PROTEUS and Eclipse Keep Department of Defense Networks Vigilant

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W ith nearly 80 employees and sales growth worthy of achieving the 2007 Baltimore and Washington DC *SmartCEO Magazine* "*Future 50*" top honor, PROTEUS Technologies of Annapolis Junction, Maryland is one of the 50 fastest growing high-tech firms in the state and one of the 500 fastest in the country.

One of the keys to success for this young software and systems engineering professional services firm is understanding the IT culture of their customers. Another is selecting platforms that allow them to rapidly deliver solutions that integrate well with people and technologies.

A good example of this is PROTEUS' *Common Tools Platform*, a state-of-the-art environment for developing rich graphic applications to monitor the critical processes running in
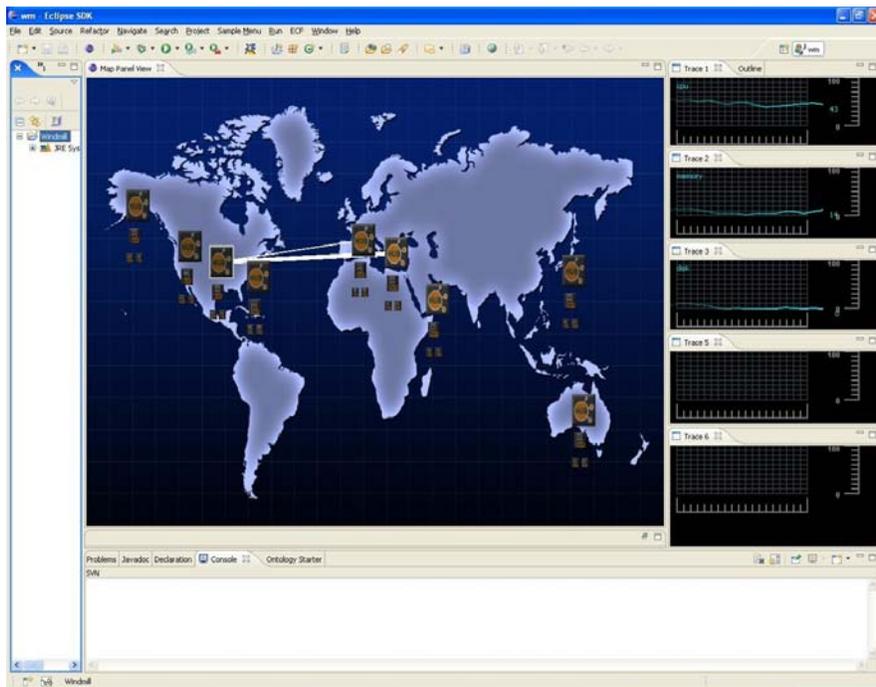
various Department of Defense (DoD) networks.

A Patriotic Vanguard

PROTEUS's founders have many years experience developing network monitoring and display systems for DoD applications, starting with basic hardware monitors in the early '90s. A lot has changed since then. Hardware is a commodity and it is now the applications and data that are interesting to

PROTEUS Technologies' *Common Tools Platform* can be run in a conventional Eclipse RCP and SWT environment by PROTEUS developers using the Eclipse IDE to instrument customized

Network Operations Center (NOC) staff. They want to monitor tens of thousands of processes in real time and be able to quickly see a variety of useful information in an easy to understand format.

James Birchfield, Director of the PROTEUS Mentor-Protégé program, which is an internal technical advancement initiative, explains, "The sheer magnitude of network elements that require monitoring presents two key challenges: the graphics processing power requirement to display them in real time, and presenting health and status data in a way that does not overwhelm the user."

complex data into a simplified format. As Phil Feldman, Senior Graphics Software Developer at PROTEUS, explains "We did a lot of psychological research to work out the best way to make data presentation manageable for the user. Techniques like directed attention displays and contextual zooming to the right details were very important."

That early version had another advantage: by using transparencies, floating windows and other advanced techniques, *Common Tools Platform* displays stand out as the sexiest in any NOC. "The *Common Tools Platform* is very attractive," relates Feldman. "Customers like it, and they tend to look at it more – which is pretty important for monitoring software."

But as successful as the initial J2D-based version was, PROTEUS found that deployment and updates were problematic. And they had no way of allowing customers to develop their own custom views – a critical feature for specialized monitoring in military and intelligence networks.

Once developers have completed their customizations, they can 'wrap' their solutions in the PROTEUS *Common Tools Platform's* presentation manager before deployment.

So when PROTEUS set out to develop the *Common Tools Platform* for the Department of Defense in mid 2006, the challenges were indeed daunting.

They developed an early version in Sun's Java 2D (J2D), which offered hardware graphics acceleration and GUI features that were useful for easing the presentation of

With Eclipse RCP, PROTEUS solved these problems while retaining cross-platform support. As Birchfield explains, "The vast majority of our customers use Eclipse internally, so both functionally and logistically it was the natural choice."

Meeting Expectations

Having delivered a really cool looking application to their clients, PROTEUS knew

that they had set some very high expectations. "We knew that functionally we could do more in Eclipse," said Birchfield. "The challenge was to match the advanced look and feel we had already delivered."

They wrote their own presentation manager for the Standard Widget Toolkit (SWT), which provided them with floating windows, transparencies and other decorative effects. But to really match the look of their earlier version, they needed to disable some standard window manager controls such as split panes. Access to the SWT source code made it straightforward to turn these features off. "Eclipse's licensing and open philosophy were key for us" said Feldman. "Without them we could not have customized SWT as heavily as we needed."

Within three months of starting, PROTEUS ported the *Common Tools Platform* from J2D to Eclipse, including the sexy presentation elements that are so popular with users.

Now, customers have the best of both worlds and developers have access to the traditional Eclipse IDE to monitor their applications as they instrument and test them. Once the developers are satisfied with their work, they can wrap their views up in the visually appealing presentation manager before going 'live'.

Dipping into the Eclipse Palette

PROTEUS made heavy use of other Eclipse projects to provide blocks of core functionality.

They extensively leveraged the Eclipse Communications Framework (ECF) to provide underlying functionality for the platform's communications layer.

The Eclipse Modeling Framework (EMF) helped them ease the process of modeling data as XML schemas which are used heavily by the developers and their customers to drive new views. For example, XSD, the XML Schema Infoset Model provided a ready-made API for DOM-accessible data interrogation and manipulation.

Although the Department of Defense required that the *Common Tools Platform* be compliant with Sun's Java Network Launch Protocol (JNLP), PROTEUS still found plenty of use for the Eclipse Update Manager. "We deliver the software via JNLP" states Birchfield, "but the Update Manager gives us the control we need for customizations and updates."

PROTEUS is not resting on their success. Feldman is looking at improving the graphics performance even further by embedding OpenGL support directly in SWT. And by using BIRT, the Eclipse Business Intelligence Reporting Tools, they may add historical analysis to an upcoming version.

PROTEUS continues to enhance its software and systems engineering services to provide technical excellence in meeting its clients needs. As such, the company anticipates a bright future for the *Common Tools Platform* in some of the most advanced and exotic networks on Earth.

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