



Improving Efficiency of Testing and Development

EMC reduces costs and accelerates time to market for its storage solutions using a cloud environment powered by Intel® Xeon® processors



“By using a cloud environment with Cisco UCS* blade servers based on the Intel® Xeon® processor E5 v2 family, we have eliminated 800 servers and reduced the infrastructure footprint in labs by 5,000 square feet. We are avoiding the cost of purchasing lab servers and dramatically reducing power and cooling costs for our labs.”

– Mike Liberty,
Senior Manager of EMSD Lab Services,
EMC

EMC runs numerous lab environments around the world to develop and test the company's new storage solutions. To improve the efficiency of processes and reduce costs, EMC implemented a virtualized cloud environment that all labs share. Built on Cisco UCS* blade servers with the Intel® Xeon® processor E5 v2 family, the cloud environment has helped EMC drive down costs by reducing the number of physical systems used for test and development. The cloud has also helped improve agility and accelerate time to market for new solutions by rapidly providing developers, engineers, and programmers the resources they need.

Challenges

- **Reduce costs.** Minimize the number of physical desktops, servers, and storage arrays used for testing and development.
- **Enhance agility.** Provide the resources test and development users need to create innovative storage solutions and sustain high product quality without requiring them to wait for the deployment of physical infrastructure.

Solution

- **Cloud environment with Cisco UCS blade servers powered by Intel Xeon processors.** EMC built a cloud environment using Cisco UCS B200 M3 and B420 M3 blade servers equipped with the Intel Xeon processor E5 v2 family. Cisco Virtual Interface Cards* (VICs) and VMware VMDirectPath* technology help connect the lab infrastructure to virtual hosts in the cloud.

Technology Results

- **Consolidated infrastructure.** Using compact blade servers with Intel Xeon processors for the cloud environment enabled EMC to maximize the number of virtual machines per server and retire approximately 800 physical servers from labs.

Business Value

- **Reduced costs.** Eliminating servers from lab environments has helped EMC avoid capital expenditures and lower ongoing operating costs.
- **Improved agility, faster time to market.** The cloud environment enables IT administrators to rapidly provide resources to test and development users, ultimately helping accelerate the time to market for innovative, high-quality storage solutions.

Like many technology companies and other manufacturers, EMC must keep operating costs low and bring products to market quickly to stay competitive. The drive for efficiency and speed prompted the company's Enterprise and Mid-range Systems Division (EMSD) to launch an innovative, multiphased lab transformation project designed to capitalize on cloud computing for developing and testing EMC VNX* storage solutions.

“Our initial goal was to enable developers, quality assurance engineers, and programmers to use shared cloud resources instead of requiring them to manage their own desktop and server environments,” says Mike Liberty, senior manager of EMSD Lab Services. “By offering self-service capabilities, we wanted to help users get the resources they need fast.”

Building a Dense Cloud Environment with Intel Xeon Processors

The first phase of the project involved building the EMSD cloud. The cloud runs VMware virtualization software and a Linux* operating system on Cisco UCS B200 M3 and B420 M3 blade servers powered by the Intel Xeon processor E5 v2 family.

“Reducing floor space is a high priority for EMC,” says Sean Earley, systems engineer at Cisco. “By selecting compact Cisco UCS blade servers with Intel Xeon processors, EMC built a very dense environment that minimizes the infrastructure footprint. The combination of the large core count and strong memory transfer rate of the Intel Xeon processor E5 v2 family enables EMC



Intel® Xeon® processors provide the foundation for a powerful, consolidated cloud

to maximize the number of virtual machines on each physical host."

After moving development environments to the cloud, the EMSD team moved physical test environments into the cloud as well, creating simulated storage arrays on the EMSD cloud. "Developers now can test their code on simulated arrays instead of having to load that code on physical systems in the lab," says Liberty. (For more on this first phase of the lab transformation, visit <http://www.intel.com/content/www/us/en/cloud-computing/emc-development-test-cloud-story.html>.)

Realizing Immediate Cost-Saving Benefits

The first phases of the project allowed EMC to replace high-powered engineering desktops and physical storage arrays used for testing and development with cloud-based resources. "We significantly reduced costs by consolidating the workloads of 20 engineering desktops onto each cloud-based host server and eliminating arrays from labs," says Liberty. "At the same time, we helped test and development teams focus on their core responsibilities instead of managing IT infrastructure. Now they can spend more time adding features and delivering the innovative solutions that customers expect from EMC."

Expanding the Transformation with an Innovative Solution

With the first phase of the project complete, the EMSD team wanted to continue the transformation by reducing the number of physical servers used in labs. "A typical lab environment had several physical hosts, each of which simulates a workload. The hosts were connected by Fibre Channel to a large

storage system with racks of drives," says Liberty. "With 2,000 developers, we needed 2,000 hosts, with 2,000 host bus adapters (HBAs)—it was too costly to purchase and operate all those physical servers. We wanted to run virtual hosts in the cloud instead of using thousands of physical hosts."

Creating a common lab infrastructure that integrated the physical lab infrastructure with the cloud environment required some innovative thinking. "The challenge was making a Fibre Channel connection from cloud-based virtual machines to the storage arrays in the labs," says Liberty.

Working with engineers from Cisco and VMware, the EMSD team devised a unique solution that uses Cisco Virtual Interface Cards (VICs) and VMware VMDirectPath technology. "The Cisco VICs enable you to create several virtual HBAs on a single blade," explains Earley. "VMware VMDirectPath then lets you pass data directly to the operating system. The solution functions as if each virtual machine has a Fibre Channel connection through its own HBA."

Reducing Costs by Retiring Lab Servers

With the connections made between the lab and the cloud, EMC is achieving its goals of reclaiming lab space and reducing costs. "By using a cloud environment with Cisco UCS blade servers based on the Intel Xeon processor E5 v2 family, we have eliminated 800 servers and reduced the infrastructure footprint in labs by 5,000 square feet," says Liberty. "We are avoiding the cost of purchasing lab servers and dramatically reducing power and cooling costs for our labs. With fewer servers and storage arrays in labs, we are saving nearly USD400,000 in power and cooling costs alone."

Lessons Learned

"Connecting multiple independent labs to a centralized cloud is a large project that requires support across the enterprise," says Mike Liberty, senior manager of EMSD Lab Services. "It was essential for everyone to see the big picture of how a shared infrastructure can increase the efficiency of an entire organization. Once we received management buy-in, individual teams quickly joined together to do what was best for the company as a whole."

Enhancing Agility and Accelerating Time to Market

The cloud environment has helped significantly enhance the agility in responding to requests from developers, engineers, and programmers. "It takes much less time to deploy a virtual machine than to rack a host," says Liberty. "With the cloud environment, we have reduced deployment time from hours to minutes."

Ultimately, fast deployment and greater flexibility of resources are helping accelerate time to market. "As a testing and development organization, we need to deliver high-quality products to market quickly and cost-effectively," says Liberty. "Our new cloud environment is playing a key role in helping us achieve those goals."

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