National Institute of Advanced Industrial Science and Technology(AIST)

Highly Scalable Mission Critical System Consolidates and Optimizes Entire Business Process on a SPARC Enterprise Platform

Industry	Research Organization
Hardware	UNIX server SPARC Enterprise M8000, M4000 / UNIX server PRIMEPOWER 250 Storage ETERNUS4000 model 500 / Storage ETERNUS NR1000F model F3020 Tape Library ETERNUS LT270
Software	PRIMECLUSTER / Systemwalker Service Quality Coordinator

Requirements

- DB server performance sufficient for future workload growth
- Flexible resource allocation on performance deficiency
- Improvement in business continuity

Solutions

- Even after consolidation of over 30 application systems, the system remains scalable for further workload growth and enhancement.
- Efficiency of server resource use was much improved by swift re-allocation of server resources using partitioning, dynamic reconfiguration and capacity on demand. In addition resources between test and production systems are shared.
- A clustered database system assures operational continuity. In addition the use of the ETERNUS OPC function, makes copying data just a matter of seconds.

"For the mission critical database platform, our primary requirements were performance improvement and business continuity. Another requirement was flexible system expansion adaptable to future system renewal, organizational change, and workload growth."

To optimize its entire business processes and enable agile environmental change, AIST has created a new mission critical system based on its own unique development methodology, Packaged Development Framework. The new system is being prepared for the commencement of over 30 application systems in fiscal year 2009. These services will be provided to around 10,000 employees at AIST. For the mission critical database server, SPARC Enterprise M8000 platforms will be used for their reliability, performance and scalability

◆ **Customer Interviewees**

Mr. Junichi Kubo
Leader, Information System Management team, Tsukuba Advanced Computing Center

Mr. Masahiro Sasaki
Member of the Information System Management team, Tsukuba Advanced Computing Center

Installation Background

Tsukuba Advanced Computing Center supports research and development

In relation to the environmental problems society is facing, the National Institute AIST has been contributing to the challenging work of establishing a global sustainable society. Since its re-organization in April 2001, unifying the National Research Laboratory of Metrology and 15 laboratories of the former Trading and Industrial Ministry, AIST has also been strengthening international competency and the intellectual base in Japan.

Under a joint research framework between Government, Industry and Universities, AIST's fields of Research and Development cover broad areas of investigation, from scientific fundamentals to product research.

Sustaining productivity and efficiency in such broad areas of research requires a common IT infrastructure. The Tsukuba Advanced Computing Center in AIST has been supporting research activities by providing information and computing infrastructure including high speed networks and a research database. The center is also in charge of office IT systems and information security.

By reconstructing its mission critical system, AIST aimed for efficiency and productivity improvements. Experiments, with their new system development methodology, was another purpose.

Project Purpose

A strong research infrastructure

Junichi Kubo, leader of the Information System Management team in the Tsukuba Advanced Computing Center, talks about the reasons for reengineering their mission critical system. "Primarily we purposed strengthening research support by IT system use. We were urged to upgrade our former system due to its performance inefficiencies and obsolescence. Secondly we intended to improve our entire business process efficiency as well as specific business process efficiency. The IT system played an important role in such business process optimization." The resulting new mission critical system has 3 tiers, with Web servers, application servers and database servers. Over 30 application systems including the management of Research and Development results, and ERP systems (accounting, human resource, payments and request/approvals) are also served with around ten thousand employees potential users of this system.

Just their growing workload would have required AIST to optimize their

entire business process. Mr. Kubo talks about a key point in this system reconstruction. "For overall optimization of both business processes and systems a development visualization, under a common framework, was necessary." In preparing such a common development framework, AIST has developed a standard software development methodology and common software; this they call their Packaged Development Framework. Mr. Masahiro Sasaki, a member of the Information System Management team in the Tsukuba Advanced Computing Center talks about the effects of this framework. "Developing under such a common framework raises the visibility of the development process. We can control the system development process by sharing the ideal image for this system with the development team. Such common development frameworks can contribute to shrinking development costs and improving quality."

Unix server
SPARC Enterprise and
Storage ETERNUS

AIST's Packaged Development Framework goal is improvement of organizational activities in public and private institutions. At a first step, in creating the new mission critical system, AIST chose this framework to resolve system problems and raise research efficiency. Obviously the supporting database server at the core of the mission critical system is required to have high scalability as well as high reliability and performance.

Key Installation Points

Business continuity and flexibility are essential

Mr. Sasaki talks about the platform requirement. "Scalability and reliability are essential in a database server. The database platform is required to grow its performance as workloads grow, and is also required to provide high reliability for continuous operation. Another requirement is flexible configuration change that allows swift re-organization in line with business expansion."

In assuring business continuity, various Fujitsu technologies were employed.

- **Hardware partitioning :** Isolating failures in a partition
- **Dynamic Reconfiguration :** Moving resources such as CPUs and memory between partitions according to operational workload changes
- **Capacity on Demand :** Swift resource addition including replacement of failed processors
- **Scalable memory resources**
- **PRIMECLUSTER :** Assured business continuity with efficient server use

Installation Process

SPARC Enterprise supports research and development platform

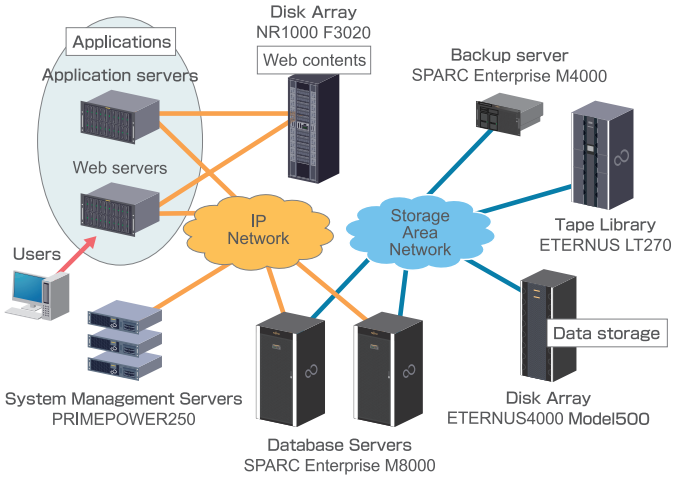
In tendering for the re-construction of the mission critical system with Packaged Development Framework, the Japanese Systems Integrator Mitsubishi Space Software proposed a system using Fujitsu's servers, storage and system management products. Mitsubishi closed the contract for this tender.

Two SPARC Enterprise M8000 servers with PRIMECLUSTER were chosen for the mission critical database server. Each M8000 can accommodate max. 16 systems using hardware partitions and can flexibly change their configuration by CoD and DR functions. A SPARC Enterprise M4000 is used as a backup server. Data can also be swiftly copied using ETERNUS4000 model 500 disk storage, with OPC functions.

Mr. Kubo confidently talks about further development. "We are preparing for commencement of the production system in fiscal year 2009. No major problems were found. We will continue to enhance our Packaged Development Framework as a common development methodology usable with public and business processes. I believe this framework will grow visibility in application development."

Fujitsu will continue to support this mission critical system and AIST's research and development work.

■ System Configuration



Customer Profile

National Institute of Advanced Industrial Science and Technology
AIST

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Established	:	April, 2001
Business details	:	・Research areas: Life sciences, communications,electronics, nano-technology, resources, manufacturing, the environment, energy, geology, metrology ・9research centers nationwide
URL	:	http://www.aist.go.jp/index_en.html

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Published by

Fujitsu Limited

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