

The background image shows a wide-angle aerial view of a city skyline during either sunrise or sunset. The sky is filled with warm, orange and yellow hues, while the buildings below are mostly dark silhouettes. In the foreground, there are several modern skyscrapers, including one with a distinctive curved facade on the right. The city extends into the distance, with more buildings and some green spaces visible.

ICRC – Azure Day

12th December 2019

James Pearse – TSI UN Lead Azure architect

Microsoft

Today's Agenda . . .

09:00 - 09:30	Welcome, introductions and run-through of today's Agenda
09:30 - 10:30	Azure 101, Scaffold and Modern Cloud Apps
10:30 - 10:45	Break
10:45 - 11:00	Overview of today's hands-on lab
11:00 - 12:00	Hands-on lab - Activate Azure pass & create VM lab environment
12:00 - 13:00	Lunch
13:00 - 15:00	Hands-on lab - Proof of concept PaaS deployment
15:00 - 15:15	Break
15:15 - 15:45	Finish off proof of concept
15:45 - 16:15	Wrap-up & summary

Microsoft TSI Team - Intro's



James Pearse

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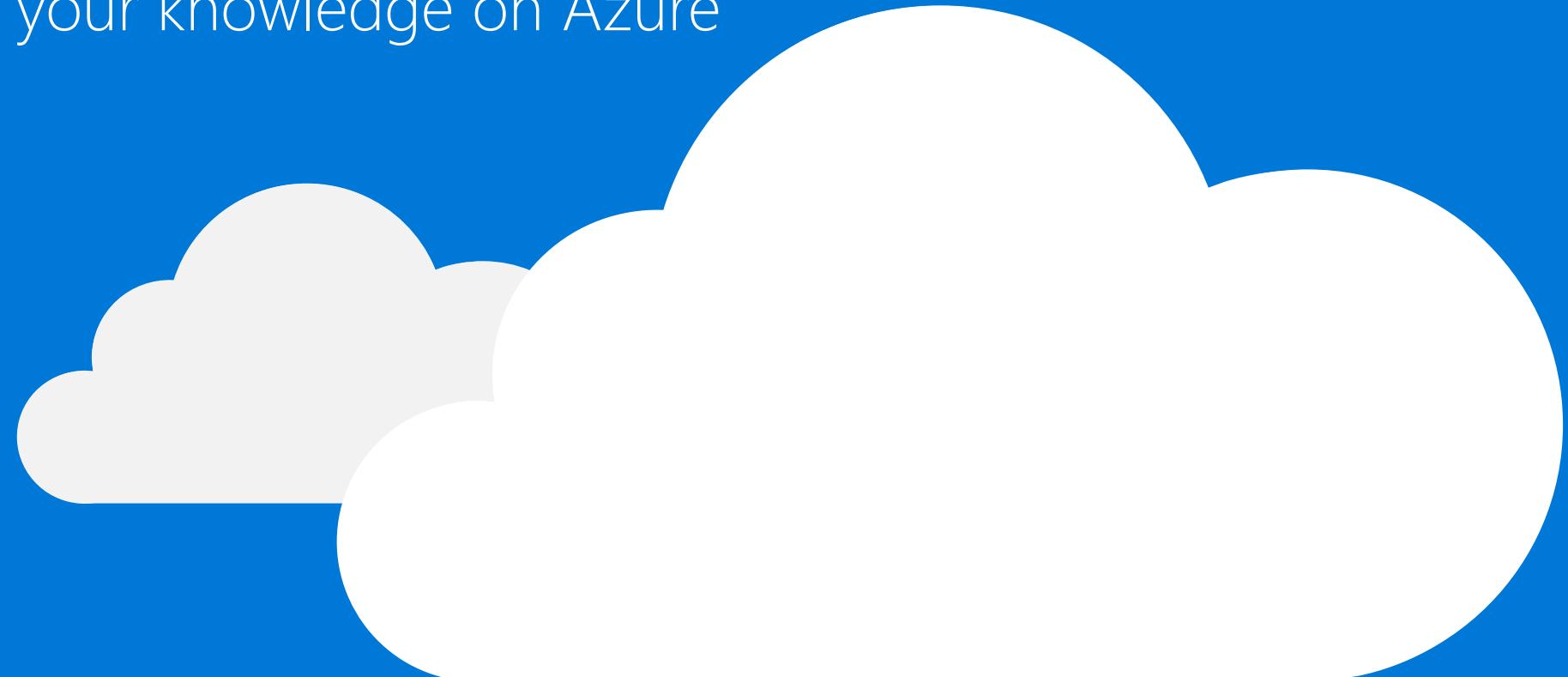
Martin Schmöllerl

TSI Azure technical strategist (UN EMEA)

Martin.schmollerl@Microsoft.com

What to expect from today

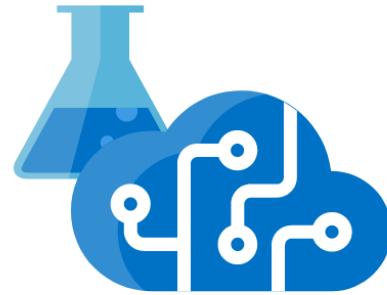
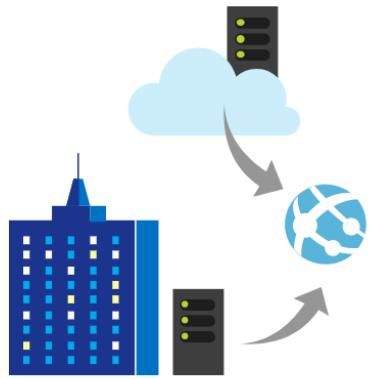
- Lots of Azure Content
- Azure hands-on labs for you to undertake
- Hopefully, increase your knowledge on Azure
- Have some fun





Azure 101

What is Azure?



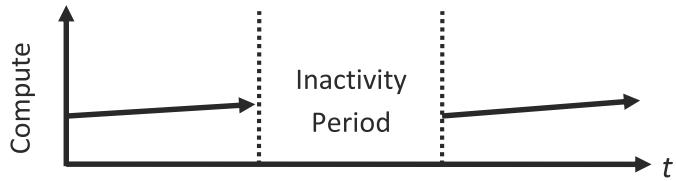
Productive for
developers

The only
consistent
hybrid cloud

The cloud for
intelligent apps

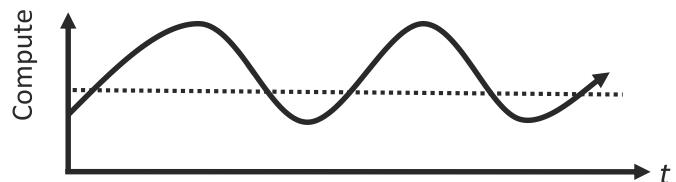
The cloud you
can trust

Why use the Cloud?



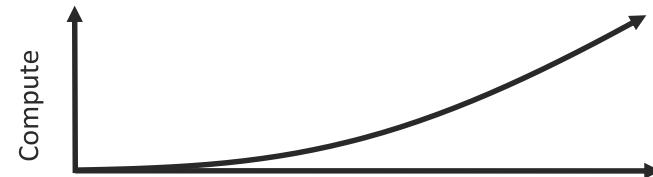
On and Off

On and off workloads (e.g. batch job)
Over provisioned capacity is wasted
Time to market can be cumbersome



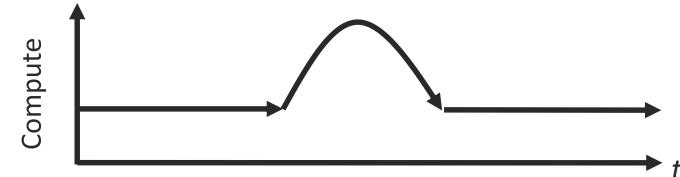
Predictable Bursting

Services with micro seasonality trends
Peaks due to periodic increased demand
IT complexity and wasted capacity



Growing Fast

Successful services needs to grow/scale
Keeping up with growth is a big IT challenge
Cannot provision hardware fast enough



Unpredictable Bursting

Unexpected/unplanned peak in demand
Sudden spike impacts performance
Cannot over provision for extreme cases

Build, manage and deploy applications on a massive global network

56

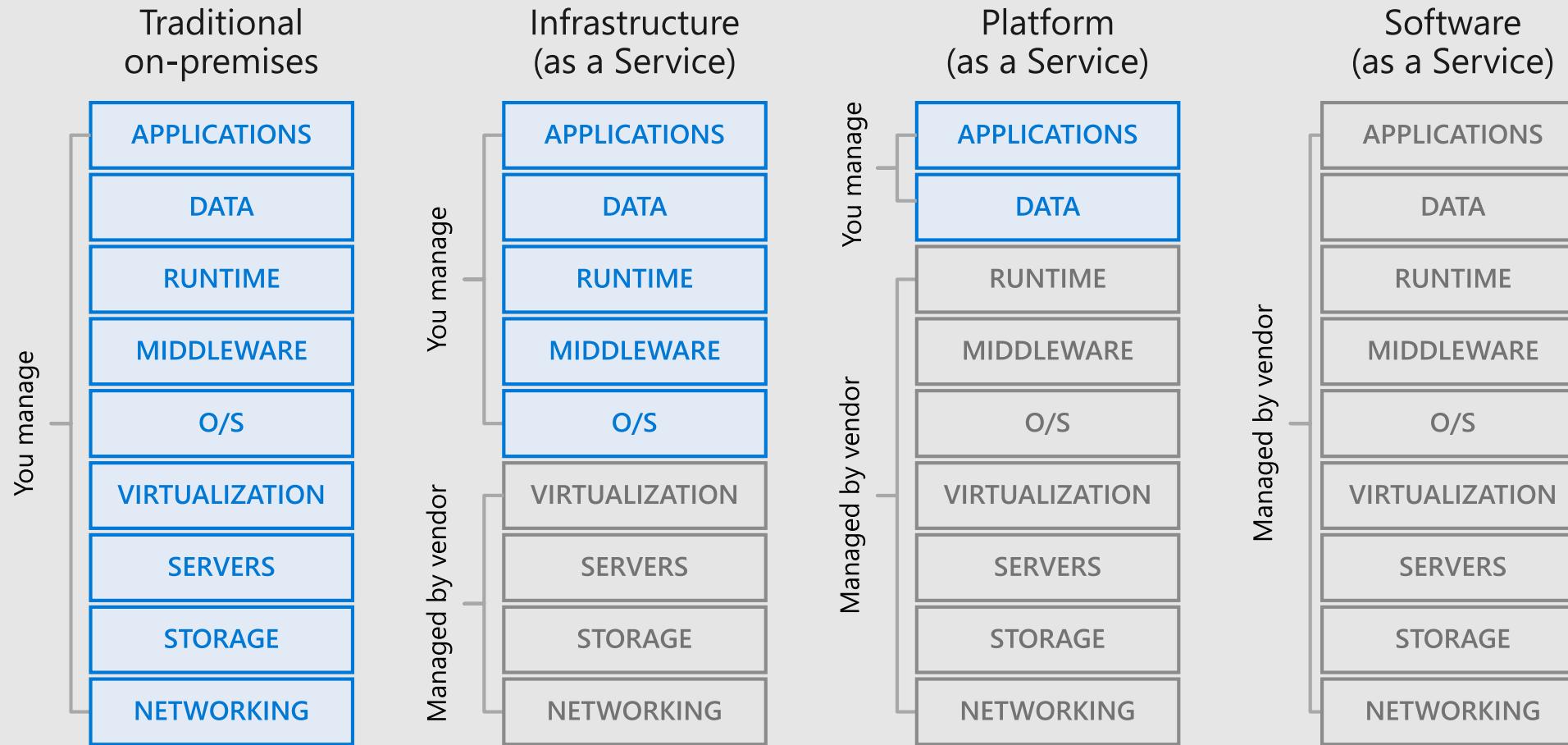
Azure regions

90 +

Compliance standards



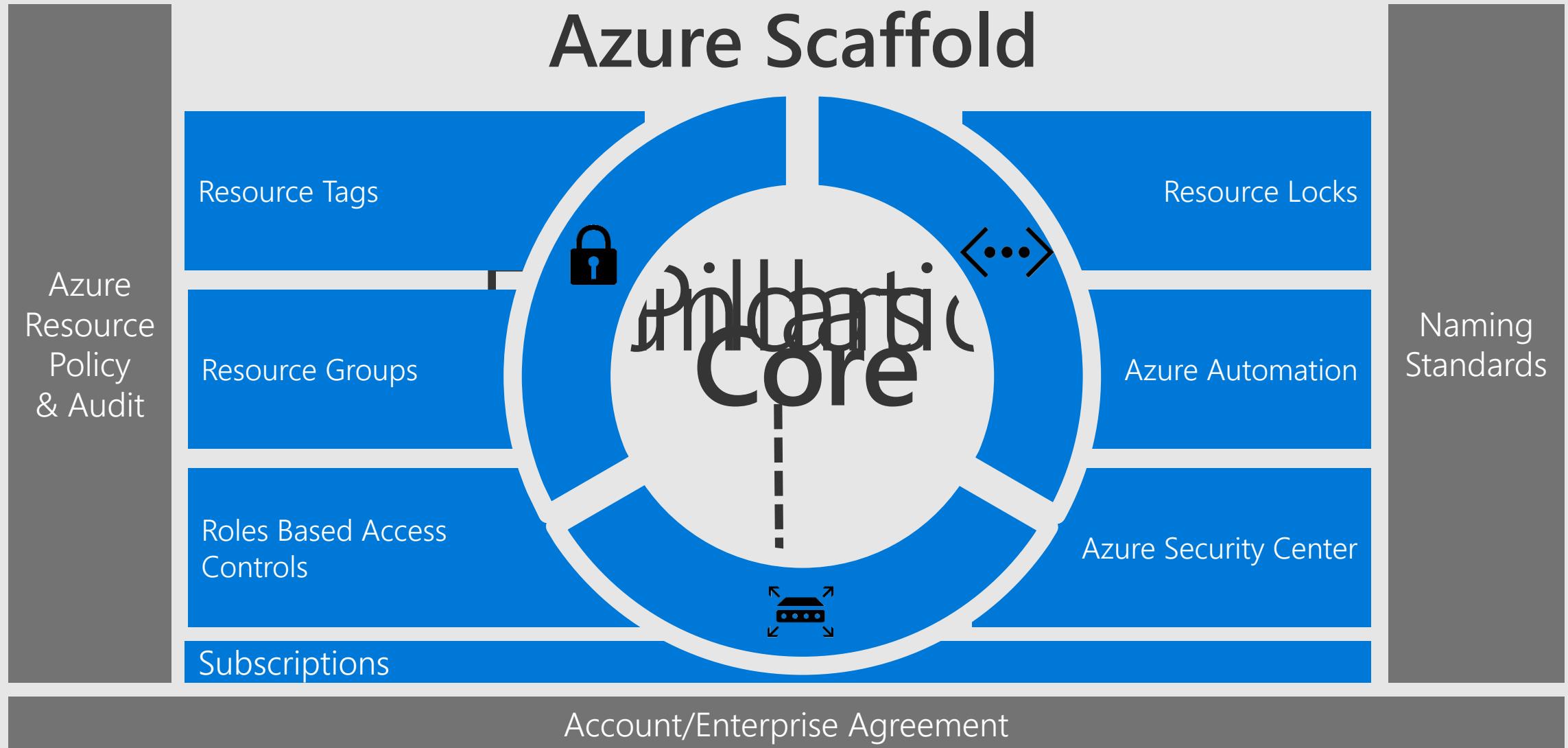
Service Overview



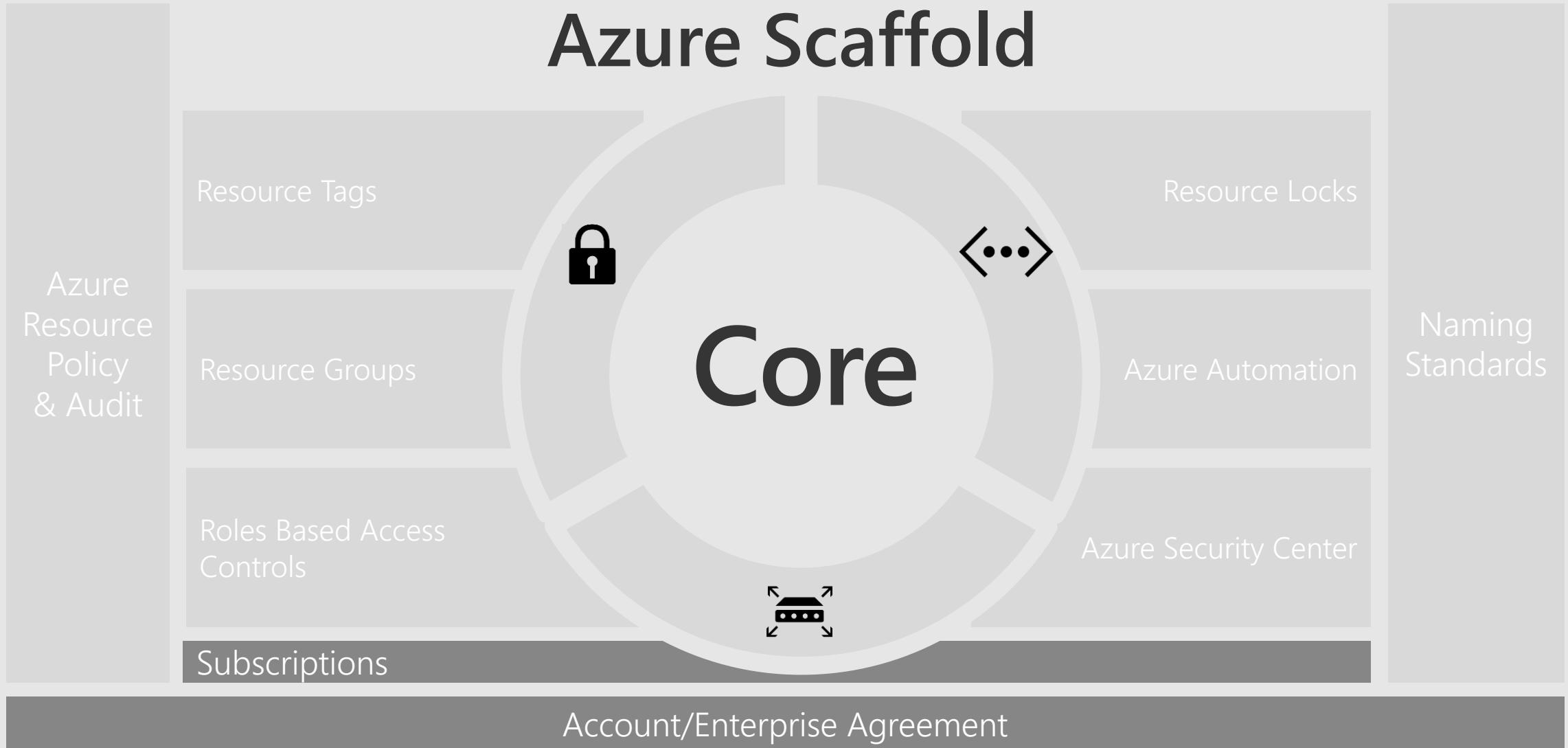


Azure Enterprise Scaffold

The Azure Enterprise Scaffold

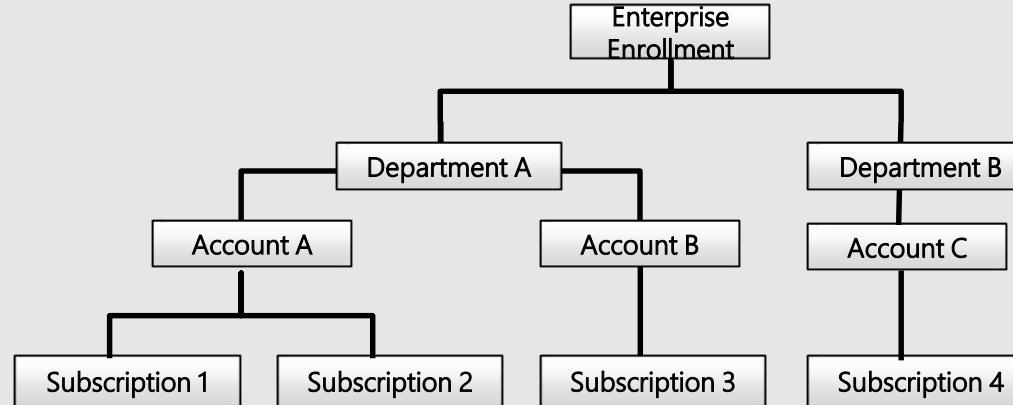


The Azure Enterprise Scaffold



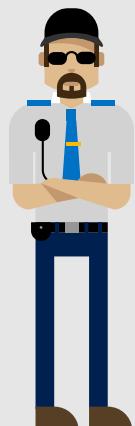
The Foundation: Enterprise Enrollment

...and Departments/Accounts and most importantly: Subscriptions



Finance/Business

- Concerned with how costs can be monitored and rolled up and ultimately correctly allocated

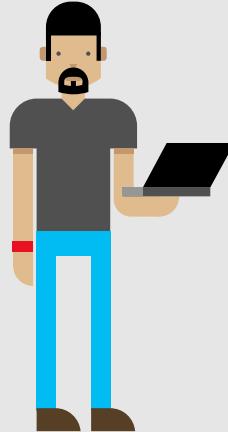


Security/Risk Mgmt.

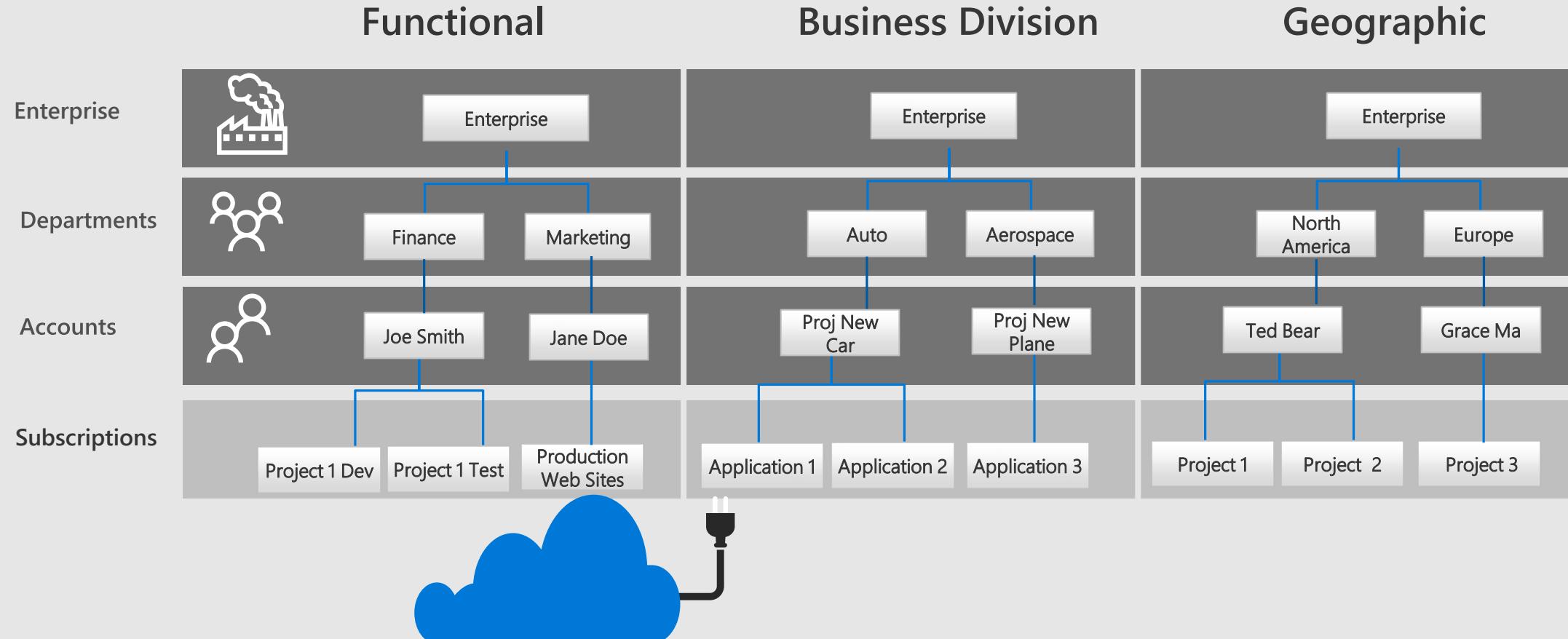
- Concerned about everything ...but mostly looking to ensure that appropriate controls are in place

Technology Pro

- Concerned with how they will manage the growth and where to put resources



Departments/Accounts – A Foundation



Adapted from the Azure Direct EA Onboarding Guide:

https://eaportalonboardingvideos.blob.core.windows.net/onboardingvideos/AzureDirectEACustomerOnboardingGuide_En.pdf

Subscriptions are the Cornerstone

...Determine the model you will follow before anything else!



Technical Requirements

Security Requirements

Scalability Requirements



Business Requirements



Azure Subscription Limits

Subscription limits

Resource	Default Limit	Maximum Limit
Cores per subscription ¹	20	10,000
Co-administrators per subscription	200	200
Storage accounts per subscription ²	200	250
Cloud services per subscription	20	200
Local networks per subscription	10	500
SQL Database servers per subscription	6	150
DNS servers per subscription	9	100
Reserved IPs per subscription	20	100
Hosted service certificates per subscription	400	400
Affinity groups per subscription	256	256
Alert rules per subscription	250	250

¹Extra Small instances count as one core towards the core limit despite using a partial core.

²This includes both Standard and Premium storage accounts. If you require more than 200 storage accounts, make a request through [Azure Support](#). The Azure Storage team will review your business case and may approve up to 250 storage accounts.

Subscription limits - Azure Resource Manager

The following limits apply when using the Azure Resource Manager and Azure Resource Groups. Limits that have not changed with the Azure Resource Manager are not listed below. Please refer to the previous table for those limits.

For information about handling limits on Resource Manager requests, see [Throttling Resource Manager requests](#).

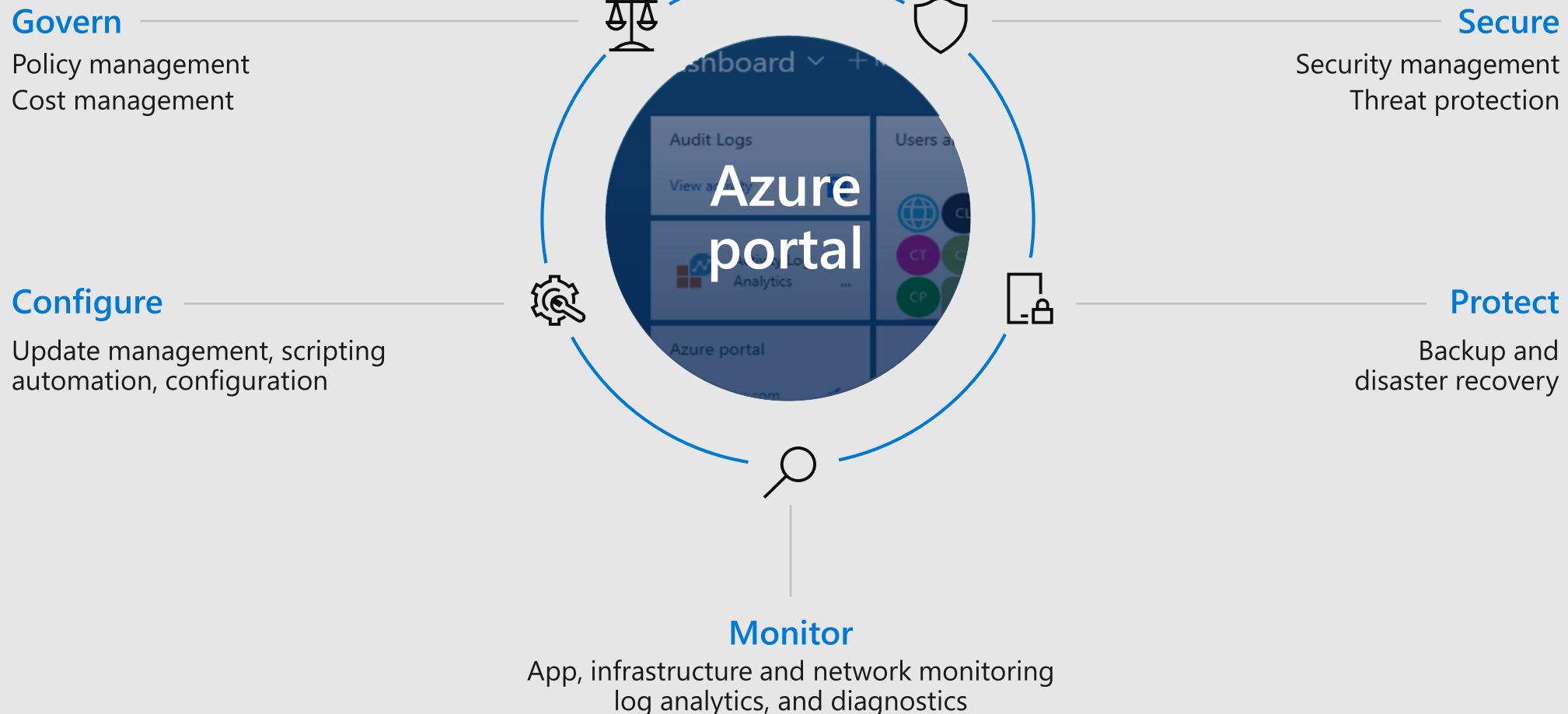
Resource	Default Limit	Maximum Limit
VMs per subscription	10,000 ¹ per Region	10,000 per Region
VM total cores per subscription	20 ¹ per Region	Contact support
VM per series (Dv2, F, etc.) cores per subscription	20 ¹ per Region	Contact support
Co-administrators per subscription	Unlimited	Unlimited
Storage accounts per subscription	200	200 ²
Resource Groups per subscription	800	800
Availability Sets per subscription	2,000 per Region	2,000 per Region
Resource Manager API Reads	15,000 per hour	15,000 per hour
Resource Manager API Writes	1,200 per hour	1,200 per hour
Resource Manager API request size	4,194,304 bytes	4,194,304 bytes
	unlimited	unlimited
	10,000	10,000
	Not Applicable ⁴	Not Applicable ⁴
	Not Applicable ⁴	Not Applicable ⁴

Note

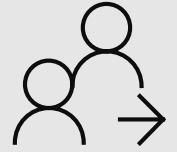
If you want to raise the limit or quota above the **Default Limit**, [open an online customer support request at no charge](#). The limits can't be raised above the **Maximum Limit** value shown in the following tables. If there is no **Maximum Limit** column, then the resource doesn't have adjustable limits.

Free Trial subscriptions are not eligible for limit or quota increases. If you have a Free Trial, you can upgrade to a [Pay-As-You-Go](#) subscription. For more information, see [Upgrade Azure Free Trial to Pay-As-You-Go](#).

Azure portal offers enterprise-grade management



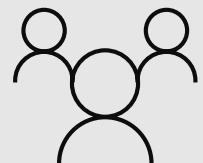
Continuous cost optimization



Management



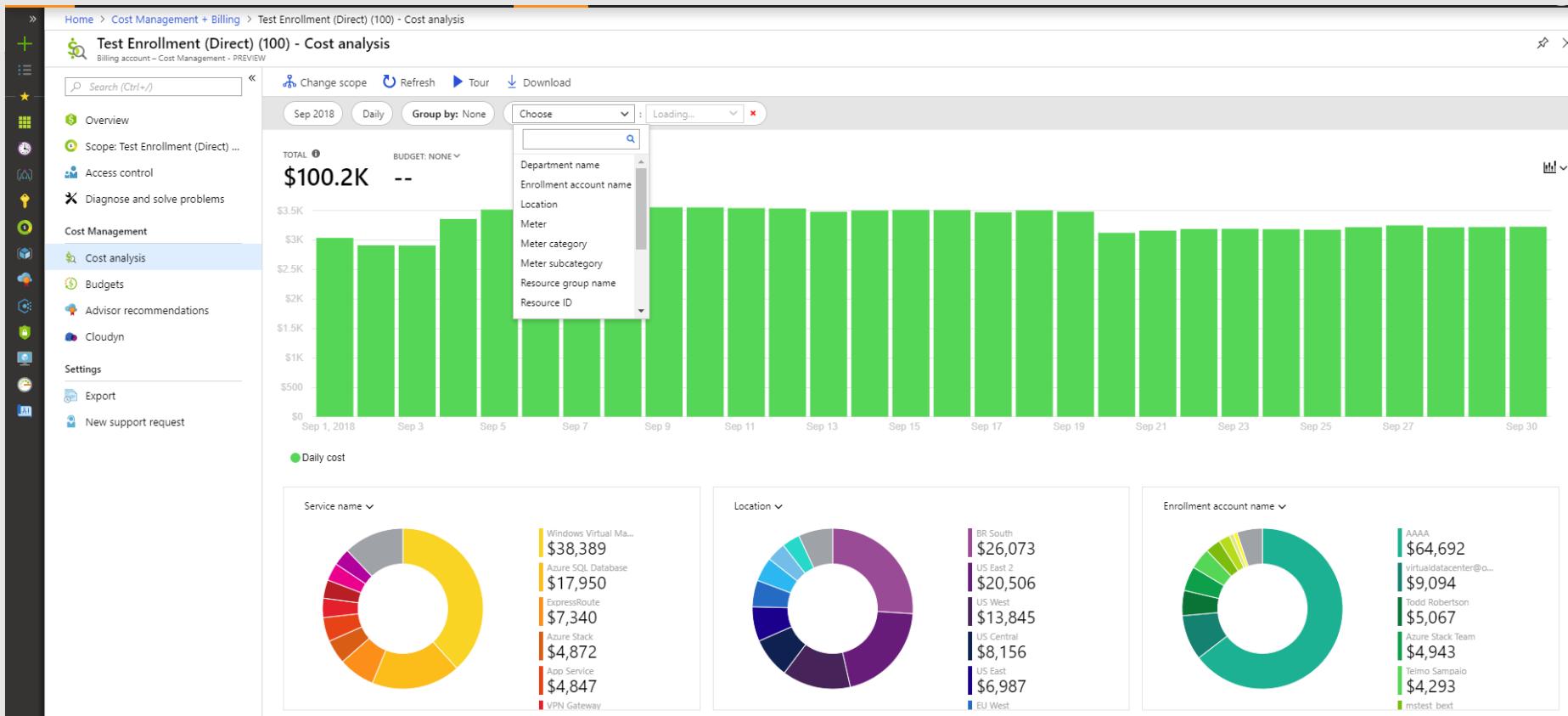
Finance



App teams



Cost Analysis



- Enables detailed cost exploration
- Group/Filter/view data by 14 different dimensions
- Ability to select date ranges
- View data at daily, accumulated, monthly grain
- Multiple chart views to analyze data
- Integration with budgets
- Support multiple scopes (Enrollment, subscription, MG, RG's)

Budgets for monitoring and notifications

→ Monitor your costs using budgets

→ Get notified when threshold are met

→ Automate with Action Groups

→ Integrated into cost analysis

Home > Subscriptions > Cost Management Demo - Budgets

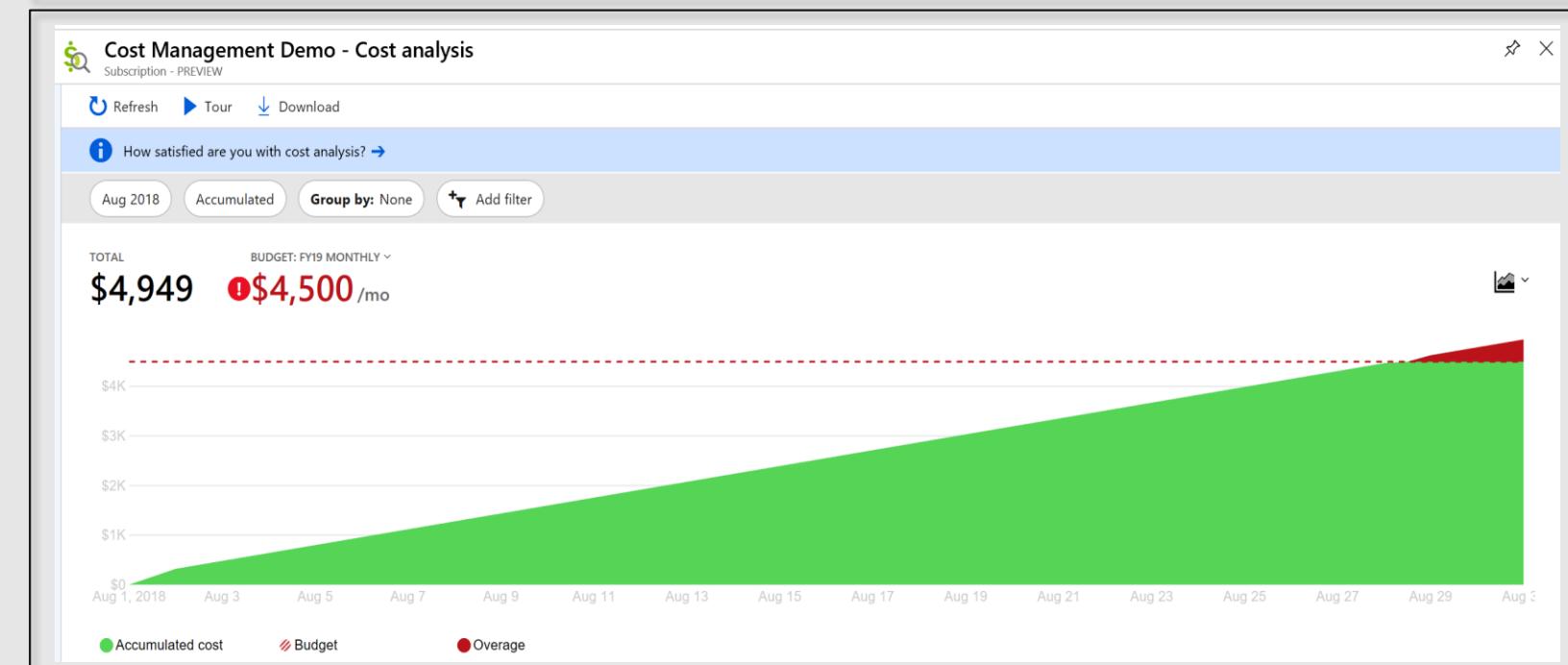
Cost Management Demo - Budgets

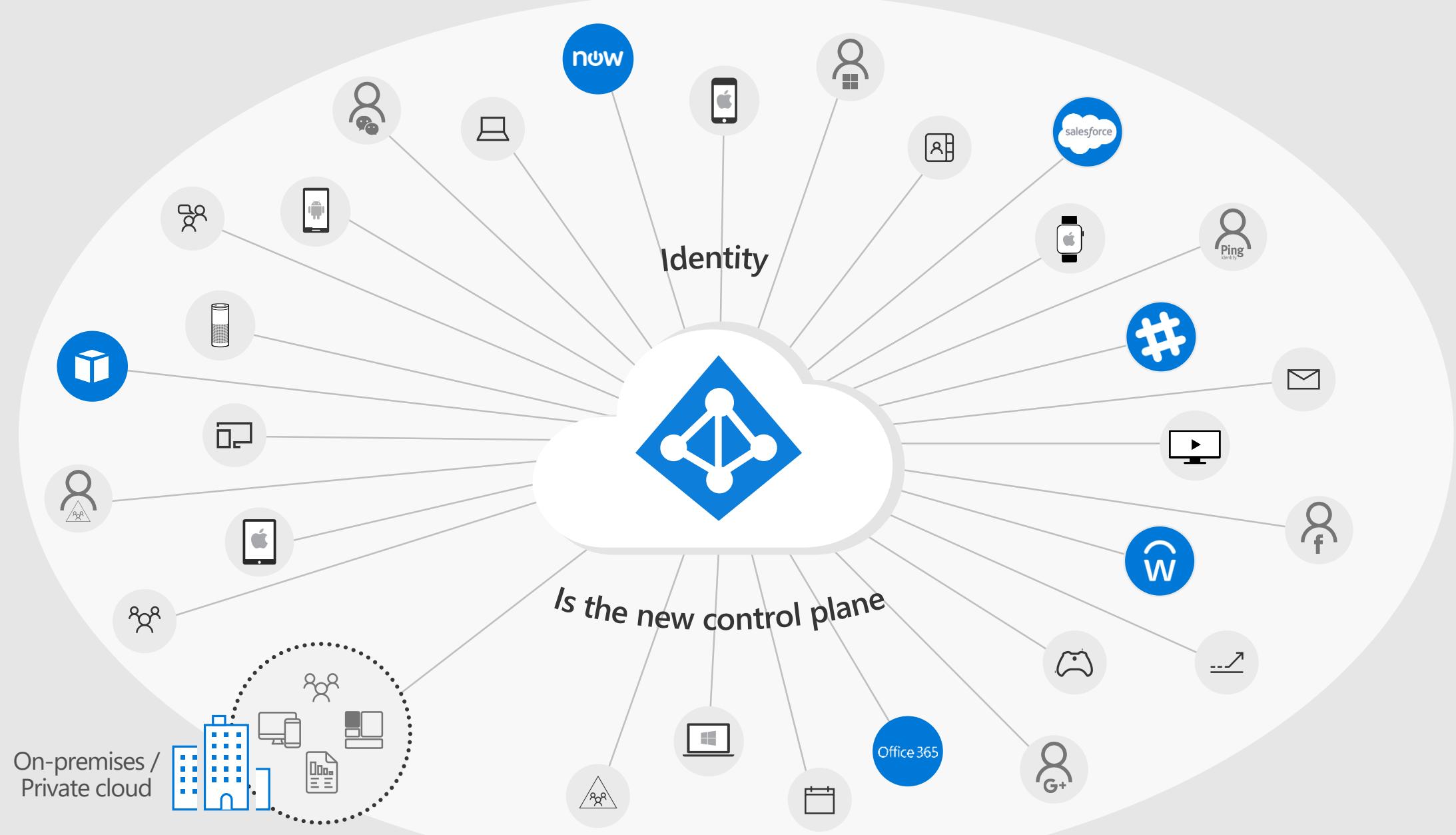
Subscription

+ Add

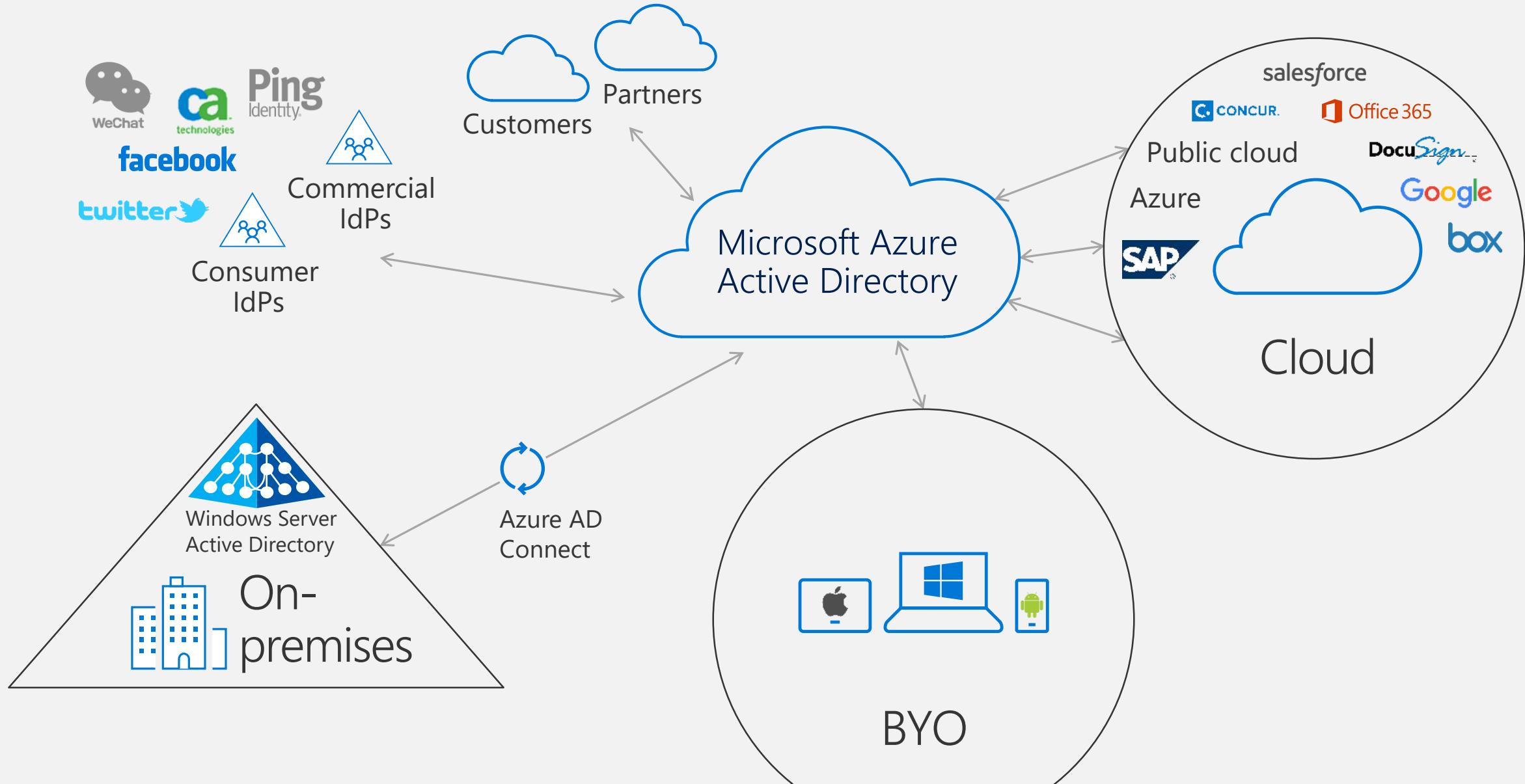
⚠️ Budgets preview currently supports cost-based budgets only.

NAME	RESET PERIOD	START DATE	END DATE	BUDGET	CURRENT COST	PROGRESS	...
FY19 Monthly	Monthly	7/1/2018	7/1/2028	\$4,500.00	\$1,880.16	41.78%	...
FY19 Quarterly	Quarterly	7/1/2018	7/1/2028	\$13,500.00	\$11,782.58	87.28%	...
FY19	Annually	7/1/2018	7/1/2028	\$54,000.00	\$11,782.58	21.82%	...
test	Monthly	9/1/2018	8/31/2020	\$1,000.00	\$1,880.16	188.02%	...

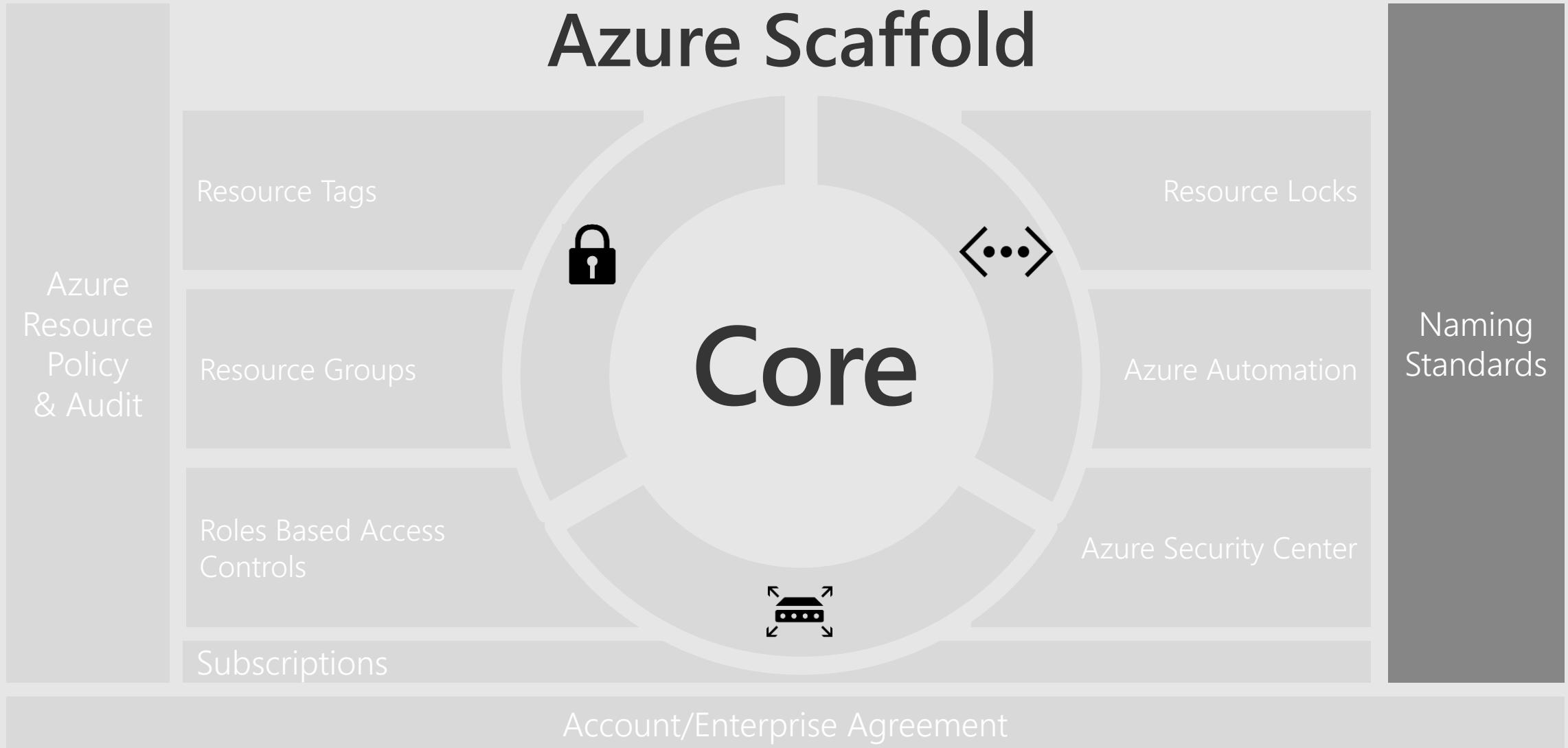




Identity as the Control Plane

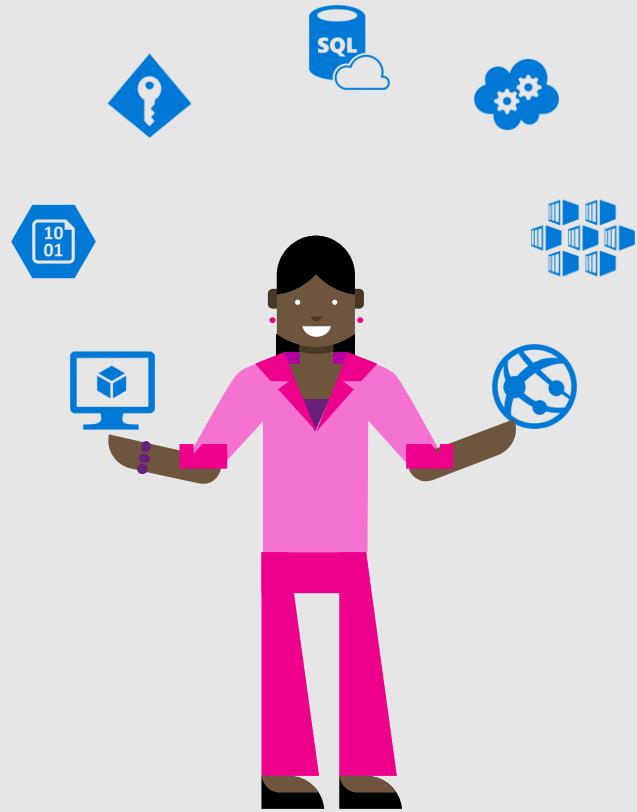


The Azure Enterprise Scaffold



The Pillars: Naming Standards

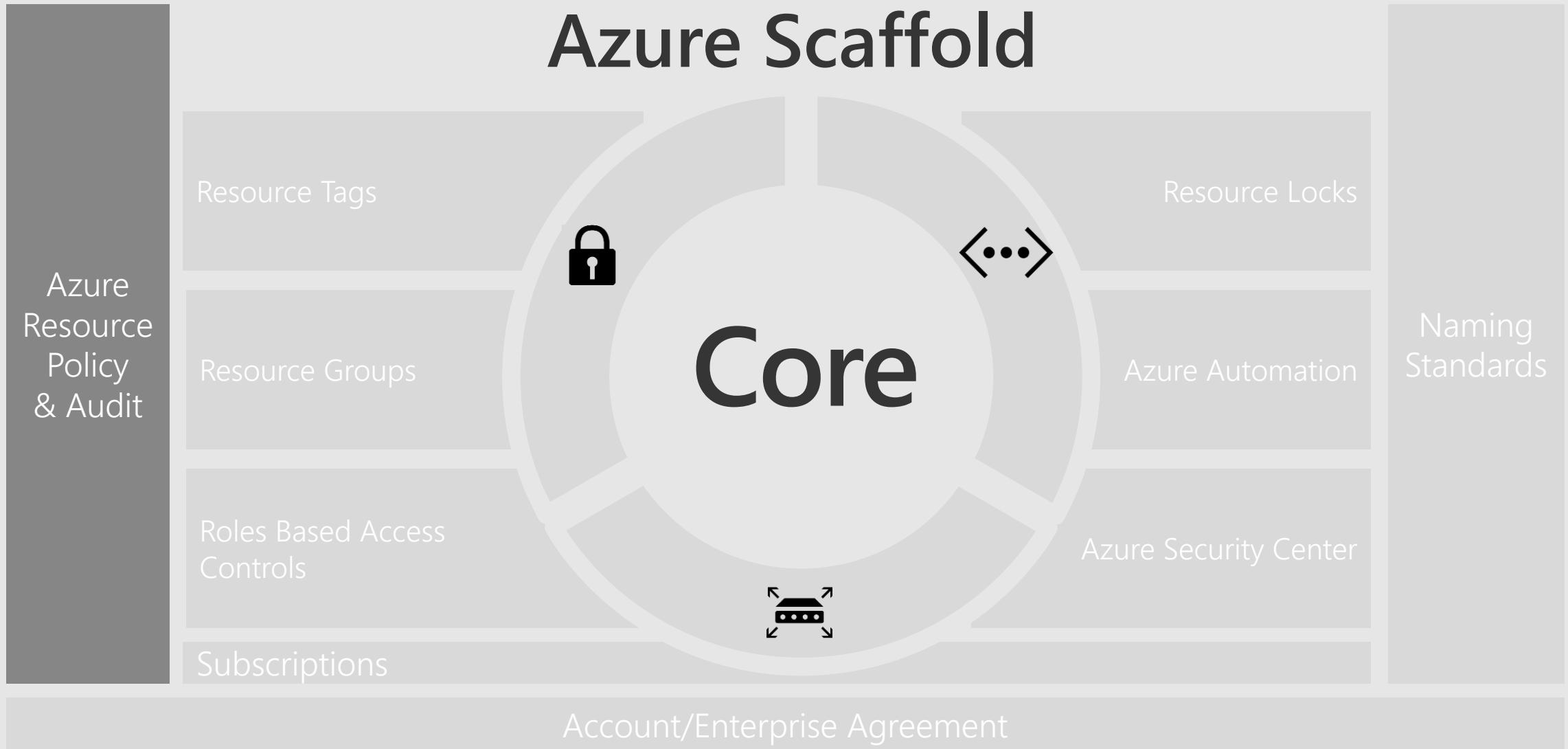
- Allow easier identification of resources in the Portal and in logs etc.
- Allows easier breakout of data in Dashboards and Billing



- Enables scripting and automation by having standard conventions
- Enables Microsoft to help the customer better!

(not having 100 subscriptions named Microsoft Azure Enterprise)

The Azure Enterprise Scaffold



The Pillars: Azure Resource Manager Policies

...enables you to address many concerns.

Finance/Business

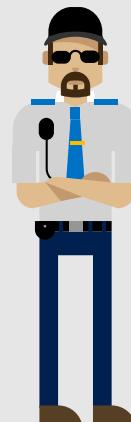
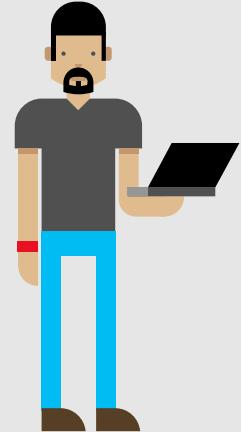
- How can I be notified when costly resources are created?
- How can I ensure that new resources are identified with common information like "Cost Center"



```
{  
  "if" : {  
    <condition> | <logical  
operator>  
  },  
  "then" : {  
    "effect" : "deny | audit | append"  
  }  
}
```

Technology Pro

- How can ensure my subscriptions have only allowed resources?
- Can I make sure developers follow our established naming conventions?



Security/Risk Mgmt.

- How do I ensure we don't violate data sovereignty rules?
- How can I find out when resources are created so I can verify they follow our Security Policies

Azure Policies – Also Available in the Portal

Add assignment

Policies can be assigned to multiple subscriptions and resource groups. Each subscription or resource group can be assigned multiple policies (N:N). Fill in the below fields to create a new assignment for a policy. [Learn more](#)

* Policy definition ⓘ
Allowed virtual machine SKUs

This policy enables you to specify a set of virtual machine SKUs that your organization can deploy.

* Allowed SKUs ⓘ
10 selected

* Assignment name ⓘ
es-vm-allowed-skus

Description
This policy only allows D-Series SKU's in the VM

* Scope ⓘ
rodend 1 - Internal Sub

Create common Policies types

- Allowed Locations
- Allowed Resource Types
- Allowed Storage Account SKUs
- Allows VM SKUs
- Not Allowed Resource Types
- Require SQL Server v. 12
- Require Storage Account Encryption

Policy Initiatives

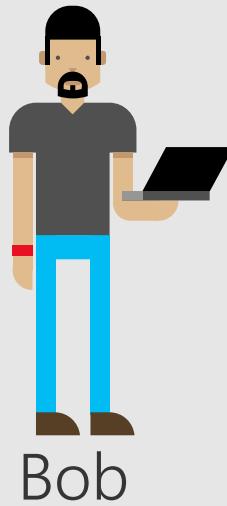
Examples:

- Azure Policy's Guest Configuration
- Industry security baselines such as CIS/STIG/ISO27001
- Out of box

Scope	Definition type	Type	Category	Search	
Azure Pass - Sponsorship	Initiative	All types	All categories	Filter by name or id...	
NAME	DEFINITION LOCATION	POLICIES	TYPE	DEFINITION TYPE	CATEGORY
[Preview]: Audit ISO 27001:2013 controls and deploy specific VM Extensions to support au...		61	Built-in	Initiative	Regulatory Compliance
[Preview]: Audit that certificates are not expiring on Windows VMs		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that password security settings are set correctly inside Linux and Window...		18	Built-in	Initiative	Guest Configuration
[Preview]: Audit that the specified Windows certificates are in the Trusted Root certificate ...		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that Windows VMs has been restarted within a specified number of days		2	Built-in	Initiative	Guest Configuration
[Preview]: Enable Azure Monitor for VM Scale Sets (VMSS)		6	Built-in	Initiative	Monitoring
[Preview]: Enable Azure Monitor for VMs		6	Built-in	Initiative	Monitoring
[Preview]: Enable Data Protection Suite		1	Built-in	Initiative	Security Center
[Preview]: Enable Monitoring in Azure Security Center		68	Built-in	Initiative	Security Center
[Preview]: Audit that an application is installed inside Linux VMs		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that an application is installed inside Windows VMs		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that an application is not installed inside Linux VMs		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that an application is not installed inside Windows VMs		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that the Administrators group inside Windows VMs contains only the specified mem...		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that the Administrators group inside Windows VMs excludes the specified members		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that the Administrators group inside Windows VMs includes the specified members		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that Windows PowerShell modules are installed inside Windows VMs		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that Windows VMs is currently joined to the Domain specified by user		2	Built-in	Initiative	Guest Configuration
[Preview]: Audit that Windows web servers are using secure communication protocols		2	Built-in	Initiative	Guest Configuration

The Pillars: Azure Resource Manager Policies

Scenario



Bob



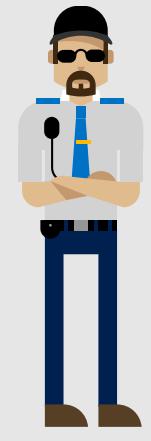
LRS



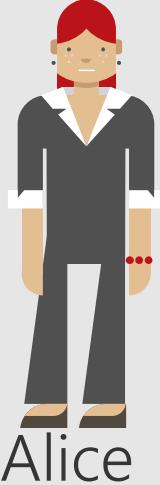
GRS



GRS RA



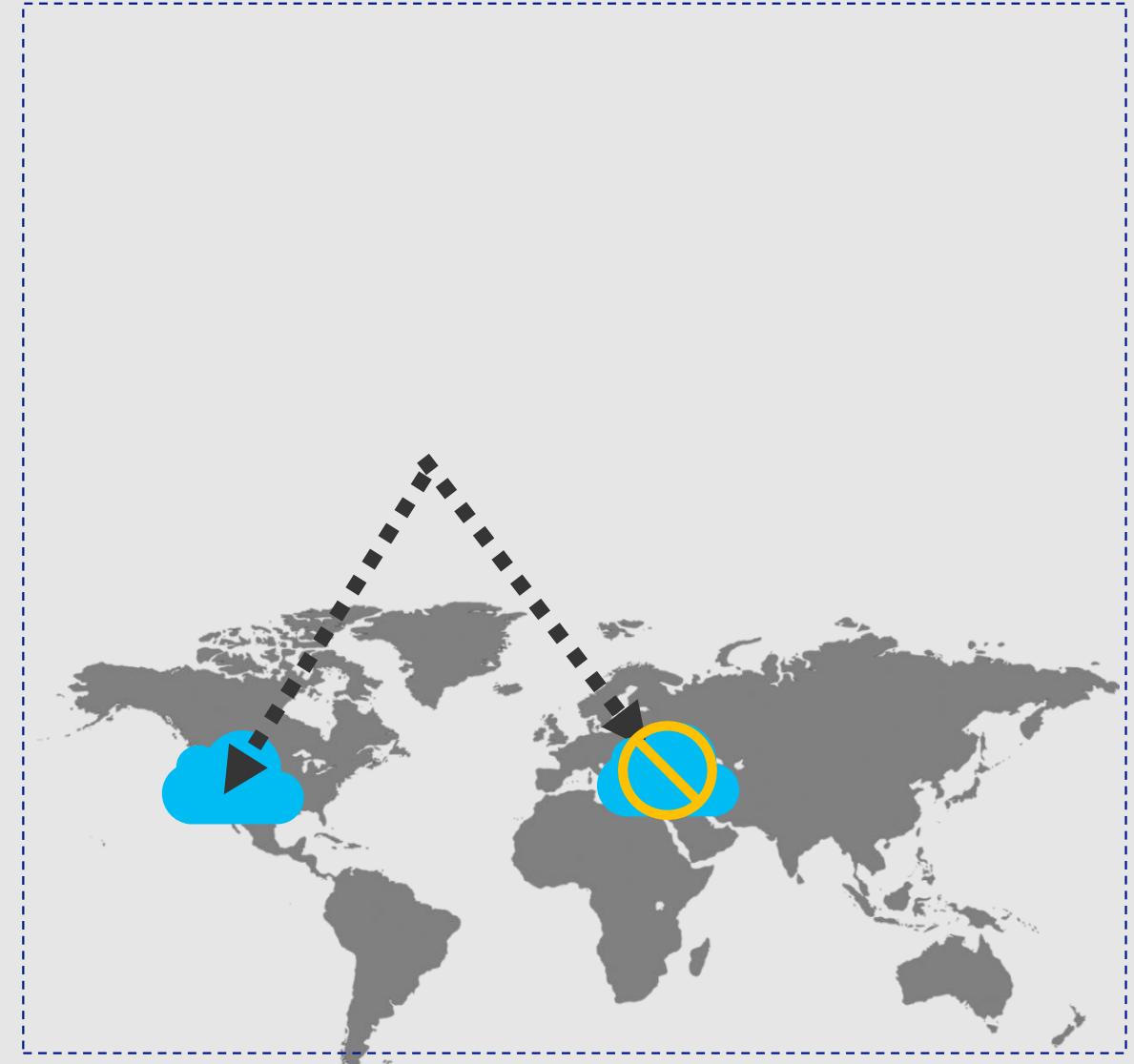
Dan



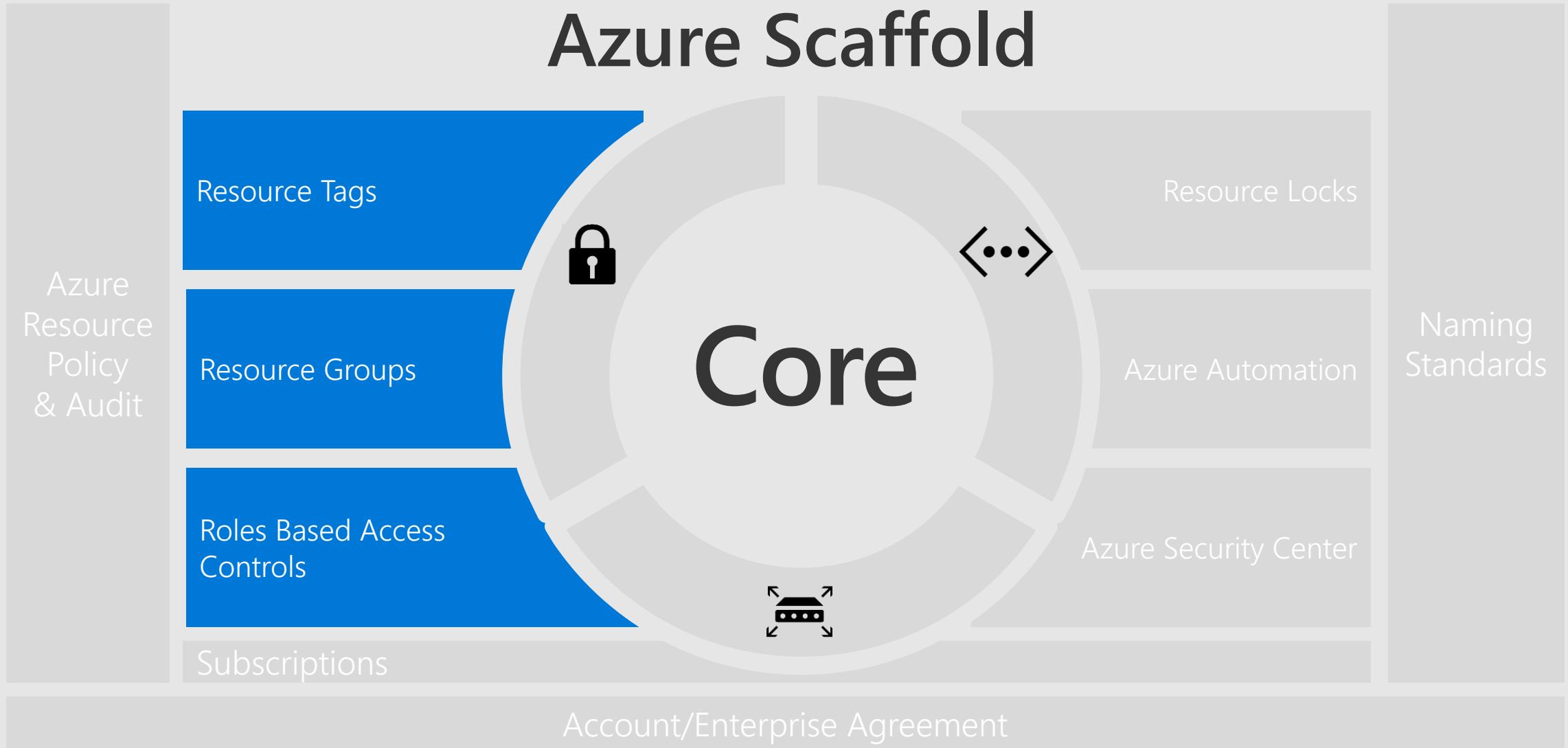
Alice



Storage Resource Policy

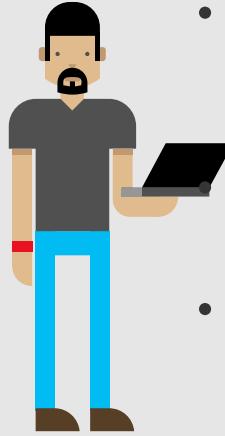


The Azure Enterprise Scaffold



The Core: Resource Groups

Technology Pro

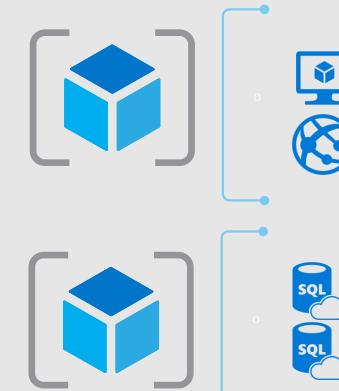


- Wants to maximize the use of a Subscription (multiple apps)
- Wants to know who owns certain resources
- Wants to deploy and manage apps as a unit

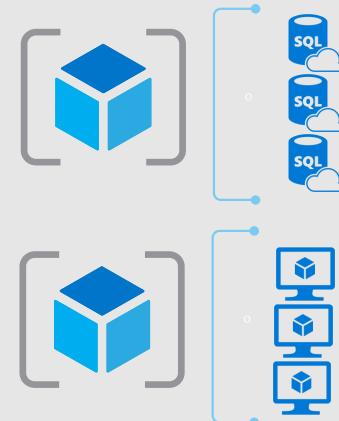
Application Lifecycle



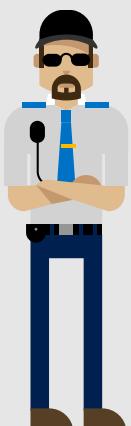
Application Tier



Span of Control



Security/Risk Mgmt.



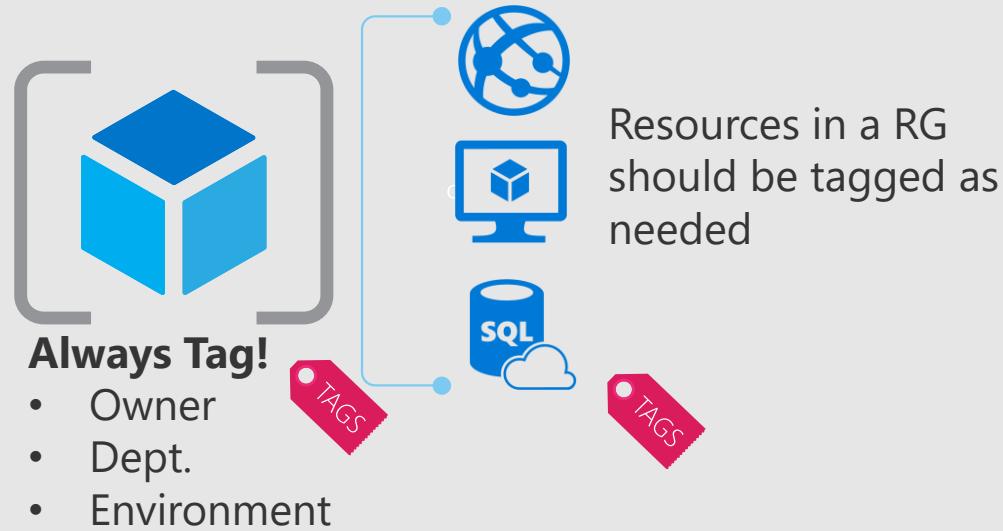
- Want to design for “least privilege access” to ensure that the access is appropriate to the role
- Desire to isolate applications for review and audit

The Core: Tags



TechnologyPress

- Want to enable the break down costs by resource dimensions such as Customer, Cost Center, Environment



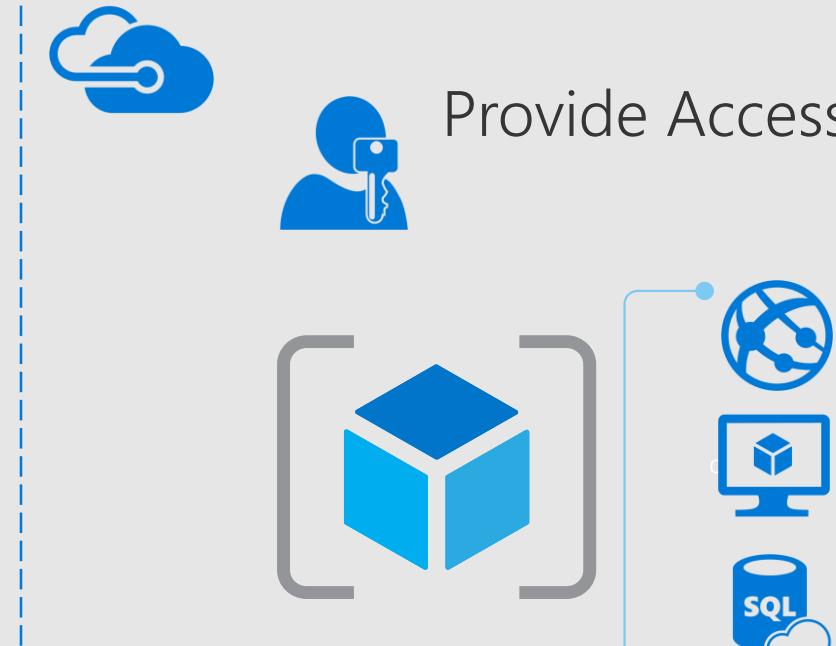
The Core: Roles Based Access Control (RBAC)

Security & Risk Mgmt.

- Wants to ensure that it has a well-defined behavior access to resources
- Wants to know who owns what
- Wants to design for "least privilege access" to ensure that the access is appropriate to the role
- Needs to ensure application owners don't clash



Limit Co-Admins, Use Subscription Owners (ARM)



Provide Access at a RG level

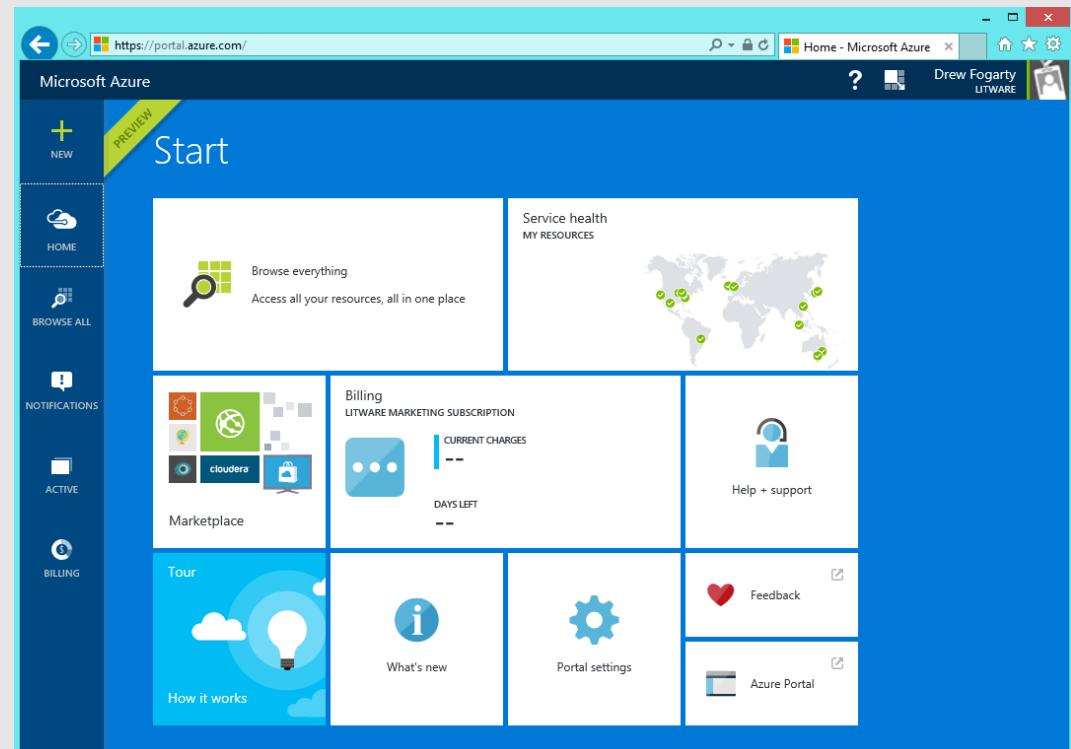
Least Privilege as a Model

Goal

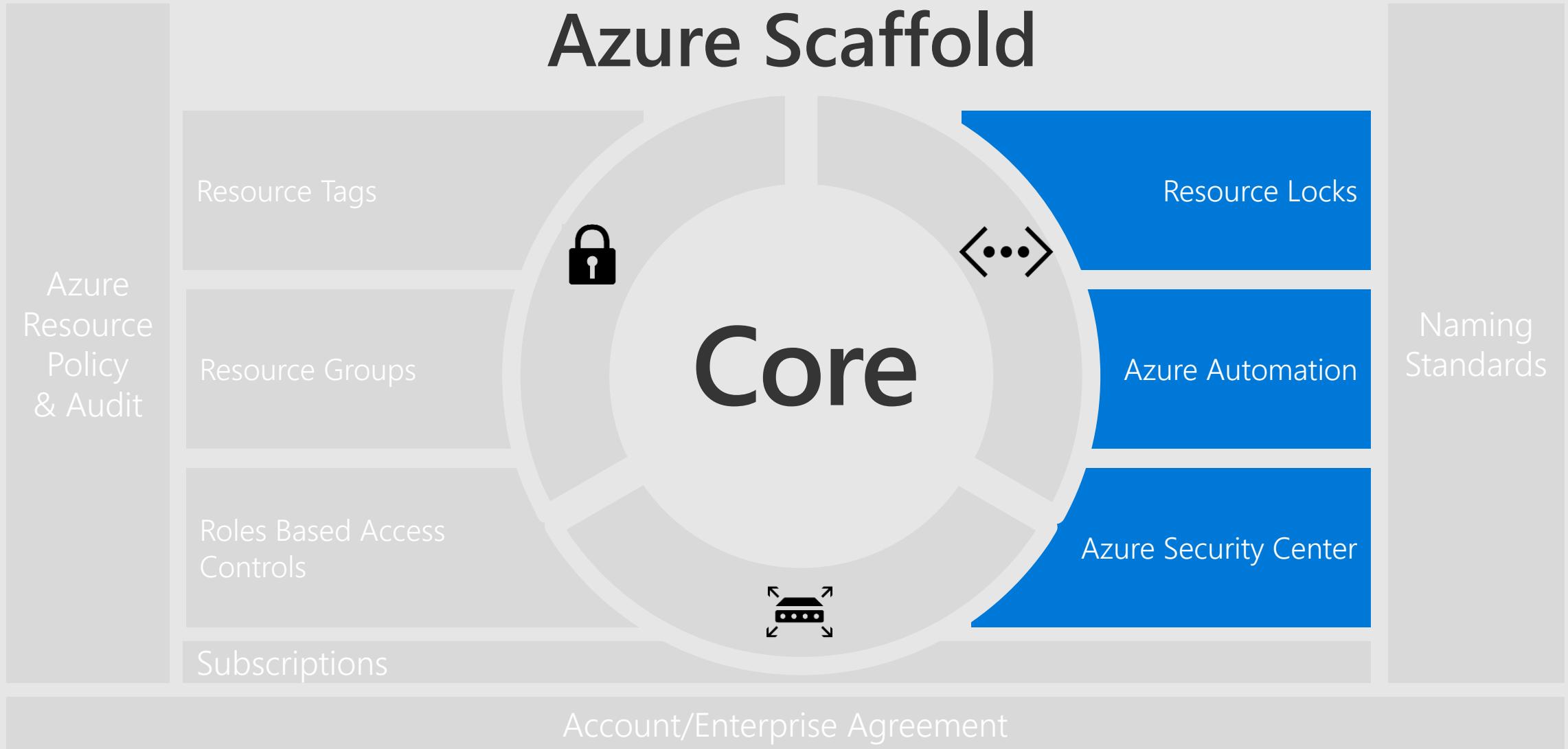
- Users can do the tasks their job requires
- But no more than that

Best practices

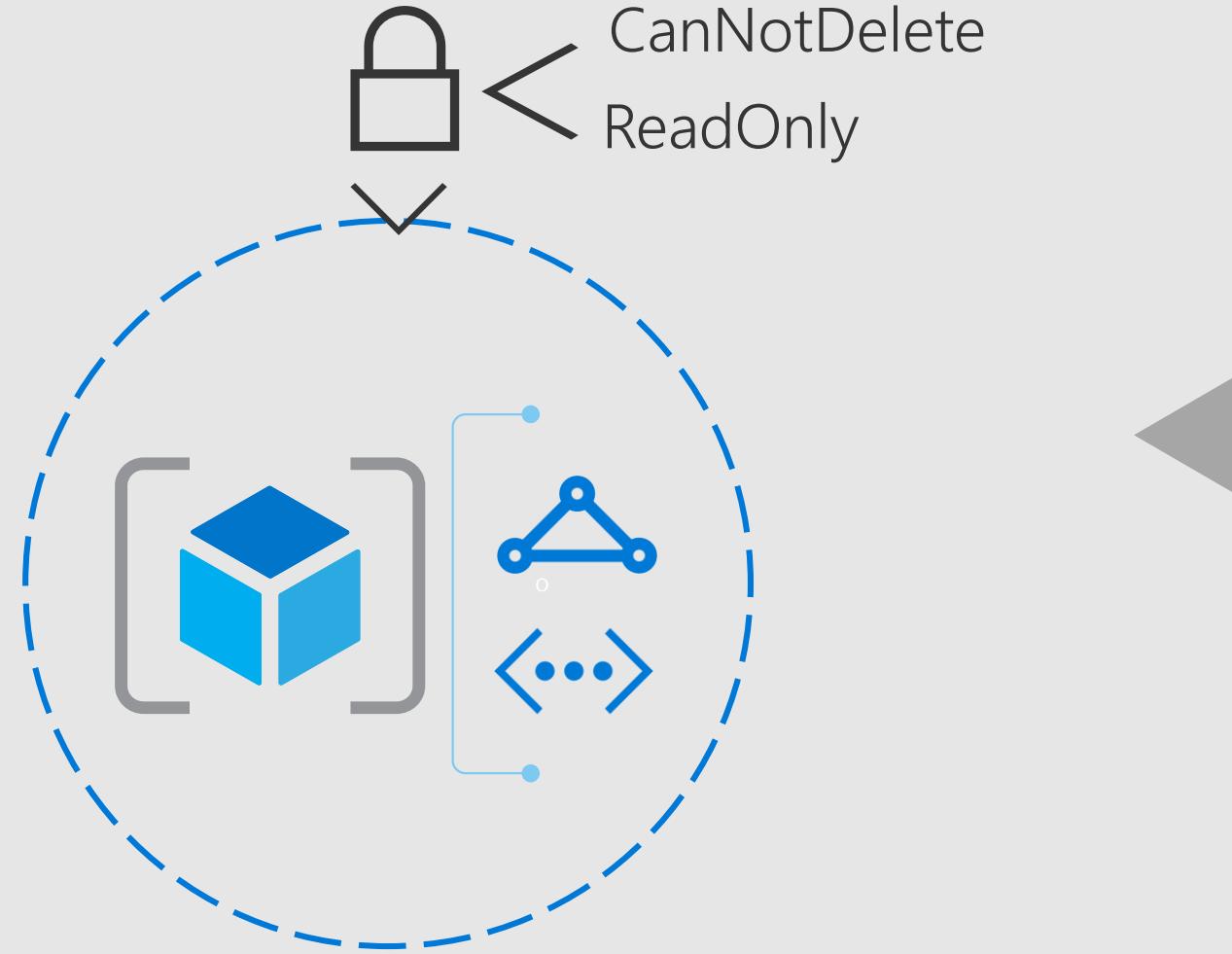
- Use the portal and ARM API
- Assign the Built-in role 1st
- Follow least privileges
- Use resource groups



The Azure Enterprise Scaffold

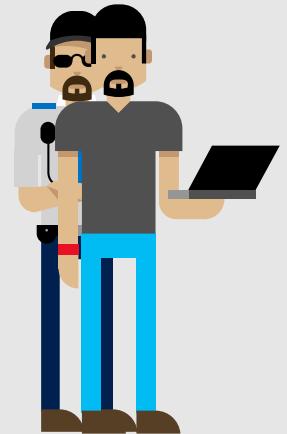


The Core: Resource Locks

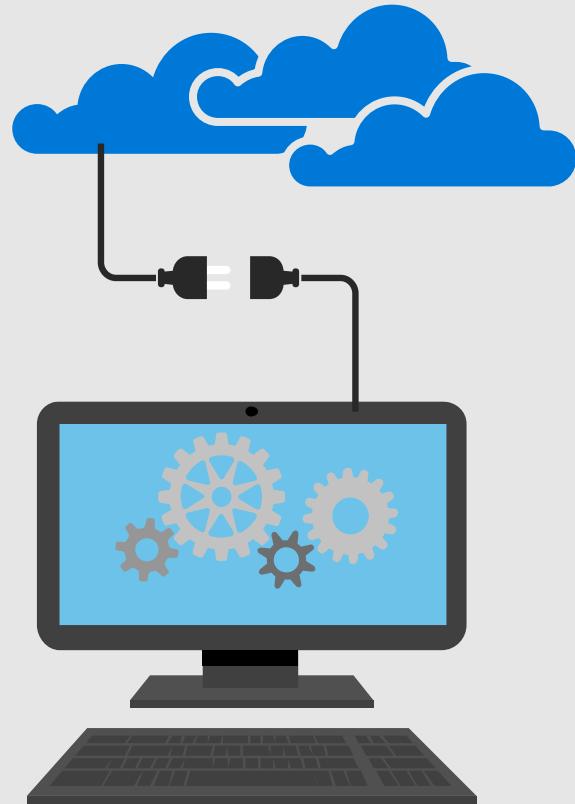


Security & Risk Mgmt.

- Preserves stability of security priorities by locking key resources from deletion or modification.



The Core: Azure Automation Technology Pro

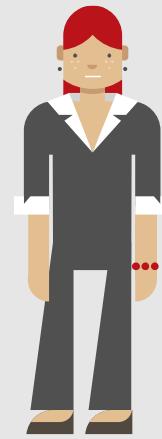


- Allow Technology Pros to create libraries of re-usable code to manage their environments



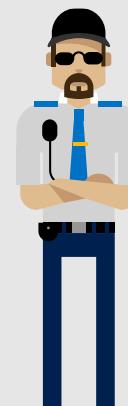
Finance/Business

- Smart use of Automation allows business to be more flexible to demand

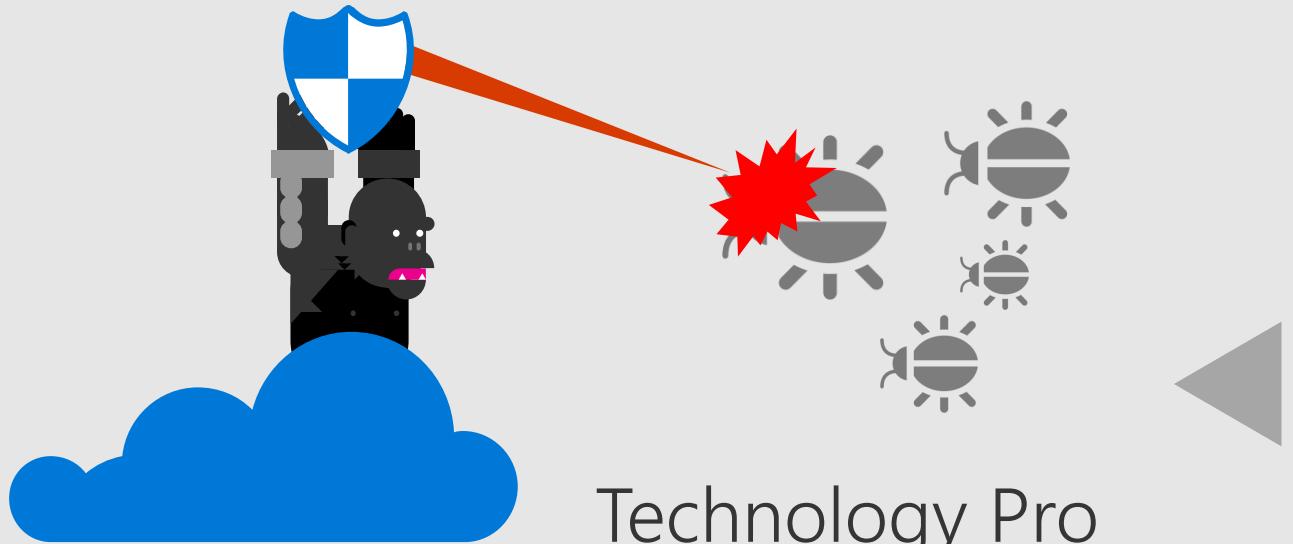


Security/Risk Mgmt.

- Provide consistent deployment of needed tools and resources for security management (agents, etc)



The Core: Azure Security Center



Technology Pro

- Helps to ensure that newly deployed resources aren't accidentally exposing the company's information.
- It provides guidance that they can use in concert with the Security/Risk Management department

Security/Risk Mgmt.

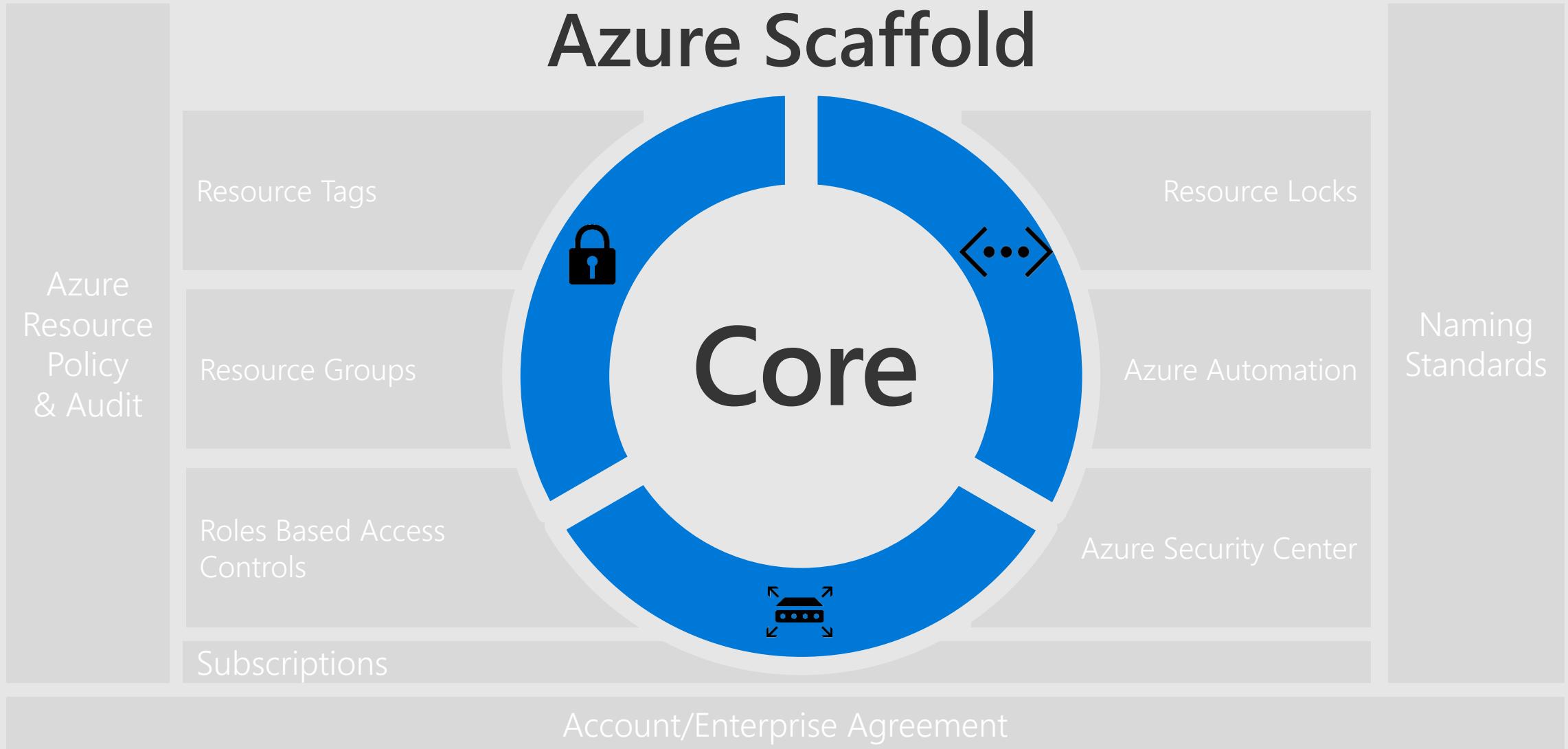
- Gives the Security and Risk Management teams the ability to see where they are vulnerable and how to address

Finance/Business

- From the Business POV Azure Security Center provides a level of surety that data and systems are being protected, increase stability and availability



The Azure Enterprise Scaffold

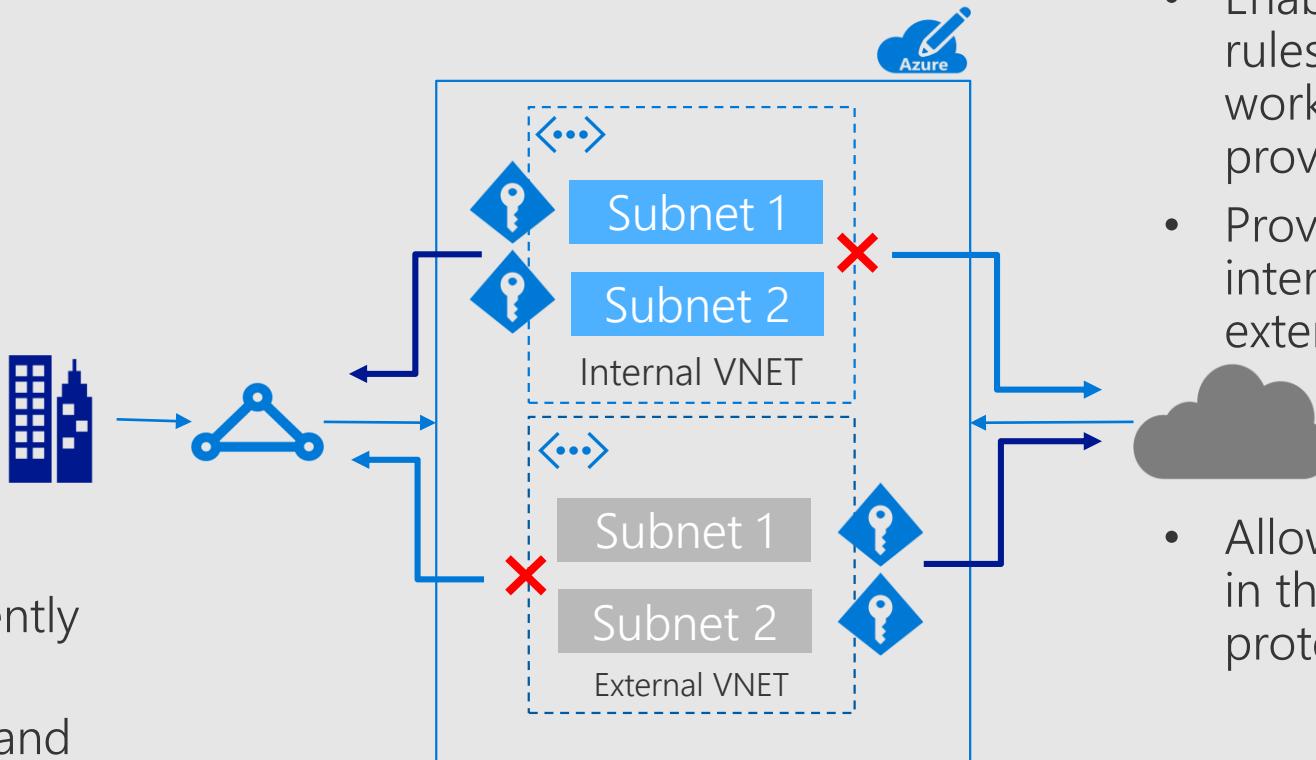


The Gooey Center: Core Network



Technology Pro

- Ensures that when resources are deployed owners won't inadvertently open up vulnerability
- By setting up Network and security first you can have a solid starting point
- Will work with the planned "VNET Peering" Capability



Security/Risk Mgmt.

- Enables a core set of initial NSG rules to be enabled BEFORE workloads are deployed providing a secure foundation
- Provides a separation of internally focused workloads and externally focused workloads
- Allows for additional appliances in the environment for additional protection



Interacting with Azure

- ▶ Azure portal
- ▶ PowerShell
- ▶ Azure CLI
- ▶ Azure REST API

Deployment Features (Infrastructure as Code)

- ▶ ARM Templates (json)
- ▶ Terraform (Hashicorp)



Open Source

Our approach to open source on Azure



Enable

open source use cases in the cloud



Integrate

open source technologies in our platform



Release

innovative technologies as open source

Draft	PowerShell
R Server	ACS Engine
.NET Core	Graph Engine
Service Fabric	PowerBI Visuals
Roslyn	MSR projects
F#	TypeScript



Contribute

to the open source ecosystem



OPEN SOURCE ECOSYSTEM



Use the open source tools you like

DevOps

Nagios®



Management

CHEF



ANSIBLE

SALTSTACK



mist.io



SCALR CLOUD MANAGEMENT

Applications



Pivotal



SAP

App frameworks & tools



nodeJS



eclipse



Databases & middleware



cloudera



SAP S/4 HANA

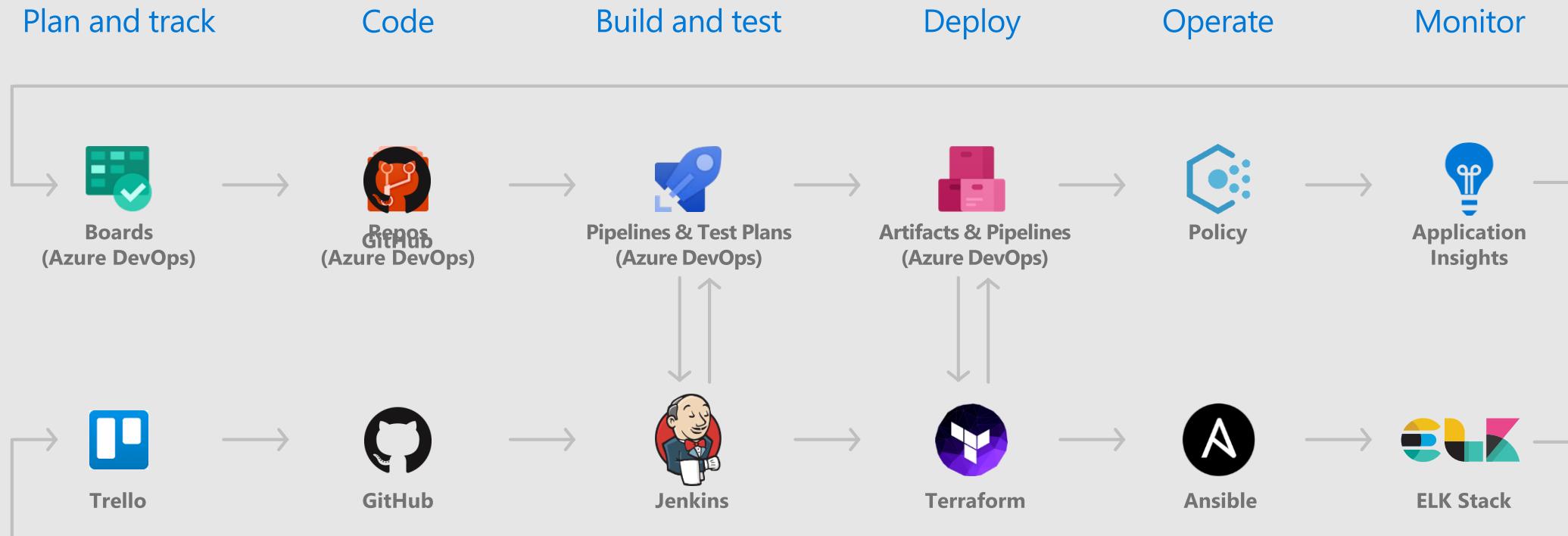
Infrastructure



ORACLE LINUX



DevOps on Azure framework





Modern Cloud Apps

Platform as a Service scenarios



Azure Web Apps

Create and deploy mission-critical **web applications** that scale with your business



SQL Azure
Databases

Managed database services that takes care of scalability, backup, and high availability of the database



Azure Functions

Azure Functions is a solution for easily running small pieces of code, or "functions," in the cloud.

Azure App Service



WEB APPS

Web apps that scale with your business



MOBILE APPS

Build Mobile apps for any device



LOGIC APPS

Automate business process across SaaS and on-premises



API APPS

Easily build and consume APIs in the cloud

What is an Azure SQL Database?

Azure SQL Database is a relational database-as-a service using the Microsoft SQL Server Engine. SQL Database is a high-performance, reliable, and secure database you can use to build data-driven applications and websites in the programming language of your choice, without needing to manage infrastructure.



What are Azure Web Apps?

Azure App Service Web Apps (or just Web Apps) is **a service for hosting web applications**, REST APIs, and mobile back ends. You can develop in your favourite language, be it .NET, .NET Core, Java, Ruby, Node.js, PHP, or Python.





Hands-on Lab

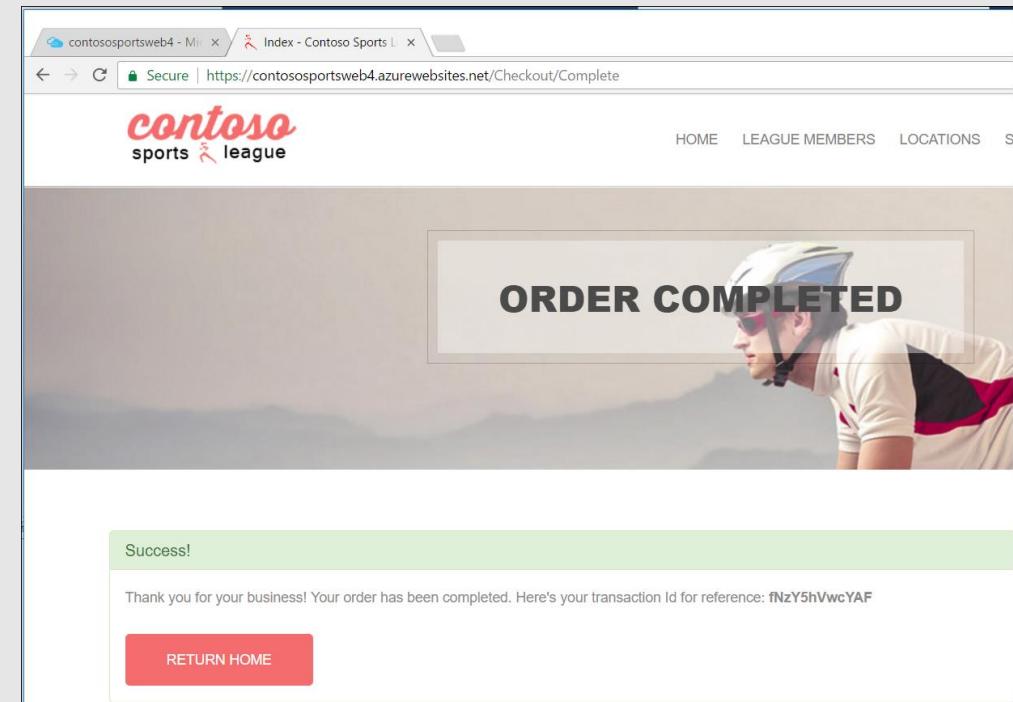
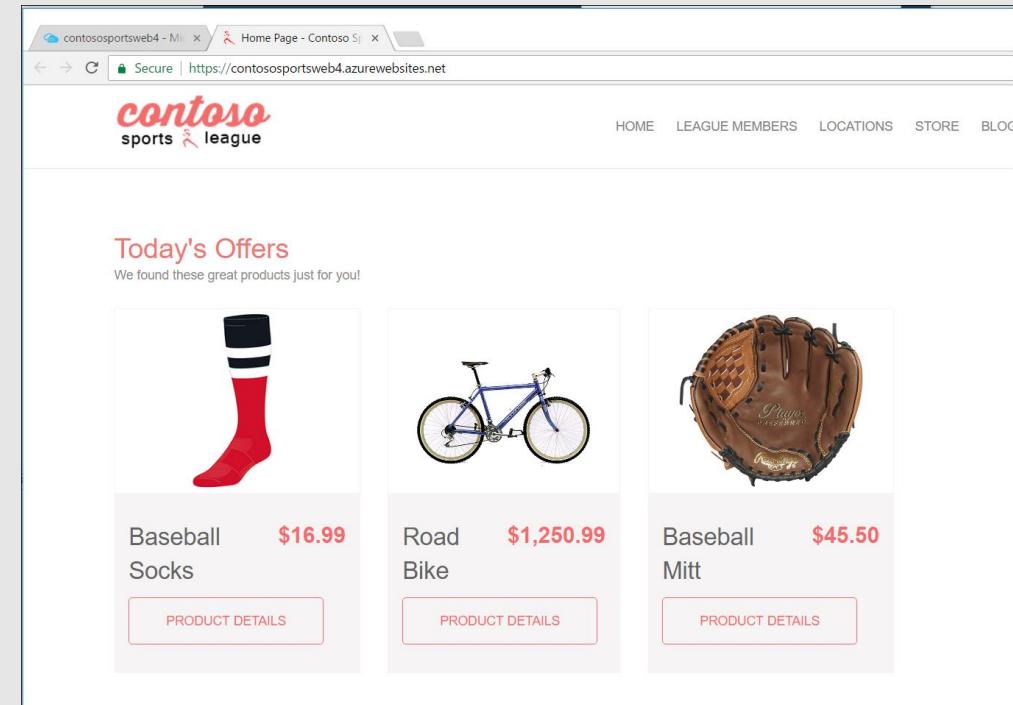
Hands-on Lab Overview

<https://jamespearce80.github.io/ICRC-Modern-Cloud-Apps/>

Hands-on Lab

What are we going to be doing ...

- You will be deploying both IaaS & PaaS services into Azure (Windows VM, Azure App service & SQL DB)
- Lab is fully scripted with step by step instructions
- End goal is the deployment of a custom “Contoso sports league Ecommerce website”
- Most of all we want you to have fun ☺



Notes:

Pre-requisites

- You will need a Microsoft account i.e bob.smith@outlook.com

Steps

1. The Step by Step instructions can be found on my GitHub page (under)

Path = **ICRC-Modern-Cloud-Apps/Hands-on lab/HOL step-by-step - Modern cloud apps**

2. Activate Azure Pass (spreadsheet)

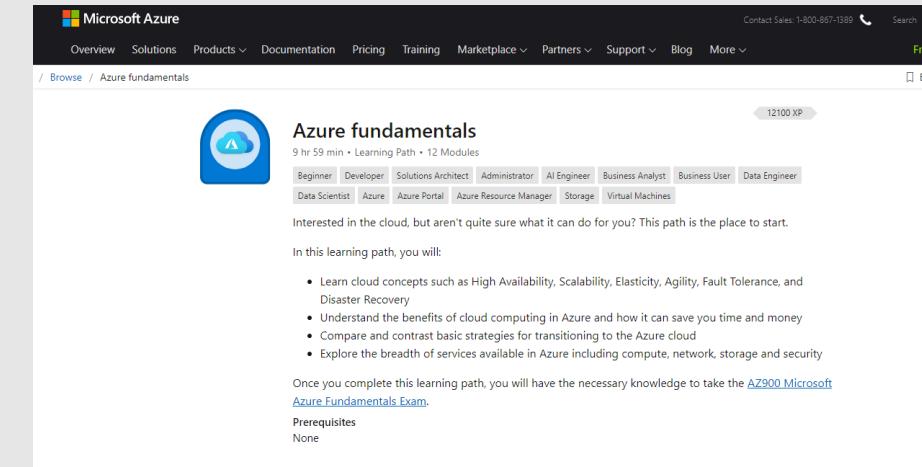
- Your name is allocated to an Azure pass promo code (\$200)
- Password - **AzureICRCday!**

Please note for labs

- Use Microsoft “**West Europe**” for deploying resources
- You need to complete Exercise 1 before moving onto Exercise 2
- Log into Visual Studio Community edition with your “MS credentials” you use for Azure in the LabVM

Summary & Wrap-up

- I hope you all found today useful?
- Please do go home and continue playing with Azure – you have 30 days left of your Azure credit 😊
- Please reach out if you want to know anything more james.pearse@Microsoft.com
- Please continue learning, we have lots of different ways to skill up further in Azure!!!! I have put some additional info in the “additional learning” folder (within GitHub content)
 - <https://docs.microsoft.com/en-us/learn/>
 - <https://docs.microsoft.com/en-us/learn/patterns/azure-fundamentals/>



THANK YOU!

