Technology Evaluation Case Study

Intel® Xeon® Processor
Service Providers
Service Delivery Infrastructure

Building the Data Center of the Future

China Telecom looks at the advantages of Quad-Core Intel® Xeon® processor E7350 for its data center

Company:	China Telecom (CTC) is the largest fixed service telecommunications provider in the People's Republic of China.
Product evaluated:	Quad-Core Intel® Xeon® processor[1] E7350.
Challenge:	CTC servers occupy much space in its data center and are difficult to manage with non-uniform server utilization.The telco needs to consolidate its services and reduce its number of servers in order to save more rack space.
Results:	Servers based on Quad-Core Intel® Xeon® processor E7350 come with hardware-enhanced Intel Virtualization Technology (VT), which allows CTC to make full use of virtualization solutions such as VMware* to consolidate and efficiently manage a lesser number of servers while improving overall system utilization rate.
Impact:	Quad-Core Intel® Xeon® processor 7300 series and Intel VT allows CTC to customize a robust server solution that can deliver a smaller server footprint while making full use of existing server resources.
Next steps:	With the conclusion of the technology evaluation, CTC aims to move into further testing of the advanced features of Quad-Core Intel® Xeon® processor 7300 series as it awaits the next acquisition cycle.

"Quad-Core Intel® Xeon® processor E7350 allows CTC to explore exciting virtualization possibilities as we prepare to gear up for greater data center performance."

Shi Yirong
Deputy Director
Enterprise Information Verification Lab
China Telecom Group, Shanghai Co., Ltd.

Challenge: Maximize use of system resources and minimize sever footprint

As the largest fixed service telecommunications provider in the People's Republic of China, China Telecom's main businesses include operating numerous domestic and international fixed line telecom networks.

With such massive operations, CTC naturally runs an equally impressive scale of backend IT infrastructure in order to ensure the smooth functions of its business.

However as its operations continue to grow, CTC found that its number of servers is fast outstripping available space in its data center.

CTC needed to look into a new server solution that can not only save space in its data center, but also improve overall server utilization rate to maximize its overall server efficiency and productivity, allowing it to sense, predict and act on IT demands at short notice.

Technology Evaluation: Quad-Core Intel® Xeon® processor E7350

Turning to Intel for answers, CTC began to look into the benefits offered by the Quad-Core Intel® Xeon® processor 7300 series.

Multi-processor platforms based on the new Quad-Core Intel® Xeon® processor E7350 enable CTC to maximize data center performance and density.

With up to 16 threads, 32 and 64-bit processing capabilities, and up to 8 MB of L2 cache per processor, Quad-Core Intel® Xeon® processor E7350 allows CTC to consolidate its data center onto fewer systems.

The energy efficiency gained from Intel Core™ microarchitecture further enables CTC to take control of data center cooling, power limitations, and space constraint issues.

Quad-Core Intel® Xeon® processor 7300 series also comes with the ability to conduct live VM migration, offering tremendous flexibility for fail-over, load-balancing, disaster-recovery, and real-time server maintenance scenarios.

Additionally, a new feature known as Intel® VT FlexMigration, gives CTC the capability to add future Intel® Xeon® processor-based systems to the same resource pool when using future versions of virtualization software.

Results: Efficient data center

As part of the test deployment, Intel and CTC engineers built three idle servers based on the new Quad-Core Intel® Xeon® processor E7350 to simulate a real-time operating environment and found that the servers delivered:

- Up to 2.44 times the performance throughput in virtualized environments compared to leading dual-core systems.
- Up to 1.86 times performance improvement compared to leading quad-core systems.
- Up to 1.53 times database, 1.78x enterprise resource planning (ERP), and 2.01x e-Commerce performance improvements compared to leading dual-core systems.
- Up to 3 times performance/watt compared to leading dual-core systems.
- Up to 4 times memory capacity improvement over previous generations of Quad-Core Intel® Xeon® processors.

Furthermore, these improvements meant that CTC can now:

- **Sense:** Quad-Core Intel® Xeon® processor 7300 series comes with Intel® I/OAT, which senses and manipulates data traffic more efficiently for greater network and system performance.
- **Predict:** Intel® Core™ microarchitecture provides more computing power and performance without increasing footprint and power demands, helping CTC pre-empt energy concerns while delivering faster and more stable, energy-efficient servers.
- **Act:** Intel® VT allows CTC to consolidate all its server resources onto fewer machines, lowering space and energy footprints while improving performance across the board.

Impact: Higher performance at lower costs

With the successful test deployment of servers running on Quad-Core Intel® Xeon® processor E7350 for its data center, CTC has found a robust server solution that allows it to reap significant Predictive Enterprise benefits such as:

- **Greater energy efficiency:** The lower energy and cooling costs presented by Quad-Core Intel® Xeon® processor 7300 series, further augmented with energy management tools, enables unparalleled performance per watt for CTC while keeping up with environmentally-friendly computing standards.
- **Improved dynamic resource management:** Quad-Core Intel® Xeon® processor 7300 series optimizes asset utilization and increase agility through virtualization and dynamic, policy-based resource management, providing CTC with the core foundation for performance and scalability in its data center.
- **Higher data processing performance:** Quad-Core Intel® Xeon® processor 7300 series support the most demanding requirements in data processing. Together with multi-threaded programming models, this provides the power for massive data crunching.

Future: Further evaluation of advanced features

While it awaits the next acquisition cycle in its IT upgrading roadmap, CTC intends to conduct further testing of the advanced features of Quad-Core Intel® Xeon® processors technology.

Find a business solution that is right for your company. Contact your Intel representative or visit the Reference Room at
www.intel.com/references
or visit the industry solutions-specific sites at:
www.intel.com/business/bss/industry

[1]64-bit Intel® Xeon® processors with Intel® EM64T requires a computer system with a processor, chipset, BIOS, OS, device drivers and applications enabled for Intel EM64T. Processor will not operate (including 32-bit operation) without an Intel EM64T-enabled BIOS. Performance will vary depending on your hardware and software configurations. Intel EM64T-enabled OS, BIOS, device drivers and applications may not be available. Check with your vendor for more information. Performance will vary depending on the specific hardware and software you use. See most up to date benchmarks at http://www.intel.com/products/benchmarks/server/index.htm for detailed information.

[2]Source: China Telecom Group Shanghai Co., Ltd

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