Issues
• Deal with processing capacity limitations of existing servers to cope with rapid increase in transaction volume.
• Ensure the high reliability needed to meet the stringent requirements of the securities industry where 24-hour, 365-day operation is a prerequisite.
• Implement a platform with excellent expandability able to deliver high performance reliably over the long term.

Solution
• 4-way server fitted with Intel® Xeon® processor 7500 series

Expected Benefits
• Performance that scales linearly as additional processors are added.
• Ensure overall system reliability, availability, and data security through extensive processor-based support for RAS functions.
• Major cost reductions and greater choice of platforms for mission-critical applications.

High Reliability and High Performance Mandatory Requirements for Securities Industry ASP Service Platform
Nomura Research Institute (NRI) is active in the fields of consulting, financial IT solutions, industrial IT solutions, and IT platform services, supplying a range of services that underpin society, business, and people’s daily lives. Among these, NRI has particular expertise in the field of finance and many of the services established by the company function as part of our financial infrastructure.

NRI is also a trusted participant in the securities industry and its TRADESTAR® Internet securities trading system that it operates as an application service provider (ASP) was created in 2007 as a solution to the rapid increase in on-line share trading. Describing the system, Nobuaki Sako, technical engineer at the Systems Platform Department at NRI, commented that, “as well as being a mission-critical application that demands 24-hour, 365-day operation in an industry that is subject to stringent regulation and currently going through major changes, it is also important that the platform used to deliver the ASP service maintains high performance together with a high level of reliability to ensure data integrity and fault-tolerance.”

As Existing Capacity Approaches its Limits, Attention Turns to Expandability of Latest Processors
Now, however, three years after the service first started, the rapid expansion in trading volumes has brought a several hundredfold increase in transactions and this is confronting the service with a major challenge in the form of looming capacity limitations. “Although we have attempted to upgrade and tune the system in various ways to the extent that maximum performance is now several times that of the initial design, it has become clear that
Combining high performance and reliability with excellent scalability, the Intel® Xeon® processor 7500 series can handle mission-critical applications this does not solve the underlying problem of ensuring scalability," explained Mr. Sako.

This need for a server replacement has coincided with the arrival of the Intel® Xeon® processor 7500 series, which is optimized for core mission-critical computing environments. Already aware of the high performance, reliability, and expandability of the 7500 series, one of NRI’s first steps was to request two vendors to conduct testing of different servers. Based on the new system concept, the configuration chosen to run comparisons with the existing system was an 8-way server fitted with the Intel® Xeon® processor 7500 series, and running Red Hat Enterprise Linux 5.5* together with commercial database software.

**Relationship between Performance Improvement and Number of Processors Tested Under Production Conditions**

The trials reproduced NRI’s production environment on the two vendor systems to perform comparisons with the existing system. Yuka Hirai, technical engineer of NRI’s Systems Platform Department, said, “because the Intel® Xeon® processor 7500 series, can be scaled up to an 8-way configuration (64 cores), our key focus of interest was whether performance would scale linearly with the number of processors. Unfortunately, performing meaningful testing of the 8-way configuration proved impractical because the operating system (OS) was not ready in time, but we were able to record a 1.8 times improvement in maximum performance using a 4-way (32-core) configuration which is the same as the existing system which provided the baseline for the comparison. Not only did the new servers deliver reliable performance, even when subjected to the heavy loads anticipated by our future demand forecasts, we were also able to demonstrate that even the 4-way configuration had sufficient margin to meet our current needs. With progressive enhancements to the OS anticipated, we have high expectations for the 8-way configuration.”

With reliability being a fundamental prerequisite for ensuring stable operation, NRI also undertook a comparison of the more than 20 RAS functions that have been considerably enhanced on the new processor, including automatic error correction and fail-over functions, with the RAS functions of the existing system. They also undertook approximately three months of rigorous testing and evaluation to determine whether they could guarantee the overall reliability and performance of NRI’s entire system, including the OS, servers, storage, middleware, and applications, and whether this could be built into the design.

**Great Potential Foreseen in Unsurpassed Cost-Performance and Wider Choice**

To cope with the rapid growth in transaction volumes and deliver unsurpassed scalability without jeopardizing service continuity, NRI chose 4-way servers fitted with the Intel® Xeon® processor 7500 series, with a view to upgrading to an 8-way configuration in the future. The upgrade project is now underway with the target of commencing full operation in 2011.

While commenting that, “we can expect a dramatic improvement in performance while significantly reducing costs,” Nobuaki Sako also emphasizes the point that, “for a company like ourselves that operates a multi-vendor environment, open x86 servers are a practical option for mission-critical applications and this has the great advantage of opening up a range of options when choosing a platform.” The benefits of the Intel® Xeon® processor 7500 series, do not end with the ongoing growth of the ASP service that is the target of the current reconfiguration project, they also provide a new impetus for improving the overall competitiveness of the business.

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