

ROGUE WAVE® SOFTWARE PARALLEL COMPUTING ASSESSMENT



FOR DETERMINATION OF POSSIBLE AND RECOMMENDED SOFTWARE PARALLELIZATION TECHNIQUES

Background: The “Multi-Core Dilemma” & Emerging Technologies

Parallel computing is not a new concept. Developers have created multi-threaded code to address the needs of certain large scale applications for many years. Rogue Wave has delivered portable threading classes in its SourcePro libraries since the mid 1990's. However, because developing multi-threaded code has been a difficult, high risk proposition, many development teams have continued to write single-threaded code to avoid the potential risk in multi-threaded applications.

These single-threaded applications have historically been able to continue meeting the needs of a growing business, because companies were able to continue buying faster processors to run them on. However, recently that strategy has not been nearly as successful as in the past, because chip vendors are no longer able to deliver chips with faster clock speeds. The solution these vendors offer to customers is to put more processors on a chip, creating multi-core chips. Additionally, customers seeking the fastest processing possible are now interested in deploying key application components on specialized processors such as Graphics Processing Units (GPU), IBM's Cell Broadband Engine and FPGA's.

In order for a given application to leverage the power of multicore chip architectures or specialized processors, it must be able to execute tasks in parallel. The techniques for developing multi-threaded code are well known, and can be a component of the solution to this problem. However, due to the expense and risk involved in developing multithreaded code, this may not always be the best approach to allow an application to execute tasks in parallel.

Professional Services Expertise: Parallel Computing Assessment

Building on our significant experience helping customers implement software that can execute tasks in parallel we are offering a Parallel Computing Assessment package through our Professional Services Group (PSG) to assist customers in addressing this now pervasive need.

Corporate
Headquarters:
Boulder, Colorado

Global Locations:
United States
France
Germany
United Kingdom

Year Founded:
1989

Products:
SourcePro C++
- SourcePro Core
- SourcePro DB
- SourcePro Net
- SourcePro
Rogue Wave Hydra
- HydraSCA
- HydraExpress
- HydraSDO
Stingray

Technology Partners:
IBM
Intel
AMD
Microsoft
HP
Sun
Red Hat
Gemstone



Business:

Enterprise class C++ components and infrastructure that enable organizations to build and deploy high performance applications.

Customers:

Corporate IT organizations and ISVs responsible for the development of enterprise class C++ high performance business applications including the majority of the Fortune 1000.

“The Gartner applications research team received more customer inquiries about, ‘How can I modernize my legacy applications,’ than any other topic in 2007, and that trend looks to continue in 2008. Overall, enterprises are looking to generate higher performance and broader integration with what they already have. They can do more than they think, especially with the innovations around multi-core and SOA, and they do not need to start from scratch.”

- Mark Driver, Research Vice President at Gartner

The assessment will identify architectural issues or performance bottlenecks that are negatively impacting the performance and/or scalability of a selected application. We will also provide an analysis of the possible software parallelism techniques available to overcome these issues and provide recommended remedial actions. Determining the best parallelism options for an application is greatly enhanced by the availability of Professional Services personnel who are highly skilled and experienced in the possible concurrency options. Our expertise has been conveniently packaged into an offering that will help you make the right choices initially, saving a great deal of time and cost.

Program Overview: Parallel Computing Assessment

Application Review (1 day)

A Rogue Wave PSG consultant will work with your team to get an understanding of your application, its architecture, performance, known problems and bottlenecks, performance goals and future direction. Any profiling work already completed will also be discussed. This summary will be included in the final report, and is often helpful to everyone involved in a project.

Profiling the Application (1.5 days)

Rogue Wave’s consultant will work with your application to gather further information on bottlenecks and other performance information. The consultant will also be looking for information that may affect the ability of the application to use certain parallelization solutions.

Parallelization Analysis (2.5 days)

Based on the profiling results, Rogue Wave’s consultant will begin analyzing the problem areas to determine possible solutions for parallelization. Several possibilities will be examined, including multithreading with various tools, grid computing, multiprocessing, service grid, GPU, Cell Broadband, and FPGA. Recommendations will be formulated for each area and estimations of effort will be presented in the final report.

Report Creation (1 day)

Rogue Wave’s consultant will create a detailed report of the findings. The report will start with a summary of the current application. A description of the tasks undertaken during the visit will follow. The results of the profiling and a description of the problems found will be detailed next. Recommendations for resolving the problems, estimates of the effort required to implement the changes, and the estimated improvement from implementing these changes will complete the report.

At the conclusion of the Parallel Computing Assessment, you will have a report that documents the current state of your selected application, a description of the issues impacting the

performance and/or scalability, along with an analysis of possible parallel computing options and an actionable plan for moving forward.

Parallel Computing Assessment Summary

Our recommendations for assistance are based on years of experience with similar projects, with organizations in similar situations. The services described represent what we believe to be the optimum package of services to provide your existing in-house technical resources with the detailed information they require. These services are not intended to represent the extent of the effort involved in modifying your application code to take advantage of one or more parallelism techniques.

The following is a summary of the proposed services:

Activity	Rate Basis			# of Days Allocated
	Workshop	Consulting & Programming	Writeup	
Application Review		√		1
Application Profiling		√		1.5
Parallelization Analysis		√		2.5
Report Creation			√	1
Total				6

Consulting and Programming are \$1,700 a day, and writeup work is \$1,500 a day. Travel and living expenses for services performed on-site will be billed additionally and separately. The total estimated funding level of the above package of services is \$10,000, not including travel and living expenses.

For more information, please contact your account manager, or visit our website www.roguewave.com.