

Course / Programme:	MSc Cloud and Network Security
Module name and code:	CLD7302: Cloud Solutions and Implementation
Tutor:	Francis Morrissey
Assignment Number:	2 of 2
Assignment Title:	Implementation of Cloud solutions
Weighting	60% of overall module grade
Issue Date:	16/05/2025
Word count	Not applicable
Technical Demonstration	16/05/2025@2355
Submission Deadline:	16/05/2025@2355
For late submission, see Assessment Regulations for Postgraduate Programmes: Assessment Regulations for Postgraduate Taught Programmes 2024-25	

Learning Outcome assessed:

2. Demonstrate implementation of complex Cloud solutions based on a given brief.
3. Demonstrate how to address complex problems related to Cloud security in a systematic manner.

Scenario

Ocean power is a promising renewable energy source for several reasons. With over 70% of Earth's surface covered by oceans, they offer a vast and largely untapped energy resource that includes tidal, wave, ocean current, and thermal gradient energy. This energy source is particularly reliable, as tidal and wave patterns are more predictable compared to other renewables like solar and wind. Additionally, the high density of water enables ocean energy systems to generate more power from smaller volumes than wind energy, making them an efficient choice. Ocean power also contributes to reducing greenhouse gas emissions since it does not produce carbon emissions during operation.

Oceanic Energy Solutions (OES), a new UK-based firm, is dedicated to developing solutions for harnessing ocean power. One of their innovative technologies which will be released in the short term are advanced marine buoys. These buoys play several critical roles, such as ensuring safe navigation, monitoring the environment, and protecting marine ecosystems. They act as navigational aids by guiding vessels to safe paths and away from hazards like submerged rocks. Moreover, these specialised buoys are equipped with sensors that collect vital data to support their broader initiatives, including the development of commercial ocean-powered stations to supply energy to data centres, which have become increasingly energy-intensive with the rise of AI.

OES buoys are autonomous, utilising tidal turbines to harness energy from ocean currents and produce electricity. They also collect meteorological and oceanographic data for use in weather forecasting and climate research. The data gathered by these buoys will be transmitted through satellite internet networks, stored in data lakes, and then processed and analysed using predictive modeling techniques. This process aims to support scientific research and shape government policy related to marine environmental concerns.

Task 1 of 1 (60% of module grade due 16/05/2025@2355)

Task Background

Oceanic Energy Solutions (OES) has hired your firm to create a technological infrastructure plan to support their planned services. Initially, your firm proposed a Cloud Infrastructure solution and highlighted its numerous advantages. After submitting a report (Assignment 1) that thoroughly compared Cloud solutions and sustainability with traditional infrastructure models and practices, including security considerations, the Board of Directors of OES is confident that this approach is the most suitable for their needs.

Task Instructions

Submit a portfolio in the form of a report:

- detailing the implementation of key Cloud concepts and features suggested for OES
- considering how security will be addressed.

Guidance

Concepts and features covered in your solution may include (but are not limited to): Compute resources (e.g., AWS EC2); Storage resources (e.g., AWS S3); Databases resources (e.g., AWS PaaS; AWS RDS); security strategies (Firewalls, e.g. Security Groups, Identity e.g. AWS IAM, Virtual Private Cloud e.g. AWS VPC); Compliance (e.g. AWS Artifact; Data lake (e.g. AWS Lake Formation); and Billing and Cost Management.

Further Guidance

Incorporate/include the following:

- justification of strategies chosen, and alternatives considered.
- discussion of issues encountered throughout and analyses of resolutions.
- captioned images and figures which are high-quality, neatly cropped to support your discussion.
- assumptions clearly stated with explanations of how they have influenced the development of your solution.

Technical Demonstration

You are required to create a screencast of approximately ten minutes to present the key aspects of your solution to your tutor. The screencast should explain how you have addressed the client's requirements and showcase the features of your solution. After the screencast, your tutor may ask questions for further clarification. You must upload the screencast to the designated Moodle upload area.

Declaration: At the end of the assessment you should also include a declaration of any software tools including Generative AI (GAI) applications that you used in developing and completing the assessment.

Secondary Research Requirements

Level HE7 - It is expected that the Reference List will contain between fifteen to twenty sources. As a MINIMUM the Reference List should include four refereed academic journals and five academic books.

Submission

Submission of report should be made to Turnitin via Moodle before the deadline using the file naming convention below:

CLD7302_A2_IDnumber. For example, if your ID Number is 2400000, then your file name in Turnitin should be CLD7302_A2_2400000.

Use of Generative Artificial Intelligence (GAI) Applications in this Assessment

AI Status	Application	Notes
Category A	No GAI tool is permitted.	While grammar and/or spell checkers may be used to correct individual words and sentences, the use of GAI is not allowed. This is because the learning outcomes require you to produce original assessment work without any GAI assistance <u>Any GAI generated content which is presented as your own original work and is not acknowledged will be assessed for academic misconduct.</u>

Grading

A percentage mark will be provided based on *General Assessment Guidelines for Written Assessments*. Grading is as follows:

Distinction: 70 - 100%

Merit: 60 - 69%

Pass: 50 - 59%

Marks below 50% will be classed as fail.

Specific Assessment Criteria:

Please note that the General Assessment Criteria will also apply. Please see section 16)

Distinction (70% and above):

Students will demonstrate an excellent understanding of the subject content while constructing a portfolio detailing key Cloud concepts, features and associated security strategies based on a given brief, critical analyses results in clear, logical conclusions. Students will demonstrate a comprehensive understanding of the appropriate use of technologies and situations for which they are best suited. Extensive research demonstrating the use of a wide range of current secondary research sources will be evident. Academic style and referencing will be of an excellent standard.

Merit (60-69%):

Students will demonstrate a good understanding of the subject content while constructing a portfolio detailing key Cloud concepts, features and associated security strategies based on a given brief, analyses results in acceptable conclusions. Students will demonstrate a reasonable understanding of the appropriate use of technologies and situations for which they are best suited. Research demonstrating

the use of current secondary research sources will be evident. Academic style and referencing will be of a good standard.

Pass (50-59%):

Students will demonstrate an acceptable understanding of the subject content while constructing a portfolio detailing key Cloud concepts, features and associated security strategies based on a given brief, some analyses will be conveyed. Students will demonstrate an adequate understanding of the appropriate use of technologies and situations in which they are best suited. Research demonstrating some use of current secondary research sources will be evident. Academic style and referencing will be of a fair standard.

Fail (49% and below):

Students who do not meet the requirements of a Pass grade will not successfully complete the assessment activity.

Guidelines for the Preparation and Submission of Written Assessments

1. Written assessments should be word-processed in Arial or Calibri Light font size 12. There should be double-spacing, and each page should be numbered.
2. There should be a title page identifying the programme name, module title, assessment title, your student number, your marking tutor, and the date of submission.
3. You should include a word-count at the end of the assessment (excluding references, figures, tables and appendices).
Where a word limit is specified, the following penalty systems applies:
 - Up to 10% over the specified word length = no penalty
 - 10 – 20% over the specified indicative word length = 5 marks subtracted (but if the assessment would normally gain a pass mark, then the final mark to be no lower than the pass mark for the assessment).
 - More than 20% over the indicative word length = if the assessment would normally gain a pass mark or more, then the final mark will be capped at the pass mark for the assessment.
4. All written work should be referenced using the standard University of Bolton referencing style— see: <https://libguides.bolton.ac.uk/resources/referencing/>
5. Harvard Referencing is used for this module.
6. Unless otherwise notified by your Module Tutor, electronic copies of assignments should be saved as word documents and uploaded into Turnitin via the Moodle class area. If you experience problems in uploading your work, then you must send an electronic copy of your assessment to your Module Tutor via email BEFORE the due date/time.
7. Please note that when you submit your work to Moodle, it will automatically be checked for matches against other electronic information, as well as for hidden text characters and AI generated text. You will be able to see similarity matches but not currently flags for hidden characters and AI-generated text. The outcomes of Turnitin reports may be used as evidence in an academic misconduct investigation (see Section 14).
8. **Late work**
Late work will be subject to the following penalties:
 - Up to 7 calendar days late = 10 marks subtracted but if the assignment would normally gain a pass mark, then the final mark to be no lower than the pass mark for the assignment.

- More than 7 calendar days late = This will be counted as non-submission and no marks will be recorded.
- Late submission of assessments on refers and those which are graded Pass/Fail only, is not permitted unless an extension is approved. See below.

9. Extensions

In the case of exceptional and unforeseen circumstances, an extension of up to 14 days after the assessment deadline may be requested using the standard University Extension Request Form. For approval there would need to be an explanation and evidence of relevant circumstances.

Longer extensions for individual assessments, projects and artefacts may be granted, at the discretion of the Programme Leader.

Requests for extensions which take a submission date past the end of the module (normally week 15) must be made using the Mitigating Circumstances procedure.

Some students with registered disabilities will be eligible for revised submission deadlines. Revised submission deadlines for disability adjustments do not require the completion extension request paperwork. However, students should request these in writing in advance.

Please note that the failure of data storage systems is not considered to be a valid reason for an extension. It is therefore important that you keep multiple copies of your work on different storage devices before submitting it.

Academic Misconduct

Academic misconduct may be defined as any attempt by a student to gain an unfair advantage in any assessment. This includes plagiarism, collusion, commissioning (contract cheating) amongst other offences. In order to avoid these types of academic misconduct, you should ensure that all your work is your own and that sources are attributed using the correct referencing techniques. You can also check originality through *Turnitin*.

Please note that penalties apply if academic misconduct is proven. See the following link for further details:

<https://www.bolton.ac.uk/student-policy-zone/student-policies-2023-24/academic-misconduct-regulations-and-procedures-23-24>

GENERAL ASSESSMENT GUIDELINES – LEVEL HE7

		Relevance Learning outcomes must be met for an overall pass	Knowledge and Understanding	Analysis, Creativity and Problem-Solving	Self-awareness and Reflection	Research/Referencing	Written English	Presentation and Structure
DISTINCTION	Exceptional Quality 85-100%	Work is directly relevant and expertly addresses the requirements of the brief. Learning outcomes are met.	Demonstrates an exceptional breadth and depth of knowledge and understanding of theory and practice which is beyond the threshold expectation for the level. Produces exceptional work which makes a contribution to knowledge in the subject area.	Presents an exceptional critique of advanced research material resulting in clear, original, and illuminating conclusions. Expertly interprets complex matters and ideas and makes sound judgments in the absence of complete data. Demonstrates exceptional creative flair and a high level of originality. Develops distinctive, insightful, and creative solutions to complex problems.	Provides insightful reflection and critical self-awareness in relation to the outcomes of own work and personal responsibility.	An extensive range of advanced research sources critically evaluated and selected. Sources cited accurately in both the body of text and in the Reference List/ Bibliography.	Writing style is clear, succinct, and relevant to the requirements of the assessment. An exceptionally well written answer with only rare errors in spelling, grammar, and punctuation. Uses a wide range of less common and more advanced vocabulary and sentence types fluently and flexibly to convey precise meanings. Paragraphs are expertly structured with linking and signposting.	The presentational style and layout are correct for the type of assignment. Evidence of planning and logically structured. Where relevant, there is effective inclusion of, and reference to, figures, tables, and images.
	Excellent Quality 70-84%	Work is relevant and comprehensively addresses the requirements of the brief. Learning outcomes are met.	Demonstrates an excellent breadth and depth of knowledge and understanding of theory and practice for this level. Clearly demonstrates originality in the application of knowledge.	Presents an excellent critique of advanced research material resulting in clear, original, and illuminating conclusions. Comprehensively interprets complex matters and ideas and makes sound judgments in the absence of complete data. Demonstrates excellent creative flair and a high level of originality. Develops distinctive and creative solutions to complex problems.	Provides excellent reflection and critical self-awareness in relation to the outcomes of own work and personal responsibility	A wide range of advanced research sources critically evaluated and selected. Sources cited accurately in both the body of text and in the Reference List/ Bibliography.	Writing style is clear, succinct, and relevant to the requirements of the assessment. A very well written answer with very few errors in spelling, grammar, and punctuation. Uses a wide range of vocabulary and sentence types fluently and flexibly to convey precise meanings. Paragraphs are very well structured with linking and signposting.	The presentational style and layout are correct for the type of assignment. Evidence of planning and logically structured Where relevant, there is effective inclusion of, and reference to, figures, tables, and images.
MERIT	Good Quality 60-69%	Work is relevant and addresses most of the requirements of the brief well. Learning outcomes are met.	Demonstrates a thorough breadth and depth of knowledge and understanding of theory and practice for this level. Demonstrates originality in the application of knowledge.	Presents a comprehensive critique of advanced research material resulting in clear and original conclusions. Systematically interprets complex matters and ideas and makes sound judgments in the absence of complete data. Demonstrates creative flair and originality. Develops creative solutions to complex problems.	Provides good reflection and critical self-awareness in relation to the outcomes of own work and personal responsibility, as required by the assessment.	A range of advanced research sources critically evaluated and selected. In the main, sources cited accurately in both the body of text and in the Reference List/ Bibliography.	Writing style is clear, succinct, and relevant to the requirements of the assessment. A well written answer with some minor errors in spelling, grammar, and punctuation. Uses a range of vocabulary and sentence types to convey precise meanings. Paragraphs are well structured with linking and signposting.	The presentational style and layout are correct for the type of assignment. Evidence of planning and logically structured in the main. Where relevant, there is effective inclusion of, and reference to, figures, tables, and images.

PASS	Satisfactory Quality 50-59%	<p>Work addresses the requirements of the brief, although superficially in places. Minor irrelevant content.</p> <p>Learning outcomes are met.</p>	<p>Demonstrates a sufficient breadth and depth of knowledge and understanding of theory and practice for this level.</p> <p>Demonstrates originality in the application of knowledge in places.</p>	<p>Presents some critique of advanced research material resulting in original conclusions.</p> <p>Shows the ability to systematically interpret complex matters and ideas and makes sound judgments in the absence of complete data.</p> <p>Demonstrates creative flair and originality.</p> <p>Develops some creative solutions to complex problems.</p>	<p>Provides justified reflection and critical self-awareness in relation to the outcomes of own work and personal responsibility, as required by the assessment.</p>	<p>Advanced research sources critically evaluated and selected.</p> <p>Some errors evident in relation to referencing the text and Reference List/Bibliography</p>	<p>Writing style is readable and relevant to requirements of the assessment in the main.</p> <p>Competently written with minor lapses in spelling, grammar, and punctuation. For example, paragraphs are structured and include some linking and signposting. Sentences are complete.</p> <p>A range of appropriate vocabulary is used.</p>	<p>The presentational style and layout are correct for the type of assignment.</p> <p>Logically structured in the most part.</p> <p>Inclusion of figures, tables, and images but not all relevant or referred to.</p>
FAIL	Borderline Fail 45-49%	<p>Work addresses some of the requirements of the brief. Irrelevant and superficial content.</p> <p>One or more learning outcomes have not been met.</p>	<p>Some omissions are evident in knowledge and understanding of theory and practice for this level.</p> <p>Demonstrates limited originality in the application of knowledge.</p>	<p>A limited critique of research material presented, with simplistic conclusions drawn.</p> <p>Some complex matters and ideas are interpreted but not systematically, resulting in flawed judgements.</p> <p>Limited creativity and originality evident.</p> <p>Demonstrates insufficient problem- solving skills and initiative.</p>	<p>Provides limited reflection and critical self-awareness in relation to the outcomes of own work and personal responsibility, when required.</p>	<p>Sources selected are limited and lack validity/relevance.</p> <p>Poor referencing technique employed.</p>	<p>Writing style is generally readable but lacks relevance to requirements of the assessment in places.</p> <p>Intermittent lapses in grammar, spelling and punctuation pose obstacles for the reader. For example, some paragraphs may lack structure and there is limited linking and signposting.</p> <p>Some appropriate vocabulary is used</p>	<p>For the type of assignment, the presentational style, layout and/or structure are lacking.</p> <p>Inclusion of figures, tables, and images but not clear, relevant and/or referred to.</p>
	Fail 0-44%	<p>Work does not address the requirements of the brief. Irrelevant and superficial content.</p> <p>One or more learning outcomes have not been met.</p>	<p>Demonstrates inadequate knowledge and understanding of theory and practice for this level.</p> <p>A lack of originality in the application of knowledge is evident.</p>	<p>An absence of critique of research material evident with unjustified conclusions.</p> <p>Complex matters and ideas not interpreted correctly resulting in flawed judgements.</p> <p>Creativity and originality are absent.</p> <p>Insufficient problem-solving skills and initiative demonstrated.</p>	<p>Provides inadequate reflection and critical self-awareness in relation to the outcomes of own work and personal responsibility, when required.</p>	<p>Relevant and valid sources are not selected.</p> <p>Poor referencing technique employed.</p>	<p>Writing style is unclear and does not match the requirements of the assessment in question.</p> <p>Deficiencies in spelling, grammar and punctuation makes reading difficult and arguments unclear. Unstructured paragraphs</p>	<p>For the type of assignment, the presentational style, layout and/or structure are lacking.</p> <p>Inclusion of figures, tables, and images but not clear, relevant and/or referred to.</p>