



ArcGIS Enterprise: Advanced Topics in Administration

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SEE
WHAT
OTHERS
CAN'T

Topics

- **Advanced ArcGIS Enterprise Workflows**
 - Expanding your site
 - Multi-Machine site administration
 - Applied Monitoring Techniques & Tips
- **Resources**

Expanding your site

Why expand?

How can ArcGIS Enterprise Expand?

Expanding ArcGIS Server to a multi-machine site

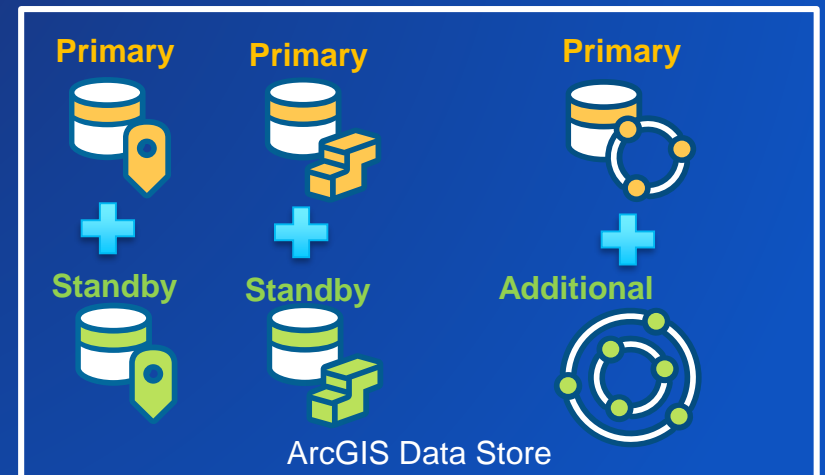
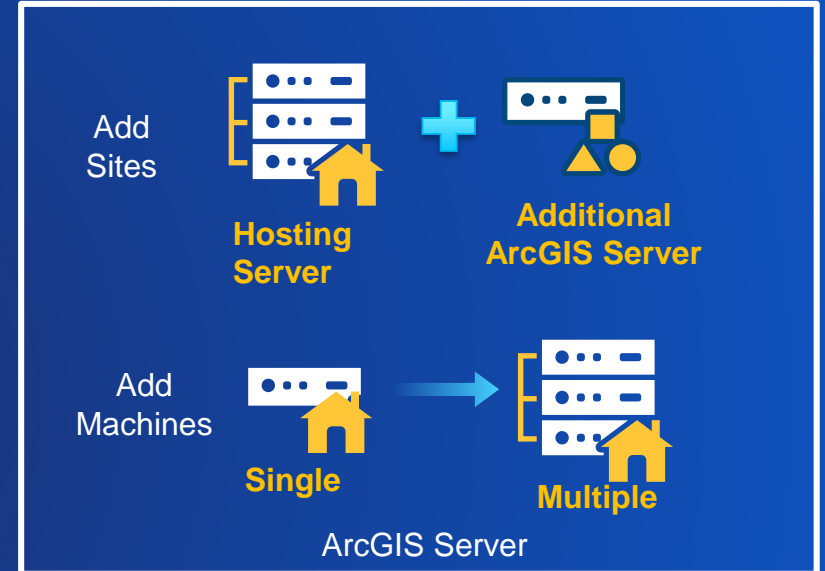
Advanced Enterprise Workflows: Expanding

Why Expand?

- To handle increased load/usage
- Utilize additional ArcGIS Server capabilities
- Workload and functionality separation
- High Availability

How can ArcGIS Enterprise Expand?

- Portal for ArcGIS
 - Can add a single Standby Enterprise portal
- ArcGIS Server (two approaches)
 - Multiple Sites – Add further server sites to the deployment
 - Multiple Machines – Additional machines on an existing server site
- ArcGIS Data Store
 - Relational Data Store – Add a single Standby data store
 - Tile Cache Data Store – Add a single Standby data store
 - Spatiotemporal Big Data Store – Add multiple data stores



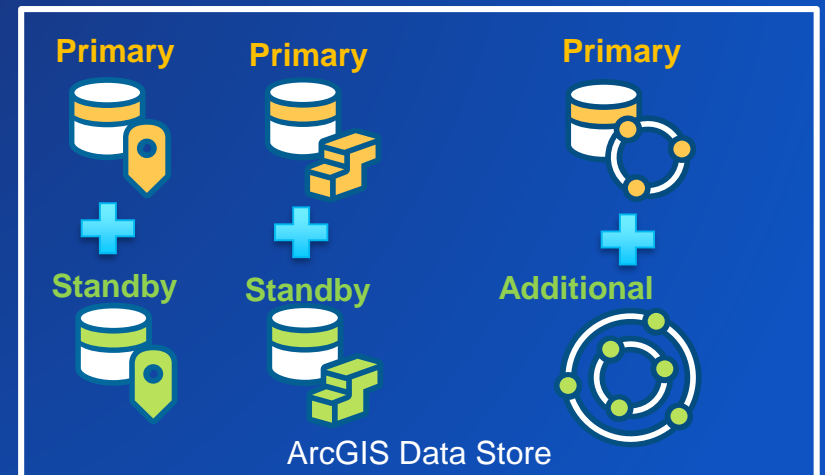
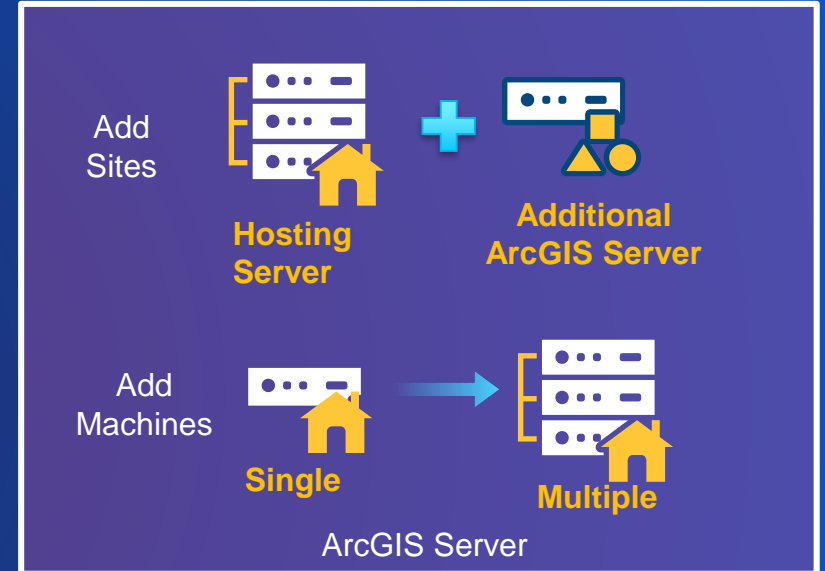
Advanced Enterprise Workflows: Expanding

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Advanced Enterprise Workflows: Expanding ArcGIS Server

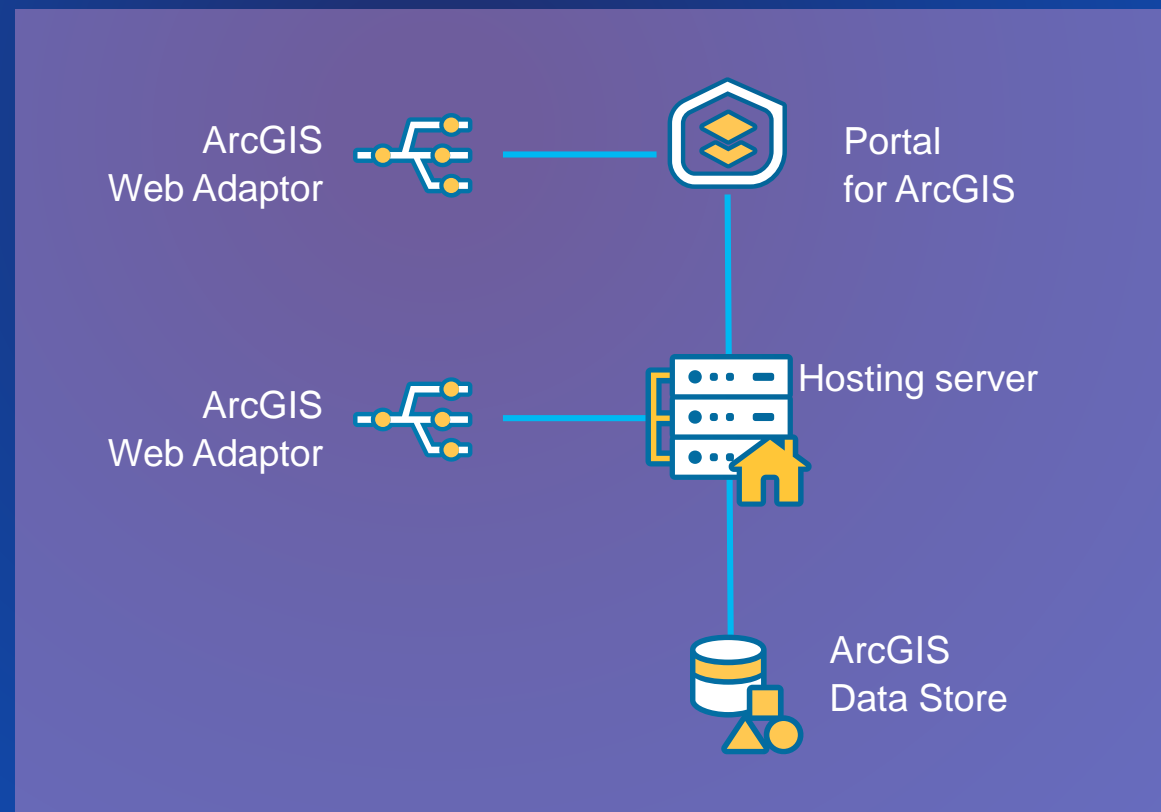
Adding further ArcGIS Server Sites to the Base Deployment

- Benefits:

- Isolates the Hosting Server from other specialized GIS Server duties
- Separates out ArcGIS Servers that serve specific functionality or workload/services

Workflow:

- Provision machines
- Install + License
- Create new site
- Federate new site with portal



GIS Server



Image Server



GeoEvent Server



GeoAnalytics Server



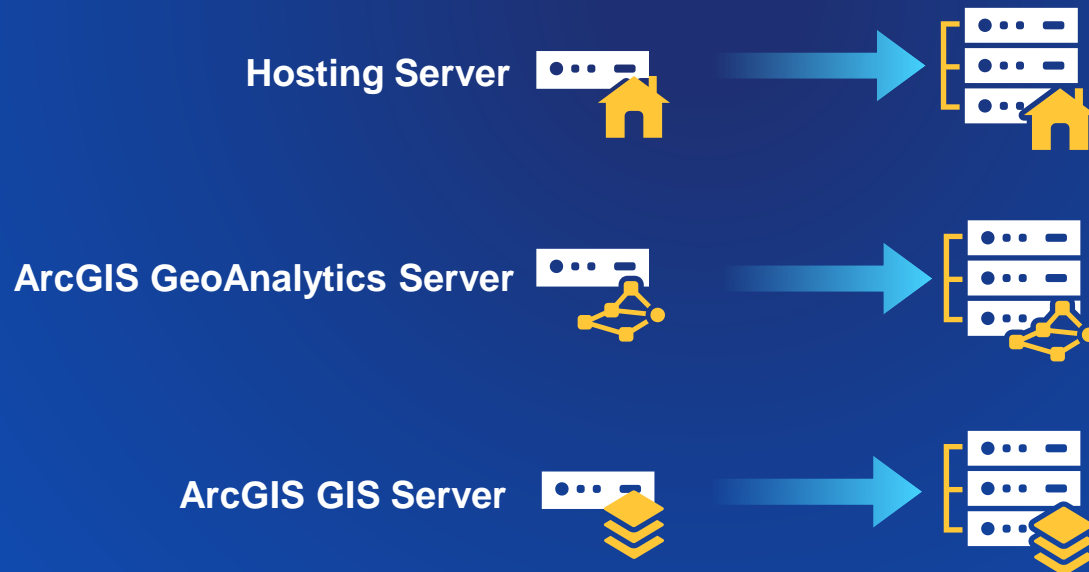
Business Analyst Server

Advanced Enterprise Workflows: Expanding ArcGIS Server

Add more machines to the same ArcGIS Server site

Scenarios:

- Scale out the Hosting Server site
 - Heavy usage of Analysis tools, higher number of Insights users, etc.
 - Doubles up for other functionality/workload.
- Scale out your GeoAnalytics or Image Server sites for computational requirements
- Scale out your GeoProcessing or Mapping GIS Server sites due to heavy usage



Advanced Enterprise Workflows: Expanding ArcGIS Server

Prerequisites for Expanding an ArcGIS Server site

- Server directories and Configuration store must use shared paths
- Same Operating System and Hardware Resources (Recommended)
- Same ArcGIS Server version number
- Same licenses applied
- Running using the same ArcGIS Server account (Windows Service Account)
- Can read/write from the shared server directories and config-store locations
- Can communicate with all other machines in the ArcGIS Server site through documented ports
 - May require adjusting firewall settings
- Can read all data sources referenced by the server site

How to expand an ArcGIS Server site

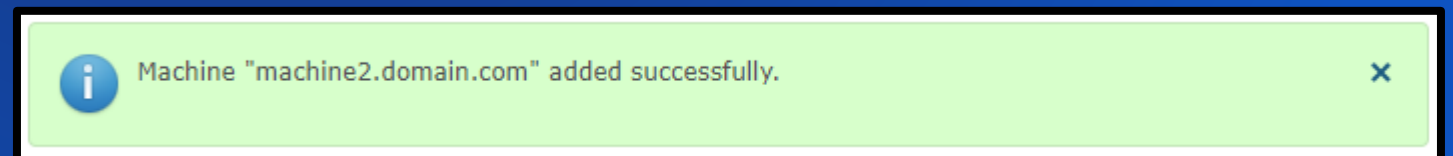
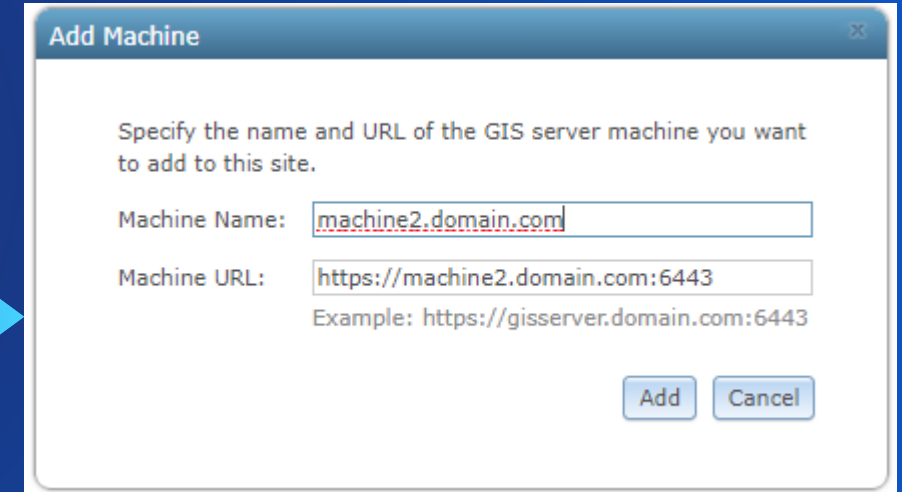
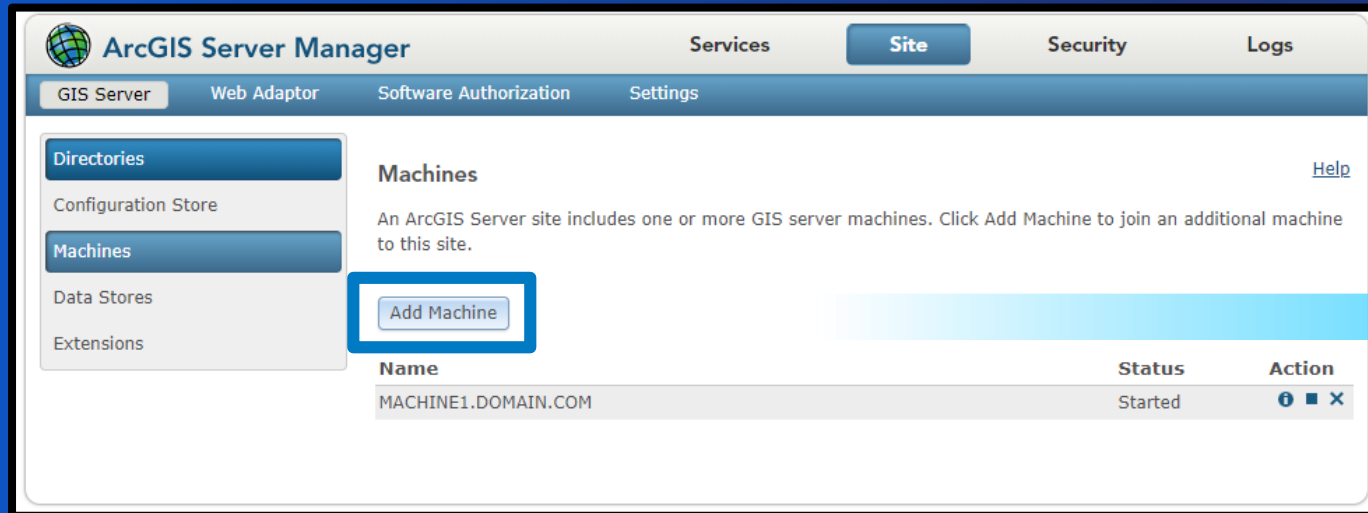
Two possible workflows:

1. Add machine
2. Join site

Advanced Enterprise Workflows: Expanding ArcGIS Server

Expanding an ArcGIS Server site with the Add machine operation

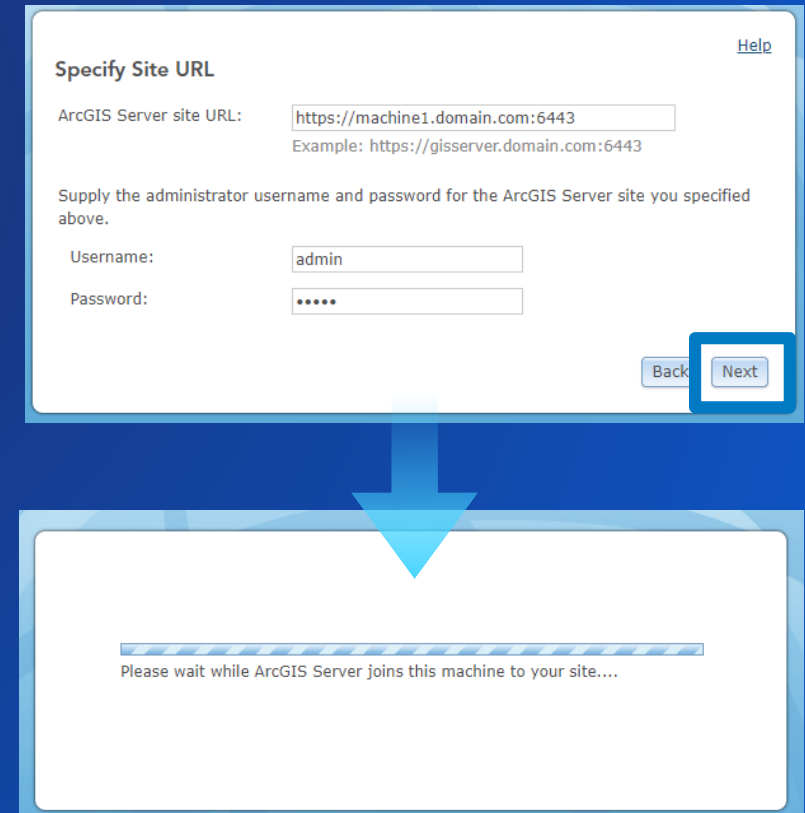
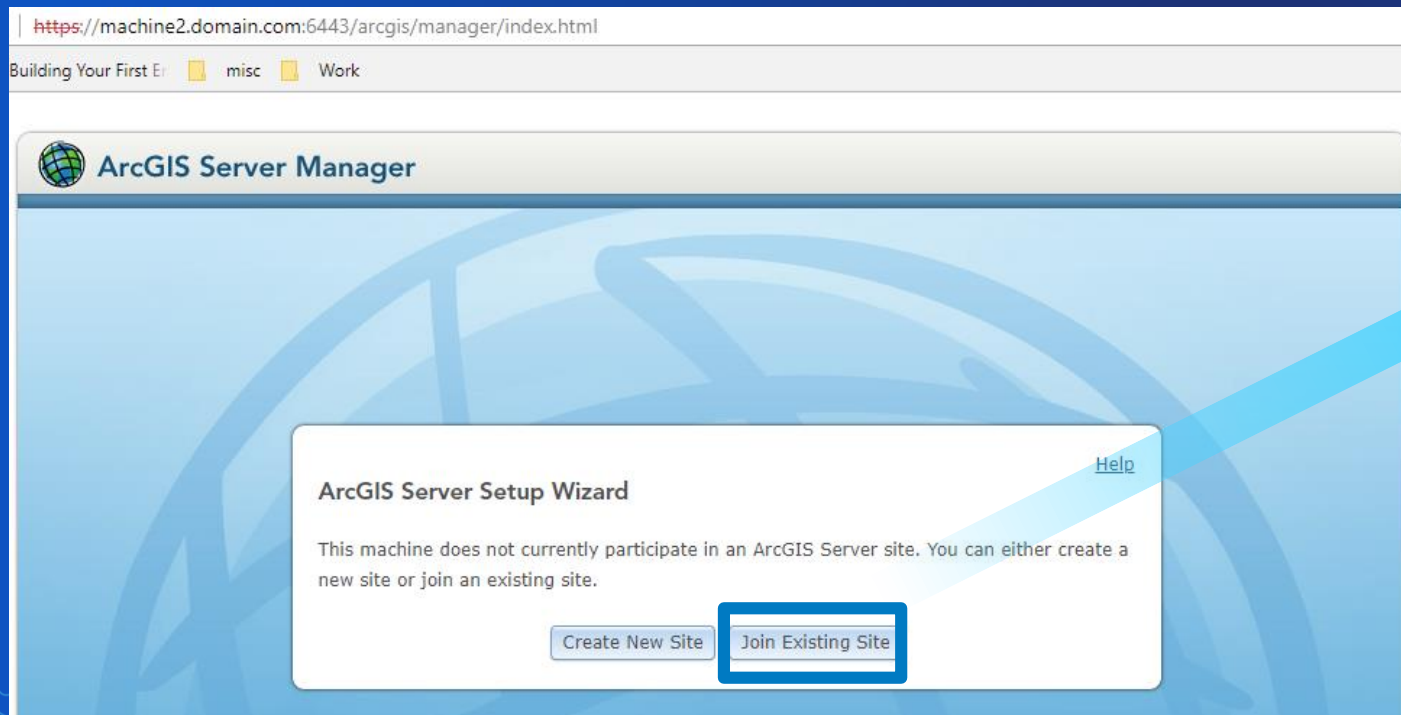
- ArcGIS Server Manager > Sites tab > Machines > Add Machine
- Enter machine name and URL for second ArcGIS Server machine, click "Add"



Advanced Enterprise Workflows: Expanding ArcGIS Server

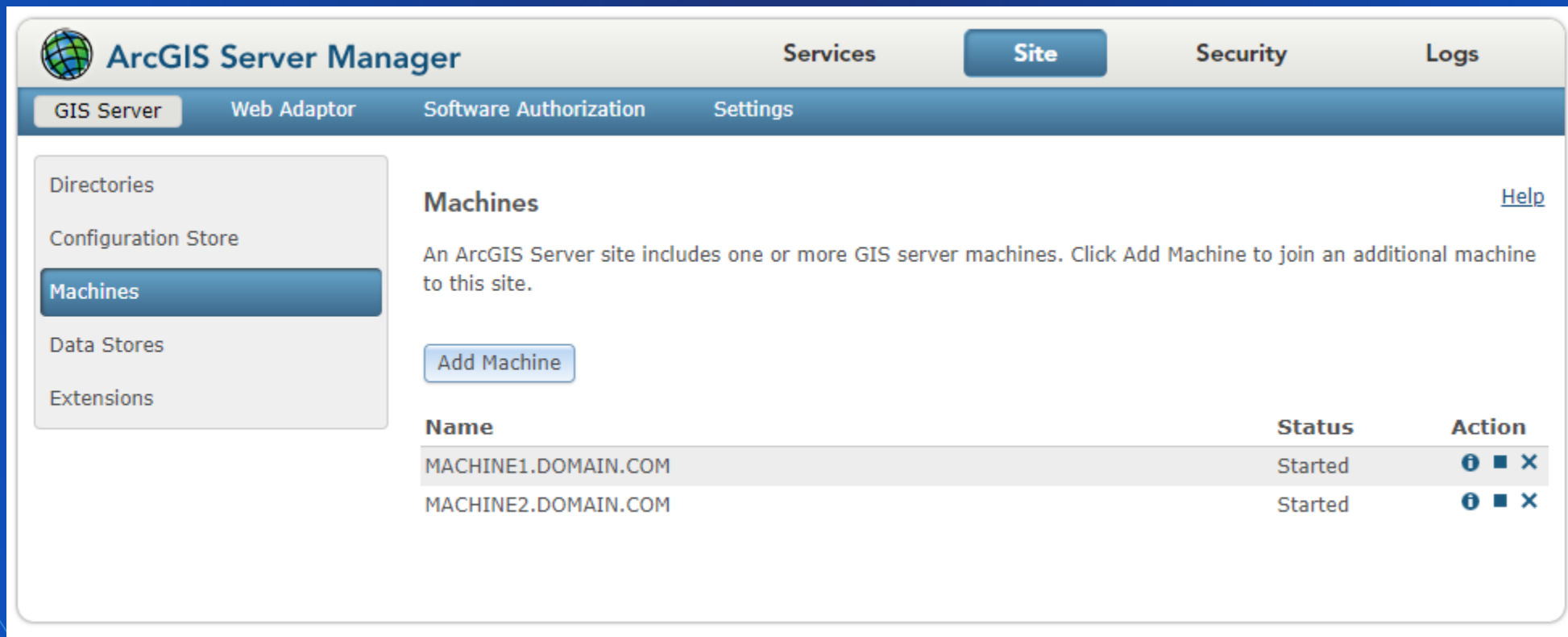
Expanding an ArcGIS Server site with the Join site operation

- On the new ArcGIS Server machine, navigate to ArcGIS Server Manager > Select “Join Existing Site”
- Enter URL and Server Administrator credentials for the first ArcGIS Server > Select “Next”
- After joining, directed to ArcGIS Server Manager login page



Advanced Enterprise Workflows: Expanding ArcGIS Server

Final Result: Multi-Machine ArcGIS Server Site



The screenshot displays the ArcGIS Server Manager web interface. The top navigation bar includes 'Services', 'Site' (selected), 'Security', and 'Logs'. Below this, a secondary bar shows 'GIS Server' (selected), 'Web Adaptor', 'Software Authorization', and 'Settings'. A left-hand sidebar contains a tree view with 'Directories', 'Configuration Store', 'Machines' (selected), 'Data Stores', and 'Extensions'. The main content area is titled 'Machines' and includes a description: 'An ArcGIS Server site includes one or more GIS server machines. Click Add Machine to join an additional machine to this site.' Below the text is an 'Add Machine' button. A table lists the configured machines with columns for Name, Status, and Action.

Name	Status	Action
MACHINE1.DOMAIN.COM	Started	i ■ x
MACHINE2.DOMAIN.COM	Started	i ■ x

Advanced Enterprise Workflows: Expanding ArcGIS Server

Additional considerations when expanding ArcGIS Server

We recommend configuring a Web Adaptor (or Reverse Proxy)

- Web Adaptor/Reverse Proxy acts as a load balancer, routing requests among machines in the site
- When federating, we recommend using the Web Adaptor/Reverse Proxy URL
 - Both the Services URL and Administration URL

Add ArcGIS Server

Enter the URLs for accessing and administering your ArcGIS Server site. Also enter credentials for an administrator of the ArcGIS Server site.

Services URL:

Example: `https://webadaptorhost.domain.com/webadaptorname`

Administration URL:

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

Username:

Password:

Advanced Enterprise Workflows: Expanding ArcGIS Server

Additional considerations when expanding ArcGIS Server

I want to expand, but Server is already federated. How do I update my URLs?

- Update the administrator URL for the federated server in the portal
- Validate your ArcGIS Server from the portal



Advanced Enterprise Workflows: Expanding ArcGIS Server

Additional considerations when expanding ArcGIS Server

I want to expand, but Server is already federated. How do I update my URLs?

- Update the administrator URL for the federated server in the portal
- Validate your ArcGIS Server from the portal

← → ↺ ⚠ Not secure | https://dev0001425.esri.com/portal/sharing/rest/community/users/admin

ArcGIS Portal Directory | Home

Community > Users > admin

JSON | API Reference

Logged in as: admin | Logout | Generate Token

User (admin)

User Id: ea578f2f2c984c959086244b912c7321

Full Name: mo mo

First Name: mo

Last Name: mo

Preferred View: Web

Org ID: 0123456789ABCDEF

Role: org_admin

Level: 2

User License Type Id: creatorUT

Description: N/A

Tags: N/A

Culture: en

Culture Format: N/A

Region: N/A

Units: metric

Thumbnail: N/A

Email: mo@mo.com

Disabled: false

User Type: N/A

IdpUsername: N/A

Fav Group: f75b3fa274aa4e3db27afcd7efe624f8

Access: public

Storage Usage: 2611620

Storage Quota: 1099511627760

Member Since: Jun 19, 2019

Modified: Jun 19, 2019

Last Login: Jul 7, 2019

Multifactor: false

Provider: arcgis

User Groups

Title	Owner	Created
Featured Maps and Apps	admin	Jun 19, 2019

Child Resources:

User Notifications | User Tags | User Invitations | User Properties | User Devices | Provisioned Listings | User App Bundles | User License Type | User

Multi-Machine Site Administration

Understanding request traffic scenarios

Common issues with multi-machine configuration

Mitigation

Understanding Multi-Machine ArcGIS Server Sites : Request Types

Service Requests

- Requests to a service endpoint for a supported operation
- Request is handled by the machine which receives it
- No modifications to site configuration needed
- Examples:
 - Querying map service records
 - Passing edits through a feature service

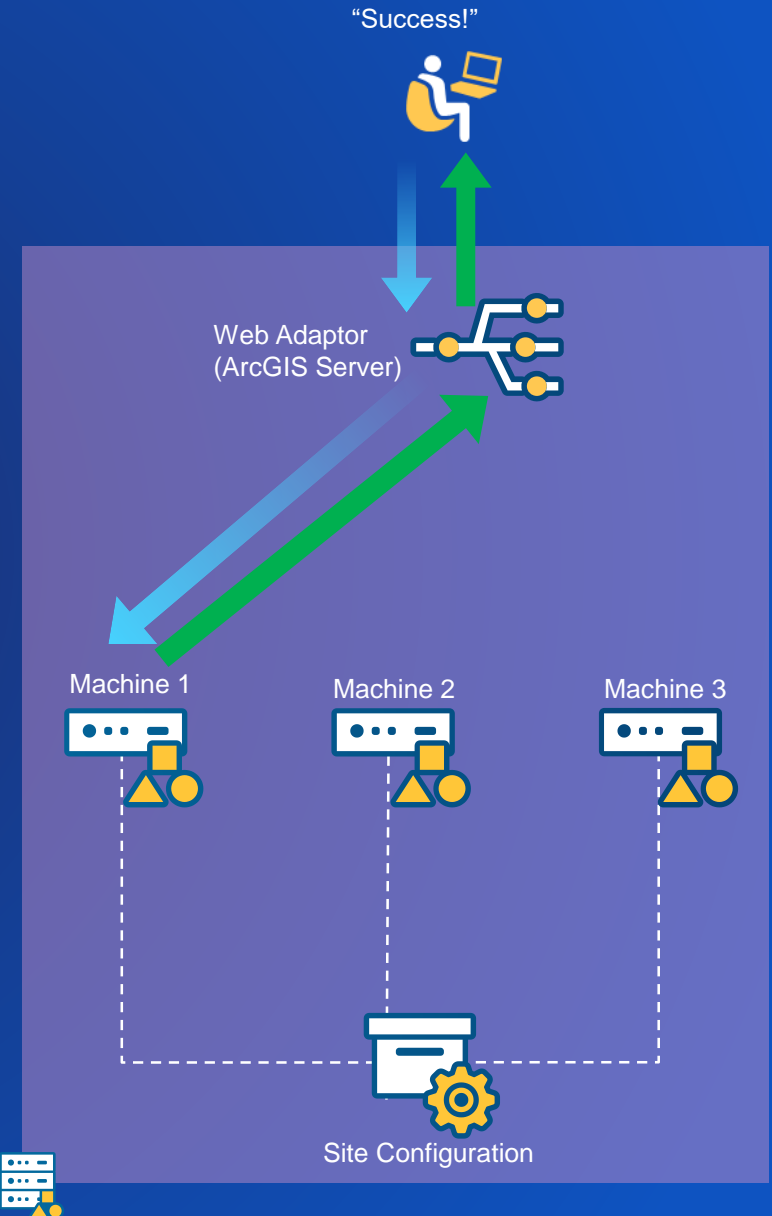
Administrative Requests

- Requests to the ArcGIS Server site to add or modify configured information
- Request is handled by the machine which receives it, and is then propagated to additional machines in the site
- Examples:
 - Publishing a new service
 - Registering a data store

Understanding Multi-Machine ArcGIS Server Sites : Request Types

How does a multi-machine ArcGIS Server site handle incoming service requests?

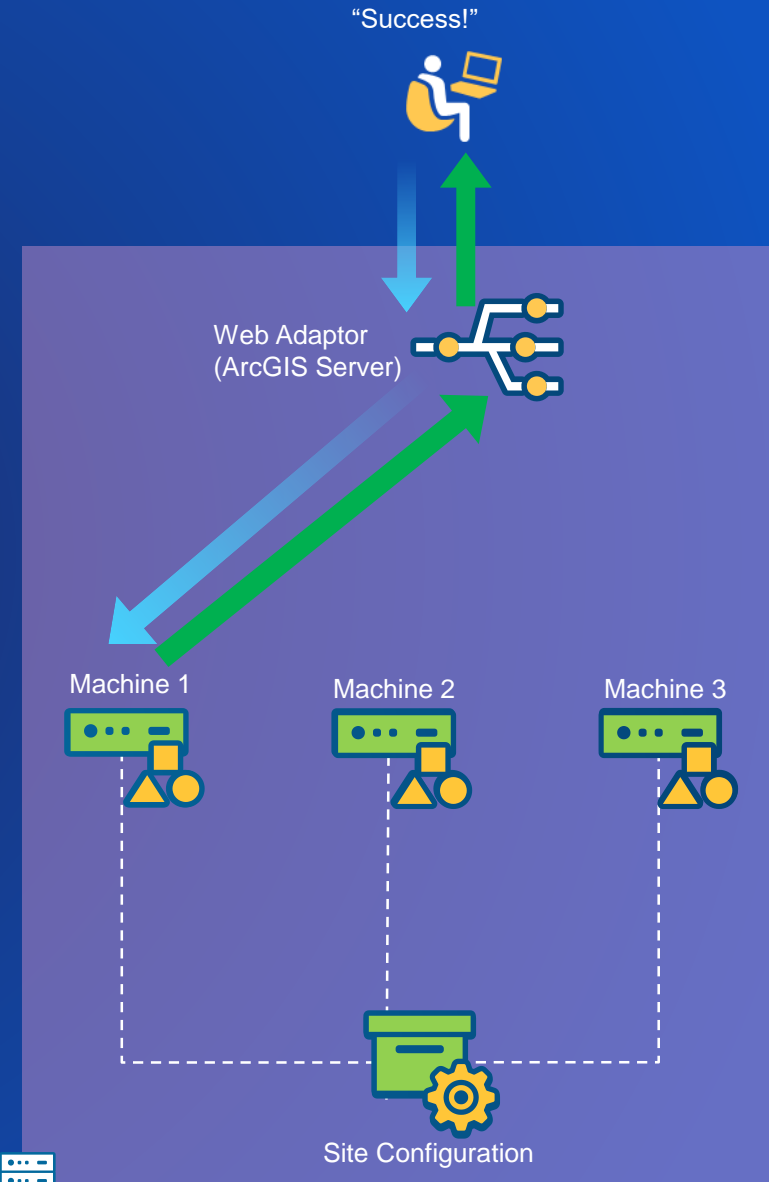
- An incoming request comes to the Web Adaptor, and is routed to one of the server machines
- The server machine accepts and processes the request
- A successful response is returned



Understanding Multi-Machine ArcGIS Server Sites : Request Types

How does a multi-machine ArcGIS Server site handle incoming administrative requests?

- An incoming request comes to the Web Adaptor, and is routed to one of the server machines
- The server machine accepts and processes the request, writing changes to the site configuration
- Other machines in the site sync with these changes
- A successful response is returned



Common issues encountered with multi-machine sites

- My site performs poorly when one or more of the machines in the site are unavailable/down.
- I want to perform updates/maintenance on individual machines without any service disruption.
- I want to control and enforce when publishing can happen on my site.
- I want my server site to still function when there are temporary disruptions to the shared site configuration.



Common issues encountered with multi-machine sites

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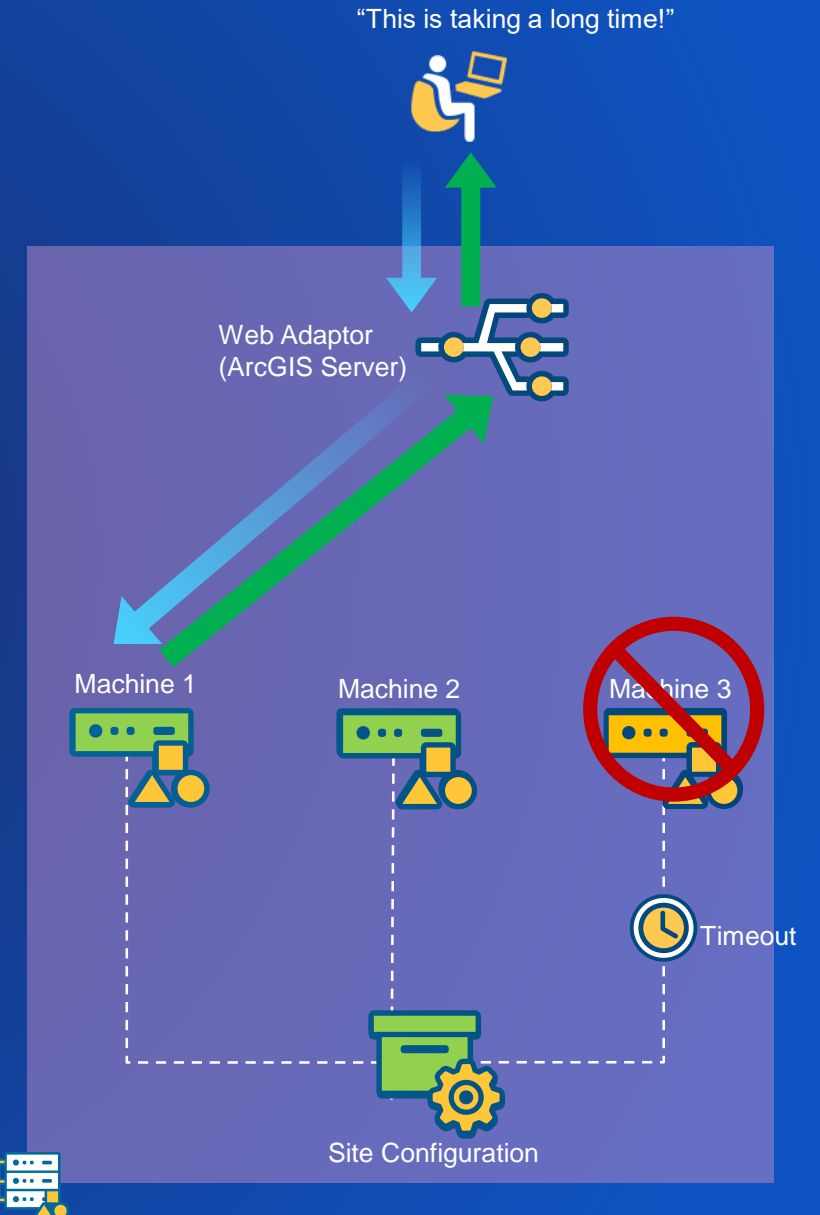
Common issues encountered with multi-machine sites

Site slow to respond to operations

For example:

- One of the machines in the site is unreachable temporarily – Machine 3
- An incoming administrative request comes to the Web Adaptor, and is routed to one of the server machines
- The server machine accepts and processes the request, writing changes to the site configuration
- The internal request to the unreachable machine eventually times out when attempting to sync.
- This makes the administrative request slow to provide a response back.
- Imagine this whenever you administer or publish.

We've added new features to help with this!

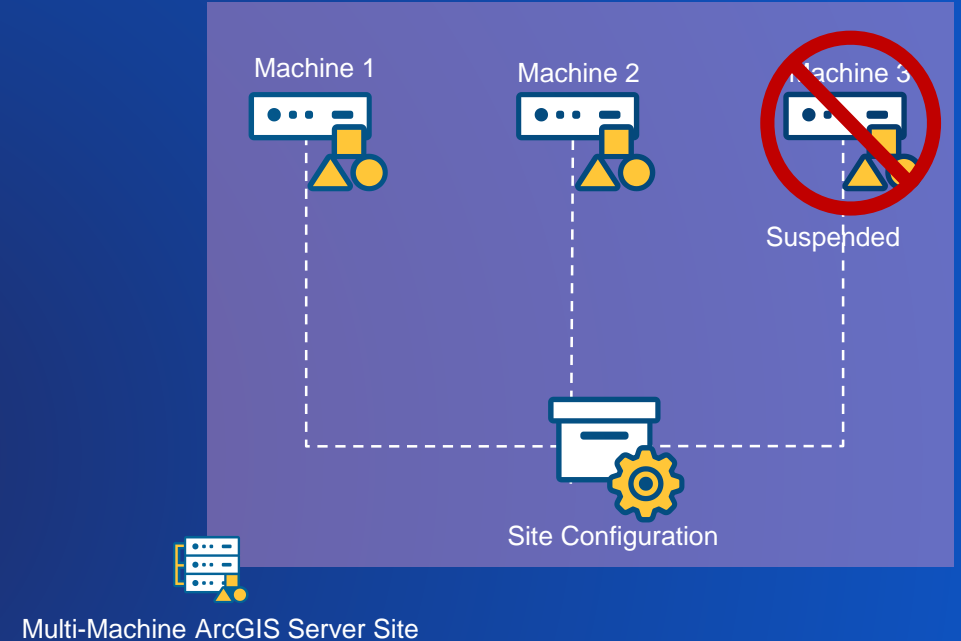


Multi-Machine ArcGIS Server Site

New Improvements to Multi-Machine Site Performance

MachineSuspendThreshold and Machine “heartbeats”

- New at 10.7!
- Each machine periodically reports its status to the site directories – a “heartbeat” health check
- When a machine doesn't report back after a set period of time, it is marked suspended – this machine is ignored for any administrative or publishing events.
 - Configurable parameter: **MachineSuspendThreshold**
 - Default: 1 hour
- Once the machine is back up and reporting its status, it is unsuspended and syncs with the rest of the site
- A suspended machine can be automatically removed from the site after a configurable amount of time
 - Configurable parameter: **suspendedMachineUnregisterThreshold**
 - Default: -1 (Disabled)



Common issues encountered with multi-machine sites

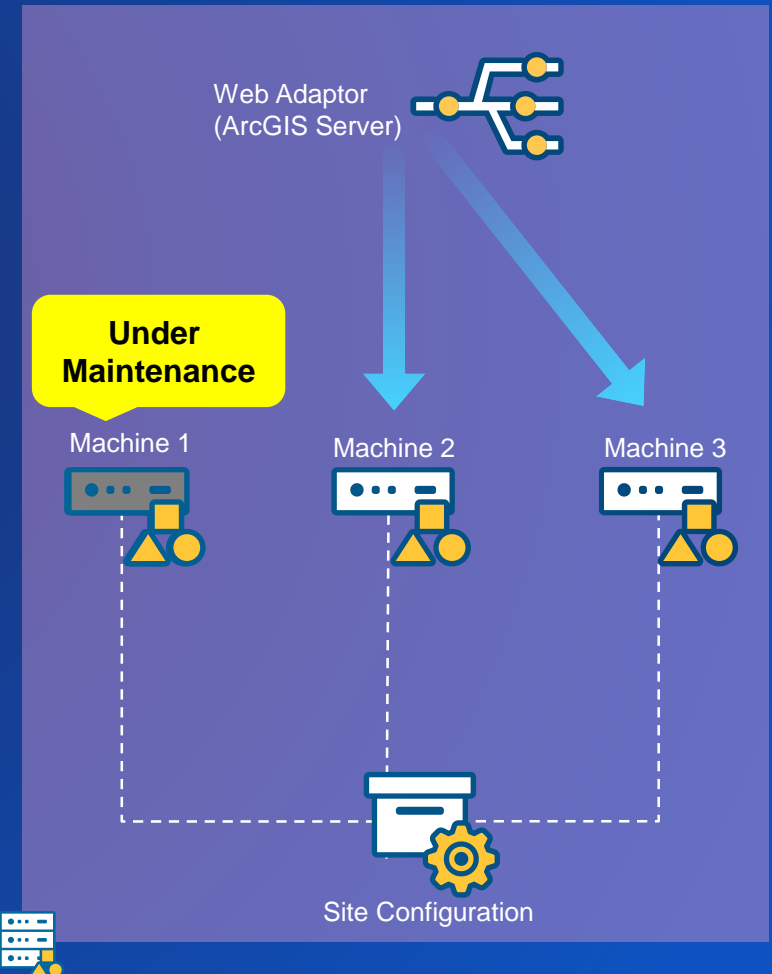
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“Under Maintenance” Mode for ArcGIS Server

- New in 10.7!
- An individual machine is configured to be “Under Maintenance”
 - Configured in ArcGIS Server Administrator Directory
 - Parameter: `underMaintenance` (‘true’)
- Causes the machine to fail any health check requests sent to it
- The Web Adaptor will not route any service requests
 - Can work with third-party load balancers/reverse proxies
- The Web Adaptor will start routing requests to the machine once `underMaintenance` is set back to ‘false’

Benefits

- Make changes without disrupting service availability
 - E.g. OS Updates, one-off machine updates



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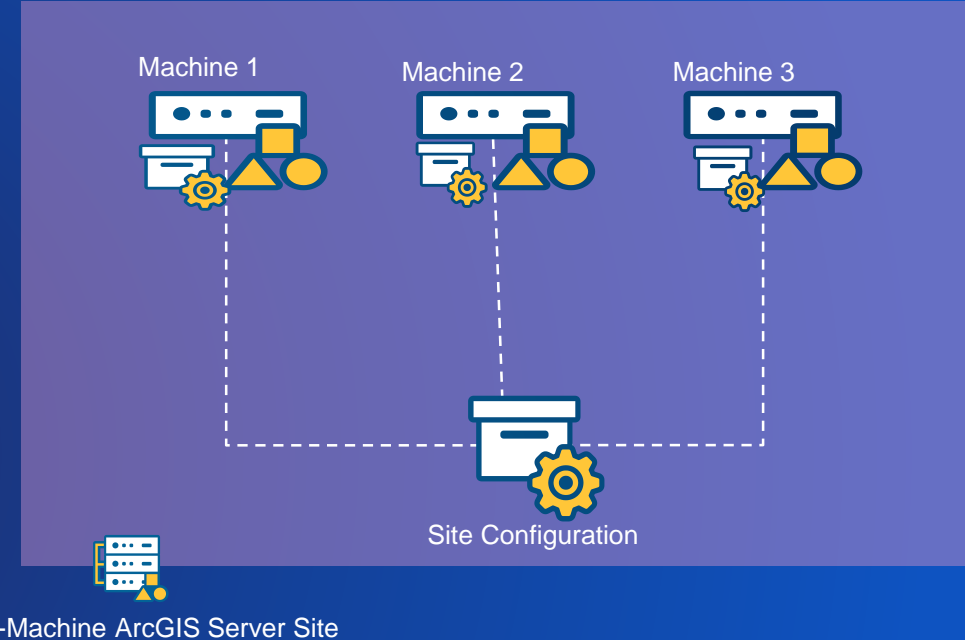
Exploring read-only mode for ArcGIS Server

How does read-only mode (ROM) work?

- Site becomes locked down – no administrator or publishing operations allowed
- Site configuration files are copied to a local repository on each machine in the site.
 - Configurable in ArcGIS Server Administrator Directory

Benefits of Read-only mode

- Enable admins to enforce publishing/administering tasks
 - E.g. Allow publishing only on certain days/times.
- Allow site to handle temporary disruptions to the site configuration.
 - E.g. A file server that contains the site configuration is unavailable temporarily. With ROM, the site is accessible, most services and operations work. Without ROM, site is dead until access is back.



Applied monitoring techniques

Usage Statistics

Request ID tracking

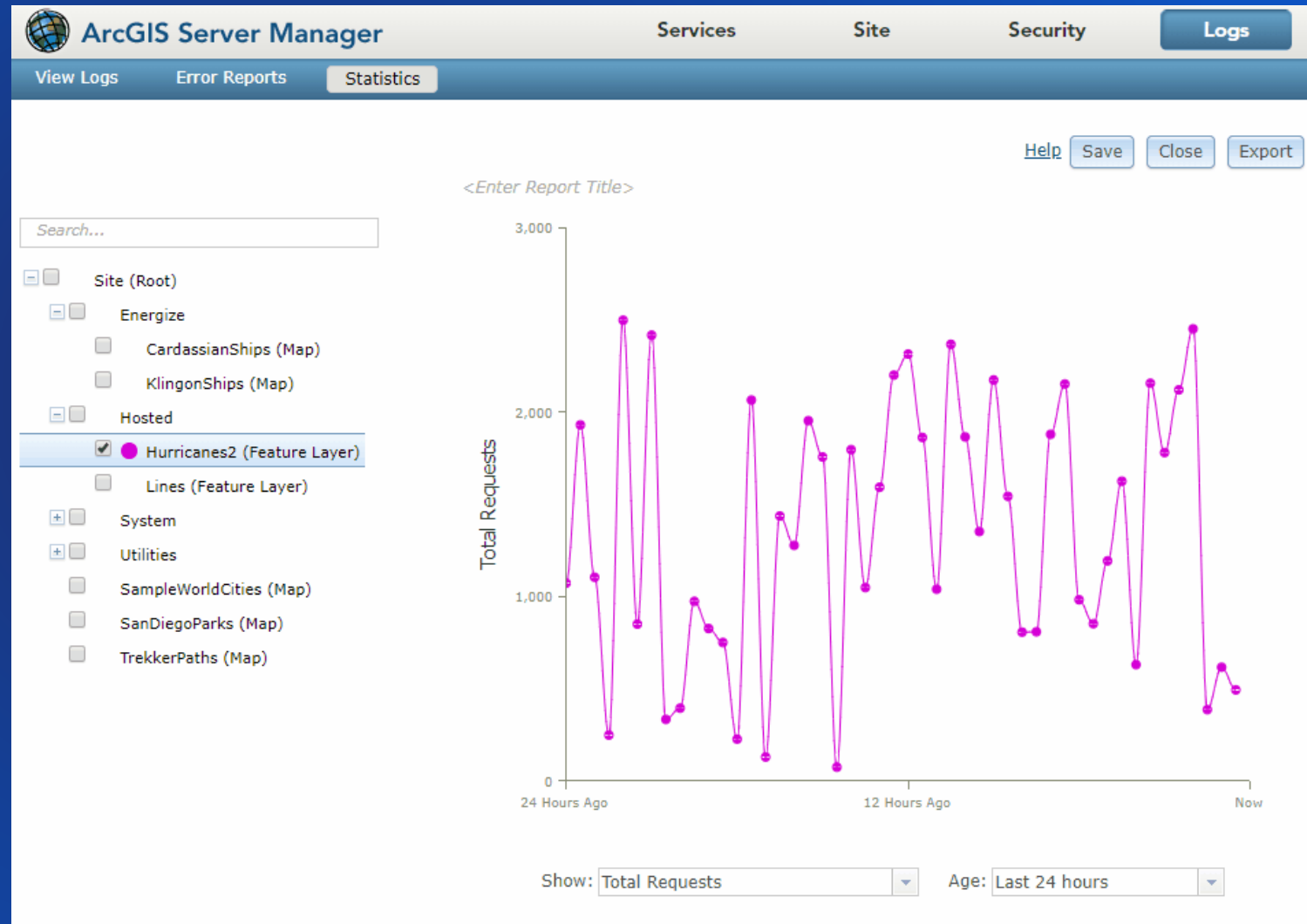
Job ID tracking

Additional quick tips for monitoring

Advanced Enterprise Workflows: Monitoring

Usage Statistics: Overview of Usage Statistics in ArcGIS Server

- Displays information such as:
 - Total number of requests
 - Avg. response times
 - Max response times
 - Timeouts
 - Count of running instances
- Helpful for:
 - Tuning service instances
 - Identifying peaks in usage
 - Performing capacity planning
 - Reports for management
- Combine statistic information with logs for effective troubleshooting



Statistics in ArcGIS Server Manager: Service, Folder, and Site-level statistics shown

Advanced Enterprise Workflows: Monitoring

Usage Statistics in the ArcGIS Server Administrator Directory

Generate report
Edit Settings

ArcGIS Server Administrator Directory
[Home](#) > [usagereports](#)

Usage Reports

Usage Reports:

- [1529690667990](#)
- [1529697995548](#)
- [1529698175094](#)
- [Max response times for the last 7 days](#)
- [Timed-out requests for the last 7 days](#)
- [Total requests for the last 7 days](#)

Resources: [settings](#)

Supported Operations: [add](#)

Supported Interfaces: [REST](#)

ArcGIS Server Administrator Directory
[Home](#) > [usagereports](#) > [Total requests for the last 7 days](#)

Usage Report - Total requests for the last 7 days

Usage Report Parameters

Name: Total requests for the last 7 days
Since: LAST_WEEK
Metrics to be reported:

Metrics	Resources
RequestCount	services/

```
{ "temp": false, "title": "Total requests for the last 7 days", "managerReport": true, "styles": { "services/": { "color": "#090009" } } }
```

Metadata:

Supported Operations: [edit](#) [delete](#) [data](#)

Supported Interfaces: [REST](#)

ArcGIS Server Administrator Directory
[Home](#) > [usagereports](#) > [Total requests for the last 7 days](#) > [data](#)

Operation - Report

Metric Filter

Filter: ☒ **Machines** ☐ { "machines" }

All
DEV0001426.ESRI.COM
dev001893.esri.com

Format:

[Generate Report](#)

ArcGIS Server Administrator Directory
[Home](#) > [usagereports](#) > [settings](#) > [edit](#)

Usage Reports Configuration

Usage Reports Configuration

Usage Reports Enabled:

Aggregate statistics every (minutes):

Keeps statistics history for (days):

Format:

[Save Edits](#)

Advanced Enterprise Workflows: Monitoring

Create your own Multi-Metric Reports

- Not available in ArcGIS Server Manager

ArcGIS Server Administrator Directory

[Home](#) > [usagereports](#)

Usage Reports

Usage Reports:

- [1529690667990](#)
- [1529697995548](#)
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ArcGIS Server Administrator Directory

[Home](#) > [usagereports](#) > [add](#)

Create Usage Report

Usage Report Properties

Usage Report (in JSON format):*

```
{  "reportname": "Total requests for the last 7 days",  "since": "LAST_WEEK",  "queries": [{    "resourceURIs": ["services/"],    "metrics": ["RequestCount", "RequestMaxResponseTime"]  }],  "metadata": {    "managerReport": false  }}
```

Format:

Create

Advanced Enterprise Workflows: Monitoring

Request IDs

- New Request ID field in ArcGIS Server logs
 - Tagged with all log messages for REST and SOAP requests
- Track a specific request through its pipeline within the server
- Ability to query using Request ID
- Currently only available for service requests

Change the level of detail that the log messages are generated at by clicking Settings.

Log Filter: Age: Source: Machine:

Message	Source	Request ID
Extent:-188.543922,-20.785769,-56.640954,111.117198; Size:400,400; Scale:138584921.96	map_egdb_shared11.MapServer	0f3ff92b-68ca-478e-bd28-c276ec1333ec
Begin ExportMapImage	map_egdb_shared11.MapServer	0f3ff92b-68ca-478e-bd28-c276ec1333ec
REST request received. Request size is 120 characters.	map_egdb_shared11.MapServer	0f3ff92b-68ca-478e-bd28-c276ec1333ec
Wait time for 'map_egdb_shared11.MapServer' service request is 0 milliseconds.	Server	0f3ff92b-68ca-478e-bd28-c276ec1333ec
Request user: Anonymous user, Service: map_egdb_shared11/MapServer	Rest	0f3ff92b-68ca-478e-bd28-c276ec1333ec
HTTP Referer: Not Available	Server	0f3ff92b-68ca-478e-bd28-c276ec1333ec
REST request successfully processed. Response size is 377 characters.	Map_File_Shared_Pro11.MapServer	3181ef25-67ef-4931-9792-f3a936c2dc4c

ArcGIS Server Administrator Directory

[Home](#) > [logs](#) > [query](#)

Query Logs

Log Filter

Start Time:

End Time:

Level:

Filter:

☒ Log Codes

Process IDs

Request IDs

Component

All

Service

All

Machines

All

```
{
  "codes": [],
  "processIds": [],
  "requestIds": ["60af6c96-8bff-4f94-ac7e-f29700e2e961"],
  "server": "*",
  "services": "*",
  "machines": "*"
}
```

Messages

1000

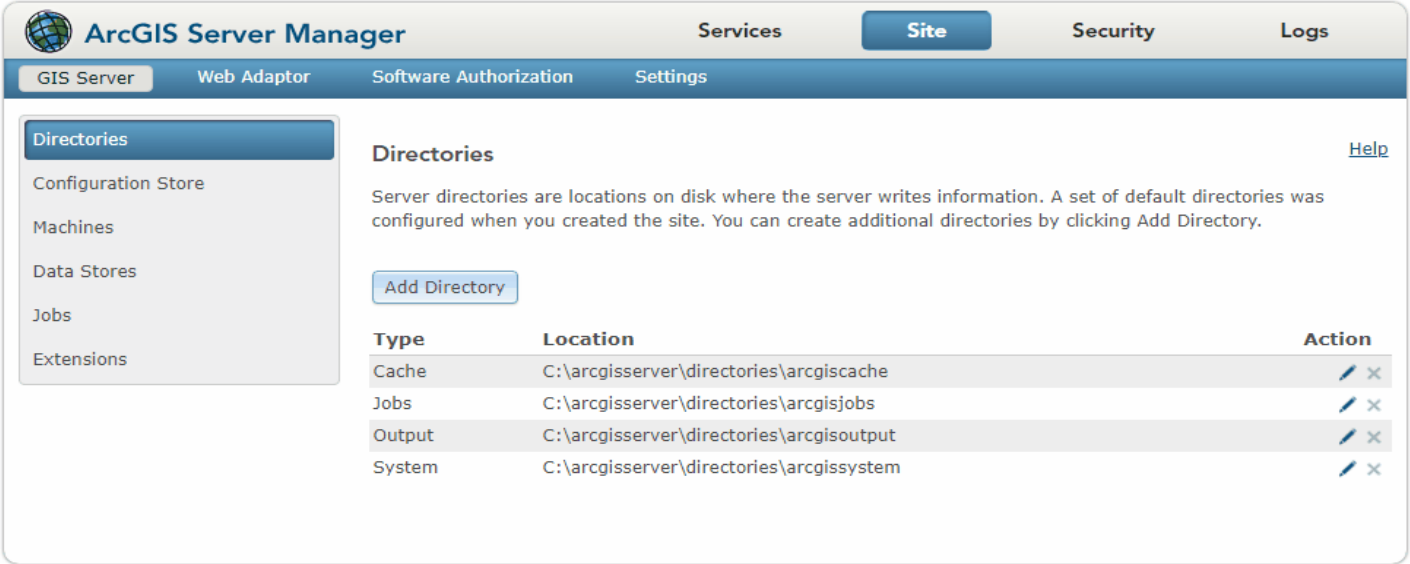
Per Page:

Format:

Advanced Enterprise Workflows: Monitoring

Job IDs – View and update status of Geoprocessing Jobs

- View and update status of jobs for Asynchronous GP services.
- Filter by service, job status, duration, user, machine
- Get details for individual jobs
- Cancel and Delete jobs



The screenshot displays the ArcGIS Server Manager web interface. The top navigation bar includes links for [esri.com](#), [ArcGIS Enterprise](#), [Sign Out](#), and [Help](#). Below this, a secondary navigation bar contains tabs for **Services**, **Site** (selected), **Security**, and **Logs**. A third navigation bar lists **GIS Server** (selected), **Web Adaptor**, **Software Authorization**, and **Settings**. On the left, a sidebar menu shows **Directories** (selected), **Configuration Store**, **Machines**, **Data Stores**, **Jobs**, and **Extensions**. The main content area is titled **Directories** and includes a [Help](#) link. It contains a descriptive paragraph about server directories and an **Add Directory** button. Below this is a table with three columns: **Type**, **Location**, and **Action**.

Type	Location	Action
Cache	C:\arcgisserver\directories\arcgiscache	/ x
Jobs	C:\arcgisserver\directories\arcgisjobs	/ x
Output	C:\arcgisserver\directories\arcgisoutput	/ x
System	C:\arcgisserver\directories\arcgissystem	/ x

Advanced Enterprise Workflows: Monitoring

- View and update status of geoprocessing jobs.
 - View and update status of GP jobs

ArcGIS Server Administrator Directory

[Home](#) > [services](#) > [GenericGPService1.GPService](#) > [jobs](#)

Jobs

Resources: [statistics](#)

Supported Operations: [query](#) [purgeQueue](#)

Supported Interfaces: [REST](#)

ArcGIS Server Administrator Directory

[Home](#) > [services](#) > [GenericGPService1.GPService](#) > [jobs](#) > [query](#)

Query Jobs

Jobs Filter

Start Time:

End Time:

Status:

NEW
SUBMITTED
EXECUTING
SUCCEEDED
FAILED
CANCELLING
CANCELLED
WAITING

User:

Machine Name:

Jobs Per Page:

Format: HTML ▼

Advanced Enterprise Workflows: Monitoring

Viewing/Updating the Status of Jobs for GeoProcessing Services

- Example of UI in ArcGIS Server Administrator Directory

1. Query Jobs

ArcGIS Server Administrator Directory

Home > services > SampleGeoProcessingService.GPServer > jobs > query

Query Jobs

Jobs Filter:

Start Time:

End Time:

Status:

NEW
SUBMITTED
EXECUTING
SUCCEEDED
FAILED
CANCELLING
CANCELLED
WAITING

User:

Machine Name:

Jobs Per Page:

Format:

Query

2. Select Job ID

ArcGIS Server Administrator Directory

Home > services > SampleGeoProcessingService.GPServer > jobs > j0c3993f75e7c4a67beb81186458045ad

Query Jobs

Jobs Filter:

Start Time:

End Time:

Status:

NEW
SUBMITTED
EXECUTING
SUCCEEDED
FAILED
CANCELLING
CANCELLED
WAITING

User:

Machine Name:

Jobs Per Page:

Format:

Query

Total Jobs : 52

- [j0c7a88e9b3e1464ab8818b82f04630fe](#) (status : esriJobFailed)
- [j0c3993f75e7c4a67beb81186458045ad](#) (status : esriJobSucceeded)
- [j737c5368102c454e9a33ab6dda2752d6](#) (status : esriJobSubmitted)
- [jbcab66c1015d4cfaae5d5abf7594fffd](#) (status : esriJobSubmitted)
- [je87c795fb3f949c6a7741efbd55e11b2](#) (status : esriJobSubmitted)

3. View Job Details and/or Perform supported operation

ArcGIS Server Administrator Directory

Home > services > SampleGeoProcessingService.GPServer > jobs > j0c3993f75e7c4a67beb81186458045ad

Job

Job Details

Job Id: [j0c3993f75e7c4a67beb81186458045ad](#)

Submitted Time: 2018-06-25T15:30:02

End Time: 2018-06-25T15:30:49

Status: esriJobSucceeded

Username: [dev001893.esri.com](#)

Machinename: [dev001893.esri.com](#)

url: [url](#)

Supported Operations: [cancel](#) [delete](#)

Supported Interfaces: [REST](#)

Advanced Enterprise Workflows: Monitoring

Additional Quick Tips for Monitoring your ArcGIS Enterprise

- Wait time information for ArcGIS Server-based GIS services
 - Viewable at FINE level in ArcGIS Server logs

FINE	Feb 4, 2019, 9:56:56 PM	Wait time for 'SampleWorldCities.MapServer' service request is 3 milliseconds.	Server
------	-------------------------	--	--------

- Disk space monitoring for ArcGIS Server, Portal for ArcGIS, ArcGIS Data Store
 - Periodic WARNING messages in logs when an intermediate threshold is reached
 - Periodic SEVERE messages in logs when a critical threshold is reached
- Roll over of internal logs (ArcGIS Server, Portal for ArcGIS)
 - service.log
 - service_error.log
- INFO-level information about locks acquisition/release in ArcGIS Server logs
- Hardware information for ArcGIS Server available through REST API

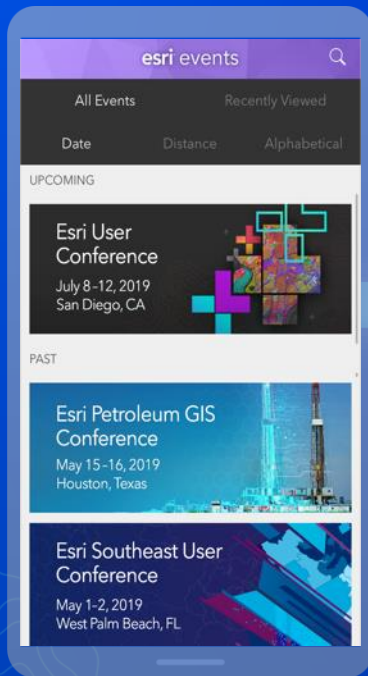
Resources

- Official Documentation: <https://enterprise.arcgis.com>
 - Helpful Sections:
 - Expand from one ArcGIS Server machine to multiple machines
 - Configure service instance settings
 - Administer a Federated Server
 - Work with server statistics
 - Work with server logs
 - “Common administrative tasks” section links
- Technical Support: <https://support.esri.com>
- Esri Showcase – ArcGIS Enterprise Area

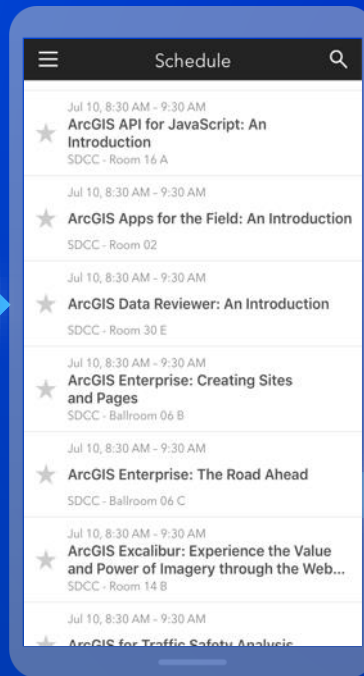


Please Share Your Feedback in the App

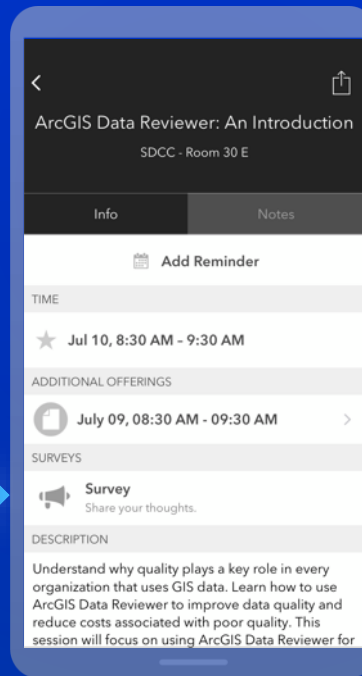
Download the Esri Events app and find your event



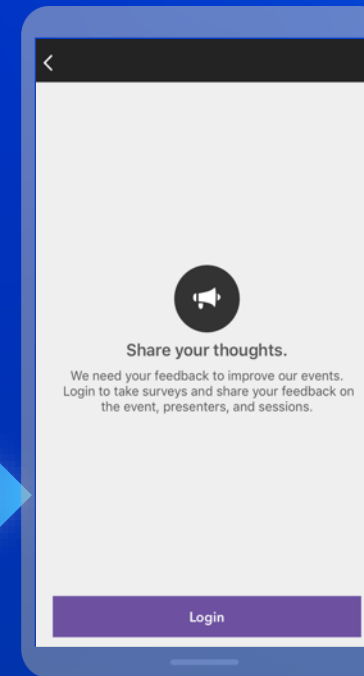
Select the session you attended



Scroll down to "Survey"



Log in to access the survey



Complete the survey and select "Submit"

