**Lab 05: vSphere and vCenter**

In this lab, we used VMware vSphere and vCenter to setup and manage virtual machines.

**vSphere**

vSphere is a cloud computing virtualisation platform that allows you to easily implement and manage VM infrastructure on a large scale. It is the most cost-effective compute resource currently available. We can create VMs from templates, revert to snapshots, create resource pools and vApps, among many other features. VMware gives the administrator complete control of the environment to not only save valuable time when creating new machines, but to also identify resource needs and apply those resources to the proper areas.

vSphere includes the ESX/ESXi hypervisor, a type 1 hypervisor that functions as the virtualization server; the vCenter Server, which manages vSphere environments; the vSphere Client, which is used to install and manage virtual machines through the hypervisor; and VMFS, the file system component from VMware.

**vCenter**

Logging onto the vCenter Appliance and using the vSphere Web Client, we created a virtual machine using a template, selecting NAS02 for storage. The status of the VM could be viewed in the Recent Tasks tool. The VM was then configured to have an extra hard disk added. A snapshot of the VM was taken, creating a record of the machine at that point in time. With the VM powered on, its performance and use of resources could be monitored. This information can be useful when troubleshooting, as it shows historical records of tasks and events related to the VM.

From vCenter, it is possible to remote into VMs allowing administration tasks to be carried out. This method is much more efficient than physically logging into machines individually. Multiple VMs can be managed from one console. From here, alarms can be set up to alert in the event of a failure, or a particular event.

Another snapshot was taken, this time while the machine remained powered on. A couple of test files and folders were created, and upon shutting down the VM a third snapshot was taken. All of the snapshots taken can be managed. From the Manage tab, you can revert to a previous snapshot if desired. This feature is particularly helpful when in a testing environment. If a new update or program interferes with the machine, it is easy to revert back to an older state which is fully-functional. This can also be used for disaster recovery.

In addition to VMs, the vCenter environment displays other objects such as Datacentre, Cluster, and Hosts, all of which offer functionality to enhance the overall system. For some of these to work, particular settings must be enabled. For example, in order to create a new Resource Pool or a vApp, vSphere DRS (Distributed Resource Scheduler) must be turned on. A Pool is essentially a group where you can change the resources of multiple VMs at once. Similarly, vApps allow you to apply resource rules to the VMs within them, however its main function is to house multiple VMs that can be powered on or shut down as a group.