

# T Level Technical Qualification in Digital Support Services

Occupational specialism assessment (OSA)

## Digital Infrastructure

All assignments

Provider guide

v1.2: Specimen assessment materials  
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## T Level Technical Qualification in Digital Support Services Occupational specialism assessment (OSA)

# Digital Infrastructure

## Provider guide

All assignments

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# Controls for this assessment

## Assessment delivery

The Digital Infrastructure occupational specialism consists of 3 separate assignments.

The assignments are set by NCFE and administered by you, the provider.

The assignments will be released to providers for planning and preparation in advance of the windows:

- assignment 1 will be delivered on set times and dates across all providers
- assignment 2 will be delivered within a set 1 week window specified by NCFE after the set dates for assignment 1
- assignment 3 will be delivered on set dates and times across all providers after the window for assignment 2

Specific information for each assignment can be found below.

Electronic workbooks for each assignment to record all evidence against each task are included in the assignment materials. Providers must ensure that students are given the relevant workbook at the beginning of each assignment.

Students must complete the assignments independently and under supervised conditions, as per the specific guidance for each assignment provided below.

Students and tutors are required to sign a declaration of authenticity for each assignment to confirm that the work is their/the student's own. A single declaration form is sufficient for all tasks within one assignment. The declaration forms can be found at [www.qualhub.co.uk](http://www.qualhub.co.uk). This is to ensure authenticity and to prevent potential malpractice and maladministration. Students must be made aware of the importance of this declaration and the impact this could have on their overall grade if the evidence was found not to be the student's own work. Tutors must be aware that by signing the declaration, they are validating it is the student's own work.

At the end of each supervised session, the tutor must collect all evidence and any other materials before students leave the room, to ensure that no student takes any external assessment material or assessment evidence out of the room. This also includes sufficient monitoring and checks to ensure that students have not made materials available to themselves or anyone else electronically via the intranet or internet.

External assessment materials should be securely stored between supervised sessions. Students must not have access to this area between the supervised sessions, including electronic files and physical hardware.

# Assignment 1

## Controls

The tasks for this assignment will be delivered over 3 days, on the dates and times specified by NCFE.

Students have 13 hours to complete all tasks within this assignment.

Task 1 = 3 hours (this will be completed in 1 session on day 1)

Task 2 = 5 hours (this will be provided after completion of task 1 and be completed in 2 sessions on day 2)

Task 3 = 5 hours (this will be provided after completion of task 2 and be completed in 2 sessions on day 3)

Students must work independently and under supervised conditions.

Students should be given a separate user account that is locked at the end of each assessment session.

Internet access is allowed for task 2 and task 3.

Students must use the electronic workbook to record all evidence against each task; the workbook is included in the assignment 1 materials provided by NCFE.

All print screens should be numbered and linked to the task as stated in electronic workbook.

Evidence should be returned to NCFE by the date specified and will be marked by NCFE.

## Resources

Providers need to ensure that students have access to the following resources:

- internet (task 2 and task 3 only - privacy mode should be disabled, and policies applied to prevent deletion of browsing history)
- word processing software
- Visio, Packet Tracer or another diagramming tool
- project planning tool that can produce a project plan and Gantt chart, for example Microsoft Project

## Assignment 2

### Controls

The assignment will be delivered within a set 1 week window, specified by NCFE.

Students have 6 hours to complete all tasks within this assignment.

Providers must schedule 2 sessions, each lasting for 3 hours, to ensure that all students complete all tasks by the end of the window.

Students must work independently and under supervised conditions.

Students should be given a separate user account that is locked at the end of each assessment session.

Internet access is **not** allowed.

Students must use the electronic workbook to record all evidence against each task; the workbook is included in the assignment 2 materials provided by NCFE.

All print screens and photographs should be numbered and linked to the task as stated in electronic workbooks.

Students must take all photographs on a digital camera provided by the provider. Students are **not** allowed to use their mobile phones.

Evidence should be returned to NCFE by the date specified and will be marked by NCFE.

### Resources

Providers need to ensure that students have access to the following resources:

#### Task 1

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

#### Task 2

- digital camera
- word processing software
- sample files for step C, downloaded as .zip file
- virtual machine (VM) test environment or physical environment (see further details below)
- a WiFi device for example printer or CCTV camera
- WiFi infrastructure, for example access points, wireless routers
- server operating system installation media - iso, memory stick or optical disk
- desktop operating system installation media - iso, memory stick or optical disk

- server and desktop operating systems
- desktop virtualisation software, for example Hyper-V, VirtualBox and VM Workstation

## Test environment

The task can be carried out using either virtualisation software or physical computers. The following information will help when creating and managing the test environment. Whichever approach is used, it is the provider's responsibility to test and configure the equipment prior to the assessment.

## Minimum system requirements

If you decide to run the assessment using virtualisation, then the following system requirements should serve as a guide:

- processor (Quad Core CPU, minimum specification i5 3GHz, i7 recommended or equivalent)
- memory (minimum 16GB DDR3 memory)
- storage (dedicated hard disk or SSD for the storage of the VMs)

For the physical installation:

- a 4 port network switch
- four physical PCs:
  - processor (Dual Core CPU, minimum specification i3 2.5GHz)
  - memory (minimum 2GB DDR3 memory)
  - storage (60GB minimum)
- Server01 should have dual network ports and 2 physical hard disks
- Server02 should have 2 physical hard disks
- PC02 should be pre-installed and configured with an operating system, local user account and password

## Virtualisation Approach

The use of the virtualisation software is not assessed; this means that if a student has any questions or issues regarding the VM application, guidance can be given by the provider. Any assistance regarding the guest operating system, for example Server01, is **not** permitted.

Two sample sets of VMs have been provided using Virtual Box V6.1 and VM Workstation V15.2:

- NCFE A2 VMs Virtual Box V6.1
- NCFE A2 VMs VM Workstation V15.2

Virtual Machines Server01, Server02 and PC01, are empty starter VMs with no operating system installed.

Virtual Machine PC02 **will** require the installation and configuration of the guest operating system before distribution to students. This is to facilitate the provider's own software used for the assessment, for example Windows 10 or Ubuntu.

If you decide to use an alternative product, this must be set up in accordance with the following guidance:

- Server01 - 2 CPU cores, 2gb memory, 2 hard disks with minimum 60GB per disk and dual NICs

- Server02 - 2 CPU cores, 2gb memory, 2 hard disks with minimum 60GB per disk
- PC01 - 2 CPU cores, 1gb memory, one hard disk with minimum 60GB per disk
- PC02 - 2 CPU cores, 1gb memory, one hard disk with minimum 60GB per disk
- all machines set for host-only network

SAMPLE

# Assignment 3

## Controls

The tasks for this assignment will be delivered over 2 days, on the dates and times specified by NCFE.

Tasks 1, 2 and 3 will be administered on day 1. Internet access is **not** allowed.

Task 4 will be administered on day 2. Internet access is allowed.

Students have 5 hours 30 minutes to complete all tasks within this assignment.

Task 1 = 2 hours (this will be completed in one session on day 1).

Task 2 = 45 minutes (this will be provided after completion of task 1 and be completed in one session on day 1).

Task 3 = 45 minutes (this will be provided after completion of task 2 and be completed in one session on day 1).

Task 4 = 2 hours (this will be provided after completion of task 3 and be completed in one session on day 2).

Students must work independently and under supervised conditions.

Students should be given a separate user account that is locked at the end of each assessment session.

Students must use the electronic workbook to record all evidence against each task; the workbook is included in the assignment 3 materials provided by NCFE.

All print screens should be numbered and linked to the task as stated in electronic workbook.

Evidence should be returned to NCFE by the date specified and will be marked by NCFE.

## Resources

Providers need to ensure that students have access to the following resources:

- a computer capable of running virtual machines via a hypervisor
- processor (Quad Core CPU, minimum specification i5 3GHz, i7 recommended or equivalent)
- memory (minimum 16GB DDR3 memory)
- storage (dedicated hard disk or SSD for the storage of the VMs)
- specimen virtual machines set up on each student PC prior to the assessment commencing (see Appendix 1 below)

### Task 1

- York office floor plan
- risk assessment template
- virtual server, client and network configuration files (the virtual network files must be copied and tested as working prior to the start of the assessment)
- word processing software

### Task 2

- word processing software



### Task 3

- word processing software

### Task 4

- students will need access to the same virtual servers and PCs that were used in task 1
- internet access (privacy mode should be disabled, and policies applied to prevent deletion of browsing history)
- word processing software

SAMPLE

# Appendix 1

## Virtual computer setup

To complete assignment 3 task 1 and task 4, students require access to a computer and a server machine. These should be virtualised computers downloaded from NCFE. The following steps should be run on all student PCs.

### Setup the virtual switch

To be able to access the internet you will need to configure a virtual switch in Hyper-V that supports NAT.

1. Run the Powershell Script “**Create NAT Adapter. Ps1**” (located in the Virtual Machine ZIP file)
2. Identify from the list the **ifIndex** number for the newly created “**NCFESwitch**”

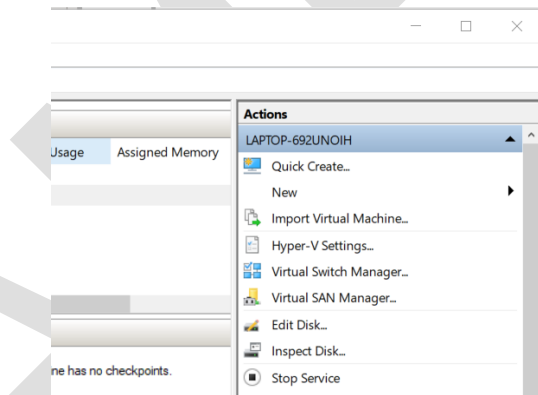
Name	InterfaceDescription	ifIndex	Status	MacAddress	LinkSpeed
WiFi	Realtek RTL8821CE 802.11ac PCIe Adapter	19	Up	80-91-33-E6-F0-15	72.2 Mbps
Bluetooth Network Conn...	Bluetooth Device (Personal Area Netw...	17	Disconnected	80-91-33-E6-F0-14	3 Mbps
vEthernet (Default Swi...	Hyper-V Virtual Ethernet Adapter	40	Up	00-15-5D-22-6B-13	10 Gbps
vEthernet (NCFESwitch)	Hyper-V Virtual Ethernet Adapter #2	50	Up	00-15-5D-01-9A-09	10 Gbps
Ethernet	Realtek PCIe GbE Family Controller	4	Disconnected	04-0E-3C-50-A0-AC	0 bps

3. When prompted input the **ifIndex** number
4. You should now have created a NAT switch in Hyper-V called “**NCFESwitch**”

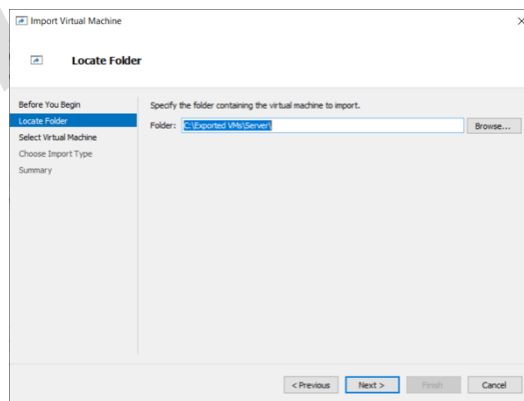
### Extracting the Virtual PCs

Once downloaded and extracted the VMs should be imported into Hyper-V on each of the student’s PCs.

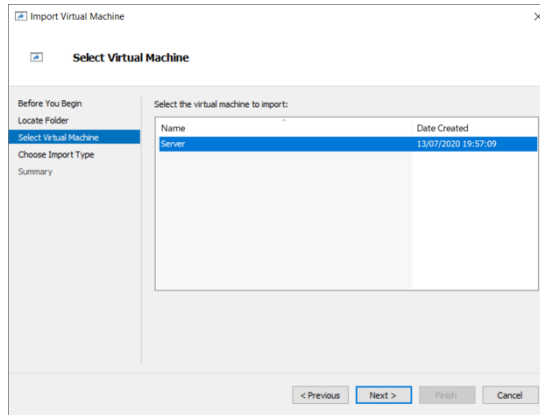
1. In Hyper-V select “Import Virtual Machine”



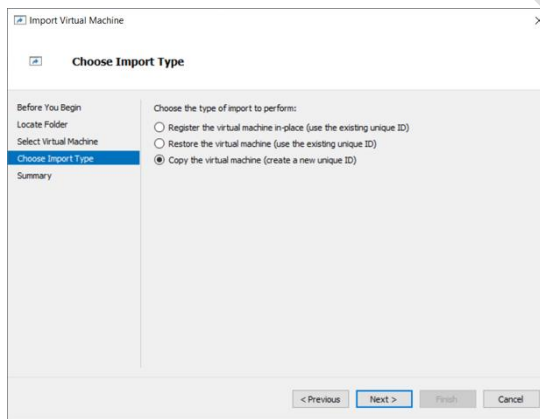
2. Browse to locate your extracted server



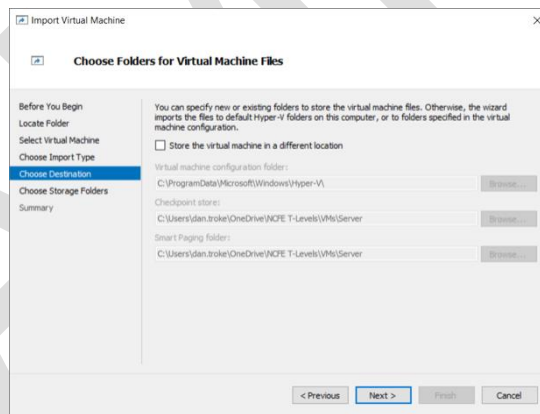
3. Select the server to import it



4. Select “copy the Virtual Machine” when prompted

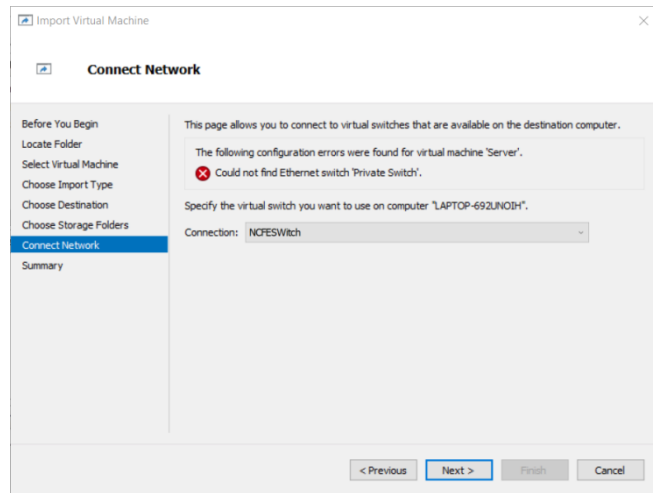


5. Choose an appropriate save location or choose the default

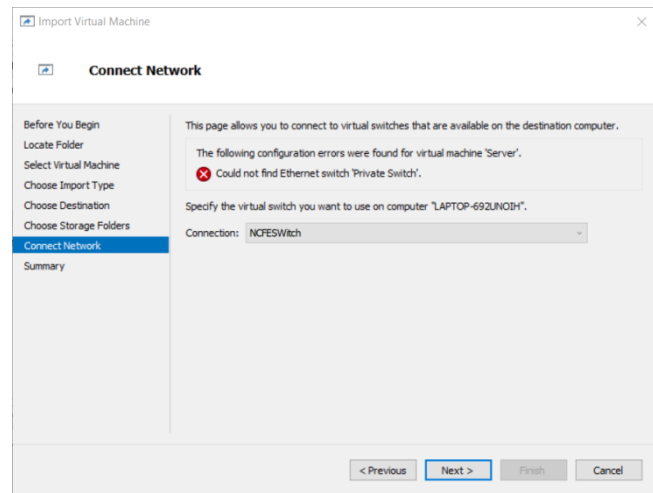


6. Choose an appropriate location to save the virtual hard drive or select the default location

7. Select the NCFESWitch when asked which switch to use



8. Select finish to complete the import



You should repeat the process for importing the client Desktop PC.

You should test to ensure you are satisfied the Virtual PCs are running correctly.

If one of the VMs is showing as out of grace period for licensing, the grace period can be reset at the command prompt with the command: **slmgr/rearm**

**The VMs have been configured as follows:**

### Virtual Machine Login Details/Configuration Issues

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#### Server

-----

Computer Name: **Willow-DC01**

Local Administrator: **Administrator / Pa\$\$w0rd**

Users:

- Louisa Warren (Finance) Louisa.Warren / Pa\$\$w0rd
- Bonnie Grace (HR Manager) Bonnie.Grace / Pa\$\$w0rd
- Jamal Turner (Reception) Jamal.Turner / Pa\$\$w0rd

- Dan Troke (Sales Director) Dan.Troke / Pa\$\$w0rd (has admin role but doesn't need it)
- Josh Smith (IT Technician) Josh.Smith / Pa\$\$w0rd (Admin)

## Desktop PC

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Computer Name: **Willow-PC01**

Local Administrator: **Willow-Admin / Pa\$\$w0rd**

## Network Drives

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Shared drive - all users can access all files.

User account is promoted to Admin without good reason.

## Issues

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No Antivirus

No AntiMalware

Firewall Disabled

Windows Defender Disabled

Eicar on HDD of local PC

Windows updates not run

Disk encryption would be beneficial

## Manual configuration

In the event that the VMs cannot be downloaded, use the following to build the VMs. It is not important what Hypervisor is used.

## Server

Sample VMs have been created with Windows Server 2016 Standard Edition.

If required, an evaluation ISO can be downloaded from:

[www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2016](http://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2016)

## Minimum Specification

**Memory:** 2048 MB RAM to be allocated (4096+ recommended).

**Storage:** 40GB (separated into 2 partitions - 30GB system partition and 10GB data partition).

**Network adapter:** An internal network adapter should be configured that allows NAT access to the internet.

In a production environment it would be expected that the server would be specified far higher than this but this as a minimum will allow the scenario to run without overloading the host computer.

## Server Configuration

On installation of Server 2016 Standard Edition the hard drive should be partitioned as follows:

C:\ - 30GB Partition (minimum)

D:\ - 10GB Partition (minimum)

Windows should be installed into the C:\ partition.

For ease of use, all passwords are to be set according to the specifications in the previous section.

Once installed, the server should be configured using the following settings.

**Server Name:** Willow-DC01

**Network IP Address:** 192.168.0.1

The server should be promoted to hold the following roles:

DHCP

Configure to use the 192.168.0.0/24 Subnet

Address Pool - 192.168.0.100 to 192.168.0.200

DNS - Use 8.8.8.8 or local DNS server for forward lookup

Active Directory Domain Controller

**Domain name:** Willow.local

All passwords should be set as the configuration guide in the previous section.

## Desktop PC configuration

Sample VMs have been created with Windows 10 Professional Edition.

If required, an ISO can be downloaded from:

[www.microsoft.com/en-gb/software-download/windows10](http://www.microsoft.com/en-gb/software-download/windows10)

### Minimum specification

**Memory:** 2048 MB RAM to be allocated (4096+ recommended)

**Storage:** 40GB

**Computer Name:** Willow-PC01

Join the PC to the **Willow.local** Domain

Local administrator details should be set according to the settings in the previous section.

Install the following:

- disable Windows Defender/Windows Firewall
- install OpenOffice ([www.openoffice.org/download/](http://www.openoffice.org/download/))
- create Eicar virus test file and save to C:\test\

## User Accounts

The following user accounts should be created:

## Server:

Computer name: Willow-DC01

Local Administrator: Administrator / Pa\$\$w0rd

Active Directory Users:

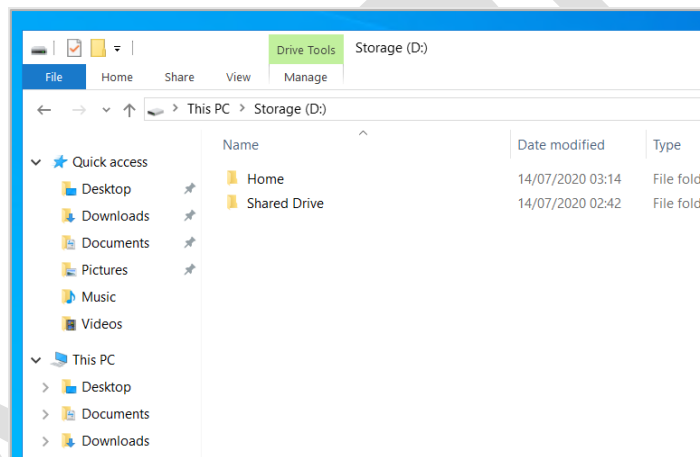
- Louisa Warren (Finance) Louisa.Warren / Pa\$\$w0rd
- Bonnie Grace (HR Manager) Bonnie.Grace / Pa\$\$w0rd
- Jamal Turner (Reception) Jamal.Turner / Pa\$\$w0rd
- Dan Troke (Sales Director) Dan.Troke / Pa\$\$w0rd (has admin role but doesn't need it)
- Josh Smith (IT Technician) Josh.Smith / Pa\$\$w0rd (admin)

## Desktop PC

Computer Name: Willow-PC01

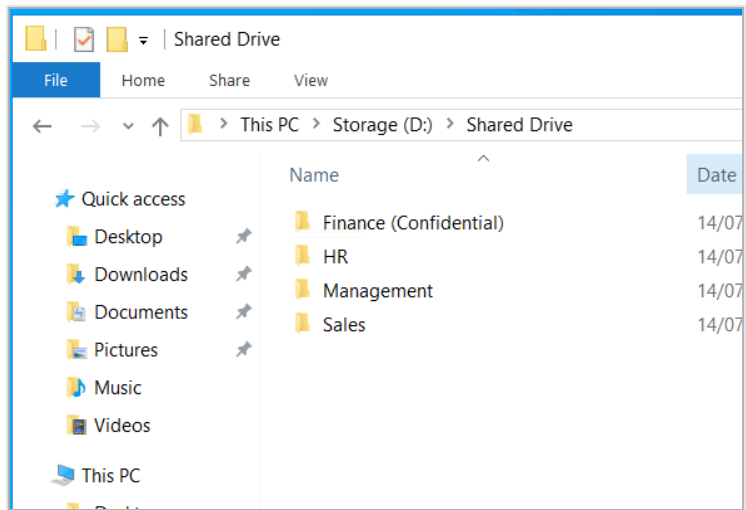
Local Administrator: Willow-Admin / Pa\$\$w0rd

On the data drive the following folders should be created:



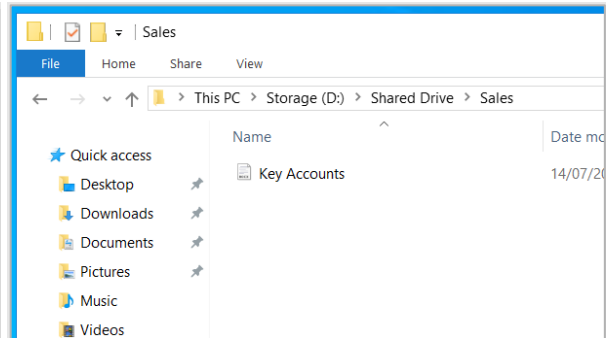
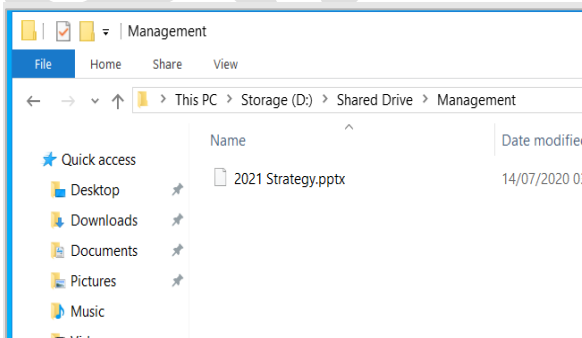
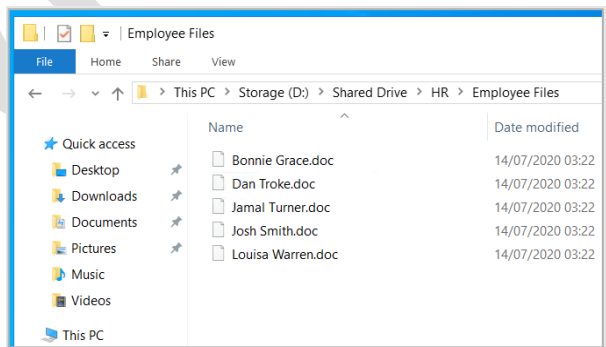
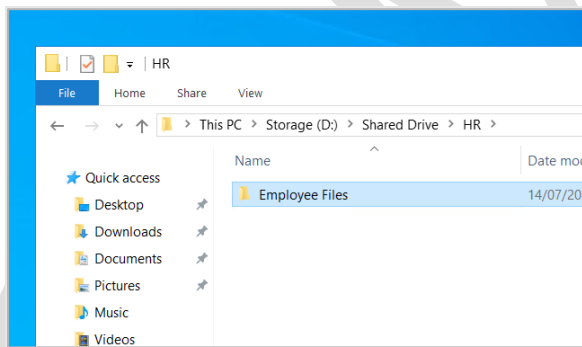
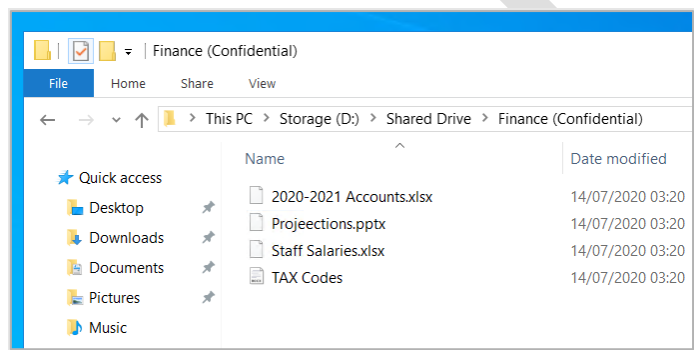
The home drive should be used as the pathway for roaming profiles for all users and should be configured with appropriate permissions.

The shared drive should contain the following folders:



All 'Shared Drive' folders should have full control permissions to all users and the shared drive should be shared on the network.

The following dummy files should be created:





## Document information

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Owner: Head of Assessment Design

## Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Post approval, updated for publication.		December 2020
v1.1	Branding and formatting final updates. NCFE rebrand.		September 2021
v1.2	Sample added as a watermark	November 2023	17 November 2023