Cloud computing is very sensitive to hardware performance. Besides hardware specifications, drivers are also a key factor affecting computation capacity. The drivers supplied by Intel are very efficient in integration and enable the entire system to perform at its best. Based on customer demand, MiCloud has also assigned Intel SSD storage space with ultra-high I/O transfer speed to provide operation platforms with efficient transfer speeds.

— Zhao Yuan Han
Director
R&D Information Service Administrative Center
MiTAC Information Technology

Cloud continues to be a highly discussed topic all over the world. However, the focus of the discussion has started to shift from how to build and use clouds to analyzing the real value of public cloud platforms for businesses. Zhao Yuan Han, director of the R&D Information Service Administrative Center of MITAC Information Technology, believes the real value of public clouds comes from the variety of services available in the cloud. Businesses can use all kinds of IT services such as email and business intelligence (BI) analysis and quickly establish or stop tasks whenever needed, in accordance with the characteristics of the cloud resources, without worrying about technical barriers or costs. This lets the business focus on improving its overall industry competitiveness.

**Challenges**

- **Make IT resources more affordable and accessible.** Integrate various business applications into the cloud and make them accessible even to small and medium-sized businesses.
- **Optimize and enhance cloud performance.** Provide fast data processing transmission speeds to achieve optimal computing capabilities.
- **Address big data demands.** Improve cloud system to cope with large and complex operations and growing amounts of data.

**Solution(s)**

- **Deploy a 10 Gigabit Ethernet network infrastructure.** Use the power of Intel Ethernet Converged Network Adapter X520-DA2, which provides high-performance cloud resources with fast internal processing to lower data transmission delays in the resource pool.
- **Use Intel® SSDs.** Improve I/O performance by using Intel SSD 520, which has ultra-high I/O transfer speed to provide operation platforms with efficient transfer speeds.
- **Meet data demands with Apache Hadoop.** Provide on-demand environment of HANA-as-a-service to address big data processing demands, creating powerful processing performance at a low cost.

**Impact**

- **Lower IT investments.** Customers can choose service packages that meet the requirements of their current scale of operations without having to worry about issues such as costly investments in IT infrastructure.
- **Better cloud performance.** Intel® technologies boost internal processing speed and minimize data transmission delays by 80 percent for storage and 50 percent for network adapters, enabling MiCloud to provide world-class cloud resources and localized services to customers.

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**Case Study**

**Intel® Solid-State Drives (Intel® SSDs)**

**Intel® Ethernet Converged Network Adapter X520-DA2**

**Cloud Computing Solutions**

Intel® Solid-State Drives (Intel® SSDs) and Intel® Ethernet Converged Network Adapter X520-DA2 to significantly reduce storage and network adapter transmission delays, boosting processing performance for improved cloud services
MiCloud provides efficient cloud services with a high-performance network architecture powered by Intel® Ethernet Converged Network Adapter X520-DA2, Intel® SSD and Apache Hadoop

Using automated cloud services to quickly meet diverse IT needs

Established in 2011, MiCloud not only provides high-quality and flexible infrastructure-as-a-service (IaaS) cloud hosting services; it has also launched many automated cloud platform-as-a-service (PaaS) and software-as-a-service (SaaS) services required by a variety of business operations, such as Lite DNS* and Web global load balancer, among others. As long as businesses connect to MiCloud and purchase the required services, they would have complete, underlying cloud resources and systems readily available to build business-level cloud architecture within a short timeframe.

"MiCloud collaborates with many well-known Internet application service providers to launch application systems necessary for businesses, including Google Business* office services, DS ERP* and other systems. Customers can choose service packages that meet the requirements of their current scale of operations. When demand continues to grow or is temporarily reduced, there is no need to worry about transaction costs. The service is truly pay-as-you-go, with no worries about issues such as over-investment in IT or inadequate computing performance," said Zhao.

As IT innovations became tools to stay ahead of the competition, businesses started to invest heavily in IT services. This became a burden for many organizations, particularly small and medium enterprises that lacked resources and IT expertise. Cloud services can easily meet daily operational requirements so that businesses can focus on their core activities, reducing maintenance and operational costs for their IT departments. Even organizations with no full-time IT staff can build a world-class information service architecture through MiCloud, greatly reducing costs while enhancing overall competitiveness.

Hadoop/HANA-as-a-service delivers on-demand, rapid analysis with big cost savings

In addition to a rich variety of office applications, MiCloud continually grows its single cloud host specifications, launching virtual hosts with memory capacities of up to 64 and 128 GB, and hard disk capacities of up to 1.5 and 3 TB. This is currently one of the world's largest cloud host specifications, providing numerous system resources and enabling companies to cope with large and complex operations.
Zhao pointed out that MiCloud has a Cluster System Building feature that can quickly copy cloud hosts with the same functions and automatically create cluster architecture. For a variety of academic research projects such as fluid simulation, genome analysis, and other complex applications, and computations such as crop gene sequencing and analysis by the Agriculture Institute, a super-computer-class computing environment can be quickly created through MiCloud without investing a lot of capital, equipment and room to host the equipment. The contract can be terminated once the project ends, removing the worry about equipment maintenance and making research more cost-effective.

"For big data processing demands, MiCloud provides an on-demand environment of Hadoop-as-a-service/ HANA-as-a-service. Users can easily create data analysis clusters within minutes and immediately release the resources after the analysis is completed, removing the need to spend on building and maintaining the system. The massive 128 GB memory in the host and the Apache Hadoop create powerful processing performance at a low cost. These advantages are ideal for use in big data comparison operations such as business intelligence and customer behavior analysis. Businesses can import their data into the cloud database for computation operations and obtain results quickly. Whether it is risk assessment, market exploration or other applications, it is able to bring substantial benefits to the business," explained Zhao.

Intel® Xeon® processor, Intel® Solid-State Drives, and Intel Ethernet Converged Network Adapter X520-DA2, and Apache Hadoop software offers a robust platform on which the ecosystem can innovate in delivering new analytics solutions.

Lessons Learned
- The massive 128GB memory in the host and Apache Hadoop create powerful processing performance at low costs.
- Adopting Intel Xeon processor as the core architecture provides high-performance cloud resources with 10 Gbps network transmission speed.
- Using Intel SSDs provide ultra-high I/O transfer speed to provide operation platforms with efficient transfer speed.

High-speed I/O strengthens backup management and host monitoring controls resource planning
Businesses that choose MiCloud can also use the cloud host monitoring service, which can collect a variety of system and network traffic information from the cloud host and compile it into reports. This enables businesses to track and assess the usage of the cloud host and plan in detail any future allocation of resources to reduce or increase cloud hosts in a timely way to achieve the optimum size.
For cloud host management, MiCloud also has good backup services such as system snapshot/image as a service. Businesses using public cloud hosts can also have this advanced feature, backing up every stage of cloud host operation status. This feature is very helpful for cloud host upgrades or when the service is revised. Coupled with MiCloud’s cloud host cloning service, old and new systems can be online at the same time for testing. If the new system’s test results are less favorable than expected, it can switch back to the original system and continue operating, ensuring that the service can be maintained in the most stable state.

“To provide the best cloud service, the underlying hardware and system architecture are critical factors. In the underlying structure of MiCloud, the hardware adopts Intel Xeon processor as the core architecture, providing high-performance cloud resources with a network transmission speed of 10 Gbps. The data storage uses the ZFS* file system, which can back up data immediately, eliminating any concerns about information not being kept up-to-date during a lengthy backup process,” said Zhou.

One of the biggest challenges for cloud-based architecture performance is the I/O, which needs to ensure fast transmission speed for optimal computing. MiCloud has fully upgraded its network to Intel Ethernet Converged Network Adapter X520-DA2 (10 Gigabit Ethernet) from Intel Ethernet Server Adapter I350-T2 and uses Intel SSD 520, replacing 7200 RPM SATA hard drives to boost disk transfer speeds. “Cloud computing is very sensitive to hardware performance. In addition to hardware specifications, drivers are also a key factor affecting computation capacity. The drivers supplied by Intel are very efficient in integration and enable the entire system to perform at its best. Based on customer demand for a more efficient transmission process, MiCloud has also assigned Intel SSD storage space with ultra-high I/O transfer speed to provide operation platforms with efficient transfer speeds,” said Zhao. “Only adequate performance can ensure the quality of service between cloud and end-users, thus maintaining a competitive edge.”

Using Intel technologies allowed MiCloud to boost internal processing speed and minimize data transmission delays by 80 percent for storage and 50 percent for network adapters, compared to the previous system configuration. This enabled MiCloud to provide world-class cloud resources and localized services to customers.”

Integrating international resources and local services to keep businesses competitive in the global marketplace

Amidst thousands of cloud service providers worldwide, Zhao believes that whether it is IaaS, PaaS or SaaS, each cloud service has its advantages that range from pricing to server room locations and even national laws and regulations, all of which are factors that influence user preference. MiTAC collaborates with several cloud service providers across the globe to come up with an integrated cloud application service, allowing businesses in Taiwan to have access to world-class cloud resources and localized services through MiCloud, including consultancy services in Chinese, to help Taiwan’s business community catch up to world standards.

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).

*Other names and brands may be claimed as the property of others.