# **SQA assessment coversheet**

**Please attach these pages to the front of your assessment.**

|  |  |
| --- | --- |
| Programme title | HND Computer Science |
| Unit number | H17C 34 |
| Unit title | Building a Local Area Network |
| Learning outcome number Assessment tasks | 2 |
| Learning outcome title | Technical Report |
| Word count | N/A |
| Student ID | 21010093 |
| Student Name | Calum Lindsay |
| Date submitted |  |

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| --- | --- |
| **Checklist** [**Note:** a checklist must be provided. The following questions are examples, you may use your own questions.] | a[[1]](#footnote-1) |
| My answer explicitly addresses the topics | a |
| Citations in the text use the Harvard referencing system | a |
| A bibliography is provided | a |
| All cited sources are listed alphabetically and in full in the bibliography | a |
| I have spell checked and proof read my submission | a |
| Word count is within 10% of the target length | N/A |
| File saved as a Word (.docx) or rich text file (.rtfx) with the filename format  ‘Student number\_unit initials\_LO number’ | a |
| I have completed all required sections of the coversheet | a |

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* **Collusion** with others when an assessment must be completed by individual candidates.
* **Copying** from another candidate (including using ICT to do so) and/or working collaboratively with other candidates on an individual task.
* **Frivolous content** — producing content that is unrelated to the assessment.
* **Offensive content** — content in assessment materials that includes vulgarity and swearing that is outwith the context of the assessment, or any material that is discriminatory in nature.
* **Plagiarism** — failure to acknowledge sources properly and/or the submission of another person’s work as if it were the candidate’s own.
* **Breaching the security of assessment materials** in a way which threatens the integrity of any exam or assessment.

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Students are responsible for ensuring the work they submit is their own and complies with the ASQR and Malpractice Policy. If you have any queries you should contact your unit lecturer or Personal Academic Tutor (PAT) before submitting your assessment.

Please note that any case of suspected malpractice will be investigated according to current UHI Academic Standards and Quality Regulations (ASQR).

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| --- | --- |
| In submitting this work, I confirm that I have read and understood UHI ASQR and malpractice policy and am aware of the possible penalties. | a |

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| **Originality checker (to be completed if Turnitin is used)** | **P [[2]](#footnote-2)** |
| I confirm that I received information about the use of Turnitin and was directed to Turnitin training | N/A |
| I understand that this assignment will be submitted to Turnitin for originality checking | N/A |

**It is highly recommended that the following questions about next steps are included in all coversheets**

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| **If you have received feedback/feedforward from coursework or an assignment for this unit/module/course, state the next steps**  You can either cut and paste these from previous assignment / coursework feedback, or pick some elements that you have decided you would like to work on |
|  |
| **If you have received feedback/feedforward from coursework or an assignment for this unit/module/course, state what you have done to address the next steps** |
|  |

# Assessment task 2 submission:

## Scenario 1:

1. Company summary of network requirements:

A company named Glen Kitchens would like a LAN installed to permit file and printer sharing. None of the computers have NICs which are required for communication across the network and so will have to be installed. The printers are not capable of being networked and the company wishes to keep using them so they will each be connected to a single computer through usb and shared peer-to-peer. The company wishes to use the 10.0.0.0/8 network which will give plenty of room for expansion as they have stated is expected soon.

1. Proposed solution (proposal of what should be implemented and physical work that would need to be undertaken to implement the job):

I would propose that a stackable 9u server cabinet is used with a single 48 port managed switch and a 48 port patch panel as this will use a third of the space (3u) in the cabinet giving plenty of room to expand within the cabinet and more cabinets can easily be added if required which aligns with the company’s intentions to expand soon. I also suggest that a total of 18 single gang 2 port face plates are installed to allow more devices to be installed easily and also allow more flexibility in changing the layout of the rooms. I have proposed a managed switch although it is not strictly necessary as it offers useful features such as virtual LANs that may later be required when the company expands.

First the server cabinet would be installed in the small room designated on the plan as the server room and the switch and patch panels can then be installed in the cabinet and connected using the 0.3m patch cables. As the office space has pre-installed trunking in the rooms and cable trays in the ceiling cavity we don’t need to worry about installing those so for each face plate UTP CAT 6 cable would need to be wired to and then routed from the patch panel going through the pre-existing trunking into the ceiling space, along the cable trays and down through more trunking to where the face plate would be assembled, wired and installed. Finally all the computers would need to have their side/top panels removed and a NIC inserted into an available PCIe slot (ideally an x1) then reassembled and connected to the closest faceplate using the 2.1m patch cables.

Each system would need to have a static IP address assigned to it as there is no DHCP service. The IP addresses for each PC are detailed in the IP addressing table below and start with 10.0.0 and then the last byte is equal to the wall port number + 10.

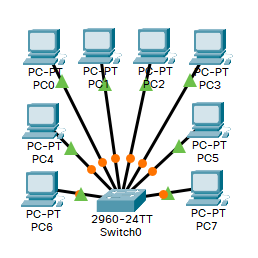
1. Itemised equipment List, including costs, suppliers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Supplier** | **Make / Model / Specification / Details** | **Price (1)** | **Qty** | **Total Cost** |
| **Managed Switch** | **Amazon** | **NetGear GS348T 48x Cat6 + 4x 1G SFP** | **£255.72** | **1** | **£255.72** |
| **48 Port Cat 6 Patch Panel** | **Amazon** | **World of Data 2u 48x Cat6** | **£49.99** | **1** | **£49.99** |
| **9u Server Rack Cabinet** | **Amazon** | **Adastra 19” Rack Cabinet (600mm)** | **£145.70** | **1** | **£145.70** |
| **Cat 6 Patch Cable (0.3m)** | **Amazon** | **Cable Matters 5-Pack Cat6 Cable** | **£7.99** | **8** | **£63.92** |
| **Cat 6 Patch Cable (2.1m)** | **Amazon** | **Cable Matters 5-Pack Cat6 Cable** | **£11.99** | **2** | **£23.98** |
| **305m UTP Cat 6 Reel** | **Cable Monkey** | **Connectix Cabling Systems Cat 6 UTP PVC Solid Cable 305m Box** | **£92.05** | **...** | **...** |
| **Single Gang Modular Face Plate** | **Cable Monkey** | **Connectix Cabling Systems Single Gang Office Style Faceplate** | **£0.54** | **18** | **£9.72** |
| **Cat 6 Module** | **Cable Monkey** | **Connectix Cabling Systems Cat 6 UTP RJ45 Module** | **£1.17** | **36** | **£42.12** |
| **Single Gang Surface Mount Back Box** | **Cable Monkey** | **Connectix Cabling Systems Single Gang Office Style Surface Mount Back Box** | **£0.95** | **18** | **£17.10** |
| **Network Interface Card (NIC)** | **Amazon** | **Tp-Link Gigabit PCIe Network Adapter** | **£8.99** | **8** | **£71.92** |
| **Total Cost £** | | | | | **£680.17** |

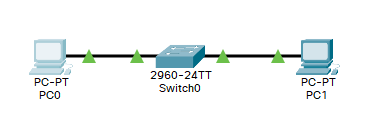
1. Physical Design of Room layout (diagram including equipment placement and cable route paths)

Visio file dimensions don’t work in open office – Do at college.. Maybe upload a screenshot to github and download at home.

1. Physical topology diagram

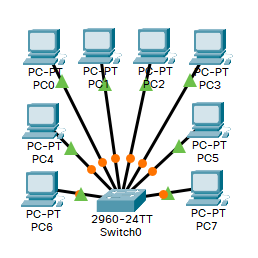


1. Logical topology diagram



1. Detailed IP Addressing table:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Device name** | **Wall Port** | **Patch Panel Port** | **Switch Port** | **IP Address** | **Network Mask** | **Network address** | **Broadcast address** |
| PC0 | 2 | 2 | 2 | 10.0.0.12 | 255.255.255.0 | 10.0.0.0 | 10.0.0.255 |
| PC1 | 6 | 6 | 6 | 10.0.0.16 | 255.255.255.0 | 10.0.0.0 | 10.0.0.255 |
| PC2 | 8 | 8 | 8 | 10.0.0.18 | 255.255.255.0 | 10.0.0.0 | 10.0.0.255 |
| PC3 | 10 | 10 | 10 | 10.0.0.20 | 255.255.255.0 | 10.0.0.0 | 10.0.0.255 |
| PC4 | 12 | 12 | 12 | 10.0.0.22 | 255.255.255.0 | 10.0.0.0 | 10.0.0.255 |
| PC5 | 14 | 14 | 14 | 10.0.0.24 | 255.255.255.0 | 10.0.0.0 | 10.0.0.255 |
| PC6 | 18 | 18 | 18 | 10.0.0.28 | 255.255.255.0 | 10.0.0.0 | 10.0.0.255 |
| PC7 | 22 | 22 | 22 | 10.0.0.32 | 255.255.255.0 | 10.0.0.0 | 10.0.0.255 |

1. Screenshot of Cisco Packet Tracer **diagram**. Name of devices appropriately and label your diagram  
   
2. Test Table – include any problems encountered.   
   (mention any issues when implementing/testing the network):

We can easily test this network by pinging between the computers. We will check if one pc is able to communicate with each of the others one by one and if so we can say that all the pcs are able to communicate.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test** | **Expected Result** | **Actual result** | **Notes/amendments** |
| ping 10.0.0.16 | Reply with <10ms time | Reply in <1ms |  |
| ping 10.0.0.18 | Reply with <10ms time | Reply in <1ms |  |
| ping 10.0.0.20 | Reply with <10ms time | Reply in <1ms |  |
| ping 10.0.0.22 | Reply with <10ms time | Reply in 1ms |  |
| ping 10.0.0.24 | Reply with <10ms time | Reply in <1ms |  |
| ping 10.0.0.28 | Reply with <10ms time | Reply in 3ms |  |
| ping 10.0.0.32 | Reply with <10ms time | Reply in <1ms |  |

**All commands were run from PC0**

1. **Submit a copy of your Cisco packet Tracer file to your lecturer**

## Scenario 2:

1. Company summary of network requirement:

The company would now like to allow laptops to be used by their managers. They will need to be able to use them in their offices and in the general area. The laptops have NICs preinstalled so we will only need 6 NICs instead of 8. The laptops need to be able to communicate with the wired devices and the printers.

1. Proposed solution (proposal of what should be implemented and physical work that would need to be undertaken to implement the job):

I would propose that we reduce our order of NICs to 6 from 8 and order a wireless access point. We will need to connect the wireless access point to the switch and I would do this using a patch cable connecting it to faceplate 23 in the corner of one of the managers offices. This should give good coverage over the entire working area and the access point would be mounted to the wall at around head height to make it easy to reset if necessary.

1. Itemised equipment List, including costs, suppliers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Supplier** | **Make / Model / Specification / Details** | **Price (1)** | **Qty** | **Total Cost** |
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| **48 Port Cat 6 Patch Panel** | **Amazon** | **World of Data 2u 48x Cat6** | **£49.99** | **1** | **£49.99** |
| **9u Server Rack Cabinet** | **Amazon** | **Adastra 19” Rack Cabinet (600mm)** | **£145.70** | **1** | **£145.70** |
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| **305m UTP Cat 6 Reel** | **Cable Monkey** | **Connectix Cabling Systems Cat 6 UTP PVC Solid Cable 305m Box** | **£92.05** | **...** | **...** |
| **Single Gang Modular Face Plate** | **Cable Monkey** | **Connectix Cabling Systems Single Gang Office Style Faceplate** | **£0.54** | **18** | **£9.72** |
| **Cat 6 Module** | **Cable Monkey** | **Connectix Cabling Systems Cat 6 UTP RJ45 Module** | **£1.17** | **36** | **£42.12** |
| **Single Gang Surface Mount Back Box** | **Cable Monkey** | **Connectix Cabling Systems Single Gang Office Style Surface Mount Back Box** | **£0.95** | **18** | **£17.10** |
| **Network Interface Card (NIC)** | **Amazon** | **Tp-Link Gigabit PCIe Network Adapter** | **£8.99** | **6** | **£..** |
| **Network Access Point** | **..** | **..** | **..** | **..** | **..** |
| **Total Cost £** | | | | | **£680.17** |

1. Physical Design of Room layout (diagram including equipment placement and cable route paths)
2. Physical topology diagram
3. Logical topology diagram
4. Detailed IP Addressing table:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Device name** | **Wall Port** | **Patch Panel Port** | **Switch Port** | **IP Address** | **Network Mask** | **Network address** | **Broadcast address** |
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1. Screenshot of Cisco Packet Tracer **diagram**. Name of devices appropriately and label your diagram
2. Test Table – include any problems encountered.   
   (mention any issues when implementing/testing the network):

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| --- | --- | --- | --- |
| **Test** | **Expected Result** | **Actual result** | **Notes/amendments** |
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**Submit a copy of your Cisco packet Tracer file to your lecturer**

## Scenario 3:

1. Company summary of network requirement:
2. Proposed solution (proposal of what should be implemented and physical work that would need to be undertaken to implement the job):
3. Itemised equipment List, including costs, suppliers

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| --- | --- | --- | --- | --- | --- |
| **Item** | **Supplier** | **Make / Model / Specification / Details** | **Price (1)** | **Qty** | **Total Cost** |
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| **Total Cost £** | | | | |  |

1. Physical Design of Room layout (diagram including equipment placement and cable route paths)
2. Physical topology diagram
3. Logical topology diagram
4. Detailed IP Addressing table:

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Device name** | **Wall Port** | **Patch Panel Port** | **Switch Port** | **IP Address** | **Network Mask** | **Network address** | **Broadcast address** |
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1. Screenshot of Cisco Packet Tracer **diagram**. Name of devices appropriately and label your diagram
2. Router config file/s. (Reduce the font size)

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| Router config/s: |

1. Test Table – include any problems encountered.   
   (mention any issues when implementing/testing the network):

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| **Test** | **Expected Result** | **Actual result** | **Notes/amendments** |
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**Submit a copy of your Cisco packet Tracer file to your lecturer**

## Scenario 4:

1. Company summary of network requirement:
2. Proposed solution (proposal of what should be implemented and physical work that would need to be undertaken to implement the job):
3. Itemised equipment List, including costs, suppliers

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| --- | --- | --- | --- | --- | --- |
| **Item** | **Supplier** | **Make / Model / Specification / Details** | **Price (1)** | **Qty** | **Total Cost** |
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| **Total Cost £** | | | | |  |

1. Physical Design of Room layout (diagram including equipment placement and cable route paths)
2. Physical topology diagram
3. Logical topology diagram
4. Detailed IP Addressing table:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Device name** | **Wall Port** | **Patch Panel Port** | **Switch Port** | **IP Address** | **Network Mask** | **Network address** | **Broadcast address** |
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1. Screenshot of Cisco Packet Tracer **diagram**. Name of devices appropriately and label your diagram
2. Router config file/s. (Reduce the font size)

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| --- |
| Router config/s: |

1. Test Table – include any problems encountered.   
   (mention any issues when implementing/testing the network):

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| --- | --- | --- | --- |
| **Test** | **Expected Result** | **Actual result** | **Notes/amendments** |
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**Submit a copy of your Cisco packet Tracer file to your lecturer**

## Scenario 5:

1. Physical Design of your network
2. NAT config
3. Test showing correct operation of NAT
4. Send [euan.robertson@uhi.ac.uk](mailto:euan.robertson@uhi.ac.uk) a copy of your final Cisco Packet Tracer file of your completed network.

1. Copy and paste ainto each box to confirm that you have read and agree with the statements. [↑](#footnote-ref-1)
2. Copy and paste **ü**into each box to confirm that you have read and agree with the statements [↑](#footnote-ref-2)