T Level Technical Qualification in Digital Support Services

Occupational specialism assessment (OSA)

Digital Infrastructure

Assignment 1 - Pass

Guide standard exemplification materials

v1.1: Specimen assessment materials
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T Level Technical Qualification in Digital Support Services
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Digital Infrastructure

Assignment 1

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Introduction

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

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

In assignment 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

Willow Technology is a company that specialises in the creative industries developing websites, computer animation, video and some motion capture work.

Willow Technology is currently in the process of moving to a new building. The new building is 2 storeys high and features a range of different rooms, all with unique purposes. The cabling and installation of network ports has already been implemented and you need to add the required hardware that will provide a very robust network.

There are 3 tasks you need to complete to help plan and specify network equipment. As you work through the assignment, more information will be provided regarding the network.

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 building is due to be handed over in 20 working days from the date you begin this assignment. You will then have a further 40 days to install, configure, test and migrate over to the new network. This is a very tight timeframe to cover all the activities required and the new network needs to be in place for go-live after this date, giving a total project duration of 60 days.

Note: A working day is Monday to Friday and any bank holidays are treated as normal working days.

To help you in planning the task, the following additional information has been provided:

- a small test network needs to be developed to verify network compatibility before the new network is implemented
- physical installation and configuration of the live system cannot begin until the building has been handed over
- network cabling will be installed by a third party during the first 5 days after the building has been handed over
- the design and selection of the infrastructure should be carried out in 2 phases: servers and storage, and communication equipment
    - servers and storage – new servers will need to be selected and data migrated from the old system to the new one – in addition to the servers, a storage solution is required to host the various websites, databases, audio, video and graphics required by the business
    - communication equipment – new switches, wireless infrastructure and CCTV cameras are required to be installed throughout the new building
- 3 days should be allocated for data migration from the old system to the new one with 1 extra day for testing and troubleshooting
- assume 3 days for delivery of any equipment being ordered
- 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:

- develop both a project plan **and** Gantt chart for the development of the new network, working within the solution lifecycle
- the implementation will require the installation of equipment – explain the legal requirements that need to be addressed when undertaking the task, including the storing and processing of data, remote access and the handling of equipment
- identify and explain a range of physical and digital security vulnerabilities that could affect the new building and the business – for each vulnerability, identify and justify the countermeasures that could be applied to the building and the network to help mitigate the threat
- annotate any physical countermeasures on the floor plans in the workbook – a copy of each floor plan is also provided at the end of this assignment brief

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:

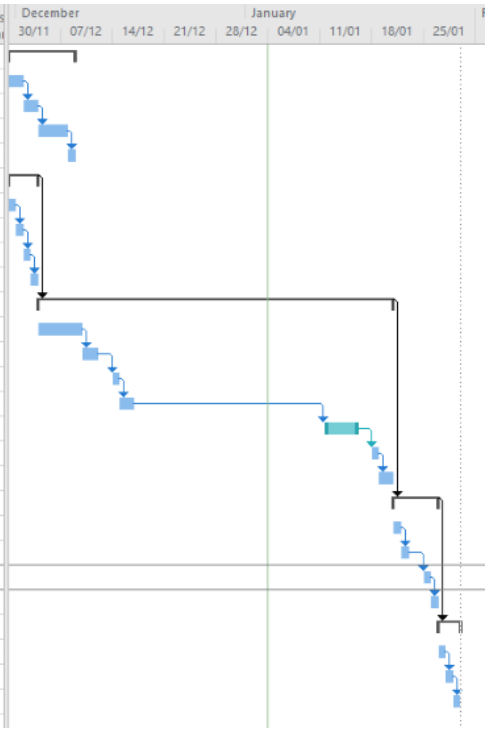
- project plan **and** Gantt chart showing critical path, with activities and suitable timeframes following the solution lifecycle
- explanation of legal requirements when working with equipment
- written account of the physical and the digital threats and security countermeasures applied
- annotated floor plans with physical security measures shown

Student evidence

Task 1: planning

Project plan and Gantt chart

	Task Name	Duration	Start	Finish	Predecessors
1	**Planning**	**7 days**	**Mon 30/11/2**	**Tue 08/12/2(**	
2	Identify requirements	2 days	Mon 30/11/2	Tue 01/12/2(	
3	Look at the floorplan	2 days	Wed 02/12/2	Thu 03/12/2(	2
4	Outline equipment	2 days	Fri 04/12/20	Mon 07/12/2	3
5	Customer meeting	1 day	Tue 08/12/2(	Tue 08/12/2(	4
6	**Design**	**4 days**	**Mon 30/11/2**	**Thu 03/12/2(**	
7	Select servers	1 day	Mon 30/11/2	Mon 30/11/2	
8	Select switches	1 day	Tue 01/12/2(	Tue 01/12/2(	7
9	Select security system	1 day	Wed 02/12/2	Wed 02/12/2	8
10	Select storage	1 day	Thu 03/12/2(	Thu 03/12/2(	9
11	**Implement**	**34 days**	**Fri 04/12/20**	**Wed 20/01/2**	**6**
12	Order equipment	4 days	Fri 04/12/20	Wed 09/12/2	
13	Install Switches	2 days	Thu 10/12/2(	Fri 11/12/20	12
14	Install servers	1 day	Mon 14/12/2	Mon 14/12/2	13
15	Install operating systems	2 days	Tue 15/12/2(	Wed 16/12/2	14
16	Configure servers	4 days	Tue 12/01/2:	Fri 15/01/21	15
17	Install cameras	1 day	Mon 18/01/2	Mon 18/01/2	16
18	Copy data	2 days	Tue 19/01/2:	Wed 20/01/2	17
19	**Test and Review**	**4 days**	**Thu 21/01/2:**	**Tue 26/01/2:**	**11**
20	Test switches	1 day	Thu 21/01/2:	Thu 21/01/2:	
21	Test servers	1 day	Fri 22/01/21	Fri 22/01/21	20
22	Test cameras	1 day	Mon 25/01/2	Mon 25/01/2	21
23	Test backup	1 day	Tue 26/01/2:	Tue 26/01/2:	22
24	**Review**	**3 days**	**Wed 27/01/2**	**Fri 29/01/21**	**19**
25	Fix outstanding errors	1 day	Wed 27/01/2	Wed 27/01/2	
26	Review with customer	1 day	Thu 28/01/2:	Thu 28/01/2:	25
27	Complete project	1 day	Fri 29/01/21	Fri 29/01/21	26



Legal requirements and data security

- health and safety – this will ensure that people use good manual handling and also work in a tidy manner – also to avoid slips trips and falls when working with equipment, ensuring you work tidy
- computer misuse act – make sure you do not damage equipment with malicious intent, or to use data inappropriately
- General Data Protection Regulation (GDPR) – to ensure that data is handled correctly, is not transmitted outside of the country, deleted when no longer needed
- backing-up – the systems need to be backed up so that if migration fails or some upgrade fails, the system can be rolled back to a previous good state
- antistatic precautions – even though new equipment is being purchased and installed, components might still need to be handed that could be considered static sensitive

Physical Threats and Security Countermeasures:

Fire

- the first risk to the building is fire, this can cause major disruption to the business whilst the building is repaired, and equipment replaced – installing sprinklers and other fire suppression systems will reduce the risk of equipment being damaged in a fire

Theft

- theft of equipment will not only cost the business money to replace the hardware, but it is the loss of the data stored on them
- I would recommend use of locks to reduce the risk of someone just walking away with a laptop that is left unattended
- use of software like Intune would allow you to lock a computer or phone that is stolen remotely
- the building should also implement CCTV cameras throughout to act as a deterrent for potential thieves – if a computer is stolen you will be able to identify the thief

Electrical and heating

- a UPS will help reduce the risk of electrical damage to equipment by providing a constant quality of electricity free of surges and drops
- keeping the server in an air conditioned space will keep equipment cool and prevent overheating

Digital threats and security countermeasures

Equipment failure

- an additional server and switch will be purchased so that if either a server or a switch fails, then another could be swapping in – locating the backup server in a different location will protect data in event of a fire

Malware

- virus checkers will be installed on all computers and the machines will also have the latest updates applied – the virus checker should be part of an endpoint security system to centrally manage updates and force computers to be up to date at all times

Hacking

- wireless access will require authentication with active directory to ensure that all users have valid accounts – a firewall should be installed on the network to prevent an intruder accessing the network from the internet – users should be blocked from installing software on their own computer

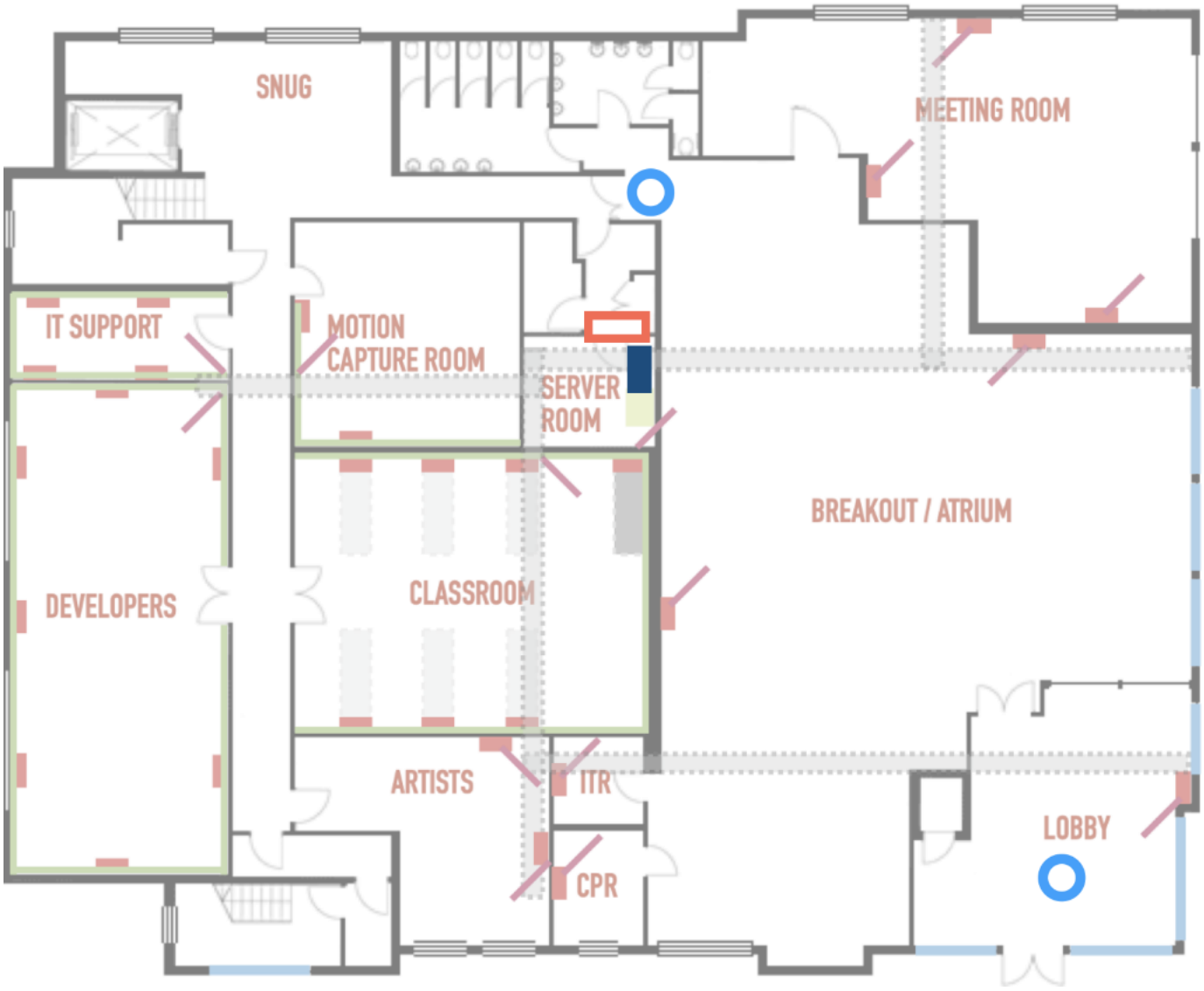
Remote access

- remote access into the business will not be provided to ensure the network is as secure as possible – however, some items will be stored in the cloud to make it easier for people to work together

Annotated floor plans

	IP camera	These will be used to guard against any theft of equipment or other malicious activity. One camera will identify any intruder accessing the building through the lobby and the other will allow us to capture any intruder accessing staff areas that shouldn't.
	UPS battery backup	In the event of a power loss, they would be able to sustain the servers until the power resumed or provide enough time to power down the servers.
	Swipe card door entry	The external door will have a swipe card access to prevent unauthorised access to the server room.

Floor plan: ground floor



Floor plan: first floor

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)

As part of the move to the new building, the selection and arrangement of the servers and subsequent storage solution needs to be addressed. Use the following requirements to help shape your implementation:

- the network will need to support 30 wired desktop computers and a further 20 wireless devices, plus an additional 15 remote access clients
- an initial 60TB of shared storage should be provided for the file servers and this figure should be able to double over the next 3 years – most of the file storage will be for the various 3D models, videos, images and sound files developed during the day-to-day business activities
- reliability and redundancy should be built into the servers
- performance is crucial for the web server and corresponding database servers as they will be used for customer testing during development

Instructions for students

Create the technical proposal for the servers, roles, storage and operating systems. The following information and diagram are required for both the customer's review and your line manager's sign-off:

- the roles and applications the business will require on the servers, including hardware and software system requirements
- a justified approach to architecting the servers, for example, physical, virtual, containers or hybrid, with a focus on resilience and performance
- details on the servers, storage and operating system required, with justification
- a server diagram that shows how the servers will be arranged with the roles and applications using a suitable tool, for example Visio or Packet Tracer
- when selecting vendors and equipment, evaluate the sources of information you use to inform and back up your selection process
- consider the reliability, validity, bias and accuracy of the sources you have used

You will have access to the following equipment:

- internet
- word processing software
- diagram software

Evidence required for submission to NCFE

The following evidence should be recorded in the workbook:

- diagram of the physical server organisation, showing roles and connectivity information with storage
- technical documentation covering the servers, configuration, storage and operating system specifications with rationale
- print screens of all online sources used clearly showing the URL – the print screens must be accompanied by your written evaluation of the sources

Student evidence

Server approach

Willow Technology is a company that specialises in creative industries. In their field they will need their network to have plenty of storage capacity, ability to host a web server and database to host customer websites.

This means they will require a large amount of file storage, a directory server and a web server. This means it will need 3 physical servers to cover this off. It makes it easier to organise as each server will just be doing fixed tasks.

One of the benefits of this approach is that the servers can be purchased with just enough capability to achieve the required task. The approach to the hardware provides better utilisation for example, CPU and memory rather than buying over the top machines.

The following table shows the various roles that will need to be installed as part of the initial build of the network

Server 01		Web server	Support
Domain name service (DNS) Dynamic host control protocol (DHCP) Active directory Remote access service (RAS)		Database Web server	File server

More detail on this in the section titled technical documentation

Server roles

This server will effectively govern the network providing authentication to all users logging in and applying policies to lock down individual computers. The roles allocated will be:

- DNS – DNS will be required on the network to allow the mapping of device names to IP addresses
- DHCP – DHCP will ensure that both wired and wireless devices are allocated an IP address that will allow them to connect to the network
- directory service (active directory) – the directory service will provide the address book of all the users and computers available on the network as well as providing the policies that will lock down computers to limit the way that end users can use them to company policies
- RAS – allows remote users to connect via VPN to access work resources

Application roles

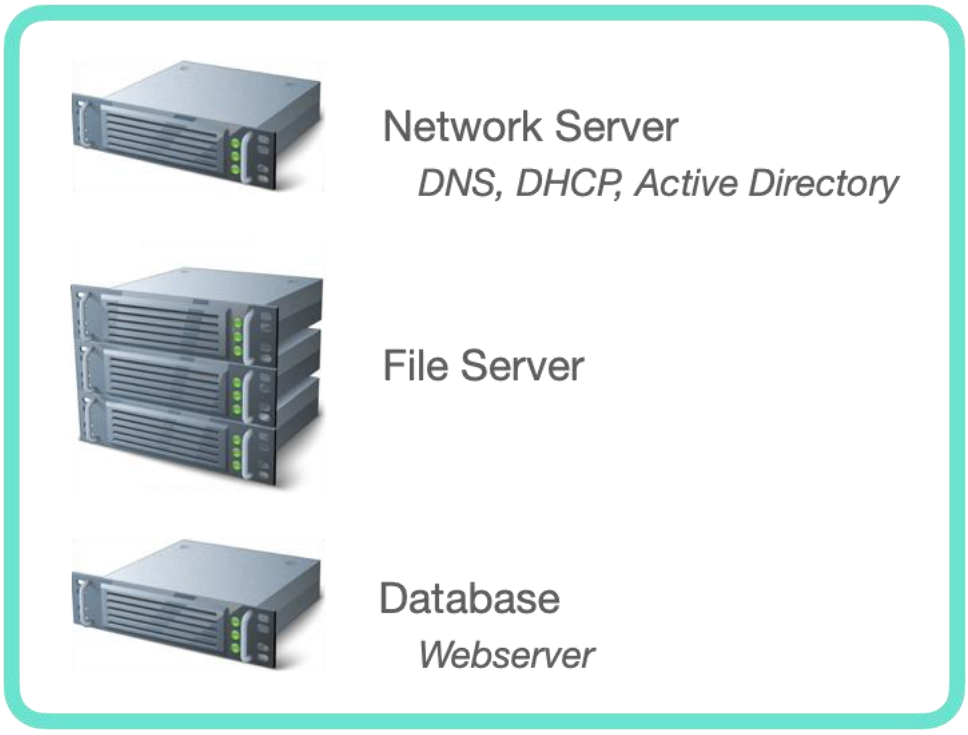
- webserver– this is where websites will be stored and created for customers to test – Internet Information Services (IIS) is built into Windows and can be used to host customers websites

- database (SQL server) – this will provide the website data required to make the websites – SQL needs to be installed on the server so that websites can access the database to save customer data
- file and storage services – this will provide centralised storage, backup and control of the files – installing this role will allow all files and data to be accessed by any user on any computer – it will also allow us to apply polices to make sure that only authorised users can actually see and access files they are allowed to – file and storage services will allow us to run backups easily to make sure that our data is protected

The following table breaks down how the various roles and applications will be split over the machines.

Network server – Server01 This server will govern the network and have the following roles	DNS DHCP Directory service (active directory) Remote access service (RAS)
Web server. This server will hold customer websites and the databases with customer data.	Database, webserver
File server This server will be used to hold company data. This server will need to be backed up daily to prevent loss of data in event of system failure.	File and storage services

Technical documentation



Network server and database (Server01 and Webserver)

I recommend that we purchase 2 of these servers and use 1 for each of the servers named above.

	HyperServe RMXE-2U8 X11SCM-F with Dual Intel Gigabit LAN & Dedicated LAN for IPMI & Remote KVM Management Intel Xeon E-2224, 4 Core, 3.4GHz, 8MB Cache, 71Watts. 4 x 16GB DDR4 2666MHz ECC UDIMM Module

The main server has been selected based on a number of reasons:

- Novatech is a good local company that have a good reputation and the system represents a good price
- the HyperServe RMXE-2U8 server offers 1x Intel Xeon E-2224, 4 Core physical and 4 virtual cores running at 3.4GHz, 8MB Cache means that this is easily powerful enough to carry out the 3 roles that are not that demanding all for the price of £1359.98
- the memory has been set at 6 x 16Gb (64Gb) filling all 4 available slots – in the future this memory could be replaced with 32GB DDR4 2666MHz ECC UDIMM Module giving a total of 128Gb of memory
- the main storage will reside on the file server, but 4x Intel S4510 480GB 2.5" SATA3 6Gb/s Data Centre SSD drives have been added to the base specification – this gives a large amount of space on the server and SSD's are very fast to respond so this should make the machine easily powerful enough to handle DHCP, DNS and active directory as well as the webserver database role

This server is sufficiently powerfully enough to powerful to run the server roles: active directory/DNS/DHCP on Server01, and IIS/SQL on the webserver.

By using 2 of these servers we will have great performance, and by using 2 different servers we separate the workload without overloading either server. Backups will allow us to recover the servers quickly in event of a server failure.

Both these servers will run Windows Server 2019 as an operating system (more details below) but this operating system is capable of providing all the roles we need as long as we install the SQL server onto the webserver as well.

The server being used as Server01 is more than powerful enough to support 50 clients connecting to it as well as allowing remote access VPN connection via RAS.

File server

	HyperServe AFX-2U24 2U Rack Chassis 24x 2.5" U.2 Bays 1600Watt Redundant PSUs Gigabyte MR91-FS0 Motherboard Intel Xeon Bronze 3204, 6 Core, 1.90GHz, 8.25MB Cache, 85Watts 2 x 16GB DDR4 2666MHz ECC Registered DIMM Module 10 x Seagate Exos 10E2400 12TB 2.5" SAS 12Gb/s 10,000RPM Enterprise HDD 1+1 1600W Platinum Redundant Power Supply rail kit included

As this machine is a file server it requires storage capability over processing, it has the ability to take 24 2.5” drives that can be added to the storage server that makes this a very useful server that can grow with the business.

The specification I have selected has 10 drive bays filled giving a total storage of 120TB of storage, if another 14 of the same hard disks are purchased then this would give 288TB of storage. This would allow all the files and media to be centrally stored for Willow.

Operating system

Each of the servers will be Windows Server 2019, this powerful and well used operating system is used extensively in industry and works with the desktop operating systems. The operating system is the latest server release from Microsoft and should support for business for the next few years. Windows Server 2019 is able to support all of the server roles listed above as long as we install the SQL server onto the webserver as well.

Another benefit of the operating system is that it has a rich and successful history and numerous sources of product support and training.

Redundancy and reliability

All the servers selected support RAID which can be implemented effectively to provide redundancy in event of hard drive failure. When configured RAID is designed to keep running when a hard drive fails with data being copies onto multiple hard drives. The broken hard drive can be replaced and the data will automatically copy itself back onto the replacement.

It is also a good idea to purchase duplicates of all the servers. If we do this, we can configure the duplicates as failover servers so that if one goes down it is able to take over keeping the overall system running.

Print screens of online sources used and written evaluation of sources

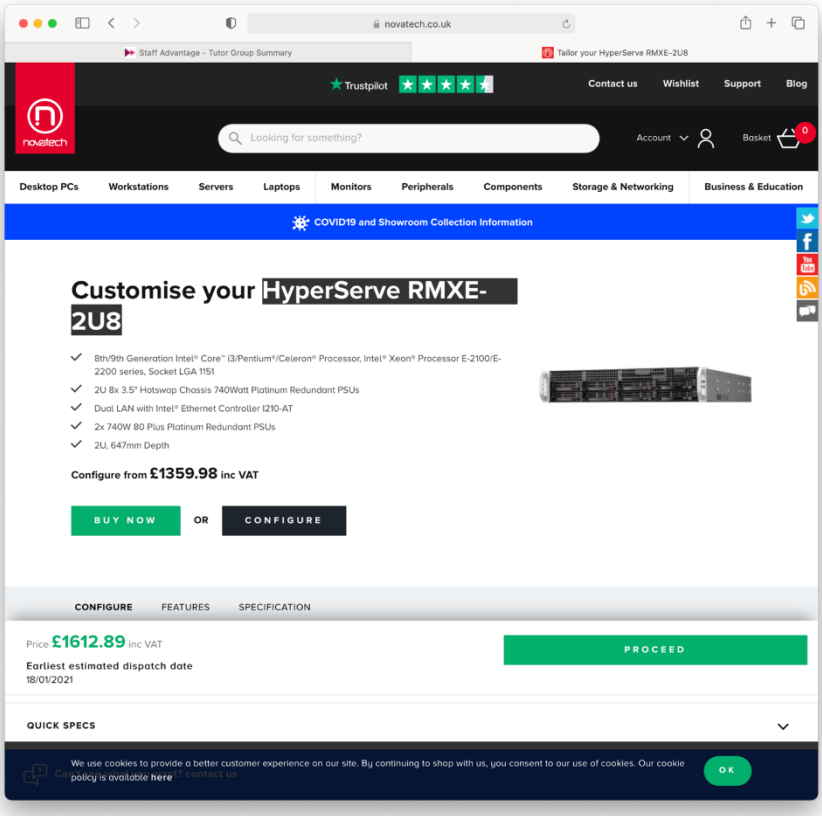


Figure 1 – www.novatech.co.uk/newmodserver.html?s=SR-0246

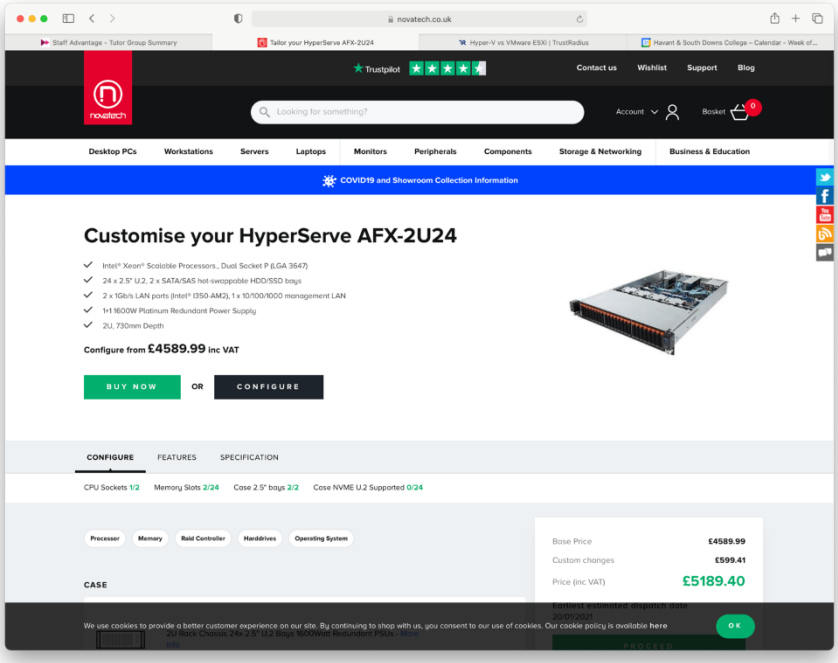


Figure 2 – www.novatech.co.uk/newmodserver.html?s=SR-0216

I used the Novatech website to select the 2 servers, as you will see later, they are a highly rated company. On the website they give you features of the various servers and also the technical specifications that you can configure to meet your needs. On the website they allow you to select servers and file servers and this was useful when picking a server. This was a good source of information and helped when selecting storage and servers.

I was able to select a server that was powerful enough to meet all the technical specifications – support (30 wired/20 wireless devices and 15 remote access connections), 60TB shared storage with capacity to double over three years, reliability and redundancy through RAID.

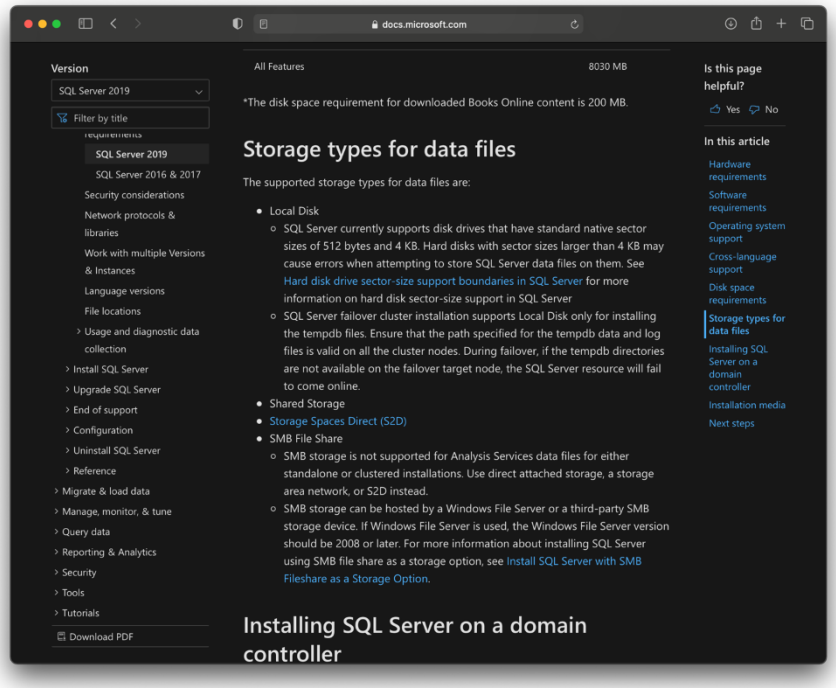


Figure 3 – www.docs.microsoft.com/en-us/sql/sql-server/install/hardware-and-software-requirements-for-installing-sql-server-ver15?view=sql-server-ver15

Microsoft is a trusted source and I needed to confirm information about the latest version of Server 2019. SQL server is needed to be installed on the web server, and I have confirmed that this Windows version supports SQL.

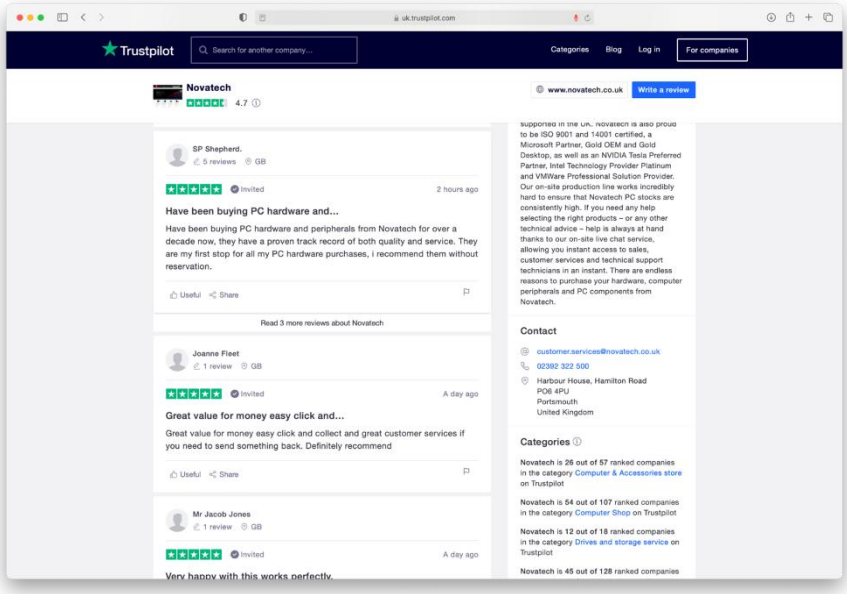


Figure 4 – www.uk.trustpilot.com/review/www.novatech.co.uk

The following source gave me confidence in the information on the Novatech website, they were rated as 4.7 out of 5 on Trustpilot. This means that you can rely on the feedback and information on the website.

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)

The final part of the move into the building is the planning and design process for the installation of the switches, WiFi and CCTV. Use the following requirements to help shape your implementation:

- the wireless network needs to be secured and should prevent access to data stored on the main network
- the network should be able to expand over time as more wireless demand is required and additional wired ports might be required
- the placement and specification of switches and WiFi equipment should have reliability, organisation and redundancy built into the approach
- the 360° IP cameras should be on a private and secure network and placed in the following locations
    - one in the lobby
    - one covering the server room
    - one placed in the dining room

Note: You can choose how the cameras are integrated into the network.

- a separate NAS device must also be included to cover the storage of the video footage on the network for 2 weeks

Guide: 10GB of storage is required for all 3 cameras per day. This means 140GB of total storage for the 2 weeks.

- the emphasis should be on security, resilience and performance

Instructions for students

Create the second part of the technical proposal for the remaining elements of network infrastructure covering the switches, access points, IP cameras and NAS drive. The following information needs to be provided to the customer and your line manager:

- annotated floor plans showing the physical placement of switches, WiFi infrastructure, IP cameras and the NAS using a suitable tool, for example Visio or Packet Tracer

Note: The floor plans for both the first floor and ground floor show the position of the planned network ports and ceiling mounted cable trays. The installation of the cables will be handled by another company; however, they do require the details on where the physical network devices will be placed and interconnected.

- justify the infrastructure selected for the problem focusing on security, manageability and upgradeability against the following **3** areas
    - switching
    - WiFi
    - IP cameras and storage

Note: Internet routing and the use of firewalls are **not** required for this task.

- when selecting vendors and equipment, evaluate the sources of information you use to inform and back up your selection process
- consider the reliability, validity, bias and accuracy of the sources you have used

You will have access to the following equipment:

- internet
- word processing software
- diagram software

Evidence required for submission to NCFE

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 which 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

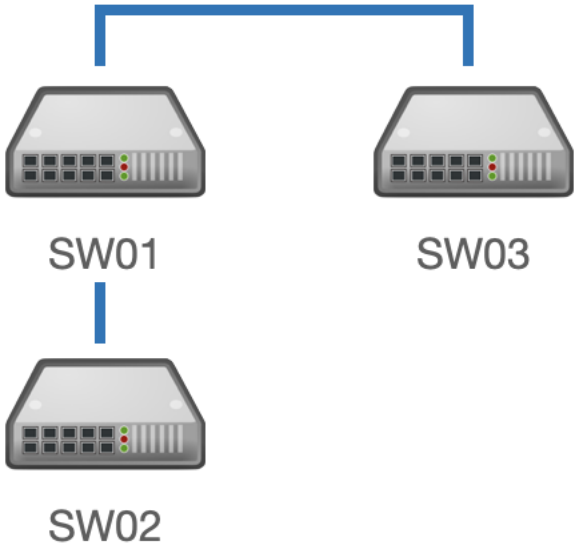
Student evidence

Technical documentation

Switches

The approach taken is to implement 3 switches in the building, 1 will be placed upstairs and the other 2 will be located in the server room and connected together. These will be managed switches, that way they can be configured and secured a little more than the unmanaged ones.

Having 3 of the same switches will provide easy configuration and installation. It also provides additional ports for spare capacity.

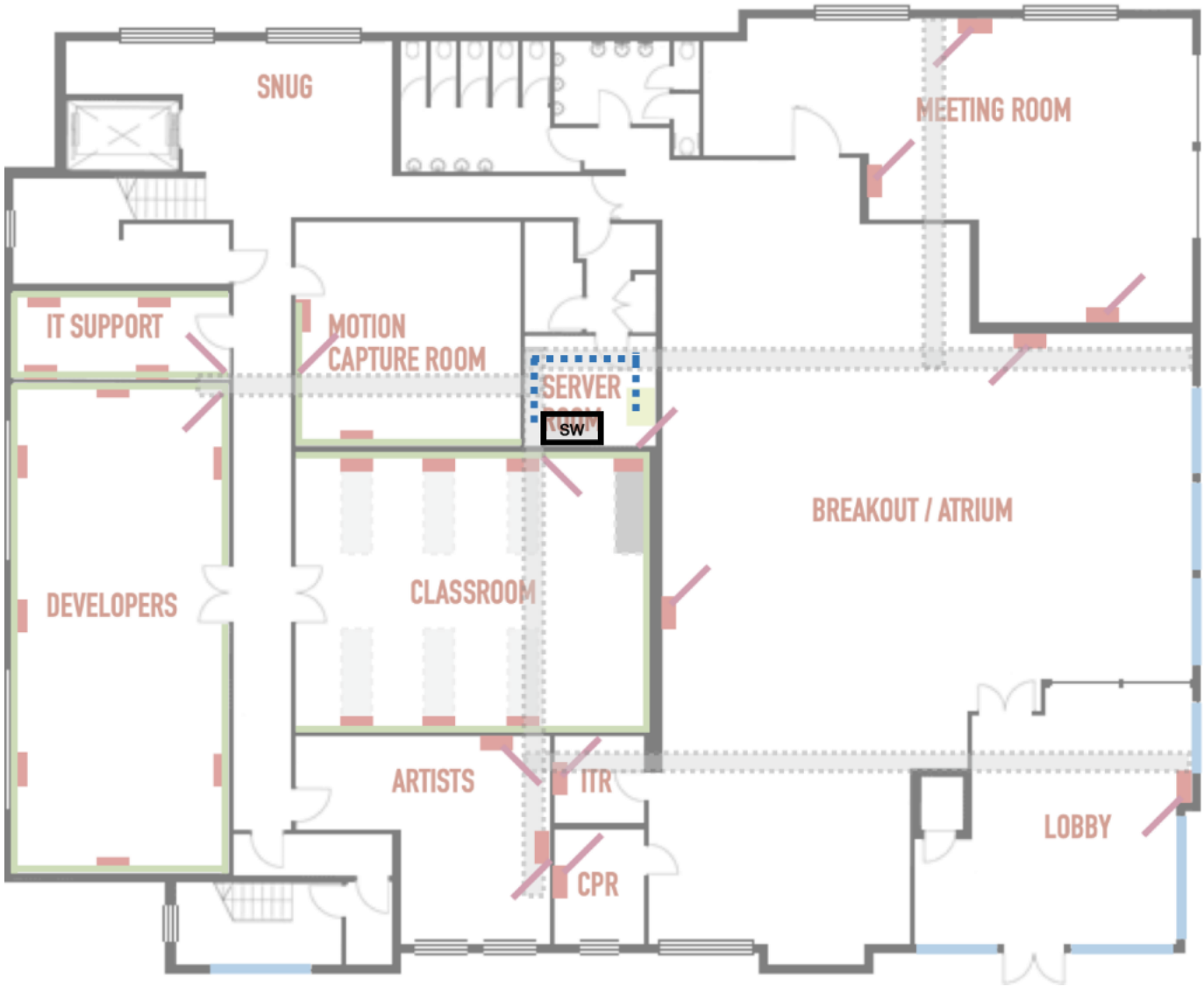


Switch	Location	Coverage	Summary
SW01	Server room	Lobby (2), breakout (4), meeting room (6), motion capture (4), artists (4), ITR (2), CPR (2), servers (4), access points	Each of the switches will have 48 network ports and 6 high speed fibre connections. This means that all the switches can be easily connect with fibre connections and also connect to the servers if they have fibre ports. This will also mean that there are sufficient extra ports should there be a reason to expand the network in future.
SW02		IT support (8), developers (14) classroom (14)	
SW03	The cinema	Cinema (4), dining room (4), lead creative (2), technical (8) – 18 ports	

	Netgear ProSafe GS752TS Manageable Ethernet switch 46 x Network (RJ-45) Ports - 6 x Expansion slots 10/100/1000Base-T – shared SFP Slot – 6 2 Layer Supported

As you can see on the floorplan below, the server room will have the 2 switches installed in the rack as outlined earlier. The 2 switches though not shown will have a fibre connection between them and another fibre going through the void to the switch directly above. This reduces the amount of cable running back to the centralised switch and separating out the 2 floors. On the map only one switch is demonstrated in the server room as they will both be installed in the same cabinet and therefore will be physically stacked together (SW01 and SW02).

All of the network ports up and downstairs will need to be cabled back to the switches. This will require quite a lot of cable. But since the cable is cheaper than buying extra switches this was felt to be a good option.


SNUG
MEETING ROOM
IT SUPPORT
MOTION
CAPTURE ROOM
SERVER
SW
BREAKOUT / ATRIUM
DEVELOPERS
CLASSROOM
ARTISTS
ITR
LOBBY
CPR

Despite the size of the upstairs, only 18 network ports have been positioned on the floor plan. The switch will be connected back via a fibre cable to the core switch in the server room. The ceiling already has the cable tray installed so the challenge of running the cable back to the single switch is relatively simple to overcome.

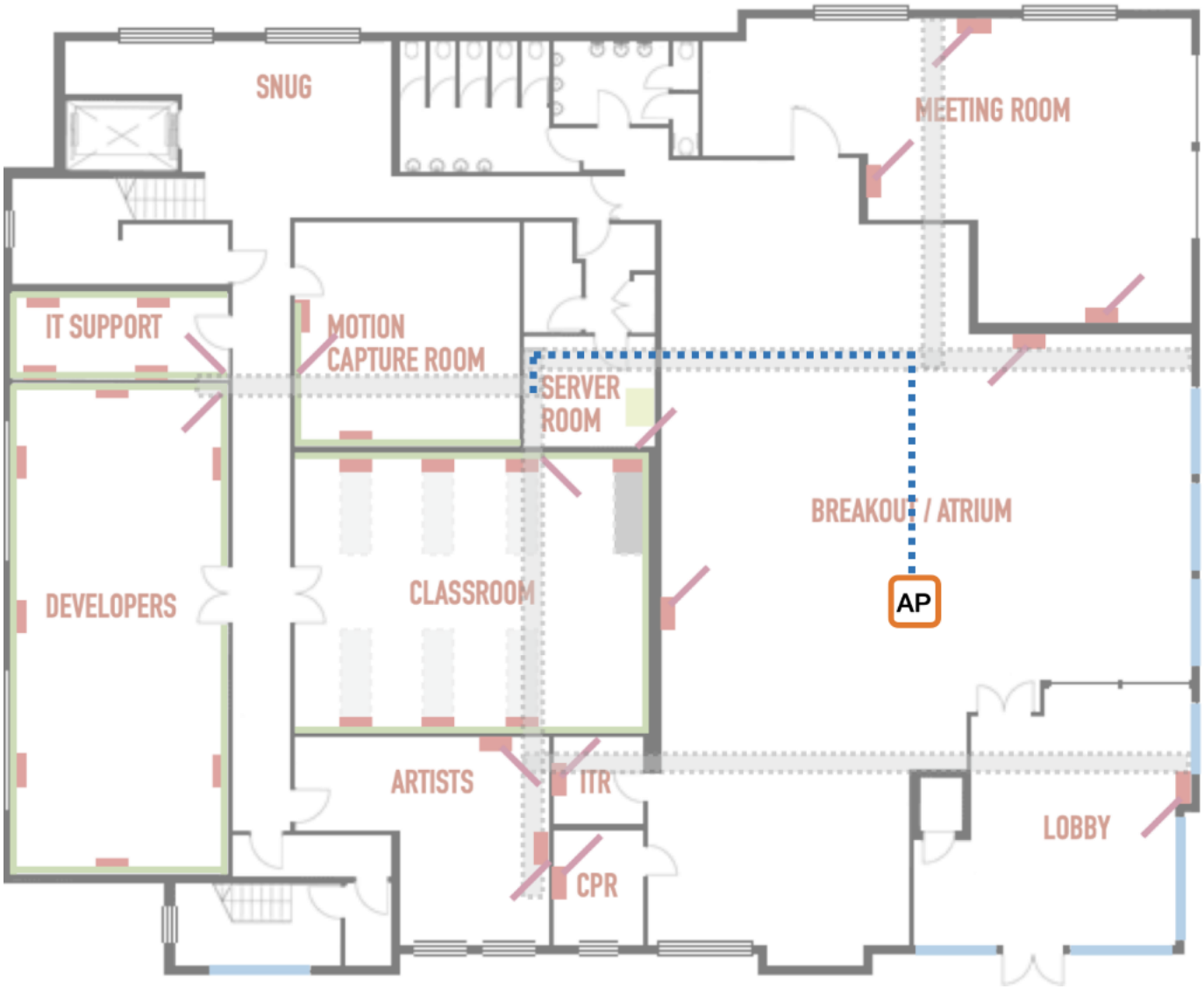
Wireless infrastructure

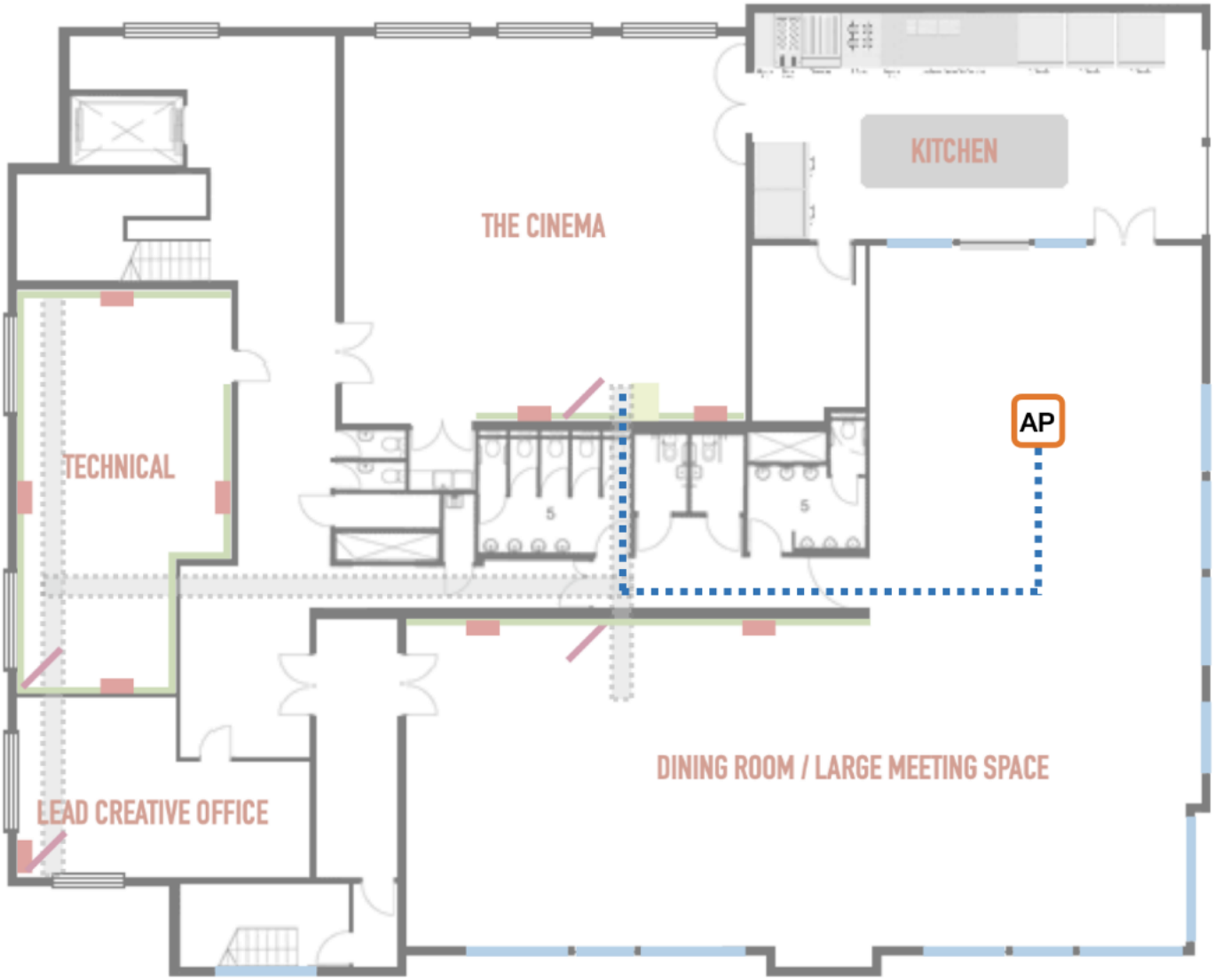
The 2 access points have been placed in high traffic areas with the majority of the customers will gather. This is why the dining room and the atrium have been covered. The built in security on the device will help secure the network as the WIFI password can be given to guests as the arrive at the building. This will also allow for future expansion as more wireless devices are added to the network as the business expands.

	TP-LINK EAP225 V3 IEEE 802.11ac 1.17 Gbit/s Wireless access point 5 GHz, 2.40 GHz 1 x Network (RJ-45)

The TP-Link supports the latest mainstream speed of 802.11ac and this is a good speed that customers and staff will appreciate. The AP connects to the central switch via an Ethernet cable.

In the upstairs spaces an AP has been installed in the dining room, again this is another public space and should a useful addition to the building. This is also connected back to the main switch using Ethernet cable.

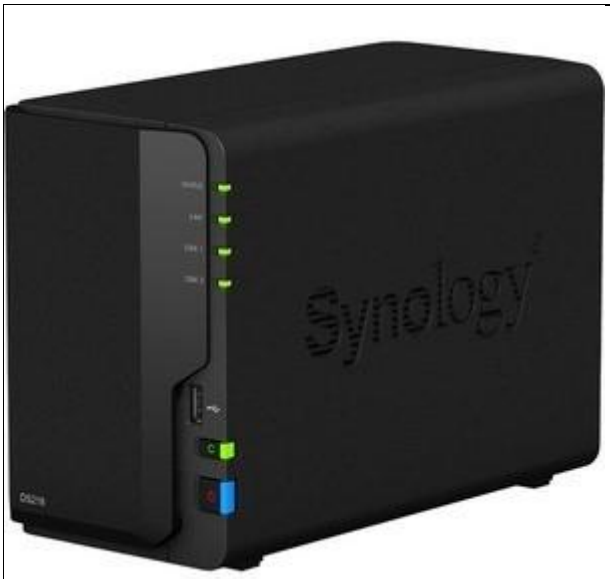

SNUG
MEETING ROOM
IT SUPPORT
MOTION CAPTURE ROOM
SERVER ROOM
BREAKOUT / ATRIUM
DEVELOPERS
CLASSROOM
AP
ARTISTS
ITR
LOBBY
CPR



CCTV solution

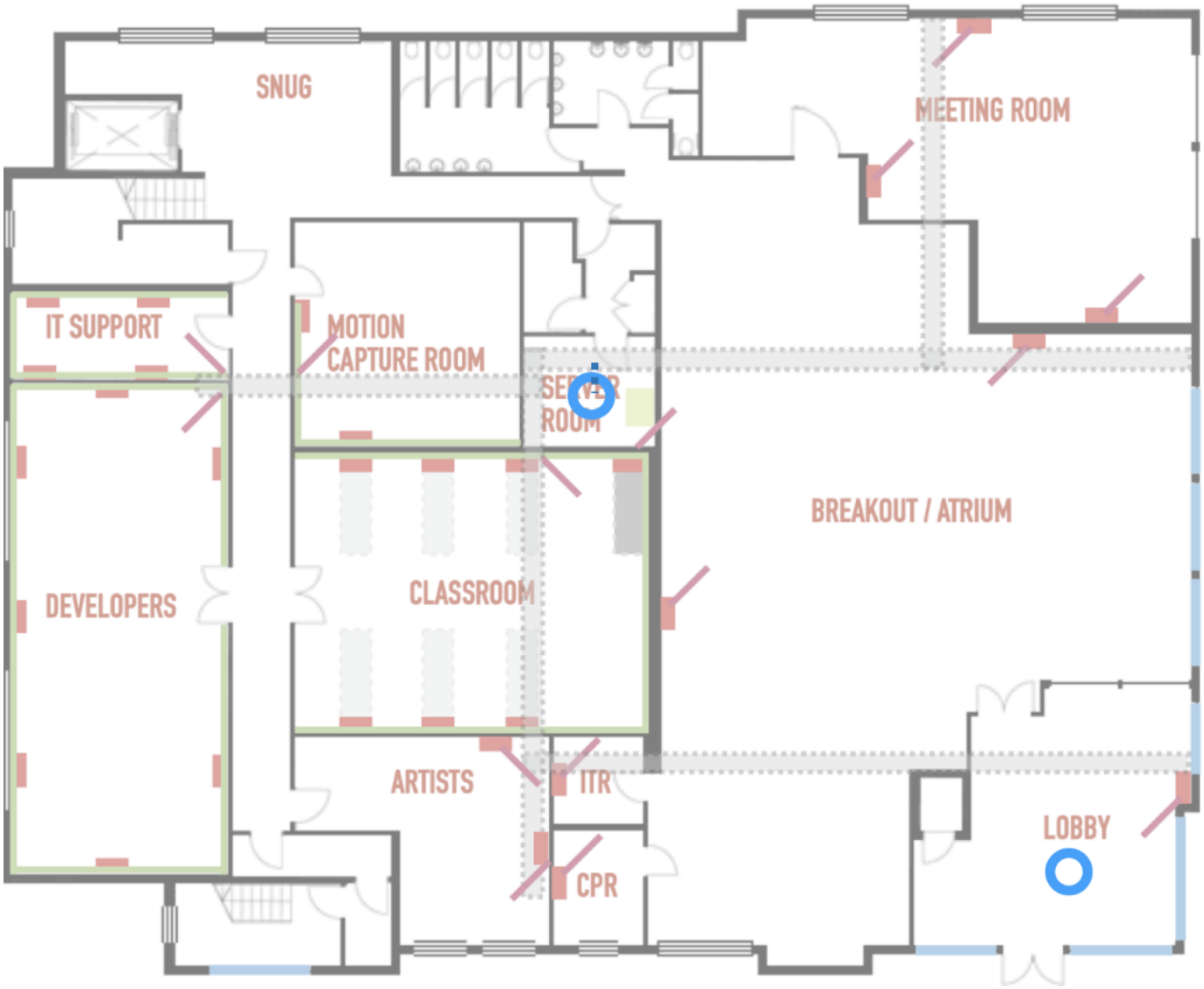
The placement of the CCTV equipment has been identified in the brief from the customer, they required a camera in the dining room, covering the server room and in the main entrance. It also stressed in the customers' requirements that they required a 360º degree camera. The D-Link cameras have been selected for a number of reasons including the price and the wireless capability.

The NAS solution is the cheapest one available from Synology and will cover off the requirements of the task. It will however need 2 hard disks added to ensure it delivers on the brief.

	Synology DiskStation DS218 2 x Total Bays SAN/NAS storage system Realtek RTD1296 quad-core (4 Core) 1.40 GHz 2 x HDD supported - 24 TB supported HDD capacity 2 x SSD supported 2 GB RAM DDR4 SDRAM
	D-Link DCS-5020L Network camera – colour - 640 x 480 CMOS Cable – fast Ethernet Wireless – Wi-Fi

Only 3 cameras and the locations have been specified by the customer as shown on the 2 floorplans. Each of the cameras will connect via wireless, this will save the need to wire them in, only needing to worry about the power for them. As they will be on the WiFi network only relevant users with the camera log in details will be able to access both the NAS drive and the camera feed.

The NAS drive also features a complete operating system that would work independently of internet access, it is also very flexible and allows for other rich additional applications to be added to the NAS drive to add functionality. It is noted on the manufacturers website that additional CCTV licenses will be required to be purchased to support every camera.


SNUG
MEETING ROOM
IT SUPPORT
MOTION CAPTURE ROOM
ROOM
BREAKOUT / ATRIUM
DEVELOPERS
CLASSROOM
ARTISTS
ITR
LOBBY
CPR

KITCHEN
THE CINEMA
TECHNICAL
DINING ROOM / LARGE MEETING SPACE
LEAD CREATIVE OFFICE

Print screens of online sources used and written evaluation of sources

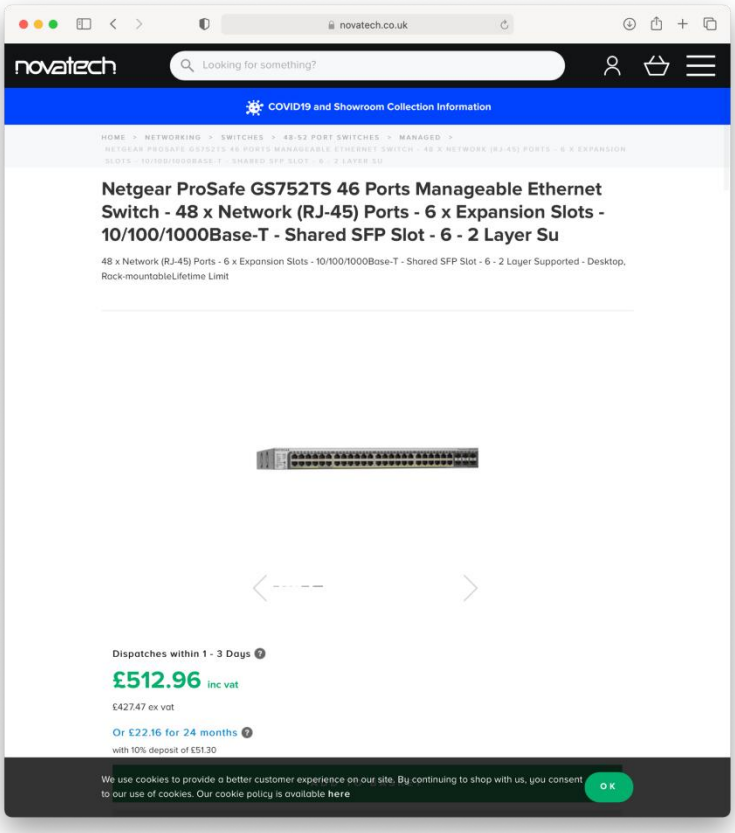


Figure 5 – www.novatech.co.uk/products/netgear-prosafe-gs752ts-46-ports-manageable-ethernet-switch-48-x-network-rj-45-ports-6-x-expansion-slots-101001000base-t-shared-sfp-slot-6-2-layer-su/gs752tsb-100eus.html

The Novatech site provided useful information about ProSafe switch, the price seemed reasonable and the technical specification would be good for what was needed.

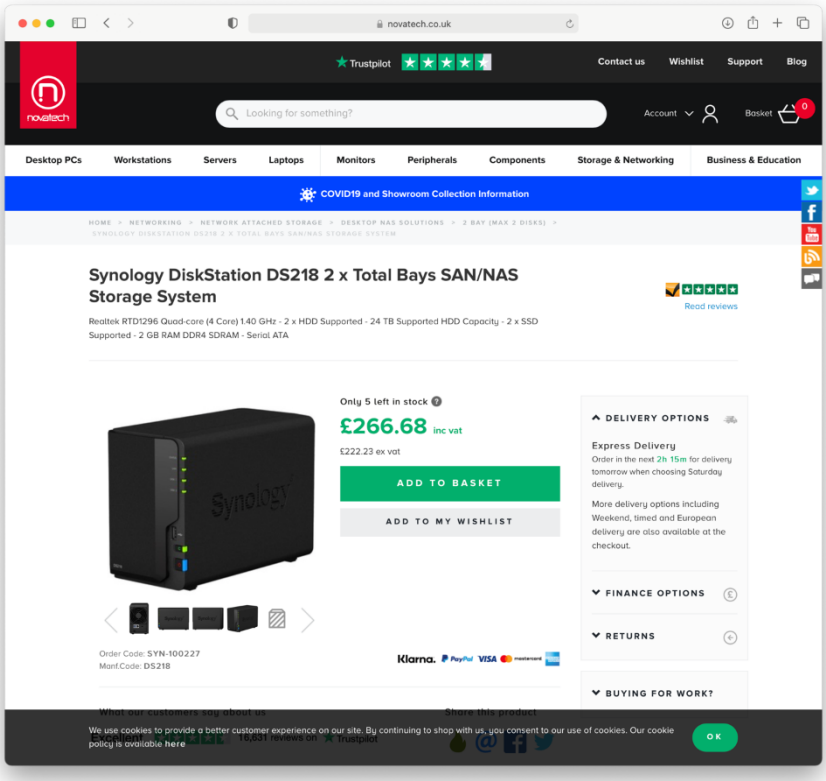


Figure 6 – www.novatech.co.uk/products/synology-diskstation-ds218-2-x-total-bays-sannas-storage-system/ds218.html

The Novatech website provided technical information about the various NAS drives available and the technical specification. Little detail was provided regarding this application, but this should achieve the task assuming all the information came from Synology in the first place.

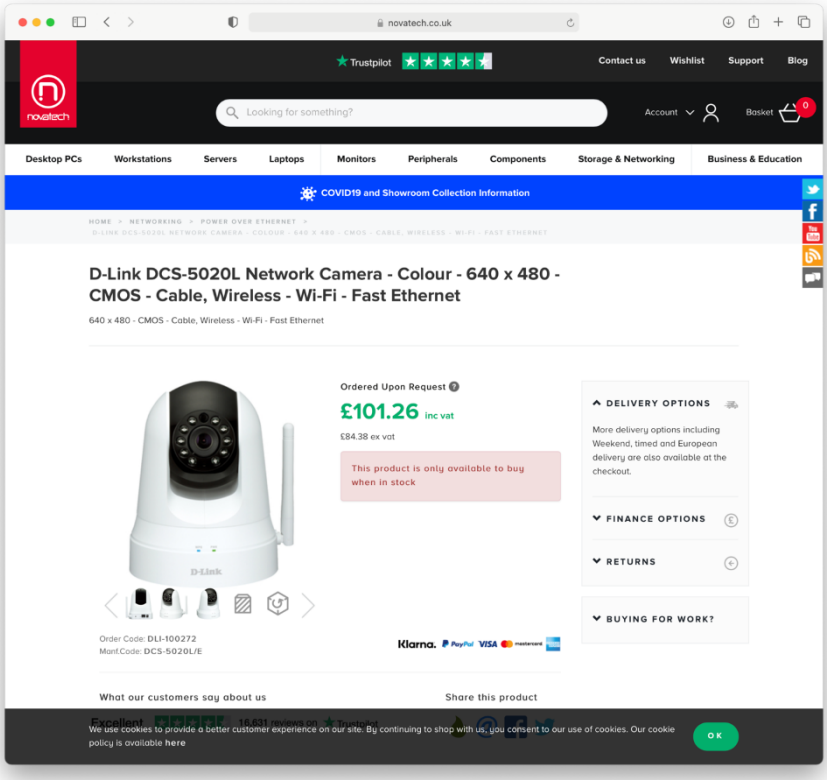


Figure 7 – www.novatech.co.uk/products/d-link-dcs-5020l-network-camera-colour-640-x-480-cmos-cable-wireless-wi-fi-fast-ethernet/dcs-5020le.html

The following page and subsequent pages just showed the features and other technical information regarding the camera. The information seemed accurate as it was on the resellers page but is has not been cross checked.

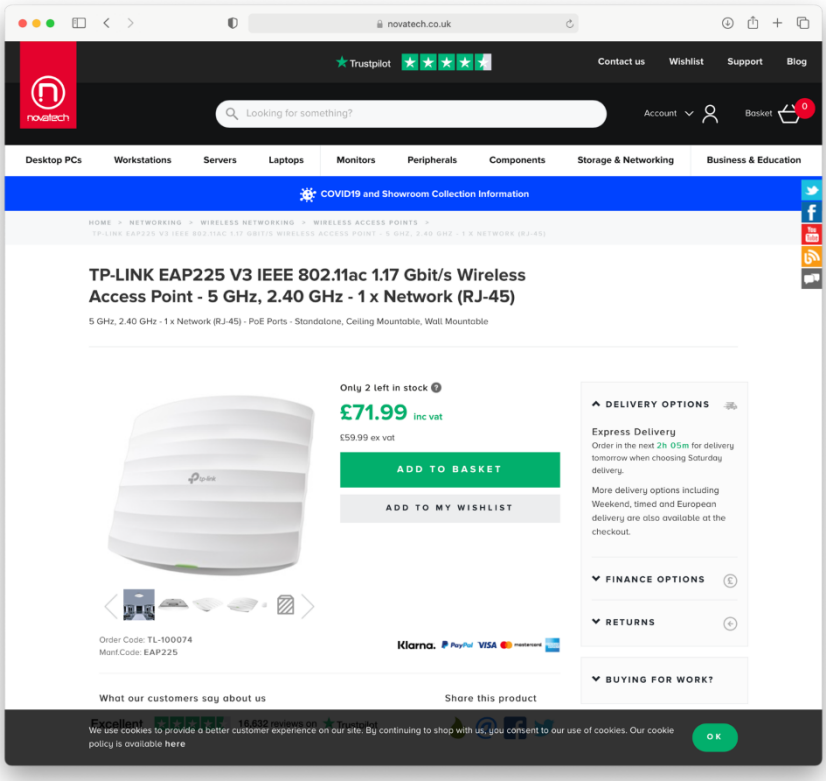


Figure 8 – www.novatech.co.uk/products/tp-link-eap225-v3-ieee-802-11ac-1-17-gbits-wireless-access-point-5-ghz-2-40-ghz-1-x-network-rj-45/eap225.html

The TP-Link camera is a good value for money access point that will provide suitable coverage with its 802.11ac connection. TP-Link is a good brand as I have used a similar access point at home and had very good results. The access point also has a secure log on to access the wireless making is a wise choice for the problem.

Examiner commentary

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

- the student throughout had a basic grasp of the case study and gave sufficient detail to demonstrate that they grasp what is required for the task
- the GANTT chart is present with sufficient breakdown to understand the thinking, but more detail would have been beneficial to award a higher grade
- the project plan would have benefited from some layout, however, the content demonstrated sufficient knowledge to understand their intentions and confirm their knowledge
- the requirements were basic but sufficient, the risks were brief, and the initial countermeasures are a good start; however, to get a higher grade we would expect these to be explored in much more detail
- the floorplans were clear, the annotation in the table was useful and clear with a basic approach undertaken
- in tasks 2 and 3, the student stuck with one vendor and selected devices that functionally deliver a solution, but this solution would not be the best fit the customer – in order to achieve a higher grade, we would expect to see an appreciation of performance, software and hardware requirements and any deep thought about what was being created for the customer

Grade descriptors

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

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

Grade	Demonstration of attainment
Pass	The evidence is logical and a **good** response to the demands of the brief.
	Makes use of relevant knowledge and is **generally** informed by the practices of the sector.
	Demonstrates an understanding of **some** perspectives or approaches associated within the sector.
	Makes **good** use of facts/theories/approaches/concepts.
	Demonstrates breadth and depth of knowledge and understanding.
	Generally selects appropriate skills/techniques/methods.
	Identifies information from appropriate sources.
	Makes use of appropriate information/appraises relevancy of information.
	Combines information to make **accurate** decisions.
	Makes **generally sound** judgements/takes appropriate action/seeks clarification and guidance.
	Able to **successfully tackle routine problems** and make **some progress** on solving non-routine problems in real life situations.
	Demonstrates **most skills and knowledge** of the relevant concepts and techniques reflected in the sector and is applied across different contexts.
	Able to **make some progress** on unstructured problems that have not been seen before, using their knowledge to find solutions to problems.
	Makes **some** justification for strategies for solving problems, giving explanations for their reasoning.
Distinction	The evidence is logical and provides an **excellent** response to the demands of the **brief.**
	Makes use of relevant knowledge and is **well informed** by the practices of the sector.
	Demonstrates an understanding of the different perspectives/approaches associated within the sector.
	Makes **excellent** use of facts/theories/approaches/concepts.
	Demonstrates **comprehensive use of** breadth and depth of knowledge and understanding.
	Consistently selects **appropriate** skills/techniques/methods.
	Identifies information from a **range** of suitable sources and makes use of appropriate information/appraises relevancy of information.
	Combines information to make **accurate** and **appropriate** decisions.
	Makes **sound** judgements/takes **appropriate** action/seeks clarification and guidance.
	Successfully tackles both routine **and** non-routine problems that reflect real life situations in the sector.
	Effectively demonstrates skills and knowledge of the relevant concepts and techniques reflected in the sector and is applied across a variety of contexts.
	Tackles unstructured problems that have not been seen before, using their knowledge to analyse and find **suitable** solutions to the problems.
	Analyses data/information in context and applies **appropriate analysis** in confirming or refuting conclusions and carrying out further work to evaluate conclusions.
	Justifies strategies for solving problems, giving clear explanations for their reasoning.

* ‘Threshold competence’ refers to a level of competence that:

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

U grades

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

Document information

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Owner: Head of Assessment Design

Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Published final version.		May 2021
v1.1	NCFE rebrand		September 2021