Outline of Use Cases

Student and Researcher VMs

- **Description**: For easing the management of the resources of the CS department, OpenStack users are going to have allocated a VLAN and a set of compute and storage resources. Each user is allowed to login to the OpenStack dashboard to create and destroy VMs under their quota. The administrators will also have the option to login to the computers using SSH to manage the resources directly. All authentication is done using CS's LDAP.
- **Sequence of Steps**:
    a. Administrator add user to the OpenStack group and set their resource allocation
        - User should be added to the appropriate group in Active Directory
        - Network configuration allows an isolated internal network called VLAN to be put in place automatically
    b. Student logs in through Horizon and own manages VMs
        - The student will use their C.S. department login as authentication method
    c. Administrator has access via Horizon or a CLI to manage other people's VMs and allocations.

Personal VMs for Teaching 'Introduction to Linux' Class

- **Description**: A professor wishes to teach a class on how to use Linux operating system. The professor would like to create a number of VM's for students to work with. This will allow easy and fast method to create any new VM for any student. The professor would like to have the ability to create and destroy these VM's with relative ease. Each VM also needs to be configured automatically to authenticate against CS's LDAP.
- **Sequence of Steps**:
    a. Professor logs into Horizon
    b. Professor creates a number of VM's for his/her class
    c. Professor assigns each VM to a student ID
        - The student will use their C.S. department login as authentication method
    d. The student logs into their designated V.M. and starts the class
    e. Once the class is over, the professor looks through each VM and grades or

makes comments as he/she pleases

f. Professor deletes the VM's to restore resources for future uses

Dr. Ludwig's and Dr. Denton's Project with Harvest Data

- **Description**: John Deere/RDO are collecting various data on beets harvesting. Dr. Ludwig wishes to store this data in a distributed file system for highly availability. This data will later be analyzed and processed by a Hadoop cluster that needs to be deployed using OpenStack. More data will be received on a weekly basis and it need to be added to the storage. The system administrator needs to receive reports of the current state of the system while Hadoop is running.
- **Sequence of Steps**
  - **a.** Data is added on the form of (block|object)? storage.
  - **b.** Researcher will login to Horizon
  - **c.** A Hadoop cluster can be deployed automatically
    - A pre-made image with Hadoop installed will be available
    - If an instance of the Hadoop cluster is running, more node can be added(is this possible)?
  - **d.** System will continuously log and report information about CPU load, IO and network usage

Distributed Rendering

- **Description**: Create a network of nodes to render videos. Ability to adjust the size of the network based off each individual rendering need. Each of the nodes will be working together to render the same video. Once the video is done rendering, destroy the nodes for future use.
- **Sequence of Steps**:
  a. Estimate the resources needed to render a particular video
  b. Log on to Horizon and create the number of nodes needed
    - Each node has a preconfigured image with desired rendering video software
  c. Each node works together to render the same video
  d. Once the video is rendered, destroy the resources for future use