Security and Compliance in Azure
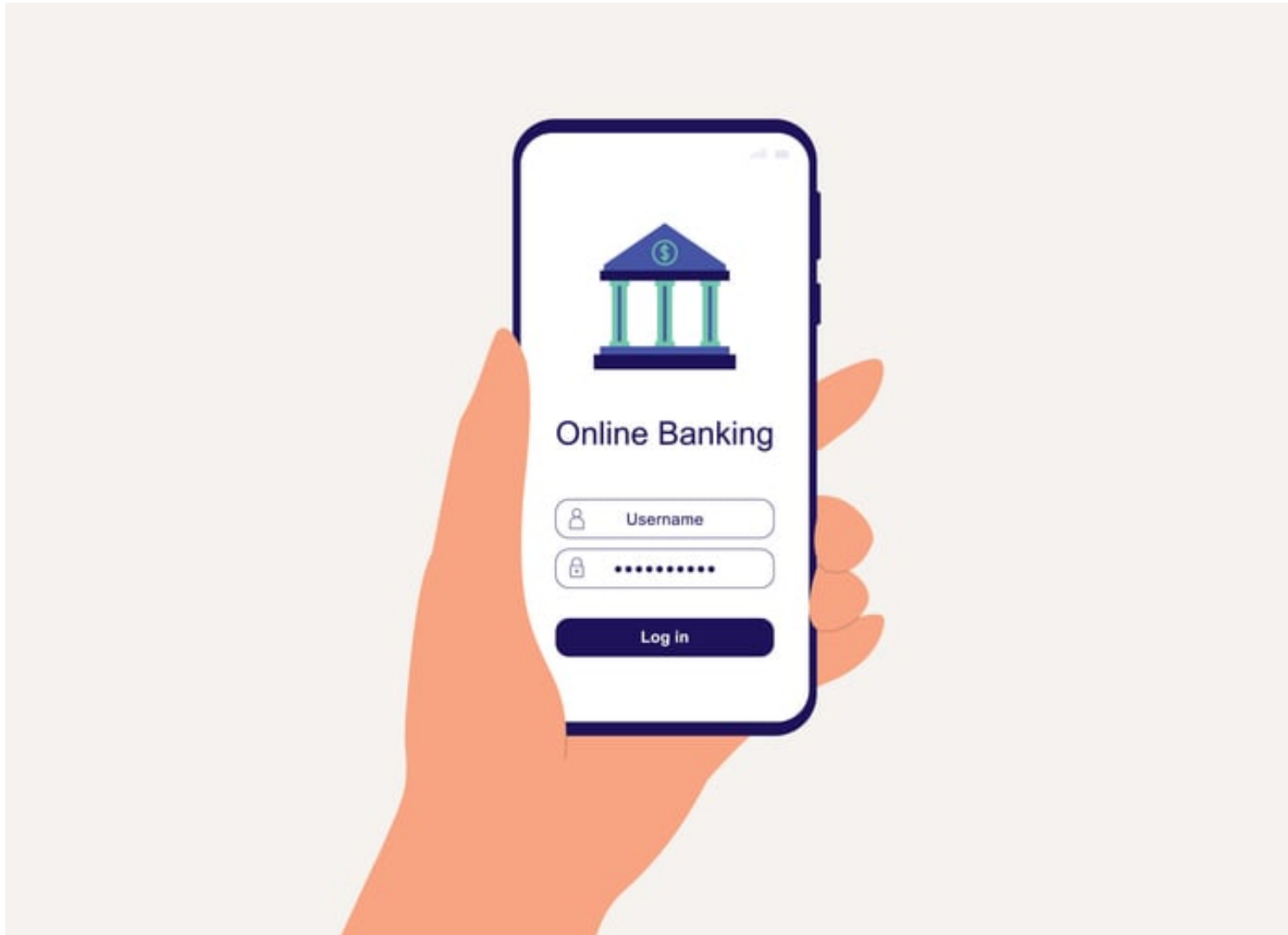
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Technical Lead and Training Architect

Think security

- Logging into an unsecured online banking application
  - Username, password, and money at risk from theft

- Data security and compliance maintain customer trust in organizations

- Global regulations have legal implications for businesses

Azure Security Center

- Provides robust security

- Offers unified security management

- Advanced threat protection

- Provides recommendations and insights for enhanced security

Security Center

Azure Policy

Policy

- Enforces organization-wide standards

- Assesses compliance at scale
  - Corporate and regulatory

Azure Blueprints

- Consistent deployments

- Combines templates and policies

- Offer blueprint to meet GDPR requirements

Blueprints

Data Protection and Identity

Encryption

Access Control

Key Vaults

Azure Information
Protection

Encryption

- Secures data at rest

- Protects data in transit

Encryption

Encryption

- Secures data at rest

- Protects data in transit

- Like safe plus armored truck

- Encrypted data thwarts breaches

Role-based access control

- Utilizes role-based access control (RBAC) to allocate permissions

- Includes custom and predefined roles for select users or groups

- Supports extensive roles:
  - Contributor
  - Owner
  - Reader
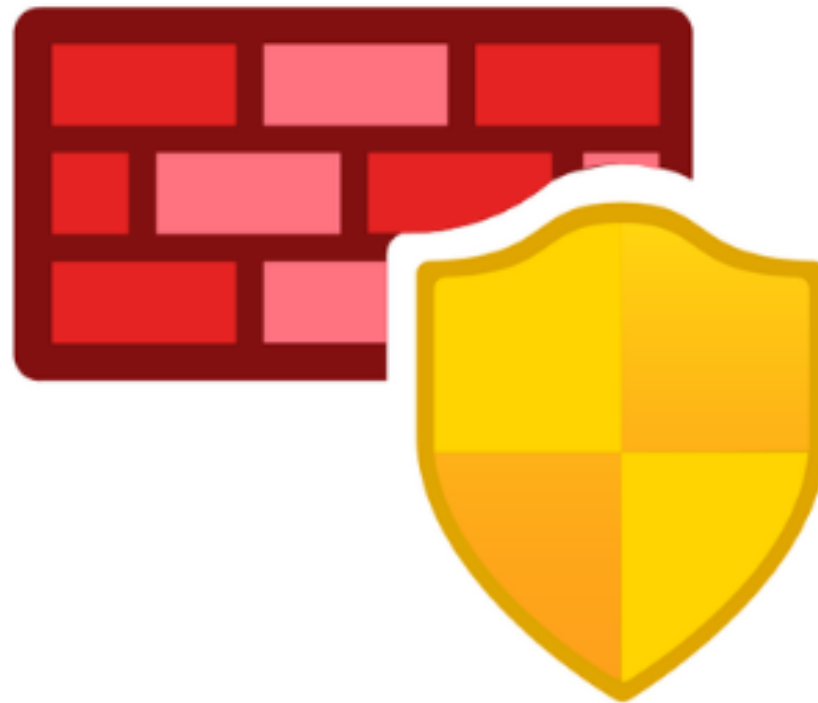 - RBAC administrator
  - User access administrator

Access Control

Network security

DDoS Protection

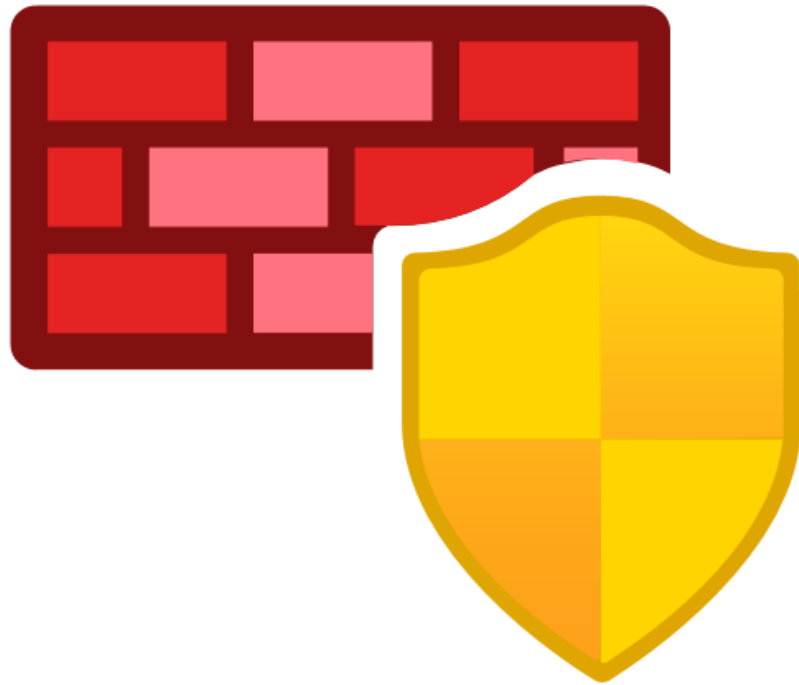Azure Firewall

Network Security Groups

Network security groups

Network Security
Groups

- Filters inbound and outbound traffic

- Administrators set and enforce security rules

Firewall

Azure Firewall

- Provides advanced threat protection

- Filters and analyzes network traffic

- Allows only safe and approved connections

DDoS protection

DDoS Protection

- DDoS floods sites with fake traffic
  - Inaccessible to real users

DDoS protection

- DDoS floods sites with fake traffic
  - Inaccessible to real users

- Azure DDoS acts as security guard

- Allows genuine users only

- Guards continuously against large-scale attacks

Managing security
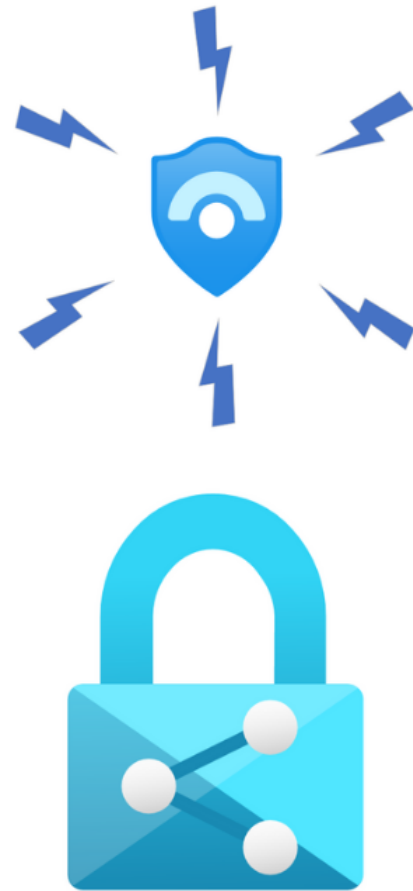

Sentinel

Azure Information Protection

Key Vaults

Managing security

Sentinel

- Detects and manages threats

Managing security

Sentinel

- Detects and manages threats

Azure Information Protection

- Helps govern and classify sensitive information

Managing security

Sentinel

- Detects and manages threats

Azure Information Protection

- Helps govern and classify sensitive information

Key Vault

- Securely stores classified information

Compliance

- Committed to compliance standards
  - e.g., ISO, IEC, GDPR

Let's practice!

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Azure Economics

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Azure pricing

Azure Free Account

- New Azure users get some services free for first 12 months

- No initial financial commitment needed

- Select resources free indefinitely

- Always review pricing for budgeting

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Pay as you go

- Azure uses pay-as-you-go pricing model

- Responsibilities vary by service type

- Options available to reduce costs

- No upfront costs with pay-as-you-go

- Scale resources as needed for cost optimization

Reservations

- Commit to plans for cost reduction

- Save up to 72% off pay-as-you-go

- Reservations ideal for:
  - consistent resource usage
  - long-term projects

Reservations

- Like advanced hotel booking

- Secures space at lower rates

- Ensures availability on arrival

- Avoids premium on-the-spot rates

Spot Instances

- Reduce costs with Spot instances
  - Virtual machine usage

- Buy unused compute capacity at savings

- Ideal for interruptible workloads

- No specific completion time needed

Azure Hybrid Benefit

- Allows you to reuse on-premises licenses that already exist
  - Results in substantial savings

- Avoid new purchase costs

- Maximize existing investments

- Easier migration due to familiar setup

Planning costs in Azure

- Use the Pricing Calculator

- Consult Total Cost of Ownership Calculator

- Monitor and optimize costs with best practices

Azure Pricing Calculator

- Estimate costs with pricing calculator

- Specify needs for accurate estimates

- Customizable options for budgeting

- Simulate scenarios for cost-effectiveness

- Optimize cloud spending with detailed breakdowns

Total Cost of Ownership

- Focuses on long-term value

- Estimates savings with Azure migration

- Also considers:
  - operational benefits

  - reduced downtime risks

  - scalability options

Azure Cost Management

- Use centralized dashboard to monitor costs

- Apply budget caps for optimization

- Analyze costs by service, resource group
  - Pinpoint high cost resources

Cost Optimization

- Regularly review costs to avoid waste

- Turn off underutilized resources

- Azure Advisor offers personalized recommendations
  - Provides insights on cost-efficiency and performance

Let's practice!

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Azure pricing calculator

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Managing Azure Resources
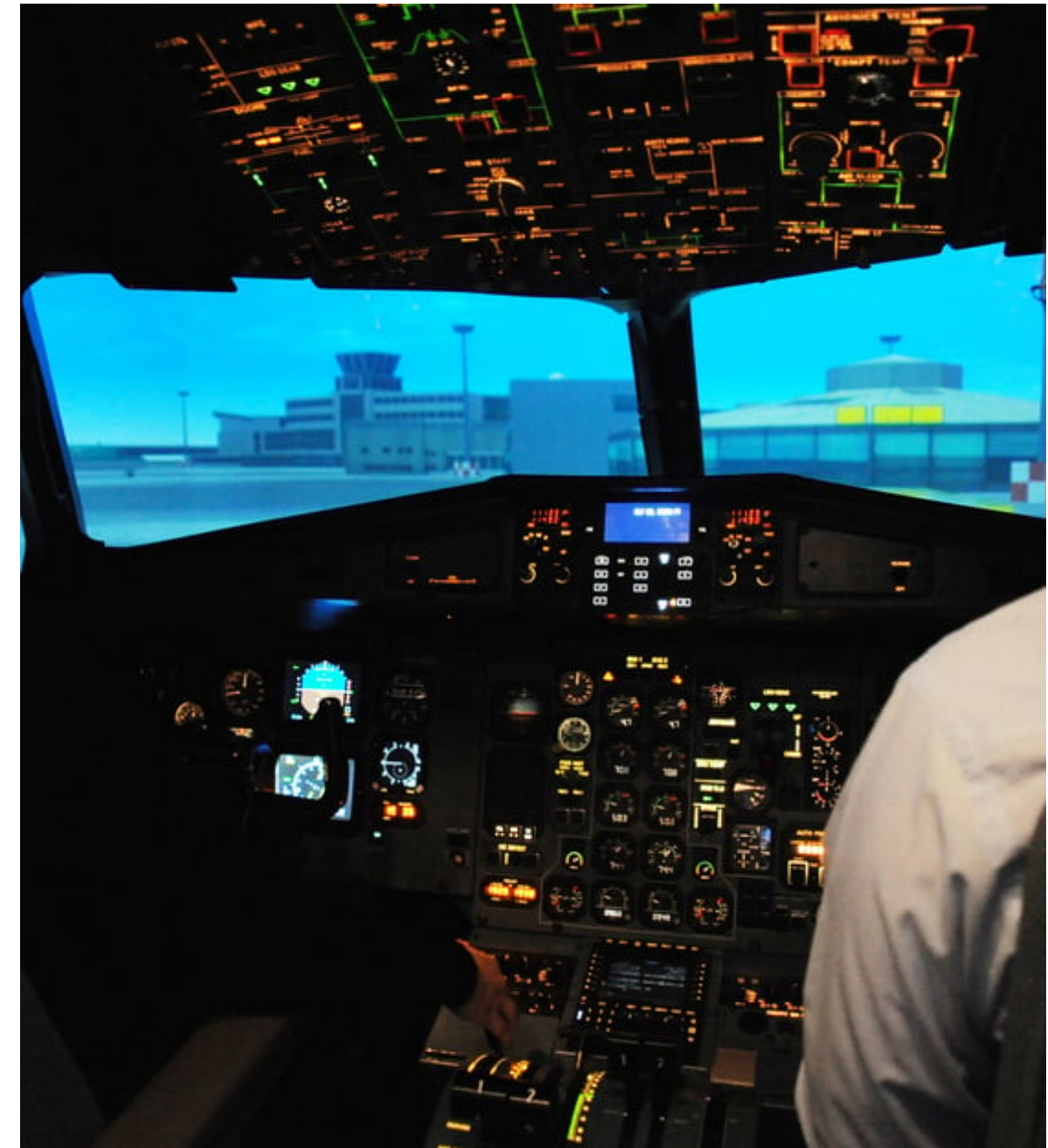
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Azure Resource Manager (ARM)

- Deploys and manages Azure resources

- Acts like a pilot for navigating Azure resources

Azure Resource Manager (ARM)

- Deploys and manages Azure resource

- Acts like a pilot for navigating Azure resources

- Centralized management layer in Azure

- Enables template-driven deployments for consistency

- Allows resource organization using tags
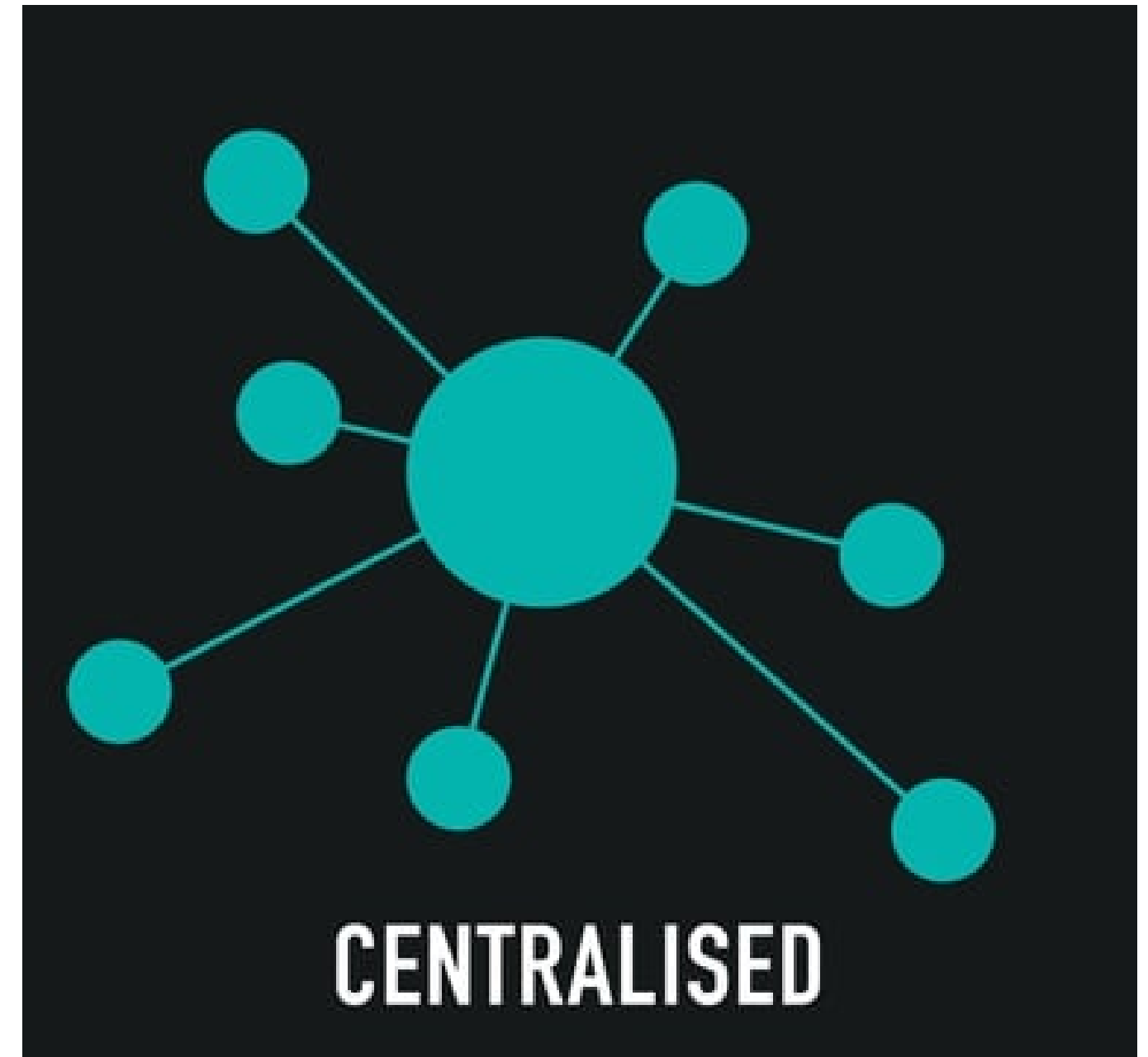
Management tools

- Azure Resource Manager is the central management tool

- Other useful services include:
  - Azure Monitor

  - Azure Automation

  - Azure Policy

  - Azure Advisor

  - Azure Blueprints

Azure Monitor
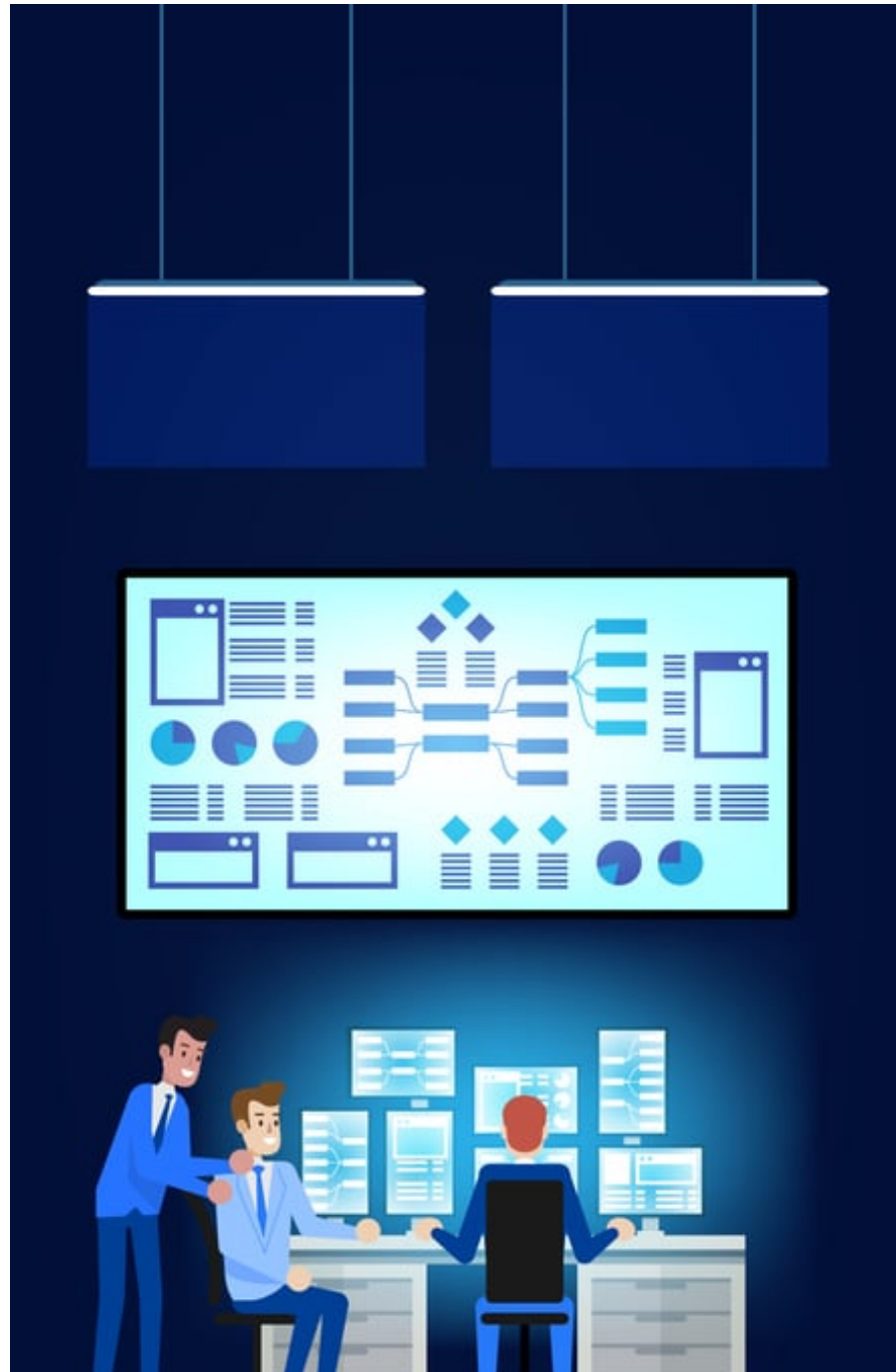
- Offers full-stack monitoring

- Provides real-time insights into resource performance
    - e.g., virtual machines, containers, databases, networks

- Includes advanced analytics for performance, security, and cost

- Features an integrated alert system for issue detection

Azure Automation

- Streamlines workflows and minimizes repetitive tasks

- Based on PowerShell for easy integration

- Enables runbook creation for routine task automation

- Supports configuration management and updating management shared capabilities

Azure Advisor

- Personalized cloud consultant

- Provides best practice recommendations
  - Helps you optimize Azure resources

- Aims to improve performance, increase security, and enhance reliability

Azure Policy

- Upholds organizational standards and compliance

- **Example** - US banks must deploy resources in US Azure regions

Azure Policy

- Upholds organizational standards and compliance

- **Example** - US banks must deploy resources in US Azure regions

- Integrates with deployment criteria and corporate guidelines

- Automates policy enforcement to reduce errors

- Offers compliance framework and auditing tools for updates and alignment
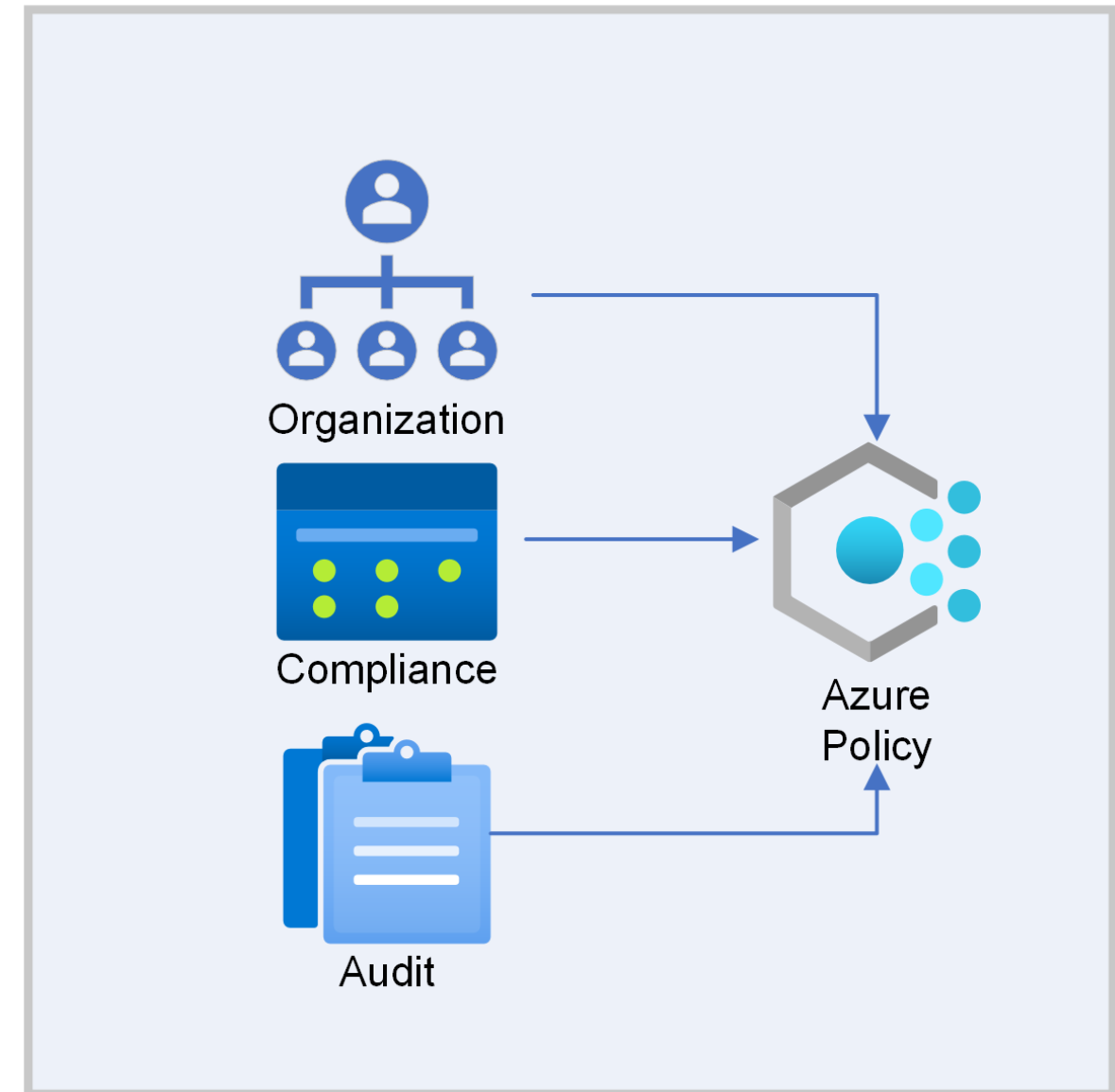
Azure Blueprints
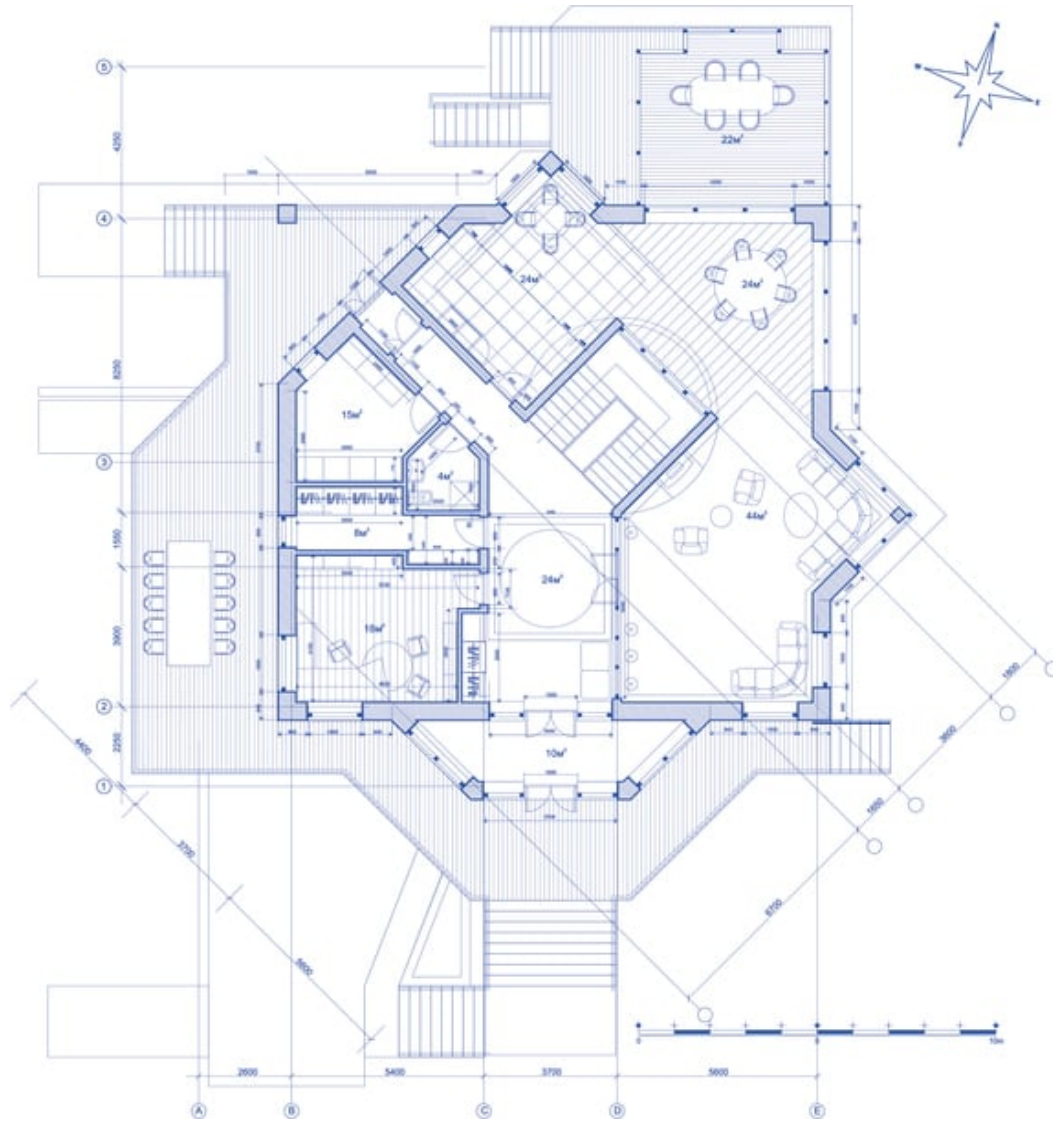
- Ensures uniform deployment of Azure resources
  - Offers templates like the GDPR blueprint for compliance

- Acts as architectural templates for best practice adherence
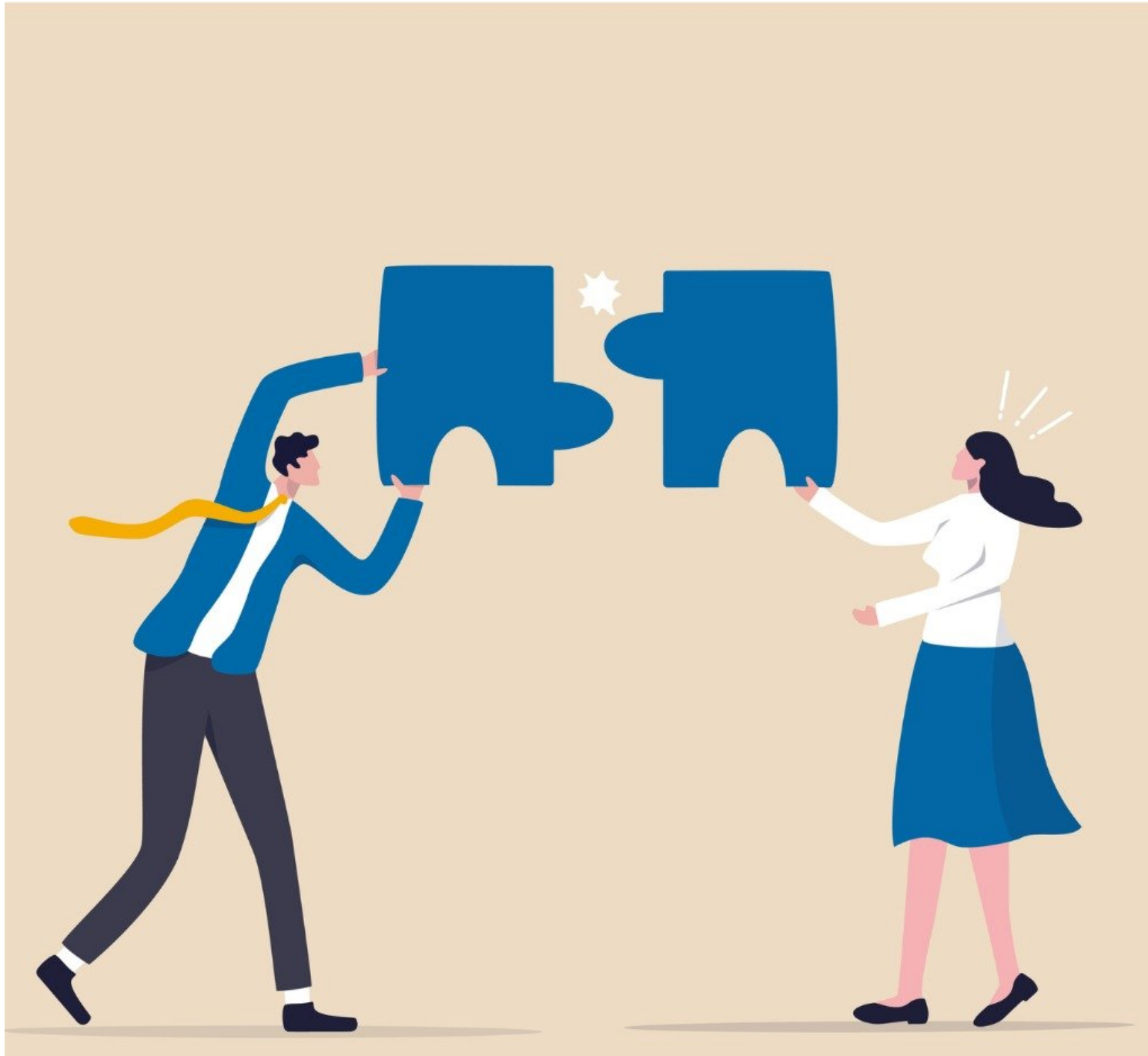
Azure Blueprints

- Ensures uniform deployment of Azure resources
  - Offers templates like the GDPR blueprint for compliance

- Acts as architectural templates for best practice adherence

- Avoids inconsistencies in manual resource setup

- Aligns deployments with organizational standards

Key Takeaways

- Ensures security, performance, and compliance in the cloud

- Maintains well-managed environments to mitigate risks

- Offers tools like:
  - Azure Resource Manager
  - Monitor
  - Automation

- Allows customization with services like Azure Policy and Blueprints

Let's practice!

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Azure Monitor

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Kevin James
Instructor

Let's practice!

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Integration and Migration to Azure

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Migration to Azure

- Migrating to the cloud impacts people, processes, and technology

- The journey continues with refining and optimizing post-transfer

- Migration includes:
  - Planning
  - Implementation
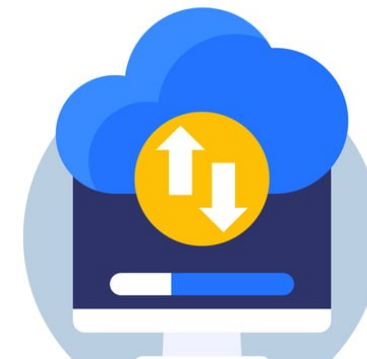 - Operations

Integration Strategies

- **Lift and Shift:** Rehost workloads to Azure without modifications

- **Rearchitect** - Redesign maximizing features and efficiency

- **Refactor:** Small modifications for cloud benefits and improved scalability

- **Rebuild:** Start new in Azure for outdated apps needing overhaul

Hybrid Connectivity

- Hybrid approach links on-premise systems to Azure via VPN

- Azure ExpressRoute offers private, direct data center to Azure connections
  - Improved speed and reliability

- Azure Virtual WAN simplifies branch connections
  - Enhances flexibility and scalability

Azure Migrate

- Azure Migrate offers a complete migration solution

- Assesses on-premises environment for Azure readiness

- Provides guidance on sizing and cost estimates

Azure Site Recovery

- Offers disaster recovery as a service

- Automates protection and replication of virtual machines

- Enables services in Azure during outages

- Customizable recovery plans ensure business continuity

Azure Database Migration Service

- Simplifies database migration to Azure

- Supports various database sources, ensuring minimal downtime

- Provides assessment tools for migration guidance

- Focuses on secure and compliant data migration

Migration Best Practices

Azure migration is a journey requiring
planning and execution

1. Assess infrastructure to determine
   challenges

2. Start with minor applications or data sets
   to manage potential mistakes

3. Perform tests post-migration

4. Take a phased approach and prioritize
   security from the beginning

Post-Migration

- Track expenses to meet budgets during migration

- Upskill teams to maximize Azure's capabilities

Let's practice!

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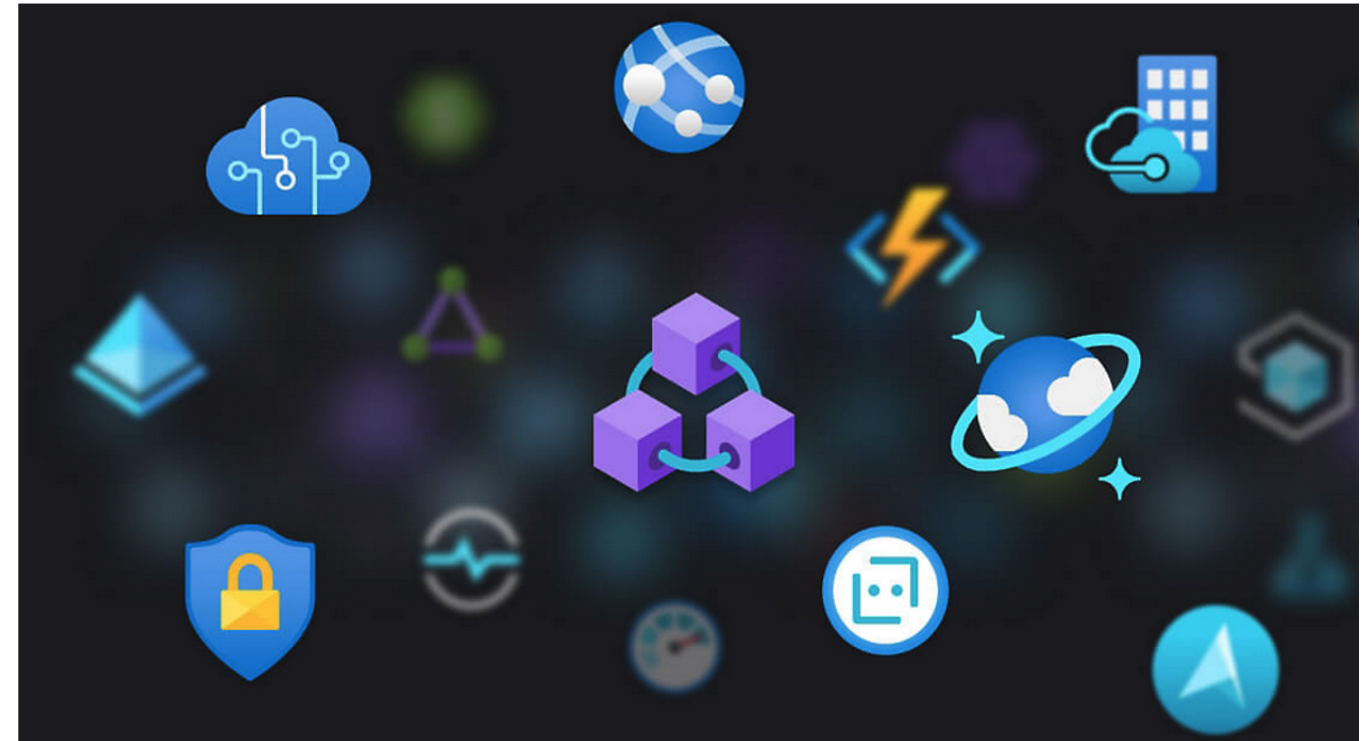
Wrap-up

INTRODUCTION TO AZURE

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Chapter One

We learned about Microsoft Azure

- What is Microsoft Azure?

- Overview of Azure's Core Components and Services

Chapter Two

We discussed several of the services

- Overview of Azure Compute

- Azure Storage Services

- Data Processing in Azure

Chapter Three

- Covered overall management of Azure including:
  - Security
  - Demystifying pricing
  - Resource management
  - Best practices
- Explored integration and migration tools

What's next?

Continue your journey with other Cloud Computing courses.

We have several available on DataCamp

- **Azure Architecture and Services**

- **Azure Management and Governance**

Congratulations!

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