

Build, Deploy, Configure and Manage a Type 2 Hypervisor Platform Based Virtualised Network

1st Given Edward Patch
Software Engineer Student (of HND Year 2)
Network Operating Systems and Services
University of Wales Trinity St. Davids (of Nitheesh Murugan Kaliyamurthy)
Swansea, Wales
Student ID: 1801492

CONTENTS

I	Introduction	1
II	Worksheet Two - Practical	1
II-A	Windows Server I - Rename Computer	1
II-B	Windows Server I - Add Roles and Features	2
II-C	Windows Server I - Deployment Configuration	4
II-D	Active Directory Users and Computers - Add Administrator User Account . . .	5
II-E	Active Directory Users and Computers - Add User Account	5
II-F	Active Directory Users and Computers - Edit User Account	6
II-G	Active Directory Users and Computers - Add Workstation	7
II-H	Windows 10 Client I - Rename Computer	7
II-I	Windows 10 Client I - Set Domain . . .	7
II-J	Windows 10 Client I - Login User Account	7
III	Worksheet Two - Observational	8
III-A	Domain Name System	8
III-B	Server Roles Available	9
III-C	Different Levels of Access/Roles	9
IV	Conclusion	9
V	References	9

Abstract—Type 2 hypervisor platform-based virtualised network documentation.
Index Terms—Type-1, Type-2, Hypervisor

I. INTRODUCTION

This report separates into two sections:-

- Workshet Two - Practical.
- Worksheet Two - Observational.

Resources required to complete the listed resources:-

- Type 2 Hypervisor Management Software.
- Server based Network Operating System and intrinsic services and features.
- Client based Network Operating systems and suitable, intrinsic/external features.

Worksheet Two requires critical network services on the virtual network.

II. WORKSHEET TWO - PRACTICAL

A. Windows Server I - Rename Computer

Renamed Windows Server I to DC1-NW1.

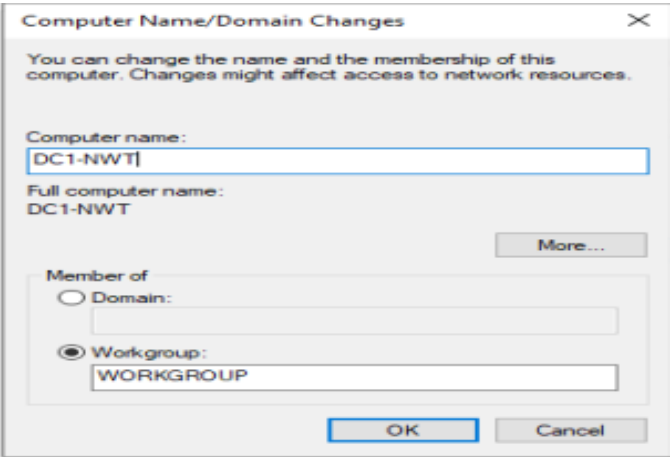


Fig. 1. Figure of Renaming Windows Server I.

Evidence:

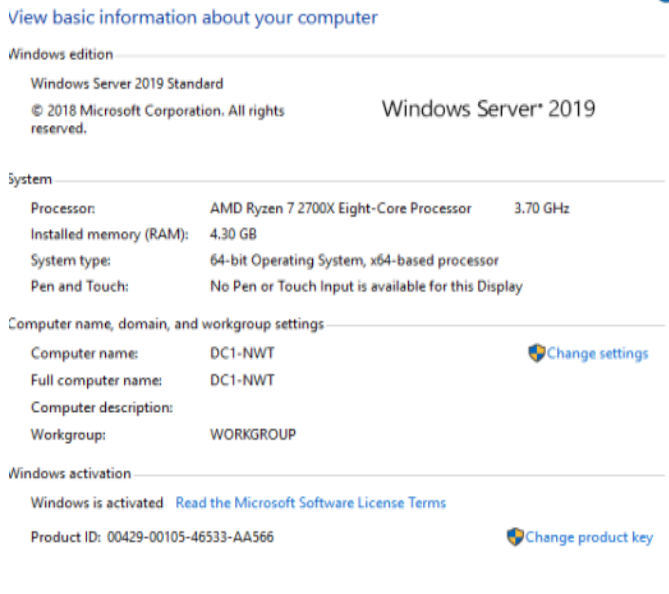


Fig. 2. Figure of Renaming Windows Server I.

B. Windows Server I - Add Roles and Features

Step One

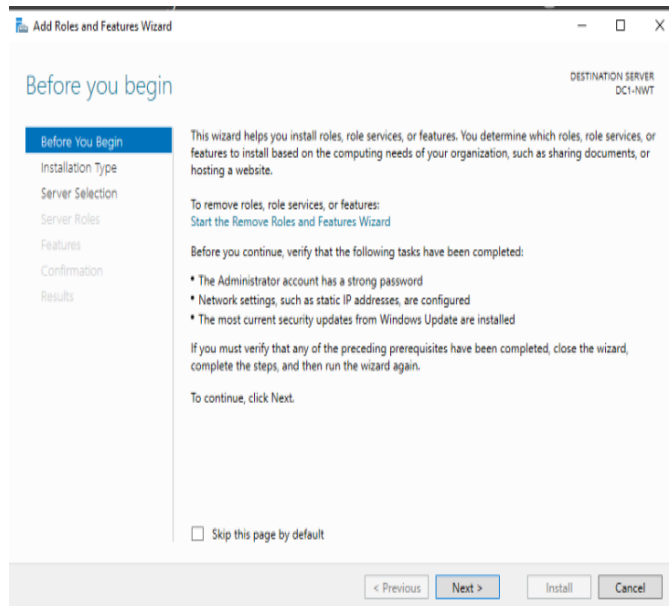


Fig. 3. Figure of Add Roles and Features.

Step Two

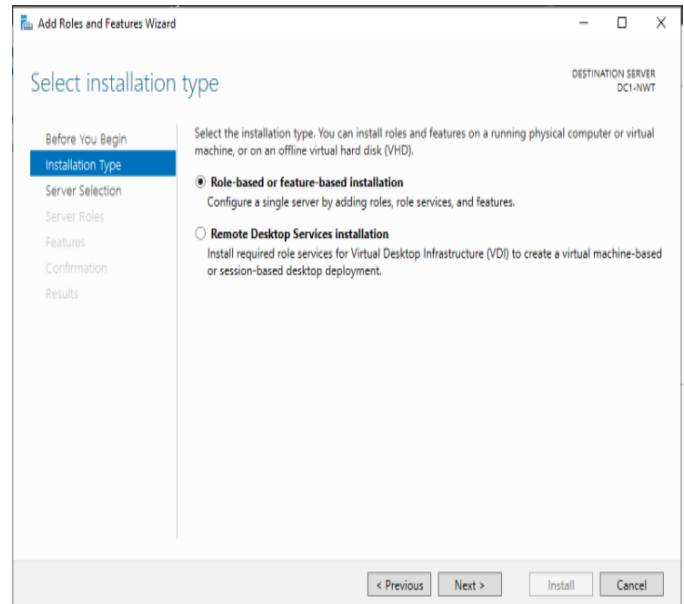


Fig. 4. Figure of Add Roles and Features.

Step Three

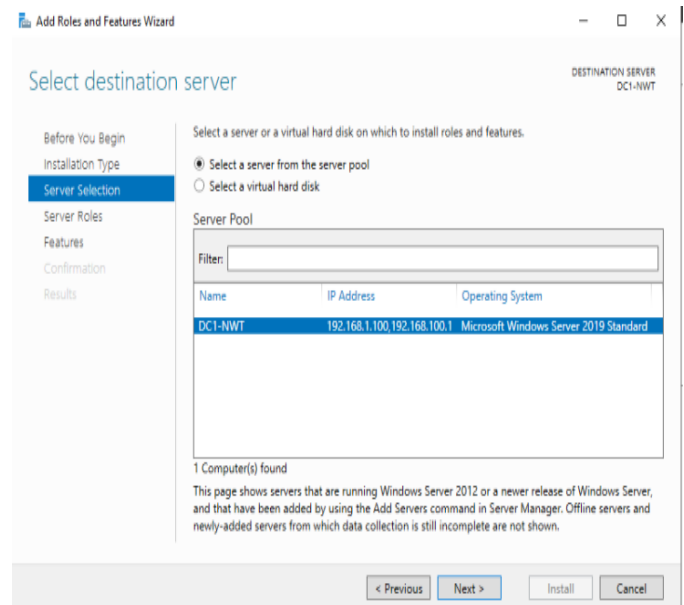


Fig. 5. Figure of Add Roles and Features.

Step Four

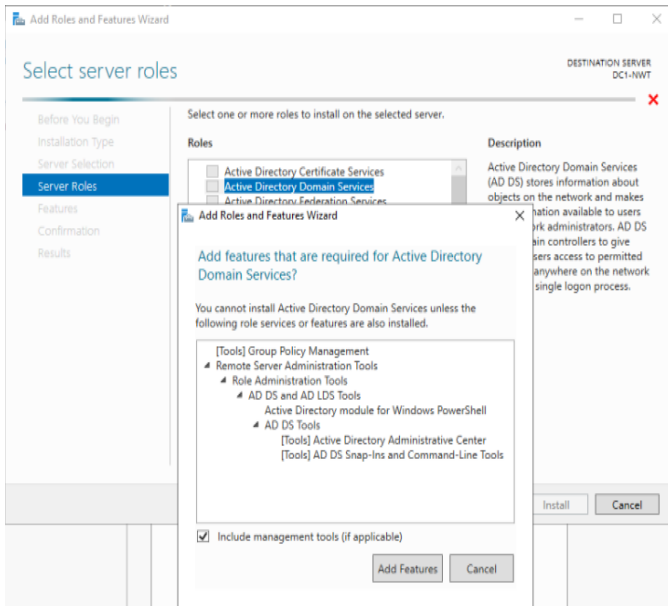


Fig. 6. Figure of Add Roles and Features.

Step Six

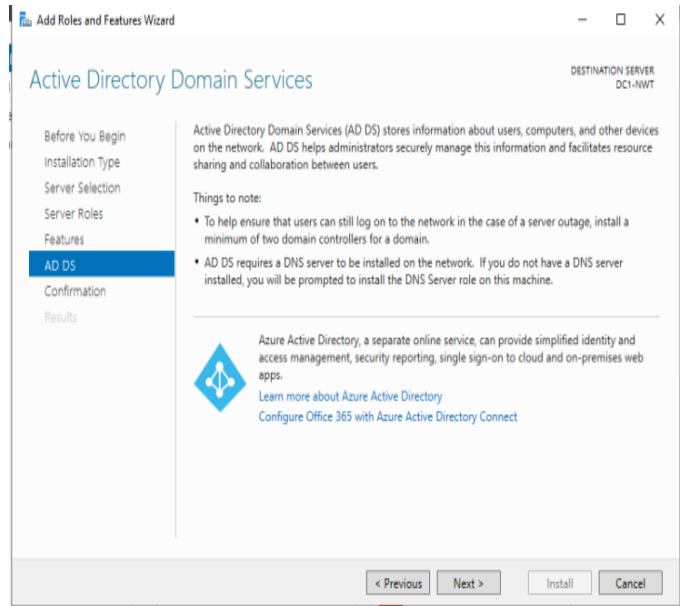


Fig. 8. Figure of Add Roles and Features.

Step Five

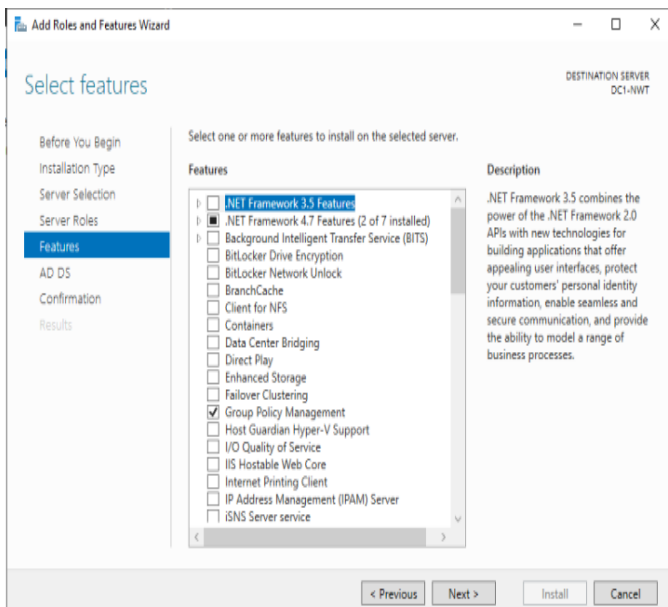


Fig. 7. Figure of Add Roles and Features.

Step Seven

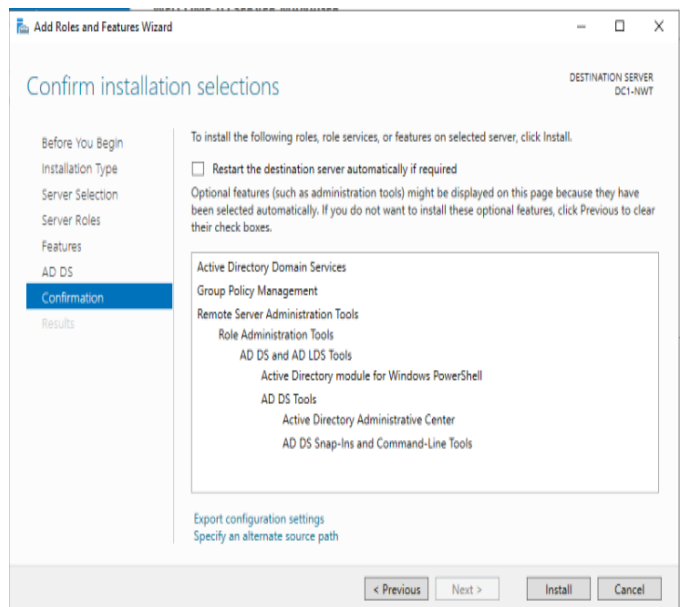


Fig. 9. Figure of Add Roles and Features.

C. Windows Server I - Deployment Configuration

Step One

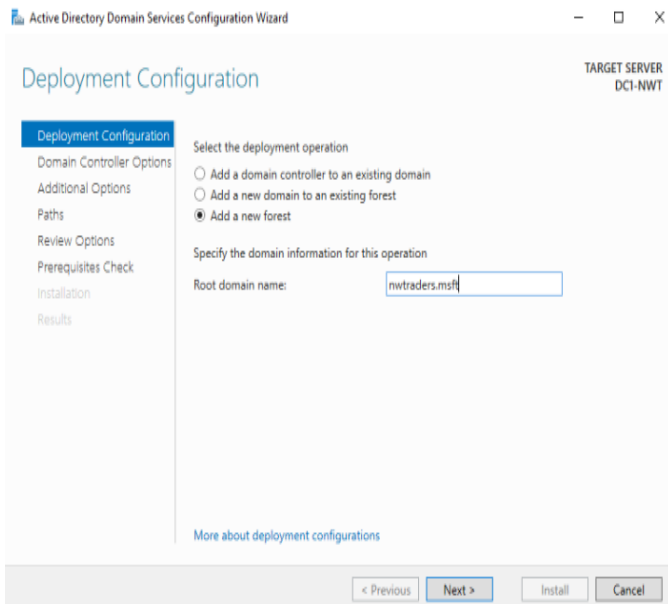


Fig. 10. Figure of Deployment Configuration.

Step Two

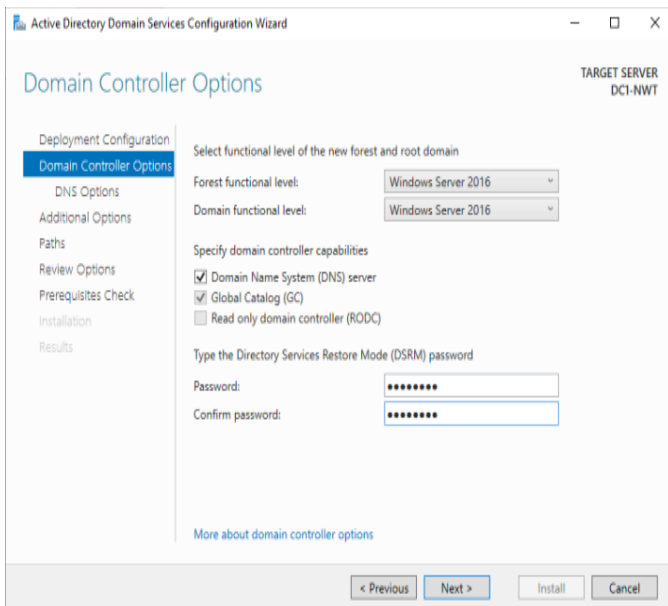


Fig. 11. Figure of Deployment Configuration.

Step Three

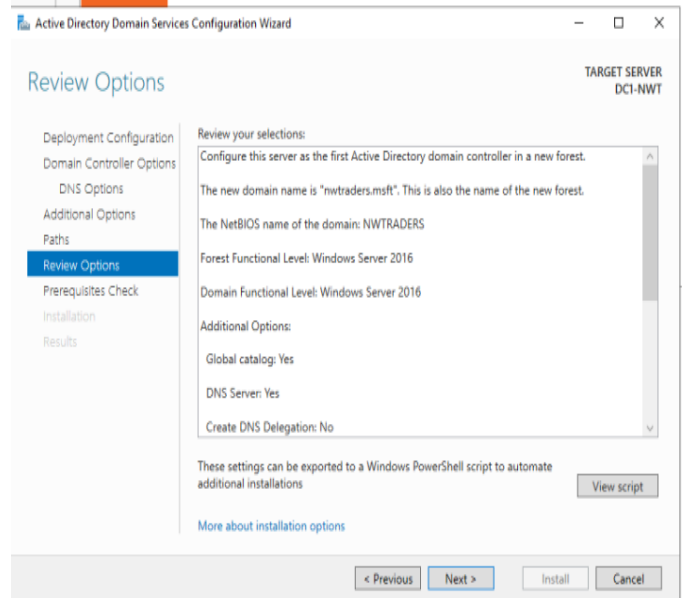


Fig. 12. Figure of Deployment Configuration.

Step Four

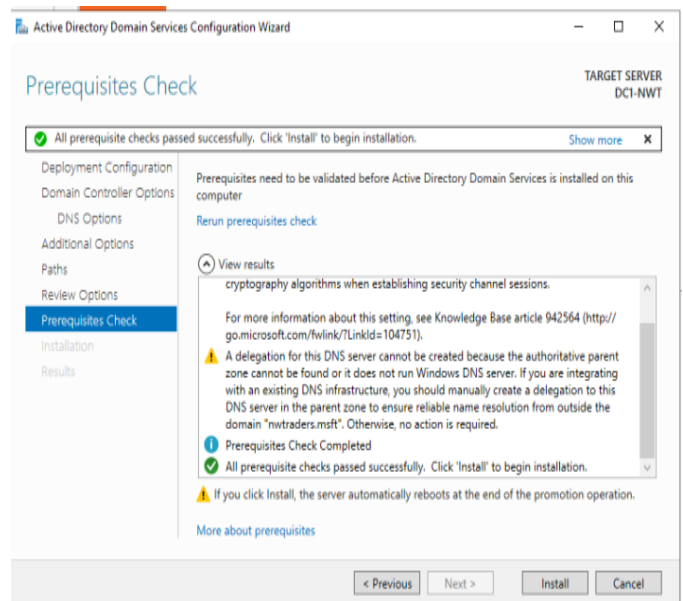


Fig. 13. Figure of Deployment Configuration.

D. Active Directory Users and Computers - Add Administrator User Account

Creation of Standard User Account

User information that is set: **First Name:** Edward **Initials:** EP
Last Name: Patch **User logon name:** NWT-EP
Password: vtp9hBnm

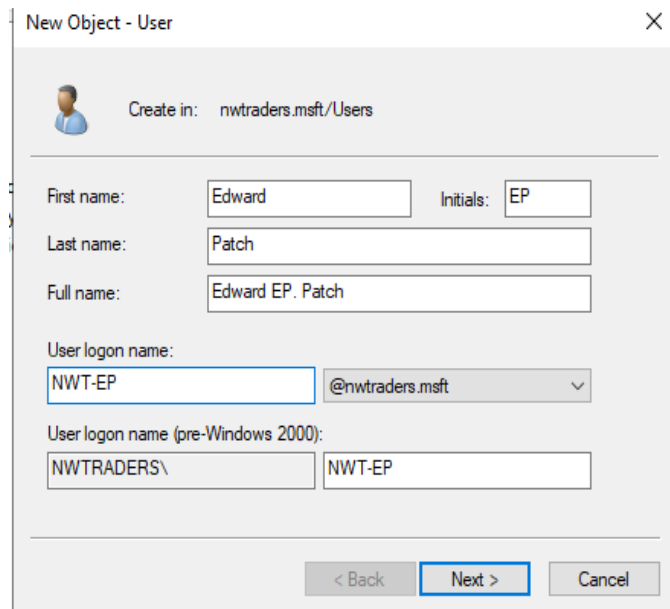


Fig. 14. Figure of Creation of Administrator User Account.

Promotion to Administrative User Account

After pressing the Add button on the Domain Admins Properties, allowed the user to add Edward EP. Patch user to the Domain Admins Properties window. This indicates that the user account is now an administrative user.

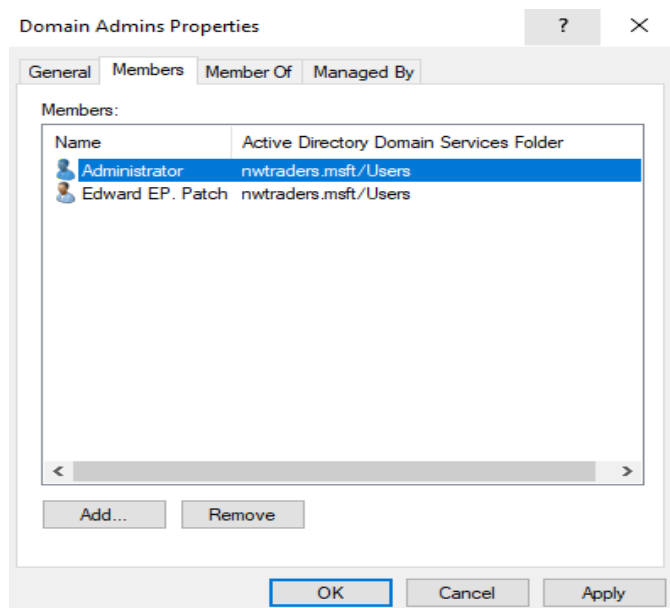


Fig. 15. Figure of Creation of Administrator User Account.

E. Active Directory Users and Computers - Add User Account

Creation of Standard User Account

User information that is set: **First Name:** Gareth **Initials:** GS
Last Name: Smith **User logon name:** NTW-GS
Password: tSNBLh6T

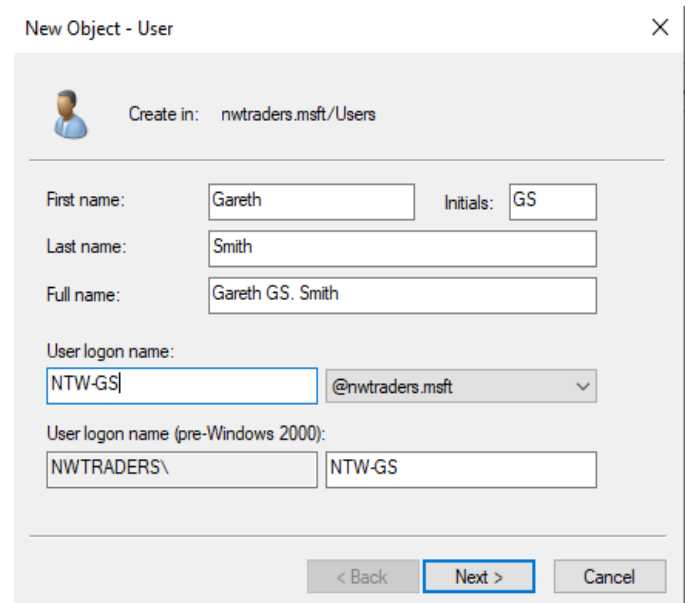


Fig. 16. Figure of Creation of User Account.

Evidence of User Accounts

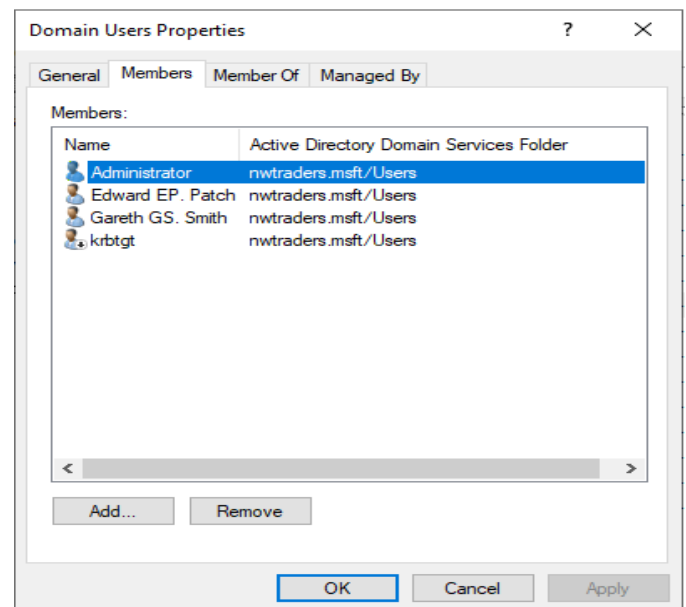


Fig. 17. Figure of Creation of User Account.

F. Active Directory Users and Computers - Edit User Account

Edit User

Following edited properties: **User cannot change password:**
Checked **User Logon Name:** NWT-GS, refer to fig 19 Edited Logon Name, Page 6.

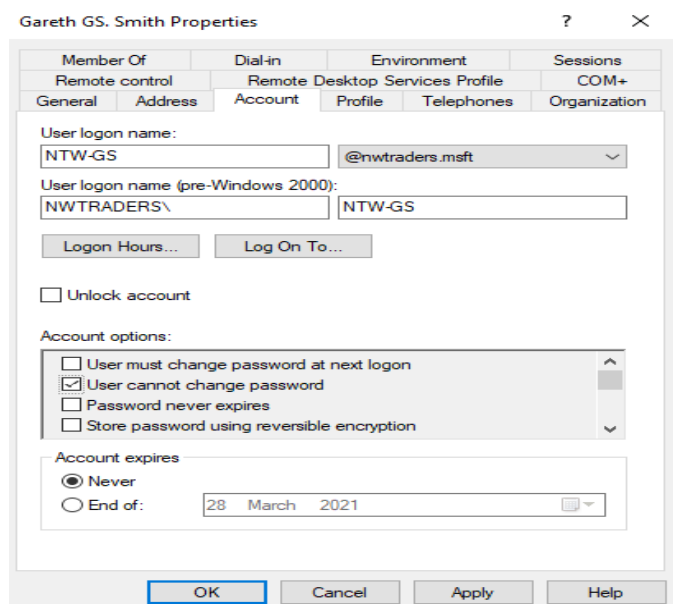


Fig. 18. Figure of Editing the User Account.

Edited Logon Name

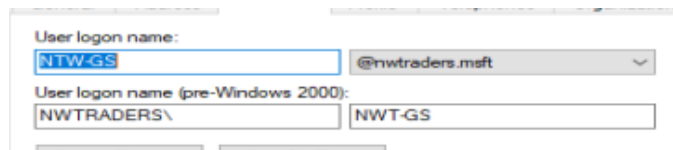


Fig. 19. Figure of Editing the User Account.

Edit Login Restrictions

Set time restrictions from Monday 8PM to Thursday 5PM, including 1PM to 2PM restriction.

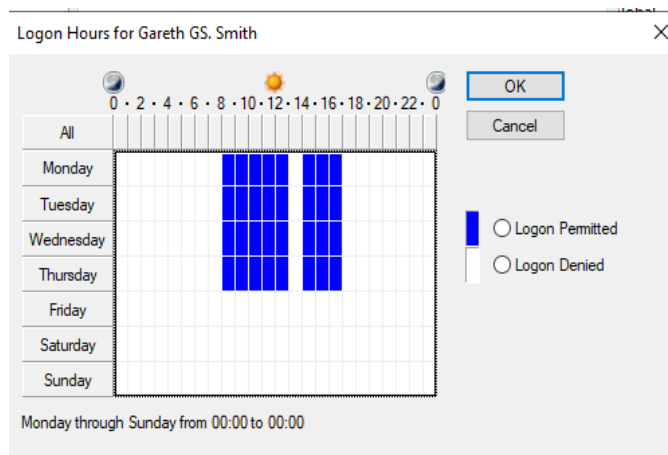


Fig. 20. Figure of Editing the User Account.

G. Active Directory Users and Computers - Add Workstation

New Object - Computer dialog enables the user to add a trusted workstation. Computer name, *WS1-NWT* (Client I) is added.

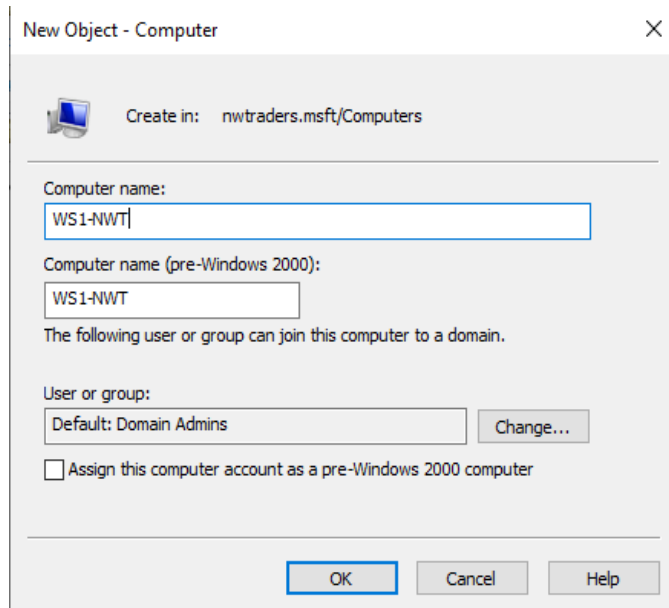


Fig. 21. Figure of Adding a Workstation.

H. Windows 10 Client I - Rename Computer

Renamed Client I to *WS1-NWT*.

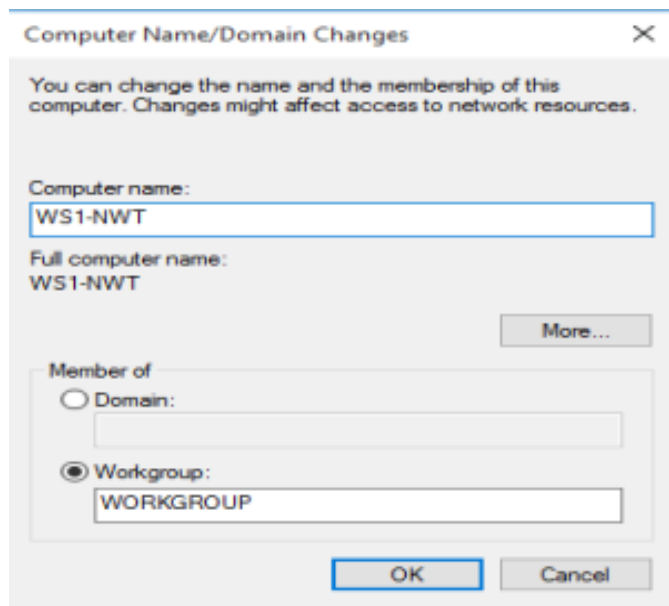


Fig. 22. Figure of Renaming Client I.

I. Windows 10 Client I - Set Domain

Set domain of Client I to *nwtraders.msft*.

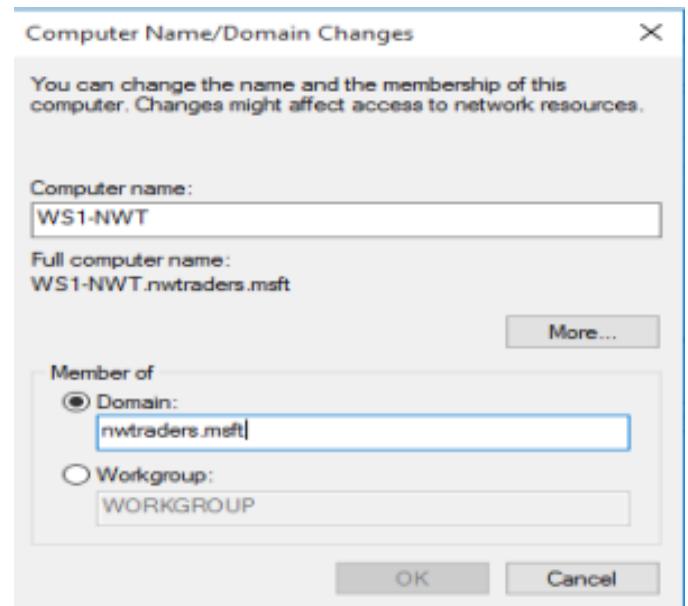


Fig. 23. Figure of Adding Client I to Domain.

J. Windows 10 Client I - Login User Account

Logon to Gareth Smith

Note: The login was tested before Login Name was changed.

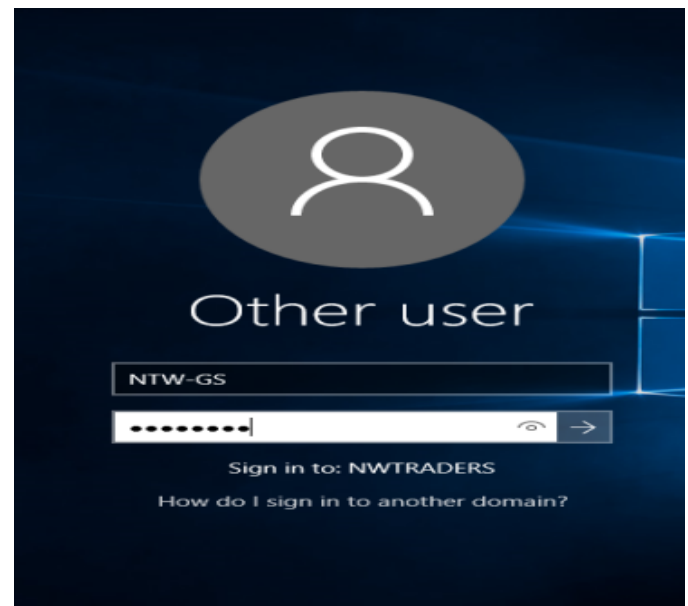


Fig. 24. Figure of Logging into the User Account.

Evidence of Login

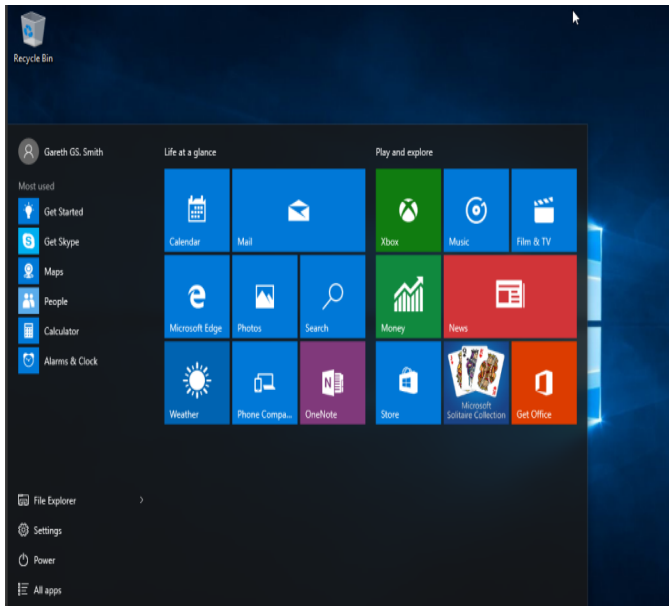


Fig. 25. Figure of Logging into the User Account.

Login Restriction

Evidence of login restriction working. Login attempt was made on a Sunday Evening at 2:30PM.

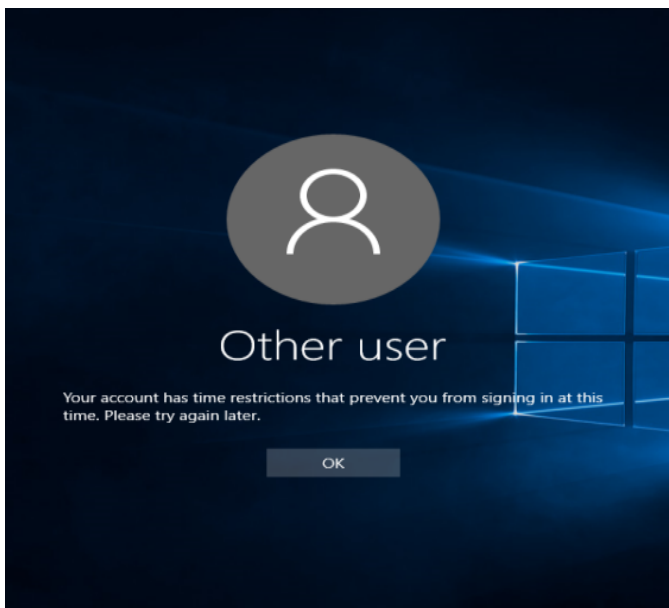


Fig. 26. Figure of Logging into the User Account.

III. WORKSHEET TWO - OBSERVATIONAL

A. Domain Name System

A domain name system acts as a pointer to the relevant IP address. To describe this, imagine a web address, <http://www.google.com/>. DNS of the web address translates the Uniform Resource Locator (URL) to 172.217.12.228. Try clicking on the two links and see how the public IP address of Google and the URL of Google opens the same location.

The tool used to gather the website's public IP address,

WHOIS IP Lookup Tool,

URL: <https://www.ultratools.com/tools/ipWhoisLookupResult>.

Domain name systems connect to a domain name server, such as companies, for example, DNSExit. A service like DNSExit or other domain services enables linking domain names to a static or dynamic IP address. Aliases can be customised, and redirections based on certain URL names are also available. These services, particularly DNSExit, will generate their DNS address, which requires the user to configure their domain with the new DNS. Some examples of other DNS services are mentioned in the article, Best free and public DNS servers in 2021 by Mike Williams [1]:-

- OpenDNS.
- CloudFlare.
- Google Public DNS.

Figure 27 displays that when the computer tries to access www.example.com. Communication to DNS Resolver then communicates to other server services such as **Root Name Server**, **Top Level Domain Name Server** and **Authoritative Name Server**. DNS resolver will pass back a readable IP address, which can be used for communication to an external server. These are but not limited to:- **Hyper-Text Transfer Protocol Secure (HTTPS)**, **File Transfer Protocol Secure (FTPS)** and **Simple Mail Transfer Protocol (SMTP)**.

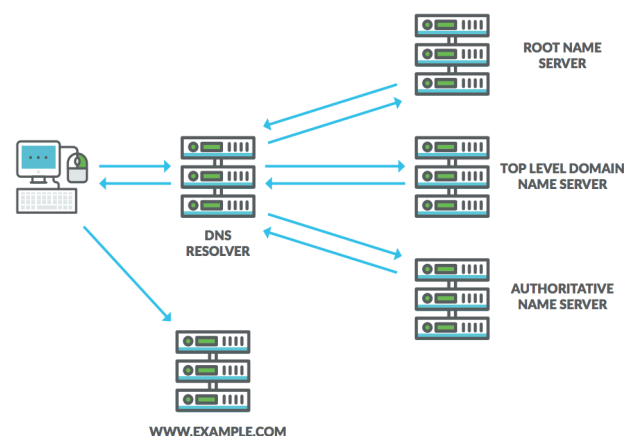


Fig. 27. Figure of Paul Davenport [2] - What is DNS – and why is it important?

Active Directory Domain Services

Microsoft's [3] DNS and AD DS documentation states, "Active Directory Domain Services (AD DS) uses Domain Name System (DNS) name resolution services to make it possible for clients to locate domain controllers and for the domain controllers that host the directory service to communicate with each other."

Microsoft's statement implies that the AD DS uses DNS to help workstations within the network to communicate to the servers. An example of the DNS being used in the network is in fig 23 Windows 10 Client I - Set Domain, 7. Member of Domain isn't an IP address but a custom domain name. The DNS will point this domain to the Server I setup.

B. Server Roles Available

Information sourced from Microsoft's [4] Roles, Role Services and Features included in Windows Server - Server Core article.

DNS Server role acts as a dictionary to hold the hostname, and IP address, creating a link. DNS server then points a hostname, for example, a computer name within a network, *Computer-A*, to *192.168.1.65*. This, in turn, creates communication between a *Server-A* and *Computer-A*.

AD DS role, which is installed to *Server I*, includes the DNS Server package to establish a link between a computer name. Refer to section II-G Active Domain Users and Computers - Add Workstation, page 7.

File and Storage Server role creates a file storage environment that is connected to networked clients. Storage spaces could be connected to any device if access was granted.

A few examples of the methods to connect to a file server with a selection of devices:-

- **Android** - EX File Manager application includes Network Sharing capabilities. It's possible to connect or host files from the device. **Note:** Other Applications Available.
- **Windows** - Windows 10 offers an Add a Network Location option to add file servers. Windows 10 or Windows 2019 Servers (not excluding other Windows Operating Systems) can both share or connect to file servers.
- **Linux** - Linux distributions have the ability to connect to or host file servers. If not, open-source software is available to allow network file sharing.

The benefits of File and Storage Server allows user access via any workstation within the workplace. **Note:** The network file system is never stored on the C drive on the client's workstation. Network drives are identified by two backslashes and server name (**ServerName**).

Web Server (ISS) role offers some key web protocols. For example, **HTTP** (HyperText Transfer Protocol), **HTTPS**, and **FTPS**. Web Server (ISS) is included in the AD DS role. Web server services are often used for intranet web pages so that workstations have a company homepage or a controlled web environment.

C. Different Levels of Access/Roles

Information gathered from documentation Active Directory Security Groups by Microsoft [5] and Azure AD built-in roles by Microsoft [6].

A few built-in roles are **Domain Name Administrator**, **Security Administrator** and **User Administrator**. The purpose of a variety of user groups is to add flexibility and ease when setting up the operating system. Each user group can customise and to make new user groups. The idea of user groups is to restrict the user from having unnecessary permissions. For example, a Domain Name Administrator would not need to change security settings. This creates a productive environment for the user and protects the network as much as possible.

Author Thoughts AGDLP stands for accounts, global group, domain local groups, permissions. AGUDLP stands for accounts, global group, universal group, domain local groups, permissions.

Microsoft's methods of sorting out user groups are similar to a hierarchy found in the workplace. It's identical to other setups found in Linux servers or another type of servers.

User groups can be created, modified or removed. This creates an ideal environment to create a safe and productive environment. A user could implement user groups' restrictions like time or software restrictions to the server and increase workflow and security.

As a system administrator, they may have to manage the user carefully. Although, if any software was not available or tighter permissions were set than necessary, then it is most likely to impact the system administrator's time. Having a derived user group system to share parents permissions could prevent this from happening.

IV. CONCLUSION

Server I and Client I is now setup for communication and network administrative and user accounts are setup and tested on both Server I and Client I.

V. REFERENCES

- [1] M. Williams, "Best free and public DNS servers in 2021," Feb. 2021. [Online]. Available: <https://www.techradar.com/uk/news/best-dns-server>
- [2] P. Davenport and AppNeta, "101: What is DNS – and why is it important?" Dec. 2018. [Online]. Available: <https://www.appneta.com/blog/101-what-is-dns-and-why-is-it-important/>
- [3] iainfoulds, v_kents, and Microsoft, "DNS and AD DS," Aug. 2018. [Online]. Available: <https://docs.microsoft.com/en-us/windows-server/identity/ad-ds/plan/dns-and-ad-ds>
- [4] pronichkin and Microsoft, "Roles, Role Services, and Features included in Windows Server - Server Core," Feb. 2018. [Online]. Available: <https://docs.microsoft.com/en-us/windows-server/administration/server-core/server-core-roles-and-services>
- [5] Dansimp and Microsoft, "Active Directory Security Groups (Windows 10) - Microsoft 365 Security," Apr. 2017. [Online]. Available: <https://docs.microsoft.com/en-us/windows/security/identity-protection/access-control/active-directory-security-groups>
- [6] rolyon and Microsoft, "Azure AD built-in roles - Azure Active Directory," Feb. 2021. [Online]. Available: <https://docs.microsoft.com/en-us/azure/active-directory/roles/permissions-reference>