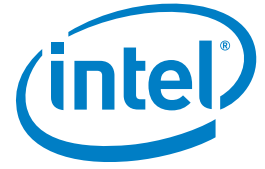


CASE STUDY

Intel® Xeon® Processor 5600 Series

Virtualization: Dynamic Resource Management

Cloud Computing



Enhancing Data Centers for Cloud Computing Services

TCC Technology goes for an open, standards-based platform with Intel® Xeon® processor to strengthen its cloud computing services



TCC
TECHNOLOGY

TCC Technology is a carrier neutral provider of commercial managed hosting and data center services designed to meet the needs of organizations looking to outsource their IT hosting requirements.

CHALLENGES

- **Extend service capabilities.** Expand its leadership role in industry by embracing the latest technologies and standards that enhance the company's service offerings.
- **Improve infrastructure efficiency.** Provide a solid foundation for virtualization technology, rapid provisioning, and optimal use of all computing resources.
- **Reduce operational costs.** Lower total cost of operations (TCO) and reduce capital expenditures and data center operational costs.

SOLUTIONS

- **Migrate fully to an open, standards-based environment.** Support an IT strategic move to an open standards environment based on x86 architecture and migrate applications from existing RISC-based systems to Intel® processor-based systems.
- **Use the latest Intel® Xeon® processor-based servers.** Scale-up the data center server infrastructure with Intel® Xeon® processor 5500 and 5600 series¹.

As a leading technology services provider and member of the Asia Data Center Alliance, TCC Technology (TCCT) delivers hosting and data center services designed to meet its customers' most stringent requirements. Services delivery is managed by the company's two world-class data centers located in downtown Bangkok and the city's eastern suburbs. Delivering first-class services requires maximizing efficiencies in its data centers' operations. With this in mind, TCCT embarked on a move to consolidate its server infrastructure to embrace an open standards technology-based environment and move its RISC-based applications over to run on the latest Intel® Xeon® processor 5600 series platform.

Embracing the Intel® Xeon® processor enabled TCC Technology to consolidate on an open, standards-based platform to deliver flexibility of resources, performance, and service agility to its private and public cloud customers



“We have made a decision to walk away from a proprietary to an open system in order to reduce costs and mitigate dependency risk.”

Kosit Suksingha
Managing Director
TCC Technology

Assessing the situation

The IT infrastructure in the data center plays an important role in data and application hosting services for TCCT. Delivering cloud computing services is a major function of TCCT’s data centers. These services cover a wide range of applications, including enterprise resource planning (ERP), messaging and email, warehouse management, unified communications and collaboration, and even medical imaging services.

“We have been running a cloud-like business for the past nine years,” says Kosit Suksingha, TCCT’s managing director. “We started with private cloud services for large enterprise customers and have moved to offer public services which provide more affordable solutions targeted at medium businesses, maximizing our strong presence in premium data center and the technical real estate business.”

TCCT’s data centers contained a mix of both RISC-based and x86 processor-based platforms. While these had served the company well, there was a growing need to consolidate into a singular platform architecture. Managing and operating disparate systems would become a liability to the company in the future as it sought to further develop its cloud computing services. Apart from the costs involved with maintaining different system platforms, cloud services require a highly scalable architecture with rapid provisioning and dynamic resource management.

TCCT’s challenge was to ensure that its platform choice could fulfill three goals:

- **Lower TCO** of its computing resources with the group, with reduced capital expenditure and operational costs for the data centers.
- **Improve performance and efficiency** in the data centers through technologies that provide strong support for virtualization and green IT.
- **Provide flexibility and scalability** of resources to enable TCCT to meet customers’ needs with the capability to easily scale their investments to meet evolving needs.

Reducing costs through green IT

While going green is the epitome of being a good corporate citizen, being environmentally responsible is also tied to realistic issues such as operational costs and space in terms of server footprint. “We need to consider the growing public sentiment for energy efficiency and increasing concern among today’s IT executives that energy cost will play an even more important role in future business,” says Kosit. Improving data center energy efficiency is becoming a fundamental requirement in most organizations, not only to contain operating costs, but also to support growth, extend the life of existing facilities, protect the environment, and address increasing regulatory requirements.

According to Gartner⁴ research, “Going green is about more than just ‘political correctness’; it also can have a tremendous, positive effect on business pressures to lower the overall cost of computing.” Energy costs will become an increasingly significant component of IT budgets and an increasingly tough challenge for organizations as they work to grow their computing capabilities and contain costs.

Basically, there are two ways to increase data center energy efficiency: reducing energy consumption and improving cooling efficiency. In most cases, it is more effective and less costly to reduce consumption. This approach delivers savings both directly, through lower consumption, and indirectly, by generating less heat and therefore reducing the load on the cooling infrastructure.

The Intel® Xeon® processor 5600 series-based solution

“We have made a decision to walk away from a proprietary system to an open system in order to reduce costs and mitigate dependency risk as part of our dynamic data center program,” says Kosit.

TCCT selected the latest Intel® Xeon® processor 5600 series as the basis for its new server platform to provide the infrastructure, authentication, billing, application, and database servers. The new platform incorporates high performance with the energy-efficient

benefits of 32nm silicon technology and advanced power state management. This enables TCCT to increase its total computing performance with no significant increase in power and cooling requirements. The open, standards-based architecture of the new platform freed TCCT from its dependency on proprietary hardware systems. This meant TCCT had greater freedom of choice and could benefit from the wide range of configurations and vendors.

With cloud computing being a key driver of TCCT’s business, the company uses virtualization technology heavily in its data centers to efficiently manage and deliver its cloud services. One of the key benefits in using the Intel® Xeon® processor is that Intel® Virtualization Technology2 (Intel® VT) is built into the processor. Virtualization software can take advantage of this hardware-based virtualization technology to boost performance even more and with higher reliability and stability. Intel® Xeon® processor 5600 series with next-generation Intel® VT enhances virtualization performance by up to 3.5x and reduces roundtrip virtualization latency by up to 2x.³

TCCT’s Managed Hosting solution runs on both RedHat Enterprise Linux (5)* and Microsoft Windows Server 2008 R2* operating systems. Virtualization software includes VMware vSphere 4*,

RedHat Virtualization and Microsoft HyperV*. Another area of concern for TCCT was security, including data integrity, data recovery, privacy, and related legal issues such as regulatory compliance. Moreover, cloud services bring the additional challenge of multi-tenancy.

“There is a need to manage customers’ feelings of being shared as well as their security concern,” explains Kosit with regards to its outsourced services. “Currently, TCCT has extensive conventional security controls in place.” TCCT’s new platform design enhances the company’s existing security controls through new security features to help secure data by speeding up data encryption and protecting against software attacks at launch. The new processor incorporates Intel® AES New Instructions (Intel® AES-NI), which TCCT believes will benefit its security posture to further develop its cloud services. Intel AES-NI improves processor performance for encryption for secure Internet transactions and allows for broader use of encryption throughout the data center.

“We wish to build on our existing security infrastructure with platform benefits such as Intel AES-NI for accelerated data encryption and data transport over encrypted connections,” adds Kosit.



Controlling power usage is an important consideration factor for TCCT, since it directly ties into the operating costs of its data centers. Intel® Xeon® processors 5500 and 5600 series automatically regulate power consumption and intelligently adjust server performance according to application needs, maximizing both energy efficiency and performance. Processors are automatically put into the lowest available power state that meets current workloads. Individual idling cores can reduce their power states to near-zero independent of other operating cores. This feature alone can significantly reduce server idle power consumption and effectively help TCCT reduce its power and cooling requirements in the data centers and promote green IT.

THE RIGHT DECISION

TCCT is now scaling up its data centers with new servers based on the Intel® Xeon® processor 5600 series as part of its roadmap for cloud services for both internal corporate enterprise and public services.

As part of this scaling-out plan, TCCT will launch several cloud initiatives within the year. The company is convinced that its decision is the right one for TCCT's future and will help it achieve its stated goals that include lowering TCO and reducing capital expenditures and operation costs in its data centers.

"We strongly believe that by embracing an open technology standard and extending our (cloud) service capabilities with our partners, we will not only solidify our leading role in current infrastructure business, but also secure our position in the future through a new and even more flexible alternative for customers to drive more corporate efficiency using our advanced technological infrastructure," declares Kosit.

Find a solution that is right for your organization. Contact your Intel representative or visit the Reference Room at www.intel.com/references

¹ 64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. Consult with your system vendor for more information.

² Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain platform software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

³ Performance results on VMmark benchmark. Intel® Xeon® processor X5470 data based on published results for HP ProLiant ML370 G5 server platform with Intel® Xeon® processors X5470 3.33 GHz, 2x6 MB L2 cache, 1333 MHz FSB, 48 GB memory, VMware ESX® V3.5.0 Update 3 Published at 9.15@ 7 tiles vs. Intel reference platform using two Intel Xeon processors X5680 (12 M Cache, 3.33 GHz, 6.40 GT/s Intel® QPI), 96 GB memory (12x 8 GB DDR3-800 Reg ECC DIMMs), VMware ESX® V4.0 Update 1. Performance measured at 32.25@ 26 tiles. Roundtrip latency for the different CPU generations based on internal Intel CPU architectural assessments for Intel® Xeon® processor 5600 series (Nehalem) relative to Intel® Xeon® processor 5400 series (Penryn).

⁴ No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology is a security technology under development by Intel and requires for operation a computer with Intel® Virtualization Technology, an Intel Trusted Execution Technology-enabled processor, chipset, BIOS, Authenticated Code Modules, and an Intel or other compatible measured virtual machine monitor. In addition, Intel Trusted Execution Technology requires the system to contain a TPMv1.2 as defined by the Trusted Computing Group and specific software for some uses. See <http://www.intel.com/technology/security> for more information.

⁵ Source: Data Centre Conference: Day 4 Highlights the 'Greening' of Data Centres, by John R. Phelps and Mike Chuba, November 30, 2007, Gartner, Inc., ID Number G00153658.

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