



ICTICT428

Select cloud storage solutions

Assessment 1 of 3

Short Answer Questions

Assessor Guide



Assessment Instructions

Task Overview

This assessment task includes 10 short answer questions. Read each question carefully before typing your response in the space provided.

Important: Before commencing your work, you must update your *Student name* and *Student number* in the footer from **page 2** onwards.



Assessment Information

Submission

You are entitled to three (3) attempts to complete this assessment satisfactorily. Incomplete assessments will not be marked and will count as one of your three attempts.

All questions must be responded to correctly to be assessed as satisfactory for this assessment.

Answers must be typed into the space provided and submitted electronically via the Learning Platform. Hand-written assessments will not be accepted unless previously arranged with your assessor.

Reasonable adjustment

Students may request a reasonable adjustment for assessment tasks.

Reasonable adjustment usually involves varying:

- the processes for conducting the assessment (e.g. allowing additional time)
- the evidence gathering techniques (e.g. oral rather than written questioning, use of a scribe, modifications to equipment)

However, the evidence collected must allow the student to demonstrate all requirements of the unit.

Refer to the Student Handbook or contact your Trainer for further information.



Please consider the environment before printing this assessment.

Question 1

Define the three (3) cloud computing service delivery models (IaaS, PaaS and SaaS) and outline their application in cloud storage options.

[Approximate word count: 40-65 words per model]

Assessor instructions: Students must identify and outline the directions in ICT on cloud computing technology as they apply to cloud storage options.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 1 – Question 1 answer table

Cloud computing service delivery models	Answer: [40-65 words per model]
IaaS	<p>Infrastructure-as-a-Service (IaaS) provides virtualised computing resources over the Internet, including virtual machines, storage, and networking. Organisations can rent servers, storage, and networking infrastructure on-demand, allowing for flexible scaling and cost efficiency.</p> <p>In cloud storage options, IaaS allows users to provision and manage storage infrastructure remotely, enabling scalable and on-demand storage solutions without needing physical hardware.</p>
PaaS	<p>Platform-as-a-Service (PaaS) offers development platforms and tools over the Internet, allowing developers to build, deploy, and manage applications without worrying about the underlying infrastructure. In cloud storage,</p> <p>In cloud storage, PaaS platforms often provide storage services integrated with application development frameworks, offering features like database storage, file storage, and content delivery networks (CDNs).</p>
SaaS	<p>Software-as-a-Service (SaaS) delivers software applications over the Internet on a subscription basis, eliminating the need for organisations to install and maintain software locally.</p> <p>In cloud storage, SaaS solutions offer fully managed storage applications accessible via web browsers or APIs. These solutions include file sharing and collaboration platforms, document management systems, and email hosting, enabling users to access and store data securely from any device.</p>

Question 2

Define the typical cloud deployment models (private, public, hybrid, multi-cloud) and outline their application in cloud storage options.

[Approximate word count: 40-65 words per model]

Assessor instructions: Students must identify and outline the directions in ICT on cloud deployment models as they apply to cloud storage options.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 2 – Question 2 answer table

Cloud deployment models	Answer: [40-65 words per model]
Private Cloud	<p>A cloud deployment model dedicated to a single organisation, offering enhanced control, security, and customisation.</p> <p>In cloud storage, private clouds are ideal for organisations with stringent data security requirements, providing exclusive storage infrastructure for sensitive data, such as financial records or proprietary information.</p>
Public Cloud	<p>Cloud resources shared among multiple organisations, offering scalability, cost-efficiency, and ease of access.</p> <p>Public cloud storage options, like AWS S3 or Azure Blob Storage, provide scalable and accessible storage solutions for organisations of all sizes, supporting various data storage needs, from backups to application data.</p>
Hybrid Cloud	<p>Combines private and public cloud environments, allowing data and applications to move between them.</p> <p>Hybrid cloud storage options enable organisations to leverage the scalability of public cloud storage for non-sensitive data while keeping critical or regulated data on-premises or in a private cloud, ensuring data sovereignty and compliance.</p>
Multi-cloud	<p>Utilises services from multiple public cloud providers to avoid vendor lock-in and optimise performance, cost, and resilience. In cloud storage, multi-cloud strategies allow organisations to distribute data across different cloud platforms, mitigating risks associated with outages or disruptions in a single provider and leveraging best-of-breed storage solutions from different providers.</p>

Question 3

Identify and outline three (3) current trends in information and communications technology (ICT) and their application in cloud storage options.

[Approximate word count: 25-50 words per identified trend]

Assessor instructions: Students must identify and outline trends in ICT as they apply to cloud storage options.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 3 – Question 3 answer table

ICT trends	Answer: [25-50 words per trend]
1. AI and ML integration	Using these current ICT trends in cloud storage helps to optimise performance, automate management tasks, and enhance security. These technologies can predict storage needs, automate data placement, detect anomalies, and provide intelligent data management and analytics.
2. Sustainability initiatives	Cloud service providers are investing in green data centres, utilising renewable energy sources, and implementing energy-efficient technologies. This direction is driven by both regulatory pressures and customer demand for eco-friendly solutions.
3. Hybrid and multi-cloud architectures	These cloud storage options provide organisations with flexibility, resilience and optimised cost management by combining on-premises infrastructure with cloud storage services from multiple cloud storage providers. These approaches offer flexibility, prevent vendor lock-in, and enable organisations to leverage the best features of different cloud environments.
<p>Other answers may include:</p> <ul style="list-style-type: none"> • Serverless architectures: In cloud storage, serverless architectures enable dynamic scaling and efficient resource utilisation, reducing operational overhead and costs. Serverless storage allows developers to focus on application logic without worrying about storage provisioning and management. This trend is part of a broader move towards fully managed services that simplify cloud operations. • Edge computing: This brings computation and data storage closer to the data sources, reducing latency, enhancing performance, and supporting real-time processing, which is crucial for IoT applications and other time-sensitive tasks. • Automation and DevOps integration: Automation and integration with DevOps practices are becoming standard in cloud storage management. Infrastructure as Code (IaC) tools, such as Terraform and Ansible, are used to automate the deployment and management of storage resources. This integration streamlines operations, improves consistency, and accelerates development cycles. 	

Question 4

In Australia, cloud storage providers and users must adhere to several major industry technology standards to ensure security, interoperability and compliance.

Identify three (3) major industry technology standards that organisations in Australia must consider and outline how they apply when using cloud storage options.

[Approximate word count: 30–55 words per technology standard]

Assessor instructions: Students must identify and outline the major industry technology standards as they applies to cloud storage options.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

1. **Privacy Act 1988 and the Australian Privacy Principles (APPs)** – This is an Australian legislation that regulates the handling of personal information, with specific guidelines for organisations on how to manage personal data responsibly.
2. **Information Security Registered Assessor Program (IRAP)** – This provides a comprehensive process for the independent assessment of a system's security against the Australian Government ISM requirements. The goal is to maximise the security of Australian federal, state and local government data by focusing on the ICT infrastructure intended for data storage, processing and communication.
3. **Information Security Manual (ISM)** – Developed by the Australian Cyber Security Centre (ACSC), this provides guidance on how organisations can protect their information and systems from cyber threats, including those using cloud storage solutions.

Other answers may include:

General Data Protection Regulation – Although this is not an Australian standard, it has a significant impact on Australian companies handling the data of European Union residents, requiring compliance with stringent protection and privacy regulations for cloud storage options.

PCI DSS – This is a global information security standard designed to prevent fraud through increased control of credit card data. Therefore, cloud storage providers must implement strong encryption and other security measures to protect cardholder data stored in the cloud.

Question 5

Outline the following major themes relating to data within organisational environments and how they apply when selecting cloud storage solutions.

[Approximate word count: 65-100 words per theme]

Assessor instructions: Students must demonstrate their understanding of major themes relating to data within organisational environments and their applications when selecting cloud storage options.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 4 - Answer table for Question 1

Themes relating to data	Answer: [65-100 words per theme]
a. Data structure and formats	<p>Data can be structured (e.g., databases, tables) or unstructured (e.g., documents, images, videos). The format refers to how data is organised and stored, such as JSON, XML, CSV for structured data, or JPEG, MP4 for unstructured data.</p> <p>Cloud storage solutions need to support various data structures and formats. For example, Amazon RDS is suitable for structured data requiring relational databases, while AWS S3 or Azure Blob Storage can handle a mix of unstructured data formats, providing flexibility in storing and retrieving diverse data types.</p>
b. Data volume and scalability	<p>Data volume refers to the amount of data generated and stored. Scalability is the ability of the storage solution to grow with increasing data volumes without performance degradation.</p> <p>Cloud storage solutions like Google Cloud Storage and Amazon S3 offer scalable storage options that can automatically adjust to growing data volumes. This scalability ensures that businesses can handle increased data without investing in additional hardware, supporting their growth and data management needs efficiently.</p>
c. Data backup and disaster recovery	<p>Data backup involves creating copies of data to protect against loss. Disaster recovery refers to strategies and solutions for recovering data and maintaining business continuity in the event of data loss or disasters.</p> <p>Cloud storage solutions offer robust backup and disaster recovery options. For example, AWS Backup provides automated backup management across AWS services, while Google Cloud offers Disaster Recovery as a Service (DRaaS) to ensure data can be quickly restored after an incident, minimising downtime and data loss.</p>

Question 6

Outline the following major themes related to cybersecurity within organisational environments and how they apply when selecting cloud storage solutions.

- Identity and Access Management (IAM)
- Multi-Factor Authentication (MFA)
- Data encryption
- Data loss prevention
- Threat detection and response

[Approximate word count: 65-100 words per theme]

Assessor instructions: Students must demonstrate their understanding of major themes relating to cybersecurity within organisational environments and their applications when selecting cloud storage options. Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 5 – Question 6 answer table

Themes relating to cybersecurity	Answer: [65-100 words per theme]
<p>a. Identity and Access Management (IAM)</p>	<p>IAM involves managing user identities and controlling access to resources within an organisation. It ensures that only authorised users can access specific data and systems.</p> <p>When selecting cloud storage solutions, robust IAM capabilities are essential. Providers like AWS, Azure, and Google Cloud offer comprehensive IAM services, allowing organisations to define and enforce access policies, assign roles, and manage permissions. This ensures that sensitive data is accessed only by authorised personnel, reducing the risk of unauthorised access and potential data breaches.</p>
<p>b. Multi-Factor Authentication (MFA)</p>	<p>MFA requires users to verify their identity using multiple factors (e.g., password, mobile app, biometrics) before gaining access to data or systems.</p> <p>Implementing MFA enhances security by adding an extra layer of protection beyond passwords. When selecting cloud storage solutions, it's crucial to choose providers that support MFA. For example, AWS, Azure, and Google Cloud all offer MFA options. This additional security measure helps prevent unauthorised access even if passwords are compromised, protecting sensitive organisational data stored in the cloud.</p>

Themes relating to cybersecurity		Answer: (65-100 words per theme)
c. Data encryption	<p>Data encryption involves converting data into a coded format that can only be deciphered by authorised users with the correct decryption key.</p> <p>Encryption is vital for protecting data at rest and in transit. When selecting cloud storage solutions, organisations should ensure that the provider offers robust encryption capabilities. Services like AWS S3, Azure Blob Storage, and Google Cloud Storage provide encryption features to secure data. This ensures that even if data is intercepted or accessed without authorisation, it remains unreadable and secure, maintaining data confidentiality and integrity.</p>	
d. Data loss prevention	<p>DLP strategies and tools are designed to detect and prevent data breaches, unauthorised access, and data leaks. They monitor and control data transfer and use within an organisation.</p> <p>Choosing cloud storage solutions with integrated DLP capabilities is crucial for safeguarding sensitive information. Providers like Microsoft Azure and Google Cloud offer DLP tools that help identify, monitor, and protect sensitive data. These tools ensure compliance with regulatory requirements and prevent accidental or malicious data exfiltration, thereby protecting the organisation's valuable information assets.</p>	
e. Threat detection and response	<p>Threat detection involves identifying potential security threats and vulnerabilities, while response refers to the actions taken to mitigate and manage these threats.</p> <p>Cloud storage solutions should include advanced threat detection and response capabilities to protect against cyberattacks. Services like AWS GuardDuty, Azure Security Center, and Google Cloud Security Command Center offer real-time threat detection, automated responses, and incident management. These tools enable organisations to quickly identify and address security threats, minimising potential damage and maintaining the integrity and availability of their cloud-stored data.</p>	

Question 7

Identify three (3) popular cloud storage providers and compare their advantages and disadvantages based on factors that may include, but are not limited to, the following:

- potential for vendor lock-in
- range of storage services on offer
- support services and availability of documentation
- competitiveness in pricing
- user-friendliness
- reliability

For each cloud service provider, identify and list:

- three (3) advantages
- three (3) disadvantages.

Assessor instructions: Students must outline the advantages and disadvantages of cloud storage providers.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 6 – Question 7 answer table

Cloud storage service provider name	Advantages [List 3]	Disadvantages [List 3]
1. Amazon Web Services (AWS)	<ol style="list-style-type: none"> 1. Provides the broadest range of storage services 2. Large community support and extensive documentation 3. Robust management console and a wide range of tools and services that integrate seamlessly. 	<ol style="list-style-type: none"> 1. Complex due to vast array of options available, which makes the learning curve steep. 2. Storage options can be expensive and complex. 3. High-potential for vendor-lock in.
2. Microsoft Azure	<ol style="list-style-type: none"> 1. Extensive cloud storage variety and strong in hybrid and enterprise services. 2. Seamless integration with Microsoft products and services, such as Windows Server, Active Directory, and Office 365. 3. Enterprise-friendly with strong support for enterprise applications, including SAP, Oracle, and SQL Server. 	<ol style="list-style-type: none"> 1. Integration can lead to vendor-lock in 2. Competitive pricing, but complexity can add costs 3. Reliability issues: Historically, Azure has experienced more frequent outages compared to AWS.
3. Google Cloud Services	<ol style="list-style-type: none"> 1. Low potential for vendor-lock in as they are using open standards. 2. Competitive pricing with flexible billing options and sustained use discounts. 3. Generally, more user friendly 	<ol style="list-style-type: none"> 1. Smaller marketplace and ecosystem, which also limits third-party integrations. 2. Lower enterprise adoption, which might result in fewer enterprise-specific features and support. 3. Some services are not as mature or feature-rich as those offered by AWS.
<p><u>Other answers may include:</u></p> <p>IBM Cloud:</p> <ul style="list-style-type: none"> • Advantages: <ul style="list-style-type: none"> ○ IBM Cloud Storage is built with enterprise needs in mind, providing robust, secure, and reliable storage solutions. ○ Emphasis on security with features like encryption, access control, and compliance with industry standards and regulations (e.g., GDPR, HIPAA). ○ Extensive global network of data centers, ensuring low latency and high performance for international operations. • Disadvantages: 		

Cloud storage service provider name	Advantages [List 3]	Disadvantages [List 3]
	<ul style="list-style-type: none"> ○ BM Cloud has a smaller market share compared to the leading cloud providers like AWS, Azure, and GCP, which might limit its ecosystem and third-party integrations. ○ While comprehensive, the range of services might not be as extensive as those offered by larger competitors like AWS or Azure. ○ Although pricing is flexible, IBM Cloud services can be relatively expensive, particularly for small and medium-sized enterprises (SMEs). 	<p>Oracle Cloud:</p> <ul style="list-style-type: none"> ● Advantages: <ul style="list-style-type: none"> ○ Offers a comprehensive suite of integrated cloud services, including SaaS, PaaS, and IaaS. ○ Oracle Cloud prioritises security with advanced encryption, identity management, and compliance certifications, ensuring data protection and regulatory compliance for sensitive workloads. ○ With its high-performance infrastructure and advanced technologies like Autonomous Database, Oracle Cloud provides scalability to handle diverse workloads efficiently. ● Disadvantages: <ul style="list-style-type: none"> ○ Limited market share compared to competitors like AWS, Azure, and GCP, which may impact ecosystem support and user adoption. ○ The pricing structure can be complex, with various components and licensing models, leading to potential confusion and unexpected costs for users. ○ Those outside the Oracle ecosystem may face challenges when integrating with existing technologies and tools.

Question 8

Identify and list the advantages and disadvantages of the following cloud storage options:

- Block storage
- Object storage
- File storage

For each cloud storage option, outline:

- advantage[s]
- disadvantage[s]

[Approximate word count: 10-25 words per advantage/disadvantage]

Assessor instructions: Students must outline the advantages and disadvantages of cloud storage options.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 7 – Question 8 answer table

Cloud storage options	Advantages (10-25 words per option)	Disadvantages (10-25 words per option)
Block Storage	It offers low latency and high IOPS, making it suitable for databases and transactional applications.	Block storage can be more expensive, especially as data volumes grow.
Object Storage	Highly scalable, capable of storing vast amounts of unstructured data.	Object storage is generally slower in performance. This is not ideal for high-performance applications.
File Storage	Uses familiar hierarchical file systems, making it easy for users and applications to interact with data.	Less scalable; may struggle with very large volumes of unstructured data.

Question 9

Outline the following SLA terms related to service availability and performance of cloud storage solutions.

[Approximate word count: 5 - 15 words per term]

Assessor instructions: Students must outline the meaning of the SLA terms related to service availability and performance for cloud storage options.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 8 – Question 9 answer table

SLA terms	Answer: (5-15 words per term)
Uptime	The percentage of time the cloud storage service is operational and accessible.
Downtime	The period during which the service is unavailable.
Availability Zones	Geographically separate locations with independent power, cooling, and networking.
Latency	The time taken to complete a single read/write operation.
IOPS	The number of read/write operations the storage system can handle per second.
Throughput	The amount of data processed in a given time period, usually measured in MB/s or GB/s.
Data durability	The likelihood that data will be retained without corruption or loss.
Maintenance windows	Scheduled times for performing maintenance.
Notification procedures	How and when customers will be informed about maintenance and updates.

Question 10

Outline five (5) characteristics relating to cloud storage that must be included in service level agreements (SLAs).

[Approximate word count: 25 - 50 words per characteristic]

Assessor instructions: Students must outline the characteristics related to cloud storage that must be included in SLAs.

Students are likely to use different wording than the sample answer provided. However, the acceptable responses must:

- be within the specified word limit
- reflect the characteristics described in the exemplar answer.

A sample answer is provided below.

Table 9 - Question 10 answer table

SLA characteristics	Answer: [25-50 words]
1. Availability and uptime guarantees	SLAs should specify the expected availability and uptime of the cloud storage service, often stated as a percentage (e.g., 99.9% uptime). This ensures that the service is reliable and accessible when needed, with defined consequences for downtime, such as service credits or penalties, ensuring business continuity and operational reliability.
2. Performance metrics	Performance metrics such as latency, throughput, and response times should be clearly defined in the SLA. These metrics ensure that the cloud storage service meets the performance requirements necessary for efficient data access and processing, impacting overall application performance and user experience.
3. Data security and privacy	SLAs must outline the security measures and protocols in place to protect data, including encryption standards, access controls, and compliance with regulations (e.g., GDPR, HIPAA). This ensures that sensitive information is safeguarded against unauthorised access and breaches, maintaining data confidentiality and integrity.
4. Data backup and recovery	The SLA should specify the backup frequency, retention policies, and recovery times in the event of data loss. This ensures that data can be restored quickly and accurately following a disruption, minimising downtime and potential data loss, and ensuring business continuity.
5. Support and maintenance	SLAs should detail the scalability options available, allowing businesses to easily adjust storage capacity based on their needs. This characteristic ensures that organisations can efficiently manage data growth without service interruptions, supporting dynamic business requirements and growth.
<u>Other answers may include:</u>	
<ul style="list-style-type: none"> • Scalability: Defines the ability to scale storage capacity up or down based on demand. This characteristic ensures that the service can accommodate growing data volumes without degradation in performance, supporting organisational growth and changing needs. • Maintenance and scheduled downtime: Specifies the planned maintenance windows and procedures for notifying customers of scheduled downtime. This helps organisations prepare for and mitigate the impact of maintenance activities on their operations. • Data portability and interoperability: SLAs should cover the procedures and guarantees for data portability, ensuring that organisations can move their data to and from the cloud storage provider with ease. This includes format compatibility and support for various data transfer methods, ensuring flexibility and avoiding vendor lock-in. 	

- **Compliance and auditing:** The SLA should include provisions for compliance with relevant legal, regulatory, and industry standards. It should also outline the audit processes and frequency, ensuring that the cloud storage service adheres to necessary compliance requirements, providing peace of mind and legal assurance for the organisation.

Assessment submission checklist

Students must have completed all questions within this assessment before submitting. This includes:

1	10 short answer questions completed in the spaces provided.	<input type="checkbox"/>
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Assessment feedback

Assessors are to indicate the assessment outcome as Satisfactory (S) or Not Yet Satisfactory (NYS).

Assessor Name:

Date:

Assessor comments:

S

NYS


Congratulations, you have reached the end of Assessment 1!

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