Cerner enables Medical Insights with Eclipse RCP

Medical imaging is central to modern health care. From broken bones to cancer, stroke and a wide range of diseases and injuries, technologies such as x-rays, CT scanning, and MRIs give medical practitioners invaluable, non-invasive

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insight for patient treatment. Imaging is so pervasive that a large medical facility can generate roughly 30 million individual images that must be made securely available to teams of diagnosticians, indexed, archived and available for easy retrieval within well organized workflows.
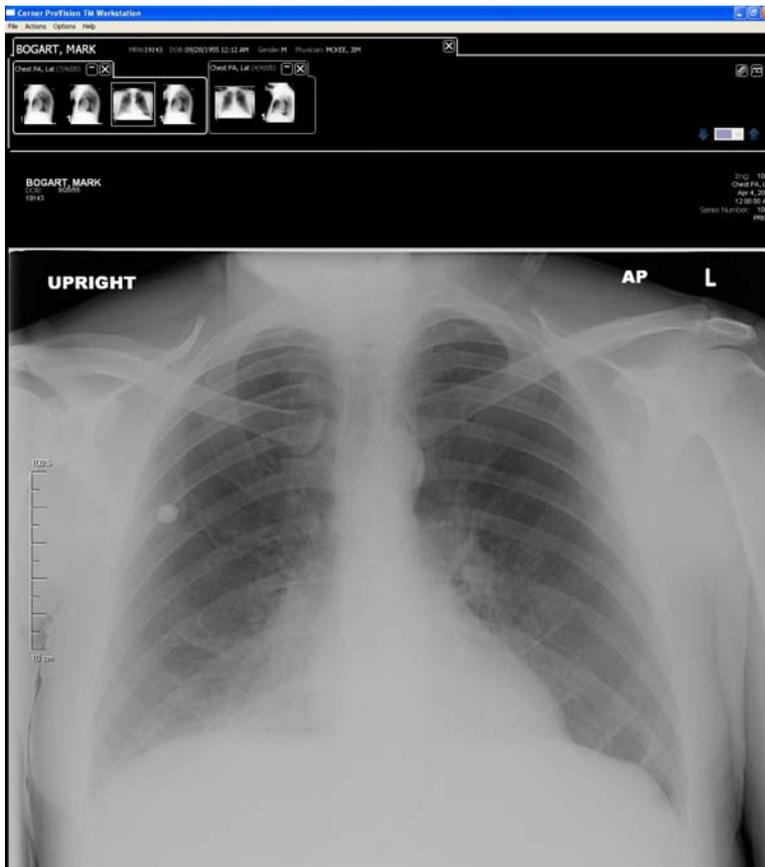
The IT infrastructure to meet these life-and-death requirements has to guarantee extremely robust and reliable delivery and display of images that often exceed a gigabyte in size. Since 1979, Cerner Corporation of Kansas City has been a leading provider of information and business management systems for the health care sector. In 2001 they launched a system to meet the dual challenges of picture archiving and communications (PACS) and radiology information systems (RIS).

A new Face on Imaging

While this legacy system met the stringent requirements of the Food and Drug Administration, and was well received in the market, it was not a long-term

solution. Cerner had licensed distributed viewing capabilities

Radiologists must manipulate very large images with ProVision to make diagnosis. Eclipse's hardware access made this feasible.

from a third party, and, as Nathan Beyer, Senior Software Architect explains, "The complexity of the integration made it challenging to develop and limited future directions. It also had the look of two distinct applications."

By 2005 Cerner had decided to redesign and replace the desktop portion of their product with a seamless solution that would serve their customers' needs for years to come.

Making High Stakes Choices

Like its predecessor, the replacement, called ProVision and released late in 2007, is part of a flexible client-server architecture with image archiving and database storage of associated data on the back-end. Clients

In addition to fitting within this architecture, Cerner had several other requirement. The tool had to meet tough FDA standards for medical devices. The software also has to provide a native OS look and feel; at first on Windows and but also on any other platforms in the future.

Cerner looked at a variety of options, including AWT/Swing, web-based rich internet application (RIA) using AJAX, HTML and a Java applet, and Eclipse RCP. Eclipse clearly came out ahead. As David Duello, Engineering Director, explains, "Only RCP really gave us everything we were looking for, including the native look of Windows and the ability to launch ProVision via Java Web Start, but the maturity of the
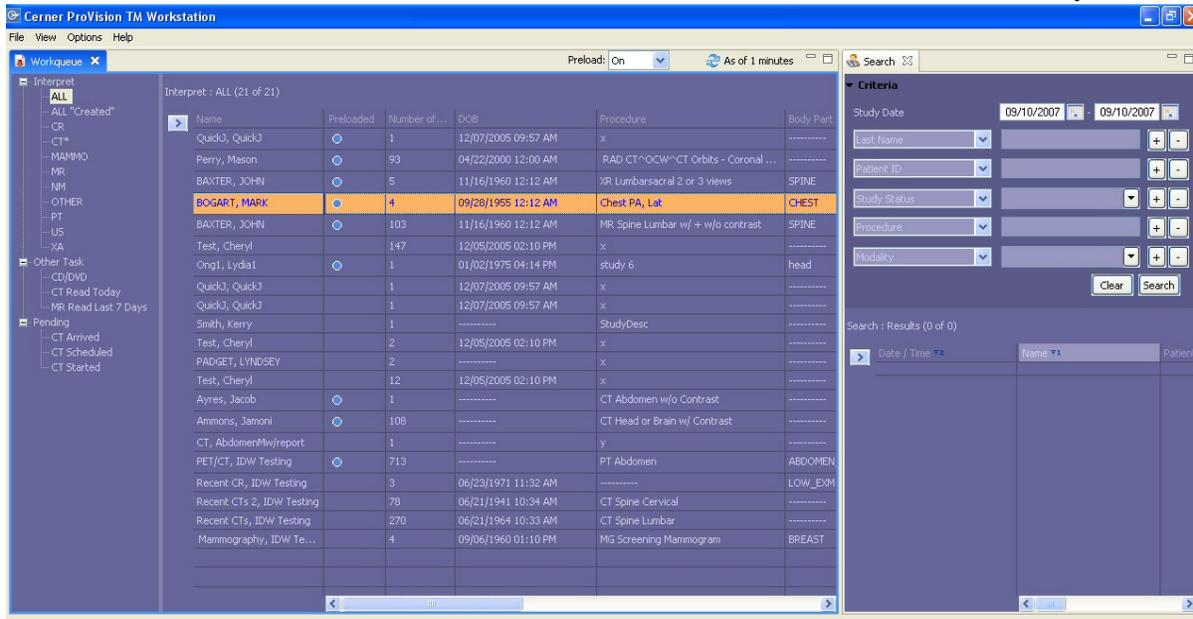
RCP gave Cerner the consistent and familiar Windows look-and-feel customers expected. The low contrast blue-on-blue interface is optimized for dimly lit diagnostics rooms.

communicate securely via HTTPS, allowing diagnosticians to view and work with imagery and other patient information from distributed workstations. These specialized workstations are often customized with multiple high-resolution monitors for viewing images in addition to a conventional monitor for application interaction.

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A case in point - radiologists often need to fine-tune image characteristics to better interpret subtle details, so access to graphics hardware was critical for acceptable performance. RCP gave Cerner's developers

the access they needed to develop this critical feature while easing development of the common functionality a modern application requires.

Building Blocks for Success

Cerner took advantage Eclipse RCP's implementation of the OSGi platform to manage ProVision as a collection of OSGi bundles, manageable units of functionality deployed in JAR files. "We currently deploy about a dozen bundles." relates Beyer, "As we continue to work with Eclipse there will be more."

In addition to the management advantages provided by bundles, Cerner leveraged the Eclipse plug-in architecture, both to take advantage of existing third-party functionality, such as the Subversion plug-in used during development, and to encapsulate and maintain clean boundaries between various parts of the application. In the future, they plan to use plug-ins to facilitate targeted updates.

When they ran into problems supporting multiple developers and testers needing to build and test the application simultaneously, the Eclipse plug-in mechanism, allowed them to integrate with an already familiar Maven 2 build system to achieve consistent and repeatable builds while providing flexibility for multiple users.

SWT, the Standard Widget Toolkit, gave them the native look and feel and performance of a Windows application, while JFace provided useful and time-saving abstraction for GUI development.

Being a large project with over 16 Java developers on two continents, there were come challenges becoming fully productive developing ProVision with Eclipse. It required a significant investment of time and energy for the team to start building an RCP application from scratch. But the wide variety of information available, from quick tutorials, screencasts and other online resources such as the IBM Developer Works site, to articles and full length books, gave Cerner a rich pool of knowledge and experience to dip into.

Cerner has exceeded their development goals for ProVision. The Eclipse Rich Client Platform allowed them to focus on meeting business needs rather than spending time developing underlying functionality. Cerner already has several other Eclipse-based projects on the go, and expect to see even greater efficiencies in the future as they leverage an expanding library of plug-ins across projects. Future plans include expanded use of OSGi bundles, BIRT, the Business Intelligence Reporting Tools, TPTP for testing.

With Eclipse in hand, the prognosis is excellent for Cerner's solutions.

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