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Gaps in the Grid

At the Grid Computing Planet conference, it became clear that the emerging grid industry is far from cohesive.

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In the grandest possible implementation, grid protocols could unify all the world's computers into a highly efficient global network, allowing users to tap into vast reserves of processing speed and storage space on an as-needed basis. That vision, however, is far from realization. At the Grid Computing Planet conference held last week in San Jose, representatives from companies like Sun, IBM, and Oracle discussed the many open questions that remain in grid computing.

While all the companies paid tribute to the importance of open standards and collaboration, it became clear that the grid landscape is far from cohesive. "There's not agreement as to what grid computing is, or, quite frankly, what the promise of grid computing is," admitted IBM's Thomas Hawk in an opening keynote. Politics and governance, he suggested, will be "a huge issue going forward...It doesn't do anybody any good to create proprietary alternatives in this space."

"I don't think it's helpful right now that there are so many permutations of what 'Grid' is," chided Ian Baird from Platform Computing. "When I hear companies talking about 'cluster grids,' thousands of 'cluster grids' deployed, I find that not helpful. Clusters are clusters...A grid to us is clusters *upon* clusters."

Rajkumar Buyya from the University of Melbourne outlined the traditional distinctions between clusters and grids. Clusters operate over a local or storage area network; grids run on IP. Clusters have a single owner and a single system image, run on homogeneous nodes, share storage, and enjoy centralized resource management and a global scheduler with full control over nodes. Grids, on the other hand, have multiple owners and run on heterogeneous nodes with distributed resource management and no control over nodes. And because grids run on untrusted nodes, security becomes a much harder problem.

Sun and Oracle, however, dissented from the academic view. "The only difference between a cluster and a grid is that one runs on IP and the other doesn't, and that is it," said Oracle's Geoff Brown.

Peter Jeffcock, marketing manager of Sun's Grid Engine Software division, called the cluster grid an "evolutionary" concept. "What makes it a grid is just software," he said. "You have the software on it that runs these things as a single collection of resources."

The role of web services in the grid computing landscape is similarly hazy. The Open Grid Services Architecture, strongly backed by IBM, is working to build web services into the next Globus Toolkit release. In Hawk's view, web services will provide applications on demand, while grid computing provides resources on demand; and the two sets of protocols should be integrated.

"We think the two are separate," disagreed Brown. "Web services is going to commoditize entry points onto the Grid."

Oracle also adheres to a model of grid computing that's fundamentally at odds with the Globus approach. "We don't believe in distributed databases...Oracle believes in a global centralized image," said Brown. "We believe in centralized data over a slightly distributed database, essentially a cluster." Data and process, he suggested, need to be kept separate in the grid architecture, or grids won't be able to scale up: "It's all about how fast you can access the data. When you have to split and fork, that complicates things considerably."

All the company representatives did agree, however, that simplifying software development within a grid environment is critically important to the adoption of the technology. "Reduced complexity is at the heart of everything we're doing," said Hawk. "We will mask and push that technology to the background, make it begin to disappear."

"My belief is that this is coming much faster than most people realize," Hawk continued. "Jumping in and learning how to swim is a good idea."

And that proposition, for once, met with consensus.