O configurations offer enormous potential for performance increases.

Effectively tapping into this potential power with your application software offers tremendous benefits. CXperf, a parallel application analysis tool, helps application developers

deliver the power of the Exemplar family of parallel servers. CXperf clearly and dramatically helps improve the performance of your complex real-world applications.

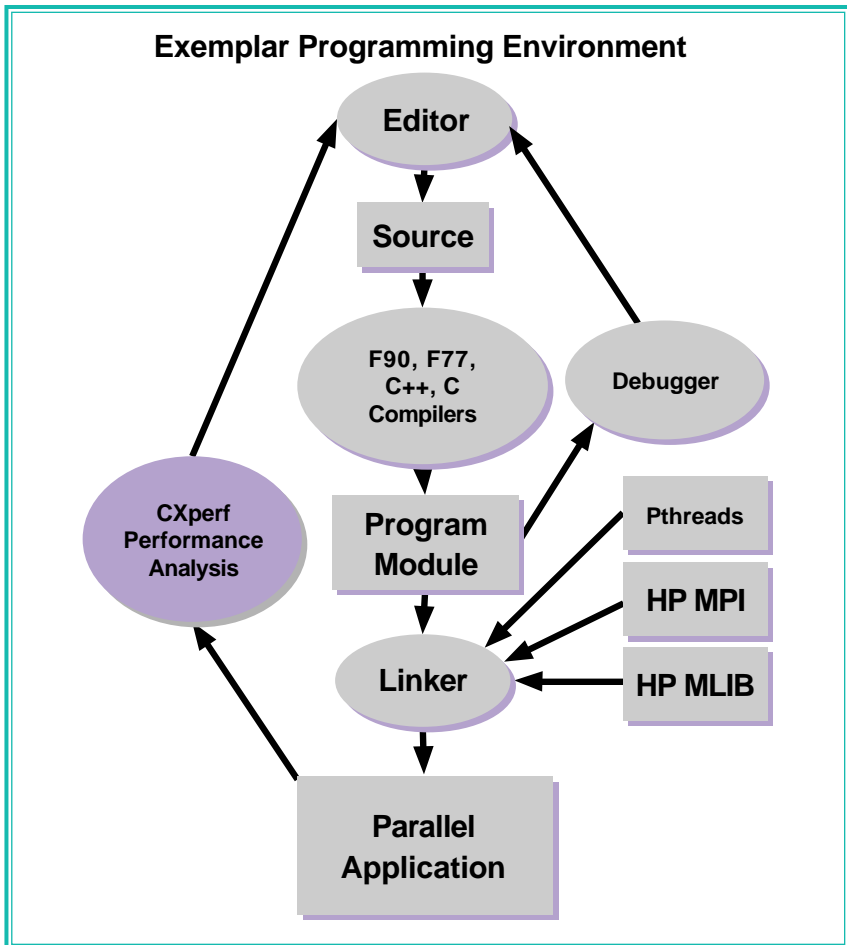
Why Application Performance Analysis?

There are several types of performance analyses, including hardware simulation, system monitoring, application monitoring and application performance analysis. Application performance analysis focuses on improving the efficiency of your code and reducing its total time to solution.

Application performance analysis involves nearly every facet of a system, including underlying hardware architecture, operating system and development tools. Analyzing the behavior of applications therefore requires well designed professionally implemented tools.

Need for Speed

To compete in the global marketplace, a product's time-to-market and its time-to-solution are paramount to success. In scientific and engineering computing, today's users require the ability to complete complex engineering and scientific development tasks as quickly as possible.



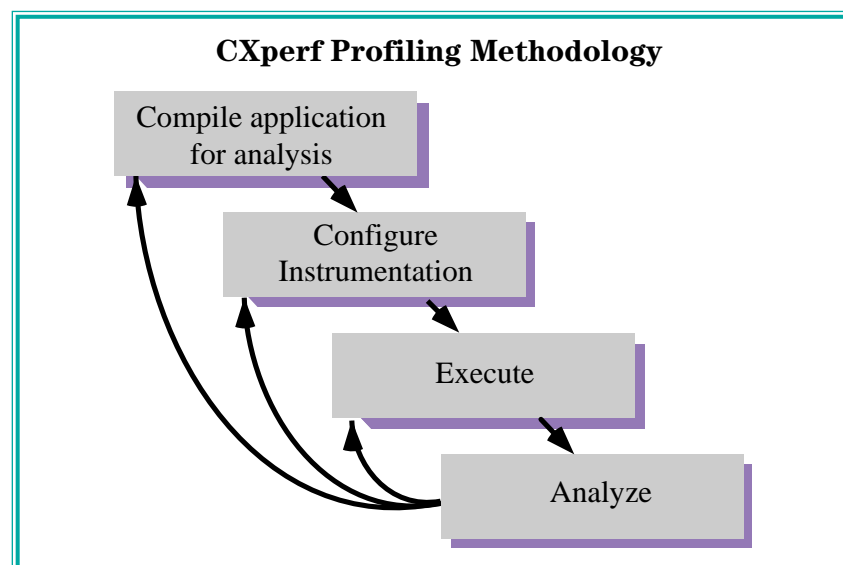
Complex Architectures

Computing architectures evolve to meet customer demands for increased performance and capability. As

processor speeds increase, and as the complexity of memory architectures increases, memory latency relative to processor speeds also increases. Managing the relative increased memory latency continues to be a significant challenge. These powerful advanced systems promise dramatically improved performance. The challenge is to gain access to this new power through applications software.

Larger Applications

As applications increase in size, they require more memory and more processors to complete in a timely fashion. Mapping applications onto multiprocessor systems with multiple levels of memory is difficult, even with the support of parallelizing compilers.



Performance tuning often involves optimizing the use of this memory by spreading the load across processors.

What is CXperf?

CXperf is an application analyzer, designed to help developers identify ways to improve the time to solution of applications. CXperf gathers a large variety of measurements of the performance of an application. To reduce the amount of data generated, CXperf uses the reductionist method of analysis. The reductionist method summarizes statistics for each region of the application you want to measure while your program runs.

CXperf is integrated with HP compilers, including Fortran 90, Fortran 77, ANSI C++ and ANSI C. CXperf supports profiling of routines and loops, including tracking compiler optimizations. CXperf is integrated with hardware and the operating system to support wall clock timing, CPU timing, memory access counts and memory latency timing. CXperf also supports profiling of shared memory applications, including compiler generated parallel code, Pthreads and user-specified parallel directives. CXperf can profile multi-process applications and message-passing parallel programming models, such as HP MPI Message Passing Interface software.

Description

Profiling an application is an iterative process. CXperf allows a user to profile an application, make changes and re-profile the same application. CXperf supports this process with an intuitive, easy to use graphical user interface as

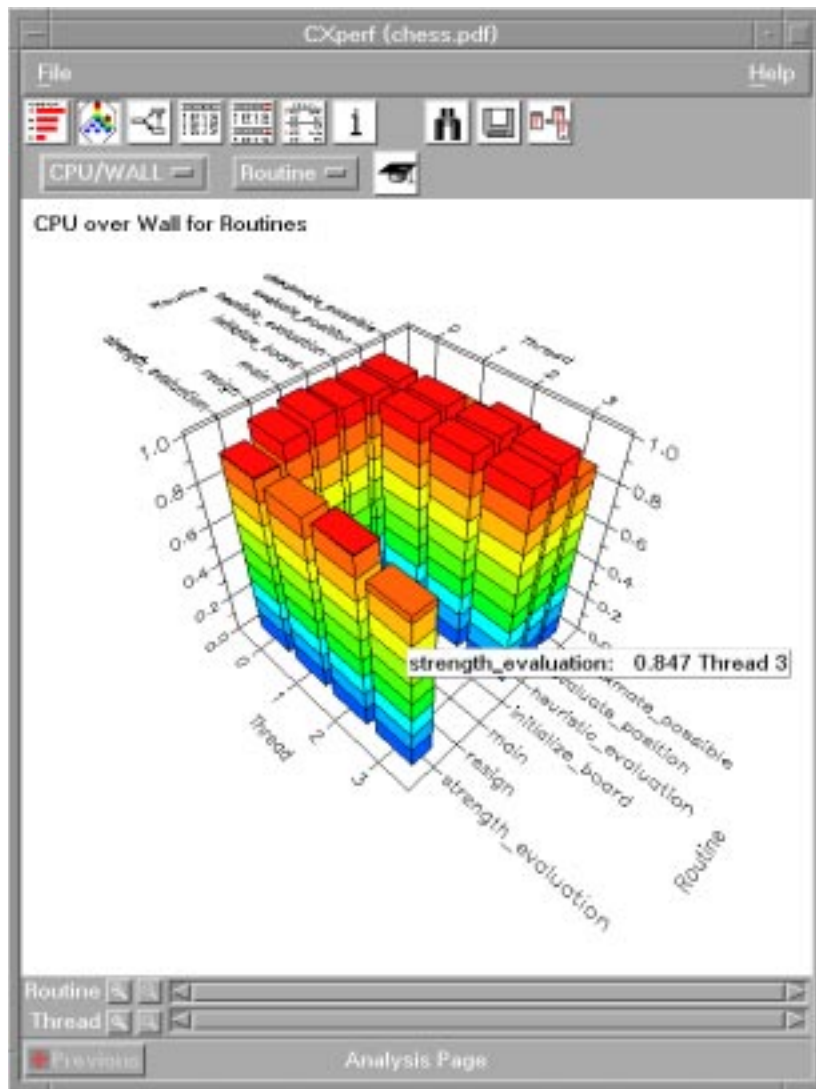
well as a command line interface to easily modify and rerun tests.

To begin the process, the user compiles the application to profile, selects the parts of the application to profile, and then selects the metrics to collect regarding those parts of the application. CXperf then instruments the application.

After the instrumentation step, the user runs the application. CXperf

generates a program data file during execution of the application.

In the analysis step, the developer uses CXperf tools to graphically display the behavior of the application as it occurred during the execution step. Call graphs, summary profiles and detailed parallel performance profiles are all readily displayed. CXperf also includes a number of textual reports to describe the overall behavior of the application.



Using the graphical tools, the user can quickly identify where memory bottlenecks occur in the application. The call graph tool shows the developer the routines called by other routines. Also, the user can see the proportion of work done by the various routines shown in the call graphs.

CXperf offers detailed CPU time analysis, graphically showing which routines used the most time. This helps identify which part of an application offers the greatest potential for improved performance through optimization.

Wall clock analysis gives a definitive look at the time required to run the application. Developers use this to identify wait times not accounted for

elsewhere in the application. This helps the developer identify routines where additional performance enhancement would be beneficial. Also, this helps to identify needed application restructuring to minimize wait times.

CXperf supports GUI, command line and batch modes. Batch support allows the user to use scripts with CXperf for production applications.

Users

People who use CXperf include professional application developers, scientists, engineers and consultants who optimize programs to more efficiently solve complex problems.

For more information, contact any of our worldwide sales offices or HP Channel Partners (in the US, call 1-800-637-7740; in Canada, call 1-800-387-3867.) Look for HP on the World Wide Web (<http://www.hp.com/go/techservers>).

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