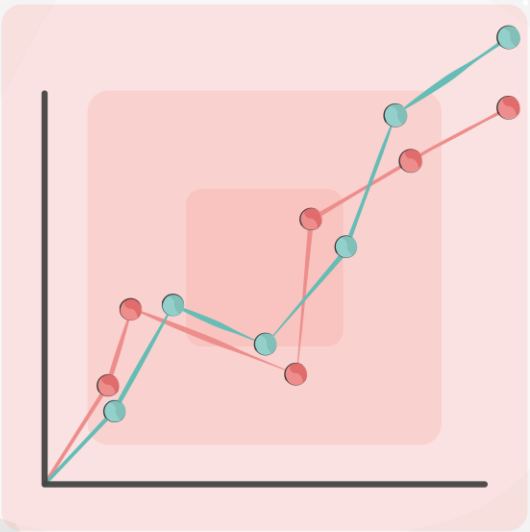
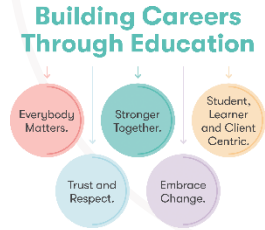
Level 5 Data Engineer
Module 5 Topic 5

Migrations, Archiving, Monitoring, and Disaster Recovery

Welcome to today's webinar.



E-learning recap



Are you happy you understand of the following?

- Robust archiving policies and frameworks are crucial for effective data management, regulatory compliance, and cost optimisation.
- Power/Interest Matrix frameworks help in creating a communication plan for cloud initiatives.
- Introducing data redundancy enhances performance and availability, protects against failures, and ensures continuity of services.
- DR policies and incident response strategies are fundamental for preparing organisations to handle unexpected events, minimising downtime, and maintaining business operations.
- Implementing DR and monitoring for an HR dashboard in a bank demonstrates the application of best practices in DR, archiving, redundancy, and monitoring to ensure resilience, performance, and security.

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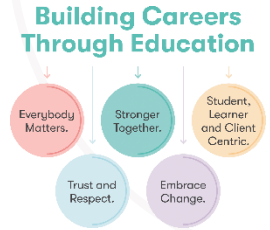
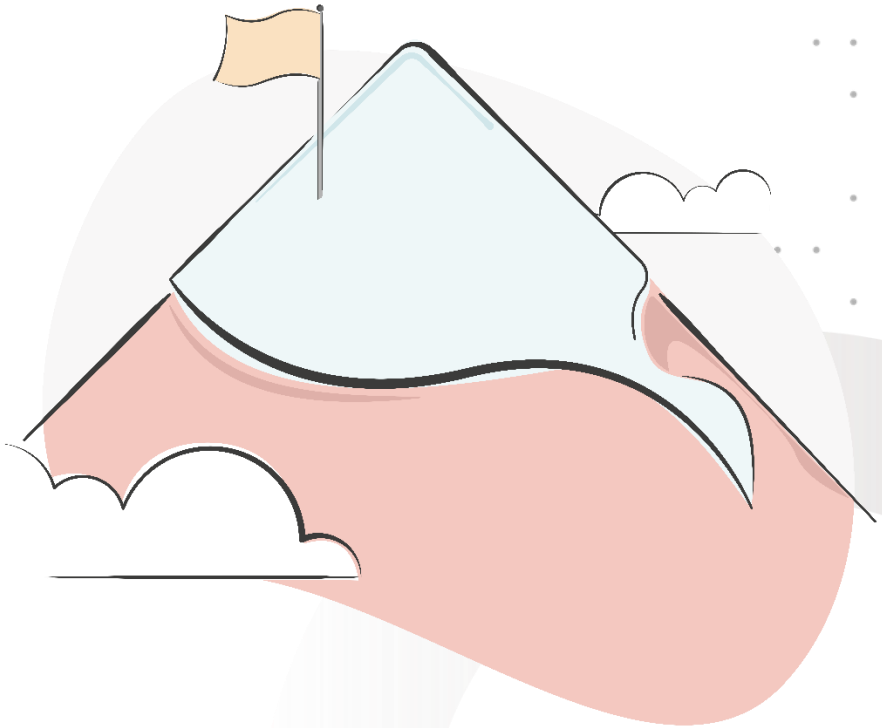
Session objectives



This webinar supports the following learning outcomes:

- Explain the various types of cloud migration projects, including successful and failed examples, and identify key factors that contribute to their outcomes.
- Describe the importance of robust archiving policies and frameworks and apply best practices to develop effective archiving strategies.
- Outline the components of effective disaster recovery (DR) policies, including incident response plans, and develop strategies to mitigate risks.
- Utilise Azure Monitor or similar tools to monitor cloud resources, configure alerts, and analyse performance metrics.



Submit your responses to the chat!

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Cloud migration

The process of moving data, applications, or other business elements to a cloud computing environment.

Types of Migrations:

- **Rehosting (Lift and Shift):** Moving applications without significant changes.
- **Refactoring:** Modifying applications to leverage cloud benefits.
- **Rebuilding:** Rewriting applications from scratch.

Key Considerations:

- Assessing readiness and compatibility.
- Planning for data transfer and integration.
- Managing change and training staff.

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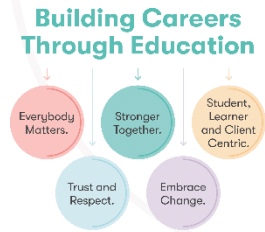
Case study

Capital One’s Migration…



- **Background:** Needed agility to innovate in financial services.
- **Approach:** Adopted a cloud-first strategy with robust security measures.

Outcomes:

- Accelerated product development.
- Improved security and compliance posture.

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A failed case study

Target…

- **Background:** Planned to move e-commerce infrastructure to AWS.

Challenges:

- Underestimated complexity and costs.
- Cultural resistance and lack of cloud expertise.
- **Outcome:** Project halted; reverted to on-premises solutions.

A failed case study

Lessons learned…

- Importance of realistic assessments and expectations.
- Need for skilled personnel and stakeholder buy-in.
- Critical role of security and compliance considerations.
- Prioritise risk assessment and management.

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Cloud migration

Common pitfalls…

- Lack of clear strategy and objectives.
- Underestimating costs and timelines.
- Ignoring cultural and organisational change.
- Inadequate training and skill development.

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Cloud archiving

Reasons for archiving…

- Regulatory compliance and legal requirements.
- Historical data preservation.
- Optimising primary storage performance.

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Cloud archiving

Archiving policy…

- **Data Classification:** Determining what data needs to be archived.
- **Retention Schedules:** Defining how long data should be retained.
- **Access Controls:** Ensuring only authorised access to archived data.
- **Disposal Procedures:** Securely deleting data when retention periods expire.

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Cloud archiving

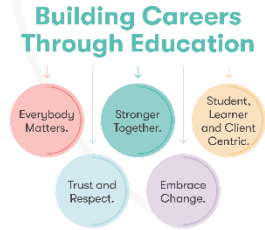
Best practices…

Use different storage tiers based on data access frequency.

- **Hot Storage:** For frequently accessed data.
- **Cold Storage:** For infrequently accessed data.
- Reduce storage requirements by eliminating duplicate data (deduplication)
- Use compression
- Use encryption and secure key management
- Regular audits

Cloud archiving

Challenges…



Challenge : Managing Legacy Data Formats

- **Example:** A government agency needing to access data stored in obsolete formats.
- **Solution:** Migrated data to standard formats and updated archiving systems.

Challenge 2: Cost Management

- **Example:** A media company facing escalating storage costs for large volumes of archived video content.
- **Solution:** Adopted cloud-based cold storage solutions like Amazon Glacier or Azure Archive Storage.

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Discussion

Apply your learning

In breakout rooms, design an archiving strategy for a fictional company in a regulated industry

(e.g., finance, healthcare).

Considerations:

- Identify types of data to archive.
- Determine retention periods and compliance requirements.
- Choose appropriate storage solutions and security measures.

Submit your responses to the chat!

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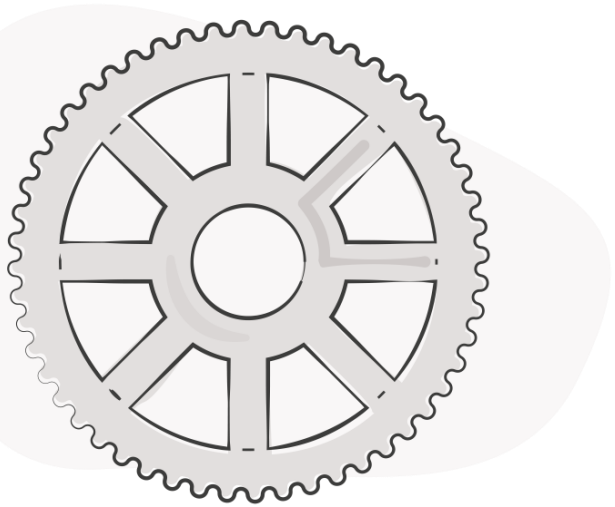
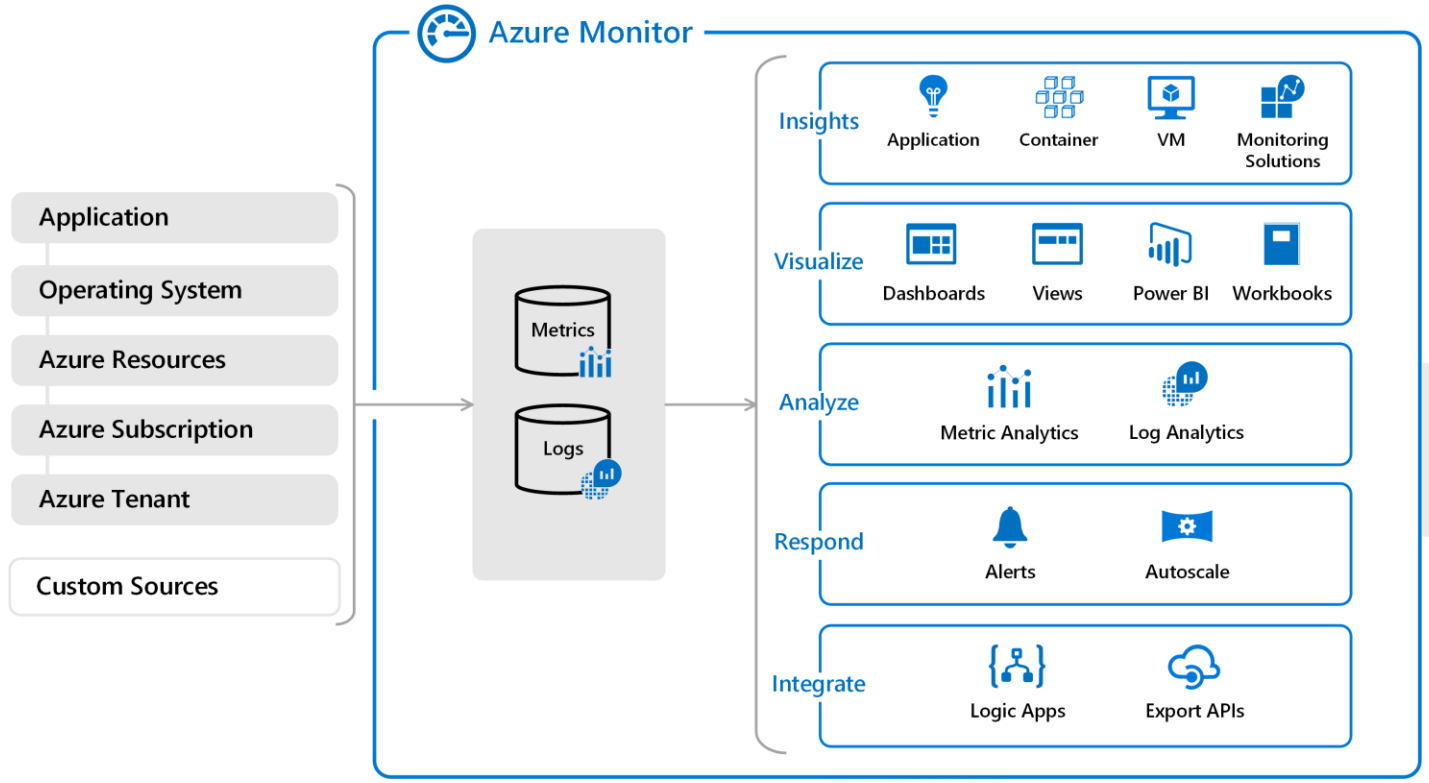
Walkthrough

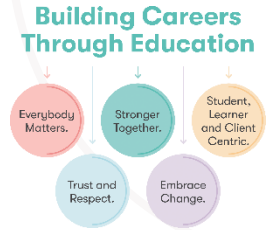
Azure monitor console

- Exploring metrics
- Exploring logs
- Set up alerts
- Using dashboards





Discussion



Monitoring and disaster recovery strategies

Activity:

- **Task:** In groups, discuss the following questions:
  - How can proactive monitoring prevent disasters?
  - What are the key elements of an effective disaster recovery plan?
  - How do archiving and redundancy contribute to disaster recovery?

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Submit your responses to the chat!

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Disaster recovery

The components of a DR plan…

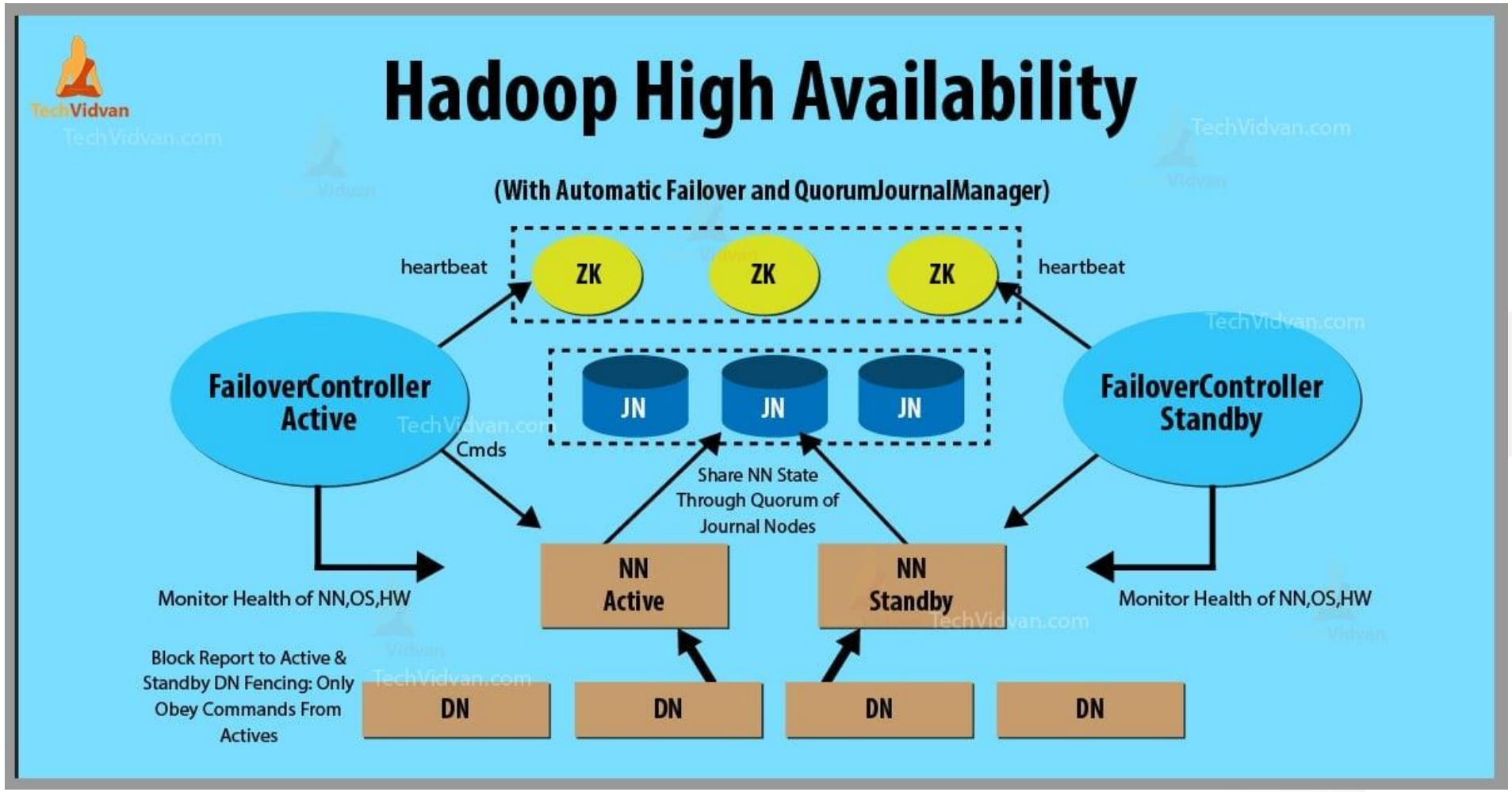
- **Risk Assessment:** Identifying potential threats and vulnerabilities.
- **Business Impact Analysis:** Determining critical functions and acceptable downtime.
- **Recovery Strategies:** Developing methods to restore systems and data.
- **Communication Plan:** Establishing protocols for internal and external communications

Redundancy

- **Data Redundancy:** Replicating data across multiple storage devices or locations.
- **Hardware Redundancy:** Using multiple hardware components to prevent single points of failure.
- **Network Redundancy:** Employing multiple network paths to ensure connectivity.

Deep Dive

Hadoop High Availability…



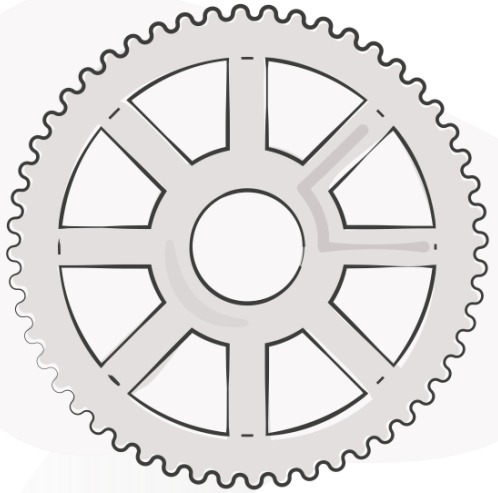
Walkthrough

Writing and Deploying a Cloud-Native Monitoring Service in Python

Building a custom monitoring service allows for tailored observability of specific applications or systems.

Using Python, a versatile and widely used programming language, you will create a cloud-native monitoring application that collects metrics, processes data, and integrates with monitoring platforms.

Re-visit your e-learning for some useful code snippets.



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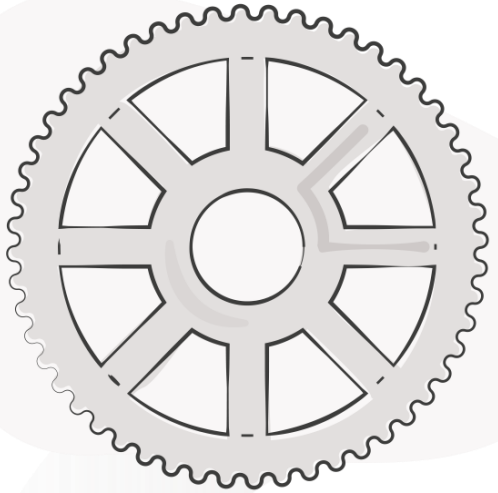
Walkthrough

Monitor your deployment

After you containerise and deploy your Python app, use Azure Monitor to identify the most relevant metrics that you can use to monitor your deployment

- https://learn.microsoft.com/en-us/azure/container-apps/observability
- https://learn.microsoft.com/en-us/azure/container-apps/metrics
- https://learn.microsoft.com/en-us/azure/azure-monitor/essentials/analyze-metrics



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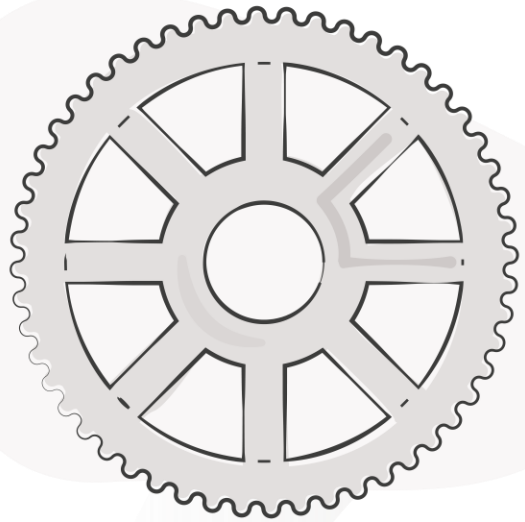
Post-webinar tasks

Apply…

- **Task 1:** Document a migration plan including potential pitfalls and lessons learned

- **Task 2:** Develop a basic disaster recovery plan and incident response procedure



Key Learning Summary

The key takeaways from this session are as follows:

- Migrations, archiving, monitoring, and disaster recovery are essential components of cloud computing.
- Robust archiving policies and frameworks are essential for effective data management, regulatory compliance, and cost optimisation.
- The power/interest matrix framework helps in creating a communication plan for cloud initiatives.
- Introducing redundancy enhances performance and availability, protects against failures, and ensures continuity of services.
- DR policies and incident response strategies are fundamental for preparing organisations to handle unexpected events, minimising downtime, and maintaining business operations.
- Implementing DR and monitoring for an HR dashboard in a bank demonstrates the application of best practices in DR, archiving, redundancy, and monitoring to ensure resilience, performance, and security.

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Thank you

Do you have any questions, comments, or feedback?