

LEVEL 4 ASSESSMENT SPECIFICATION

Student name:		Student ID number:	
Programme:			
Module:	Networks and Cyber Security Essentials		
Module code:	ACCA4024	Contribution to Overall Module Assessment (%):	50%
Lecturer:	Dr. Nitheesh Murugan Kaliyamurthy	Internal Verifier:	Dr. Carlene Campbell
Assignment Title:	<u>Analyse the networks and discuss its security postures</u>	Word count (or equivalent):	<u>2000</u>
Submission deadline:	on or before 6 th January 2023 (Friday) by 15:00 Hrs	Return date of provisional marks & written feedback:	on or before 3 rd Feb 2023 (Friday) by 15:00 Hrs
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 40%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

Module Learning Outcomes (from module syllabus)
• Develop fundamental understanding of network basics in terms of architecture, devices, application and protocols. • Demonstrate systematic understanding of security policies and measures to mitigate internal and external attacks and threats in a network.

TASK DESCRIPTION

Background:

Securing the network is one of the top priorities in today's business operations. According to the Department for Digital, Culture, Media and Sport's 2022 [1] report on Cyber security breaches survey, Cyber-attack remains 39% that is same as 2021, Phishing is reported at 83% of the attacks reported.

Various recent reports similar to the above would give clearer picture about the current status of Cyber-attacks and the cost involved in defending the attacks. Having given this background, you are asked to work on the problems based on the scenario given below and document reasonable solutions appropriately citing them to academic credible literatures, industry whitepapers, statistical data, cybersecurity reports etc.

1. 2022 Cyber security breaches survey ([Link](#))

Scenario:

Fred Jones is running an NGO "Mystery Incorporated" to lend hands to help the vulnerable population globally. The NGO runs with 50 employees in its own building. At one point of time, Fred thought of sharing the building with few more business to generate revenue. To manage the property, he hired a Property Manager by giving Roadside advertisements. The Property Manager was hired on a First come first served basis. The property manager brought in 3 new business inside the building and was generating good revenue.

All went well until "Mystery Incorporated" NGO's confidential files (with details about beneficiaries, fund raisers etc) were breached and leaked to their rivals. Fred wanted to mitigate and strengthen the infrastructure security. A 3rd Party Cybersecurity Consultant was hired and asked to do a Penetration testing to find out the vulnerabilities within the network. You are hired by Mystery Incorporated NGO as an Apprentice Employee to assist the 3rd Party Cybersecurity Consultant on behalf of the organisation.

The 3rd Party Cybersecurity Consultant completed the Penetration Testing over the network, following which the few vulnerabilities were listed.

1. Default Login credentials
2. A remote host is running a Telnet service allowing cleartext logins over unencrypted connections
3. A server is running with SSL/ TLS is prone to an information disclosure vulnerability

4. A possible usage of the deprecated SSLv2 and/or SSLv3 protocol on this system.
5. A remote SSL/ TLS server certificate and/or any of the certificates in the certificate chain is using RSA key with less than 2048 bits.

You are tasked to do the following:

Part 1: You are tasked to do research on the above stated vulnerabilities and propose necessary mitigation strategies.

- a) To understand the above vulnerabilities, you need to do research about different types of threats, vulnerabilities, and attacks to get an overview.

Word Limit: 500 Words

Structure: *(This is only a Guideline)*

Threats:

What is a Threat?

Types of Threats.

Significance of threats in a Network.

(Not Limited to)

Vulnerabilities:

What?

Why?

How?

(Not Limited to)

Attacks:

What?

Why?

How?

(Not Limited to)

- b) Based on your research about threats, vulnerabilities and attacks, reason out the above stated vulnerabilities in the scenario section with **what, why, how, and when** questions. Give justification for arguments and make judgements for each listed vulnerability.

Word Limit: 800 Words

- c) Continue your research to find out any available mitigation strategies on any two of the below listed encryption file formats. (200 Words)

(Choose any two)

1. Rnsmwr
2. Evillock
3. Kernel_time
4. Abc
5. edgel

Structure: *(This is only a Guideline)*

“Rnsmwr” file format attack

What it is?

How it affects the operation?

Are there any possible methods to recover?

(Not Limited to)

NB: There is no limit in discussing the number of threats, vulnerabilities, attacks, and encryption file formats. The more, the better. For each type you discuss, in-text cite appropriate literatures/references. Note that, your submission should follow IEEE report format and it is addressed to Fred.

Part 2: Demonstrate to Fred, any one vulnerability listed above of your own choice. Word Limit: 200 Words

- a) Complete “Introduction to Packet Tracer” course from Cisco networking academy. (<https://www.netacad.com/courses/packet-tracer/introduction-packet-tracer>) and attach the Certificate of Completion and share your digital badge link to verify.
- b) Complete all the 5 Module Exams and Final Exam for Palo Alto Network Security Fundamentals and Cybersecurity Foundation and submit the certificate to verify.
- c) Draw Physical and Logical Topology that suits better to demonstrate your chosen vulnerability.
- d) Implement the Topology as stated above and assign IP addresses and other required configurations. (Use Cisco Lab to complete this and document adequate screenshots with description)

Part 3: Draft a guideline to mitigate the above listed vulnerabilities. Word Limit: 300 Words

- a) Propose security devices that could be added to the network to secure the network.
- b) Propose Mitigation strategies to overcome the vulnerabilities.

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Report Requirements:

- The report should be 2000 words.
- The figures should be clear enough so that all the captions will be clearly readable.
- The report should be presented in an academic way (IEEE/ACM format)

Report format Example:

- Table of Contents (Word count not included)
- List of Figures/ Tables (Word count not included)
- Abstract (The abstract should be a summary of your entire work, like what you have done in this coursework. Recommendation: Your abstract should start with a couple of lines introducing your work)

and then the problem followed by the proposed solution and its outcome. Finally, your conclusion)
(Word count not included)

- Introduction (Give a background of your work) (Word count not included)
- Part 1 a) (Include appropriate and adequate research aspect/literature review focusing on threats, vulnerabilities, and attacks)
- Part 1 b) (Include appropriate and adequate research aspect/literature review focusing on the listed vulnerabilities)
- Part 1 c) (Include appropriate and adequate research aspect/literature review focusing on encryption file formats)
- Part 2 (Include appropriate and adequate screenshots with description, Links for digital badges etc. If needed added annexures/ appendix to support your work. Make sure the completed packet tracer file should be attached separately)
- Part 3 (Include Mitigation Strategies and guidelines for the organisation)
- Conclusion, recommendation, and future work (From your findings what do you recommend, discuss or state these. What can be done in the future to improve on your findings will be the future work). (Word count not included)
- References (Add all the references used in this report and make sure they are in-text cited) (Word count not included)
- Abbreviations (Add abbreviations for technical terms) (Word count not included)
- Annexures/ Appendix (If any) (Word count not included)

GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

NOTE: The guidance offered below is linked to the five generic assessment criteria overleaf.

1. Engagement with Literature Skills

Your work must be informed and supported by scholarly material that is *relevant* to and *focused* on the task(s) set. You should provide evidence that you have accessed an appropriate *range* of sources, which may be academic, governmental and industrial; these sources may include academic journal articles, textbooks, current news articles, organisational documents, and websites. You should consider the *credibility* of your sources; academic journals are normally highly credible sources while websites require careful consideration/selection and should be used sparingly. Any sources you use should be current and up-to-date, mostly published within the last five years or so, though seminal/important works in the field may be older. You must provide *evidence* of your research/own reading throughout your work, using a suitable referencing system, including in-text citations in the main body of your work and a reference list at the end of your work.

Guidance specific to this assessment: Your work must include articles published by peer reviewed journals, conference proceedings, books, and related website (e.g. IEEE, ACM, Science direct). Information from website such as how, wiki, forums, etc. will not be accepted.

Marks will be awarded for: (Part 1, 2 and 3)

- Diversity of sources and materials used
- Key concepts discussed (Threats, Attacks, Vulnerabilities, encryption file formats etc)
- Appropriate summaries of articles and level of critical appraisal of literature
- Application of appropriate referencing conventions (Note that **10 marks** allocated for proper and appropriate referencing)

2. Knowledge and Understanding Skills

At level 4, you should be able to demonstrate knowledge of the underlying concepts and principles associated with your area(s) of study. *Knowledge* relates to the facts, information and skills you have acquired through your learning. You demonstrate your *understanding* by interpreting the meaning of the facts and information (knowledge). This means that you need to select and include in your work the concepts, techniques, models, theories, etc. appropriate to the task(s) set. You should be able to explain the theories, concepts, etc. to show your understanding. Your mark/grade will also depend upon the *extent* to which you demonstrate your knowledge and understanding.

Guidance specific to this assessment: Your work must demonstrate understanding of concepts and underlying principles. You should explain the scenarios you have derived in a meaningful way. The strategy upon the security policy you create will be the blueprint that dictates your scenarios.

This will be assessed by (Part 1, 2 and 3)

- Depth of the research
- Strength of the statements

3. Cognitive and Intellectual Skills

You should be able to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of your subject(s) of study. You should be able to evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work. Your work must contain evidence of logical, analytical thinking. For example, to examine and break information down into parts, make inferences, compile, compare and contrast information. This means not just describing what! But also justifying: Why? How? When? Who? Where? At what cost? You should provide justification for your arguments and judgements using evidence that you have reflected upon the ideas of others within the subject area and that you are able to make sound judgements and arguments using data and concepts. Where relevant, alternative solutions and recommendations may be proposed.

Guidance specific to this assessment: Your work must demonstrate critical analysis and evaluation of chosen technologies. Your work must also justify your choice and provide evidence that your choice is better than other methods.

This will be assessed by the quality of your comments and conclusions, throughout the report:

- Innovative approach used in discussing the attacks matching to the stated scenario.
- Key observations and impact identified to support security measures.
- Observations are well thought through and discussed
- Organisation of ideas and evidence
- Analysis of the findings
- Eg: what, why, how, and when questions. Justification for arguments and Judgements

4. Practical Skills

At level 4, you should be able to apply the basic underlying concepts and principles to evaluate and interpret these within the context of your area of study. You should be able to demonstrate how the subject-related concepts and ideas relate to real world situations and/or a particular context. How do they work in practice? You will deploy models, methods, techniques, and/or theories, in that context, to assess current situations, perhaps to formulate plans or solutions to solve problems, or to create artefacts. This is likely to involve, for instance, the use of real world artefacts, examples and cases, the application of a model within an organisation and/or benchmarking one theory or organisation against others based on stated criteria.

Guidance specific to this assessment: You must use Packet Tracer, and/or any other suitable networking tools to demonstrate the implementation scenario you have adopted.

This will be assessed by the network or web/database model construction based on:

- Introduction to Packet Tracer” course completion (5)
- Network Security Fundamentals course Module Exams and Final Exam (7.5)
- Cybersecurity Foundation course Module Exams and Final Exam (7.5)
- Physical and Logical Topology diagram (5)
- Topology Implementation and its configurations (15)

5. Transferable Skills for Life and Professional Practice

Your work must provide evidence of the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility. This includes demonstrating: that you can communicate the results of your study/work accurately and reliably, and with structured and coherent arguments; that you can initiate and complete tasks and procedures, whether individually and/or collaboratively; fluency of expression; clarity and effectiveness in presentation and organisation. Work should be coherent and well-structured in presentation and organisation.

Guidance specific to this assessment: You must submit a report which should be approximately 2,000 words in length. The report should be presented in an academic way (IEEE/ACM format) and therefore must include an abstract, an introduction, a conclusion and a list of references. The report must be submitted via Turnitin as well.

This will be assessed based on the written and presentational quality of your report:

- Flow
- Professionalism
- Comprehension (grammar and spelling)
- Completeness and presentation of report
- Structure of the paper
- Quality of the report
- Following IEEE report format

STUDENT FEEDBACK FORM

This section details the *extent* to which the assessment criteria are demonstrated by you, which in turn determines your mark. The marks available for each category of skill are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Generic Assessment Criteria	Marks available	Marks awarded
1. Engagement with Literature Skills	15	
2. Knowledge and Understanding Skills	15	
3. Cognitive and Intellectual Skills	20	
4. Practical Application Skills	40	
5. Transferable Skills for Life and Professional Practice	10	

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)

Late Submission Penalties (tick if appropriate)

Up to 1 week late (40% Max)

Over 1 week late (0%)

%

GENERIC ASSESSMENT CRITERIA

Level 4

In accordance with the Framework for Higher Education Qualifications, at the end of Level 4 students will be expected to have demonstrated knowledge of the basic underlying concepts and principles of a subject, and an ability to evaluate and interpret these within the context of that area of study. They should be able to present, evaluate and interpret qualitative and quantitative data in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of their subject(s) of study. They will have learned how to evaluate different approaches to solving problems, and will be able to communicate the results of their study/work accurately and reliably, and with structured and coherent arguments. They will be able to undertake further training and develop new skills within a structured and managed environment and will have the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility.

Level 4	FAIL	MARGINAL FAIL	SATISFACTORY (3 rd / Pass)	GOOD (2.2 / Pass)	VERY GOOD (2.1 / Merit)	EXCELLENT (1 st / Distinction)	EXCEPTIONAL (1 st / Distinction)
Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
Engagement with literature (including reading, referencing, academic conventions and academic honesty)	Little or no evidence of reading and/or reliance on inappropriate sources. Views and findings mostly unsupported and non-authoritative. Referencing conventions used incoherently or largely absent.	Poor engagement with essential reading. No evidence of wider reading. Reliance on inappropriate sources, and/or indiscriminate use of sources. Heavily reliant on information gained through class contact. Inconsistent and weak use of referencing.	Engagement with a limited range of mostly relevant and credible sources but with some reliance on information gained through class contact. Some omissions and minor errors. Referencing conventions evident though not always applied accurately or consistently.	Engagement with an appropriate range of literature, including sources retrieved independently. Some over-reliance on texts rather than other sources. Referencing may show minor inaccuracies or inconsistencies.	Engagement with a wide range of literature, including sources retrieved independently. Selection of relevant and credible sources. Generally sound referencing, with no/very few inaccuracies or inconsistencies.	Engagement with an extensive range of relevant and credible literature. Consistently accurate application of referencing.	Exceptional engagement with an extensive range of relevant and credible literature. High-level referencing skills consistently applied.
Knowledge and understanding (Knowledge of the basic underlying concepts and	Major gaps in knowledge and understanding of the basic underlying concepts and	Gaps in knowledge of the basic underlying concepts and principles, with flawed or	Limited knowledge and understanding of the basic underlying concepts and	Knowledge of the basic underlying concepts and principles is accurate with a	Competent knowledge of the basic underlying concepts and principles. Exhibits very	Excellent knowledge and understanding of the basic underlying concepts and	Exceptional, detailed knowledge and understanding of the basic underlying

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principles of a subject.)	principles of the subject matter. Inclusion of irrelevant material. Substantial inaccuracies.	superficial understanding. Some significant inaccuracies and/or irrelevant material.	principles within the subject area. Some elements may be missing.	good understanding of the field of study but lacks depth and/or breadth.	good understanding.	principles of the subject.	concepts and principles
Cognitive and intellectual skills (Evaluate underlying concepts and principles of a subject and interpret qualitative and quantitative data in order to develop lines of argument and make sound judgements.)	Wholly or almost wholly descriptive work. Little or no evaluation of the underlying concepts and principles. Failure to develop arguments, leading to illogical or invalid judgements. Minimal or no use of evidence to back up views.	Largely descriptive work, with superficial evaluation of the underlying concepts and principles. Weak interpretation of data, flawed development of arguments and judgements. Information accepted uncritically, uses generalised statements made with scant evidence and unsubstantiated opinions. Ideas sometimes illogical and contradictory.	Limited attempt at evaluation of the underlying concepts and principles, tending towards description. Can interpret qualitative and quantitative data but with some errors. Some evidence to support emerging arguments and judgements but these may be underdeveloped or with a little inconsistency / mis-interpretation.	Good evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data, with minor errors. An emerging ability to use evidence to support the argument. Mostly valid arguments and logical judgements.	Sound evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data accurately. Ability to devise arguments using evidence to make mostly appropriate and valid judgements.	Excellent evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data accurately and with some insight. Excellent ability to devise arguments using evidence and make appropriate and valid judgements.	Exceptional evaluation of the underlying concepts and principles based evidence. Outstanding interpretation of qualitative and quantitative data. Exceptional ability to devise arguments using evidence and make wholly appropriate and valid judgements.
Practical skills (Different approaches to solving problems in particular contexts.)	Limited or no use of taught, basic methods, materials, tools and/or techniques. Little or no appreciation of the context of the application.	Rudimentary application of taught, basic methods, materials, tools and/or techniques but without consideration and	An adequate awareness and mostly appropriate application of basic methods, materials, tools and/or techniques.	A good and appropriate application of basic methods, materials, tools and/or techniques. Clear appreciation of	A very good application of a range of basic methods, materials, tools and/or techniques. Very good consideration of the context of	An advanced application of a range of taught, basic methods, materials, tools and/or techniques. The context of the application is	Exceptional levels of application and deployment skills in particular practical contexts. Outstanding identification of

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Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
	Very weak evidence of different approaches to problem-solving in particular contexts.	competence. Flawed appreciation of the context of the application. Weak evidence of different approaches to problem-solving in particular contexts.	Basic appreciation of the context of the application. Can identify problems in particular contexts and propose basic alternative approaches or solutions though there may be errors.	the context of the application. Good evidence of different approaches to problem-solving in particular contexts and proposes mostly appropriate solutions.	the application. Very good evidence of different approaches to problem-solving in particular contexts and proposes appropriate solutions.	well considered, and insightful. Excellent evidence of different approaches to problem-solving in particular contexts and proposes appropriate solutions.	problems in particular contexts and formulation of wholly appropriate, thoughtful solutions / different approaches.
Transferable skills for life and professional practice (Communicate the results of their study/work accurately and reliably, and with structured and coherent arguments; the qualities needed for employment requiring the exercise of some personal responsibility within a structured and managed environment.)	Work is poorly structured, disorganised, inaccurate and/or confusingly expressed. Very weak use of language and/or very inappropriate style. Failure to work effectively individual or as part of a group. Little or no evidence of the skills for employment requiring the exercise of some personal responsibility.	Work is poorly presented in a disjointed manner. It is loosely, and at times incoherently, structured, with information and ideas often poorly expressed. Weak use of language and/or inappropriate style. Flawed approach to individual or group work, meeting only partial obligations to others. Limited evidence of the skills for employment requiring the	Mostly ordered presentation and structure in which relevant ideas / concepts are reasonably expressed. Work may lack coherence and/or accuracy in places. Can work as part of a group, meeting most obligations to others but perhaps with limited involvement in group activities. Demonstrates the basic skills for employment requiring the exercise of some personal responsibility, with some areas	Mostly coherent, organised and accurate work, in a suitable structure and is for the most part clearly expressed. Can work effectively independently and/or as part of a team, with clear contribution to group activities. Demonstrates the skills for employment requiring the exercise of some personal responsibility, with some areas of strength and some of minor weakness.	Work is accurate, coherent, fluent, well-structured and organised. Can work effectively independently and/or as part of a team, with very good contribution to group activities. Demonstrates very good skills for employment requiring the exercise of some personal responsibility, with just occasional minor weakness.	Work is coherent, very fluent and is presented professionally. Can work effectively independently and/or as part of a team, with an excellent contribution to group activities. Demonstrates excellent skills for employment requiring the exercise of some personal responsibility with an appetite for further development.	Work is accurate, exceptionally coherent, very fluent and presented well. Can work effectively independently and/or as part of a team, with an exceptional contribution to group activities. Demonstrates exceptional skills for employment requiring the exercise of some personal responsibility with an appetite for further development.

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Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
		exercise of some personal responsibility.	of minor weakness.				

THIS DOCUMENT IS ALSO AVAILABLE IN WELSH