# Cloud storage migration week 8 -10 part 1

The current infrastructure problems faced by this European company with a US office show critical issues in traditional on-premises data storage. Power outages resulting in data loss, combined with performance issues for international users, demonstrate the need for a robust cloud migration strategy. This essay shows a complete cloud-based solution for the factors in the company’s dual file type requirements while maintaining security, cost-effectiveness, and operational efficiency.

# Advantages and Disadvantages of Cloud-Based Storage

## Advantages

**Enhanced reliability and disaster recovery**: Cloud can offer better redundancy compared to single data center operations. Cloud providers also have service-level agreements guaranteeing 99.999999999% durability for object storage. This is very important for data storage. Worldwide data centers also ensure businesses can continue and keep making money.

**Improved global performance:** Multi-region deployments enable data to be stored closer to the user. The US office will benefit from local data replicas, immensely reducing latency and improving file access, keeping users happy.

**Dynamic scalability**: Cloud storage eliminates the need for capacity planning. Storage will scale automatically based on the demand, preventing capacity shortages and having too much storage space that is not used.

**Cost optimization through tiered storage:** Automated lifecycle management systems allow files to move between storage tiers based on access, optimizing money spent.

## Disadvantages

**Monthly costs:** unlike a big one-time payment for on-prem hardware, cloud storage involves a monthly cost that, if not supervised, will grow over time.

**Internet dependency:** cloud access requires a good and reliable internet connection. Network outages will impact file access, though this risk is mitigated by having local copies of critical data.

# Data storage strategy

The solution implements a hybrid multi-tier storage architecture:

**Type 1 files:** These files will be stored in Amazon S3 standard storage initially, using S3 intelligent tiering to automatically move files to S3 infrequent access after 30 days of reduced access. After extended periods of no use, files transition to S3 Glacier for long-term archival storage. Cross-region replication will be configured to create copies in the US East region for better access performance for American users.

**Type 2 files:** given their infrequent access requirement and size, these files will be stored directly in S3 Glacier Deep Archive, providing the most cost-effective storage option with retrieval times of 12 hours, which is good enough for how much they need to be accessed.

**Hybrid synchronization:** AWS storage gateway will maintain sync copies of recent data in the on-prem data center

## Security considerations

* **Encryption:** all data will be encrypted both when stored and during transmission. AWS Key Management Service will manage encryption keys with automatic rotation.
* **Access management:** We will be using AWS IAM, a role-based access control. Ensuring users only access files appropriate to their role
* **Storage policies:** S3 object lock will prevent file deletion by normal users
* **Audit logs:** AWS CloudTrail will log all access and modification

## Service model classification

This solution represents a hybrid IaaS/PaaS implementation:

**Platform as a service (PaaS):** core storage like S3 and Glacier will be fully managed by AWS, eliminating the need for infrastructure management

**Infrastructure as a service(IaaS)** is used for syncing tools or VMs that connect the local data center with the Cloud

## Efficiency tools

**AWS CLI and PowerShell:** The AWS CLI provides command-line access to all services, enabling automation through PowerShell scripts

**Third-party open source tools:** Rclone offers cross-platform file synchronization. Supporting multiple cloud providers

**AWS DataSync:** This service can transfer large amounts of data between on-prem storage and AWS

**Scripts:** PowerShell and Python scripts can automate routing tasks

## Required skills

**Cloud Management:** understanding of AWS services

**Security and compliance:** knowledge of cloud security, encryption, and compliance monitoring

**Scripting and automation:** skill in PowerShell, Python, or Bash for automation

**Monitoring and troubleshooting:** able to use CloudWatch and other tools to maintain system health/performance

## Storage class selection and rationale

Type 1 files

* **S3 standard (0-30 days):** immediate access and frequent modifications
* **S3 standard-IA(30 days-1 year):** less access with less storage costs
* **S3 Glacier (1+year):** **long-term** archival with decent retrieval times

Type 2 files

* **S3 glacier deep archive:** infrequent access and maximum cost savings

## Conclusion

The proposed cloud migration strategy addresses all requirements while providing enhanced reliability, performance, and cost savings. The hybrid approach maintains local data access while benefiting from cloud advantages like scalability and disaster recovery. Through security controls and automated management tools, this solution will modernize the company’s data infrastructure while reducing risks and costs. The multi-tiered storage approach optimizes expenses based on actual usage patterns,

## References

Amazon Web Services. (2024). *Amazon S3 Storage Classes*. <https://aws.amazon.com/s3/storage-classes/>

Amazon Web Services. (2024). *AWS Storage Gateway User Guide*. <https://docs.aws.amazon.com/storagegateway/>

Rclone. (2024). *Rclone Documentation*. <https://rclone.org/docs/>