



T Level Technical Qualification in Digital Support Services

Occupational specialism assessment (OSA)

Network Cabling

Assignment 3 - Distinction

Guide standard exemplification materials

T Level Technical Qualification in Digital Support Services Occupational specialism assessment

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Network Cabling

Assignment 3

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Introduction

The material within this document relates to the Network Cabling 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 3, the student must troubleshoot a set of faulty cables, troubleshoot a proposed cabling installation and carry out a risk assessment of the client's network.

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

Assignment 3

Scenario

You have just been hired as a junior network cabler to work at a large company. The roles and responsibilities of your new role include undertaking a range of implementation, monitoring and testing tasks, as well as ensuring that all work is documented appropriately to meet organisation quality standards and best working practice. Below are 3 tasks you have been given to complete.

Task 1: troubleshooting faulty cables

Time limit

1 hour 30 minutes

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

(25 marks)

As your first task you have been asked to fix several cables that one of the apprentices has incorrectly constructed, so they can be reused. The cables have various problems that need troubleshooting before they can be used in a cabling installation. Issues you may encounter include latency, jitter, cross talk and poor connections in the cables.

You are required to:

- test the cables to find and fix the faults in accordance with TIA/EIA 568B standards
- document the faults in the test plan template provided and record suitable solutions
- fix the fault on each cable and document the test results in the test plan template
- take photographs of the corrected cables which clearly show the connections of the internal wiring to the RJ45 and the coloured outer cable

You will have access to the following equipment:

- a hand-held cable/network tester
- a network impairment simulator/network delay simulator
- a digital camera
- a supply of RJ45 connectors

Evidence required for submission to NCFE

Completed test plan template in .pdf format.

For each cable you need to provide in .pdf format:

- a clear photograph showing a close up of the RJ45 connector and the corrected wires within it, with the coloured cable clearly visible
- a photograph of the read-out from the cable tester showing the full results of testing, with the coloured cable clearly visible

Student evidence

The table below indicated the physical tests I have completed on each cable, the images below identify the 5 different cables, the issue and how I resolved them.

| What is being tested? | How is it to be tested? | Expected outcome | Actual outcome | Solution | Remarks |
|---------------------------------------|--|--|--|----------|---|
| Physical check - for cable damage | Checking the cable end to end thoroughly to ensure there is no obvious damage | Cable to be smooth with no feel of being buckled inside and no damage to the outer sleeve | Cable appeared to be damage free | N/A | Although the outer sleeve had some black marks on it this should not affect its performance |
| Physical check - RJ45 damage | Check both RJ45 ends to ensure they have no physical damage | Ends show no damage | Both ends show no sign of damage and both tabs are still intact | N/A | The tag on one end is a little looser but it is not loose enough to justify a new end |
| Physical check - crimped correctly | Check the RJ45 heads are firmly in place and the sleeve is clamped in the head | The RJ45 head not to come off the cable with an appropriate amount of force and the inner pairs of cable to be not visible outside of the boot | Cable ends did not come off and the cable appears to be clamped into the head firmly | N/A | N/A |

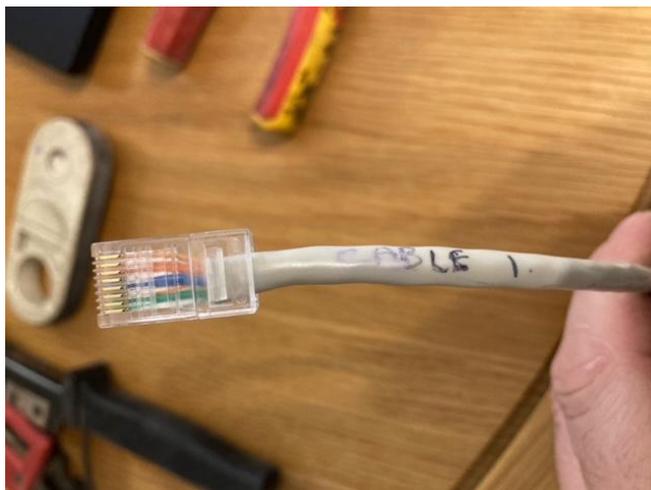
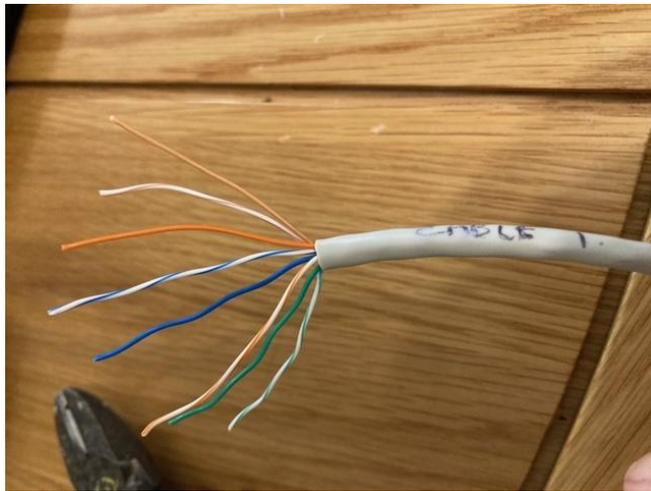
| | | | | | |
|------------------------------|---|---|---|--|--|
| Check against T568B standard | Use the cable tester to ensure connectivity on all pairs at both ends then check the cable order within the RJ45 head | Connectivity successful and the cable order to be (in either direction) Stripe orange Orange Stripe green Blue Stripe blue Green Stripe brown Brown | No connectivity, one of wires appears to be too short within the RJ45 head however they were in the correct order on both ends. | Cut the end of the cable off and terminate in a new RJ45 head. | The one short wire resulted in a failure. The solution was easy to implement as there was plenty of spare cable, had the cable already been the perfect length for its required task a new cable would have been required. |
|------------------------------|---|---|---|--|--|

[Relevant photos supplied and annotated for which test they are for]

Equipment



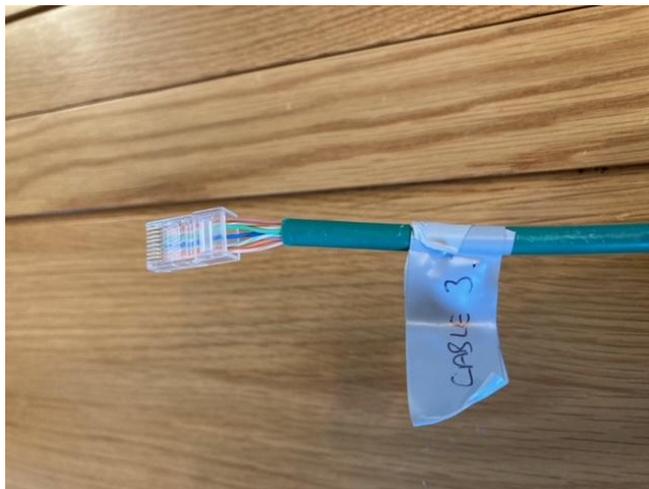
**Cable 1: one RJ45
configured as cross-
over cable – removed
end and replaced.
Labelled ‘Cable 1’**



Cable 2: short across wires inside one RJ45, replaced end and labelled 'Cable 2'



**Cable 3: outer sheath
of cable not gripped by
crimp within one RJ45.
Removed the end on
the green cable and
replaced – then
labelled 'Cable 3'**



Cable 4: one RJ45 has been wired 'upside down' but has not been crimped, pulled off, replaced RJ45 and crimped. Then labelled 'Cable 4'



Cable 5: the wires within one end of the cable do not reach the copper pins within the RJ45, this was removed and replaced correctly. Then this was labelled 'Cable 5'



Task 2: troubleshooting the proposed cabling installation

Time limit

2 hours

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

(20 marks)

Your predecessor was in the process of designing 2 separate, interconnected networks for a law firm that is a client of your organisation. Unfortunately, because they have left the company, they were unable to finish the project. You have been asked by your manager to complete this project by troubleshooting and resolving any issues within the design of the interconnected networks. You are to perform thorough troubleshooting of all cabling on the interconnected network design to identify and fix any faults identified prior to the customer conducting their own testing (UAT). You will describe how you will approach the troubleshooting, including why you will approach it that way, and record the results in a test plan.

You will be using the Cisco Packet Tracer file to carry out troubleshooting to ensure that data can be transmitted across all devices on the interconnected networks.

You must:

- write a brief description of how you will analyse, interpret and solve any issues which arise from the troubleshooting process - 4 marks are available for this element of the task
- document your troubleshooting in a logical order, demonstrating that no aspect of troubleshooting and analysis has been omitted
- use the test plan template provided to record the results of the troubleshooting
- you will have access to the following equipment:
 - word processing software
 - Cisco Packet Tracer

Evidence required for submission to NCFE

- screenshots of all issues identified and resolved within the Cisco Packet Tracer file, in .pdf format (this must be a before and after screenshot)
- completed test plan template in .pdf format
- written description of analysis and interpretation of issues, as well as solution of issues

Student evidence

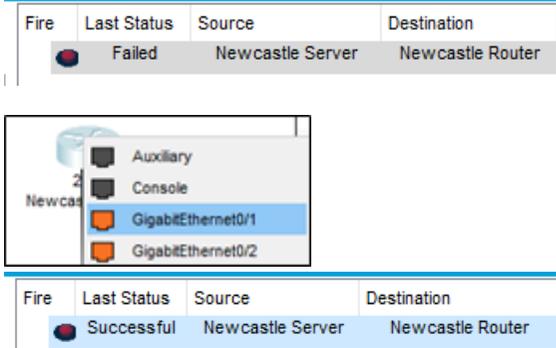
To ensure the most efficient corrections are put in place to resolve the issues with the network I will be performing all testing first and not implementing any resolutions until all tests have been completed and the results of those tests recorded.

The testing will mostly consist of using the ping tool to confirm communication between devices and manually checking configuration of devices to ensure the details are correct.

Firstly, testing the connection between the 2 routers will be done as this is a simple test but any issues at this level will show up as failures in many other tests. Once done tests will be done on each site fully to see where connectivity issues lay within each network separately.

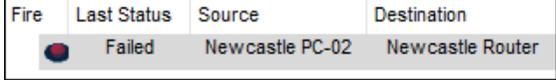
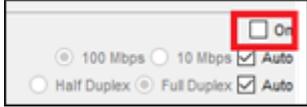
If there is an issue with the link between sites this will be resolved, then a test from communication between each device to the other site will be performed.

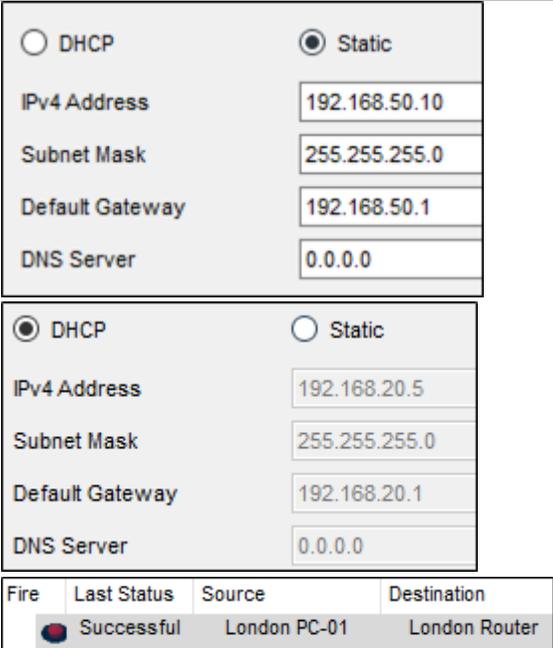
| What is being tested? | How is it to be tested? | Expected outcome | Actual outcome | Solution | Remarks | Test |
|--|-----------------------------------|--------------------------|---|---|--------------|---|
| 1.Connectivity of the site to site connection from each router | Ping from one router to the other | Successful communication | Success | N/a | N/a | Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms |
| 2.Connectivity between Newcastle router and Newcastle switch | Ping between each device | Successful communication | Failed with the message "no functional ports" | This is due to the switch not having an IP address, but one is not required for communication | A none issue | |
| 3.Connectivity between London router and London switch | Ping between each device | Successful communication | Failed with the message "no functional ports" | This is due to the switch not having an IP address, but one is not required for communication | A none issue | |
| 4.Connectivity between Newcastle server and Newcastle switch | Ping between each device | Successful communication | Failed with the message "no functional ports" | This is due to the switch not having an IP address, but one is not required for | A none issue | |

| | | | | | | |
|--|--------------------------|--------------------------|---|---|--------------|---|
| | | | | communication | | |
| 5.Connectivity between Newcastle server and Newcastle router | Ping between each device | Successful communication | Ping failed | The cable was in the incorrect port. Moved from G0/2 to G0/1 which was properly configured. | N/a |  <p>The screenshot shows a network status table with columns: Fire, Last Status, Source, Destination. A row shows a failed ping from Newcastle Server to Newcastle Router. Below this is a configuration menu for GigabitEthernet0/1, with options for Auxiliary, Console, GigabitEthernet0/1 (selected), and GigabitEthernet0/2.</p> |
| 6.Connectivity between London server and London switch | Ping between each device | Successful communication | Failed with the message “no functional ports” | This is due to the switch not having an IP address, but one is not required for communication | A none issue | |
| 7.Connectivity between London server and router | Ping between each device | Successful communication | Ping failed | Port F0/1 was disabled on the switch. | N/a |  <p>The screenshot shows a network status table with columns: Fire, Last Status, Source, Destination. A row shows a failed ping from London Server to London Router. Below this is a configuration menu for FastEthernet0/1, with options for Port Status (On), Bandwidth (100 Mbps), Duplex (Auto), Access, VLAN (1), and Tx Ring Limit (10).</p> |

| | | | | | | <table border="1"> <thead> <tr> <th>Fire</th> <th>Last Status</th> <th>Source</th> <th>Destination</th> </tr> </thead> <tbody> <tr> <td></td> <td>Successful</td> <td>London Server</td> <td>London Router</td> </tr> </tbody> </table> | Fire | Last Status | Source | Destination |  | Successful | London Server | London Router |
|---|--------------------------|--------------------------|---|---|--------------|--|------|-------------|--------|-------------|---|------------|---------------|---------------|
| Fire | Last Status | Source | Destination | | | | | | | | | | | |
|  | Successful | London Server | London Router | | | | | | | | | | | |
| 8.Connectivity between Newcastle PC-01 and Newcastle switch | Ping between each device | Successful communication | Failed with the message “no functional ports” | This is due to the switch not having an IP address, but one is not required for communication | A none issue | | | | | | | | | |
| 9.Connectivity between Newcastle PC-02 and Newcastle switch | Ping between each device | Successful communication | Failed with the message “no functional ports” | This is due to the switch not having an IP address, but one is not required for communication | A none issue | | | | | | | | | |
| 10.Connectivity between Newcastle PC-03 and Newcastle switch | Ping between each device | Successful communication | Failed with the message “no functional ports” | This is due to the switch not having an IP address, but one is not required for communication | A none issue | | | | | | | | | |

| | | | | | | |
|--|--------------------------|--------------------------|---|---|---|--|
| 11.Connectivity between London PC-01 and London switch | Ping between each device | Successful communication | Failed with the message “no functional ports” | This is due to the switch not having an IP address, but one is not required for communication | A none issue | |
| 12.Connectivity between London PC-02 and London switch | Ping between each device | Successful communication | Failed with the message “no functional ports” | This is due to the switch not having an IP address, but one is not required for communication | A none issue | |
| 13.Connectivity London PC-03 and London switch | Ping between each device | Successful communication | Failed with the message “no functional ports” | This is due to the switch not having an IP address, but one is not required for communication | A none issue | |
| 14.Connectivity between Newcastle PC-01 and Newcastle router | Ping between each device | Successful communication | Communication failed | Cable was plugged into Gig0/2 on the router, after checking configuration of the other ports I discovered that Gig0/1 was | Another solution would have been to configure the Gig0/2 port to have the same IP addressing as Gig0/1 but the simpler solution was to move the | |

| | | | | actually configured correctly, moving the cable from Gig0/2 to Gig0/1 resolved the issue. | cable. | | | | | | | | | | | | | | | | | |
|--|--------------------------|--------------------------|----------------------|---|--|---|------|-------------|--------|-------------|--|--------|-----------------|------------------|------|-------------|--------|-------------|--|------------|-----------------|------------------|
| 15.Connectivity between Newcastle PC-02 and Newcastle router | Ping between each device | Successful communication | Communication failed | Fa0/1 on the PC was set to Down. Altering this to Up resolved the connectivity issue. | I expected the fix from the previous test to resolve this issue and when it did not further investigation was required on the device itself. |  <table border="1"> <thead> <tr> <th>Fire</th> <th>Last Status</th> <th>Source</th> <th>Destination</th> </tr> </thead> <tbody> <tr> <td></td> <td>Failed</td> <td>Newcastle PC-02</td> <td>Newcastle Router</td> </tr> </tbody> </table>   <table border="1"> <thead> <tr> <th>Fire</th> <th>Last Status</th> <th>Source</th> <th>Destination</th> </tr> </thead> <tbody> <tr> <td></td> <td>Successful</td> <td>Newcastle PC-02</td> <td>Newcastle Router</td> </tr> </tbody> </table> | Fire | Last Status | Source | Destination | | Failed | Newcastle PC-02 | Newcastle Router | Fire | Last Status | Source | Destination | | Successful | Newcastle PC-02 | Newcastle Router |
| Fire | Last Status | Source | Destination | | | | | | | | | | | | | | | | | | | |
| | Failed | Newcastle PC-02 | Newcastle Router | | | | | | | | | | | | | | | | | | | |
| Fire | Last Status | Source | Destination | | | | | | | | | | | | | | | | | | | |
| | Successful | Newcastle PC-02 | Newcastle Router | | | | | | | | | | | | | | | | | | | |
| 16.Connectivity between Newcastle PC-03 and Newcastle router | Ping between each device | Successful communication | Communication failed | This connection now works with no further work. The misconfigured cable in a previous test has also resolved this issue | I also checked the IP addressing to ensure DHCP was working and it appears to be fine. | | | | | | | | | | | | | | | | | |

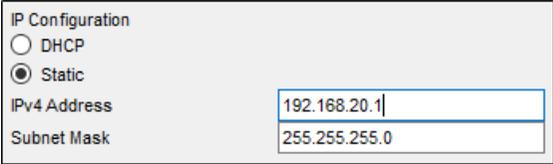
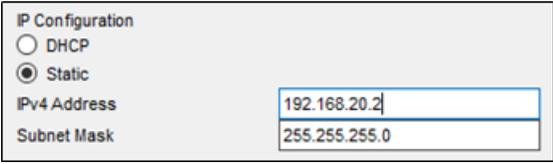
| <p>17.Connectivity between London PC-01 and London router</p> | <p>Ping between each device</p> | <p>Successful communication</p> | <p>Communication failed</p> | <p>Address was set to static not DHCP.</p> | <p>The PC's IP addressing was set to static and had the wrong network address in. Resolving this did not resolve the issue so an investigation into the server revealed it was also configured correctly, this moved me onto the switch to discover the port the server was using was Down, marked it as Up and connectivity was achieved.</p> |  <table border="1" data-bbox="1467 758 2020 829"> <thead> <tr> <th>Fire</th> <th>Last Status</th> <th>Source</th> <th>Destination</th> </tr> </thead> <tbody> <tr> <td></td> <td>Successful</td> <td>London PC-01</td> <td>London Router</td> </tr> </tbody> </table> | Fire | Last Status | Source | Destination | | Successful | London PC-01 | London Router |
|---|---------------------------------|---------------------------------|-----------------------------|---|--|--|------|-------------|--------|-------------|--|------------|--------------|---------------|
| Fire | Last Status | Source | Destination | | | | | | | | | | | |
| | Successful | London PC-01 | London Router | | | | | | | | | | | |
| <p>18.Connectivity between London PC-02 and London router</p> | <p>Ping between each device</p> | <p>Successful communication</p> | <p>Communication failed</p> | <p>Fixing the servers connectivity in the previous test appears to have resolved this machines connectivity issue after refreshing its DHCP</p> | <p>Previous connectivity issues caused by not being able to get an IP address as the server was not contactable.</p> | | | | | | | | | |

| | | | | | | |
|---|-----------------------------|-----------------------------|-----------------------------|---|--|---|
| | | | | information. | | |
| 19.Connectivity London PC-03 and London router | Ping between each device | Successful communication | Successful communication | Fixing the servers connectivity in the previous test appears to have resolved this machine's connectivity issue after refreshing its DHCP information. | Previous connectivity issues caused by not being able to get an IP address as the server was not contactable. | |
| 20.Ping from server to server | Ping between each device | Successful communication | Successful communication | N/a | N/A | Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms |

| | | | | | | |
|---|--------------------------|--------------------------|--------------------------|-----|-----|--|
| 21.Connectivity between London PC-01 and Newcastle router | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 22.Connectivity between London PC-02 and Newcastle router | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 23.Connectivity London PC-03 and Newcastle router | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 24.Connectivity between Newcastle PC-01 and London router | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |

| | | | | | | |
|---|--------------------------|--------------------------|--------------------------|-----|-----|--|
| 25.Connectivity between Newcastle PC-02 and London router | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 26.Connectivity between Newcastle PC-03 and London router | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 27.Connectivity between London PC-01 and Newcastle server | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 28.Connectivity between London PC-02 and Newcastle server | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |

| | | | | | | |
|--|-----------------------------|-----------------------------|-----------------------------|-----|-----|--|
| 29.Connectivity London PC-03 and Newcastle server | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 30.Connectivity between Newcastle PC- 01 and London server | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 31.Connectivity between Newcastle PC- 02 and London server | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |
| 32.Connectivity between Newcastle PC- 03 and London server | Ping between each device | Successful communication | Successful communication | N/a | N/a | <p>Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 2ms, Maximum = 4ms, Average = 2ms</p> |

| | | | | | | |
|---|---|---|--|--|-----|--|
| 33.Ensure London Server has correct IP address details | Check the details manually | Details to be within the 192.168.20.0/24 scope | Correct IP address but the default gateway was pointing at the Newcastle router which would work but is not good practice. | Changed address to 192.168.20.1 for the server's default gateway | N/a |   |
| 34.Ensure Newcastle server has correct IP address details | Check the details manually | Details to be within the 192.168.10.0/24 scope | All correct | N/a | N/a | |
| 35.Ensure DHCP is correctly configured on server at Newcastle | Manually check the server's configuration for the DHCP pool | 192.168.10.0 pool with 255.255.255.0 subnet mask And default gateway of 192.168.10.1 | Configuration is correct | N/a | N/a | |
| 36.Ensure DHCP is correctly | Manually check the server's configuration for | 192.168.20.0 pool with 255.255.255.0 | Configuration is correct | N/a | N/a | |

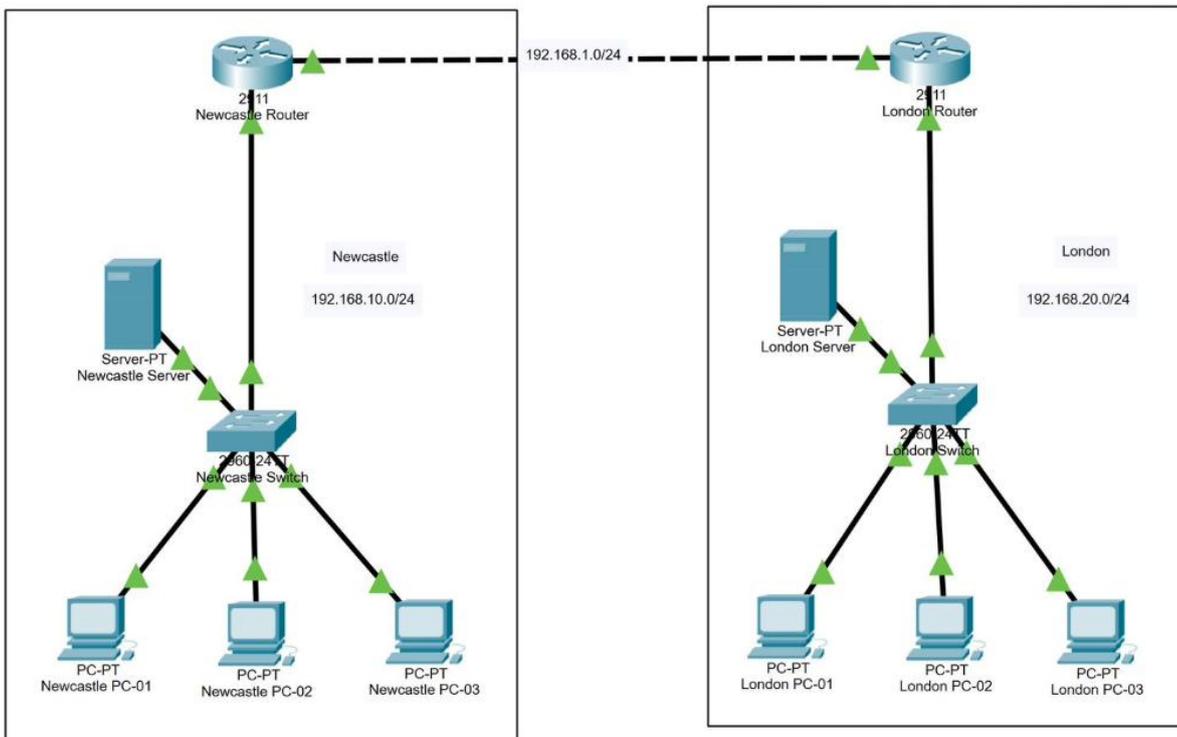
| | | | | | | |
|--------------------------------------|---------------|--|--|--|--|--|
| configured on server at London | the DHCP pool | subnet mask And default gateway of 192.168.20.1 | | | | |
|--------------------------------------|---------------|--|--|--|--|--|

Task 3: carry out a risk assessment of the client's network

Time limit

2 hours

(16 marks)



The law firm in task 2 has now implemented your interconnected network design. You have been asked to perform a risk assessment on both the Newcastle and London sites. Your manager has given you the following details from an information gathering session that they attended.

Both sites are in industrial areas and have no record of flooding. They are in areas with a high level of reported crime. The 2 sites are linked through a site-to-site VPN configured on the routers and communication is vital between the 2 sites due to shared services. Both sites have high speed internet connections, so latency is rarely an issue. The London site also has a back-up mobile data (4G) connection.

Both sites have a single server. The London server is the law firm's domain controller and runs their DNS and DHCP. The Newcastle server is their file server and print server, however printing is rare and considered non-essential. Both servers have 4 network cards, however due to time constraints during the network setup only one was utilised.

Both sites have inert gas fire suppression systems for the server rooms to help prevent a fire from destroying the servers and switches. There are no other fire suppression systems installed in the rest of the building and fire safety relies on building evacuation. To prevent and detect intruders, the buildings are locked at night by the last member of staff to leave the building. All staff have a master key which can be used on any door in the building. There is currently no CCTV or burglar alarm system.

All infrastructure cabling is accessible due to easily opened trunking and floating ceilings. When your manager inspected this, they noted that Cat5e U/UTP cable is used for all machines and all infrastructure cabling. They also

noted that a large batch of the cabling was running parallel and near to the power cables. When inspecting the cabling, your manager noticed evidence of rodents possibly being above the floating ceiling.

The law firm has a large budget to pay for any changes that you recommend as a result of your risk assessment.

Your risk assessment should include:

- identification of possible threat to the interconnected networks
- vulnerability related to threat identified
- asset at risk
- impact if threat is exploited
- likelihood that threat is exploited
- overall risk to business
- recommended action
- type of control implemented as mitigation

You should consider:

- the information provided by your manager above
- both internal and external cabling
- security of the interconnected network on both sites
- all hardware network components
- documentation to support mitigation

You will have access to the following equipment:

- word processing software

Evidence required for submission to NCFE

Completed risk assessment document.

Student evidence

| Threat | Vulnerability | Asset | Impact | Likelihood | Risk | Action | Control type |
|---|---|--|--|--|---|---|--------------|
| Rodents and wildlife damaging cables | Unprotected and exposed external cabling | Physical cables and data being transmitted | High Loss of service to customer Potential reputational damage for organisation Additional cost for replacement of cables. | Medium Although the majority of cable is protected, some sections are exposed | High Cables are damaged by wildlife, leading to loss of service for client and damage to reputation for providing organisation | Ensure buried physical trunking protects cables in their entirety. Ensure cables for outdoor use are shielded in order to protect cables should the trunking be breached. Implement methods to deter wildlife where needed. | Preventative |
| Single key pattern | All doors use the same master key which all staff have a copy of. | All physical assets and digital assets residing on physical assets | High Potential GDPR issues depending on both physical and/or digital assets taken/damage Loss of service based on damage or theft Financial impact based on damage or theft | Medium Due to the number of users with this key pattern as well as the area being noticed as having a high level of crime | High Key is lost, stolen, not collected in when staff leave, or copies made without authorisation | Replace locks with unique lock barrels and only issue keys based on required access. Ensure key control is kept strict and logged Alternative solution would be to replace locks with Keycard access, this would allow for not only strict monitoring of who is allowed access, but also would provide a full audit history of the access to these secure areas. | Preventative |

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|------------------------------|---|---|--|---|---|---|------------|
| Flooding | Ground floor equipment | Physical assets with potential impact on digital assets | High Damage to physical assets resulting in loss of digital data. This may result in downtime and have a financial impact | Low The area is noted to not have any flooding and no mention of water mains within the building being near important areas | Medium Equipment being water damaged leading to loss of service | Raise servers to a high points in the rack and ensure rack is off the floor where possible, this should ensure that should there be any water issues that the servers should be a lower risk. | Acceptance |
| Fire – in server room | All assets in the server room potentially spreading to the rest of the building | Physical assets within server room resulting in loss of digital assets and potential of spreading to other assets | High Loss of services with varying impact depending on site Financial loss due to equipment or digital asset loss | Low Modern equipment coupled with a fire suppression system being implemented hugely reduces the risk of this potential threat | Medium Damage to equipment in the server room leading to loss of service | As there is already an electrical/hardware safe fire suppression system in place there are no further actions needed. We must also ensure that the off-site backups are taking place to ensure that should there be a fire and the equipment be damaged then we have alternatives. | Acceptance |
| Fire – in offices | All assets in the offices potentially spreading | Physical assets in the office with potential to spread to other key areas | Medium Financial loss from replacement of equipment and down time | Medium As there is no fire suppression within the main offices any fire in this area would likely not be stopped leading to equipment loss | Medium Damage to office equipment leading to loss of service | As most fire suppression systems would be harmful to the equipment, other than installing the required fire extinguishers by law there is not much that can be done to prevent this other than good staff training and building maintenance to ensure the likelihood of a fire is kept as low as possible. Ensuring that data is not | Acceptance |

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| | | | | | | stored locally on machines would mean that the loss would be limited to hardware and not data. | |
| Break in/theft | Loss of assets and/or data | Physical assets with potential loss of digital assets depending on the items taken/damaged | Medium Potential GDPR issues Loss of data Loss of equipment Damage of assets Financial loss | High Due to the lack of CCTV, alarm system and being in a high crime area as well as the doors sharing the same key | Medium Equipment could be damaged or stolen leading to a loss of productivity, financial loss as well as data loss which could lead to a GDPR issue | Install CCTV and alarm systems as this would deter would be thieves from attempting to access equipment. However also adding elements such as ASSET tagging and Smart Water systems would mean that should something be taken then they could be identified and returned. | Deterrent |
| Loss of site to site communication | | Routers, cabling, configuration | Medium Loss of services made available from the other site. | Medium | Medium As only London has a 4G backup line a secondary site to site link cannot be created | Add a 4G failover backup line at to both routers which would allow for site to site communication should the main internet connection fail at either office. | Preventative |
| Loss of service – Active Directory | Server/service | Digital services | Medium Logging into devise will be impacted where not using cached accounts | Medium As only one server offers this service for both networks this is a single point of failure | Medium Loss of business-critical service resulting in a loss of productivity and potential financial impact | Ensuring that we have a secondary Active Directory server would ensure that should the main server fail there was a secondary option. | Preventative |

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| Loss of service – DNS | Server/service | Digital services | Medium Loss of ability to translate domain names to IP addresses, this will affect name translation on the network and ability to visit websites | Medium As only one server offers this service for both networks this is a single point of failure | Medium Loss of business-critical service resulting in a loss of productivity and potential financial impact | Configure the alternative server to act as a secondary DNS server to avoid a single point of failure. Also configuring the routers to use an alternative DNS should the internal DNS server fail would allow for extra redundancy. | Preventative |
| Loss of service – file storage | Server/service | Digital services | Medium Loss of file services which will reduce productivity and have a potential financial impact | Medium As only one server offers this service for both networks this is a single point of failure | Medium Loss of business-critical service resulting in a loss of productivity and potential financial impact | Utilise the alternative server as a file storage backup which can be used in the event the main file storage is lost. Instigate off site file storage backup to ensure that should the site where the server is stored then there is access from the other site. | Preventative |
| Loss of service – DHCP | Server/service | Digital services | Medium Loss of devices being able to communicate on the network which will reduce productivity and have a potential financial impact | Medium As only one server offers this service for both networks this is a single point of failure | Medium Loss of business-critical service resulting in a loss of productivity and potential financial impact | Configure the alternative server to act as a secondary DHCP server to avoid a single point of failure | Preventative |
| Loss of service | Server/service | Digital services | Low | Medium | Medium | As this is specified as rarely used and not vital it could be | Acceptance |

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| – printing | | | Loss of user's ability to print | As only one server offers this service for both networks this is a single point of failure | Loss of no business-critical service resulting in a loss of some productivity | left on one server as it is not business critical. Would be advised that during next replacement the printers are replaced with self-managing network printers to reduce the risk of this happening. | |
| Issues with network communication | Server/services/network communication | Data communication between devices | Medium Intermittent service loss and general network unreliability | High Due to cables being ran next to power that are not suitable | Medium Data loss and reduction of productivity | Replacing all infrastructure cabling with at least Cat5e S/FTP to reduce interference from power lines and other EMF sources. Rearrange cables to not go near power or add shielding wherever possible. | Preventative |
| Security breach between sites | The site to site connection | Data communication between sites | Medium Confidential data loss potentially resulting in GDPR | Low Due to the site to site connection utilising a VPN connection to secure traffic between the 2 sites | Medium The site to site link is breached by a third party without authorisation | To ensure the connection is not breached regular monitoring of logs and scheduled changes to the pre-shared key used to secure the VPN. Access controls will be monitored regularly. | Preventative Detective |
| Loss of network connectivity to servers | One or more services are lost | Data communication between network and server | Medium Potential loss of several services depending on the server | High As the servers only use 1 out of their 4 network cards that is a single point of failure | Medium Depending on the server lost, different services will be affected ranging from: • logging in | Utilising 2 or more network cards would allow for load balancing or redundancy. Ensuring load balancing and Spanning Tree Protocol were enabled on the switches would minimise this risk. | Preventative |

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|--|--|--|--|--|---|--|--|
| | | | | | <ul style="list-style-type: none"> • access files • accessing webpages • accessing network resources • printing | | |
|--|--|--|--|--|---|--|--|

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| Risk levels: low medium high critical | Business control types: physical administrative technical | Mitigating control types: preventative detective corrective deterrent directive compensating acceptance |
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Assignment 3

Examiner commentary

The student has performed a variety of tests on each cable. The tests are all relevant, given clear names and the way they are tested is appropriate. Any issues found are resolved and documented.

Detailed testing table with screenshots evidence the failings of the network, the corrective work, and the result after the corrective work. Although screen shots are present the submission could be improved with more detailed screenshots with more annotation. The tests are all relevant and show methodical testing structure.

The threats are well considered with their impact, likelihood and actions being relevant to the issue and the solutions. The solutions are reasonable and would address the threat where applicable in a reasonable way.

Overall 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.

Occupational specialism overall grade descriptors:

| Grade | Demonstration of attainment |
|-------------|---|
| 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/seek clarification and guidance |
| | Successfully tackles both routine and non-routine problems that reflect real life situations in the sector |

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| | 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 |
| 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/seek 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 |

* “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 |