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IT 4600
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RE: Project Design Document

Synapsis:
The project that I have selected to do is create a VMware vSphere cluster that will allow for Apple OS X (OSX) guest virtual machines. The purpose of creating this cluster will allow Dixie State College, soon to be Dixie State University, students to gain more exposure to working with the Apple OS. Now, up until a few years ago, virtualizing OSX clients was not legally possible. However, Apple finally created a licensing agreement to allow these clients to work with Apple’s xServe and Mac Pro equipment. Sense Apple no longer makes the xServe rack mount server, that leaves the Mac Pro to use as the basis of the cluster. The Computer Information Technology (CIT) department has purchased Mac Pro units in the past. However, some of the units were replaced with iMac machines, and therefore were surplused. I will use four of these machines to demonstrate how a cluster can be created.

Hardware Overview:
During the planning stages, the Mac Pro was selected because DSC/DSU had remaining units that were not being used in their inventory. The Mac Pro’s that will be used are the first generation (MacPro 1,1). Apple built these units to include full workstation/server class hardware, which will be critical for the cluster to operate nominally. These systems are based off of Intel Xeon processors and utilize fully buffered (FB-DIMM) ram modules for precise system integrity. Now, if the CIT department chose to keep this implementation, their ram would need to be upgraded to allow more than one guest OS to run at any given time. But, for testing purposes, these machines will operate nominally.

Software Overview:
There are many different types of hypervisor OS’s, but I have selected VMware’s vSphere technology due to its robust sets of features. Also, I selected the hypervisor because of the amount of technical documentation that points to the success of my project. There are many other different hypervisors that I could have used, but they usually trade off functionality over ease-of-use, something that CIT students will need if they are going to use the new cluster.

Configuration Details:
During the beginning stages, I will only configure one server to get the proper installation image ready. Then, after the hypervisor has been successfully installed, I will install the necessary server to allow remote administration and that will enable server clustering. Finally, I will install a guest VM with OSX to verify the claims of the documentation. After the guest OS is verified to be running properly, I will use the cluster-management tools to migrate the guest machine to other systems for redundancy.

After redundancy has been configured, I will start to configure my second sets of goals, enabling remote VM storage to cover a catastrophic failure of any of the vSphere servers. Once this feature has been enabled, I will try to configure accessibility for the CIT students via the LDAP
account authentication protocol. This will finally enable CIT faculty and students to create and manage their own VM’s, much like they are able to do with the Shakespeare QEMU-based VM cluster.

Cost breakdown:
While all of the hardware being used is already owned by the college, there are not any immediate costs for procurement of the systems. Additionally, VMware allows their vSphere software a 60-day trial period where all features are enabled. For pre-production testing, the total cost of the implementation will be $0.00. However, if the solution is approved for use, DSC/DSU has campus licensing for all of the major vSphere and vCenter (the control servers), which could be applied to the installed infrastructure.

Final Overview:
This project should satisfy a trend to allow any CIT student to use an OSX machine. This will also enable lower-division students the opportunity to work with the OS more in-depth as an administrator, and enable the CIT faculty to possibly formulate a curriculum that helps students become more exposed to the OSX operating system, increasing their comfort level for when they enter 2000+ level classes, and for when they graduate and have to work with these types of systems in the field.