CASE STUDY

Empowered by Innovation NEC

Revenue Management Solutions

RMS Chooses NEC Itanium Systems for one of the Largest Microsoft SQL Databases in the World

Challenges

- Maintains one of the largest Microsoft® SQL databases in the world – totaling over 50 billion records.
- Ability to process and analyze collected data in a timely and orderly fashion.
- Develops customized applications to enable clients to manage its business intelligence derived from raw data collected.
- Rapid growth in recent years in both domestic markets and expansion overseas.

Solutions

- NEC Express5800 Itanium-based servers
- In 2006, migrated to NEC's dual-core Itanium server running Microsoft SQL Server 2005.
- NEC designed chipset, A3 (A Cube) has been implemented to fully utilize performance improvement from 64-bit Dual-Core Intel® Itanium 2 processor.
- NEC S-Series Storage to support 10 TB of data storage needs

Benefits

- A 500% performance gain with much more reliability with the NEC Itanium platform when compared to the previous 32-bit server deployment.
- Greatly reduced the wait time on raw data cleansing and structuring process. This process that could take months, is now completed within weeks or days.
- Can now deliver the analysis results much faster, which allows the customers to make business decisions in a timely and effective manner.

About RMS

Revenue Management Solutions (RMS) was founded in 1994 to provide statistical modeling and analytical services to the hospitality and retail industries. Its purpose is to model client data using econometric techniques and supply businesses with intelligence around market trends and consumers' behavior that lead to additional revenue and profit so that clients gain a unique competitive advantage.

RMS' core business focuses on data and revenue management, strategic marketing analyses and real estate site selection. RMS has a strong global customer base that is spread across continents, including North America, Asia, and Europe. Its continuous commitment to provide valuable solutions with a high standard of services and professionalism makes RMS an indispensable partner.

The Challenge

RMS maintains one of the largest Microsoft® SQL databases in the world – totaling over 50 billion records. The company collects a huge quantity of data points about each client's business such as item number, selling price, item cost and quantity sold from each location. Also collected is demographic and other commercial data.

In order to provide meaningful intelligence and develop effective pricing strategies, analyze real estate site criteria and aid clients in promotion development and media planning, RMS must be able to process and analyze collected data in a timely and orderly fashion. In addition, RMS develops customized application to enable clients to manage its business intelligence derived from raw data collected.

RMS has experienced rapid growth in recent years in both domestic markets and expansion overseas. John Oakes, VP of IT for RMS, says, "RMS' main advantages over the competition are in two areas – the ability to provide the sophisticated statistical processing clients cannot replicate in-house and the ability to provide cutting edge data management services effectively; from collection, processing and client interface to in-depth analysis and findings. It's absolutely critical to have systems that are secure, reliable, scalable and powerful enough to keep up with our growth."

"RMS chose NEC's Itanium system because it offers reliability, scalability and performance at a price point that no one else could beat…,"

John Oakes,
VP of Information Technology
Revenue Management Services

The Solution

NEC Platform – Single- and Dual-Core Itanium® Servers with NEC Storage

To help support the growing data and processing needs, RMS selected NEC's high-end Express5800 Itanium-based server in 2004. This server utilizes the Microsoft Windows® Server 2003 operating system, SQL Server 2000 and supports up to 512 GB of shared main memory.

RMS saw a 500% performance gain with much more reliability with the NEC Itanium platform when compared to the previous 32-bit server deployment. Two years after the successful deployment of NEC's Itanium server running SQL 2000, RMS needed a platform that could support their need for performance and scalability in a true 64-bit environment and decided to migrate to NEC's dual-core Itanium server running Microsoft SQL Server 2005.

NEC Itanium Server - RAS Features

Mainframe Level

Conventional Open Server Level

PC Server Level

	Reliability	Availability	Serviceability
Center plane	No chipset on the center plan		
Chipset	ECC protection	Dynamic recovery	Hot pluggable
Clock		Duplexed 16 processor domain segmentation	Hot pluggable
Core I/O		Core I/O relief	Hot pluggable
PCI card			Hot pluggable
Memory	ECC protection SDDC Memory	Memory mirroring	
CPU (L3 cache)	Intel Cache Safe Technology		
Power		N + 1 Redundant Two Independent power source	Hot pluggable
HDD		SW & HW RAID	Hot pluggable

(figure-1)

The new dual-core platform, NEC Express5800 Itanium-based server, which is designed to share core architecture with NEC mainframe systems, continues to offer powerful Mainframe-class RAS features that are only available on the NEC platform. RAS features – Reliability, Availability and Serviceability – are designed to deliver a high level of reliability and availability within a single server without clustering, which usually comes with a higher price tag and complex management process (figure-1).

In addition, the NEC designed chipset, A3 (A Cube) has been implemented to fully utilize performance improvement from 64-bit Dual-Core Intel® Itanium 2 processor. A3, the proprietary chipset, implements the VLC (Very Large Cache) architecture which allows cache-to-cache data transfer between multiple CPUs within a cell with low latency. With this architecture, data resides in cache memory and can be accessed directly by bypassing the chipset. A3 also supports dedicated cache coherency interface, called CCI.

When compared to other Non-Uniform Memory Access (NUMA) architectures, CCI has much lower latency for cache-to-cache data transfer between cells. Both VLC architecture and CCI interface are technologies leveraged from NEC's vector supercomputer. It's clear that the NEC Express5800 [single-core or dual-core] Itanium-based server platform offers advanced technologies with exceptional value for businesses that seek higher performance and scalability from the platform.

RMS realizes the benefits NEC's Itanium platform delivers since it greatly reduces the wait time on raw data cleansing and structuring process. This process that could take months, is now completed within weeks or days. RMS is able to deliver the analysis results much faster, which allows the customers to make business decisions in a timely and effective manner.

With the growing volume of data and its impact on business efficiency, RMS has also deployed NEC S-Series Storage to

support 10 TB of data storage needs. The S2500 supports high-speed 4Gbps Fiber Channel host interface and is FC/SATA disk drives installable. With over 40 years of storage history, NEC provides maturity and refinement through its products. S-Series storage provides end-to-end performance and availability that sets NEC apart from the rest of the competition, including:

NEC Storage Differentiators	Value
Self Diagnosing HDDs & On-Line Spares	Better Reliability
RAID-6 Double Parity	Better Reliability
4Gbps FE	Fast Front End/Host Connectivity
FC/SATA Mix for Integrated, Tiered Storage	Better Value
N + 1 components	Non-Disruptive Upgrades, (ALL) Field Replaceable and Hot-Swappable
Mirrored Cache	Active/Active controllers with shared cache for High Availability
Dynamic Pooling/Provisioning	Non-Disruptive storage growth to the host for High Availability
Reallocation Control	Ability to re-provision storage for Greater Flexibility
Large cache up to 16 MB Cache	Equates to Better Performance

64-bit SQL Server 2000 and native 64-bit architecture SQL 2005

RMS previously deployed Microsoft SQL Server 2000 on NEC's single-core Express5800 Itanium-based server. The purpose was to create a powerful, consolidated environment to reduce management costs and deployment time of new Microsoft applications. With the release of Microsoft SQL Server 2005, RMS can fully leverage the native 64-bit architecture in SQL Server 2005 and take advantage of the powerful business intelligence features it offers - analysis services, data mining and reporting services that are critical to RMS' everyday needs.

Using NEC technology as the underlying foundation while running Microsoft SQL Server 2005, RMS quickly realized that this is the most efficient, reliable and powerful environment to address any customer requirements, as well as growing its business.

The Results

The results delivered by the NEC Express5800 Itanium-based server combined with Microsoft SQL Server were impressive. RMS is developing all of its customized database applications and tools on the NEC/Microsoft platform with enterprise-level performance and reliability. It is also able to simplify the overall IT infrastructure to reduce costs while increasing productivity.

Ultimately, RMS is able to utilize the power of 64-bit to better serve its customers, which in turn contributes to the bottom line for both RMS and its client base.

John Oakes further states, "RMS chose NEC's Itanium system because it offers reliability, scalability and performance at a price point that no one else could beat. We are extremely satisfied with not only NEC's products but also the professionalism demonstrated through their support and services teams. NEC is a name we can trust."

Moving forward, RMS will continue to rely on NEC technology to support its IT infrastructure backbone. It is a fruitful partnership that has positive long-term impact on both parties and respective customer bases.

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