I.T Internship at Endeavour Mining – Adamus Res. Ltd, Nzema Ghana

Systems Design

FOREWORD

This Document represents a Technical Documentation of the Internship I had at Adamus Resources Limited, Nzema Plant, Ghana (A Subsidiary of Endeavour Mining Corp.)

PREFACE

This document is organized as follows

- Executive Summary
- Introduction
- Internship Plan
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Executive Summary

The purpose this internship was to have firsthand knowledge and experience in Enterprise Networks and also design a network to test the integration of Windows 2008 R2 and Windows 2012.

Adamus Resources Ltd would want to migrate from Windows 2008R2 to Windows 2012 in the coming year and this project was to serve as a test case to know some of the challenges and opportunities this change would offer.

The internship was supervised by Bernard Bimpong-Amoah, the IT Manager at Adamus Resources Ltd. In this project I was shown a business network and how it support the business to achieve its goals.

I was also allowed to take part in the day to day I.T support provided by the IT department. I worked with a team of three (3) comprising of 2 IT Administrators and 1 National Service Person.

Some of the daily activities included; changing printer cartridges, checking network connections, monitoring, troubleshooting, installations, etc.

Introduction

The name of the project is: KLOU Project 2015 and it started on 5th and ended on 27th January, 2015.

Areas that were covered included Hypervisor Installation, Creation of Virtual Servers, Remote Management, and Installation of Windows Server 2008 R2 and 2012. Active Directory Installation and Management, some Server Roles and Features were also installed in the Windows 2008R2 and 2012 environments.

Internship Plan

The internship plan was designed by the IT Manager after several correspondence with me. There were other topics under consideration but after careful analysis we arrive at what will be relevant to the Company and my training.

Below is the schedule for the KLOU Project 2015. This served as the guidelines for the project.

K-LOU PROJECT - JAN 2015		
ACTIVITIES A - Virtual Servers Environment	**Days**	**Date**
WEEK 1		
Activity 01- Introduction to Enterprise I.T Networks and General Knowledge Assessment	Day 1	Mon -5th Jan
Activity 02 - Virtual Machines Environment & Installation of VMs - EMC ESXi 5.x & Configurations	Day 2	Tues - 6th Jan
Activity 03 - Introduction to VSphere and Detailed VM Configurations		
ACTIVITIES B -Windows Servers 2008 and 2012 Environment	**Days**	**Date**
Activity 04 - Introduction to Windows Server Platforms	Day 3	Wed - 7th Jan
Activity 05 - Introduction to Windows 2008 R2 and 2012 Environments / Assignment		
Activity 06 - Installation of Windows 2008 R2 & Basic Configurations	Day 4	Thu - 8th Jan
Activity 07 - Detailed Windows 2008 R2 Configurations / **Week 1 Review**	Day 5	Fri - 9th Jan
WEEK 2		
Activity 08 - Windows 2012 Installations & Basic Configuration	Day 6	Mon -12th Jan
Activity 09 - Detailed Windows 2012 Configurations	Day 7	Tue -13th Jan
Activity 10 - Roles ,Features and Services - Windows 2008 -DNS, DHCP, WINS, RDP , etc	Day 8	Wed-14th Jan
Activity 11 - Roles , Features and Services - Windows 2012 – DNS, DHCP, RDP Management	Day 9	Thu - 15th Jan
Activity 12 - Performing Upgrades - Windows 2008 to Windows 2012	Day 10	Fri - 16th Jan
WEEK 3		
Activity 13 - Active Directory Installation and Management : Windows 2008 and 2012	Day 11	Mon - 19th Jan
Activity 14 - Deploying Domain Controllers and Configurations	Day 12	Tue - 18th Jan
Activity 15 - Active Directory Infrastructure Details	Day 13	Wed - 19th Jan
Activity 20 - Network Design using Visio and other tools , Design considerations	Day 14	Thu - 22nd Jan
Activity 22 - **Review** : Weeks 1- 4 / All Assignments/ Questions / Test	Day 15	Fri - 23rd Jan
WEEK 4		
Activity 16 - Group Policies, etc	Day 18	Mon - 26th Jan
Activity 17 - Remote Access and Others , etc. , **Review:** Self-Assessment and Questions	Day 20	Tues- 27th Jan

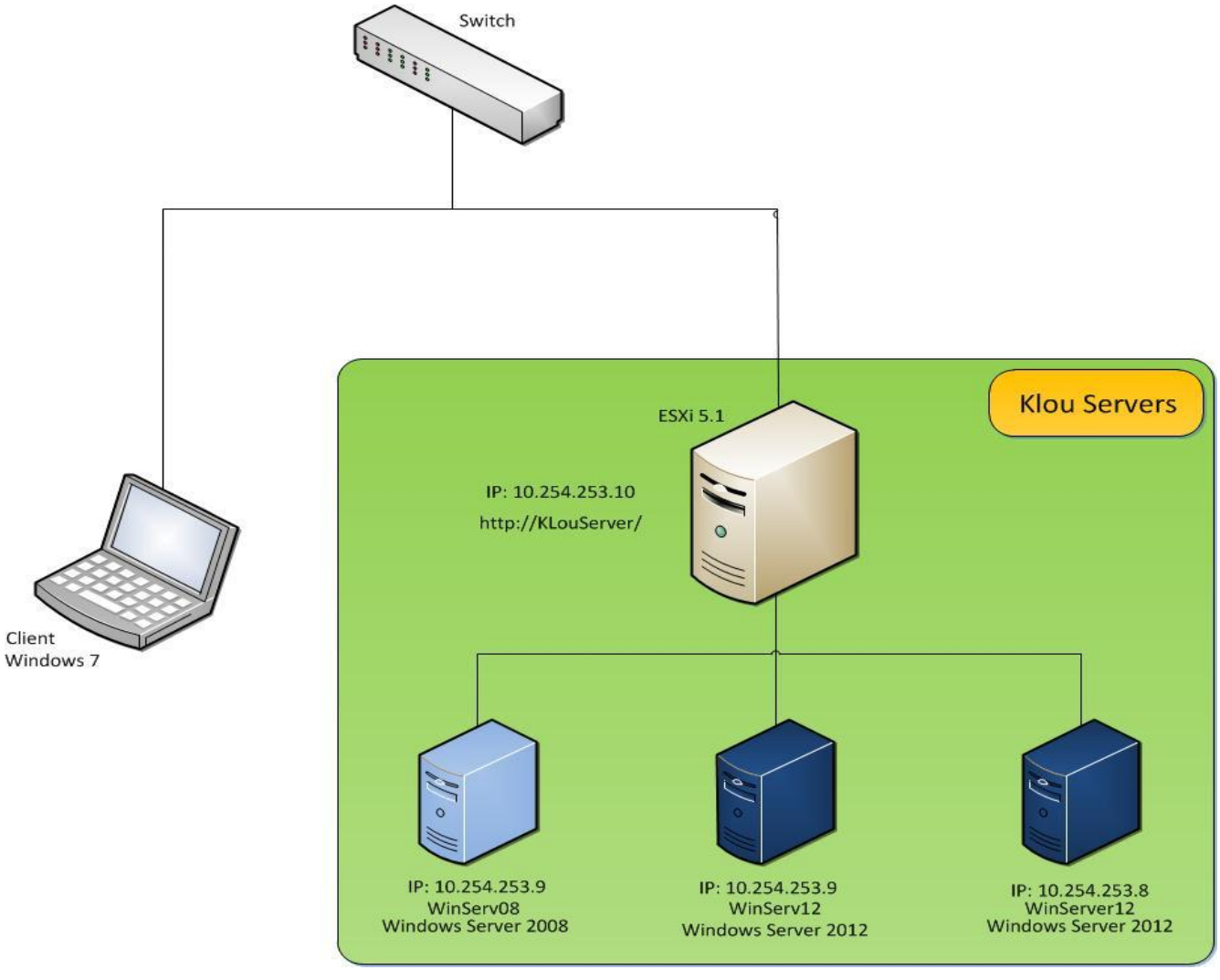
Network Design

I was introduced to network design by the IT Manager. We had a 1 hour chat talking about Enterprise networks and showing me the IT Infrastructure in place at Adamus Resources. According the IT Manager some of the areas to consider when designing a network are; Redundancy, Standardization, Connectivity, Security, Future Growth, and Recovery.

Project Network Diagram

In designing the network below the IT Manager taught me how to use MS Visio 2010 and this tool is a Microsoft product. I also watched videos from YOUTUBE at https://www.youtube.com/watch?v=5xcsQqHJE1g. This software has templates and icons of IT equipment and layouts which can be used to design networks.

Network Diagram- figure 1



Activities /Tasks Accomplished

- **Hypervisor Installations**

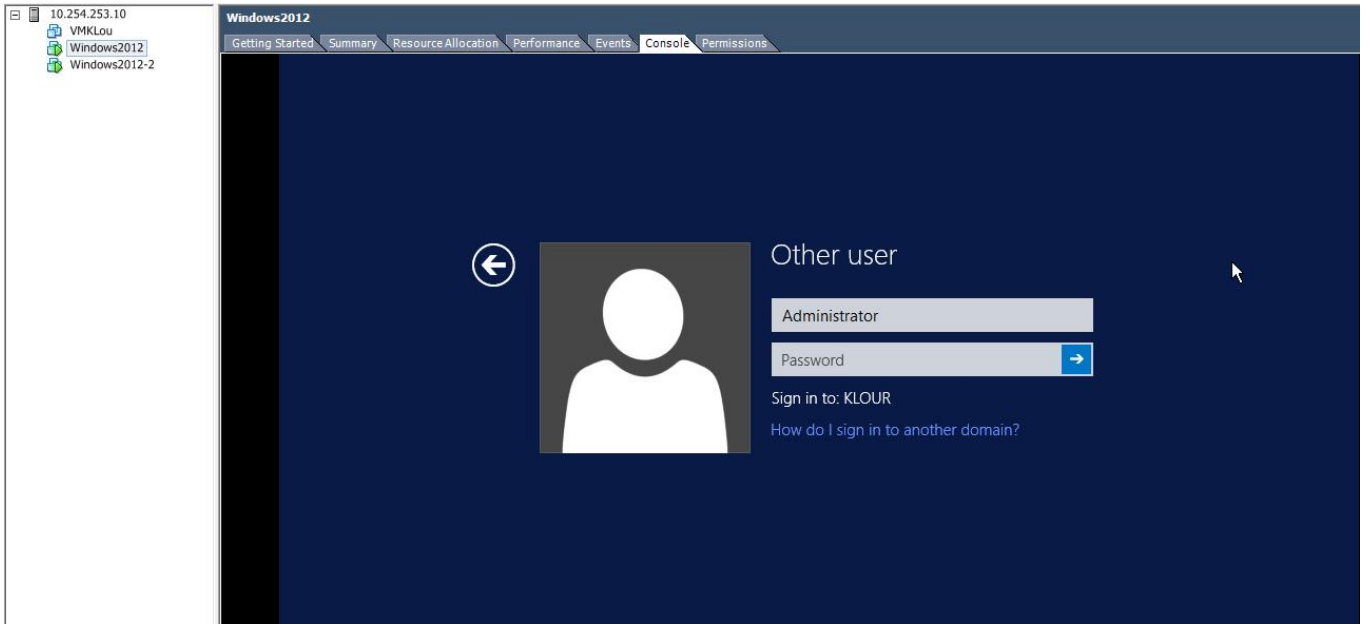
  The objective of this installation is to learn about Virtual Machines and how to implement virtual servers on a business level.

- Installed VMWare ESXi 5.1.0 on a mid-range HP server and was on bare metal.
- The specs of the host are;
  RAM = 8GB, HDD = 150GB, Processor = Intel Core 2 Duo, Speed = 3 GHz
- The host was configured with the following details;
  Hostname = KlouServer, IP Address = 10.254.253.10, DNS same as host server, Default Gateway = 10.254.253.254 (default switch IP)
- PC was configured to be in the same network as the host and a ping reply was received. This indicated the machine is available on the network.

- **Virtual Server Installations**

- VSphere client was downloaded from the ESXi server and installed on personal computer.
- VSphere was used to connect to the ESXi host server using the IP of the server.
- Virtual Machines (VMs) were created following the wizard in the Virtual environment.
- 3 Virtual Machines were created (see below) on the host with names ;
  VMKLou, Windows2012, Windows2012-2
- Windows 2008 R2 and Windows 2012 CDs were used to install the operating systems on the VMs.

The figure below shows the virtual Environment



Windows 2008R2

- First Virtual machine (VMKLou) had Windows 2008R2 Standard installed and I was taken through the features of the operating system.
- The server IP = 10.254.253.9, Server Name =WinServ08
- The following was installed – DNS, DHCP, Active Directory, Remote Desktop Services, etc.
- I was taken through all these services various configurations were made and tested by me.
- A domain was created and the server was used the domain controller.
- The Domain name is: Klou.com
- I was introduced to the roles and features in Windows 2008 environment.

Windows 2012

- Second (Windows2012) and third (Windows2012-2) virtual machines both had Windows 2012 Standard installed and I was taken through the features of the operating system.
- The Server1 Name = WinServ12 , Server1 IP = 10.254.253.8
- The Server2 Name = WinServer12, Server2 IP = 10.254.253.9
- The following was installed – DNS, DHCP, Active Directory, Remote Desktop Services, on server 1 serving as the main Domain controller
- I was taken through all these services various configurations were made and tested by me.
- This was to be done by myself to show that what I had learnt from the Windows Server 2008 installation.
- A domain was created and the server was used the domain controller.
- The Domain name is: klou12.com
- The second server was configured as Backup domain controller and was part of the klou12.com domain
- I was introduced to the roles and features in Windows 2012 environment.

Challenges

When we attempted to make the first installation (Windows Server 2008) join the domain created on Windows Server 2012, it was not possible, so a third virtual machine was made.

This happened because when installing Windows 2012 domain, room was not given for earlier Windows server versions to join.

Caution: It is important to note that when installing windows domain one has to give room for earlier server versions to join if there is the plan to do so in future.

Lessons:

- Active Directory determines whether a user is an administrator or user with special permissions and applies security policies as is required.
- RDP, this is so that Administrators can control and edit what the server does without having to use the hypervisor.
- DNS, the role of this service is to resolve IP addresses into Computer Names and vice versa.
- DHCP, this gives IP addresses to computers when they first connect to the network. And it is done automatically.
- Group Policy, it is used to enforce specific actions depending on the user logging on and/or the group the member is in.
- I made several users and groups of users to see how they would have an effect on the server and how the different levels of users affected what the user could and could not do.
- When a user is created on one Domain Controller, that user automatically appears on the backup controller if replication is working.

Conclusion

In all, the exercise exposed me to Virtualization and Windows Servers environments.
The daily exercises and practices helped me to have practical experience with these systems and how they support the business. I wish to develop the skills acquired from this training and take it to the next level.

My special thanks goes to Mr. Bernard Bimpong-Amoah and the entire IT team at Adamus Resources Ltd.

Prepared by: ……

Date: ……. Signature: …….

IT Manager (Project Supervisor)……

Date: ……. Signature: …….