THE CLIPPER GROUP
Captain's Log™
Navigating Information Technology Horizons℠

Published Since 2001 Report #TCG2004087 October 27, 2004

# Grids for Business — Business as Grids

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Most of us, at some point, have worked for a reactive organization that careened from crisis to crisis, throwing employees into various breaches to staunch the calamities that seem to happen far too often. Many of us moved on, as quickly as possible, to more decorous organizations, with detailed job descriptions, where one's time was a more-carefully protected asset. As the economy has faltered, the neatness of these silos of responsibility has become less supportable. Most of us now wear many hats. Our jobs consist of a changing litany of initiative- or project-based responsibilities. Once-permanent jobs have become consulting opportunities, and once-fixed costs now vary with the volume of business activity. These changes, sometimes deplorable at a personal level, have made organizations more supportable through the ebb-and-flow of business cycles. **Organizations also have changed the orientation of business processes from that of *often-unspecified processes that specific people do* to *highly-specified things done by unspecified or optionally-sourced people*. The view of business process has, in essence, become more transactional or, to use a buzzword, more *service-oriented*.**

**This changed focus can make it easier to see opportunities where IT grids can give businesses process a power assist.** As an enterprise works through the articulation and analysis of a business process, often in an effort to find ways that IT can support the process better, the process architecture and potential bottlenecks become visible. However, instead of conscripting people to throw at the problem, you can consider an IT grid architecture.

A look at the enterprise needs spurring recent commercial grid implementations involving IBM will show that grids are being used by enterprises to do more than increase IT resilience, flexibility, and utilization of IT assets. The grid implementations below also optimize business process, and some enable new business processes and new business models. IBM's grid partnerships now go substantially beyond the old subset of grid management players and engineering and design software, though the field has deepened in these areas. The partners now include more enterprise process software, as well as input from IBM Research. The lead partner in an engagement is often the business process application vendor, not a grid hardware or software provider. Here, as in business, tightly specifying the result desired mandates flexibility on the part of the participants.

The IBM customer examples below are an indication of how IBM and its partners have expanded the enterprise territory in which grids can be beneficial, and the way they approach these expanded opportunities.

## Grid as Process Optimizer

These days, process optimization is often a matter of time as well as of scale.

- A grid implementation by **Siemens Mobile**[1] is an optimization of a design and development process. Mobile telephony is a quickly evolving, quality-sensitive, and a massive market opportunity. Impatience reigns supreme. In a centralized environment, the design applications suffered from timing problems and took too long to run. Platform Computing, Inc. of Toronto, Ontario, Canada and IBM deployed a grid on IBM *Linux on Opteron* servers that allowed Siemens to compile faster and iterate more often.

[1] Siemens Information and Mobile Group, a part of Siemens AG of Munich, Germany.

- **Many industries must deal with complexity as part of their process. In these situations, grid architecture can reduce time to completion.**

- **Nippon Steel Solutions (NSSOL),** the technology unit of Nippon Steel Corporation of Tokyo, Japan, is using a grid to accelerate the steel production process. Steel ingots are rolled out as slabs of various dimensions, depending on what is to be done to them next. Their slab design analytics are custom software that was taking too long to run on NSSOL's UNIX servers. By recompiling the application for parallel deployment, and by using the open source *Globus Toolkit* to set up a grid across two locations, Nippon Steel Solutions was able to optimize the production process. In addition, they found in grid an extensible solution that also would work for other production-related applications.

  - **As the cost of holding inventory becomes less tolerable, it is important to be able to tune production more closely to demand.**

While both of these examples are infrastructure solutions to IT problems, they were IT problems that were caused by the demands of business. **Grid computing allowed the infrastructure to become part of the solution, not part of the problem.**

### Grid as Process Backbone

- **NTT Communications** needed to provide the global customers of its Open Communications Network with a reliable quality of service. To do this, it needed to capture the quality of service that was actually received by customers. The company worked with IBM's Research Laboratory in Tokyo to develop a distributed client monitoring system that could unobtrusively track the quality of service that customers received. The feedback from these monitors was then used by Tivoli software to rebalance workloads across NTT's existing server infrastructure to deliver the requisite service at a lower cost. For NTT, providing a reliable quality of service is core to their business.

  - **A grid architecture, together with the end-use quality of service monitor and Tivoli load balancing, let NTT optimize its basic service in a way not before possible.**

- **Yurion**, is a subsidiary of the huge Korean conglomerate ReignCom, which makes the *iRiver* MP3 player and other digital multimedia devices. Yurion had a similar quality-of-service focus, but in this case, the project was to design a digital entertainment channel, *funcake.com*. The objective was to build a system, at relatively modest cost and needing minimal management. The system needed to support at least 100,000 concurrent users accessing content from a repository of over 200 terabytes of data without user-perceived service slowdown. Here, IBM used Linux clusters on *BladeCenters*, *FAStT* storage, and IBM's *xCAT* (Extreme Cluster Administration Toolkit), as well as their *SAN Volume Controller*, *Flash Copy*, and *SAN File System*, to complete the grid solution.

  - **When building a system to support a large, but unanticipatable demand, a grid architecture can give the resilience that is needed.**

**In these cases, the grid architecture was what enabled key process characteristics.** As more enterprises seek to incorporate automatic feedback on customer-side actual service performance, distributed, grid architectures will become more frequently useful.

### Data Grids - Information Access as Process

Avaki Corporation's data integration software plays a critical part in the next two grid implementation examples.

- **Sinopec Corporation**, China's largest producer and marketer of oil products and second largest crude oil producer, needed to share data more easily between different sites in its oil exploration and production operations, while keeping storage utilization acceptably high and its costs under control. The data was accessed by IBM, SGI, and Sun servers. Sinopec's computing infrastructure is heterogeneous and distributed. The inability to share computing power was their primary challenge. In order to share compute power and distributed applications, the sharing of data, in this case seismic data, was necessary. Sinopec asked IBM to create a data grid infrastructure to facilitate access to distributed data that resided in silos across the enterprise. The goal was to reduce issues due to unmanaged file access and repetitive copy operations. There were pockets of underutilized storage to be optimized. To address the challenge, IBM Global Services working with Avaki grid middleware were able to deploy and implement a solution that optimized file access in a distributed and heterogeneous environment. Avaki's Data Grid software running on IBM xSeries was implemented.

- Avaki is also involved with a very recently initiated grid project at the **U.S. Environmental Protection Agency**. The engagement is being lead by CSC. The grid infrastructure includes servers running RedHat Linux and IBM's *Grid Toolbox*. To develop better air quality models, the EPA and state agencies needed a way to share data. Efficient data sharing will improve the air pollutions tracking and abatement for all organizations involved, and will let the information be used in related fields of human health, toxicology, and genomics. A grid architecture was seen as the sensible way to make information broadly and quickly available.

  - ***Data stovepipes*** **are a consequence of the way data has traditionally related to applications (closely) and the way applications have been related to enterprise business units (often by direct ownership). These days, enterprises often need a way to integrate data from disparate sources. Grids are one solution to this enterprise dilemma.**

## Grids - Flexible Elements, Flexible Roles

The variety of roles that grids can play in the enterprise demands that the roles played by vendors of solution components be similarly flexible. In the above examples, IBM played a variety of roles, not all of them central[2]. **Grid is not a *one-size-fits-all* deliverable, but rather one sized and shaped to customer need.**

Who takes the lead role in the implementation will depend on the focus and functionality demanded, as well as customer preference. What *is* important is that the solution be complete. Partnering – fully functional partnering – is needed to enable delivery of a fully integrated solution tailored to the situation. This past June, IBM expanded its Grid partnerships beyond the area of grid software to include more traditional distributed applications - folks such as Citrix, Fluent, Abaqus Sefas, Engineous, Actuate, and Cognos. Now, it has added 10 more software vendors in design (Exa, Cadence, LTSC), financial services and insurance (Searchspace, Axis GGY and Insbridge), IT management (Peregrine Systems and Chordiant), data services (Ascential), and another Grid management player (TurboWorx). These partnerships expand the framework on which enterprises can hang their grid plans.

- **Who you will turn to - for grid - will depend on the sum of your requirements, and how well various vendors can meet them. These days, fulfillment is not just a matter of product offerings, but of the breadth and nature of a vendor's partnerships. The amount of flexibility in the roles that all concerned are willing to take to deliver a solution that meets all of your needs is also important.**

## Conclusion

Consider what grids can do for you, and how you can get what you want on your own terms. The flexibility and reach of IBM may be just what you need.

[2] For a discussion of IBM's approach to its service channel, see The Clipper Group **Navigator**), *Navigating the Service Channel with IGS, (Sept. 12, 2004)* at http://www.clipper.com/research/TCG2004075.pdf.

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