ArcGIS Enterprise:

Building content for Sustainable Development

Matthias Schenker – CTO Esri Schweiz - Zurich

Sam Libby – Nonprofit Practice Lead, Esri Professional Services - Denver

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Themes for today's presentation

- Introducing and Explaining ArcGIS Enterprise
- Planning ArcGIS Enterprise Deployments
- Best Practices and Options for Sharing Content
- Recent Enhancements in ArcGIS Enterprise
- Working in the Cloud

What is Web GIS?

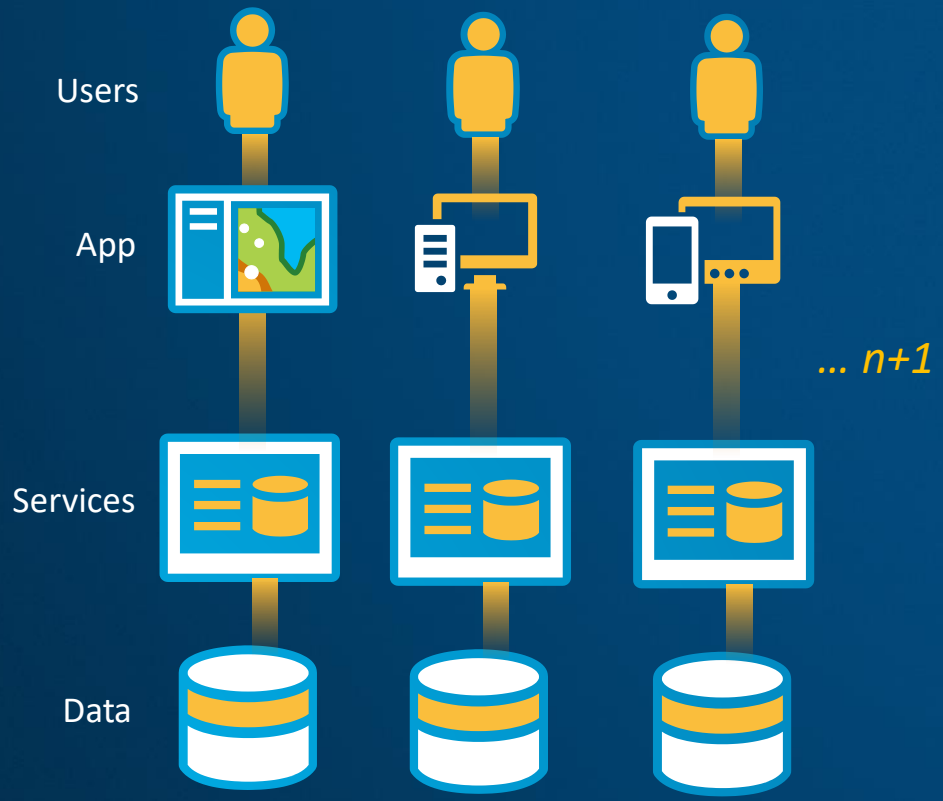
Working with ArcGIS Enterprise

ArcGIS Enterprise is a complete system for data management, spatial analysis and application building that is installed on infrastructure you control, whether in the cloud or on-premises.

ArcGIS Enterprise | Server GIS vs. Web GIS

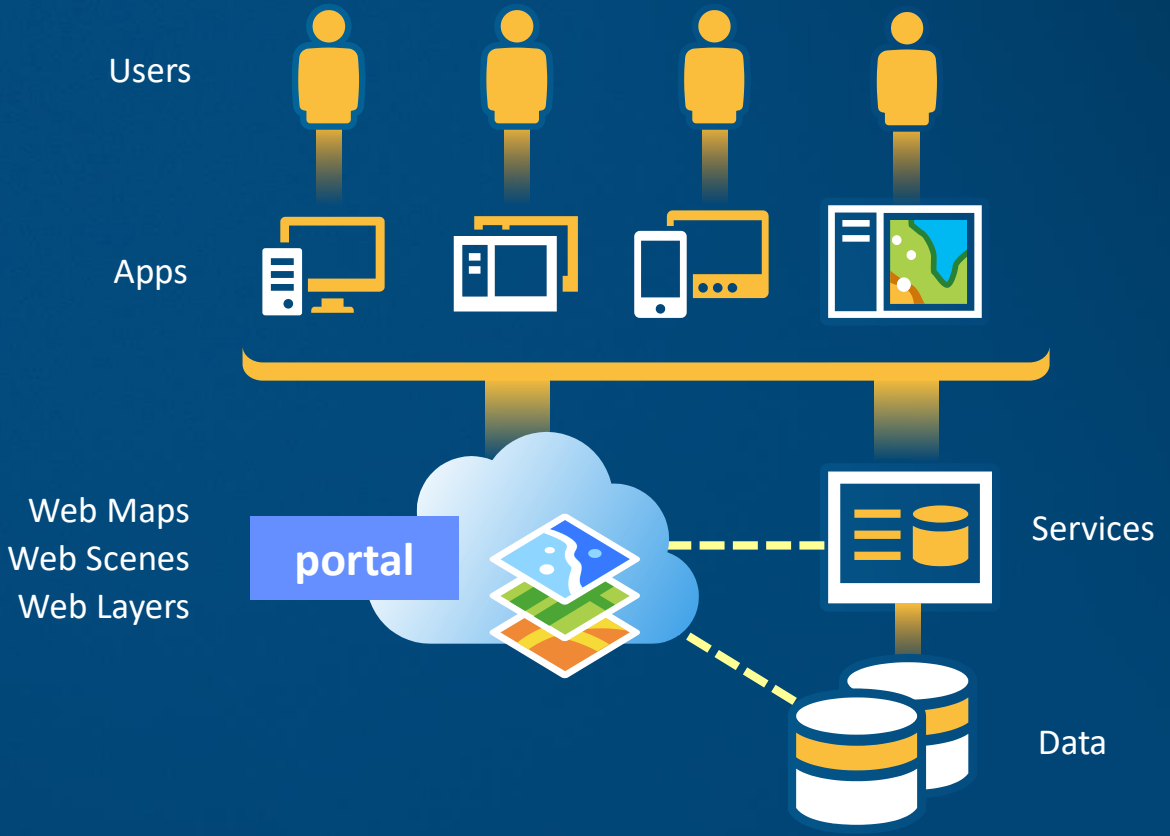
Server GIS

Use of GIS services with custom front end applications



Web GIS

Pervasive use of web layers, scenes, and maps within all of the ArcGIS apps



ArcGIS

ArcGIS Online

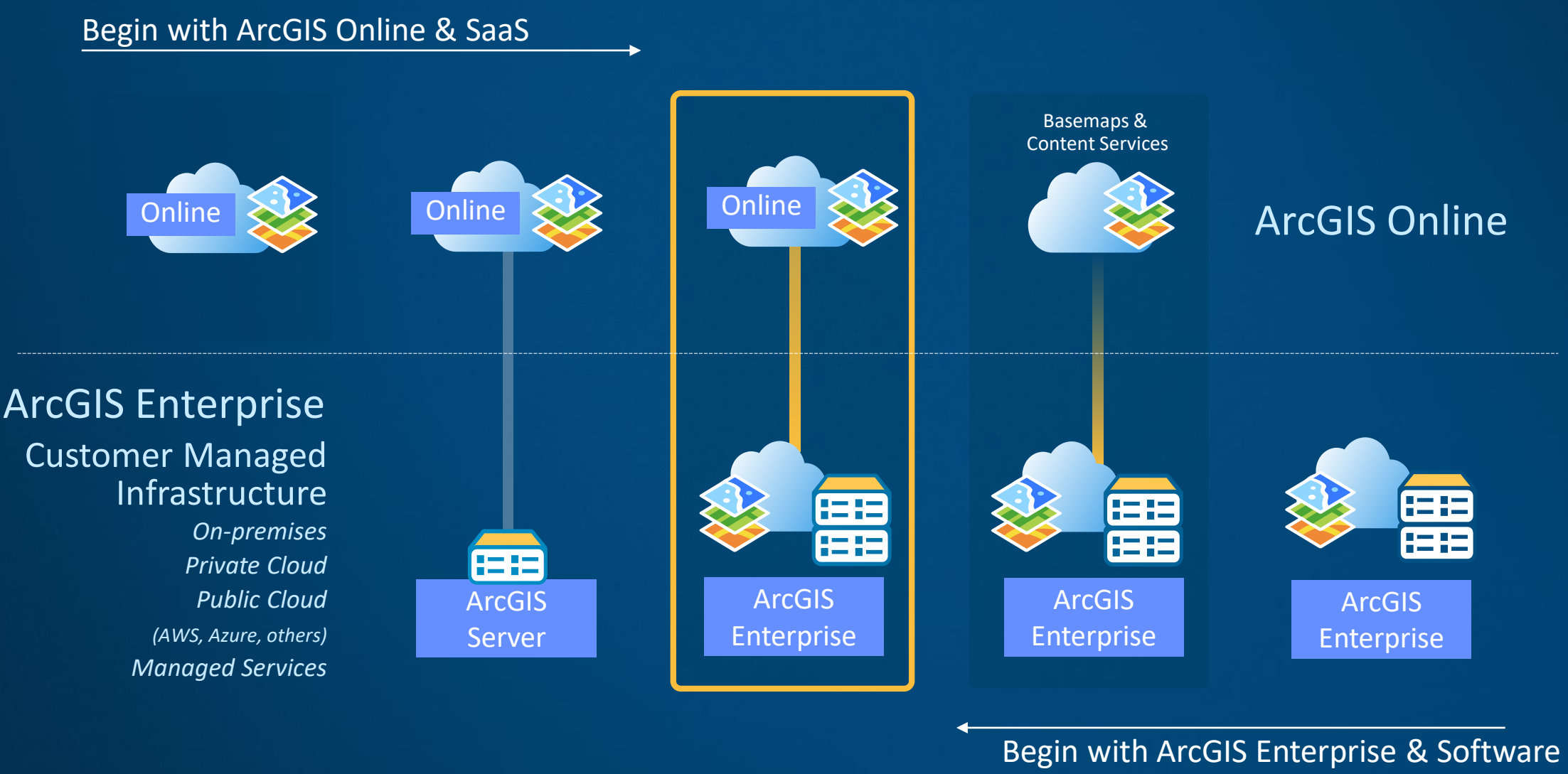
- Hosted by Esri (SaaS)
  - Upgraded automatically (by Esri)
  - Esri controls SLA
- Esri-provided content and services
  - Basemaps
  - Living Atlas
  - GeoEnrichment, Routing, …

Core Web GIS functionality
(Apps, visualization, smart mapping, analysis…)

ArcGIS Enterprise

- In your own infrastructure (Software)
  - Upgraded by the organization
  - Organization controls SLA
- Advanced GIS functionality
  - GIS Server
  - Image Server (optional)
  - GeoEvent Server (optional)
  - GeoAnalytics Server (optional)

ArcGIS Enterprise | Web GIS Pattern Evolution



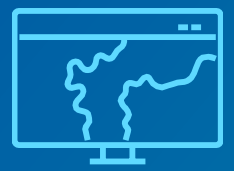
What can I do with ArcGIS Enterprise?

Publish, host and serve web services

Share and collaborate

Work with imagery and raster data

Build and use applications



Customize the look & feel of your GIS

Data science and machine learning

Web mapping and analysis

Run field operations

Monitor real-time data and your IoT

Access all kinds of data

Analyze big data

ArcGIS User Types | Match the Way Your Team Works

ArcGIS Enterprise

ArcGIS Online

Identity + **Capabilities** + **Apps**

View
Edit
Analyze
Create
Share
Administer

User Types

- New licensing model for users beginning at 10.7
- Provides the much requested ‘intermediate level’ user
- Each user type has an identity, capabilities and included applications
- Match your licensing to your workflows

ArcGIS User Types | App Bundles

ArcGIS Essential Apps

Map & Scene Viewer

Configurable Apps & Web AppBuilder

Esri Story Maps

Operations Dashboard for ArcGIS

Field Apps Bundle

Collector for ArcGIS

Survey123 for ArcGIS

Workforce for ArcGIS

Office Apps Bundle

ArcGIS Maps for Office

ArcGIS Maps for SharePoint

Planning your Deployment:

ArcGIS Enterprise architecture

Server Licensing Roles

One software component, multiple server roles

*** GeoEvent Server requires installing the ArcGIS Server software + overlaying the GeoEvent Server setup**

**** Notebook Server is a separate download and install that does not require the main ArcGIS Server setup**

Software Components

ArcGIS Enterprise

=

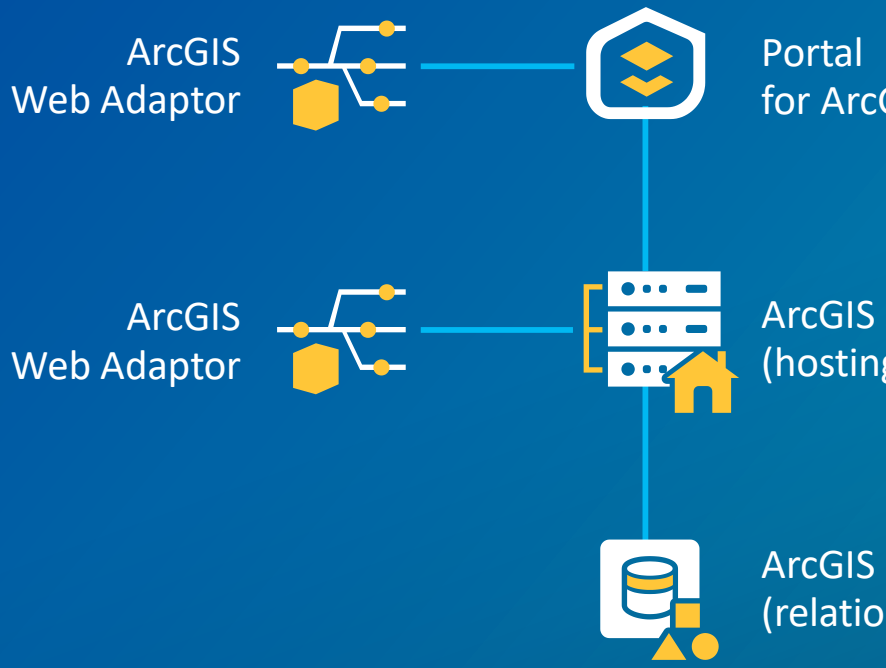
ArcGIS
Web Adaptor

Portal
for ArcGIS

ArcGIS
Server

ArcGIS
Data Store

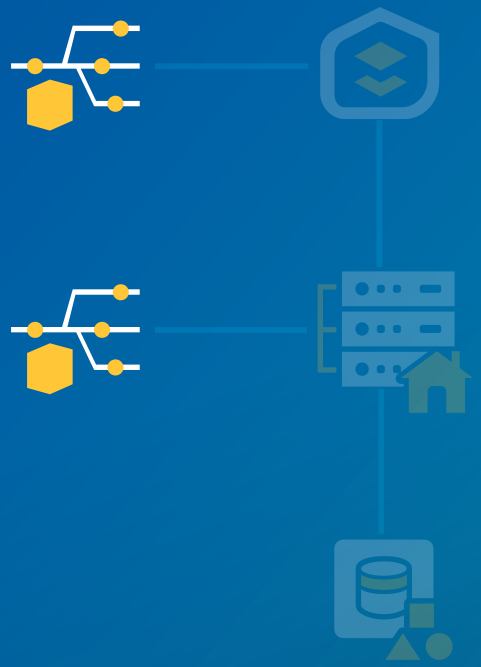
Base Deployment Logical Architecture



Base Deployment Logical Architecture

ArcGIS Web Adaptor

Integrates with your organization's existing web server to provide a single endpoint that distributes incoming requests and enables you to use web-tier authentication.



Base Deployment Logical Architecture

Portal for ArcGIS

The software component that enables the ArcGIS Enterprise portal. Portal for ArcGIS is the web frontend and API backend that supports a user's interaction and overall experience with your Web GIS.

Base Deployment Logical Architecture

ArcGIS Server

In a base deployment ArcGIS Server should be configured with a GIS Server licensing role and as the hosting server. In this capacity it gives you the ability to publish and share maps and layers from ArcGIS Pro using your own business databases and by copying data to the server.

Base Deployment Logical Architecture

ArcGIS Data Store

The ArcGIS managed data repository that stores the Enterprise portal's hosted content. It is not a replacement for your enterprise geodatabases.

Base Deployment Logical Architecture

ArcGIS Data Store

- Relational
- Tile Cache
- Spatiotemporal

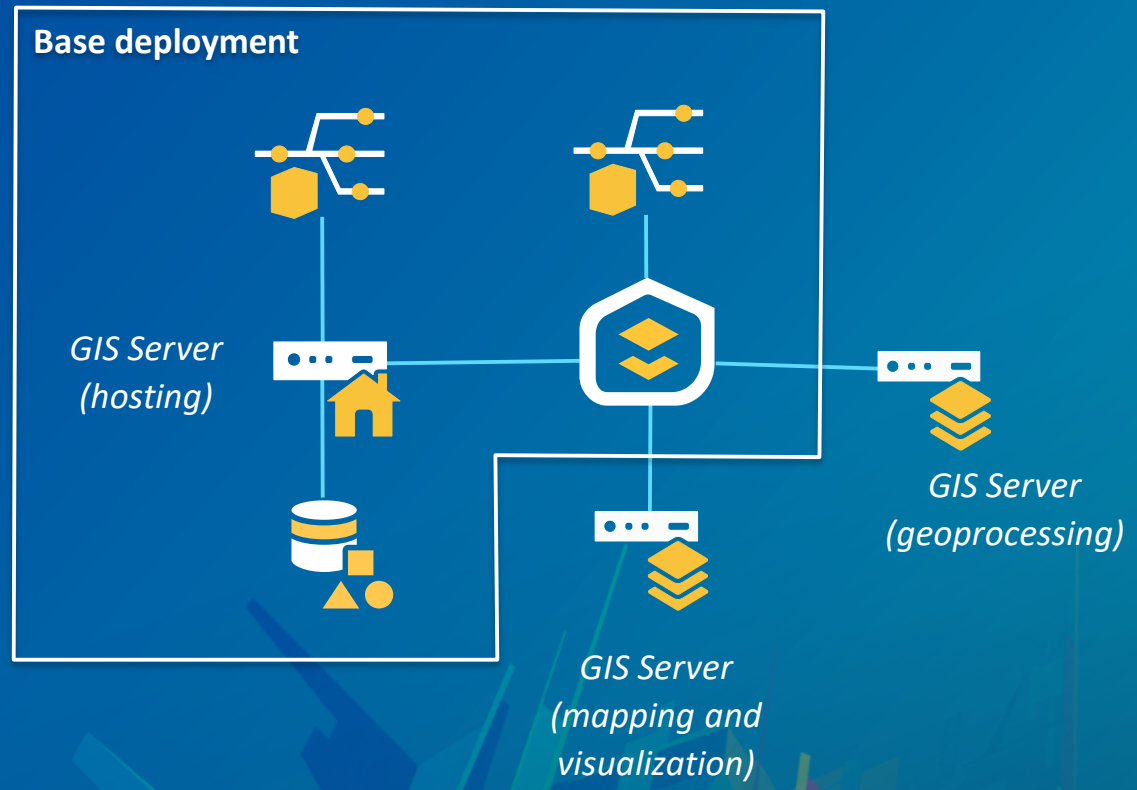
NOTE: This is not a replacement to your Enterprise Geodatabases.

Expanding out from the base deployment

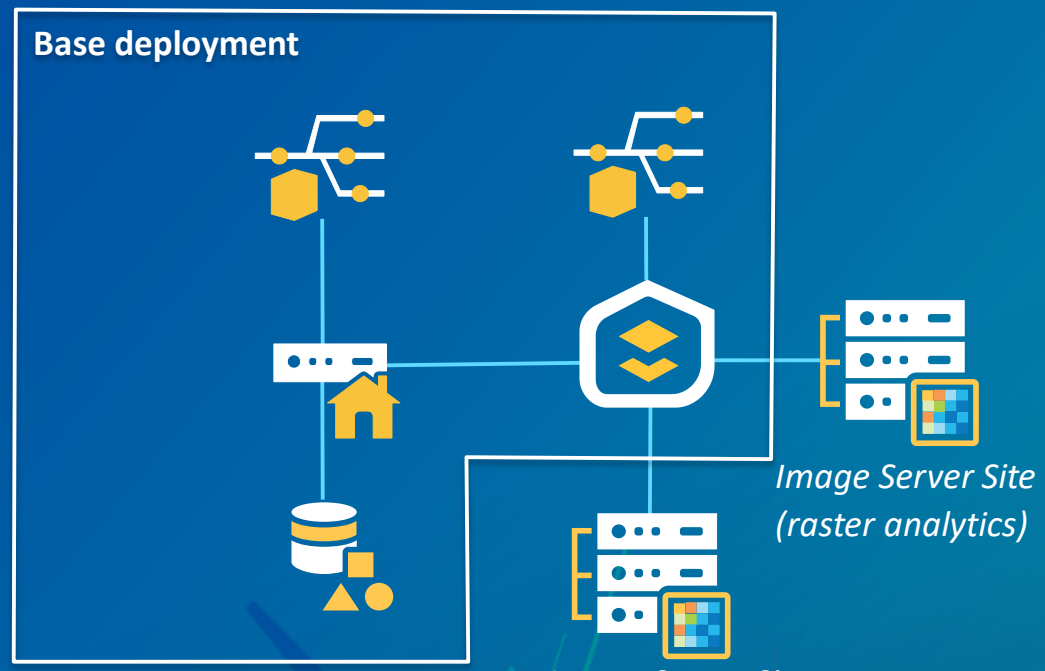
- Multiple reasons and ways to add to the base deployment

1. Adding additional GIS Server sites
   - Isolate hosting server site from traditional GIS Server duties
   - Have dedicated GIS Server sites for various purposes: heavily used map services, geoprocessing services, …
2. Adding additional capabilities
   - Image Server
   - GeoEvent Server
   - GeoAnalytics Server

Adding additional GIS Server site to your deployment



Adding Image Server to your deployment



Separate Image Server sites for each capability

Summary – Deployment Architecture

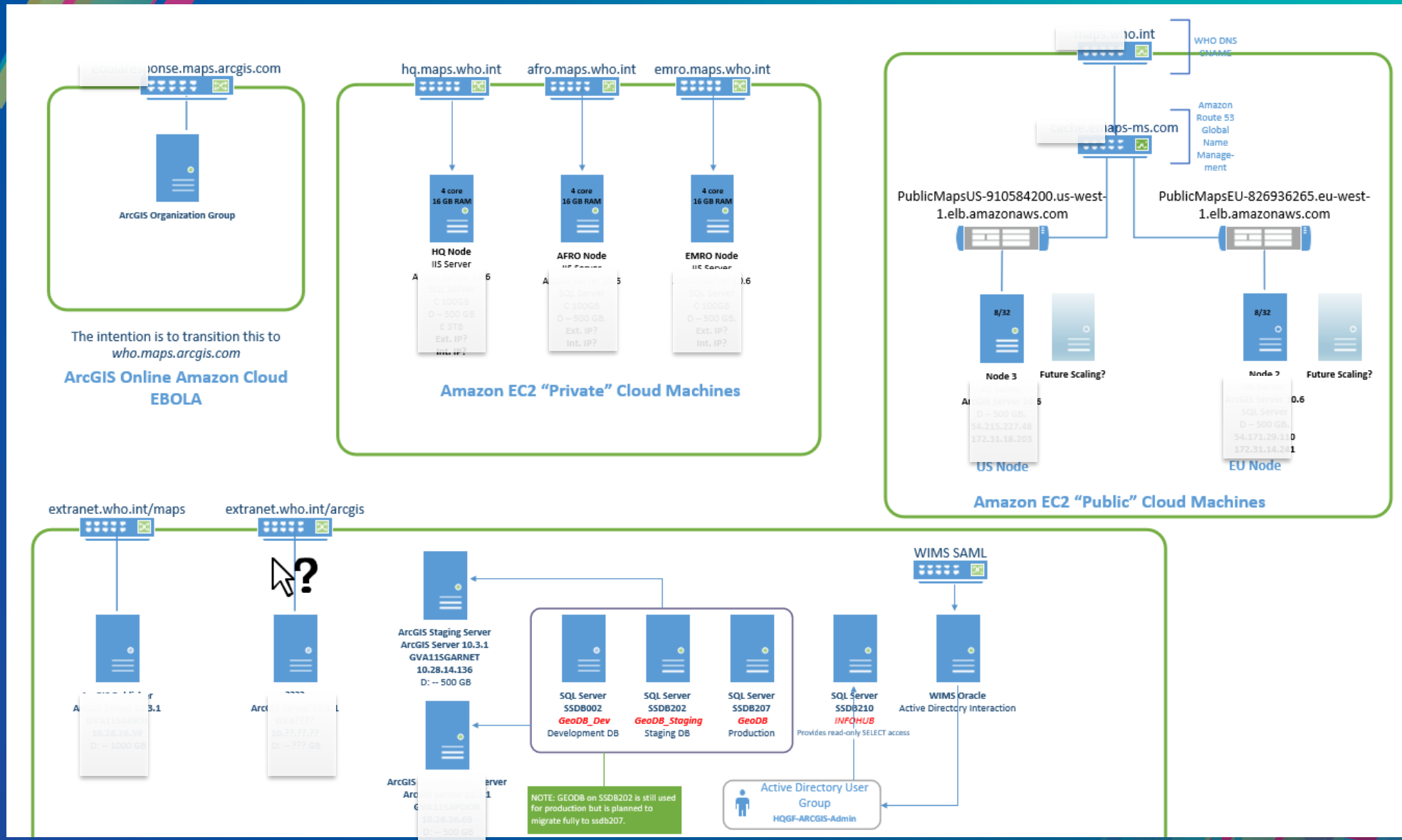
- Always start with your Base Deployment
  - Higher SLA requirement/importance -> redundant components and more complicated systems
- With strong Base Deployment you can expand in multiple directions later on

Next steps when Deploying

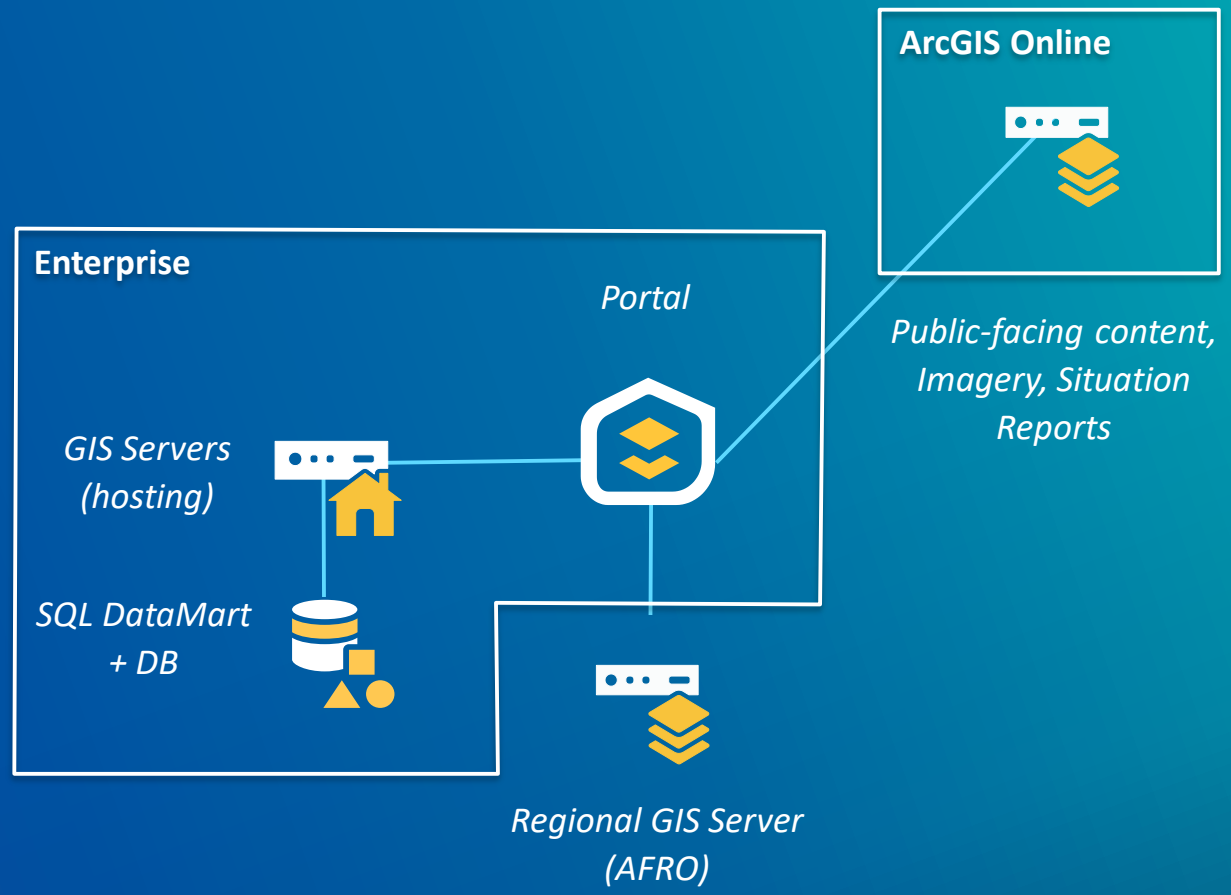
- Verify deployment (Publish test data)
- Add members (Built-In or enterprise users)
- Customize the portal

Examples

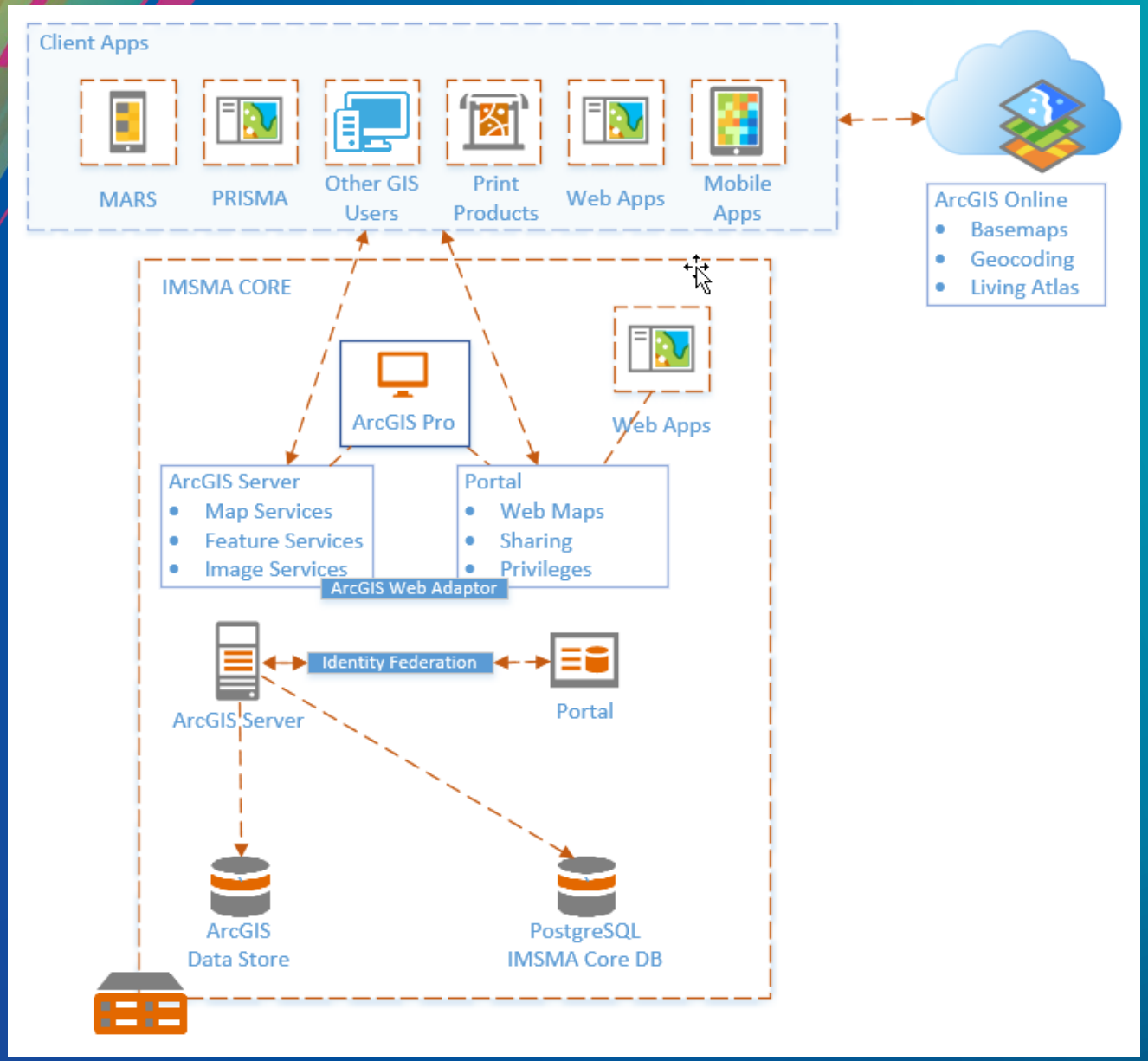
ArcGIS Enterprise in the Wild



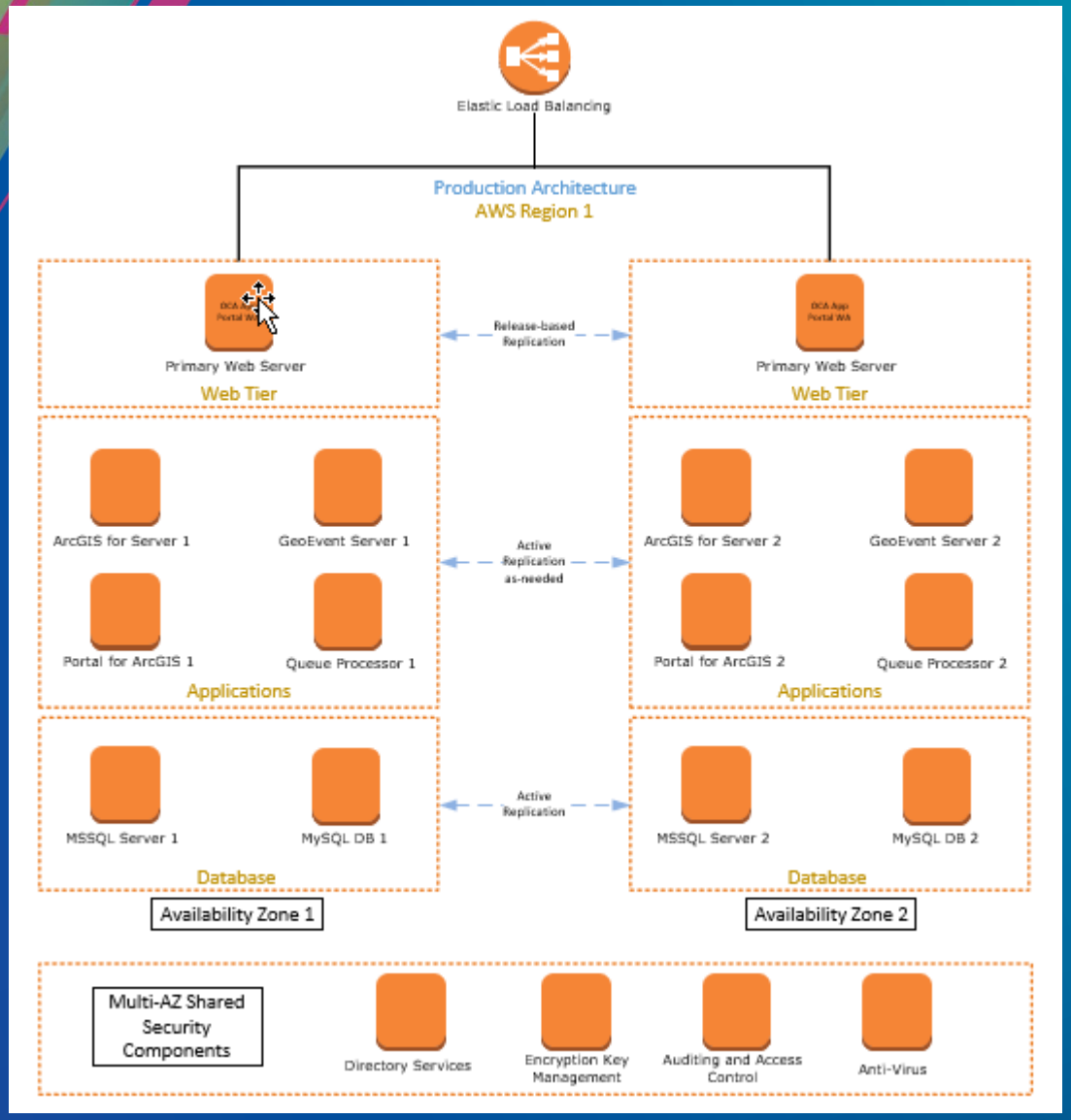
World Health Organization



World Health Organization



GICHD – IMSMA Core



American Red Cross

Best Practices:

Sharing Content with ArcGIS Enterprise

GIS is Evolving

Influenced by Innovation in Many Areas

Web GIS

Technology

Virtualization

Big Data

IoT

Faster Computing

Distributed Processing

Smart Devices

Consumerization

Cloud

Content

Lidar

Field Survey

Real-Time

Sensors

Social Media

GPS

Crowdsourcing

Scientific Data

UAVs

Remote Sensing

Applications

Analytics

3D

Apps

Mobile

Real-Time

Visualization

Collaborative

Implementation

Configurable

Agile

Open

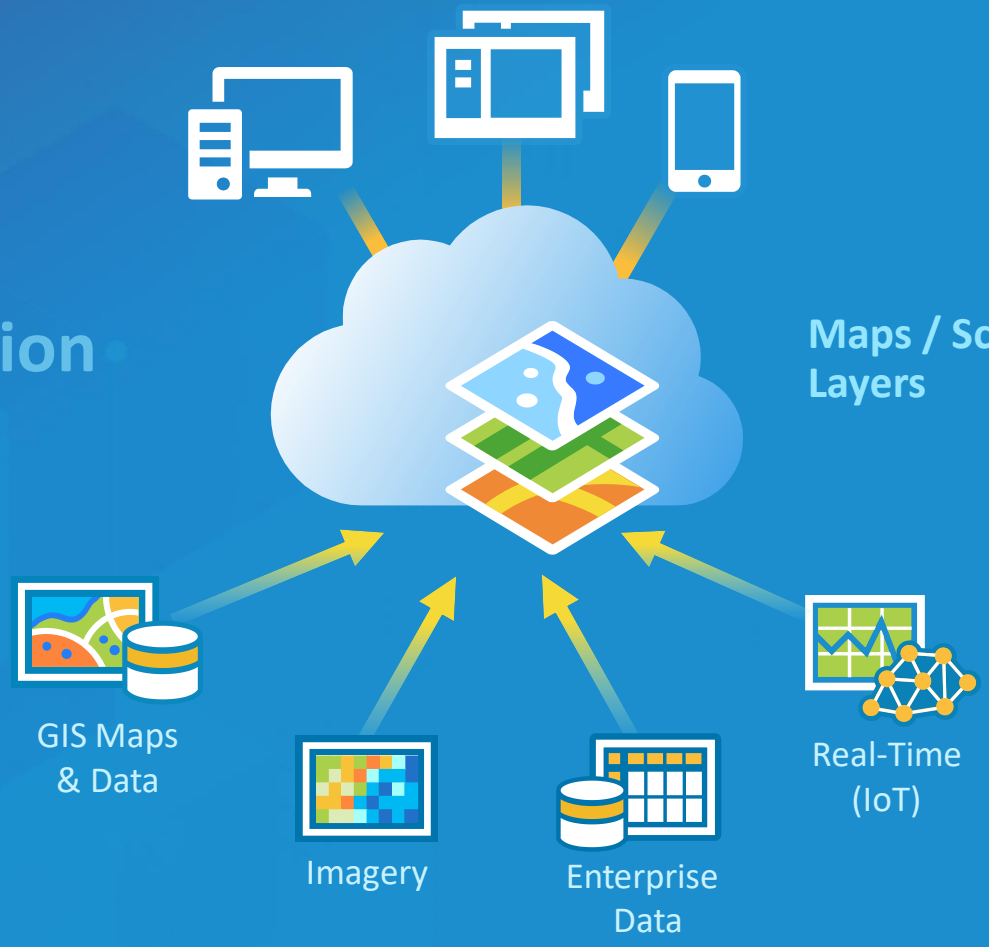
Easier

Ready to Use

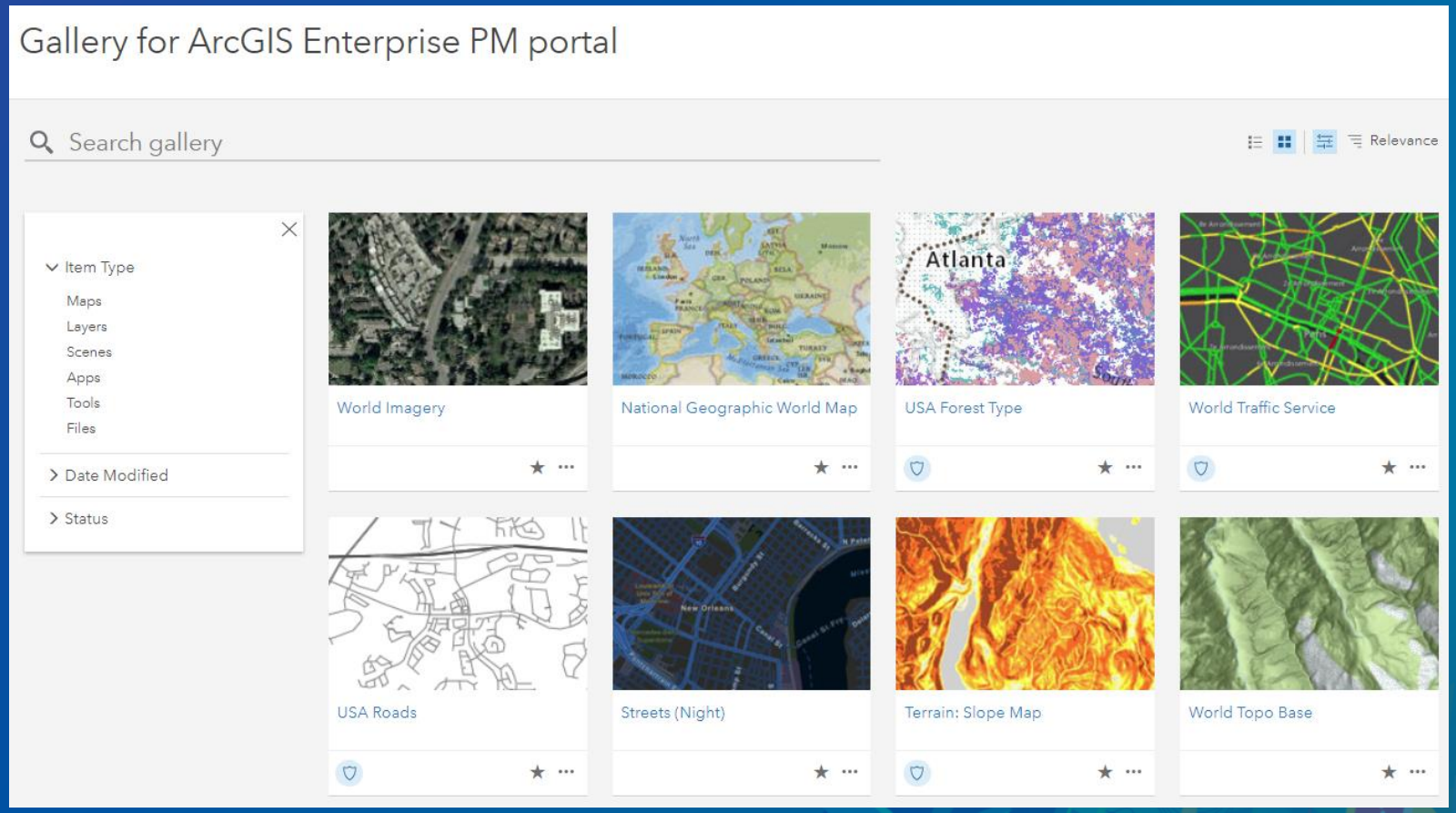
Web GIS

Abstracts & Organizes All Types of Geospatial Data

GeoInformation Model

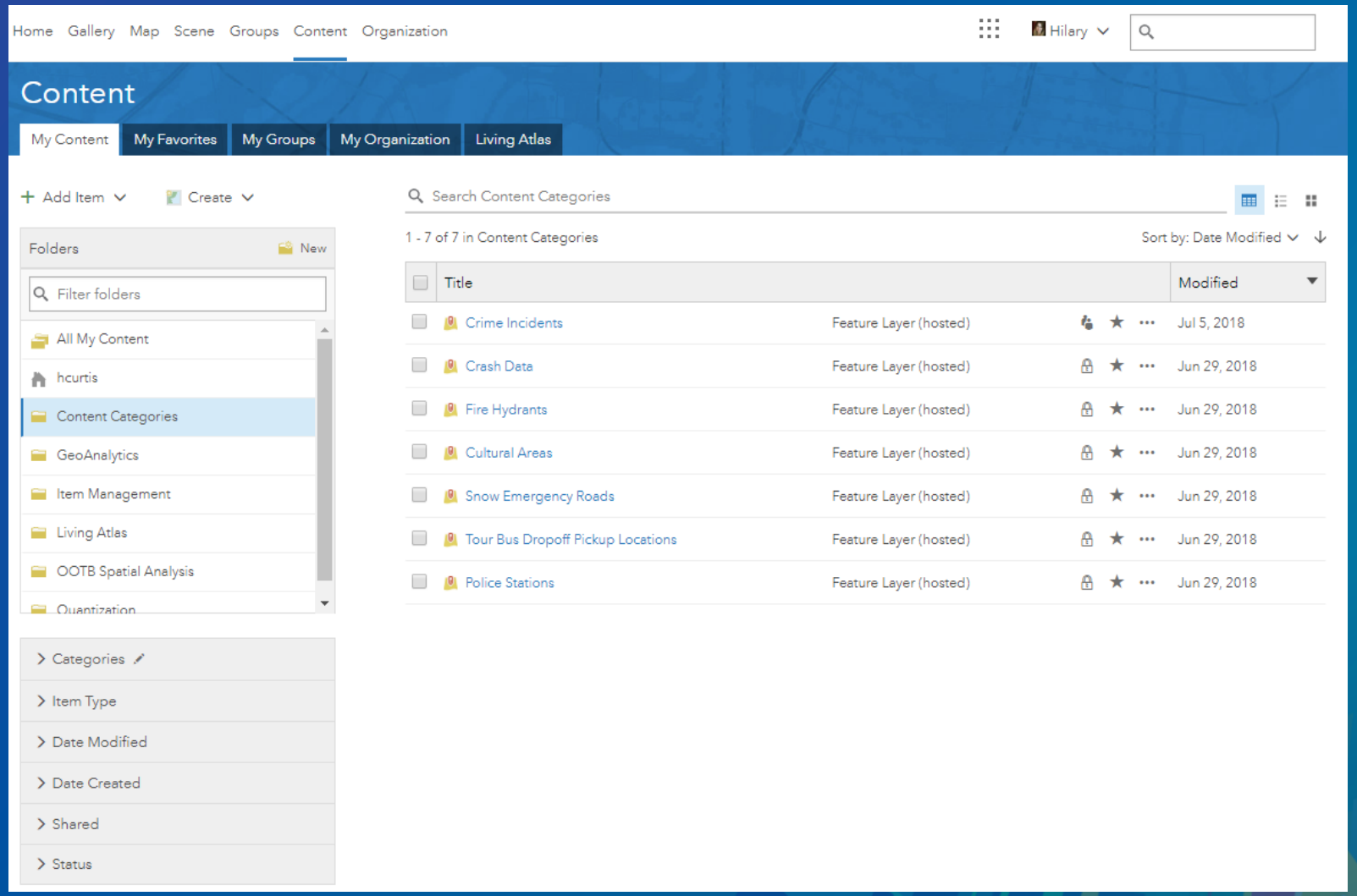


Gallery



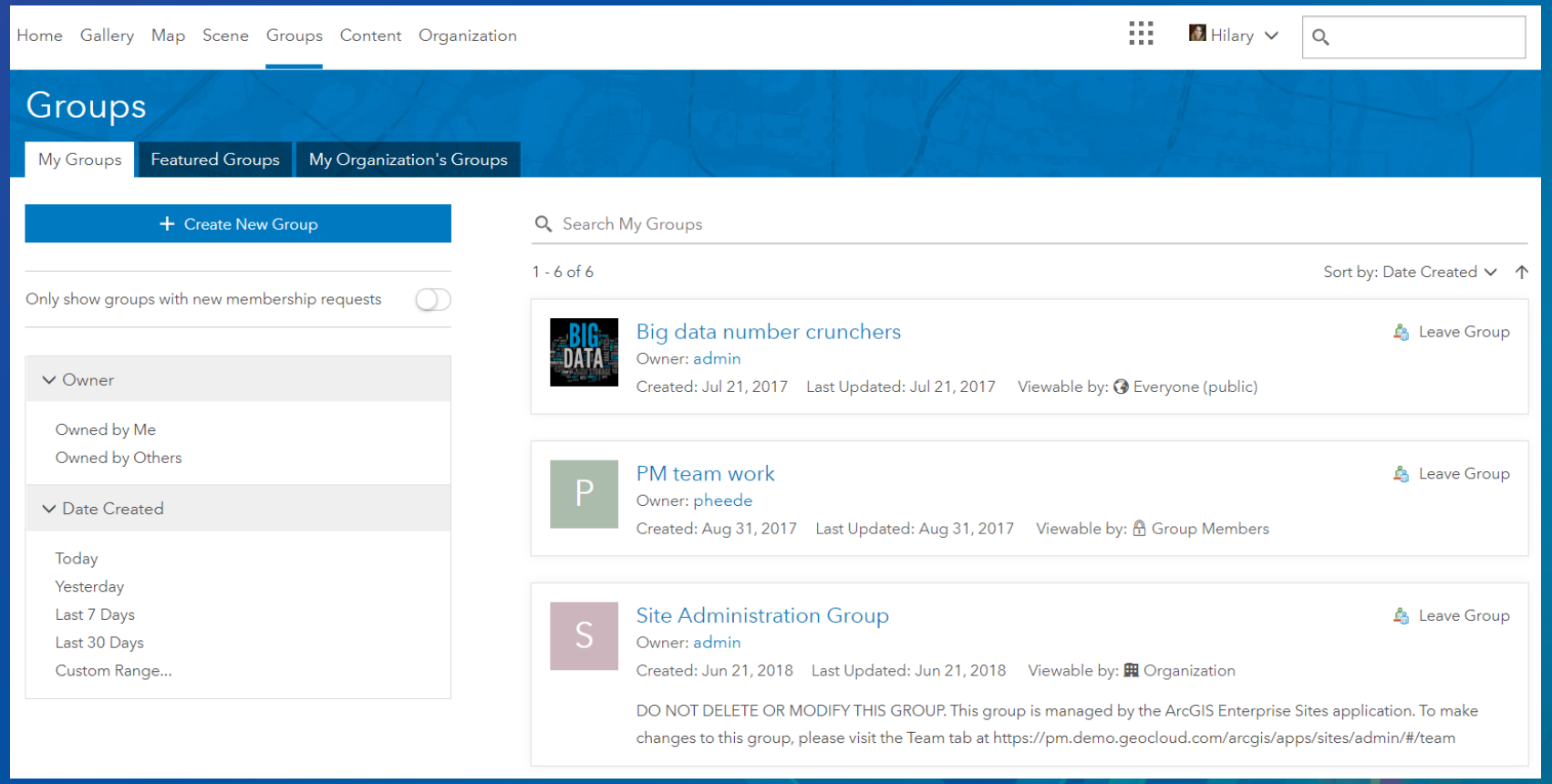
- View all content or a curated group
- Filters: Date Modified, Status
- Search
- Living Atlas tab (‘Esri Featured Content’) moved to Content page

Content



- Tabs for Subsets
- Filters: categories, date modified, date created, shared, status
- Sort by date modified, title
- Display: grid, table, list
- Search

Groups

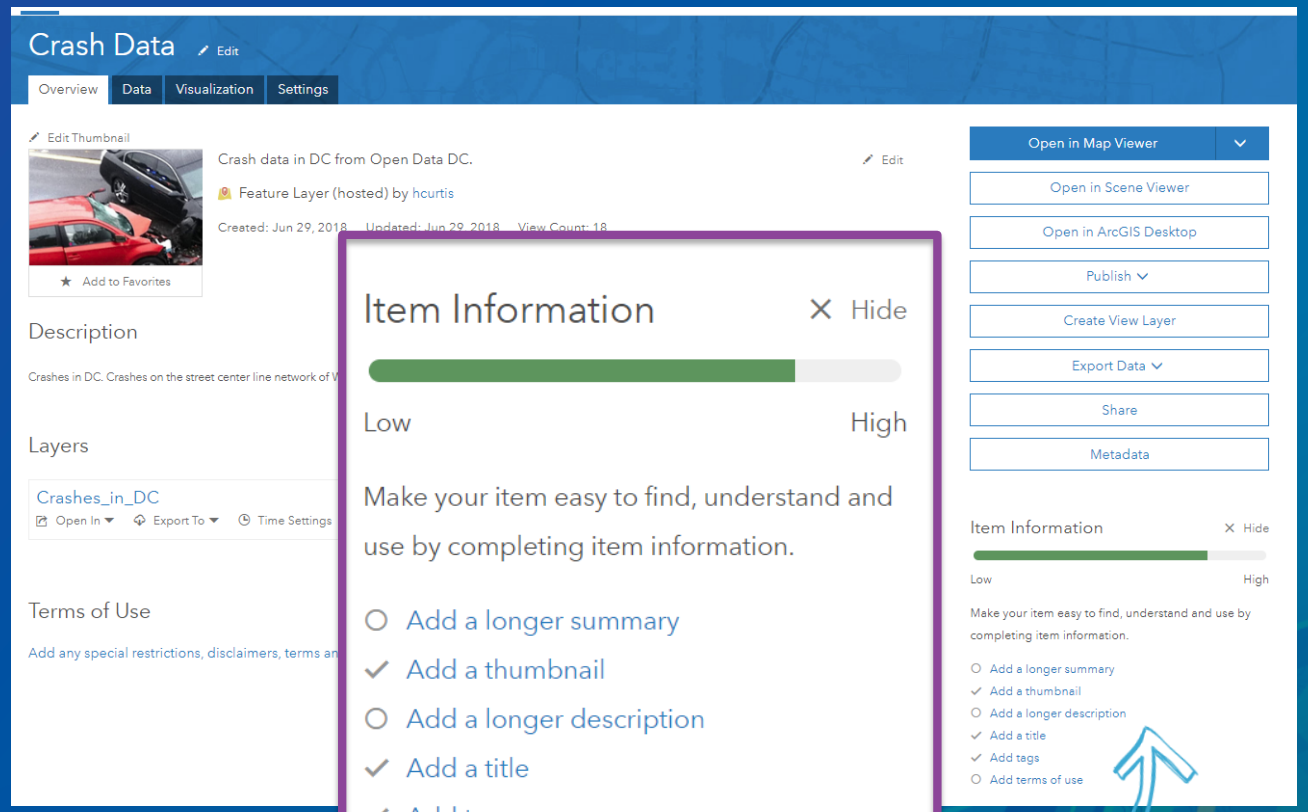


- Filters: date created, viewable by
- Sort by title, date modified, date created
- Search

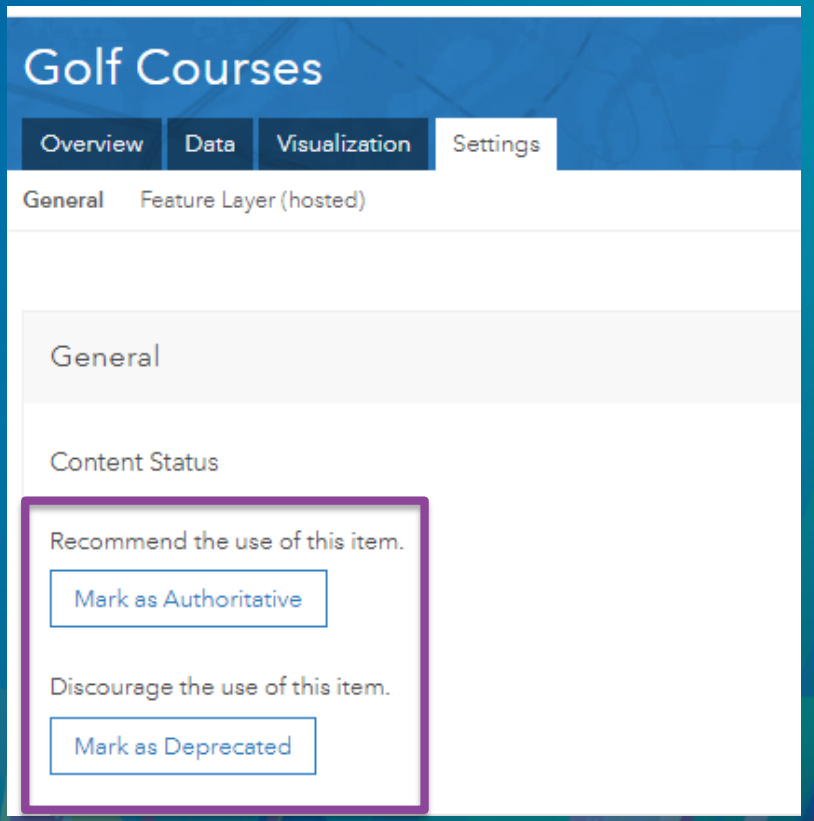
Item level enhancements

- New item information bar

- Authoritative and deprecated badges



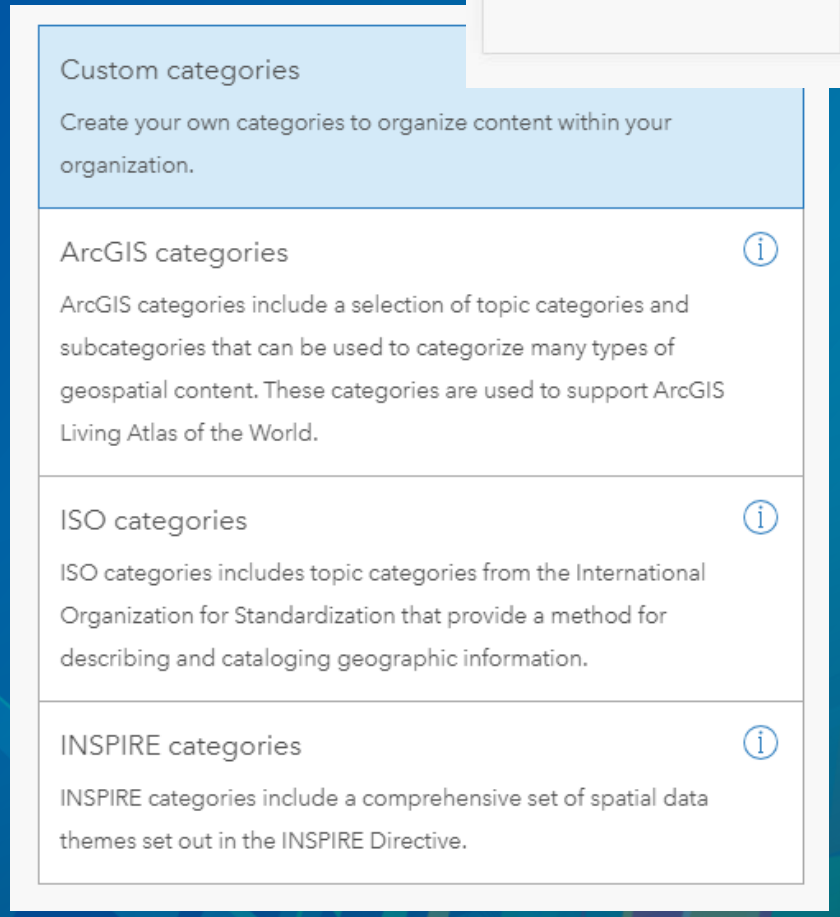
Encourage quality metadata



Promote quality items

Content categories

- A way to arrange and discover content based on organization-wide themes
- Categories allow members to organize items consistently and provide a simple way to browse content in the organization



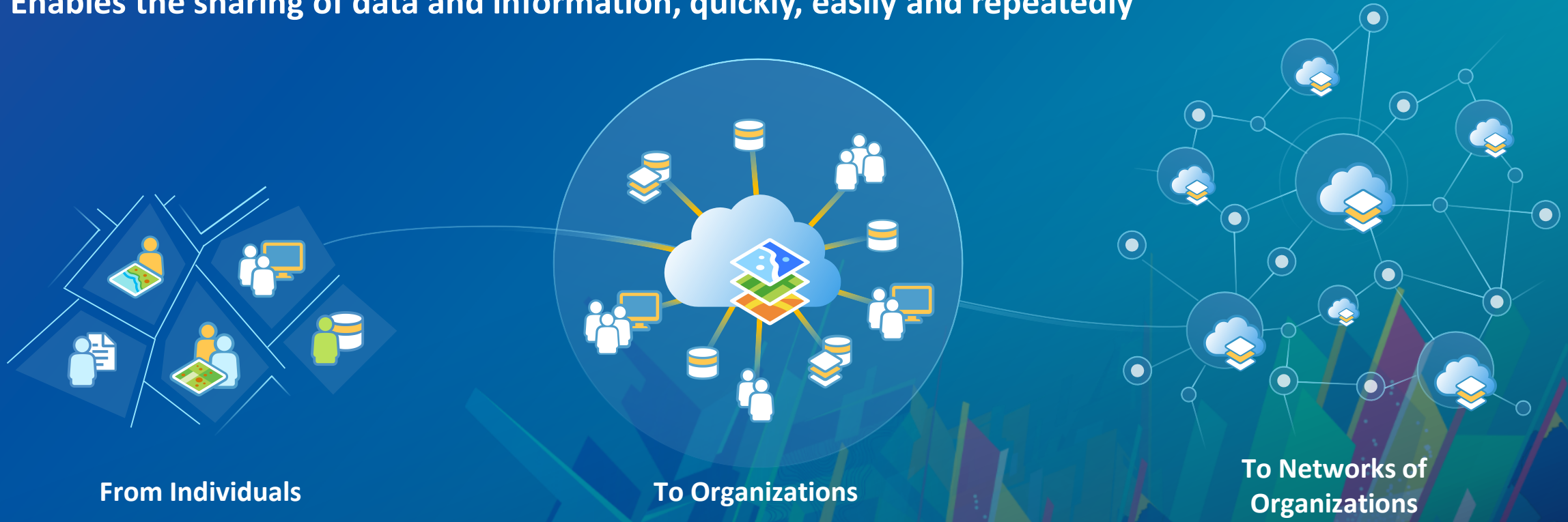
- Use custom or template hierarchies
- Default administrator role or custom role with privilege ‘manage categories’

Sharing beyond your organization

Distributed collaboration

Establishes a trusted, collaborative environment with others

Enables the sharing of data and information, quickly, easily and repeatedly



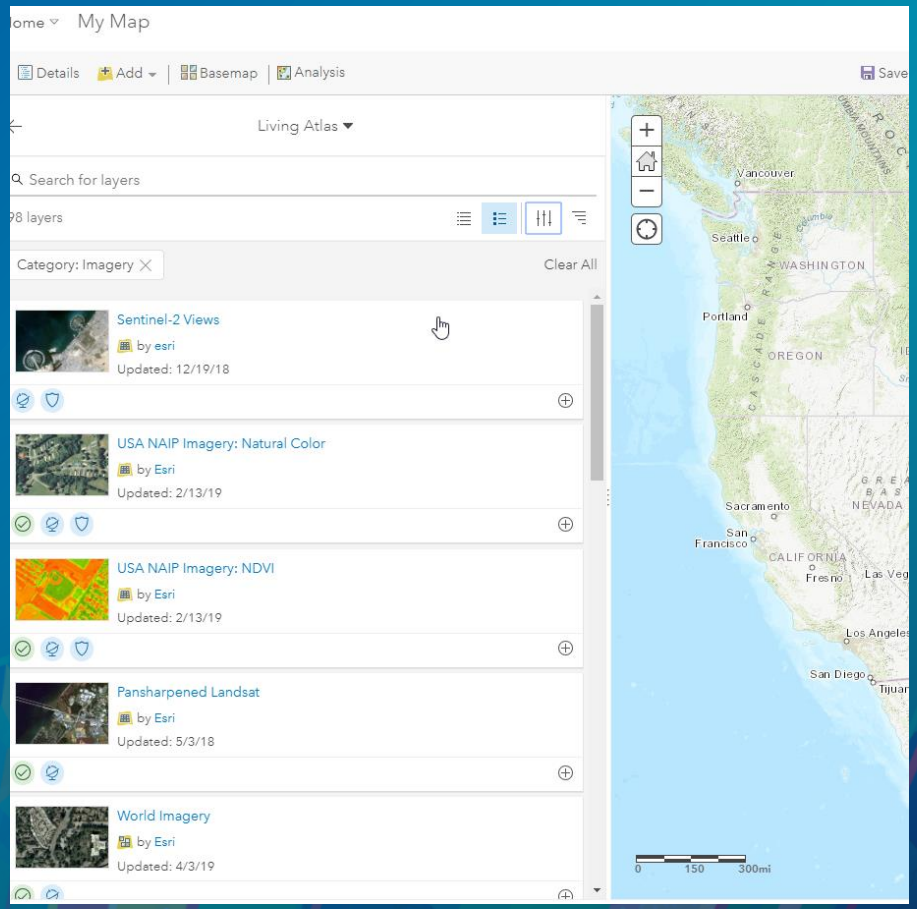
From Individuals

To Organizations

To Networks of Organizations

Sharing Summary

- Understand the Sharing Model
  - Access and Permissions
- Build a sharing model to match your org structure
- Use sharing + user roles for fine grained access control
- Highlight quality content with tags and item info



Demo

Sharing in Enterprise:
Categories, Tags and Authoritative Content

Recent Enhancements:

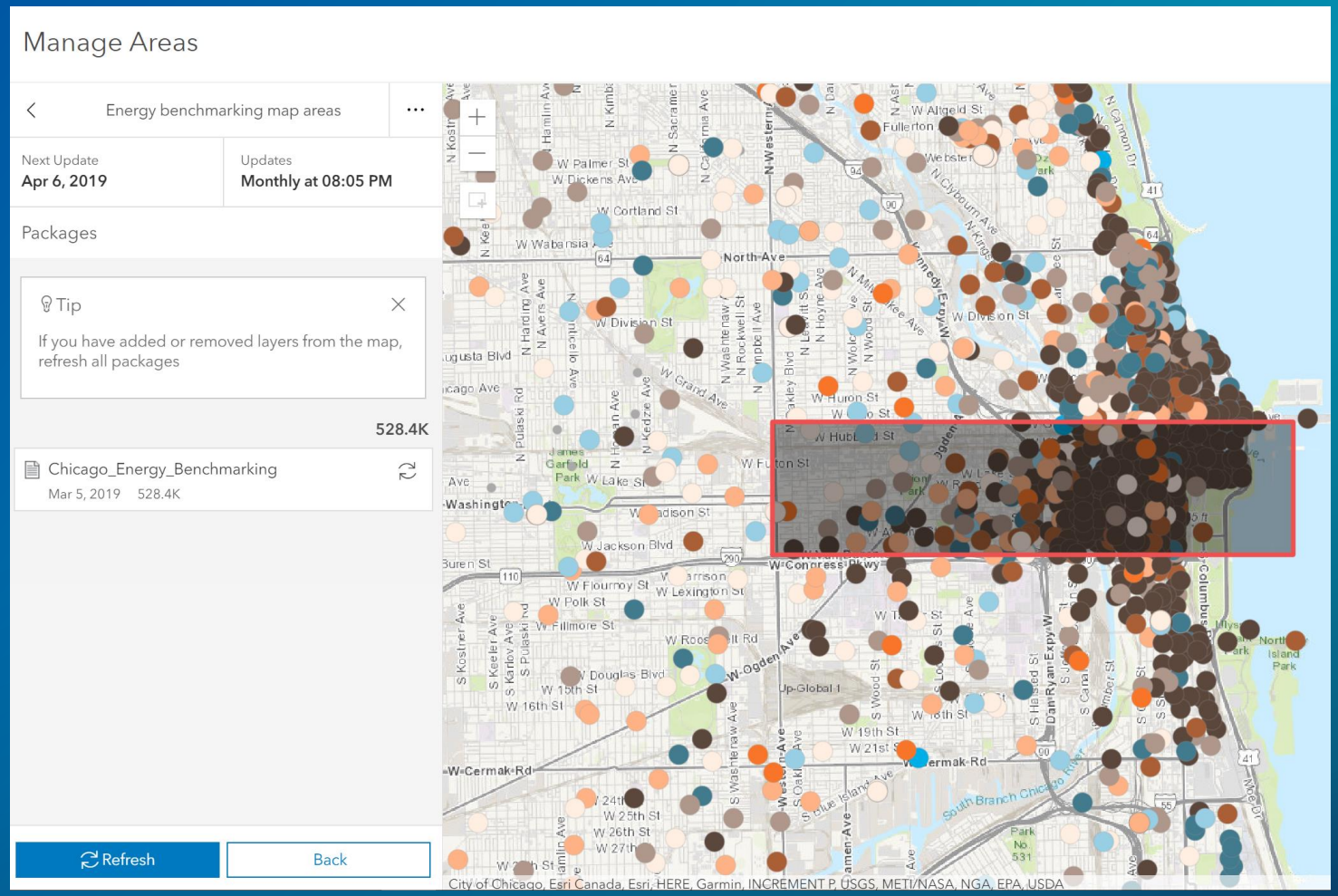
ArcGIS Enterprise 10.6.1/10.7.0

Create offline map areas

Support offline field workflows

Create pre-determined map areas to take offline:

- Makes it easier and faster to package up and take maps offline
- Update offline areas on a schedule to reflect changes in your web map
- Use in apps built using the Runtime SDK or Collector for ArcGIS



ArcGIS Notebook Server

Host Python notebooks in your infrastructure

A powerful data science platform

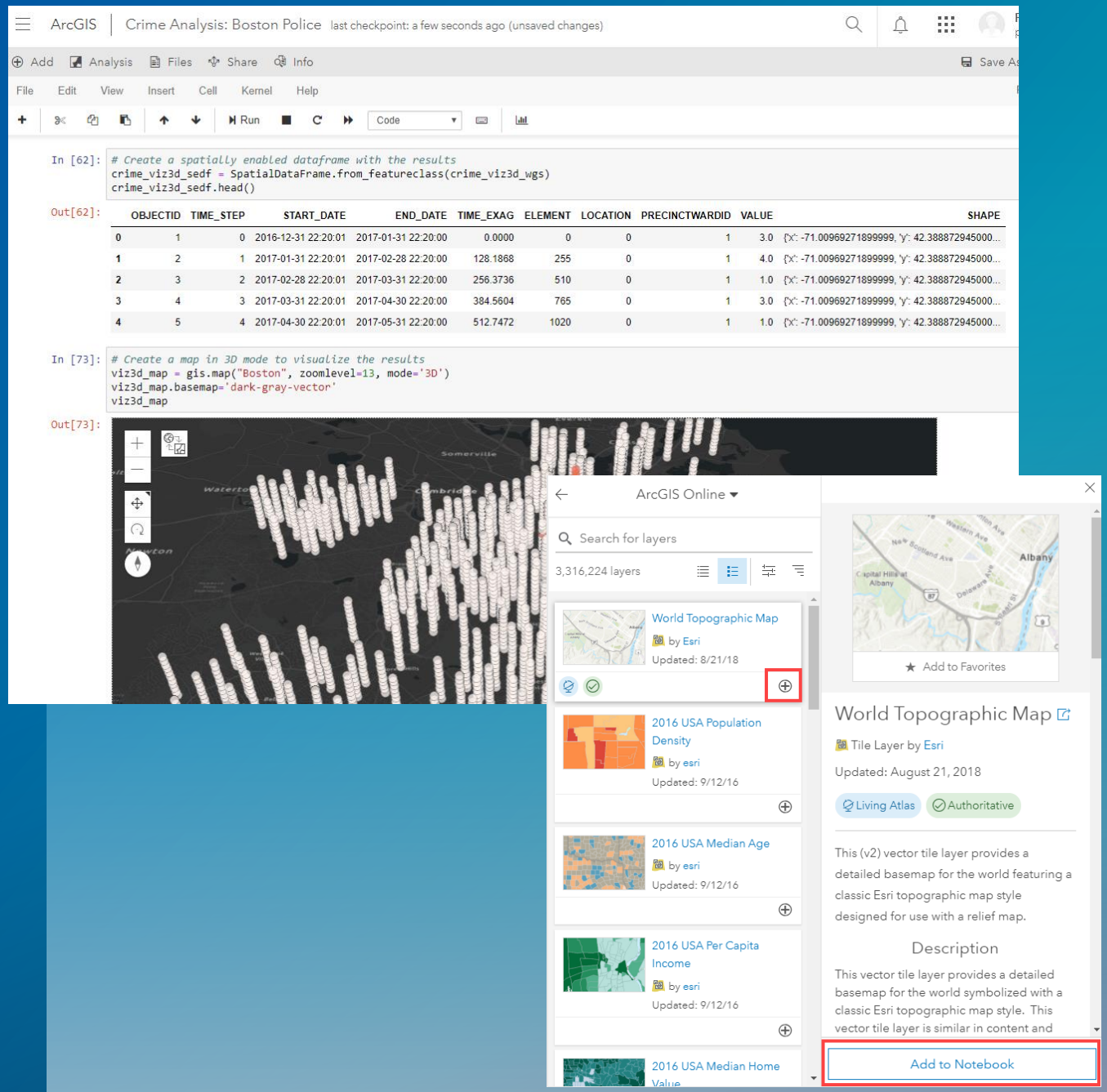
- Uses Docker containers to isolate each notebook author's workspace
- Code with the Python API and ArcPy
- Dynamic mapping and visualization

Integrated with your portal

- Users are granted notebook privileges via portal user roles
- Add and reference portal items
- Share notebooks in the portal

Included with Enterprise (Standard)

Comes with a rich gallery of sample notebooks to illustrate workflows



Introducing webhooks

Automate notifications based on portal actions

An action occurs.

- Something is published
- A user creates a new account
- An item is deleted

The webhook is triggered.

- Delivers JSON description of event
- Relevant info fields

```
  "info": {
    "webhookName": "Group monitoring",
    "webhookId": "72fed926aeb74c9ca8a22aacddc6725a",
    "portalURL": "https://machineURL/portal/",
    "when": 1543192196521
  },
  "events": [{
    "username": "administrator",
    "userId": "173dd04b69134bdf99c5000aad0b6298",
    "when": 1543192196521,
    "operation": "update",
    "source": "group",
    "id": "173dd04b69134bdf99c5000aad0b6298",
    "properties": {}
  }]
}
```

Your platform of choice kicks in.

- IFTTT
- Zapier
- Microsoft Flow
- Integromat

It performs an action.

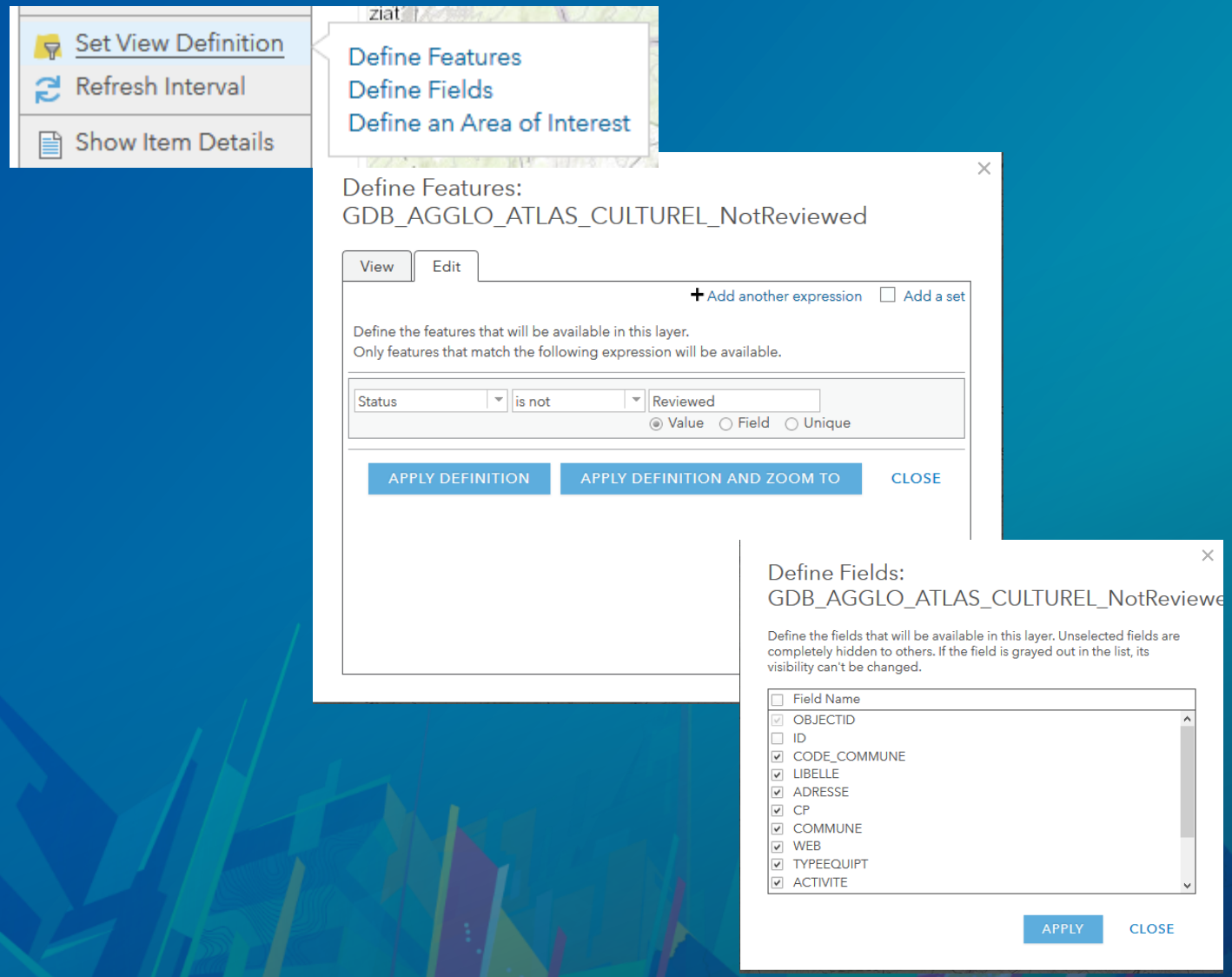
- Emails you
- Messages You, e.g. in Slack
- Update a Website
- …

!

Hosted feature layer views

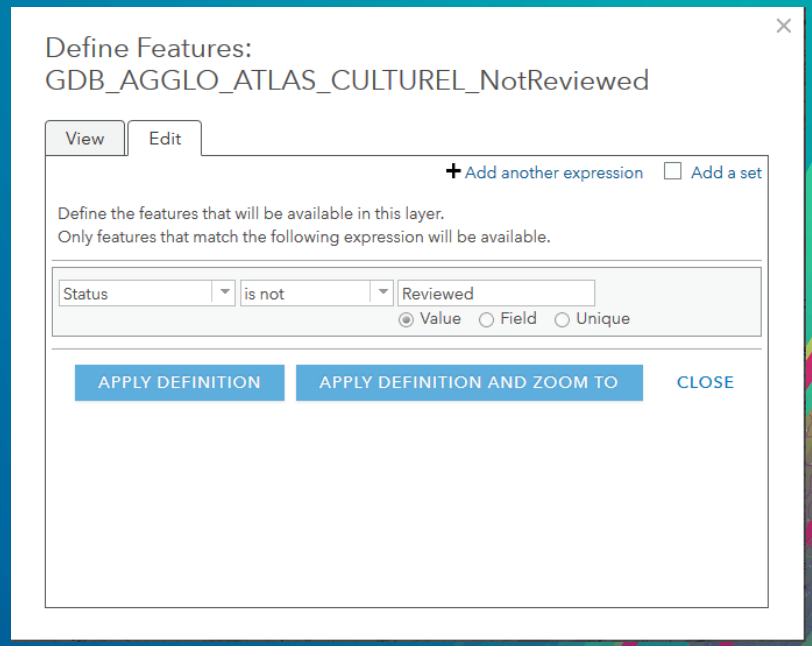
Apply different characteristics than the source data:

- Styles and symbology
- Editing settings
- Feature and/or field definitions
- User access through group sharing



Demo

Hosted Feature Layer Views



Working in the Cloud:

Options for deployment and Automation

Cloud Deployment Best Practices

- Our cloud compatibility and strategy
- Tools for Cloud Deployments

aws

HUAWEI

Considering Automation

Efficiency

- Get up and running faster
- Handle systems of any size
- Schedule install and upgrade

Consistency

- Avoid long list of manual steps
- Install/upgrade workflows generally same
- Dependable, testable results

Productivity

- Save yourself the time and effort
- Easier upgrades!
- Run off-peak hours, start working sooner

ArcGIS Enterprise Automation Tools

Deployment Automation

How you setup the software

ArcGIS Enterprise Builder

Amazon Web Services

Microsoft Azure

Chef

Powershell DSC

Workflow Automation

How you automate analytical and administrative tasks

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

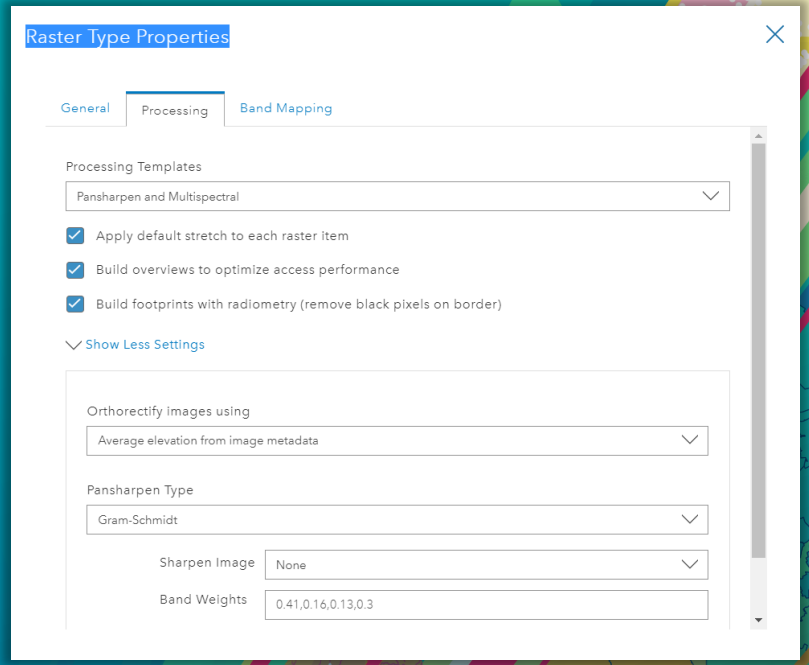
IT Standard Framework

Chef

Powershell DSC

Demo

- Azure Cloud Builder
- Administering Enterprise with Notebooks



What’s next?

How to learn more and take action

Other Sessions at the Conference

- 1300h -1400h – Lunch Break in the Expo area
- This afternoon – Panel Discussions on Humanitarian, Sustainable Business and Staff Development

- Wednesday Plenary – Analysis Tools and GeoAI
- Wednesday Technical Workshops – ArcGIS Pro and Story Maps
- Thursday – Field Mobility, Developer Track and Business Intelligence

m.schenker@esri.ch

slibby@esri.com

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