

Data Store Management Best Practices

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Session Agenda

1. Overview
2. Installation and Configuration
3. Backing up the data store
4. Restoring the data store
5. Moving data store to a new machine
6. Upgrading
7. Questions

Overview

The background of the slide features a vibrant, abstract design. The upper portion is dominated by a gradient of warm colors, ranging from deep red to bright orange, with a textured, wavy pattern that resembles liquid or smoke. The lower portion of the slide is characterized by a dark blue, grid-like pattern that also exhibits a wavy, organic shape, creating a layered, topographical effect against the warmer background.



ArcGIS
Enterprise

=



ArcGIS
Web Adaptor

+



Portal
for ArcGIS

+



ArcGIS
Server

+



ArcGIS
Data Store



ArcGIS
Enterprise

=



ArcGIS
Web Adaptor

+



Portal
for ArcGIS

+



ArcGIS
Server

+



ArcGIS
Data Store

Web GIS Deployment Patterns

Begin with ArcGIS Online & SaaS →



Basemaps &
Content Services



ArcGIS Online

ArcGIS Enterprise

Customer Managed Infrastructure

On-premises

Private Cloud

Public Cloud

(AWS, Azure, others)

Managed Services



← Begin with ArcGIS Enterprise & Software

Understanding Data Stores

- **ArcGIS Server data store concept**

- Valid location that contains data used for web services
- Read/write by the ArcGIS Server service account
- Two types: Folders and Databases
- Define via ArcGIS Server Manager or Desktop



- **ArcGIS Data Store**

- Separate software installation; available since 10.3
- Used to configure and deploy a hosting server configuration with Portal for ArcGIS



ArcGIS Data Store Types

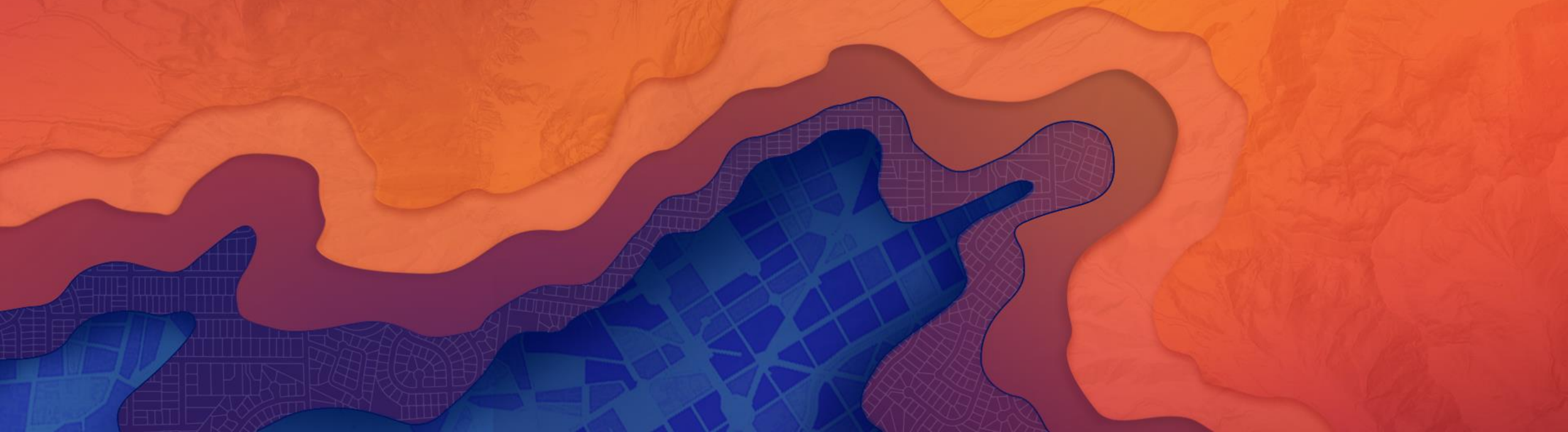
- **Relational Data Store**
 - Hosted feature services, managed by Portal and ArcGIS Server
- **Tile Cache Data Store**
 - Publish scene layers, not Hosted tile services
- **Spatiotemporal Big Data Store**
 - Archive observation data streamed when using ArcGIS GeoEvent Server.
 - Stores output from GeoAnalytics Server tools

Functionality ArcGIS Data Store provides

Functionality	Data store type
Publish scene layers	Tile cache and relational data store
Editor tracking, ownership-based access control	Relational data store
Enable or disable attachments	Relational data store
Publish an empty hosted feature layer	Relational data store
Publish thousands of hosted feature layers	Relational data store
Create feature templates	Relational data store
Calculate values for a field	Relational data store
Publish a hosted tile layer	Relational data store
Archive observation data streamed when using ArcGIS GeoEvent Server.	Spatiotemporal big data store
Feature analysis tools	Relational data store
GeoAnalytics Tools	Spatiotemporal big data store and relational data store
Raster analysis tools	Relational data store

Apps that utilize the ArcGIS Data store include Insights for ArcGIS, Survey 123 for ArcGIS, Geopanner for ArcGIS, Workforce for ArcGIS

Installation and Configuration



ArcGIS Data Store Installation and Configuration Notes

- Starting at 10.4, ArcGIS Data Store installs using an OS or Domain service account.
- In a distributed server environment, the ArcGIS Data Store should be installed with fast network access to ArcGIS Server. Portal for ArcGIS does not communicate directly with the ArcGIS Data Store; only ArcGIS for Server does.
- ArcGIS Data Store Ports: 2443 (HTTPS), 9876 (TCP)
 - Tile cache data store: 29080 (HTTP), 29081 (HTTPS)
 - Spatiotemporal big data store: 9220, 9320
- Configure with ArcGIS Server via web browser or a command line utility
- Supports availability via a Primary and Standby node

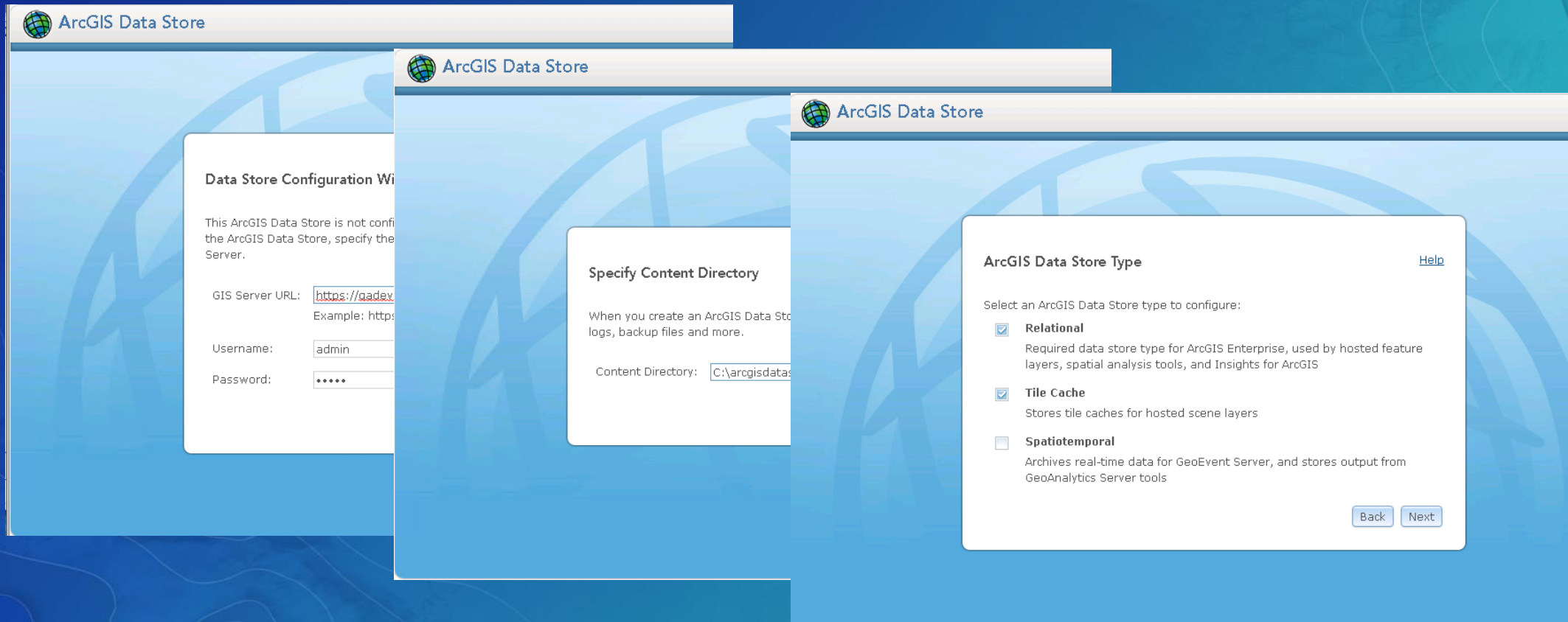
Installation and Configuration

- **Estimate amount of disk space to account for installation, configuration, and data**
 - Minimum requirement for one empty data store type is 13 GB of available disk space
 - This does not include data
 - ReadOnly mode threshold - Data stores placed in read-only mode or stopped when machine disk space drops below threshold
- **Data stores by their nature store large volumes of data**
 - Install on drive with plenty of free space
- **Spatiotemporal big data store**
 - Should be installed on dedicated machines
 - Install on robust machines with significant amounts of available RAM
 - By default consumes 50 percent of available memory
- **Create a Domain service account in advance of installation to support network backup operations**

Configuration

Data Store Configuration Wizard

- Ability to configure all data store types from Data Store Wizard



The image displays three overlapping screenshots of the ArcGIS Data Store configuration wizard, illustrating the steps to configure a data store.

Left Screenshot: Data Store Configuration Wizard

This ArcGIS Data Store is not configured. To use the ArcGIS Data Store, specify the Server.

GIS Server URL:
Example: https://gadex...

Username:

Password:

Middle Screenshot: Specify Content Directory

When you create an ArcGIS Data Store, you specify the content directory for logs, backup files and more.

Content Directory:

Right Screenshot: ArcGIS Data Store Type

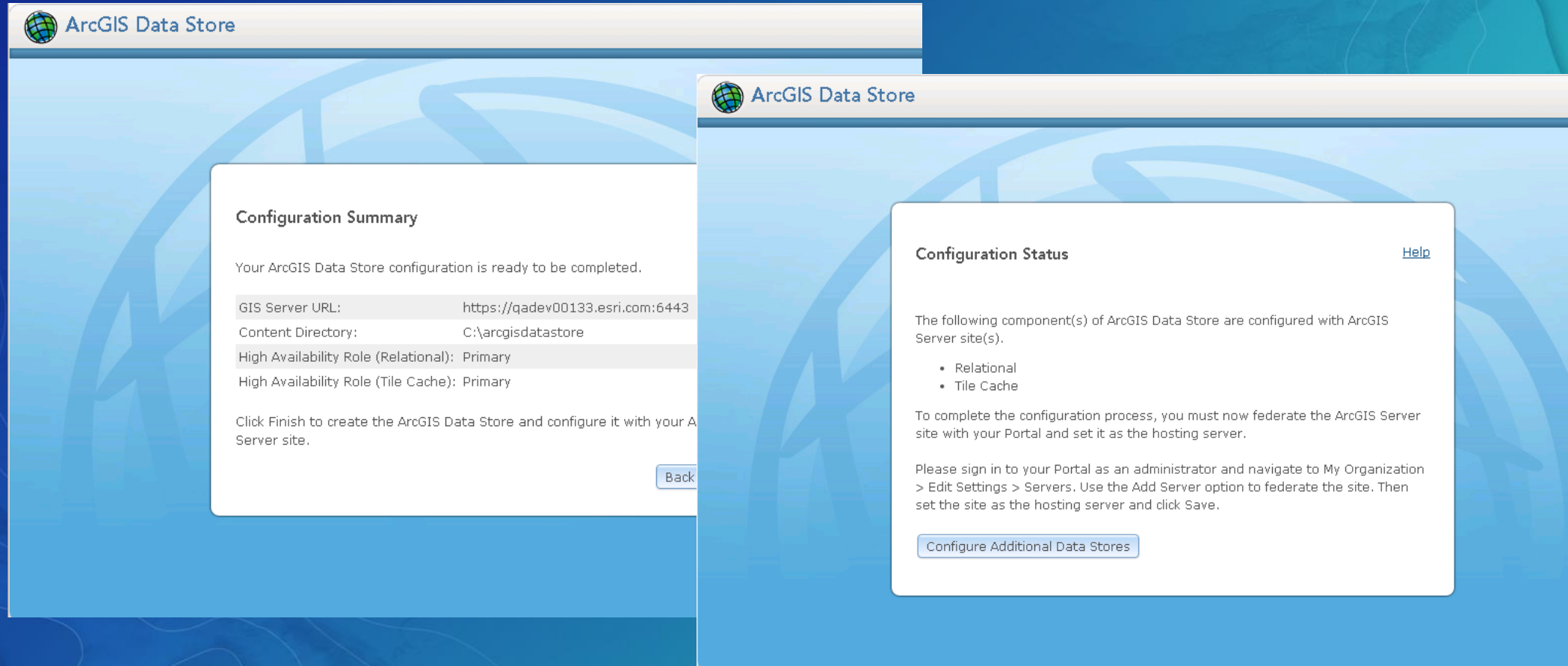
Select an ArcGIS Data Store type to configure: [Help](#)

- ☒ **Relational**
Required data store type for ArcGIS Enterprise, used by hosted feature layers, spatial analysis tools, and Insights for ArcGIS
- ☒ **Tile Cache**
Stores tile caches for hosted scene layers
- ☐ **Spatiotemporal**
Archives real-time data for GeoEvent Server, and stores output from GeoAnalytics Server tools

[Back](#) [Next](#)

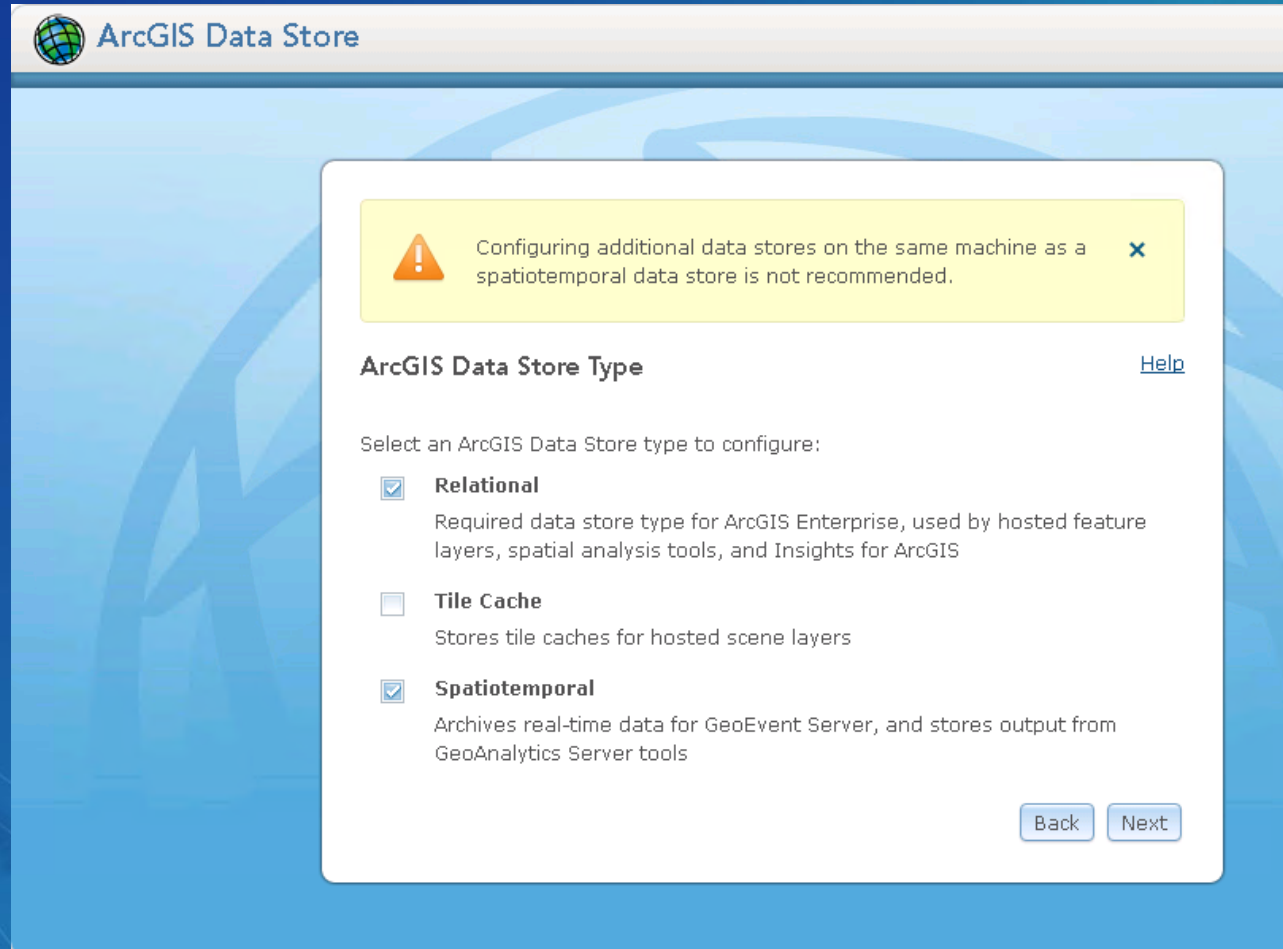
Data Store Configuration Wizard

- Option to configure additional data store types later



Data Store Configuration Wizard

- Configuring the spatiotemporal big data store

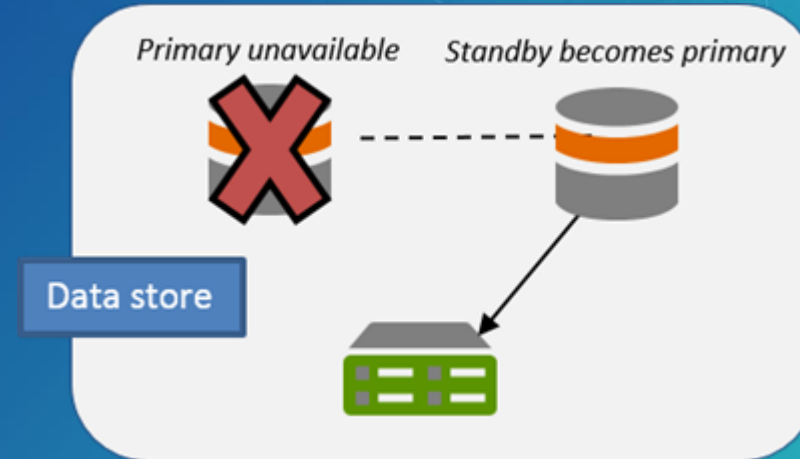
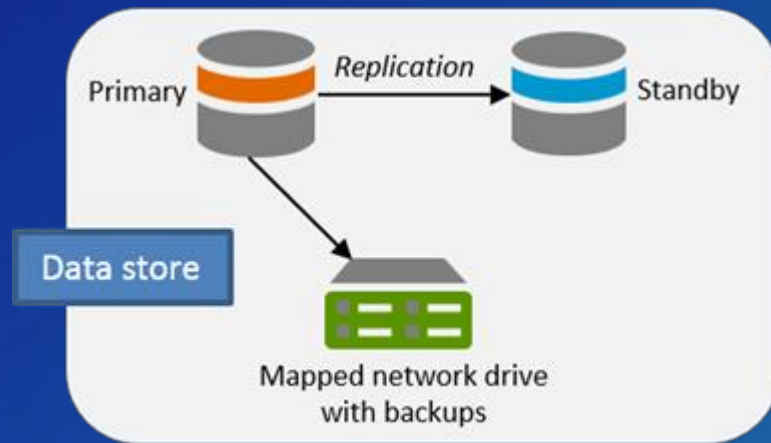


The screenshot shows the 'ArcGIS Data Store' configuration window. At the top, there is a title bar with the ArcGIS logo and the text 'ArcGIS Data Store'. Below the title bar, a yellow warning box contains an orange triangle icon and the text: 'Configuring additional data stores on the same machine as a spatiotemporal data store is not recommended.' with a close button (X). Below the warning box, the section is titled 'ArcGIS Data Store Type' with a 'Help' link. The instruction 'Select an ArcGIS Data Store type to configure:' is followed by three options, each with a checkbox and a description:

- ☒ **Relational**
Required data store type for ArcGIS Enterprise, used by hosted feature layers, spatial analysis tools, and Insights for ArcGIS
- ☐ **Tile Cache**
Stores tile caches for hosted scene layers
- ☒ **Spatiotemporal**
Archives real-time data for GeoEvent Server, and stores output from GeoAnalytics Server tools

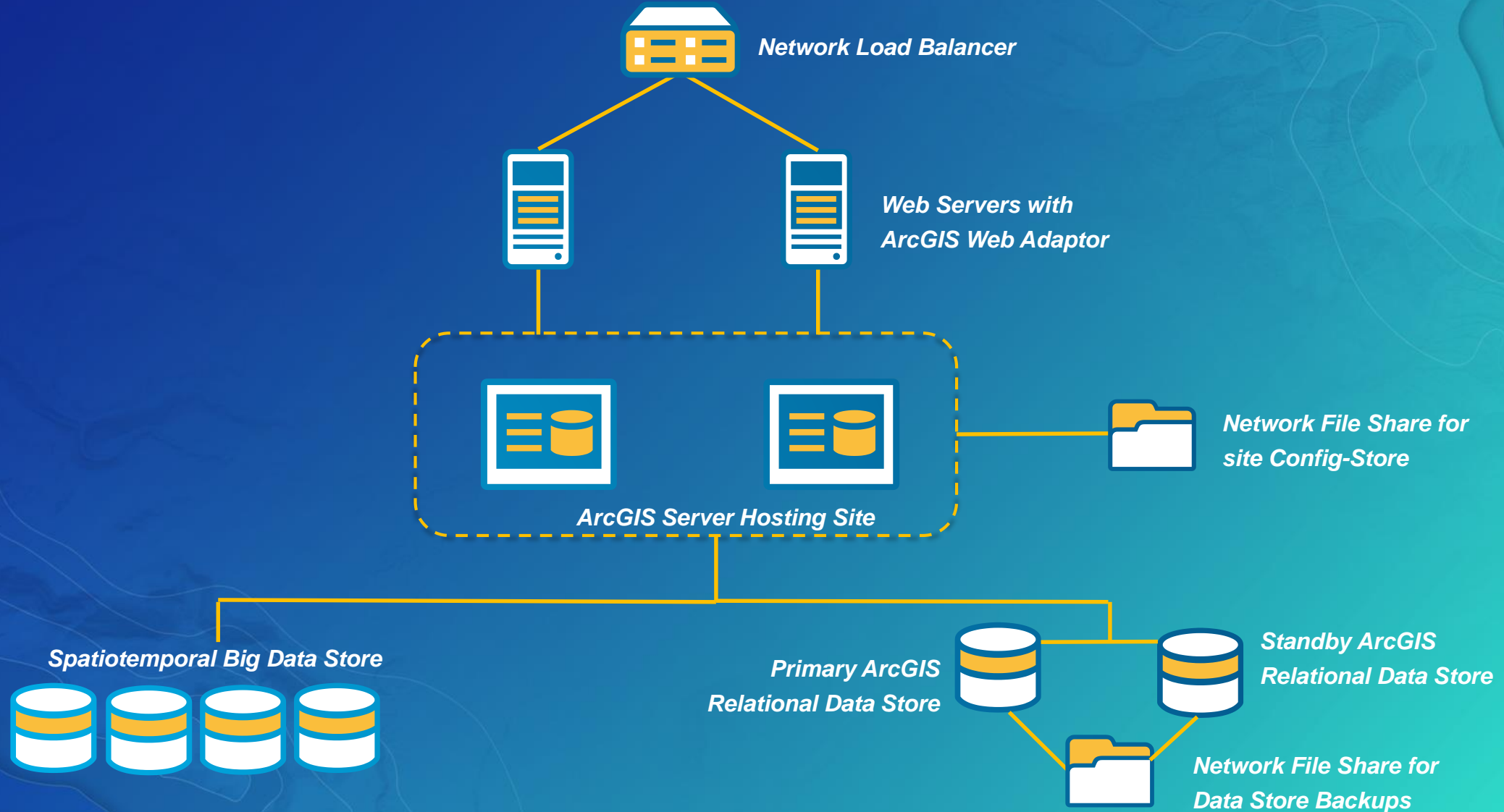
At the bottom right of the configuration area, there are two buttons: 'Back' and 'Next'.

Installing a standby relational and tile cache data store for high availability



- **Validate ports are open to second server**
- **Install ArcGIS Data Store on second server using same Domain Account as Primary Data Store**
- **Configure ArcGIS Data Store to same ArcGIS Server site**
- **Verify the Configuration Summary knows that this is a Standby Data Store**

Sample Highly Available ArcGIS Server Hosting Site



Backing up the data store



Backing up the data store

- Backups can be taken for all data store types at 10.5 and 10.5.1
 - Backups grow and consume disk space over time
 - Configure backup location to a shared drive
 - Ensure ArcGIS Data Store account has permissions on shared drive

Usage: `configurebackuplocation --location <backup-location> [configure-backup-location-options]`

Supported `configure-backup-location-options`:

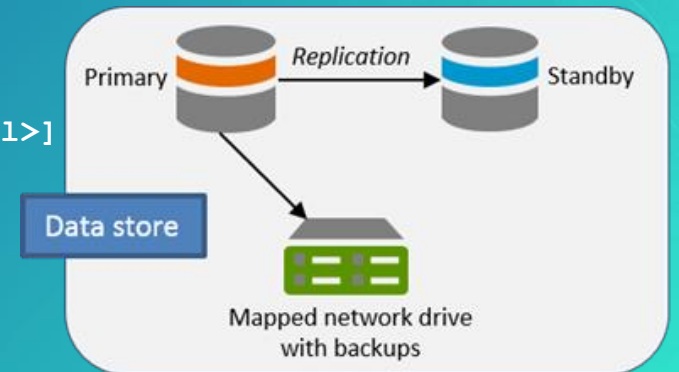
`[--operation <change | register | unregister>]`

`[--store <relational | tileCache | spatiotemporal>]`

`[--prompt <yes|no>]`

Usage: `backupdatastore [backup-name] [--store <relational|tileCache|spatiotemporal>]`

`[--prompt <yes|no>]`



Backing up the data store

- Backup schedule and retain days
- Default values at 10.5.1
 - retain days 7, backup schedule every 4 days

Usage: `updatebackupretaindays <num-of-days>`

Usage: `updatebackupschedule [--store relational| tileCache| spatiotemporal]
<--frequency num-of-days> [--starttime HH:MM:SS]`

Backing up the data store

- **Considerations for enabling / disabling point-in-time recovery for relational data store**
 - **Less disk space required if disabled**
 - Disabled by default at 10.5.1
 - **Point-in-time needed for WebGISDr tool**

Usage: `changedbproperties --store <relational|tileCache|spatiotemporal> [configure-options]`

Supported configure-options:

`[--disk-threshold-readonly <disk-threshold-readonly>]`

`[--max-connections <max-connection-number>]`

`[--pitr <enable|disable>]`

`[--heap-size <heap-size-in-MB>]`

`[--rebalance <true|false>]`

`[--max-rebalance-off <time-in-minutes>]`

`[--allocation <true|false>]`

`[--prompt <yes|no>]`

Backing up the data store

- **Exports and backups**
 - Advantages and differences prior to 10.5.1
 - 10.5.1 default behavior

Usage: `exportmanageddb <destination> <backupName> [backup-options]`

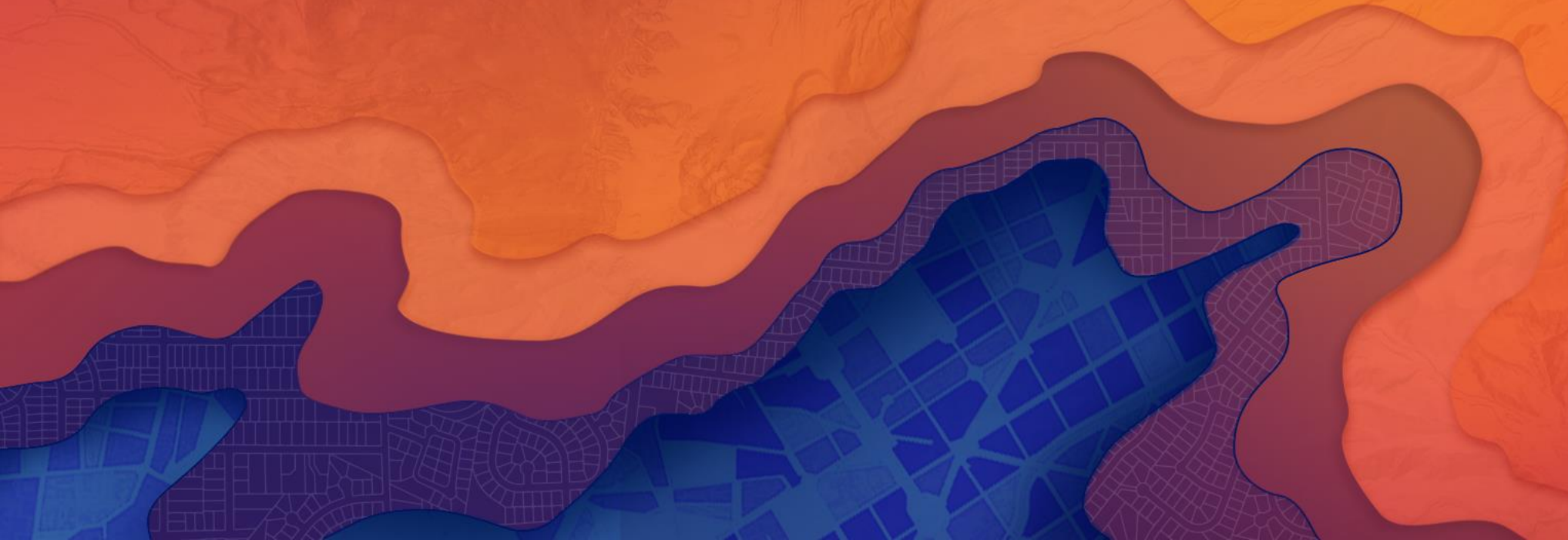
Supported backup-options:

`--stores [relational][,][tileCache]`

`--include-tilecache <true|false>`

`--prompt <yes|no>`

Restoring the data store



Restoring the data store

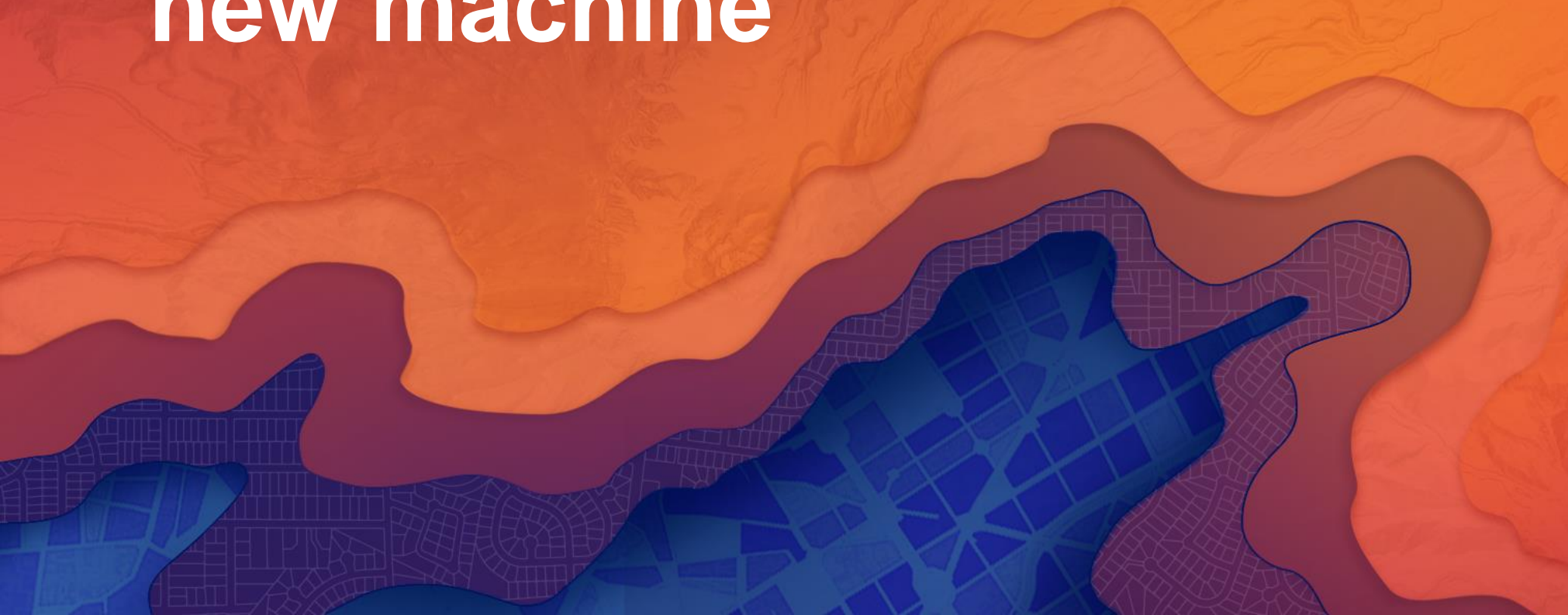
- Restoring options
 - Restoredatastore
 - importmanageddb (prior to 10.5.10)

Usage: `restoredatastore[restore-options]`

Supported restore-options (Time need be in UTC):

```
[--store <relational|tileCache|spatiotemporal>]
[--target <most-recent|yyyy-mm-dd-hh:mm:ss>|source-backup-name]
[--source-loc <source-backup-loc>]
[--bound <true|false>]
[--data-dir <data_dir>]
[--server-url <server_url>]
[--server-admin <admin_user>]
[--server-password <admin_password>]
[--loaddata true|false]
[--prompt <yes|no>]
```


**Moving to the data store to a
new machine**



Moving ArcGIS Data Store to a different server

- There are times when organizations may need to move the ArcGIS Data Store content to a different server, such as a server hardware upgrade.



- Steps
 - Install ArcGIS Data Store on new server
 - Configure relational ArcGIS data store to ArcGIS Server site as standby Data Store
 - Once configured and data is fully replicated, promote the standby Data Store to primary
 - Remove the standby data store from the site (the original primary)
 - Uninstall Data Store software from original server; decommission.

```
Administrator: Command Prompt

C:\Program Files\ArcGIS\DataStore\tools>describedatastore.bat

General information of ArcGIS data stores on GLENEAGLE.ESRI.COM
=====
Data store release.....10.5.1.7333
Staging location.....D:\arcgisdatastore\staging
Log location.....D:\arcgisdatastore\logs
Free disk space.....163.00GB
Threshold for READONLY mode.....1024MB

Information for relational data store ds_32myzsbh
=====
Backup location.....D:\arcgisdatastore\backup
Is backup folder shared.....false
Backup schedule.....{"schedule-starttime":"00:00:00","schedule-frequency":"Every 4 DAYS"}
Days backup retained.....7
Data store status.....Started
Member machines.....GLENEAGLE.ESRI.COM
Maximum connections.....150
Owning system URL.....https://GLENEAGLE/server
Portal for ArcGIS URL.....https://gleneagle.esri.com/portal
Number of connections.....0 connection(s) to managed database
Data Store mode.....READWRITE
Is Point-in-time recovery enabled...Yes

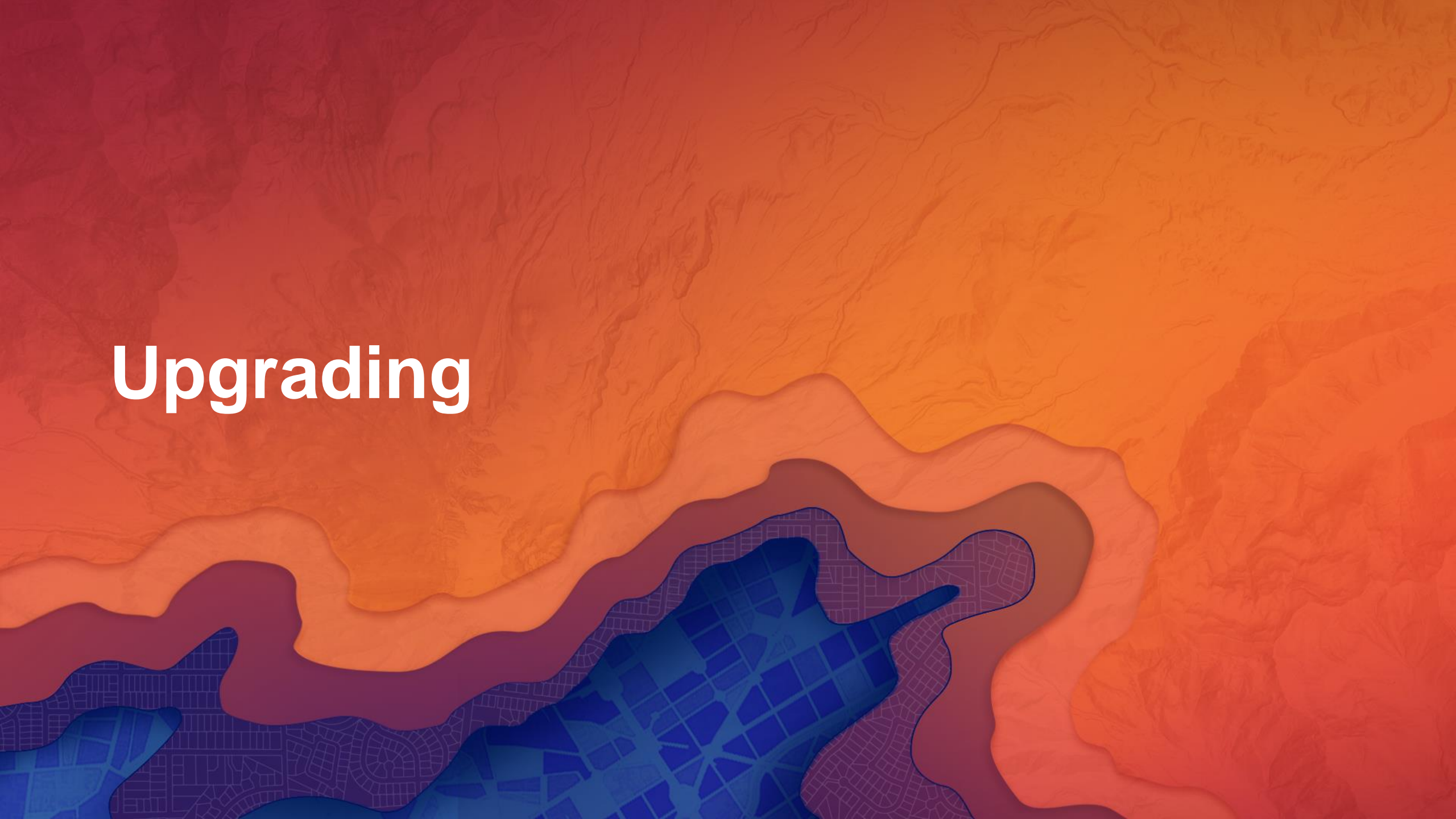
Information for tile cache data store tcs_tuvcazcr
=====
Data location.....D:\arcgisdatastore\nosqldata
Data store status.....Started
Backup location.....D:\arcgisdatastore\backup\tilecache
Is backup folder shared.....false
Member machines.....GLENEAGLE.ESRI.COM
Owning system URL.....https://gleneagle.esri.com:6443/arcgis/admin
Portal for ArcGIS URL.....https://gleneagle.esri.com/portal

Operation completed successfully
```

Demo

Command Line Utilities

Upgrading



Considerations Before Upgrading

- **ArcGIS Server must be upgraded before ArcGIS Data Store**
- **Stop service and copy entire content directory to a safe location**
- **Generate an export via exportmanagedddb command line utility**

Usage: `exportmanagedddb <destination> <backupName> [backup-options]`

Supported backup-options:

`[--stores [relational][,][tileCache]`

`[--include-tilecache <true|false>]`

`[--prompt <yes|no>]`

- **For relational and tile cache, upgrade primary before standby**
- **For spatiotemporal**
 - **Stop all but one spatiotemporal data store, upgrade, and then subsequently start and upgrade the rest one-by-one**

- Content directory is detected and greyed out

The image displays two sequential screenshots of the ArcGIS Data Store configuration wizard. The left screenshot shows the 'Data Store Configuration Wizard' window. It has a title bar with the ArcGIS Data Store logo and name. The main content area contains the following text: 'Data Store Configuration Wizard', 'This ArcGIS Data Store is not configured with an ArcGIS Server site. To configure this ArcGIS Data Store, specify the URL and an administrator account for your GIS Server.', and three input fields: 'GIS Server URL:' with the value 'https://dev001726.esri.com:6443' and a clear button, 'Username:' with the value 'admin', and 'Password:' with masked characters. Below the URL field is an example: 'Example: https://gisserver.domain.com:6443'. The right screenshot shows the 'Specify Content Directory' window. It also has the ArcGIS Data Store logo and name in the title bar. The main content area contains the following text: 'Specify Content Directory' with a 'Help' link, 'The following content directory was detected from your configuration. Press Next to continue.', and a 'Content Directory:' field with the value 'C:\arcgisdatastore\' which is greyed out. At the bottom right are 'Back' and 'Next' buttons.

Data Store Configuration Wizard

This ArcGIS Data Store is not configured with an ArcGIS Server site. To configure this ArcGIS Data Store, specify the URL and an administrator account for your GIS Server.

GIS Server URL:

Example: https://gisserver.domain.com:6443

Username:

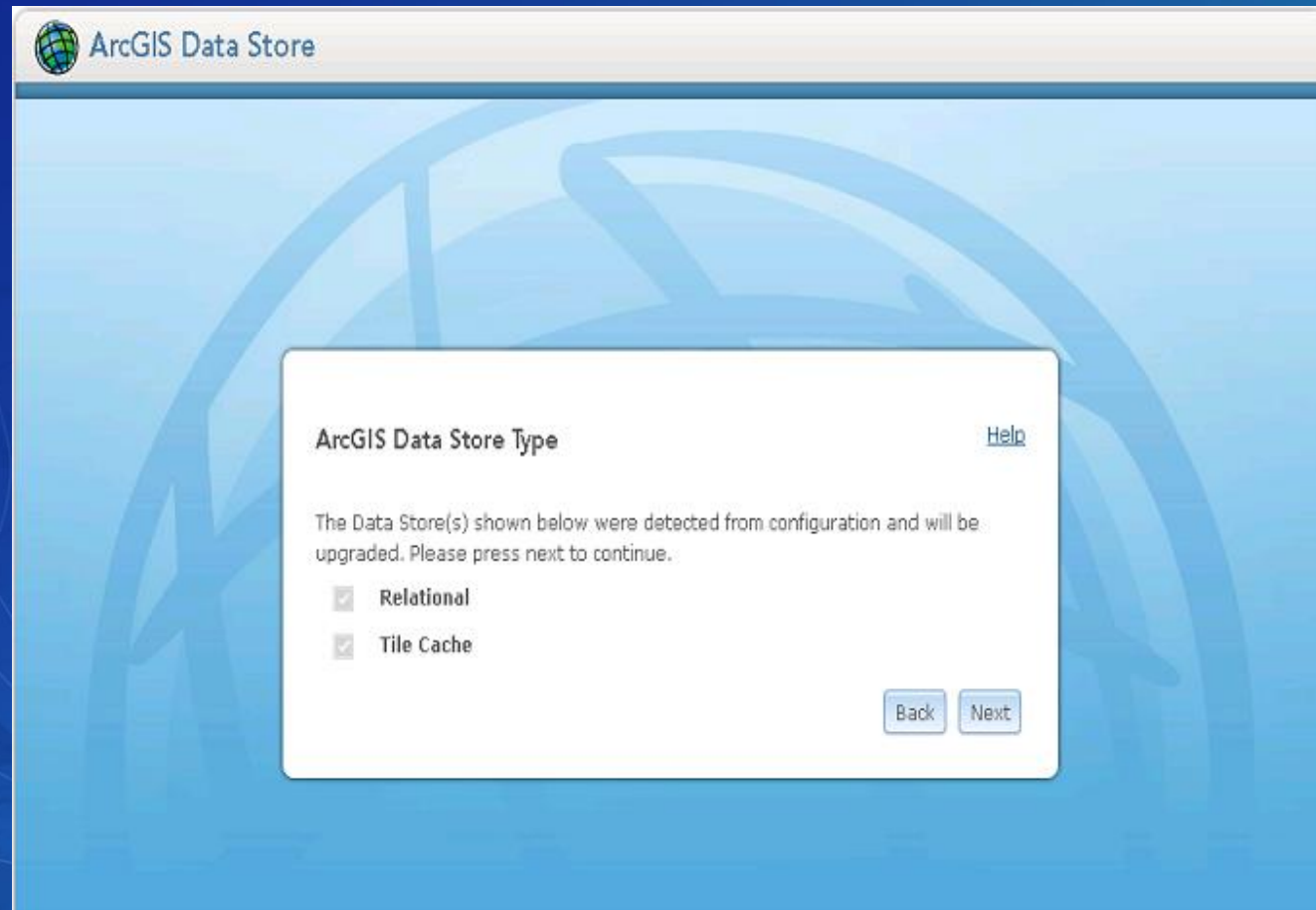
Password:

Specify Content Directory [Help](#)

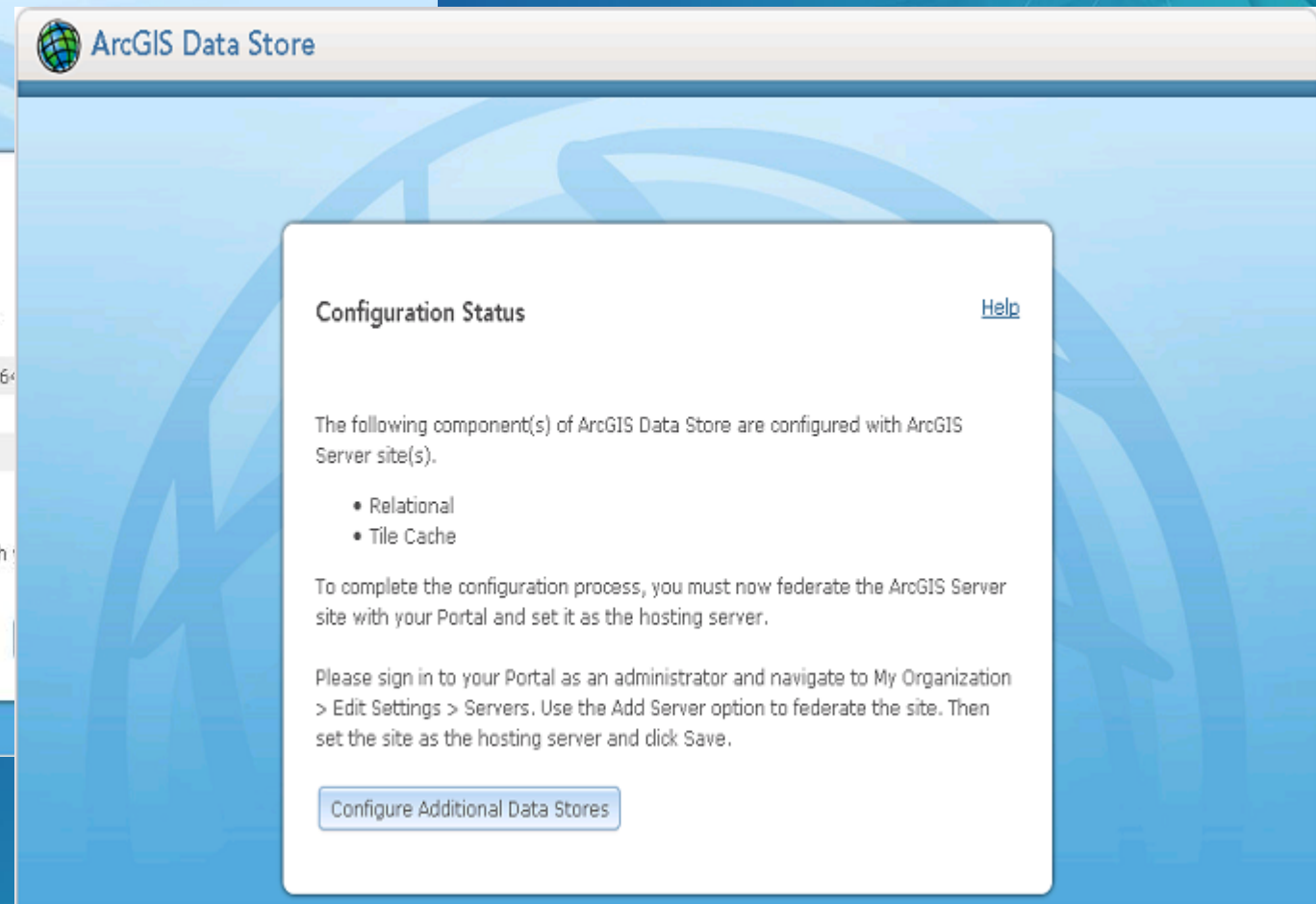
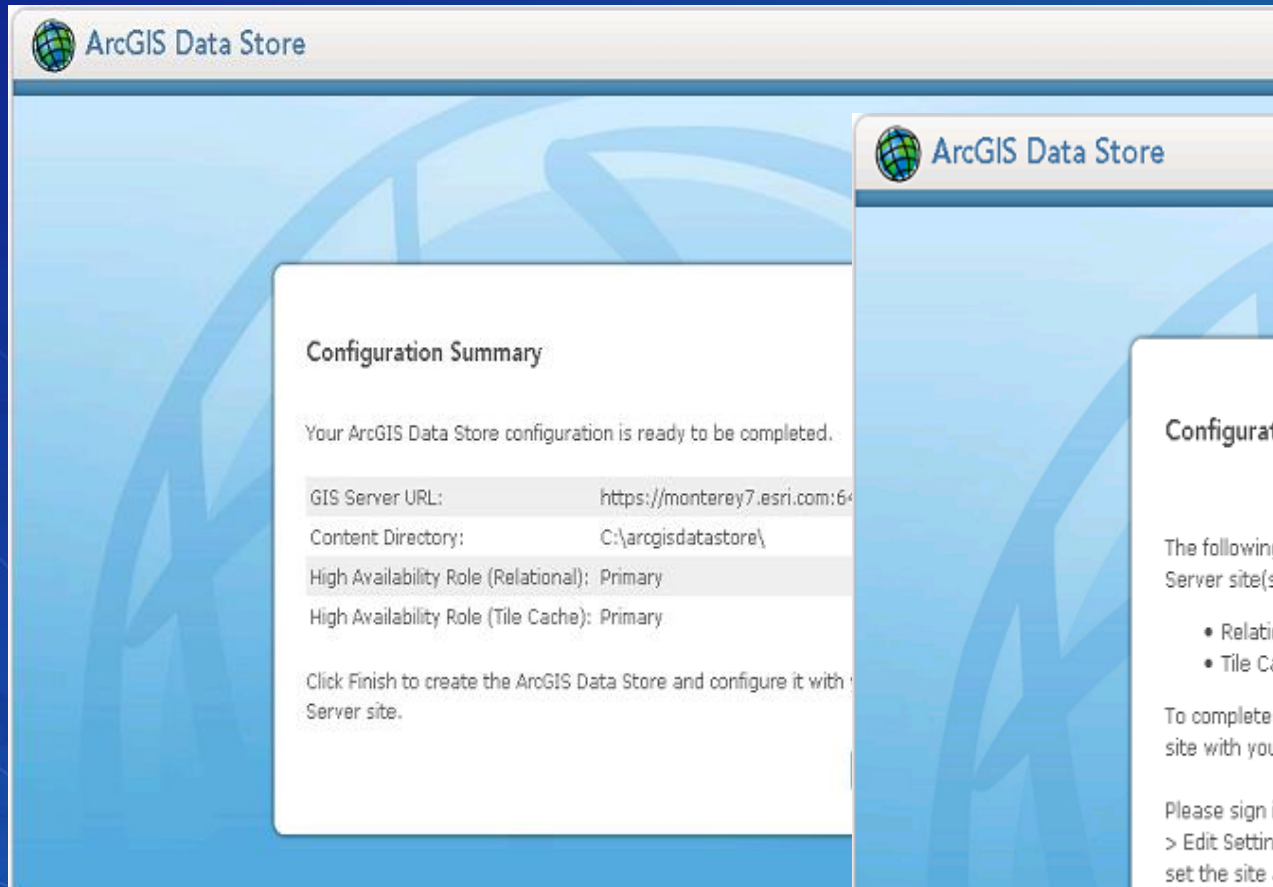
The following content directory was detected from your configuration. Press Next to continue.

Content Directory:

- **Data Store types to be upgraded are detected from configuration**



- Configuration summary and status provided



After Upgrading

- Run describedatastore command
- Validate data stores
 - <https://gisserver.domain.com:6443/arcgis/admin/>

ArcGIS Server Administrator Directory Logged in: admin

[Home](#) > [data](#) > [items](#) > [nosqlDatabases](#) > [AGSDataStore_bigdata_bds_71ft6kij](#) > [machines](#) > [DEV000881.ESRI.COM](#)

Machine - machine.domain.com

Data Store Machine Properties

Name:	machine.domain.com
Admin URL:	https://machine.domain.com:2443/arcgis/datastoreadmin/
Platform:	Windows
Database port:	9320
Role:	BIGDATA_ONLY

Supported Operations: [start](#) [stop](#) [remove](#) [validate](#)

Supported Interfaces: [REST](#)

- Verify services still work

The background features a warm orange-to-red gradient with a textured, marbled appearance. In the lower portion, there is a dark blue area with a white grid pattern, resembling a city map or street layout, which is partially obscured by the orange gradient.

QUESTIONS?

Want to learn more?

- ArcGIS Enterprise Showcase Area – Data Store topics
- ArcGIS Enterprise: Architecture Best Practices
 - Tuesday 10:30am
- High Availability and Disaster Recovery for ArcGIS Enterprise
 - Tuesday 8:30am, Thursday 3:15pm
- Web GIS: Architectural Patterns and Practices
 - Tuesday 10:15am, Thursday 10:15am

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