



VMware Helps Shanghai Telecom Research Institute Deploy a Flexible Testing Environment



KEY HIGHLIGHTS

Industry: Telecommunications

RESULTS

- Reduced new testing environment deployment time using templates, transforming a process that once took days to less than an hour of work.
- Previously built testing environments were migrated from physical servers to virtual platforms using P2V tools, implementing rapid environment change.
- Used Virtual Center to unify resource management and allocation, increasing resource utilization.
- Increased server utilization from around 10% to 70%-80%.
- Used VMotion to enable flexible provisioning and server resources management .
- Greatly decreased Data Center electricity consumption and air conditioner use by integrating services and storage equipment. Integrated numerous servers and deployed more than 20 virtual machines.

"Through adopting this cutting-edge technology, we have now fully experienced the benefits of server virtualization. We now enjoy better server management, easier deployment of new applications, and higher work efficiency."

Shi Yi-rong

Director of China Telecom Enterprise Informatization Validation Lab,
China Telecom Co., Ltd.

VMware ESX Server's P2V, VMotion tools and VirtualCenter helped Shanghai Telecom Research Institute speed deployment time and improve maintenance of their testing environment. Before using VMware building a testing environment for an application system used to require days, but now it takes less than an hour, significantly reducing labor costs and increasing development efficiency.

Shanghai Telecom Research Institute struggled with constantly changing testing environments

The Shanghai Research Institute is China Telecom's main product development and business research division, and a vital R&D and innovation unit of the China Telecom Group (CTG). Equipped with advanced research facilities and a powerful, 400-strong research team with expertise in product development, business research and technical support, the Shanghai Research Institute delivers critical R&D to China Telecom.

China Telecom has built multiple laboratories focusing on different development areas including 3G Net, Next Generation Network, Intelligent Business Development Platform, Middle to Broadband Network. CTG primary laboratories include China Telecom Switch Software Management and Testing Platform, and China Telecom Network Management System Software Management and Testing Platform.

The Shanghai Telecom Research Institute is responsible for extensive product testing tasks. Requirements for testing environments are broad and varied, and change constantly; furthermore, if a project requires a completed test to be re-run at a later time, the testing environment must be reset to the exact original configurations. The result is a testing challenge that is not only costly but also difficult to manage in a physical server environment.

Test Lab Requirements:

- Rapid testing environment is required for timely testing services.

- Testing environments need to be able to implement changes quickly to enable better hardware utilization.
- Some testing environments need to be repeated, but servers cannot stay idle for a long time.
- Servers need to be well managed to reduce maintenance costs.
- It is also important to reduce the space that servers occupy.

Virtual Center and VMotion increase the deployment flexibility of testing environments

After researching and analyzing server virtualization technology and comparing results from different server virtualization software providers, VMware ESX Server was chosen for its high availability and features that include VMotion and P2V to best meet the needs of China Telecom's enterprise-class operations.

Shanghai Telecom Research Institute, part of China Telecom, built its virtualization application infrastructure with four Dell PowerEdge 6850 Servers (quad-socket quad-core Intel processors) with back-ends connected to EMC CX600 disk arrays.

Shanghai Telecom Research Institute adopted ESX Server 3.5 as their server virtualization solution, using P2V, VMotion and HA (high availability), to deploy part of the virtual testing environment. Five to six virtual machines were hosted on each physical server, and system migration was quickly completed via Virtual Center's centralized management of virtual machines, computing resources, and storage resources provisioning.

- Shanghai Telecom Research Institute frequently needs to run tests for new business systems that require different (and in many cases, separate) testing environments. These tests often need to be completed quickly. Through virtualization and uniform templates, new application environments can be quickly deployed, and can be saved for later use.
- Previously, each physical server could only host one application testing environment, so resource utilization was rather poor. Now, through server virtualization, one physical server can host multiple virtual machines, hence better utilizing physical machines computing power.
- Building a testing environment, from deciding requirements, deleting the old environment, to deploying the new environment used to take days. Now, through server virtualization templates, all these tasks can be completed in less than an hour. Additionally, when re-using a previously stored environment, only a few minutes are needed to activate the virtual machine.
- After adopting a virtualization-based solution, server utilization rose from 10% to 70%-80%.
- Previously, if the test environment required different computing power, the test would need to be carried out on another physical server, which would require reinstallation. Now, with VMotion and Virtual Center, resource provisioning can be done quickly for the test environment.

VMware Products in Operation

- VMware ESX 3.5
- VMware Virtual Center
- VMware VMotion
- VMware P2V
- VM Operating System: Windows Server 2000, Windows Server 2003
- Virtual application: 118 114 directory service, testing environment
- Four quad-socket quad-Intel-processor Dell PowerEdge 6850 Servers

More flexible resource management through enhanced hardware capability and server virtualization

Enhanced hardware capability reduces server usability. And because most of the application systems require isolated testing environments, which make server consolidation become possible.

Previously, for multiple tests to be run involving several departments, dozens of servers were needed because each test required several physical servers. This resulted in server resource provisioning problems and often caused a temporary resource shortage as well as wasted excess procurement.

Through server virtualization, Shanghai Telecom Research Institute is able to host multiple virtual machines on a server and quickly build necessary testing environments, meeting testing needs and maximizing server utilization.

With four servers connected to back-end storage and a virtualized application environment, whenever an application requires a particular testing environment, all that is necessary is to invoke the correspondent testing system through Virtual Center, or to build a correspondent system using templates.

Based on previous system testing environment requirements, Shanghai Research Institute implemented server virtualization environments on the four new quad-socket quad-Intel-processor Dell PowerEdge 6850 Servers. Each physical server now hosts five to six virtual machines on which relevant testing environments are deployed. This deployment has delivered proven increased management efficiency and saved significant resources.

At the same time, through P2V tools, Shanghai Telecom Research Institute easily migrated their previous application testing environments to the virtualized environments. This ensures that the previously built virtual systems can be migrated to the new environments without disruption, avoiding business losses.

Since adopting virtualization, system operation has been very stable, meeting the rigorous testing needs of the institute, saving maintenance costs as well as electricity consumption. This also reduced the number of physical servers, thus freeing up data center space. Shanghai Telecom Research Institute is planning to further consolidate existing x86 servers, expanding adoption of server virtualization solutions.

Shi Yi-rong, Director of China Telecom Enterprise Informatization Validation Lab, says: "Virtualization technology is the world's most advanced technology. It has helped us fully realize better server management, faster new application deployment, and has significantly increased efficiency while decreasing server resource load."

VMware Beijing Office
Unit 601 Level 6, Tower W2, The Towers, Oriental Plaza,
No.1 Chang'an Avenue, PR. China
Tel: +8610-85200148 Fax: +8610-85200110

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