Telco IT-as-a-Service Deployment with Oracle VM Realizes Higher Business Availability

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Customer Profile

Industry: Telecommunications

Oracle Products and Services: Oracle VM, Oracle Linux, Oracle Enterprise Manager, Oracle Database, Oracle Real Application Clusters, Oracle WebLogic Suite, Oracle Database Vault, Oracle Audit Vault, Oracle Business Intelligence Enterprise Edition, Oracle Data Integrator, Oracle Hyperion applications, Oracle WebCenter Suite

A large Telco delivering wireless and wireline communications services to consumer, business, government is the featured customer in this customer success story. The Telco Wireless subsidiary supports millions of retail customers nationwide. The Telco also provides converged communications, information, and entertainment services and business solutions to customers worldwide. Providing information technology (IT) services to this global enterprise is the job of an internal support group that manages the hardware and software infrastructure for the Telco’s key information systems, including financials, supply chain management, human resources, payroll, employee portals and many custom applications.

“Virtualization lets us separate the physical layers of the infrastructure so we can allocate resources at the sub-server level,” explains the enterprise architect for the IT group. “We can allocate just enough resources for people to do their jobs, whether it’s running payroll or closing the books at the end of the month. Our goal is to virtualize everything, mainly because virtualization presents all sorts of opportunities to reduce costs and increase flexibility. We have been doing this for years without problems.”
The Need for Virtualization

Today’s IT pros are tasked with improving application performance while controlling the costs of doing business. In most IT environments, fluctuating demand causes over provisioning: resources are deployed and running all the time in anticipation of peak demand, driving up the cost of hardware, software, maintenance, electricity, and data center space. In addition, high availability (HA) requirements create the need for redundant configurations that are difficult to synchronize and costly to manage. Meanwhile, internal charge backs pressure IT to accurately allocate the cost of shared services across individual operating units to give line-of-business managers a clear picture of the cost of doing business.

Telco is solving these challenges with Oracle VM, a virtualization solution that enables an “IT as a service” operating model. Virtualization supplies computer processing power and storage resources as a utility that each business unit pays for as needed. A virtual machine behaves like a real computer that has been divided into logical partitions; the software executed on these virtual machines is separated from the underlying hardware resources. The goal is to centralize administrative tasks while improving scalability and maximizing hardware-resource utilization.

The IT architect’s goals are to fully virtualize the IT infrastructure, automate deployment functions across the application stack, and create a more flexible, cost-effective application environment.

“Our objective is to enforce organizational and process standardization, with a self-service, multi-tenancy model where business units pay for what they use,” says the Telco IT architect. “The standard virtualization story that you hear from most vendors concerns consolidation. To me, consolidation occurs naturally as you allocate the required resources to each application. Very few applications use the full complement of the hardware. Virtualizing the infrastructure cuts costs by reducing equipment purchases.”

Selecting Oracle VM

Telco evaluated virtualization solutions from several leading vendors before selecting Oracle VM as its corporate standard. According to the selection team, one of the most attractive things about the Oracle solution was the licensing terms: Telco prefers to have a ratio of six to eight virtual machines to each physical one, but some of the other vendors, such as VMware, don’t support this architecture in a cost-effective way.

“VMware doesn’t allow for a one-to-one virtualization model because it is too expensive to license the virtualization hypervisor,” he maintains. “In addition, VMware couldn’t scale to the size we needed. Their largest version at the time was equivalent to one of our small development boxes. It wouldn’t work.”

The team also considered RedHat, but its Kernel-based Virtual Machine (KVM) wasn’t yet available. Telco had some experience with Novell SuSE XEN, but the Telco IT team found the deployment had been problematic. “Oracle VM fit the bill,” as they sum up. “It satisfied our needs and the hypervisor is very stable.”
Rapid Implementation with Oracle VM Templates

The implementation of Oracle VM went smoothly, thanks to the use of Oracle VM Templates. Experts from Oracle Consulting helped throughout the process. The team began with an implementation in Site A that included 128 servers. For the Telco IT architect, the hypervisors were easy to install with an automated “kickstart” method.

“We used standard Oracle VM Templates to create the base configuration,” he recalls. “It took about 10 minutes per box to roll them out in parallel. The implementation went fairly smoothly.”

Oracle VM Templates include pre-built, pre-configured, pre-patched virtual environments that streamline the deployment of specific application stacks. They contain a complete Oracle software solution, such as Oracle WebLogic Server or Oracle Database, including the operating system. Within these templates, Oracle software is laid out in the same manner as if it were installed and patched using traditional methods. Administrators simply download the template file, decompress it, and import the resulting image into Oracle VM Manager to create virtual machines.

Telco also built customized templates with Oracle VM Template Builder to include specific applications, accelerating the replication and deployment of its enterprise software stacks. They used a network-based installation method for booting up both physical and virtual machines on various types of hosts.

Integrated Storage Environment Enhances Backup and DR

To compliment the Oracle VM environment, Telco deployed a network-attached storage (NAS) solution that allows storage administrators to scale file systems and volumes dynamically. By creating snapshots of storage volumes, they can recover Oracle Database and Oracle Applications in minutes by taking advantage of the virtual images. A snapshot records the state of the virtual machines and storage devices at an exact point in time. Administrators can revert to this state as necessary and the VM will appear exactly as it did when the snapshot was taken. These techniques are useful as Telco seeks to replicate its IT environment to another data center.

“If you need to migrate a VM farm or individual VM applications between data centers dynamically, having it all in the network makes it easier,” observed the Telco architect.

“One of our big drivers is the need for standardization,” notes the Telco IT architect. “The Intel solution with Oracle VM meets the majority of our needs. It can run Windows or Linux, and we can switch among hardware providers without changing the operating system and everything on top of it. This flexibility enables us to react quickly to changes in the marketplace.”

During the initial deployment, the team reduced Telco’s total number of physical servers from 240 down to 128. They created four VM pools with 32 servers each. Each pool has 80TB of NAS-based storage used for applications, with the remaining 8 servers set aside for emergency capacity and failover. Telco can easily expand these VM pools by adding more servers and storage capacity, as demand dictates.
Running IT as a Service

Today, Telco can allocate its IT resources based on demand according to a true “IT as a Service” model.

“Oracle VM meets our needs for a flexible virtualization solution. If a customer requests a virtual machine, we can deliver it, watch the resource use, and shrink or expand the available resources as necessary,” explains the Telco IT architect. “As the application reaches maturity or consumption starts to go down we can reclaim those resources for another purpose. Similarly, if the load spikes at a certain time of the month or in response to increased business activity, we can add resources to meet that demand.”

This flexibility also makes it easy to add temporary resources to support in-place application upgrades. With a quick reboot or a few clicks, new application servers automatically inherit the code they need to operate in this environment.

Since Telco standardized on Oracle VM, its server deployment time has been reduced from many hours to about 15 minutes, which means virtual servers can be allocated as soon as a project is approved. The average VM server memory footprint is 12GB and the company is only consuming 62 percent of its available capacity. Every server can be virtualized, from the smallest Web server to the largest database, including Telco’s Oracle RAC clusters.

“We have 100 Oracle RAC clusters deployed in the virtual environment,” the IT architect says. “RAC works well in the Oracle VM environment.”

In the event of a physical server failure, any VM that was running on the failed server will be automatically restarted on another available server. This architecture boosts availability and enables pro-active server maintenance. If a hardware problem is detected, any VMs running on that server can be moved to another server without interruption to the application. The server can then be powered off for service and reintroduced to the cluster when servicing is complete.

Virtualization enables Telco to address intangibles as well, such as warranty service. “Instead of purchasing 4-hour response time, 365 days per year, we can opt for a less expensive service contract by simply having extra capacity and being able to shift the load in the event of an outage,” Telco architect says. “We reduce our fixed costs by not having to service or replace parts so quickly.”

Thanks to this flexibility, hardware technology refreshes can be performed with little or no outage to the application. As our Telco customer puts it, “As long as an app can handle a momentary outage of an element within the infrastructure, the resources are continuously available.”

Server elasticity is another noteworthy benefit. IT administrators can shut down less critical applications to supply resources for more critical ones, as well as prioritize the allocation of IT resources based on corporate needs. For example, at the end of the month when the financial reporting cycle kicks into high gear, administrators can make sure that the finance applications receive priority and that they have extra resources available to them.

With Oracle VM, the Telco customer can temporarily shift resources to an application very quickly and easily. From the Telco customer, “In the near future these priority shifts will become automatic so that
the Telco can grow and shrink portions of the application layer to meet resource needs without having to do any rework. It’s all cabled once, it’s all in a pool, and we have created processes and procedures to quickly add more resources as we need them. Oracle VM provides this elasticity."

Key Benefits

Traditional server implementations are characterized by the following:

- The need to plan for peak capacity
- Dedicated silos of resources
- Idle server waste
- Costly and complex High Availability requirements
- The need for excessive redundancy
- Difficulty scaling to meet fluctuating business cycles

Telco’s infrastructure virtualizes every application regardless of size or complexity. It is characterized by the following:

- Shared pools of resources
- Highly efficient server utilization
- Dynamic resource provisioning
- Rapid deployment using ready-to-run Oracle VM Templates
- Inherent High Availability
- Automated, full-stack monitoring and management with Oracle Enterprise Manager

For More Information

- Downloads: [http://edelivery.oracle.com/oraclevm](http://edelivery.oracle.com/oraclevm)
- Oracle Linux: [http://oracle.com/linux](http://oracle.com/linux)