

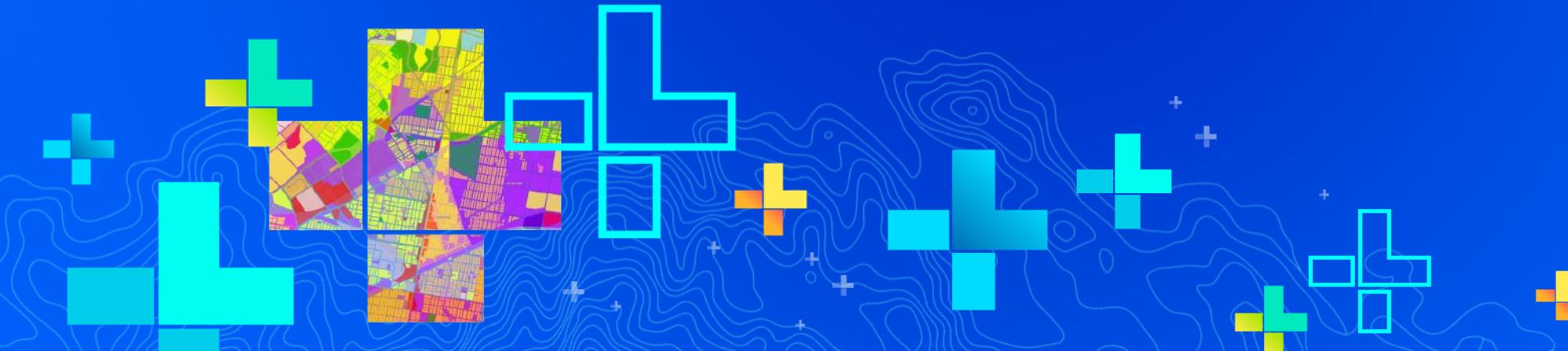


# Automating Your Deployment

Cameron Kroeker

Nik Shampur

Cherry Lin



SEE  
WHAT  
OTHERS  
CAN'T

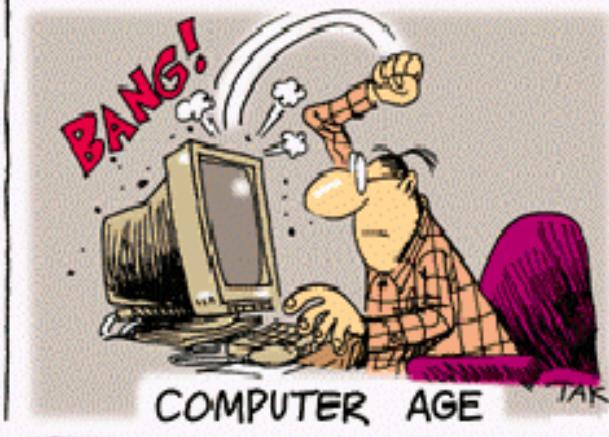
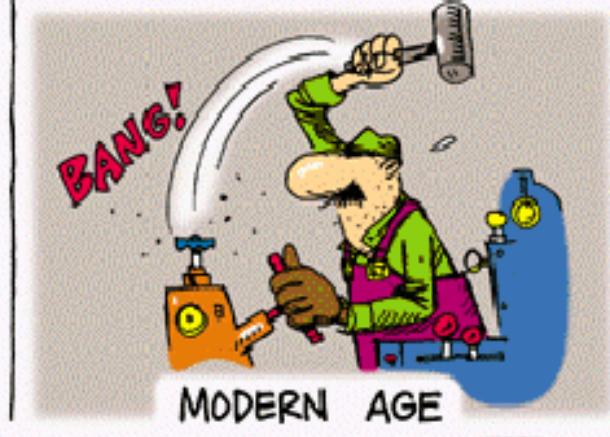
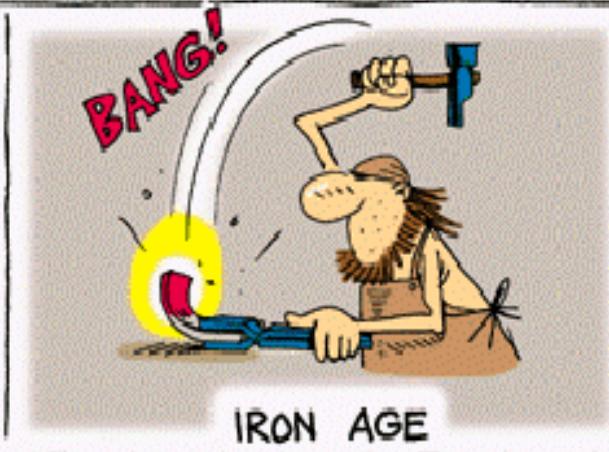
# Quick Survey

- Your role in your organization?
- Already using Esri provided automation?
- Which one?
- Are you using it on the cloud?



# Age of Automation

## Nothing can stop automation



# Automation Tools

## Deployment Automation

How you setup the software



ArcGIS Enterprise  
Builder



Amazon Web  
Services



Microsoft  
Azure



Chef



Powershell  
DSC



ArcGIS API  
for Python



webgisdr  
Utility

...

and more



# Deployment automation tools styles/experiences

## Wizard



ArcGIS Enterprise  
Builder

## Machine Images + Tooling



Amazon Web  
Services



Microsoft  
Azure

## Script-based



Chef



Powershell  
DSC

# Best fit environments for deployment automation tools



ArcGIS Enterprise  
Builder



Amazon Web  
Services



Microsoft  
Azure



Chef



Powershell  
DSC

# Best fit environments for deployment automation tools



## On-premises deployments

All-in-one, single  
machine  
deployments **only**



**ArcGIS Enterprise  
Builder**



**Amazon Web  
Services**



**Microsoft  
Azure**

Any  
deployment  
scenario



**Chef**



**Powershell  
DSC**

# Tools that have deep dive sessions

Tools that have a deep dive session we will overview quickly



ArcGIS Enterprise  
Builder



Amazon Web  
Services



Microsoft  
Azure



Chef

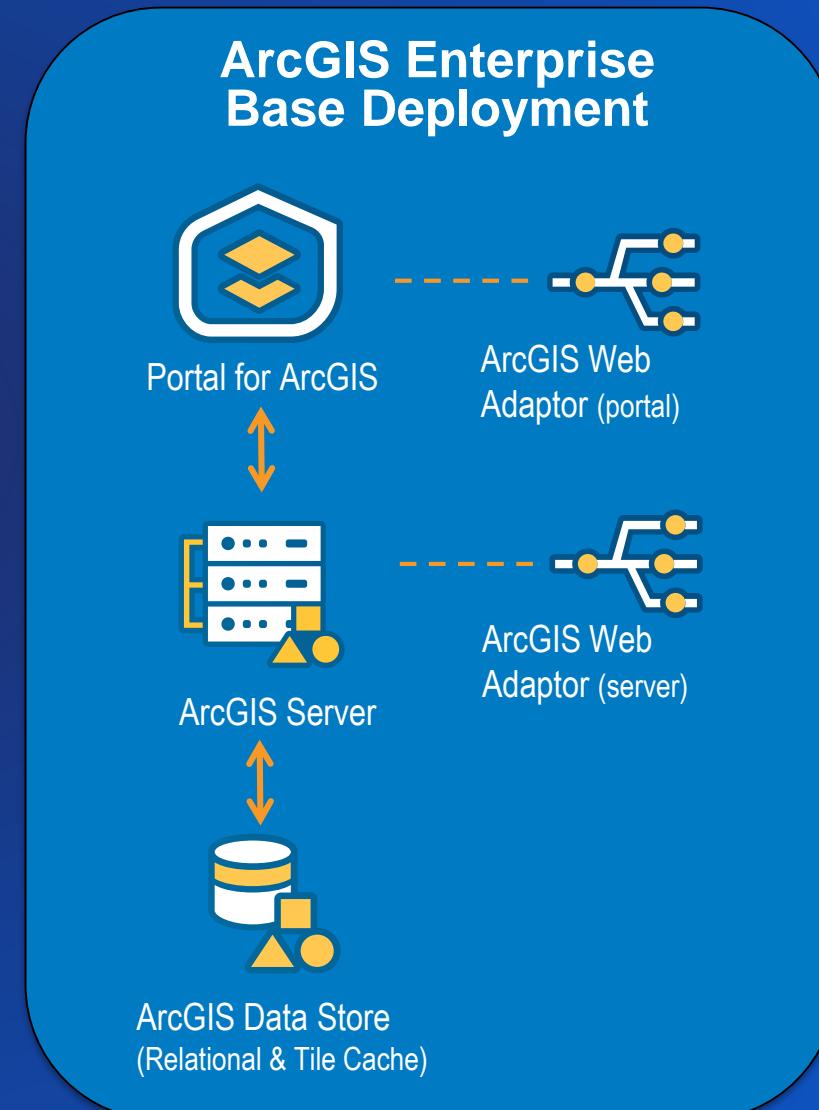


PowerShell  
DSC

# ArcGIS Enterprise Builder

# ArcGIS Enterprise Builder – Single Machine Base Deployment

- **Minimum options**
  - **Install directory**
  - **RunAs account username/password**  
**(Windows only)**



# ArcGIS Enterprise Builder | UI for Installation and Configuration

The screenshot displays the ArcGIS Enterprise 10.7 Builder interface, showing the progression from account creation to initial configuration.

**ArcGIS Enterprise Account (Left Panel):**

- Title:** ArcGIS Enterprise Account
- Description:** Specify the account username and password that all processes will run under.
- Fields:** User name: `arcgis`, Password: `*****`, Confirm Password: `*****`.
- Note:** This can be an account local to this machine, or a domain account. If you specify a local account that does not already exist, it will be created for you.
- Buttons:** < Back, Next >, Cancel.

**ArcGIS Enterprise Builder (Main Window):**

- Title:** ArcGIS Enterprise Builder
- Message:** The ArcGIS Enterprise installation has completed. Click the ArcGIS Enterprise Configuration Wizard and complete deployment (Configuration Wizard is available only if a successful deployment is completed).
- Components Status:**
  - ✓ Portal for ArcGIS
  - ✓ ArcGIS Server
  - ✓ ArcGIS Data Store
  - ✓ ArcGIS Web Adaptor for portal - portal
  - ✓ ArcGIS Web Adaptor for server - server
- Initial Administrator Account (Modal):**
  - Title:** Initial Administrator Account
  - Description:** Create the account that will be used as the initial administrator for your ArcGIS Enterprise deployment.
  - Note:** This is a new account that is stored with your deployment and is not an operating system account. Use this account when you are asked to sign in to your deployment for the first time and for administrative tasks such as creating additional user accounts.
  - Fields:** Username: `admin`, Password: `*****`, Confirm Password: `*****`.
  - Buttons:** Help, Back, Next.
- Additional Account Information (Modal):**
  - Title:** Additional Account Information
  - Description:** Enter additional information for the initial administrator account you specified on the previous prior panel.
  - Fields:** First Name: `admin`, Last Name: `lastname`, Email: `myemail@domain.com`, Confirm Email: `myemail@domain.com`, Security Question: `What city were you born in?`, Security Answer: `Redlands`.
  - Buttons:** Back, Next.

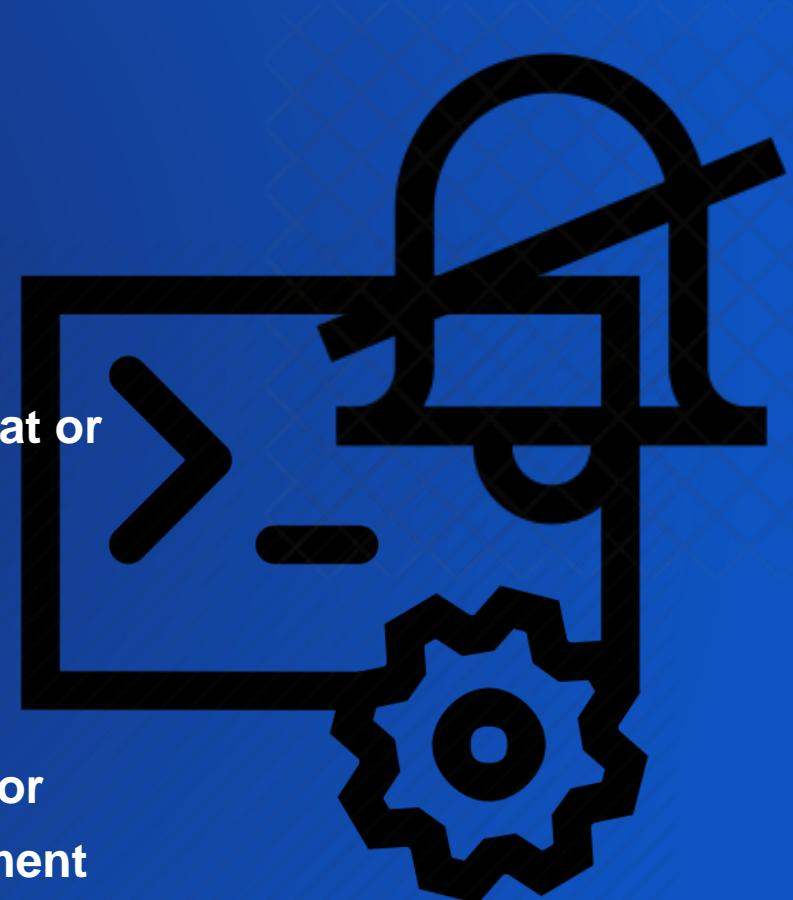
# Upgrading an Enterprise Deployment

- One click experience that upgrades all components
- Upgrade only deployments previously deployed by Enterprise Builder



# Command Line Utilities – Install, Configure and Upgrade Silently

- **Install**
  - <location of setup>/Builder.exe or
  - ./Setup
- **Configure**
  - <ArcGIS Server Install Dir>/tools/configurebaseddeployment/configurebaseddeployment.bat or
  - <location of utility>\configurebaseddeployment
- **Upgrade**
  - <ArcGIS Server Install Dir>/tools/upgradebaseddeployment/upgradebaseddeployment.bat or
  - <ArcGIS Server installation directory>\tools\upgradebaseddeployment



# ArcGIS Enterprise Builder for Automation - Takeaways

- **Silent Option**
  - Schedule to execute install/Configure/Upgrade
  - Repeat on different machines
- **Limitations**
  - Single machine only
  - Standardizes the installation directories for all software components
  - Very limited options
- **More customizing:**
  - Powershell DSC or Chef



# Deep Dive Session

Title: Introduction to ArcGIS Enterprise and Building Your First Deployment

Date: 03/05/2019

Time: 2:30pm - 3:30pm

Presenter: Jonathan Quinn



The Builder deep dive session has already passed  
– watch the video later and/or **please bring questions to the Expo.**

# ArcGIS Enterprise Automation on AWS



# Getting Started

On-premise	AWS
<p>Esri authorization files</p> <p>Domain_name for your application</p> <p>SSL Certificate for your domain</p> <p>Esri software setups</p> <p>Infrastructure</p> <ul style="list-style-type: none"><li>Machines/VMs/Networks</li><li>Web Servers and/or Load Balancer</li><li>File Server</li><li>Data storage/Database</li><li>.....</li></ul>	<p>Esri authorization files</p> <p>Domain_name for your application</p> <p>SSL Certificate for your domain</p> <p>AWS Account</p>

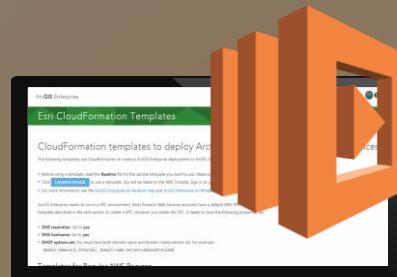
# Deployment Tools for AWS



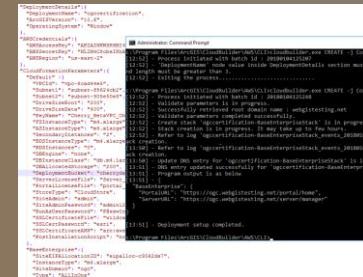
**CHEF**  
Automation  
Tools



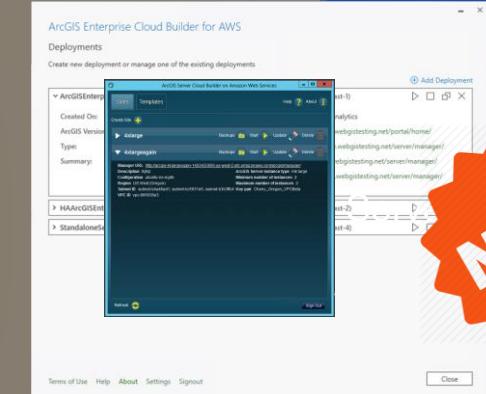
Public Esri  
AMIs



Esri  
CloudFormation



CBCLI



CB GUI

Power  Simplicity

# Deployment Tools for AWS

AWS Private Image: User's AMI + Esri ArcGIS Enterprise package



**CHEF**

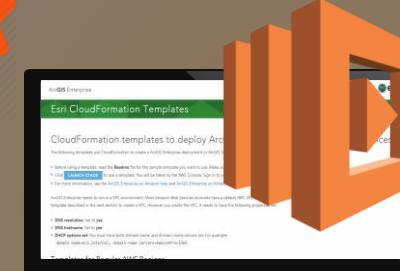
Automation  
Tools



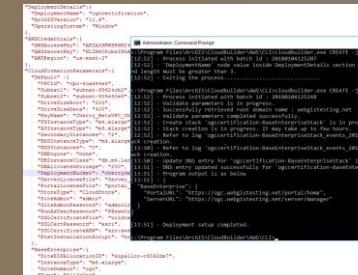
**NEW**



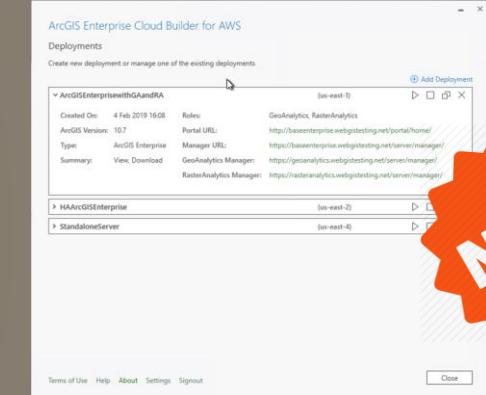
Public Esri  
AMIs



Esri  
CloudFormation



CBCLI



CB GUI



Power



Simplicity

# Deep Dive Session

Title: ArcGIS Enterprise: Cloud Operations using Amazon Web Services

Date: 03/07/2019

Time: 4:00pm - 5:00pm

Location: Catalina/Madera



# ArcGIS Enterprise on Azure

# Deploying on Azure

- Ready to use Virtual Machine Images
  - Public Azure (54 Regions)
  - U.S. Government Cloud (Fairfax)
- Easy to deploy and manage
  - Deployment Tools
    - Cloud Builder
    - Automation

Microsoft Azure

FREE ACCOUNT >

Why Azure Solutions Products Documentation Pricing Partners Blog Resources Support

Azure Marketplace Browse Sell Learn

Products > ArcGIS Enterprise

**ArcGIS Enterprise**  
Esri

Overview Plans + Pricing

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

**ArcGIS Enterprise Cloud Builder 10.5 for Microsoft Azure**

Get Started!

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

sign in to azure

U.S. Government Cloud

**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.

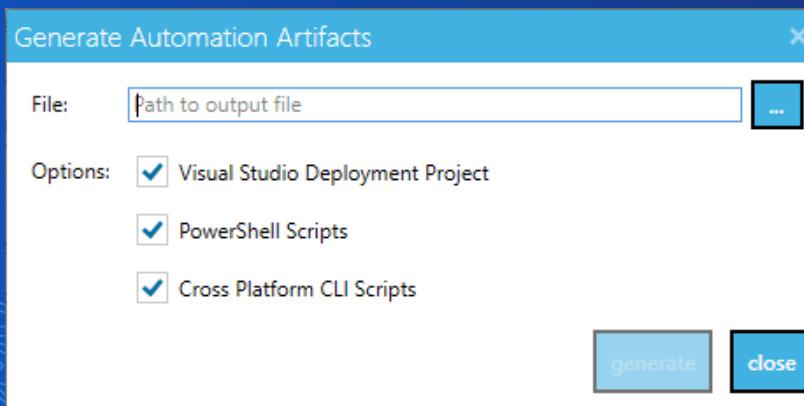
**Image Server**  
Used for publishing image services for on-the-fly visualization and performing distributed analytics on raster data. An Image Server is federated with Portal for ArcGIS.

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

back next cancel

# Cloud Builder Overview

- Wizard driven deployment experience
- Base deployment + Distributed GIS
  - Single Machine/Tier
  - Multi Machine/Tiers
- Designer to generate automation artifacts



ArcGIS Enterprise Cloud Builder 10.7 for Microsoft Azure

Summary

*Summary of Deployment. Click Finish after reviewing*

**Region:-** eastus  
**DNS Name:-** loganalyticsworkspacedemo.eastus.cloudapp.azure.com  
**Create New:-** Yes  
**Resource Group:-** loganalyticsworkspacedemo  
**GIS Server:-** Yes  
**Server Role:-** GeneralPurposeServer  
**From Own Image:-** Yes  
**Image Name:-** server\_10450  
**Total Machines:-** 1  
**Machine Names:-** tkServer-0  
**Time Zone:-** Pacific Standard Time  
**Enable OS Updates:-** No  
**Remote Desktop:-** Yes (Port 3389)  
**ARM Resource Prefix:-** tk  
**Deployment Storage Account:-** departifacts (base10444-1) (eastus)  
**Preserve artifacts:-** Yes  
**Use Cloud Storage:-** No  
**Uses Azure Monitor Logs Workspace:-** Yes  
**Azure Monitor Logs Workspace:-** devsummit19 (Resource Group - devsummit19)  
**Capture Server Logs:-** Yes

**Machine Administrator UserName:-** esriadmin  
**Machine Administrator Password:-** \*\*\*\*\*

**Server Site Name:-** arcgis  
**Server License Path:-** \\metro\\Released\\Authorization\_Files\\Version10.7\\ArcGIS\_Server\\Advanced\\Server\_Ent\_Adv.ecp  
**Site Administrator UserName:-** siteadmin  
**Site Administrator Password:-** \*\*\*\*\*

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

[Generate Cost Estimate](#) [Save Automation Artifacts](#) [Save Summary](#)

[back](#) [finish](#) [cancel](#)

# Deployment Options



Cloud Builder



Visual Studio



PowerShell



Command Line



Windows

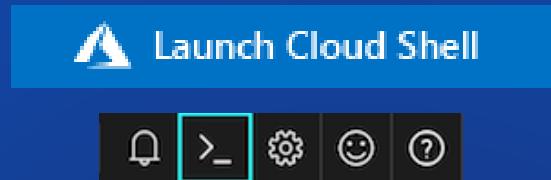


Mac

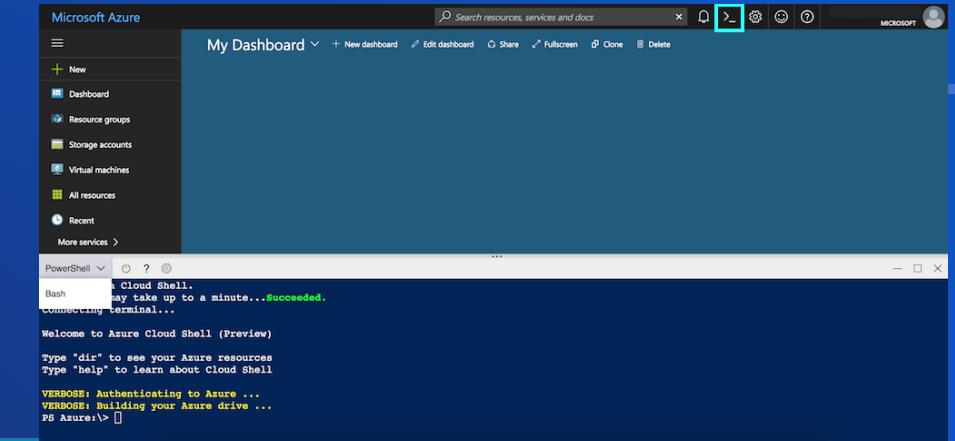


Linux

# Integrate with ...



Azure Cloud Shell



PowerShell DSC



Travis CI

# Cloud Builder VS. Automation



Visual Studio



**BASH**  
THE BOURNE-AGAIN SHELL



PowerShell

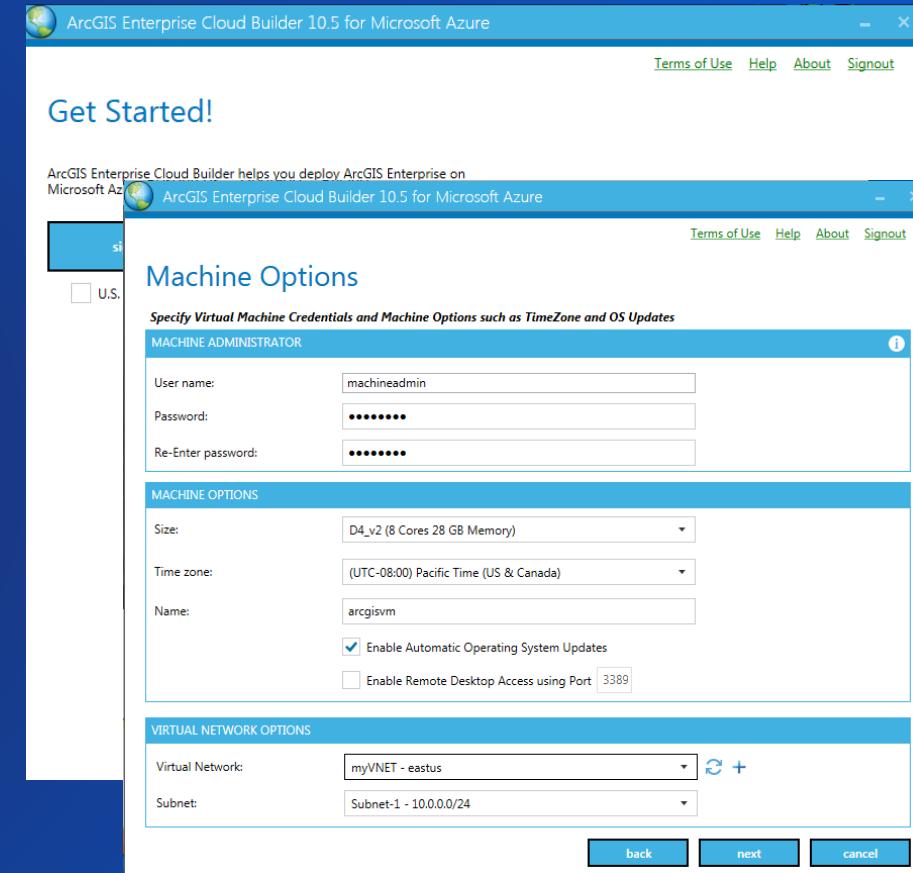
Customize or Extend



Wizard Driven

Power

Simplicity



# Deep Dive Session

ArcGIS Enterprise: Cloud Operations Using Microsoft Azure

Date: 03/07/2019

Time: 4:00pm - 5:00pm

Location: Pasadena/Sierra/Ventura



**Microsoft Azure**

# Automation with PowerShell DSC

# Use PowerShell DSC when ...

- Microsoft Shop
  - Bias towards Microsoft Windows Tools
  - PowerShell DSC is built into Windows
- Windows Administrators love PowerShell
  - DSC is a natural fit
- Low Tech solution for push automation across multiple machines
  - No centralized server needed



PowerShell  
DSC

# PowerShell over the years



PowerShell Releases

# What is PowerShell DSC (Desired State Configuration)

“Declarative platform used for configuration, deployment, and management of systems.”

## Automation Concepts

- Idempotent
- Declarative

```
New-SmbShare -Path '\\\\foo\\share'
```

### Not Idempotent

```
Import-Module ServerManager
#Check and install ASP.NET 4.5 feature
If (-not (Get-WindowsFeature "Web-Asp-Net45").Installed) {
    try {
        Add-WindowsFeature Web-Asp-Net45 -ErrorAction Stop
    }
    catch {
        Write-Error $_
    }
}
#Check and install Web Server Feature
If (-not (Get-WindowsFeature "Web-Server").Installed) {
    try {
        Add-WindowsFeature Web-Server -ErrorAction Stop
    }
    catch {
        Write-Error $_
    }
}
#Create a new website
Import-Module WebAdministration
New-Website -Name MyWebsite -Port 80 -HostHeader MyWebsite
    -PhysicalPath "$env:systemdrive\\inetpub\\wwwroot\\MyWebsite"
#Start the website
Start-Website -Name MyWebsite
```

### Imperative

```
if(-not(Get-SmbShare -Name '\\\\foo\\share'))
{
    New-SmbShare -Path '\\\\foo\\share'
}
```

### Add Checks to ensure idempotent

```
Configuration WebSiteConfig
{
    Node MyWebServer
    {
        WindowsFeature IIS
        {
            Ensure = "Present"
            Name = "Web-Server"
        }
        WindowsFeature ASP
        {
            Ensure = "Present"
            Name = "Web-Asp-Net45"
        }
        Website MyWebSite
        {
            Ensure = "Present"
            Name = "MyWebsite"
            PhysicalPath = "C:\\Inetpub"
            State = "Started"
            Protocol = @("http")
            BindingInfo = @("*:80:")
        }
    }
}
```

### Declarative

# PowerShell DSC

```
Configuration IISWebsite
{
    Node Server1, Server2
    {
        WindowsFeature IIS
        {
            Ensure      = "Present"
            Name        = "Web-Server"
        }

        WindowsFeature ASP
        {
            Ensure      = "Present"
            Name        = "Web-Asp-Net45"
        }
    }
}
```

```
Start-DscConfiguration 'server' -Verbose -Wait
```

Archive	Unpack .zip files
Environment	Manage env variables
File	Manage files, folders
Group	Manage local groups
Log	Write message to log
Package	Install/Uninstall .msi and setups
Registry	Manage registry keys & values
Script	Run PowerShell script blocks
Service	Manage Services
User	Manage local users
Windows Feature	Add/Remove Windows Features
Windows Process	Manage Processes

Built in DSC Resources

# Wealth of DSC Resources

xHyper-V  
xSafeHarbor xSmbShare xChrome  
xDismFeature xDefender  
xFailoverCluster xSQLServer  
xComputerManagement xPython  
xWindowsUpdate x7Zip xPHP xWinEventLog  
xWindowsContainer xRobocopy xWindowsRestore  
xWebDeploy xSharePoint xBitLocker  
xWordPress  
xDatabase  
xMySQL xFirewall  
xDisk

[PowerShell Gallery](#)

[DSC Resource Kit](#)

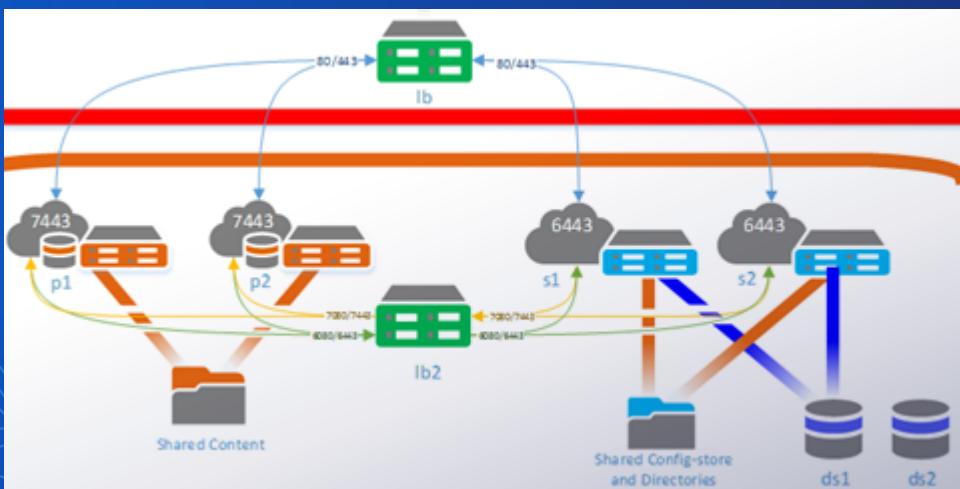
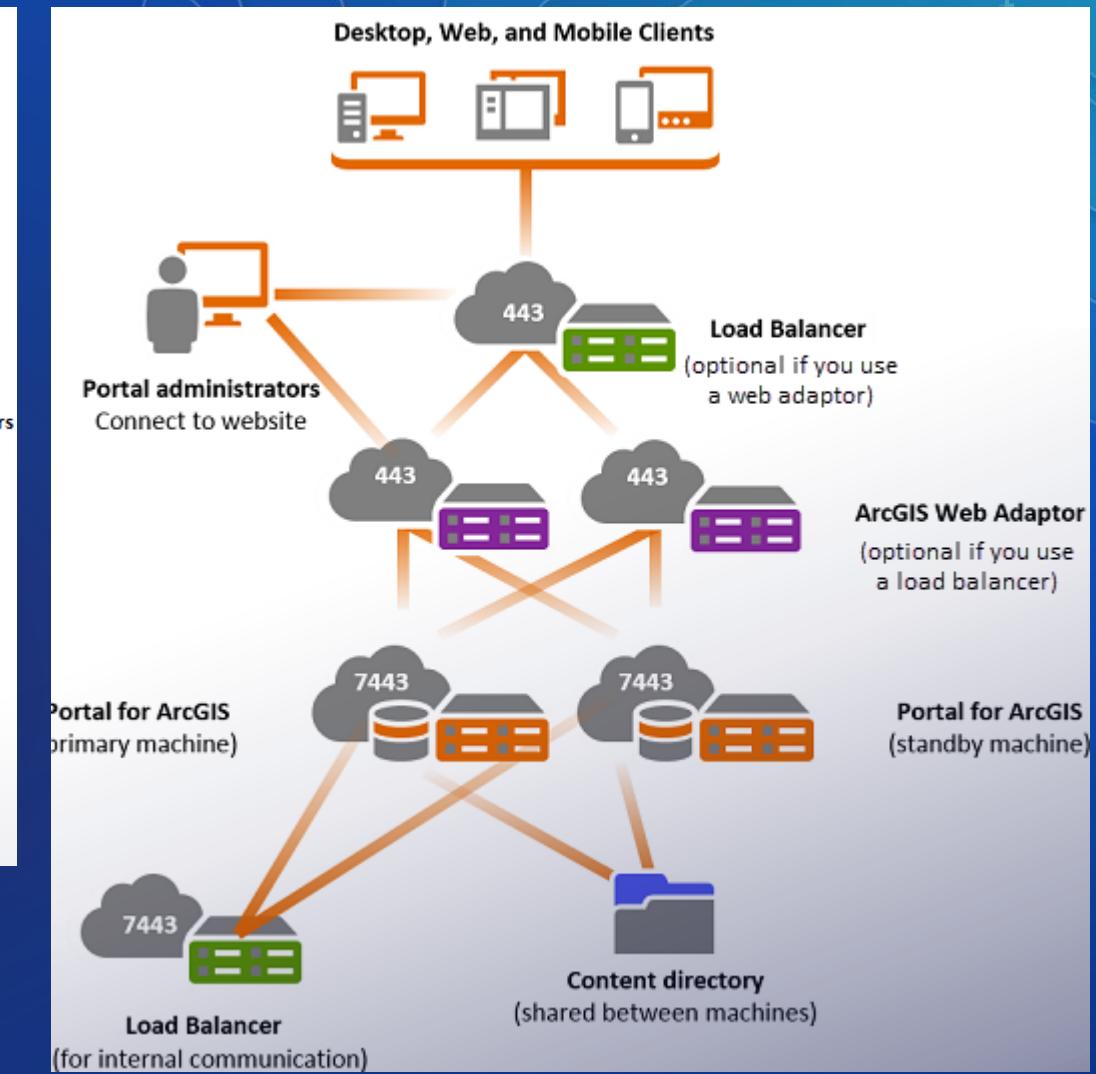
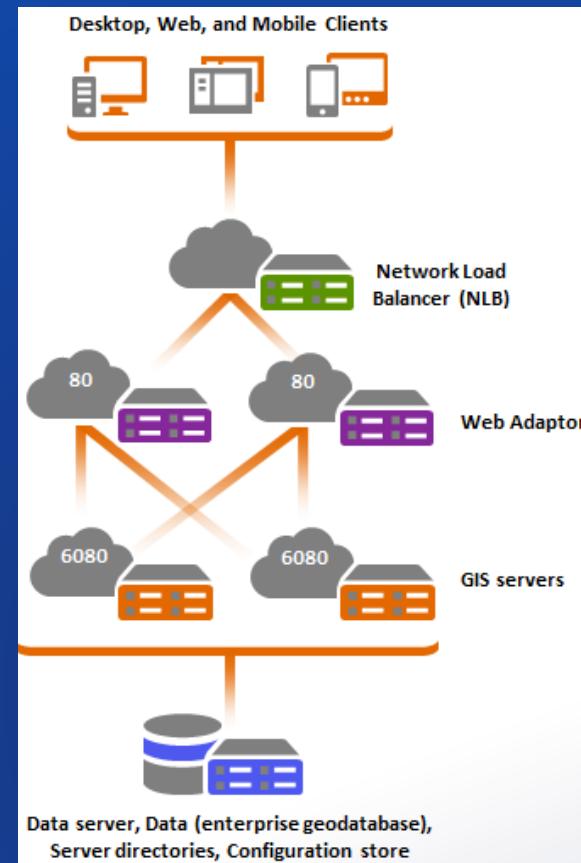
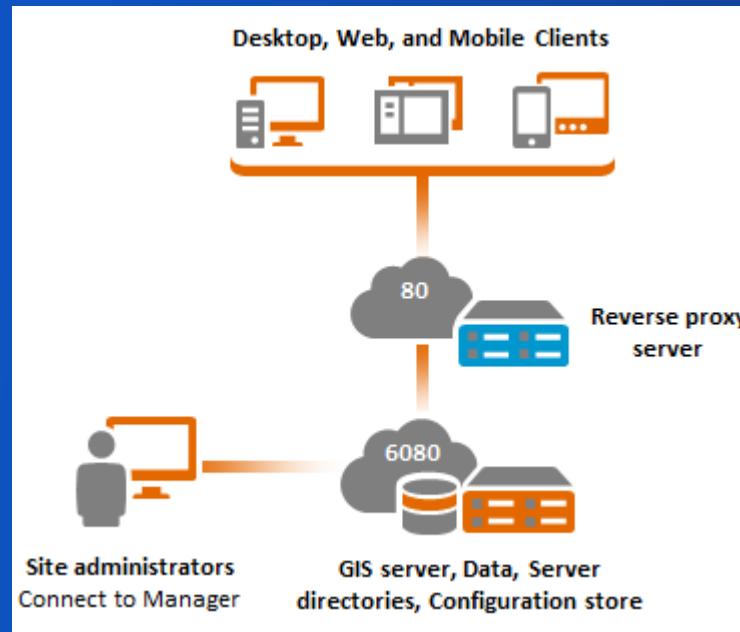
# What about ArcGIS?

```
Configuration ArcGISServer
{
    Import-Module ArcGIS
    Node MyArcGISServer
    {
        ArcGIS MyArcGISSite
        {
            Ensure = "Present"
            ConfigStorePath = "C:\arcgis\server"
            SiteAdministrator = "..."
            State = "..."
        }
    }
}
```

Wouldn't this be great?

Not so Fast!

# GIS Infrastructure



GIS Infrastructure needs vary

# Discrete States

- Install Software
- License Software
- Configure Service Account
  - Create Windows Local/Domain User Account
  - Assign File System Privileges
  - Assign Windows Service to User
- Create Site
- Import SSL Certificates
- Register/Configure Databases or Data Stores
- Federate Site
- Stop/Start Server Services
- Publish Services

# ArcGIS DSC Resources

ArcGIS_Install	Manages the (un)installation of ArcGIS (Server) Software
ArcGIS_License	Licenses ArcGIS (Server) Software
ArcGIS_ServiceAccount	Configures the 'Run As' Service with appropriate (file system) privileges
ArcGIS_Server	Configures the ArcGIS Server Site
ArcGIS_Portal	Configures the Portal for ArcGIS
ArcGIS_DataStore	Configures the ArcGIS DataStore
ArcGIS_Server_TLS	Configures SSL on a Server Site
ArcGIS_Portal_TLS	Configures SSL on a Portal Site
ArcGIS_WebAdaptor	Configures Web Adaptor on IIS for Portal/Server
ArcGIS_EGDB	Enables/Registers an SQL Server flavor EGDB with Server
ArcGIS_GeoEvent	Configures GeoEvent Extension for Server
ArcGIS_Federation	Configures Federation between Server and Portal
ArcGIS_IIS_TLS	Configures SSL on IIS
...	...

Do I need to learn all these DSC Resources to use it?

**No!**

*We want the getting started experience to be simple*

You only get one first impression

# Getting Started

# Getting Started

- **Install ArcGIS PowerShell Module**

```
PS C:\> Install-Module arcgis
```

- **Edit (JSON) configuration file**
  - Sample Configurations are
  - **documented for common site topologies**

```
"ConfigData": {
  "Version": "10.5.1",
  "ServerContext": "server",
  "PortalContext": "portal",
  "ServerRole": "GeneralPurposeServer",
  "Credentials": {
    "PrimarySiteAdmin": {
      "UserName": "admin",
      "Email": "shgoel@esri.com",
      "Password": "changeit"
    },
    "ServiceAccount": {
      "Password": "Arc_123456_Gis",
      "UserName": "arcgis"
    }
  },
  "Server": {
    "LicenseFilePath": "\\\\metro\\\\ArcGIS_Automation\\\\Authorization_Files\\\\Version10.5\\\\Server_Ent_Adv_AllExt.prvc",
    "Installer": {
      "Path": "\\\\esri.com\\\\software\\\\Esri\\\\Released\\\\1051_Final\\\\ArcGIS_Server_Windows_1051_156124.exe",
      "InstallDir": "C:\\\\\\ArcGIS\\\\\\\\Server",
      "InstallDirPython": "C:\\\\\\Python27"
    },
    "ServerDirectoriesRootLocation": "C:\\\\\\arcgisserver\\\\directories",
    "ConfigStoreLocation": "C:\\\\\\arcgisserver\\\\config-store"
  },
  "Portal": {
    "LicenseFilePath": "\\\\metro\\\\ArcGIS_Automation\\\\Authorization_Files\\\\Version10.5\\\\portal_2000_1000.prvc",
    "ConfigData": {
      "Version": "10.5.1",
      "ServerContext": "server",
      "PortalContext": "portal",
      "ServerRole": "GeneralPurposeServer",
      "Credentials": {
        "PrimarySiteAdmin": {
          "UserName": "admin",
          "Email": "shgoel@esri.com",
          "Password": "changeit"
        },
        "ServiceAccount": {
          "Password": "Arc_123456_Gis",
          "UserName": "arcgis"
        }
      },
      "Server": {
        "LicenseFilePath": "\\\\metro\\\\ArcGIS_Automation\\\\Authorization_Files\\\\Version10.5\\\\Server_Ent_Adv_AllExt.prvc",
        "Installer": {
          "Path": "\\\\esri.com\\\\software\\\\Esri\\\\Released\\\\1051_Final\\\\ArcGIS_Server_Windows_1051_156124.exe",
          "InstallDir": "C:\\\\\\ArcGIS\\\\\\\\Server",
          "InstallDirPython": "C:\\\\\\Python27"
        },
        "ServerDirectoriesRootLocation": "C:\\\\\\arcgisserver\\\\directories",
        "ConfigStoreLocation": "C:\\\\\\arcgisserver\\\\config-store"
      }
    }
  }
}
```

```
PS C:\> Configure-ArcGIS pathToConfigFile
```

# Automation using PowerShell DSC | System Requirements

- PowerShell 5.0 or Higher
  - Windows Management Framework 5.0 or Higher
    - Windows Server 2012 and higher
- Automation delivered via
  - [PowerShell Gallery](#) (best experience)
  - [GitHub](#) (Manual Install)
- Download Installers and Licenses from my ESRI (regular means)

# Demo

PowerShell DSC



# Automation using PowerShell DSC | Key Takeaways

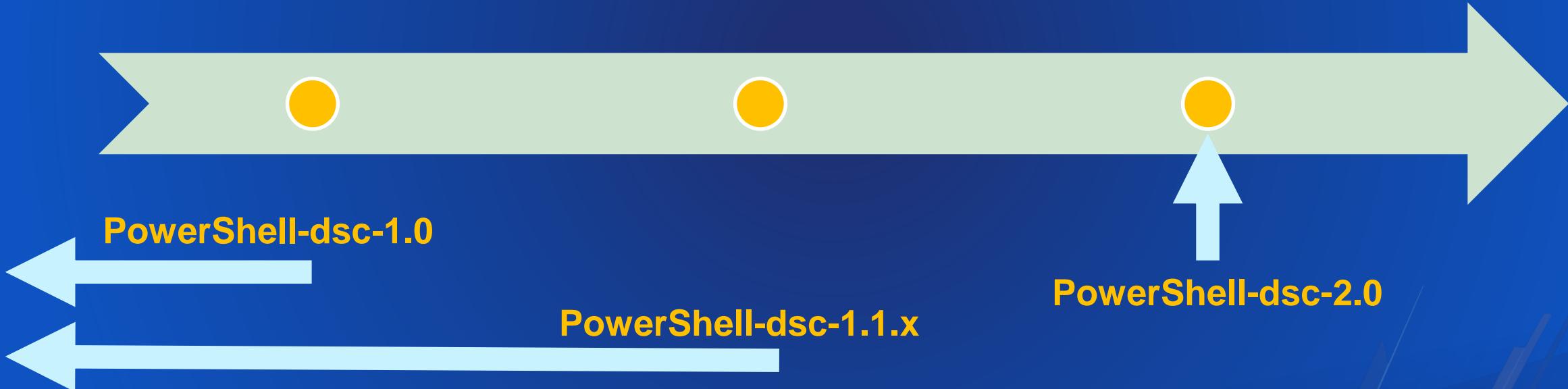
- New Automation Option at 10.6
  - Analogous to Chef Automation
  - Targets an audience with a bias towards Microsoft Windows tooling
    - Windows Admins love PowerShell
    - DSC - Natural Fit
  - Easy Low Tech Solution for Push Model
- Delivered via
  - PowerShell Gallery <https://www.powershellgallery.com/packages/ArcGIS/>
  - Github <https://github.com/Esri/arcgis-powershell-dsc>
- Supports Single and Multi machine sites
  - Install, Uninstall and Upgrade workflows

# ArcGIS PowerShell DSC releases vs. ArcGIS Enterprise releases

10.6

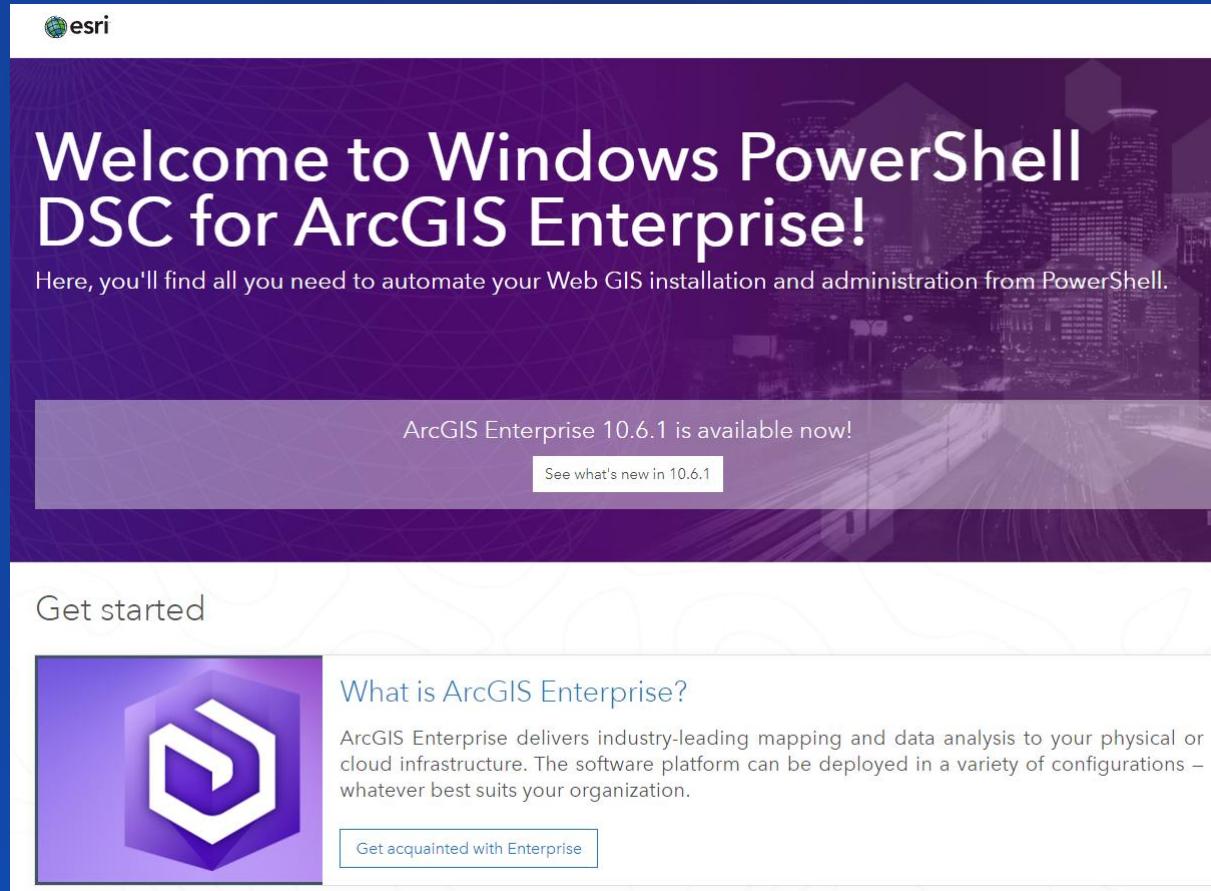
10.6.1

10.7



# Resources for ArcGIS PowerShell DSC

[esri.github.io/arcgis-powershell-dsc](https://esri.github.io/arcgis-powershell-dsc)



# Automation with Chef

# What is Chef and what do we offer for it

- One of the most popular IT automation toolkit
- Install ready-to-use resources
- Define the configuration
- Deploy exact the way you want.
- No required programming skills
- ArcGIS Automation team offers a range of resources for you to use:



## Cookbooks

A full set of files to install a software product, such as:

- ArcGIS Enterprise
- ArcGIS Desktop
- Insights for ArcGIS

## Recipes

An individual JSON file in a cookbook for a specific task:

- Install ArcGIS Server
- Federate a server
- Apply an authorization file

## Roles

Our custom sets of recipes pulled to set up a machine:

- Base deployment
- ArcGIS Image Server
- ArcGIS (Big) Data Store

# Getting Started

<http://esri.github.io/arcgis-cookbook/>



The screenshot shows the 'Welcome to Chef on ArcGIS Enterprise!' page. At the top, the Esri logo is visible. Below it, a large heading reads 'Welcome to Chef on ArcGIS Enterprise!'. A sub-headline states: 'Here, you'll find all you need to automate your Web GIS installation and administration.' A dark blue banner at the top of the main content area announces 'ArcGIS Enterprise 10.6 is available now!' with a link to 'See what's new in 10.6'. The main content is organized into two sections: 'Get Started' and 'Cookbooks for ArcGIS Enterprise deployments'. The 'Get Started' section contains two cards. The first card, titled 'What is ArcGIS Enterprise?', features a purple hexagonal icon and a description of the software's purpose: 'ArcGIS Enterprise delivers industry-leading mapping and data analysis to your physical or cloud infrastructure. The software platform can be deployed in a variety of configurations – whatever best suits your organization.' It includes a 'Get acquainted with Enterprise' button. The second card, titled 'What is Chef?', features an orange and blue circular icon and a description of the framework: 'Chef is a software framework to automate installation and configuration of IT components. It uses a Chef server, which can be deployed open-source, as SaaS, or with a subscription to Chef Automate.' It includes a 'Learn more about Chef' button. The 'Cookbooks for ArcGIS Enterprise deployments' section shows three cards with icons: a red card with a house icon, a blue card with a network icon, and a green card with a clock icon.

esri

## Welcome to Chef on ArcGIS Enterprise!

Here, you'll find all you need to automate your Web GIS installation and administration.

ArcGIS Enterprise 10.6 is available now!

See what's new in 10.6

### Get Started

 [What is ArcGIS Enterprise?](#)

ArcGIS Enterprise delivers industry-leading mapping and data analysis to your physical or cloud infrastructure. The software platform can be deployed in a variety of configurations – whatever best suits your organization.

[Get acquainted with Enterprise](#)

 [What is Chef?](#)

Chef is a software framework to automate installation and configuration of IT components. It uses a Chef server, which can be deployed open-source, as SaaS, or with a subscription to Chef Automate.

[Learn more about Chef](#)

### Cookbooks for ArcGIS Enterprise deployments

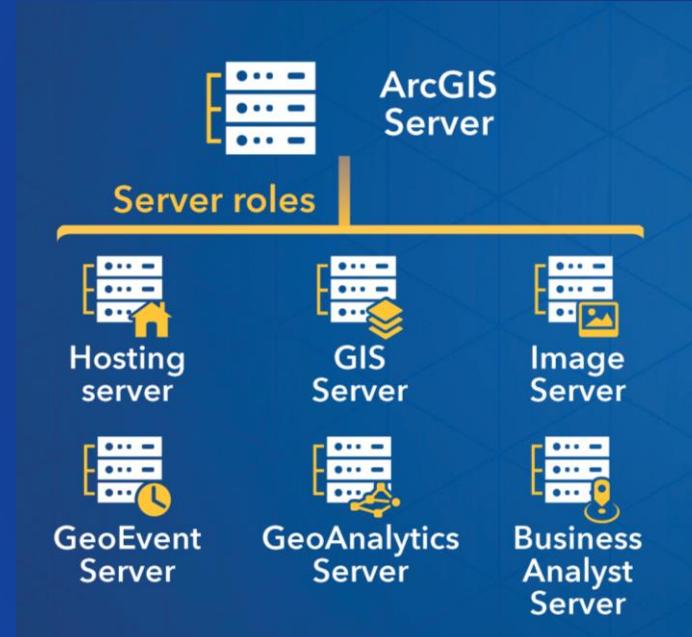




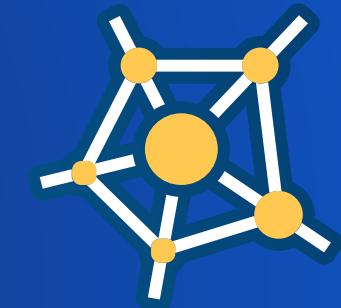


# Plan your deployment

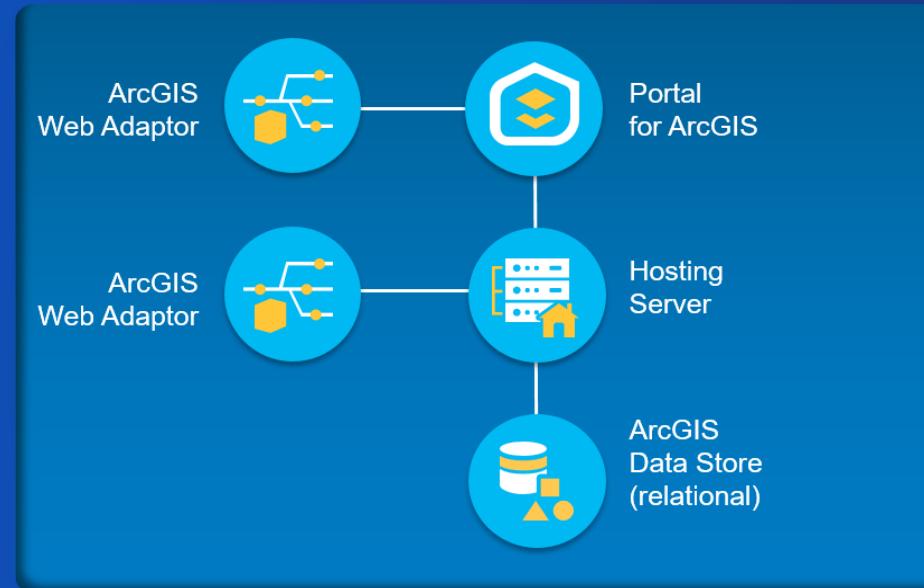
Base deployment, or extend with server roles?



One or many machines?



# A Fresh ArcGIS Enterprise Install



# Easy to Start

# Install Chef Client and Download Cookbook

## Edit Property json file

“*chef-solo -j <properties>.json*”

```
        "archives": "\\\\esri.com\\\\Software\\\\Esri\\\\Released",
    },
    "web_adaptor": {
        "admin_access": true
    },
    "server": {
        "admin_username": "admin",
        "admin_password": "admin",
        "authorization_file": "\\\\metro\\\\ArcGIS_Automation"
    },
    "portal": {
        "admin_username": "admin",
        "admin_password": "esri.agp",
        "admin_email": "admin@mydomain.com",
        "security_question": "Your favorite ice cream flavor",
        "security_question_answer": "vanilla",
        "authorization_file": "\\\\metro\\\\ArcGIS_Automation"
    }
},
"run_list": [
    "recipe[arcgis-enterprise::system]",
    "recipe[esri-iis]",
    "recipe[arcgis-enterprise::portal]",
    "recipe[arcgis-enterprise::portal_wa]",
    "recipe[arcgis-enterprise::server]",
    "recipe[arcgis-enterprise::server_wa]",
    "recipe[arcgis-enterprise::datastore]"
]
```

# Idempotent

# Demo

Chef – Single Machine Deployment

# Upgrading an Existing Deployment

# Upgrade

Download New Version of Cookbook

New Version #; New Setups; New License Files

*“chef-solo -j <properties>.json”*

```
  "run_as_user": "arcgis",
  "version": "10.6",
  "repository": {
    "archives": "\\\\esri.com\\Software\\Esri\\Release\\",
  },
  "web_adaptor": {
    "admin_access": true
  },
  "server": {
    "admin_username": "admin",
    "admin_password": "admin",
    "authorization_file": "\\\\metro\\ArcGIS_Automation\\",
  },
  "portal": {
    "admin_username": "admin",
    "admin_password": "esri.agp",
    "admin_email": "admin@mydomain.com",
    "security_question": "Your favorite ice cream flavor",
    "security_question_answer": "vanilla",
    "authorization_file": "\\\\metro\\ArcGIS_Automation\\"
  }
}
```

# Using Chef Puts You on an “Upgrade Track”

10.6

10.6.1

10.7

10.7.1



Chef  
cookbooks  
3.2.0

Chef  
cookbooks  
3.2.1

Chef  
cookbooks  
3.3.1

Chef  
cookbooks  
3.4.0

# Demo

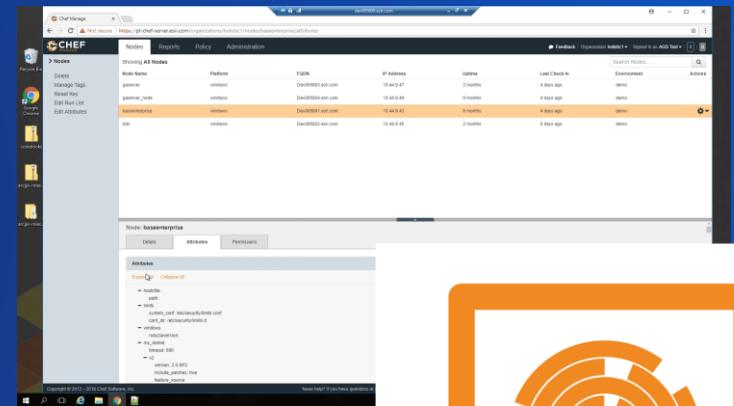
Chef – Upgrade



# Expanding Chef for Multi-machine deployments

# Expanding Chef for Multi-machine Deployment

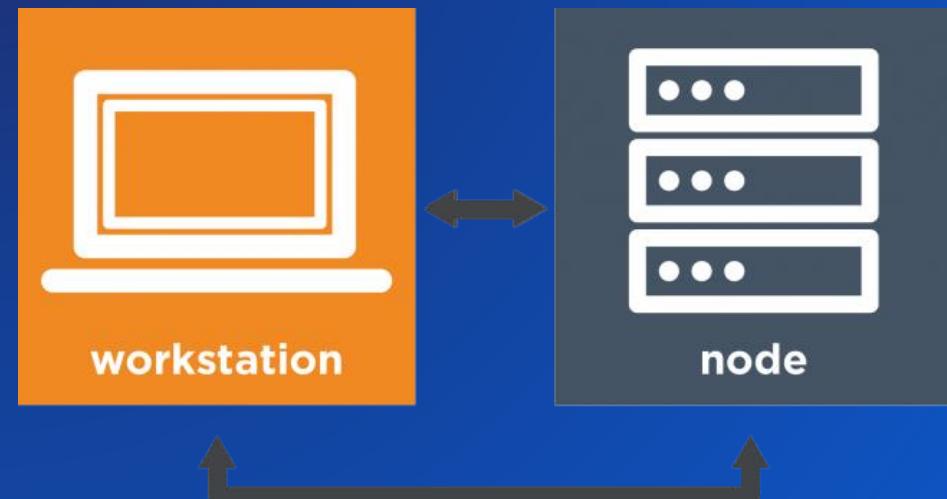
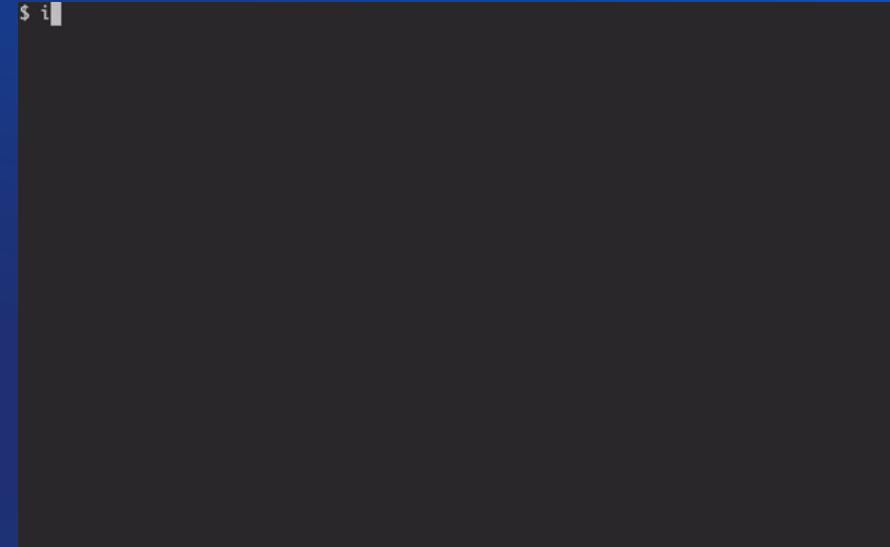
- **Chef-Server**
  - **Central repository of all your files**
  - **Three options for Chef Server**
    - **Open source on your own infrastructure**
    - **Subscribe to Hosted Chef Server (SaaS)**
    - **Subscribe to Chef Automate (full-stack software)**
- **Chef Client**
  - **Performs the work**
  - **Receives necessary files from Chef Server**



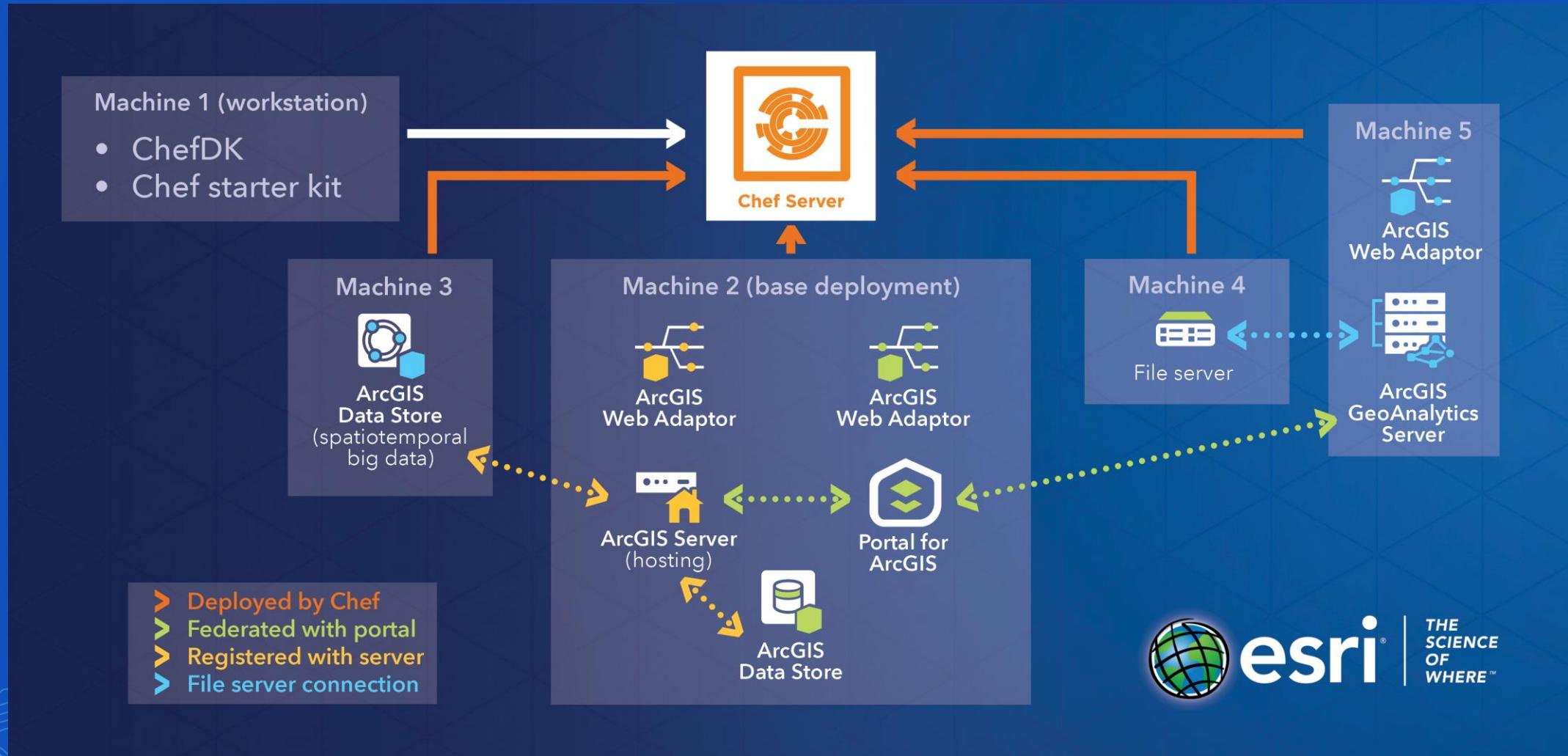
**Chef Server**

# Expanding Chef for Multi-machine Deployment

- Chef-Run: Remote administration
  - SSH
  - WinRM
- OS Remote running Chef-solo
  - SSH
  - WinRM



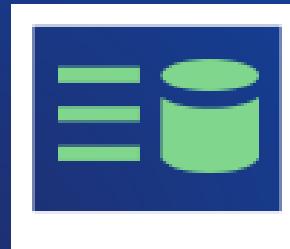
# Using Chef – A Typical Multi-machine Deployment



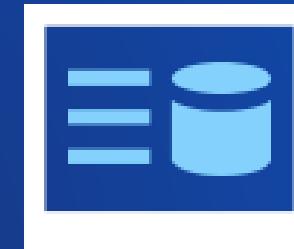
# Tips, Tricks & Key Points

# Plan Ahead

- **Need to plan**
  - Design
  - Configuration
  - Testing
- **Repeatable**
  - Success in production environment
  - Less downtime in production
  - Faster recovery



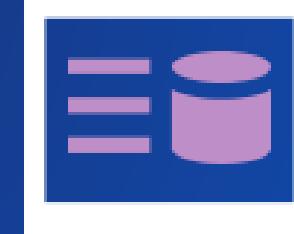
Production



Recovery



Dev



QA



# Consider Baking a Base Image



Install Chef; Cookbook

Have Some Processes Done.  
e.g., Setups, System Requirements

Have some components baked in,  
e.g. base map, security updates, etc

# Work With



ArcGIS API  
for Python



webgisdr  
Utility

- Other software deployment automation tools
- Whole system infrastructure automation
- GIS workflow automation tools
  - Python API for ArcGIS
  - WebGISDR tool

# ArcGIS Software Repository

- A central location where all ArcGIS Software setups are stored
  - File share: local software repository
  - AWS S3 bucket
- At 10.7 and 10.7.1 all ArcGIS Cookbooks use this variable

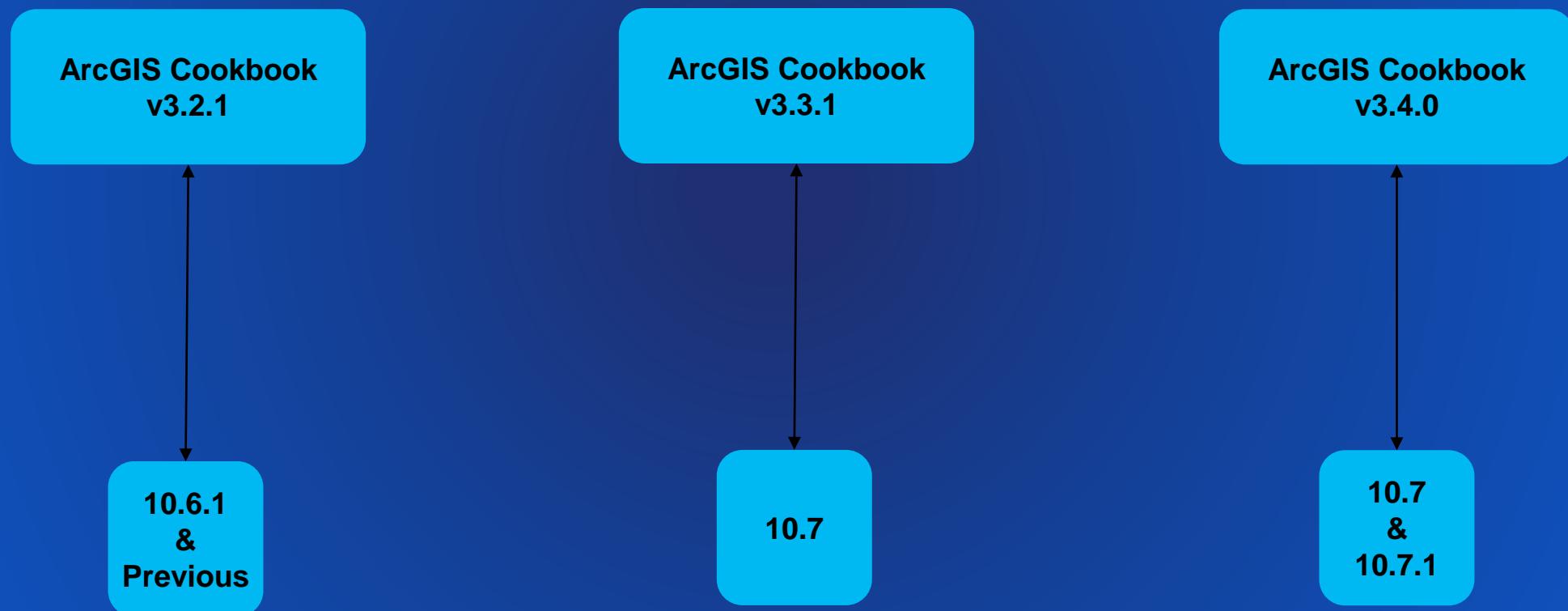
```
  "version": "10.7",
  "repository": {
    "archives": "\\\\esri.com\\Software\\Esri\\Released\\"
  },
  "server": {
    "admin_username": "admin",
    "admin_password": "admin",
    "authorization_file": "\\\\metro\\ArcGIS_Automation\\",
    "is_hosting": false
  }
}
```

# ArcGIS Software

- **ArcGIS Enterprise**
  - **Portal for ArcGIS**
  - **ArcGIS Server**
    - **Enabled Roles:** **Hosting, Image Server, GeoAnalytics, GeoEvent Server**
  - **ArcGIS Data Store**
    - **Relational, Tile Cache, Spatiotemporal**
  - **ArcGIS Web Adaptor**
- **And other Esri Software:**
  - **ArcGIS Pro**
  - **ArcGIS Insight**
  - **ArcGIS Desktop**
  - **ArcGIS License Manager**



# ArcGIS Cookbook releases vs. ArcGIS Enterprise releases



# Other Tricks & Tips

- **Disconnected Environment Considerations**
  - Make sure you have proper Esri license files staged for use
  - Software setups in a common location for access
  - Having Chef Client installation staged for installation
- Set password in an environment variable
- “-I debug” for debug
- Attributes value of True or False, no “”. e.g. “configure\_autostart”: true
- Support security configuration for ArcGIS Server.



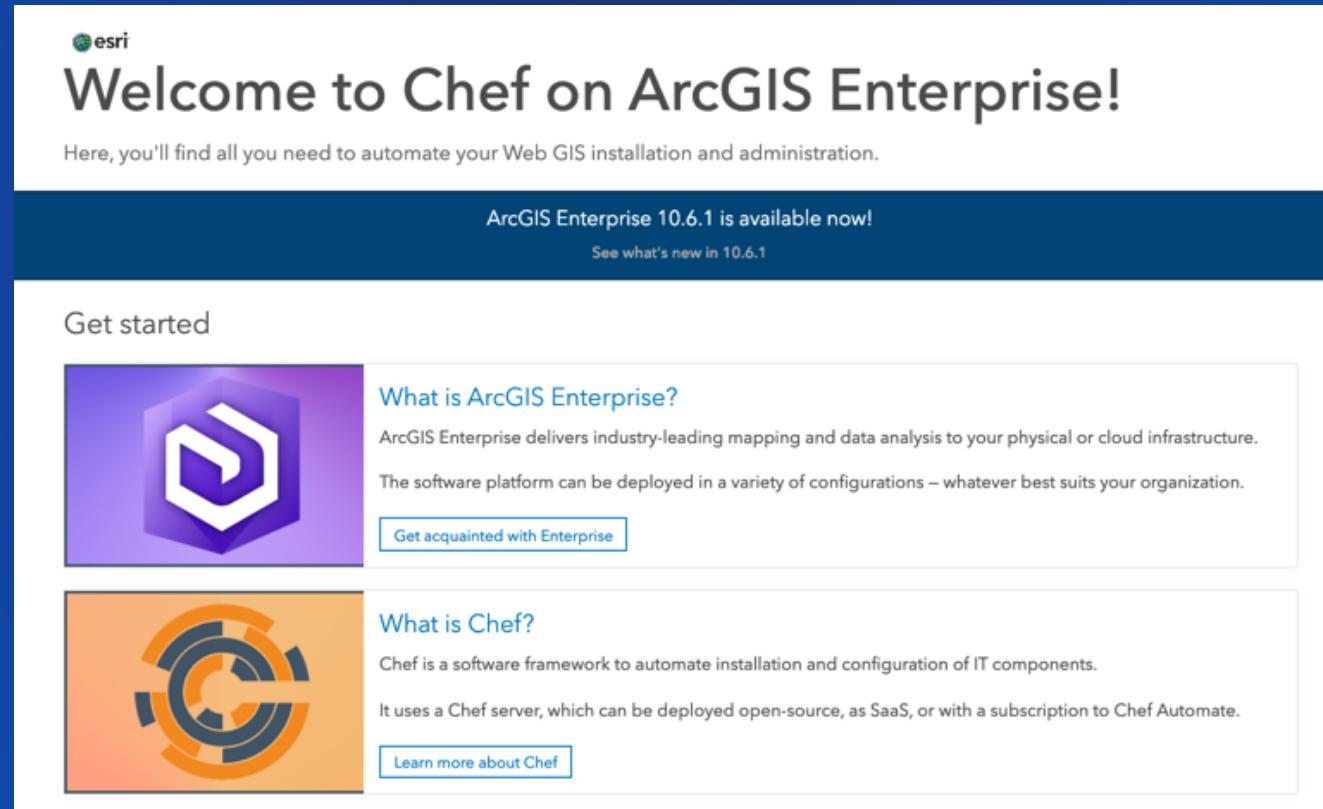
## Why use Chef?

- Easy
- Flexible
- Customizable
- Repeatable
- Forward-thinking



# Resources for Chef + ArcGIS Enterprise

[esri.github.io/arcgis-cookbook](https://esri.github.io/arcgis-cookbook)



The screenshot shows the homepage of the [esri.github.io/arcgis-cookbook](https://esri.github.io/arcgis-cookbook) website. The header features the Esri logo and the title "Welcome to Chef on ArcGIS Enterprise!". Below the title, a sub-header reads: "Here, you'll find all you need to automate your Web GIS installation and administration." A prominent dark blue banner at the top of the main content area announces "ArcGIS Enterprise 10.6.1 is available now!" with a link to "See what's new in 10.6.1". The main content is organized into two sections: "Get started" and "What is ArcGIS Enterprise?". The "Get started" section includes a purple hexagonal icon with a white "D" and a "Get started" button. The "What is ArcGIS Enterprise?" section includes a purple hexagonal icon with a white "D" and a "Get acquainted with Enterprise" button. The "What is Chef?" section includes an orange hexagonal icon with a white "C" and a "Learn more about Chef" button. The overall design is clean and modern, using a white background with dark blue and purple accents.

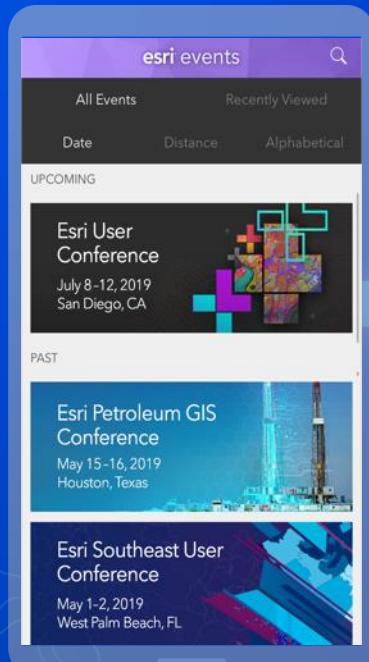
# Summary

## Best fit use case:

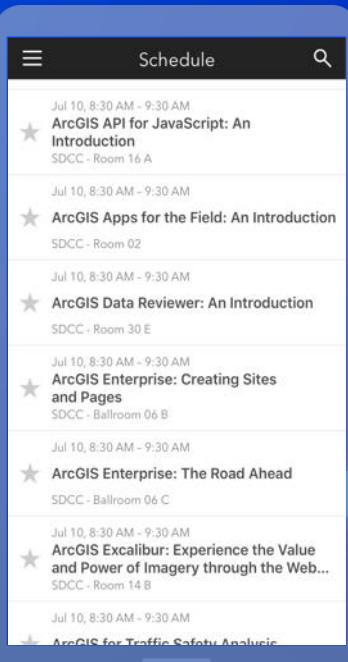
- **ArcGIS Enterprise Builder** = Single machine deployment all-in-one, very limited options
  - Base deployment only
- **AWS** = Deploying in Amazon cloud
  - Base deployment, server roles
- **Azure** = Deploying in Azure cloud
  - Base deployment, server roles
- **Powershell DSC** = All deployments, on premises or cloud, Windows, repeat deployments
  - Base deployment, server roles, HA, DR
- **Chef** = All deployments, on-premises or cloud, Windows or Linux, repeat deployments
  - Base deployment, server roles, HA, DR

# Please Share Your Feedback in the App

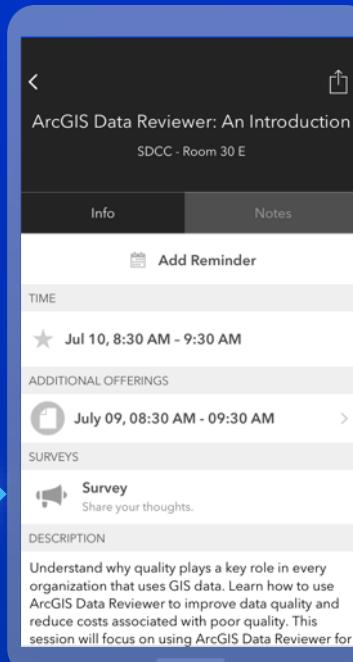
Download the Esri Events app and find your event



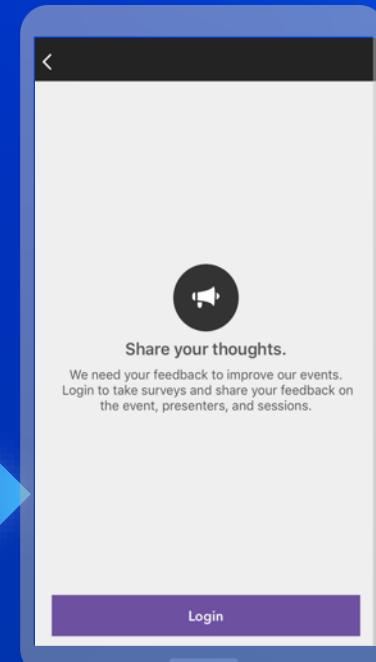
Select the session you attended



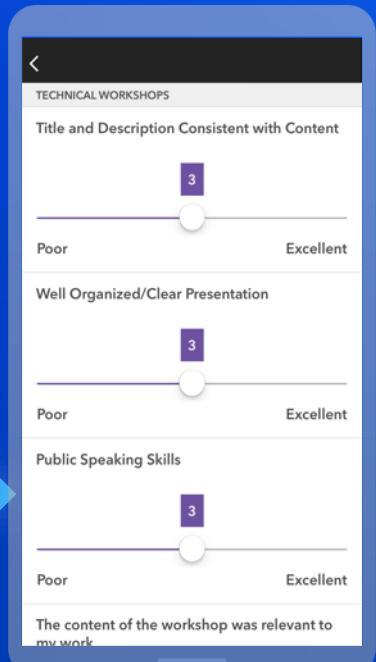
Scroll down to "Survey"



Log in to access the survey



Complete the survey and select "Submit"





# Presentation Title

Presenter Names

A blue-toned background featuring abstract map elements such as contour lines, a legend with color-coded categories, and various geometric shapes (crosses, squares, L-shapes) in cyan, yellow, and orange. The overall aesthetic is professional and technical.

SEE  
WHAT  
OTHERS  
CAN'T



# Section Header

Section Subhead

# Demo Title

Presenter(s)

