Unit 4
Computer networks

Model assignment
H/507/5003
Version 2 May 2017
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Please note:
You can use this assignment to provide evidence for summative assessment, which is when the learner has completed their learning for this unit and is ready to be assessed against the grading criteria.

You can use this assignment as it is, or you can modify it or write your own; we give more information in this document under Guidance for tutors.

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Guidance for tutors on using this assignment

General

OCR Cambridge Technical model assignments are available to download from our website: www.ocr.org.uk.

The purpose of this assignment is to provide a scenario and set of tasks that are typical of how a network analyst would use computer networking knowledge, to enable you to assess your learner against the requirements specified in the grading criteria. The scenario and its tasks are intended to give a work-relevant reason for applying the skills, knowledge and understanding needed to achieve the unit.

This assignment will not instruct learners how to meet the highest grade. Whether learners achieve a pass, merit or distinction will depend on what evidence they produce.

You can modify the scenario we provide in this assignment to make it more relevant to your local or regional needs. Please refer to the information under ‘Modifying the model assignment’ later in this section.

You don’t have to use this assignment. You can use it as a guide to help you to design your own assignment, and we provide an assignment checking service. You’ll find more information on these matters in section 8 of the qualification handbook.

In the tasks, we’ll refer to the format of evidence. Learners are not required to follow that format unless we tell them otherwise.

It’s essential that the work every learner produces is their own. Please make sure you read through the information we give on authenticity in section 8 of the qualification handbook and make sure that your learners and any staff involved in assessment understand how important authenticity is.

We provide this assignment to be used for summative assessment. You must not use it for practice or for formative assessment.

Before using this assignment to carry out assessment

Learners will need to take part in a planned learning programme that covers the knowledge, understanding and skills of the unit.

When your learners are ready to be assessed, they must be provided with a copy of the following sections of this assignment:

- General information for learners
- Assignment for learners
- Evidence Checklist

They may carry out preparation prior to undertaking the tasks and there is no time limit for this.
When completing the assignment

You should use this assignment in conjunction with the unit specification and qualification handbook.

- Learners must be allowed sufficient time to complete all of the tasks. The amount of time may vary depending on the nature of the tasks and the ability of individual learners. To help with your planning against each of the tasks we have given an indication of how long it should take.

- Learners can produce evidence in several sessions.

Resources to complete the tasks

There are no specific resources that you need to make available to learners when they are taking this assignment. You’ll need to give them a copy of the scenario and the tasks.

Time

You should plan for learners to have 5–8 hours to complete this assignment.

Learners must be allowed sufficient time to complete all the tasks. The amount of time may vary depending on the nature of the tasks and the ability of individual learners. To help with your planning, against each of the tasks we’ve given an indication of how long it should take.

Learners can produce evidence in several sessions.

Format of evidence

Learners have to produce evidence that demonstrates how they have met the grading criteria. At the very least they must produce evidence that meets all of the pass criteria.

Please make sure your learners realise that missing just one pass criterion means they will not pass the unit, even if they have successfully met the merit and distinction criteria.

We have said what format the evidence could take for each task. Learners are not required to follow the format we have given unless we have told them otherwise. For example, if we say ‘You could include a report on …’ the evidence does not have to follow any specific reporting conventions. You can modify the format of the evidence but you must make sure the format allows the learner to access all of the grading criteria. If we require that evidence must take a specific format, we will make that clear in the task for learners.

If we have not specified a format for evidence learners are free to use the format that they feel is most appropriate for the purpose and target audience for each individual task.

For more guidance on generation and collection of evidence, please refer to the section 8 ‘Internal Assessment’, in the qualification handbook.
Authenticity

Authenticity in assessment is about making sure the work the learner produces for assessment is their own. We give information on authenticity in the qualification handbook under section 8. You must read through this and make sure all staff involved in assessment and your learners understand how important authenticity is.

Group work

This assignment has not been written to include group work. If you plan to ask learners to work in a team to complete work for assessment, you need to determine at which point in an assessment task learners can work together.

After completing the assignment

Once the learner has submitted their work to you to be assessed, you must judge or ‘mark’ the work against the grading criteria for the unit and identify one grade for the unit. For further information about assessment, please refer to section 8 of the qualification handbook.

Your assessment decisions must be quality assured across the cohort of learners in your centre who are being entered for the same unit. This must be done through an internal standardisation process. We give information on internal assessment and standardisation in the qualification handbook.

Reworking the assignment

If you and the learner feel they’ve not performed at their best during the assessment, the learner can, at your discretion, improve their work and resubmit it to you for assessment. If a learner is working on improving their work before it is resubmitted, you and the learner must continue to make sure the work is the learner’s own.

Any feedback you give to the learner must not direct them on how to improve their work. You can identify what area of the work could be improved but you cannot give the learner any details about how they could improve it. You must follow the guidelines given in section 8 of the qualification handbook under ‘Authenticity of learner work’.
Modifying the model assignment

The tasks in this assignment allow learners access to the full range of grades detailed in the grading criteria of this unit.

If you modify this assignment you must **not** change the grading criteria provided in the tasks for the learner or in the evidence checklist. These grading criteria are taken from the unit.

You can modify the scenario to suit your local or regional needs and the tasks may be contextualised to match any changes you have made to the scenario. If you supply your own drawings to support a different scenario, these must be sufficiently detailed for learners to complete the tasks.

You can modify the type of evidence and the format it takes, unless we expressly state that evidence must take a specific format.

You must also make sure that you avoid discrimination, bias and stereotyping and support equality and diversity. For more information, please see the section ‘Designing your own assignments for internally assessed units’ in section 8 of the qualification handbook.

If modifications are made to the model assignment, whether to the scenario alone, or to both the scenario and individual tasks, it’s your responsibility to make sure that all grading criteria can still be met and that learners can access the full range of grades.

If you are using this model assignment and delivering the Introductory Diploma, Foundation Diploma or Diploma you have an opportunity to secure meaningful employer involvement by working with an employer to modify it.
Q What do I need to do to pass this assignment?
A You need to produce evidence to meet the requirements of all the pass criteria for the unit this assignment relates to. If you miss just one pass criterion, you will not achieve this unit and will receive an unclassified result.

Q What do I need to do if I want to get a merit or distinction for this assignment?
A For a merit, you need to produce evidence to meet the requirements of all the pass criteria for the unit this assignment relates to and you need to produce evidence to meet all the merit criteria.

For a distinction, in addition to the above, you also need to meet all the distinction criteria for this unit.

Q What help will I get?
A Your tutor will support you when completing this assignment and will make sure that you know what resources or facilities you need and are allowed to use. We’ve given your tutor information about how much support they can give you.

Q What if I don't understand something?
A It's your responsibility to read the assignment carefully and make sure you understand what you need to do and what you should hand in. If you are not sure, check with your tutor.

Q I've been told I must not plagiarise. What does this mean?
A Plagiarism is when you take someone else’s work and pass this off as your own, or if you fail to acknowledge sources properly. This includes information taken from the internet.

It's not just about presenting a whole copied assignment as your own; you will also be plagiarising if you use the ideas or words of others without acknowledgement, and this is why it's important to reference your work correctly (see Q&A below for more information on referencing).

Plagiarism has serious consequences; you could lose the grade for this unit or you may not be allowed to achieve the whole qualification.

Always remember that the work you produce must be your own work. You will be asked to sign a declaration to say that it is.

Q What is referencing and where can I find out more information about it?
A Referencing is the process of acknowledging the work of others. If you use someone else’s words and ideas in your assignment, you must acknowledge it, and this is done through referencing.

You should think about why you want to use and reference other people’s work. If you need to show your own knowledge or understanding about an aspect of subject content in your assignment, then just quoting and referencing someone else’s work will not show that you know or understand it. Make sure it’s clear in your work how you are using the material you have referenced to inform your thoughts, ideas or conclusions.

You can find more information about how to reference in the The OCR Guide to Referencing available on our website: http://www.ocr.org.uk/i-want-to/skills-guides/.
Q  *Can I work in a group?*
A  Yes. However, if you work in a group at any stage, you must still produce work that shows your individual contribution. Your tutor can advise you how to do this.

Q  *Does my work for each task need to be in a particular format?*
A  You can present your work in a variety of ways – it can be handwritten, word-processed, on video or in digital media. What you choose should be appropriate to the task(s) and your tutor can advise you. There may be times when you need proof that you have completed the work yourself: for example, if you do something during work placement that you want to use as evidence, the tutor might ask the employer to provide a witness statement.

Make sure you check the wording in each task carefully. For each task, we’ll tell you if your evidence has to be in a specific format:

- If we say use the word *must*, for example ‘You must produce a report’ or ‘Your evidence/work must include a diagram’, then you must produce the work in the stated format.
- If we use the word *could*, for example ‘You could include sketches of your ideas’ or ‘You could do this by annotating your diagram’, this means that you are not required to follow the format we have given, but you must make sure that the work you do produce allows you to demonstrate the requirements of the grading criteria.

If you are unsure about what evidence you need, please ask your tutor.

Q  *Can I ask my tutor for feedback on my work?*
A  Yes, but they can't give you detailed feedback.

We have given your tutor instructions on what kind of feedback they can give you. For example, they are not allowed to tell you exactly what to do to make your work better, but they can remind you about what they’ve taught you and you can use this additional learning to try and improve your work independently. They can say what they’ve noticed might be wrong with your work, for example if your work is descriptive where an evaluation is required, but your tutor can’t tell you specifically what you need to do to change it from a description to an evaluation – you will need to work out what you need to do and then do it for yourself.

Q  *When I have finished, what do I need to do?*
A  If you have included the personal details (such as name, address or date of birth) of someone other than yourself in your work, this must be blanked out (anonymised) – your tutor will tell you how to do this. You don’t need to do this for information contained in references.

You can complete the evidence checklist to show your tutor where they can find the evidence for each grading criterion in your work.

You should make sure your work is labelled, titled and in the correct order for assessing.

Hand in the work that you’ve completed for each task to your tutor. They might ask to see your draft work, so please keep your draft work in a safe place.

Q  *How will my work be assessed?*
A  Your work will be marked by someone in your centre who has been authorised to do so. They will use the information in the grading criteria to decide which grade your work meets. The grading criteria are detailed in each unit and are also given in the tasks within this assignment. Please ask your tutor if you are unsure what the grading criteria are for this assignment.
Scenario

You work for Progress IT Support in their networking division. A client, Westwood Dental Practice, is about to undertake a major refurbishment of the Dental Practice and the IT systems it uses.

The Dental Practice consists of:

- a reception area
- a patient waiting area
- a children’s play area
- three treatment rooms
- a staff kitchen area
- a practice manager’s office
- store rooms
- toilets

The staff in the Practice consists of:

- a practice manager
- 2 receptionists
- 2 dental surgeons
- 1 dental hygienist
- 3 dental nurses

IT facilities include:

- 1 PC at reception
- 1 PC in the practice manager’s office
- Wi-Fi throughout the practice accessed by staff
- a printer in the reception area and a printer in the practice manager’s office

It is planned that the refurbishment will include updating of IT facilities to include:

- an on-line patient appointment booking system
- 1 PC in each of the treatment rooms and 1 tablet device in each of the treatment rooms for accessing patient records and recording treatment details
- Wi-Fi in the patient waiting area accessible by patients
- an additional PC computer at reception
- a file server for storing all practice files
- backup procedures for all practice files
The network specification will need to be customised by the centre assessor to reflect changes in working practices, to consider:

• stakeholder requirements i.e.: client, network user
• applications
• services
• constraints (e.g. cost, environment, time)
• security
  o risk assessment
  o Wi-Fi security
  o network security (e.g. firewall, MAC filtering)
• purpose (e.g. file sharing, internet access, network printing)

This could be done by incorporating meaningful employer involvement by an industry practitioner, providing an opportunity to make the scenario relevant to the learners’ experiences.
The tasks

**Task 1 : Plan a computer network for a client**

(This task should take between 3 and 4 hours)

Learning Outcome 1: **Understand the concept of networks**, is assessed in this task. and
Learning Outcome 2: **Be able to plan computer networks to meet client requirements**, is assessed in this task.

Your task is to:

Explain network addressing and how it is used. Your explanations must include how the IP address identifies a specific network, how to determine different hosts and networks that can be addressed and the function of the MAC address in transporting data between two IP hosts.

You are required to compare and contrast the OSI and TCP/IP networking models. Your comparisons must include the purpose as well as the similarities and differences between the two models. Your comparison should identify each of the network protocols (Ethernet, IP, TCP, UDP, FTP and SMTP) with each model and explain the role each protocol plays.

You are required to discuss the role of TCP/IP in networks for different topologies as listed in the teaching content. You should discuss how TCP/IP routes data between the listed network components and across different types of network. Your discussions will also include the purpose of TCP ports and the use of subnet masking.

You are required to create a network specification to meet the client’s requirement, as outlined in the scenario using different components and topologies. Assumptions relating to the scenario may be made, as necessary, and outlined in the response. The specification may have to be modified iteratively until it meets the client’s requirements.

Explain security mechanisms in computer networks. You must explain different threats to the security of your network specification you have created and then explain security systems that can be used to minimise the threat.

You are required to justify security measures for inclusion in your network specification. This criterion extends the specification of P3. You will carry out a security risk assessment for the given scenario.

You are required to produce planning documentation for the implementation of the identified network solution. You will use the network specification to create a complete network plan to meet the client’s requirements.
### Model Assignment Version 2

**Unit 4: Computer networks**

#### Pass

<table>
<thead>
<tr>
<th>Pass</th>
<th>Merit</th>
<th>Distinction</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1: Explain how network addressing is used</td>
<td>M1: Compare and contrast the OSI and TCP/IP networking models</td>
<td>D1: Discuss the role of TCP/IP in networks</td>
</tr>
<tr>
<td>P2: Explain security considerations for computer networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P3: Create a network specification to meet an identified client requirement</td>
<td>M2: Justify security measures for inclusion in an identified network solution</td>
<td></td>
</tr>
<tr>
<td>P4: Produce planning documentation for the implementation of an identified network solution</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Evidence

**A report or technical guide – P1, M1, D1**

This should explain network addressing and how it is used. Your explanations must include how the IP address identifies a specific network, how to determine different hosts and networks that can be addressed and the function of the MAC address in transporting data between two IP hosts.

You are required to compare and contrast the OSI and TCP/IP networking models. Your comparisons must include the purpose as well as the similarities and differences between the two models. Your comparison should identify each of the listed network protocols with each model and explain the role each protocol plays. Evidence for this could be related to the network plan.

You are required to discuss the role of TCP/IP in networks for different topologies (bus, wireless, segments, backbones). You should discuss how TCP/IP routes data between the listed network components and across different types of network. Your discussions will also include the purpose of TCP ports and the use of subnet masking. The evidence could be supported by illustrated examples showing how connectivity could be related to the network plan.

**A report – P2, P3, M2**

You are required to create a network specification to meet the client’s requirement. The specification may have to be modified iteratively until it meets the client’s requirements. If the scenario has been modified to cover a real client, the evidence could indicate client agreement.

You are required to explain security mechanisms in computer networks. You must explain different threats to the security of the network specification that you have created and explain security systems than can be used to minimise the threat.

You are required to justify security measures that you have included in your network specification. The evidence could be a clearly marked addendum to the network specification of P3 (M2).

#### Planning documentation – P4

You are required to produce planning documentation for the implementation of the identified network solution. You will use the network specification to create a complete network plan to meet the client’s requirements. Your evidence will be the planning documentation which will include any modifications required by the client.

Throughout the task it is important that you correctly reference all sources used, following appropriate conventions.

You are required to justify security measures that you have included in your network specification. The evidence could be a clearly marked addendum to the network specification of P3.
Task 2: Communicating the networking solution

(This task should take between 1 and 2 hours)

Learning Outcome 3: Be able to present network solutions to clients, is assessed in this task.

Your task is to:

Propose the computer network solution that you have created to the client. You will use the network plan to prepare a visualisation of the network.

(P5: Communicate the network solution to the identified client)

You are required to recommend performance tools to benchmark your network solution. Your recommendation should give an explanation of what these tools do.

(M3: Recommend performance tools to benchmark network solution)

<table>
<thead>
<tr>
<th>Pass</th>
<th>Merit</th>
<th>Distinction</th>
</tr>
</thead>
<tbody>
<tr>
<td>P5: Communicate the network solution to the identified client</td>
<td>M3: Recommend performance tools to benchmark network solution</td>
<td></td>
</tr>
</tbody>
</table>

Evidence

Presentation with detailed speaker notes – P5

You will be able to propose the computer network solution that you have created to the client. You will use the network plan to prepare a visualisation of the network. The evidence will be the network plans and visualisation and may be supported by a videoed presentation of you presenting the network solution.

A report or technical guide – M3

You are required to recommend performance tools to benchmark your network solution. Your recommendation should give an explanation of what these tools do.
**Task 3 : Maintaining the network**

(This task should take between 1 and 2 hours)

Learning Outcome 4: Be able to plan maintenance activities for computer networks, is assessed in this task.

Your task is to:

Create a maintenance plan for the network solution that you have created. The maintenance plan should relate to the proposed solution from P5. The evidence will be the actual maintenance plan, which should consider issues as listed in the teaching content.

You are required to evaluate the selection of maintenance activities identified for the network solution that you have created in P6. You should review the maintenance plan created in P6 and evaluate how the activities will support the ongoing functionality of the network.

<table>
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<tr>
<th>Pass</th>
<th>Merit</th>
<th>Distinction</th>
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</thead>
<tbody>
<tr>
<td>P6: Create a maintenance plan for the network solution</td>
<td></td>
<td>D2: Evaluate the selection of maintenance activities for the network solution</td>
</tr>
</tbody>
</table>

**Evidence**

**Maintenance plan document – P6**

Create a maintenance plan for the network solution that you have created. The maintenance plan should relate to the proposed solution from P5. The evidence will be the actual maintenance plan, which should consider issues as listed in the teaching content.

**Report or presentation – D2**

You are required to evaluate the selection of maintenance activities identified for the network solution that you have created in P6. You should review the maintenance plan created in P6 and evaluate how the activities will support the ongoing functionality of the network. This could be presented as a report or a presentation with speaker notes, for example.
## Evidence Checklist

**OCR Level 3 Cambridge Technicals in IT**  
**Unit 4: Computer Networks**

**LEARNER NAME:**

<table>
<thead>
<tr>
<th>For PASS have you: (as a minimum you have to show you can meet every pass criterion to complete the unit)</th>
<th>Where can your tutor find the evidence? Give page no(s)/digital timings, etc.</th>
</tr>
</thead>
</table>
| Explained how network addressing is used (P1)  
e.g. A report explaining network addressing and how it is used |  |
| Explained security considerations for computer networks (P2)  
e.g. A report explaining security mechanisms in your network specification |  |
| Created a network specification to meet an identified client requirement (P3)  
e.g. A report detailing your network specification to meet the client’s requirement |  |
| Produced planning documentation for the implementation of an identified network solution (P4)  
e.g. Planning documentation for the implementation of an identified network solution |  |
| Communicated the network solution to the identified client (P5)  
e.g. A presentation with detailed speaker notes proposing the computer network solution that you have created to the client |  |
| Created a maintenance plan for the network solution (P6)  
e.g. A maintenance plan document for the network solution that you have created |  |
<table>
<thead>
<tr>
<th><strong>For Merit have you:</strong></th>
<th><strong>Where can your tutor find the evidence? Give page no(s)/digital timings, etc.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Compared and contrasted the OSI and TCP/IP networking models (M1)</td>
<td></td>
</tr>
<tr>
<td>e.g. A report comparing and contrasting the OSI and TCP/IP networking models</td>
<td></td>
</tr>
<tr>
<td>Justified security measures for inclusion in an identified network solution (M2)</td>
<td></td>
</tr>
<tr>
<td>e.g. A report justifying security measures for inclusion in the network specification that you have created</td>
<td></td>
</tr>
<tr>
<td>Recommended performance tools to benchmark the network solution (M3)</td>
<td></td>
</tr>
<tr>
<td>e.g. A report recommending performance tools to benchmark your network solution</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>For Distinction have you:</strong></th>
<th><strong>Where can your tutor find the evidence? Give page no(s)/digital timings, etc.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussed the role of TCP/IP in networks (D1)</td>
<td></td>
</tr>
<tr>
<td>e.g. A report discussing the role of TCP/IP in networks for different topologies</td>
<td></td>
</tr>
<tr>
<td>Evaluated the selection of maintenance activities for the network solution (D2)</td>
<td></td>
</tr>
<tr>
<td>e.g. A report or presentation evaluating the selection of maintenance activities identified for the network solution that you have created</td>
<td></td>
</tr>
</tbody>
</table>