

A breakthrough for the IT infrastructure

The Fujitsu Group's TRIOLE strategy
can help Oracle users tackle today's
key data center challenges
while building tomorrow's
flexible computer grids



The TRIOLE strategy can help reduce by as much as 70 percent

In business today, the formula for success includes two vital ingredients: constant innovation and ever-increasing speed.

Increasingly, executives look to the IT department to deliver both of those capabilities.

In reality, however, the typical IT department works hard just trying to keep existing systems up and running—leaving little time to explore new approaches. "Data centers find themselves with a complicated array of technologies that have grown up over time and become very difficult to manage," says Richard McCormack, vice president of product and solution marketing for Fujitsu Computer Systems Corporation.

Those hard-to-manage systems are labor-intensive and costly to operate, and major analysts report that some three-quarters of data center staff time is devoted to routine maintenance tasks. Just as troubling, such complex infrastructures impair a company's ability to adapt and compete in a rapidly changing world. "Information technology has the potential to really add value and contribute to business success," says McCormack. "But too often, today's IT departments are running as hard as they can just to stay in place—which means systems are in great danger of being out of sync with the business."

In today's data centers, it is now clear that companies need to make fundamental changes in their approach to enterprise technologies. To help companies make those changes, the Fujitsu Group has created the TRIOLE™ global strategy for developing and deploying optimized IT infrastructures. "With the TRIOLE strategy, companies in general—and Oracle users in particular—can have the products, solutions, services, and expertise needed to tame complex data center technology, move ahead on the road to grid computing,

and create truly autonomic system infrastructures," says Mitsuhiro Hashimoto, senior vice president of Fujitsu Limited's Software Group.

The TRIOLE strategy targets a range of technology challenges facing companies, with the goal of delivering solid benefits to the business. The strategy is designed

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—Chuck Rozwat, executive vice president, Database Server Technologies, Oracle Corporation

to increase *efficiency*, enhance *agility*, and help improve *business continuity* while providing security and safety to the IT infrastructure.

To deliver those benefits, the TRIOLE strategy draws on three core technologies:

- *Virtualization*, which separates business applications and data from hardware resources. This allows companies to pool hardware resources—rather than dedicate servers to applications—and assign those resources to applications as needed.

- *Automation*, which uses computers to manage computers. The automatic adjustment of platforms and infrastructure helps companies keep up with changes in operations and the business environment.

- *Integration*, which uses sophisticated middleware to achieve the fast and seamless integration of existing and new technologies in the IT infrastructure.

The TRIOLE strategy delivers a number of concrete solutions that embody the virtualization, automation, and integration concepts, with technologies that range from servers and networks to storage and middleware. With these solutions, companies can address a number of pressing data center issues—and reduce operational costs for routine activities by as much as

70 percent while enhancing the availability and flexibility of IT resources.

Increasing Availability and Responsiveness

Today, corporations often have large Intel-based server farms running Linux- or Windows-based applications. In terms of up-front investment, these server farms can provide cost-effective scalability—but when problems occur, troubleshooting can be slow and complicated, with various IT specialists having to comb through hardware, operating systems, applications, and networks to find the cause of the problem. As a result, it is often difficult to provide the reliability and availability of critical systems needed to keep the business running.

With the TRIOLE technology's virtualization and automation capabilities, companies can use sophisticated deployment tools to quickly provision any server in the farm with an operating system or application. Its central control center technology can constantly monitor system availability and

operational costs while enhancing IT performance.

automatically trigger corrective actions when there is a problem. These actions are based on predefined rules that essentially embed the knowledge of human experts into the system. For example, if the system detects a failed service, it can begin by restarting that service; if that does not solve the problem, it can then move software from the troubled server to another server.

In this kind of situation, error correction starts immediately, as soon as a problem is identified; companies do not have to wait to marshal a group of specialists. In addition, new servers can easily be added, existing servers can be expanded, and new applications can be brought on—all without disrupting operations. Reaction times are reduced from hours or days to just minutes, downtime is minimized, maintenance costs are kept under control, and overall flexibility is increased.

Making Better Use of Resources

The Fujitsu Group's TRIOLE technology can also help address resource utilization problems that often plague data centers. In many server farms, each application has its own specific server, with each server typically having built-in "safety capacity" to handle peak workloads. As a result, much of the capacity in those systems goes largely unused; analysts report that the average utilization rate of Intel-based servers is

below 15 percent. In essence, companies end up buying a great deal of computing power that they rarely use. That arrangement also tends to reduce flexibility and the ability to respond to changing business conditions. If workloads for a particular application increase, for example, it is difficult to provide more computing resources to that application beyond its dedicated server.

With TRIOLE virtualization and automation technology, on the other hand, the operating system and application are stored centrally, and in essence, every application can be run on every server in the farm. Servers can be provisioned remotely, and it takes only minutes to shift a service from one server to another. Much of the management of workloads can be handled automatically—again, using centralized monitoring and predefined rules. For example, the system can start or stop an application or server to increase or decrease capacity, making it easier to adapt to changes in quality-of-service parameters. Or it can operate autonomously to shift workloads among servers to handle fluctuations in demand without interrupting the operation of systems.

In this type of situation, TRIOLE technologies allow companies to manage multiple servers as a single system. Companies can easily reallocate servers to adapt to changing workloads with increased efficiency—

and without human intervention. This helps improve utilization rates, which translates into a reduced need for servers overall. And it enhances the IT group's ability to respond quickly to new business situations.

Integration for Lower Risk, Greater Agility

Today's IT infrastructures have typically evolved through waves of new business processes, advancing technologies, and organizational changes—leaving companies with a mix of systems from a variety of vendors. Bringing those technologies together is time-consuming and expensive, and modifying a patched-together infrastructure over time can be very difficult. This makes it hard to bring on new, innovative technologies and to keep IT aligned with changing business needs.

The TRIOLE strategy addresses those problems with its integration technologies. For example, its high-performance middleware provides a straightforward way to combine legacy systems and bring on new technologies as they emerge, including mobile and e-business solutions. The TRIOLE approach to integration also includes pre-tested and validated templates that speed up the implementation and integration of systems in multivendor environments.

With TRIOLE integration technologies, companies can reduce the cost and risk

About the Fujitsu Group

The Fujitsu Group is a leader in 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 more information:

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

of integrating legacy systems and implementing new technologies. This protects their investments in existing technologies while their infrastructure evolves. Companies can combine technologies and information to support unified processes across the organization. Plus, with faster implementation of tested configurations, they can take advantage of innovations and support new processes with increased agility.

Combining Technology and Know-How

In addition to sophisticated technologies, the TRIOLE strategy encompasses the knowledge and expertise needed to put those technologies to work. The strategy draws on the Fujitsu Group's five decades of experience in enterprise computing and industry-standard infrastructures, and on its work with industry organizations. The Fujitsu Group is a key member of the Global Grid Forum (GGF), where it is co-chair of the forum's Open Grid Services Architecture (OGSA) working group. Fujitsu Siemens Computers and Oracle have joined other industry leaders to found the Enterprise Grid Alliance (EGA), a consortium that aims to accelerate the deployment of grid computing and help establish clear directions for grid-related industry standards. The Fujitsu Group also co-chairs the Web Services Resource Framework Technical Committee (WSRF-TC) of the Organization for the Advancement of Structured Information Standards (OASIS).

The Fujitsu Group recognizes that building an optimized, adaptive IT infrastructure requires a range of technologies from a range of vendors. As a result, partnering is a key element of the TRIOLE strategy. For example, the Fujitsu Group and Oracle have been working together on a number of grid computing initiatives—and they have found that the TRIOLE strategy and Oracle's grid initiatives are a good fit, with the Fujitsu Group essentially delivering the platform for the consolidated, flexible IT infrastructure, and Oracle addressing the database and applications portions. Among other things, this collaboration has resulted in Fujitsu Group middleware being fully integrated

A global strategy with local delivery

In the past year, the TRIOLE strategy has been rolled out globally to the entire roster of Fujitsu Group companies (see "About the Fujitsu Group" on page S3). These companies are continuing to enhance TRIOLE technologies, solutions, and services with their combined global efforts. In addition, Fujitsu Group companies and affiliates are pursuing their own location-specific activities and offerings related to the TRIOLE strategy.

This combination of global and regional support allows the TRIOLE strategy to leverage the combined resources of the entire Fujitsu Group in delivering the

latest innovations and insight, while giving individual Fujitsu companies the flexibility to stay close to the customer—and deliver solutions designed to meet the varying needs of companies in specific regions.

To find out more about the TRIOLE strategy from both global and regional perspectives, visit:

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

with Oracle Database 10g and Oracle Application Server 10g. "By joining forces, the Fujitsu Group and Oracle are helping companies control complex software architectures, incorporate existing applications into modern systems, and speed up the move toward grid computing and the adaptive infrastructures that are becoming critical to business," says Chuck Rozwat, executive vice president of Database Server Technologies at Oracle Corporation.

With this broad range of efforts, the Fujitsu Group will continue to develop and expand its TRIOLE technologies and knowledge to bring the on-demand utility infrastructure to more and more companies. As it does so, the Group will focus on delivering increasingly powerful technologies for virtualization, automation, and integration—and on helping companies achieve real business benefits with those technologies. "We are working on many fronts in the effort to move toward tomorrow's flexible, adaptive infrastructures," says Dr. Joseph Reger, CTO of Fujitsu Siemens Computers. "Across all these initiatives, we are staying focused on increasing efficiency, agility, and business continuity. Our objectives are clear: reduce IT operating costs and workloads while providing customers with the ability to quickly react to changing business needs." •

Resources

Oracle and Fujitsu

- uc.fujitsu.com/oracle
- www.fujitsu-siemens.com/oracle
- us.fujitsu.com/computers/oracle
- www.oracle.com/partnerships/hw/fujitsugroup

Enterprise Grid Alliance

- www.gridalliance.org

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