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

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

Azure Marketplace

Microsoft Azure

Why Azure | Solutions | Products | Documentation | Pricing | Partners | Blog | Resources | Support

FREE ACCOUNT

Azure Marketplace | Browse | Sell | Learn

Sign in

Products > ArcGIS Enterprise

ArcGIS Enterprise

Esri

Overview | Plans + Pricing

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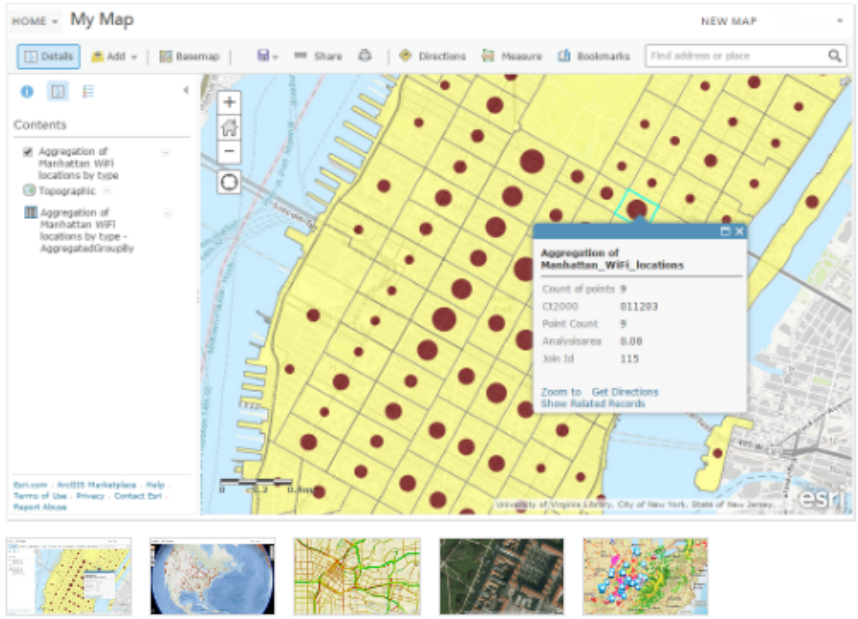
Version
1.0.2

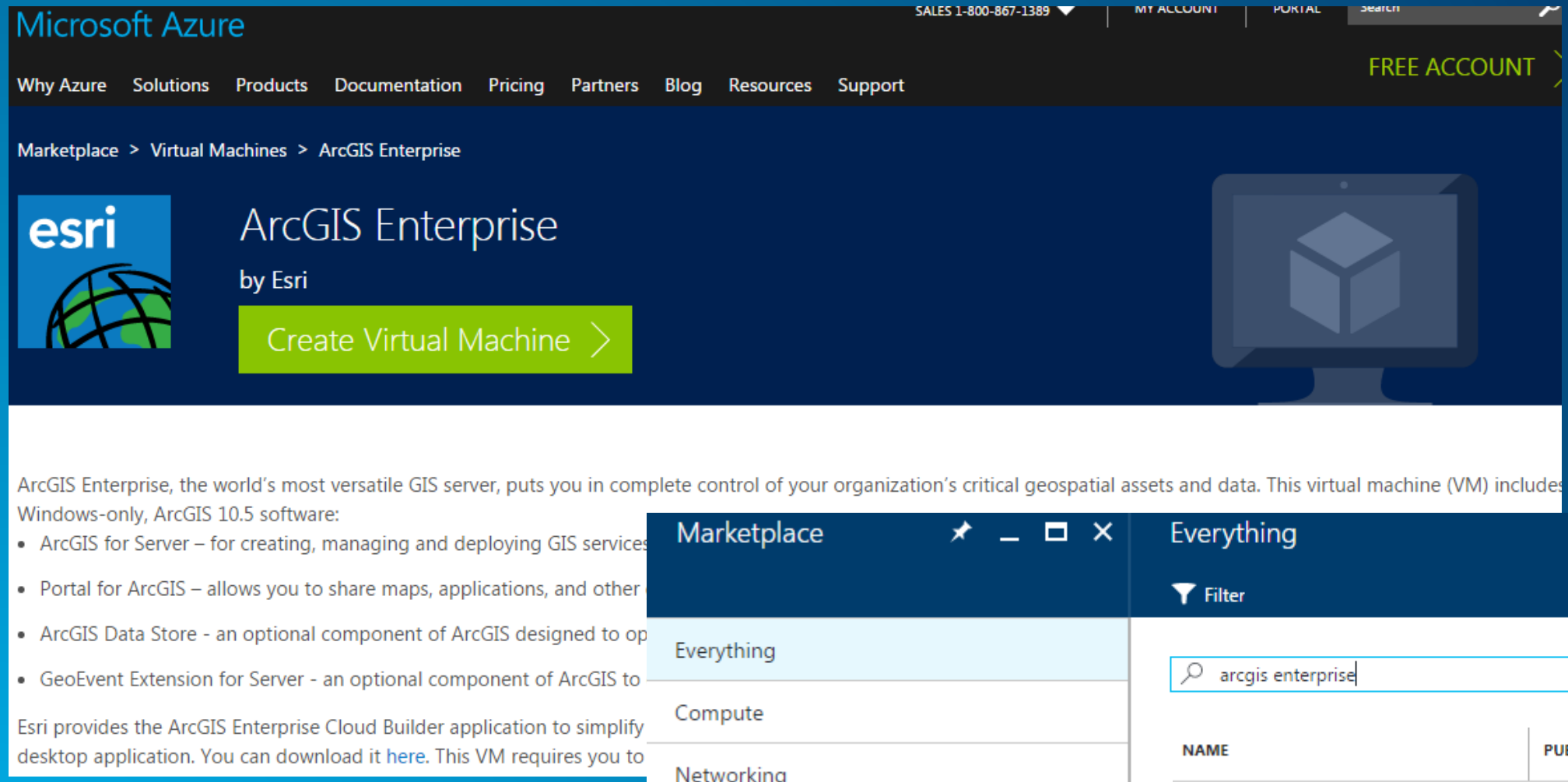
Mapping and Web GIS for Your Enterprise.

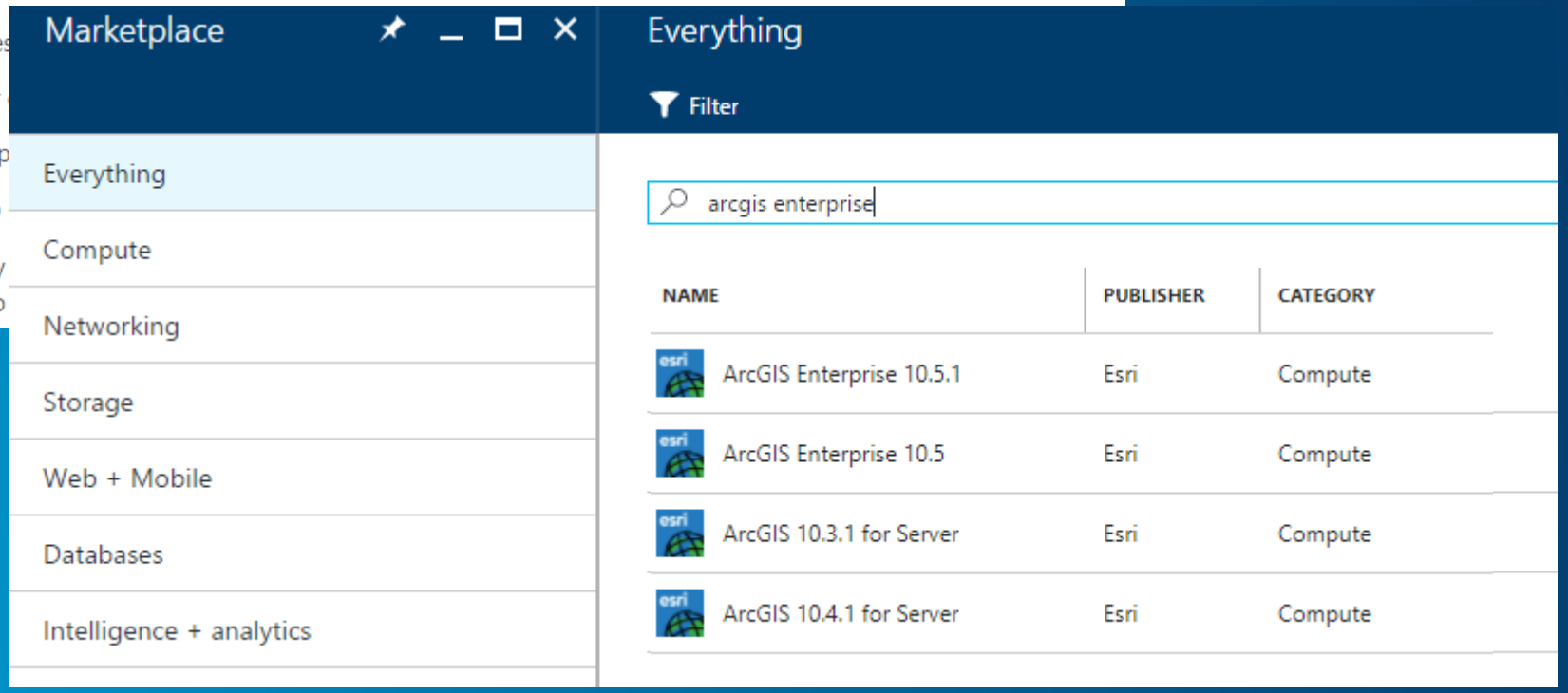
ArcGIS Enterprise, the world's most versatile GIS server, puts you in complete control of your organization's critical geospatial assets and data. This virtual machine (VM) includes Windows-only, ArcGIS 10.5 software:

- 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.

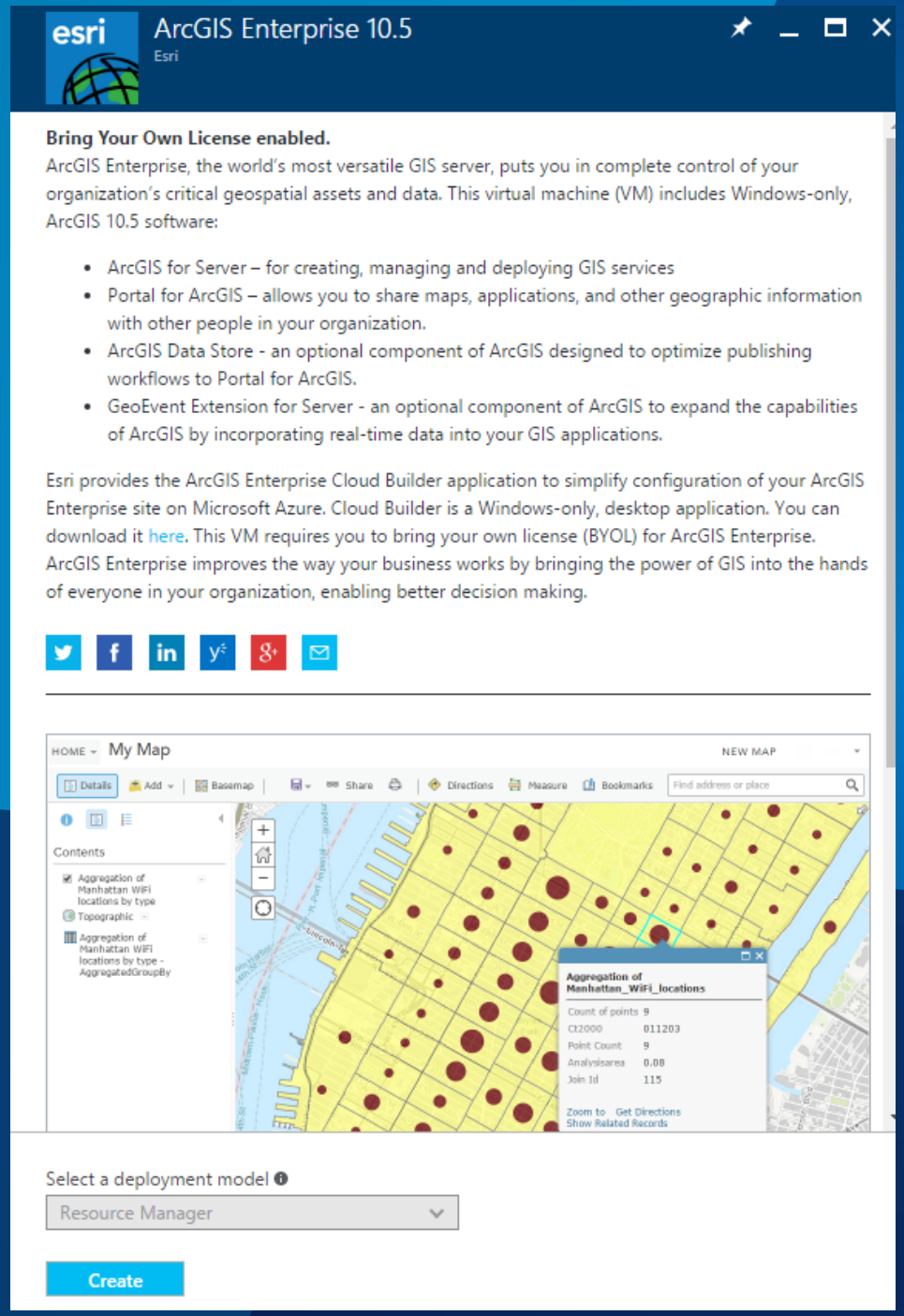
Esri provides the ArcGIS Enterprise Cloud Builder application to simplify configuration of your ArcGIS Enterprise site on Microsoft Azure. Cloud Builder is a Windows-only, desktop application. You can download it here. This VM requires you to bring your own license (BYOL) for ArcGIS Enterprise.







Azure Portal

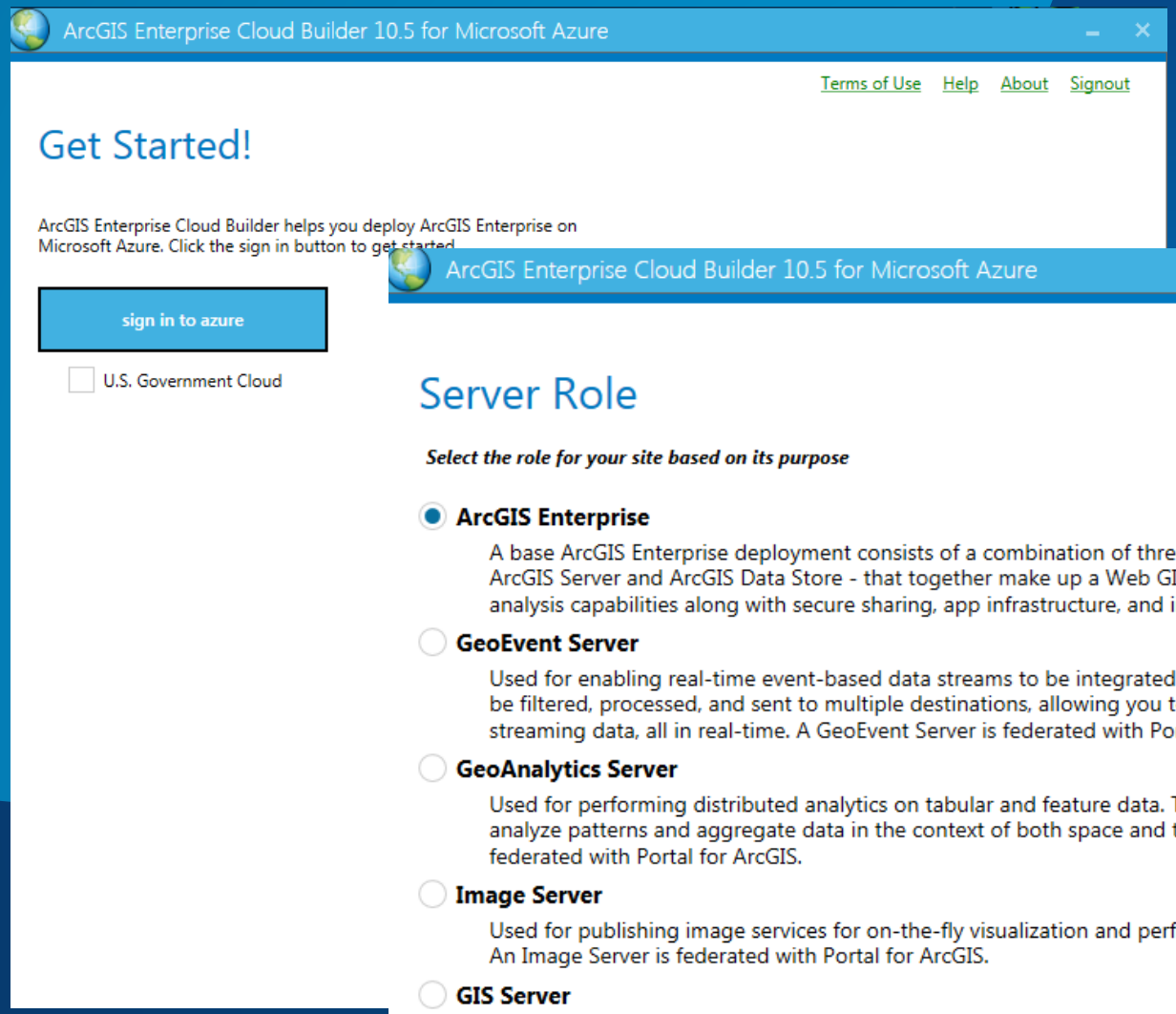


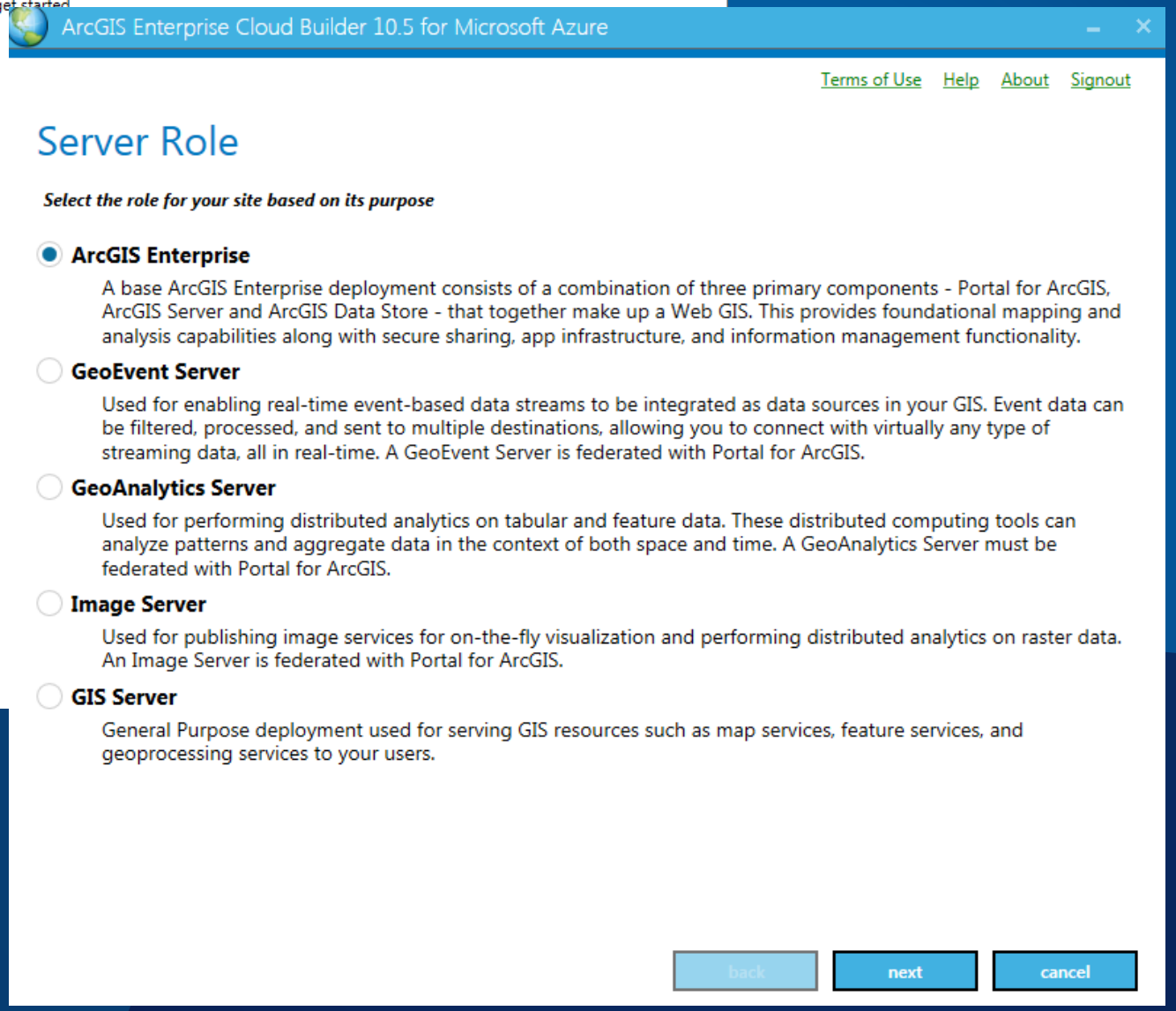
ArcGIS Enterprise

BYOL Image

Cloud Builder

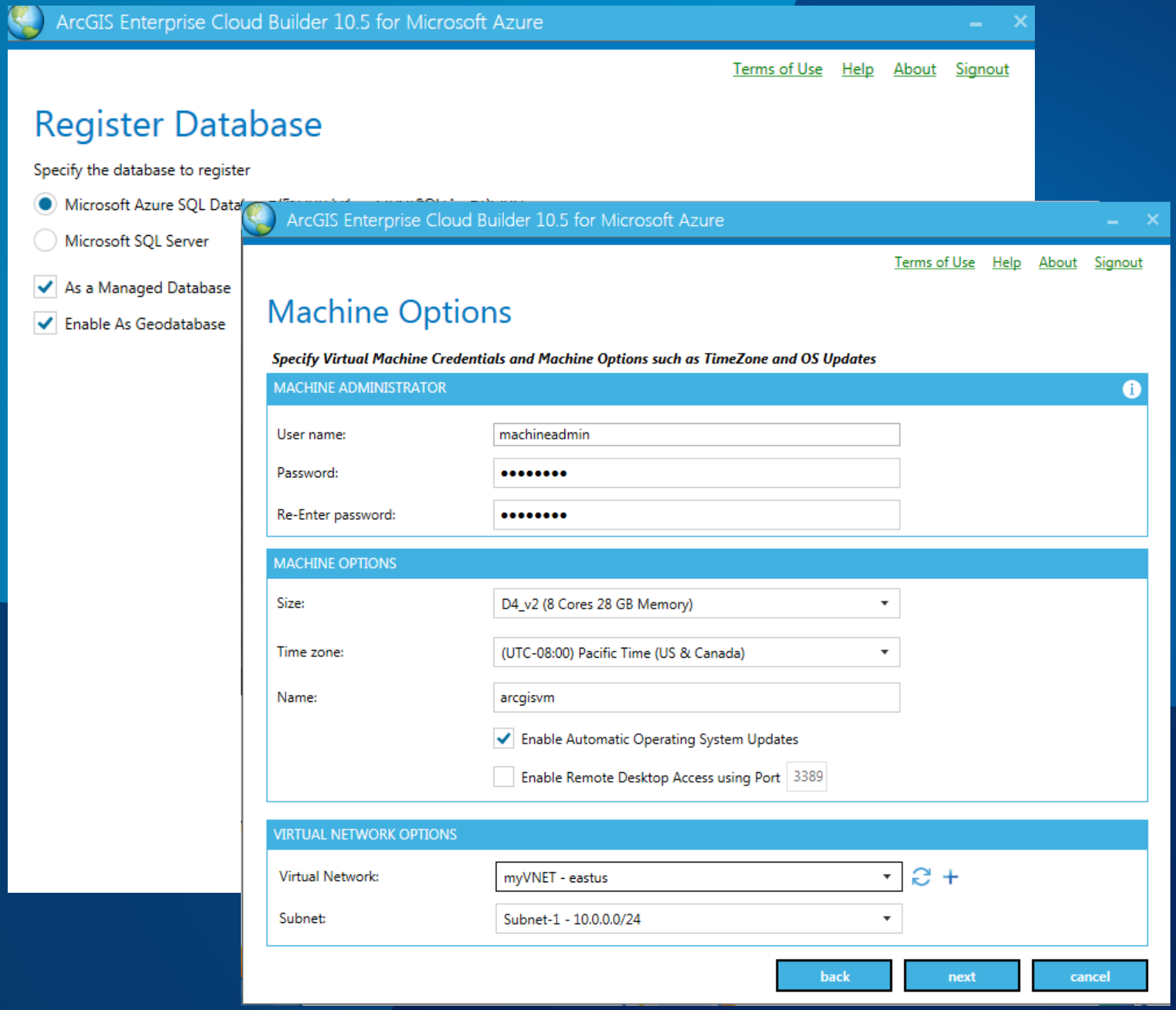
Overview





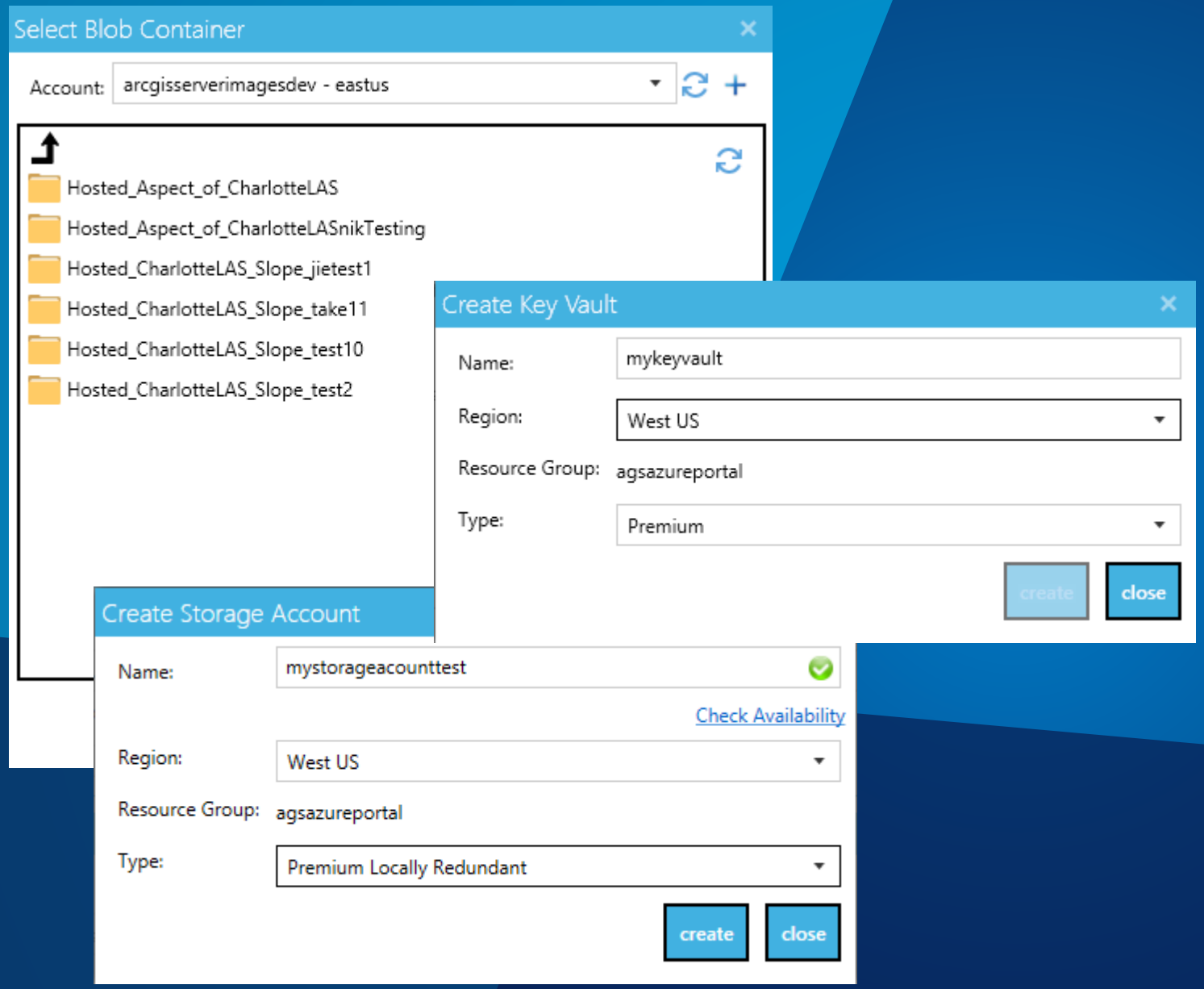
Desktop Application

For Windows



Wizard Driven Experience

Deployment Workflows
Database Options



Cloud Native Features

Azure Storage
Azure Key Vault
Azure Blob Storage
Azure Data Lake Store *

*** Planned**

Site Deployments

Specialized Servers

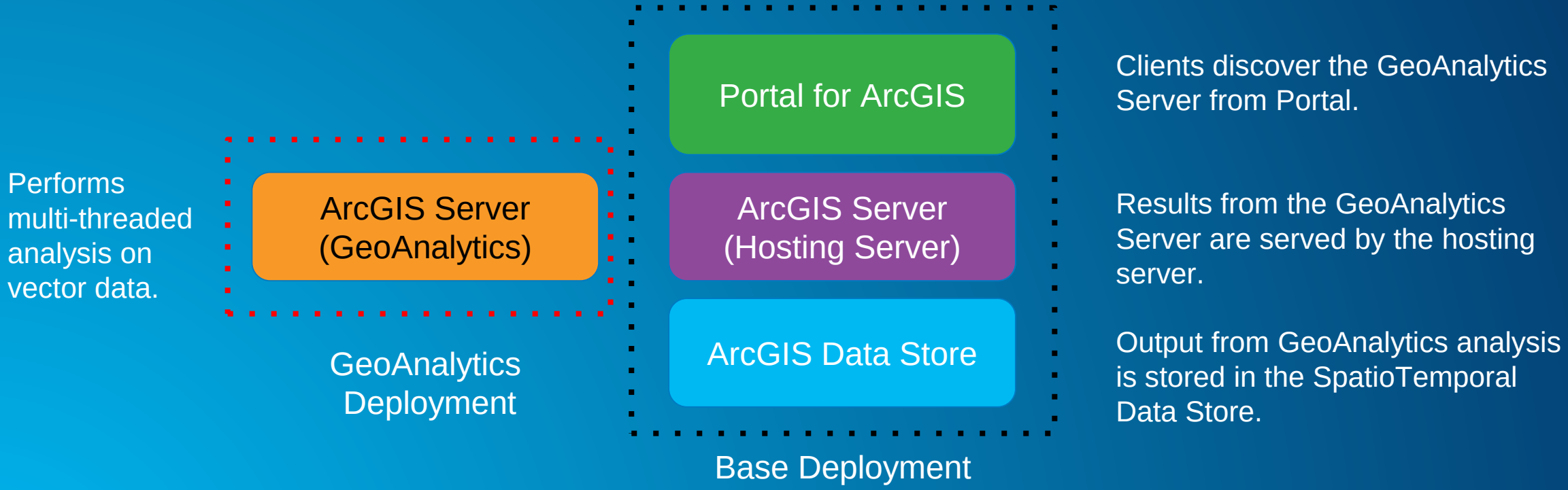
ArcGIS Enterprise : Conceptual Overview

- 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

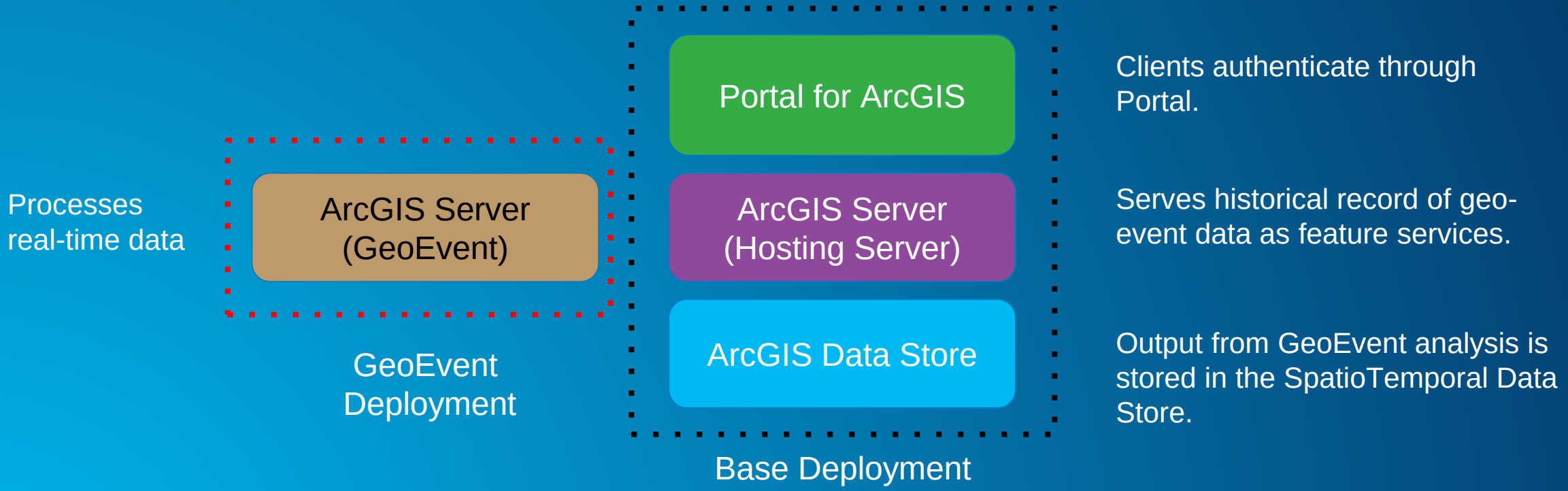
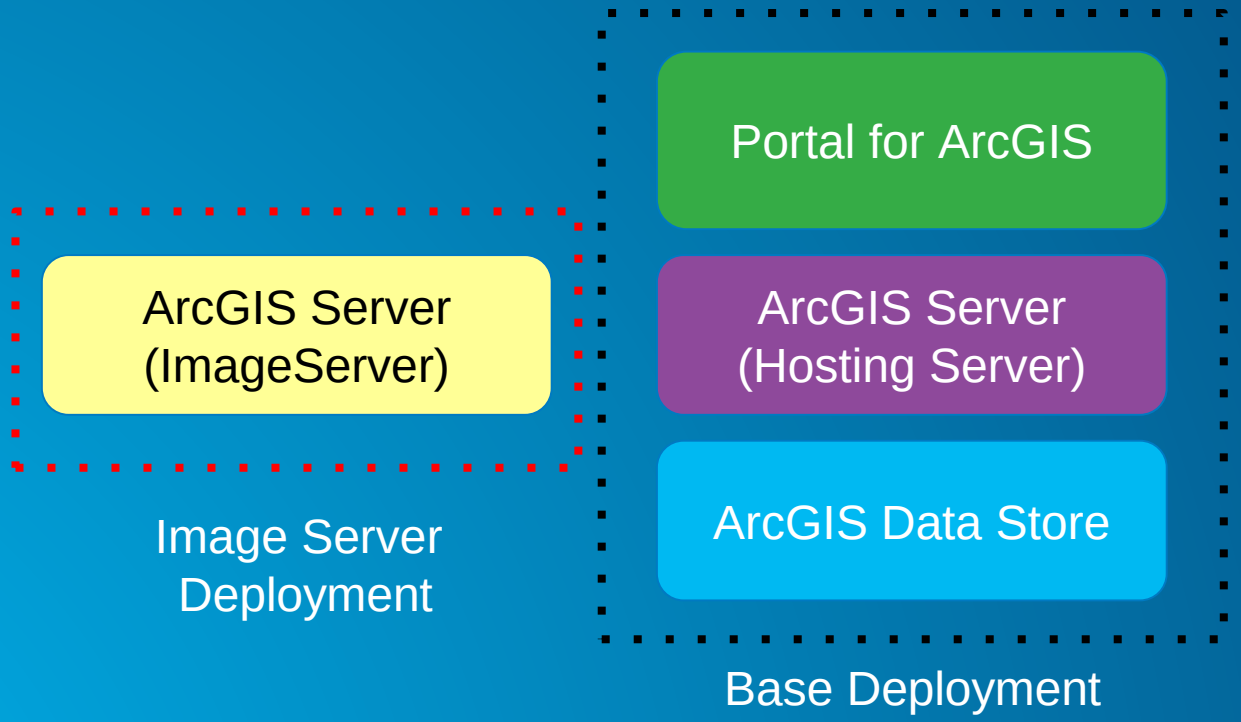


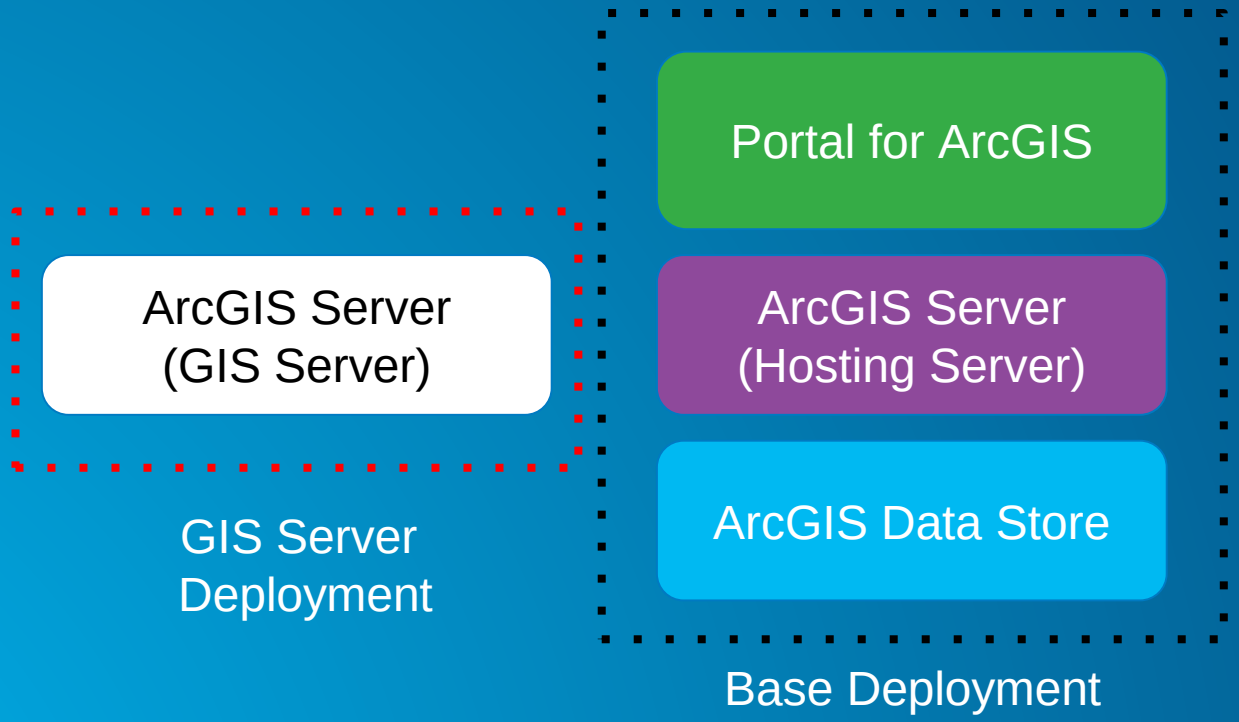
Image Server Deployment

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

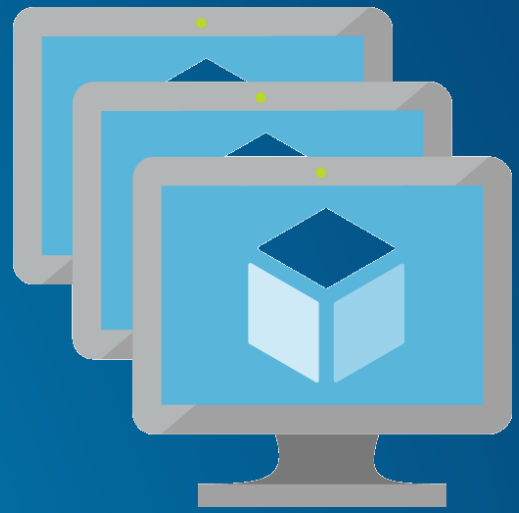
ArcGIS Spatiotemporal Big Data Store

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

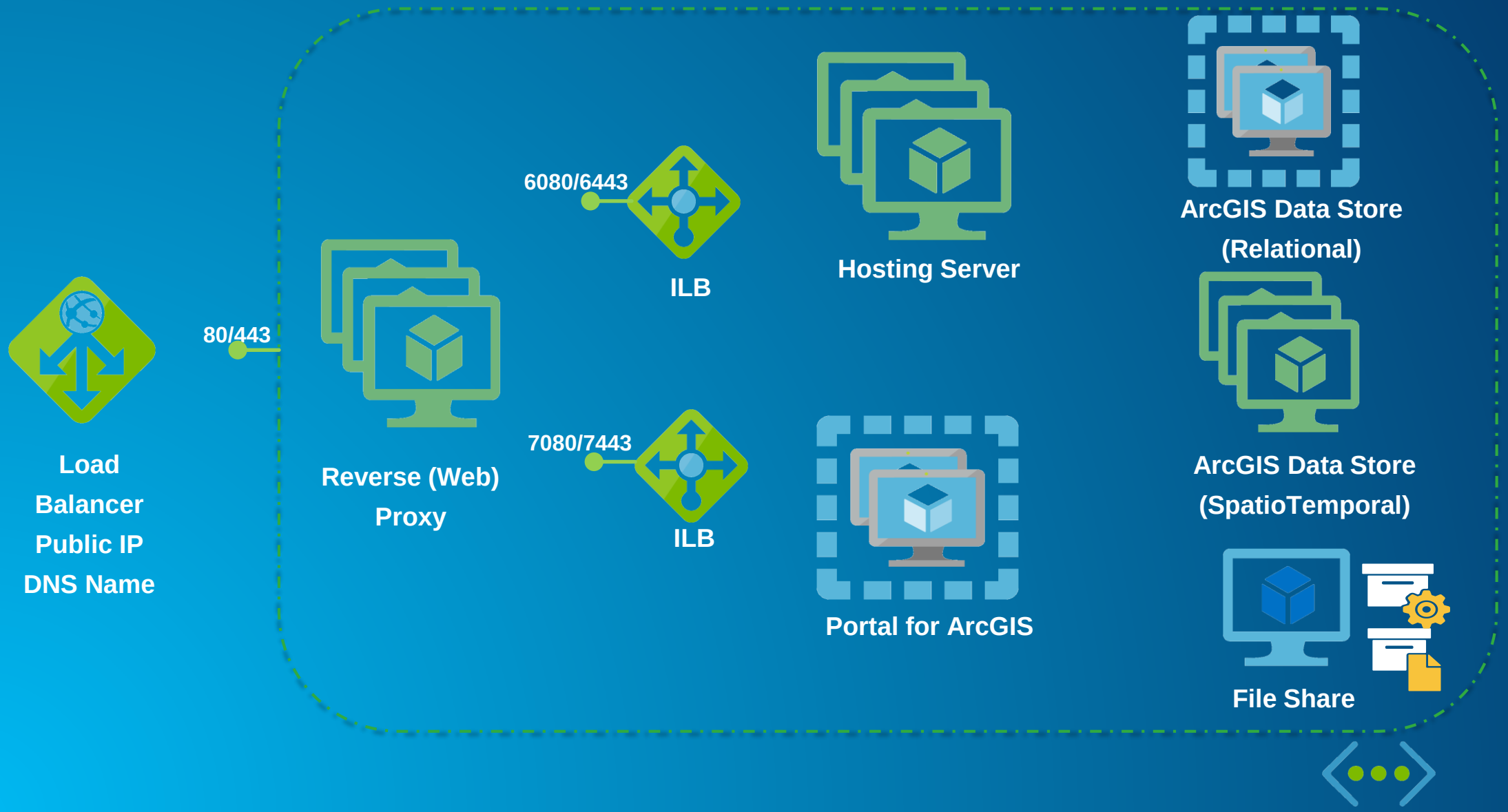
Portal for ArcGIS

Hosting Server

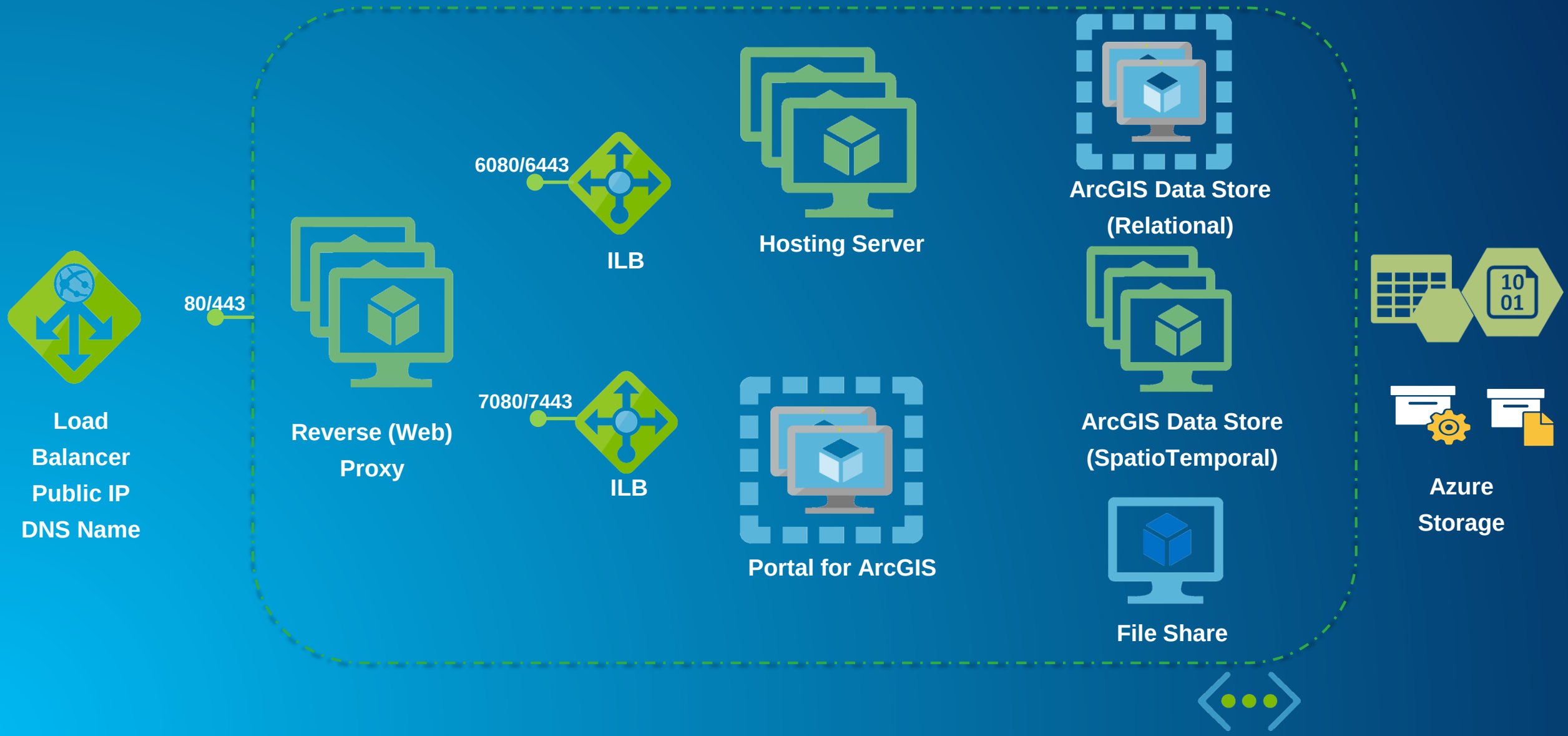
ArcGIS Data Store

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

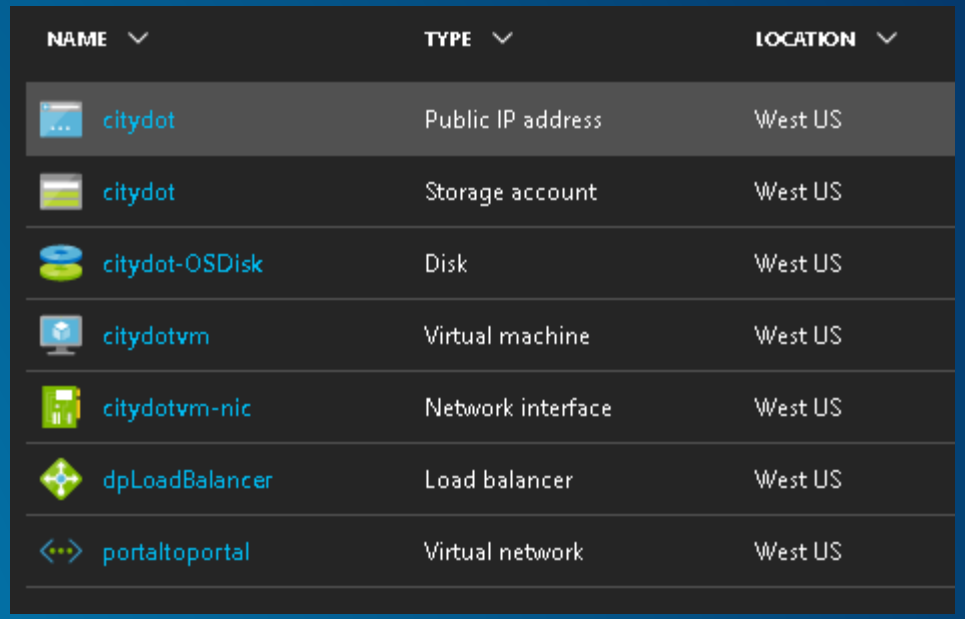
Cloud Builder

Under the hood

How Cloud Builder works

Two Responsibilities

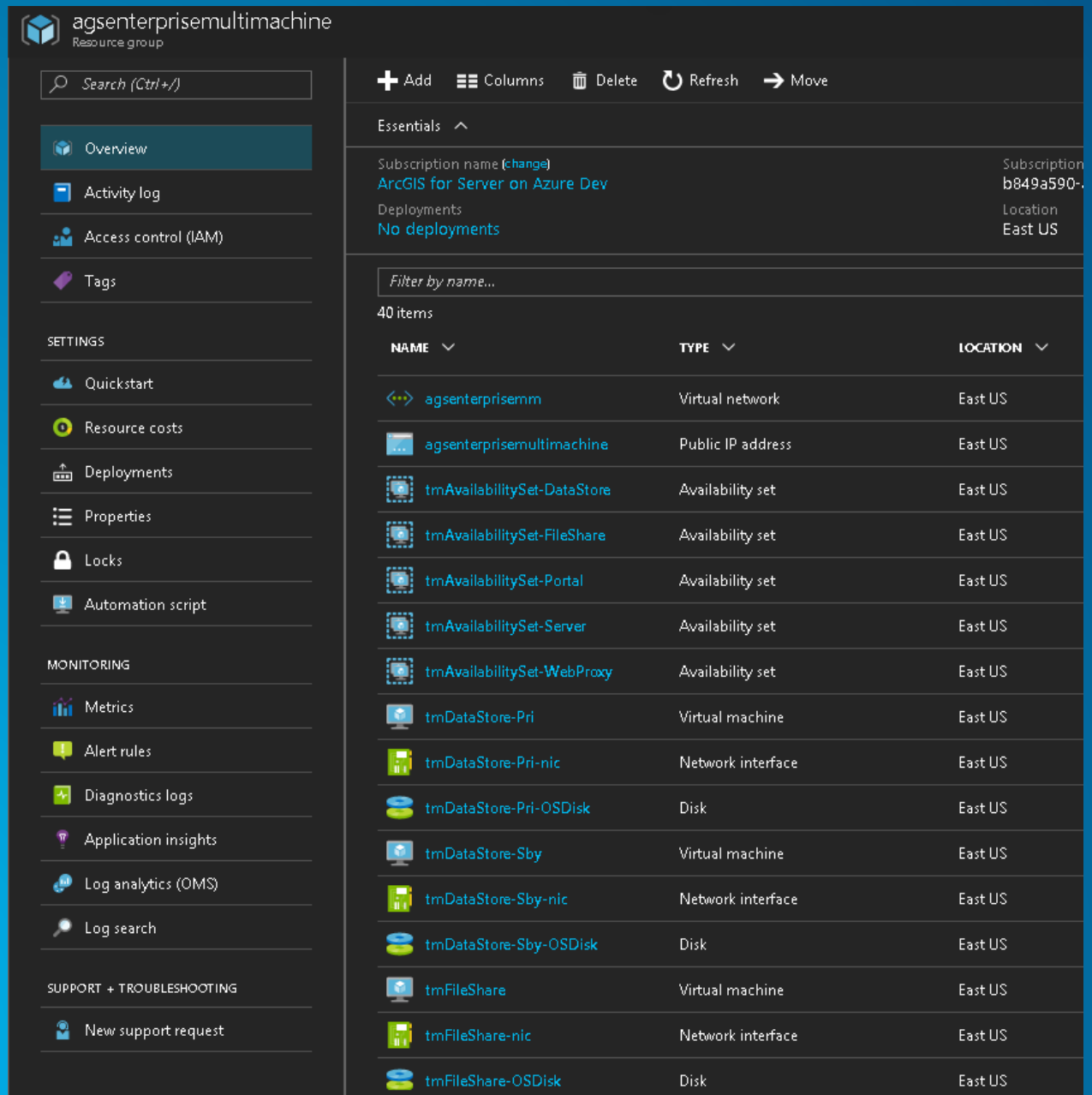
- **Provision Infrastructure Resources**
  - Azure Resource Manager (ARM) API
  - Imperative/Declarative



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
portaltoportal	Virtual network	West US

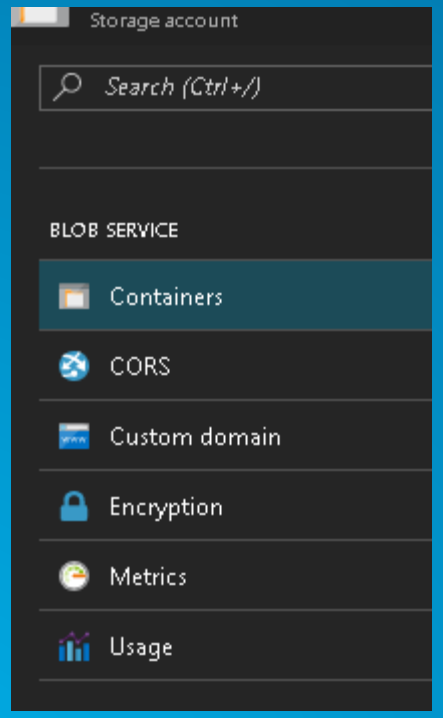
- **Trigger In-VM Configuration of ArcGIS Components**
  - Automation using PowerShell Desired State Configuration (DSC)
  - Azure Custom Script Extension

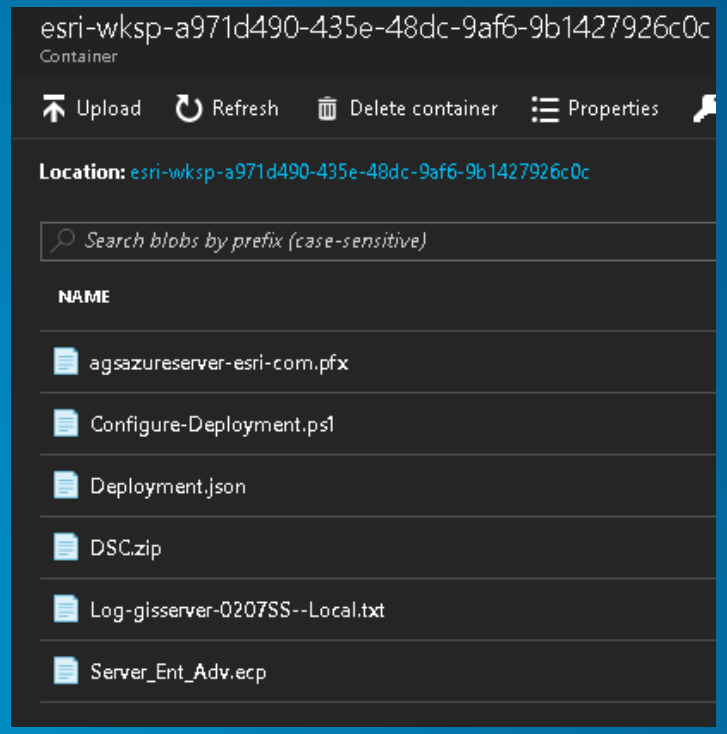
1 Provision Azure Infrastructure Resources



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

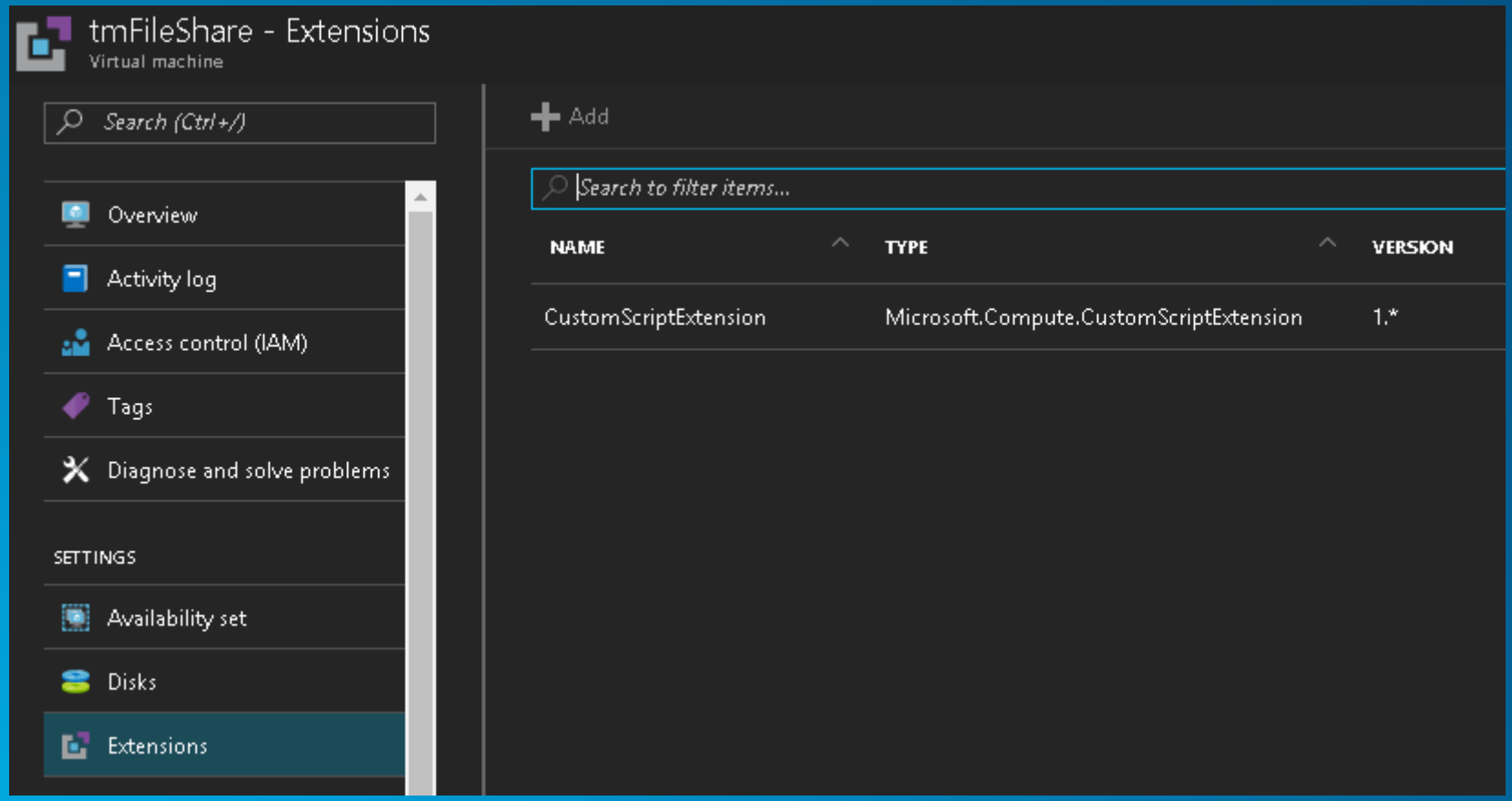
2 Stage Deployment Artifacts



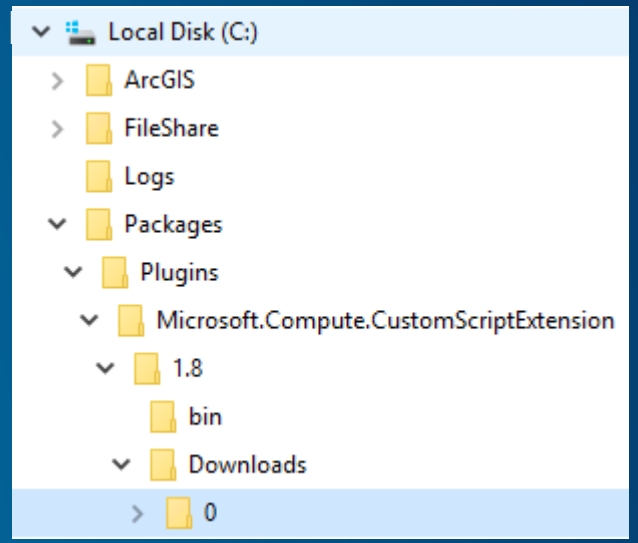


- SSL Certificate
  - Certificate.pfx
- Bootstrap Script
  - Configure-Deployment.ps1
- Deployment Description
  - Deployment.json
- Automation Code
  - DSC.zip
- Output Log File
  - Log.txt

3 Trigger Custom Script Execution on File Share Machine

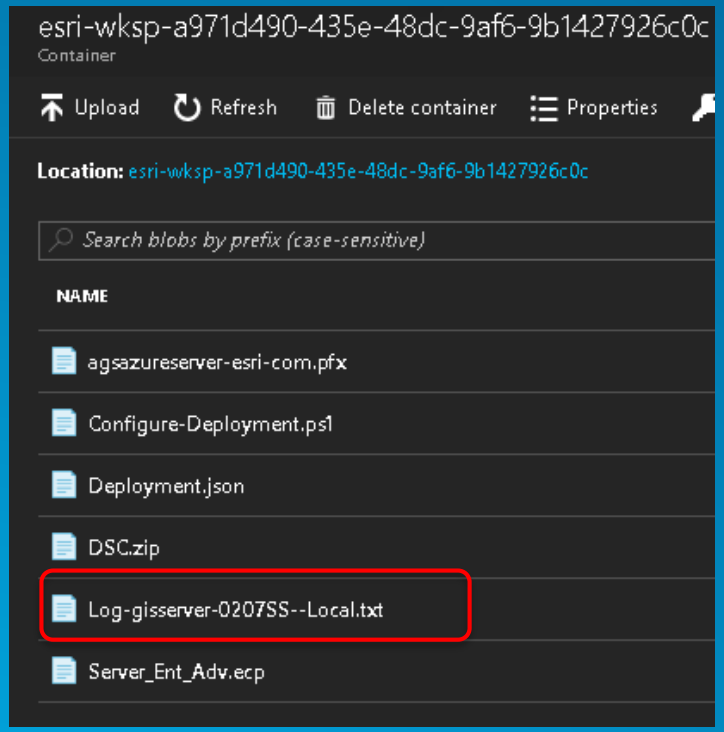


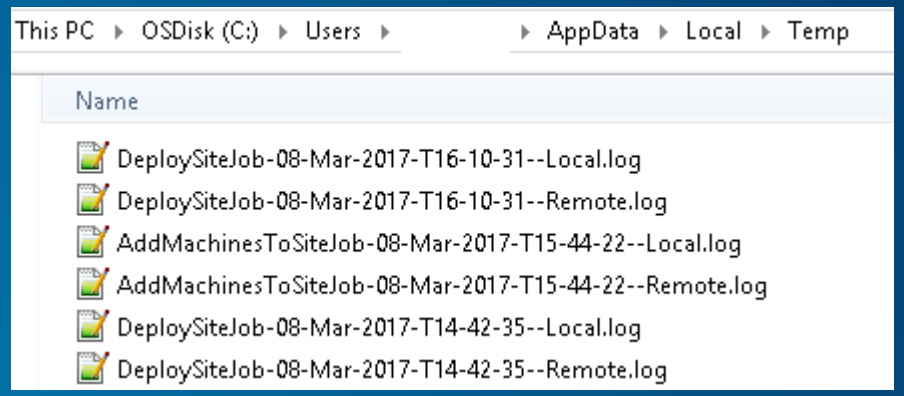

```
"commandToExecute": "powershell -ExecutionPolicy
Unrestricted -file Configure-Deployment.ps1  -OperationId 8e779bf4
-OperationName ConfigureDeployment -LogOutputFileUrl
https://arcgisserverdeploy.blob.core.windows.
net/esri-wksp-8e779bf4-9076-4001-acc5-73ab321368c9/Log-tmFileShare-0054SS--Local
.txt?sv=2016-05-31\"&\"sr=b\"&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

- **Distributed Configuration**
  - **WinRM**
  - **Powershell DSC**
- 

- **Logs in c:\ArcGIS\Deploy**

4 Download Log File at end of Script Execution





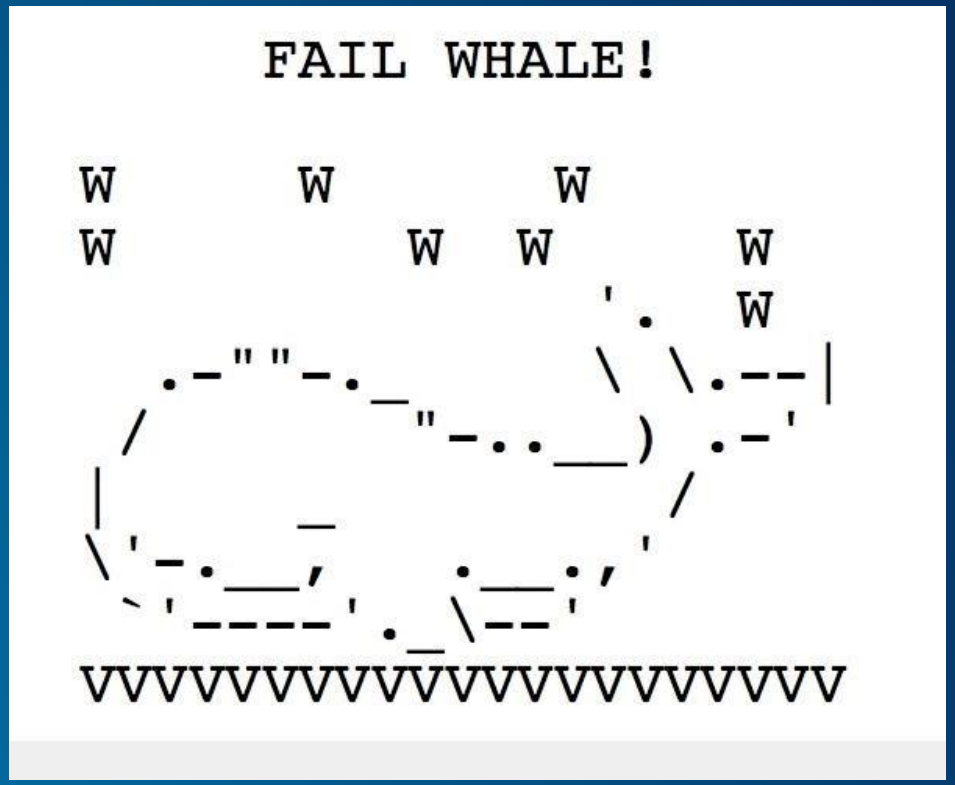
- **%TEMP% folder on Cloud Builder machine**

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 Storage

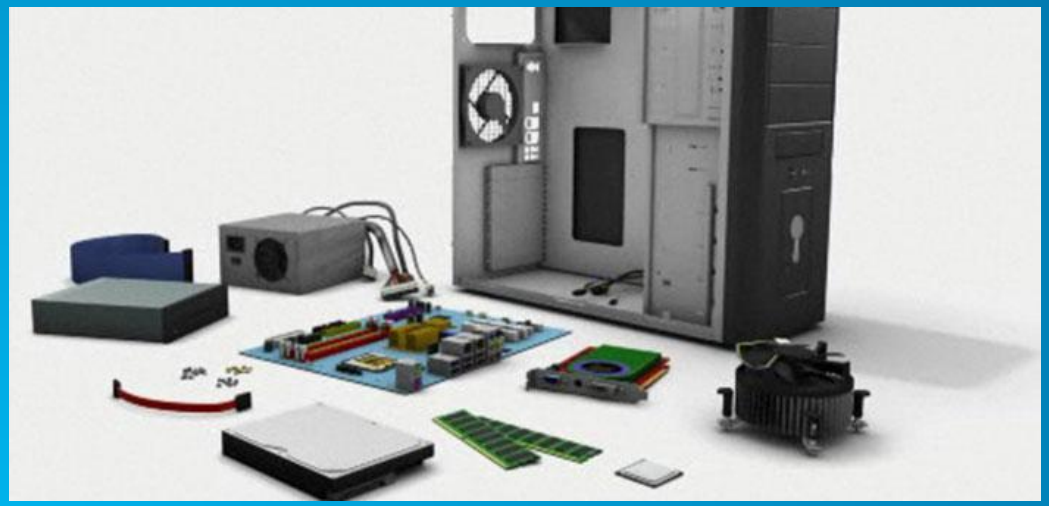
Azure Key Vault

Azure Managed Disks

Managed Disks

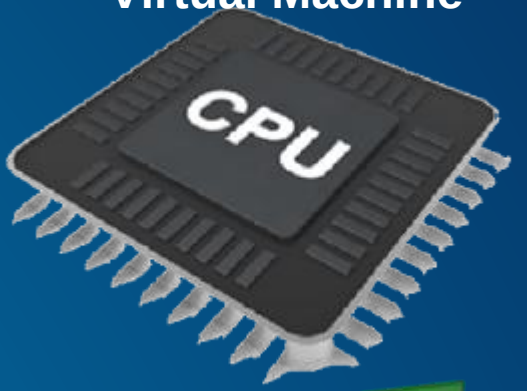
Machine Sizes

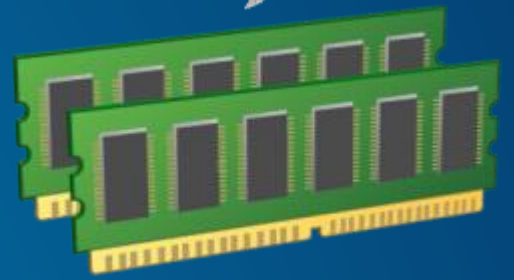
Anatomy of a Machine



Physical Machine

Virtual Machine



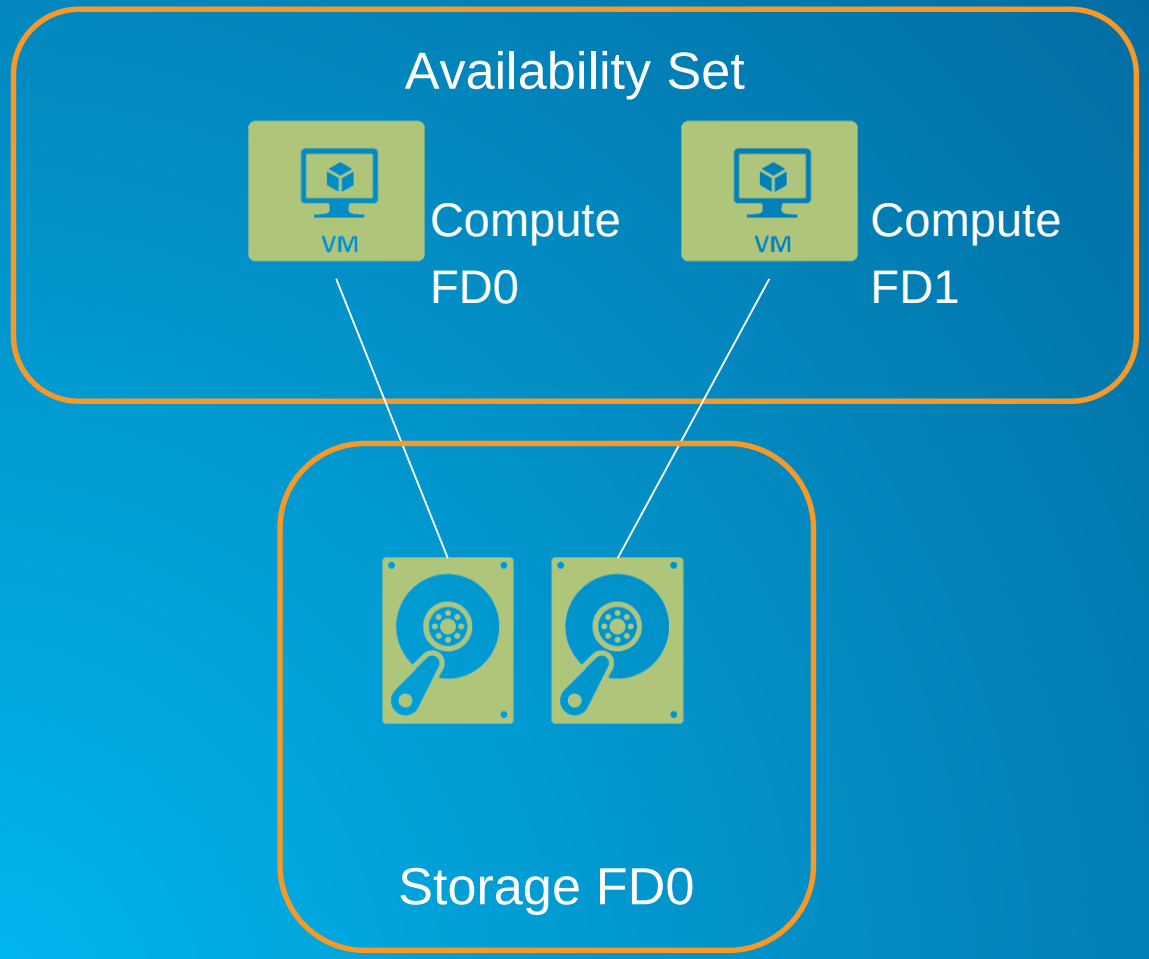


OS Disk

Data Disk

Unmanaged Disks

Physical View



Logical View

MyResourceGroup

Availability Set

VM Compute FD0

DiskUrl:
http://mydisks0../disk0.vhd

VM Compute FD1

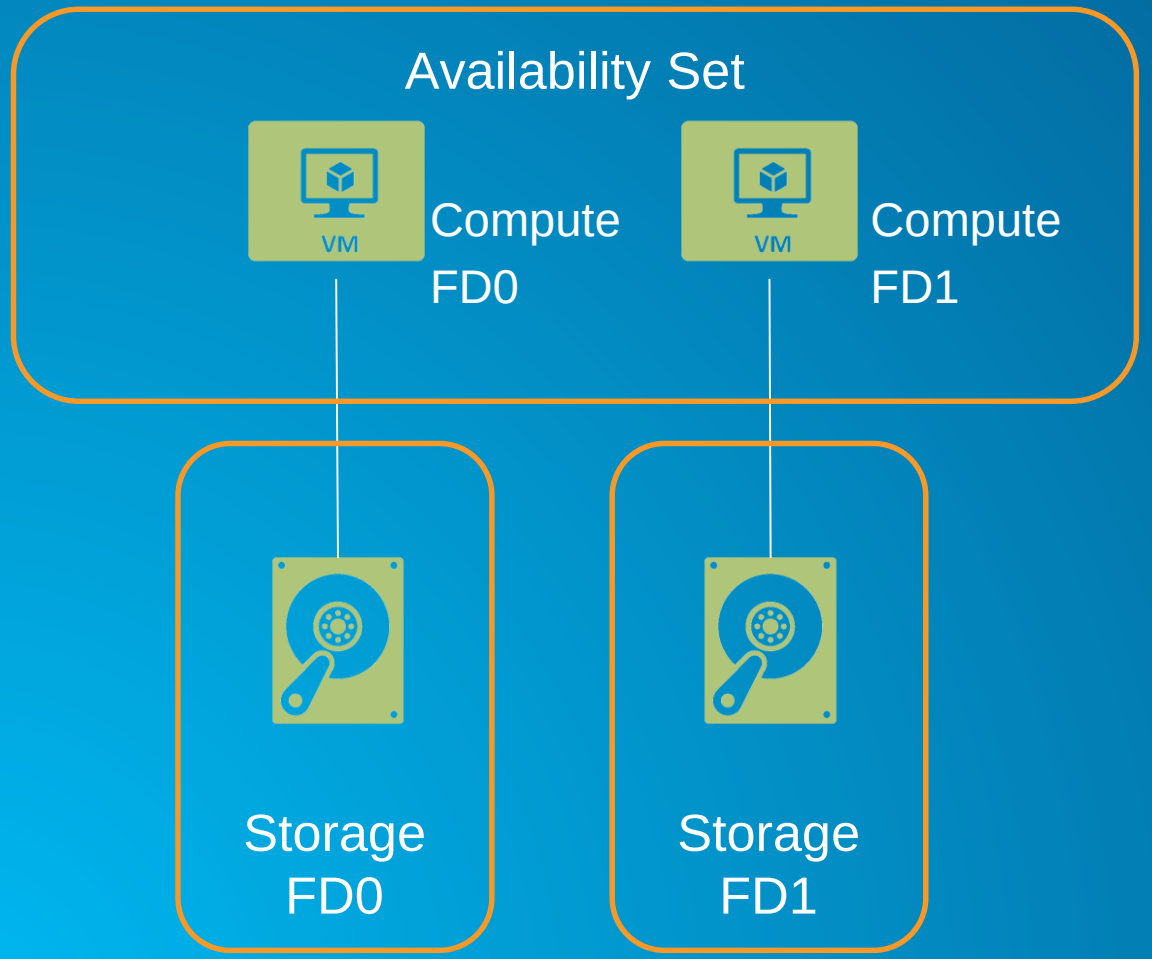
DiskUrl:
http://mydisk1.../disk1.vhd

Account Name:
mydisks0

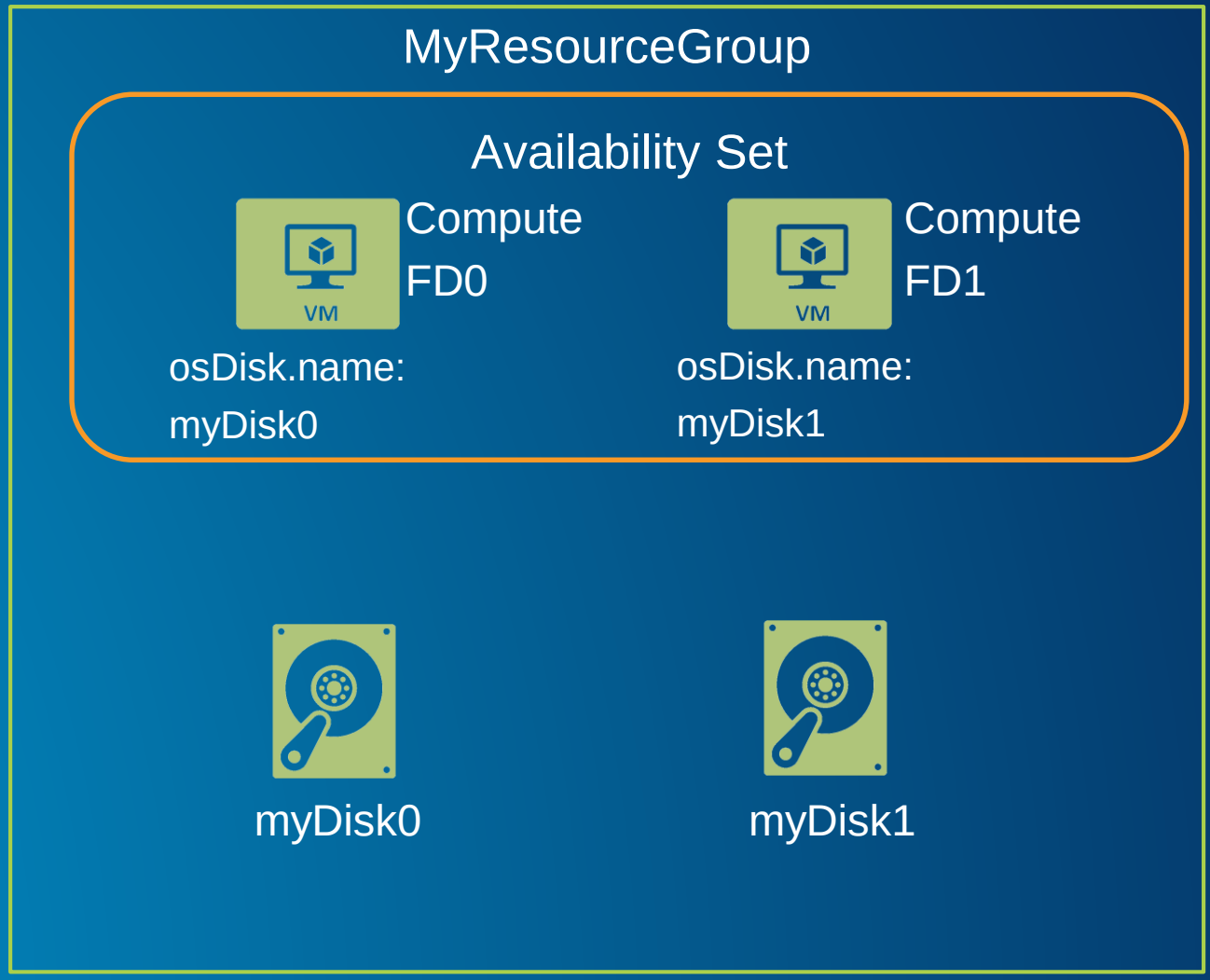
Account Name:
mydisks1

Managed Disks

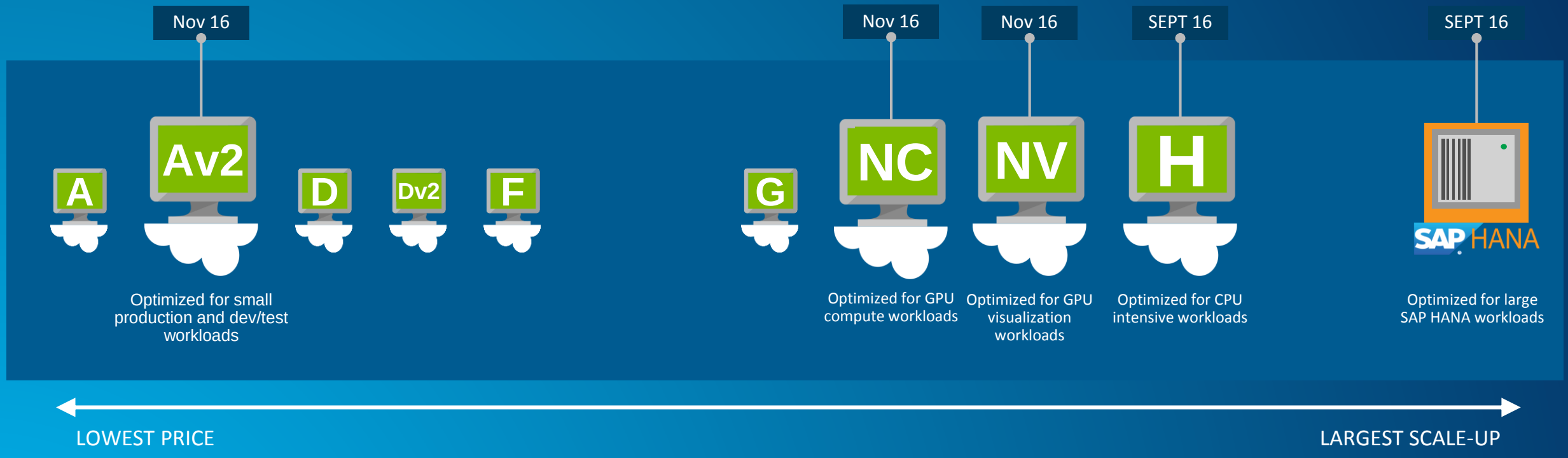
Physical View



Logical View

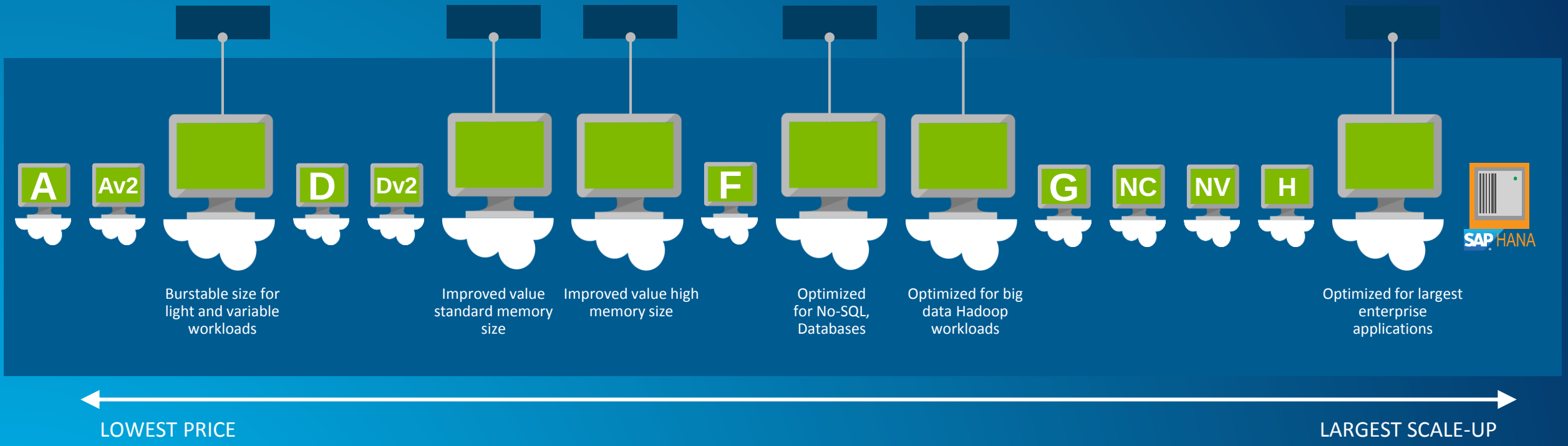


VM sizes added in last 6 months



Doubling the compute offerings in 2016

Next 6 months



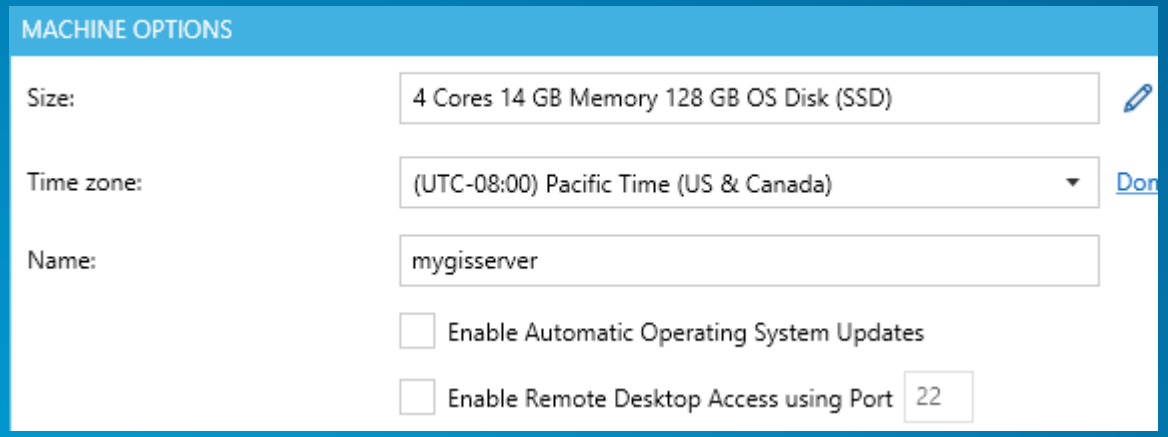
Continuing the growth in 2017

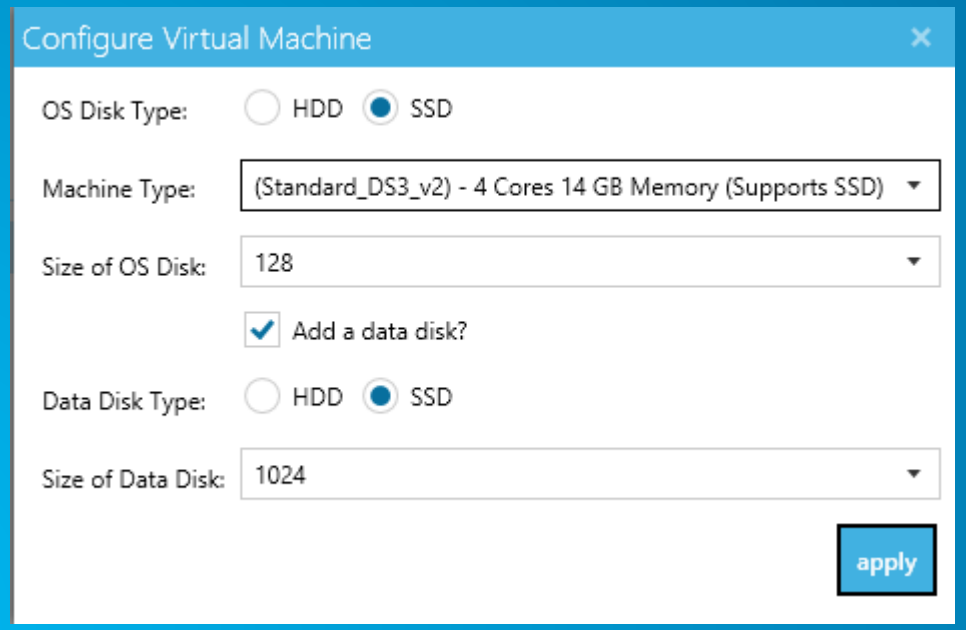
VM Size Availability by Region

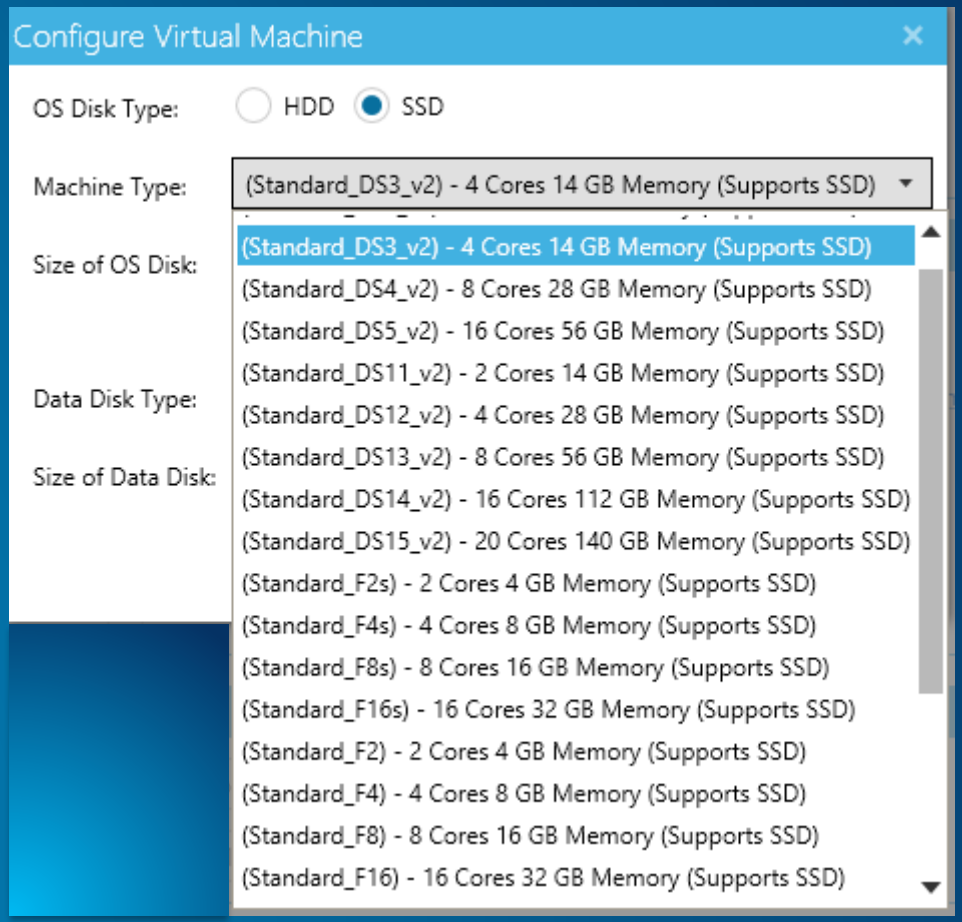
Americas | Europe | Asia Pacific

		United States								Azure Government				Canada		Brazil
PRODUCTS	GLOBAL	EAST US	EAST US 2	CENTRAL US	NORTH CENTRAL US	SOUTH CENTRAL US	WEST CENTRAL US	WEST US	WEST US 2	US GOV VIRGINIA	US GOV IOWA	US DOD EAST	US DOD CENTRAL	CANADA EAST	CANADA CENTRAL	BRAZIL SOUTH
COMPUTE																
Virtual Machines		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
A0 - A7		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Av2		●	●	●	●	●	●	●	●	●	●			●	●	●
A8 – A11 (Compute Intensive)		●			●	●		●	●							●
D-series		●	●	●	●	●		●		●						●
Dv2-series		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
DS-series		●	●	●	●	●		●		●						●
DSv2-series		●	●	●	●	●	●	●	●			●	●	●	●	●
F-series		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fs-series		●	●	●	●	●	●	●	●			●	●	●	●	●
G-series			●					●		●				●	●	
GS-series			●					●		●				●	●	
H-series		●			●	●		●								
NC-Series		●				●										

Managed Disks and Virtual Machine Size





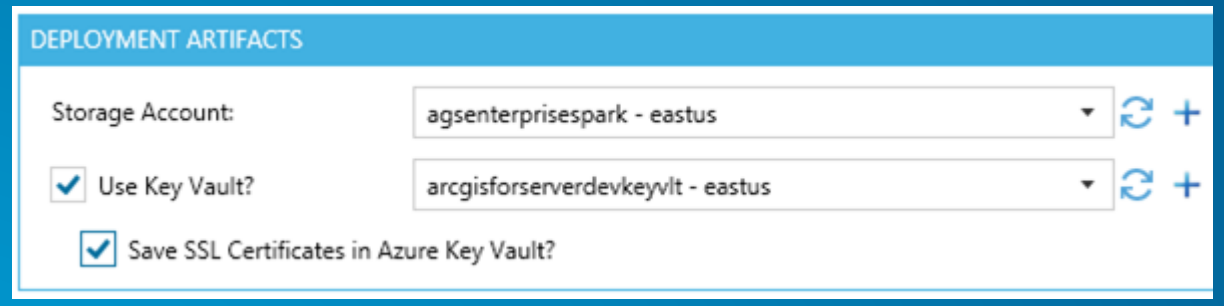


Key Vault

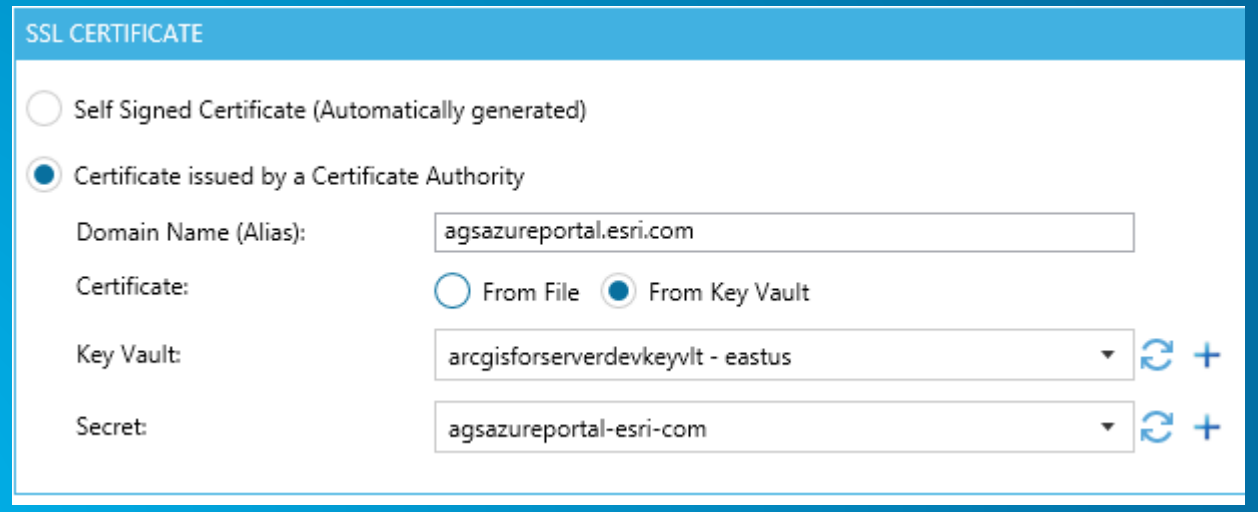
Secure Store for SSL Certificates

Key Vault Integration

- **Safeguard Certificates in Azure Key Vault**



- **SSL Certificate**

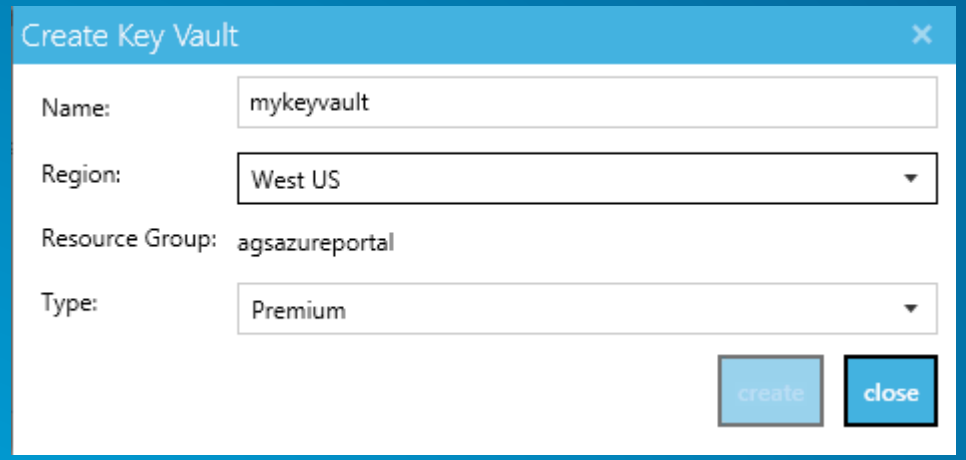


Azure Key Vault

SSL Certificates in Key Vault as Secrets

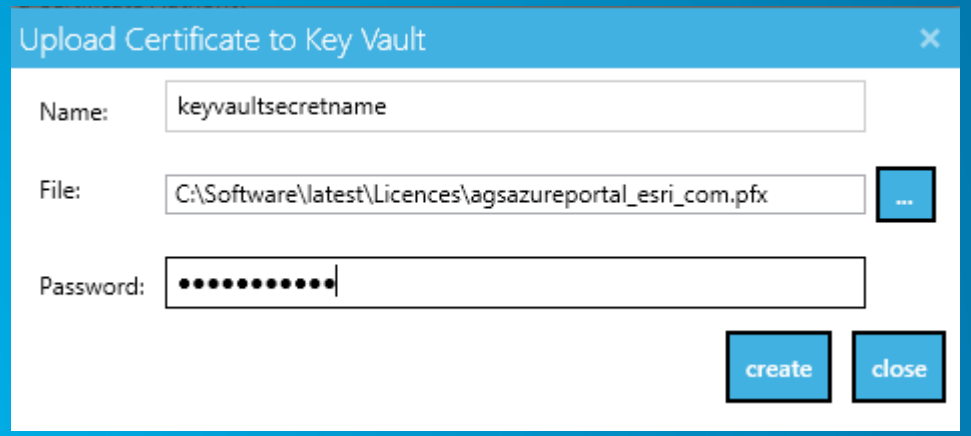
https://blogs.technet.microsoft.com/kv/2016/09/26/manage-certificates-via-azure-key-vault

- **Create Key Vault**



Azure Key Vault

- **SSL Certificate**



Digi Cert

GlobalSign

WoSign

Demo

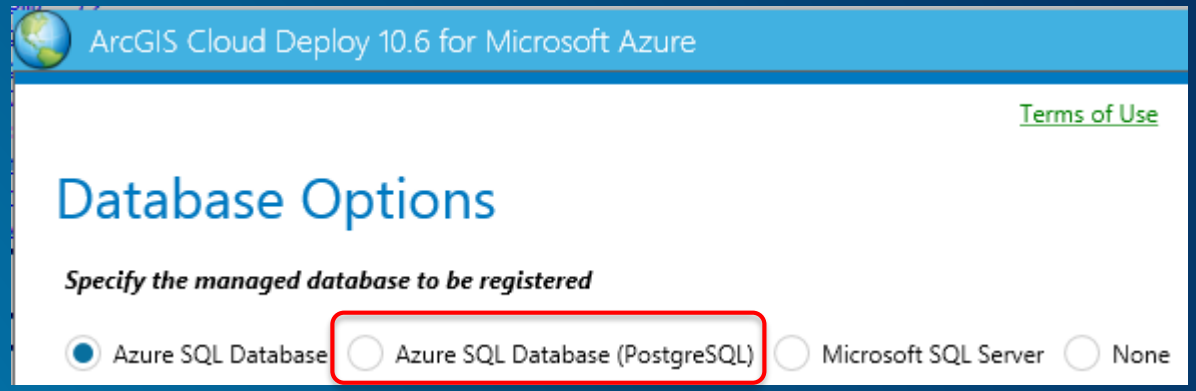
10.5.1 New Features

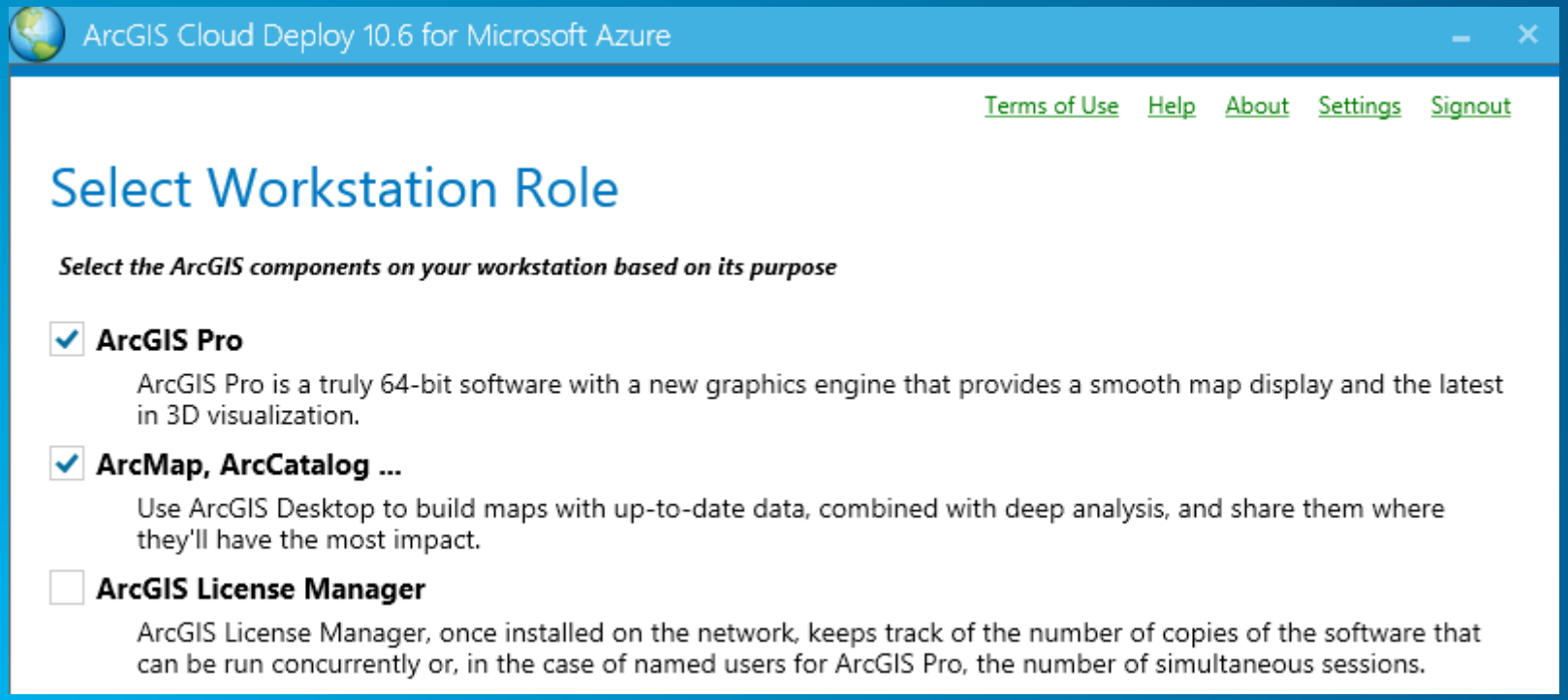
Sneak Peek

10.6

New Features

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





Disclaimer Subject to Change!

Deployment Options

Cloud Builder

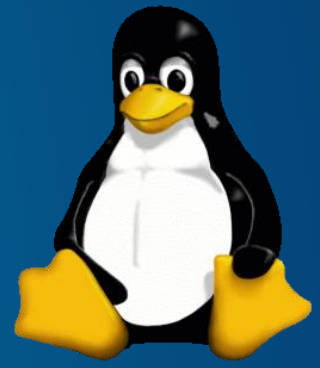
Visual Studio

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

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

Questions?

Understanding our world.