Deploying and Using ArcGIS Enterprise in the Cloud

Chris Woodside, Justin Turco

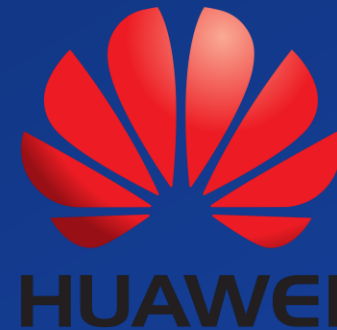2020 ESRI FEDERAL GIS CONFERENCE | WASHINGTON, D.C.

Quick Survey

- Your role in your organization

- Already a cloud user

- Running Esri deployment on AWS

- Running Esri deployment on Azure

- Consider yourself knowledgeable of AWS and/or Azure

ArcGIS Enterprise Support for Cloud Providers

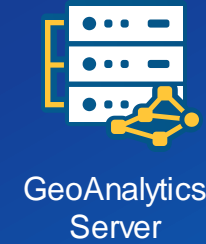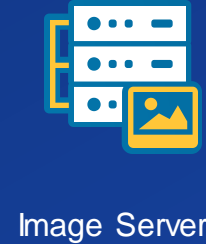# ArcGIS Enterprise Special Tooling

Cloud deployments

Amazon Web Services

Microsoft Azure

ArcGIS Enterprise

Portal

GIS Server	Image Server
GeoEvent Server	GeoAnalytics Server

Data Store   Data Store

ArcGIS Enterprise = ArcGIS Web Adaptor + Portal for ArcGIS + ArcGIS Server + ArcGIS Data Store

GIS Server   Image Server   GeoEvent Server   GeoAnalytics Server   ArcGIS Spatiotemporal Big Data Store
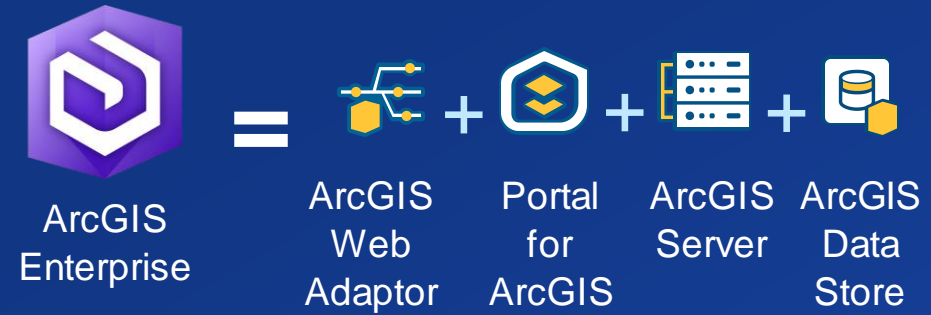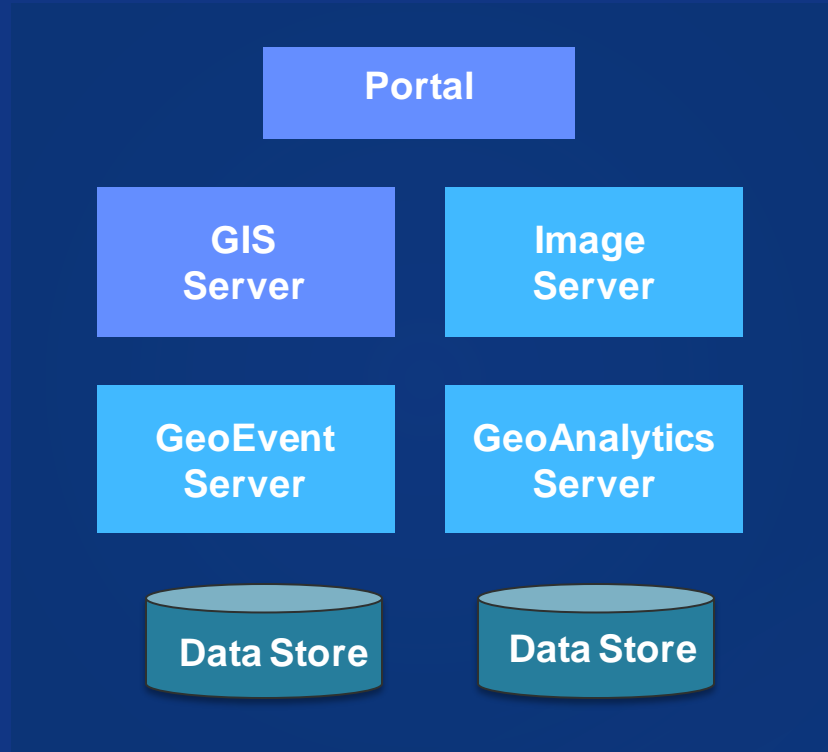
Before Starting

On-premise	AWS / Azure
Esri authorization files	Esri authorization files
Domain_name for your application	Domain_name for your application
SSL Certificate for your domain	SSL Certificate for your domain
Esri software setups	Azure/AWS Account and IAM roles
Infrastructure	
Machines/VMs/Networks	
Web Servers and/or Load Balancer	
File Server	
Data storage/Database	
......	

Start Deployment

On-premise	AWS / Azure

Some knowledge about your infrastructure
 	
Manually run setups/configurations on all
 	
machines, or
 	
Deployment automation
	Some knowledge about Azure/AWS
	
	AWS
	
	   • Esri CloudFormation template
	   • One deployment for different patterns
	   • Scripting tools, python or powershell
	   • Esri ArcGIS Cloud Builder CLI for AWS (10.6)
	   • Customization with AMIs/CF Templates
	
	Azure
	
	   • ArcGIS Enterprise Cloud Builder for Azure
	   • ARM Templates
	   • DSC Automation

Deploying on ArcGIS Enteprises in the cloud is a lot like building a house….

You can build everything from scratch...

You customize ...

Manual

- Our images (AMIs) or yours
- Most flexible
- Can automate using Chef or Powershell DSC
- Most work

Cloud Formation Templates / ARM Templates

- Our images or customizations of our images
- Full automation through AWS / Azure console using templates
- Many, but not all architectures
- Can customize template

Cloud Builder

- Easiest
- Our images
- Full automation through Esri tool
- Common architectures, including high availability

ArcGIS Enterprise Offerings

Azure

Getting Started

- Get an Azure subscription
  - https://azure.com

- Get ArcGIS Enterprise software license
  - https://accounts.esri.com

- Get ArcGIS Enterprise Cloud Builder (one-click application)
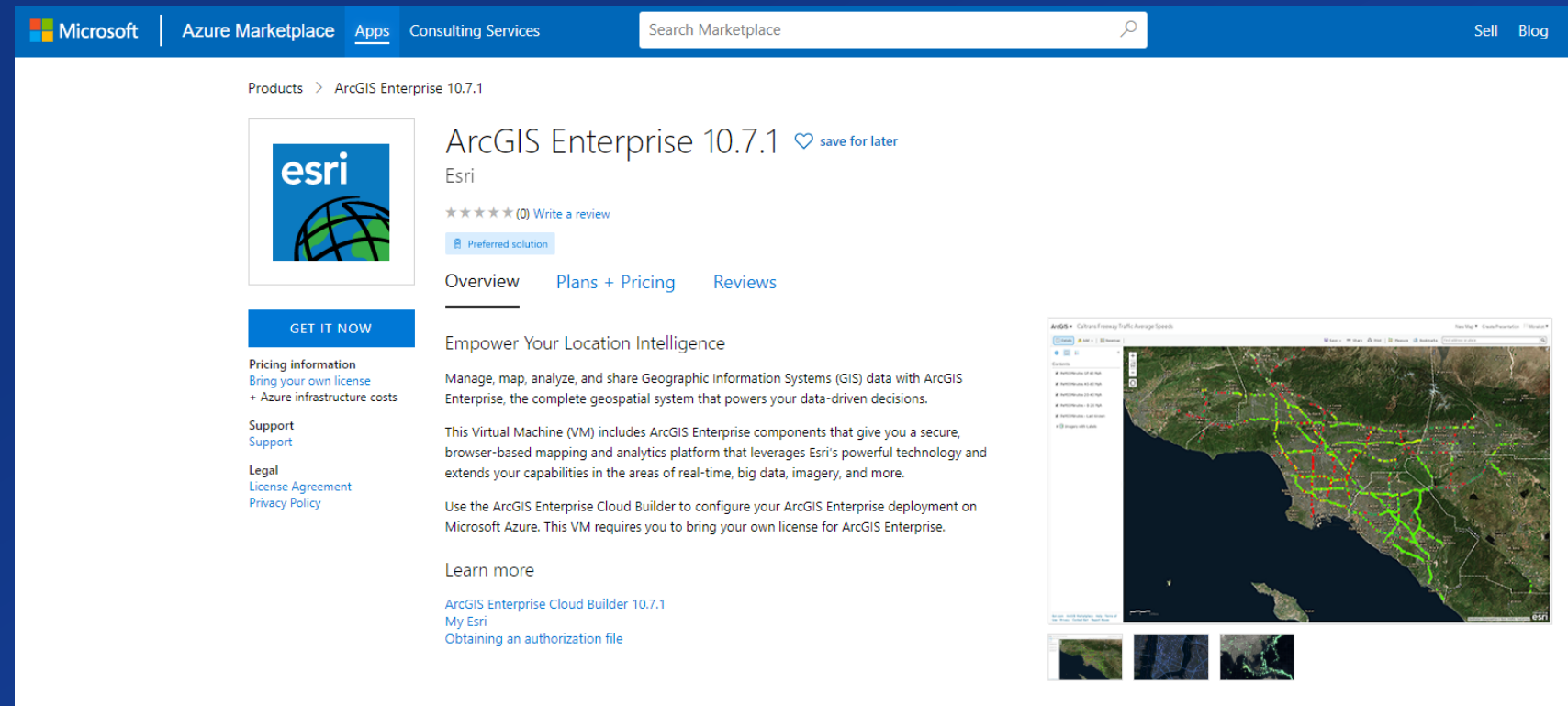 - http://links.esri.com/azure/azure-cb-download

How do we deploy ArcGIS Enterprise on Azure?

- Ready to use Virtual Machine Images
  - Public Azure
  - U.S. Government Cloud

- Approaches
  - Deployment Tools
    - Cloud Builder
    - Automation
  - Manual

ArcGIS Enterprise Cloud Builder for Microsoft Azure

- What is it?
  - Deployment tool

- Easy to deploy and manage
  - # Machines
  - DB's
  - SSL Certificates
  - Upgrades

ArcGIS Enterprise Cloud Builder 10.7.1 for Microsoft Azure

Terms of Use Help About Settings

Get Started!

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

[sign in to azure]

☐ U.S. Government Cloud

ArcGIS Enterprise Cloud Builder 10.7.1 for Microsoft Azure

Terms of Use Help About Settings Signout

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.

○ **Notebook Server**
Used to host and run ArcGIS Notebooks, which offer a full Python data science platform in your ArcGIS Enterprise portal. ArcGIS Notebook Server uses Docker containers to provide each notebook author with an isolated workspace.

○ **GIS Server**
General Purpose deployment used for serving GIS resources such as map services, feature services, and geoprocessing services to your users.

[back] [next] [cancel]

Deployed On:-	8 Nov 2018 02:54
Version:-	10.6.1
Role:-	ArcGIS Enterprise

Portal URL:- http://oiesri.eastus.cloudapp.azure.com/portal/home/

Manager URL:- https://oiesri.eastus.cloudapp.azure.com/server/manager/

Upgrade Deployment

https://links.esri.com/azure/1071/cb-download

Cloud Builder

- Desktop application for Windows

- Wizard Driven Experience
  - Deployment
  - Post Deployment

- Configure Azure native features
  - Azure Managed Databases
  - Azure Key Vault
  - Azure Blob Storage
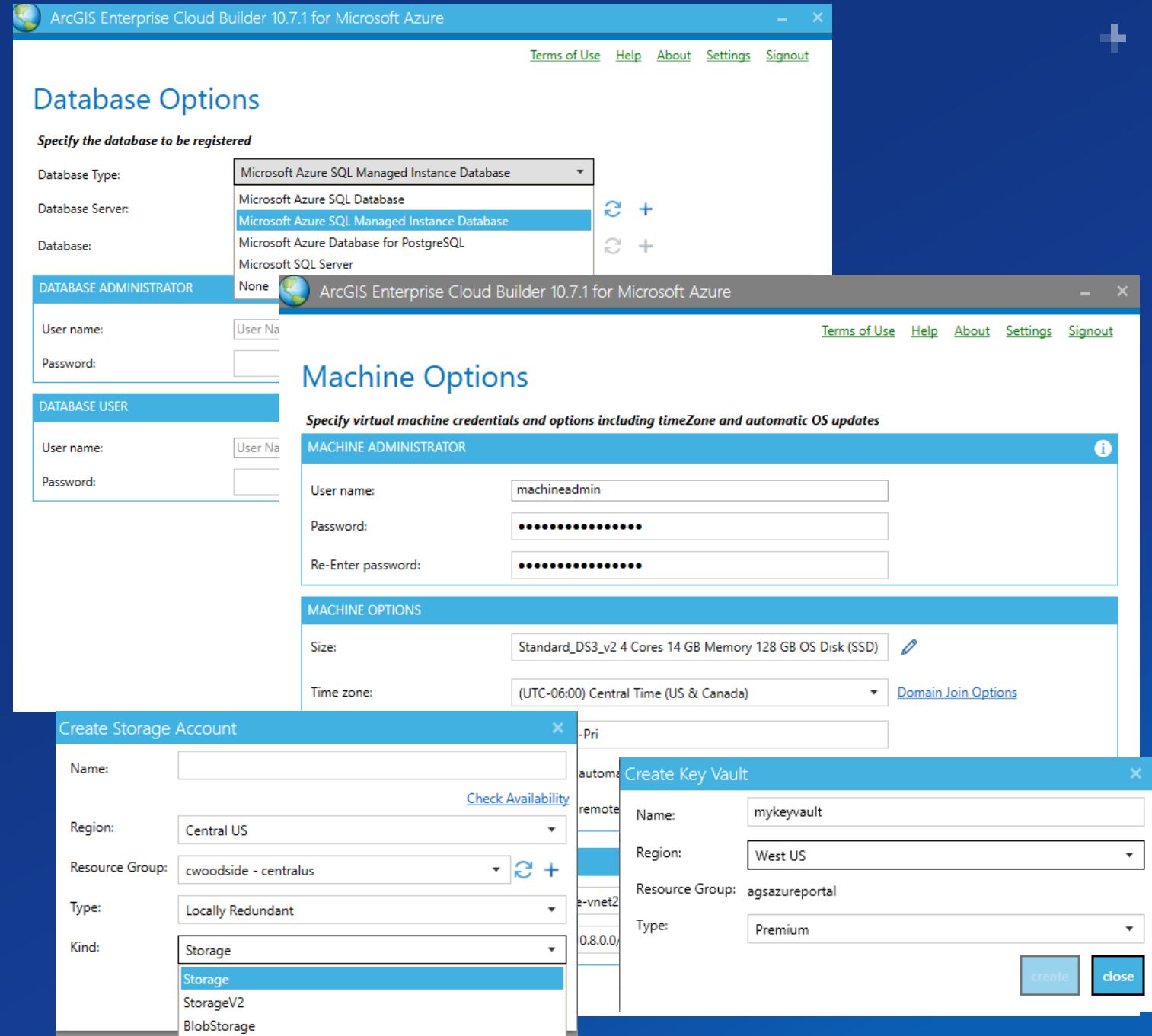
Deployment Options

Single Machine

Multiple Machines

Single Tier (All in One)

Multiple Tiers

Portal for ArcGIS

Hosting Server

Reverse Proxy

ArcGIS Data Store

Storage Options

File Share

Azure Blobs + Tables

Azure Files (SMB)

Why it's a big deal | 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

Other Automation options

- Cloud builder is great, but what else?

ARM templates

- Designer to generate automation artifacts

Generate Automation Artifacts

File: `Path to output file`

Options:
- ☑ Visual Studio Deployment Project
- ☑ PowerShell Scripts
- ☑ Cross Platform CLI Scripts

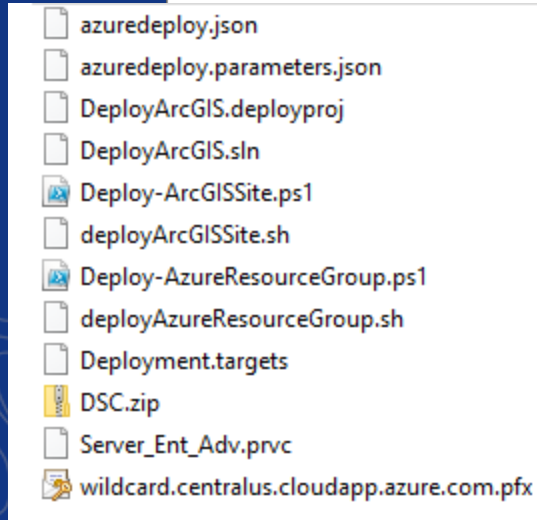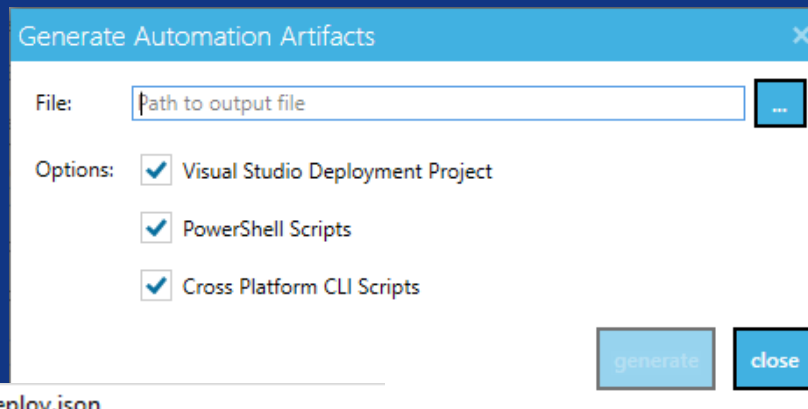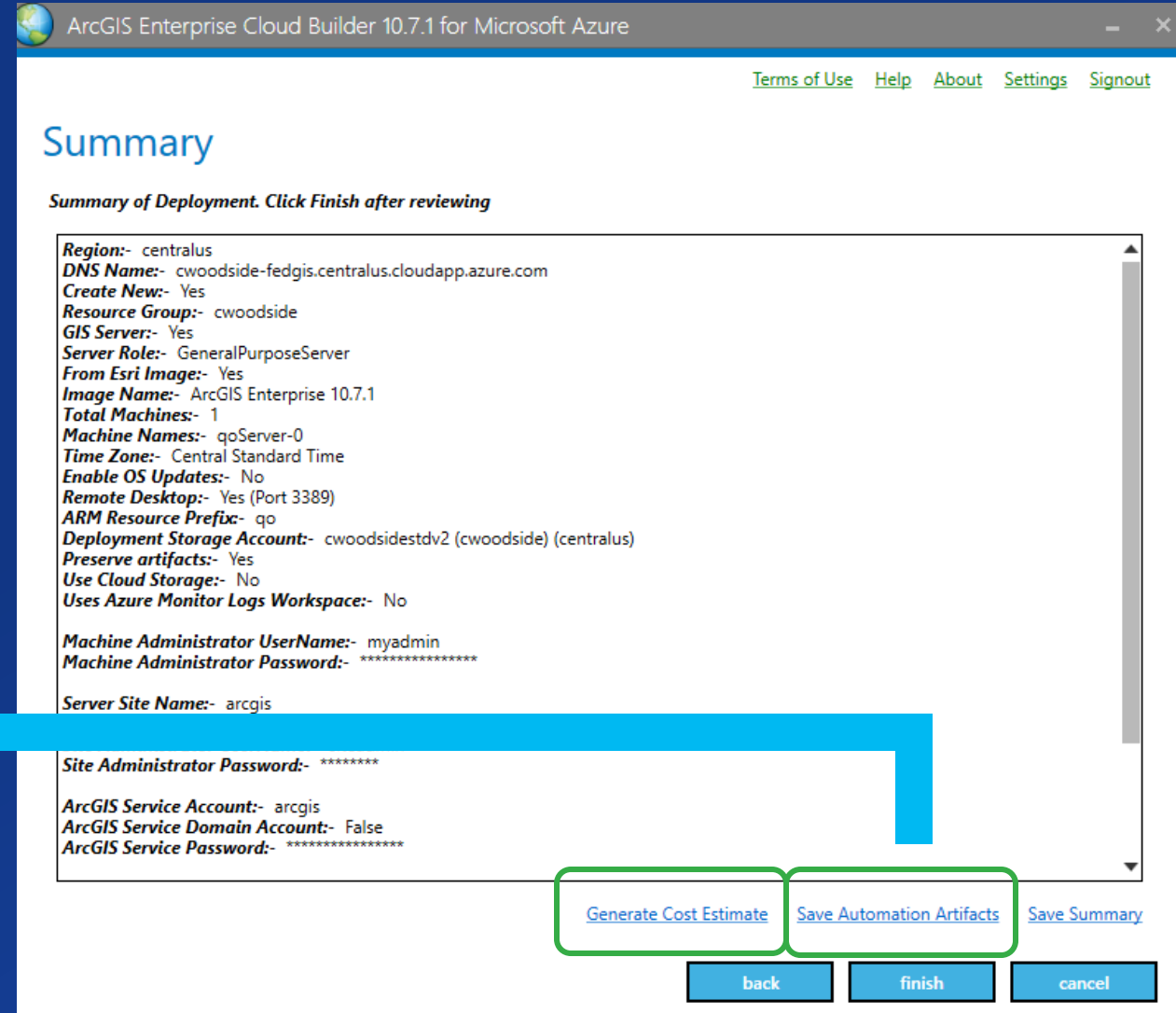[generate] [close]

Files:
- azuredeploy.json
- azuredeploy.parameters.json
- DeployArcGIS.deployproj
- DeployArcGIS.sln
- Deploy-ArcGISSite.ps1
- deployArcGISSite.sh
- Deploy-AzureResourceGroup.ps1
- deployAzureResourceGroup.sh
- Deployment.targets
- DSC.zip
- Server_Ent_Adv.prvc
- wildcard.centralus.cloudapp.azure.com.pfx

- **Template Parameters**
- **Automation**
- **Licenses**
- **SSL Certificate**

ArcGIS Enterprise Cloud Builder 10.7.1 for Microsoft Azure

Terms of Use   Help   About   Settings   Signout

Summary

Summary of Deployment. Click Finish after reviewing

```
Region:-  centralus
DNS Name:-  cwoodside-fedgis.centralus.cloudapp.azure.com
Create New:-  Yes
Resource Group:-  cwoodside
GIS Server:-  Yes
Server Role:-  GeneralPurposeServer
From Esri Image:-  Yes
Image Name:-  ArcGIS Enterprise 10.7.1
Total Machines:-  1
Machine Names:-  qoServer-0
Time Zone:-  Central Standard Time
Enable OS Updates:-  No
Remote Desktop:-  Yes (Port 3389)
ARM Resource Prefix:-  qo
Deployment Storage Account:-  cwoodsidestdv2 (cwoodside) (centralus)
Preserve artifacts:-  Yes
Use Cloud Storage:-  No
Uses Azure Monitor Logs Workspace:-  No

Machine Administrator UserName:-  myadmin
Machine Administrator Password:-  ****************

Server Site Name:-  arcgis


Site Administrator Password:-  ********

ArcGIS Service Account:-  arcgis
ArcGIS Service Domain Account:-  False
ArcGIS Service Password:-  ****************
```

Generate Cost Estimate   Save Automation Artifacts   Save Summary

[back]   [finish]   [cancel]

Deploying ARM templates

Deploy using Azure PowerShell for '...

If you have not already done so, install Azure PowerShell for Windows

1. Open a PowerShell console and browse to your extracted automatio...

2. Run the `Deploy-ArcGISSite.ps1` script.

3. If prompted, log in to Microsoft Azure. Once authenticated, the deplo...
you previously provided in ArcGIS Enterprise Cloud Builder for Micro...
identical deployment.

Artifact file path	Artifact description
`azuredeploy.json`	An Azure Resource Manager (ARM) template that models the entire deployment as run by the Cloud Builder.
`azuredeploy.parameters.json`	An ARM template parameters file populated with the values you specified in the Cloud Builder wizard.
`DSC.zip`	Automation artifacts used to configure ArcGIS components on the virtual machine.
`<licenses>.prvc`	License files for your ArcGIS Server and (optionally) Portal for ArcGIS specified during the Cloud Builder setup.
`<sslCertificate>.pfx`	The SSL certificate (CA-signed or self-signed) specified during the Cloud Builder setup. If using a self-signed certificate, a wildcard certificate is generated with the name `wildcard_<region>_cloudapp_azure_com.pfx` for use in any deployment within the specified Azure region.
`Deploy-AzureResourceGroup.ps1`	An entry point script for automation used by Visual Studio and PowerShell.

- Visual Studio
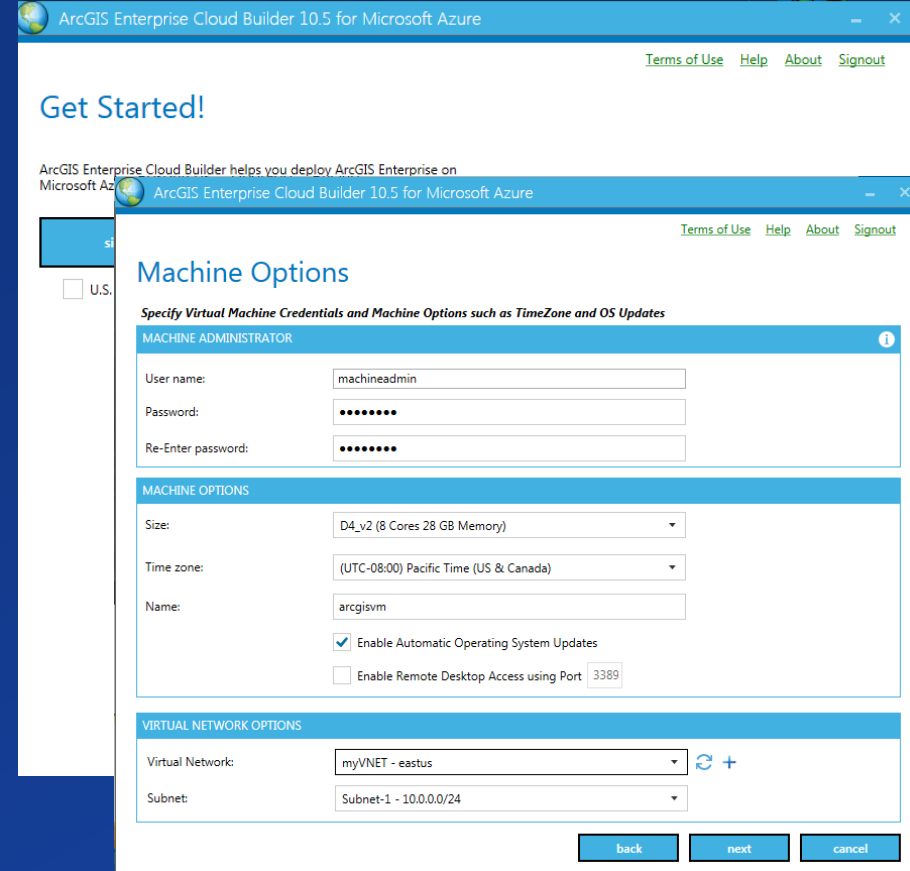- PowerShell
- CLI on Bash

Packer templates on github | New at 10.7.1

- Build Custom Virtual Machine Images
- Industry Standard Packer (HashiCorp) technology

Follow these instructions to create a custom Microsoft Azure image to deploy ArcGIS Enterprise on Microsoft Azure.

Azure Image - Packer Build Scripts

1. **Create an Azure resource group** - During the build process, Packer creates temporary Azure resources as it builds the source virtual machine (VM). To capture that source VM for use as an image, you must define a resource group. The output from the Packer build process is stored in this resource group.

Create a resource group with New-AzResourceGroup Cmdlet found in Azure Az Powershell Module. The following example creates a resource group named myResourceGroup in the East US location:

```
New-AzResourceGroup -Name "mypackerGroup" -Location "East US"
```

To create the same resource group in the same location using Azure CLI, type the following:

```
az group create -l eastus -n "mypackerGroup"
```

For an example of creating a resource group using Azure Portal, see this Juniper article.

2. **Create Azure credentials** - Packer authenticates with Azure using a service principal. An Azure service principal is a security identity that you can use with apps, services, and automation tools like Packer. You control and define the permissions as to what operations the service principal can perform in Azure. Create a service principal with New-AzADServicePrincipal and assign permissions for the service principal to create and manage resources with New-AzRoleAssignment. The value for -DisplayName needs to be unique; replace with your own value.

```
$sp = New-AzADServicePrincipal -DisplayName "PackerServicePrincipal"
$BSTR = [System.Runtime.InteropServices.Marshal]::SecureStringToBSTR($sp.Secret)
$plainPassword = [System.Runtime.InteropServices.Marshal]::PtrToStringAuto($BSTR)
New-AzRoleAssignment -RoleDefinitionName Contributor -ServicePrincipalName $sp.ApplicationId
```

9. **Run Packer build** - Open a Windows command line on the machine where Packer is installed, change directories to the Azure/Windows folder in the directory where you cloned the ArcGIS Packer repository, and run the following:

```
packer build -var-file=packer-parameters.json ArcGIS_Azure_Image_Build.json
```

Once the Packer template executes successfully, you can access the image you created using a URL in the following format:

```
https://<Azure_StorageAccountName>.blob.core.windows.net/system/Microsoft.Compute/Images/<Azu
```

You can use this URL in the ArcGIS Enterprise Cloud Builder for Microsoft Azure.

https://github.com/Esri/arcgis-packer

Manual approach

- IT Policies
  - No Public IP addresses
 - Public Images
- Architectural differences
- Linux deployments

Install ArcGIS Enterprise Cloud Builder for Microsoft Azure

ArcGIS 10.7 | Other versions ˅

ArcGIS Enterprise Cloud Builder for Microsoft Azure is an application you install on your local Windows machine to deploy ArcGIS Enterprise and stand-alone ArcGIS Server sites on Microsoft Azure. It helps you to extend your Azure implementation to include ArcGIS.

Cloud Builder

Demo
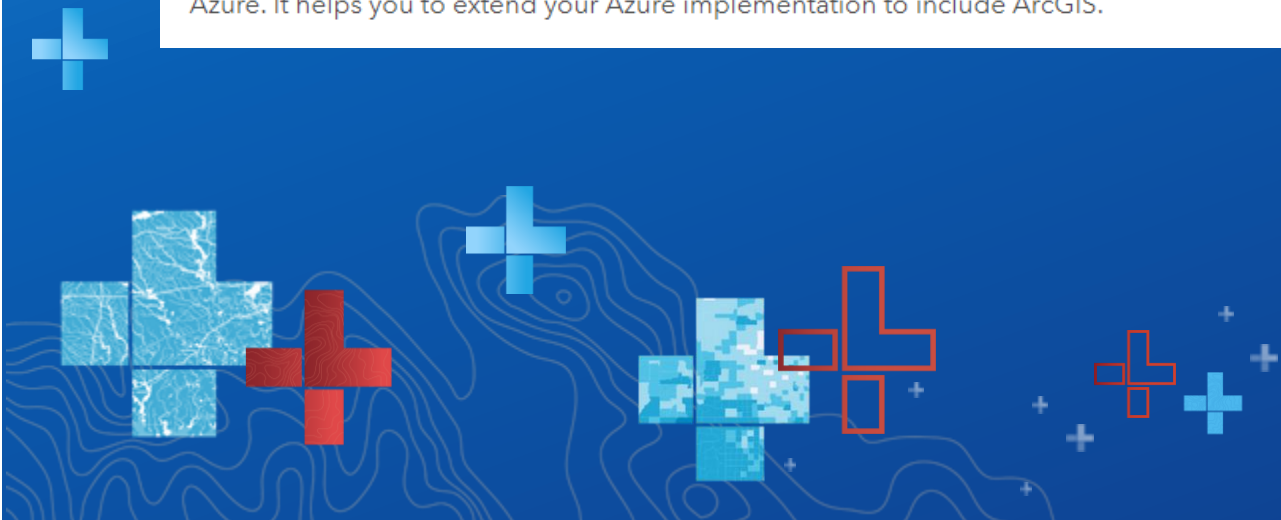
Under the hood

How Cloud Builder Works

Two Responsibilities

- Provision Infrastructure Resources
  - Azure Resource Manager (ARM) API

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)

① Provision Azure Infrastructure Resources

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

AVAILABILITY SET		
☐ ouAvailabilitySet-BaseDeployment		Availability set
☐ ouAvailabilitySet-SpatiotemporalDataStore		Availability set
DISK		
☐ devsummitsm-OSDisk		Disk
☐ ouSpatioT-0-DataDisk		Disk
☐ ouSpatioT-0-OSDisk		Disk
☐ ouSpatioT-1-DataDisk		Disk
☐ ouSpatioT-1-OSDisk		Disk
☐ ouSpatioT-2-DataDisk		Disk
☐ ouSpatioT-2-OSDisk		Disk
LOAD BALANCER		
☐ ouLoadBalancer		Load balancer
NETWORK INTERFACE		
☐ devsummitsm-nic		Network interface
☐ ouSpatioT-0-nic		Network interface
☐ ouSpatioT-1-nic		Network interface
☐ ouSpatioT-2-nic		Network interface
VIRTUAL MACHINE		
☐ devsummitsm		Virtual machine

② Stage Deployment Artifacts

- SSL Certificate
  - Certificate.pfx

- Automation Code
  - DSC.zip

- License
  - License.prvc
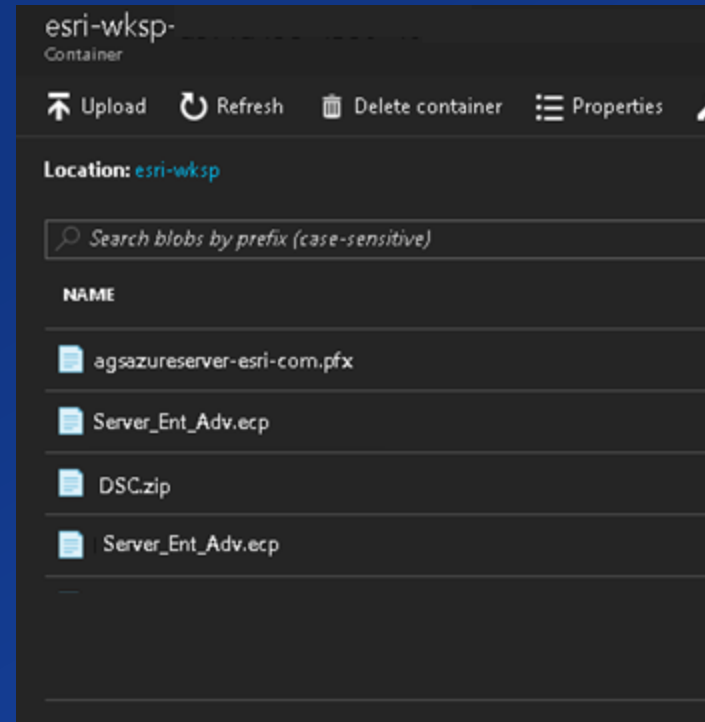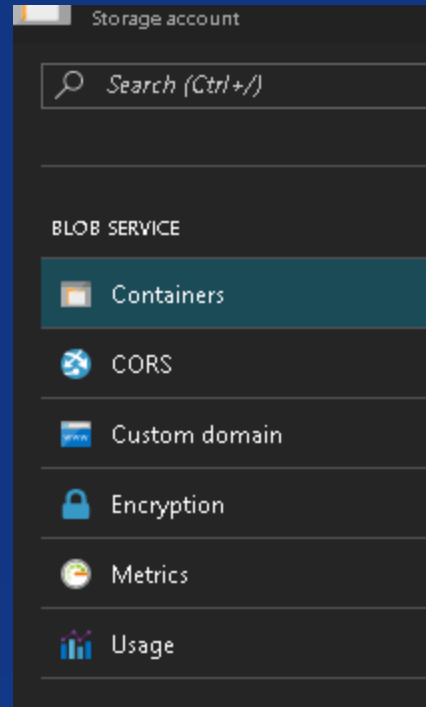
3 Trigger Deployment using ARM Template

az group deployment create --name $deploymentName --resource-group $resourceGroupName --template-file 'azuredeploy.json' --parameters $paramsFile

New-AzureRmResourceGroupDeployment –Name $deploymentName -ResourceGroupName $ResourceGroupName -TemplateFile $TemplateFile -TemplateParameterFile $TemplateParametersFile

Deployment Architecture Changes | New at 10.8

- Single hostname (endpoint) for Web GIS Deployments
  - Azure Application Gateway (Layer 7 Load Balancer)
  - Ability to use Web Application Firewall (WAF)
- Support for deployments accessible using a Private IP
- Able to deploy Tile Cache Data Store on separate tier of machines
  - Couch DB deployment changes at 10.8

Deployment Concepts | Conceptual Software Architecture
V1
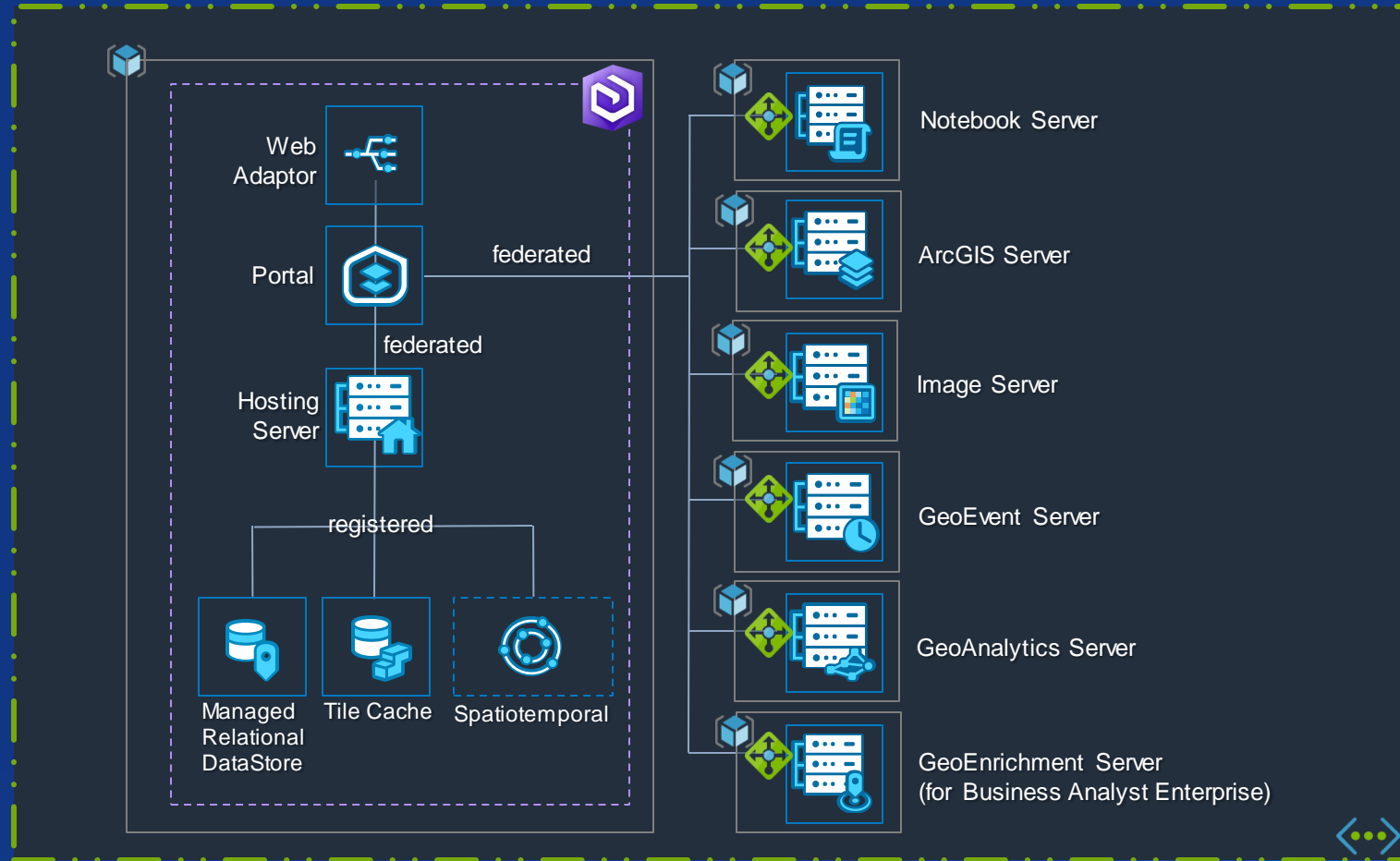
ALL federated ArcGIS Server Roles
- Fully qualified domain name (FQDN)

Deployment Concepts | Conceptual Software Architecture
V2

ALL federated ArcGIS Server Roles
- **Single (FQDN)**
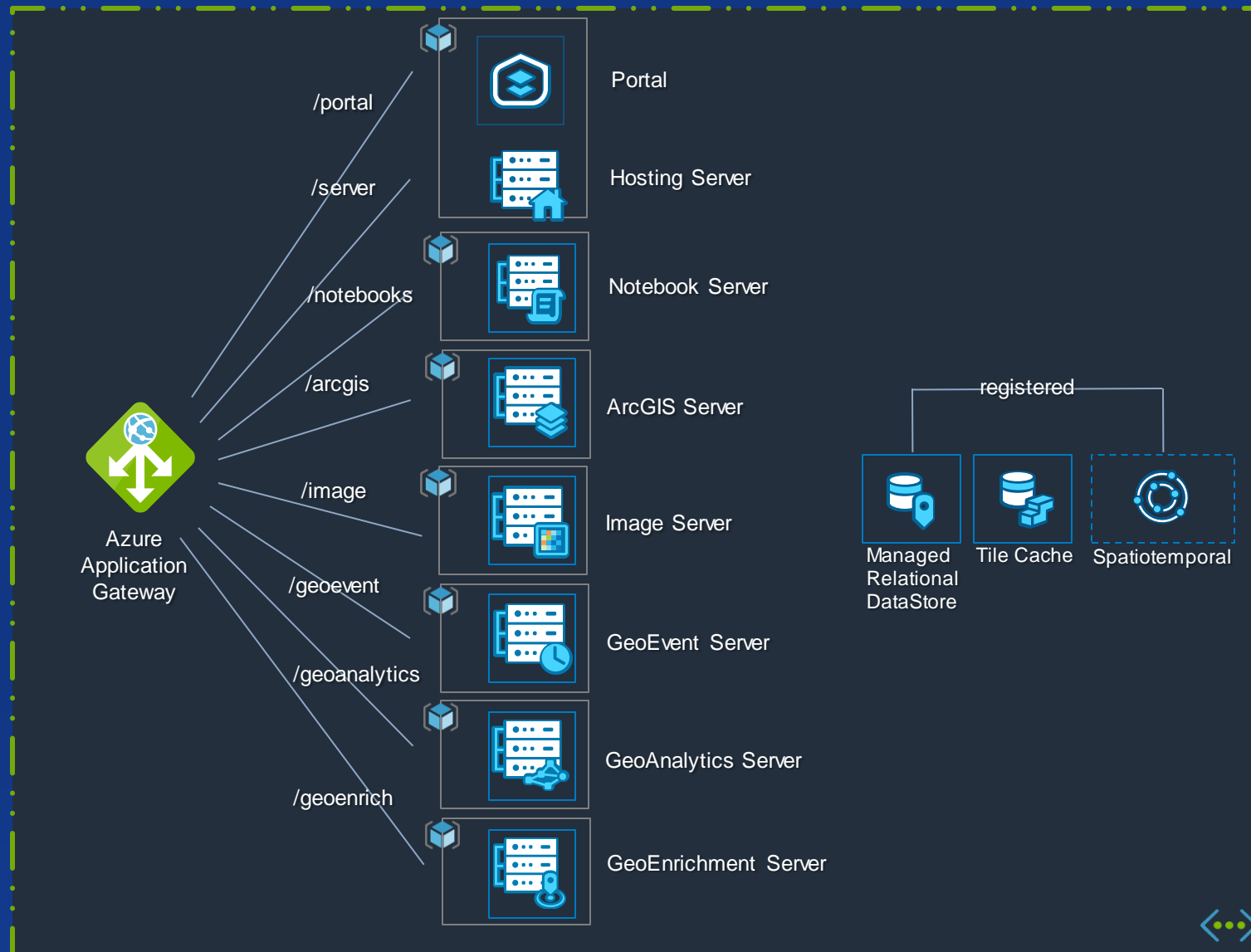
ArcGIS Enterprise Offerings

AWS

Users want this...

Cloud Formation Templates

Cloud Builder

...but are forced, due to compliance reasons, to use this….

Manual

Private Image Build Demo

aws marketplace

Categories ▼   Delivery Methods ▼   Solutions ▼   Migration Mapping Assistant   Your Saved List   Partners   Sell in AWS Marketplace   Amazo

esri

Esri ArcGIS Enterprise 10.6.1 on Windows (Jan 2019)

Continue to Launch

You must first configure the software.

Choose a fulfillment option below to select how you wish to deploy the software, then enter the information required to configure the deployment.

Fulfillment Option

Private Amazon Machine Image ▼

Private Amazon Machine Image
Deploy or build a private Amazon Machine Image (AMI) by installing software on your own image

ArcGIS Enterprise 10.6.1 ▼

Software Version

10.6.1 (Patched Jan 2019) (Ap ▼

Fulfillment Option ID: fo-3ybeua3a3dscu
Supported Operating System: WIN2016 v2016 Base, WIN2012 v2012 Base

This is an estimate of typical software and infrastructure costs based on your configuration. Your actual charges for each statement period may differ from this estimate.

Software Pricing

Esri ArcGIS $0/hr
Enterprise 10.6.1
on Windows (Jan
2019)
BYOL
running on
m5.xlarge

Infrastructure Pricing

EC2:   1 * m5.xlarge

Monthly Estimate: $138.00/month

Private Image

Choose a region to launch an existing private image or build a new private image in that region.

1. Choose a region

Select a region where you want to retrieve or create a private image.

US East (N. Virginia) ▼

esri

Esri ArcGIS Enterprise 10.6.1 on Windows (Jan 2019)

Continue to Launch

You must first configure the software.

1. Choose a region

Select a region where you want to retrieve or create a private image.

US East (N. Virginia) ▾

2. Choose a private image to launch

Create a new private image or select an available image from the table below.

Create New Private Image

Any new private images you create here will be saved as AMIs to your AWS account, they will be available on your EC2 console under AMIs **Owned by me**. Please consult the Private Image Build documentation ⧉ for more information.

Technical requirements

Chef-Client 13
Powershell 5
EBS volume for the D:\ drive

Select a base AMI to use

Owned by me ▾   These are AMIs that are specifically owned by your AWS account

Select a base AMI owned by you

Gold Image (ami-0760e6603cd7d8b49) ▾ ✅

aws marketplace

Categories ▾   Delivery Methods ▾   Solutions ▾   Migration Mapping Assistant   Your Saved List   Partners   Sell in AWS Marketplace

esri

Esri ArcGIS Enterprise 10.6.1 on Windows (Jan 2019)

Continue to Launch

You must first configure the softwa

Instance Profile

Choose an instance profile that will be used by the Amazon EC2 instance created during the image build process. See the Private Image Build documentation ⧉ for more information.

ecsInstanceRole ▾   ⟳

Automation Role

Choose an IAM role that will be used by AWS Systems Manager Automation during the image build process. See the Private Image Build documentation ⧉ for more information.

test ▾   ⟳

Installation Logs

Provide the name of an S3 bucket, for example, *myAWSBucket*, where the software installation logs will be saved. The S3 bucket must be in the region where you are building the private image.

esri-geocloud-108

Private Image Name

Provide a name for the new AMI that will be created by the image build process.

OurArcGISEnterpriseImage

Optional Fields

The following fields are optional for the private image building process

aws marketplace

Categories ▾   Delivery Methods ▾   Solutions ▾   Migration Mapping Assistant   Your Saved List   Partners   Sell in AWS Marketplace   Amazon

esri

Esri ArcGIS Enterprise 10.6.1 on Windows (Jan 2019)

Continue to Launch

You must first configure the software.

Instance Type

Your private image build process will be run on the selected EC2 instance.

m5a.large   ▾

Memory: 8 GiB
CPU: 2 virtual cores
Storage: EBS Only
Network Performance: Up to 10 Gigabit Ethernet

VPC

vpc-0560c11742e20d751   ▾   ↻

Create a VPC in EC2 ↗

Security Group

A security group acts as a firewall that controls the traffic allowed to react one or more instances. Learn more ↗

default   ▾   ↻

Create a security group in EC2 ↗

Subnet Settings

Add as subnet of your VPC to your private image.

subnet-043c94ef7b7186e09 (us-east-1b)   ▾   ↻

IPv4 CIDR block: 10.0.3.0/24

Create a subnet in EC2 ↗

Enable Simple Notification System

esri

Esri ArcGIS Enterprise 10.6.1 on Windows (Jan 2019)

Continue to Launch

You must first configure the software.

A security group acts as a firewall that controls the traffic allowed to react one or more instances. Learn more ⧉

default ▾   ⟳

Create a security group in EC2 ⧉

Subnet Settings

Add as subnet of your VPC to your private image.

subnet-043c94ef7b7186e09 (us-east-1b) ▾   ⟳   **IPv4 CIDR block:** 10.0.3.0/24

Create a subnet in EC2 ⧉

Enable Simple Notification System

Notifications will be sent to your selected SNS topic when the build status changes.

Select a SNS topic ▾   ⟳

Cancel   **Start Build**

* There will be approximately 1-2 hours of software and infrastructure charges incurred for each private image you build.

ArcGIS Enterprise

Esri CloudFormation Templates 10.6.1

CloudFormation templates to deploy ArcGIS Enterprise on Amazon Web Services

The templates listed on this page use CloudFormation to create an ArcGIS Enterprise 10.6.1 deployment or ArcGIS Server 10.6.1 roles on Amazon Web Services (AWS).

Looking for a different Esri template version?

10.6	10.5.1	10.5	10.4.1	10.4	10.3.1

Table of Contents

- To use the CloudFormation templates
- Esri Cloud Builder Command Line Interface for Amazon Web Services
- ArcGIS Enterprise CloudFormation templates
    - Create a VPC to deploy ArcGIS Enterprise
    - Deploy base ArcGIS Enterprise
    - Deploy additional ArcGIS Server deployments
- Stop and start all the EC2 instances in your deployment stack
- Automate CloudFormation stack creation using Python and PowerShell
- Upgrade to 10.6.1
- Troubleshooting guide

To use the CloudFormation templates

Esri - Google Drive   AWS Session - Google Slides   AWS Marketplace Private Im   AWS Marketplace: Esri ArcG   AMIs | EC2 Management Co   CloudFormation templates t

s3.amazonaws.com/arcgisstore1061/9270/docs/index.html

A base ArcGIS Enterprise deployment includes Portal for ArcGIS, a GIS Server to be used as the portal's hosting server, and a relational and a tile cache data store created through ArcGIS Data Store and registered with the portal's hosting server.

These templates create a base ArcGIS Enterprise deployment You also have the option to include a spatiotemporal big data store with your base deployment when you use the following templates.

Template Name	Description	Platform	View	Launch
Single-machine deployment	Create a base ArcGIS Enterprise deployment on a single machine. This is the minimal all-in-one configuration, where all the components are installed on a single instance. ReadMe	Windows 2016	View	LAUNCH STACK
		Ubuntu LTS 16.04	Vi	
Highly available deployment	Create a highly available deployment with two machines. Both machines contain all ArcGIS Enterprise components. The second machine acts as a standby ArcGIS Enterprise machine, which minimizes downtime in scenarios when one machine is unavailable. ReadMe	Windows 2016		
		Ubuntu LTS 16.04	Vi	
	ELB for highly available base ArcGIS Enterprise deployment. The highly available base ArcGIS Enterprise CloudFormation template allows you to use an existing ELB. This option makes it easier to keep your existing domain_name mapping. The existing ELB has certain requirements, for example, the VPC, SSL cert, etc. It is recommended to create the ELB using this template.		View	LAUNCH STACK
Disaster recovery deployment in a different region	Build an identical ArcGIS Enterprise deployment in a different region and periodically synchronize content from the active deployment to a deployment in a different region. If the active deployment goes offline, you can switch your clients to use the second deployment. ReadMe	Windows&Ubuntu		

Context menu:
Open link in new tab
Open link in new window
Open link in incognito window
Save link as...
Copy link address
Inspect   Ctrl+Shift+I

Deploy additional ArcGIS Server deployments

In addition to the base ArcGIS Enterprise deployment, you can add functionality and capacity with additional ArcGIS Server sites.

Template	Description	Platform	View	Launch

https://s3.amazonaws.com/arcgisstore1061/9270/templates/arcgis-allinone-windows.template

9:59 AM
12/11/2019

```
{
    "AWSTemplateFormatVersion": "2010-09-09",
    "Description": "ArcGIS CloudFormation Template: Provisions a ArcGIS site with Portal for ArcGIS, ArcGIS Server, ArcGIS Data Store and ArcGIS Web Adaptor on an EC2 instance running Windo
    "Mappings" : {
        "RegionMap" : {
                        "ap-south-1": {
                          "en": "ami-05d1e687ddf06da37"
                        },
                        "eu-west-3": {
                          "en": "ami-04bc5ff4c7fb2cc5d"
                        },
                        "eu-west-2": {
                          "en": "ami-04819decfe3d41afc"
                        },
                        "eu-west-1": {
                          "en": "ami-098d793717620ebd8"
                        },
                        "ap-northeast-2": {
                          "en": "ami-01e3072d39c6f61e6"
                        },
                        "ap-northeast-1": {
                          "en": "ami-0bd303e073f6be317"
                        },
                        "sa-east-1": {
                          "en": "ami-085b07d2ea9059714"
                        },
                        "ca-central-1": {
                          "en": "ami-004c022eb67d510f5"
                        },
                        "ap-southeast-1": {
                          "en": "ami-0f72603c6d15f9f3c"
                        },
                        "ap-southeast-2": {
                          "en": "ami-04fc18f5dba0a067f"
                        },
                        "eu-central-1": {
                          "en": "ami-082471e13c2076356"
                        },
                        "us-east-1": {
                          "en": "ami-026c2392d89effd0c"
                        },
                        "us-east-2": {
```

```json
    "Mappings" : {
        "RegionMap" : {
                "ap-south-1": {
                  "en": "ami-05d1e687ddf06da37"
                },
                "eu-west-3": {
                  "en": "ami-04bc5ff4c7fb2cc5d"
                },
                "eu-west-2": {
                  "en": "ami-04819decfe3d41afc"
                },
                "eu-west-1": {
                  "en": "ami-098d793717620ebd8"
                },
                "ap-northeast-2": {
                  "en": "ami-01e3072d39c6f61e6"
                },
                "ap-northeast-1": {
                  "en": "ami-0bd303e073f6be317"
                },
                "sa-east-1": {
                  "en": "ami-085b07d2ea9059714"
                },
                "ca-central-1": {
                  "en": "ami-004c022eb67d510f5"
                },
                "ap-southeast-1": {
                  "en": "ami-0f72603c6d15f9f3c"
                },
                "ap-southeast-2": {
                  "en": "ami-04fc18f5dba0a067f"
                },
                "eu-central-1": {
                  "en": "ami-082471e13c2076356"
                },
                "us-east-1": {
                  "en": "ami-XXXXXXXXXXXXX"
                },
                "us-east-2": {
                  "en": "ami-0f74012cbb4c89e5c"
```

aws   Services ▾   Resource Groups ▾   ★   🔔• Portal Py ▾   N. Virginia ▾   S

Specify template

Step 2
Specify stack details

Step 3
Configure stack options

Step 4
Review

Prerequisite - Prepare template

Prepare template
Every stack is based on a template. A template is a JSON or YAML file that contains configuration information about the AWS resources you want to include in the stack.

- ● **Template is ready**   - ○ Use a sample template   - ○ Create template in Designer

Specify template
A template is a JSON or YAML file that describes your stack's resources and properties.

Template source
Selecting a template generates an Amazon S3 URL where it will be stored.

- ○ Amazon S3 URL   - ● Upload a template file

Upload a template file

[Choose file ⬆] *myWindowsTemplate.txt*

JSON or YAML formatted file

S3 URL: https://s3-external-1.amazonaws.com/cf-templates-sdzhesh7y1gr-us-east-1/2019345S1e-myWindowsTemplate.txt   [View in Designer]

Cancel   [Next]

Compliance Issue #2

We can't have any of our servers in a public subnet.

DMZ Architectures

New @ 10.8!

Public Subnet Architecture

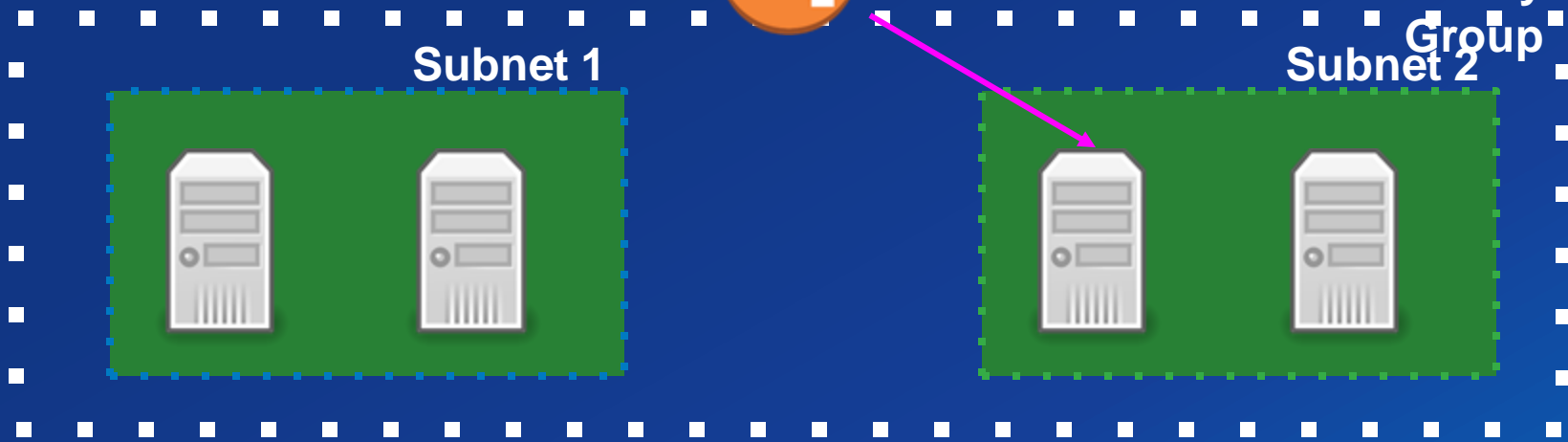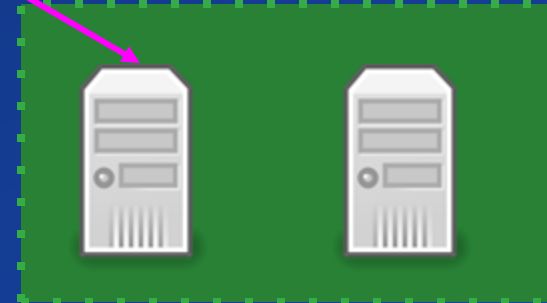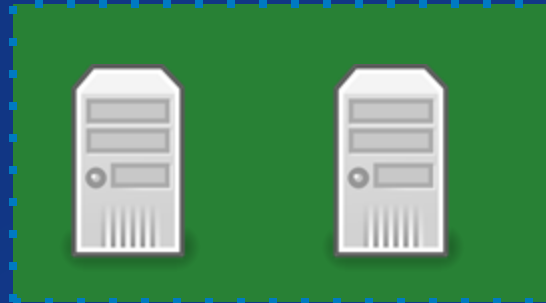Load Balancer
(incoming traffic)

Security Group
- Incoming - web only
- Outgoing - any traffic

Security Group

Subnet 1

Subnet 2

Public Subnets

DMZ Architecture

Internet Gateway +
Load Balancer
(incoming traffic)

NAT Gateway
(outgoing web
traffic)

Public
Subnets

Subnet 1

(empty - no instances)

Subnet 2

(empty - no instances)

Security
Group

Private
Subnets

Subnet 3

Subnet 4

Is a DMZ architecture right for me?

- Advanced workflow
  - Cloud Formation or Manual
  - Requires considerable networking knowledge
- Only available at 10.8
- Public Subnets or DMZ?
  - Security benefit - customer should decide
  - Public subnets require less knowledge
  - DMZ architecture does not require more time
  - Accessing DMZ machines requires a "bastion" server.

Wait, I thought there already is a Cloud Builder?

There has been an ArcGIS *Server* Cloud Builder since 10.1.

For Enterprise, Cloud Formation has been the story since 10.3.

Then why introduce a Cloud Builder then?

In a few words…..

Certificates

Licensing

Typos

Wait, are there *two* Cloud Builders for AWS then?

The ArcGIS Server Cloud Builder's last release was 10.7.

The ArcGIS Enterprise Cloud Builder can launch stand-alone ArcGIS Server sites and ArcGIS Enterprise deployments.

What does the Cloud Builder do then?

Launch
and
Upgrade

Launch

You get all of these….

- Base deployment
- Base deployment + GeoAnalytics
- Base deployment + Image Hosting Server + Raster Analytics
- Highly available base deployment + highly available federated ArcGIS Server
- Base deployment + GeoEvent
- Base deployment + Notebook Server + GeoAnalytics
- Base deployment + Image Server
- Any stand-alone ArcGIS Server server role

…with one click...

…in record time!

easy

Upgrade

When you launch...

...we store your deployment information...

Your S3 bucket

information

...so we have all the information we need to upgrade.

License Info

10.8 Items of Note

Notebook Server

New CLI Operations
(start, stop, and list)

Open some ports when upgrading
(29079-29090 and 4369)

In closing....

We're removing barriers to adoption.

Upgrades, working on making them easier, more reliable

Cloud Builder - easier, faster