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**Flash Research Assignment #3: Virtualization and Cloud Computing**

 With virtualization technology, we can cut down our current physical stock of servers by 72% which amounts to savings of $9,200,000 over a three year period. Without virtualization, each server only houses one application, typically leaving 95% of its capacity to waste. Virtualization can bring server utilization nearly to 100% capacity, cutting down the amount of servers we need to buy and maintain.

 Without virtualization, most server farms hold 1:1 server-to-application ratios due to complications that can arise from compatibility issues between applications. This amounts to higher needs for capacity in server farms both in physical space, utility costs, and in the amount of servers needed. Virtualization technology allows us to partition a server into different compartments for different applications. Each compartment is its own virtual machine that functions as if it were just one server, insulating applications from compatibility issues. Virtual machines are flexible and can even be moved over from one server to another by a simple drag-and-drop mechanism without the need for complicated installation.

 Considering we are starting a hardware refresh cycle, we would need to buy 1,000 new servers at $8,000 per server if we did not employ virtualization technology. With $2,000 per year on maintenance for these servers, the total over a three year period without virtualization would be $14,000,000. If we invest in virtualization technology, we will be able to convert 80% of our server needs into 80 virtualized servers at $16,000 per server with $3,000 per year maintenance costs. We would still have 200 nonvirtualized servers but the total over three years would only be $4,800,000. That is a savings of 9,200,000 and an ROI of 91.67%. Virtualization technology is essential for both modernizing our servers and lowering our costs.

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| --- | --- | --- |
|  | **Costs without Virtualization** |  |
| **Servers** | **Year 1** | **Year 2** | **Year 3** | **Total** |
| **1,000 Nonvirtualized** | 8,000,000 | 0 | 0 | 8,000,000 |
| **Maintenance Costs** | 2,000,000 | 2,000,000 | 2,000,000 | 6,000,000 |
| **Total** | 10,000,000 | 2,000,000 | 2,000,000 | **14,000,000** |
|  |  |  |  |  |
|  | **Costs with Virtualization** |  |
| **Servers** | **Year 1** | **Year 2** | **Year 3** | **Total** |
| **200 Nonvirtualized** | 1,600,000 | 0 | 0 | 1,600,000 |
| **80 Virtualized** | 1,280,000 | 0 | 0 | 1,280,000 |
| **Maintenance Costs** | 640,000 | 640,000 | 640,000 | 1,920,000 |
| **Total** | 3,520,000 | 640,000 | 640,000 | **4,800,000** |

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| --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Total** |
| **Cost** | 3,520,000 | 640,000 | 640,000 | 4,800,000 |
| **Benefit** | 6,480,000 | 1,360,000 | 1,360,000 | 9,200,000 |
|  |  |  | **Net Benefit** | 4,400,000 |
|  |  |  | **ROI** | 0.9167 |

**Bibliography**

Eli the Computer Guy (2012, February 3). *Introduction to virtualization*. Retrieved September 30, 2013, from <http://www.youtube.com/watch?v=zLJbP6vBk2M&feature=c4-overview-vl&list=PL3EFBFBCE1249ABC0>

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