National computer grid aids breast cancer screening and diagnosis

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A powerful national computing grid designed to advance breast cancer screening and diagnosis has been established by the University of Pennsylvania. The National Scalable Cluster Project supplements the National Digital Mammography Archive (see http://www.dimag.com/pacsweb/stories/news04090101.shtml).

While the mammography archive is designed to collect and house digital images to assist and improve breast cancer detection and diagnosis, the grid focuses on exploiting parallel networks and distributed processor systems so users can take advantage of such large databases. New models of computing, grids deliver computing power over the Internet the same way an electrical grid conveys electricity. The concept allows geographically distributed sites to share applications, data, and computing resources.

The power of distributed computing is practically unlimited. Last August, for instance, IBM designed the world's most powerful computing grid for a consortium of four U.S. research centers capable of processing 13.6 trillion calculations per second.

Together, the new Penn grid and the mammography archive are expected to enable thousands of hospitals to store mammograms in digital form while providing analytical tools that help clinicians diagnose individual cases as well as identify cancer clusters in the population.

Once a patient's mammograms are loaded into the system, they can be evaluated with powerful tools that isolate abnormalities very quickly by comparing current x-rays with those from previous years, said Robert Hollebeek, Ph.D., director of Penn's National Scalable Cluster Lab. "Traditional film x-rays of individual patients are often scattered among various medical facilities, making them hard to locate when needed," he said. "The grid helps ensure that all of a patient's vital data are provided to authorized physicians quickly, efficiently, and securely."

Hospitals connect to the grid via secure Internet portals that allow authorized physicians to upload, download, and analyze digital images.

The Penn grid is funded by the National Library of Medicine. It is built around a three-tiered architecture that takes advantage of the strengths of server technology as well as open protocols from the Globus Project, a research and development project focused on enabling the application of grid concepts to scientific, engineering, and medical computing.

At the user level, each participating hospital is equipped with a portal consisting of two IBM eServer xSeries systems. One xSeries machine serves as a temporary repository for the digital data, and the other is a link to the next generation of the Internet, called Internet2.

Still in the early stage of deployment, the grid connects hospitals at Penn, University of Chicago, University of North Carolina, and the Sunnybrook and Women's College Hospital in Toronto, although the system is conceptually capable of serving thousands of hospitals.

Disclosures:

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