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
- Amazon Web Services
- IBM Cloud
- Microsoft Azure
- 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
ArcGIS Enterprise

Overview

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.
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 content
- ArcGIS Data Store - an optional component of ArcGIS designed to optimally store ArcGIS data
- GeoEvent Extension for Server - an optional component of ArcGIS to support the processing of real-time data

Esri provides the ArcGIS Enterprise Cloud Builder application to simplify desktop application. You can download it here. This VM requires you to have ArcGIS installed.
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.
Cloud Builder
Overview
Get Started!

ArcGIS Enterprise Cloud Builder helps you deploy ArcGIS Enterprise on Microsoft Azure. Click the sign in button to get started.

Server Role

Select the role for your site based on its purpose

- **ArcGIS Enterprise**
  A base ArcGIS Enterprise deployment consists of a combination of three primary components - Portal for ArcGIS, ArcGIS Server and ArcGIS Data Store - that together make up a Web GIS. This provides foundational mapping and analysis capabilities along with secure sharing, app infrastructure, and information management functionality.

- **GeoEvent Server**
  Used for enabling real-time event-based data streams to be integrated as data sources in your GIS. Event data can be filtered, processed, and sent to multiple destinations, allowing you to connect with virtually any type of streaming data, all in real-time. A GeoEvent Server is federated with Portal for ArcGIS.

- **GeoAnalytics Server**
  Used for performing distributed analytics on tabular and feature data. These distributed computing tools can analyze patterns and aggregate data in the context of both space and time. A GeoAnalytics Server must be federated with Portal for ArcGIS.

- **Image Server**
  Used for publishing image services for on-the-fly visualization and performing distributed analytics on raster data. An Image Server is federated with Portal for ArcGIS.

- **GIS Server**
  General Purpose deployment used for serving GIS resources such as map services, feature services, and geoprocessing services to your users.
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: machineadmin
Password: ********
Re-Enter password: ********

MACHINE OPTIONS

Size: D4.1xv2 (8 Cores 28 GB Memory)
TimeZone: (UTC-08:00) Pacific Time (US & Canada)
Name: arcgis
- Enable Automatic Operating System Updates
- Enable Remote Desktop Access using Port 3389

VIRTUAL NETWORK OPTIONS

Virtual Network: myVNET - eastus
Subnet: Subnet-1 - 10.0.0.0/24

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

Clients discover the GeoAnalytics Server from Portal.

Results from the GeoAnalytics Server are served by the hosting server.

Output from GeoAnalytics analysis is stored in the SpatioTemporal Data Store.

Performs multi-threaded analysis on vector data.

ArcGIS Server (GeoAnalytics)
GeoEvent Deployment

Output from GeoEvent analysis is stored in the SpatioTemporal Data Store.

Clients authenticate through Portal.

Serves historical record of geo-event data as feature services.
Image Server Deployment

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

Portal for ArcGIS
ArcGIS Server (Hosting Server)
ArcGIS Data Store

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

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

ArcGIS Server (GIS Server)

GIS Server Deployment

Portal for ArcGIS
ArcGIS Server (Hosting Server)
ArcGIS Data Store

Base Deployment

Clients discover services and authenticate.
ArcGIS Enterprise Sites

Portal for ArcGIS

Server Sites

Data Stores

ArcGIS GIS Server Site
ArcGIS Image Server Site
ArcGIS GeoEvent Server Site
ArcGIS GeoAnalytics Server Site

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)

- Multiple Tiers
  - ArcGIS Data Store
  - Hosting Server
  - Portal for ArcGIS
  - Reverse (Web) Proxy
Multi Tier Site Topology

- Load Balancer
- Public IP
- DNS Name

- Reverse (Web) Proxy
  - 80/443

- Hosting Server
  - 6080/6443

- Portal for ArcGIS
  - 7080/7443

- ArcGIS Data Store (Relational)
- ArcGIS Data Store (SpatioTemporal)

- File Share
Multi Tier Site Topology (Cloud Storage)

- Load Balancer
- Public IP
- DNS Name
- Reverse (Web) Proxy
- ILB
- Hosting Server
- ArcGIS Data Store (Relational)
- ArcGIS Data Store (SpatioTemporal)
- Portal for ArcGIS
- File Share
- Azure Storage
- 80/443
- 6080/6443
- 7080/7443
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
Under the hood
How Cloud Builder works
Two Responsibilities

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

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

- Distributed Configuration
  - WinRM
  - Powershell DSC

```
"commandToExecute": "powershell -ExecutionPolicy Unrestricted -file Configure-Deployment.ps1 -OperationId 8e779bfa -OperationName ConfigureDeployment -LogOutputFileUrl https://arcgisserverdeploy.blob.core.windows.net/esri-wksp-8e779bfa-9076-4001-acc5-72ab321368c9/Log-tmFileShare-00545S--Local\txtz\v-2016-95-31\""&"sr-bn&
"slg=WyfoneYXyF%2Bw2X02%2BUq1P1R6qzL6173wIlYoMCsWL7430D\"&
"ses=2017-03-00T05%3A54%3A38Z\"&"sp=sw -DebugMode"
```
4 Download Log File at end of Script Execution

- %TEMP% folder on Cloud Builder machine
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
Managed Disks
Machine Sizes
Anatomy of a Machine

Physical Machine

Virtual Machine

CPU

OS Disk

Data Disk

Network Interface
Physical View

- Availability Set
  - Compute FD0
  - Compute FD1
  - Storage FD0

Logical View

MyResourceGroup

- Availability Set
  - Compute FD0
    - DiskUrl: http://mydisks0../disk0.vhd
    - Account Name: mydisks0
  - Compute FD1
    - DiskUrl: http://mydisk1.../disk1.vhd
    - Account Name: mydisks1
VM sizes added in last 6 months

Av2

Nov 16

Optimized for small production and dev/test workloads

D

Dv2

F

NC

Nov 16

Optimized for GPU compute workloads

NV

Nov 16

Optimized for GPU visualization workloads

H

SEPT 16

Optimized for CPU intensive workloads

SAP HANA

SEPT 16

Optimized for large SAP HANA workloads

LOWEST PRICE

LARGEST SCALE-UP

Doubling the compute offerings in 2016
Next 6 months

- A Av2: Burstable size for light and variable workloads
- D Dv2: Improved value standard memory size
- F: Improved value high memory size
- G: Optimized for No-SQL, Databases
- NC: Optimized for big data Hadoop workloads
- NV H: Optimized for largest enterprise applications

Continuing the growth in 2017

LOWEST PRICE  
LARGEST SCALE-UP
## VM Size Availability by Region

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>Americas</th>
<th>Europe</th>
<th>Asia Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>United States</td>
<td>Azure Government</td>
<td>Canada</td>
</tr>
<tr>
<td><strong>COMPUTE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Virtual Machines           | ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● }
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)
- **Name:** myglosserver
  - 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 GB
- **Add a data disk?**
- **Data Disk Type:** HDD, SSD
- **Size of Data Disk:** 1024 GB

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

- SSL Certificate
SSL Certificates in Key Vault as Secrets

- Create Key Vault

Create Key Vault

Name: mykeyvault
Region: West US
Resource Group: azureportal
Type: Premium

- SSL Certificate

Upload Certificate to Key Vault

Name: keyvaultsecretname
File: C:\Software\test\Licenses\azureportal_esi_com.pfx
Password: ************
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
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?