

AZ900 - SESSION 2

TODAY

- » Second half of the materials
- » Some practical questions
- » Hopefully some questions :)

SOME HELPFUL LINKS:

- » Those slides
- » The study materials
- » Azure portal
- » az900 in 3 hours from FreeCodeCamp
- » Whizlabs to train yourself

Sign into docs using your own email

REGISTERING FOR THE EXAM

Practical questions #1

techacademy@ing.com

Please try this to activate the ING account, follow the below steps:

1. Visit <https://esi.microsoft.com>
2. Enter your ING e-mail address
3. Verify your e-mail address by entering your verification code
4. Now connect a private Microsoft account to you ING e-mail address**This ensures you own the certificate after your training
1. Pick a training and start learning!

STUDY AND THE GROUPS

- » Please come and study
- » Please take the exam

ABOUT THE EXAM

- » Use your own laptop if you can
- » Prepare well
- » Try out questions and 'frame yourself'

FOR THE EXAM

AZ-900 Domain Area	Weight
Describe cloud concepts	20-25%
Describe core Azure services	15-20%
Describe core solutions and management tools on Azure	10-15%
Describe general security and network security features	10-15%
Describe identity, governance, privacy, and compliance features	20-25%
Describe Azure cost management and Service Level Agreements	10-15%

TODAY

- » Azure Fundamentals part 4: Describe general security and network security features
- » Azure Fundamentals part 5: Describe identity, governance, privacy, and compliance features
- » Azure Fundamentals part 6: Describe Azure cost management and service level agreements

DESCRIBE GENERAL SECURITY AND NETWORK SECURITY FEATURES

PROTECT AGAINST SECURITY THREATS ON AZURE

AZURE SECURITY CENTER

- » Azure Security Center
- » CyberSecurity, controls, both on and off cloud
- » Recommendations, Machine Learning
- » Security Alerts
- » Enforce rules

AZURE SECURITY CENTER - OVERVIEW

Policy & compliance

Overall Secure Score



59% (~33 of 56 points)



[Review your Secure Score >](#)

Regulatory compliance



PCI DSS 3.2.1

34 of 45 passed controls



Azure CIS 1.1.0

20 of 24 passed controls



SOC TSP

12 of 13 passed controls

Subscription coverage



30 Covered resources

Fully covered	1
Partially covered	0
Not covered	0

SECURE SCORE

- » Score based on security controls
- » Identities, data, apps, devices, and infrastructure

AZURE SENTINEL

- » Azure Sentinel
- » Security information and event management (SIEM)
- » Using cloud data
- » Use AI and detect advanced threats
- » Build automation and orchestration

AZURE SENTINEL

- » Enterprise feature
- » Data sources : Office 365, AD, ...
- » But also external : Okta, CloudTrail, Citrix, ...
- » Graphs, Stats and Relations of investigation
- » Automation using Azure Monitor Workbooks

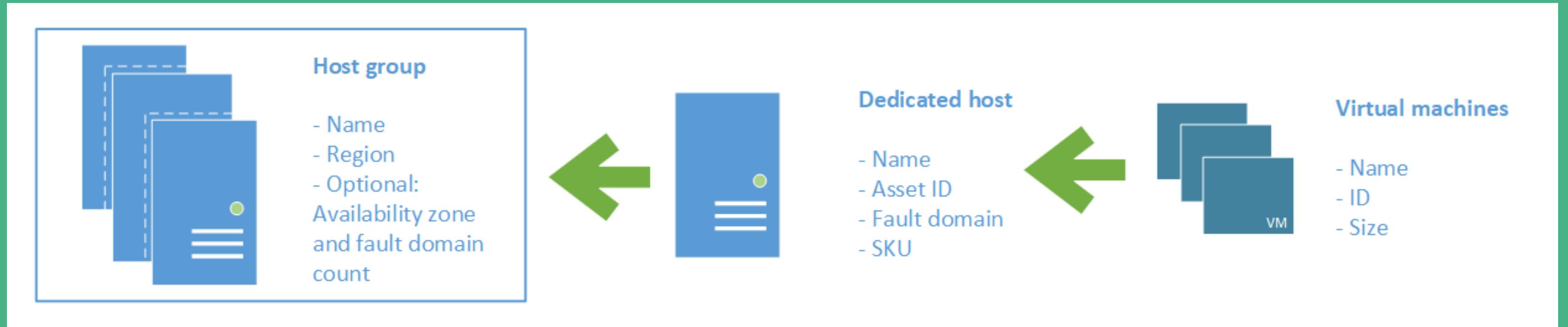
AZURE KEY VAULT

- » Azure Key Vault
- » Manage Secrets, encryption keys, SSL certificates, hardware security module (HSM)
- » Centralize secrets, monitoring and simple admin, integration

AZURE DEDICATED HOSTS

- » Azure VMs, shared hardware
- » Compliancy might require dedicated hosts.
- » Specific VM size, series, power, . . .
- » \$\$\$\$

AZURE DEDICATED HOSTS



DEFENSE IN DEPTH

- » Physical (building)
- » Identity (SSO)
- » Perimeter (DDOS, firewalls), Network (deny by default)
- » Compute, Application, Data
- » Confidentiality, Integrity, Availability

PROTECTING YOUR NETWORK

- » Azure Firewall
- » Azure DDoS Protection (Basic and standard)
- » Network security groups (internal networks).
Filter traffic between resources
- » Azure Application Gateway

SECURITY POSTURE

- » Confidentiality
- » Integrity

DESCRIBE IDENTITY, GOVERNANCE, PRIVACY, AND COMPLIANCE FEATURES

AUTHENTICATION AND AUTHORIZATION

- » Authentication : Who are you? Prove it!
- » Authorization : I know who you are. Are you allowed to do/see this?

ACTIVE DIRECTORY

- » Allows to manage infrastructure by giving users a single way to log in.
- » Identity and Access Management
- » Azure AD : The cloud, managed version of AD.
Microsoft ensure availability
- » Adds suspicious log-in detections.

AZURE AD

- » AAD is for everyone
- » Admins : Create and manage access to apps and resources
- » Devs : Standard approach for auth.
- » Users : reset, manage info, log in, ...
- » Seamless integration with cloud environments (Office 365, ...)

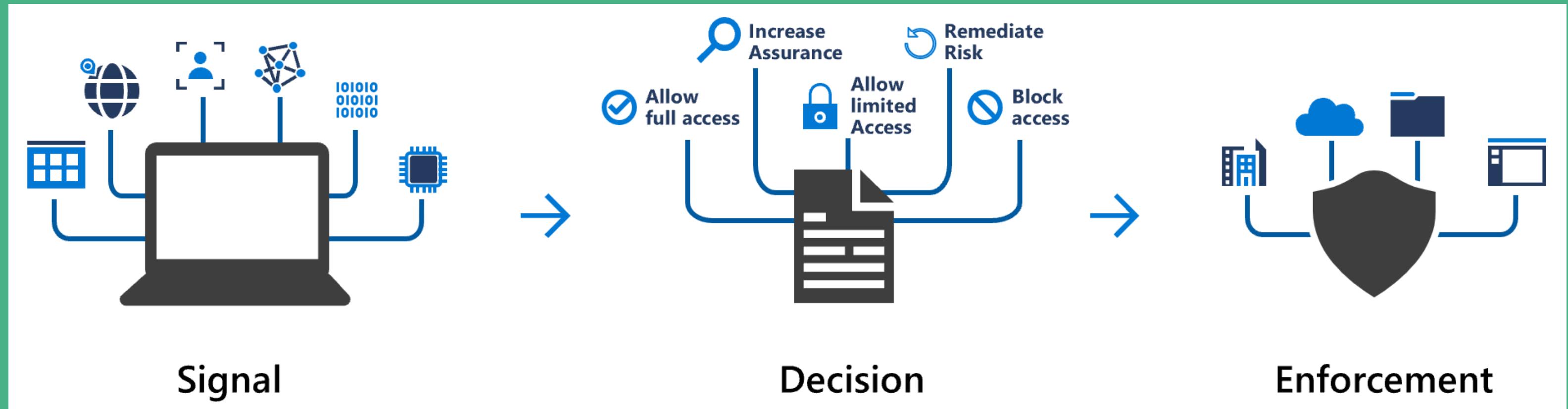
AZURE AD

- » Single Sign On (SSO) : Only one username / pw.
Easy way to manage users!
- » Authentication, Multi factor, ...
- » App Management
- » Devices too!

MULTIFACTOR AUTH?

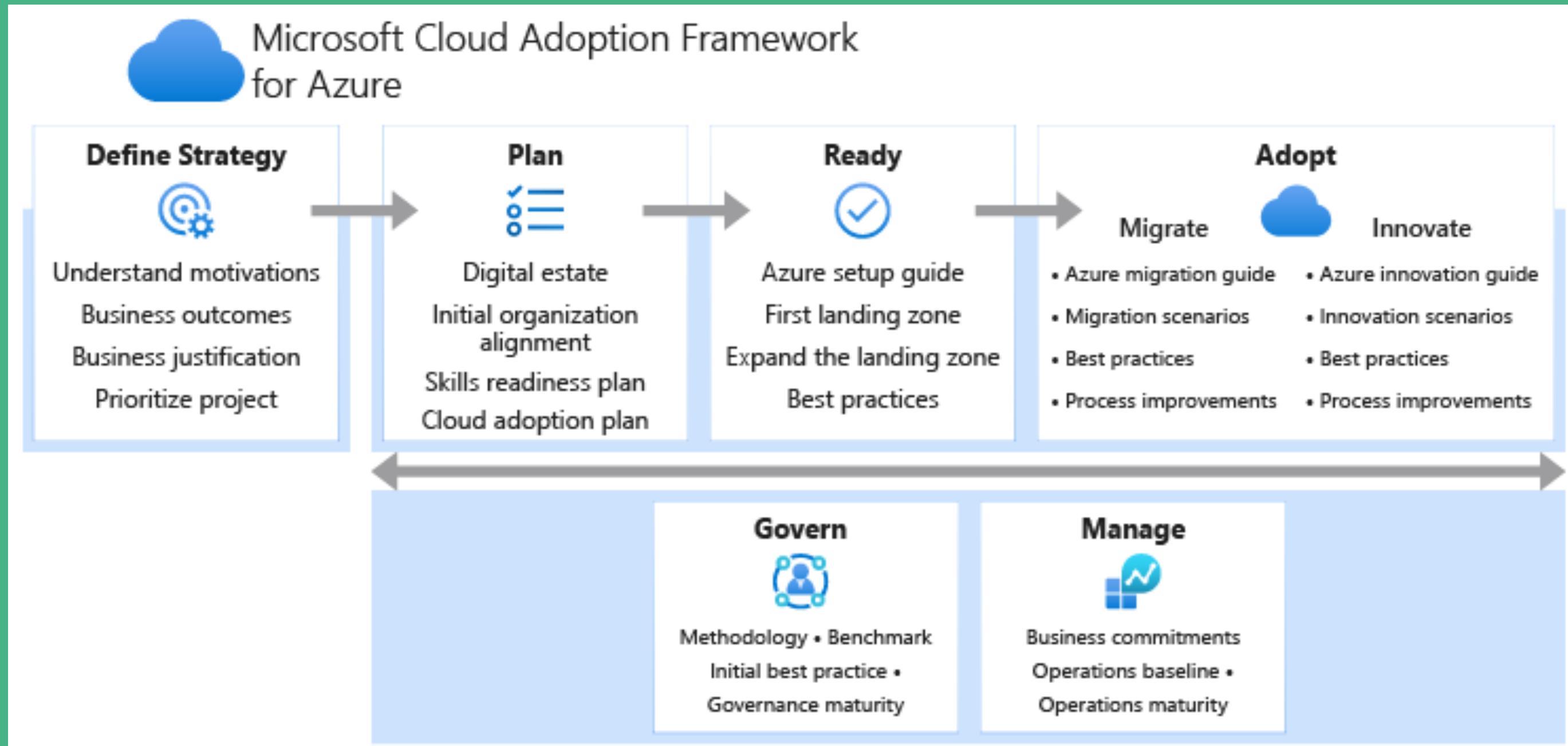
- » Something you know, something you are, something you have
- » Extra security in today's world
- » Azure AD Multi-Factor Authentication

CONDITIONAL ACCESS



- » Conditional Access, you need an Azure AD Premium P1 or P2 license

CLOUD ADOPTION FRAMEWORK



CLOUD ADOPTION

- » Define your strategy (motivations, business outcome, pick first project)
- » Make a plan (inventory, orga alignment, skills, cloud plan)
- » Ready your organization (Setup guide, landing zone (\$\$), enlarge, ensure best practises)
- » Adopt the cloud (migrate, improve)
- » Innovate (business value, iterate)

SUBSCRIPTION GOVERNANCE STRATEGY

- » Billing (resource tags, department or project, subscriptions)
- » Access control (What boundaries do you want, dev/prod,)
- » Subscription limits (for example Express Route)

AZURE ROLE-BASED ACCESS CONTROL

- » ARBAC
- » Scopes and Roles
- » Managed using the Resource Manager

AZURE ROLE-BASED ACCESS CONTROL

	Role				
	Reader	Resource-specific	Custom	Contributor	Owner
Scope					
Management group					
Subscription	Observers	Users managing resources			Admins
Resource group					
Resource		Automated processes			

RESOURCE LOCKS

- » Resource locks
- » Not RBAC, avoid IT admin cleanups :).
- » CanNotDelete, ReadOnly

USING TAGS

- » A way to organize resources. Key value pairs
- » Management of resource, cost, operations, security, compliancy, automation, ...
- » Can be done in many ways (CLI, ARM Templates, portal, Azure Policy)
- » Can be used to run queries

AZURE POLICIES

- » Azure Policy
- » Can also take action
- » MFA, location of resources, updates, ...
- » Azure Policy initiative -> sets of policies
- » Ready made standard compliance policies
- » Applied to specific scope of a management group, a subscription, or a resource group

AZURE BLUEPRINTS

- » Azure Blueprints
- » Kickstart for new environments, in compliance.
- » Composed of artifacts

MICROSOFT COMPLIANCE OFFERINGS

- » Microsoft Compliance Offerings
- » Criminal Justice Information Services (CJIS)
- » Health Insurance Portability and Accountability Act (HIPAA)
- » National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF)
- » European Union Model Clauses

MICROSOFT COMPLIANCE OFFERINGS

- » UK Government G-Cloud
- » Service Organization Controls (SOC) 1, 2, and 3
- » International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) 27018
- » Cloud Security Alliance (CSA) STAR Certification

MICROSOFT AZURE AND PRIVACY

- » Microsoft Privacy Statement, Online Services Terms, Data Protection Addendum
- » Microsoft Trust Center for Azure relation to standards
- » Azure Compliance Documentation

SPECIAL AZURE LOCATIONS

- » Azure government
- » Azure China 21Vianet

DESCRIBE AZURE COST MANAGEMENT AND SERVICE LEVEL AGREEMENTS

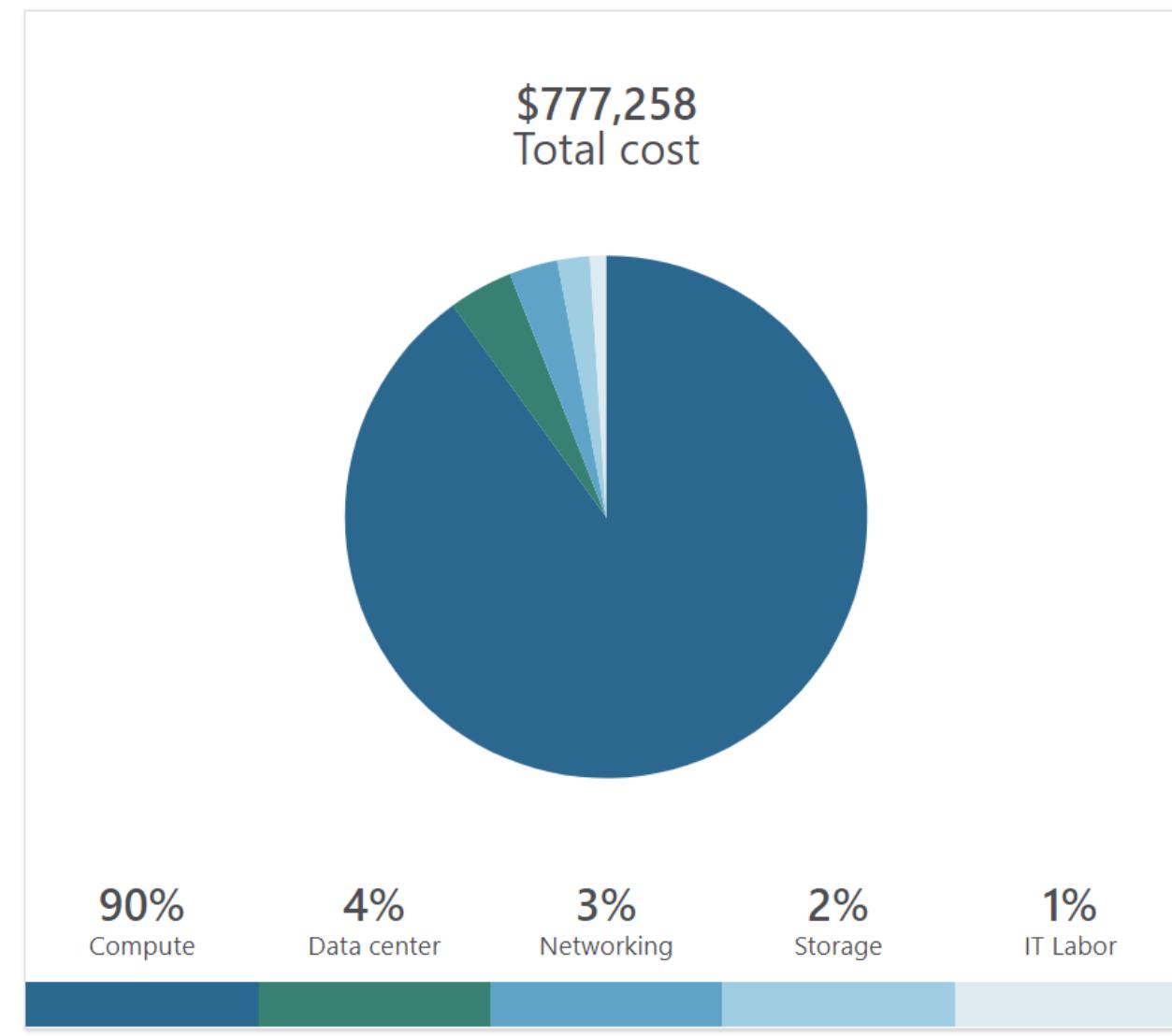
TOTAL COST OF OWNERSHIP

- » TCO Calculator
- » Contains licenses, hardware, maintenance labor, electricity,
- » Software Assurance -> Reuse of your existing licenses

TOTAL COST OF OWNERSHIP

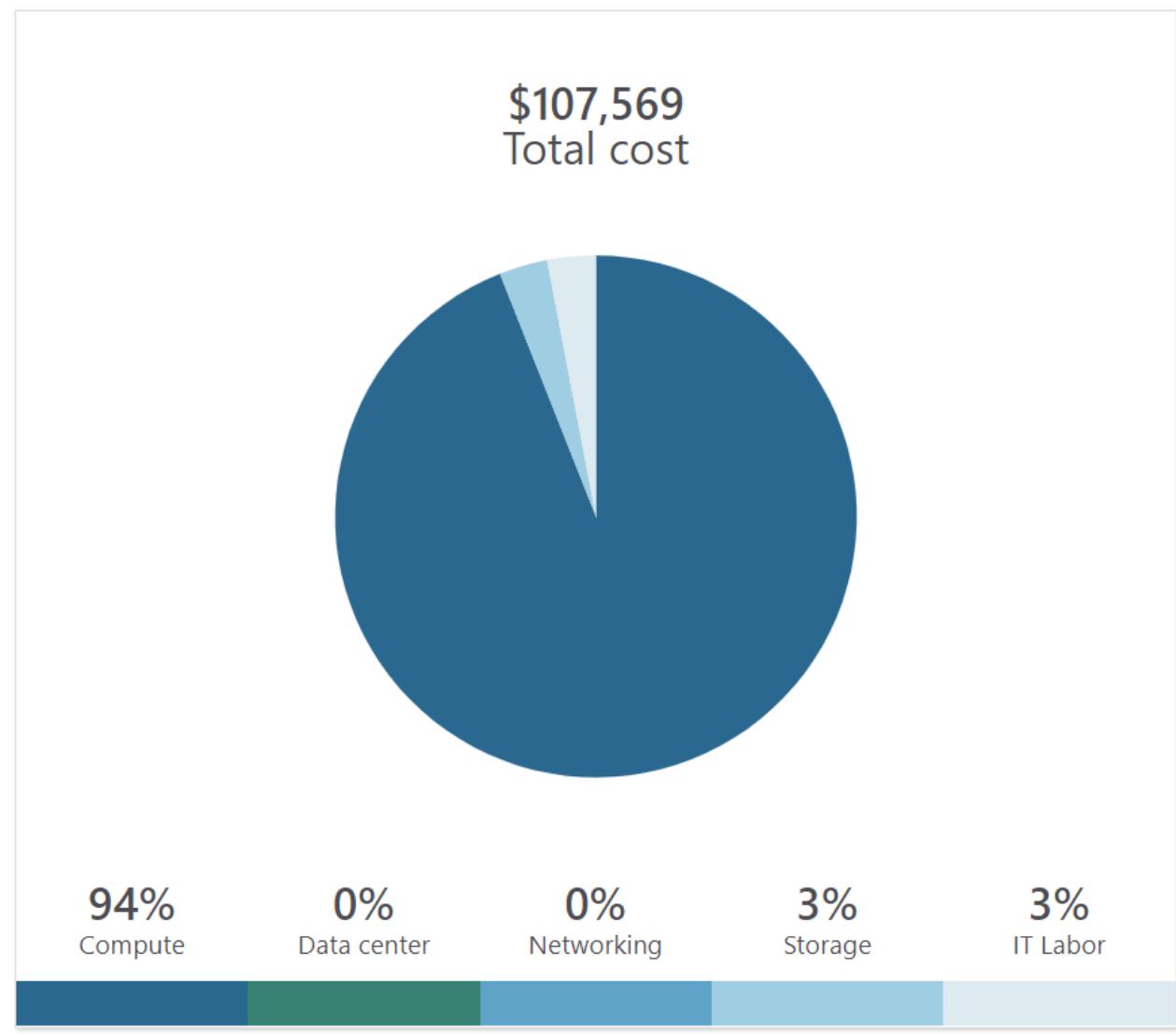
Total on-premises over 2 year(s)

TCO of on-premises environments tends to be driven by compute and data center costs.



Total Azure cost over 2 year(s)

In Azure, certain cost categories decrease or go away completely.



AZURE SUBSCRIPTIONS

- » Free trial (12 months, 25 services, some always free)
- » Pay-as-you-go
- » Member offers (existing customers like Startups, Imagine, ...)

PURCHASING

- » Through an Enterprise Agreement
- » From the web
- » Through a Cloud Solution Provider

COST FACTORS

- » Resource type (ex : type, performance tier, access tier)
- » Usage meters (depends on the service, CPU, Ram, Disk, IP)
- » Resource Usage (resource exists. VM, disks, ...)
- » Subscription type
- » Location and Network

AZURE PRICING CALCULATOR

- » Azure Pricing Calculator
- » Example Scenarios
- » Saved Estimates

AZURE ADVISOR

- » Azure Advisor
- » Spending limits
- » Azure Reservations (>70% discounts). 1 to 3 years prepaid
- » Low cost regions
- » Azure Cost Management + Billing (reporting, budget, alerting, tags, ...)

COST REDUCTION STRATEGIES

- » Resize underutilized virtual machines
- » Deallocate virtual machines during off hours
- » Delete unused resources
- » Migrate from IaaS to PaaS services
- » Save on licensing costs
- » Azure Hybrid Benefit - Software Assurance

SLAS - SERVICE LEVEL AGREEMENTS

- » SLA Page
- » One for each service
- » Free products don't have a SLA
- » Azure Status to get health of services.

UPTIME / DOWNTIME

SLA percentage	Downtime per week	Downtime per month	Downtime per year
99	1.68 hours	7.2 hours	3.65 days
99.9	10.1 minutes	43.2 minutes	8.76 hours
99.95	5 minutes	21.6 minutes	4.38 hours
99.99	1.01 minutes	4.32 minutes	52.56 minutes
99.999	6 seconds	25.9 seconds	5.26 minutes

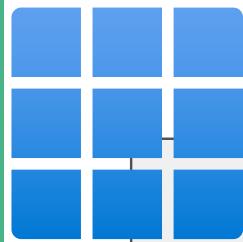
SERVICE CREDITS AFTER CLAIMS

Monthly uptime percentage	Service credit percentage
< 99.99	10
< 99	25
< 95	100

DEFINING YOUR SLA

- » Uptime / Money
- » Need and behaviour of users?
- » SLAs are harder than they look :).

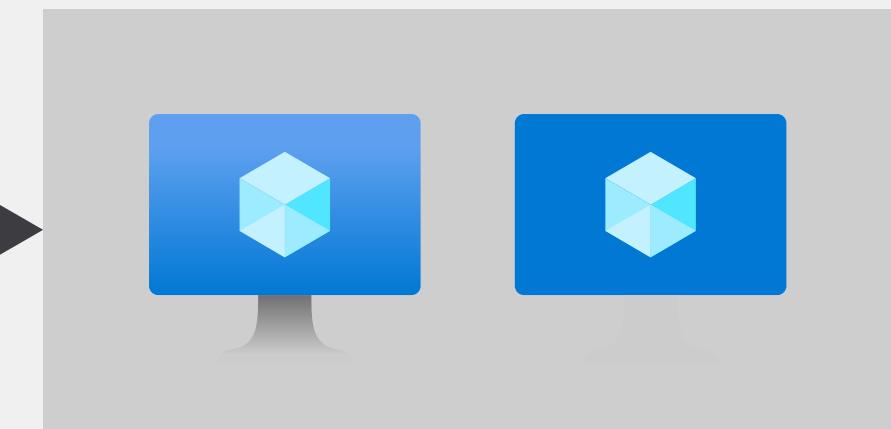
COMPOSITE SLA



The Special Orders application



Azure
Load Balancer



Virtual machines



Azure
SQL Database

COMPOSITE SLA

Service	SLA
Azure Virtual Machines	99.9 percent
Azure SQL Database	99.99 percent
Azure Load Balancer	99.99 percent

Therefore, for the Special Orders application, the composite SLA would be:

$$\begin{aligned} & 99.9\% \times 99.9\% \times 99.99\% \times 99.99\% \\ & = 0.999 \times 0.999 \times 0.9999 \times 0.9999 \\ & = 0.9978 \\ & = 99.78\% \end{aligned}$$

ADJUSTING SLA

- » Different products have different SLA (Example, disks)
- » Service tiers
- » Include redundancy

AVAILABILITY ZONE

- » Unique physical location within an Azure region.
- » One or more datacenters with independent power, cooling, and networking
- » Different schedules for maintenance

SERVICE LIFECYCLE

- » Releasability of services to the public
- » Dev phase
- » Public preview
- » General available (GA) -> Customer support
- » Some preview services
- » The preview portal
- » Azure updates for latest info

AZURE SUPPORT PLANS

» Azure support plans



LET'S HAVE SOME FUN

A company currently has an Azure subscription and an Azure tenant. They want to implement Azure Multi-factor authentication. Is it possible to add an SMS as a second means of authentication for a user?

- A. Yes
- B. No

A company is planning on using Azure Security Center. They already have a set of resources defined on the Azure platform. Is the company limited to the usage of Azure Security Center to secure its Virtual Machines **ONLY** in Azure Cloud?

- A. Yes
- B. No

A company wants to have a service that could fulfil the below requirement

“Provide the ability to generate keys in hardware security modules that never leave the hardware security module boundary”

Which of the following service could be used for this requirement?

- A. Azure Key vault
- B. Azure Security Center
- C. Azure Advisor
- D. Azure Network Security Groups

A company is planning on creating several policies in the Azure Policy service. These policies are all meant to achieve a particular goal. Which of the following could be used to organize these policies into one group?

- A. Management Groups
- B. Initiative Definition
- C. Resource Groups
- D. Subscriptions

A company is planning to implement an Azure DDoS protection plan.

- The company has multiple subscriptions
- The total number of resources across subscriptions are 75

Does the DDoS Protection Standard Plan meet the above requirements?

- A. DDoS Protection Standard Plan does not meet the first requirement
- B. DDoS Protection Standard Plan does not meet the second requirement
- C. Multiple DDoS Protection Standard Plans are required, one for each requirement
- D. DDoS Protection Standard Plan meets both the requirements

A company wants to implement Azure policy to monitor the virtual machines whose disk encryption is not enabled. What are the ways of creating the policy assignment?

Please select three options.

- A. Azure Portal, ARM Template
- B. Python, REST
- C. Azure CLI, Azure PowerShell
- D. Azure Monitor

A company hosts a web application which is load balanced (2 Web Servers and 2 App Servers).The application uses Azure SQL Database, to avoid accidental deletion of the Database, a ReadOnly lock is applied on the Database. An application user wants to update a transaction through the Web application. Which of the following are a valid action? **Pick 2 options.**

- A. An update transaction is not allowed since ReadOnly lock is applied on the Database
- B. An update transaction is a valid action
- C. Only Select statements are valid, Update/Delete actions are invalid
- D. Only Select/Delete statements are valid, Update action is invalid

A company is planning to deploy a set of Azure virtual machines. They want to understand the cost estimate for deploying the virtual machines to Azure. Which of the following are factors that affect the compute cost of the virtual machines? Choose 2 answers from the options given below.

- A. The size (instance specification) of the virtual machine
- B. The region the virtual machine is located in
- C. The data center the virtual machine is located in
- D. The resource group the virtual machine is located in

A company has a set of virtual machines defined in Azure. They want to explore options on how costs can be cut down for the running cost of the virtual machines. Which of the following is an option that can be considered for cutting down the costs without impacting the services running on the virtual machine?

- A. Deallocate the public IP address from the virtual machine.
- B. Look at buying Reserved Instances.
- C. Stop the virtual machines.
- D. Change the resource group of the virtual machine.

A company has a set of resources in Azure. They want to get reports of "Costs incurred by resource". Where should they go to get this information?

- A. Azure Monitor
- B. Azure Cost Management
- C. Azure Virtual Machines
- D. Azure Advisor

A company wants to start moving its resources to Azure. They have an on-premise data center and want to migrate their workloads to Azure. They need to realize the costs and provide a business case for moving the workloads to Azure. Which of the following can they use to help justify the costs?

- A. Azure pricing calculator
- B. Azure cost management
- C. Azure TCO calculator
- D. Azure Advisor

A company is planning to deploy an application onto Azure. They have set up an Azure subscription and an Azure tenant. They want to implement disaster recovery for the application. Which of the following aspect of Azure could be used for disaster recovery purposes?

- A. Azure Data centers
- B. Azure Regions
- C. Azure resource groups
- D. Azure subscriptions

A company is planning to deploy a set of repeatable resources to Azure. They want to deploy the resources in the most efficient way possible. Which of the following could they use for this requirement?

- A. Resource groups
- B. Resource Manager templates
- C. Resource providers
- D. Management groups

A company wants to purchase an Azure support plan. Which of the following is the most cost-effective plan that has the following embedded into the plan?

- Access to the full set of Azure Advisor Recommendations.
- Business hours access to support engineers via email.

- A. Basic
- B. Developer
- C. Standard
- D. Professional Direct
- E. Premier

A company is planning to set up an Azure Free Account. Does the Standard Support plan come along with the Azure Free Account?

- A. Yes
- B. No

A company is planning to use its Azure Free Account for hosting production-based resources. Does the Azure Free Account allow you to host production-based resources?

- A. Yes
- B. No

A company is planning to purchase Azure AD tier Premium P2 for their Azure account. Does the Azure AD Premium P2 tier come with an SLA of any Azure AD Service 99.99%

- A. Yes
- B. No

A company wants to try out some services which Azure is offering in Public Preview. Do the services in Public Preview in Azure come with an SLA?

- A. Yes
- B. No

A company is planning to set up a solution in Azure. The solution would have the following key requirement.

- An Integration solution for the deployment of code

Which of the following would be best suited for this requirement?

- A. Azure Advisor
- B. Azure Cognitive Services
- C. Azure Application Insights
- D. Azure DevOps

A company is planning to set up a solution in Azure. The solution would have the following key requirement.

- A tool that provides guidance and recommendations to improve an Azure environment

Which of the following would be best suited for this requirement?

- A. Azure Advisor
- B. Azure Cognitive Services
- C. Azure Application Insights
- D. Azure Devops

A company needs to implement a solution in Azure. Below are the key requirements for this solution.

- No need for schema or Index management
- Ensure low latency access to data from around the world.

Which of the following data solution would you consider for this requirement?

- A. Azure SQL Database
- B. Azure CosmosDB
- C. Azure SQL Datawarehouse
- D. SQL Server Stretch database

A company is planning to deploy Azure resources to a resource group. But the resources would belong to different locations. Can you have resources that belong to the same resource group but be in multiple locations?

- A. Yes
- B. No

A company is planning to deploy Azure resources to a resource group. The company is planning to assign tags to the resource groups. Would the resources in the resource group also inherit the same tags?

- A. Yes
- B. No