



ArcGIS Enterprise in the Azure Cloud

Nikhil Shampur

Quick Survey

1. Role within your Org (Dev, IT, Analyst, Management)
2. Level of IT Exposure and Experience (1-5)
3. Use of Microsoft Azure Cloud Before?
4. Use of Azure Cloud Builder?

Agenda

- Why
 - What
 - How
-
- Looking Ahead
 - Q&A

ArcGIS Enterprise Support for Cloud Providers



Google Cloud Platform



rackspace
the open cloud company



amazon
web services™



IBM **Cloud**



Microsoft Azure



阿里云计算
Alibaba Cloud Computing

Etc...

ArcGIS Enterprise in the Cloud - Special Tooling



Azure IaaS Concepts

- Resource Groups
- Load Balancers
 - Layer 7 vs Layer 4
- Traffic Rules
 - NAT (Network Address Translation) Rules
 - Load Balancer Rules
 - Health Probes
- Virtual Networks
 - Subnets, CIDR, Network Interfaces (NICs)
- Network Security Groups
- Windows Firewall Configuration
- Web Server SSL Certificates
- Availability Sets/ VM Scale Sets
- Azure Key Vault
- Azure Active Directory



What

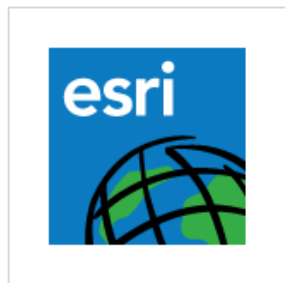
- Ready to use Virtual Machine Images
 - Public Azure (34 + 6 Regions)
 - U.S. Government Cloud (6 + 2 Regions)
- Easy to deploy and manage
 - Deployment Tools
 - Cloud Builder
 - Automation*



Esri Images

Azure Marketplace

Products > [ArcGIS Enterprise](#)



ArcGIS Enterprise

Esri

[Overview](#)

[Plans + Pricing](#)

GET IT NOW

Categories
[Compute](#)

Legal
[License Agreement](#)
[Privacy Policy](#)

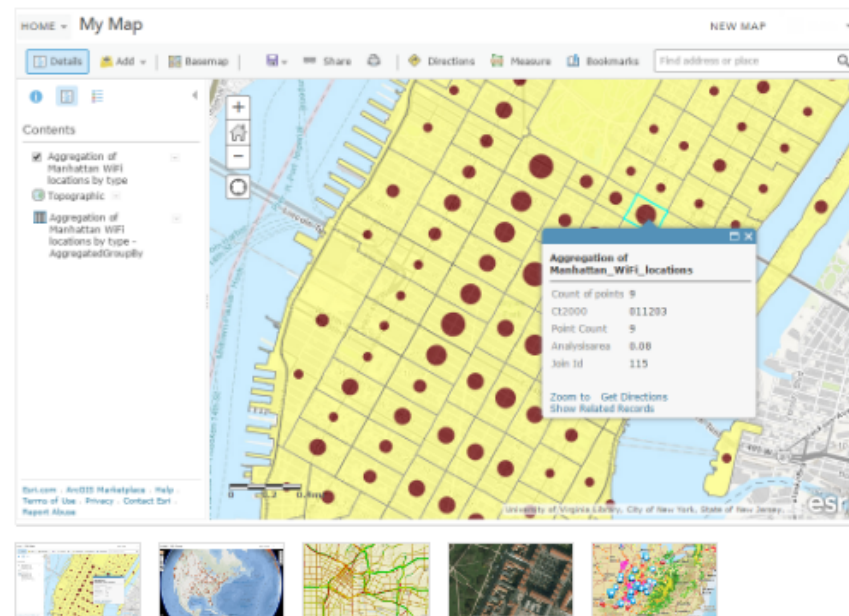
Version
1.0.2

Mapping and Web GIS for Your Enterprise.

ArcGIS Enterprise, the world's most versatile GIS server, puts you in complete control of your organization's critical geospatial assets and data. This virtual machine (VM) includes Windows-only, ArcGIS 10.5 software:

- ArcGIS for Server – for creating, managing and deploying GIS services
- Portal for ArcGIS – allows you to share maps, applications, and other geographic information with other people in your organization.
- ArcGIS Data Store - an optional component of ArcGIS designed to optimize publishing workflows to Portal for ArcGIS.
- GeoEvent Extension for Server - an optional component of ArcGIS to expand the capabilities of ArcGIS by incorporating real-time data into your GIS applications.

Esri provides the ArcGIS Enterprise Cloud Builder application to simplify configuration of your ArcGIS Enterprise site on Microsoft Azure. Cloud Builder is a Windows-only, desktop application. You can download it [here](#). This VM requires you to bring your own license (BYOL) for ArcGIS Enterprise.



Marketplace > Virtual Machines > ArcGIS Enterprise



ArcGIS Enterprise

by Esri

Create Virtual Machine >



ArcGIS Enterprise, the world's most versatile GIS server, puts you in complete control of your organization's critical geospatial assets and data. This virtual machine (VM) includes Windows-only, ArcGIS 10.5 software:

- ArcGIS for Server – for creating, managing and deploying GIS services
- Portal for ArcGIS – allows you to share maps, applications, and other
- ArcGIS Data Store - an optional component of ArcGIS designed to op
- GeoEvent Extension for Server - an optional component of ArcGIS to

Esri provides the ArcGIS Enterprise Cloud Builder application to simplify desktop application. You can download it [here](#). This VM requires you to

Azure Portal

Marketplace

Everything

Compute

Networking

Storage

Web + Mobile

Databases

Intelligence + analytics

Everything

Filter

arcgis enterprise

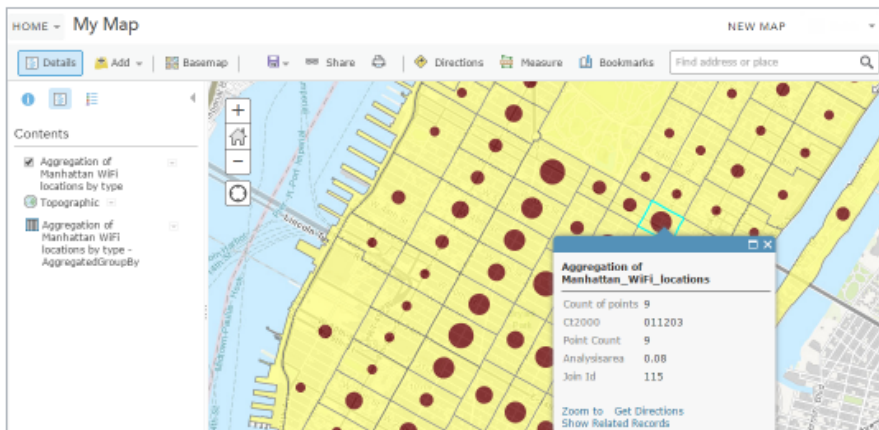
NAME	PUBLISHER	CATEGORY
 ArcGIS Enterprise 10.5.1	Esri	Compute
 ArcGIS Enterprise 10.5	Esri	Compute
 ArcGIS 10.3.1 for Server	Esri	Compute
 ArcGIS 10.4.1 for Server	Esri	Compute

**Bring Your Own License enabled.**

ArcGIS Enterprise, the world's most versatile GIS server, puts you in complete control of your organization's critical geospatial assets and data. This virtual machine (VM) includes Windows-only, ArcGIS 10.5 software:

- ArcGIS for Server – for creating, managing and deploying GIS services
- Portal for ArcGIS – allows you to share maps, applications, and other geographic information with other people in your organization.
- ArcGIS Data Store - an optional component of ArcGIS designed to optimize publishing workflows to Portal for ArcGIS.
- GeoEvent Extension for Server - an optional component of ArcGIS to expand the capabilities of ArcGIS by incorporating real-time data into your GIS applications.

Esri provides the ArcGIS Enterprise Cloud Builder application to simplify configuration of your ArcGIS Enterprise site on Microsoft Azure. Cloud Builder is a Windows-only, desktop application. You can download it [here](#). This VM requires you to bring your own license (BYOL) for ArcGIS Enterprise. ArcGIS Enterprise improves the way your business works by bringing the power of GIS into the hands of everyone in your organization, enabling better decision making.

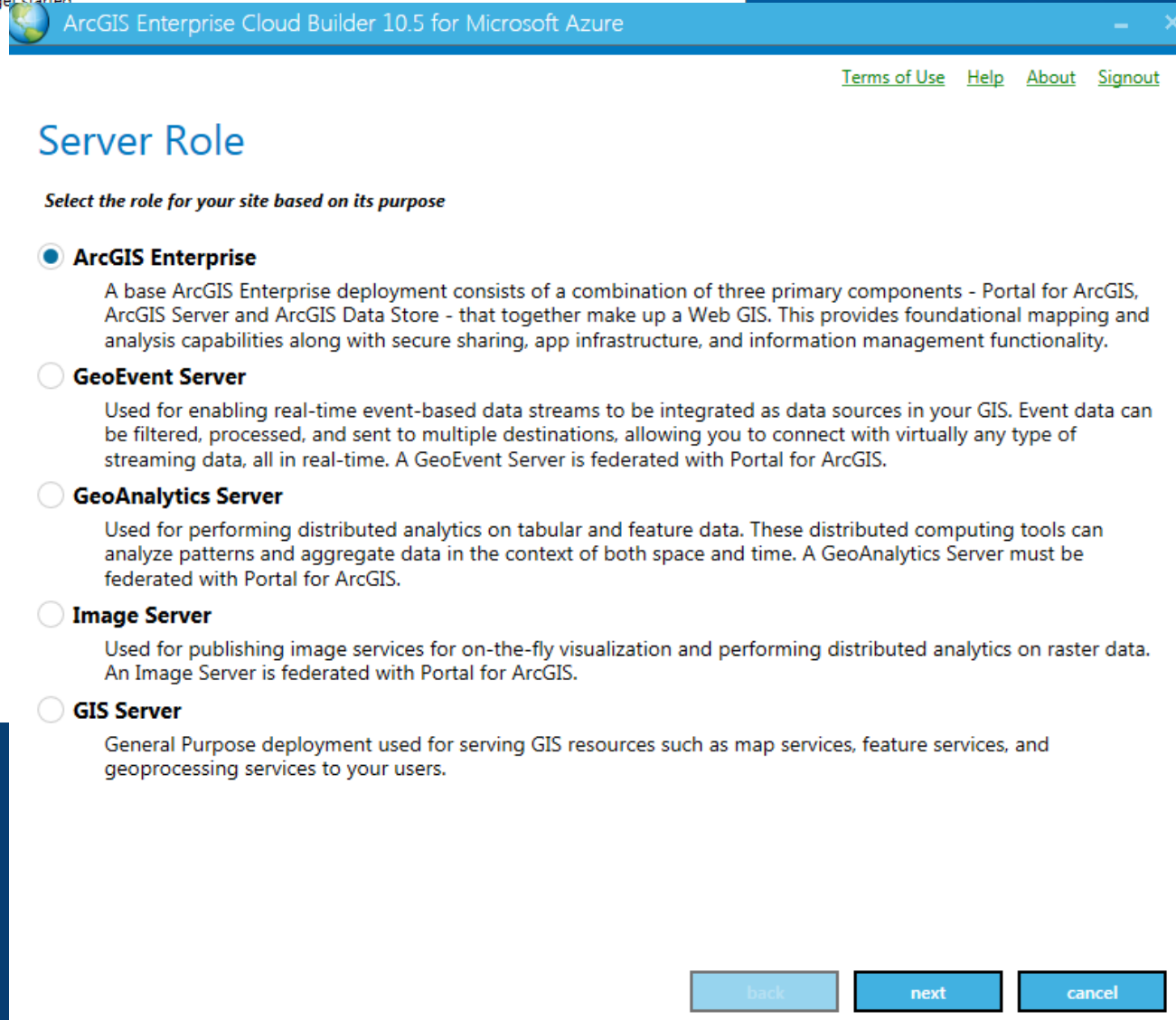
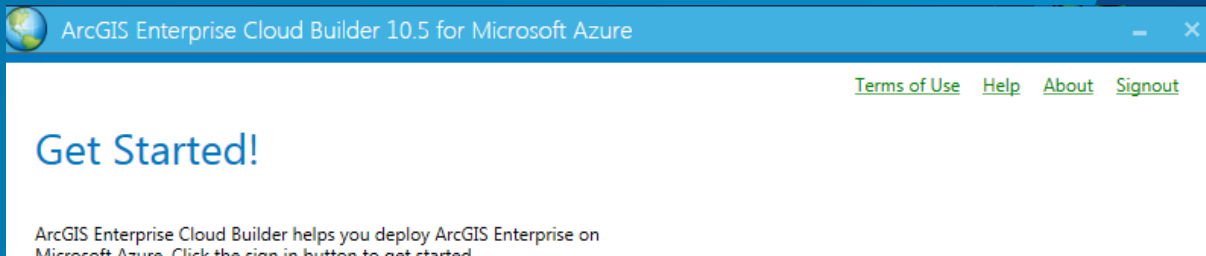


ArcGIS Enterprise

BYOL Image

Cloud Builder

Overview



Desktop Application For Windows

Register Database

Specify the database to register

- ☒ Microsoft Azure SQL Database
- ☐ Microsoft SQL Server
- ☒ As a Managed Database
- ☒ Enable As Geodatabase

Machine Options

Specify Virtual Machine Credentials and Machine Options such as TimeZone and OS Updates

MACHINE ADMINISTRATOR

User name:

Password:

Re-Enter password:

MACHINE OPTIONS

Size:



Time zone:

Name:

☒ Enable Automatic Operating System Updates

☐ Enable Remote Desktop Access using Port

VIRTUAL NETWORK OPTIONS

Virtual Network:  

Subnet:

[back](#)[next](#)[cancel](#)

Wizard Driven Experience

Deployment Workflows
Database Options

Select Blob Container

Account:

Hosted_Aspect_of_CharlotteLAS
Hosted_Aspect_of_CharlotteLASnikTesting
Hosted_CharlotteLAS_Slope_jietest1
Hosted_CharlotteLAS_Slope_take11
Hosted_CharlotteLAS_Slope_test10
Hosted_CharlotteLAS_Slope_test2

Create Key Vault

Name:

Region:

Resource Group:

Type:

Create Storage Account

Name: ☒

[Check Availability](#)

Region:

Resource Group:

Type:

Cloud Native Features

Azure Storage

Azure Key Vault

Azure Blob Storage

Azure Data Lake Store *

* Planned

Site Deployments

Specialized Servers

ArcGIS Enterprise : Conceptual Overview

- Following are Conceptual Overviews
- Base Deployment
- The following deployments all require a base deployment
 - GeoAnalytics Deployment
 - GeoEvent Deployment
 - Image Server Deployment
 - GIS Server Deployment

ArcGIS Enterprise Base Deployment

Portal for ArcGIS

For collaboration and sharing of your GIS content.

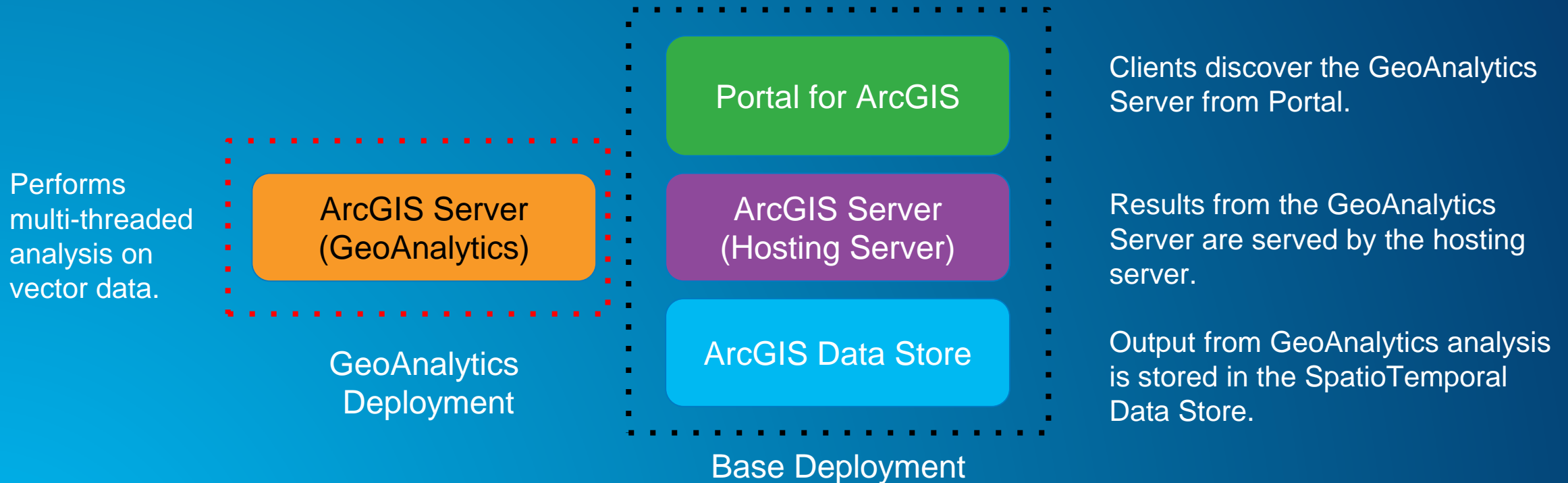
ArcGIS Server
(Hosting Server)

Let's you view your content, performing spatial analysis, and save your results.

ArcGIS Data Store

Stores your live content, 3D tiles, and spatiotemporal data.

GeoAnalytics Deployment



GeoEvent Deployment

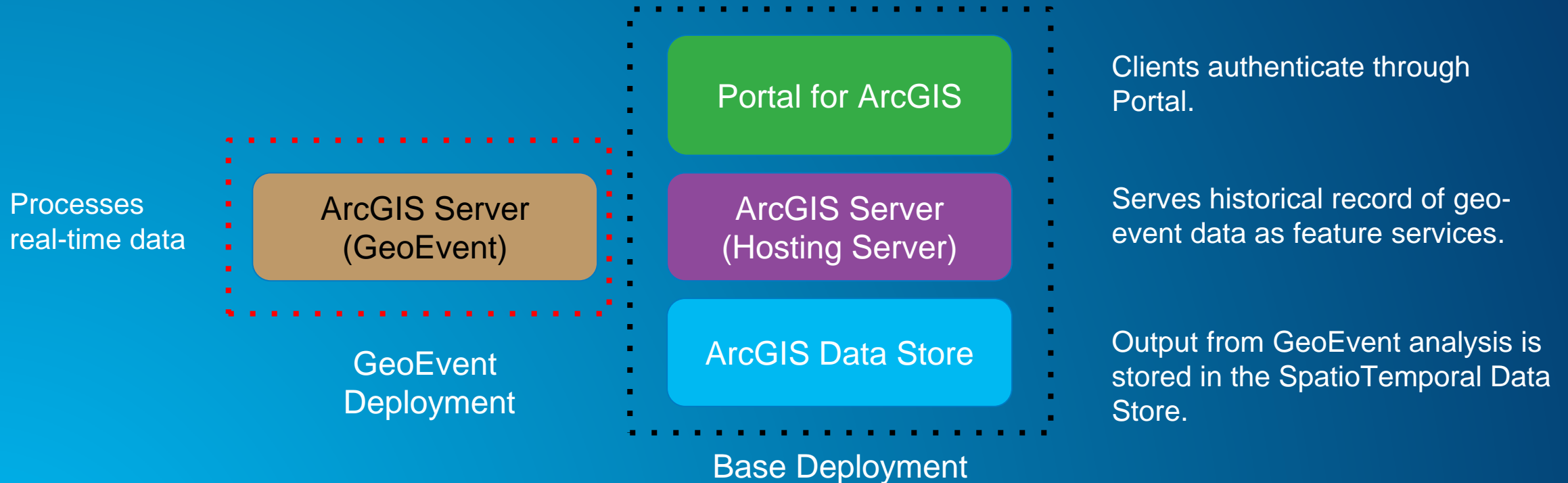
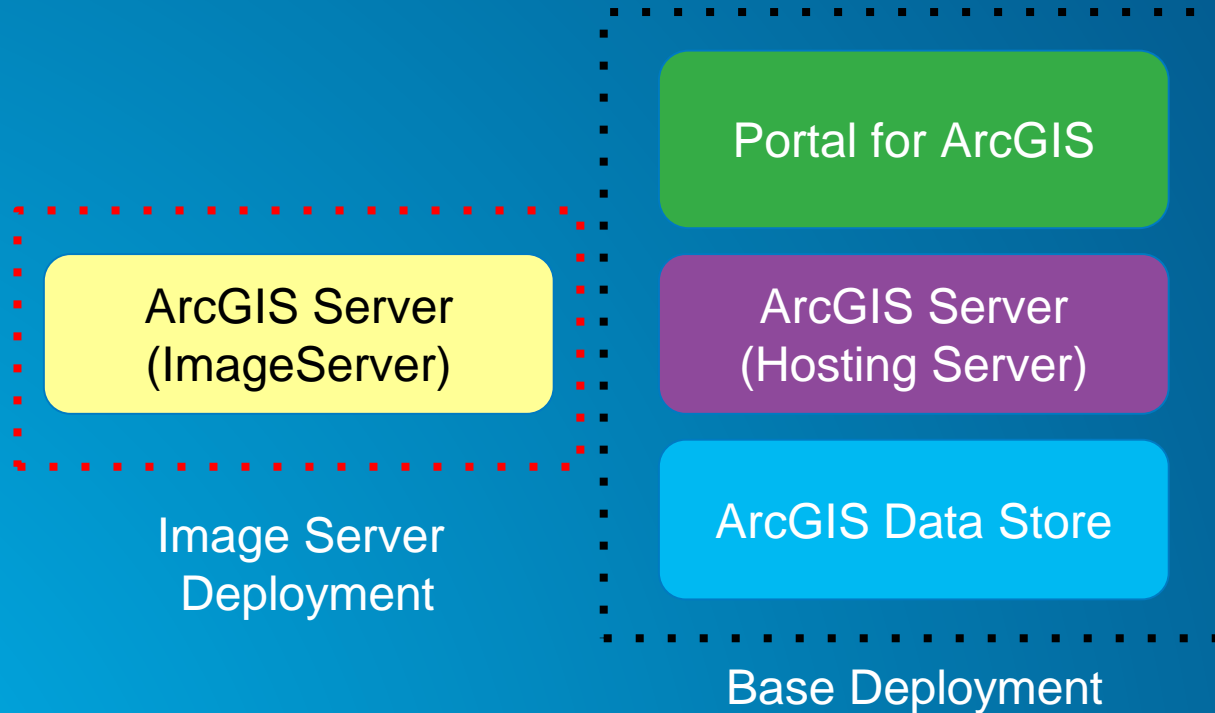


Image Server Deployment

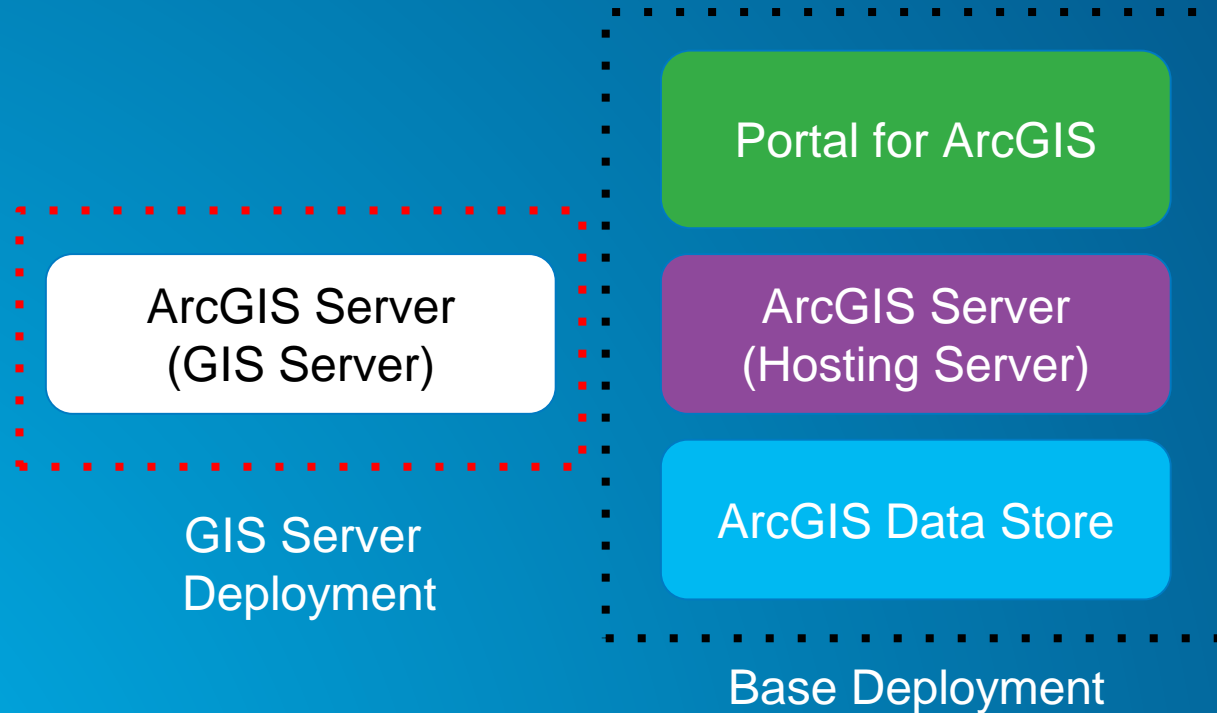
Serves and analyzes raster data in a multi-threaded way.



Clients discover the Image Server and raster analytics capabilities from Portal.

GIS Server Deployment

Map services,
geocode
services,
geoprocessing
services, network
services.



Clients discover services and
authenticate.

ArcGIS Enterprise Sites

Portal for ArcGIS



Hosting Server
Site

Server Sites



ArcGIS
GIS
Server Site



ArcGIS
Image
Server Site



ArcGIS
GeoEvent
Server Site



ArcGIS
GeoAnalytics
Server Site



Generic
Server Site

Data Stores



ArcGIS
Relational
Data Store



ArcGIS
Tile Cache
Data Store



ArcGIS
Spatiotemporal
Big Data Store



Big Data
File Share

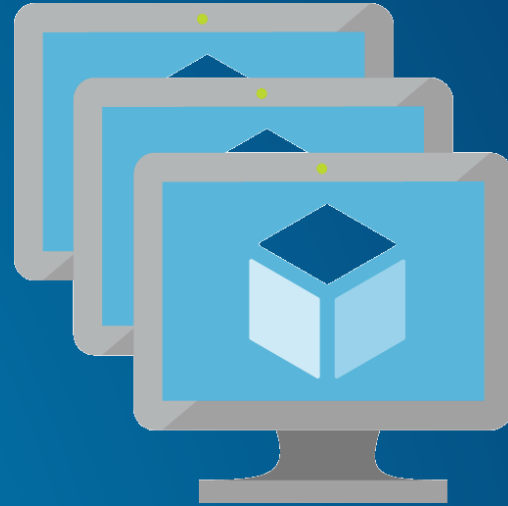


Generic Data
Store
(Non-Esri)

Site Deployment Options – Number of Machines



Single Machine



**Multiple
Machines**

Site Deployment Options - Tiers



**Single Tier
(All in One)**



Reverse (Web) Proxy



Portal for ArcGIS



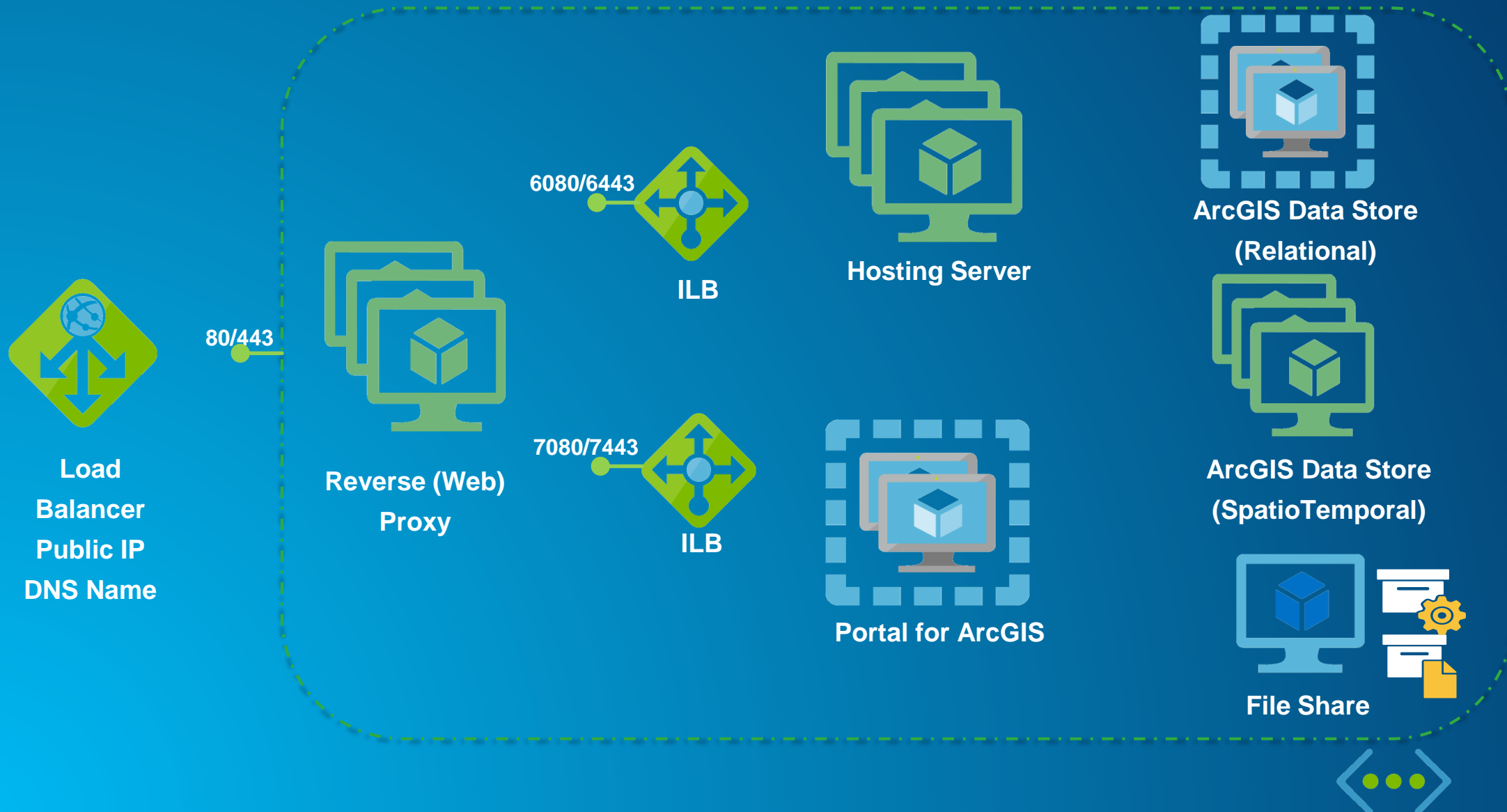
Hosting Server



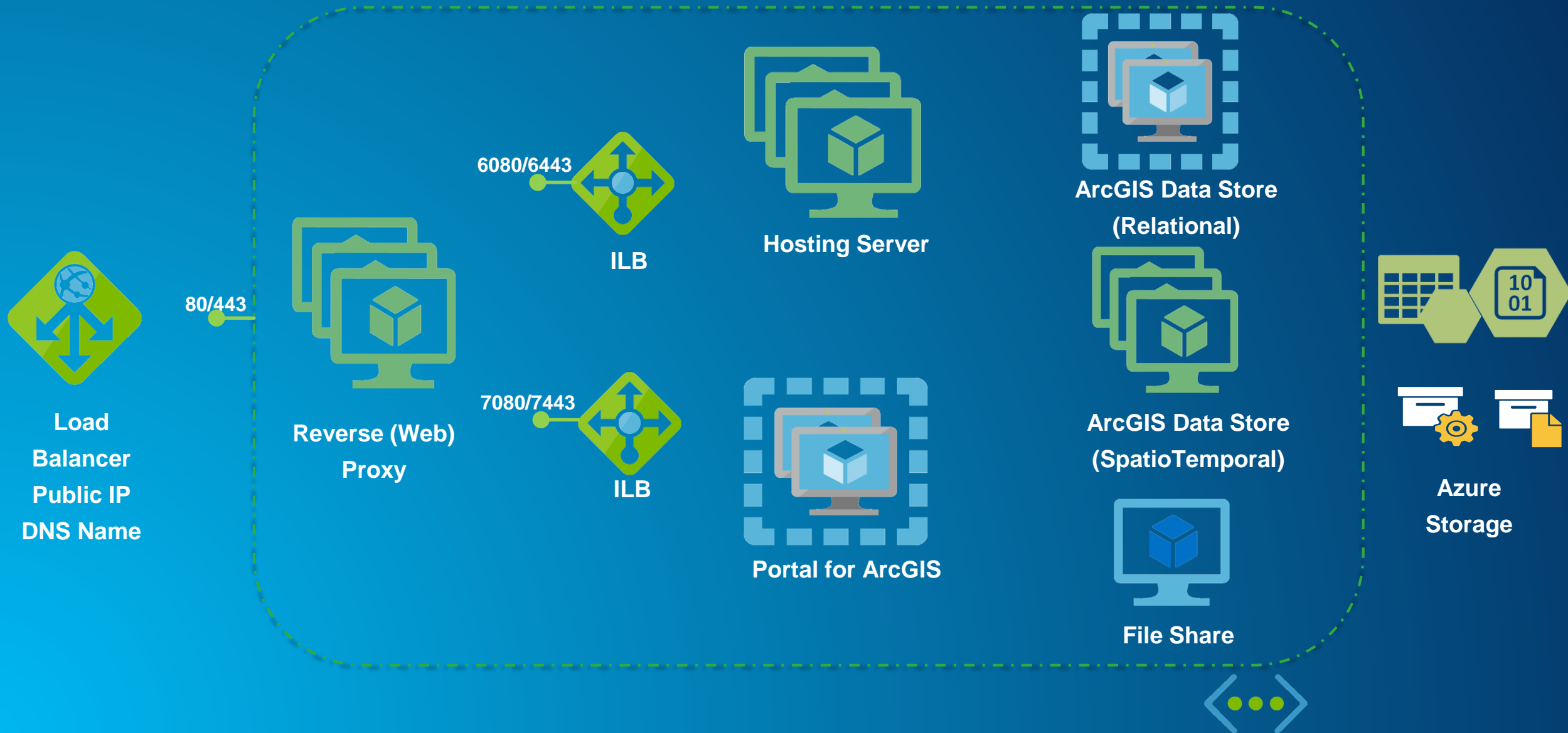
ArcGIS Data Store

Multiple Tiers

Multi Tier Site Topology



Multi Tier Site Topology (Cloud Storage)



How

Getting Started

- **Get Azure subscription**
 - <https://azure.com>
- **Get ArcGIS for Server software license – download from My Esri**
 - <https://accounts.esri.com>
- **Get ArcGIS Server Cloud Builder – download from My Esri**



Demo

Cloud Builder








Under the hood

How Cloud Builder works

Two Responsibilities

- **Provision Infrastructure Resources**

- Azure Resource Manager (ARM) API
- Imperative/Declarative

NAME	TYPE	LOCATION
 citydot	Public IP address	West US
 citydot	Storage account	West US
 citydot-OSDisk	Disk	West US
 citydotvm	Virtual machine	West US
 citydotvm-nic	Network interface	West US
 dpLoadBalancer	Load balancer	West US
 portaltportal	Virtual network	West US

- **Trigger In-VM Configuration of ArcGIS Components**

- Automation using PowerShell Desired State Configuration (DSC)
- Azure Custom Script Extension



1

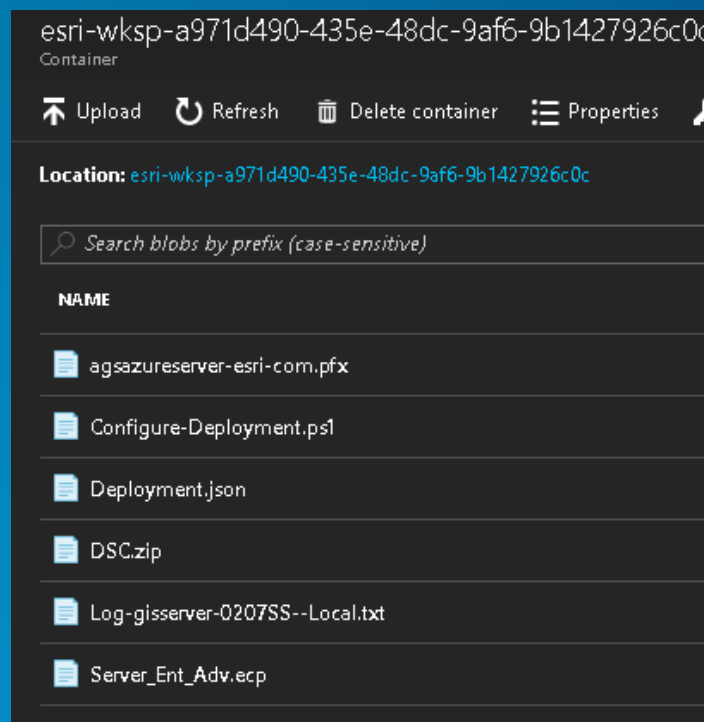
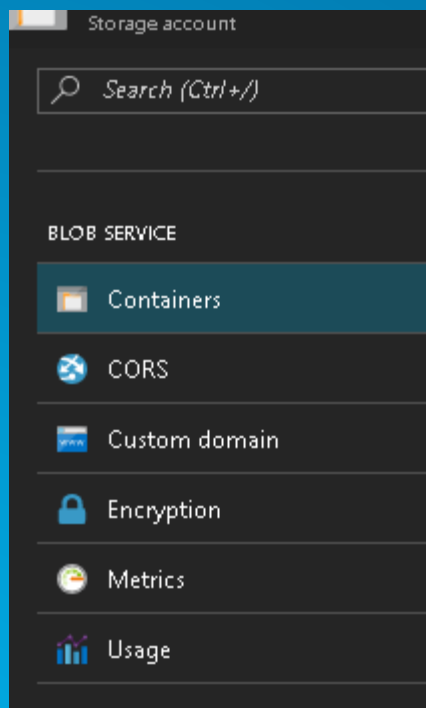
Provision Azure Infrastructure Resources

The screenshot displays the Azure portal interface for a resource group named 'agsenterprisemultimachine'. The left sidebar contains navigation options: Overview, Activity log, Access control (IAM), Tags, SETTINGS (Quickstart, Resource costs, Deployments, Properties, Locks, Automation script), MONITORING (Metrics, Alert rules, Diagnostics logs, Application insights, Log analytics (OMS), Log search), and SUPPORT + TROUBLESHOOTING (New support request). The main pane shows the 'Essentials' section with subscription details (Subscription name: ArcGIS for Server on Azure Dev, Subscription ID: b849a590-..., Location: East US) and a table of 40 resources. The table has columns for NAME, TYPE, and LOCATION. The resources listed include virtual networks, public IP addresses, availability sets, virtual machines, network interfaces, and disks.

NAME	TYPE	LOCATION
agsenterprisemm	Virtual network	East US
agsenterprisemultimachine	Public IP address	East US
tmAvailabilitySet-DataStore	Availability set	East US
tmAvailabilitySet-FileShare	Availability set	East US
tmAvailabilitySet-Portal	Availability set	East US
tmAvailabilitySet-Server	Availability set	East US
tmAvailabilitySet-WebProxy	Availability set	East US
tmDataStore-Pri	Virtual machine	East US
tmDataStore-Pri-nic	Network interface	East US
tmDataStore-Pri-OSDisk	Disk	East US
tmDataStore-Sby	Virtual machine	East US
tmDataStore-Sby-nic	Network interface	East US
tmDataStore-Sby-OSDisk	Disk	East US
tmFileShare	Virtual machine	East US
tmFileShare-nic	Network interface	East US
tmFileShare-OSDisk	Disk	East US

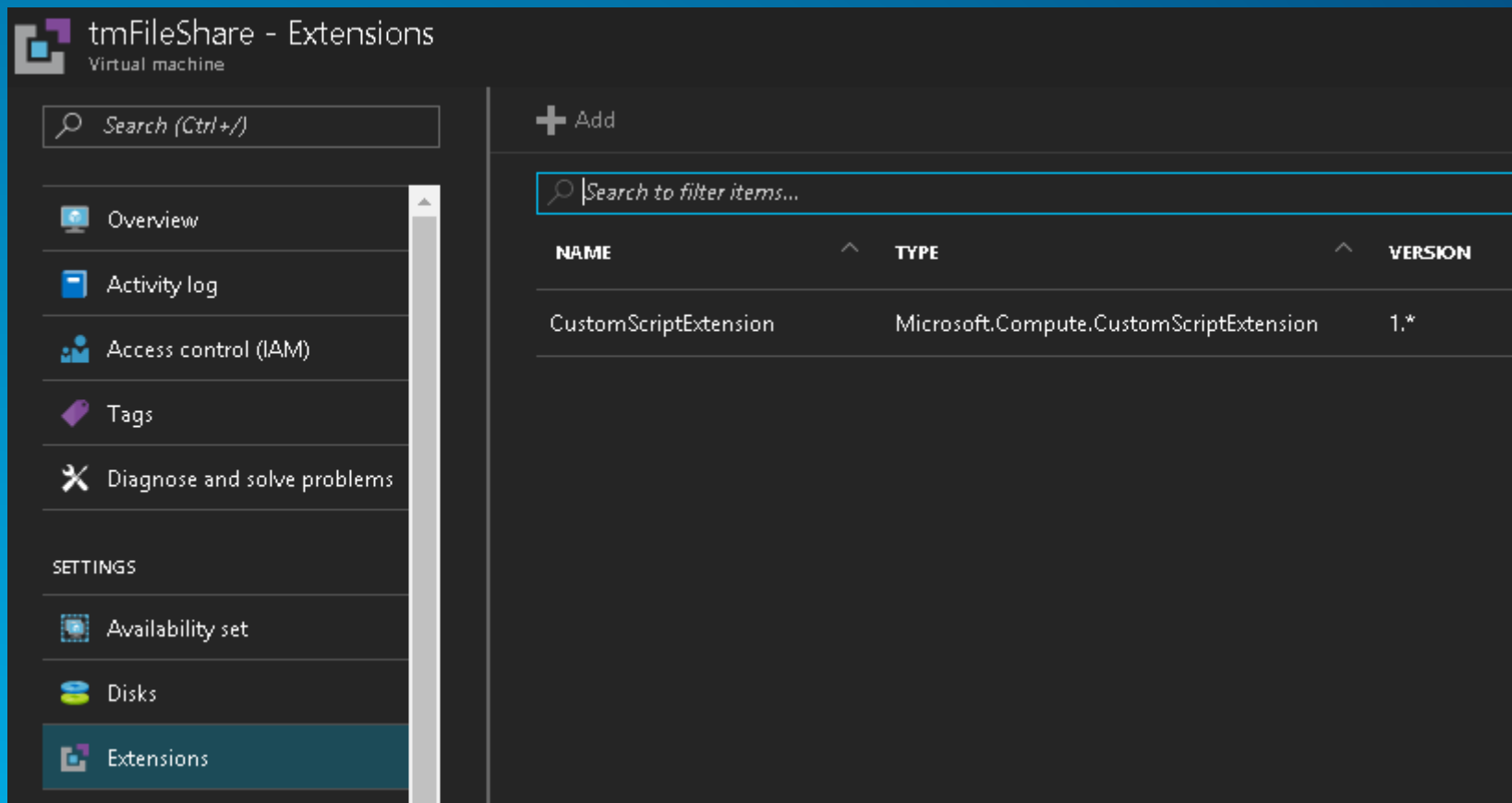
- Virtual Machines
 - Network Interfaces
 - Disks
- Availability Sets
- Load Balancers
- Virtual Networks

2 Stage Deployment Artifacts



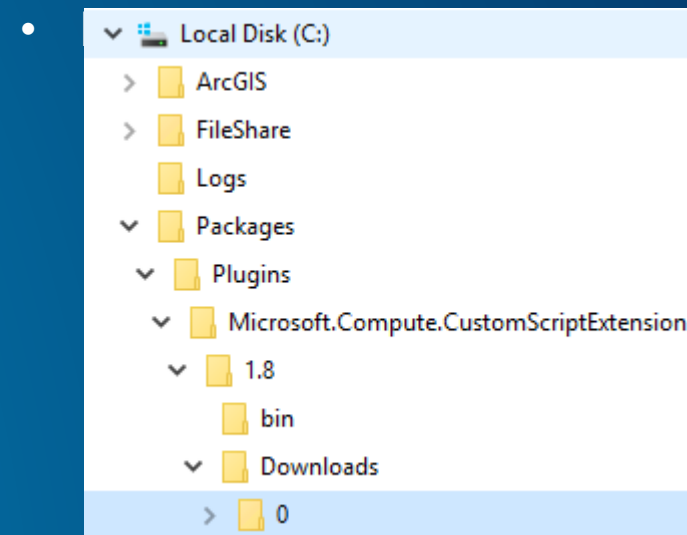
- **SSL Certificate**
 - **Certificate.pfx**
- **Bootstrap Script**
 - **Configure-Deployment.ps1**
- **Deployment Description**
 - **Deployment.json**
- **Automation Code**
 - **DSC.zip**
- **Output Log File**
 - **Log.txt**

3 Trigger Custom Script Execution on File Share Machine



- Distributed Configuration

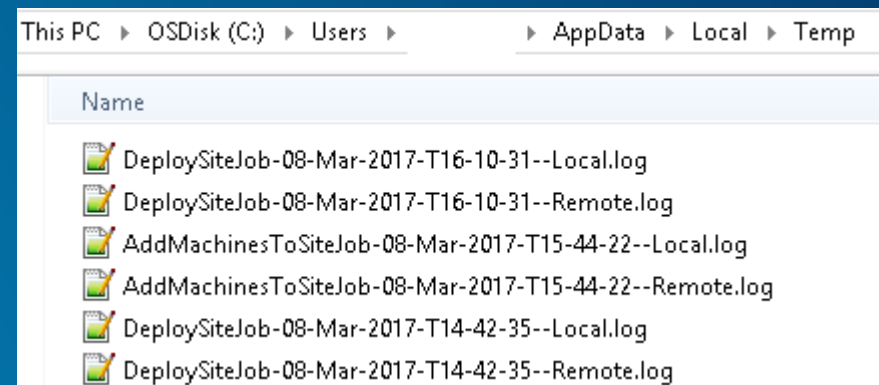
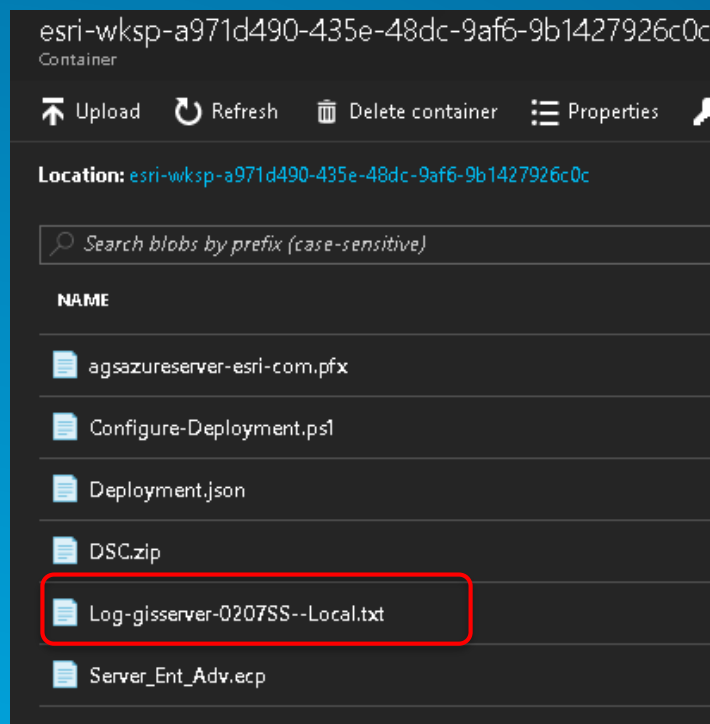
- WinRM
- Powershell DSC



```
"commandToExecute": "powershell -ExecutionPolicy  
Unrestricted -file Configure-Deployment.ps1 -OperationId 8e779bf4  
-OperationName ConfigureDeployment -LogOutputFileUrl  
https://arcgisserverdeploy.blob.core.windows.net/esri-wksp-8e779bf4-9076-4001-acc5-73ab321368c9/Log-tmFileShare-0054SS--Local.txt?sv=2016-05-31\"&\"sr=b\"&\"sig=WYjJ7DXYMq%2FuW%2Bo%2BUqriPtR6qzL6l7JwIlyoNCsWi74%3D\"&\"se=2017-03-08T03%3A54%3A38Z\"&\"sp=rw -DebugMode\"
```

- Logs in c:\ArcGIS\Deploy

4 Download Log File at end of Script Execution

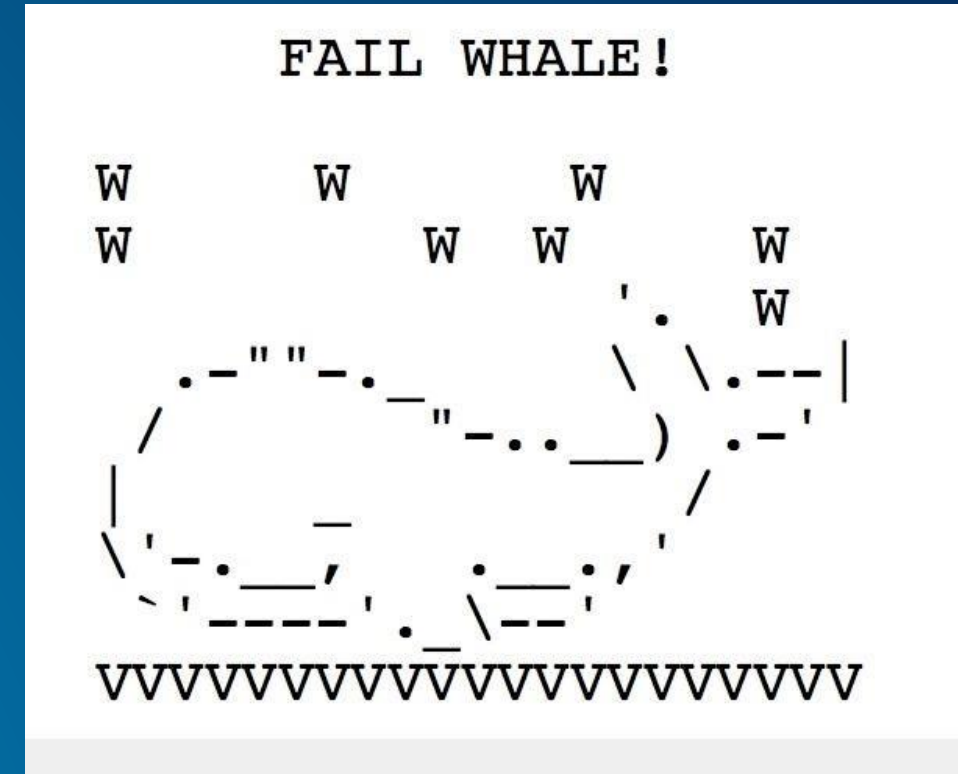


- %TEMP% folder on Cloud Builder machine

```
DeploySiteJob-08-Mar-2017-T16-10-31--Remote.log
17 [8ee19ad0][03/09/2017 00:22:10][GEOVM] Starting DSC ArcGISConfiguration on GEOVM for full configuration
18 [8ee19ad0][03/09/2017 00:22:15] Perform operation 'Invoke CimMethod' with following parameters, 'methodName' =
    SendConfigurationApply, 'className' = MSFT_DSCLocalConfigurationManager, 'namespaceName' =
    root/Microsoft/Windows/DesiredStateConfiguration'.
19 [8ee19ad0][03/09/2017 00:22:15] An LCM method call arrived from computer GEOVM with user sid
    S-1-5-21-3255415470-654925712-3576164113-500.
20 [8ee19ad0][03/09/2017 00:22:15] [GEOVM]: LCM: [ Start Set      ]
21 [8ee19ad0][03/09/2017 00:22:15] [GEOVM]: LCM: [ Start Resource ] [[User]ArcGIS_RunAsAccount]
22 [8ee19ad0][03/09/2017 00:22:15] [GEOVM]: LCM: [ Start Test     ] [[User]ArcGIS_RunAsAccount]
23 [8ee19ad0][03/09/2017 00:22:20] [GEOVM]: [[User]ArcGIS_RunAsAccount] A user with the name arcgis
```

Troubleshooting failed deployments

- **Examine log files for errors**
 - Local Log, Remote Log
- **Provide strong password for Windows Credentials**
- **Try the defaults**
 - Start with small deployments
- **Submit a support incident**
 - Log Files
 - Deployment Summary

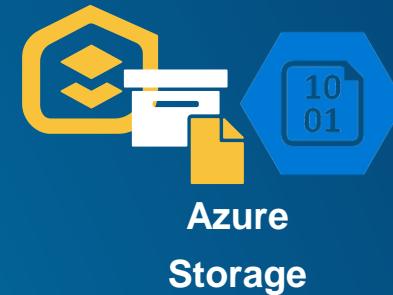


What's New

10.5.1

New Features

- **Windows Server 2016**
- **Azure Blob Storage**
 - Portal Content
 - GeoAnalytics Big Data File Share
- **Azure Native Features**
 - Azure Key Vault
 - Managed Disks
 - Virtual Machine Size Picker
- **Manage machines in a Site**
 - Add/Remove machines from a site
 - Start/Stop/Delete
 - Manage Virtual Machine Size



Azure Key Vault



Azure Managed
Disks

Managed Disks

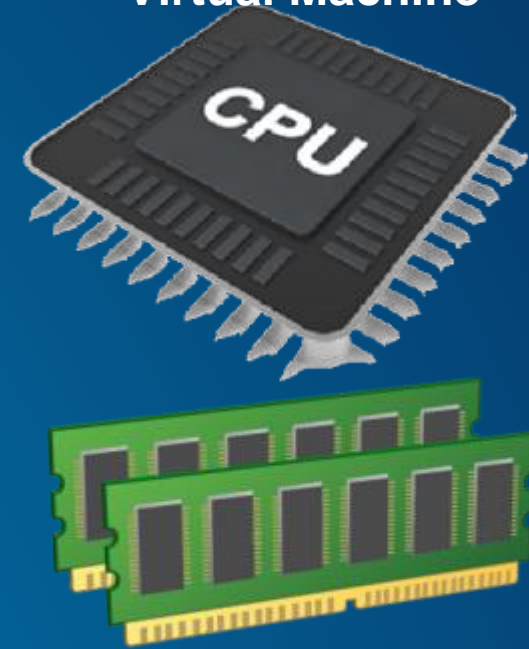
Machine Sizes

Anatomy of a Machine



Physical Machine

Virtual Machine



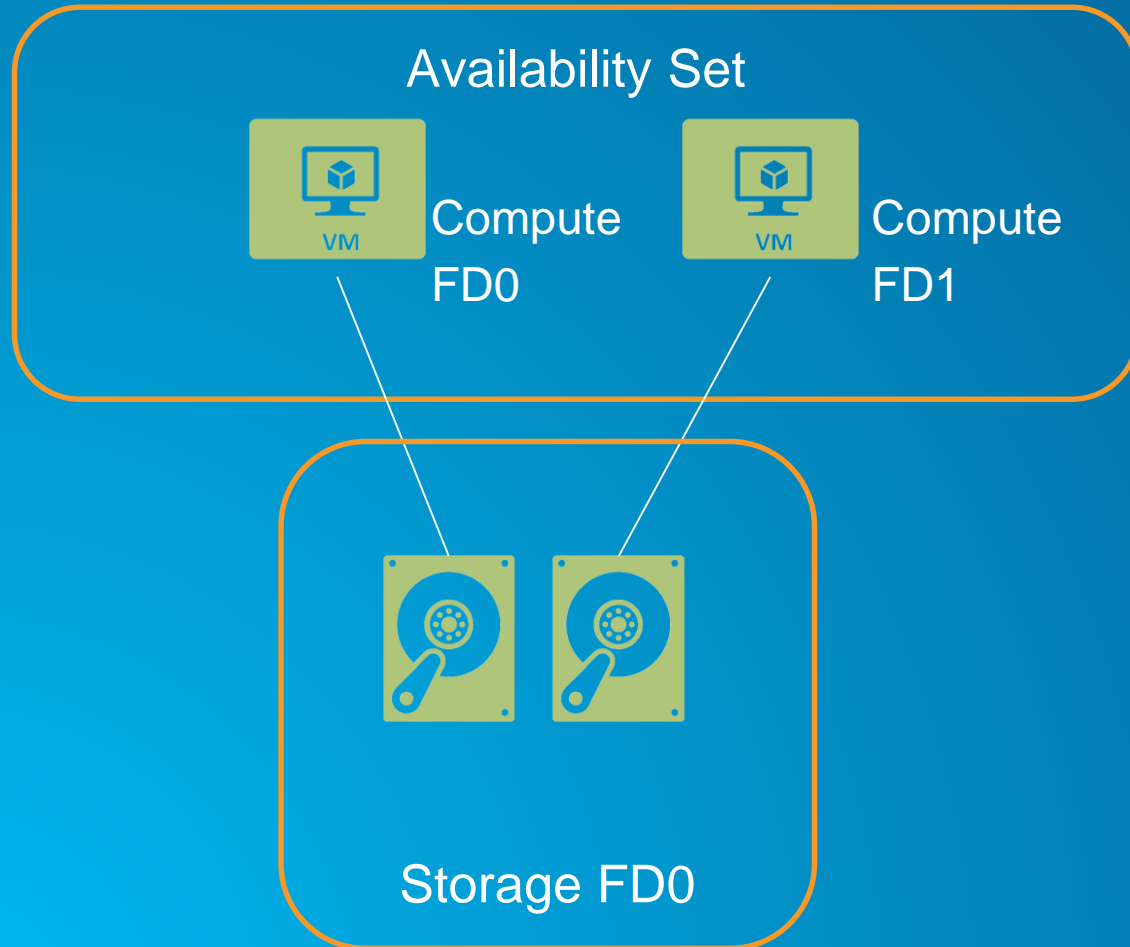
OS Disk



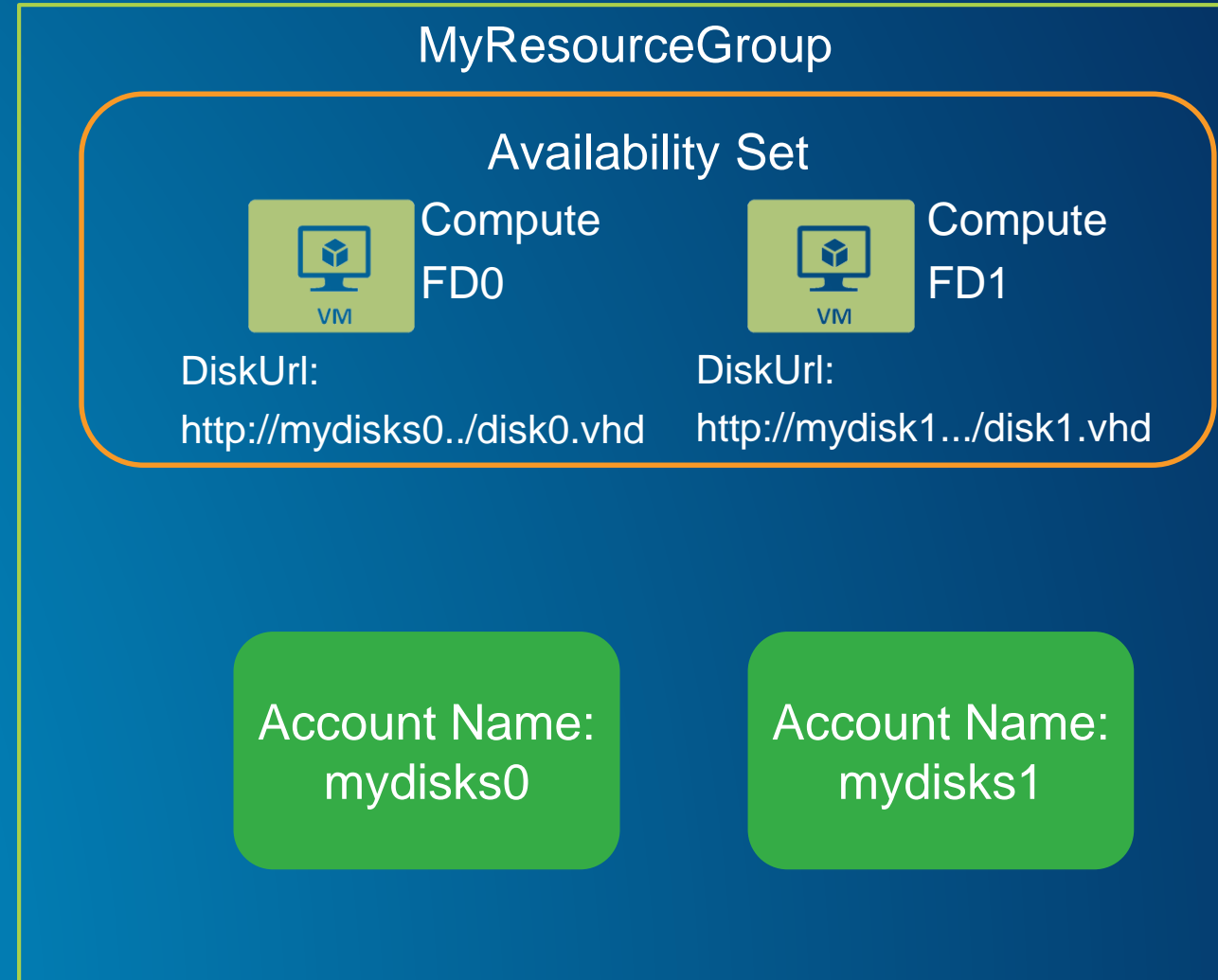
Data Disk

Unmanaged Disks

Physical View

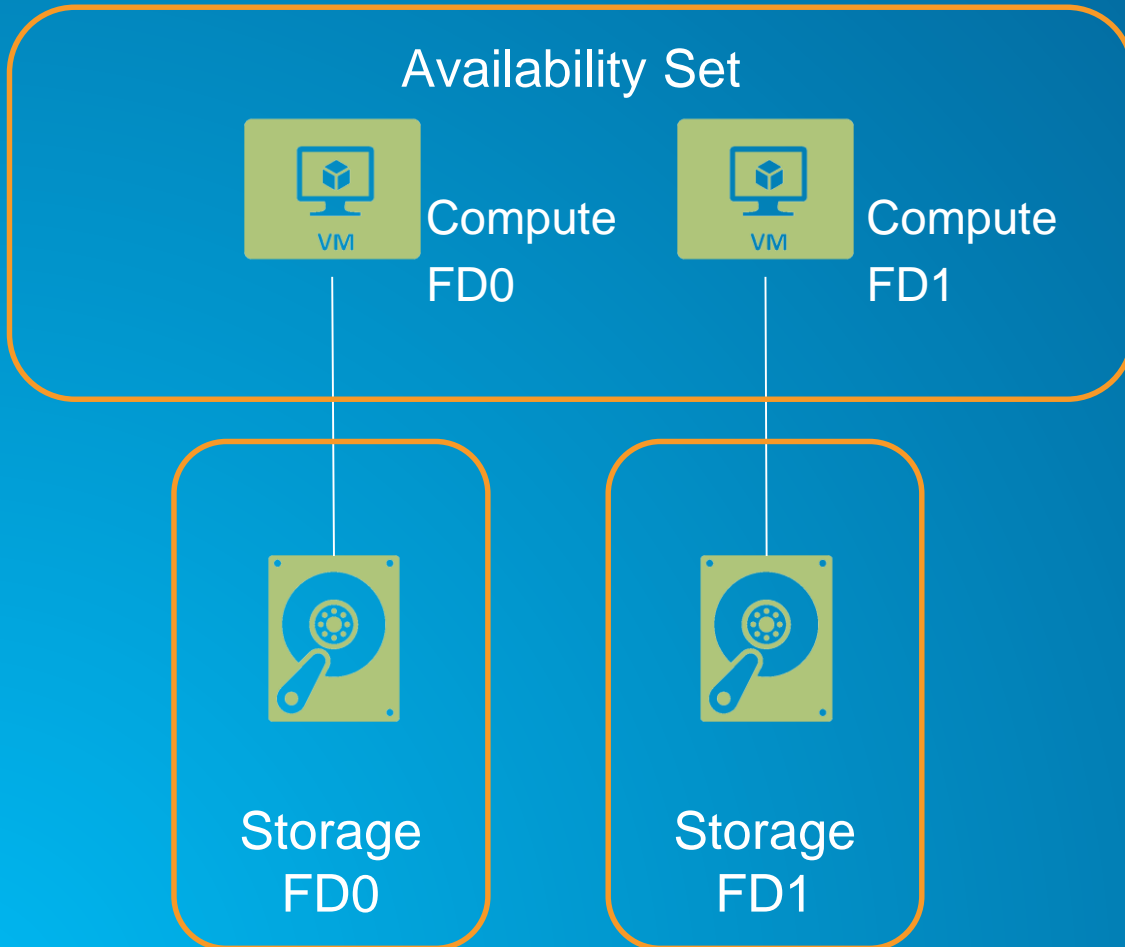


Logical View

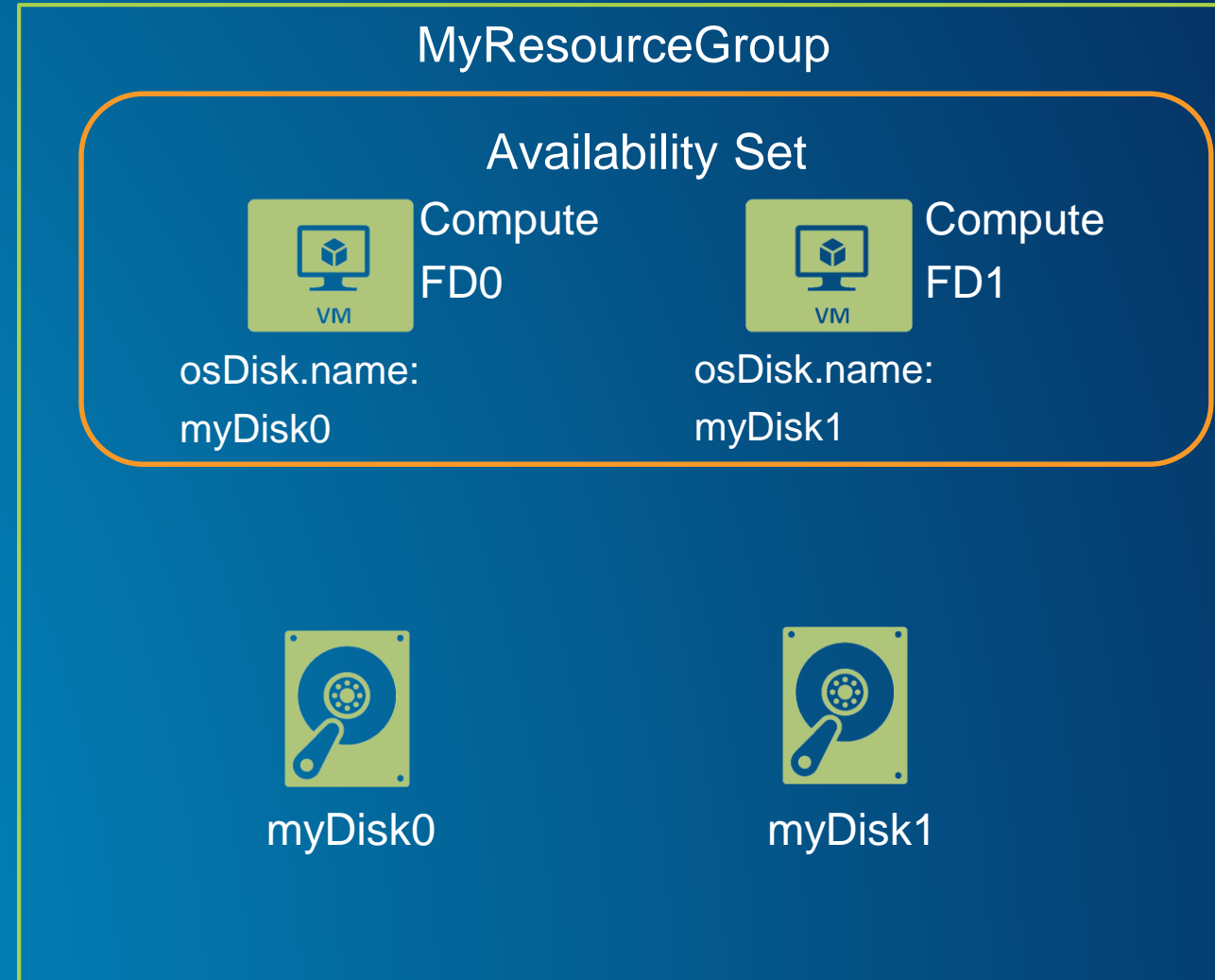


Managed Disks

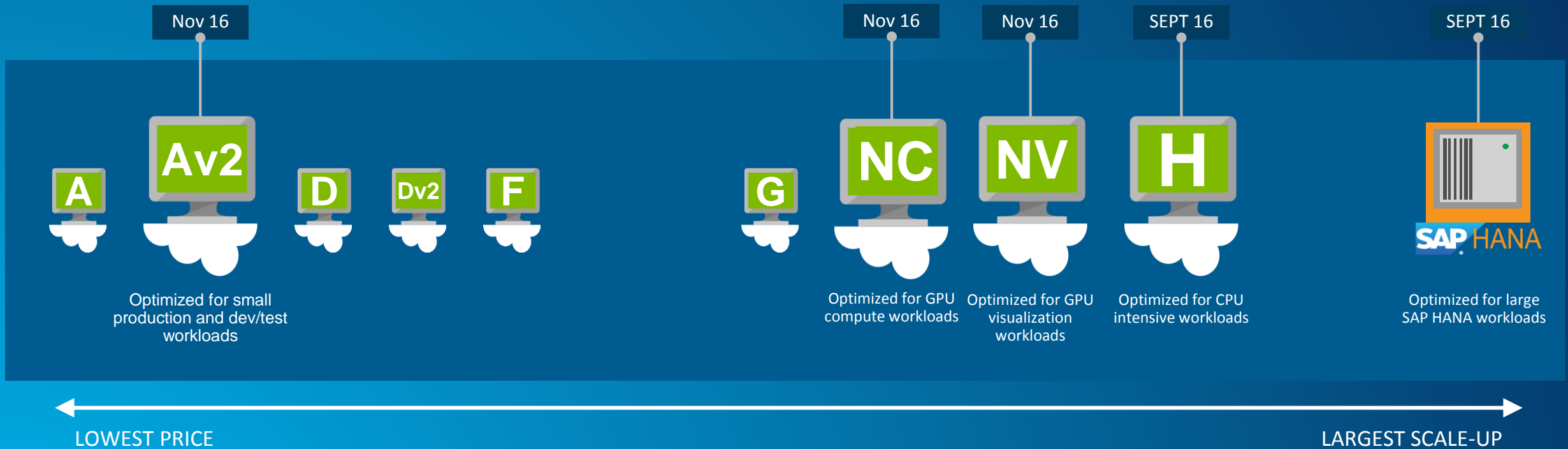
Physical View



Logical View

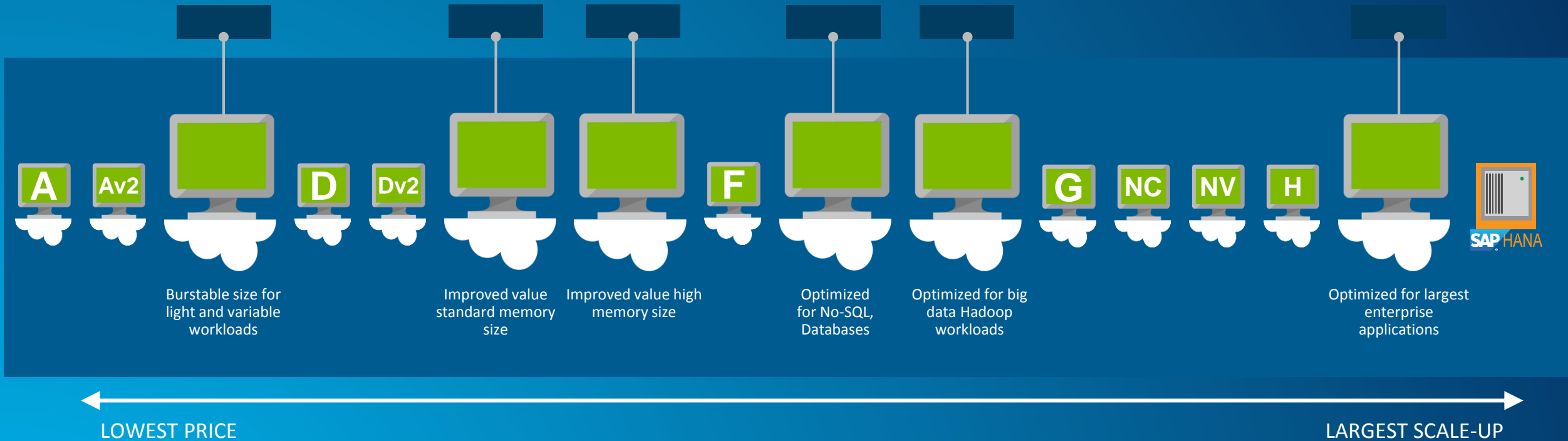


VM sizes added in last 6 months



Doubling the compute offerings in 2016

Next 6 months




Continuing the growth in 2017


VM Size Availability by Region

[illegible]

Managed Disks and Virtual Machine Size

MACHINE OPTIONS


Size: 4 Cores 14 GB Memory 128 GB OS Disk (SSD) 

Time zone: (UTC-08:00) Pacific Time (US & Canada)  [Don't change](#)


Name: mygisserver


☐ Enable Automatic Operating System Updates

☐ Enable Remote Desktop Access using Port

Configure Virtual Machine 


OS Disk Type: ☐ HDD ☒ SSD


Machine Type: (Standard_DS3_v2) - 4 Cores 14 GB Memory (Supports SSD) 


Size of OS Disk: 128 

☒ Add a data disk?


Data Disk Type: ☐ HDD ☒ SSD


Size of Data Disk: 1024 



Configure Virtual Machine 

OS Disk Type: ☐ HDD ☒ SSD

Machine Type: (Standard_DS3_v2) - 4 Cores 14 GB Memory (Supports SSD) 

Size of OS Disk: (Standard_DS3_v2) - 4 Cores 14 GB Memory (Supports SSD) 

Data Disk Type: (Standard_DS4_v2) - 8 Cores 28 GB Memory (Supports SSD)

Size of Data Disk: (Standard_DS5_v2) - 16 Cores 56 GB Memory (Supports SSD)

(Standard_DS11_v2) - 2 Cores 14 GB Memory (Supports SSD)

(Standard_DS12_v2) - 4 Cores 28 GB Memory (Supports SSD)

(Standard_DS13_v2) - 8 Cores 56 GB Memory (Supports SSD)

(Standard_DS14_v2) - 16 Cores 112 GB Memory (Supports SSD)

(Standard_DS15_v2) - 20 Cores 140 GB Memory (Supports SSD)

(Standard_F2s) - 2 Cores 4 GB Memory (Supports SSD)

(Standard_F4s) - 4 Cores 8 GB Memory (Supports SSD)


(Standard_F8s) - 8 Cores 16 GB Memory (Supports SSD)

(Standard_F16s) - 16 Cores 32 GB Memory (Supports SSD)

(Standard_F2) - 2 Cores 4 GB Memory (Supports SSD)

(Standard_F4) - 4 Cores 8 GB Memory (Supports SSD)

(Standard_F8) - 8 Cores 16 GB Memory (Supports SSD)

(Standard_F16) - 16 Cores 32 GB Memory (Supports SSD) 



Key Vault



Secure Store for SSL Certificates

Key Vault Integration

- Safeguard Certificates in Azure Key Vault

DEPLOYMENT ARTIFACTS

Storage Account:  

☒ Use Key Vault?  

☒ Save SSL Certificates in Azure Key Vault?

- SSL Certificate



SSL CERTIFICATE



☐ Self Signed Certificate (Automatically generated)

☒ Certificate issued by a Certificate Authority

Domain Name (Alias):

Certificate: ☐ From File ☒ From Key Vault

Key Vault:  

Secret:  

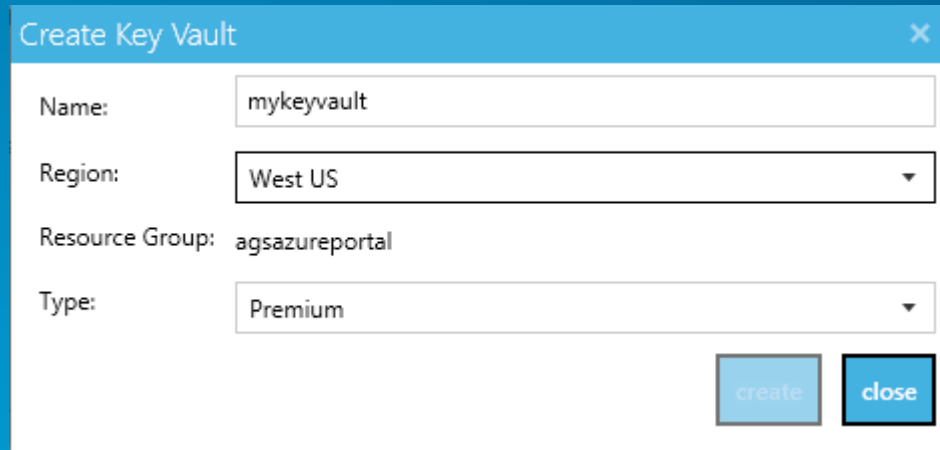


Azure Key Vault

SSL Certificates in Key Vault as Secrets

<https://blogs.technet.microsoft.com/kv/2016/09/26/manage-certificates-via-azure-key-vault>

- Create Key Vault

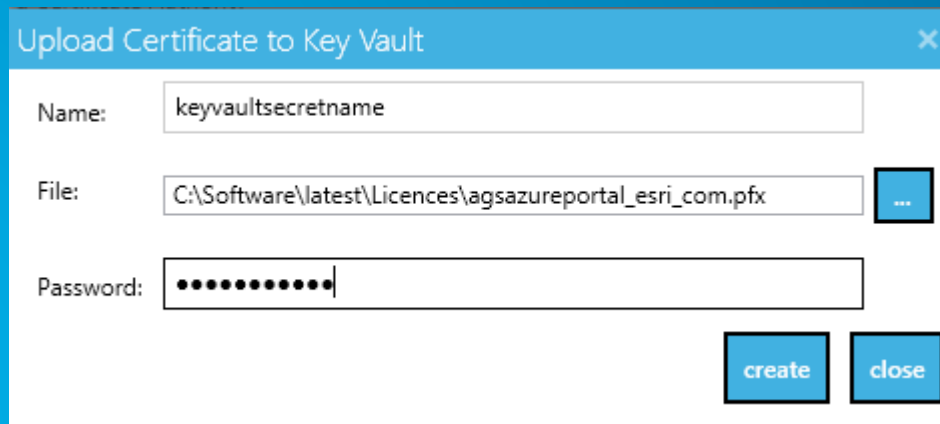


A screenshot of the 'Create Key Vault' dialog box. It has a title bar with a close button. The form contains four fields: 'Name' with the value 'mykeyvault', 'Region' with a dropdown menu showing 'West US', 'Resource Group' with the value 'agsazureportal', and 'Type' with a dropdown menu showing 'Premium'. At the bottom right are two buttons: 'create' and 'close'.



Azure Key Vault

- SSL Certificate



A screenshot of the 'Upload Certificate to Key Vault' dialog box. It has a title bar with a close button. The form contains three fields: 'Name' with the value 'keyvaultsecretname', 'File' with the value 'C:\Software\latest\Licences\agsazureportal_esri_com.pfx' and a file selection button, and 'Password' with a masked input field. At the bottom right are two buttons: 'create' and 'close'.



Digi Cert



GlobalSign

n



WoSign

Demo

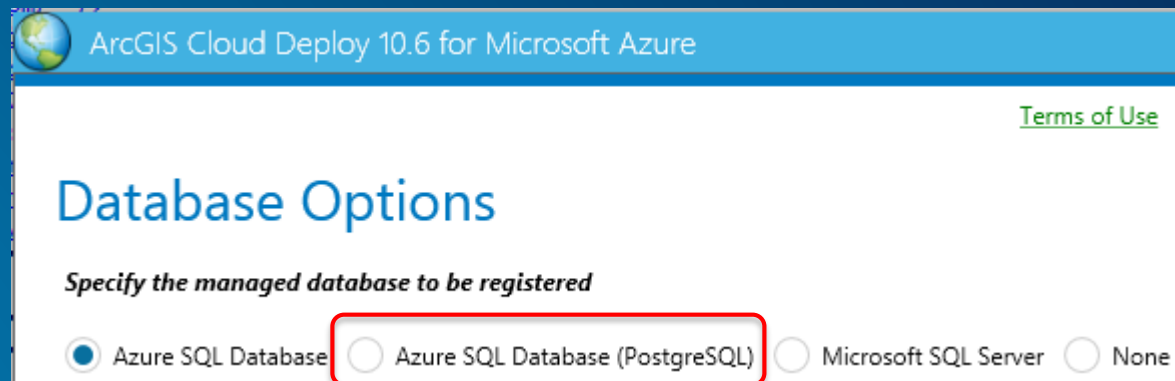
10.5.1 New Features

Sneak Peek

10.6

New Features

- Automation
- Azure SQL Database for PostgreSQL
- Bringing Workstation GIS to Azure
 - GPU Backed Virtual Machines



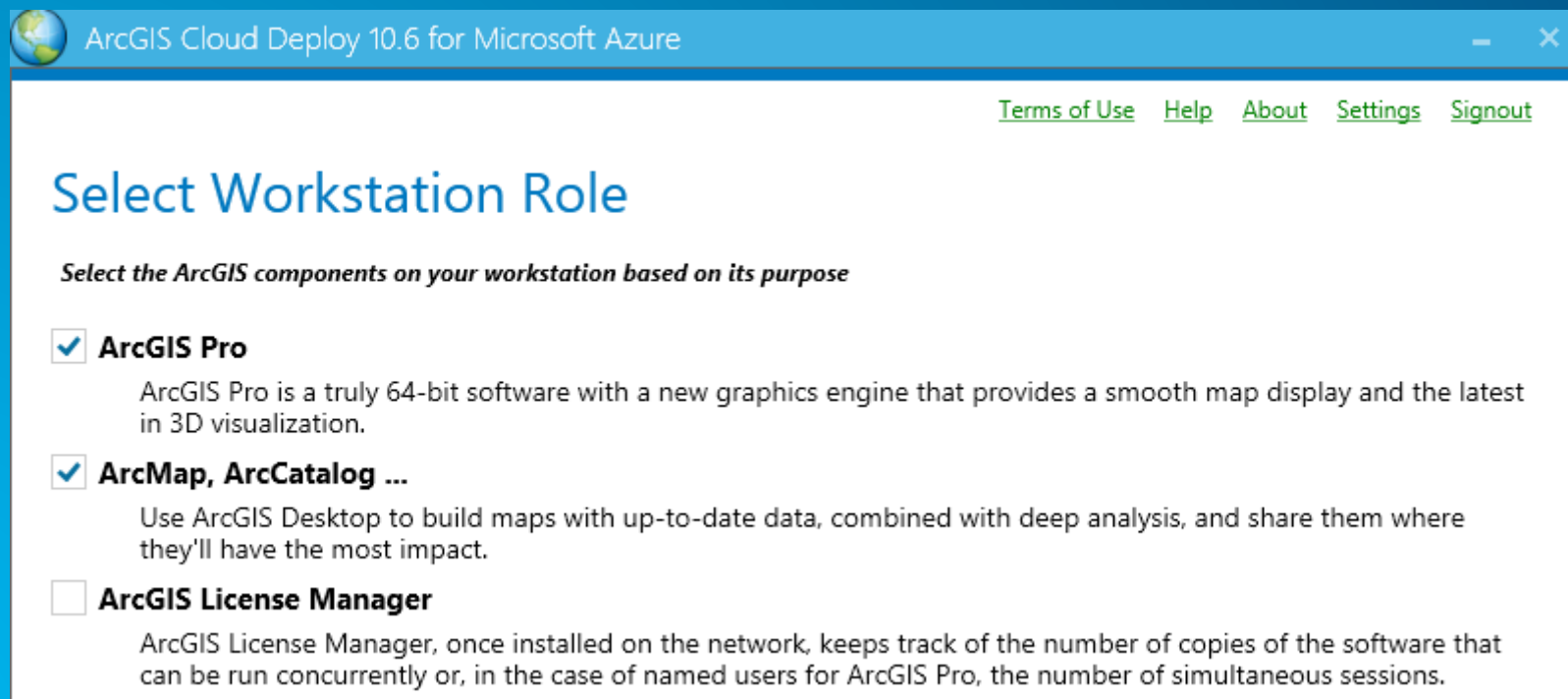
ArcGIS Cloud Deploy 10.6 for Microsoft Azure

[Terms of Use](#)

Database Options

Specify the managed database to be registered

☒ Azure SQL Database ☐ Azure SQL Database (PostgreSQL) ☐ Microsoft SQL Server ☐ None



ArcGIS Cloud Deploy 10.6 for Microsoft Azure

[Terms of Use](#) [Help](#) [About](#) [Settings](#) [Signout](#)

Select Workstation Role

Select the ArcGIS components on your workstation based on its purpose

☒ **ArcGIS Pro**
ArcGIS Pro is a truly 64-bit software with a new graphics engine that provides a smooth map display and the latest in 3D visualization.

☒ **ArcMap, ArcCatalog ...**
Use ArcGIS Desktop to build maps with up-to-date data, combined with deep analysis, and share them where they'll have the most impact.

☐ **ArcGIS License Manager**
ArcGIS License Manager, once installed on the network, keeps track of the number of copies of the software that can be run concurrently or, in the case of named users for ArcGIS Pro, the number of simultaneous sessions.

Deployment Options



Cloud Builder



Visual
Studio



PowerShell



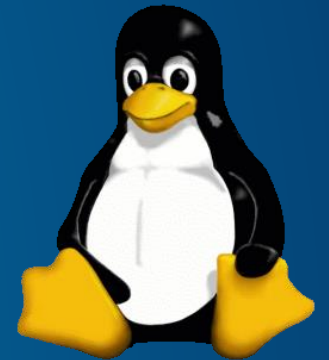
Command Line



Windows



Mac



Linux

Demo

10.6 New Features

Feedback and Wish list

- VM Backup (Azure Recovery Services)
- Azure Monitor (OMS) Integration
- Auto Scaling (VM Scale Sets)
- In-place Upgrades
- Network Security Groups
- Linux
- Azure Automation
- Azure AD (Enterprise Logins)
- Pricing Estimate



Q & A

Survey



☒ Excellent
☐ Very good
☐ Good
☐ Average
☐ Poor

- Quick to fill out
- Esri Events App
- We read your comments!

Questions?



Understanding our world.