

Information Technology
Parkes Campus

Certificate IV 19009
(Networking)

19009 Certificate IV in Networking

Introduction

The following information is intended for students enrolled in 19009 Certificate IV (Networking) at Parkes Campus, Western Institute of TAFE.

This document contains three (3) practical projects for which are referred to in the “Student Unit and Assessment Guide” document that can be downloaded from the link <http://www.lachlanonline.edu.au/courses/19009/index.html>.

These projects are an alternative for students who would prefer to demonstrate their skills using integrated projects rather than working through individual ‘Toolbox’ units.

Each of the following projects consists of a number of practical tasks, each of which has one or more items (dot points) that you will need to complete. All work must be completed to an acceptable workplace standard. The required resources for each project are listed at the beginning of the project text. If you have any concerns or difficulties in understanding the projects, please contact your teacher.

We are increasingly using virtualization as our main technique to quickly and efficiently build complex network environments. To this purpose we have created an Online Virtual IT Lab accesses through the site <http://portal.lachlanonline.edu.au>. There are podcasts on the use of the virtual IT lab which can be viewed at <http://www.lachlanonline.edu.au/Documents/Podcasts/index.html> . To learn more about virtualization in general, follow this link: <http://www.vmware.com/technology/virtualization.html>.

Much of the technical reference material for Microsoft operating systems and their implementation are publically available at the TechNet section of the Microsoft internet site. This can be found at <http://technet.microsoft.com>.

Student can now also undertake technical training courses through our partnership with the Microsoft IT Academy program, which directly support many of the features that you will be asked to configure as part of these projects. Access to these courses requires students to have internet access to the <http://itacademy.microsoftlearning.com> site, a Windows Live™ ID user account and an Access code provided by your teacher.

While these projects are framed around the use of Microsoft operating systems, other operating systems (such as linux based systems) may be used where the student has more access or experience with these systems.

Any questions can be emailed to your individual teacher or lachlanonline@tafensw.edu.au.

Good luck and best wishes from the Lachlan IT team.

Project 1. Basic Server Installation

This project is used in the assessment of modules ICAS3032B, ICAS3120B and ICAI4097B.

In this project, your employer has been asked to produce a simple 'Client/Server' network for a small business client called 'Where 2 Surveying'. They have a licence for a Windows Server operating system which they would like to integrate with their mixed environment of Windows XP SP2, Windows Vista and Windows 7 computers.

You will need:

- A computer capable with broadband internet access. Standard minimum specifications for your host operating system are all that is required. The use of multiple monitors is an advantage.
- VMwareView Client software, used to access the Virtual It lab. This software can be downloaded from <http://www.lachlanonline.edu.au/courses/index.html> and must be installed on your local computer.
- View the podcast "Introduction to the Online virtual Lab – Part 1" and "Introduction to the Online virtual Lab – Part 2" from the Podcast section of the Lachlan IT Online site. This can be found at: <http://www.lachlanonline.edu.au/Documents/Podcasts/index.html>.
- Username and password access to the site <http://portal.lachlanonline.edu.au>.

You will need to complete the following tasks:

1. Microsoft Training – peruse the Microsoft Course 2274: **Managing a Microsoft® Windows Server™ 2003 Environment** or the **Fundamentals of Windows Server 2008 Active Directory** depending on the operating system you wish to use. These courses can be found at the <http://itacademy.microsoftelearning.com> site. You will need a Windows Live™ ID user account and an Access codes provided by your teacher.
2. Business Requirements

This task allows you to demonstrate that you are able to research the IT requirements of a business. Your client will require a DELL rack-mount server, with a RAID 5 iSCSI disk system, minimum 8GB of RAM and a minimum dual core Xeon processor.

The network has an ADSL modem (192.168.1.1) which provides Network Address Translation (NAT) for the business network which currently has all client PC's and laptops set up with static IP addresses from the 192.168.1.0 /24 network. But the client has no current naming conventions and no IP address allocation plan or record of used addresses. They do not have a registered domain name space.

They require their employees be able to log on from any PC and that laptops be able to join the network when in the office. All data is to be placed on a single network share location called 'Company Data'. Individual users must also have network 'home' directory and roaming profile directory.

You are to:

- Write a memo named 'Network Configuration Report' to your teacher that gives information about the requirements of the proposed Windows 2003 Domain controller. Your memo should have the following sections:
 - Overview.** This should outline the contents and purpose of the report.
 - Recommended Server Hardware:** this should contain a systems specification of a commercially available server which matched the business requirements. Include the price of the units with the specifications.
 - Naming Conventions.** Identify the domain name and computer naming conventions that you recommend be used.

Computer naming convention
(explain): _____

DNS Suffix: _____

Server Name: _____

Client Name: _____

- Network Settings.** List the IP settings to be used for the network's configuration.

Network Address: _____

Broadcast Address: _____

Subnet Mask: _____

Server IP address: _____

Client IP address: _____

Primary DNS server address: _____

Gateway address: _____

3. Configure IP settings between the Server and the client.

This task allows you to demonstrate your ability to configure an operating system which meets the specifications of a business. In this task you will need a Server and a client PC. For your server, clone to your workspace and deploy **EITHER** a **Windows Server 2003** or **Windows Server 2008** virtual machine for this task. For your Client, clone to the same workspace and deploy **EITHER** a **Windows Vista** or **Windows 7** virtual machine.

Your server will need to run DNS and user account management software for this

exercise. Ensure that you know how to install/ access each of these services in your chosen operating systems. For the purpose of these exercises, set the gateway to the server's IP address.

You are to:

- Rename the server and client host names and domain suffixes according to your specifications from Task 1 of this project.
- Configure the IP address properties of the server and client operating systems according to your specifications from Task 1 of this project.
- Configure a DNS service on the server operating system to include a forward and reverse DNS zone for the domain name
- Test the physical connectivity of the computers through command line commands such as IP protocol commands ping, ipconfig and nslookup to verify that the network services are working and that each host is locatable by both IP address and hostname.
- Configure an Active Directory (AD) installation for your domain name.
- Load the event viewer to evaluate the status of the server's hardware and to verify an error free installation. Any problems identified here should be discussed with your supervising teacher.
- Complete the following specification details of the server for the client's asset register:

Host Name: _____

CPU Model and Speed: _____

RAM: _____

HDD Model and Size: _____

NIC Models and Speed:

Demonstrate this configuration to your teacher when complete.

4. System Maintenance.

This task allows you to demonstrate your ability to maintain an Operating system which meets the specifications of a business. In this task you will clone to your workspace and deploy the “**Windows XP with a virus**” configuration (Windows XP image). The Norton Anti Virus (NAV) software for Windows XP or Vista from the ‘NAV10.ISO’ file which can be connected to your virtual machine's CD/DVD drive.

You are to:

- Load the appropriate Anti Virus program for your operating system and conduct a complete Anti Virus scan, removing any viruses found.

- Ensure the PC is secure by loading the Security Centre Application and correcting the deficiencies found.
- Check the Process list, CPU utilization and network utilization of the computer to verify that no malicious software is active.

5. Basic User Accounts - Creation and Configuration

This task allows you to demonstrate your ability to complete basic configurations in Active Directory on the Windows server. You may either use your server from task 1 OR clone and deploy the “**Windows Server 2003 with AD installed**” configuration.

‘Where 2 Surveying’ requires each user have a standard user configuration and that it should be available from any computer that they logon to within the business. Listed below are the standard user configuration requirements from the operations manual:

“Network User Requirements

All user accounts must meet the following requirements:

- User Accounts:** *User Passwords must be changed on first login and should expire every 28 days. They should also be members of a domain local group ‘Where 2 users’.*
- User Folders:** *The ‘My Documents’ folder should be redirected to the user’s home directory. The user’s home directory should be a folder bearing their logon name, located in a network share on the server called ‘Home’. The user profile directory should be a folder bearing their login name, located in a network share on the server called ‘Profiles’.*
- Desktop:** *The desktop should contain shortcuts to ‘My Computer’, the users ‘U:\’ drive (home directory) and ‘Internet Explorer’. The desktop theme should be set to ‘Windows Classic’.*
- Screen saver:** *Set to ‘Marquee’ using the text ‘Where 2 Surveying’. It should have a 5 minutes delay and require a password when resuming.* “

To complete this task, you are to:

- Create a new Organisational Unit (OU) in Active Directory on the server called “Test Unit”.
- Create a user account called “User Template” within the “Test Unit” OU. The “User Template” account must be configured to meet the business requirements, stated above. Create a group policy to apply to the “Test Unit” OU which redirects each user’s ‘My Documents’ folder to their home folder. Test the account by logging into the domain.
- When satisfied that the “User Template” account is configured correctly, set the profile as the Default Users profile. If completed correctly, all new users will have the correct desktop profile automatically.
- Test your work by creating a new Organisational unit and user account. Log into the system using the account to verify that the account is configured correctly. To do this, create an Organisational unit for the ‘Accounts Department’ and create a new user by copying the ‘User Template’ account.

The sample user should inherit appropriate security and profile features from both the 'User Template account and the 'Default User' desktop profile.

Record the new account details below:

Account Login Name: _____

Password: _____

Demonstrate this configuration to your teacher when complete.

6. Disaster Recovery/Backup

This task allows you to demonstrate your ability to backup important information on a Domain Controller and have input into the disaster recovery plan.

Part of the current Disaster Recovery policy for 'Where 2 Surveying' states that:

"Backups of the Domain controller must be conducted regularly. Backing up the server's System Disk is not necessary. Only backups of the server's System State (which includes active directory), are required. Microsoft recommends two current backups must be present at all times. For a backup to be current, it must have been completed during the 'Tombstone' life of Active Directory which is set to 60 days. Backups older than 60 days from the time of the server's failure cannot be used.

Backups of the domain controller's system state are to be stored on the domain controller itself in a folder 'C:\backups. Backup files should be named according to the date they are conducted."

To complete this task, you are to:

- Following the policy stated above, create a single backup of the Domain Controller system state, using the NTbackup tool, which is supplied with Windows Server.
- There are at least **two** major problems with the official backup policy of 'Where 2 Surveying'. Modify the policy to reflect at **two** significant changes.

Your suggested Disaster Recovery policy changes are:

1.

2.

7. Demonstration – Presentation

Using this document as a basis, demonstrate the setup and configuration of your domain controller to your teacher. The presentation itself is not assessable, but the quality of your domain controller configuration and your depth of knowledge will contribute to the marks allocated for each task.

Project 2. Network Software and Security

Covers modules ICAI4030A and ICAS4124A.

In this project, your employer has been asked to produce a simple 'Client/Server' network for a small business client called 'Where 2 Surveying'. This project requires you to work with the Library configuration "**Windows 2008 AD and Client**" which consists of a Windows Server 2008 system with Active Directory installed and a Windows 7 client computer to test your network.

Your role is to secure and configure network services of the server and then use it to deploy software across the network.

You will need:

- A computer capable with broadband internet access. Standard minimum specifications for your host operating system are all that is required. The use of multiple monitors is an advantage.
- VMwareView Client software, used to access the Virtual It lab. This software can be downloaded from <http://www.lachlanonline.edu.au/courses/index.html> and must be installed on your local computer.
- View the podcast "Introduction to the Online virtual Lab – Part 1" and "Introduction to the Online virtual Lab – Part 2" from the Podcast section of the Lachlan IT Online site. This can be found at: <http://www.lachlanonline.edu.au/Documents/Podcasts/index.html>.
- Username and password access to the site <http://portal.lachlanonline.edu.au>.

You will need to complete the following tasks:

1. Determine Client requirements – Application Software

This task allows you to demonstrate your ability to examine a business' requirements for application software and recommend appropriate software solutions.

'Where 2 Surveying' is suffering from the use of an outdated application software package which is locally installed on all computers. Office 2000 is no longer supported by Microsoft. It cannot read newer file formats and its ability to transfer data to other applications is also limited.

The client has requested information on what recommendations you have for a new replacement application software. It should include word processing, Spreadsheet, Database and presentation software. The current choices would seem to be between purchasing a 50 user licence of the latest version of Microsoft Office or moving to an open source package such as Open Office. Open Office is available from <http://www.openoffice.org/>.

Your are to:

- Create a report named 'Application Software Review – P2T1'. This report should review and compare the two best software packages available.

The report should contain a brief (min 1 page) summary of the differences between the current versions of Open Office and Microsoft Office. The last section of your report must provide your recommendation of which would be

best suited for WITSIMIT. Additional information may be attached as appendices to the report.

The report should include details related to the package's cost, supplier, after sales support (and cost) and the installation requirements for the host computer. The report should also evaluate the benefits of upgrading software as opposed to starting with a new produce line.

2. Software Deployment – Implementation

This task allows you to demonstrate your ability to deploy software over a network with minimal disruption to clients and hence modify the system according to requested changes. For the purposes of this task, you are going to deploy software using the latest version of 'Open Office' for Windows. Open Office is available from <http://www.openoffice.org/>.

You are to:

- Using the "Test Unit" OU and "Test User" account in the Active Directory of the server, investigate the best way to deploy the software.
- Determine the best strategy to deploy this software during business hours with minimal impact upon other users. Produce a memo outlining your recommended strategy.

3. User Training (Providing instructions and support) – Application Software

This task allows you to demonstrate your ability to research and recommend appropriate staff training for new software.

You are to:

- Prepare a memo highlighting the most appropriate update training program for employees of WITSIMIT. It should be aimed at updating employees skills in the new software package. There are many training products available – short courses from commercial providers, online courses, books etc. The memo should also identify the most appropriate and cost effective provider of the training program. Include details of the training option you recommend.
- Design an evaluation questionnaire that could be completed by staff members at the end of any training program. Information from this could be used to evaluate the effectiveness of the training package.

4. User Configuration – Controlling User Accounts with group policies

This task allows you to demonstrate your ability to ensure that user accounts meet business security requirements.

Ensure the following User Account security features are configured using 'Group Policies' on your server:

- User Accounts: Ensure that the new user accounts meets the following requirements set out by 'Where 2 Surveying'. In particular ensure that:

1. Each user account has password complexity enabled and users must change their password every 30 days.
 2. Each user has a login script that presents them with a 'Daily Bulletin' Message every time they logon.
 3. Group policies ensure that users cannot install software on their local computer or browse the network.
 4. Group policies redirects users 'My Documents' folder to their home directory on the server
- The server locks user accounts after 4 failed login attempts.
 - Enable encryption of data on all user's home folders.

5. Secure file and Resource Access and Monitor Threats to the System – Security Analysis

This task allows you to demonstrate your ability to access independent security analysis tools to evaluate security settings in the network.

Secure file/folder access on your system. You are to:

- Ensure only Individual users and administrators have access of each user's Profile folder on the server
- In the 'Company Data' network share create in project 1, create a folder called 'inbox' where members of the 'Domain users' group can only save new files, but not view, modify or delete the existing files. Members of the Administrator group should have full access to all files in the 'Inbox' folder.
- Implement these folder/groups/permissions on your server and test them.

Secure operating system vulnerabilities on your system. You are to:

- Run/Download OS vendor security diagnosis tools such as Microsoft Baseline Security Analyzer (MSBA) available from <http://www.microsoft.com/technet/security/tools/mbsahome.asp> to check for missing security updates on your server.
- Write a brief memo named 'System Security Analysis ' summarizing any updates that your server would require.
- Resolve any problems with your domain controller, raised in your memo. This may involve the modification of group policies, user accounts, or the installation of the service packs. Document all changes made for future reference. Re run the MSBA tool to view the effect of these changes.

6. Demonstration – Presentation

Demonstrate the work done in this project to your teacher and other students. This demonstration should consist of :

- A practical demonstration of work done during each of the tasks completed in the project.

The presentation itself is not assessable, but the quality of your domain controller configuration and your depth of knowledge will contribute to the marks allocated for each task.

Project 3. Internet/Intranet Infrastructure

Covers modules ICAI4099A, ICAS4127A and ICAT4221A

Prerequisite: Project 1 (or equivalent) and ICAI3101A Install and manage network protocols.

In this project, your employer has been asked to produce a internet capable network for the small business client called 'Where 2 Surveying'. You will need to clone and deploy server and client operating systems to your workspace from the virtual IT library.

Your role is to produce a functional internet/intranet capable business network. This network will have a gateway to the internet (outside network), fully functional DNS and DHCP services and a number of IP network ranges.

You will need:

- A computer capable with broadband internet access. Standard minimum specifications for your host operating system are all that is required. The use of multiple monitors is an advantage.
- VMwareView Client software, used to access the Virtual It lab. This software can be downloaded from <http://www.lachlanitonline.edu.au/courses/index.html> and must be installed on your local computer.
- View the podcast "Introduction to the Online virtual Lab – Part 1" and "Introduction to the Online virtual Lab – Part 2" from the Podcast section of the Lachlan IT Online site. This can be found at: <http://www.lachlanitonline.edu.au/Documents/Podcasts/index.html>.
- Username and password access to the site <http://portal.lachlanitonline.edu.au>.

You will need to do the following:

1. Microsoft Training – peruse the Microsoft Course **2008 Server Fundamentals**. This course can be found at to the <http://itacademy.microsoftlearning.com> site. You will need a Windows Live™ ID user account and an Access code provided by your teacher.
2. **Plan and design Intranet – Intranet Network Infrastructure**

This task allows you to demonstrate your ability to plan and design intranet.

'Where 2 Surveying' does not currently have Intranet services running as part of their current network system. They would like their own staff to have internet access as well as hosting a http or 'web site' service for their internet clients. You are to investigate the equipment required and approximate costing of providing corporate Intranet services.

It has been recommended that the following network design (Fig 3.1) be used as a basis for this network specification.

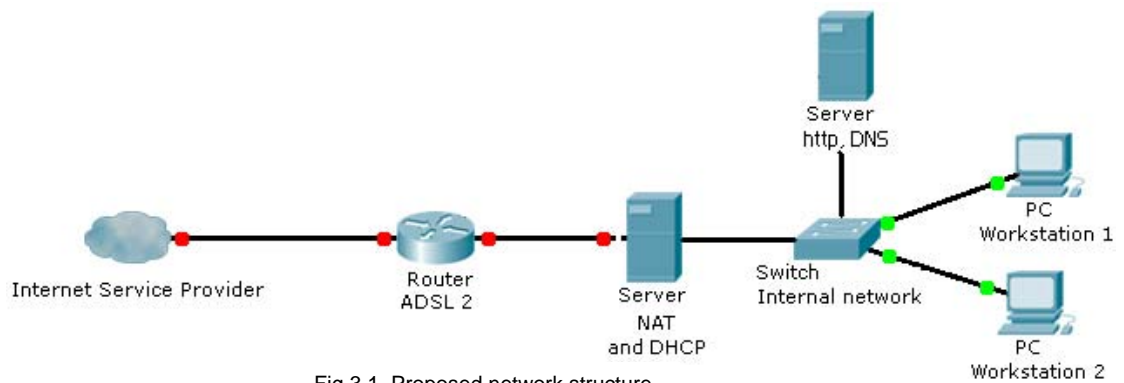


Fig 3.1 Proposed network structure

You are to prepare a report named 'int1' (and submit to your teacher) which examines the following items as a minimum:

- **Network Hardware:** Itemise the hardware required to replicate this network in the workplace. You should suggest models and approximate prices for each server/router switch and Workstation. When stating the costs, price each item individually, then indicate how many of those items will be required.
- **Network Software:** List the Operating system and application software required for the services of this network to be functional. You should identify the key software to be used on each device. Such software may include operating systems, NAT/DNS/DHCP software, http server software, etc.
- **Domain Name:** What costs are involved in registering a domain name of 'where2surveying.com.au' and what steps must be taken for that to occur.

The report should include an overview of the situation as well a summary at the end. Additional technical information may be attached as appendices. Each item investigated should include initial costs leading to an Installation cost and an ongoing monthly access cost. These should be listed in the summary section at the end.

3. Install and configure Intranet Infrastructure

This task allows you to demonstrate your ability to install and configure Intranet services on a computer.

You will need to create the following computer systems. Each of the following systems should be Windows Server 2008, but could be replaced by Linux server systems if desired. They should be configured as:

- **Server 1. Http/DNS server**– Create a webpage template with the company's logo for testing purposes. Ensure the DNS has both forward and reverse zones for the domain 'xxx.local' where 'xxx' refers to your initials.
- **Server 2. NAT/DHCP server** – server which will provide NAT and DHCP services between the public address (outside) 203.14.171.65 255.255.255.254 and the private address range of 192.168.1.x 255.255.255.0.

Test a client PC to ensure they are able to access all available network addresses and services. In your VMware environment, the ADSL router and internet provider can be your existing network broadband connections. If in doubt how to approach the task, please contact your teacher.

4. **Event Viewer – Locate equipment, system and software faults**

This task allows you to demonstrate your ability to apply systematic principles to fault finding in IT.

You are to write a report named 'System Error Log - P3T5' based on the following requirements

- Using your server 1 Windows 2008 system, examine the event viewer's system log for system errors relating to 'W32 time' services. Select one of log items
- Research the event viewer message using appropriate internet resources such as Microsoft's knowledge base or third party tools.
- List the causes behind this problem.
- Document a procedure to correct the event viewer failure based upon your research. It should aim to cause minimal server downtime.
- Configure a time server on the live system and test the system
- Detail the actual results of the modification as a memo for future reference.

5. **System Performance – Load Testing**

This task allows you to demonstrate your ability to identify the system's capacity to handle high traffic situations.

To determine the capability of your server while still in the testing phase, companies produce load testing applications, which simulate actual activity. Microsoft is one company that produces such software. Test the Internet Interfaces of your server using the Microsoft Web Application Stress (WAS), Inetmonitor and Web Capacity Analysis (WCAT) tools as appropriate.

You are to:

- Write a report named 'Load Testing Tools' explaining the purpose of each testing tool. Investigate Microsoft Knowledge Base Article - Q231282 or similar articles referring to the Web Application Stress (WAS), Web Capacity Analysis (WCAT) and Inetmonitor tools.
- Download each tool and install on your system(s).
- Based upon the results of these tools, the report should also identify the expected capacity of the system, upgrades to the server configuration that are required to improve its performance and any website monitoring features available.

6. **Demonstration – Presentation**

Demonstrate the work done in this project to your teacher and other students. This presentation should consist of a demonstration of each of the tasks completed in this

project.

The presentation itself is not assessable, but the quality of your domain controller configuration and your depth of knowledge will contribute to the marks allocated for each task.