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# The Complete Beginners Azure Overview



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# About Me

Live in Albuquerque, New Mexico

Graduate

University of New Mexico

20 Years IT Experience

Database Expert

Speaker, Climber, Photographer, Reader

[landrews@pragmaticworks.com](mailto:landrews@pragmaticworks.com)





# Objectives



Cloud Infrastructure



Core Services



Understanding of Benefits



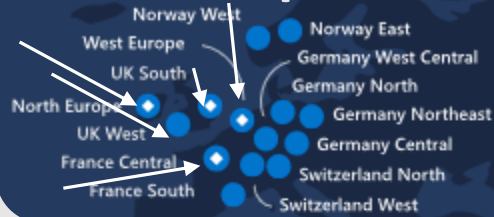
# ***Azure Physical Architecture***

# Map of Regions – December 2018

## Americas



## Europe



## Asia Pacific



## Middle East & Africa



- Available region
- Announced region
- ◆ Availability Zones

# Region Pairs

## Americas



## Europe



## Middle East & Africa



## Asia Pacific





# Architecture Benefits

High Availability

Scalability

Elasticity

Agility

Fault Tolerance

Disaster Recovery



# Infrastructure Review

Data Centers

Regions & Geographies

Region Pairs

Availability Zones







***Azure Services***

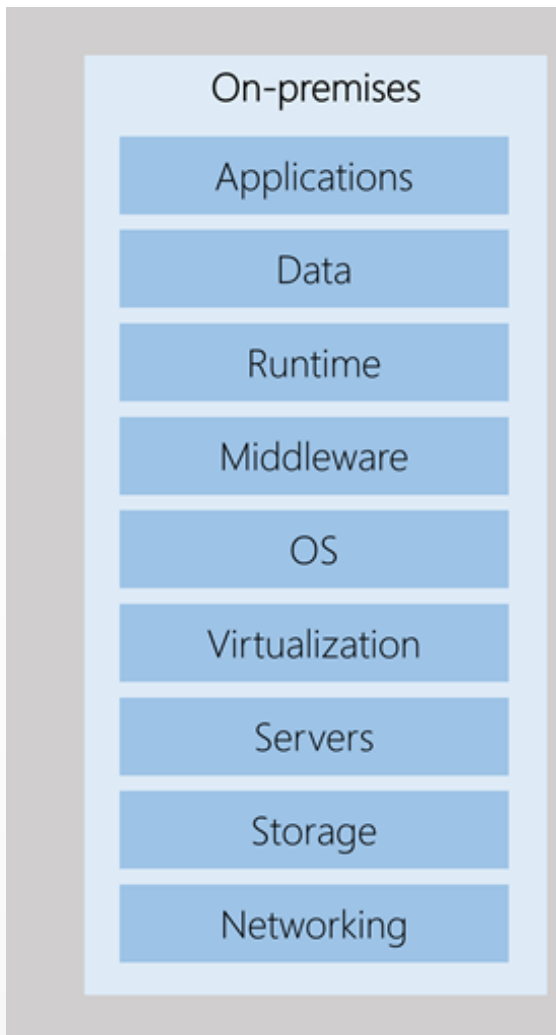


# Core Services

Infrastructure

Platform

Software

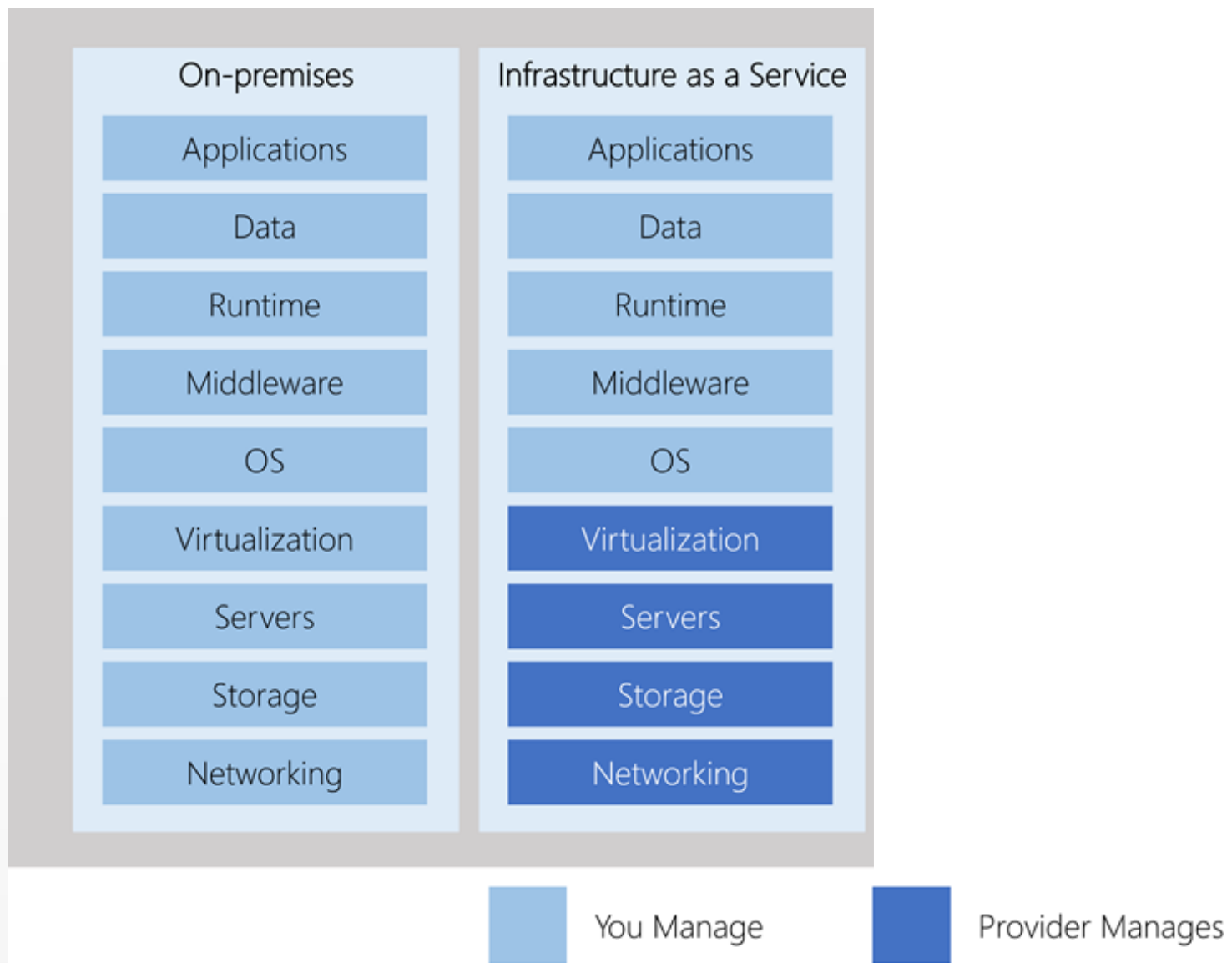


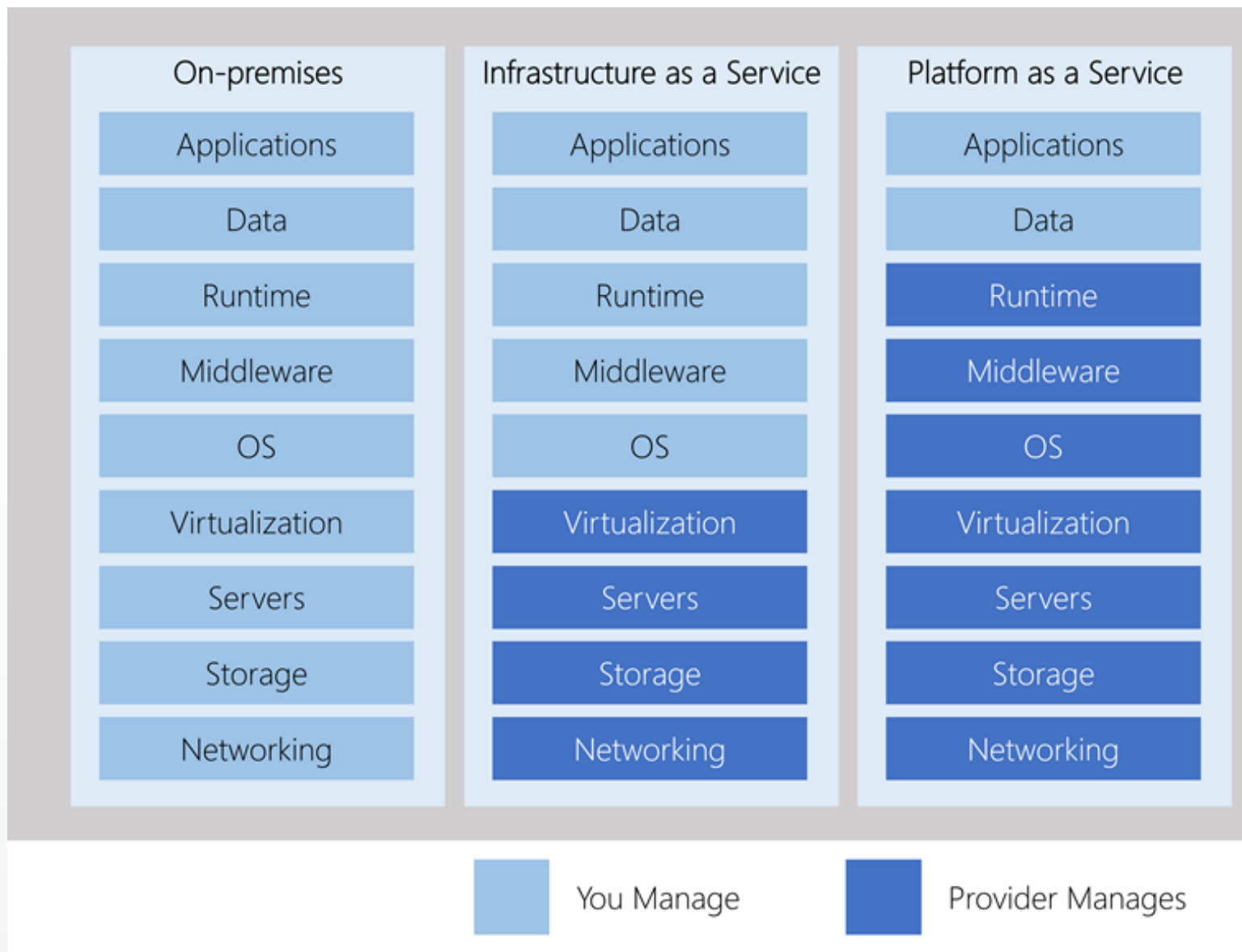
You Manage

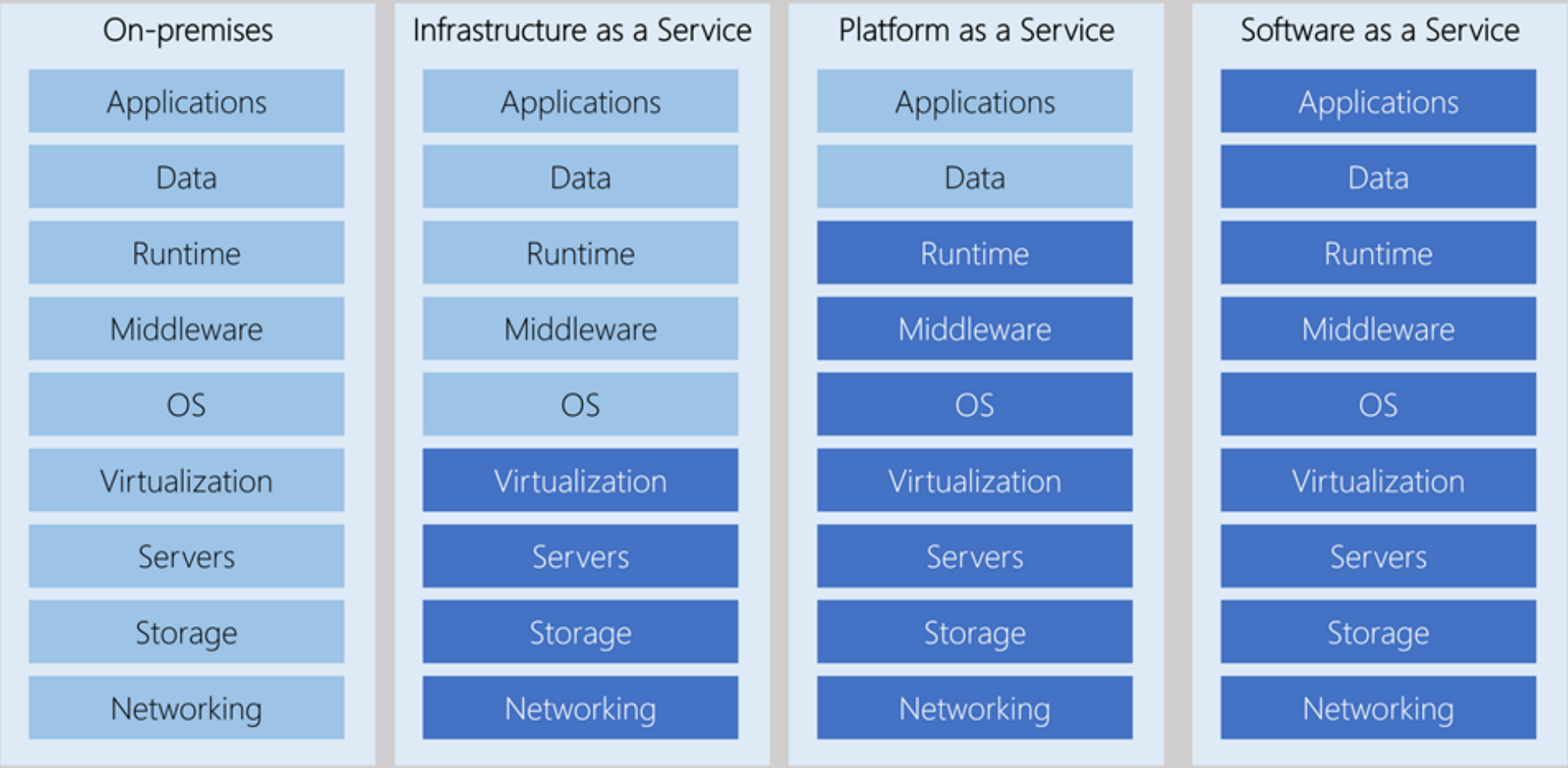


Provider Manages









You Manage



Provider Manages



## Security & Management

- Security Center
- Azure portal
- Azure Active Directory
- Azure AD B2C
- Multi-Factor Authentication
- Automation
- Key Vault
- Azure Marketplace
- VM Image Gallery
- REST API and CLI

## Platform Services

### Media & CDN

- Media Services
- Media Analytics
- Content Delivery Network

### Integration

- API Management
- Service Bus
- Azure Logic Apps

### Application Platform

- Web Apps
- Mobile Apps
- API Apps
- Cloud Services
- Service Fabric
- Notification Hubs
- Functions

### Data

- SQL Database
- SQL Data Warehouse
- Cosmos DB
- SQL Server Stretch Database
- Azure Cache for Redis
- Table Storage
- Azure Search

### Intelligence

- Cognitive Services
- Bot Services
- Azure ML Studio

### Compute Services

- Container Service
- VM Scale Sets
- Azure Batch
- Dev/Test Lab

### Developer Services

- Visual Studio
- Mobile Engagement
- Azure DevOps
- Xamarin
- Application Insights
- Visual Studio App Center

### Analytics & IoT

- HDInsight
- Machine Learning
- Stream Analytics
- Data Catalog
- Data Lake Analytics Service
- Data Lake Storage
- IoT Hub
- Event Hubs
- Data Factory
- Power BI Embedded

## Hybrid Cloud

- Azure AD Connect Health
- AD Privileged Identity Management
- Domain Services
- Backup
- Azure Monitor
- Import/Export
- Azure Site Recovery
- StorSimple

## Infrastructure Services

### Compute

- Virtual Machines
- Containers and Azure Kubernetes

### Storage

- Blob
- Queues
- Files
- Disks

### Networking

- Virtual Network
- Load Balancer
- DNS
- Express Route
- Traffic Manager
- VPN Gateway
- App Gateway

## Datacenter Infrastructure

<https://docs.microsoft.com/en-us/learn/modules/welcome-to-azure/3-tour-of-azure-services>



# ***Azure – Getting Started***





# Signing Up


[Azure.Microsoft.com](https://azure.microsoft.com)

Microsoft Account


Azure Portal




### Azure services



Create a resource



Subscriptions




Virtual machines



All resources



Resource groups




Advisor



Policy



App Services



Storage accounts



More services



Home > Subscriptions

# Subscriptions

Pragmatic Works

Documentation

+ Add

Showing subscriptions in Pragmatic Works. Don't see a subscription? [Switch directories](#)

My role ⓘ

8 selected

Status ⓘ

3 selected

Apply

Showing 2 of 2 subscriptions  Show only subscriptions selected in the [global subscriptions filter](#) ⓘ

Search to filter items...

Subscription name	↑↓ Subscription ID	↑↓ My role	↑↓ Current cost	Status	↑↓
Azure subscription 1	6be616c0-61c8-4482-9023-55ddaa68a39b	Owner	0.00	Active	...
Visual Studio Enterprise Subscri...	7135f1d2-dd66-4501-859e-c3550b202769	Account admin	0.00	Active	...



### Azure services

Create a resource

Subscriptions

Virtual machines

All resources

Resource groups

Advisor

Policy

App Services

Storage accounts

More services



All services

Search All

General

Compute

Networking

Storage

Web

Mobile

Containers

Databases

Analytics

Blockchain

AI + machine learning

Internet of things

GENERAL (15)

All resources

Recent

Management groups

Subscriptions

Resource groups

Cost Management + Billing

Marketplace

Help + support





All services > Resource groups

## Resource groups

Pragmatic Works



**+ Add** | Edit columns | Refresh | Export to CSV | Assign tags | Feedback

Filter by name...

Subscription == all

Location == all

+ Add filter

Showing 1 to 2 of 2 records.

No grouping

<input type="checkbox"/> Name ↑↓	Subscription ↑↓	Location ↑↓	
<input type="checkbox"/> [Icon] <a href="#">LesliesTestApp</a>	<a href="#">Azure subscription 1</a>	Central US	...
<input type="checkbox"/> [Icon] <a href="#">NetworkWatcherRG</a>	<a href="#">Visual Studio Enterprise Subscription – M...</a>	Central US	...





## Create a resource group

Basics

Tags

Review + create

**Resource group** - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)

### Project details

Subscription \* ⓘ

Azure subscription 1



Resource group \* ⓘ

### Resource details

Region \* ⓘ

(US) Central US



Review + create

&lt; Previous

Next : Tags &gt;





## Create a resource group



Basics

Tags

Review + create

**Resource group** - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)

### Project details

Subscription \* ⓘ

Azure subscription 1

Resource group \* ⓘ

### Resource details

Region \* ⓘ

(US) Central US

Review + create

< Previous

Next : Tags >





## Create a resource group

Basics

**Tags**

Review + create

Apply tags to your Azure resources to logically organize them by categories. A tag consists of a key (name) and a value. Tag names are case-insensitive and tag values are case-sensitive. [Learn more](#)

Name ⓘ

Value ⓘ

Resource

Department

:

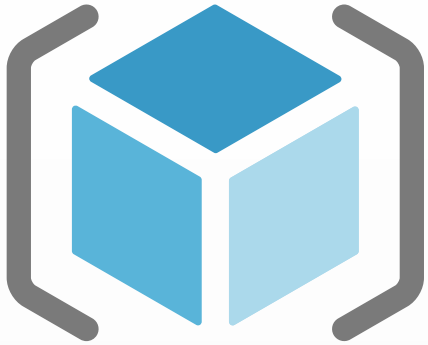
Accounting

Resource group

Review + create

< Previous

Next : Review + create >



# Resource Groups

Can NOT be nested

Resources can only belong to **ONE** Resource Group

# Resource Creation

PowerShell

Command Line Interface

Templates


Software Development Kits



### Azure services



Create a resource



Subscriptions



Virtual machines



All resources



Resource groups



Advisor



Policy



App Services



Storage accounts



More services



## Welcome to Azure Cloud Shell

Select Bash or PowerShell. You can change shells any time via the environment selector in the Cloud Shell toolbar. The most recently used environment will be the default for your next session.

Bash |  PowerShell

# Downloads

Get the SDKs and command-line tools you need

Unified SDKs

SDKs

**Command-line tools**

Standalone Tools

## Command-line tools

Manage your Azure services and apps using scripts from the command line.

### Azure command-line interface

[Install](#)

[Documentation](#)

### Azure Storage Emulator

[Install](#)

### PowerShell

[Install](#)

[Documentation](#)

### AzCopy Command-Line Tool for Azure Storage

[Install \(Windows only\)](#)

[Install \(cross-platform\)](#)

[Documentation](#)

[Documentation \(if using AzCopy v10\)](#)

# Downloads

Get the SDKs and command-line tools you need

Unified SDKs

SDKs

Command-line tools

Standalone Tools

## Unified SDKs

The Azure Unified SDKs are collections of libraries for .NET, Java, JavaScript, and Python. They're built on a common core for easy use of Azure services, with a focus on consistency, familiarity, and language idiomaticity.

If you're starting a new project or migrating existing projects, Microsoft recommends adopting these libraries. If you're looking for older versions, go to the SDKs tab.

### Java

[Install Unified SDK](#)

[API reference](#)

### Python

[Install Unified SDK](#)

[API reference](#)

### .NET

[Download Visual Studio 2019](#)

[Download Visual Studio 2019 for Mac](#)

<https://azure.microsoft.com/en-us/overview/>



### AzureOverview

Resource group

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)
- Tags
- Events
- Settings
- Quickstart
- Deployments
- Policies**
- Properties
- Locks
- Export template

[+](#) Add
 [☰](#) Edit columns
 [🗑️](#) Delete resource group
 [🔄](#) Refresh
 [➔](#) Move
 [⬇️](#) Export to CSV
 [🏷️](#) Assign tags
 [🗑️](#) Delete
 [⬇️](#) Export template
 [❤️](#) Feedback

Subscription [\(change\)](#) : Azure subscription 1 Deployments : 1 Succeeded

Subscription ID : 6be616c0-61c8-4482-9023-55ddaa68a39b

Tags [\(change\)](#) : Department : Accounting

Showing 1 to 2 of 2 records.  Show hidden types

<input type="checkbox"/> Name ↑↓	Type ↑↓	Location ↑↓	
<input type="checkbox"/> LeslieTest (pw-leslie/LeslieTest)	SQL database	West US 2	...
<input type="checkbox"/> pw-leslie	SQL server	West US 2	...











# Policy - Getting started

Search (Ctrl+)

- Overview
  - Getting started**
  - Join Preview
  - Compliance
  - Remediation
- Authoring**
- Assignments
  - Definitions

## Recommended policy assignments

Select one to learn more and assign the policy to your environment.

 <b>Inherit tags from Resource Group</b> Automated inheritance of tags from Resource Group to resources.	 <b>Require tag on Resource Group</b> Enforce existence of a tag on Resource Group.
 <b>Not allowed resource types</b> Block the creation of specified resource types.	 <b>Audit Windows VMs for security</b> Deploy security baselines for Windows VMs.

## Policy - Definitions

Search (Ctrl+/)

+ Initiative definition + Policy definition Refresh

Scope:  ...
 Definition type: 
 Type: 
 Category: 
 Search:

Name	Definition location	Policies	Type	Definit...	Category	
Enforce tag on resource	Azure subscription 1		Custom	Policy	General	...
Audit virtual machines without di...			Built-in	Policy	Compute	...
Azure Backup should be enabled ...			Built-in	Policy	backup	...
[Preview]: Show audit results fro...			Built-in	Policy	Guest Configu...	...
SQL managed instance TDE prote...			Built-in	Policy	SQL	...
[Preview]: Network traffic data col...			Built-in	Policy	Monitoring	...
Deploy Diagnostic Settings for Se...			Built-in	Policy	Monitoring	...
[Preview]: Deploy Log Analytics A...			Built-in	Policy	Monitoring	...
Vulnerability Assessment settings...			Built-in	Policy	SQL	...
Diagnostic logs in Azure Data Lak...			Built-in	Policy	Data Lake	...

- Overview
- Getting started
- Join Preview
- Compliance
- Remediation

Authoring

- Assignments
- Definitions

Related Services

- Blueprints (preview)
- Resource Graph
- User privacy

# Policy - Assignments

Search (Ctrl+/)

Assign initiative Assign policy Refresh

- Overview
- Getting started
- Join Preview
- Compliance
- Remediation
- Authoring
  - Assignments
  - Definitions
- Related Services
  - Blueprints (preview)
  - Resource Graph
  - User privacy

Scope:  ...
 Definition type: 
 Search: 
 Category:

Total Assignments ⓘ **3**
 Initiative Assignments ⓘ **2**
 Policy Assignments ⓘ **1**

name	Scope	Type	Policies	Category
<a href="#">ASC DataProtection (subscription: 6be616c0-6...</a>	Azure subscription 1	Initiative	1	Security Center
<a href="#">ASC Default (subscription: 6be616c0-61c8-448...</a>	Azure subscription 1	Initiative	98	Security Center
<a href="#">Enforce tag on resource</a>	Azure subscription 1/AzureOver...	Policy	1	General



## Enforce tag on resource

Edit Policy Assignment

Basics

Parameters

Remediation

Review + save

### Basics

Scope	Azure subscription 1/AzureOverview
Exclusions	--
Policy definition	Enforce tag on resource
Assignment name	Enforce tag on resource
Description	--
Policy enforcement	Enabled
Assigned by	Leslie Andrews

### Parameters

tagName	Department
---------	------------

### Remediation



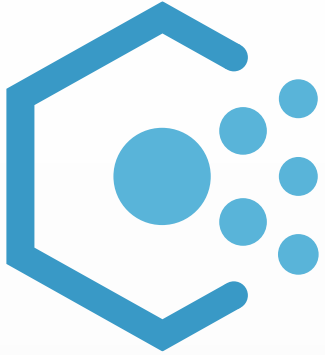
No managed identity associated with this assignment.

Save

Cancel

Previous

Next



# Policies

Restricting Regions

Type/Size of VM

Enforce Naming Conventions

### AzureOverview

Resource group

Search (Ctrl+/)

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- Export template

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 [❤️](#) Feedback

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Subscription ID : 6be616c0-61c8-4482-9023-55ddaa68a39b

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Showing 1 to 2 of 2 records.  Show hidden types

<input type="checkbox"/> Name ↑↓	Type ↑↓	Location ↑↓	
<input type="checkbox"/> LeslieTest (pw-leslie/LeslieTest)	SQL database	West US 2	...
<input type="checkbox"/> pw-leslie	SQL server	West US 2	...

# AzureOverview - Locks

Resource group

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)
- Tags
- Events

### Settings

- Quickstart
- Deployments
- Policies
- Properties
- Locks**
- Export template
- Cost Management
- Cost analysis
- Cost alerts

+ Add Subscription Refresh

## Add lock

Lock name:  ✓

Lock type:  ▼

Notes:

OK Cancel

### AzureOverview - Locks

Resource group

+ Add Subscription Refresh

Lock name	Lock type	Scope	Notes
BlockDeletion	Delete	azureoverview	<a href="#">Edit</a> <a href="#">Delete</a>





### AzureOverview

Resource group

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<input type="checkbox"/> Name ↑↓	Type ↑↓	Location ↑↓	
<input type="checkbox"/>  LeslieTest (pw-leslie/LeslieTest)	SQL database	West US 2	...
<input type="checkbox"/>  pw-leslie	SQL server	West US 2	...





# Resources

Servers

Networks

Applications



## Create SQL Database

Microsoft

Basics

Networking

Additional settings

Tags

Review + create

Create a SQL database with your preferred configurations. Complete the Basics tab then go to Review + Create to provision with smart defaults, or visit each tab to customize. [Learn more](#)

### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \* ⓘ

Azure subscription 1



Resource group \* ⓘ

AzureOverview



[Create new](#)

### Database details

Enter required settings for this database, including picking a logical server and configuring the compute and storage resources

Database name \*

Enter database name

Review + create

Next : Networking >

### AzureOverview

Resource group

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- 
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Tags [\(change\)](#) : Department : Accounting

Showing 1 to 2 of 2 records.  Show hidden types No grouping

<input type="checkbox"/> Name ↑↓	Type ↑↓	Location ↑↓	
<input type="checkbox"/> LeslieTest (pw-leslie/LeslieTest)	SQL database	West US 2	...
<input type="checkbox"/> pw-leslie	SQL server	West US 2	...



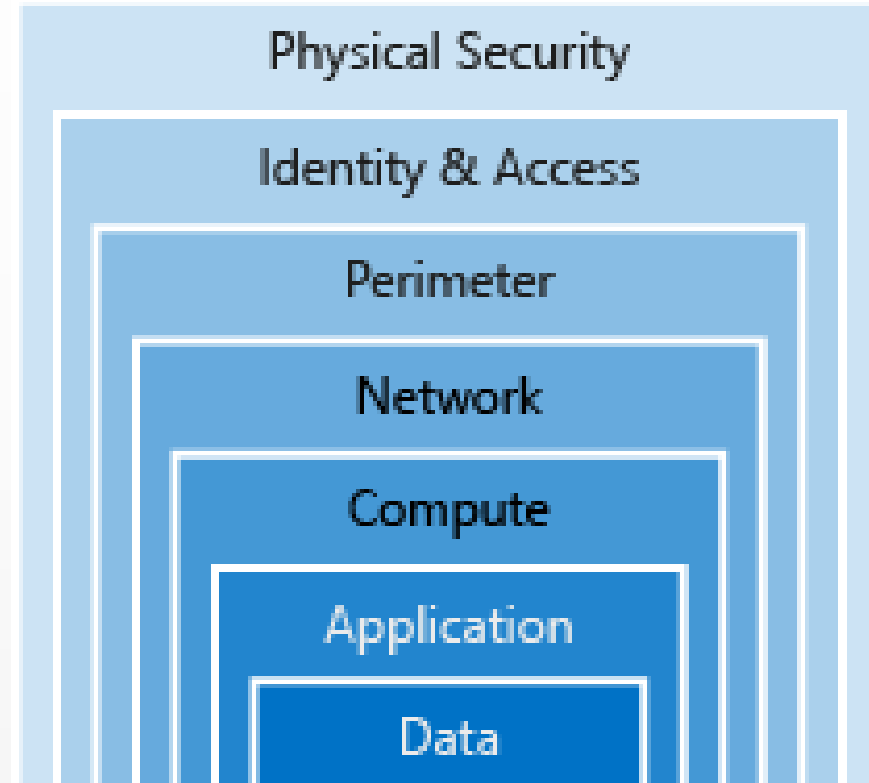
# Security

System  
Architecture  
Application

Responsibility	On-prem	IaaS	PaaS	SaaS
Data governance & rights management	Customer	Customer	Customer	Customer
Client endpoints	Customer	Customer	Customer	Customer
Account & access management	Customer	Customer	Customer	Customer
Identity & directory infrastructure	Customer	Customer	Shared	Shared
Application	Customer	Customer	Shared	Microsoft
Network controls	Customer	Customer	Shared	Microsoft
Operating system	Customer	Customer	Microsoft	Microsoft
Physical hosts	Customer	Microsoft	Microsoft	Microsoft
Physical network	Customer	Microsoft	Microsoft	Microsoft
Physical datacenter	Customer	Microsoft	Microsoft	Microsoft

■ Microsoft    ■ Customer

# Defense in Depth Rings



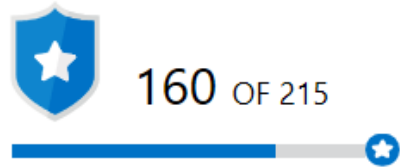
### Security Center - Overview

Showing 2 subscriptions

[Documentation](#)

[Subscriptions](#) [What's new](#)

#### Overall secure score

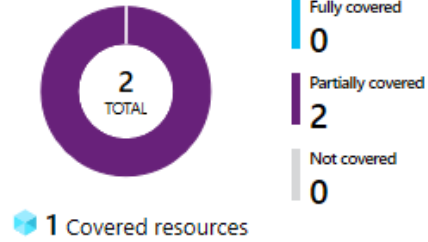


[Review your secure score >](#)

#### Regulatory compliance

No regulatory

#### Subscription coverage



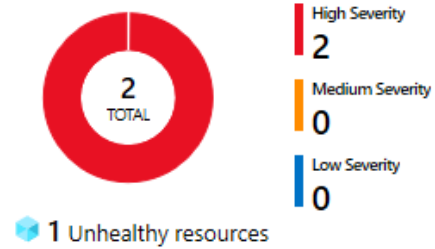
#### Make alert data available to SIEM

Security Center  
Azure's cloud-native SIEM

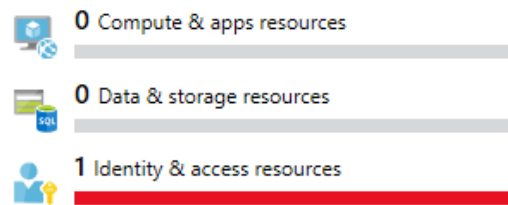
[Learn more >](#)

### Resource security hygiene

#### Recommendations



#### Resource health by severity



#### Networking



There are 0 high severity recommendations to resolve.

[Secure your network resources](#)

#### Review and improve

Review and improve your secure score

[Learn more >](#)



# Role-based Access Control

## RBAC

# AzureOverview - Access control (IAM)

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)**
- Tags
- Events
- Settings
- Quickstart
- Deployments
- Policies
- Properties
- Locks
- Export template
- Cost Management

+ Add Edit columns Refresh Remove Got feedback?

Check access Role assignments Deny assignments Classic administrators Roles

**Check access**  
Review the level of access a user, group, service principal, or managed identity has to this resource. [Learn more](#)

**Find** ⓘ

Azure AD user, group, or service principal

Search by name or email address

**Add a role assignment**

Grant access to resources at this scope by assigning a role to a user, group, service principal, or managed identity.

**Add** [Learn more](#)

**View role assignments**

View the users, groups, service principals and managed identities that have role assignments granting them access at this scope.

**View** [Learn more](#)

### AzureOverview - Access control (IAM)

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)
- Tags
- Events

#### Settings

- Quickstart
- Deployments
- Policies
- Properties
- Locks
- Export template

#### Cost Management

+ Add Edit columns Refresh Remove Got feedback?

Check access Role assignments Deny assignments Classic administrators Roles

Manage access to Azure resources for users, groups, service principals and managed identities at this scope by cre

Name  Type  Role

Group by

0 items

<input type="checkbox"/>	Name	Type	Role
No user assignments exist			

### Add role assignment

Role

- Owner
- Contributor
- Reader
- AcrDelete
- AcrImageSigner
- AcrPull
- AcrPush
- AcrQuarantineReader
- AcrQuarantineWriter
- API Management Service Contributor
- API Management Service Operator Role
- API Management Service Reader Role
- App Configuration Data Owner

Save Discard





***Azure – Daily Use***

My Dashboard

- + New dashboard
- ↑ Upload
- ↓ Download
- ✎ Edit
- 🔗 Share
- 🖥 Full screen
- 📄 Clone
- 🗑 Delete
- 🔄 Refresh

Auto refresh : **Off**

Last updated: a few seconds ago

All resources

All subscriptions

Refresh

LesliesTestApp	App Service
AppServicePlanName	App Service plan
LesliesTestApp	Application Insights

Azure getting started made easy!

Launch an app of your choice on Azure in a few quick steps

[Create DevOps Project](#)

Quickstarts + tutorials

[Windows Virtual Machines](#)

Provision Windows Server, SQL Server, SharePoint VMs






[Linux Virtual Machines](#)

Provision Ubuntu, Red Hat, CentOS, SUSE, CoreOS VMs

[App Service](#)

Create Web Apps using .NET, Java, Node.js, Python, PHP

## Tile Gallery

24 tiles **!** You can drag any tile to the dashboard Metrics chart [Add](#) Resource groups [Add](#) All resources [Add](#) Clock [Add](#) User Activity Summary [Add](#) Users and groups [Add](#) Resource graph single value tile [Add](#) Resource graph chart tile [Add](#) Resource graph grid tile [Add](#)

## My Dashboard

Mountain Stand...

[Edit](#)

5:18 AM

Tuesday, January 7, 2020



Service Health



Marketplace

## All resources

All subscriptions

[Refresh](#) LeslieTest (pw-leslie/LeslieTe... SQL database LesliesTestApp App Service AppServicePlanName App Service plan LesliesTestApp Application Insights pw-leslie SQL server

## Azure getting started m



## Quickstarts + tutorials

 Windows Virtual Machin  
Provision Windows Server, SQL Linux Virtual Machines  
Provision Ubuntu, Red Hat, Cen App Service [↗](#)  
Create Web Apps using .NET, J Functions [↗](#)

Auto refresh : Off

Last updated: 4 minutes ago

Mountain Stand... Edit 5:19 AM Tuesday, January 7, 2020

Service Health

Marketplace

All resources All subscriptions Refresh LeslieTest (pw-leslie/LeslieTe... SQL database LeslieTestApp App Service AppServicePlanName App Service plan LeslieTestApp Application Insights pw-leslie SQL server

Azure getting started made easy! Launch an app of your choice on Azure in a few quick steps Create DevOps Project

- Quickstarts + tutorials Windows Virtual Machines Provision Windows Server, SQL Server, SharePoint VMs Linux Virtual Machines Provision Ubuntu, Red Hat, CentOS, SUSE, CoreOS VMs App Service Create Web Apps using .NET, Java, Node.js, Python, PHP Functions



***Azure –***

***What's it gonna cost?***





<https://azure.microsoft.com/en-us/pricing/calculator/>

# Pricing calculator

Configure and estimate the costs for Azure products



Products

Example Scenarios

Saved Estimates

FAQ

Select a product to include it in your estimate.

Search products



Featured

Compute

Networking

### Virtual Machines

Provision Windows and Linux virtual machines in seconds

### Storage Accounts

Durable, highly available, and massively scalable cloud storage

### Azure SQL Database

Managed, intelligent SQL in the cloud

Select a product to include it in your estimate.

Search products



Featured

Compute

Networking

Storage

Web

Mobile

Containers

Databases

Analytics



### Virtual Machines

Provision Windows and Linux virtual machines in seconds



### Storage Accounts

Durable, highly available, and massively scalable cloud storage



### Azure SQL Database

Managed, intelligent SQL in the cloud



### App Service

Quickly create powerful cloud apps for web and mobile



### Azure Cosmos DB

Globally distributed, multi-model database for any scale



### Azure Kubernetes Service (AKS)

Simplify the deployment, management, and operations of Kubernetes



### Azure Functions

Process events with serverless code



### Cognitive Services

Add smart API capabilities to enable contextual interactions



### Cost Management + Billing

Optimize what you spend on the cloud, while maximizing cloud potential

Select an example scenario to include in your estimate. You may add or remove products in your example scenario.

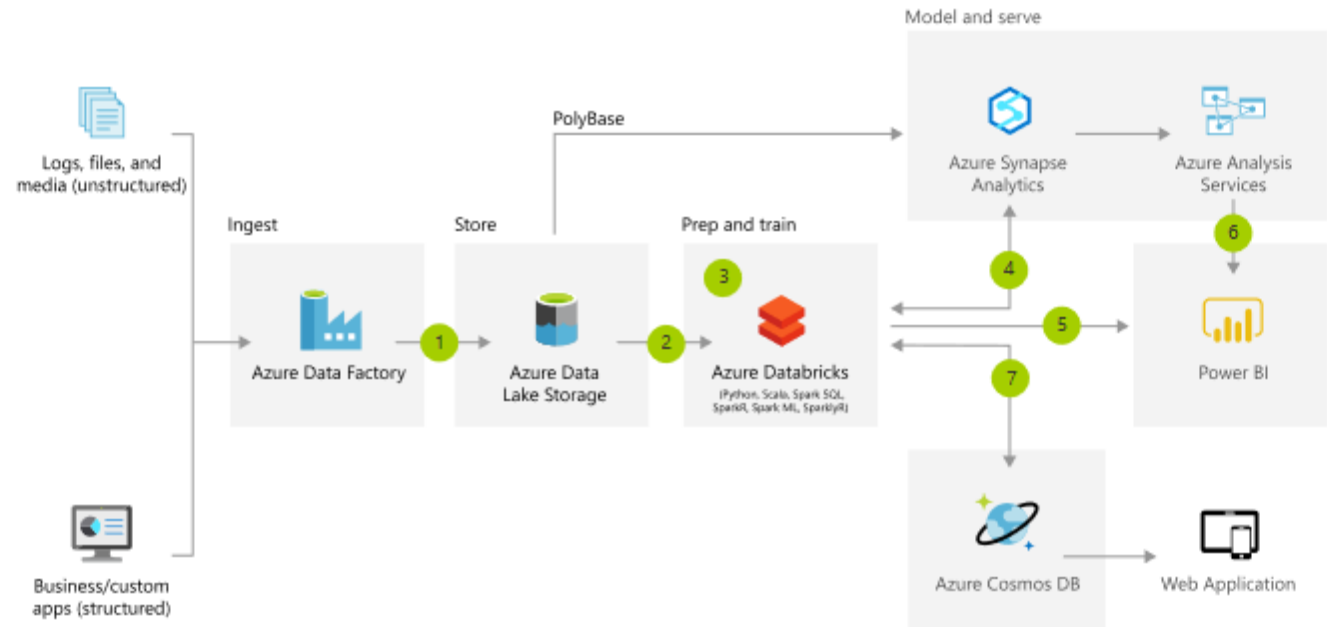
### Advanced analytics on big data

### CI/CD for Azure Web Apps







### CI/CD for Containers

### Modern data warehouse

Transform your data into actionable insights using the best-in-class machine learning tools. This architecture allows you to combine any data at any scale, and to build and deploy custom machine learning models at scale.



### Products

-  Azure Analysis Services
-  Azure Cosmos DB
-  Data Factory
-  Azure Databricks
-  Power BI Embedded
-  Storage Accounts



# Resources

<https://docs.microsoft.com/en-us/learn>

<https://www.pragmaticworks.com/resources/free-webinars/azure/>



# Review



Cloud Infrastructure



Core Services



Understanding of Benefits



# Questions?

[landrews@pragmaticworks.com](mailto:landrews@pragmaticworks.com)



@landrews5807