CASE STUDY

Intel® Xeon® Processors E7 and E5 Families

Financial Services

Energy, Environment and Performance

Building a Digitized Cornucopia

China Huarong Asset Management Corporation builds a new-generation data center with quality performance, reliability and energy efficiency, fueled by Intel® Xeon® processors E7 and E5 families

中国华融资产管理股份有限公司
CHINA HUARONG ASSET MANAGEMENT CO., LTD.

"The data custody center, based on Intel® Xeon® processors E7 and E5 families, has effectively satisfied our needs for high performance, reliability and low TCO. The new data center also provides the strongest evidence for our consistent pursuit of green energy and environmental protection."

Ai Jun
Secretary-General, Informatization Leading Team
China Huarong Asset Management Corporation

Established in October 1999, China Huarong Asset Management Corporation is a wholly state-owned financial institution approved by the State Council, with registered capital of RMB10 billion. Headquartered in Beijing and operating in 32 offices across the country, China Huarong has 10 platform companies providing service to 30 provinces, municipalities and autonomous regions. Thanks to a decade of successful operation and development, China Huarong has completely accomplished its policy-oriented asset disposal mission and made a huge contribution to the healthy and stable development of society and the economy. Specifically, this contribution shows in the promotion of the reform and development of state-owned commercial banks, relieving debts and difficulties for state-owned enterprises and maintaining the stable operation of the financial system to minimize the country's losses.

CHALLENGES

- **Massive data.** Data center maintained by China Huarong was facing challenges from massive amount of data created by the rapid development in financial services.
- **High failure rate.** Existing data center is becoming obsolete since since it is not reliable.
- **Intolerable total cost of ownership (TCO).** The high maintenance cost of China Huarong's data center makes the company's TCO insupportable.

SOLUTIONS

- **Utilize a hosted data center.** The professional management of People's Bank of China data center provided a reliable maintenance process, and most importantly, lowered the TCO.
- **Deploy servers with Intel® Xeon® processors.** Thanks to their powerful processing performance, virtualization technology, high reliability, and environmental protection features, Intel Xeon processors E7 and E5 families helped China Huarong easily cope with massive data demands.

IMPACT

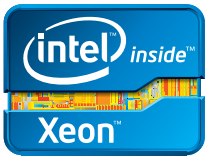
- **Boost the development of China Huarong.** The new Intel technology-based data center, with outsourced management, helped China Huarong reduce its energy consumption by 60 to 70 percent and its data center space consumption by 40 percent. The new data center enables the company to provide efficient, reliable, energy-efficient, and environmentally-friendly service.

In today's big data era, data centers play an important role in the day-to-day operation and maintenance of financial enterprises. As a very well-known financial institution, China Huarong has always attached great importance to the construction and development of its data center. Its continuous efforts to boost its data center building have helped China Huarong grow its sales revenue by 100 percent for three consecutive years.

However, China Huarong's data center could no longer keep up with the times. It had to fit into a room converted temporarily from an old factory built in the 1960s and 1970s. As the company expanded its operations, the existing data center could no longer accommodate the growing number of servers. Since the air conditioning was not originally designed for the computer room, an exterior fan was needed during the hot summer. Also, the room could no longer sustain round-the-clock services. All these problems posed a huge challenge for the continuity of China Huarong's business operations.

"These obstacles should be addressed to meet the high standards of China Huarong. As a leading financial institution, we can't afford to suffer from setbacks brought about by inefficiencies in data center operations," said Ai Jun, secretary-general of the Informatization Leading Team of China Huarong Asset Management Corporation.

To address the situation, China Huarong needed to update the data center. It had to decide whether to upgrade to a better platform and completely transform the existing data center or to use a new data center, the Custodian Data Center*.



Powered by Intel® Xeon® processors E7 and E5 families, the new data center gives China Huarong the performance, virtualization, safety, reliability, and eco-friendly features to deal with its big data

China Huarong assessed its needs and did a calculation:

- Switching to a larger computer room would cost 12 to 15 million Yuan.
- Renting a space with 60 square meters, the normal expenses, excluding the water and electricity bills, would be less than one million Yuan.

It is important to consider expenditures such as these since financial institutions expect a return on capital of at least 15 percent. China Huarong realized that the capital return for updating the computer room could cover the costs of the Custodian Data Center.

After moving into the Custodian Data Center, China Huarong saved on operation and maintenance. But with the area of the data center decreased from 140 to less than 60 square km, China Huarong was worried that performance would suffer. To help address this, China Huarong turned to Intel to help maximize its data center performance.

"Our business is growing very quickly, and our data center needs to keep up. As our data grows, so do the demands on our computing system. Intel's technology helped our small computer room meet our huge business demands. Its expertise in addressing data center issues was the reason why we chose Intel," explained Jun.

To make the small computer room work to its maximum, China Huarong has updated its 14 racks and 80 physical servers into blade servers. Jun said, "The blade server can provide better efficiency. According to our estimate, using blade servers can save up to 60 to 70 percent on energy and over 40 percent on space. If we use traditional technologies, even an area of 200 square meters would not be enough for our new computer room. In addition to this, we can simplify the wiring. For example, a blade cage is 11U, which can accommodate up to 16 blades if there is a half blade. Since these 16 blades are in one blade cage, only four strong lines are needed to connect the outside. If the flow rate is not very high, the external network interface just needs one strong line. Even when you want it to be more reliable, two lines at most would be enough. One server needs at least two power lines, and the existing 4U needs more power lines and more cable lines as well. In summary, using the blade server can save space and electricity and even make the wiring simpler. I believe that is a trend."

To ensure China Huarong's new data center maintains powerful performance, Intel introduced Intel Xeon processors E7 and E5 series. The Intel Xeon processor E7 series has many applications for high-end computing including business intelligence, real-time data analysis, and the new standard for virtualization, which can support Intel® Turbo Boost Technology[1], Intel® Hyper-Threading Technology[2], and Intel® Virtualization Technology (Intel® VT)[3]. The Intel Xeon processor E5 family is particularly designed for the cloud computing in the future, with more powerful performance and much lower power consumption.

While maintaining high performance, the deployment of the Intel Xeon processor-based blade server has also saved China Huarong a lot of trouble in terms of easy maintenance. Jun shared, "The new framework's wiring—including the lines for the network, storage, and power—has been reduced by 20 times. Such a huge reduction implies a revolution for the maintenance of the computer room. In comparison, assembling the previous large RISC-based server took me one and a half days wiring the machine. That was really a huge job. The cable lines were so large in diameter, they had to be put under the deep floor. It was really an exhausting task to accomplish. There were at least four lines between two machines and in one channel there were four lines. Eight channels would mean having 32 lines. When we dismantled and reassembled the machines, the line job was extremely hard indeed."

At the same time, Intel data center's management technologies have helped China Huarong gain capacity in the remote control of the data center. Through the sensor, China Huarong can monitor the temperature in the fans, the power, and the CPU. Also, through a special management interface, China Huarong can implement remote management to the data center room, significantly reducing the number of times entering and exiting the computer rooms and going to the computer's site.

To save on resources and enhance management, China Huarong will also introduce virtualization into its new data center. This specifically aims to reduce the number of servers in the data center and increase their efficiency, further laying a foundation for China Huarong to provide cloud computing services. Hardware-assisted Intel VT offers solid technical support for the virtualization of China Huarong's new data center with its wide range of unique virtualization technology advantages. First, Intel VT provides a completely new space for the virtual machine monitor (VMM), supporting the unmodified operating systems and applications running in the specifically designed environment and simplifying hardware maintenance. Second, through the hardware's underlying instruction set, Intel VT provides support to the switch between the VMM and the operating system installed on the virtual machine, making virtualization more efficient, simpler, safer, and more reliable. Finally, the Intel VT retains the processor status information of the VMM and the operating system installed on the virtual machine in the private memory address space, reducing the interval of the operating system accessing the hardware and improving the security isolation between the operating systems on the virtual machine. Through Intel's technical support, China Huarong has deployed 31 virtual servers on its seven servers in the core computer rooms. Additionally, they deployed about 30 virtual servers on the two servers in the Baiyun Road Testing Center.

Find a solution that's right for your organization. Contact your Intel representative, visit Intel's Business Success Stories for IT Managers (www.intel.com/itcasestudies) or explore the Intel.com IT Center (www.intel.com/itcenter).

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[1] Intel® Turbo Boost Technology 2.0 requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your server manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit http://www.intel.com/go/turbo

[2] Intel® Hyper-Threading Technology (Intel® HT) is available on select Intel® Core™ processors. Requires an Intel® HT Technology-enabled system. Consult your PC manufacturer. Performance will vary depending on the specific hardware and software used. For more information including details on which processors support HT Technology, visit http://www.intel.com/info/hyperthreading.

[3] Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, and virtual machine monitor (VMM). Functionality, performance, or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your system manufacturer. For more information, visit http://www.intel.com/go/virtualization.

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