



ArcGIS Server and Portal for ArcGIS An Introduction to Security

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Agenda



Strongly Recommend:

Knowledge of ArcGIS Server and Portal for ArcGIS

- **Security in the context of ArcGIS Server/Portal for ArcGIS**
- **Access**
- **Authentication**
- **Authorization: securing web services**
- **Encryption and certificates**
- **ArcGIS Server + Portal for ArcGIS**
- **Enterprise groups and SAML in Portal for ArcGIS**
- **Summary**



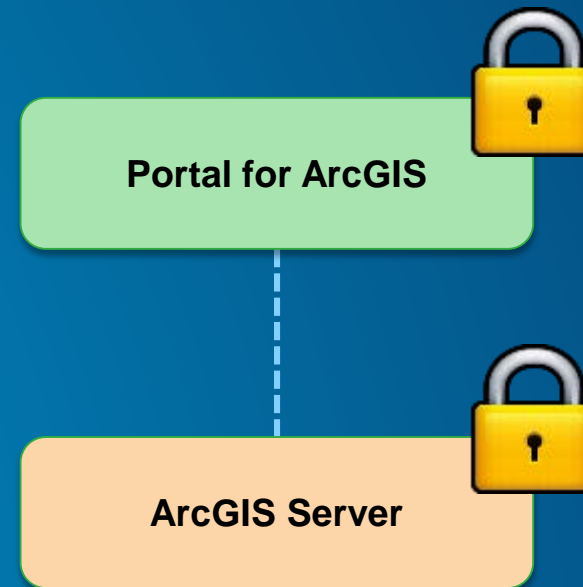
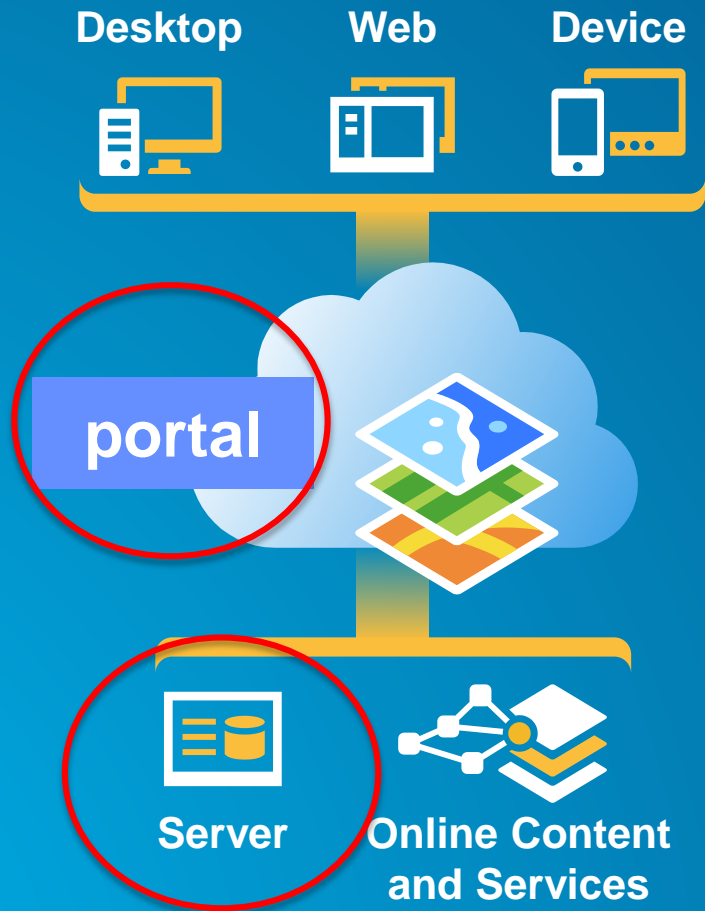
How to configure



ArcGIS Server/Portal for ArcGIS Security

Protect your assets
Control access and set permissions

ArcGIS 10.3.x for Server – Web GIS in your Infrastructure



Enter name and number: **** *

A1

B3

C1

D7

E1

F3

G2

H6

I2

J3

K1

L5

SCANNING FOR MATCH

(dat-ser:1000223)

SEARCHING DATABASE /
CONFIRMING IDENTITY

Access granted }

Access

Who can login to ArcGIS Server?

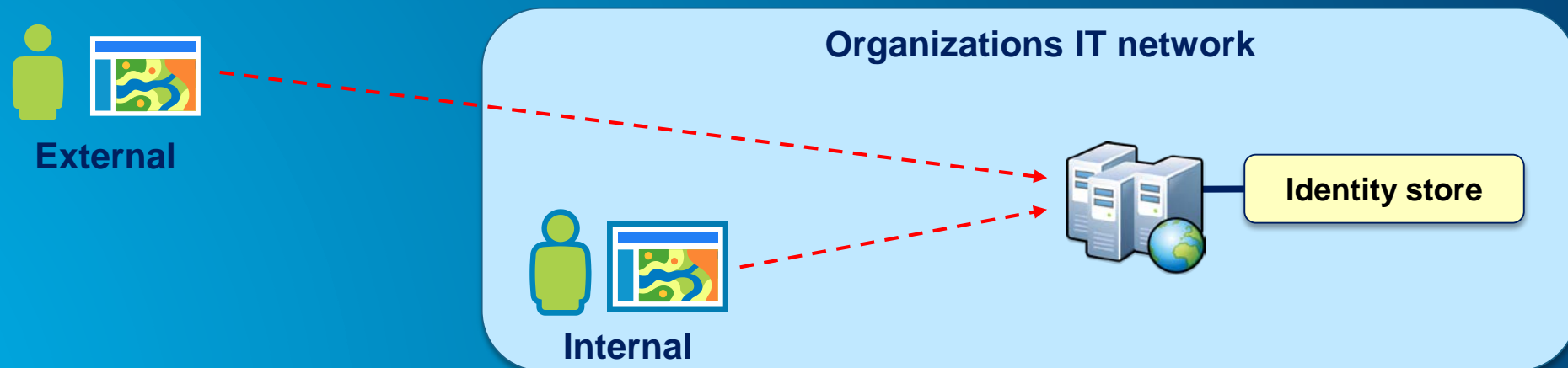
ArcGIS Server Access

- **User** → Valid login to access
- **Role** → Grouping of users
 - 3 types
 1. **Administrators** – Full admin control
 2. **Publishers** – Publish web services
 3. **Users** – View web services
- **Identity store** → Defines your users and roles
 - User store + Role store



ArcGIS Server: User considerations

- Where are your users coming from?
 - Determines which type of identity store you should use
- Intranet → Windows Active Directory or LDAP
- Internet → Built-in or custom



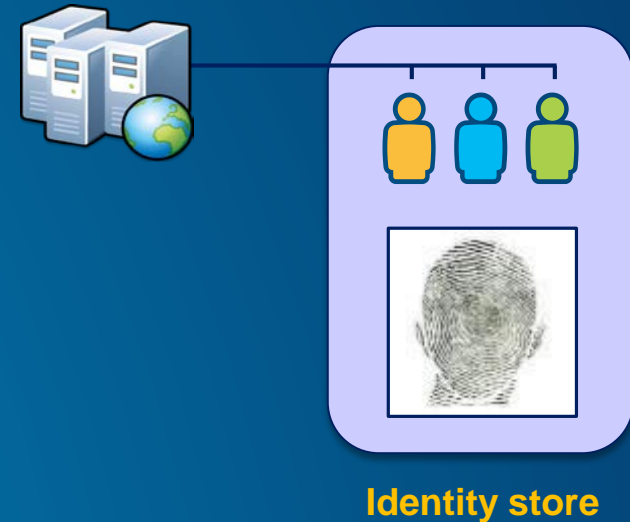
ArcGIS Server: Role considerations

- How much control do I have on my ArcGIS Server site?
 - Managed by me, within my Dept? or
 - Managed by my organization's IT Dept
- May affect where you define your roles



ArcGIS Server: Identity Store

- **Identity Store** → Defines your users and roles
- 3 different options
 1. **Built-in** (default)
 2. **Register with an enterprise identity store**
 - Windows Active Directory
 - LDAP
 3. **“Mixed mode”**
 - Users from enterprise identity store
 - Roles from built-in store



Demo

ArcGIS Server Manager

Show Users and Roles



Authentication

Check and verify user identity

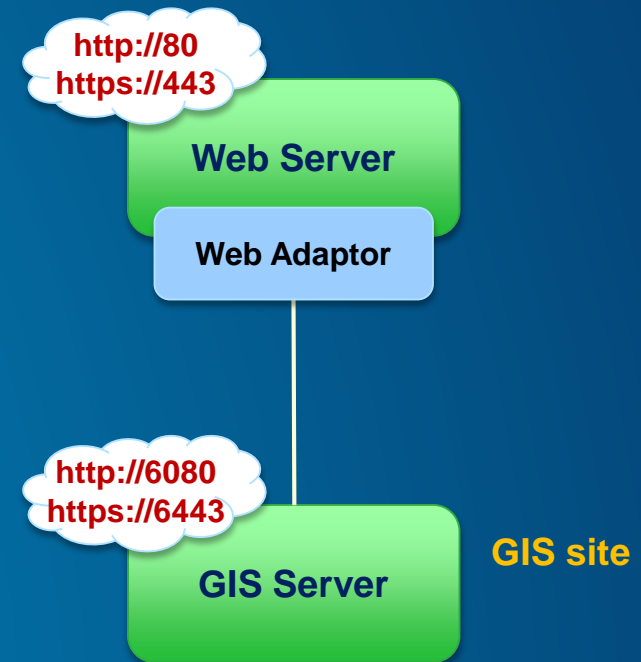
Authentication Tier/Method

- **Authentication** → Check and verify user identity
- 2 options
 1. **GIS Tier**
 - Uses tokens to authenticate
 2. **Web Tier**
 - Uses HTTP authentication
 - E.g., Basic, Digest, Integrated Windows, Client certificates, and Custom



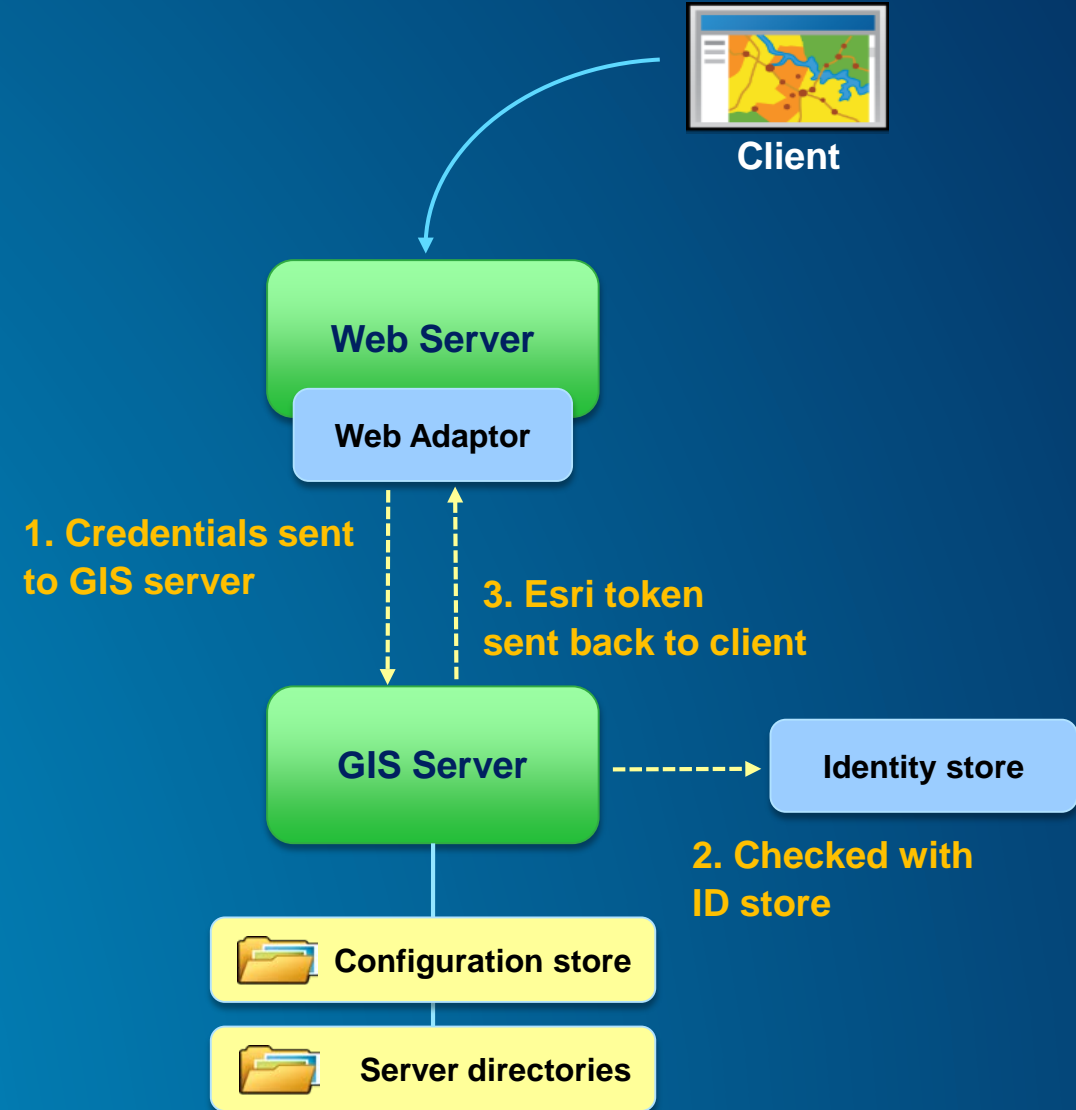
ArcGIS Web Adaptor

- Enables ArcGIS Server to work with 3rd party web server
 - E.g., Microsoft IIS, IBM Web Sphere, etc.
- Leverage web server features
- Required for web-tier authentication
- Provides more flexibility to control site access
- Conceptually like a reverse proxy
- Separate software install
 - Included with ArcGIS for Server



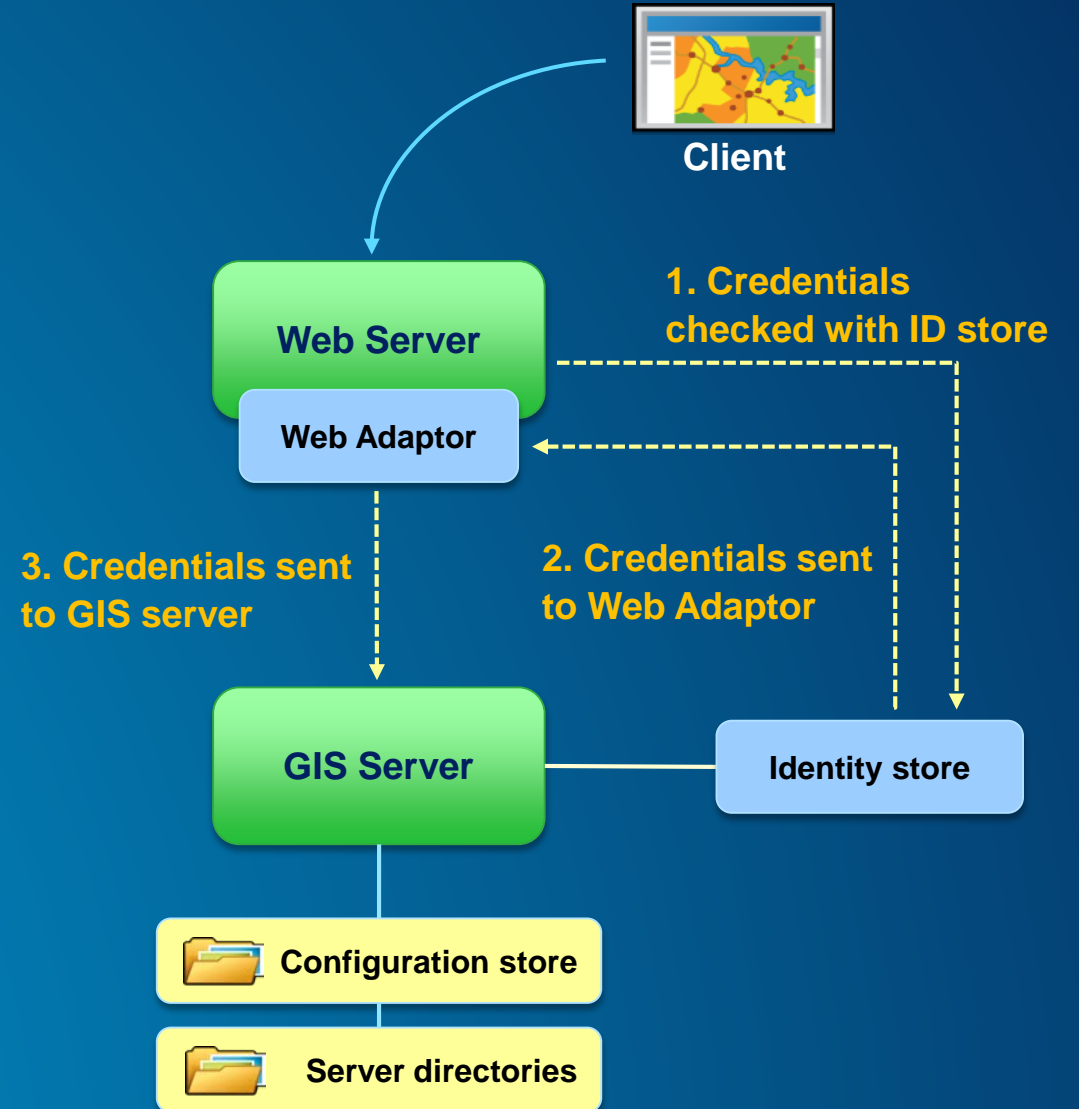
GIS Tier Authentication

- GIS Server checks credentials
- **Token** → Unique identifier sent from GIS Server to client to identify an interaction session



Web Tier Authentication

- Web server checks credentials
- Must use ArcGIS Web Adaptor
- HTTP authentication



GIS Tier vs. Web Tier Authentication

	GIS Tier / Token	Web Tier / HTTP Auth
Default	Yes	No
Public / anonymous possible	Yes	No
Clients Supporting	Esri	All, including OGC
Requirements	Enable SSL	ArcGIS Web Adaptor(s) required Basic – require SSL Digest – special setup IWA – Windows only

Demo

ArcGIS Server Manager

Show how to select authentication method

Show IIS configuration of ArcGIS Web Adaptor

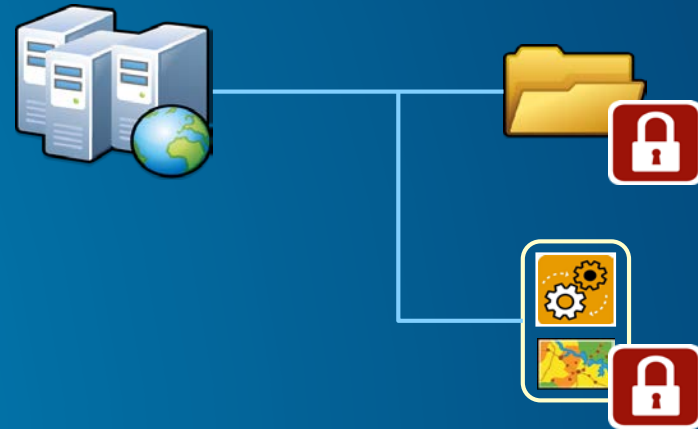


Authorization

What you are allowed to do

Securing GIS Web Services

- **Set permissions for roles on folders and services**
 - Administrators/Publishers grant permissions
- **All new services are public by default**
 - Anonymous access
- **Can specify whether folders require HTTPS**



Demo

ArcGIS Server Manager

Show securing a web service

Show accessing a secured web service

ENCRYPTED



Encryption and HTTPS

Securing communication protocols

Should you be using HTTPS?

Hypertext Transfer Protocol Secure (HTTPS)



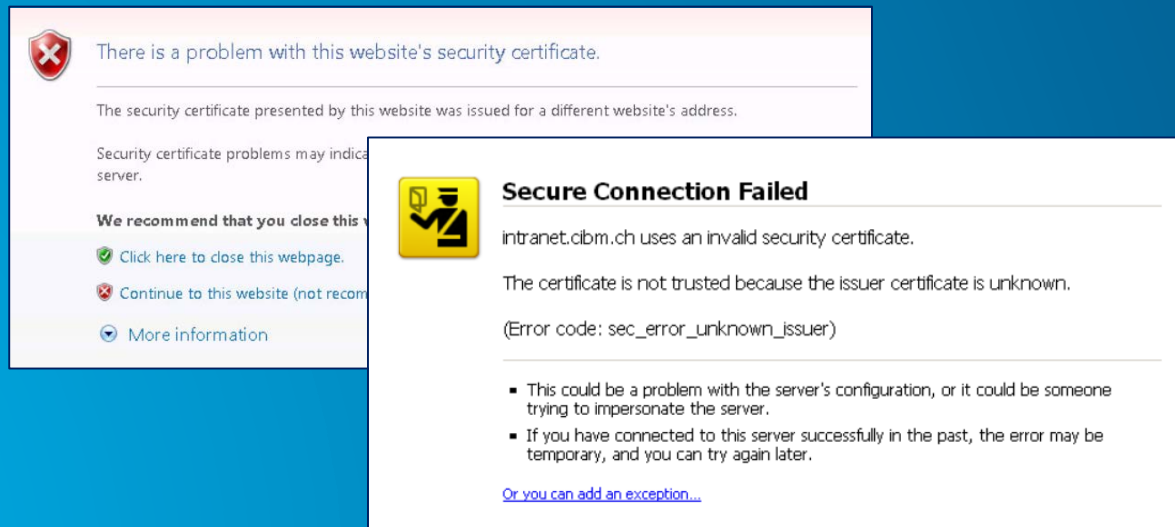
- HTTPS: a protocol for secure communication
- **Yes!**
- To enable, you need to update the security configuration within the ArcGIS Server Administrator Directory
 - Select 'HTTP And HTTPS' or 'HTTPS Only'
- HTTPS requires security certificate, which contains
 - Key information, owner identity, and digital signature of an entity that has verified the certificate's contents are correct



Security Certificates

- Enabling HTTPS in ArcGIS Server generates a self-signed certificate for every machine in the site
 - Used to communicate with the ArcGIS Web Adaptor over port 6443
- For production site, the ArcGIS Web Adaptor should use a certificate signed by a domain or well-known Certificate Authority (CA)
- Web clients use the certificate to trust content from ArcGIS Server

Want to avoid:



The image shows two overlapping browser security warning dialog boxes. The top one is a standard Windows-style warning with a red 'X' icon, stating 'There is a problem with this website's security certificate.' and 'The security certificate presented by this website was issued for a different website's address.' The bottom one is a more detailed 'Secure Connection Failed' dialog with a yellow warning icon, stating 'intranet.cibm.ch uses an invalid security certificate. The certificate is not trusted because the issuer certificate is unknown. (Error code: sec_error_unknown_issuer)'. It includes a list of troubleshooting steps and a link to 'Or you can add an exception...'.



Certificate signed by domain or well-known CA

How do you set up a Security Certificate?

1. **Generate a Certificate Signing Request (CSR)**
2. **Send CSR for signing**
 - **By a domain or well-known Certificate Authority**
3. **Import signed certificate**



Demo

ArcGIS Server

Create a security certificate and use in IIS

IIS Security Certificate Demo Summary

- **Generate CSR for a new certificate**
- **Send CSR to certificate authority**
- **Import signed certificate**
- **Update web site to reference signed certificate**



© ArcGIS for Server

Portal for ArcGIS

An ArcGIS for Server extension

Enabling Web GIS in Your Infrastructure

Portal for ArcGIS helps you organize and share information throughout your organization with those who need it via maps and apps. It provides a framework to easily manage and secure geographic assets within your organization, enabling better decision making.



The Friendly Front End to Your Server Site

Portal for ArcGIS, which is included with ArcGIS for Server Standard and Advanced, provides the same great experience as ArcGIS Online but within your infrastructure (on-premise or in the cloud). You can create, organize, secure, and manage geographic assets and connect end users with useful apps, maps, and geographic data.



The Right Apps for the Task Makes All the Difference

Portal for ArcGIS includes many apps to distribute geospatial data and tasks in simple, focused interfaces and Web AppBuilder for ArcGIS, a great way to quickly build web apps. It also links with apps such as Field Maps for Office, Collector for ArcGIS, and Operations Dashboard for ArcGIS.



Use and Reuse Data to Quickly Generate Maps

Web maps allow users to mash up ArcGIS services and define how the map behaves. Once authored, web maps can then be used repeatedly in everything from web browsers to mobile devices and embedded within websites. Web maps reduce the time it takes to get maps in the hands of people who need them.



Control Access to Your Geospatial Resources

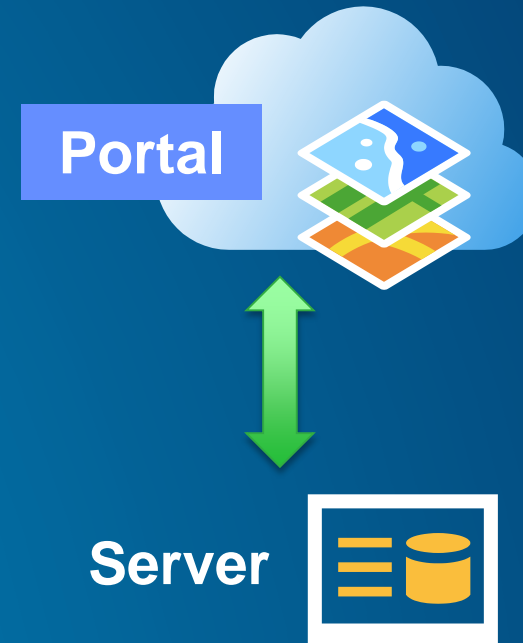
Allow access to relevant information while protecting sensitive information. Portal for ArcGIS acts as a central node of the ArcGIS platform, controlling access to items across all ArcGIS clients. Learn more about the role of Portal in the ArcGIS platform.

Portal for ArcGIS

Extension to ArcGIS for Server

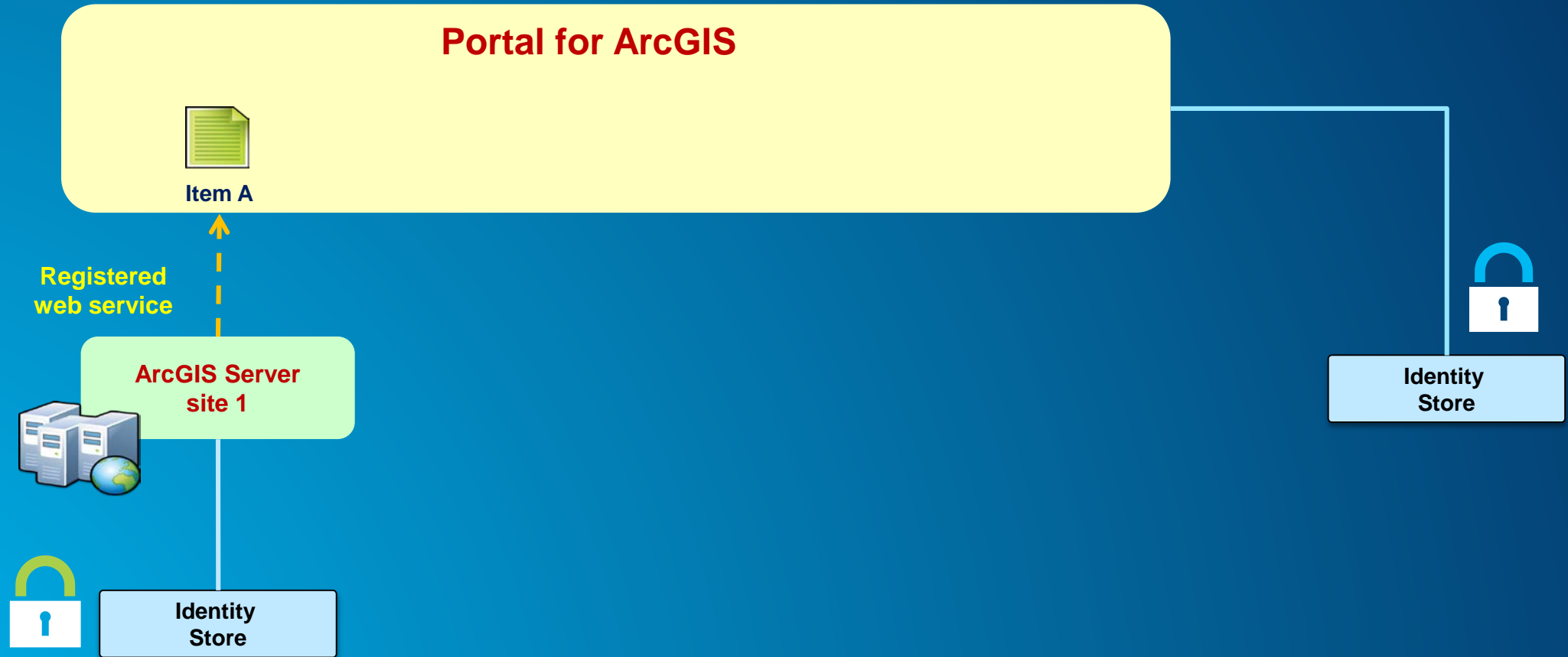
Using Portal with ArcGIS Server

1. **Registering services**
2. **Federating an ArcGIS Server site**

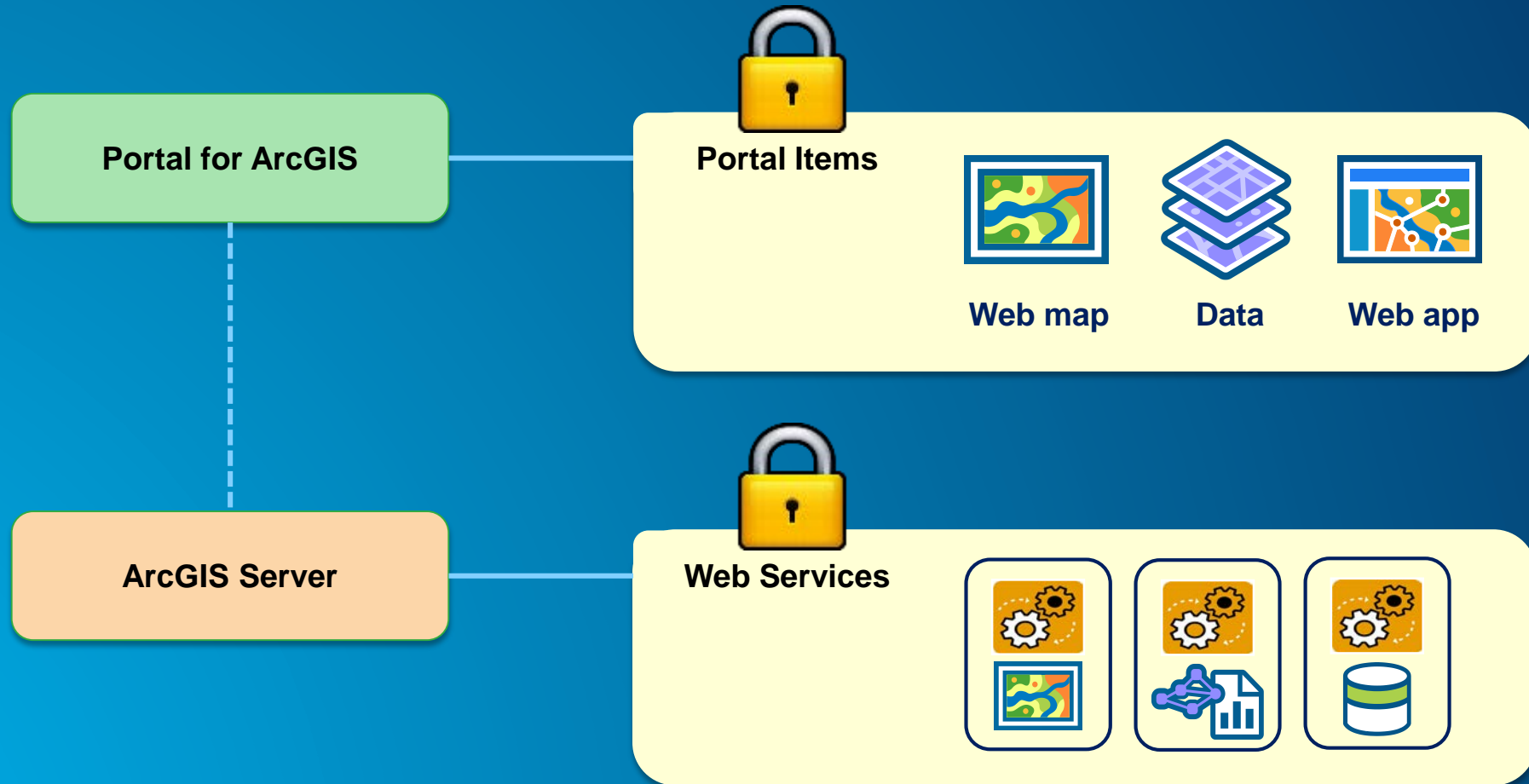


Implementation Patterns

Portal for ArcGIS + ArcGIS Server



What can be Secured and Where?



What does it mean to be Secured?

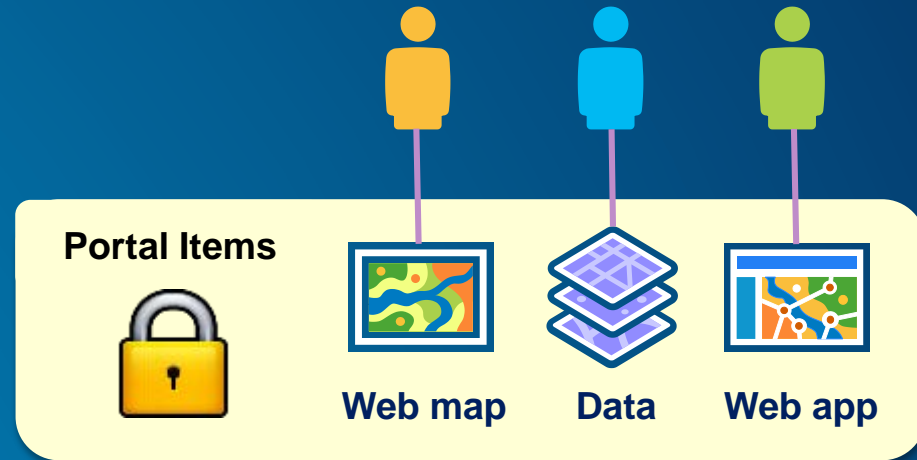
Portal Item	What access means
Web Map	Can know what the URLs for the layers in the map Layers are secured independently
Packages	Can download the package
Data	Can download the data
Application	Allows opening of app* (except referenced external app)

ArcGIS Server	What access means
Any service	Can perform any operation that is enabled

How is Security Set?

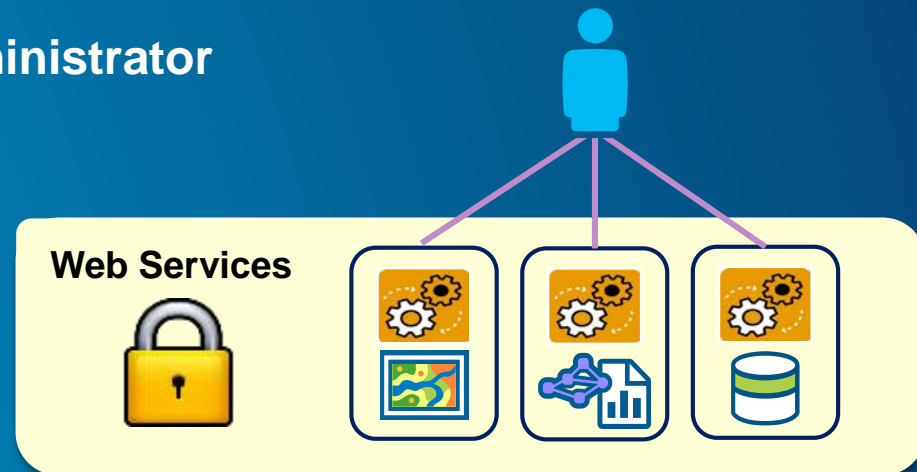
- Portal for ArcGIS

- Permissions set by item owner
- Can be changed by administrators



- ArcGIS Server

- Permissions can be set by any publisher/administrator



Portal for ArcGIS Security

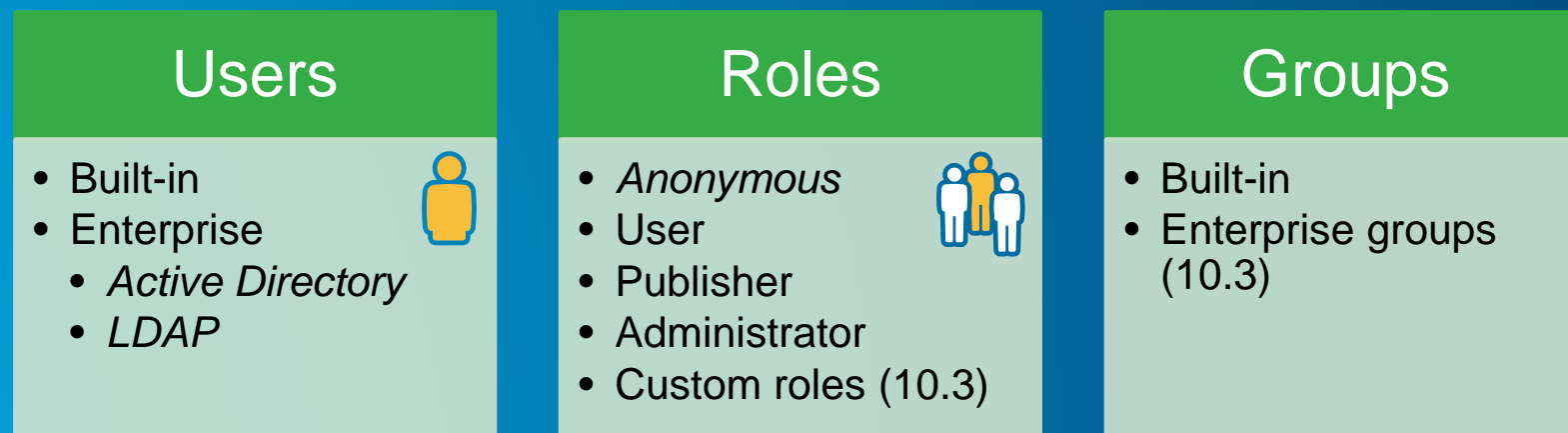
Integrates with Your Enterprise Security Infrastructure



- **Authentication**

- Web tier authentication, including Windows Authentication & PKI
- Web single sign-on (SSO) with SAML (10.3)
- Portal tier authentication combining both built-in and enterprise users (10.3.1)

- **Users, Roles, and Groups**



How to Choose Identity Store for Portal for ArcGIS

If the org has an
Identity provider

SAML



If the users are mostly
or all internal

Windows
Active Directory
or LDAP

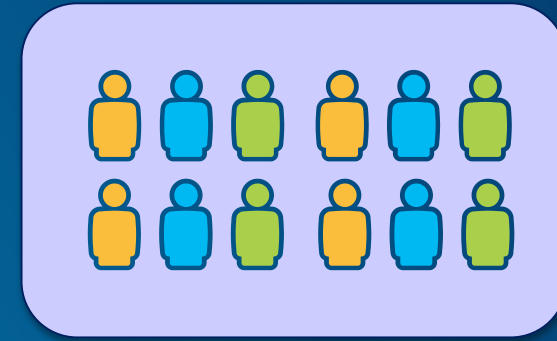


If the users are mostly
external

Built-in

Groups and Roles

- A collection of users is called ...
 - Group in Portal for ArcGIS
 - Role in ArcGIS Server
- In Portal, you define the Group
 - If you use enterprise identity store, can leverage enterprise groups
- In Server, Role defined with built-in roles or from enterprise identity store



Collection of users

Portal for ArcGIS Roles

- Permissions for Portal users defined by roles
- 3 default roles
 1. **Administrator**
 2. **Publisher**
 3. **User**
- Custom roles (as of 10.3)
 - Provide more fine grained access control



Portal for ArcGIS: Custom Roles

- Provide more flexibility to enable fine grained control on what members can do
- My Organization page > Edit Settings > Roles > Create Role

HOME GALLERY MAP SCENE GROUPS MY CONTENT MY ORGANIZATION Administr...

My Organization

SAVE CANCEL

General
Home Page
Gallery
Map
Item Details
Groups
Utility Services
Servers
Roles
Security

Roles ?

Role Name:

Description:

Select a role or template on which to base the new role:

TOGGLE ALL ON COLLAPSE ALL SAVE ROLE DISCARD CHANGES

General Privileges

Groups Content Sharing

<input type="checkbox"/> Create, update, and delete	<input checked="" type="checkbox"/> Create, update, and delete	<input type="checkbox"/> Share with groups
<input checked="" type="checkbox"/> Join organizational groups	<input checked="" type="checkbox"/> Publish hosted feature layers	<input checked="" type="checkbox"/> Share with portal
	<input type="checkbox"/> Publish hosted tile layers	<input checked="" type="checkbox"/> Share with public
	<input type="checkbox"/> Publish hosted scene layers	<input type="checkbox"/> Make groups visible to portal
		<input type="checkbox"/> Make groups visible to public

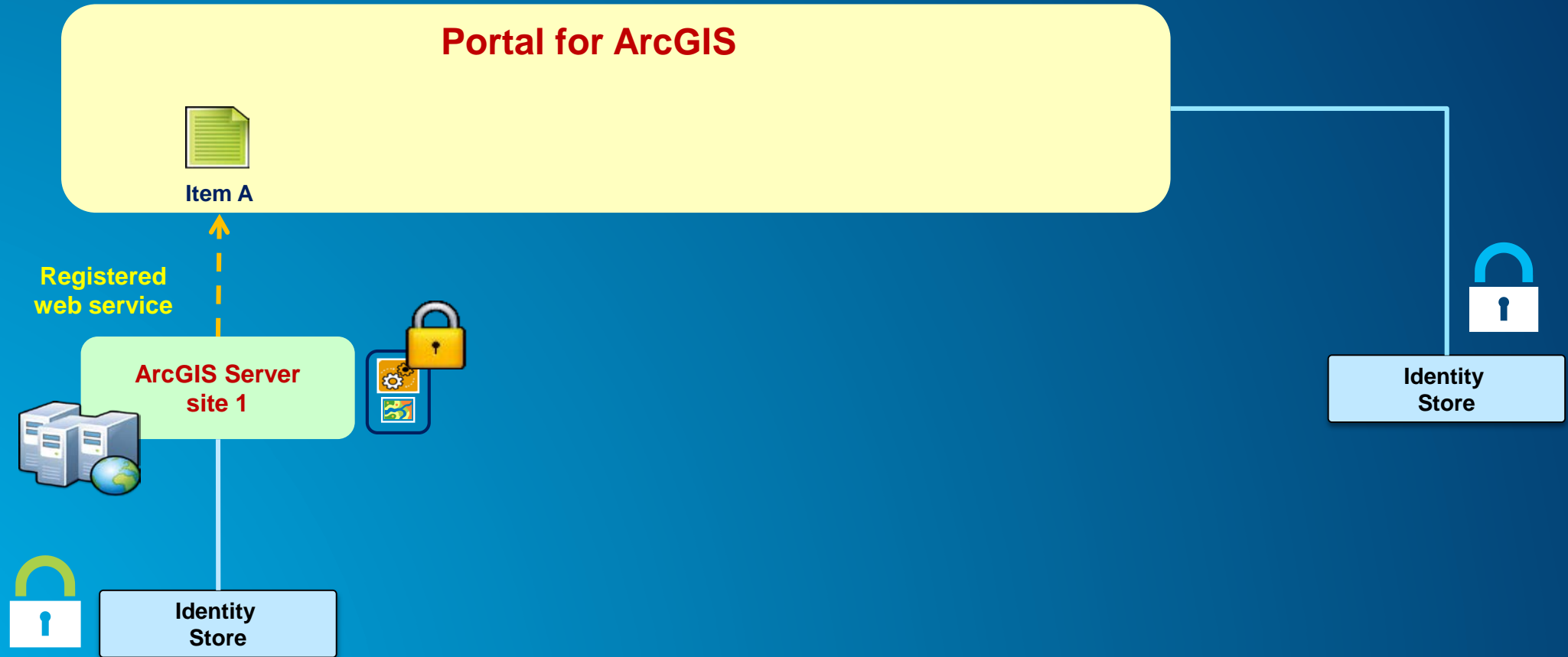
Administrative Privileges

Members Groups Content

<input type="checkbox"/> View all	This privilege grants the ability to update member account information within your portal.	<input type="checkbox"/> View all
<input type="checkbox"/> Update		<input type="checkbox"/> Update
<input type="checkbox"/> Delete		<input type="checkbox"/> Delete
<input type="checkbox"/> Disable	<input type="checkbox"/> Reassign ownership	<input type="checkbox"/> Reassign ownership
<input type="checkbox"/> Change roles	<input type="checkbox"/> Assign members	
<input type="checkbox"/> Manage licenses	<input type="checkbox"/> Link to enterprise group	

Implementation Patterns

Portal for ArcGIS + ArcGIS Server



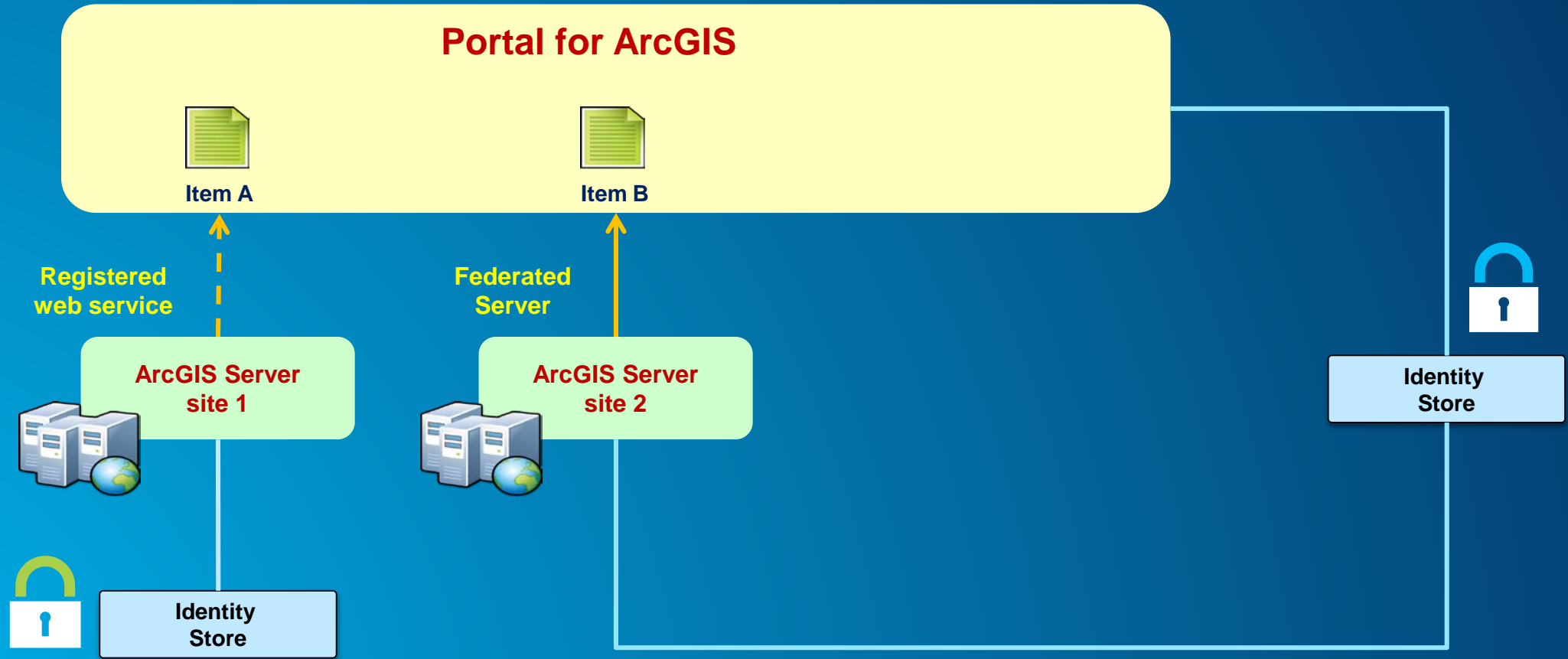
Demo

Portal for ArcGIS

Show how a secured web service behaves in Portal

Implementation Patterns

Portal for ArcGIS + ArcGIS Server



Portal – Server Federation

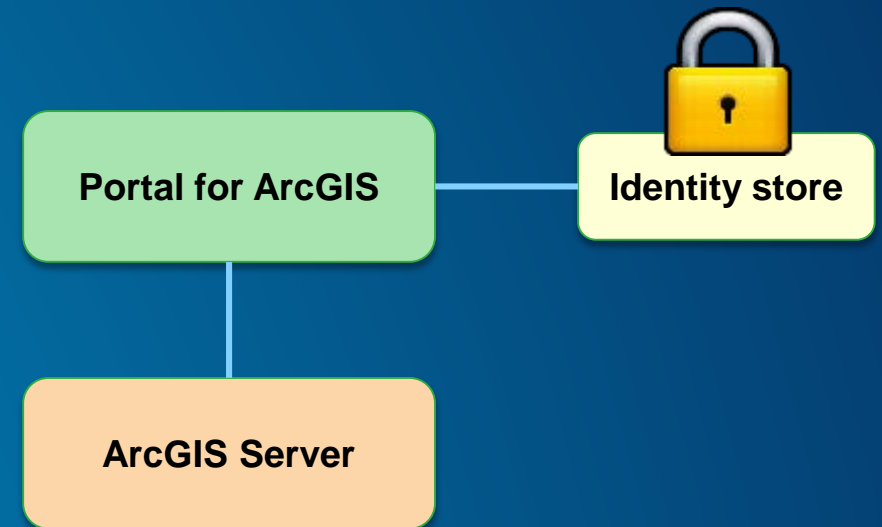
- Allows a single sign-on (SSO) experience between Portal and Server
- Permissions are all managed in Portal
- ArcGIS Server site must be HTTPS enabled

When to use:

- Desire for SSO user experience

When NOT to use

- When Portal/Server are in different physical locations
- Portal and Server are different releases



Demo

Portal for ArcGIS

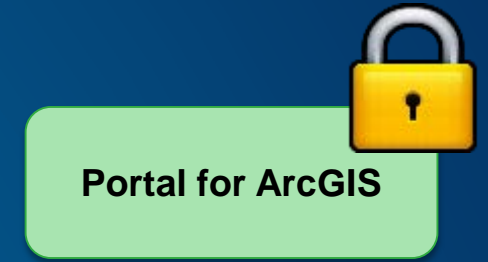
Show federating an ArcGIS Server site with Portal

Portal for ArcGIS and HTTPS



- **The ArcGIS Web Adaptor is the primary access point for Portal**
 - For production site, use a signed certificate from a domain or well-known Certificate Authority (CA)
- **By default, Portal for ArcGIS encrypts communication between itself and the ArcGIS Web Adaptor on port 7443 via HTTPS**
- **Portal maintains a list of trusted CA Certs used when accessing external services over HTTPS**
 - Needs to be updated if Portal is accessing internal services via HTTPS
 - Configuring the portal to trust certificates from your certifying authority

Other Security Options in Portal for ArcGIS



- **At 10.3, several enhancements were added**
 1. **Support for enterprise groups when Portal uses an enterprise identity store**
 - Windows Active Directory or LDAP
 2. **Support for SAML authentication**

HOME GALLERY MAP GROUPS MY CONTENT MY ORGANIZATION siteadmin

Groups

SAVE CANCEL

Name:
Group Name

Summary:

Description:

Size

Enter the group description here

Status:

Private (Users cannot find this group and can join by invitation only.)

Organization (Users within your organization can search for and find this group.)

Public (Users can search for and find this group.)

Users:

Can join by invitation only

Can apply to join group

From an Enterprise Group:

Enterprise group name

SEARCH FOR GROUP

Select Group

Select an enterprise group by clicking on the row of the desired enterprise group, then clicking Select Group. Use the search field to narrow your results.

Find Group: SEARCH

Group Name	Description
AVWORLD\Domain Computers	All workstations and servers joined to the domain
AVWORLD\Domain Guests	All domain guests
AVWORLD\Domain Admins	Designated administrators of the domain
AVWORLD\Domain Users	All domain users
AVWORLD\Group Policy Creator Owners	Members in this group can modify group policy for the domain
AVWORLD\Domain Controllers	All domain controllers in the domain
AVWORLD\Read-only Domain Controllers	Members of this group are Read-Only Domain Controllers in the domain
AVWORLD\Exchange Domain Servers	DO NOT move or rename - Exchange Domain

1 - 10 of 1000 results

Go to Page: GO

SELECT GROUP CANCEL

10.3 Support for Enterprise Groups

Enabled when Portal is configured with Windows Active Directory or LDAP

Demo

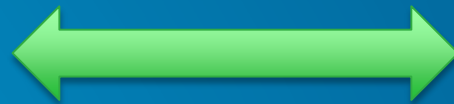
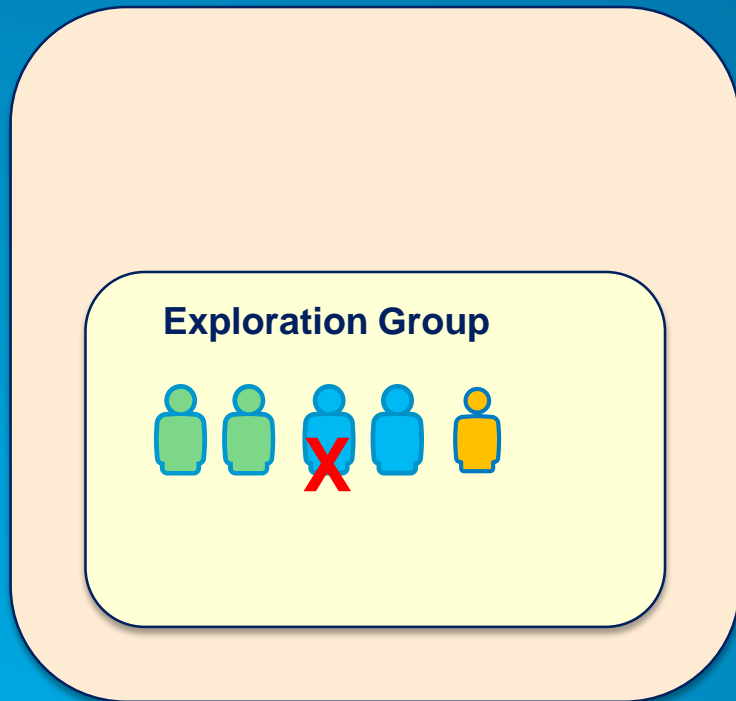
Portal for ArcGIS

Show enabling IWA security in Portal

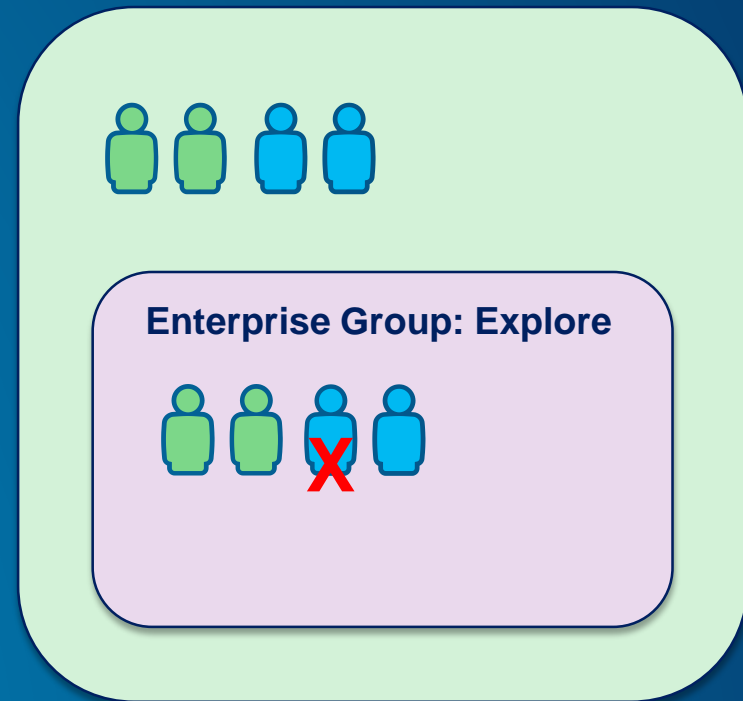
Show creating an Enterprise group

Enterprise Groups in Portal for ArcGIS

Windows Active Directory
or LDAP



Portal for ArcGIS



SAVE CANCEL

General
Home Page
Gallery
Map
Item Details
Groups
Utility Services
Servers
Roles
Security

Security

Configure the security settings for your portal.

Policies

Allow access to the portal through SSL only.

Allow anonymous access to your portal.

Enterprise Logins

You can set up your portal so that your users will be able to sign in to Portal for ArcGIS using the same username and password that they use with your existing on-premises systems.

The key to this is through a technology known as identity federation that this section will help you set up through two actions.

SET IDENTITY PROVIDER



Set Identity Provider

Specify the properties to establish your portal's Enterprise Identity Provider.

Name:

Your users will be able to join:
 Automatically After you add the accounts to the portal

Metadata for the Enterprise Identity Provider will be supplied using:
 A URL A File Parameters specified here

URL:

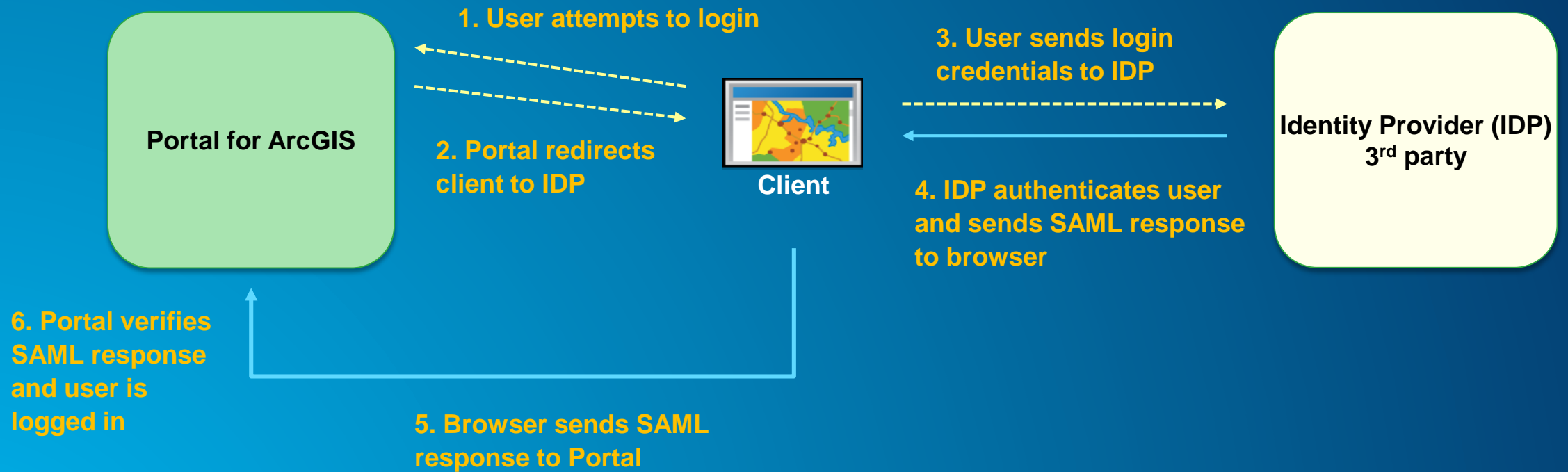
Show advanced settings

SET IDENTITY PROVIDER CANCEL

10.3 Single Web Sign On through SAML (Security Assertion Markup Language)

Industry standard for SSO

SAML – Conceptual Workflow



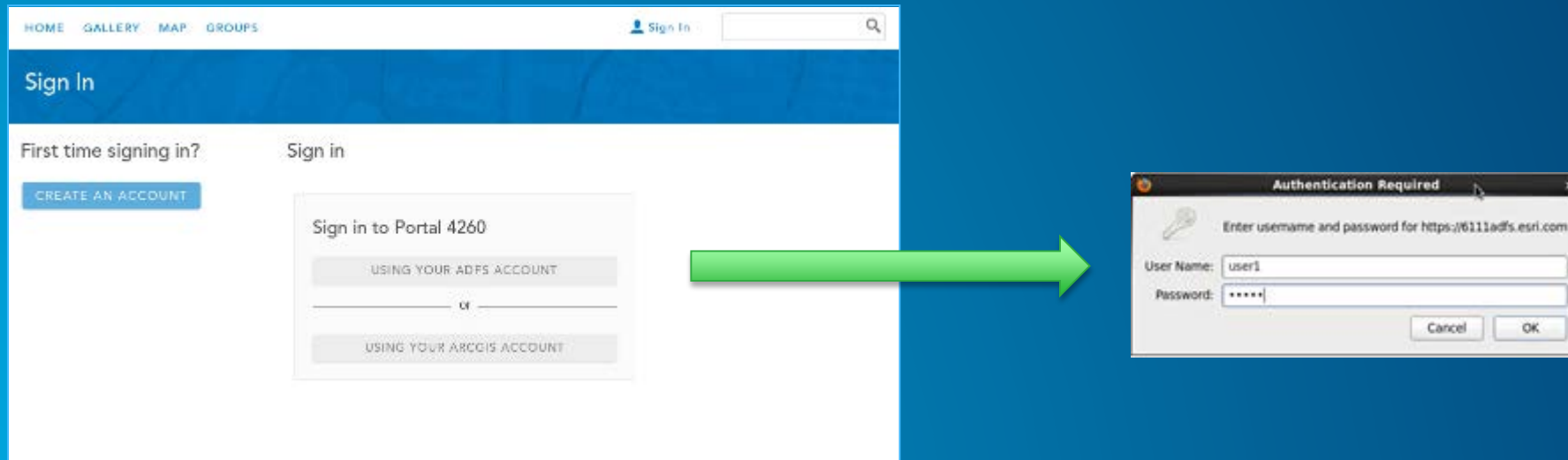
Demo

Portal for ArcGIS

Show enabling SAML authentication in Portal

SAML login User Experience

- With SAML authentication enabled, user will be prompted by IDP to login
- Use IDP login or built-in login



5 Key Points

- **Multiple ways to utilize your Enterprise Identity store**
- **Select the authentication option that best meets your business requirements**
- **Enable HTTPS on your ArcGIS Server site**
- **Use a security certificate signed by your domain or a well-known CA**
- **Portal – Server Federation is optional**

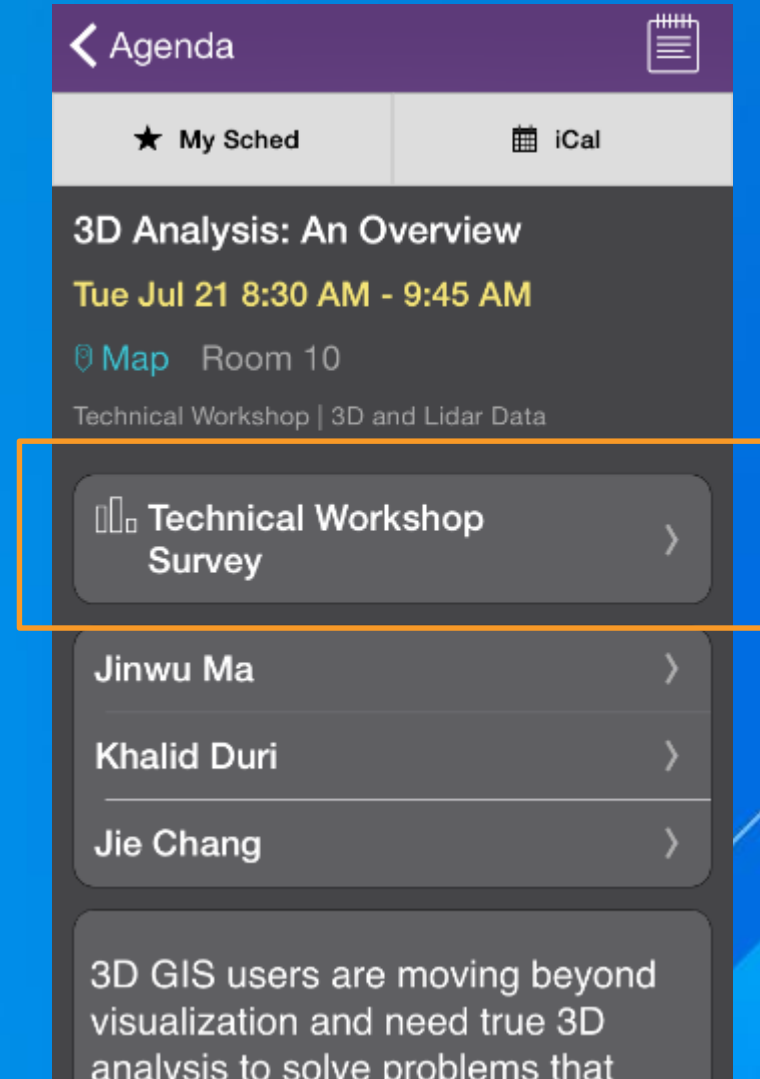
Summary

- **Security in the context of ArcGIS Server/Portal for ArcGIS**
- **Access**
- **Authentication**
- **Authorization: securing web services**
- **Encryption and certificates**
- **ArcGIS Server + Portal for ArcGIS**
- **Enterprise groups and SAML in Portal for ArcGIS**



Thank you...

- Please fill out the session survey in your mobile app
- Select **ArcGIS Server and Portal for ArcGIS: An Introduction to Security** in the Mobile App
 - Use the Search Feature to quickly find this title
- Click “Technical Workshop Survey”
- Answer a few short questions and enter any comments



Other Security Tech Workshops



- **ArcGIS Server: Advanced Security**
 - Wed 3:15 pm Room 3
 - Thurs 3:15 pm Room 4
- **Best Practices in Setting up Secured Services in ArcGIS for Server**
 - Tues 5:30 pm Demo Theater 14 – Tech Support
- **Building Security into Your System**
 - Tues 4:30 pm Implementation Center
- **Enterprise GIS: Security Strategy**
 - Tues 10:15 am Ballroom 6E
 - Thurs 3:25 pm Ballroom 6E

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Understanding our world.