T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Digital Support Services

Occupational specialism assessment (OSA)

Digital Infrastructure

Assignment 1

Assignment brief

v1.1: Additional sample material
17 November 2023
603/6901/2

NCFE

T Level Technical Qualification in Digital Support Services
Occupational specialism assessment (OSA)

Digital Infrastructure

Assignment brief

Assignment 1

Contents

About this assignment **3**
Introduction 3
Scenario **5**
Task 1: planning **6**
Task 2: design – servers and storage **8**
Task 3: design – communication equipment **10**
Floor plan: DoubleUp Bookkeeping office **12**
Document information **13**
Change History Record 13

About this assignment

Introduction

This assignment is set by NCFE and administered by your provider over 3 days. The times and dates will be specified by NCFE.

The assignment will be completed under supervised conditions.

You must complete all tasks in this assignment independently. You are required to sign a declaration of authenticity to confirm that the work is your own. This is to ensure authenticity and to prevent potential malpractice and maladministration. If any evidence was found not to be your own work, it could impact your overall grade.

Internet access is allowed for task 2 and task 3.

Use the electronic workbook provided to record all your evidence against each task.

Annotations should be made digitally on the floor plans in the workbook.

Ensure all print screens have been labelled with a brief description of what is being shown.

Save your workbook regularly as you work through the assessment.

Submit the workbook as a single .pdf file at the end of the assessment.

Timing

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

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

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

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

Individual tasks must be completed within the timescales stated for each task, but it is up to you how long you spend on each part of the task, therefore be careful to manage your time appropriately.

Marks available

Across all assignment 1 tasks: 76 marks.

Details on the marks available are provided in each task.

You should attempt to complete all of the tasks.

Read the instructions provided carefully.

Performance outcomes (POs)

Marks will be awarded against the skills and knowledge performance outcomes (POs) as follows:

Task 1

(20 marks)

PO1: Apply procedures and controls to maintain the digital security of an organisation and its data (12 marks)

PO2: Explain, install, configure, test and manage both physical and virtual infrastructure (8 marks)

Task 2

(28 marks)

PO2: Explain, install, configure, test and manage both physical and virtual infrastructure (20 marks)

PO3: Discover, evaluate and apply reliable sources of knowledge (8 marks)

Task 3

(28 marks)

PO1: Apply procedures and controls to maintain the digital security of an organisation and its data (4 marks)

PO2: Explain, install, configure, test and manage both physical and virtual infrastructure (16 marks)

PO3: Discover, evaluate and apply reliable sources of knowledge (8 marks)

Scenario

DoubleUp Bookkeeping is a local accountancy firm who have a single office located in the centre of Birmingham. It currently employs 5 full-time employees and hopes to increase this to 10 over the next 12 months.

DoubleUp Bookkeeping has purchased the neighbouring building and will merge offices so they can increase the size of their operation. The business now owns a larger office space that includes a reception area, 7 offices; each of which can house 2 workstations for the accountants, a meeting room and a spare room. The business intends to use this spare room to store the servers and network-attached storage (NAS). The property has 5 security cameras located around the perimeter of the premises and the recording data from these needs to be stored on a central server.

All offices will be provided with a desktop workstation, power and network facilities. To allow for the accountants to present and report to clients, there is a laptop located in the meeting room that everyone has access to. DoubleUp Bookkeeping plan to purchase and install 2 new servers to allow a functional, secure, and high-performing network to be provided to the team.

Note: A working day for the office is Monday to Friday, 9:00am to 5:30pm and the company does not open on bank holidays, the office needs to be accessible over weekends to authorised employees to support peaks in workload at certain times of the year

Your role is to help the business implement their planned changes. There are 3 tasks you need to complete, to help plan and specify network equipment. As you work through the assignment, more information about the network will be provided.

Task 1: planning

Time limit

3 hours

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

(20 marks)

The office move project has a deadline of 10 weeks (50 working days) from the first Monday after you begin this assignment. The move must be fully completed by the deadline. All equipment must be purchased, installed, configured and tested; software must also be licenced for use.

As the infrastructure technician, you will need to plan the project. This should include reviewing the infrastructure, supporting the offices and the internal server and network environment.

The following additional information has been provided to help you plan the task:

- half of the network cabling is already set up ready to be patched into the server and is hidden within cladding around the building
- the purchased building was previously an estate agents' office and needs cabling added order to comply with the company needs
- the design and selection of the infrastructure should be carried out in 3 phases:
    - networking equipment – new switches and wireless infrastructure is required to be installed throughout each new building
    - servers and storage – new servers will need to be selected and data migrated from the old system to the new one, servers must be installed with relevant software and network roles, and must be configured and tested correctly
    - telephony systems – each accountant will require a desk phone
- an extensive risk assessment should be completed with relevant risks identified and mitigation put in place

Additional considerations:

- allocate 1 day for data migration from the old system to the new one, with 2 extra days for testing and troubleshooting
- a service level agreement with a supplier guarantees 2 days for delivery of any equipment being ordered, any equipment over the price of £1,000 would need sign off from your manager
- ensure the timings are realistic and that the workload is balanced throughout the project

Instructions for students

The project is currently in the opening phase and requires some initial planning and documentation to be set up before the design and development work commences. Please provide print screens of all online sources used clearly showing the URL – the print screens must be accompanied by your written evaluation of the sources. You should:

- develop a project plan for the development of the new network that considers the following:
    - as you are working with a range of equipment you are required to identify any required personal protective equipment (PPE) and processes to follow to keep you and your team safe, you are to identify what health

and safety equipment will be needed for your team, especially when they are working with the hardware of the desktops

- explain the legal requirements that must be addressed when storing and processing data, either locally or on the server, as you will be working with financial documentation and information, you must explain what access control is needed once the build is complete
- complete a risk assessment to identify and explain a range of physical and digital security vulnerabilities, for each vulnerability, identify and justify countermeasures that could be applied to the building or network to help minimise its impact, you are also asked to identify prioritisation and likelihood of the vulnerability in a risk assessment template
- 2 buildings on the same street have recently reported damages and theft., please annotate on the floor plan any physical security measures that are needed to secure the company – a copy of the floor plan is also provided at the end of this assignment brief

- produce a Gantt chart for the development of the new network, working within the solution lifecycle, the Gantt chart should show the critical path of activities within the development project

You will have access to the following equipment:

- word processing software
- project planning software

Evidence required for submission to NCFE

The following evidence should be recorded in the workbook:

- both a project plan and Gantt chart showing the critical path for the development of the new network infrastructure, working within the solution lifecycle
- explanation of legal requirements when working with equipment
- risk assessment of the physical and the digital threats and security countermeasures applied
- annotated floor plans with physical security measures shown

Task 2: design – servers and storage

Time limit

5 hours

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

You are advised to spend approximately 1 hour on the research element of the task.

Internet access is permitted but must only be used for the purposes of research and information gathering as required by the task, for example, viewing manufacturer websites and technology review sites.

At the end of this task, you will be required to submit your browsing history to verify the sources used.

(28 marks)

You have been requested by the client to propose and plan the digital infrastructure to support the planned 10 accountants and the internal wireless environment. The purpose is to allow for central network-attached storage (NAS) and servers to store and retrieve financial documentation. Your client is concerned about how employees can save documents on their desktop computers and then retrieve them when presenting via the laptop, therefore this must also be included in your proposal. There are potentially 10 employees going to be working in the head office at any one time.

You have been asked to confirm the network architecture you will use, which servers will be appropriate and other networking architecture requirements. You are required to collate this information ready to present to the client for sign off.

Instructions for students

Note: Please provide print screens of all online sources used clearly showing the URL – the print screens must be accompanied by your written evaluation of the sources

Create the technical proposal for the servers, roles, storage and operating systems. You need to present the following information and diagram before your line manager can sign-off your work:

- identify 3 suitable physical servers and make a justified recommendation of 1 to be purchased, for example, by referring to suitable storage and operating system, and potential costs:
    - when selecting equipment, you must evaluate the sources of information used to inform your selection process (including consideration of reliability, bias and accuracy), the company currently uses Windows server 2012 and the client wants to know if they should stay with this OS for the purpose of network connectivity
- discuss the proposed architecture for the network infrastructure:
    - explain the reason for the architecture used and how this will benefit access from the accountants, along with the receptionist
    - justify the approach to the architecture of the network, for example, the use of physical, virtual, cloud or hybrid, you should focus on resilience and performance
    - recommend the roles and applications the business will require on the 2 servers, including software requirements
- produce a network diagram to show the topology used within head office, refer to roles and applications using a suitable network diagram tool (for example, Microsoft Visio or Cisco Packet Tracer)

You will have access to the following equipment:

- internet
- word processing software
- diagram software (for example, Microsoft Visio or Cisco Packet Tracer)

Evidence required for submission

The following evidence should be recorded in the workbook:

- technical proposal covering servers, storage and operating system specifications with rationale
- print screens of all online sources clearly showing the URL – print screens must be accompanied by your written evaluation of the sources
- technical proposal with justification of planned network architecture and topologies, including recommended roles and applications to be installed on the servers
- network diagram to show the physical server arrangement with roles and applications

Task 3: design – communication equipment

Time limit

5 hours

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

You are advised to spend approximately 1 hour on the research element of the task.

Internet access is permitted but must only be used for the purposes of research and information gathering as required by the task (for example, viewing manufacturer websites and technology review sites).

At the end of this task, you will be required to submit your browsing history to verify the sources used.

(28 marks)

To complete the new network the installation and configuration of switches, routers and wireless access points must be undertaken. Use the following requirements to help shape your implementation:

- the wireless network needs to be secured and should prevent access from all unauthorised users
- the network should be able to expand over time as the accountants are planning for a growth in video conferencing and footfall in the building and additional capacity might be required
- the building has thin stud walls between meeting rooms that are easy to drill through, consider how many wireless access points are required to maintain a strong connection
- the placement and specification of switches and wireless equipment should have reliability, organisation and redundancy built into the approach
- cloud services and platforms can be recommended to improve the functionality, security or performance of the network however the company has not previously used the cloud before and a strong proposal would be needed

Note: You may suggest any suitable providers of cloud services and platforms

Guide: 25GB of storage is required for all 5 cameras per day, this means 350GB of total storage for 2 weeks

- the emphasis should be on security, resilience and performance across the network, and storage

Instructions for students

Note: Please provide print screens of all online sources used clearly showing the URL – the print screens must be accompanied by your written evaluation of the sources.

Create a technical proposal that includes:

- a suitable network must be provided for authorised users' use:
  - with the regular use of financial documentation the owner is concerned employees could cause a data breach, you must propose how to minimise and mitigate data breaches on the network (both technically and by the authorised users)
  - employees should only be able to connect to the network internally via a wired or wireless connection, clients will not have access to either the wired or wireless networks (internet access should be password protected to prevent access from clients but to allow for the accountants to present in the office)
  - the specification of network devices and media should consider reliability, performance, redundancy and security

  - the network should be scalable to meet planned further increases in capacity and recruitment is planned, along with the storage of more financial documents
  - the client would like you to propose device management software to prevent the one presentation laptop from going missing, this software should ensure effective backing up of data, enforce encryption and allow for remote device management
  - when recommending cloud services and platforms for future integration you must evaluate the sources of information used to inform your selection process, including a consideration of reliability, bias and accuracy
- an updated floor plan (provided) to show suitable placement of network devices within the current office

You will have access to the following equipment:

- internet
- word processing software
- diagram software (for example, Microsoft Visio or Cisco Packet Tracer)

Evidence required for submission

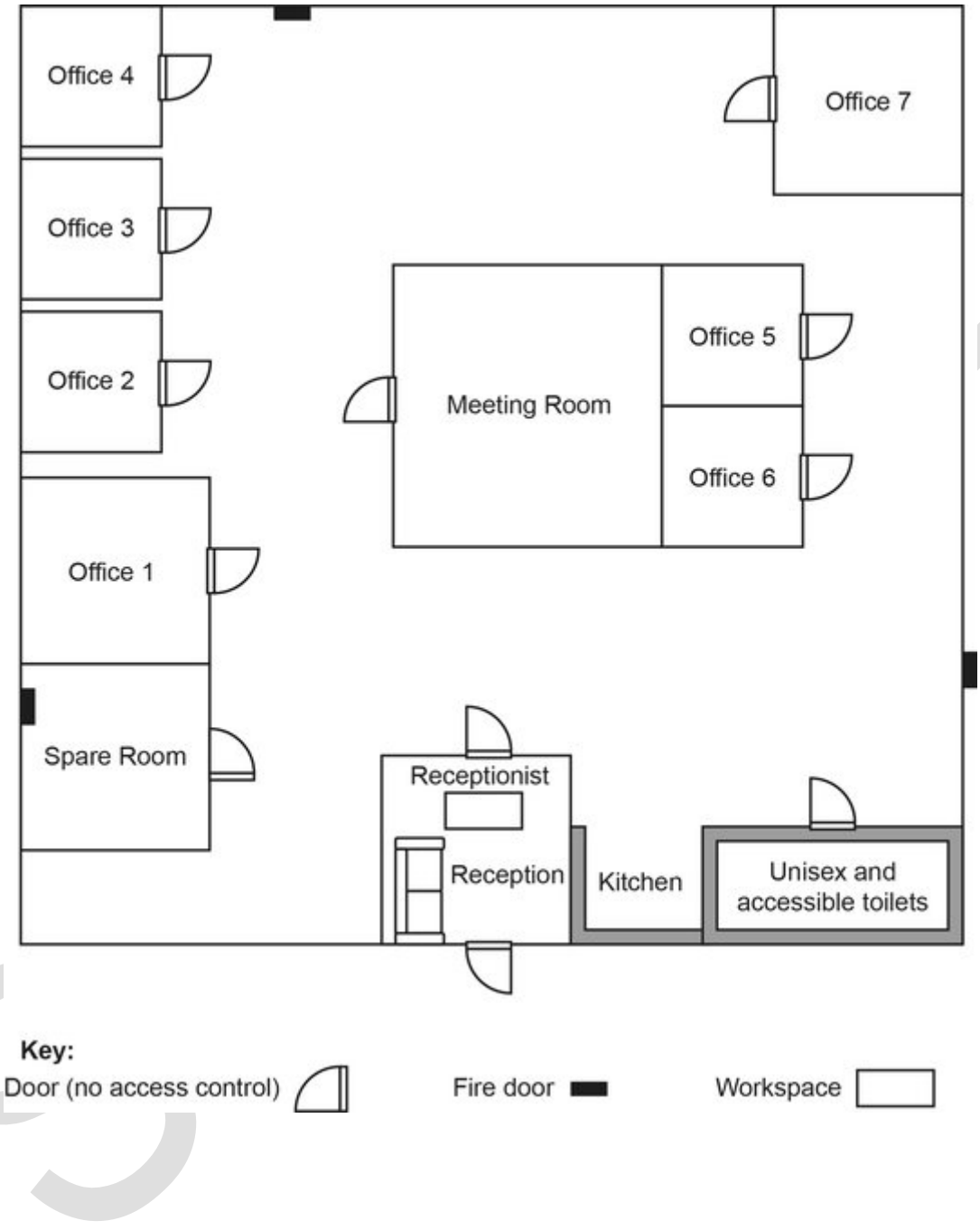
The following evidence should be recorded in the workbook:

- annotated floor plans showing the placement of the infrastructure

Note: This can be one floor plan showing all elements or separate floor plans focusing on different infrastructure elements

- technical documentation covering the switches, wireless infrastructure, specifications, configuration and placement with rationale
- justification for your approach to the problem, that considers security, manageability and upgradeability
- print screens of all online sources used clearly showing the URL - the print screens must be accompanied by your written evaluation of the sources

Floor plan: DoubleUp Bookkeeping office



Document information

The T Level Technical Qualification is a qualification managed and approved 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.

Owner: Head of Assessment Design

Change History Record

Version	Description of change	Approval	Date of issue
v1.0	Additional sample material		01 September 2023
v1.1	Sample added as a watermark	November 2023	17 November 2023