T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Digital Support Services

Occupational specialism assessment (OSA)

Digital Infrastructure

Assignment 2 - Pass

Guide standard exemplification materials

v2.0: Specimen assessment materials
19 June 2023
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NCFE

T Level Technical Qualification in Digital Support Services
Occupational specialism assessment

Guide standard exemplification materials

Digital Infrastructure

Assignment 2

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Introduction

The material within this document relates to the Digital Infrastructure occupational specialism sample assessment. These exemplification materials are designed to give providers and students an indication of what would be expected for the lowest level of attainment required to achieve a pass or distinction grade.

The examiner commentary is provided to detail the judgements examiners will undertake when examining the student work. This is not intended to replace the information within the qualification specification and providers must refer to this for the content.

In assignment 2, the student must first consider a list of job requests and prioritise them, before actioning the requests. The second task requires them to produce an instructional document and video that can be used by new employees to the company.

After each live assessment series, authentic student evidence will be published with examiner commentary across the range of achievement.

Assignment 2:

Scenario

Willow Technology is planning an upgrade on the backend servers. As part of this upgrade, a small test system needs to be developed that can be used to test the compatibility with the existing backend systems and explore the features of the latest server operating system.

During this assignment you will be required to undertake 2 practical tasks covering cable creation, and the installation and configuration for the new test system that will be used to simulate the new network.

Task 1

It is recommended that you spend 20 minutes on this task.

(4 marks)

Instructions for students

Before you create the test system, a custom length network cable needs to be created to enable the test system to connect to a network port.

You have been provided with a length of Cat5e ethernet cable, 4 x RJ45 ends and suitable cable creation tools.

You need to:

- create a straight through network cable
- provide annotated evidence that the cable has been created correctly
- test that the cable works and provide suitable evidence of the process of validating your cable

You will have access to the following equipment:

- a 1m length of Cat5e ethernet cable
- four RJ45 connectors
- cable creation tools – crimping tool, cable cutter
- network cable tester
- digital camera
- word processing software

Evidence required for submission to NCFE

Annotated photographic evidence of the following stages of cable creation should be provided:

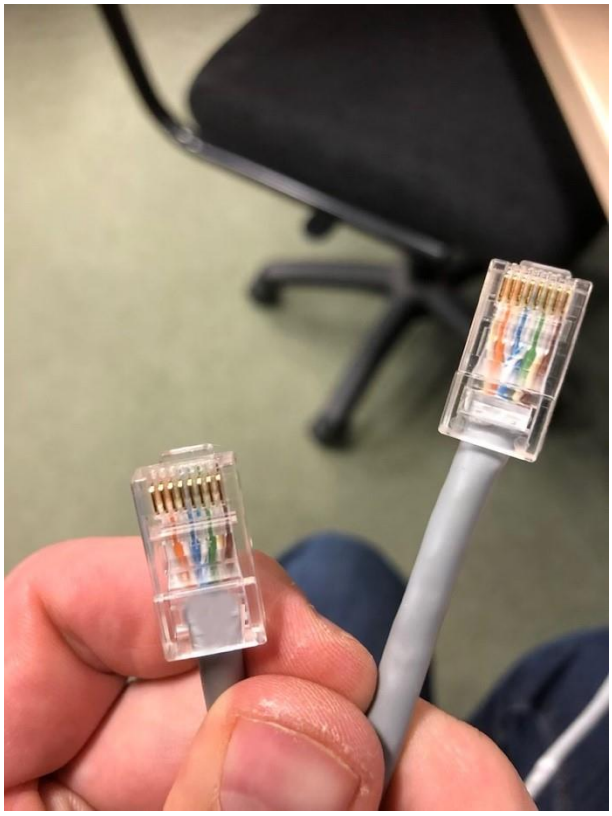
- both RJ45 ends have the strands of cable in the correct order and forming a good connection
- an image of each cable strand being tested on the cable tester to verify connection

Note: this will require 8 or 9 images depending on the cable testing device used.

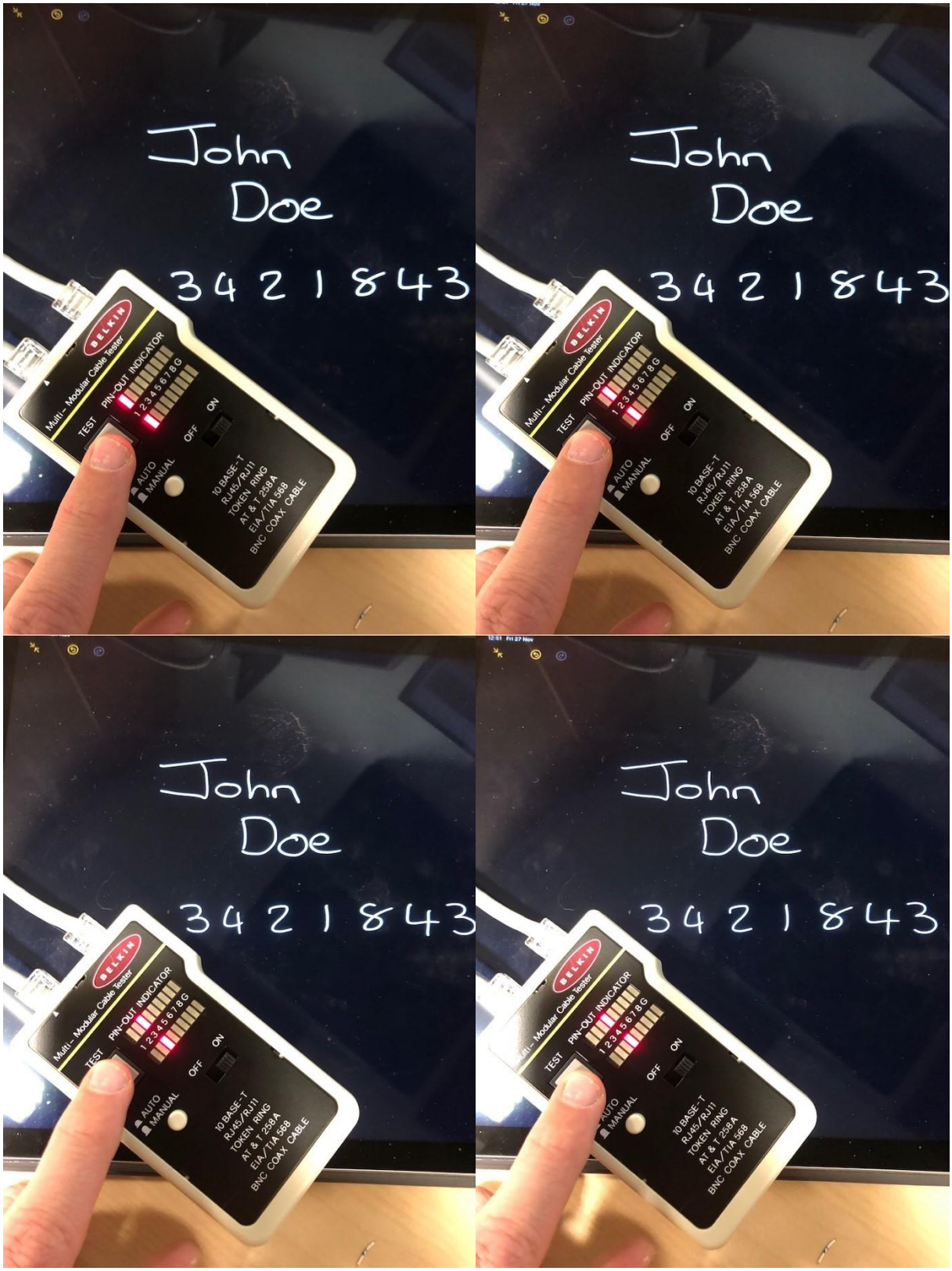
Student evidence

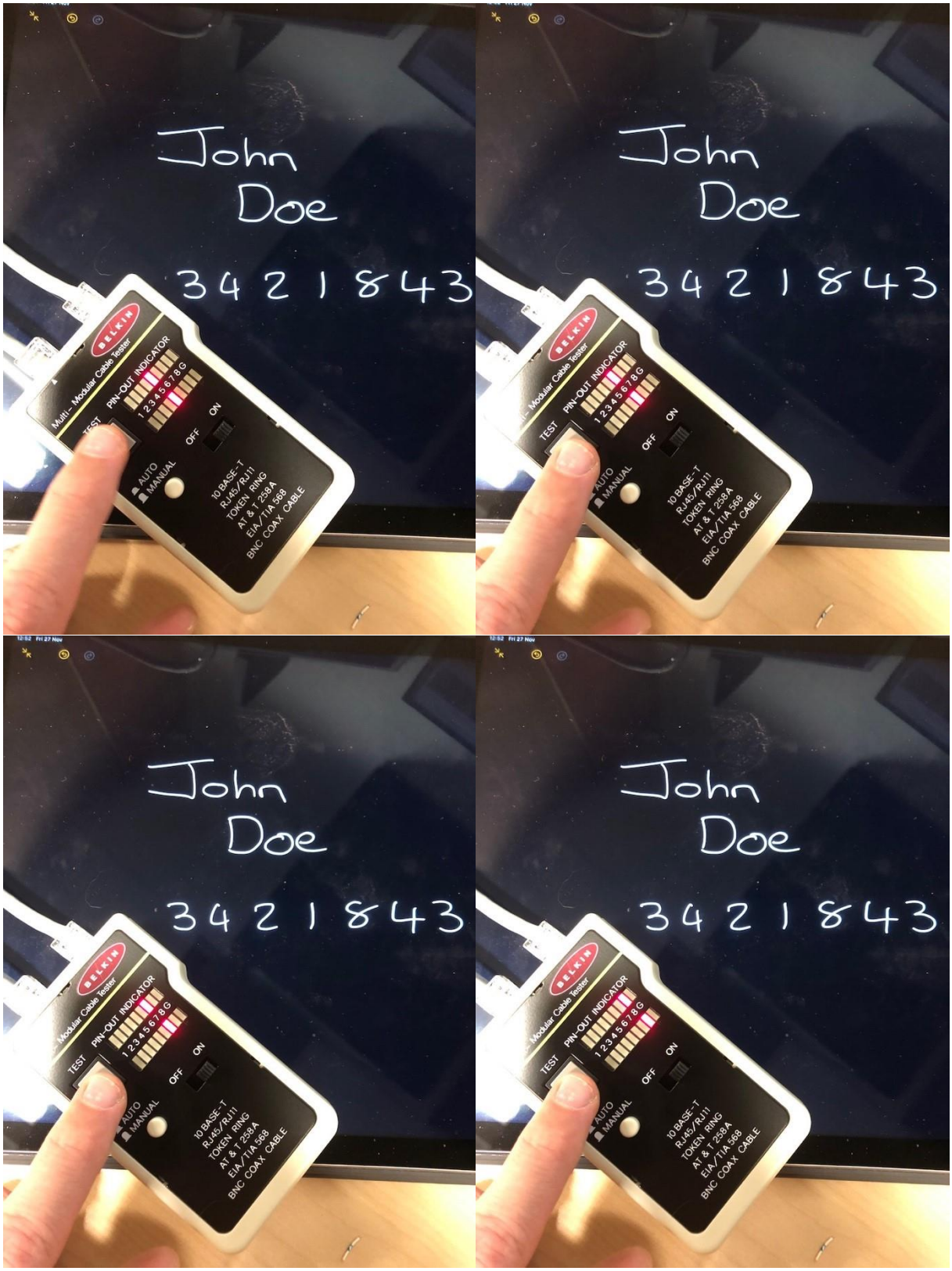
Task 1

RJ45 connected
All the copper connectors connect with the cable
All the ends of the cable are arranged correctly
The plastic cover is at the right depth to catch under the fixing in the RJ45 end



Cable testing
The cable tester lights show that each strand is working correctly


John
Doe
3421843
Multi- Modular Cable Tester
PIN-OUT INDICATOR
1 2 3 4 5 6 7 8 G
TEST
ON
OFF
AUTO
MANUAL
10 BASE-T
RJ45/RJ11
TOKEN RING
AT & T 258A
EIA/TIA 568
BNC COAX CABLE



These photos show that the cable is made correctly and tested as working. Each photo shows one of the pins and confirms a signal can be carried on each wire in the cable.

Task 2

Essential information

It is recommended that you spend 5 hours 40 minutes on this task.

(49 marks)

Equipment

You have been provided with 4 computers. These might be 4 physical machines, or 1 machine with 4 virtual machines. You are required to develop the test system based on the specification outlined by your line manager.

The following information regarding the implementation of the network has been provided:

- Server01 – this will be the domain controller, DNS and DHCP server, no operating system installed
- Server02 – secondary server, file server and another role server, no operating system installed
- PC01 – desktop machine, no operating system installed
- PC02 – desktop machine, operating system pre-installed
- one wireless device, for example, wireless printer, media sender or IP camera recommended
- one optional access point/wireless router/wireless print server

In addition, you will have access to:

- digital camera
- word processing software
- sample files for step C

Network information

The following information outlines the settings you will need to use when configuring the network:

- Subnet – 255.0.0.0
- Server01 IP address -–10.1.1.1 and 10.1.1.2
- Server02 IP address – 10.1.1.3
- DHCP scope – 10.1.1.5-10.1.1.10
- default gateway – 10.1.1.254 (no internet access provided)

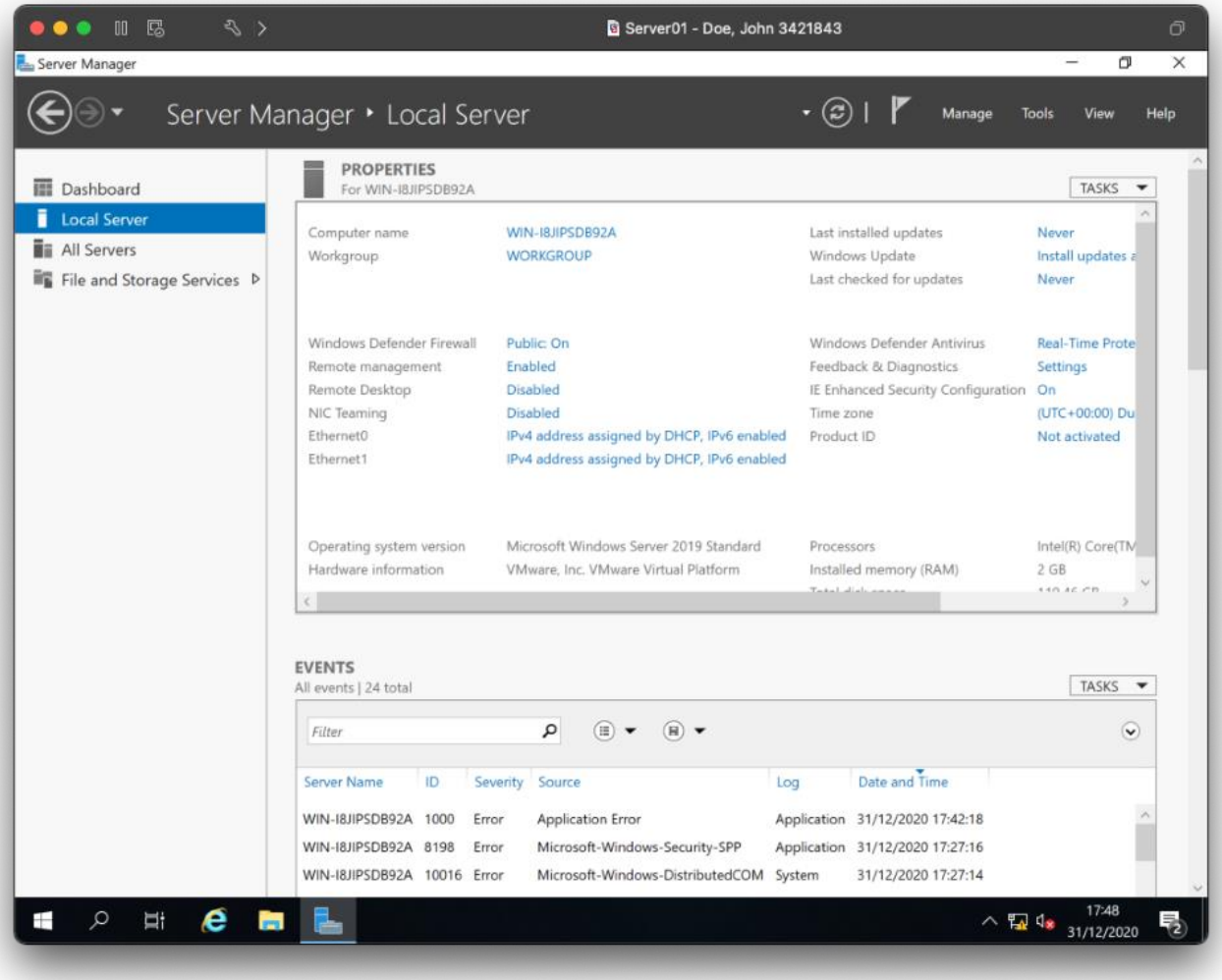
Evidence required for submission to NCFE

- you must take print screens and/or photographs of the processes you have carried out
- use the tick box □ in the evidence required column to ensure that all the required print screens and/or photographs have been provided

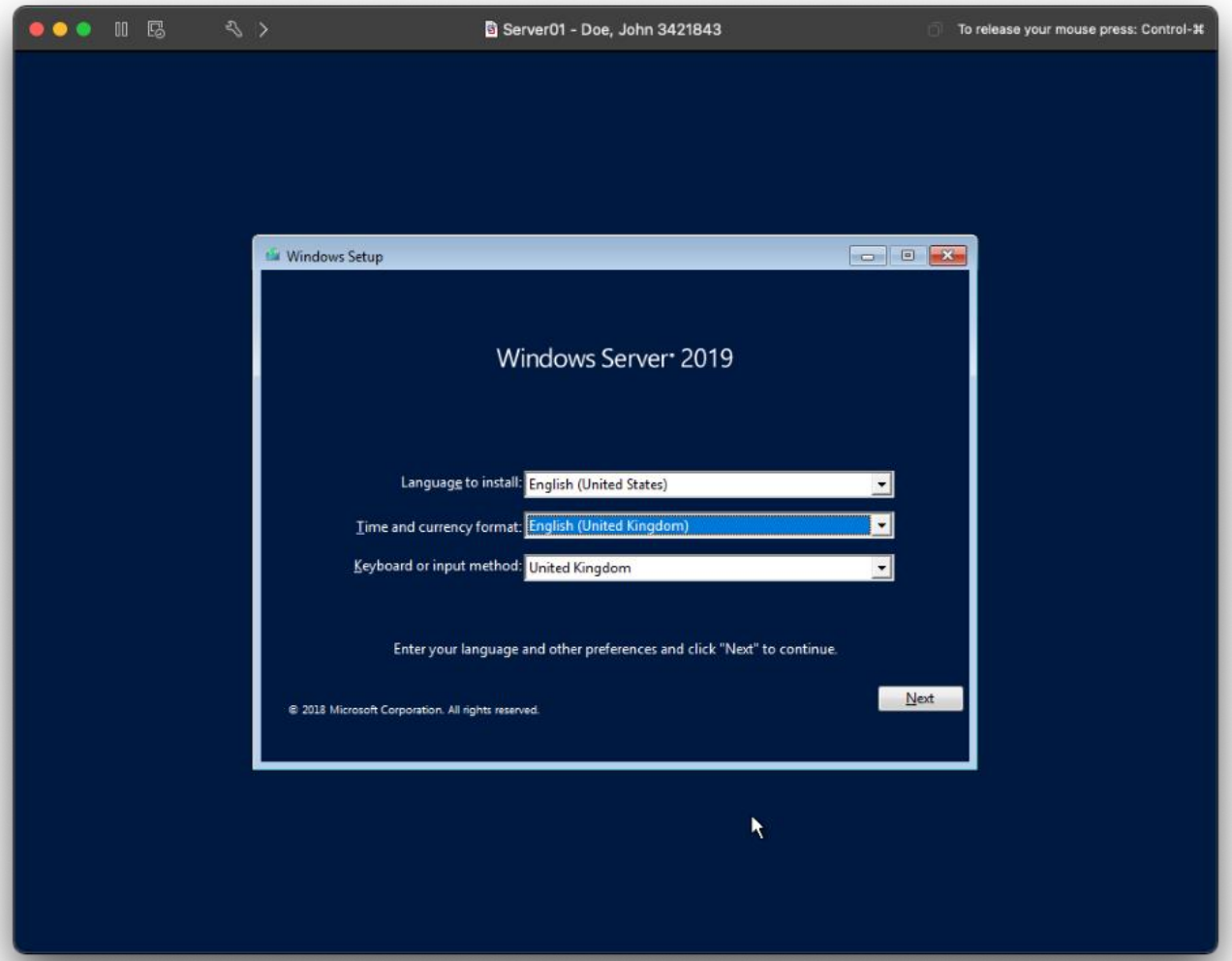
Student evidence

Step A
Server01 installation and configuration

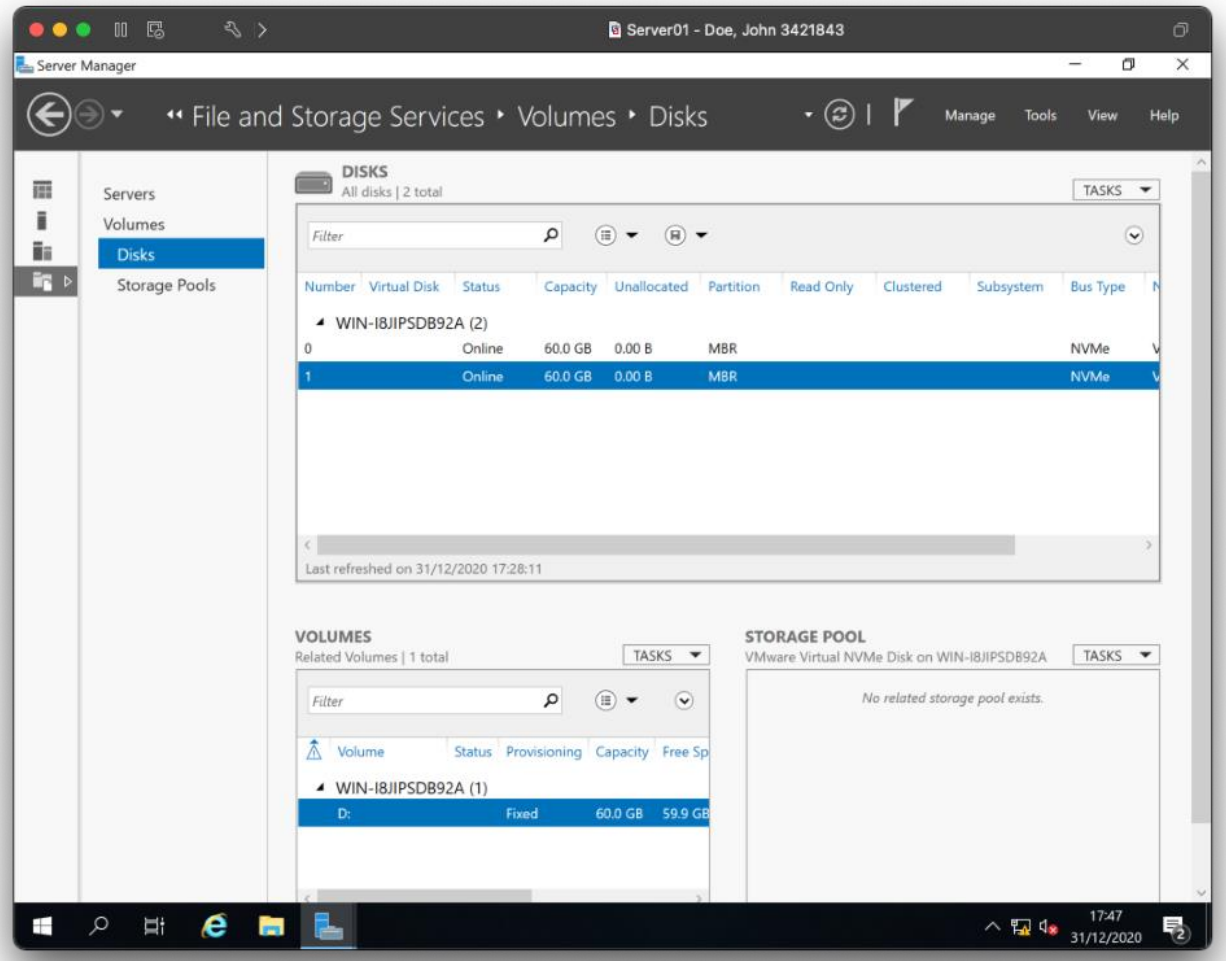
- this screen shot demonstrates that the operating system has been installed



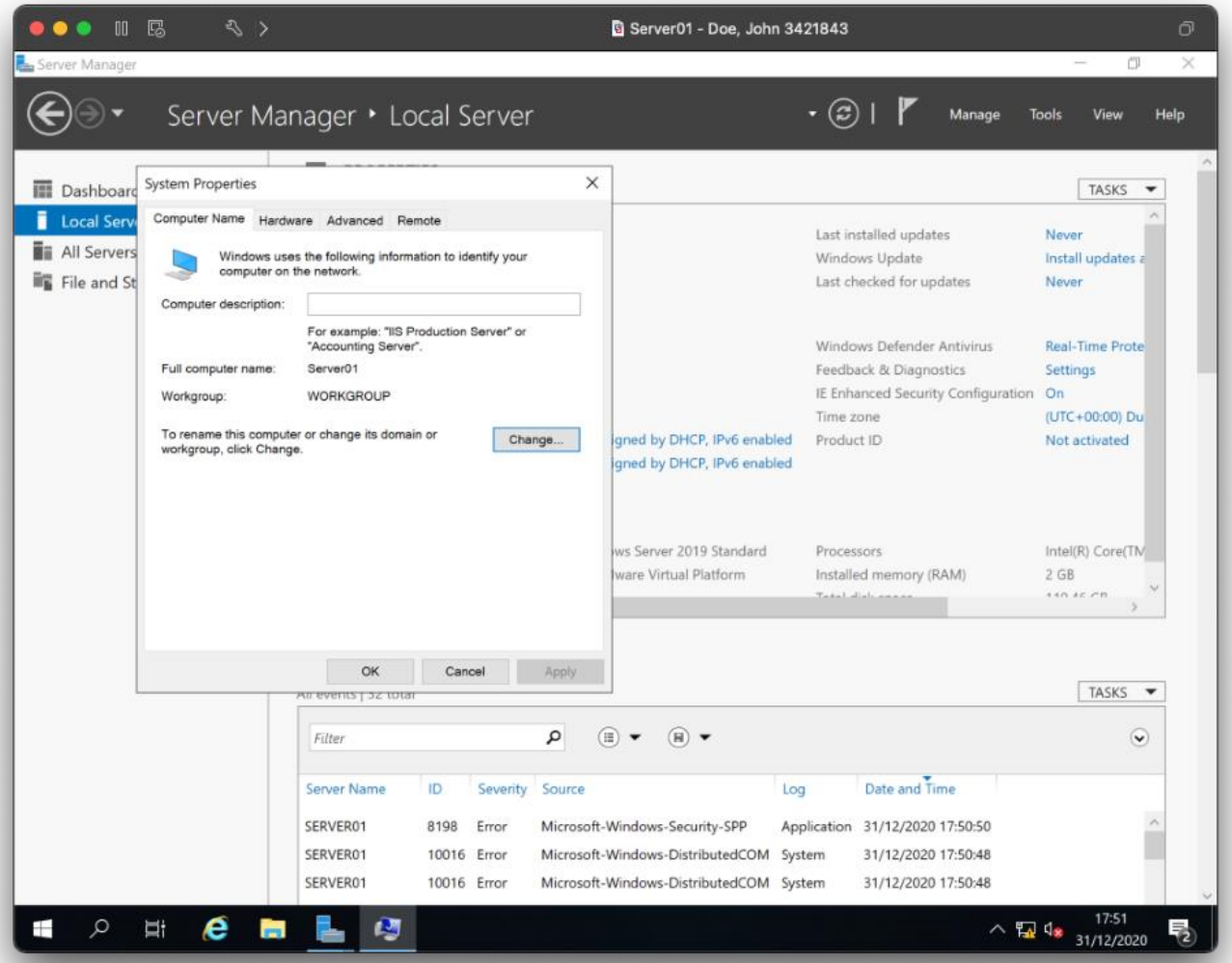
- this demonstrates that I have selected suitable region and language settings



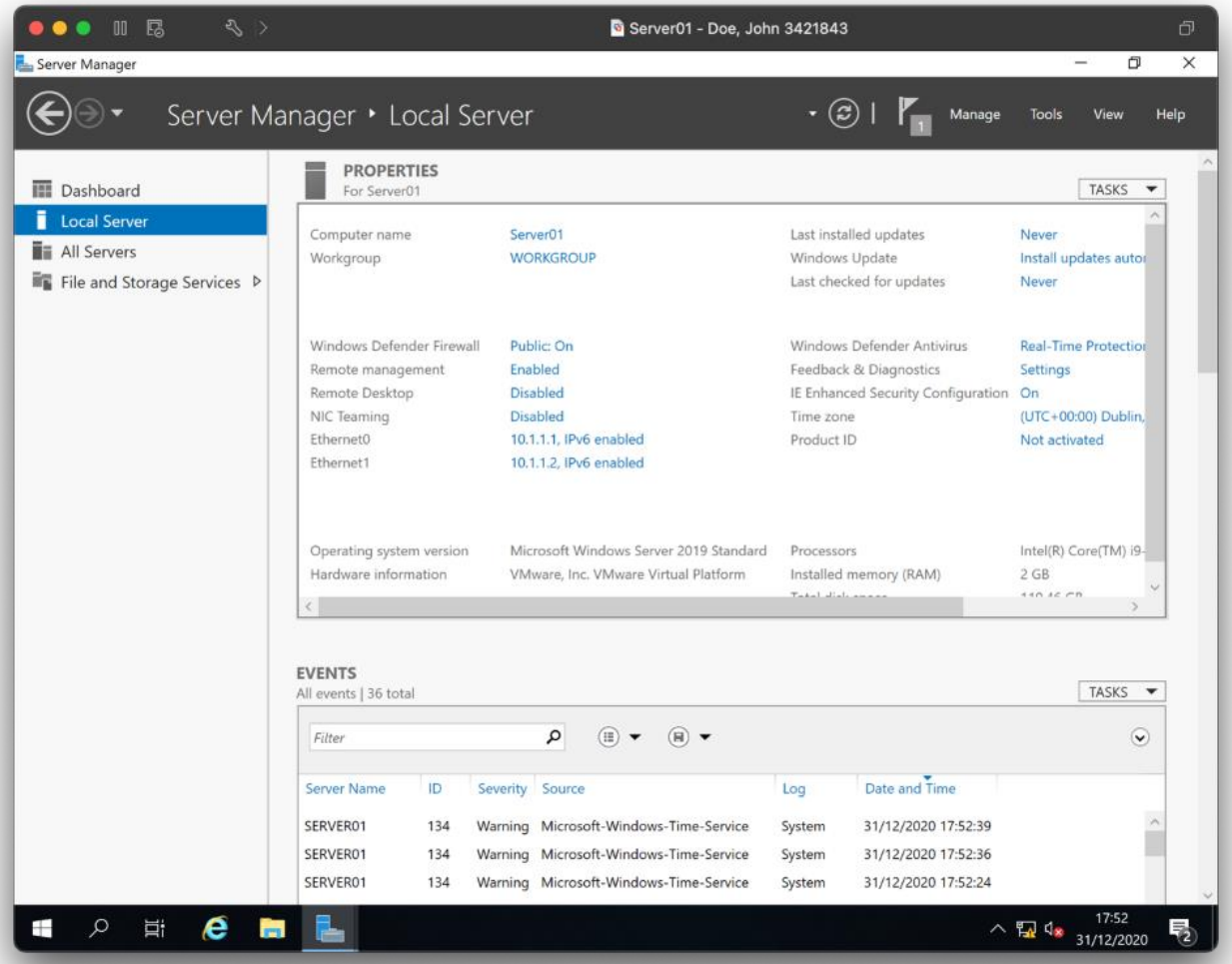
- this demonstrates I have configured the disk partitions



- this demonstrates the machine has been named correctly

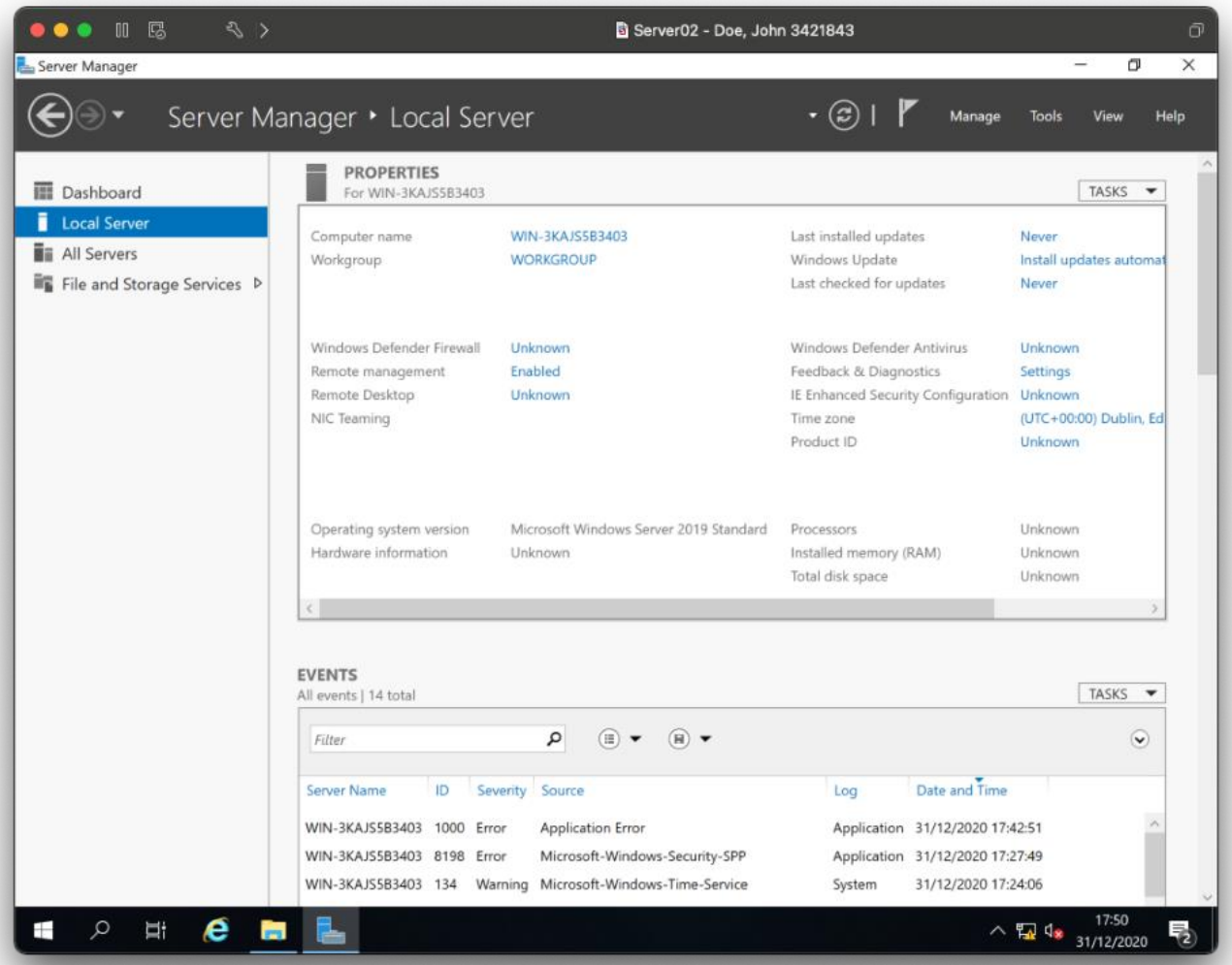


- this shows that I have fixed IP addressing set

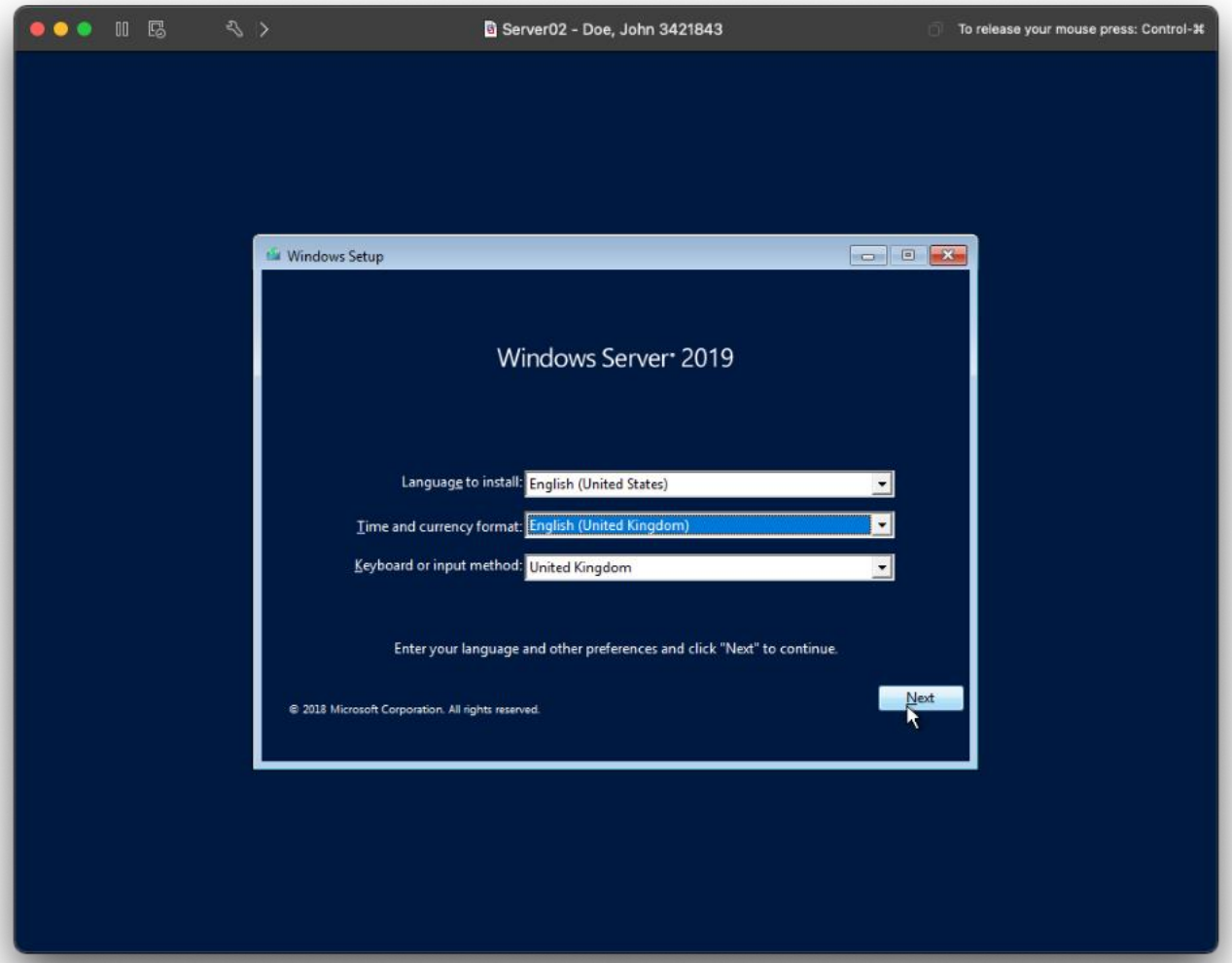


Server02 installation and configuration

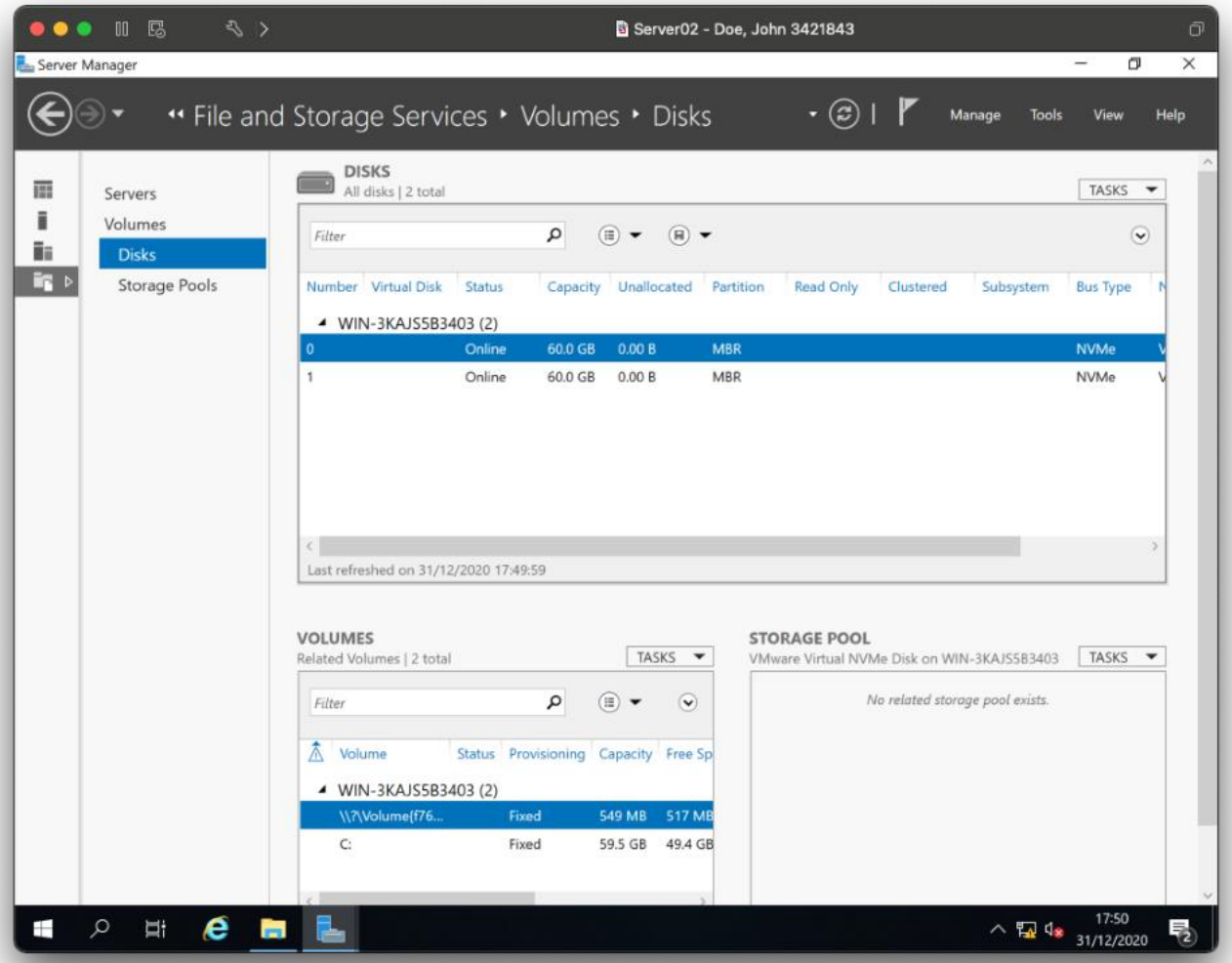
- this demonstrates that I have installed the operating system



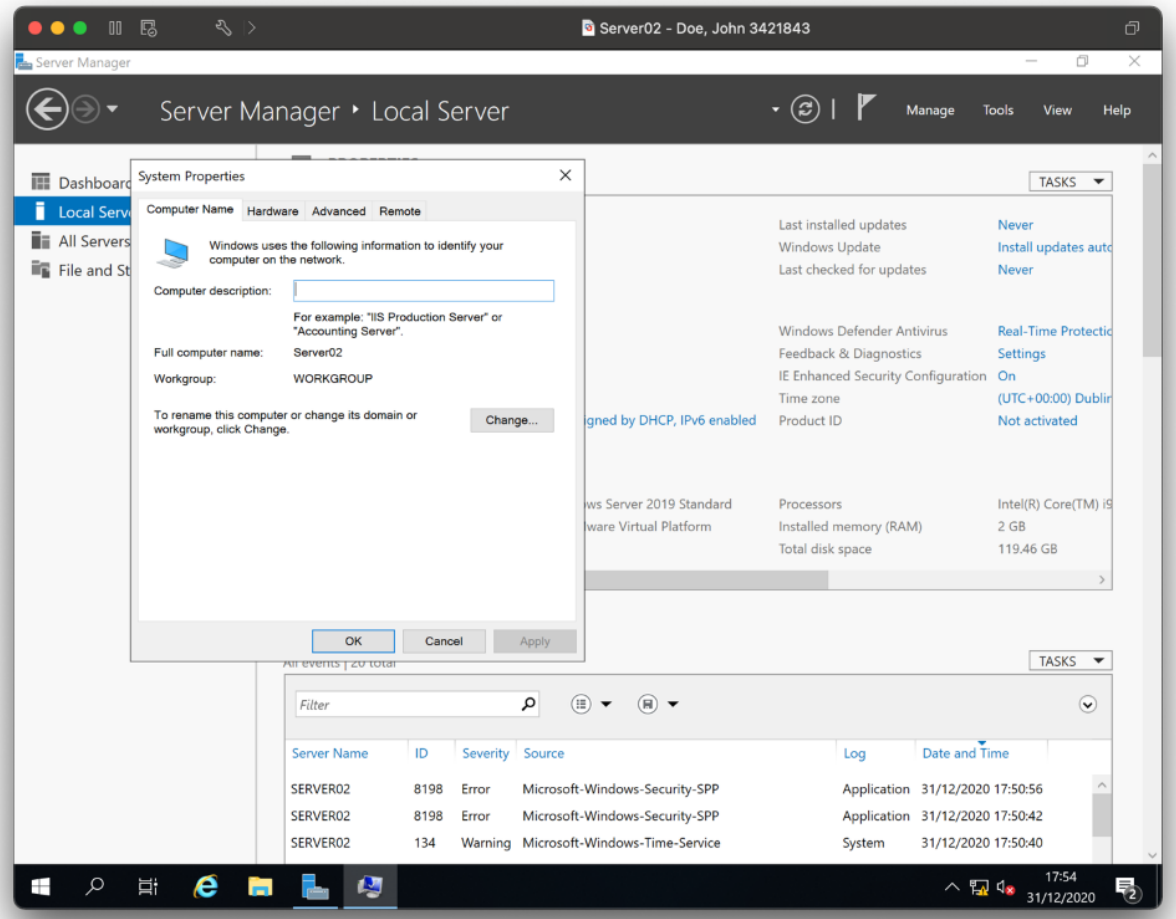
- suitable region and language settings



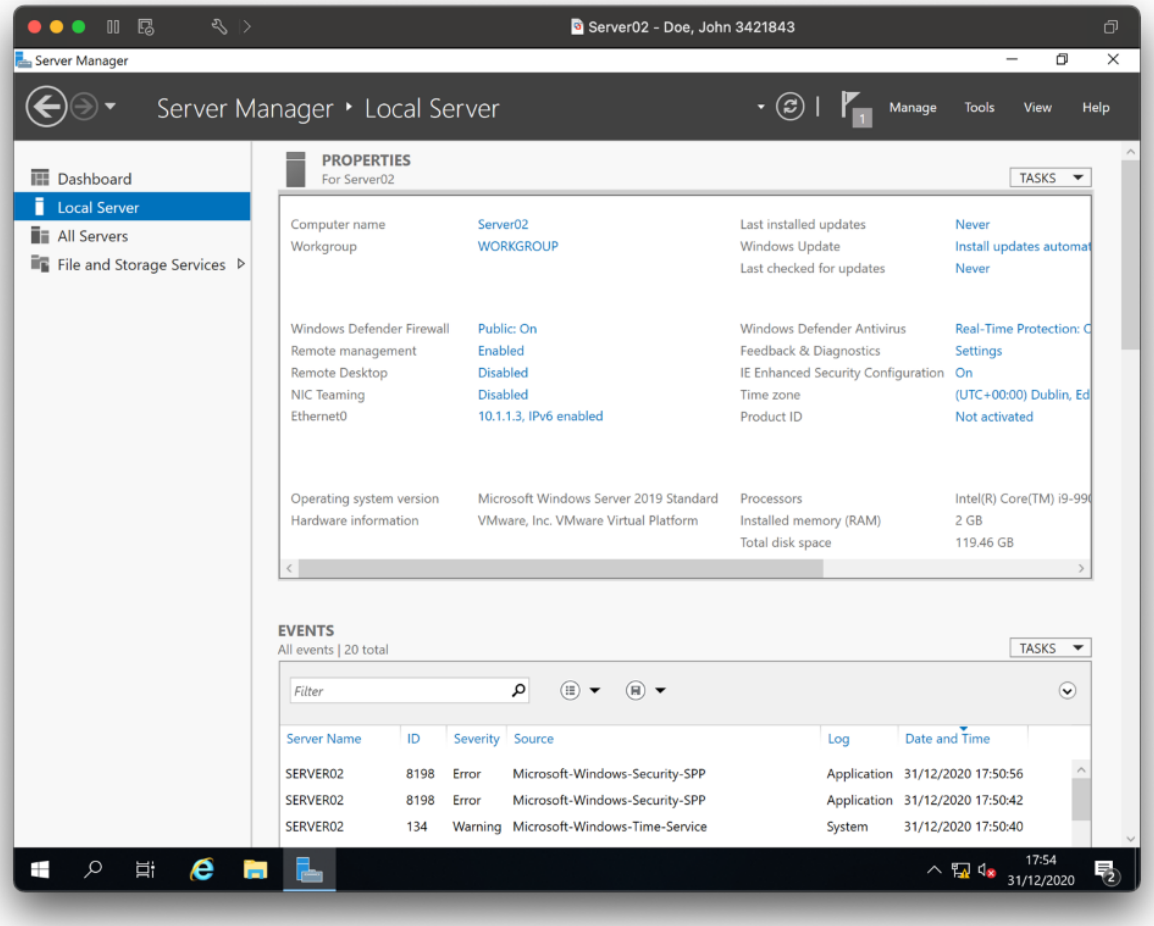
- disk partitions



- machine named correctly

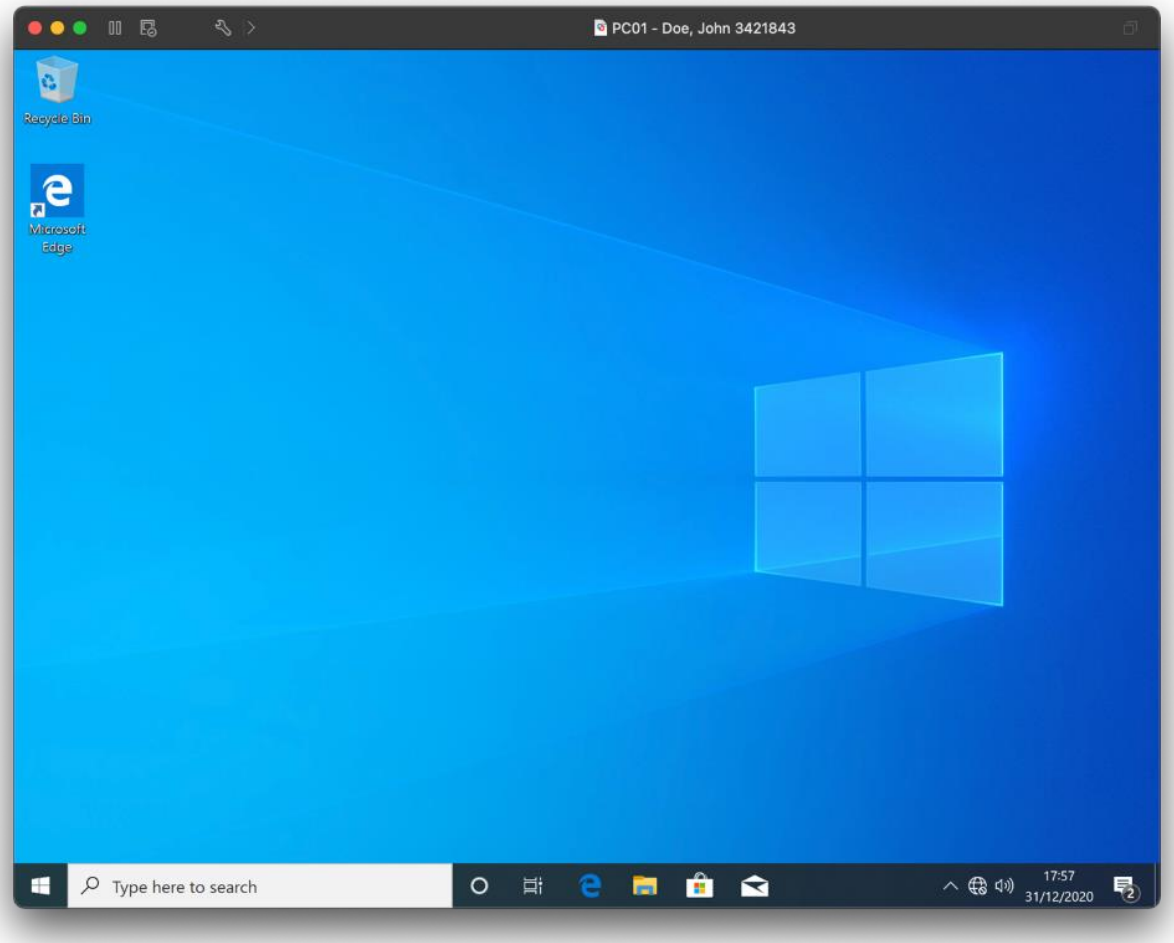


- fixed IP addressing set

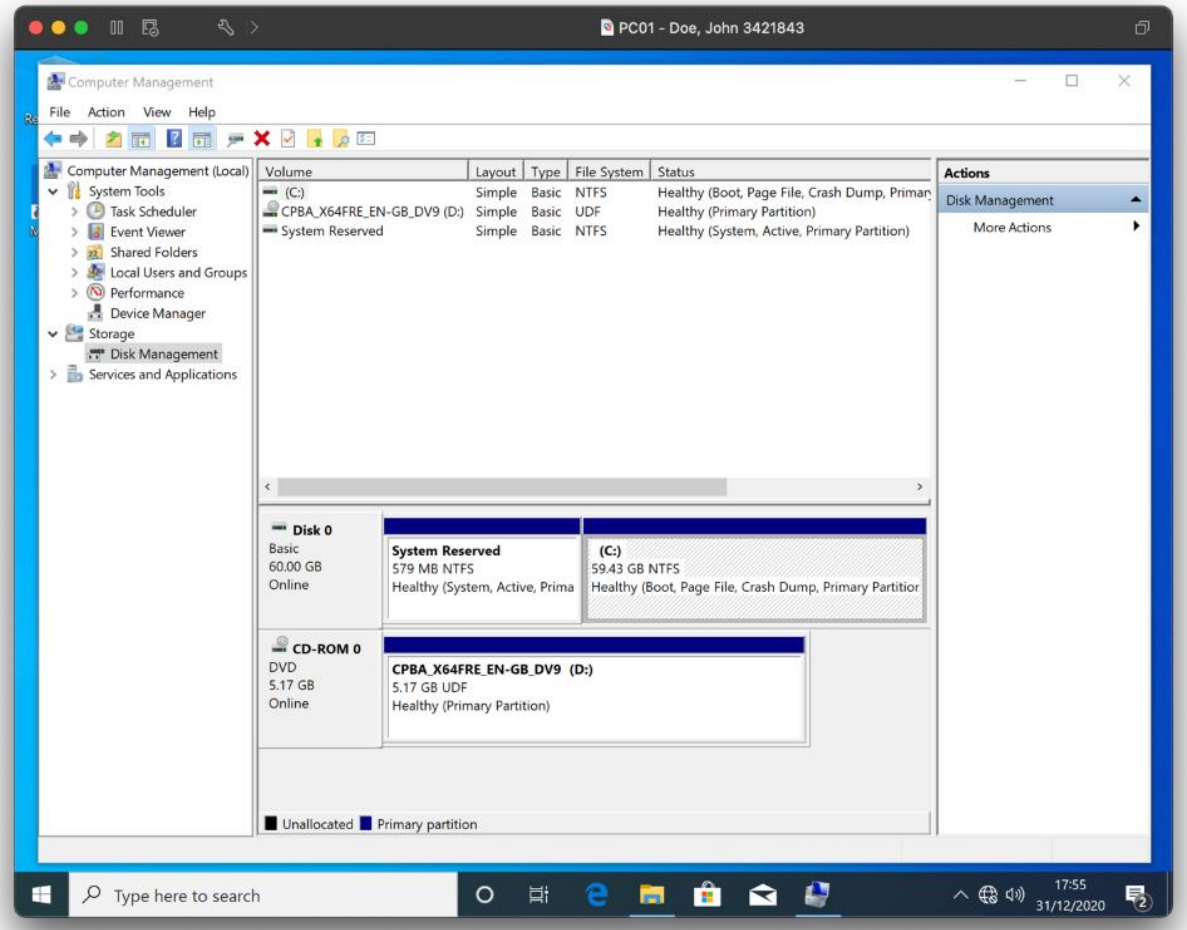


PC01 installation and configuration

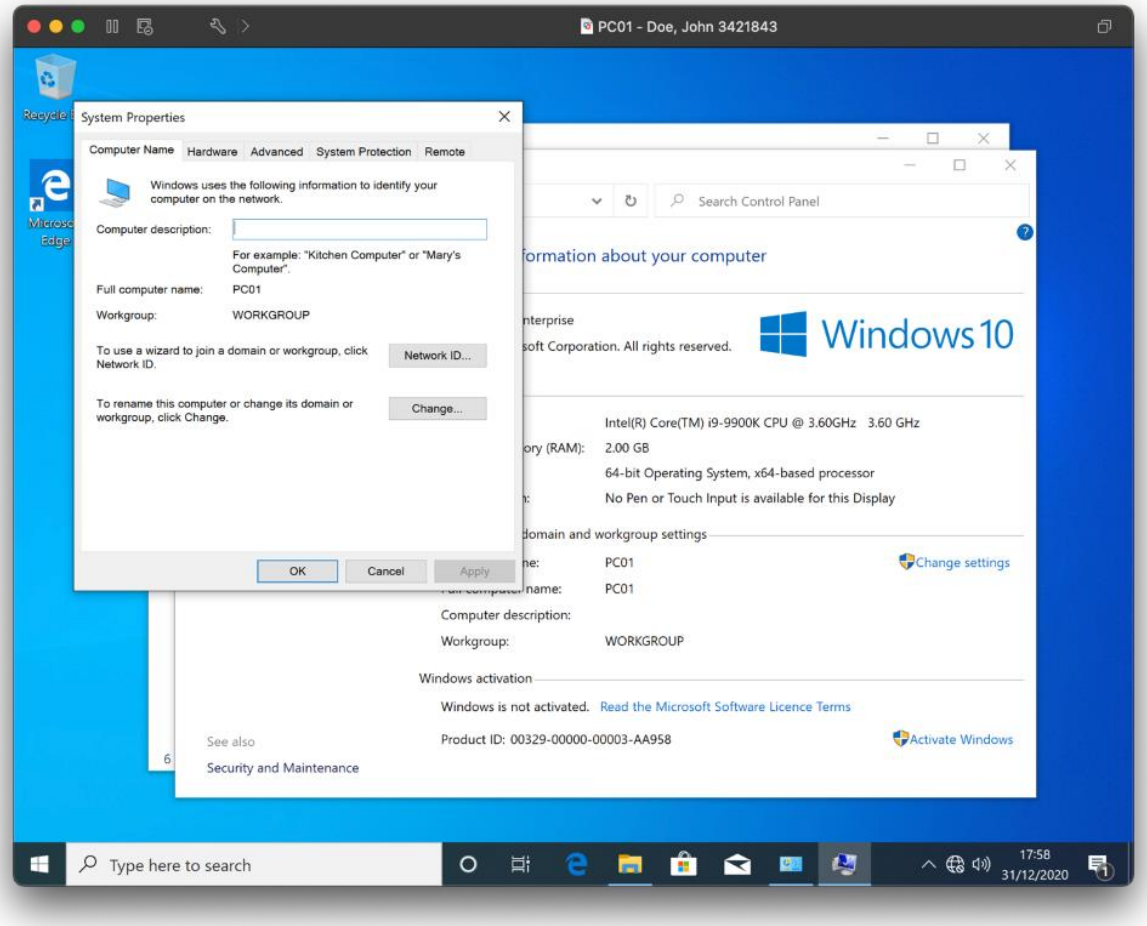
This demonstrates that I have installed the operating system (Windows 10)



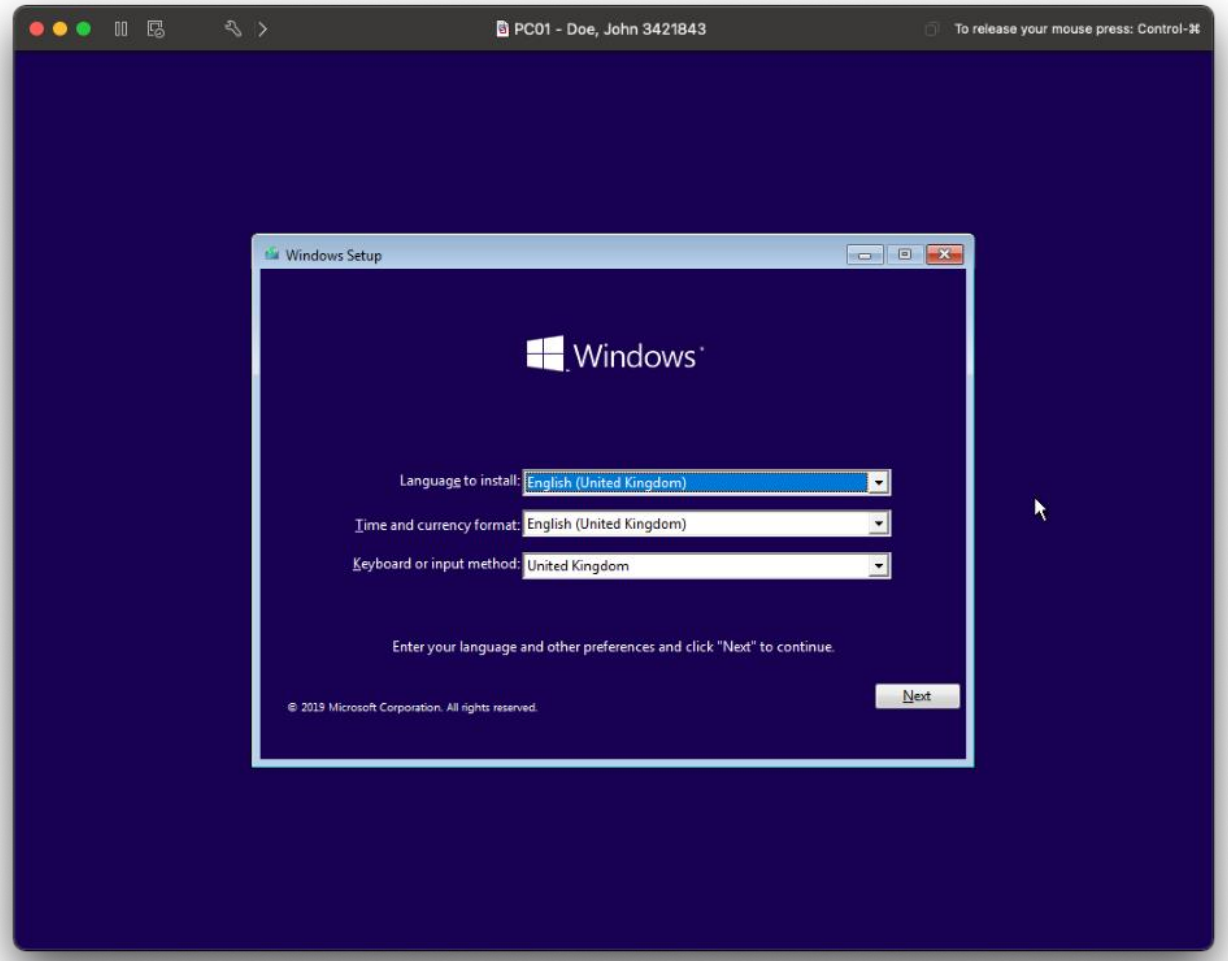
- disk partitions



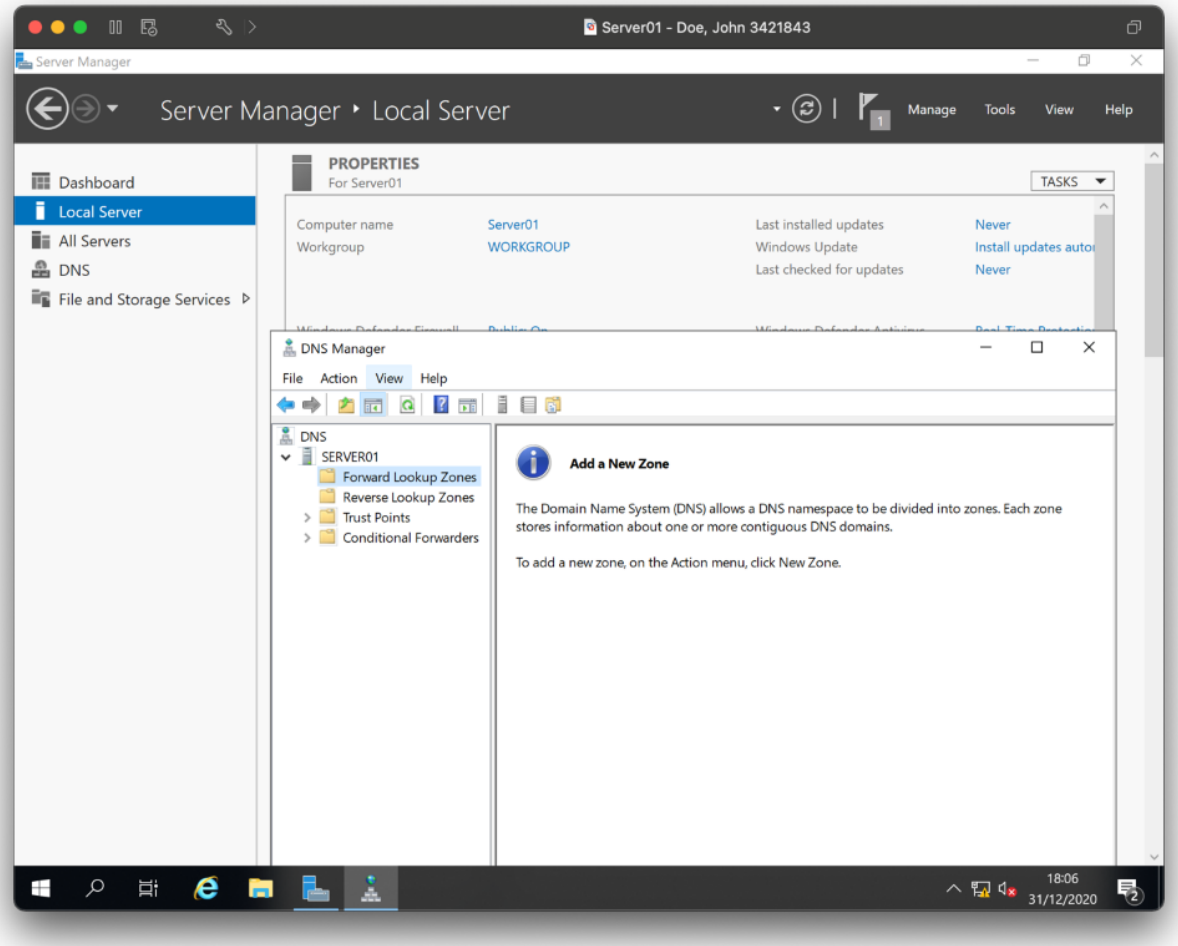
- machine named correctly



- suitable region and language settings

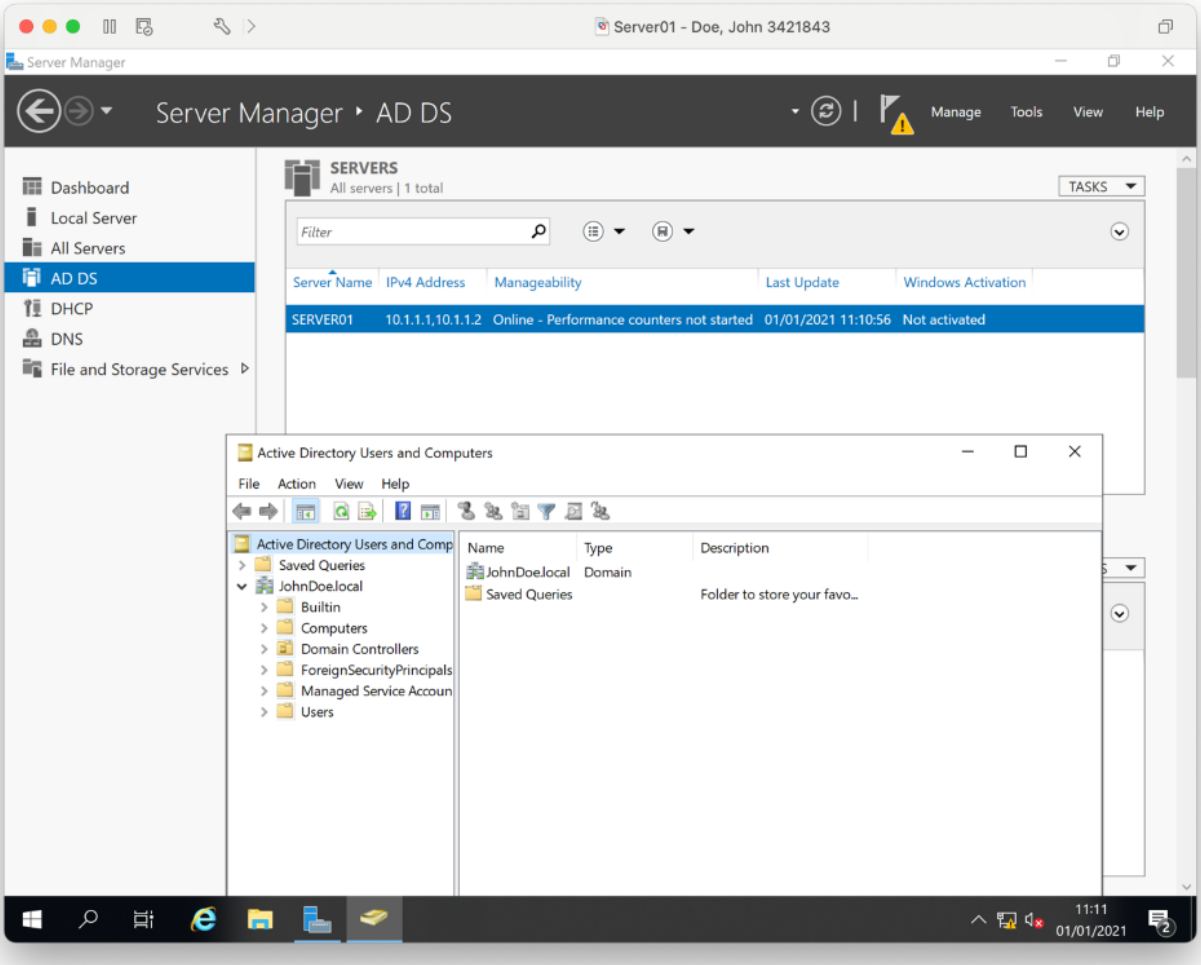


Step B
I have configured the DNS so that I can access websites.



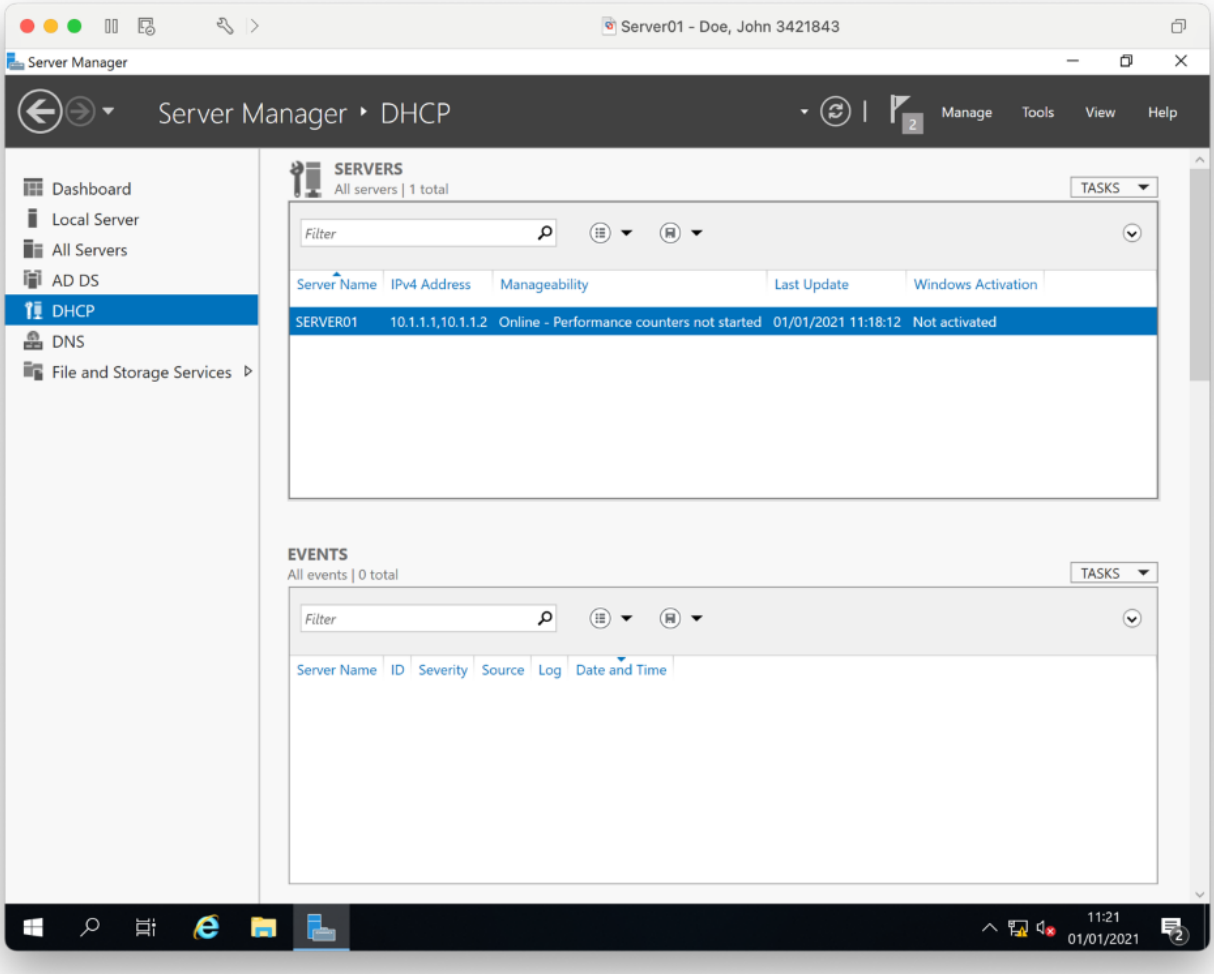
Directory service

I have configured the Active Directory service so I can configure users.

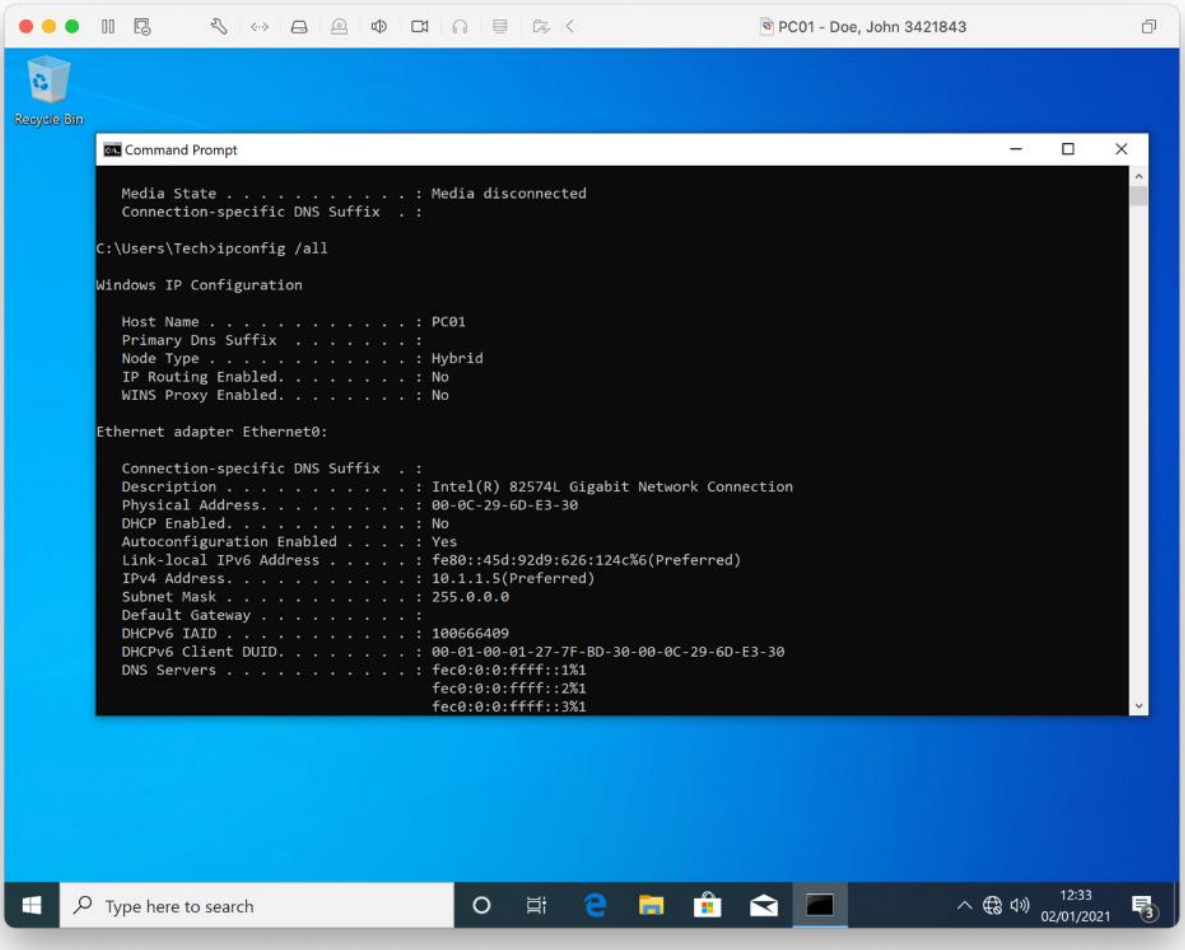


DHCP

- DHCP service installed
- I configured the DHCP service

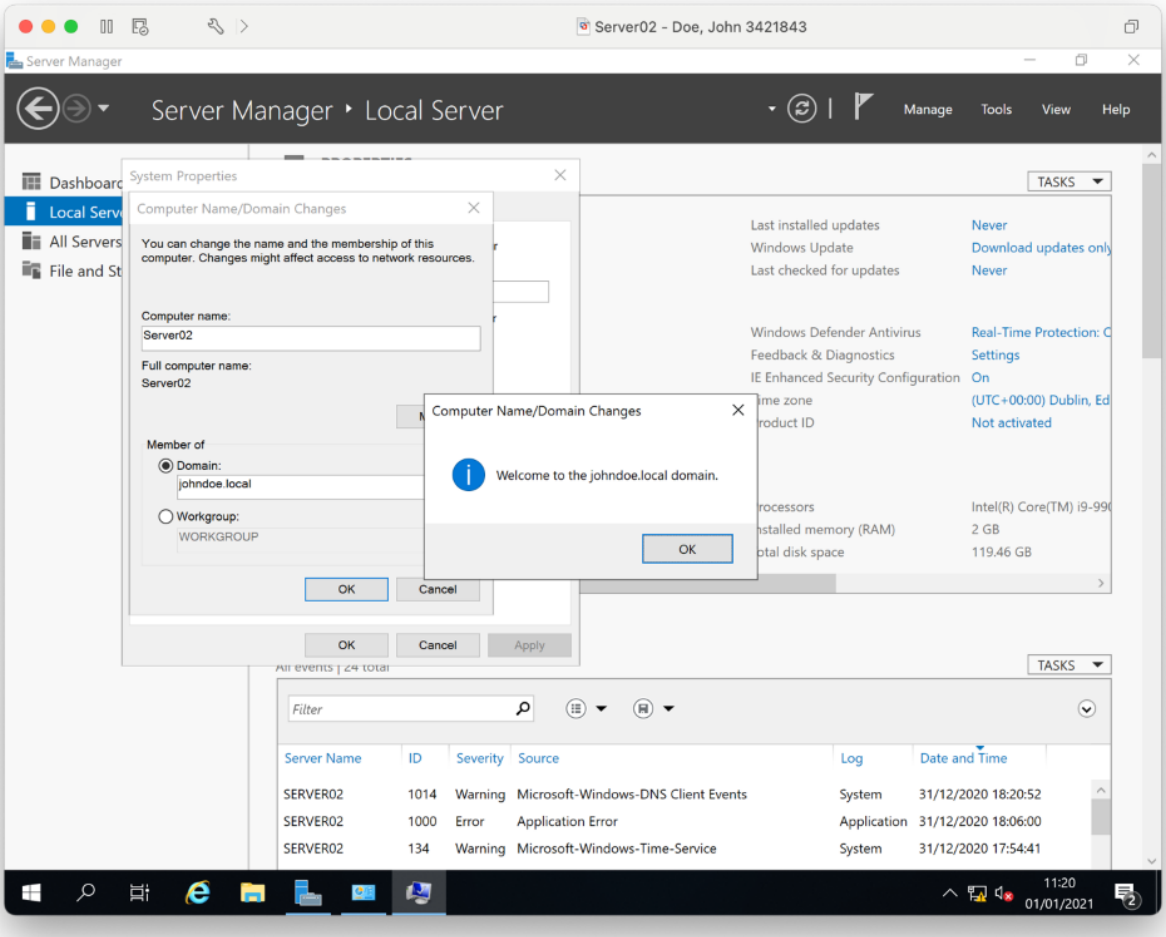


PC01 has been assigned a DHCP address using IPCONFIG /ALL

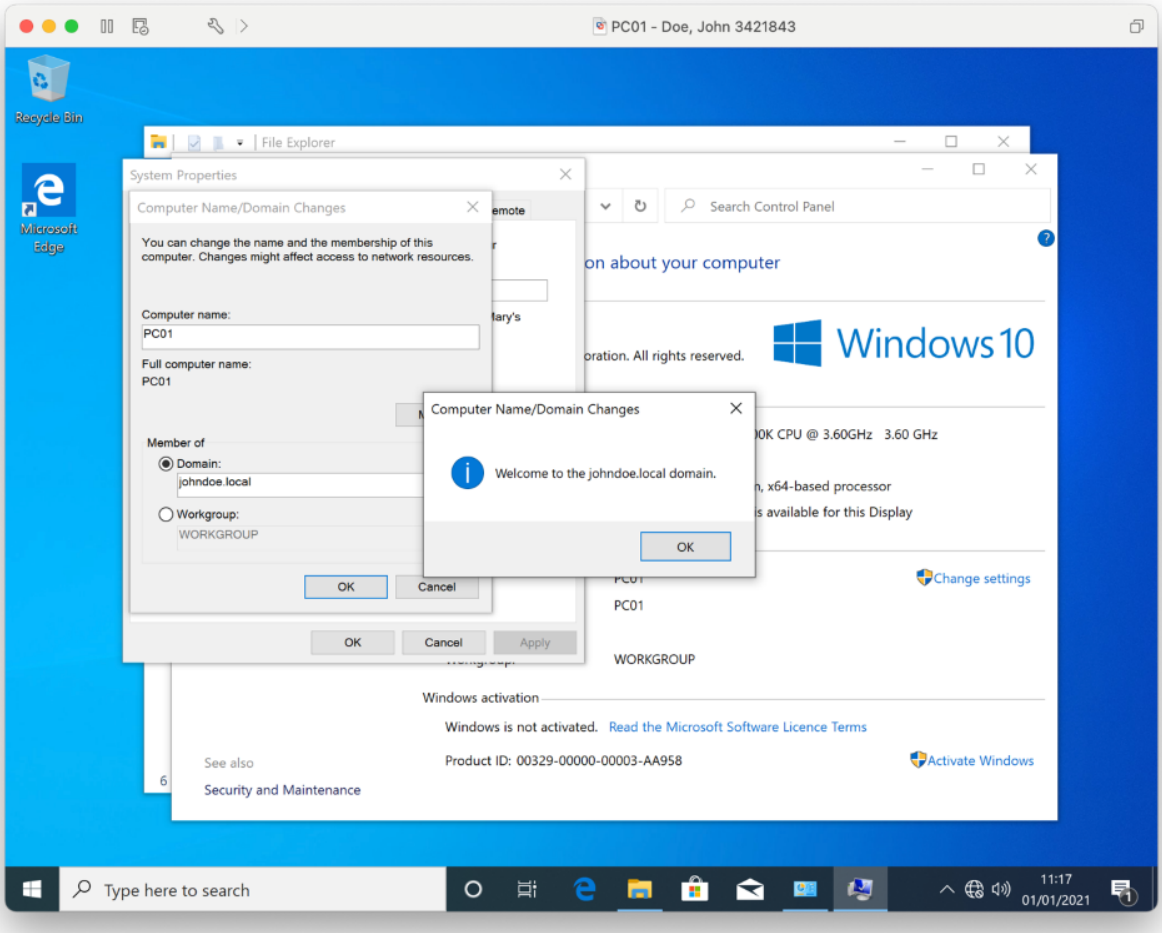


Domain joins

Server02 domain joined to (FirstnameSurname).local

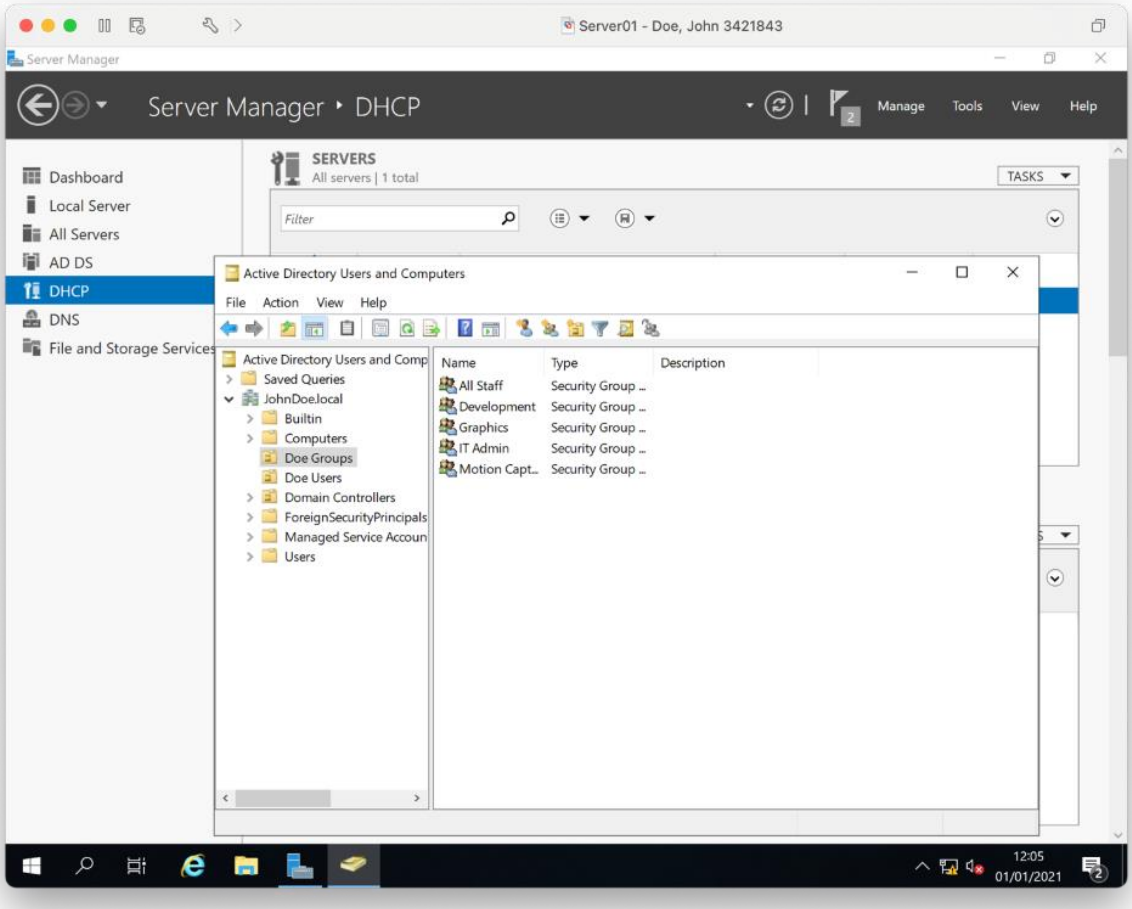


PC01 domain joined at logon to (FirstnameSurname).local



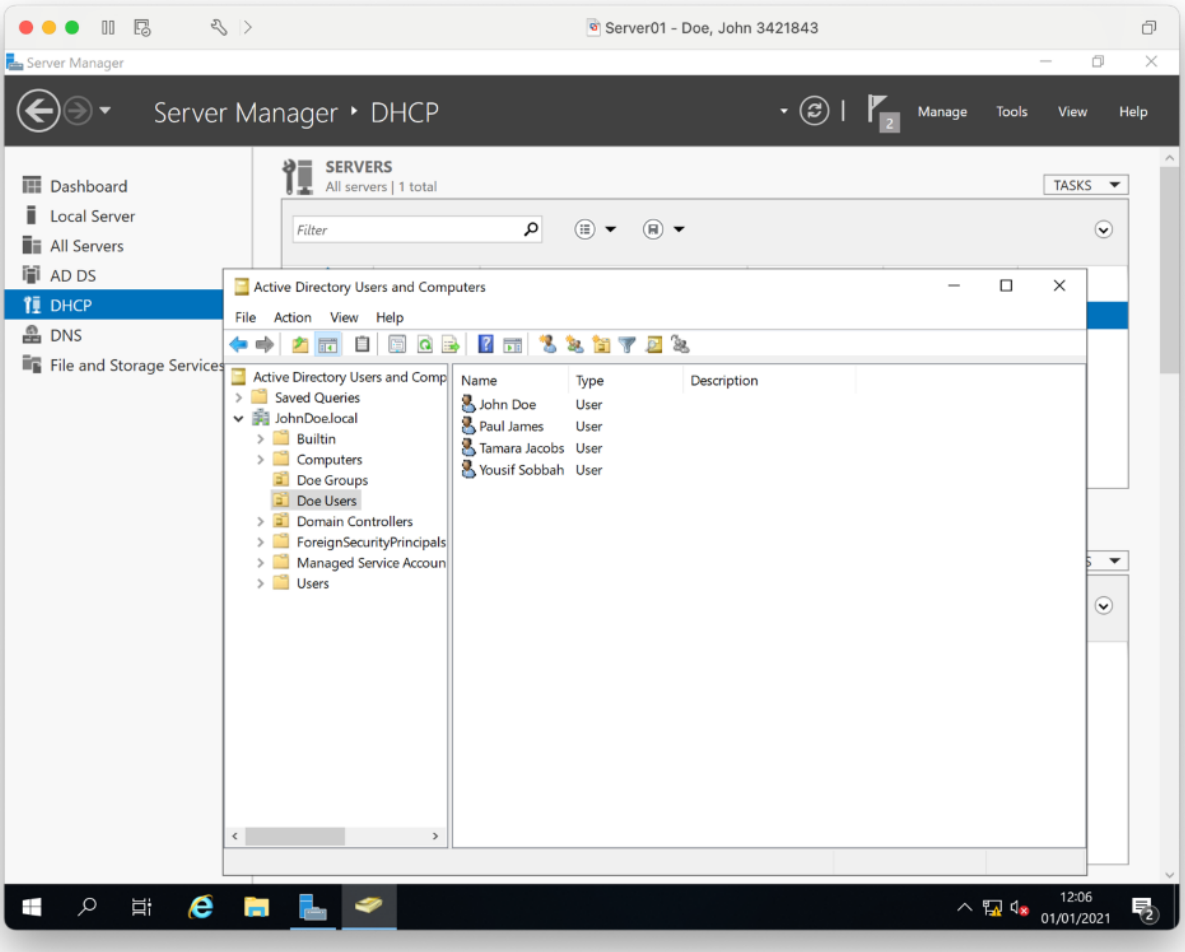
Reverse lookup

Step C
Group creation

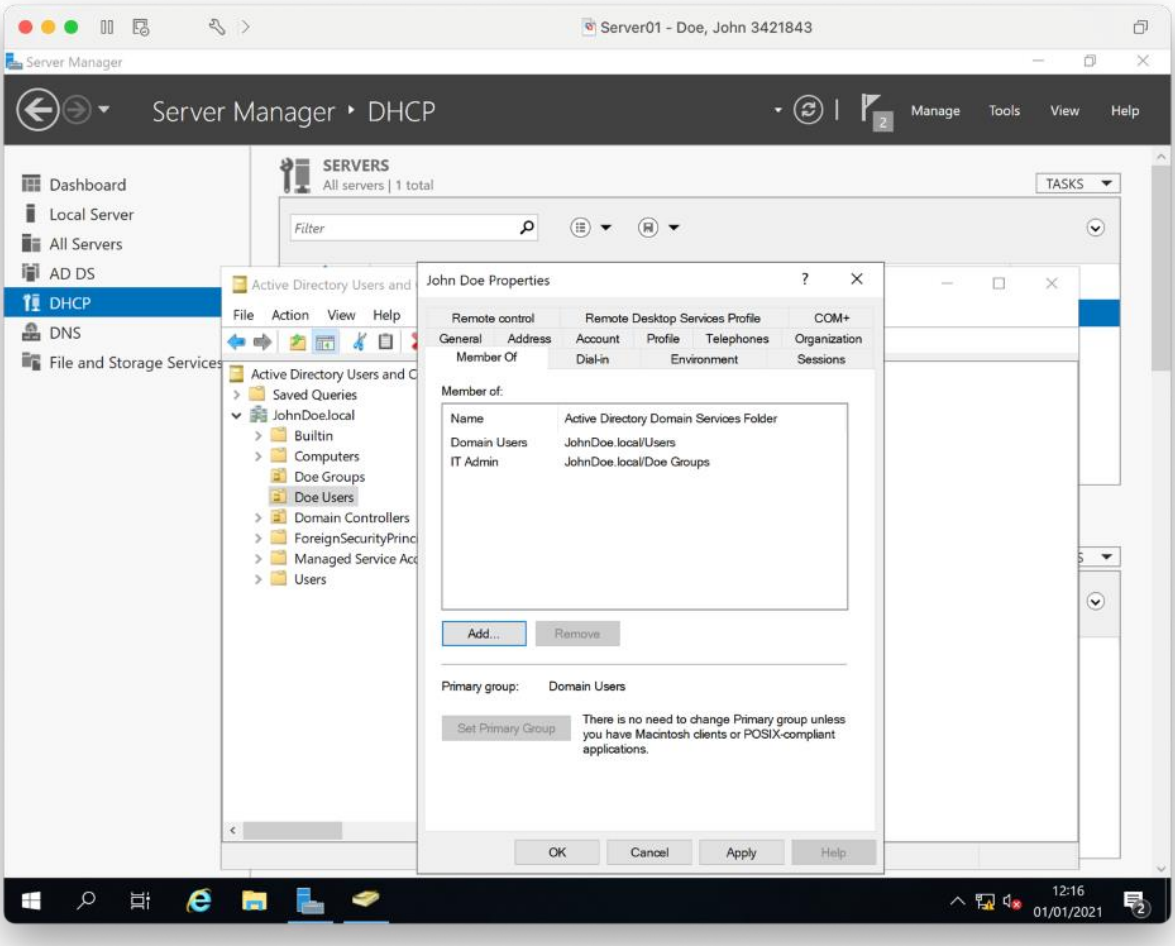


User creation

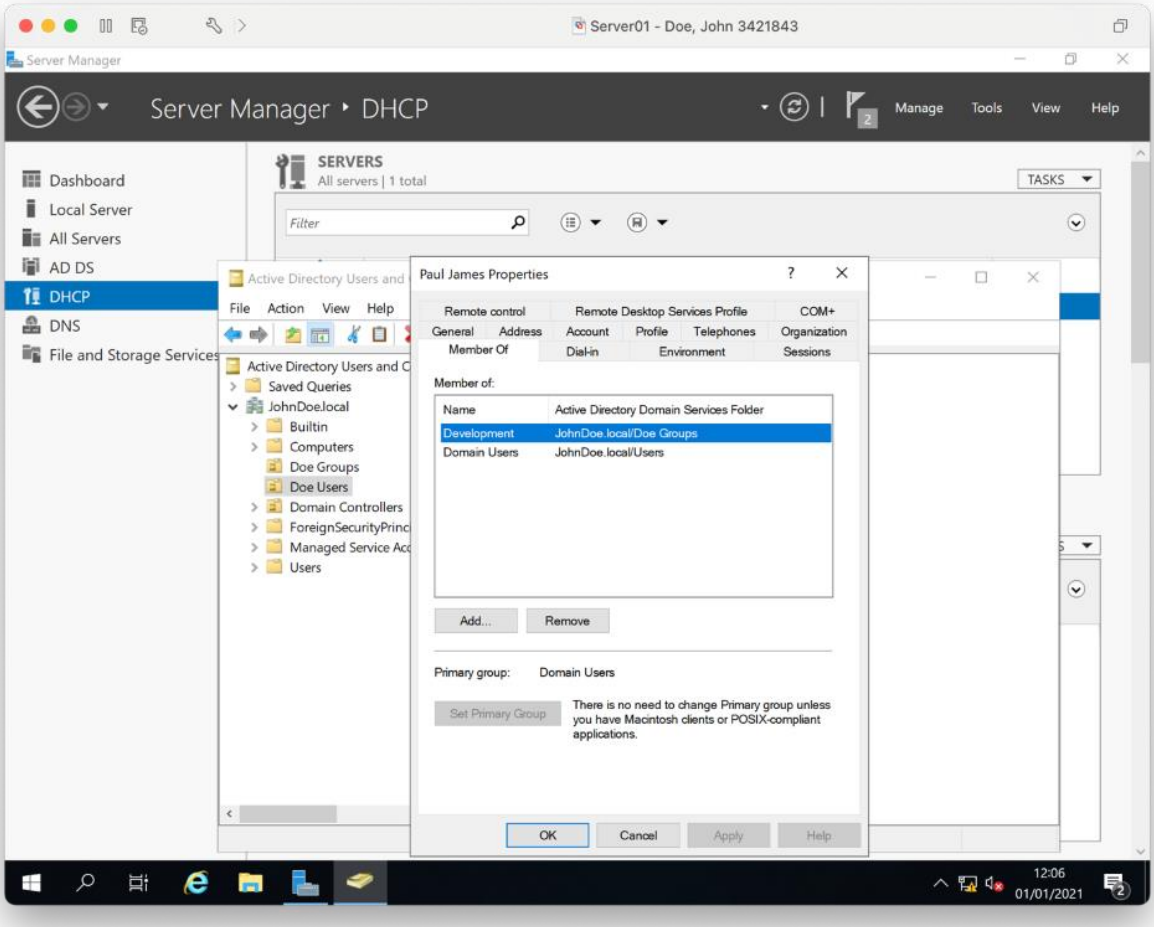
Users -Your first and surname, Paul James, Tamara Jacob and Yousif Sobbah has been created



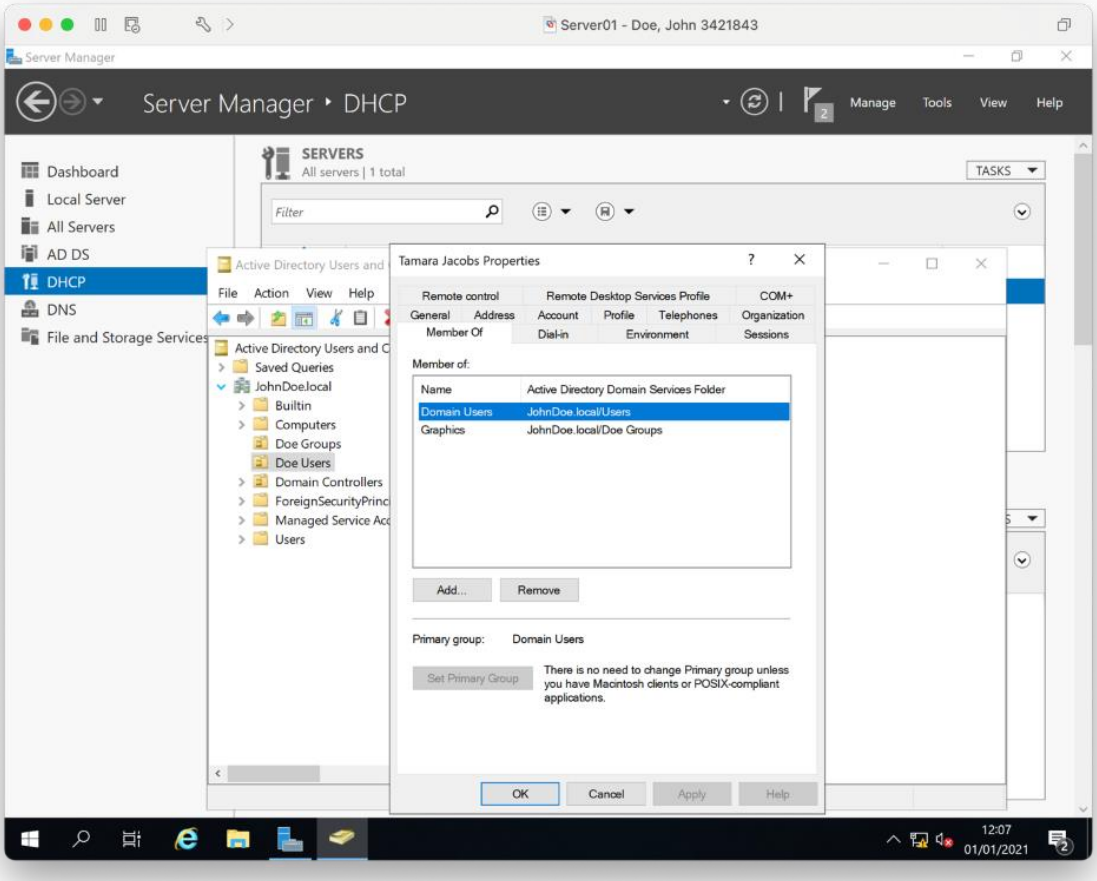
Your first and surname is now a member of the group IT admin



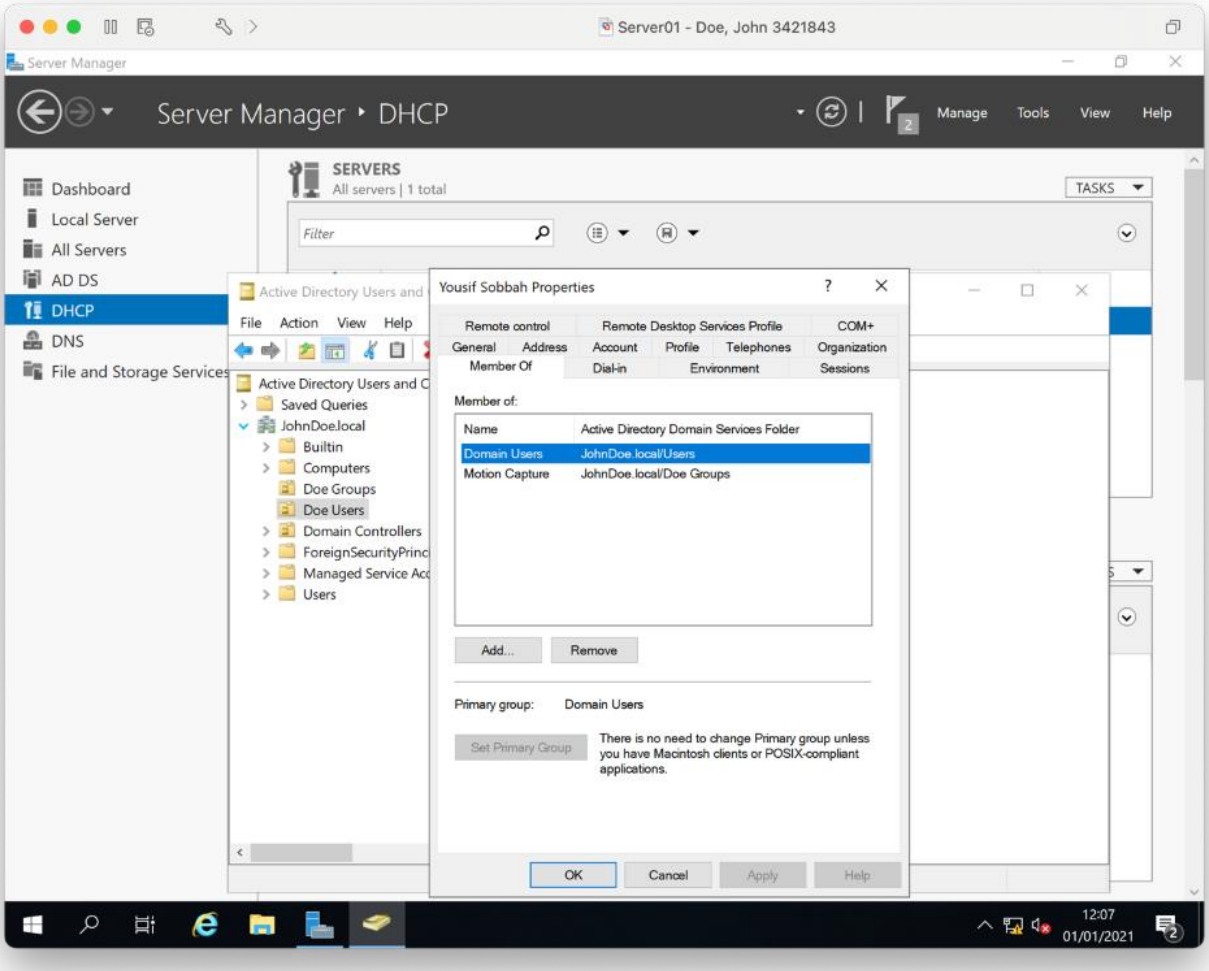
Paul James is now a member of the group Development



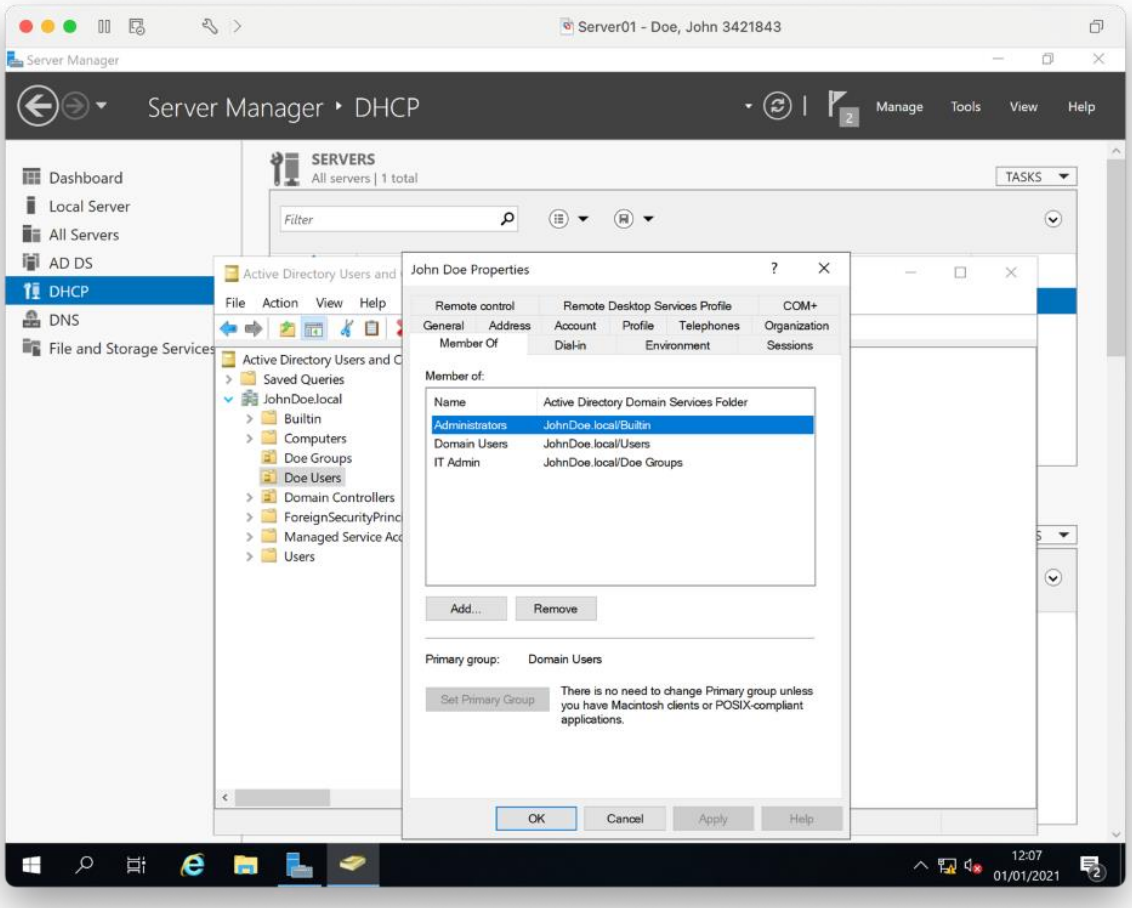
Tamara Jacobs is now a member of the group Graphics



Yousif Sobbah is now a member of the group Motion Capture



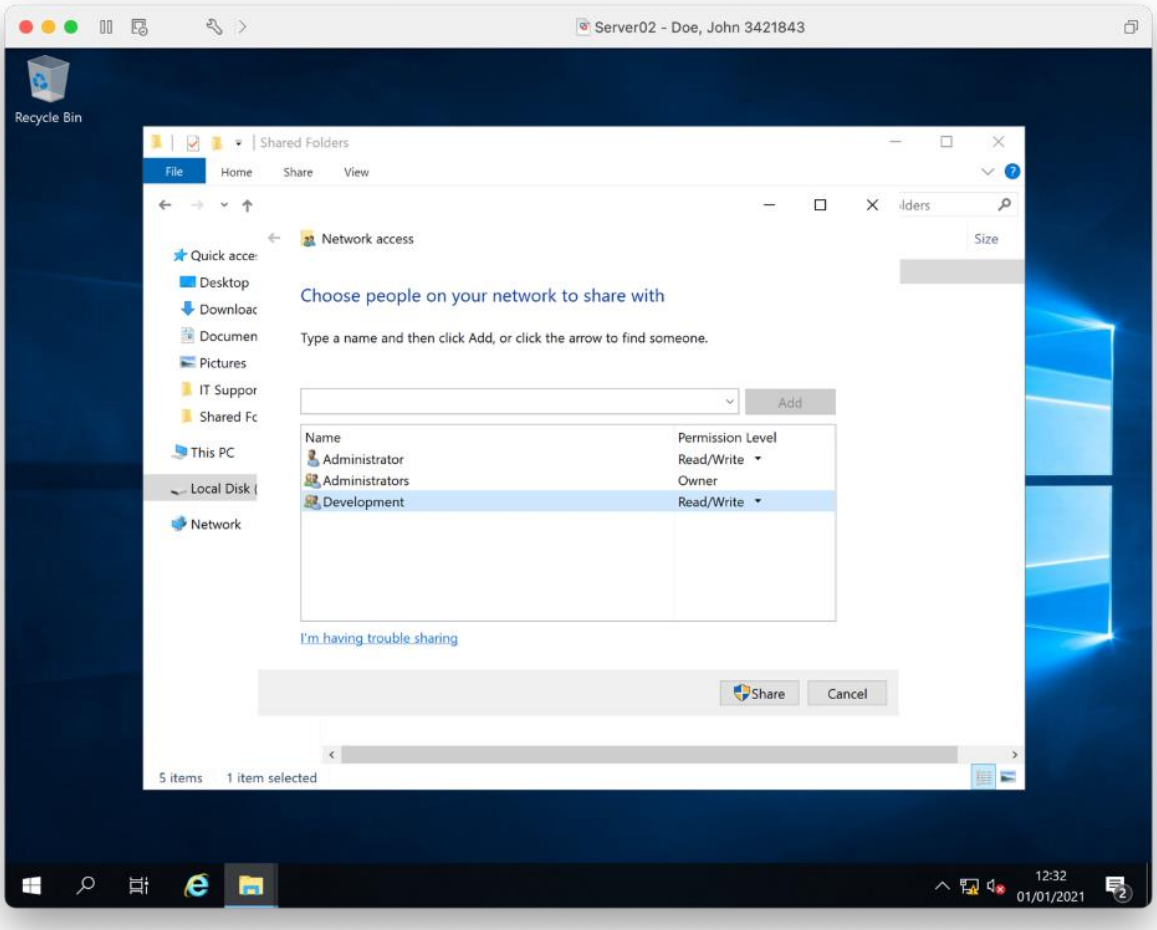
Your first and surname has been made an administrator



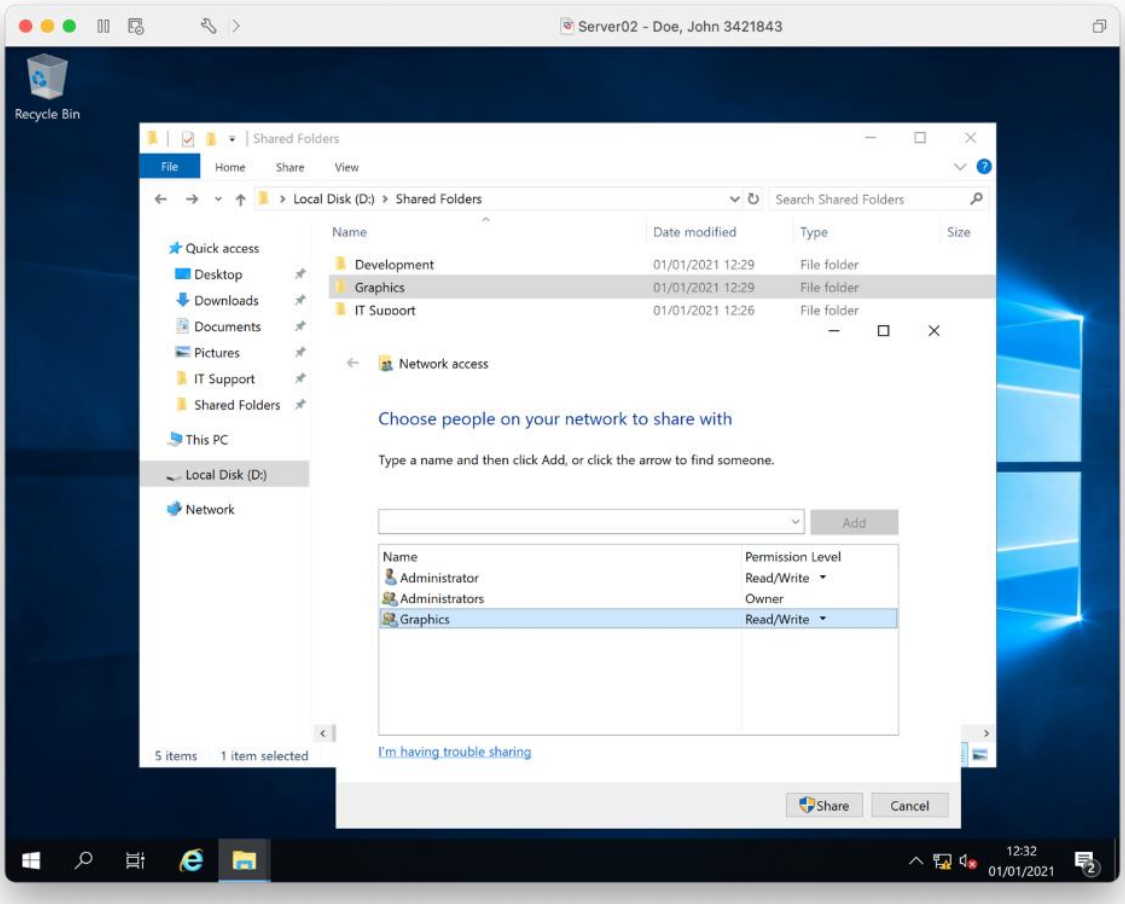
Staff added to groups

Folder permissions

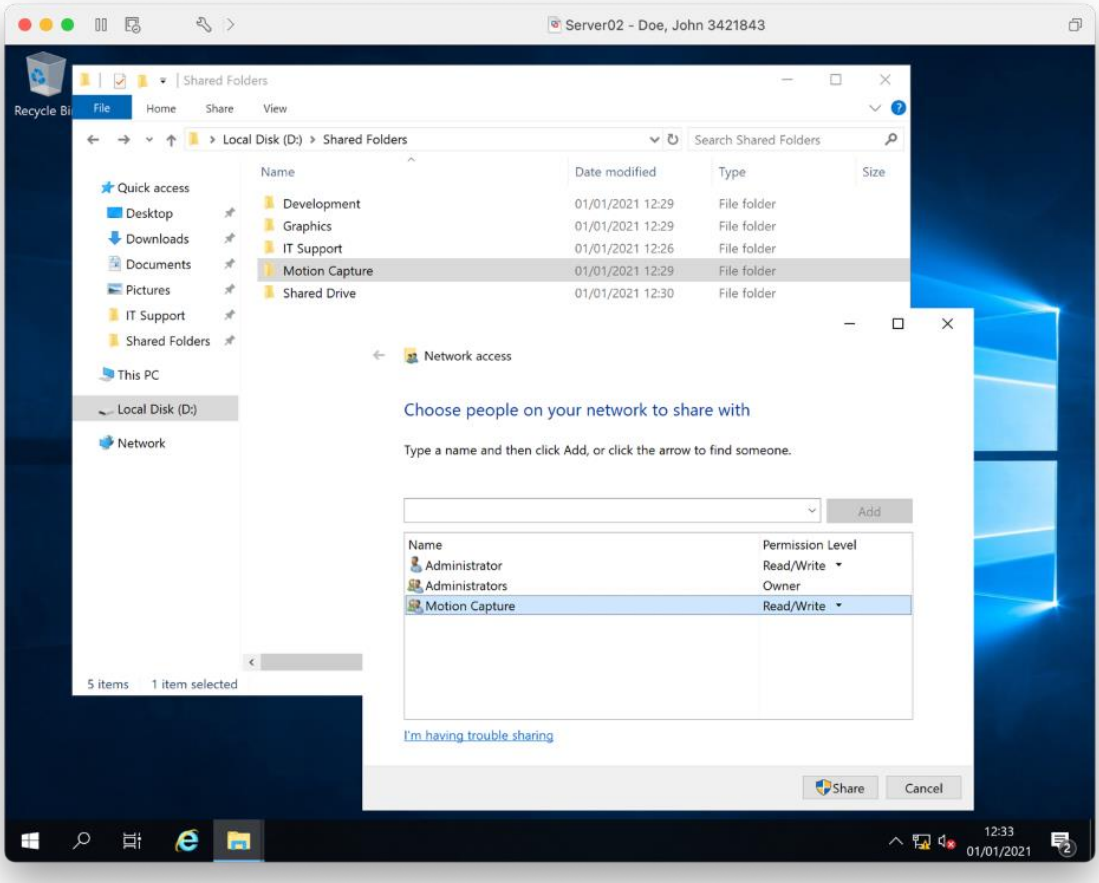
Development folder has the group Development added with read and write permission



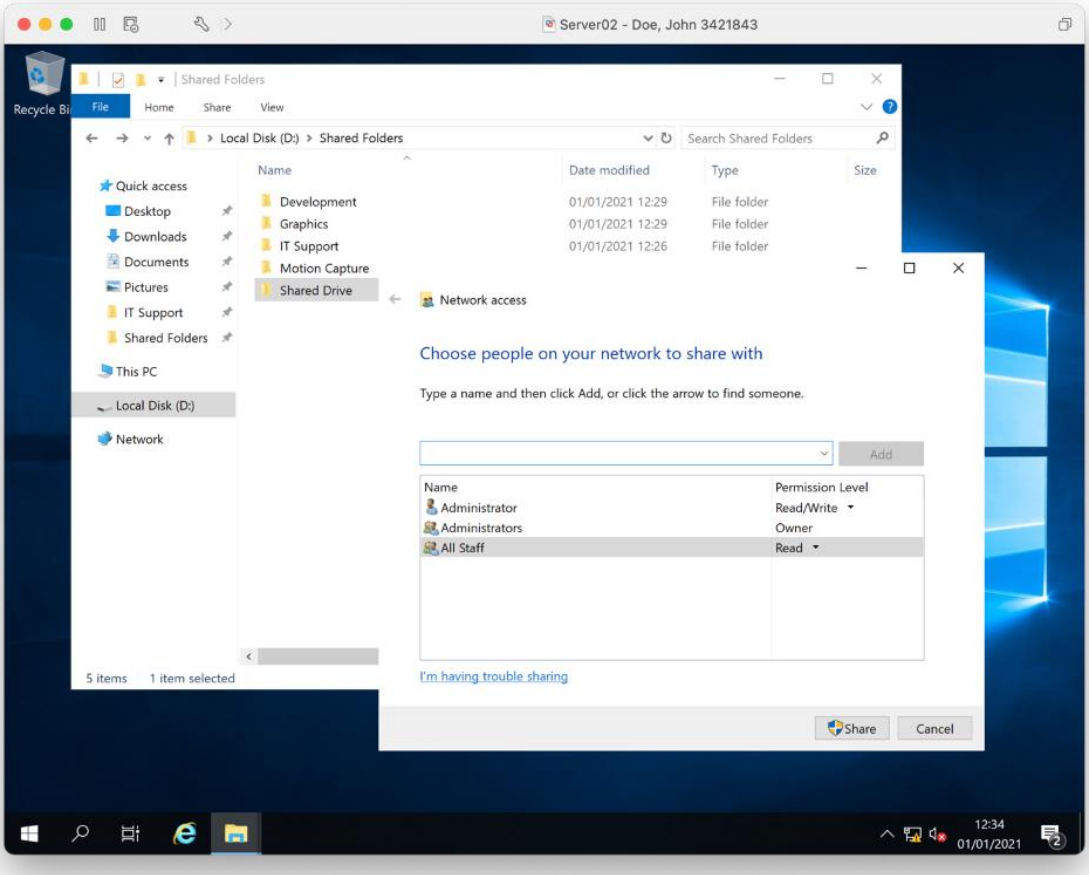
Graphics has the group Graphics added with read and write permission



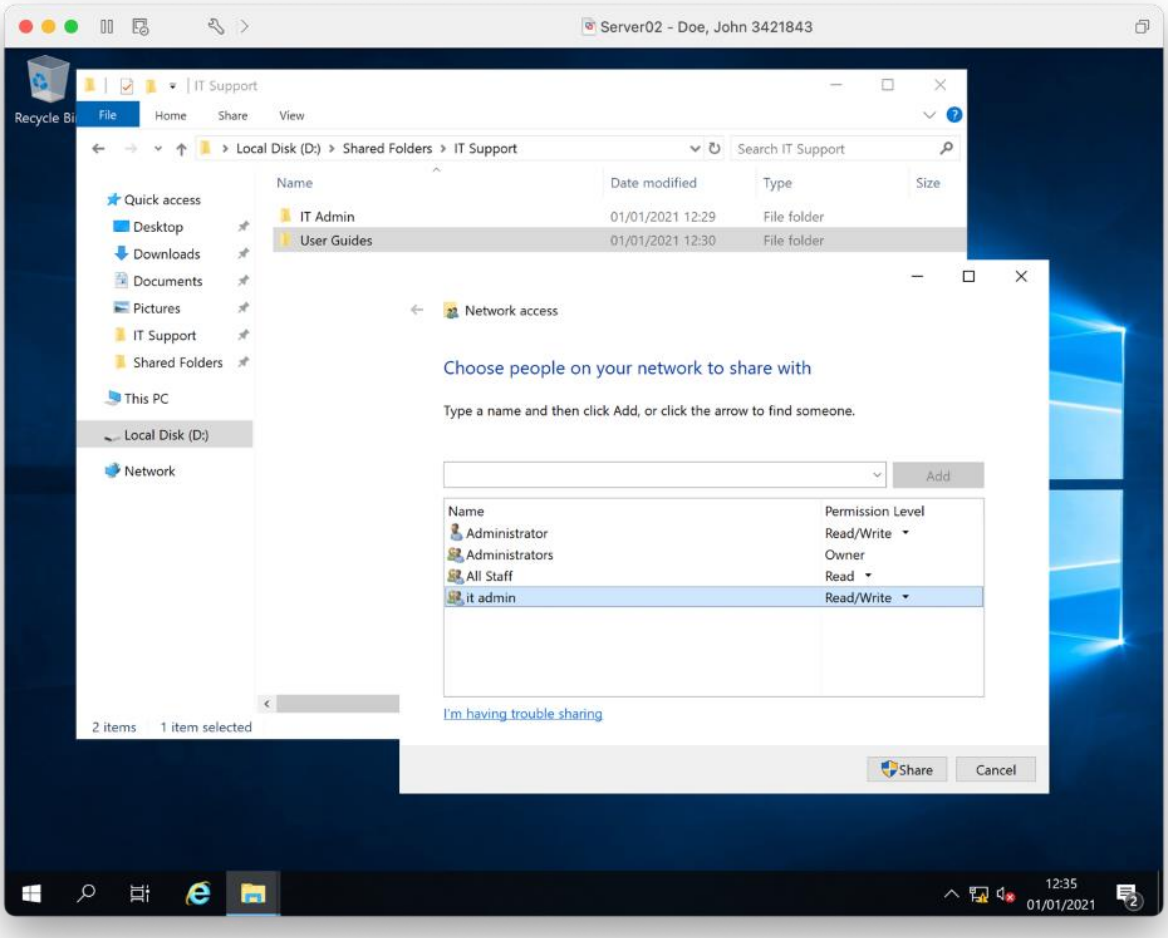
Motion capture has the group Motion Capture added with read and write permission



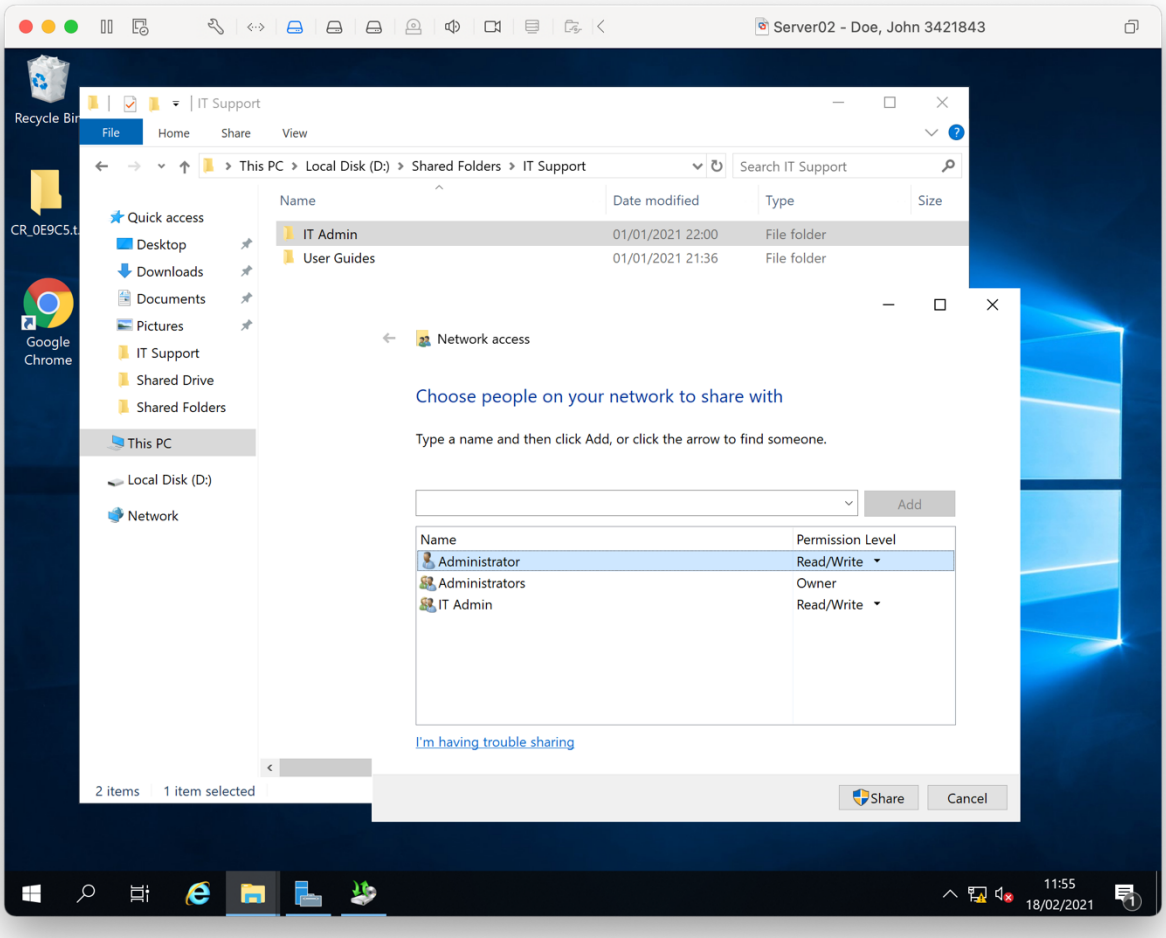
Shared drive has the group All Staff added with read permission



User guides has the group all staff added with read permission and IT admin added with read and write permission



IT admin has the group IT admin added with read and write permission for IT admin



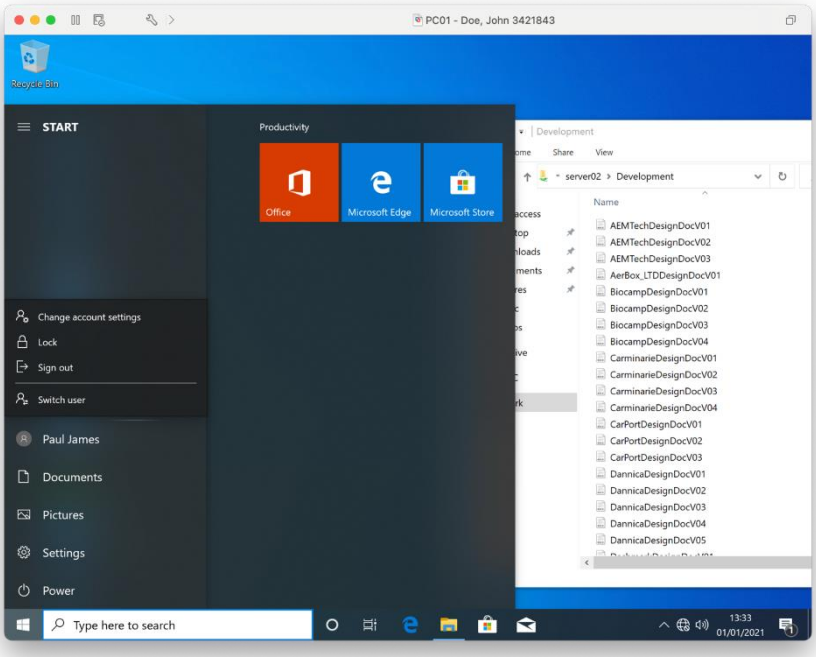
Folder testing

Add more rows to the table as required

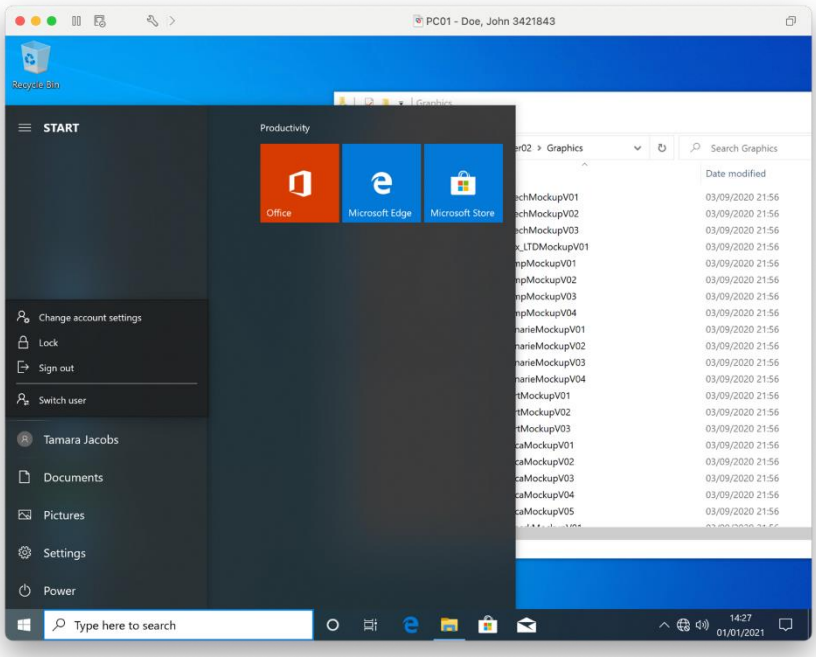
Test ID	Folder being tested	User account (Test data)	Test description and expected outcome	Actual outcome
1	Development	Paul James	Testing that a valid member of the development group as read access	The user was able to read files stored in the folder
2	Graphics	Tamara Jacobs	Testing that a valid member of the graphics group as read access	The user was able to read files stored in the folder
3	Motion capture	Yousif Sobbah	Testing that a valid member of the motion capture group as rad access	The user was able to read files stored in the folder
4	Shared drive	Tamara Jacobs	Testing that a valid member of the all staff group as read access	The user was able to read files stored in the folder
5	User guides	Tamara Jacobs	Testing that a valid member of the all staff group as read access	The user was able to read files stored in the folder

6	User guides	Your first and Surname	Testing that a valid member of the IT admin group as read access	The user was able to read files stored in the folder
7	IT admin	Your first and Surname	Testing that a valid member of the IT admin group as read access	The user was able to read files stored in the folder
8	Development	Paul James	Testing that a valid member of the development group has read and write access	The user was able to write to files stored in the folder
9	Graphics	Tamara Jacobs	Testing that a valid member of the graphics has read and write access	The user was able to write to files stored in the folder
10	Motion capture	Yousif Sobbah	Testing that a valid member of the motion capture group as read and write access	The user was able to write to files stored in the folder
11	User guides	Your first and surname	Testing that a valid member of the IT admin group as read and write access	The user was able to write to files stored in the folder
12	IT admin	Your first and surname	Testing that a valid member of the IT admin group as read and write access	The user was able to write to files stored in the folder

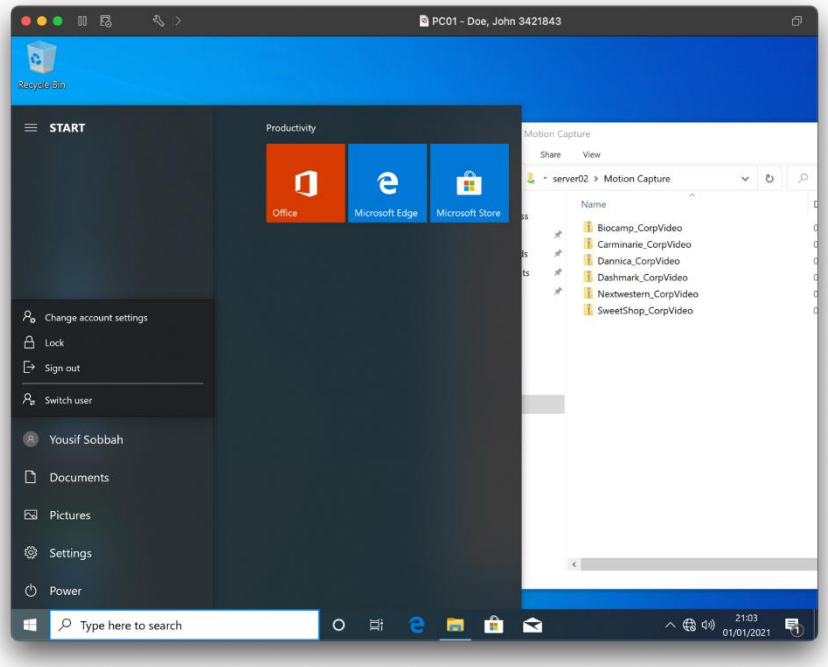
Print screen showing the result of test number 1, showing the folder opens correctly



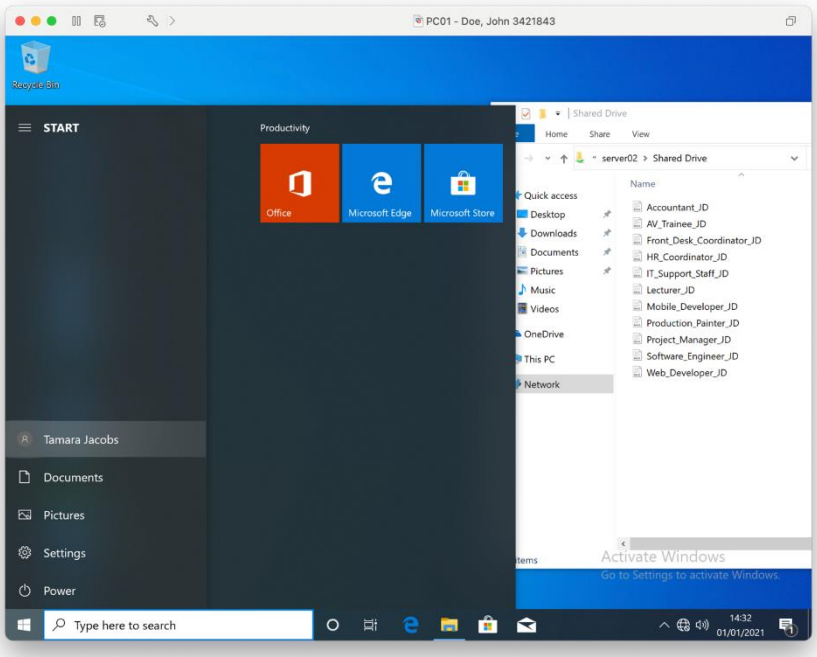
Print screen showing the result of test number 2, showing the folder opens correctly



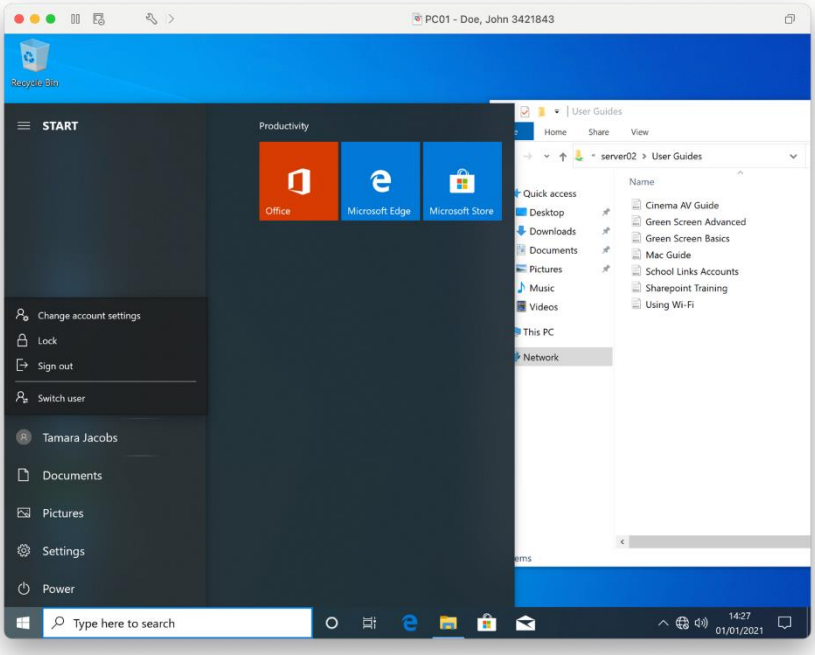
Print screen showing the result of test number 3, showing the folder opens correctly



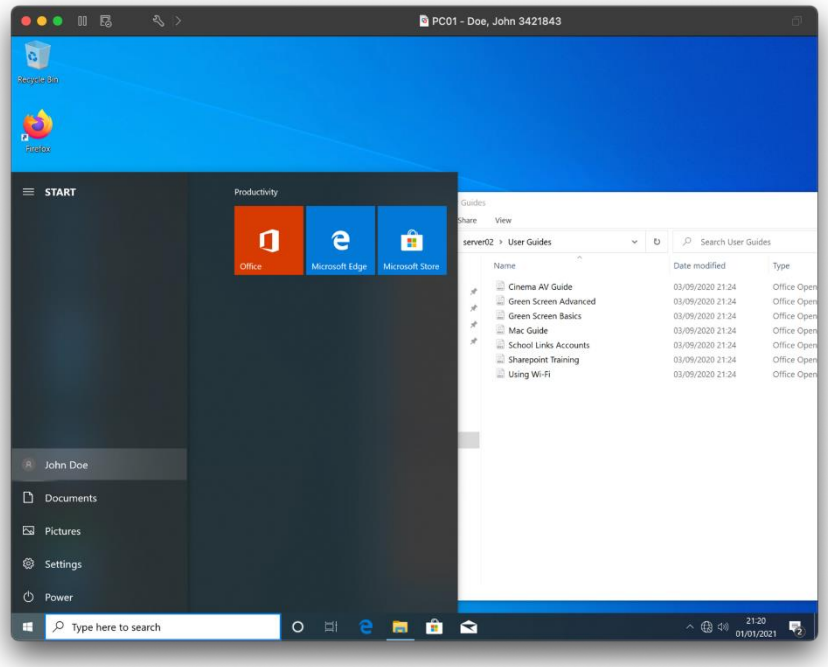
Print screen showing the result of test number 4, showing the folder opens correctly



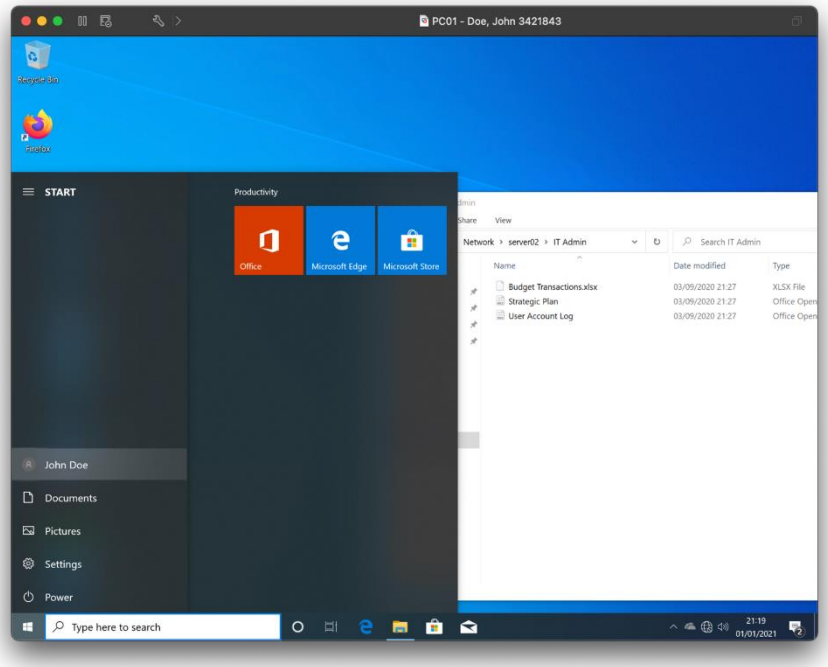
Print screen showing the result of test number 5, showing the folder opens correctly



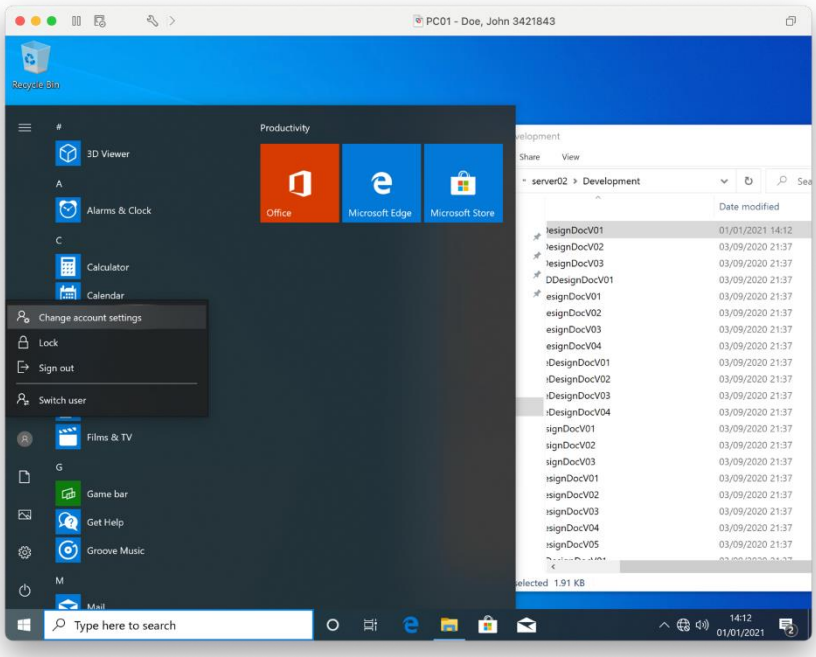
Print screen showing the result of test number 6, showing the folder opens correctly



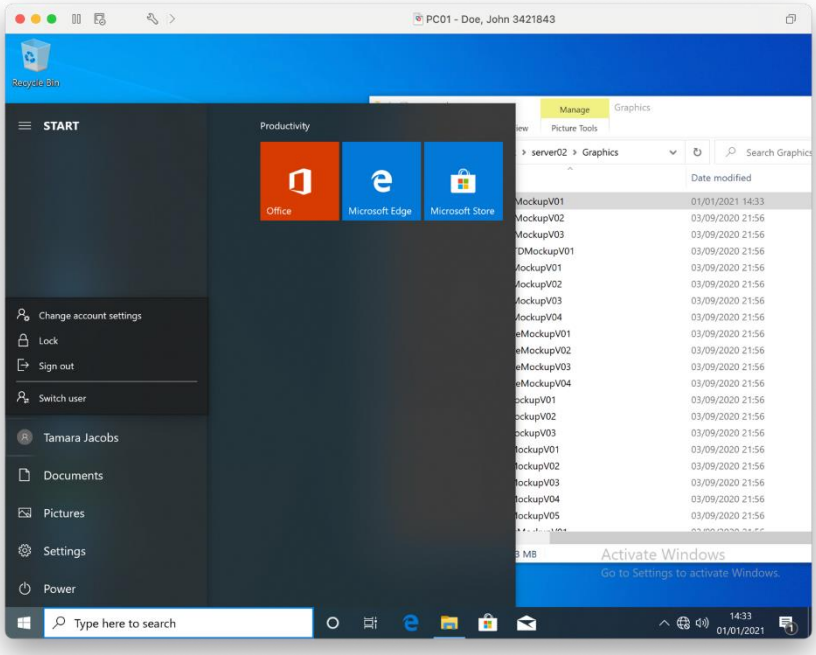
Print screen showing the result of test number 7, showing the folder opens correctly



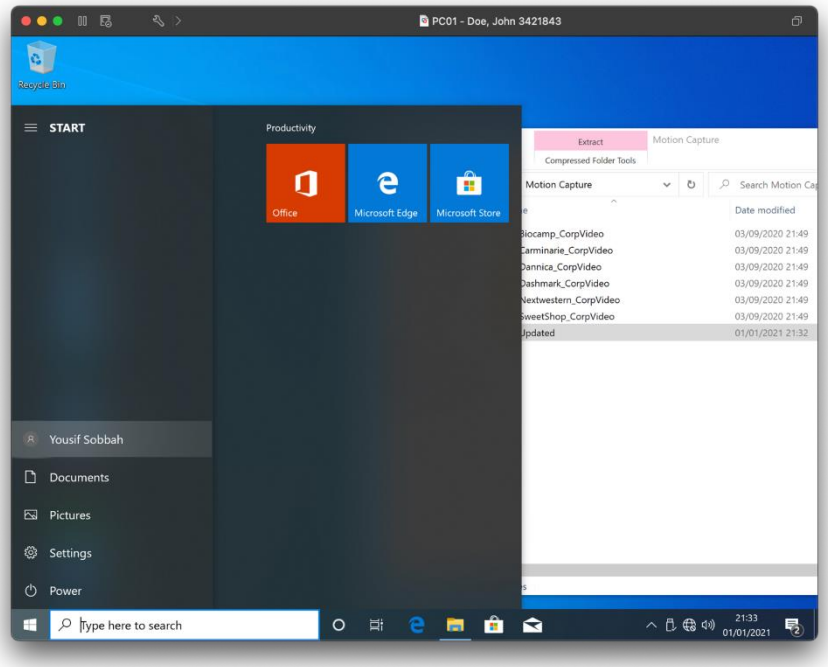
Print screen showing the result of test number 8, showing the file has been opened and saved back correctly



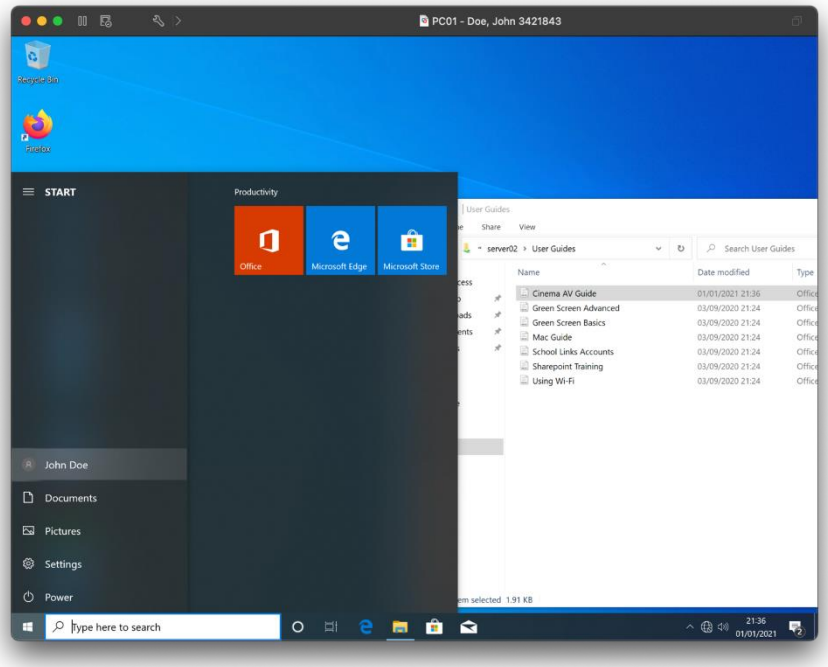
Print screen showing the result of test number 9, showing the file has been opened and saved back correctly



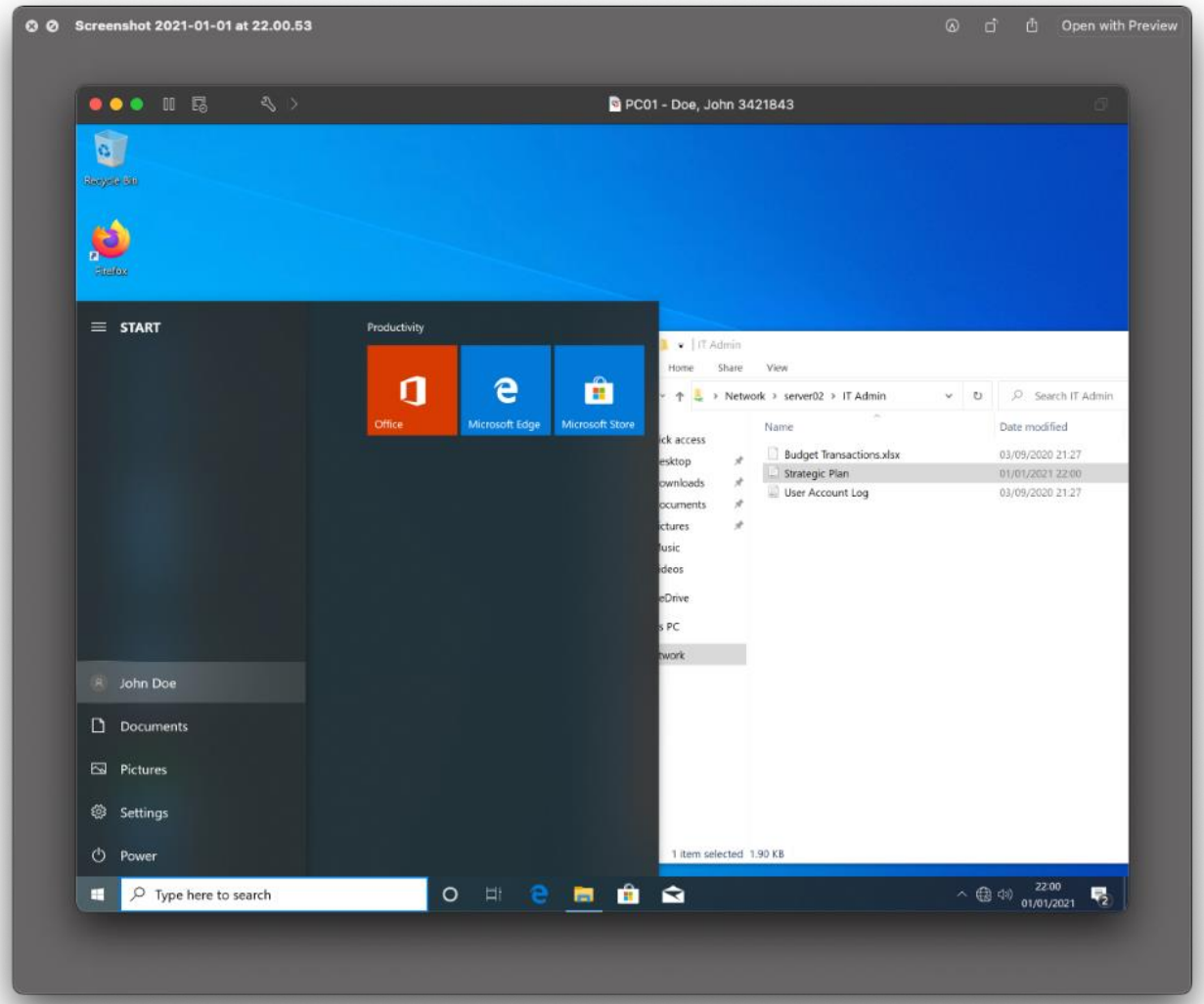
Print screen showing the result of test number 10, showing the file has been opened and saved back correctly

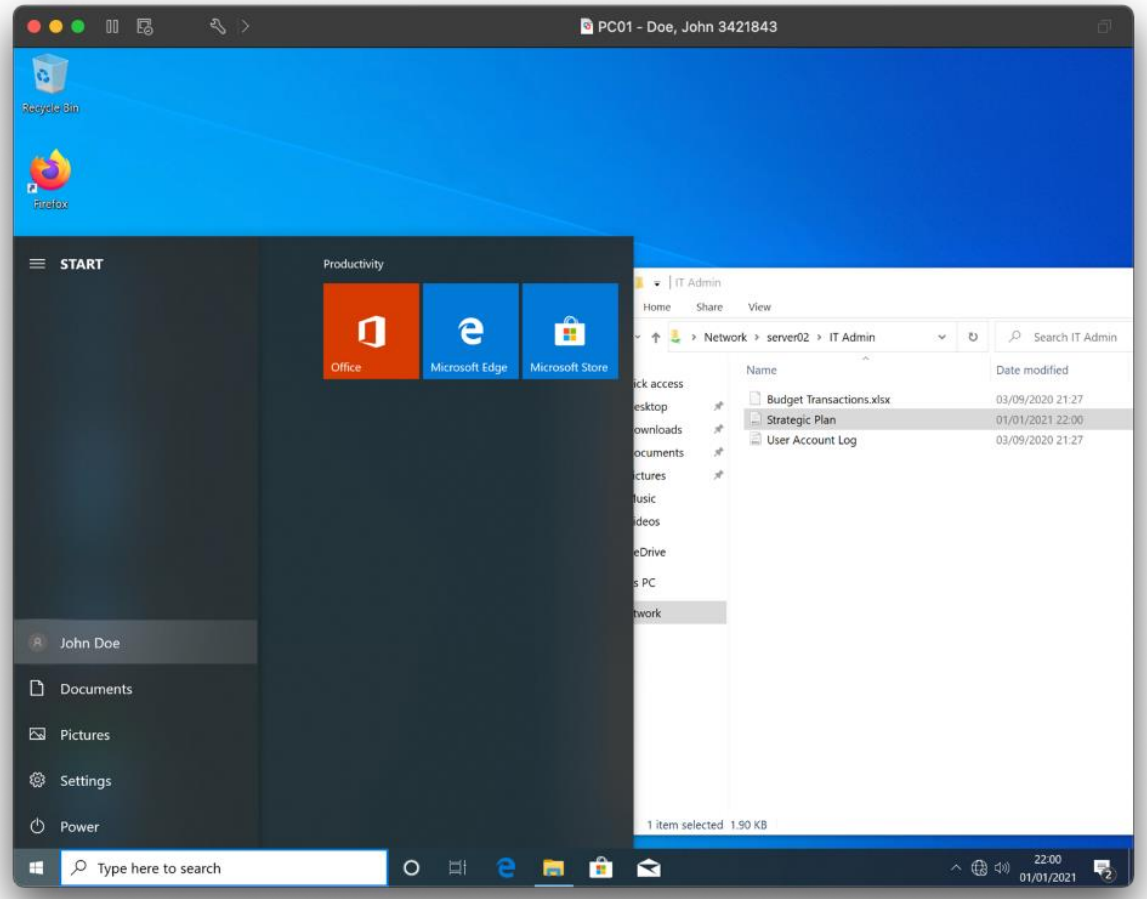


Print screen showing the result of test number 11, showing the file has been opened and saved back correctly



Print screen showing the result of test number 12, showing file has been opened and saved back correctly

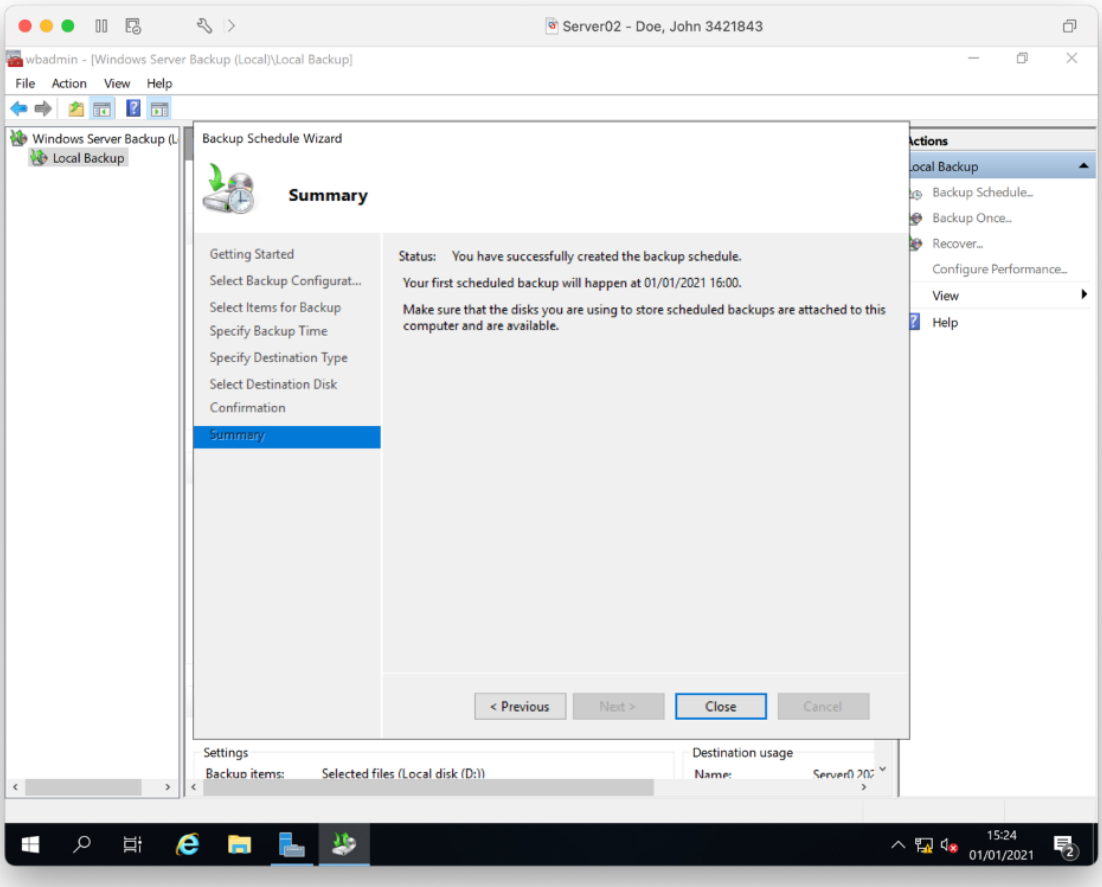



PC01 - Doe, John 3421843
Recycle Bin
Firefox
START
Productivity
Office
Microsoft Edge
Microsoft Store
John Doe
Documents
Pictures
Settings
Power
Type here to search
IT Admin
Home
Share
View
Network
server02
IT Admin
Search IT Admin
Name
Date modified
Budget Transactions.xlsx
03/09/2020 21:27
Strategic Plan
01/01/2021 22:00
User Account Log
03/09/2020 21:27
1 item selected 1.90 KB
22:00
01/01/2021

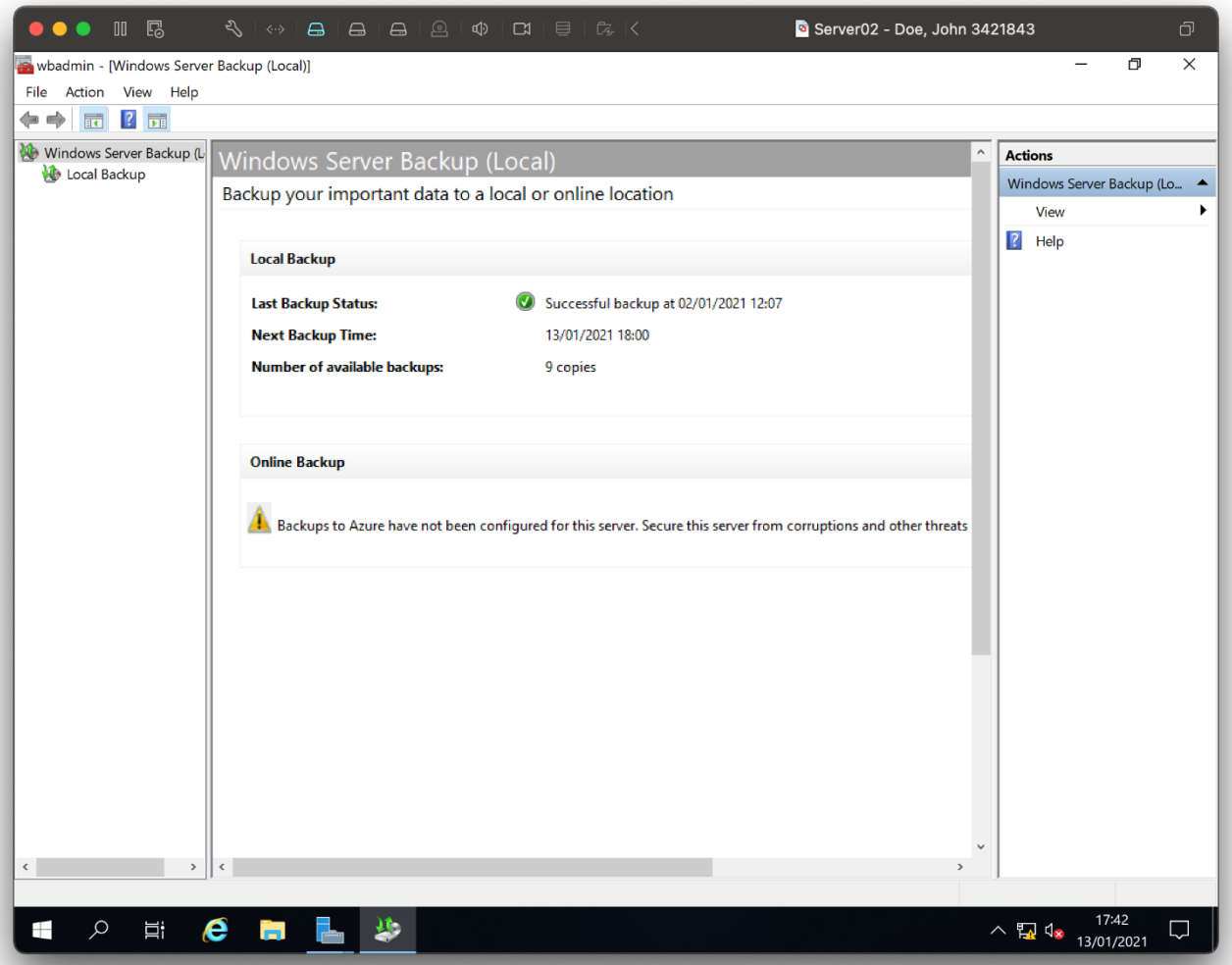
Step D

Create backup

Print screen showing the scheduled backup has been put in place from the backup manager dialogue box

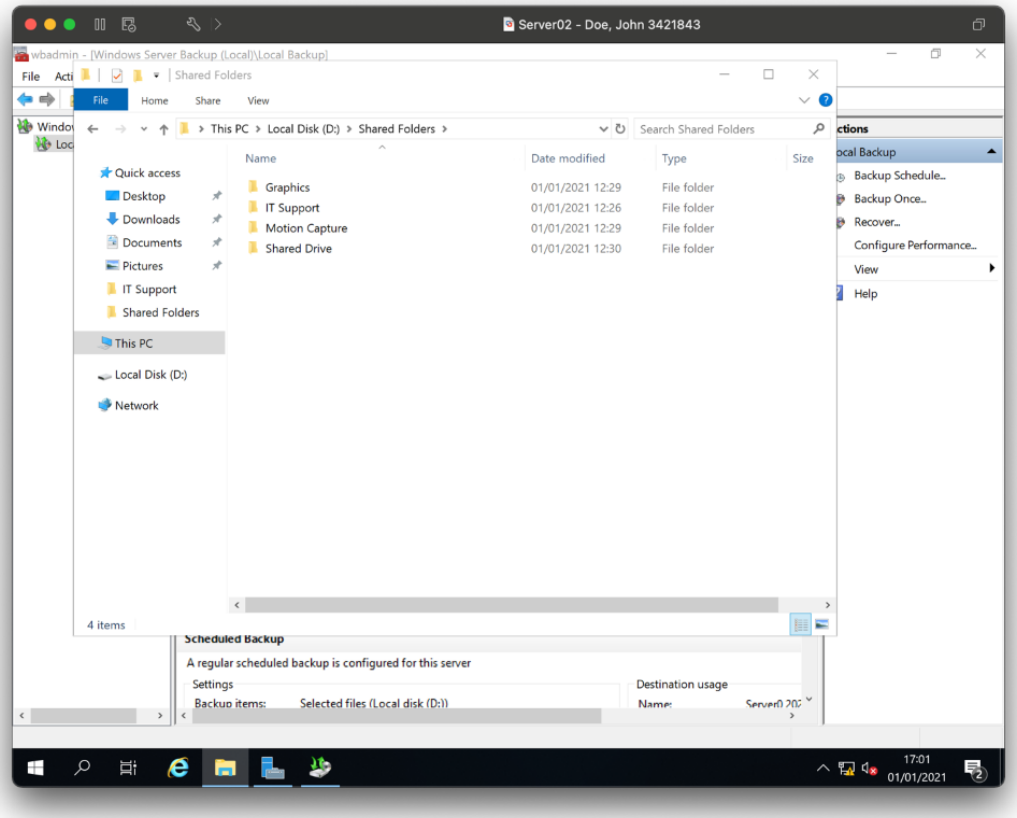


Print screen showing the scheduled backup has been completed from the backup manager dialogue box

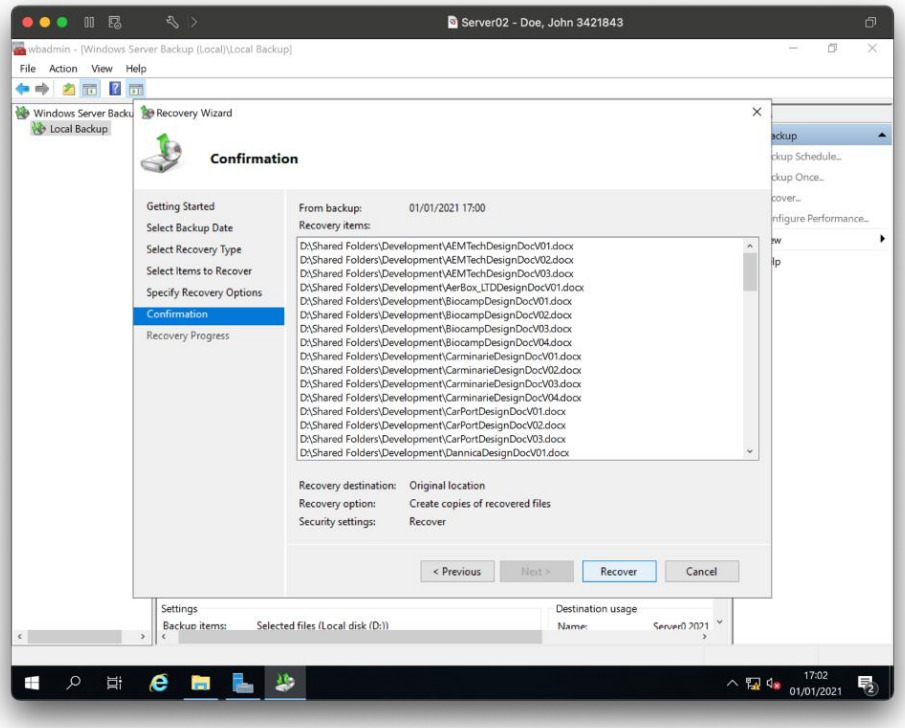


Backup restoration

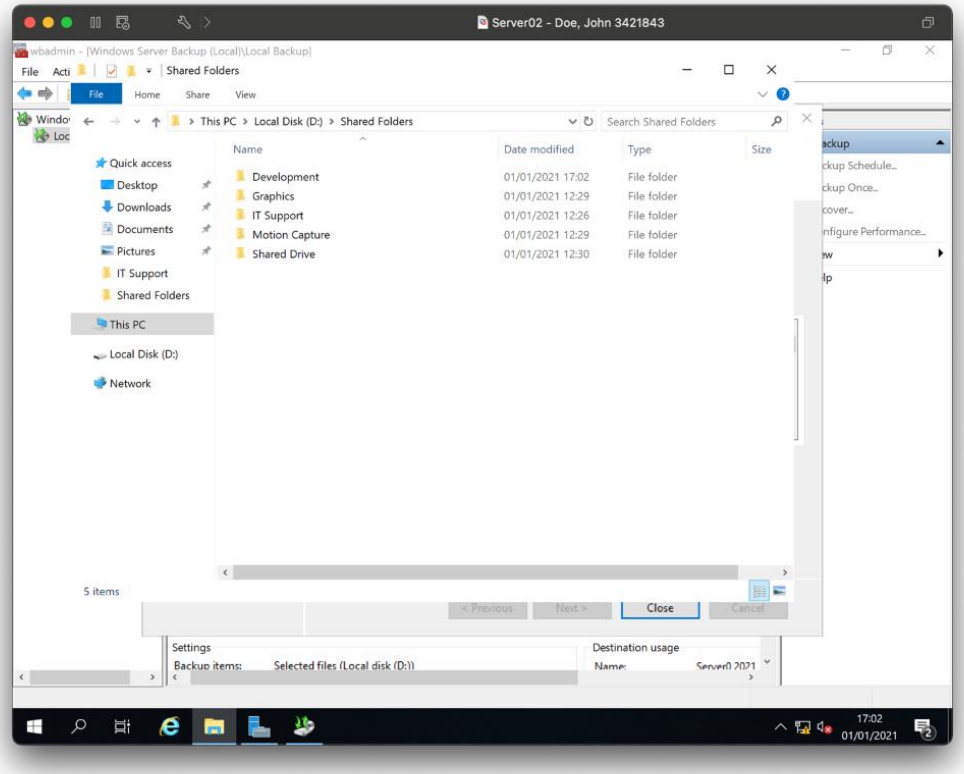
Showing that the folder development has been deleted



Print screen showing the file selected in the restoration dialogue box



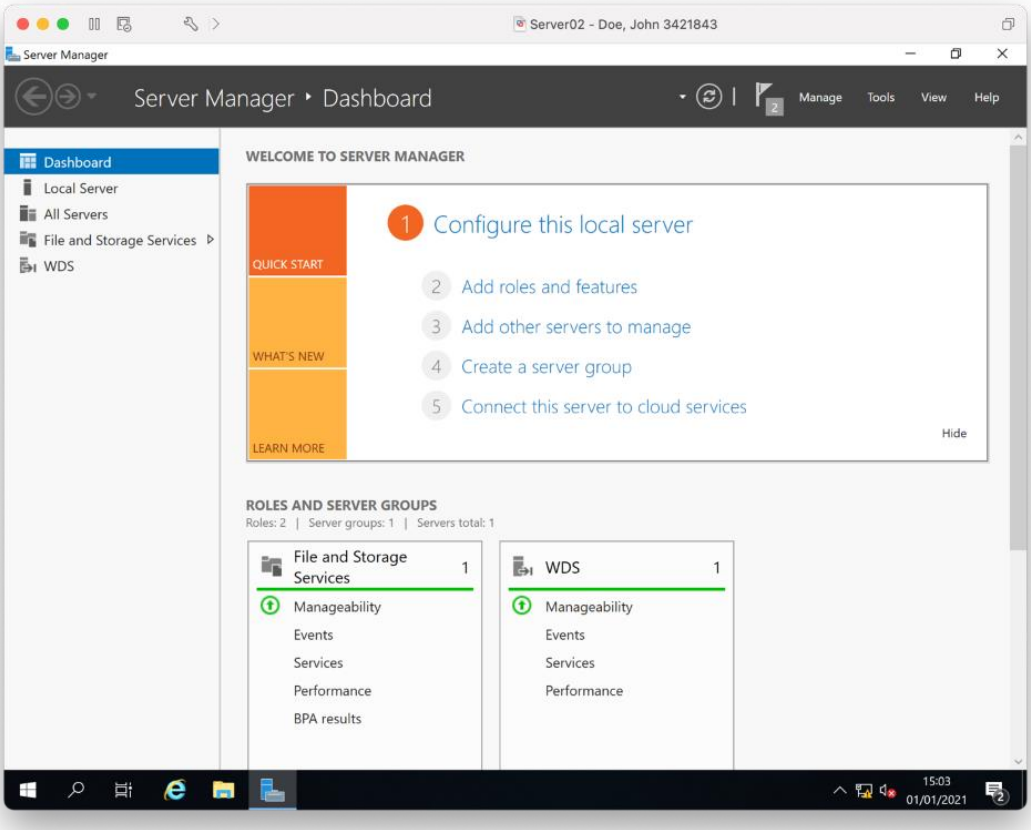
Print screen showing the successful restoration of the folder back to a suitable location



Step E

Role installation

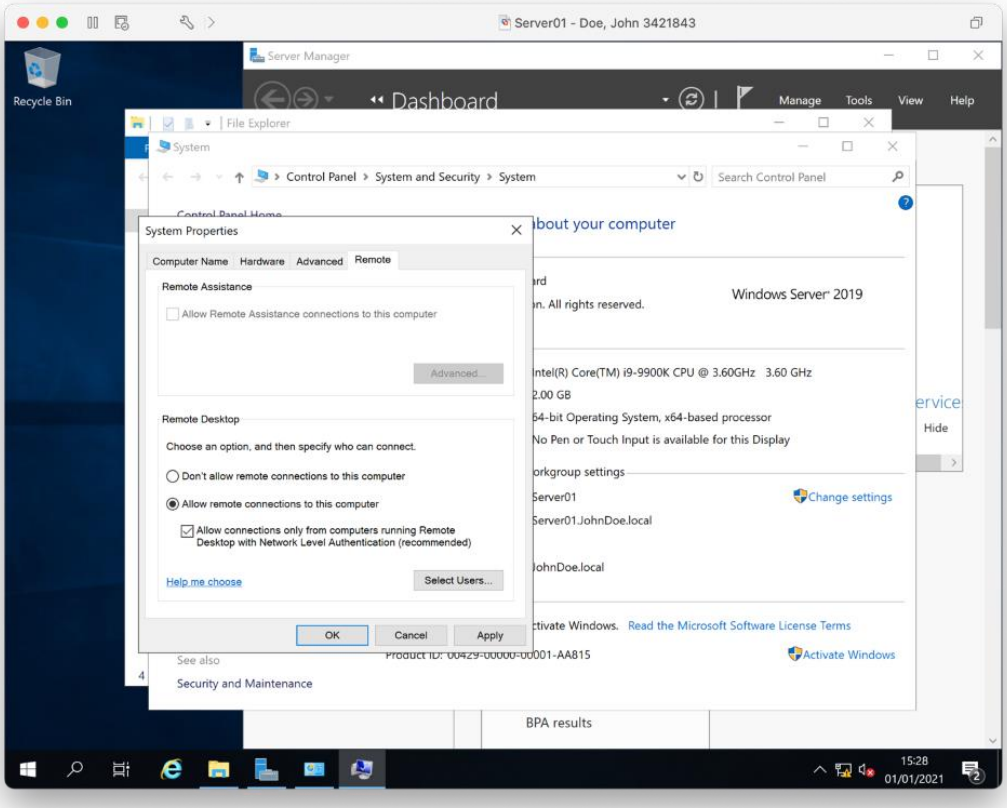
Print screen showing the Windows deployment role has been installed and shown in server manager dialogue box



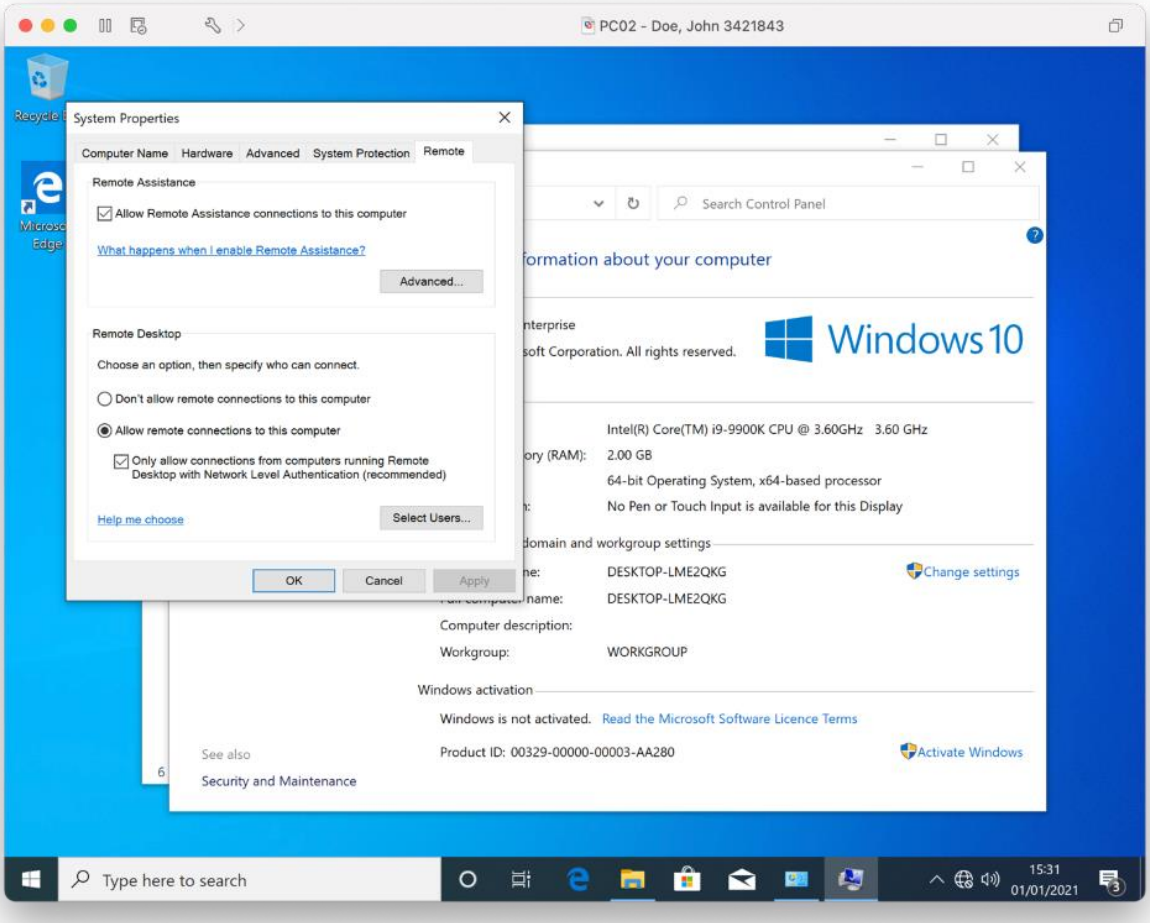
Step F

Configuration

Print screen showing the remote desktop has been enabled on the server in system properties

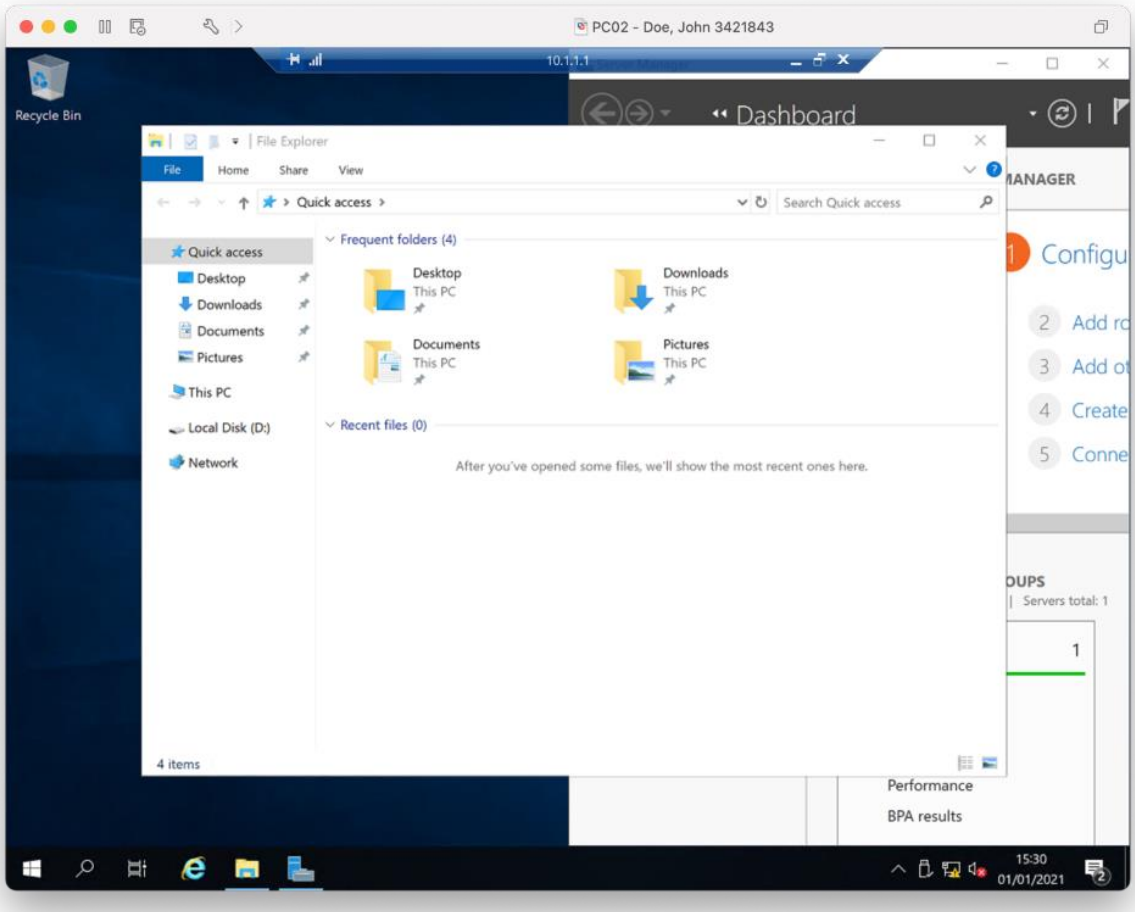


Print screen showing remote access has been enabled for PC02 in system properties



Accessing

Server in a remote desktop window being administered

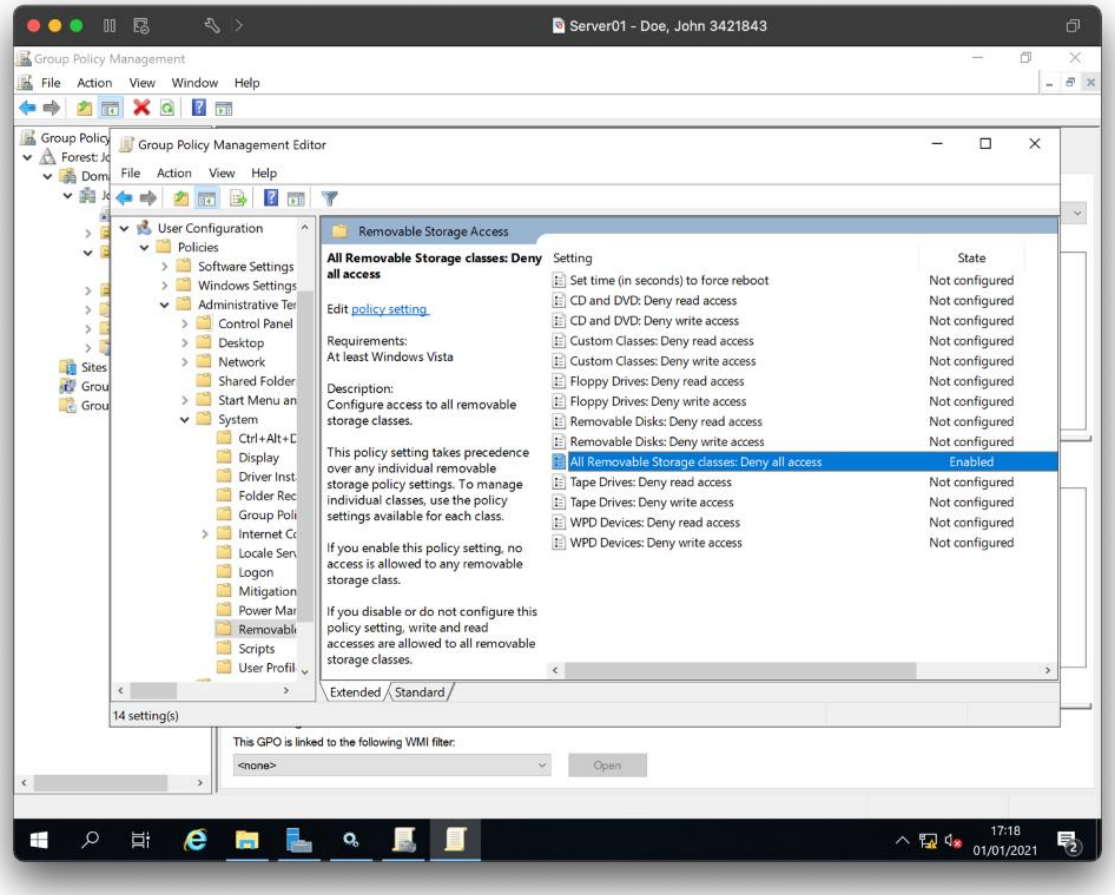


Step G
SNMP

Step H

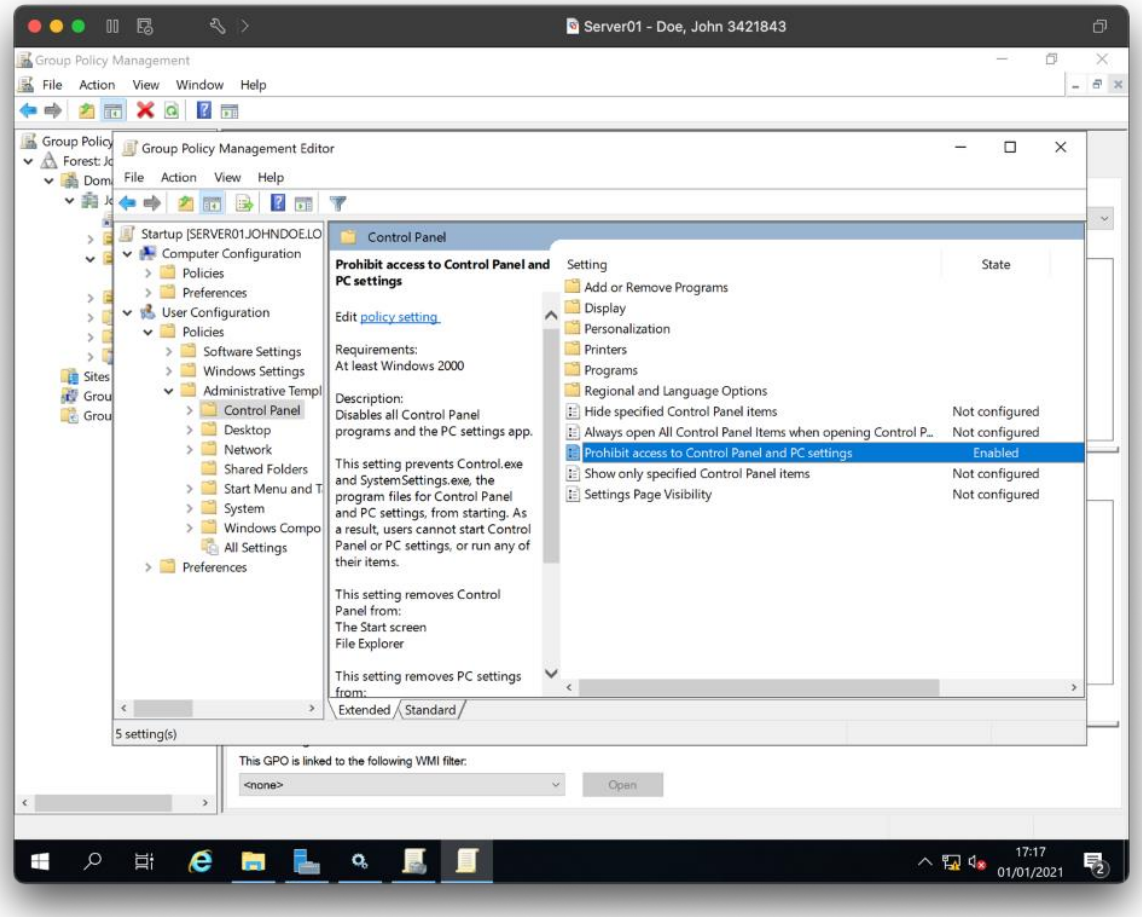
Policy 1 – disable USB support

Print screen on Server01 showing the blocking of removable devices have been enabled in group policy



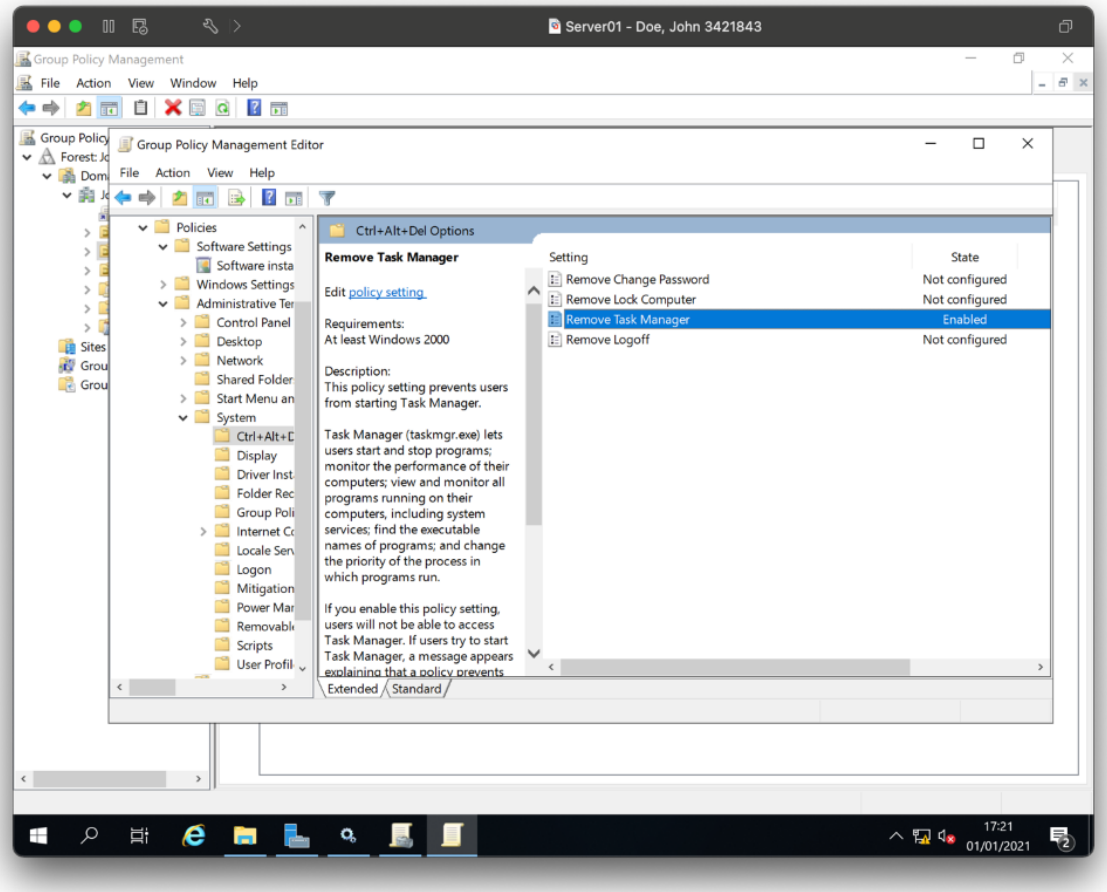
Policy 2 – disable access to the control panel

Print screen on Server01 showing control panel access have been enabled in group policy



Policy 3 - disable task manager access

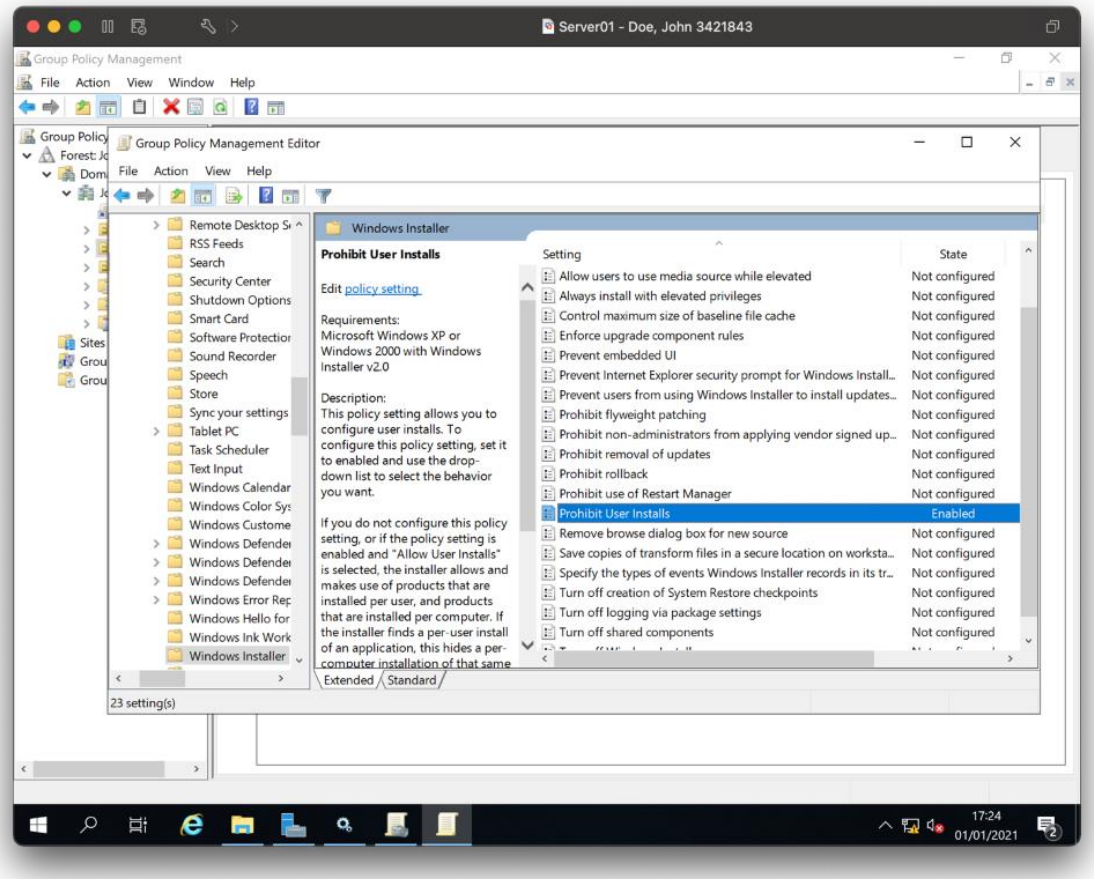
Print screen on Server01 showing that task manager access is denied in group policy



Policy 4

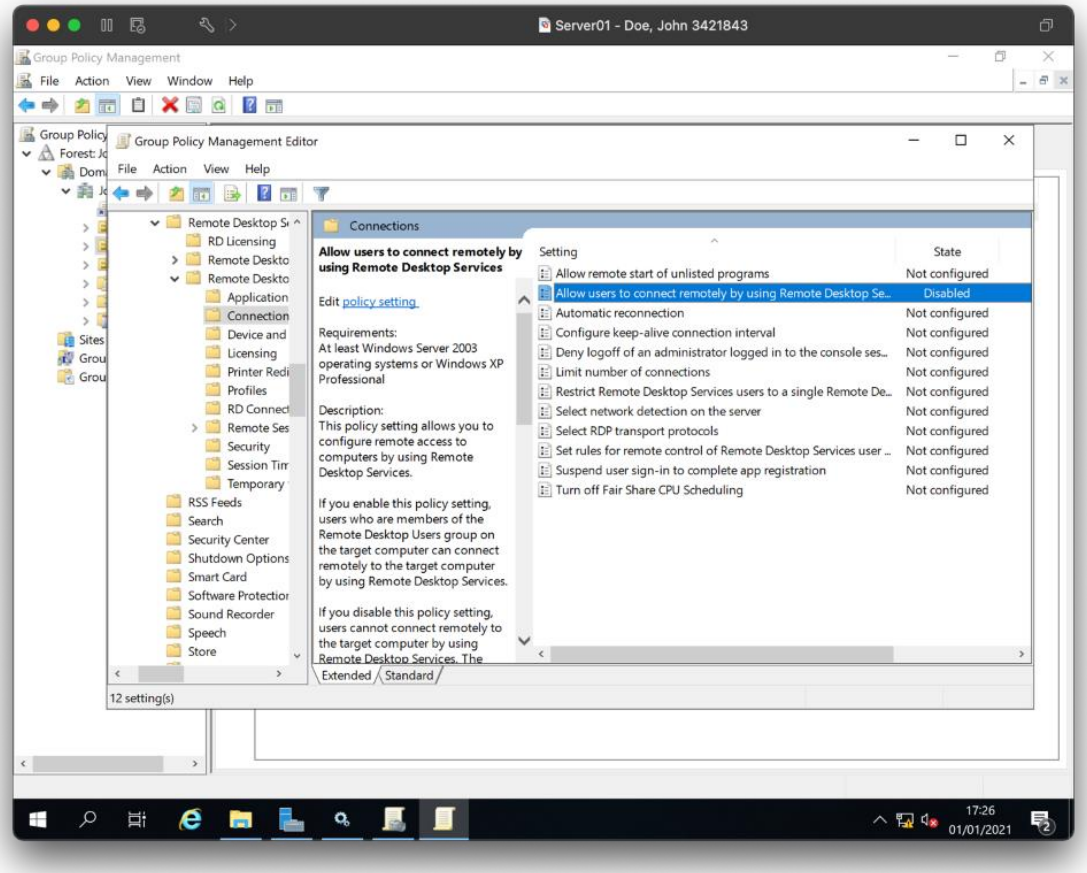
Prevent the installing of applications

Print screen on Server01 showing the prevention of installing applications in group policy



Policy 5 - disable remote desktop

Print screen on Server01 showing remote desktop has been disabled in group policy



Step I

Installation and configuration of the wireless device

Installation of a wireless printer

Task sequence

Step A

(3 marks)

Processes	Settings	Marks	Evidence required
Install the provided server operating system on Server01 and Server02 Use suitable configurations that match your current time zone and provide evidence of the successful installation of the server operating system on both Server01 and Server02	All hard disks should be partitioned to a single 100% partition, and the machines named Server01 and Server02 Server01 and Server02 should have fixed IP addresses	**1**	Provide print screen or photographic evidence of the following: ☑ Server01 disk partitions ☑ Server01 IP address (1) Set ☑ Server01 IP address (2) Set ☑ Server01 name set ☑ Server01 regional settings, date and time
		1	☑ Server02 disk partitions ☑ Server02 IP address set ☑ Server02 name set ☑ Server02 regional settings, date and time
Install the provided desktop operating system on PC01	All hard disks should be partitioned to a single 100% partition Use suitable region-specific settings, otherwise the defaults should be taken	**1**	Provide print screen or photographic evidence of the following: ☑ PC01 disk partitions ☑ PC01 name set ☑ PC01 regional settings, date and time

Step B

(8 marks)

Processes	Settings	Marks	Evidence required
Install and configure DNS		**8**	☑ print screen showing DNS has been installed
Install and configure a directory service	Install a directory service with the domain name set as (First nameSurname).local, for example: JohnSmith.local		☑ print screen showing the directory service has been installed and configured
Install DHCP service on Server01			☑ print screen showing the DHCP service installed
Implement a DHCP scope using the IP range provided earlier			☐ print screen showing the DHCP scope configured
Evidence PC01 is using DHCP to join the network			☑ print screen showing PC01 has been assigned a DHCP address
Domain join Server02 and PC01 to Server01 forming the start of the network			☑ print screen showing Server02 domain joined ☑ print screen showing PC01 domain joined
Install and confirm a reverse DNS lookup works on Server02 using NSLOOKUP			☐ print screen showing Server02 successfully completed a reverse lookup

Step C

(8 marks)

Processes	Settings	Marks	Evidence required

Create the following groups in your directory service	All staff, developer, graphics, motion capture, IT admin	**1**	☑ print screen showing the 5 groups created in your directory service

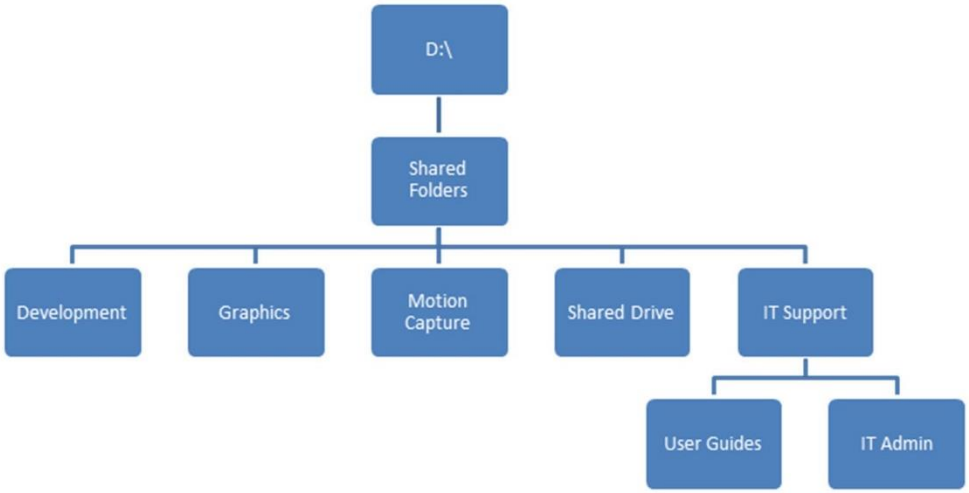
Populate the directory service with the following user accounts making sure they are added to the correct group and each user has the right privilege:

User account	Privileges	Job description	Group
Your first and surname	Administrator	IT admin	IT admin
Paul James	Standard user	Developer	Development
Tamara Jacobs	Standard user	Graphics artist	Graphics
Yousif Sobbah	Standard user	Motion capture specialist	Motion capture

1

☑ print screen evidence that each user has the correct name, privilege, job description and has been added to the correct group

Using the group called **all staff,** add the following groups to this group: • development • graphics • motion capture • IT admin	**1**	☐ print screen showing all 5 groups added to the all staff group

Processes	Settings	Marks	Evidence required
Create the following folder structure on second partition of Server02  		**N/A**	Marks are **not** awarded for creating the folder structure and you do **not** need to submit evidence for this task

<table>
<tr><th>Processes</th><th>Settings</th><th>Marks</th><th>Evidence required</th></tr>
<tr><td>Apply the following privileges to each of the folders using the groups created earlier</td><td>
<table>
<tr><th>Folder</th><th>Group</th><th>Permission</th></tr>
<tr><td>Development</td><td>IT admin</td><td>Read/Write</td></tr>
<tr><td>Graphics</td><td>Development</td><td>Read/Write</td></tr>
<tr><td>Motion Capture</td><td>Motion Capture</td><td>Read/Write</td></tr>
<tr><td>Shared Drive</td><td>All staff</td><td>Read</td></tr>
<tr><td>User Guides</td><td>All staff</td><td>Read</td></tr>
<tr><td>IT admin</td><td>IT admin</td><td>Read/Write</td></tr>
</table>
</td><td>1</td><td>☑ print screens showing each folder with correct privileges</td></tr>
<tr><td colspan="2">Using the files provided, populate the folder structure</td><td></td><td></td></tr>
<tr><td colspan="2">Using the test plan template provided in the workbook, prove that the privileges work correctly using both a valid and invalid user

Note: the shared drive only requires a valid user to be tested</td><td>4</td><td>☑ completed test plan
☑ print screens showing folder privileges have been tested</td></tr>
</table>

Step D

(3 marks)

Processes	Settings	Marks	Evidence required
Using an external hard disk drive or an additional virtual disk to Server02, implement a scheduled backup of the shared folders to run every hour to the second physical hard or external storage device		**3**	☑ print screen showing scheduled backup set
Confirm the backup has been taken successfully by restoring the contents of the backup **Note**: You might need to return to this step later to collect the required evidence			☑ print screens showing a successful backup ☑ print screens showing a successful restoration

Step E

(4 marks)

Processes	Settings	Marks	Evidence required
Using Server02, install and configure a single application service from the following list: • desktop deployment • media server • database server • IT helpdesk • web server • print server		**4**	☐ print screens showing the service being installed and configured
Prove the service has been tested and works			☐ print screens showing the service is running ☐ print screens showing the service being tested

Step F

(2 marks)

Processes	Settings	Marks	Evidence required
Create a remote connection from PC02 to Server01 **Note**: you are **not** permitted to domain join the computer		**2**	☑ print screens showing the remote connection process

Step G

(4 marks)

Processes	Settings	Marks	Evidence required

Implement a SNMP on all machines on the network		**4**	☐ print screens from PC01 and Server02 showing that SNMP has been enabled
Verify that SNMP data is being collected by the traps and can be viewed			☐ a series of print screens showing the SNMP data is being collected centrally

Step H

(10 marks)

Processes	Settings	Marks	Evidence required
Using policies, implement 5 rules that will make the domain joined PC01 more secure		**10**	☑ provide a short description of each policy and what it will achieve ☑ provide a print screen showing each of the policies created on Server01
Carry out testing to prove the policies have been applied correctly			☑ provide evidence of each policy applied on PC01

Step I

(7 marks)

Processes	Settings	Marks	Evidence required
Using the wireless device provided, integrate the device into your network		**7**	Provide print screen or photographic evidence of the following: ☑ set an IP address for the device ☑ connect to a wireless AP or other such device ☑ install the required drivers or management software ☑ configure the device with suitable settings ☐ evidence that SNMP data is being captured
Test that the device works and is accessible from any 2 machines			☐ a series of print screens and photographs showing connection and configuration of the wireless device

Examiner commentary

The student has achieved the required standard for the following reasons:

- the majority of the process for the network cable creation is good. This is clear that the student did have an appreciation of the process but lacked the full technique
- the early tasks of the assignment have been carried out to a good level and show a good level of skills for example, initial installation and configuration of the operating system
- the higher-level skills seemed to be missing, for example the reverse lookup zone was clearly not attempted. This is a pattern throughout, the lower-level tasks have been completed to a good level but when the topics get complicated the skills are lacking
- a little careless as the student had missed the step of configuring DHCP, hence PC01 being assigned a manual IP address
- either based on a lack of time, organisation or a lack of skill, a number of the tasks have been missed which has reduced the marks available
- the presentation of the work was very clear, organised and should be commended

To achieve a higher score, the student could have:

- provided evidence of attempting the reverse lookup for DNS
- provided evidence of configuration of the role, evidence of role activation, evidence of role testing for role installation
- provided evidence of attempting SNMP
- demonstrated competency in installing and configuring the wireless printer through comments

Grade descriptors

The performance outcomes form the basis of the overall grading descriptors for pass and distinction grades.

These grading descriptors have been developed to reflect the appropriate level of demand for students of other level 3 qualifications, the threshold competence requirements of the role and have been validated with employers within the sector to describe achievement appropriate to the role.

Grade	Demonstration of attainment
Pass	The evidence showing installations and configuration setup is logical and displays sufficient knowledge in response to the demands of the brief.
	The student makes some use of relevant knowledge and understanding of implementing network infrastructure but demonstrates adequate understanding of perspectives or approaches associated with industry standards in digital infrastructure roles.
	The student makes adequate use of facts/theories/approaches/concepts and attempts to demonstrate breadth and depth of knowledge and understanding in their implementations and

	configurations.
	The student is able to identify some information from appropriate sources and apply the appropriate information/appraise relevancy of information and can combine information to make some decisions.
	The student makes sufficient judgements/takes appropriate action/seeks clarification with guidance and is able to make adequate progress towards prioritising and solving non-routine problems in real life situations.
	The student attempts to demonstrate skills and knowledge of the relevant concepts and techniques to plan, install, configure, deploy and populate network infrastructure and generally applies this across different contexts.
	The student shows adequate understanding of unstructured problems that have not been seen before, using sufficient knowledge to attempt to prioritise and solve problems with some attempt at verifying their implementations.
Distinction	The evidence is precise, logical showing installations, configuration and deployment that provides a detailed and informative response to the demands of the brief.
	The student makes extensive use of relevant knowledge and has extensive understanding of the practices of the sector and demonstrates a depth of understanding a threshold competency of the different perspectives/approaches associated with installing, testing, monitoring and maintaining digital infrastructure.
	The student makes decisive use of facts/theories/approaches/concepts, demonstrating extensive breadth and depth of knowledge and understanding and selects highly appropriate skills/techniques/methods to apply network infrastructure practices.
	The student is able to comprehensively identify information from a range of suitable sources and makes exceptional use of appropriate information/appraises relevancy of information and can combine information to make coherent decisions.
	The student makes well-founded judgements/takes appropriate action/seeks clarification and guidance and is able to use that to reflect on real life situations in a digital infrastructure role; being able to apply implementation and configuration of the network.
	The student demonstrates extensive knowledge of relevant concepts and techniques reflected in a digital infrastructure role and precisely applies this across a variety of contexts and tackles unstructured problems that have not been seen before, using their knowledge to analyse and find suitable solutions to the problems.
	The student can thoroughly examine data/information in context and apply appropriate analysis in confirming or refuting conclusions and carrying out further work to justify and evaluate strategies for solving problems, giving concise explanations for their reasoning.

* “Threshold competence” refers to a level of competence that:

- signifies that a student is well placed to develop full occupational competence, with further support and development, once in employment

- is as close to full occupational competence as can be reasonably expected of a student studying the TQ in a classroom-based setting (for example, in the classroom, workshops, simulated working and (where appropriate) supervised working environments)
- signifies that a student has achieved the level for a pass in relation to the relevant occupational specialism component

U grades

If a student is not successful in reaching the minimum threshold for the core and/or occupational specialism component, they will be issued with a U grade.

Document information

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Owner: Head of Assessment Design

Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Published final version.		May 2021
v1.1	NCFE rebrand		September 2021
v2.0	Annual review 2023: Amends to grade descriptors to ensure clarty	June 2023	19 June 2023