lyit | Institiúid Teicneolaíochta Leitir Ceanainn
Letterkenny Institute of Technology

Assignment 1

Lecturer:	John O'Raw
Report Title:	Assignment 1
Submit to:	Blackboard with all files as specified in the assignment, submitted as a single ZIP folder.
Date Submitted:	07 Feb 2021

Student Name:	Mamta Mittal
Student Number:	L00161832
Programme of Study:	M.Sc. In Cloud Technology
Module:	Private Cloud Technology

Please refer to the Institute's Quality Assurance Handbook, Version 3.0, September 2018

1. Practical work, forming part of the CA of a module, will only be assessed if the student has attended the relevant practical classes.
2. CA work must be completed within the schedules and specifications (specified in the CA brief). Students who submit CA late may forfeit some or all the marks for that work.
    a. The total marks available for an assessment be reduced by 15% for work up to one week late; i.e., a grade of 50% would become (50*0.85) = 42.5%
    b. The total marks available be reduced by 30% for work up to two weeks late i.e., a grade of 60% would become (60*0.7) 42%
    c. Assessment work received more than two weeks late should receive a mark of zero.

    Work is deemed late when an unauthorised missing of a deadline has occurred.
3. CA must be the student's own work, refer to Plagiarism Policy, in section 5.7 of the QA manual.

Summary

The scope involves providing virtualization solution for electric-petrol station for the branch site Sligo. VMWare has been chosen as virtualization vendor and various applications are installed as Virtual Machine (VM) so that less hardware will be required for the design. Two server hardware from Dell will be used as cluster which will load balance the VMs. If one of the servers goes down, another server will be available, hence providing redundancy. Servers will be connected to switches in different buildings, one at ForeCourt and another in Test/Service so that if damage happens to one building, server in another building will be safe. Total 6 VMs will be created as below:

1. Domain Controller/DHCP/DNS
2. File and Print Server,
3. Database Server,
4. Web Server/Application Server
5. Telephony Server
6. Avaya SBC (Session Border Controller)

All the VMs will be available in both the servers. IP Telephony server and SBC from Avaya has been recommended. Number of VMs supported on a host depends on the number of Cores, Memory, Hard Disk present on the hardware/host machine. Based on the requirement of each VM, Dell Smart Value Power Edge R640 Server Optimal Pricing has been chosen. Extra memory and hard disk space have been allocated considering future expansion.

Redundancy has been provided for below devices as well.

1. Hard Disk
2. Power Supply
3. Management Port to access Server
4. NIC port for connection to switch
5. PDU (Power Distribution Unit)
6. UPS (Uninterrupted Power Supply)

Each server cabinet will have two of above device/component except Hard Disk where redundancy is provided using 3 hard disks in each server for load balancing. Sufficient space in hard disk has been provided for data, considering 25 employees for the SME. It has been assumed that customer is not looking for any backup solution, hence backup of file/print server and database server has not been considered.

Servers will be connected to switches using 10 Gbps CAT6 cables for better speed. Two UPS of 1500VA for each server rack from vendor APC have been recommended keeping in mind that around 30 mins of backup time should be there to handle any power issue. Having 2 UPS in each cabinet will also take care of redundancy. Smart UPS used has extra features for monitoring, control and energy management. Each server cabinet is provided with one KVM switch to make troubleshooting them easier. Cabinets have been chosen such that there is enough space for placing server and ancillary equipment such as PDU, UPS, Cabling etc.

Network Contractor who is an Aruba reseller will handle data networking part and will take care of the installation of networking equipment and racks. A brief has been provided to network contractor explaining the requirement including details on cabinets type and model, switches, port requirement, router, redundancy, etc. Switches will be connected using fiber across various buildings such that there is redundant path available. Controller for ventilation equipment, power requirement, solar panels will be used and monitoring will be done for them, which has been briefed to contractor. Application for monitoring can be installed on one or more VMs as per the requirement.

Dell Power Edge R640 Server chosen has basic next business day warranty for 36 months. Extended Service of ProSupport with 4Hrs Mission Critical for 36 months has been chosen. ProSupport increases productivity and minimizes downtime as support staff will be available 24x7 across the globe. Average lifespan of the server would be around 7 years and by regular upgrade and part replacement, it can go beyond 10 years.

ProSupport with 4Hrs Mission Critical for 36 months will cost **€2534.12** for 2 servers chosen.
Total cost of 2 Dell R640 Server hardware recommended is **€25491.16.**

Server project needs roughly 80 hours of Labor and considering €100 per hour as labor charge, total amount for labor charge comes to **€ 9,080.00.**

.