

Dear Sir or Madam,

The servers we currently have are running at only a fraction of their capacity and costing us \$2 million per year. Server consolidation via virtualization will address this excess capacity problem by running several isolated operating systems simultaneously on one server. This consolidation will also reduce the annual operating cost by \$1.36 million and generate a net benefit of \$9.2 million over a 3-year period.

Virtualization is the creation of virtual machines, hosted on different partitions of a VM server. VMs share the server's resources, such as processors, memory, and storage, but function as independent computers. This means you can install Windows in one VM and Linux in another without them affecting the other. Virtualization enables server consolidation because you can create separate VMs for different applications without additional hardware. In our data center, we can virtualize 80% of our 1000 servers, leaving the critical systems on traditional servers. Since traditional servers can be consolidated to VM servers by a ratio of 10:1, we can reduce the total number of servers to 280. Server consolidation also improves resource utilization by using up to 80% of the server's capacity compared to only 5-10% for single-system servers.

As we enter the hardware refresh cycle, an investment in server consolidation by virtualization will bring a net benefit of \$9.2 million by the end of a 3-year period. The total hardware and operation costs for such architecture will be \$4.8 million over the course of 3 years but we are also realizing a benefit of \$14 million over the same time period because we eliminated the hardware and the operation cost of 1000 traditional servers. In just the first year we will save \$5.12 million in hardware expenses and we will save \$1.36 annually in operation by consolidating our servers.

Sincerely,
Yinping Hu
CTA

1. Dawson, Philip, and Nathan Hill. *Hype Cycle for Virtualization, 2014*. Rep. N.p.: Gartner, 2014. *Gartner*. Web. 20 Sept. 2014.
2. Sundarajan, Srikanth, and Hariprasad Nellitheertha. "Server Consolidation and Virtualization." Infosys. Web. 20 Sept. 2014.
3. Dinesh. "Server Consolidation Benefits – With Real World Examples." *Sysprobs Not Another Tech Blog*. N.p., n.d. Web. 20 Sept. 2014.

Appendix. Calculations

Current Architecture v. Virtualized Architecture			
	Current	Virtualization	Difference
Number of Physical Servers	1000	200	
Avg Server Cost (per server)	\$8,000	\$8,000	
Cost of Physical Servers	\$8,000,000	\$1,600,000	
Number of VM Servers	0	80	
Avg VM Server Cost (per server)	\$0	\$16,000	
Cost of VM Servers	\$0	\$1,280,000	
Total Hardware Cost	\$8,000,000	\$2,880,000	(\$5,120,000)
Operating Cost (\$2000/server)	\$2,000,000	\$400,000	
Operating Cost (\$3000/VM server)	\$0	\$240,000	
Total Operating Cost	\$2,000,000	\$640,000	(\$1,360,000)

3-Yr Cost/Benefit for Virtualization				
	Year 1	Year 2	Year 3	Total
<u>Cost</u>				
200 Traditional Servers	\$1,600,000	\$0.00	\$0.00	\$1,600,000
80 VM Servers (10:1 consolidation)	\$1,280,000	\$0.00	\$0.00	\$1,280,000
Traditional Server Maintenance	\$400,000	\$400,000.00	\$400,000.00	\$1,200,000
VM Server Maintenance	\$240,000	\$240,000.00	\$240,000.00	\$720,000
Total Cost	\$3,520,000	\$640,000.00	\$640,000.00	\$4,800,000
<u>Benefit</u>				
Eliminate 1000 Traditional Servers	\$8,000,000	0	0	\$8,000,000
Eliminate Traditional Server Main.	\$2,000,000	\$2,000,000	\$2,000,000	\$6,000,000
Total Benefit	\$10,000,000	\$2,000,000	\$2,000,000	\$14,000,000
Net Benefit				\$9,200,000

1. Dawson, Philip, and Nathan Hill. *Hype Cycle for Virtualization, 2014*. Rep. N.p.: Gartner, 2014. *Gartner*. Web. 20 Sept. 2014.
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