



High-performance commerce data center is the engine for Thai economic growth

SOLUTION SUMMARY

Challenge

At the dawn of the twenty-first century, the Kingdom of Thailand is poised for change. The end of the last century saw the adoption of a new constitution in an effort to improve political stability. At the same time, Thailand's economy—for decades one of the fastest growing in the world—was battered by the Asian financial crisis of 1997-98. Softening global markets and extensive international debt has slowed economic recovery. But with a new parliament and a Prime Minister who brings a mandate to create a new, more modern government, Thailand is focusing national efforts on renewed economic growth as the engine to political, economic, and social stability. Today, the centerpiece of that effort is the new data center for the Ministry of Commerce (MOC), the government department that is responsible for developing business and trade.

Solution

Within the first year of the new administration, the Ministry of Commerce, under Minister Adisai Photharamik, planned a brand-new government trade data center, built from the ground up to support Thailand's economic recovery. New Technology Information (NTI), an Intel® Premier Provider, built seven high-density rack servers based on the high-performance Intel® Xeon™ processor and the Intel® Server Board SE7500WV2. The system powers database, web, e-mail, networking, and streaming video servers that support the Ministry, its operations throughout Thailand's seventy-six provinces, interfaces to the Prime Minister's Operation Center, and Thai trade offices worldwide. NTI provided complete hardware, software, networking, and training support for this high-profile project.

Value

The Ministry of Commerce data center is the centerpiece of the new Thai government's push for economic growth with a "dual track" policy that is aimed at simultaneously strengthening the internal economy and exports. The new Intel-based data center provides a clearinghouse for real-time trade and economic information across the country's 76 provinces, as well as its worldwide trade offices. Since becoming operational in July 2003, the new system supports as many as 2,000 concurrent connections and 5,000 transactions per minute.

Hardware

The Thai Ministry of Commerce data center is based on seven high-density Intel servers. Each server consists of a rack-optimized Intel® Server Chassis SR2300, Intel Server Board SE7500WV2 with dual Intel Xeon 2.0 GHz processors, Intel® RAID Controller SRCMRU, and an Intel® PRO/100 S Server Adapter.

Software

The data center Web server and streaming video server run on Microsoft Windows® 2000 server. Microsoft Exchange server and Microsoft SQL Server 2000 power e-mail and database management. Firewall and proxy support is provided by Microsoft ISA® server. Network management is provided by Hewlett-Packard OpenView® software.

Data Protection

The Intel RAID (redundant array of independent disks) Controller SRCMRU is a zero channel, cost-effective RAID solution that ensures the high-density rack-mount servers' availability and reliability around the clock. In the event of a disk drive failure, the RAID controller automatically ensures that the server continues to operate.

Challenge

A KINGDOM AT STAKE

The Kingdom of Thailand enjoyed phenomenal economic growth throughout much of the late twentieth century. From 1985-95, Thailand had the world's highest economic growth rate – nearly nine percent annually. This growth crashed to a halt with the Asian financial crisis of 1997-98, when financial market instability and banking problems led to the collapse of the baht, Thailand's national currency. The economy contracted by more than ten percent that year, to enter a period of slow recovery that was fueled largely by exports.

In February 2001, Thaksin Chinnawat, an astute businessman and successful cellular phone industry executive, became Prime Minister of Thailand. Prime Minister Thaksin brings a CEO management style that is based on his success in business and extensive background in information technology. Within the constitutional monarchy of this traditional Southeast Asian country, Prime Minister Thaksin is creating a more modern, businesslike Thai government.

terrorism, and the war in the Middle East have dampened Thailand's exports. In order to increase exports and reestablish Thailand as a strong presence in world markets, Thai businesses need round-the-clock access to real-time data on domestic and international market trends, commodities pricing, and business partners.

"Since the economic crisis in 1997, the government had to change in order to increase competitiveness," said Kavee Rauyrueen, Chief Information Officer of the Ministry of Commerce. "The information of internal and external trade and other necessary statistical data for business analysis is critical for the MOC to feed to all ministers and the Prime Minister."

The MOC's fifteen-year-old data center wasn't up to the task. It was time for a new data center, built to give Thai exporters and businesses real-time data that allows them to react efficiently and effectively to take advantage of market trends.

Solution

NEW GOVERNMENT WASTES NO TIME

Prime Minister Thaksin and his ministers came into office in early 2001. Losing no time, the MOC data center project was initiated in the fourth quarter of that year. The ministry chose New Technology Information Co., Ltd. (NTI), an Intel Premier Provider, to develop the new data center. Design and procurement were complete by the end of 2002 and the system's pilot test was completed in March of the next year. The new data center was completely operational in July 2003.

New Technology Information provides full turnkey solutions for government and educational segments. Project managers were Amnat Srisombut, general manager of NTI, and Sisadee Runsiri, R&D director of the Ministry of Commerce.

BRAND-NEW DATA CENTER PRESENTS NUMEROUS TECHNICAL CHALLENGES

The project presented numerous challenges. This was a brand-new system being installed in a new building. The system needed to be designed to consolidate all distributed systems while maintaining strict security protocols for sensitive data.

Nine departments within the Ministry of Commerce use the data center, with as many as three hundred client computers in each department. In addition, Ministry of Commerce offices throughout Thailand's 76 provinces are connected to the data center. The project also includes extended arms of the MOC, the Thai trade offices located throughout North America and Europe. These offices, similar to US foreign commercial services offices, promote Thai exports, match foreign companies with Thai companies, and develop information on export markets for Thai businesses. Data from all of these sources is fed into the MOC data center and updated constantly for real-time worldwide market data.

The MOC data center also serves the transactions of the "One Tambon, One Product" (OTOP) policy. This is a government economic stimulation policy that helps rural Thai districts (tambons) promote and export local products to worldwide markets.

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Under Prime Minister Thaksin, Thailand's national efforts are focused on renewed economic growth as the engine to political, economic, and social stability. The centerpiece for these efforts is the Ministry of Commerce (MOC), the government department that is responsible for developing Thai business and trade. Minister of Commerce Adisai Photharamik was given the challenge of developing a new MOC data center. The new data center provides up-to-date trade information to support the administration's

"dual track" policy that is aimed at strengthening the internal economy simultaneously with exports.

THAILAND'S TRADE CHALLENGES

Situated on the Malay Peninsula in Southeast Asia, Thailand has roughly the same land area and population as France. The country is rich in natural resources and has a growing industrial base. Major exports include computers and parts, integrated circuits, textiles, and rice, and the kingdom is the world's second-largest producer of tungsten and the third-largest producer of tin. Thailand is one of few net exporters of agricultural products in the world.

Thai economists estimate that the country needs sustained economic growth of at least five percent over several years in order to service its public debt. While domestic consumption and property values have strengthened, the global recession,

A web site set up by the government offers thousands of products online and enables buyers to contact vendors directly.

The data center design involved not only the hardware system, but also the network infrastructure, both intranet and Internet. The intranet link to other offices in 76 provinces is 512 Kbps, and the link to the Internet is 1 Mbps (with plans to upgrade to 34/4 Mbps for both domestic and international by October 2003). The high-speed link is needed to serve transactions such as internal business reporting, videoconferencing, online company registration, online intellectual property registration, and internal trade transactions. While remote offices outside Thailand currently connect to the data center via the Internet, the MOC plans to implement a virtual private network (VPN) in 2004 to support high-speed connection to the MOC intranet.

While developing the hardware and software, NTI also developed training materials for the system administrators who operate the system.

“This was a brand-new implementation from start to finish,” said Amnat Srisombut, general manager of NTI. “With the nation’s attention on the results, it was important to implement high-performance, fail-safe hardware and software. New Web and server applications required the highest CPU performance and security protocols. In addition, expectations were high to provide results quickly as this was the first of a series of expected information technology projects throughout the Thai government. Intel Server Products ideally fit the bill.”

INTEL SERVER PRODUCTS MEET THE DEMANDS FOR RELIABILITY AND PERFORMANCE

NTI assembled a data center built around seven Intel rack servers. The data center includes servers for network management, firewall, proxy, mail, and streaming video, and two database servers. For the reliability, stability, and performance required to serve up to 2,000 concurrent transactions, each rack is based on the Intel Server Board SE7500WV2, a high-density, rack-mount server that features two Intel Xeon 2.0 GHz processors in a 2U chassis. The Intel Server Chassis SR2300 gave the ministry multiple storage options and power configurations, and easily supported the six hot-swappable 36GB hard drives and a hot-swappable redundant power supply required for reliability. The SR2300 is a high-quality chassis ideal for a high-demand rack environment through such features as embedded Intel® Server Management, hot-swap drives and power, Intel® Light Guided Diagnostics, and Intel® Active Airflow Control.

The two database servers include six 40/80GB tape backup units, while the other servers include an onboard Intel RAID Controller for data protection and manageability. Intel products ideally met the MOC’s requirements for a cost-effective RAID solution. The Intel RAID Controller SRCMRU is designed specifically for the Intel Server Board SE7500WV2 and provides the highest possible reliability and integration. Combined with the latest in I/O processing

power, the new architecture of the Intel RAID controller delivers more features, increased stability and ease of use, simple installation, and improved performance.

The database and application servers reside in a two-node cluster with a 216GB hard disk. Clients access most data from this cluster, which also links to the Web server. Stand-alone servers provide mail, proxy, firewall, streaming video, and network management services.

The data center’s firewall and proxy servers rely on the Intel PRO/100 S Server Adapter to reduce bottlenecks and improve availability and security. The Intel PRO/100 S Server Adapter offloads IPSec encryption/decryption, which conserves CPU resources for greater network performance. The adapter provides the highest level of encryption widely available to protect data traveling on the network, and is optimized for Microsoft Windows 2000 Server.

The Intel® SMaRT (Server Maintenance and Reference Training) Tool was an invaluable asset for the Ministry of Commerce team, as it’s integrated with Intel Server Management, allowing network administrators to monitor the servers and easily identify and correct problems before they become critical.

THE RESULTS SPEAK FOR THEMSELVES

The successful data center now provides a central database for all trade-related data, including information on international and domestic markets, company information, partnerships, registration, government regulations, etc. The center also provides high-speed, secure Internet access for the Ministry. The streaming server is used for video broadcast and training systems. The database also supports the Web site for the Ministry of Commerce, which provides public online registration services, video broadcasting for MOC activities, and other public statistical data.

With the new Ministry of Commerce data center, government ministries and businesses can check the status of commodities, the economy, and export promotions; research and develop contacts with overseas businesses and commercial offices; and analyze ways to expand their businesses. Information is available on demand via the Web.

The implementation of Intel Server Products let the Ministry of Commerce consolidate information into a single data center within its limited space and budget, and offered exceptional flexibility for access while still ensuring proper security policies. The

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deployment was critical—the deadline was tight and the solution was new to all the staff. In addition, this solution was highly visible. The MOC relied heavily on NTI for a smooth implementation. Although the MOC's new data center has only been actively online since July 2003, employees are already providing positive feedback on the improved system response time.

“With the new data center, ministry employees feel the touch of the next generation in their work,” said Kavee Rauyruen, Chief Information Officer of the Ministry of Commerce. “They now have real-time data from a single point, improved registration services (trademark, intellectual property, company name, etc.) through the Internet, and the enhanced communication of video conferencing.”

NTI worked with the MOC from ground zero. NTI offered a complete, professional solution that included networking, hardware, software, and training support. The fact that NTI was an IPP and Microsoft certified strongly influenced the MOC's decision.

With only a few months at full implementation, the system has already seen success, along with a dramatic rise in Thai exports and imports.

FUTURE PROJECTS

The Ministry of Commerce data center is a flagship project, providing the latest Intel technology and tools to support Thailand's economic recovery. Going forward, the Prime Minister's Operation Center (PMOC) will be the central repository from which the Prime Minister will operate the country, with data collected and analyzed from operation centers in all 26

government ministries. The PMOC is currently in a pilot run with test connections to four ministries including the Ministry of Commerce. The pilot server at the PMOC also uses Intel Server Products with the same configuration as the MOC data center. By the end of 2003, all ministries will be connected and feeding data to the PMOC.

LESSONS LEARNED

- **The design and deployment of the successful Ministry of Commerce data center will act as a model for other ministry data centers. The system will be the reference design for other ministries to replicate.**
- **Intel Server Products are ideally meeting the performance, reliability and cost requirements for the MOC project. These highly scalable and integrated products allow for enormous design flexibility, making them ideal for projects throughout other ministries.**
- **Working with an Intel Premier Provider such as NTI was a key success factor for this project. NTI provided critical training, access to technical expertise, and professionalism in project management to ensure that this high-profile project exceeded expectations.**

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