Facet User Profile/3

"Many of these sites are good candidates to move to a multiprocessor environment, and it became obvious that a multithreaded architecture with MP support would be a big selling point in Facet 3.0. The only question was which development tools to go with. We used mostly Sun C++ tools to create the original product, and when we saw what SunSoft was doing in the MP area, we signed up for the beta version. It turned out to be the best beta product we have ever seen."

The Solution

"This is a case where multithreading closely matches the actual model we are implementing," Hawkins said. "A spreadsheet is built around tables where one change can precipitate others. Hence the process in not linear, but is a complex branching tree. Our approach was to use the spreadsheet itself as a metaphor for multithreading. Each thread gets assigned to one or more cells, and each cell can potentially get its own thread."

Part of SPARCworks/iMPact 2.0, SPARCworks Debugger MT enabled the Facet programming team to continuously monitor individual Solaris threads. The debugger's major commands provide thread-level support, including the ability to set breakpoints, examine and modify data, trace call stacks, and control execution in specific threads. "Debugging in a multithreaded environment would have been very tough without it," Hawkins said.

SunSoft WorkShop tools also reduced the edit/compile/debug cycle. In particular, the Fix and Continue feature enabled developers to make on-the-fly changes without having to relink applications and restart debugging sessions.

"We also found that SPARCompiler C++ ran up to three times faster than previous versions," Hawkins said. "The compiler is a robust, complete ANSI implementation with excellent error messaging.

Benefits

The combination of a proven C++ language system and innovative development tools kept development time on Facet 3.0 to a minimum. "We were able to do the entire job in only two or three person-months," Hawkins said. "In some parts of the cycle we have saved an hour or two a day. That has enabled us to maintain the same development team, even though the scope of the development has gone way up. Without these tools we would have to either extend our schedule or hire more programmers. We couldn't have created Facet 3.0 without it."

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User Profile

SunSoft WorkShop for C++
Customer: Facet Decisions Systems, Inc.

Profile
Developers at Facet Decisions Systems, Inc., (Vancouver, British Columbia) are using SunSoft's SPARCworks™/iMPact multithreaded development tools to create a new version of its Facet Spatial Spreadsheet that will take advantage of a multiprocessor environment. The application is the world's first visualization and modeling tool that uses the familiar spreadsheet metaphor. SPARCworks/iMPact tools are a component of SunSoft Workshop™ for C++, an integrated product suite for the development of advanced, object-oriented applications.

Facet developed the spreadsheet to provide a more flexible and familiar alternative to GIS (geographic information systems) and remote sensing packages -- a single application that can draw maps, simulate fluid flow, and model habitats, yet still calculate cash-flow. Spreadsheets are very good at 'what-if' analysis, where you set up a model and then manipulate numbers to various scenarios," said David Hawkins, Facet CEO and president. "Our idea is to extend this familiar tool beyond numeric data to incorporate multi-dimensional rastar and vector images."

Applications for the Facet Spatial Spreadsheet range from client risk analysis to engineering research, pipeline planning, environmental monitoring and economical forecasting. One major customer, Southern California Edison, uses Facet to correlate proposed transmission line routes with public reaction to those plans. The spreadsheet lets managers run different "what-if" scenarios to determine the most optimal approach. Other Facet customers include the National Rivers Association in the United Kingdom, Photon Systems in Calgary, Alberta, and the British Columbia Ministry of Forests.

The Challenge
Like many imaging and analysis tools, the Facet Spatial Spreadsheet is extremely compute-intensive. A typical map, for example, may contain several million elements that all must be recalculated. "When users put the spreadsheet through its paces, they need all the number crunching ability they can get," Hawkins said. "Consequently, most of out customers are at the high-end of the desktop, with about half running SPARCstation 10s.

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