

**Implementing Server Virtualization
At
Southwestern Illinois College
(Case Study)**

Submitted by
Christine Leja, CDP/CCP

Background

Southwestern Illinois College (SWIC) is a community college started in 1946 and located in southern Illinois just east of St. Louis, MO. Server virtualization became an initiative in 2006 for the Information technology (IT) division. This case study documents the initiative to date.

Server virtualization is becoming a mainstream solution in the Data Center. Cost of hardware and the cost of staff to support numerous servers in a data center are primary reasons for early adopters to move to server virtualization. Additional benefits included the reduction of physical data center space for the proliferation of servers. “Greening of IT” grew in importance as the benefit of reduced power consumption has been documented as a long-term operating expense reduction. Server virtualization is now a mainstream IT activity as server virtualization has matured and the economy acts as reinforcement to reduce operating expenses.

SWIC initiated research into server virtualization in 2006 when physical space and power for servers became a concern. The concern grew as circuit utilization neared capacity. Further, one of the two main SWIC Data Center’s has no generator and limited UPS (Uninterruptable Power Supply).

A key concern was the transition to 24 x 7 (24 hours per day times seven days per week) production support of online services that included student registration. How can downtime be minimized? How can services be relocated should a server go down or a data center lose power?

Research

SWIC is primarily a Microsoft shop with some Mac services. SWIC looked seriously at two server virtualization products, Microsoft’s virtualization and VM Ware. Microsoft’s server virtualization had been tested with PeopleSoft Financials in 2008 even though not yet supported by Oracle. The users complained how slow transaction service had become. So, Microsoft server virtualization was removed and performance returned to normal.

VMware introduced their server virtualization product in 1999. By 2006, VMware had a significant segment of the virtualization market and was supporting x86 servers. SWIC being primarily a Microsoft shop had more than 70 servers with a significant number being x86

servers! Many of these 70 servers had low utilization thus making them good candidates for server virtualization. After reviewing four servers with an implementation partner, only 35 to 40 servers were identified as good candidates for virtualization. Consideration was given to location, specific hardware requirements, and the criticality of applications

Given the market share for VMware and industry studies showing experienced vendors who implemented VMware, SWIC IT researched server virtualization again and conducted a feasibility study in the summer of 2008. Given the ability to purchase replacement servers using available bond dollars, SWIC IT was able to afford the purchase of some initial virtual servers, seek a local vendor to assist with the initial configuration and move non-mission critical servers, and learn server virtualization technology.

In the fall of 2008, four Dell ESX hosts, four VM licenses, and one Microsoft Data Center license were purchased. In addition, a Xiotech Magnitude 3D Storage Area Network (SAN) was used.

Server Virtualization Implementation of 2009 – Phase 1

The initial configuration was part of a test plan to learn how to configure a virtual server and have SWIC colleagues access the virtualized server. SWIC colleagues testing access experienced improved performance mostly due to the transition from some old servers. Documentation during the test plan created standard procedures for setting up virtualized servers and tested those procedures. Further, the server migration process was tested as well as the backup and restore process.

Server monitoring was setup and a support process was put in place. Updates to the virtual servers were also tested. The test plan was done with guidance from an implementation vendor who provided IT staff with training. Once testing was complete, the SWIC IT staff became the implementation owners for creating virtualized servers. No further consulting help was needed.

Templates for Total Cost of Ownership (TCO) and Return On Investment (ROI) template typically show a 50% reduction in TCO with an ROI over a three year span of over 200%. SWIC IT took one of these templates and completed it for SWIC to get an estimated projection of SWIC TCO (See charts and spreadsheets at end of document). Thirty-five servers were planned for virtualization over a three year period. Direct costs between setting up servers and setting up virtualized servers were compared. Projected direct costs without virtualization were estimated at \$279,000 and \$130,938 with virtualization giving a cost savings of \$148,053. Indirect costs of rack space, power, cooling, server provisioning, hardware administration and procurement contributed an additional cost savings of \$133,303 for a total of \$281,366 over three years.

During calendar year 2009, the 35 servers were virtualized beating the three year projected implementation time. Nine servers were decommissioned. Three aging servers were

reallocated for “light” duty, and the rest of the servers were redeployed. In addition, two new servers were not purchased to support instructional software by installing the software on a virtualized server and avoiding the server purchase cost of \$12,000.

Server Virtualization Implementation for 2010 – Phase 2

As fast as SWIC IT is consolidating traditional servers onto a virtualized server platform, new software requiring development and test environments are emerging. The older servers are being virtualized where possible and supporting the development and test environments. As new servers are needed, virtualization is examined using the servers that have been taken out of service from the virtualization process. This first option avoids the purchase of new servers. However, the indirect cost reduction of rack space, power and cooling is being redeployed for these new services.

Even with the active move to server virtualization, i.e., accomplishing the three year project in one year, there are a number of servers that cannot be virtualized at this time. For example, Oracle is not yet supporting the virtualized server platform and traditional production servers still need to be purchased. Even with this constraint, SWIC IT is looking to virtualize PeopleSoft development servers and possibly test servers with VMware.

Desktop Virtualization

Given the early success with virtualization of servers, desktop virtualization testing is about to begin. A startup configuration has been purchased. 2010 will be a test year to examine what is practical for this platform at SWIC.

Measuring Success with Virtualization

Given that SWIC has a single source for heating and cooling at the Belleville Campus, actual measurement of the reduction of power consumption cannot be achieved beyond the academic template model used.

IT can measure what servers have NOT been purchased as new software was introduced to the institution and server virtualization was used instead of purchasing new servers. In addition, where old servers have been decommissioned, power has become available for increased storage needs thus avoiding a request to add power in the ISB and MC Data Centers.

Next Steps

Server virtualization using VMware will continue as software packages support this platform. Non-production instances of PeopleSoft will be tested in a virtualized server environment to see if PeopleSoft development and test instances can be utilized thus decreasing the physical number of PeopleSoft servers.

Desktop virtualization is being researched as a way to streamline delivery of instructional desktop configurations. Should the 2010 test validate the decrease in time to upgrade

classrooms and labs, staff time between semesters can be reduced by deploying desktop virtualization. Recovery time of a corrupted desktop will also be reduced thus minimizing the impact in the classroom when software problems occur.

The life cycle of a desktop computer can increase where software can be run via a server making the desktop computers more “terminal-like”. In addition, remote access can provide service via a server increasing security by limiting delivery of SWIC data outside its extended network onto personal or public computers. Mobile devices can be included in this extended SWIC network by again limiting the exposure of SWIC data outside the supported network infrastructure.

Summary

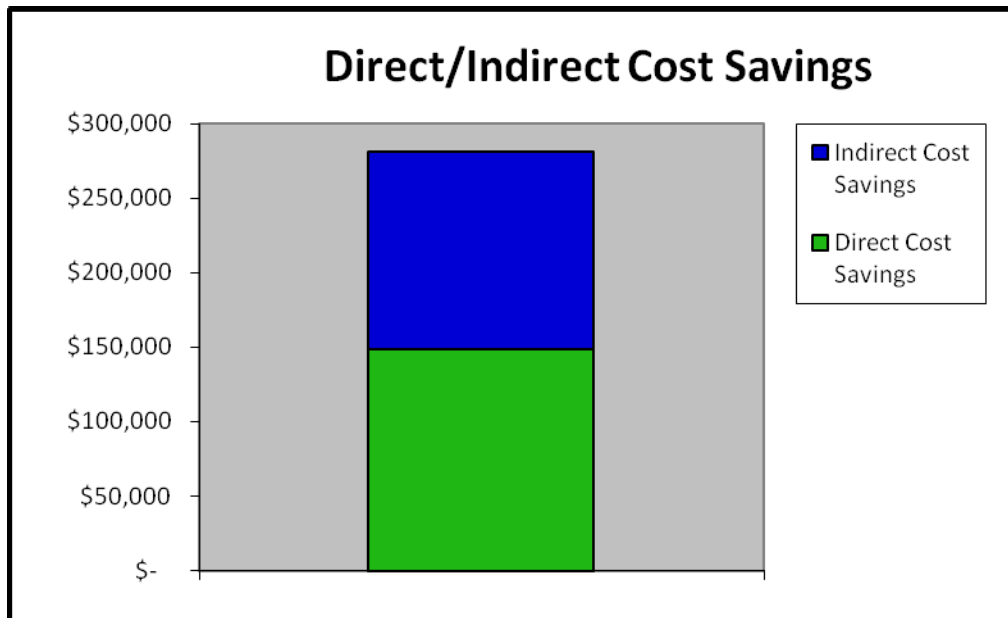
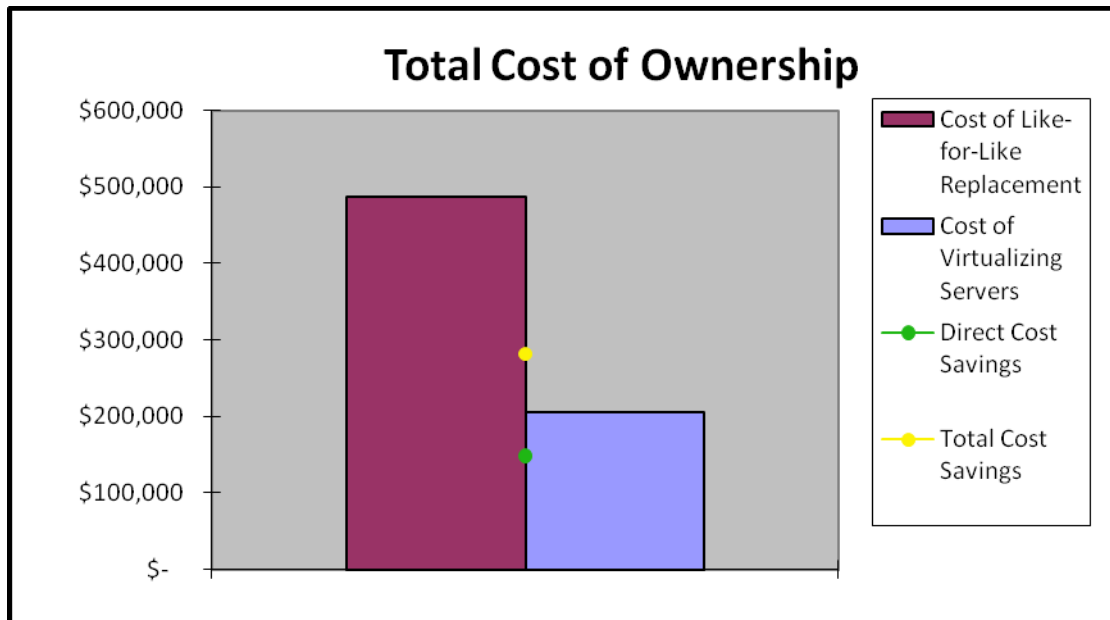
This case study of Southwestern Illinois College supports the experience of many organizations as they move to server virtualization. The TCO and ROI are achieved. Still, expenditures for servers, rack space, power and cooling continue to rise to accommodate new IT services. Where is the next source for reducing IT operations costs? Is cloud computing a potential solution? Ah, but that is another topic and a possible future case study.

Team Members

The following IT staff participated in the implementation of Server Virtualization – Phase 1:

Ron Durrer	Network Manager
Per Hagstrom	Internet Systems Manager
Mike Hinton	Principle DBA
Chris Ieja	CIO
Glenda Young	Director of Network Services

SWIC TCO and ROI Charts and Spreadsheets



3 Year Total Cost of Ownership

	Without VMware	With VMware	Savings
Direct Costs			
VMware Services	\$ -	\$ 17,000	\$ (17,000)
VMware Software & Support	\$ -	\$ 38,938	\$ (38,938)
Third Party Software & Support	\$ -	\$ -	\$ -
Server Hardware	\$ 229,500	\$ 27,000	\$ 202,500
Network Costs	\$ 49,500	\$ 18,000	\$ 31,500
SAN Costs	\$ -	\$ 30,000	\$ (30,000)
Total Direct Costs	\$ 279,000	\$ 130,938	\$ 148,063
Indirect Costs			
Data Center	\$ 136,823	\$ 16,965	\$ 119,858
Server Provisioning	\$ 11,745	\$ 1,980	\$ 9,765
Server Administration	\$ 50,760	\$ 55,080	\$ (4,320)
Procurement	\$ 8,750	\$ 750	\$ 8,000
Total Indirect Costs	\$ 208,078	\$ 74,775	\$ 133,303
Total Cost of Ownership	\$ 487,078	\$ 205,712	\$ 281,366

Return On Investment

		Year 1	Year 2	Year 3
Investments	VMware Services	\$ 17,000	\$ -	\$ -
	VMware Software & Support	\$ 27,813	\$ 5,563	\$ 5,563
	Third Party Software & Support	\$ -	\$ -	\$ -
	Server Hardware	\$ 27,000	\$ -	\$ -
	Network Costs	\$ 6,000	\$ 6,000	\$ 6,000
	SAN Costs	\$ 10,000	\$ 10,000	\$ 10,000
	Data Center	\$ 5,655	\$ 5,655	\$ 5,655
	Server Provisioning	\$ 1,980	\$ -	\$ -
	Server Administration	\$ 18,360	\$ 18,360	\$ 18,360
	Procurement	\$ 750	\$ -	\$ -
	Total Investments	\$ 114,557	\$ 45,577	\$ 45,577
Savings	Server Hardware	\$ 32,000	\$ 76,500	\$ 94,000
	Network Costs	\$ 10,500	\$ 10,500	\$ 10,500
	SAN Costs	\$ (10,000)	\$ (10,000)	\$ (10,000)
	Data Center	\$ 39,953	\$ 39,953	\$ 39,953
	Server Provisioning	\$ 9,765	\$ -	\$ -
	Server Administration	\$ (1,440)	\$ (1,440)	\$ (1,440)
	Procurement	\$ 8,000	\$ -	\$ -
	Software & Services	\$ (29,979)	\$ (12,979)	\$ (12,979)
Total Savings		\$ 58,799	\$ 102,534	\$ 120,034
Total Cumulative Investments		\$ 114,557	\$ 160,135	\$ 205,712
Total Cumulative Savings		\$ 58,799	\$ 161,332	\$ 281,366
Total Return on Investment		151%	201%	237%
ROI Time Frame		Year 1		