

ASSESSMENT RESULT SHEET

Centre:

Centre for Cyber & Cloud
 Belfast Metropolitan College
 Castlereagh Campus

Course:

Foundation Degree in Software and Cloud Development with Data Analysis

Assessment Set By: O Scullion

Date :22/09/2023

Assessment Validated By: S. Allen

Date:

Name:	Mark Awarded (out of 100)	Weighting Within Module:
Module Title:	Date Issued:	Date Due:
Cyber and Cloud Computing Fundamentals	14/11/2023	28/11/2023
Assessment No: 2		

Outcomes – No. & Title

A1: Identify types of threats and vulnerabilities within an organisation with relation to Cyber Security and Cloud.

A2: Select countermeasures based on vulnerabilities and apply relevant security management to mitigate.

A3: Describe different Cloud and Cyber Security skills, techniques and technologies.

A4: Review current policies and procedures within an organisation.

B1: Review and evaluate a developed Cloud and Cyber Security policy.

B2: Interpret and evaluate results from an existing organisation, through their network architecture and security policy and explain solutions identified to address issues of potential threats and vulnerabilities in relation to Cloud and Cyber Security.

C1: Prepare and deliver a presentation identifying Cloud and Cyber Security concerns and suggest appropriate solutions and justify their choices.

C2: Review an organisation's policies & provide solutions to rectify design concerns as well as detect potential threats and vulnerabilities.

C3: Work effectively as a team member and reflect on own practice and that of others to critically analyse potential Cyber Security threats.

Aspects Assessed	Percentage Awarded	Percentage Available
Cloud Proposal	50%	
Cyber Report	50%	
		100%

Signature of Assessor Date: _____
 Cross Assessor Signature Date: _____

Section A

Scenario

Trendy Wear, a popular clothing retailer with both physical stores and an existing e-commerce website, is considering a major transformation. The company wishes to migrate its e-commerce operations to the cloud to improve scalability, cost-efficiency, and overall customer experience. However, Trendy Wear has significant concerns regarding which cloud services to use and the cybersecurity challenges it must address. As a cloud architect you have been asked to create a proposal that will include a design and plans of a suitable cloud network that will meet the requirements of Trendy Wear. Your proposal should include:

1. Customer requirements? (4)
2. An explanation of which deployment model Trendy Wear should use and why? (3)
3. An explanation of which cloud service model Trendy Wear should use and why? (3)
4. A Diagram of the cloud network. (10)
5. An explanation what services you would deploy and why? (20)
6. A power point presentation summarising your proposal including advantages and disadvantages of moving the cloud.(10)

END OF SECTION A

If you're considering the move to the cloud, let me introduce you to the perfect solution: Hybrid Cloud. As your cloud architect, I'm here to tell you, it's the ultimate way to elevate your digital experience.

Security is our top priority. Don't just rely on your cloud provider; it's a team effort. Picture your data as a precious gem – we're creating rules and fortresses to guard it. Policies for access, encryption for protection, configurations tailored to your needs, and vigilant monitoring – we've got it all covered.

Why Hybrid Cloud? It's not just a move; it's a secure transformation. Your data won't just be stored; it'll thrive in a fortress in the clouds. Ready for a secure journey into the future? Let's make it happen. ✨🌟

Section A: Cloud Transformation Proposal for Trendy Wear

1) Customer Requirements:

- Scalability: To accommodate varying traffic, especially during peak seasons or promotions.
- Cost-Efficiency: An economical solution that optimizes resource utilization.
- Enhanced Customer Experience: Fast page loading, high availability, and a secure online shopping environment.

- Cybersecurity: Robust measures to protect customer data and prevent unauthorized access.

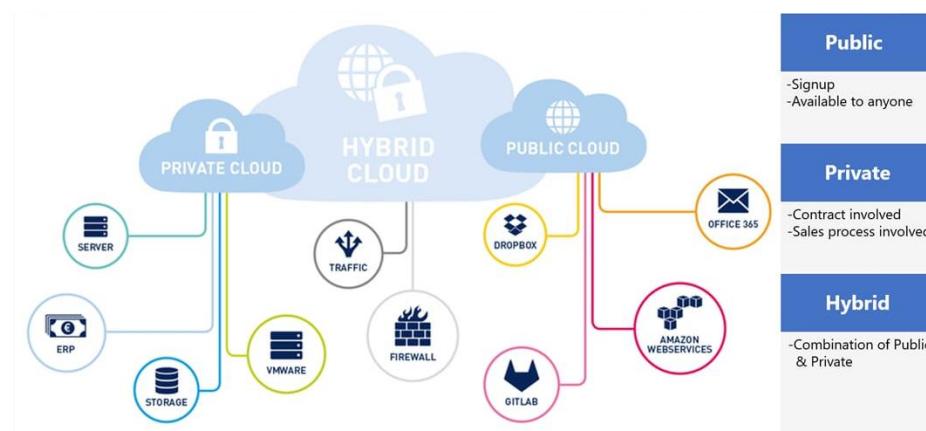
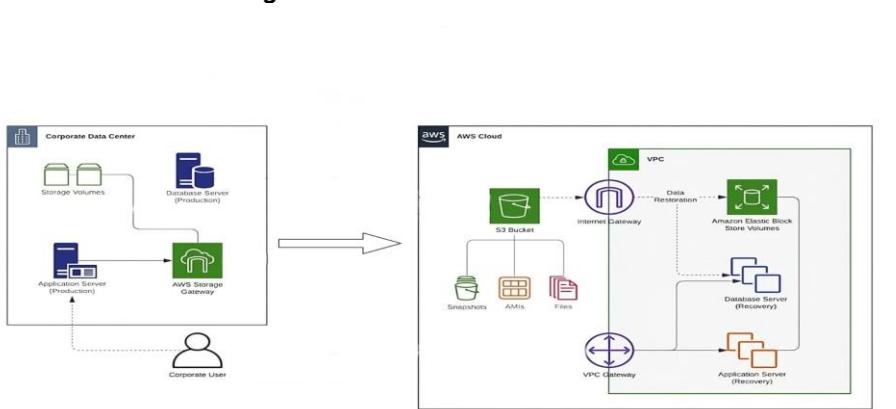
2) Deployment Model Recommendation: Trendy Wear should adopt a hybrid cloud deployment model.

- Reasoning: Hybrid model balances public and private clouds for flexibility and data security.
- Flexibility: Allows customization based on needs, optimizing performance and security.
- Data Security: Sensitive data stored in the private cloud for better control and compliance.

3) Cloud Service Model Recommendation: Trendy Wear should use a combination of Infrastructure as a Service (IaaS) and Platform as a Service (PaaS).

- IaaS: Flexibility and control over infrastructure components like virtual machines.
- PaaS: Streamlines development and deployment, reducing operational overhead.

4) Cloud Network Diagram:



5) Services Deployment and Justification:

- Content Delivery Network (CDN): Enhances speed and availability for a seamless shopping experience.

- Database as a Service (DBaaS): Efficient and scalable management of customer data for high availability.
- Load Balancing: Distributes traffic evenly, optimizing resource utilization and improving performance.
- Identity and Access Management (IAM): Controls and secures access to resources, ensuring only authorized personnel manage critical systems.
- Security Services (e.g., WAF): Implements Web Application Firewall for protection against web application attacks.
- Monitoring and Logging Services: Proactively identifies and responds to performance issues or security incidents.
- Backup and Disaster Recovery Services: Ensures data resilience and business continuity.

6)PowerPoint Presentation

- Title Slide-
 - Introduction to Trendy Wear's Cloud Transformation
- Agenda Slide-
 - Outline the key components to be discussed.
- Customer Requirements Slide-
 - Highlight the specific customer needs and expectations.
- Deployment Model Slide-
 - Explain the choice of a hybrid deployment model.
- Cloud Service Model Slide-
 - Justify the use of IaaS and PaaS.
- Cloud Network Diagram Slide-
 - Visual representation of the proposed cloud network.
- Services Deployment Slide-
 - Detail the services deployed and their justifications.
- Advantages Slide:
 - List the advantages of moving to the cloud.
- Disadvantages Slide:
 - Discuss potential challenges and disadvantages.
- Recommendation Slide:

Conclude with a clear recommendation for Trendy Wear.

SECTION B

TrendyWear, a popular clothing retailer with both physical stores and an existing e-commerce website, is considering a major transformation. The company wishes to migrate its e-commerce operations to the cloud to improve scalability, cost-efficiency, and overall customer experience. However, TrendyWear is concerned about which cloud services to use and the cybersecurity challenges it must address. As a cyber specialist, you have been asked to create a report to identify potential cloud vulnerabilities and threats and explain what security measures could be implemented to mitigate these.

Identify and explain cloud vulnerabilities.(5)

Identify and explain cloud threats.(5)

Explain security measures that could be taken to make the cloud more secure. (20)

Update your diagram to reflect those security measures.(5)

Explain how your secure cloud network design implements the CIA triad.(15)

END OF SECTION B

Section B: Cybersecurity Report for TrendyWear

1) Cloud Vulnerabilities:

- Data Breaches: Unauthorized access to sensitive customer data due to misconfigurations or vulnerabilities.
- Insecure Interfaces and APIs: Weaknesses in design or implementation of interfaces and APIs.
- Insufficient Identity, Credential, and Access Management (ICAM): Poor management of user identities and access controls.
- Insecure Data Storage: Weak encryption, misconfigured storage permissions, or inadequate security practices.
- Lack of Compliance Controls: Failure to adhere to industry-specific regulations and compliance standards.

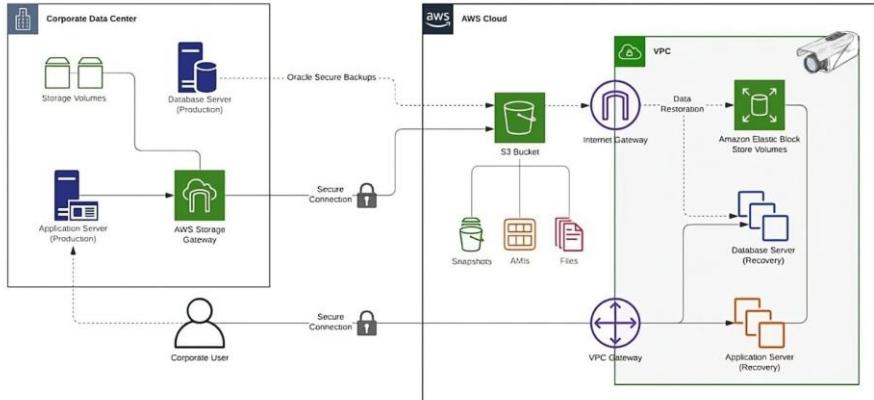
2) Cloud Threats :

- Data Interception: Unauthorized interception of sensitive data during transmission.
- Denial of Service (DoS) Attacks: Malicious attempts to overload the cloud infrastructure.
- Insecure Application Programming Interfaces (APIs): Exploitation of vulnerabilities in APIs.
- Malware Injection: Introduction of malware into the cloud environment.
- Account Hijacking: Unauthorized access to user accounts due to weak authentication.

3) Security Measures:

- Encryption: Implement end-to-end encryption for data in transit and at rest.
- Multi-Factor Authentication (MFA): Enforce MFA to enhance user authentication.
- Regular Security Audits and Penetration Testing: Identify and rectify vulnerabilities through regular assessments.
- Access Controls and Privilege Management: Implement strict access controls based on the principle of least privilege.
- Security Automation: Utilize automation tools for real-time threat monitoring and response.
- Secure APIs: Follow secure coding practices and regularly audit APIs for vulnerabilities.
- Incident Response Plan: Develop and update a plan for efficient response to security incidents.
- Backup and Recovery Procedures: Establish regular data backup and recovery procedures.
- Vendor Security Assessment: Evaluate and assess the security measures of cloud service providers.
- Employee Training and Awareness: Provide regular training on security best practices and raise awareness about potential threats.

4) Diagram Update :



5) Implementation of CIA Triad :

- Confidentiality: Achieved through encryption, access controls, and secure APIs.
- Integrity: Maintained through regular security audits, data validation, and backup procedures.
- Availability: Ensured via DDoS protection, redundancy, and an incident response plan.

-Reference

<https://cloud.google.com/learn/what-is-hybrid-cloud#:~:text=A%20hybrid%20cloud%20is%20a,centers%20or%20E2%80%9Cedge%E2%80%9D%20locations.>

https://www.tiger-technology.com/tiger-bridge-hybrid-cloud-data-management-software/?utm_term=hybrid%20cloud%20infrastructure&utm_campaign=Tiger+Bridge+-+Search+Campaign&utm_source=adwords&utm_medium=ppc&hsa_acc=5861433372&hsa_cam=20637521991&hsa_grp=163914634068&hsa_ad=679783624747&hsa_src=g&hsa_tgt=kwd-313201802812&hsa_kw=hybrid%20cloud%20infrastructure&hsa_mt=e&hsa_net=adwords&hsa_ver=3&gclid=CjwKCAiAjrarBhAWEiwA2qWdCOclv90V65GpQFQPQv3l9rYZ6y5hYE96Ko2GPMLstcYv1rL0jxffkRoCRYUQAvD_BwE

<https://aws.amazon.com/what-is/hybrid-cloud/>