



Toward the Grid—and Beyond

The Fujitsu Group is helping companies make the move to grid technology, and pioneering the infrastructure of tomorrow

“The data center is changing, and CIOs and IT managers need to adopt new strategies for managing it,” says Toshio Morohoshi, president and chief executive officer at Fujitsu Computer Systems Corporation. In particular, he explains, executives constantly have to find ways to control costs and work with limited budgets. At the same time, however, they need to make systems more reliable, flexible, and responsive so that IT can handle changing business requirements and support the innovations that are critical to the success of the business.

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president and chief executive officer, Fujitsu Computer Systems Corporation

The struggle to meet those dual demands is leading many companies to explore grid computing, an emerging approach in which multiple servers, storage systems, and databases are brought together via the network to create a single pool of resources. Those combined systems can then be operated as a coherent whole, making it easier to shift workloads, tap the largely unused capacity typically spread across numerous servers, and keep systems in step with changing business conditions.

“Today’s low-cost modular servers, networked storage, and powerful databases are supplying the infrastructure for grid computing,” explains Morohoshi—and the Fujitsu Group and Oracle are working to help companies take advantage of this new approach. “Grid computing is of strategic importance to the entire Fujitsu Group and the companies we serve,” he says. “Grid architecture components, such as Oracle Database10g on our servers, give customers new options for maximizing IT resources.”

As important as grid computing is, the Fujitsu Group sees it as part of a much

broader vision. “We are focused on creating simpler, more flexible IT infrastructures that are easier to implement and operate, and better able to support the business. Grid computing is a key element in that effort,” says Morohoshi. The Fujitsu Group’s strategy is to provide infrastructures that enable and support consolidation, standardization, the virtualization of resources, the automation of operations, high availability, and the integration of data and systems—and do so in a way that makes things less complex: “Reducing complexity is essential to bringing costs down and increasing responsiveness and efficiency—and ultimately, spending less while doing more.”

A Framework for Flexibility

One result of the focus on flexible infrastructures is SysFrame, the company’s framework for developing and providing autonomous systems. Such systems are designed to be self-managing—sensing and responding to their own conditions automatically, with minimal human intervention, much like a person’s autonomic nervous system regulates breathing without any conscious effort by the person.

With SysFrame, a key element is targeted in the IT cost equation: the expense of operating complex infrastructures. “The majority of IT costs can be attributed to administration efforts such as managing equipment and applications, and maintenance work such as monitoring and troubleshooting,” says Dieter Herzog, vice president of PRIMERGY Products at Fujitsu Siemens Computers. “With the complexity found in the traditional data center, expensive specialists tend more and more to get stuck with routine work.” To help eliminate such costs, the SysFrame initiative is working to provide infrastructures that are:

- **Self-configuring**—defining themselves on the fly and adapting configurations online to meet changing technology and business requirements.
- **Self-optimizing**—optimizing the use of system resources or systems in the enterprise network to meet business and end-user needs, without human intervention.
- **Self-healing**—recognizing and anticipating error conditions and performing repair operations automatically, without interruption to running applications.

THE EVOLVING FUJITSU GROUP

A few months ago, Fujitsu combined its operations in North America. Drawing on the joint resources of Fujitsu PC Corporation, Fujitsu Technology Solutions Inc., and some functions of Fujitsu IT Holdings, the new company, Fujitsu Computer Systems Corporation, gives customers a single point of contact for consistent, high-quality IT infrastructure products and knowledge. Toshio Morohoshi serves as the company’s president and chief executive officer.

Fujitsu Computer Systems Corporation is the newest addition to the Fujitsu Group, a leader in customer-focused IT and communications solutions for the global marketplace. The group’s technologies cover a range of personal and enterprise computing needs—from handhelds, notebooks, and PCs to workstations, servers, mainframes, and storage solutions, as well as a full range of IT services.

The Fujitsu Group serves customers in most regions worldwide: Fujitsu Limited and its subsidiaries cover Japan and Asia Pacific; Fujitsu Siemens Computers focuses on markets in Europe, the Middle East, and Africa; and Fujitsu Computer Systems Corporation operates mainly in North America.

For information about other regions, please visit www.fujitsu.com.

For more information:

- **Fujitsu Limited:** www.fujitsu.com
- **Fujitsu Siemens Computers:** www.fujitsu-siemens.com
- **Fujitsu Computer Systems Corporation:** us.fujitsu.com/computers

Great for the Grid

The Fujitsu Group has a number of offerings designed to help companies create flexible, cost-effective infrastructures:

- **Industry-standard Intel-based PRIMERGY servers and SPARC64®-compliant PRIMEPOWER servers.**

Reliability is built into these servers at the hardware level, with redundancy in many components to eliminate single points of failure. Scalability is also built-in, as PRIMERGY systems support up to 16 processors, while PRIMEPOWER servers scale to 128 processors in a single system. And for enhanced flexibility, Fujitsu offers a capacity-on-demand environment that allows companies to have additional resources preinstalled in a server and then purchase and activate those resources permanently to match growing workloads or temporarily to meet unexpected peaks.

- **PRIMECLUSTER™ technology.** This technology provides a powerful, cost-effective way to link different platforms and to maximize the availability and scalability of the IT



infrastructure. The PRIMECLUSTER product suite offers sophisticated cluster failover management, support for parallel databases, and dynamic load balancing.

- **A full range of IT services.** The Fujitsu Group has the world's third-largest IT services organization, which covers everything from large-scale systems construction to IT and Web integration, strategic planning, system design, operation, maintenance, and support.

- **Self-protecting**—managing access to all resources, protecting against unauthorized access, detecting intrusions, and reporting problems as they occur.

The SysFrame concept covers the entire portfolio of business-critical computing technologies, including PRIMERGY™ Intel-based servers, PRIMEPOWER™ servers based on the Solaris™ Operating Environment, BS2000/OSD mainframes, and storage solutions—as well as desktop and mobile systems. This broad range of technologies allows the company to take a comprehensive approach to delivering flexible infrastructures.

Ultimately, SysFrame aims to have the technology manage the operations of the IT infrastructure. That, in turn, helps ensure that IT professionals spend less time on routine work and more time on strategic, value-adding tasks. SysFrame also provides a solid but flexible platform for consolidation and centralization efforts, data and application integration, and high availability.

Making the Grid Real

Working under the SysFrame banner, Fujitsu Siemens Computers has moved quickly to turn its vision for the flexible infrastructure into reality. FlexFrame™ for mySAP Business

Suite™ is a radical new architecture for mySAP environments running on Oracle databases. It provides a “grid in the box” approach that replaces the traditional systems environment—along with numerous dedicated and complex servers—with a modular approach that incorporates the latest blade server technology.

For application servers, the FlexFrame architecture draws on Fujitsu™ PRIMERGY blade servers, which come with one or two processors. Up to 20 server blades can be included in a single chassis, which requires only three units of rack space. This density enables companies to house up to 300 servers in a single 19-inch rack. The PRIMERGY blade servers can handle different application requirements without any physical conversion and can be easily maintained through remote management.

For database servers, the FlexFrame architecture typically uses high-end four- and eight-way PRIMERGY servers featuring Intel Xeon MP technology. Where systems require very large databases and the highest levels of performance, PRIMEPOWER Solaris-compatible, SPARC®-compliant servers are typically implemented. PRIMEPOWER provides hardware partitioning that allows simultaneous support of multiple test and database servers.

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With FlexFrame, a pool of servers uses a shared central operating system. This makes operating-system provisioning obsolete: New servers can simply be switched on and be up and running immediately with the shared operating system. “For the operating system, installation time is reduced to zero, and configuration is reduced to a minimum,” says Herzog. “Patches and upgrades to the operating system can be tested on a spare server and then released in seconds to all servers on the grid—all without any downtime of production servers.”

FlexFrame also enables the virtualization of server, storage, and application software. That is, companies can install software independent of specific servers, and all servers can run all applications without reconfiguration or reinstallation. As a result, IT personnel can balance workloads with ease and replace a server in a matter of minutes, rather than an entire weekend. FlexFrame lets companies automate a variety of system-management processes and manage the entire pool of resources through a single point of control. The use of standard technologies such as Intel processors and Linux also helps simplify management and keep costs down.

Overall, FlexFrame enables companies to consolidate systems on a single, easily managed platform and reallocate hardware resources on demand to keep pace with changing business demands. And companies do so using an architecture that is already proving itself in real-world operations. For example, FlexFrame for *mySAP Business Suite* runs at Hella KG Hueck & Co., the German auto components supplier. “We were able to effectively counteract rising costs,” says Stefan Osterhage, the company’s CIO. “And the concept also showed us how to handle often-unpredictable IT service requirements.”

“The FlexFrame architecture is up and running at a number of our customer sites,” says Herzog of Fujitsu Siemens Computers. “So, FlexFrame gives Oracle users a clear way to move into grid computing. And with its ability to scale seamlessly from 50 to several thousand users, FlexFrame is suited to a wide variety of customer environments. The Fujitsu Group is the only vendor offering Intel- and SPARC-based hardware for three Oracle platforms: Linux, Windows, and the

RESOURCES

Oracle and Fujitsu

- www.fujitsu-siemens.com/oracle
- www.oracle.com/fujitsu
- www.ftsi.fujitsu.com/services/alliances/oracle.html

Oracle and Grid Computing

- www.oracle.com/solutions/grid

Fujitsu PRIMEPOWER Servers

- www.fujitsu.com/primepower
- www.fujitsu-siemens.com/primepower
- www.ftsi.fujitsu.com/primepower

Fujitsu PRIMERGY Servers

- www.fujitsu.com/primergy
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- www.computers.us.fujitsu.com/www/enterprise_solutions.shtml?PRIMERGY

Solaris Operating Environment. That’s important, given the heterogeneous environments of most companies.”

“With its wide range of powerful server options and grid-oriented architecture, the Fujitsu Group gives Oracle users a strong infrastructure for Oracle Database 10g and Oracle Application Server 10g software,” says Benny Souder, vice president of Distributed Database Development at Oracle. “Oracle and the Fujitsu Group have cooperated for more than 12 years to offer business-critical solutions to enterprises, and we’re now continuing to help customers reduce the time, labor, and cost of IT operations as we move into the world of grid computing.”

“With FlexFrame and SysFrame, we are taking business-critical computing to the next step and helping to ensure that IT supports the business in a challenging and changing world,” says Herzog of Fujitsu Siemens Computers. “This is moving us toward utility computing, where a heterogeneous IT infrastructure can deliver computing power as a service whenever and wherever it’s needed in the organization. From grid technology to the entire infrastructure, we’re focused on providing reliability, flexibility, and high availability so companies can achieve their business goals without worrying about the technology. We want the technology to take care of itself.” •