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Project One: Executive Summary

**Addressing the Needs for Server Virtualization**

As our company develops our server infrastructure should do so at the same rate. Physical servers are assigned independent tasks to perform: one is designated to control our email and messaging services, another provides the domains used for our network, etc. Our server structure, which currently uses physical hardware (server racks) to perform tasks, will start to become more costly as we move into the future. This setup works on a smaller scale but development will become an issue in the near future; as we require more services from our servers the more physical servers we need to add to our infrastructure. This poor scalability of hardware will also become more expensive to the company. Servers are not allocating all possible resources and more servers are required to handle these tasks, with reports indicating that only 8-12% of a server’s processing power being optimized (Daniels, 10). Scalability and cost of upgrading can be alleviated by switching from physical servers to a virtual server environment.

**Advantages to a Virtual Server Environment**

Virtual servers run on physical hardware but more instances can be run on the same set of hardware. As an example, instead of utilizing two physical servers to run our mail services and another to set up our domains, we can run a virtual server to handle both tasks on one physical server. This model of server management allows us to save on hardware costs (up to 50%) and makes our current hardware more efficient where cost is a consideration. While one server should not be designated to handle all server functions, this still allows us to consolidate onto a smaller amount of physical servers and opens up the option of moving to server space we saved when more tasks are needed. Consolidating servers to a virtual environment could reduce energy costs by up to 80% by requiring less hardware (Daniels, 10). This will cascade into less power used to both run the hardware and maintain a proper temperature to keep hardware optimal.

Servers in a virtual environment are also more convenient to service for our IT department. Updates can be applied to the virtual environment on a test platform instead of rolling out immediately to our live network. Potential software bugs or system issues can be discovered and resolved before being released for use. Virtual services also allow for physical upgrades to server hardware have little impact on day-to-day operations. If physical hardware of a server needs to be addressed, or replaced, the virtual server can simply be moved to another location while its former physical server is worked on (Daniels, 11). Redundant operations should also be implemented by our virtual servers. While performing the same task multiple times seems nonsensical, having a group of systems provides a safety net in case one virtual server crashes. When one virtual server has an issue the redundant server can still function and provide its services to the network.

**Disadvantages and Solutions**

While a virtual environment offers more utilization of hardware it comes with its own set of challenges. One specific issue will be the specialized knowledge required from our IT department to maintain the new network. Training and preparation of the new environment will be mandatory for the division so that potential issues can be dealt with in a swift and efficient nature.

A hardware issue, which was touched upon earlier in the report, is that no virtual server should be responsible for handling most of the tasks required. Some of our software applications require substantial amounts of processing power and memory to function and it would not be feasible to run multiple instances of those applications on the same virtual server. While more of the server can be used for other services overloading the server with tasks will slow down operations of both the server and the services that are provided by it (Oguchi, 50). This can be resolved by limiting the amount of tasks that can be performed by any one virtual server and moving multiple applications that require high hardware overhead to other virtual servers.

**Conclusion**

Server virtualization offers many advantages to our company: scalability can be increased by requiring less physical hardware and money can be saved by optimizing current hardware in use. While the issues of increased complexity of the environment and potential overloading of servers can occur, we can eliminate these concerns by properly training our IT department to handle issues and appropriately allocate our server resources to prevent congestion. Our company is evolving and it only makes sense to develop our infrastructure to keep that growth possible.

References:

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