

Occupational specialism assessment (OSA)

Digital Support

Assignment 1 - Distinction

Guide standard exemplification materials

v2.0: Specimen assessment materials 19 June 2023 603/6901/2

Internal reference: DSS-GSEM-15



T Level Technical Qualification in Digital Support Services Occupational specialism assessment

Guide standard exemplification materials

Digital Support

Assignment 1

Contents

Introduction	
Scenario	4
Task 1	
Task 2	14
Examiner commentary	
Grade descriptors	
Document information	
Change History Record	

Introduction

The material within this document relates to the Digital Support 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 1, the student must first plan a network installation, then install and configure a small network, before producing installation notes to inform the client of the work they have carried out.

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

Assignment 1:

Scenario

You are a digital support specialist who has been contracted to work for a new small food manufacturing company (the client) based in the North of England.

The client requires your digital expertise in planning to support a future network. There are currently no business control techniques in place as the company is only just starting out, and they are unaware of any measures on how to operate their data systems effectively, appropriately, and securely.

The client also requires your immediate support with preparing and installing a smaller network of computers and a mobile device for the employees within the company.

Task 1: prepare for installation

Time limit

8 hours

Task 1(a) must be completed prior to starting task 1(b).

Task 1(a) is allocated 3 hours 30 minutes.

Task 1(b) is allocated 4 hours 30 minutes.

You can use the time how you want but each task must be completed within the time limit.

(20 marks)

Student instructions

Based on the scenario, you are required to complete the relevant preparation that will enable you to set-up 100 computers, a switch, server and 5 colour printers including identifying the relevant software for the client in the future. The network would be required to be set-up within a 2 week window, to ensure all employees are up and running as quickly as possible.

You are required to:

1(a) Create a report to explain the security considerations required for the installation, configuration, and support of end-user services to ensure confidentiality, integrity and availability including:

- suitable recommendations on implementing business control techniques within the workplace (physical/administrative)
- explanations on how the client should operate the new data systems effectively, appropriately, and securely, considering GDPR/ DPA 2018 and its principles

(8 marks)

1(b) Plan and complete the relevant network planning documentation:

- health and safety risk assessment for the work to be undertaken
- network planning, including:
 - o timescales
 - o network design, including IP addressing scheme
 - o inventory
 - o security risk assessment for the work to be undertaken, according to ISO 27001 principles

(12 marks)

You will have access to the following equipment:

• a computer with office software pre-installed

Evidence required for submission to NCFE

The following evidence should be submitted:

- summary of all business controls documentation required (word processing document)
- summary of how to secure data systems effectively (word processing document)
- health and safety risk assessment (worksheet in appendix 1)
- network planning documentation including timescales and network design (word processing document)
- inventory log (worksheet in appendix 1)
- security risk assessment (worksheet in appendix 1)

Student evidence

Task 1(a)

Security recommendations for the implementation of business controls in the workplace

Introduction

As a business we have a responsibility to put in place controls to protect our networks and data from loss (accidental or deliberate), theft or damage. To be effective in this we need to ensure that adequate controls are put in place and best practice is that we should use a range of controls of different categories.

Categories of controls include:

- physical any control which involves a physical action taking place or object in use (for example, locked doors, ID badges, air gapping)
- administrative any control that involves a procedure or process that may control behaviour to improve security (for example, operating procedures, password policies or mandatory training)

We can also categorise controls based on how they operate:

- preventative something that physically stops an attacker or breach (for example, a locked door will prevent access to the server)
- detective something that can be used to identify how a security breach happened or who was responsible (for example, log files, CCTV cameras or intrusion detection system (IDS) software)
- corrective a control designed to fix or stop a security breach in progress (for example, fire suppression systems to put out a fire or intrusion prevention system (IPS) software)
- deterrent anything that makes an attacker think twice (security guard, signage, acceptable use policies (AUP))
- directive anything control that requires someone to behave in a certain manner (security policies, signage)
- compensating controls that compensate for something that could otherwise cause harm (for example, air conditioning)
- recovery controls to allow the business to get up and running again after a breach (for example, daily backups or business continuity plans)

It is possible for controls to fit across multiple categories (for example, a CCTV camera would be an example of a physical control that is both detective and deterrent in nature, or a company's AUP would be directive in nature as it specifies usage and behaviour, but also is a deterrent as it could potentially influence someone to avoid malicious or harmful behaviour).

A good security posture will include a mix of both physical and administrative controls and will also include preventative, detective, corrective, deterrent, directive, compensating and recovery controls.

Recommendations

For our network it is recommended that we implement the following controls:

- locked server room (physical, preventative) prevents unauthorised access to company servers
- separation of duties (administrative, preventative) prevents one person checking their own work meaning that they cannot hide fraudulent activity, for example, someone responsible for creating user accounts would not audit user accounts and vice versa
- CCTV cameras in critical areas and corridors (physical, detective and deterrent) allows identification of an intruder as well as the presence of visible cameras discouraging the intruder in the first place
- daily audit log checks (administrative, detective) allows identification of security breaches that have triggered entries on logs such as the event log
- no entry signage in secure areas (physical, directive and deterrent) provides clear instruction on what access is allowed as well as a deterrent for an intruder
- server rooms should be air conditioned (physical, compensating) ensures servers are maintained at a constant temperature reducing risk of system failure from overheating
- password policy with password training (administrative, directive and compensating) policy will prevent the use
 of inadequate passwords with training to ensure staff know how to choose a good password, and also not
 make common password mistakes such as writing them down where an attacker could see or find them
- server backups to cloud (physical, recovery) ensure all business critical data is backed up off site to a cloud provider on a daily basis

Operating the data systems:

As well putting these security controls in place it is important that data is handled correctly and securely. This is particularly the case with customer data and information as failure to do so could include a breach of the Data Protection Act (DPA) 2018 which incorporates the General Data Protection Regulation (GDPR) into British law.

The DPA 2018 includes the following principles:

- lawfulness, fairness and transparency:
 - all data collected must be done in a legal manner meaning the customer must know their data is being collected and have given consent to do so. We need to tell the customer how we are going to use the data at the point of collection (transparency) and needs to only use it for the reasons we have told them (fairness). This should all be included in a data notice at point of collection
- purpose limitation:
 - this puts the idea of fairness into practice. We need to inform clients of what we will do with their data and be explicit and specific about this. Once we have the customer data, we should only ever use it for the purposes we said we would use it for
- data minimisation:
 - we can only collect data we need. This means that we should know what data we need from the customer and only ever ask for this. Under GDPR rules we have to justify in our policy the amount of data we wish to collect and why
- accuracy:

- where we hold data on a customer, we need to make sure it is up to date. When a customer informs us of an update or change to their data or information, we should update this immediately. Old or outdated data should not be kept and should be removed
- storage limitation:
 - we can only keep data for as long as we need it. We have a responsibility to keep data in a form which permits identification of data subjects for no longer than necessary. A data retention policy will specify what data we keep, for what reasons and how long
- integrity and confidentiality (security):
 - all data needs to be kept secure. This means we need to implement adequate security (for example, encryption of customer data in transit, policies preventing customer data being kept on mobile devices, or anonymising data to protect customer identity. ISO 27001 accreditation will help achieve this)
- accountability:
 - adequate documentation should be maintained to allow any auditor to see that you are compliant with the DPA 2018. All data management needs to be planned and you must be able to demonstrate that you are compliant with all 7 principles

Summary

To ensure that we meet our obligations under the DPA 2018 and to ensure that we protect our networks and data (including company confidential data) adequately we need to implement a range of controls (administrative and physical) across our network. The recommendation above will give a range of preventative, detective, corrective, deterrent, directive, compensating and recovery controls that will maximise the protection our network has from a wide range of potential attacks.

Task 1(b)

Network design

Client specification:

Network should include:

- 1 server
- 100 client PCs
- 5 colour printers
- switch

To meet this requirement, I am recommending that we install:

• server:

0

- 1 server running Windows Server 2016 with the following roles:
 - domain controller (Active Directory)
 - file and print server
 - DHCP server
 - DNS server

- Windows server update service (WSUS) server (to manage operating system updates)
- for security the server should also include antivirus/endpoint protection software capable of maintaining antivirus/endpoint protection clients on all client PCs (Sophos Endpoint Protection)
- client PCs
 - o all client PCs should be installed with Windows 10 Enterprise and joined to the domain
 - o all client PCs should be installed with the following software:
 - productivity software:
 - Office 365 (Word, Excel, PowerPoint and Outlook)
 - allows working with common working documents and email management
 - Adobe Acrobat
 - allows opening and working with PDF format files
 - endpoint protection software:
 - Sophos Endpoint Protection maintains protection from viruses, malware, spam, external threats
- switches:
 - based on the client specification, the network will require connectivity for a minimum of 106 devices (100 PCs, 1 server, 5 printers). I have also allowed for connectivity to a gateway firewall/router as well to provide internet access
 - o to allow for this level of connectivity we are recommending installation of 4 managed switches:
 - switch 1 connectivity of core hardware (server, gateway firewall/router, printers, other switches (10 devices in total)):
 - specified as one 12 port switch allowing 2 spare ports for future growth
 - switch 2 to 4 connectivity of client PCs:
 - specified as three 40 port switches with 1/3 of client PCs connected to each, allowing spare ports on each switch for future expansion
- gateway router/firewall:
 - although not listed in the specification brief, a gateway router/firewall has been included to allow secure internet connectivity
- IP addressing:
 - it is recommended that the network is configured using the following IP addressing scheme:
 - network IP addressing:
 - network: 192.168.0.0/24
 - reserved IP addresses:
 - 192.168.0.1 reserved for server
 - 192.168.0.10-19 reserved for printers

- 192.168.0.220-229 reserved for switches
- 192.168.0.254 reserved for gateway router
- DHCP server scope:
 - 192.168.0.100 to 209

Full details of network configuration can be seen by consulting the network configuration diagram at the foot of this document.

Network installation plan

The network installation should be completed with the following steps:

- stage 1: physical infrastructure set-up:
 - o physical installation of switches and router firewall
 - physical installation of cabling
- stage 2: server installation:
 - o installation of server 2016 software
 - o configuration of server settings
 - o installation of Active Directory
 - o installation of security software
- stage 3: set-up and configuration of client PCs:
 - o installation of Windows 10 on reference client PC
 - o installation of key software (office, Adobe Acrobat)
 - Sysprep of system ready for imaging
 - imaging of reference PC
 - o answer file created including configuration of domain join
 - o adding Sysprepped image to installation server
 - o physical installation of client PCs (physical set-up)
 - PCs connected to installation server via PXE boot
 - o remote installation of client PCs

Project completed

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
	Physical installation of Switches and														
Stage 1: Physical	Router Firewall														
Infrastructure Setup	Physical installation of Cabling														
	Installation of Server 2016 Software														
Stage 2: Server Installation	Configuration of Server Settings														
	Installation of Active Directory														
	Installation of Security Software														
	Installation of Windows 10 on reference Client PC														
	Installation of key software (Office, Adobe Acrobat)														
	Sysprep of system ready for imaging														
	Imaging of reference PC														
Stage 3: Setup and	Answer file created including configuration of Domain Join														
Configuration of Client PCs	Adding Sysprepped image to Installation server														
	Physical installation of client PCs (physical setup)														
	PCs connected to Installation server via PXE boot														
	Remote installation of client PCs.														
	Project Completed.														



Version: v2.0 19 June 2023 | Specimen

Task 2: install and configure a small network

Time limit

11 hours

You can use this time how you want but all parts of task 2 must be completed within the time limit.

(56 marks)

Student instructions

The client has asked you to install a new small network, against a set of requirements. These devices can be either virtual, physical or emulator.

All employees will use the computers centrally within head office, and any off-site employees will use a mobile device (laptop, tablet or phone) to be able to work remotely via the approved remote working solution.

The computers need to be set-up allowing the employees to email, write letters to suppliers, update financial spreadsheets and create weekly presentations.

The computers will also need to access the internet and have instant messaging/video conferencing software such as Skype, GoToMeeting or Teams on Microsoft office 365 installed. Employees will require access to project management software in order to help them plan upcoming projects.

The client wants to ensure there is suitable software installed to mitigate any vulnerabilities to the system, including suitable back up security controls in place.

The client has also asked you to create installation notes for the software installations that took place, in order to support their staff responsible for IT. Your final task is therefore to create a useable document that briefs these individuals on the set-up of your system.

You will have access to the following equipment:

- 3 computers with full administrator rights, or virtual/emulator machine and software
- internet
- operating system
- word processing, presentation and spreadsheet software
- email software
- instant messaging software
- project management software
- mobile device or emulator
- IP address allocations for task 2 in line with provider's own network IP addressing schema
- digital camera

2(a) You must install, configure and support a small-scale network which includes 3 workstations and one mobile device via WiFi and evidence (you should reference the IP addressing schema allocated to you by your provider):

• implementing physical network and network security measures to prevent the unauthorised access, misuse, modification or denial of a computer, information system or data (CIA and IAAA)

- install Windows Server and create Active Directory
- software licence management (software install log within appendix 1)

Note: you will need to provide annotated screenshots for the processes you follow and the implementations you make along with any key explanations for all decisions. As you carry out the various tasks, you will log all network security measures that have been implemented along with any software installations that are planned and how software licenses will be managed in the provided installation and configuration log (security risk assessment and software install log worksheets in appendix 1).

(18 marks)

Evidence required for submission to NCFE

The following evidence should be submitted:

 annotated screenshots (if using virtual machines) or photographs (if using physical machines/devices) showing the setup and successful implementation of the network and server/Active Directory install

2(b) Provide evidence of the following for the client:

- installing and setting up an operating system and antivirus software
- join computer to Active Directory domain
- installing and configuring application software suitable for the client
- implementing back up security controls
- install/update device drivers

Whilst waiting for the installation to take place, set-up and configure a WiFi mobile device for network connectivity:

- configure a mobile device to include device lock security measures, mobile locator application and back up
- carry out all necessary mobile device updates including anti-virus

Note: You will need to provide annotated screenshots/photographs for the processes you follow and any implementations you make. This will include completing the software installation log (worksheet in appendix 1) and explaining your justifications for your decisions. You will also need to show evidence of any drivers which require installing, alongside taking screenshots of device manager. When updating any software/OS updates, you must evidence that there are no further updates required on the system. The installation may take some time to complete and therefore you should continue with task 2(c).

(22 marks)

Evidence required for submission to NCFE

The following evidence should be submitted:

• screenshots (if using virtual machines) or photographs (if using physical machines/devices) showing the setup and successful implementation of software, device driver status and mobile device

2(c) Review the installation and configuration notes and log (started in task 1) that report the following information to the client, making sure it is up-to-date and correct:

- record of all operating system/software application installations and utilities, upgrades, uninstalls and any major configuration changes
- identify and explain any vulnerabilities detected in the current system set-up/network
- recommend actions to mitigate any vulnerabilities found

Note: You will have been filling in the installation and configuration log as you have been completing the task. You will need to review what you have done, ensure that all information contained is correct and also identify the vulnerabilities and mitigations required.

Apply your communication skills appropriately, using standard English. Use accurate spelling, punctuation and grammar. Consider your target audience.

(16 marks)

Evidence required for submission to NCFE

The following evidence should be submitted:

- annotated screenshots and/or photographs for the set-up and successful implementation of the network and server/active directory install
- screenshots and/or photographs for the set-up and successful implementation of software, device driver status
 and mobile device
- completed installation and configuration log (appendix 1)

Student evidence

Task 2(a)

Evidence for this task will include a series of either screenshots or photographs documenting the installation process to show what the student has done. I have provided a descriptor for each key screenshot I would anticipate along with the appropriate commentary. It is likely that these screenshots will have been taken of an installation of server software such as Windows Server 2016.

Installing Windows Server 2016

Screenshot:

Al Windows Satura	
H Windows Server [*] 2016	
Language to install: English (United States)	
Time and currency format: English (United Kingdom)	
Enter your language and other preferences and click "Next" to continue.	
© 2016 Microsoft Corporation. All rights reserved.	

• screenshot shows server being booted from Windows server installation media

Screenshot:

	🕞 💰 Windows Setup
	Select the operating system you want to install Operating system Architecture Date modified Windows Server 2016 Standard Evaluation x64 7/16/2016 Windows Server 2010 Standard Evaluation x64 7/16/2016 Windows Server 2016 Standard Evaluation x64 7/16/2016 Windows Server 2016 Datacenter Evaluation x64 7/16/2016 Windows Server 2016 Datacenter Evaluation x64 7/16/2016
	Description: This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be run on a Server Core installation. All server roles and features are supported. For more details see "Windows Server Installation Options."
	Next
1 Collecting information	2 Installing Windows

• screenshot shows selection of Windows Server 2016 (desktop experience) - this provides a full Windows desktop to make it easier to manage the Windows environment on our network

Screenshot:

¢	Applicable notices and license terms	×
	IMPORTANT NOTICE (followed by LICENSE TERMS) Diagnostic and Usage Information. Microsoft automatically collects this information over the internet, and uses it to help improve your installation, upgrade, and user experience, and the quality and security of Microsoft products and services. Consistent with these purposes, the information may be associated with your organization. Windows Server 2016 has four (4) information collection settings (Security, Basic, Enhanced, and Full), and uses the "Enhanced" setting by default. This level includes information required to: (i) run our antimalware and diagnostic and usage information technologies; (ii) understand device quality, and application usage and compatibility; and (iii) identify quality issues in the use and performance of the operating system and applications.	*
	☞ <u>I accept the license terms</u>	Net
Collecting information	Installing Windows	

• screenshot shows me selecting to agree to the licence agreement as required by Microsoft to use the software

Screenshot:

•	🚱 🔏 Windows Setup
	Which type of installation do you want?
	Upgrade: Install Windows and keep files, settings, and applications The files, settings, and applications are moved to Windows with this option. This option is only available when a supported version of Windows is already running on the computer.
	Custom: Install Windows only (advanced) The files, settings, and applications aren't moved to Windows with this option. If you want to make changes to partitions and drives, start the computer using the installation disc. We recommend backing up your files before you continue.
	Help me decide
1 Collecting information	2 Installing Windows

 screenshot shows me selecting a custom install - this option allows me to do a full installation of the Windows software

Screenshot:

¢	Windows Setup Where do you want to install Wi	indows?	×	
	Name	Total size	Free space Type	
	Drive 0 Unallocated Space	40.0 GB	40.0 GB	
	€ Load driver A Estend	Format	* New	
			Next	
1 Collecting information 2	Installing Windows			

• screenshot shows me selecting the hard drive that I want to install Windows onto

Screenshot:

	🕍 Windows Setup
	Installing Windows
	Status
	Copying Windows files Getting files ready for installation (0%) Installing features Installing updates Finishing up
$1^{\text{Collecting information}}$	2 Installing Windows

• Windows Server 2016 is now installing on the server; this will take some time

Screenshot:

Customize	e settings			
Type a password for th	ne built-in administrator accou	int that you can use to sig	In in to this computer.	
<u>U</u> ser name				
Password	•••••			
<u>R</u> eenter password	•••••	ب		

- Windows is now installed; I am prompted to set a password for the main local administrator account for the server
- for security reasons, this password must be complex (for example, at least 8 characters, including upper/lowercase and a symbol) to minimise the risk of the password being compromised

Screenshot:



• I am now prompted to log into Windows for the first time with the administrative details set in the previous step

Screenshot:



• I have checked device manager; all drivers for this server have been detected and installed automatically

Setting up network settings

Screenshots:



Version: v2.0 19 June 2023 | Specimen

🚘 Server Manager					– 0 ×
€⋺੶	Server Manager 🕨 l	Dashboard	•	🕄 🚩 Manage	Tools View Help
	Network and Sharing Center			- 0	×
🔛 Dashboard	← → · ↑ 💺 « Network	and Internet > Network and Shari	ng Center 🗸 🖑	Search Control Panel	Q
Local Server	Carbol Develutions	View your basic netwo	rk information and set un	connections	
All Servers	Control Panel Home	🔋 Ethernet Status	×		
File and Storag	Change adapter settings	General			
	Change advanced sharing settings	Connection		ype: Internet	
		IPv4 Connectivity:	Internet	The second second	
		IPv6 Connectivity:	No network access		
		Media State:	Enabled		
		Speed:	10.0 Gbps	t up a router or access point.	
		Details			
				hooting information.	Hide
		Activity			
		Sent —	Received		
		Bytes: 1,117,40	1 12,026,368		
		Properties Disable	Diagnose		
	See also		Close		
	Internet Options				
	Windows Firewall				
l			BPA results		
			03/04/0003	22.25	~
			02/01/2023		22:33 📃
					- 03/01/2021 2

• I can now see the details for the network card in use

Server Manager Server Manager C Server Manager C Server	ashboard • (- I X I Manage Tools View Help - I X
 I Dashboard ← → ~ ↑ I Coal Server All Servers File and Storag Change adapter settings Change advanced sharing settings 	Internet > Network and Sharing Center View vour basic network information and set up of the context of the con	Search Control Panel
See also	Cos Packet Scheduler Acceler Cost Packet Scheduler Internet Protocol Version 4 (TCP/IPv4) Microsoft Network Adapter Multiplexor Protocol Microsoft LLDP Protocol Driver Microsoft LLDP Protocol Driver Internet Protocol Version 6 (TCP/IPv6) Install Uninstall Properties Description Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.	oting information. Hide
Internet Options Windows Firewall	OK Cancel	22:26

• I open the settings and select IP settings because I need to change the settings to a static (fixed) address

Server Manager	Server Manager 🔸	– Dashboard • 🕄 🏲 Manage Tools V – 🗆 ×	īew Help
Dashboard Local Server All Servers File and Storage	 ✓ Network and Sharing Center ✓ → ✓ ↑ 🔛 « Network Control Panel Home Change adapter settings Change advanced sharing settings 	and Internet > Network and Sharing Center	Hide
: 0 []	See also Internet Options Windows Firewall	Default gateway: Obtain DNS server address automatically Ouse the following DNS server addresses: Preferred DNS server: Alternate DNS server: Validate settings upon exit OK Cancel 02/01/2021 22/26	22:34

Server Manager	Server Manager • D	ashboard • 🕲 🏲 Manage Tools - 🗆 ×	− □ × View Help
 Dashboard Local Server All Servers File and Storag 	 ← → ~ ↑	Internet > Network and Sharing Center View vour basic network information and set un connections Internet Statue Ethemet Properties Internet Protocol Version 4 (TCP/IPv4) Properties Internet Protocol Version 4 (TCP/IPv4) Properties You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. Obtain an IP address: IP ad	Hide
L ۲ ()	é 🖪 占 💷	OK Cancel 02/01/2021 22:26 ☞ 및 ⊄ ₈	22:36 03/01/2021

- I set to static and add the address details I wish to use
- I set the server with the IP address 192.168.0.1/Subnet Mask 255.255.255.0 in line with my network configuration plan

€∋∙	Server Manager • Da	ashboard	• ②	Manage Tools	View Help
DashboardLocal Server	← → ✓ ↑ ♥ Control Pan	el > System and Security > Sy	stem v Ö Search	n Control Panel	
All Servers File and Storac	Control Panel Home	View basic information Windows edition	about your computer		
	 Remote settings Advanced system settings 	Windows Server 2016 Stand © 2016 Microsoft Corporat reserved.	dard Evaluation tion. All rights H Window	vs Server⁺ 2016	
		System Processor: Installed memory (RAM): System type:	Intel(R) Core(TM) i5-8265U CPU @ 1.60GF 2.00 GB (0.98 GB usable) 64-bit Operating System, x64-based proce	Hz 1.80 GHz	
		Pen and Touch:	No Pen or Touch Input is available for this	s Display	Hide
		Computer name, domain, and Computer name: Full computer name: Computer description: Workgroup:	workgroup settings WIN-D5742H8EN2J WIN-D5742H8EN2J WORKGROUP	Change settings	
		Windows activation Windows is activated Rea	d the Microsoft Software License Terms		
	See also Security and Maintenance	Product ID: 00378-00000-0	0000-AA123	Change product Key	
			BPA results		-
	ê 📄 占 💷		02/01/2021 22:26	늘 ┠ (<mark>></mark> (22:38 03/01/2021

having set the network, I open the server information window to see settings

(€)⊛•	Server Manager Dashboard System Properties	√ ② [™] Manage Tools - □ ×	<u>V</u> iew <u>H</u> elp
🔛 Dashbc	Computer Name Hardware Advanced Remote	System V 🗗 Search Control Panel 🔎	
Local Serv	Windows uses the following information to identify your computer on the network.	on about your computer	
- The arte	For example: "IIS Production Server" or "Accounting Server". Full computer name: WIN-D5742H8EN2J Workgroup: WORKGROUP	Standard Evaluation Poration. All rights Windows Server* 2016	
	To rename this computer or change its domain or Change Change	Intel(R) Core(TM) i5-8265U CPU @ 1.60GHz 1.80 GHz I): 2.00 GB (0.98 GB usable) 64-bit Operating System, x64-based processor No Pen or Touch Input is available for this Display and workgroup settings	Hide
		WIN-D5742H8EN2J Change settings WIN-D5742H8EN2J	
	OK Cancel Apply	WORKGROUP	
L	Windows activation		
	Windows is activate Product ID: 00378-0 See also Security and Maintenance	d Read the Microsoft Software License Terms 00000-00000-AA739 Change product key	
		BPA results	

I can now set the name of the machine so that it is easily recognised

	System Properties	×			- 🗆 ×	
Dashbc	Computer Name/Domain Changes	×	System	✓ ♂ Search Con	trol Panel 🔎	
Local Serv All Serv File and	You can change the name and the membership of this computer. Changes might affect access to network reso	computer	ion about your comp	uter		
	Computer name: WIN-D5742H8EN23 Full computer name: WIN-D5742H8EN2J		itandard Evaluation poration. All rights	H Windows S	erver [®] 2016	
	Member of O Domain: Workgroup: WORKGROUP	re ange	Intel(R) Core(TM) i5-8 4): 2.00 GB (0.98 GB usable 64-bit Operating Syste No Pen or Touch Input and workgroup settings WIN-D5742H8EN2J	265U CPU @ 1.60GHz 1. le) em, x64-based processor it is available for this Disp	80 GHz lay Change settings	Hide
	OK Car		WIN-D5742H8EN2J WORKGROUP			
	W	indows activation				
		Windows is activate	d Read the Microsoft Softwar	e License Terms		
	See also Security and Maintenance	Product ID: 00378-0	0000-00000-AA739		Change product key	

here I add the name to use, WORKGROUP, so that it is easily recognised

📥 Server Manager			_	0 X
€€	Server Manager 🕨	Dashboard	• 🕄 🚩 <u>M</u> anage <u>T</u> ools	<u>V</u> iew <u>H</u> elp
	👱 System		- 🗆 X	^
🔛 Dashboard	🗧 🚽 🕤 🛧 🔛 > Control F	Panel > System and Security > System ~	👌 Search Control Panel 🔎	
Local Server	Control Panel Home	View basic information about your computer	0	
File and Storag	💔 Device Manager	Windows edition		
	Remote settings	Windows Server 2016 Standard Evaluation		
	Advanced system settings	Microsoft Windows X	[−] Windows Server [®] 2016	
		You must restart your computer to apply these changes	U @ 1.60GHz 1.80 GHz	
		Before restarting, save any open files and close all programs.	based processor	
		Restart Now Restart Later	able for this Display	Hide
		Computer name, domain, and workgroup settings		
		Computer name: WIN-D5742H8EN2J (will cha restarting this computer)	nge to DC01 after 🛛 🌍 Change settings	
		Full computer name: WIN-D5742H8EN2J		
		Computer description:		
		Workgroup: WORKGROUP		
		Windows activation		
		Windows is activated Read the Microsoft Software Licer	nse Terms	
	See also	Product ID: 00378-00000-00000-AA739	Change product key	
	Security and Maintenance			
		BPA results	021 22.26	
	é 🔒 🖳		ې ۲ <u>۵</u> پ	22:41
 the PC will 	need to restart to apr	bly the name change		5/01/2021

the PC will need to restart to apply the name change

Server Manag	ger	⊡ X ww <u>H</u> elp
Dashbo Local Se All Serv File anc	System Properties Computer Name/Domain Changes You can change the name and the membership of this computer. Changes might affect access to network resources. Computer name: Computer name: DC01 Full computer name: DC01 More ange Intel(R) Core(TM) i5-8265U CPU @ 1.60GHz 1.80 GHz Vi: 2.00 GB (0.98 GB usable) 64-bit Operating System, x64-based processor No Pen or Touch Input is available for this Display and workgroup: WORKGROUP OK Cancel System voit Search Control Panel P Search Control Panel P Somputer <th>Hide</th>	Hide
	OK Cancel Apply WORKGROUP Windows activation Windows is activated Read the Microsoft Software License Terms Product ID: 00378-00000-00000-AA739 @ Change product key See also Security and Maintenance BPA results Image: Comparison of the settings and powel set the domain 02/01/2021 3226 22/02/021 3226	:41 1/2021 2

System Properties		×	X	
C Computer Name/Domain Ch	anges X	System	✓ [™] Search Control Panel	
You can change the name and t computer. Changes might affect	the membership of this comput access to network resources.	ion about your comput	ter	J
Computer name:		Standard Evaluation		
DC01	Computer Name/Do	main Changes	Windows Server [®] 2016	
Full computer name: DC01	You must	restart your computer to app	blv	
	these char	nges	U @ 1.60GHz 1.80 GHz	
Member of	Before restan	ting, save any open files and close all		
O <u>D</u> omain:	programs.		based processor	
Workgroup:		OK	able for this Display	Hi
WORKGROUP		WIN-D5742H8EN21 (will	L change to DC01 after	
	OK Cancel	restarting this compute	r)	
		WIN-D5742H8EN2J		
	OK Cancel App	WORKGROUP		
	Windows activatio	in		
	Windows is ac	tivated Read the Microsoft Software	License Terms	
See also	Product ID: 00	378-00000-00000-AA739	Change product key	
Security and Maint	tenance			
		BPA results		-

again, a restart is required to complete this change

$\leftarrow \rightarrow \checkmark \uparrow \blacksquare$ Control F	Secolar Contains and Consider a Co			
	anel > System and Security > Sy	stem	マ Ö Search Control Panel の	
Control Panel Home	View basic information	about your computer	•	
Device Manager	Windows edition			
👂 Remote settings	Windows Server 2016 Stan	dard Evaluation		
Advanced system settings	© 2016 Microsoft Corporat	Windows Server® 2016		
	System			
	Processor:	Intel(R) Core(TM) i5-8265U CPU @ 1.60GHz		
	Installed memory (RAM):	2.00 GB		
	System type:	64-bit Operating System, x64-based processor		
	Pen and Touch:	No Pen or Touch Input is available for this Display		
	Computer name, domain, and	workgroup settings		
	Computer name:	DC01	Change settings	
	Full computer name:	DC01		
	Computer description:			
	Workgroup:	WORKGROUP		
	Windows activation			
	Windows is activated Rea	d the Microsoft Software License Terms		
	Product ID: 00378-00000-0	0000-AA739	Change product key	
See also				
Security and Maintenance				
		BPA results		

Allocating server roles

Screenshot:



 here I have opened the server dashboard so I can start the process of allocating server roles and installing active directory - on this screen, I will select roles and features

Screenshot:

📥 Server Manager			_	o ×
Ser Ser	ver Manager • Das	nboard - 🕄 I	Manage Tools View	Help
 Dashboard Local Server All Servers File and Storage Se 	WELCOME TO SER	VER MANAGER type Select the installation type. You can install roles and features on a runn machine, or on an offline virtual hard disk (VHD). • Role-based or feature-based installation Configure a single server by adding roles, role services, and features • Remote Desktop Services installation Install required role services for Virtual Desktop Infrastructure (VDI) or session-based desktop deployment.	- C X DESTINATION SERVER DC01 ing physical computer or virtual to create a virtual machine-based	ide
		< Previous Next >	Install Cancel	
		02/01/2021 22:42		~
	ê 📄 🔚		열 🎧 🖓 22:46 이3/01/2	021

• I am selecting role-based installation as this is the simplest way to install the features as it uses a wizard
Screenshot:

Ser Ser	rver Manager 🕨 Da	ashboard • 🕄 🚩 Manage Tools View	v Help
🔛 Dashboard	WELCOME TO S	ERVER MANAGER	
Local Server			
All Servers	📥 Add Roles and Features Wiz	ard – 🗆 🗙	
File and Storage Se	r		
	Select destination	DN SETVER DESTINATION SERVER	
	Before You Begin	Select a server or a virtual hard disk on which to install roles and features.	
	Installation Type	 Select a server from the server pool 	
	Server Selection	Select a virtual hard disk	
	Server Roles	Server Pool	
	Features	Filter	ide
	Confirmation		uc
	Results	Name IP Address Operating System	
		DC01 192.168.0.1 Microsoft Windows Server 2016 Standard Evaluation	
		1 Computer(s) found	
		and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.	
		22:4	7

 I am selecting my server here (DC01); server manager allows 1 PC to control several servers if it is set up to do so

Screenshot:



Version: v2.0 19 June 2023 | Specimen



I add the additional features needed for AD

Server Manager	rver Manager + Dat	shboard • 🕑 l	— 🗇 🗙 Manage Tools View Help
 Dashboard Local Server All Servers File and Storage Se 	Add Roles and Features Wizard Select server role Before You Begin Installation Type Server Selection Server Roles Features AD DS DHCP Server Confirmation Results	Add Roles and Features Wizard Add features that are required for DNS Server? The following tools are required to manage this feature, but do not have to be installed on the same server. Remote Server Administration Tools Role Administration Tools Role Administration Tools ITools] DNS Server Tools Include management tools (if applicable) Add Features Cancel	DESTINATION SERVER DC01 DC01 Stion Name System (DNS) Server es name resolution for TCP/IP ks. DNS Server is easier to e when it is installed on the erver as Active Directory n Services. If you select the Directory Domain Services u can install and configure erver and Active Directory n Services to work together.
#	é 🖬 🖶	< Previous Next >	Install Cancel 22:49 ⓑ ⓑ ↓ 03/01/2021 ₹2)

• I add the additional features needed for DNS; these are selected automatically when you use this wizard

Server Manager	rver Manager • Da	shboard	• @ P	Manage Tools View	□ × w Help
 Dashboard Local Server All Servers File and Storage Set 	WELCOME TO SE Image: Add Roles and Features Wizar Select server role Before You Begin Installation Type Server Selection Server Roles Features AD DS Confirmation Results	REVER MANAGER d Add Roles and Features Wizard Add features that are required for DHCP Serv The following tools are required to manage this feature, I have to be installed on the same server. Remote Server Administration Tools Role	X rer? but do not	DESTINATION SERVER DC01 ption ic Host Configuration of (DHCP) Server enables you rally configure, manage, and a temporary IP addresses and information for client ters.	ide
# P 🖽	ê 🖬 🖶	< Previous	Next >	install Cancel 22: 한 및 식 28 03/01,	48 /2021

I add the additional features needed for DHCP

📥 Server Manager			- 0	\times
Ser	ver Manager 🕨 Da	shboard • 🗇 I	Manage Tools View H	lelp
🔛 Dashboard	WELCOME TO SI	RVER MANAGER		Â
Local Server				-
All Servers	Add Roles and Features Wizar	d	– 🗆 X	
File and Storage Ser				
	Confirm installat	ion selections	DESTINATION SERVER DC01	
	Before You Begin	To install the following roles, role services, or features on selected se	rver, click Install.	
	Installation Type	Restart the destination server automatically if required	1	
	Server Selection Add Roles	and Features Wizard X	on this page because they have	
	Server Roles		nal features, click Previous to clear	
	Features	If a restart is required, this server restarts automatically, without additional notifications. Do you want to allow automatic restarts?		
	AD DS		^ ide	
	DHCP Server			-
	DNS Server	Yes No		
	Confirmation	Pamata Sanar Administration Tools	J	
	Results	Role Administration Tools		
		AD DS and AD LDS Tools		
		Active Directory module for Windows PowerShell		
		AD DS Tools		
		Active Directory Administrative Center	~	
		AD DS Shan-Incland Command-Line Tools		
		Export configuration settings Specify an alternate source path		
		< Previous Next >	Install Cancel	
		02/01/2021 22:42		~
	é 📄 占		22:50 回 「 <u>「</u> 」(_{※ 03/01/2021}	2

I accept the automatic restarts; this speeds up the process

Screenshot:

🚘 Server Manager				_	ø ×
Ser Ser	ver Manager 🕨 Das	shboard • 🗇 🖡	Manage	Tools Vie	w Help
Desklaged	WELCOME TO SE	RVER MANAGER			^
Dasnboard					
Local Server					
All Servers	🚡 Add Roles and Features Wizard	3	-		
📲 File and Storage Sei	r				
	Installation progr	ess	DESTINA	ATION SERVER DC01	
	Before You Begin	View installation progress			
	Installation Type	Feature installation			
	Server Selection				
	Server Roles	Installation started on DC01			
	Features	Active Directory Domain Services		\sim	
	AD DS	DHCP Server			ide
	DHCP Server	DNS Server			
	DNS Server	Group Policy Management			
	Confirmation	Remote Server Administration Tools Role Administration Tools			
	Results	AD DS and AD LDS Tools			
		Active Directory module for Windows PowerShell			
		AD DS Tools			
		AD DS Snap-Ins and Command-Line Tools		~	
		You can close this wizard without interrupting running tasks. View ta page again by clicking Notifications in the command bar, and then Export configuration settings	ısk progress or o Task Details.	open this	
		< Previous Next >	Close	Cancel	
		02/01/2021 22:42		22-	52
	e 🖡 🔚		Υ <u>π</u>	¶ <u>,</u> √ <mark>≥</mark> 03/01	/2021 2

• the features install and the server restarts as needed



• this screenshot shows the server roles installing without error

Setting up DHCP

Screenshot:

🚘 Server Manager			– 0 ×
Server M	anager • Dashboard	• (2)) 🎢 Manage Tools View Help
Dashboard	WELCOME TO SERVER MANAGE	Post-deployment Configura TASKS	· ×
All Servers		Services at DC01 Promote this server to a domain controlle	,
AD DS	QUICK START	Post-deployment Configuration	
DNS	2	Configuration required for DHCP Server at	DC01
■File and Storage Services ▶	3	Complete DHCP configuration	
	WHAT'S NEW 4	Feature installation	
	5	Configuration required. Installation succee DC01.	ded on
	LEARN MORE	Add Roles and Features	
	ROLES AND SERVER GROUPS Roles: 4 Server groups: 1 Server:	total: 1	
	AD DS	1 TI DHCP	1
	 Manageability 	Manageability	-
	Events	Events	
	Services	Services	
	Performance	Performance	
	BPA results	BPA results	
🚛 🔎 🖽 렪 🍺			≝ 😱 d <mark>∞</mark> 22:54 100 03/01/2021

- now we can see there is configuration needed for DHCP and DNS
- at the top of the server manager window, I click on the yellow symbol and select complete DHCP configuration and then complete the wizard using the default settings as they are the ones I want to use



📥 Server Manager		– 0 ×
Ser Ser	ver Manager 🕨 Das	hboard 🔹 🥲 🍢 Manage Tools View Help
Dashboard	WELCOME TO SEE	RVER MANAGER
Local Server		
All Servers	📥 DHCP Post-Install configuratio	n wizard — 🗆 🗙
AD DS		
Î∎ DHCP	Summary	
🛱 DNS	Sammary	
File and Storage Ser		The status of the post install configuration steps are indicated below:
	Summary	
		Creating security groups
		Please restart the DHCP server service on the target computer for the security groups to be
		effective.
		l liue
		< Previous Next > Close Cancel
		22-54
	e 🔒 🔚	
 onco configure 	d the DHCD needs to	a be restarted so that the scope can be configured

once configured, the DHCP needs to be restarted so that the scope can be configured ٠

📥 Server N	flanager					_	Ð	×
$\mathbf{\epsilon}$	Serv	er Manager 🕨 DH([P	• (Z)	Manage	Tools	View	Help
	🏆 DHCP				-		×	^
Dasi	File Action V	/iew Help					s	-
Loca							_	
All S	e > iii dc01	Contents of DHCP	Status		Actions)
🖬 AD (D	dc01			DHCP More Actions		•	
1 DHC	CF				More Actions		ated	
🔒 DNS	5							
File File	а							
							c.	-
							3	
							•	
					#		22:56	~
	נט כ	i 💼 🎽			·	0 ^{کی ہ} یک	3/01/2021	2

• here you can see that the server dc01 is shown in the DHCP table, this is because it is the DHCP server

🚘 Server Manager					– 0 ×
Server Ma	nager • Di	НСР			🕶 🍘 🍢 Manage 🔽 Tools View Help
Ŭ					Active Directory Administrative Center
_	SERVERS				Active Directory Domains and Trusts
Dashboard	All servers	1 total			Active Directory Module for Windows PowerShell
Local Server	Elter		0		Active Directory Sites and Services
All Servers	ruter				Active Directory Users and Computers
AD DS	Sanuar Nama IR	VA Address M	(anagoability	Lact I	ADSI Edit
	Server Hame In	VH Address IV	lanageability	Lust	Component Services
	DC01 19	92.168.0.1 O	Inline - Performance counters not sta	arted 03/01	Computer Management
B DNS					Defragment and Optimize Drives
File and Storage Services ▷					DHCP
					Disk Cleanup
					DNS
					Event Viewer
					Group Policy Management
					iSCSI Initiator
					Local Security Policy
	EVENTS				Microsoft Azure Services
	All events 3 total				ODBC Data Sources (32-bit)
	Filter				ODBC Data Sources (64-bit)
	1 1111				Performance Monitor
	Server Name ID) Severity	Source	Log Da	Print Management
					Resource Monitor
	DC01 10	0020 Warning	Microsoft-Windows-DHCP-Server	System 03	Services
	DC01 10)36 Error	Microsoft-Windows-DHCP-Server	System 03	System Configuration
	DC01 10)35 Error	Microsoft-Windows-DHCP-Server	System 03	System Information
					Task Scheduler
					Windows Firewall with Advanced Security
					Windows Memory Diagnostic
					Windows PowerShell
					•
📲 🍳 🗆 🥭 📕					^{22:56} ₩ 🙀 🔩 03/01/2021

• from tools, I select DHCP to open the next wizard



• when the new scope wizard opens I click next to begin

File A	Action View Help		U		s 🔻
Local 🕎 DI All Se 😳 🗉	New Scope		Actions		۲
AD D V DHCF DNS	New Multicast Scope Configure Failover Replicate Failover Scopes Define User Classes	addresses assigned to computers requesting a dynamic IP address. nfigure a scope before dynamic IP addresses can be assigned. the Action menu, click New Scope.	IPv4 More Actions	•	sted)
File a	Define Vendor Classes Reconcile All Scopes	bout setting up a DHCP server, see online Help.			
	Set Predefined Options Refresh				
	Properties				
<	>				 Image: Second sec
Show stat	tistics for this server]

• I start the wizard

Server Manager	-
File Action View Help	s 🔻
Image: All Se Image: DHCP New Scope Wizard Image: All Se Image: DHCP Image: DHCP Image: DHCP Image: DHCP Image: DHCP	by identifying a set of consecutive IP addresses.
	er scope distributes. 0 . 100 0 . 209 to DHCP Client t55 . 0 S ▼ (>)
	< Back Next > Cancel
# A @ 🤌 🗮 💺	the second sec

• I input the first and last address I want to use in the pool and select the length of the subnet which is default at /24 for a 192 address range

Image: Second secon	View Help				_		s 💌
All Se All Se AD D DHCF DNS File a Pv6	erver olicie liters To ad For m	New Scope Wizard Scope Name You have to pro a description. Type a name an how the scope is Name: Description:	vide an identifying scope name. You also have the option d description for this scope. This information helps you qu to be used on your network. Network Scope	n of providing	ctions Pv4 More Actions	•	ated)
	,		< Back Next	Cancel		- 22:	58

I add the range of IP addresses that I want to use (details below)

Server Manager	ager • DHCP • 🕝 🏲	<mark>∧ M</mark> anage 	_ Iools <u>V</u> ie D X	л м <u>н</u>	elp
Dasht				S 🔻	
All Se ✓ DHCP ✓ dc01 ✓ dc01 ✓ JPV4 ✓ Server ✓ DHCF ✓ Policie ✓ Policie	Lease Duration The lease duration specifies how long a client can use an IP address from this scope.	c tions Pv4 More Actions	* }	eted)	
DNS > Filters File a > I Pv6 To ac For n	Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate. Set the duration for scope leases when distributed by this server. Limited to: Days: Hours: Minutes:				
	< Back Next > Cancel				
< >					
e p 🗆 🧟 📘		ţ <u>s</u> Ţ	23: {∞ 03/01	00 /2021	1 2

• I now set the lease time, this is how long that address will be held for a particular machine, the default is 8 days

Dash	anager > DHCP - ② 『	▲ Manage Tools — □	<u>V</u> iew	, H s ▼	elp
Local All Se AD D Comparison of the server Policie DNS File a Policie Policie Policie Policie Policie Policie Policie Policie Policie Policie Policie Policie	New Scope Wizard Configure DHCP Options You have to configure the most common DHCP options before clients can use the scope. When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope. Or m The settings you select here are for this scope and override settings configured in the Server Options folder for this server. Do you want to configure the DHCP options for this scope now? • Yes, I want to configure these options now! • No, I will configure these options later	c tions ⊅v4 More Actions		S S S	
		ම ඩූ 4	23:0 3 03/01/	0 2021	2

Server Manager	- 1anager ► DHCP - □ ×	o × ₩ <u>H</u> elp
File Action View F Image: Dash Image: DhCP <td< td=""><td>Image: Comparison of the parent domain you want the client computers on your network to use for DNS name resolution. A score DNS name resolution. You can specify the parent domain you want the client computers on your network to use for DNS name resolution. More Actions For m Parent domain: To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers. Server name: IP address: Server name: IP address: Add Rgsolve 192.168.0.1 Remove Down Down</td><td>ated)</td></td<>	Image: Comparison of the parent domain you want the client computers on your network to use for DNS name resolution. A score DNS name resolution. You can specify the parent domain you want the client computers on your network to use for DNS name resolution. More Actions For m Parent domain: To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers. Server name: IP address: Server name: IP address: Add Rgsolve 192.168.0.1 Remove Down Down	ated)
	< Back Next > Cancel	02 /2021

• I add in the details for the DNS server so that they will be given out by the DHCP server along with the host address

Constant Consta	Manager > DHCP - (2) Help Q Q D Q New Scope Wizard	<u>Manage Tools Yi</u> i — — X	ew <u>H</u> elp −S▼ ▼
Local → DHCP → dc01 → dc01 → DHCF → dc01 → Policie → Policie → File a → Pv6	Form Router (Default Gateway) You can specify the routers, or default gateways, to be distributed by this scope. A sco You n To add an IP address for a router used by clients, enter the address below. IP address: For m IIP2.168.0.254 IP IP IP IP IP	v4 Actions	ated)
	<u>Sack Next</u> > Cancel	الله الله الله الله الله الله الله الل	3:01 11/2021 2 2

and again, I use the default option ٠

Server Manager	Manager • DHCP • 🕝 🖡	<mark>∧ M</mark> anage <u>T</u> ools — □	- 🗗	× Help
File Action View Image: Dash Image: Display the second secon	Help I Do you want to activate this scope now? To ad For M C Do you want to activate this scope now?	<mark>ctions</mark> №4 More Actions	S A b ated	
	C No. I will activate this scope later		s	•
			23:02	

 once created the DHCP tool needs to be activated in order for it to give out host addresses, this allows you to create pools in advance of being needed

Server Ma	snager ▼ Server ⁹ DHCP	Manager • DHCP	• ③ P	<u>∧ M</u> anage <u>T</u> ools — □	 Viev	Ф • <u>Н</u>	× elp
Dashi Local	File Action View	Help	Completing the New Scope Wizard	ctions Pv4 More Actions	• •	S ¥	
DNS	j Policie > ∲ Filters > ₿ IPv6	You m To adu For m	You have successfully completed the New Scope wizard.			ated)	
			To provide high availability for this scope, configure failover for the newly added scope by right clicking on the scope and clicking on configure failover. To close this wizard, click Finish.			s •	
	<		< Back Finish Cancel				
				🖷 គ្នូ ៨	23: 03/01,	03 /2021	2

- now I click finish
- I used the following settings in the wizard:
 - o scope name: network IP addresses
 - o IP address range: 192.168.0.100 to 192.168.0.209
 - o length: 24/Subnet Mask: 255.255.255.0
 - $\circ \quad \text{no exclusions were added} \\$
 - o lease duration: 8 days
- I chose to configure DHCP options:
 - o default gateway: 192.168.0.254 (as specified in network plan)
 - o DNS IP address: 192.168.0.1
- once complete, I chose to activate the scope

Setting up active directory

Screenshot:



I click on the yellow warning in server manager and select promote this server to a domain controller

Screenshots:

📸 Server Manager	— D	\times
Server Manager • DHCP • 🕑 🍢 Manage	Tools View He	elp
🚡 Active Directory Domain Services Configuration Wizard 🛛 – 🗆 🗙		^
📰 Dashbo	TASKS 💌	
Local S Deployment Configuration		
All Serv	Ū	
AD DS Deployment Configuration	tion	
Domain Controller Options	000-AA739 (Activated)	
DNS Additional Options O Add a new domain to an existing forest		
File and Paths O Add a new forest		
Specify the domain information for this operation		
Installation Domain: * Select		
Results Supply the credentials to perform this operation		
<no credentials="" provided=""> Change</no>		
	TASKS 💌	
	\odot	
More about deployment configurations		
< Previous Next > Install Cancel		
		~
	00:42	=
 now I need to add a domain 	04/01/2021	2

al S Deployment Confi Serv	guration	TARGET SERVER DC01	(
DS Deployment Configuration CP Domain Controller Options S Additional Options Paths Review Options Prerequisites Check Installation Results	Select the deployment operation Add a gomain controller to an existing domain Add a new domain to an existing forest Add a new forest Specify the domain information for this operation Root domain name: MyDomain.local		ion 000-AA739 (Activated TASKS
	More about deployment configurations		
	< <u>P</u> revious <u>N</u> ext > <u>I</u> ns	tall Cancel	

as the primary deployment configuration, I select new forest

 Active Directory Domain Dashbo Local S All Serv AD DS Deployment Configur DHCP DNS File and Additional Options Paths Review Options Prerequisites Check Installation Results 	iervices Configuration Wizard Coller Options Select functional level of the new fore Forest functional level: Domain functional level: Specify domain controller capabilities Omain Name System (DNS) serve Global Catalog (GC) Read only domain controller (ROD Type the Directory Services Restore M Password: Confirm password:	st and root domain Windows Server 2016 Windows Server 2016 C O O O O O O O O O O O O O O O O O O	- C X	TASKS ion 000-AA739 (Activated) TASKS	
	More about domain controller option	s Previous Next > Insta	II Cancel	00:44 ■ 🛺 🔩 04/01/2021	2

I add some security information (details below)

Server Mana	 Server Manage Active Directory Domain Service 	r • DHCP • 3) 🍢 Manage	—
 Dashbo Local Set All Serv AD DS 	Additional Option	S	TARGET SERVER DC01	
1 DHCP DNS File and	Domain Controller Options DNS Options Additional Options Paths Review Options	Verify the NetBIOS name assigned to the domain and change it if necessary The NetBIOS domain name: MYDOMAIN		000-AA739 (Activated)
	Review Options Prerequisites Check Installation Results			
		More about additional options Previous Next > Insta	I Cancel	
		There is a first f		
€ I give	it a name	<u>CE</u>	Ċ <u>a</u>	● 🖫 ी <mark>≋</mark> 00:44 04/01/2021 🔁

Version: v2.0 19 June 2023 | Specimen

Active Directory Domain Service Local S Paths All Serv	es Configuration Wizard		- C X	
Image: AD DS Deployment Configuration DHCP Domain Controller Options DNS DNS Options Additional Options Paths Review Options Prerequisites Check Installation Results	Specify the location of the AD DS Database folder: Log files folder: SYSVOL folder:	database, log files, and SYSVOL C:\Windows\NTDS C:\Windows\NTDS C:\Windows\SYSVOL		ion 000-AA739 (Activated) TASKS
	More about Active Directory path	s < Previous Next >	Install Cancel	

📥 Server Manager				- 0	\times
@ >-	Server Manage	· DHCP · ©	🍢 Manage	<u>T</u> ools <u>V</u> iew	<u>H</u> elp
A	Active Directory Domain Service	Configuration Wizard	- 🗆 ×		^
Dashbc Local S F All Serv AD DS	Review Options	Review your selections:	TARGET SERVER DC01	TASKS	
Image: Provide the second s	Domain Controller Options DNS Options Additional Options Paths Review Options Prerequisites Check Installation Results	Configure this server as the first Active Directory domain controller in a new for The new domain name is "MyDomain.local". This is also the name of the new for The NetBIOS name of the domain: MYDOMAIN Forest Functional Level: Windows Server 2016 Domain Functional Level: Windows Server 2016 Additional Options: Global catalog: Yes DNS Server: Yes Create DNS Delegation: No These settings can be exported to a Windows PowerShell script to automate additional installations	est.	000-AA739 (Activated)	
		More about installation options < Previous	Cancel	■ ∰ d <mark>⊗</mark> 00:45 04/01/2021	
 anu agai 	in, i select defaults				

Dashbc	Active Directory Domain Service	s Configuration Wizard	- D	X RVER DC01			•
AD DS DHCP CONS File anc	 All prerequisite checks pass Deployment Configuration Domain Controller Options DNS Options Additional Options 	ed successfully. Click 'Install' to begin installation. Prerequisites need to be validated before Active Directory Domain computer Rerun prerequisites check	Show more n Services is installed on this	×	tion 000-AA73	39 (Activated)	
	rains Review Options Prerequisites Check Installation Results	 v Options Windows Server 2016 domain controllers have a default for the security setting named "Allow cryptography algorithms compatible with Windows NT 4.0" that prevents weaker cryptography algorithms when establishing security channel sessions. For more information about this setting, see Knowledge Base article 942564 (http://go.microsoft.com/fwlink/?Linkld=104751). A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found or it does not run Windows DNS server. If you are integrating with an existing DNS infrastructure, you should manually create a delegation to this DNS server in the parent zone to ensure reliable name resolution from outside the domain "MyDomain.local". Otherwise, no action is required. If you click Install, the server automatically reboots at the end of the promotion operation. 					•
م ∎		< Previous Next >	Install Canc	el	■ ⊑₁ 4×	00:46	₹

Version: v2.0 19 June 2023 | Specimen

Installation
Deployment Configuration Domain Controller Options DNS Options Additional Options Paths Review Options Prerequisites Check Installation Results

- I use the standard cryptography
- I follow the active directory domain service (ADDS) with the following settings:
 - o deployment configuration add a new forest
 - o root domain name MyDomain.local (I have chosen this domain name for my local network)
 - o directory services restore mode password: I have set a secure password of ionsiTyp!1 for this password

Screenshot:

.



after a server reboot, I can now log in using the domain admin password I set above

Server Manager € Server Ma	nager • Local	Server		• @ 🏲	Manage	Tools	- 🗇 View I	× Help
🔛 Dashboard	PROPERTIES For DC01					[TASKS 💌	
Local Server All Servers AD DS DHCP	Computer name Domain	DC01 MyDomain.I	ocal	Last instal Windows Last check	led updates Update ced for update	25	Never Download u Never	1
 ▲ DNS ➡ File and Storage Services ▷ 	Windows Firewall Remote management Remote Desktop NIC Teaming Ethernet	Domain: On Enabled Disabled Disabled 192.168.0.1,	Domain: On Enabled Disabled Disabled 192.168.0.1, IPv6 enabled		Windows Defender Feedback & Diagnostics IE Enhanced Security Configuration Time zone Product ID		Real-Time F Settings On (UTC+00:00 00378-0000))
	Operating system versi Hardware information		on Microsoft Windows Server 2016 Standard Evaluation Microsoft Corporation Virtual Machine		Processors Installed memory (RAM) Total disk space		Intel(R) Con 1.37 GB 39.45 GB	e
	EVENTS All events 68 total					[TASKS 💌	
Filter		م	(ii) ▼ (ii) ▼				\odot	
	Server Name ID S	Severity Source			Log	Date and T	ime	
DC01 1014 Warning DC01 1014 Warning DC01 1129 Error		Varning Microsoft-Wi Varning Microsoft-Wi rror Microsoft-Wi	Microsoft-Windows-DNS Client Events Microsoft-Windows-DNS Client Events Microsoft-Windows-GroupPolicy		System 04/01/2021 System 04/01/2021 System 04/01/2021 System 04/01/2021		00:59:35 00:54:40 00:54:21	
# A 🗆 🤶 🛢					φ <u>-</u>	∎ 🚮 (<mark>×</mark>	01:10 04/01/2021	2

- I can see everything is now complete and there are no warnings
- I can now set up domain administrator accounts and manage the active directory

Screenshots:

🚘 Server Manager			– 0 ×		
Server M	anager 🕨 Local Ser	ver	🛛 🌮 🖌 Manage 🛛 Tools View Help		
Dashboard Local Server	For DC01	DC01	Active Directory Administrative Center Active Directory Domains and Trusts Active Directory Module for Windows PowerShell Active Directory Sites and Services		
All Servers	Domain	MyDomain.local	Active Directory Users and Computers ADSI Edit Component Services Computer Management		
B DNS ■ File and Storage Services ▷	Windows Firewall Remote management Remote Desktop NIC Teaming Ethernet	Domain: On Enabled Disabled Disabled 192.168.0.1, IPv6 enabled	Defragment and Optimize Drives DHCP Disk Cleanup DNS Event Viewer		
	Operating system version Hardware information	Microsoft Windows Server 2016 Standard Evalu Microsoft Corporation Virtual Machine	Group Policy Management iSCSI Initiator Local Security Policy Microsoft Azure Services ODBC Data Sources (32-bit) ODBC Data Sources (64-bit)		
	EVENTS All events 68 total <i>Filter</i>	▼ (ii) ▼ (ii) Q	Performance Monitor Print Management Resource Monitor Services System Configuration		
	Server Name ID Severity DC01 1014 Warning DC01 1014 Warning DC01 1129 Error	Source Microsoft-Windows-DNS Client Events Microsoft-Windows-DNS Client Events Microsoft-Windows-GroupPolicy	Task Scheduler Windows Firewall with Advanced Security Windows Memory Diagnostic Windows PowerShell		

• in server manager, I open tools and the AD wizard

🚔 Server Manager			- 0 ×
€ Serve	er Manager 🔸 Local Server	🔹 🕃 🚩 Manage	Tools View Help
Dashboa Dashboa File Active Dire File Active Dire File All Serve All Serve	ectory Users and Computers View Help	- C X	↑ TASKS ▼ Never Download u Never Real-Time Pr Settings Ifiguration On
> 🦲 Ma	New Computer All Tasks Contact View Contact View Interform Refresh msDS-ResourcePropertyList Export List msDS-ShadowPrincipalContainer Help mslageaguaguaguaguaguaguaguaguaguaguaguaguagua	rato up rato rato rato rato up up up up	(UTC+00:00) 00378-0000 Intel(R) Core 1.41 GB 39.45 GB > ∑
<	MSMQ Queue Alias	јие Jp У	\odot
	User Server Name ID DC01 1014 DC01 1014 Warning Microsoft-Windows-DNS Client E DC01 1014 Warning Microsoft-Windows-DNS Client E DC01 1129 Error Microsoft-Windows-GroupPolicy	vents System vents System System	Date and Time 04/01/2021 00:59:35 04/01/2021 00:54:40 04/01/2021 00:54:21

• I start by selecting 'New' and then 'User'
Server Manage	server Manager	• Local Server		• 🕄 🚩 Manage	— 🗇 🗙 Tools View Help
Dashboa	New Object - User	tors	×	- 0 X	TASKS Never
An Server	First name: Dan		on account for ad s in this group c s of this group	Â	Download u ; Never Real-Time Pi
File and S	Full name: Dan Troke User logon name: dtroke	@MvDomain local	s of this group t ccount manage s in this group c s who have ad s who have vie		Settings nfiguration On (UTC+00:00) 00378-0000(
	User logon name (pre-Windows 200 MYDOMAIN\	D): dtroke	ninistrators Gro nts who are per ed administrato stations and ser		Intel(R) Core
		< Back Next > Cancel	hin controllers i hin guests hin users ignated administrato		39.45 GB
	< >	Enterprise K Security Group Me Enterprise R Security Group Me Group Polic Security Group Me Guest User Bui Key Admins Security Group Me	mbers of this group mbers of this group mbers in this group c It-in account for gue mbers of this group		
	Server Nar DC01	ne ID Severity Source 1014 Warning Microsoft-Windows	-DNS Client Events	Log System	Date and Time 04/01/2021 00:59:35
		1014 Warning Microsoft-Windows 1129 Error Microsoft-Windows	-DNS Client Events -GroupPolicy	System System	04/01/2021 00:54:40 04/01/2021 00:54:21
Ladd th	e new user's details			Y	04/01/2021 €

I add the new user's details

Server Manager	Server Manager • Local Server	- 🕄 🚩 Manage	— 🗇 🗙 Tools View Help
Dashboa Local Ser All Serve AD DS DHCP DNS File and S	A stive Director I leave and Consourter New Object - User X Create in: MyDomain Jocal/Users on First name: Dan Initials: sof Last name: Troke Full name: Dan Troke Full name: Dan Troke Generation Stroke User logon name (pre-Windows 2000): MYDOMAIN dtroke Cancel in g Enterprise A Security Group Designated at Enterprise R Security Group Members of Enterprise R Security Group Members of Group Polic Security Group Members of Group Polic Security Group Members of Sof Guest User Built-in acco	- C X	TASKS TASKS TASKS TASKS TASKS TASKS
م	Server Name ID Severity Source DC01 1014 Warning Microsoft-Windows-DNS Clin DC01 1014 Warning Microsoft-Windows-DNS Clin DC01 1129 Error Microsoft-Windows-GroupPo	ent Events System 0 ent Events System 0 olicy System 0	Date and Time 04/01/2021 00:59:35 04/01/2021 00:54:40 04/01/2021 00:54:21 Image: Classical state

• here I add the details for the new user

Server Manage	server Manag	ger • Local Server		• 🕄 🚩 Manage	— 🗇 🗙 Tools View Help
Dashboa Local Ser All Server	Rew Object - User	Computer	×	- 🗆 X	TASKS
An Server	Password:		on account for ad s in this group c s of this group	^	Download u Never
File and S	Contirm password:	word at next logon	s of this group t count manage s in this group c s who have ad s who have vie		Settings nfiguration On (UTC+00:00) 00378-00000
	Account is disabled		ninistrators Gro nts who are per red administrato stations and ser ain controllers i		Intel(R) Core 1.34 GB
		< Back Next > C. Security Group Enterprise K Security Group	ancel ain guests ain users Designated administrato Members of this group		39.45 GB
	<	Image: Security Group Security Group Image: Group Polic Security Group Image: Guest User Image: Security Group Security Group	Members of this group Members in this group c Built-in account for gue Members of this group		
	Ser DC	ver Name ID Severity Source 01 1014 Warning Microsoft-Wir	ndows-DNS Client Events	Log System	Date and Time 04/01/2021 00:59:35
		01 1014 Warning Microsoft-Wir 01 1129 Error Microsoft-Wir	ndows-DNS Client Events ndows-GroupPolicy	System System	04/01/2021 00:54:40 04/01/2021 00:54:21
 I add th 	e initial password	for the new user: this pass	sword will have to ch	ange at first log in (s	• • • • • • • • • • • • • • • • • • •

I add the initial password for the new user; this password will have to change at first log in (see tick box)

Server Manager	• Local Server • 🕃) anage	— ⊡ × <u>T</u> ools <u>V</u> iew <u>H</u> elp
 Active Directory Users and Com File Action View Help Local Ser All Serve AD DS Context of the production of the product of	nputers Image: Security Group Mambers in this group c	×	TASKS Never Download u Never
 Builtin DNS Computers Dmain Controllers ForeignSecurityPrincipal: Managed Service Accounting Users 	Cert Publish Security Group Cloneable D Security Group Dan Troke User DefaultAcco User DefaultAcco User DefaultAcco Security Group DefaultAcco Security Group DHCP Admi Security Group DHCP Users Security Group Members who have ad DHCP Users Security Group Members who have vie DHCP Users Security Group DNS Administrators Gro		Real-Time Pr Settings Ifiguration On (UTC+00:00) 00378-00000
	DnsUpdateP Security Group DNS clients who are per Domain Ad Security Group Designated administrato Domain Con Security Group All workstations and ser Domain Gon Security Group All domain controllers i Domain Users Security Group All domain guests Domain Users Security Group Designated administrato Enterprise A Security Group Members of this group.		Intel(R) Core 1.34 GB 39.45 GB
< >	Enterprise R Security Group Members of this group Group Polic Security Group Members of this group c Group Polic Security Group Members in this group c Built-in account for que	•	
DC01 DC01 DC01	Name ID Seventy Source 1014 Warning Microsoft-Windows-DNS Client Events 1014 Warning Microsoft-Windows-DNS Client Events 1129 Error Microsoft-Windows-GroupPolicy	Log System System System	04/01/2021 00:59:35 ^ 04/01/2021 00:54:40 04/01/2021 00:54:21
🖷 A 🗆 健 📄 🖶	4	<u> </u>	01:15 1.15 04/01/2021

• the new user has been created

Server Manager	• Local Server •	<i>⊙</i>	— <u>T</u> ools ⊻iew <u>H</u> elp
 Active Directory Users and Complete File Action View Help Local Server All Server AD DS DHCP DNS File and Computers Domain Controllers Computers Domain Controllers Managed Service Accounting Users 	Apputers Image: Second Secon		TASKS Never Download u Never Real-Time Pt Settings guration On (UTC+00:00) 00378-00000 Intel(R) Core 1.34 GB 39.45 GB TASKS TASKS ate and Time
Server 1 DC01 DC01 DC01	 Name ID Severity Source 1014 Warning Microsoft-Windows-DNS Client Events 1014 Warning Microsoft-Windows-DNS Client Events 1129 Error Microsoft-Windows-GroupPolicy 	Log Da System 04 System 04 System 04 System 04	Ate and Time /01/2021 00:59:35 ^ /01/2021 00:54:40 /01/2021 00:54:21 ↓01:16 ↓01:16

• I now add the new user to a security group



the new user has been selected

Server Manager		- 0 ×
Server Manag	er • Local Server • (D I Manage Tools View Help
 Dashboa File Active Directory Users and File Active Directory Users and All Serve All Serve All Serve Active Directory Users and All Serve Act	Dan Troke Properties ? × Remote control Remote Desktop Services Profile COM+ General Address Account Profile Telephones Organization Member Of Dial-in Environment Sessions Member of:	− □ × TASKS ▼ Never Download u Never Real-Time Pt Settings nfiguration On (UTC+00:00) 00378-00000
	Add Remove Primary group: Domain Users Set Primary Group There is no need to change Primary group unless you have Macintosh clients or POSIX-compliant applications.	Intel(R) Core 1.34 GB 39.45 GB >
<	OK Cancel Apply Help	· · ·
	ver Name ID Severity Source 1 1014 Warning Microsoft-Windows-DNS Client Events 1 1014 Warning Microsoft-Windows-DNS Client Events 1 1129 Error Microsoft-Windows-GroupPolicy	Log Date and Time System 04/01/2021 00:59:35 ^ System 04/01/2021 00:54:40 ^ System 04/01/2021 00:54:21 ^ System 04/01/2021 00:54:21 ^

• and here we see the user's properties showing group membership

Server Manager	Server Manager + Local Server - (3)	Manage	– 🗇 X
Dashboa F Local Ser All Serve AD DS DHCP DNS File and S	Server Manager Local Server Create in: MyDomain Jocal/Users When you click Finish, the following object will be created: Full name: Dan Troke User logon name: dtroke@MyDomain Jocal s of this group t s who have ed s who have ed s who have ed nitistrators Gro nts who are per ed administrato tations and ser 		Tools View Help
	Image: Server Name ID Severity Source DC01 1014 Warning Microsoft-Windows-DNS Client Events DC01 1014 Warning Microsoft-Windows-GroupPolicy	Log System System System	39.45 GB 39.45 GB TASKS Other and Time 04/01/2021 00:54:40 04/01/2021 00:54:40 04/01/2021 00:54:21

• I click finish to confirm

• I created a user account called dtroke - I have added this account to the domain admin group to allow me to administer computers on the network

Installing security software

Screenshots:

C S Attps://www.avira.com/en/start-download/product/2262/-112e2 P = C Source Securi ×	□ × ☆ 戀 🙂
\land Avira	
First step successfully completed!	
You should now have the downloaded file. Now, all you need is to open and install it!	
Download Run program Install	
Your download hasn't started? Try again now	
_ <u>Back to the previous page</u>	
The avira_en_spt11phpws-spotlight-release.exe download has completed. Run Open folder View downloads ×	
$\blacksquare \ P \ \Box \ e^{01:5}$	2021

Avira	;//www. avira.com /en/start-download/	product/2262/-112e2 🔎 👻 🔒 🖒 🔀 Download Avira Fr	ree Securi ×	合分箱 - ×
		9		
		× R		
		Welcome to Avira		
	By proceeding, you are accepti	ing the <u>End User License Agreement (EULA)</u> , and the	Terms and Conditions. Avira is fulfillin	ng its
	contents of the Privacy Policy an	d access thereto. You can find our Privacy Policy here	ata Protection Regulation (GDPR) wi https://www.avira.com/en/general-j	th the <u>privacy</u>
	By proceeding you are also inst and accepted Opera's <u>End Use</u>	alling Opera, Avira's recommended fast and secure br <u>r License Agreement</u> . You can find Opera's Privacy Po	rowser and you confirm that you have plicy here: <u>https://www.opera.com/pri</u>	e read ivacy
			_	
		Agree and Install		

I agree to the licence as required

💼 Server Manager	— ť) ×
	-	
Avira Free Security		
		^
i de la constante de		
Great! You are all set		
Let's run your first smart scan		
Smart scan checks your system for security,		
privacy and performance issues		
Smart scan		
Pamind ma later		
<u>Rening ne later</u>		
	02.05	~
- F C C L C L C C L C C L C C C C C C C C	へ 管 臣 4 <mark>8</mark> 02:05	121 2
once installed, I run the first smart scan		

📥 Ser	ver Manag	er																	_	đ	\times
۲	R P	wira F	ree Se	curity	/										Regis	ter	Þ	¢			þ
i	æ																				Î
iii iii	v							He	re's v	wha	at yo	ou fix	(ed fo	r fre	e						I
ir	0								•	/ 1e	6.41 N	AB free	d up	nod							Ц
	Ţ									21 p	orivacv	v setting	gs to fix				0				H
	*									143.	.89 MI	B to fre	e up								ы
										1 slo	ow star	rtup ap	р								Ľ
						6					Fix th	ne rest	:								
											<u>Not</u> 1	<u>today</u>									
																					l
								_												12,06	~
	Q	[[]]	e	-		0	R										へ ⁴	۳ ۲	∜ <mark>⊗</mark> 04/0	01/2021	2

• here are the results for the free software

• to ensure that the server is protected, I have installed antivirus software onto the server and run a scan

Screenshots:

Server Manager		– 0 X
← Settings	- 🗆 X	Tools View Help
🔅 Home	Update status	
 Find a setting Update & security Windows Update Windows Defender 	Updates are available. • Windows Malicious Software Removal Tool x64 - v5.84 (KB890830). • 2020-09 Servicing Stack Update for Windows Server 2016 for x64-based Systems (KB4576750). • 2018-05 Cumulative Update for Windows Server 2016 for x64-based Systems (KB4103723).	
RecoveryActivation	Downloading updates 23% Update history	Hide
ዤ For developers	Update settings Available updates will be downloaded and installed automatically, excent over metered connections (where charges	
	may apply). Change active hours Restart options	
BPA results	BPA results	
- A 🖸 🤌 📄 占 🚺 :	☆ ^ ∰	□ 〒 4 <mark>∞ 02:08</mark>

 I have checked and installed any Windows updates to ensure Windows is fully patched to close any vulnerabilities

Screenshots:



I have opened Windows firewall to ensure it is enabled and working to protect the server from external attacks

Task 2(b)

Installation of client PC

Screenshots:

Windows [*]	
Languag <u>e</u> to install: English (United Kingdom)	_
Time and currency format: English (United Kingdom)	•
<u>K</u> eyboard or input method: United Kingdom	-
Enter your language and other preferences and click "Next" to a	continue.
rosoft Corporation. All rights reserved.	Next

 I first select the installation language, time and currency format and keyboard or input methods to meet the client's needs

	🖆 Windows Setup		
		_ Windows [.]	
		Install now	
	<u>R</u> epair your computer © 2020 Microsoft Corporation. All rights reserved	1	
then I click install			

then I click install

Í	A Windows Setup			x
	Windows Secup			
	Select the operating system you want to insta	all		
	Operating system	Architecture	Date modified	
	Windows 10 Home	хб4	19/11/2020	
	Windows 10 Home N	x64	19/11/2020	
	Windows 10 Home Single Language	хб4	19/11/2020	
	Windows 10 Education	хб4	19/11/2020	
	Windows 10 Education N	хб4	19/11/2020	
	Windows 10 Pro	хб4	19/11/2020	
	Windows 10 Pro N	x64	19/11/2020	
	Windows 10 Pro		Next	
Collecting information	2 Installing Windows			

• I select the version of windows I want to install, here I choose Pro as the home versions do not allow connection to a domain

	Mindows Setup		
	Activate Windows If this is the first time you're installing Wir you need to enter a valid Windows produ email that you received after buying a dig Windows came in. The product key looks like this: XXXXX-XX If you're reinstalling Windows, select I dor automatically activated later.	idows on this PC (or you're installing a different e ct key. Your product key should be in the confirm ital copy of Windows, or on a label inside the box XXX-XXXX-XXXX-XXXX ('t have a product key. Your copy of Windows will	dition), ation that
E	2rivacy statement	I don't have a product key	Next
Collecting information 2	Installing Windows		

• now I enter the product key

	X	
	🔏 Windows Setup	-
	Which type of installation do you want?	
	which type of installation do you want:	
	Upgrade: Install Windows and keep files, settings and applications	
	available when a supported version of Windows is already running on the computer.	
	Custom: Install Windows only (advanced) The files, settings and applications aren't moved to Windows with this option. If you want to	
	make changes to partitions and drives, start the computer using the installation disc. We	
	recommend backing up your files before you continue.	
Collecting information 2	nstalling Windows'	
I choose installation ty	pe	

	💽 💰 Windows Setup Where do you want to install Wind	dows?		
	Name	Total size	Free space Type	
	Drive 0 Unallocated Space	25.0 GB	25.0 GB	
	€ Refresh Delete Evend Load driver Delete Evend	Eormat .	₩ N <u>e</u> w	Next
Collecting information	2 Installing Windows			

and an installation location

	Windows Setup	
	Installing Windows Status ✓ Copying Windows files Getting files ready for installation (0%) Installing features Installing updates Getting finished	
Collecting information	☐ Installing Windows	

• now Windows installs and I can monitor the progress

The above screenshots show me installing Windows 10 onto the client computer.

- configuration steps included:
 - o selecting UK English as the installation language and keyboard layout
 - inputting Windows 10 product key I have selected 'I don't have a Product Key' and will input/activate Windows after installation
 - selecting Windows 10 Pro for installation
 - accepting the licence agreement
 - o selecting custom installation to perform a clean installation of Windows 10
 - o selecting the HDD partition to install Windows into

Screenshots:

Basics	
Let's start with region. Is this correct	?
Tuvalu	
U.S. Minor Outlying Islands	
U.S. Virgin Islands	
Uganda	
Ukraine	
United Arab Emirates	
United Kingdom	
	Yes
G	

• once installed, I need to select my location

Basics	
Is this the right keyboard layout? If you also use another keyboard layout, you can add that next.	
United Kingdom	
Canadian Multilingual Standard	
English (India)	
Irish	
Scottish Gaelic	
United States-Dvorak	
United States-Dvorak for left hand	
	Yes
Ф	

I select the keyboard layout

٠

÷	Accoun	t
Acces	Let's add your account ss your apps, files and services across your devices with your Microsoft acc	ount.
	8	
	Email, phone or Skype	
	Create account	
Offline account Privacy & Cool	kies Terms of Use	Next
• now I can add an initial ac	count	

now I can add an initial account

← Account	
Who's going to use this PC? What name do you want to use?	
(\mathbf{R})	
Admin X	
Or, even better, use an online account	Next
Ģ	

I enter the initial username as Admin

٠

← Acc	ount
Confirm your password Type your password one last time	
R	
•••••••••	<mark>6</mark>
Or, even better, use an online account	Next
<u></u>	

• and I choose a password for security

The above screenshots show me performing the initial configuration for first use of Windows 10.

- configuration steps included:
 - o selecting region (UK) and input language (British English)
 - o creation of local user account (admin) with a complex password (ionsiTyp!2)

Screenshot:

•

Recycle Bin				
Microsoft Edge				
			Browse the web with Mic The new browser recomm Microsoft for your PC	erosoft Edge nended by
			Get started	Maybe later
Type here to search	O <u>≓</u> i	@	~ 管 門	03:06 04/01/2021

I have now logged into Windows 10 for the first time

Checking device drivers

Screenshot:



I have logged into device manager on the computer and identified that all drivers have been installed correctly as part of the Windows installation process

Network configuration/domain joining

Screenshots:

0	Settings	- T X
Recycl	i i i i i i i i i i i i i i i i i i i	
	යි Home	About
Micro	Find a setting	Your PC is being monitored and protected.
	System	See details in Windows Security
	🖵 Display	Device specifications
	네) Sound	Device name DESKTOP-UR21V4D
	Notifications & actions	Processor Intel(R) Core(TM) i5-8265U CPU @ 1.60GHz 1.80 GHz
	 Focus assist 	Installed RAM 1.00 GB (807 MB usable) Device ID DE14392F-07B5-4C03-AF10-748C5FC055FB
	(¹) Power & sleep	Product ID 00330-80000-00000-AA354 System type 64-bit operating system, x64-based processor
	Battery	Pen and touch No pen or touch input is available for this display
	📼 Storage	Сору
	년 Tablet	Rename this PC
	甘 Multi-tasking	Windows specifications
	$ {\cal P} $ Type here to search	O 티 💽 📑 🔒 숙 📟 🌣 ^ 🕾 🖓 🕬 03:12
•	select rename PC and give it a name	e so that it is easy to recognise

I select rename PC and give it a name so that it is easy to recognise

About Image About Image About Your PC is being monitored and protected. System Image Image Image About Image About Image	0	Settings	
Home About Find a setting Your PC is being monitored and protected. System D Rename your PC I) I) Rename your PC I) Rename your PC I) I) Rename your PC I) Rename your PC I) Rename your PC I) I) Rename your PC I) Restart now	Recycle	Settings	
Find a setting Your PC is being monitored and protected. System P Pename your PC Image: P P P Pename this PC Image: P Image: P <th>6</th> <td>命 Home</td> <td>About</td>	6	命 Home	About
System See details in Windows Security P Rename your PC P See Rename your PC name will change to: PC001 N After you restart, your PC name will change to: PC001 P Restart now Restart later Power & sleep Storage Storage Tablet Rename this PC It Mutti-tasking	Micros Edge	Find a setting	Your PC is being monitored and protected.
Rename your PC > > After you restart, your PC name will change to: PC001 > > > > Power & sleep Battery Pen and touch No pen or touch input is available for this display Copy Tablet Image Image <th></th> <td>System</td> <td>See details in Windows Security</td>		System	See details in Windows Security
Image: single singl		Di Rename your PC	
After you restart, your PC name will change to: PCO01 Restart now Restart now <th></th> <td>🗤 sa Rename your PC</td> <td></td>		🗤 sa Rename your PC	
♪ Fc Restart now Restart later ○ Power & sleep System type 64-bit operating system, x64-based processor □ Battery Pen and touch No pen or touch input is available for this display □ Storage Copy □ Tablet Rename this PC □ Multi-tasking Windows specifications		After you restart, your PC name will	change to: PC001
OPower & sleepSystem type64-bit operating system, x64-based processor□BatteryPen and touchNo pen or touch input is available for this display□StorageCopy□TabletRename this PC□Multi-taskingWindows specifications		ی Fc	Restart now Restart later
Battery Pen and touch Storage Copy Tablet Rename this PC Multi-tasking Windows specifications		Ower & sleep	System type 64-bit operating system, x64-based processor
Image: Storage Image: Storage Image: Tablet Image: Multi-tasking Image: Storage		□ Battery	Pen and touch No pen or touch input is available for this display
Tablet Rename this PC It Multi-tasking Windows specifications		□ Storage	Сору
H Multi-tasking Windows specifications		- 문 Tablet	Rename this PC
		片 Multi-tasking	Windows specifications
# ア Type here to search O 詳 日 日 日 ① □	-	✓ Type here to search	O 벍 💽 📑 💼 < 🔤 🌣 ^ 🖮 모 🔩 03:14

Settings	H 🖌 192392333 💴 🖉 🗶	- σ ×
Home	About	
Find a setting P	Your PC is monitored and protected.	Related settings
System	Virus & Threat Protection	System info
C Display	Firewall & Network Protection App & browser control	
Al fred	Account protection	Have a question?
44 3040d	Device security	Finding out how many cores my processor has
Notifications & actions	See details in Windows Security	
ی Focus assist		
O Power & sleep	Device specifications	
🖙 Storage		
C8 Tablet mode	Device name 3dprinter Processor Intel®; Core(TM) I7 CPU 960 @ 3.20GHz	
E Multitasking	1.19 GHz Installed RAM 12.0 GB (0.00 GB usable)	
ΔP Projecting to this PC	Device ID 595CD179-CEF0-4E0C-AF08-6395C5886235 Product ID 00331-20300-44403-AA391	
X Shared experiences	System type 64-bit operating system, x64-based processor Pen and touch No pen or touch input is available for this display	
D Clipboard	Rename this PC	
) ^C Remote Desktop		
About	Windows specifications	
	Edition Windows 10 Pro Wersion 1009 Installed on 8/27/2019 OS build 10583-1255 Change product: key or upgrade your edition of Windows Read the Microsoft Services Agreement that applies to our services	
	Bard Bard Strength Colleges Terre	198M

• once restarted, I can add the PC to the domain I created

🔛 System (Pand > All Control Panel Items > System	NE 166.111 - Ø X	- 0 ×
Control Fanel Home © Device Manager © Remote settings © System protection © Advanced system settings	View basic information about your computer Window atton Window 10 Pm © 2019 Microsoft Corporation, All sight warved.	System Properties X	Windows10
	System . Heaviers Factured Processor: Intel®D Core/TM-IC CPU 962 @ 3,300Hz 1:19 GHz Instituted memory (RAM) 123 08 (302 08 analysis) System types 6 68-bit Operating System, 166-based processor Para and Touch: Noi Pern or Touch Tigat is available for this Display	Computer Name Handware Advanced Spetien Polaceton Remote The Advanced Spetien Polaceton Remote The Advance Advanced Spetien Remote Advanced The Advance Advanced Spetien Remote Advanced Advance	
	Headed Packat support Phone number: 1004-070-601(1-000-470-601) Sequet hows: In the Under Stein, 3d Hours a Key, 7 days a week Website: Control response Computer name, Bornian, and exologing withings Computer name. Japointe Full computer name. Japointe Computer Computer Security Worksproup: WORKGROUP	To a sequent force a particular of the second of the secon	Ourge utiling:
	Windows activation Windows is activated. Read the Microsoft Software License Terms Product ID: 00011-2000-4440-44301	OK Canod herby	Change product lay

See also	
and any and managements	
a a 🛊 💿 💿 🚥 🜆	~ 41 D H4 1/2000 D

Control Panel Home	View basic information about your computer		
Cevice Manager Renote settings System protection Advanced system settings	Windows edition Windows 10 Pro © 2019 Microsoft Corporation. All rights reserved.	System Properties X	Windows 10
	System Manufactures: Mexides' Packard Manufactures: Intel®D (Crer(TM) // CPU 948 @ 3.200Hz 3.11 GHz Installader memory (RMM) 12.0 GH 33.0 GHz standard System types de-84 Copering System, st64 lased processor Para and Stoch: No Pari or Tooch Input is available for this Display Heaviett Packard support Phone mumber: Intel United States, 24 hours a fair, 7 days a week.	Computer Tearrer: Hapdware: Advanced: System Protection: Remote Worksman uses: The Makenege Hamadari to dentify your computer in the nature. Despace density in: For example: Ad computer name: Substance Worksyname: WORKEROUP Ty use a systemic pain a dime are sub-grane. dol: Ty use a systemic pain a dime	
	Website Cindre support Computer name, domais and and program Computer name. 3 Aprinter Full computer name. 3 Aprinter Computer decorption: Windeprogram. WOBK2ROUP	Te ensem for a compare or change to denan or Onerge	Or supporting to a set of the
	Windows activation Windows & activated - Keal the Microsoft Software License Terms Product file: 88331-20000-44433-44301	OK Gener Ann	Change product by

Security and Maintanance	
= = 👂 🧿 o = 😰	

- here I type the name of the domain I want to join
- I have updated the computer name of the client to be PC01 in line with the network installation plan, I have also joined the MyDomain.local, using the domain admin account dtroke when prompted
- after joining the domain, the computer has rebooted and I can now log in with my domain user account I will log in with the dtroke account as this is a domain admin account and will allow me to install software as well as finish configuring the workstation

Security and installation of antivirus software

Screenshots:



• I now search for an antivirus programme



• I choose AVG and select the free download (please note: the company would have the option of purchasing a version of AVG)



• I run the download



here you can see AVG installing

•

2		
	MC Activirus Free	*
	You're protected	
	You've now got the work?'s largest thread detection outwork on your side. New that's something to braig about!	
	CONTINUE • •	
4 8 9 5		D MINT INI CON

• and now the software is installed, and the computer is protected

	*2	100 100 10	
5			
	AVC AntiVirus Free Contractor	O-	Needcadore _ = Mare = 4
	No broi Fe	wser threats foun ref the to browne away!	d

• I run a scan and the results are above; there are no browser threats
Screenshots:

lating	- 4 K-843		
© None	Windows Update		
Red a setting	Updates available Last checked Today ISSI AM	-	soking for info-on t
C. Windows Database	2020 III Cumulative Update Preview for JNIT Instrument 3.3 and 4.3 for Windows KI literation 1909 for old (\$34688478) Status Downloading – 2%	La La	an more
A Delvery Optimization	Adjust active hours to reduce disruptions		Nated Series Neck Storage
Windows Security	We instrond you regularly use you device between 100 PM and 100 MM. Would you like Windows to automatically update your active hours to match your activity? We won't restart for updates during this time.	0	S Duale into
F Salar	Tarran		
A Recovery	Pears update for 7 days Val. Advanced uption to charge the peaker period		
Actuation	Compt at the four Converts 500 Atrix 100 PM		
A Find my device	View update history two updates installed or your device		
For developers Windows Insider Program	C Abarol atom		
			A 60 0 M

• I now open settings to check for updates to see any that are not currently installed

lating	14 N. 161 1 1 1 1	- 0 X
i nee	Windows Update	
Port a setting J Update & Security J Undown Update J D Undown Update D Update Security	Restart required To develop and instrumt outside of active hours. 2000 R Communities Update Review for AET framework 3.5 and 4.8 for Windows 10 Version 1909 for add 334/34670 Restart New Schoolses the restart	Looking for who is the latest applicite? Cases more Research force Check Stronge
 Windows Security Eachup Soudieshoot Soudieshoot 	Adjust active hours to reduce disruptions the notaci you sputni, we put ensure tenses to IOI ML and IoII MM Would you like Windows to automatically updated you active hours to reach your activity? We wont? Instant to reaches during the time. Ture on	OS louder info
Actuation Actuation Find my desce B for developers	Four updates for 7 days Your Judates are specific to require the passe particle Convertige total total to a line for Convertige total total to a line for The updates hotsing The updates hotsing	
B Madate Inde August	Absence of options Assenced updates sentimised services	
 after scar 	nning, the computer shows it has missi	ng updates which I can now instal

Configuring backups

Screenshots:



Client software

The following software was requested for installation:

• office software

0

- project management software
- instant messaging client software

As per the network installation specification, I will install Microsoft Office 2019, Microsoft Project and Microsoft Teams.



here I go to the Microsoft website and select the office packages I want to install



• here I have the option to add an additional account

Manual Ohermone	C C My Algorithm C Market C Ma	m (x +	
My account			0 7
C My account A Personal Info		Subscriptions Verify what products and literates you have.	
la secreta proves	Water appen & divisions	View subscriptions	
Ann & decen	Security & privacy Protect your account and adjust important privacy antilogic to your preference.	App permissions Apps with access to your data: 16 Manage which apps have access to your data. The can revelue permission advanced you want.	
	Manage incarity & privacy	Change app permissions	
C P 🔳 🧃			sa Kirks

here I can configure personalisation such as security



• here we see the configured mail programme

Mobile phone set-up

Connecting to wireless network

Photos:



• to connect the mobile phone to WiFi, I first open settings and then WiFi options

	02 - UK ∰and as	
	Show advanced options	
1	•	
	CANCEL CONNECT	
	1 2 3 4 5 6 7 8 9 0 Q W E R T Y U I O P	
	A S D F G H J K L	and a

• I select the correct WiFi access point and input the password to gain access



- the phone is now connected
- I join the phone to the office network by scanning for the network office WiFi and entering the WPA2-PSK password when prompted

Implementing screen lock

Photos:



• now via settings, I need to access the security settings



from here, we access security



• I choose lock screen with fingerprint (biometrics)



• I enter the password as part of the security



- now I can add a fingerprint
- to improve security of the mobile device, I have added a screen lock with a PIN number of 833011 which needs to be entered to unlock the phone when using biometrics

Photos:



I now want to be able to find my device if it is lost so I access the app 'Find My Device'



• I add the relevant details



- now I can see the location is active
- in case of loss of the phone, I have added the 'Find My Device' app; this will allow me to locate a lost device on a map or make it ring to help find it, it also allows the phone to be remotely locked or remotely wiped to protect personal or company data if lost or stolen this helps to protect company data

Task 2(c) (see Appendix 1 - Workbook - DSS-007-01 Assignment 1 distinction

Examiner commentary

This project meets the requirement of the brief, fully considering the needs of the client:

- there was a full assessment of the security considerations and legislation such as GDPR and ISO27001. This included suggestions for how this could be dealt with
- the student has taken health and safety and security considerations such as signs to prevent access to dangerous areas, cooling for the server room to prevent overheating
- where practical tasks are part of the assignment, they have achieved the required outcomes of the task (installing Windows server, setting up Active Directory, installing Windows 10)
- they have provided a detailed commentary of the tasks they have undertaken and consistently use appropriate technical terms. It is clear they know and understand the technical terminology used in the sector
- the student has given the scenario deeper thought, looking beyond the assignment brief (for example, considering gateway routers on the network or the number of switches needed to achieve the project)
- where technical understanding of concepts is required, a high level of detail is seen (for instance when looking at IP addressing the solution is comprehensive with all information required)

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 and 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 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 setting up systems and demonstrates an adequate understanding of perspectives or approaches associated with industry standards in digital support services roles.		
	The student makes adequate use of facts/theories/approaches/concepts and attempts to demonstrate breadth and depth of knowledge and understanding in their 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 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 and test software systems 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 reasoning.		
Distinction	The evidence is precise, logical and 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 of the different perspectives/approaches associated with digital support.		
	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.		
	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 support role.		
The student demonstrates extensive knowledge of relevant concepts and techniques reflected in a digital support 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 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

Copyright in this document belongs to, and is used under licence from, the Institute for Apprenticeships and Technical Education, © 2020-2023.

'T-LEVELS' is a registered trade mark of the Department for Education.

'T Level' is a registered trade mark of the Institute for Apprenticeships and Technical Education.

The T Level Technical Qualification is a qualification approved and managed by the Institute for Apprenticeships and Technical Education. NCFE is currently authorised by the Institute to develop and deliver the T Level Technical Qualification in Digital Support Services.

'Institute for Apprenticeships & Technical Education' and logo are registered trade marks of the Institute for Apprenticeships and Technical Education.

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 clarity	June 2023	19 June 2023