ESRI
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ArcGIS Image Dedicated User Manual

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Contents

What is ArcGIS Image Dedicated?

ArcGIS Image Dedicated is a managed software as a service (SaaS) for imagery available for organizations mandated to store and manage imagery in their own cloud accounts or from public datastores. With ArcGIS Image Dedicated, you can do the following:

- Publish tiled imagery for fast access to cloud raster format (CRF), tile cache, raster tiles, vector tiles or scene layers
- Publish dynamic imagery, providing server-side dynamic mosaicking and on the fly processing
- Run processing and analysis services to convert data or extract information from imagery
- Run Pro Machines, enabling virtual desktops that run ArcGIS Pro

ArcGIS Image Dedicated supports imagery stored in the following cloud computing platforms:

- Amazon Web Services (AWS)
- Microsoft Azure

Setup

Registration

An ArcGIS organization in ArcGIS Online is required to use ArcGIS Image Dedicated. To register the organization, open the ArcGIS Image Dedicated site. Note that administrator privilege is required to register the organization. If you are logging in for the first time, you will be redirected to the user registration page—the point of contact and email information will be auto populated with reference to your ArcGIS Online organizational account information.

You are prompted to give ArcGIS Image Dedicated permission to create an admin access item in your ArcGIS Online account. This item will be used to administer privileges to your organization's ArcGIS Image Dedicated subscriptions. The ArcGIS Image Dedicated Admin item will be available as an application within the list of items on the Content tab of ArcGIS Online. The image below depicts the same.

Once registered, the administrator can share access of the admin item to other members in the organization. These members are now administrators to all the ArcGIS Image Dedicated services.

Note: Access to admin item should be reserved and assigned only to those organization members who need full administrator access. Create other items to grant access to finer grained services.

Cloud Storage and Data Access

With ArcGIS Image Dedicated, you can leverage raster analysis and stream directly from your imagery housed in cloud storage accounts. Currently, AWS S3 buckets and Microsoft Azure containers are supported as cloud repositories for imagery and raster data. The imagery and rasters can either be used

directly as datasets to publish image services or they can be added to a mosaic dataset, which can also be used to publish dynamic image services and as the source for analysis.

If your imagery data does not currently reside in cloud storage, depending on your cloud storage service, you can transfer a copy of your local data to the cloud. To do this, you can use the Transfer Files data management geoprocessing tool in ArcGIS to transfer files to and from cloud storage using an ArcGIS Cloud Storage (ACS) file. There are also many alternatives for transferring data to the cloud, including third party tools and tools like optimize rasters that are available to transfer data to cloud storage. For very large volumes of data, we recommend services supplied by the cloud providers, such as Amazon Snowball.

Data Access

Rasters in cloud storage can be accessed using two methods:

- Using an ACS connection to access data
- Using raster proxies to access data

With ACS connection files in ArcGIS, you can create a connection to cloud storage to access the desired data hosted in cloud storage with the Create Cloud Storage Connection File geoprocessing tool. When you create the connection, you will enter security credentials to store in the encrypted ACS file. You can then connect to the cloud storage via the catalog pane in ArcGIS Pro in a way that looks very similar to a local file system, browsing and selecting files to add. You can use multiple cloud security profiles to access various imagery collections, all from one machine.

When you use ACS files, existing ArcGIS Image Dedicated Service Management geoprocessing tools read raster datasets, such as cloud raster format (CRF), stored in the cloud as input. To speed up repeated access to the rasters, you can create local raster caches by enabling the pixel cache option on the Add Rasters dialog when authoring mosaic datasets. If caching is enabled, the server does not have to check the cloud storage for subsequent requests to the same pixels, which ensures faster pixel requests.

You can also use raster proxies to access data in cloud storage. Raster proxies are small XML files that contain information about the raster file in cloud storage. ArcGIS treats raster proxies as virtual rasters, later accesses the actual data from the cloud as needed. Raster proxies can reference most of the GDAL-readable formats and can have any file extension. They can be referenced—or embedded in a mosaic dataset—or used directly in ArcGIS. When accessed, previously read pixels and the tile index are cached locally, which ensures faster pixel requests.

Set up Tiled Imagery

As part of the tiled imagery subscription, you can use dedicated servers to serve tiled imagery services. To add a new server, you need to complete a new server request form, which is available from the home page of the ArcGIS Image Dedicated website. You can access this form by selecting the Tiled Imagery tile and selecting + New Server. From here, you will be prompted to fill out the details that are needed to add a new server, such as the cloud provider for your stored imagery and the cloud region where you would like the server to be deployed in, which should be the same region as the cloud storage. Once you submit your form, the server will be created with the specifications you provided on the Active Servers list.

Set up Dynamic Imagery

As part of the dynamic imagery subscription, you can use dedicated servers to serve dynamic image services. To add a new server, you need to complete a new server request form, which is available from the home page of the ArcGIS Image Dedicated website. You can access this form by selecting the Dynamic Imagery tile and by selecting + New Server. From here, you will be prompted to fill out the details that are needed to add a new server, such as the cloud provider for your stored imagery and the cloud region where you would like the server to be deployed in, which should be the same region as the cloud storage. Once you submit your form, the server will be created with the specifications you provided on the Active Servers list.

Upgrade Dynamic or Tiled Imagery

As part of the dynamic or tiled imagery subscription, you can now request an upgrade of your existing server to the latest version. To do so, you need to complete the Server Upgrade Request form. To access this form, click on the sever alias of the server you wish to upgrade. Click the Upgrade Server' tab. In the form, provide the Server Alias, DNS prefix for the new server, and the Imagery Server Version (the version you wish to upgrade) and submit. The server upgrade request will be processed, and the server will be upgraded. The details of the new server will then be shared with you via email. The new Imagery Server will remain active for a trial period of seven days, during which you can verify the services. You will have seven days to test the server and provide a confirmation via reply email for the DNS swap to take place or to hold the swap due to an identified issue. Failure to respond within the trial period will result in the DNS swap taking place. Subsequent to the DNS swap, the old server will be deleted.

Enable Processing and Analysis

As part of the processing and analysis subscription, you can enable tasks that allow you to process new imagery to create new representations of the data or perform analysis to extract information from imagery. Such tasks include format conversion, automated creation of mosaic datasets, classification, and deep learning.

Control Access to Cloud Storage

ArcGIS Image Dedicated allows you to create image services on Esri-managed infrastructure, with the data stored in cloud storage. To ensure Image Dedicated servers access to read or write your data, permission needs to be set in the cloud storage infrastructure. Currently, ArcGIS Image Dedicated only supports AWS and Azure.

Grant Secure Access to Data in AWS

If your data is housed in the AWS cloud infrastructure, you need to set up an Amazon Resource Name (ARN) to grant secured access to your data. To do this, you can use Python scripting or AWS CloudFormation templates. The Python scripts and CloudFormation templates are available by downloading the Create Storage Account zipped folder, which is located under the Downloads tile on the ArcGIS Image Dedicated website. By using the script, this will allow you to create the secret ARN granting appropriate access. Typically, three different ARNs are created to your S3 buckets for reading imagery, writing output from analysis, and storage of ArcGIS server logs. The settings only grant permission to an Esri-owned AWS account. You have full control when to turn off access or change permissions.

The Python script automates the process by creating a secret in AWS Secrets Manager for the given Identity and Access Management (IAM) user keys. It then encrypts them using Amazon's Key Management Service (KMS) and adds the policy to the resource to allow the Esri account to access the key. An ARN will be generated and will be shared only with the machines allowed to perform the processing. The ArcGIS Image Dedicated servers can retrieve the key with the generated ARN.

Note: To use the Python script, you will need Python 3 with boto3 installed and AWS CLI configured with keys.

Alternatively, you can upload the CloudFormation template to AWS Console to create a secret ARN. A CloudFormation template is used in AWS to quickly allocate services in a templatized format. The templates must be run in the same region as the ArcGIS Image Dedicated server. If you know which S3 buckets you would like to provide access to, you can use the aid-iam-ssm.template. This template will create an IAM user and allow access to the specified bucket and store the keys in AWS secret manager encrypted by KMS. If you only want to create the secret manager and KMS, you can use the aid-ssm.template, which stores the keys provided in the AWS secret manager encrypted by KMS.

After you've successfully implemented the ARN with either the script or the CloudFormation template, the "Secret ID" will contain the ARN of the shared secret, which can then be used to create the data storage accounts using ArcGIS Image Dedicated.

Grant Secure Access to Data in Azure

If your data is housed in the Azure cloud infrastructure, you need to be able to grant secured access to your data. In Azure, there are two ways to create storage accounts—access keys and shared access signature (SAS) tokens.

Access keys are used to authorize access to data in a storage account through a Shared Key authorization. If you create a data storage account by using access keys, it will give full permission to ArcGIS Image Dedicated servers, including, but not limited to, creating, reading, updating, and deleting operations on files, queues, blobs, and tables.

Alternatively, an SAS is a URL that grants restricted access rights to Azure storage resources. By distributing an SAS URL to these clients, you grant access to a resource for a specified period. To restrict

granted access, you can generate an account level SAS token; the permissions can be customized according to the client.

After you've successfully submitted a data storage account request, the Azure storage account key or SAS is encrypted using Advanced Encryption Standard 256, which can then be used by ArcGIS Image Dedicated.

Concepts

ArcGIS Image Dedicated Website Overview

You can register your ArcGIS Online organization in the ArcGIS Image Dedicated website to use ArcGIS Image Dedicated. ArcGIS Online identities are used to sign in and access the ArcGIS Image Dedicated website. To create or modify services, you will need to have an ArcGIS Online account with a Creator user type license.

Registration must be completed to login to the website. Register before you log in. Upon registering, the organization administrators can perform management tasks, such as creating, updating, and deleting dynamic imagery, tiled imagery, and data storage accounts and Pro Machines. Administrators can download the usage reports, which helps them to better understand the resource consumption and costs. If users are assigned appropriate privileges to access defined items in their ArcGIS Online account, they can manage image services, perform processing and analysis tasks, create Pro Machines, and view the properties of the servers created in their organization. All users can download the geoprocessing tools and documentation.

What is an Image Service?

Image services provide a way to share raster and imagery data using configurable web services. With tiled imagery services, you can serve pre-processed imagery where the rendering and further processing is performed on the client. With dynamic image services, you can share imagery collections and perform server-side dynamic mosaicking and on the fly processing.

ArcGIS Image Dedicated has a set of custom geoprocessing tools that let you publish and manage image services from imagery and raster data stored in cloud storage.

Set Up

The creation and management of image services can be performed from a web connected machine with ArcGIS Pro 2.8 or higher. These machines can either be local or a Pro Machine set up within ArcGIS Image Dedicated.

When using a local machine, MDTools must be downloaded and installed from the MDCS Github repo before you can publish image services. MDTools is a command line tool that simplifies common management tasks when working with rasters in a mosaic dataset.

You also need to download the custom ArcGIS Image Dedicated Service Management geoprocessing toolbox. The zipped folder that contains the toolbox can be found in the Downloads tile on the ArcGIS Image Dedicated website.

Service Management Toolbox

The Service Management toolbox contains tools to create and manage image services.

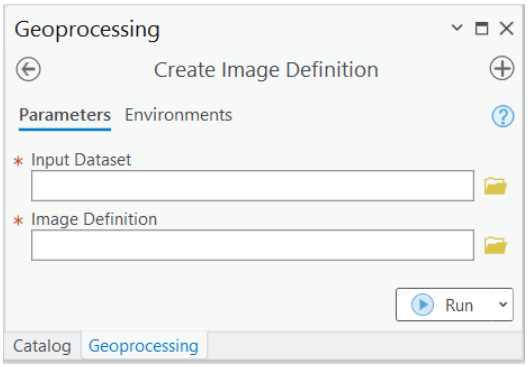
Tool	Description
Create Image Definition	This tool creates an image definition file used to manage dynamic or tile services.
Manage Dynamic Services	This tool creates and manages dynamic image services.
Manage Tile Services	This tool creates and manages tile image services.
Get Job Status	This tool lets you receive and review the status of jobs submitted by various tools.
Set System Service Settings	This tools helps in configuring the instance settings of Raster Rendering Service and Tile Services Shared Instance Pool.

Create Image Definition Tool

Overview

The Create Image Definition geoprocessing tool aggregates and zips all the relevant data needed to create an image service into a .zmd extension file, otherwise known as the image definition file. The file is saved locally on your computer and is used to publish dynamic and tiled image services.

This tool is the first tool used in the publishing workflow. This tool needs to be run whenever a compilation is ready for publishing or has been changed and an update needs to be published.



Parameters

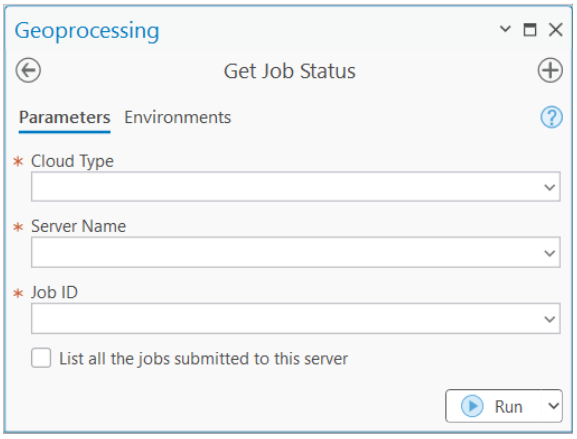
Label	Explanation	Data Type
Input Dataset	The source path of a raster dataset, mosaic dataset, tile cache, raster tiles, vector tiles or scene layer. The following are source path requirements: • **Raster Dataset**—The source path to the raster dataset should be a cloud path. • **Mosaic Dataset**—The source paths to the rasters added in the mosaic dataset should be cloud paths. If the mosaic dataset is made from raster proxies, the raster paths should be embedded. • **Tile Cache**—The source path to the tile cache should be a cloud path. The tile cache folder name must be in either of the formats "servicename" or "foldername_servicename." The "servicename"	String

	represents the tile service name and the "foldername" represents the server folder name. For example, if the tile cache name is "cities," it will be published as a service called cities in the root folder and the tile cache "world_cities" will be published as a service with the name "cities" in the folder with the name "world". If the tile cache is generated from an elevation dataset using the Elevation tiling scheme, which is a requirement for publishing it as a tile service and using it as an elevation layer in ArcGIS, it should be named in the format 'servicename_ImageServer'. This ensures that the tile cache folder name (excluding '_ImageServer') is published as the tile service name in the root folder. To specify a subfolder, the tile cache must be copied to a folder, the name of which will be utilized as the folder name. This should follow the format: '/arcgiscache/foldername/servicename_ImageServer'. • **Scene Layer, Raster Tiles, Vector Tiles**—The source path to these datasets should be a cloud path.	
Image Definition	The folder location and the name of the image definition being created. When storing the image definition in a folder, do not add a file extension to the name of the image definition because it will be added automatically.	String

Job Status

Overview

The Get Job Status geoprocessing tool allows you to review the status of jobs submitted by various tools. Each time you submit a job, a unique Job ID is returned. This is used as input to the Get Job Status tool.



Parameters

Label	Explanation	Data Type
Cloud Type	The cloud type where the server is deployed.	String
Server Name	The server alias where the job was created.	String
Job ID	The Job ID of which the status is to be determined.	String
List all the jobs submitted to this server	Lists all the jobs submitted by other users within your organization on this server.	String

Dynamic Imagery

Overview

Dynamic imagery services can be used to publish rasters directly from cloud storage or from image definitions that contain mosaic datasets built from rasters. You can also publish tile cache, cloud raster format, raster tiles, vector tiles and scene layers as tile services if you have the dynamic imagery subscription.

To enable users to publish rasters—either directly as cloud storage or as an image service—ArcGIS Image Dedicated provides dedicated imagery servers that are managed by Esri and deployed in the same cloud and region as your cloud storage of interest. With a dynamic imagery subscription, you can publish both dynamic and tiled imagery services.

Manage Dynamic Imagery

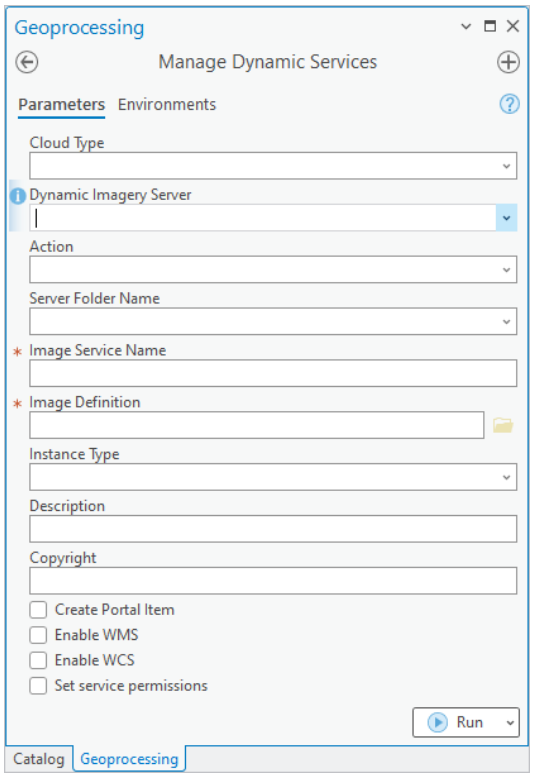
Overview

You can manage dynamic imagery using the Manage Dynamic Services geoprocessing tool, which is a part of the ArcGIS Image Dedicated Service Management geoprocessing toolbox.

Using this tool , you can:

- Create, update, delete, or start/stop a dynamic image service.
- Set or revoke service permissions if you are the data creator.

The input for dynamic imagery services are image definition files the embed mosaic datasets or reference raster datasets.



Parameters

Label	Explanation	Data Type
Cloud Type	The cloud type where the dynamic imagery server is deployed.	String
Dynamic Imagery Server	The server alias where the image service is to be created or modified.	String
Action	The action that you would like to perform to manage the dynamic image service. The following actions are available: • **Create Service**—Creates an image service on the selected server. • **Update Service**—Updates an image service on the selected server. • **Delete Service**—Deletes an image service from the selected server. • **Start/Stop Service**—Starts or stops an image service on the selected server. • **Set Service Permission**—Sets or revokes service permissions of an image service on the selected server.	String
Server Folder Name (Optional)	The name of the folder to be used by the dynamic image service. The following actions are available: • **Create Service**—Select an existing folder or enter a new folder name to create a folder. • **Update Service/Delete Service/Start Service/Stop Service/Set Service Permission**—Select the folder name in which the service is present.	String
Image Service Name	The entered name for the image service.	String
Image Definition	The image definition file (.zmd) created by the "Create Image Definition" tool. e.g., C:\Projects\imagedefinitions\sample.zmd Image definitions of size greater than 2 GB can be uploaded to an Amazon S3 bucket or Azure container. The cloud paths to these files are to be entered manually. The cloud storage used to store the image definition can be public or secured. If the storage is secured, make sure that server has read access to it. The following are the different cloud storage paths which are supported: • Cloud storage connection • S3 URI • VSI file handler (/vsis3)	String
Instance Type (Optional)	The instance type that will be used for the image service. Requests made to a service are handled by processes running on the server. Each process uses server memory to run, so it is important to limit the total number of processes. The following actions are available:	String

Label	Explanation	Data Type
	• **Shared instances**—Conserves memory usage by using a pool of processes shared by multiple services. The disadvantage of this approach is that the first request to a service may take a few more seconds to start up. Using a shared instance is recommended for larger numbers of services that each receive infrequent requests. • **Dedicated instances**—Uses a reserved pool of processes specific to the service. This uses more memory but is ideal for services that receive constant or compute-intensive requests.	
Minimum Instances	Specifies minimum number of dedicated instances that can run for the service at any given time, even when the service is not being used.	String
Maximum Instances	Specifies maximum number of dedicated instances that can run for the service at any given time, even when the service is not being used.	String
Description (Optional)	An entered description of the image service to be created or updated.	String
Copyright (Optional)	Copyright text for the image service to be created or updated.	String
Users to give or revoke permission (Optional)	Lists the users and their permission details. The following actions are available: • **User**—Specifies the username for which permissions will be applied. • **Permission detail**—Specifies whether permission is enabled or disabled.	String
Change service status (Optional)	Shows the status of the selected service. Change the value to update the status of the service. The following actions are available: • **STARTED**—The service is started. • **STOPPED**—The service is stopped.	String
Create Portal Item (Optional)	Creates a portal item for the created image service URL. If selected, a portal item will be created, and the service will be referenced using this item. If left unchecked, only the service endpoint will be created. You can register the service end point to ArcGIS Online or ArcGIS Enterprise portals.	Boolean
Enable WMS (Optional)	Enables WMS capabilities.	Boolean
Enable WCS (Optional)	Enables WCS capabilities.	Boolean
Set service permissions (Optional)	Set permissions required to access the image service. If permissions aren't set, the service will be accessible by any user with the service URL.	Boolean

Note: If the Manage Dynamic Services tool is not listing any servers or updating the server list despite having server access, delete the JSON file created with your username in the di_profiles and ti_profiles folders in the toolbox location. Once you re-run the tool, the issue should be resolved.

Tiled Imagery

Overview

Tiled imagery services can be used to publish tile cache, cloud raster format, raster tiles, vector tiles and scene layer as services directly from cloud storage. Datasets hosted in cloud storage can be accessed to create and update tile services.

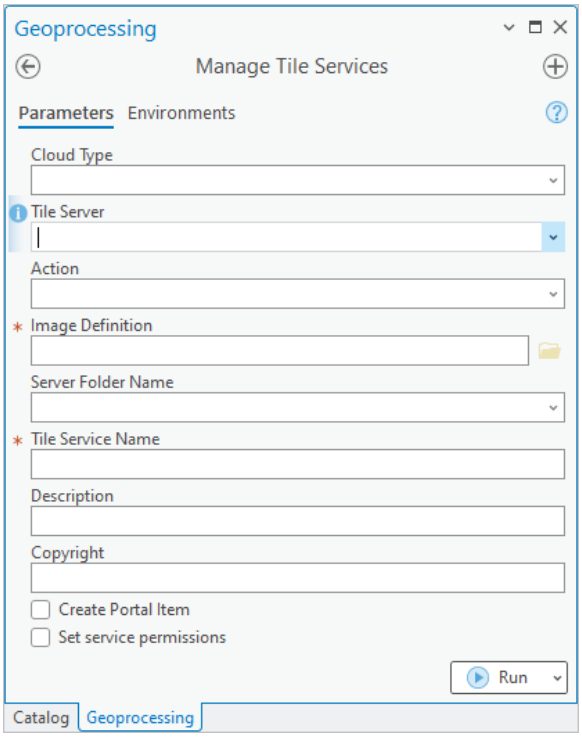
To enable users to publish datasets stored in cloud storage, ArcGIS Image Dedicated provides dedicated tiled imagery servers to organizations with a tiled imagery subscription. These servers are managed by Esri and can be deployed in the same cloud and region as your cloud storage of interest. The tiled imagery server enables you to publish tile caches, raster tiles, CRF datasets as tile services, scene layers as scene services, and vector tiles as vector tile services.

Note: Tiled imagery servers cannot serve dynamic imagery services.

Manage Tiled Imagery

Summary

You can manage tiled imagery using the Manage Tile Services geoprocessing tool, which is a part of the ArcGIS Image Dedicated Service Management geoprocessing toolbox. With this tool, you can create, update, delete, or start/stop a tiled image service. You can also set or revoke service permissions if you are the data creator.



Parameters

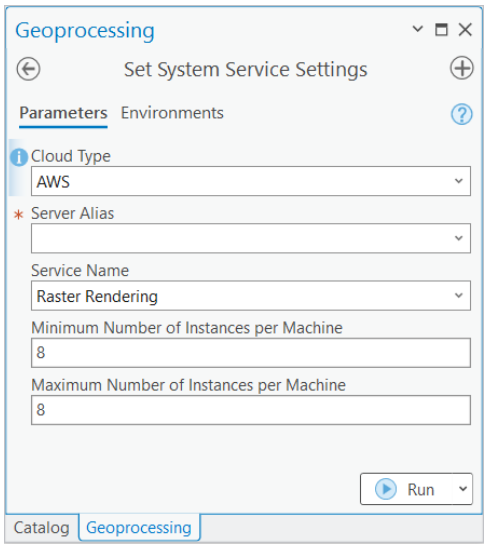
Label	Explanation	Data Type
Cloud Type	The cloud type where the tile server is deployed.	String
Tile Server	The server alias where the tile service is to be created or modified.	String
Action	The action you would like to perform to manage the tile service. The following actions are available: • **Create Service**—Creates a tile service on the selected server. • **Update Service**—Updates a tile service on the selected server. • **Delete Service**—Deletes a tile service from the selected server. • **Start/Stop Service**—Starts or stops a tile service on the selected server. • **Set Service Permission**—Sets or revokes service permissions of a tile service on the selected server. • **Clear REST Cache**–Clears the REST cache.	String
Image Definition	The created image definition file (.zmd) created by the "Create Image Definition" tool. (e.g., C:\Projects\imagedefinitions\sample.zmd)	String
Server Folder Name (Optional)	The server folder name where the tile service will be placed. The following actions are available: • **Create Service**—Select an existing folder or enter a new folder name to create a folder. • **Update Service/Delete Service/Start Service/Stop Service/Set Service Permission/Clear REST Cache**—Select the folder name where the service is located. When creating a service with tile cache, the server folder name gets populated automatically using the provided image definition.	String
Tile Service Name	The name of the tile service or scene layer. If using tile cache, the tile service name populates automatically using the provided image definition.	String
Instance Type (Optional)	The instance type that will be used for the tiled image service (CRF as input dataset). Requests made to a service are handled by processes running on the server. Each process uses server memory to run, so it is important to limit the total number of processes. The following actions are available: • **Shared instances**—Conserves memory usage by using a pool of processes shared by multiple services. The disadvantage of this approach is that the first request to a service may take a few more seconds to start up. Using a shared instance is recommended for larger numbers of services that each receive infrequent requests. • **Dedicated instances**—Uses a reserved pool of processes specific to the service. This uses more memory but is ideal for services that receive constant or compute-intensive requests.	String
Minimum Instances	Specifies minimum number of dedicated instances that can run for the service at any given time, even when the service is not being used.	String

Label	Explanation	Data Type
Maximum Instances	Specifies maximum number of dedicated instances that can run for the service at any given time, even when the service is not being used.	String
Description (Optional)	If using tile cache, scene layer, raster tiles, or vector tiles description must be entered and updated in the root.json manually.	String
Copyright (Optional)	If using tile cache, scene layer, raster tiles, or vector tiles the copyright text must be entered and updated in the root.json manually.	String
Users to give or revoke permission (Optional)	Lists the users and their permission details. The following actions are available: • **User**—Specifies the username for which permissions will be applied. • **Permission detail**—Specifies whether permission is enabled or disabled.	String
Change service status (Optional)	Shows the status of the selected service. Change the value to update the status of the service. The following actions are available: • **STARTED**—The service is started. • **STOPPED**—The service is stopped.	String
Create Portal Item (Optional)	If checked, creates a portal item for the created tile service URL.	Boolean
Set service permissions (Optional)	If checked, set permissions required to access the tile service. If unselected, the service will be accessible by any user with the service URL.	Boolean

Set System Service Settings

Overview

You can configure the instance settings of the Raster Rendering Service and Tile Services Shared Instance Pool using the Set System Service Settings geoprocessing tool, which is a part of the ArcGIS Image Dedicated Service Management geoprocessing toolbox.



Parameters

Label	Explanation	Data Type
Cloud Type	The cloud type where the server is deployed.	String
Server Alias	The server alias whose instance settings are to be updated.	String
Service Name	The service name whose instance settings are to be updated. The following services are available: • **Raster Rendering**— This service is a multi-tenant raster rendering provider. Shared instance image services make use of this service that allows many services to share a pool of compute processes. This enables a large number of different services to be served from more limited resources. • **Tile Services Shared Instance Pool**— Tile services (except Tiled Image Services) published to tiled imagery server uses this shared instance pool. Shared instances conserve memory usage by pooling active instances for use by multiple services. It can reduce the overall number of instances you need to run to meet your services traffic needs. This makes it easier to strike the optimal balance between performance and memory usage.	String
Minimum Number of Instances per Machine	The minimum number of dedicated instances per machine.	String
Maximum Number of Instances per Machine	The minimum number of dedicated instances per machine.	String
Number of Shared Instances in the Pool	The number of shared instances in a pool per machine.	String

Processing and Analysis

Overview

If you have subscribed to processing and analysis within ArcGIS Image Dedicated, you have a set number of Image Dedicated credits that you can use to run analyses or image processing tools unique to Image Dedicated.

The processing and imagery analysis services can be used to pre-process data to optimize it for publishing or to perform analysis on the imagery to extract information products. When processing jobs are submitted, Esri will launch the appropriate cloud computing instances to process or analyze the imagery in the same cloud region where the source imagery resides. This ensures faster processing and significantly reduces egress costs.

Enabling or Disabling a Processing and Analysis Service Task

A Processing and Analysis service can encompass multiple tasks. You have the option to enable all tasks simultaneously or selectively activate a specific task that aligns with your requirements. To access the Processing and Analysis Tasks page, click on the 'Processing and Analysis' chiclet in the ArcGIS Image Dedicated Site.

Upon navigating to the Processing and Analysis Tasks page, you will encounter a list of expandable folders. Click on a folder to reveal a list of Processing and Analysis services. Further details about individual tasks can be accessed by clicking on the respective service. Once you identify a task that suits your needs, click on it to explore its description. If it proves suitable, enable the task to commence submitting processing and analysis jobs.

Keep in mind that each processing and analysis job submission consumes ArcGIS Image Dedicated credits. After completing your tasks, consider disabling a specific task to prevent accidental job submissions and credit consumption.

To enable a task, toggle the button next to it. Enabling a task prompts you to either create a new access item in your ArcGIS Online account or use an existing item to regulate access to the processing and analysis task, as well as job submissions. After enabling a task, you can view details such as its current access item, your access status, and options to view or update the current access item. Additionally, you can subscribe or unsubscribe from email notifications regarding the job status, whether they have succeeded or failed.

Output to Cloud Storage

The output from processing and analysis can be output to a defined cloud storage that should be in the same region as the processing to reduce egress costs.

Publish Results

You can also publish your results to ArcGIS Online and ArcGIS Enterprise and create associated portal items. You can set this up when publishing dynamic and tiled image services using the Manage Dynamic Imagery or Manage Tile Imagery geoprocessing tools, discussed above. The image service will be referenced using this portal item in your ArcGIS organization.

Items are classified as either web content or desktop content. Desktop content is primarily consumed by desktop applications and must be published as geospatial web services before they can be widely consumed over the web. Web content can be actively consumed across all client platforms, including web browsers, mobile devices, tablets, and desktops.

You can use a portal to store and share content among users who can directly consume the services or download the content if applicable. If you do not create a portal item, only the service endpoint will be created. However, you can also register the service endpoint to ArcGIS Online or ArcGIS Enterprise. To do this, you can use the web interface of ArcGIS Online or ArcGIS Enterprise to create items that reference services by providing the REST endpoint and credential from ArcGIS Image Dedicated servers. If you don't define the credentials, the item would become a link to the service. However, if you do provide credentials, then the portal becomes a proxy server to the item. In this case, all requests will go to the portal, which will then append the required credentials and send the request. You will also receive the response through the portal. This additional step ensures suitable security; however, it does negatively impact performance, especially if the server is in a different region than the portal.

Pro Machines

Overview

As part of the processing and analysis subscription, you can also leverage virtual Pro Machines. A Pro Machine can be spun up in the same cloud and region as your imagery data to publish and manage image services and perform analyses. Pro Machines are managed in the ArcGIS Image Dedicated website and can be accessed using Remote Desktop.

You will need to bring your own ArcGIS Pro license (Basic, Standard, or Advanced) to use ArcGIS Pro on a Pro Machine. Licenses can also contain any extension, such as Image Analyst, which is often required in image analysis workflows.

Create a Pro Machine

To create a new virtual Pro Machine, you need to complete a machine request form, which is available from the ArcGIS Image Dedicated website. You can access this form by selecting the Pro Machine tile on the Image Dedicated homepage and by selecting + New Machine. From here, you will be prompted to fill out the details that are needed to create a new Pro Machine, such as the cloud provider for your stored imagery and instance type, which determines the computing power and memory of the machine you are creating. Six sizes of machines are provided, ranging from Small Central Processing Unit (CPU) to Large Graphics Processing Unit (GPU), each with different costs and increasing performance.

The instance types that are listed in the Pro Machine form will correspond to AWS and Microsoft Azure cloud storage models.

For AWS, there are six instance types that correspond with six AWS model types associated with EC2 M5 instances, I3 instances, and G6 instances. Three of the instances are CPU-based and the other three are GPU-based. More information—such as the memory, storage, and processing type—is provided in the following table. Instance type and cost correspond with the Pro Machine request form. All other fields correspond with AWS model types and the associated information.

Note: The machine types and specifications may be different depending on availability.

Instance Type	Image Dedicated Credits (per hour)	AWS Model	Processors	Memory	Instance Storage
Small_CPU	1	m5d.xlarge	4 (vCPU)	16 GiB	150 GiB
Medium_CPU	1.5	m5d.2xlarge	8 (vCPU)	32 GiB	300 GiB
Large_CPU	2	i3.2xlarge	8 (vCPU)	61 GiB	1.9 TB
Small_GPU	2	g6.xlarge	4 (vCPU) + GPU L4	16 GiB	250 GiB
Medium_GPU	3	g6.2xlarge	8 (vCPU) + GPU L4	32 GiB	450 GiB
Large_GPU	5	g6.4xlarge	16 (vCPU) + GPU L4	64 GiB	600 GiB

For Microsoft Azure, there are six instance types that correspond with Azure D-series, F-series, NC-series, and NV-series virtual machines. Three of the instances are CPU-based and the other three are GPU-based. More information—such as the memory, storage, and processing type—is provided in the

following table. Instance type and cost correspond with the Pro Machine request form. All other fields correspond with Azure model types and the associated information.

Instance Type	Image Dedicated Credits (per hour)	Azure Model	Logical Processors	Memory	Temp Disk Storage
Small_CPU	1	Standard_D4ds_v5	4 (vCPU)	16 GiB	150 GiB
Medium_CPU	1.5	Standard_F8s_v2	8 (vCPU)	16 GiB	64 GiB
Large_CPU	2	Standard_D8ds_v5	8 (vCPU)	32 GiB	330 GiB
Small_GPU	2	Standard_NC4as_T4_v3	4 (vCPU) + GPU T4	28 GiB	180 GiB
Medium_GPU	3	Standard_NC8as_T4_v3	8 (vCPU) + GPU T4	56 GiB	360 GiB
Large_GPU	5	Standard_NV12s_v3	12 (vCPU) + GPU M60	112 GiB	320 GiB

You can add additional disk storage to either a new Pro machine or to an existing Pro machine, and it will cost you a few Images Dedicated Credits. Users will be charged monthly for the additional storage regardless of the machine's status, with the amount depending on the selected storage size. To ensure users are aware of these ongoing costs when the machine is inactive, an alert message is displayed next to the status

Note: In AWS environment, if you need to update additional disk storage on a Pro Machine, please wait at least 8 hours between successive disk storage modifications. However, in the Azure environment, there is no specific waiting limit.

Additional Disk Storage	Image Dedicated Credits (per month)
250 GiB	52.5
500 GiB	105
750 GiB	157.5
1 TiB	210
1.5 TiB	315
2 TiB	420

ArcGIS Image Dedicated allows a maximum of three IP addresses for one Pro Machine. The initial IP address will auto populate based on your connecting network. If you intend to connect to the Pro Machine with different networks, these additional IP addresses must be provided. You won't be able to connect to the Pro Machine if you try to access the machine with an unspecified IP address. The IP address that you select will enable a Remote Desktop Protocol (RDP) connection to the provided IP address, which will help you access the Pro Machine.

For Pro Machines 3.4 and above, the user gets an option to connect using Remote Desktop Gateway. Using Remote Desktop Gateway (RD Gateway) to connect to Pro machines provides significant advantages over the regular method of connecting. It enhances security by providing a secure connection path, improves reliability by ensuring stable access, and optimizes the overall connection experience.

In earlier versions of ArcGIS Image Dedicated, users had to connect directly through the RDP port 3389, which often required administrators to whitelist the IP address and enable the PDP port 3389. RD

Gateway uses the HTTPS protocol to encrypt and secure the connection, encapsulating RDP within HTTPS and using SSL/TLS for encryption. This extra layer of security routes all traffic through port 443 (HTTPS), providing encryption and secure transport. With DNS over HTTPS, if the user must request whitelisting, he needs to request domain whitelisting and not IP address whitelisting, making it a one-time task. Currently, the DNS provided is *.img.ArcGIS.com.

Once you submit your request form, the Pro Machine will be created with the machine's alias and specifications you provided. It will typically take up to 10 minutes for the Pro Machine to appear in the list of active Pro Machines on the Image Dedicated website. It is recommended that you use a unique name each time you create a new Pro Machine to differentiate between machines, particularly if you have several in the same region with the same instance type.

Note: It is recommended that the Pro Machine is spun up in the same cloud region as where data is stored to avoid latency and egress costs.

Templates

You can preconfigure the Pro Machine with a set of geoprocessing tools or datasets that you can use for your workflow. When adding a new Pro Machine, you can select a template, which will configure the Pro Machine as needed. The provided template list will differ based on the cloud type and cloud region. Once selected, the template will be set up at the start-up of the Pro Machine. The respective ACS files, Imagery Workflows file, and ReadMe file will be copied to the folder in the machine that pertains to the selected template.

Access a Pro Machine

Once a Pro Machine has been created, you can access the machine on a remote desktop using the machine credentials. The credential information is found on the ArcGIS Image Dedicated website. To locate the Active Pro Machines list that contains your Pro Machine and credential information, you must select the Pro Machine tile within the ArcGIS Image Dedicated homepage. Active machines are differentiated by the cloud provider. By default, the cloud provider list will display for AWS. To switch to Microsoft Azure, select Cloud Provider and choose Azure from the drop-down list.

Pro Machine credentials can be accessed from the Active Pro Machines list under Retrieve Credentials. Select  to copy the IP address/ Gateway Server, username, and password. Alternatively, you can download the RDP file/ RDP file (Remote Desktop Gateway) containing the credential information and use that to connect to the Pro Machine. You can also connect using the Microsoft Terminal Services Client (MSTSC) command. This is because the Pro Machine is virtual and uses a remote desktop in the cloud region that was specified when completing a machine request form.

If you are unable to connect to the Pro Machine using the RDP file or MSTSC command, make sure your machine's IP address matches the IP address that you added under the Inbound access IP address preferences field for that machine. If not, you will need to update the IP address for the machine. After you update your IP address, you can connect to the virtual Pro Machine.

Use a Pro Machine

Data Management

Data on the D Drive—which is an ephemeral drive if created in Azure—and the Z drive—which is an ephemeral drive if created in AWS or Azure—will be lost if the Pro Machine is stopped or impaired. The D and Z are the same drives. Although you should not use the ephemeral Z drive or the D drive to store your data, these drives are recommended to temporarily store data to speed up temporary processing. This is because these are considered the fast drives. If you have not opted for any additional disk storage while creating your Pro Machine, it is optimal to copy pre-processed data to these drives. Perform processing with the output directed to the same drive. Alternatively, copy it to the additional disk storage if you have added the additional disk storage. In such scenarios, the result would need to be copied back to the E drive, additional disk storage or copied back to the cloud (or other storage).

Ensure any important data is backed up frequently in the E drive or additional disk storage. Any new projects created in a Pro Machine will be in the default directory E:\Projects folder. Do not delete or rename the folders in the E drive. The folder structure maintained in the E drive contains a collection of folders to organize different file types. The folder details are as follows:

- **ACSFiles**—This folder contains the pre-created ACS connection files of the cloud and region-specific public datasets available at Registry of Open Data on AWS and Microsoft's Planetary Computer Data Catalog.
- **Data**—This folder is available for you to store your data such as raster datasets. Other project-related resources can also be stored in this folder.
- **ImageryWorkflows**—This folder contains the workflows to build mosaic datasets and manage, analyze, or use imagery and rasters. The workflows available in this folder change depending on what template you select when creating a Pro Machine.
- **Projects**—This is the default location for the projects that are created in ArcGIS Pro.
- **PythonNotebooks**—This folder contains the ArcGIS Notebooks.

Data Access

Although users can access their own cloud storage in a virtual Pro Machine, discussed in Cloud Storage and Data Access, the Pro Machine also already comes with open imagery data from public AWS buckets and Azure containers. ArcGIS Image Dedicated supports the open datasets that cloud providers offer as pre-made ACS connection files. This saves the user time so they can use open datasets for image processing and analysis tasks. The ACS files automatically populate the present data from these open-source buckets. The ACS files are found on the E drive of the Pro Machine.

Stop a Pro Machine

When you are done working on a Pro Machine, restart or shut down the machine using the machine's power button. By stopping an active machine, you are preventing additional costs when it is not in use; however, know that the data in the ephemeral (D and Z) drives will be lost each time the machine is shut down. You can also start and stop the Pro Machine by selecting either START or STOP from the Start/Stop Machine column for your machine in the Active Pro Machines list from the Pro Machine tile on the Image Dedicated website. Alternatively, you can start or stop your machine by selecting your machine on the ArcGIS Image Dedicated and accessing a pop-up window that contains a Start/Stop Machine tab, where you can perform this action. The machine status typically takes up to 10 minutes to

update on the ArcGIS Image Dedicated website after you submit your request to either start or stop your machine. Your machine's credentials will also update every time you start or stop the machine. Therefore, you need to download the RDP file again to connect with the updated credentials.

Pro Timer

When you connect to a Pro Machine, the Pro Timer will automatically run with a default timer set for eight hours. You can reset and extend the timer depending on your specifications. When you are in a remote Pro Machine, the timer will run during the entire session. Unless you have reset or modified the timer, once the 8-hour timeframe is complete, the machine will be shut down by the utility. The timer can be extended to a maximum of 720 hours (or 30 days).

Aside from setting timers to automatically shut down your Pro Machine, you can also back up your data to cloud storage (AWS S3 bucket or Azure container) with the functionality in the Pro Timer. This feature ensures your data will be saved to cloud storage before the machine shuts down.

The Pro Timer also displays a caution to the users prompting about the Windows updates enabled on the Pro Machines. Even though users are notified before the actual updates, we recommend proceeding with caution as some updates may require restarting the machine, potentially interrupting operations and processes. To avoid the interruptions, users can choose to temporarily pause Windows updates by navigating to Windows Update from System Settings.

Reset Password of a Pro Machine

The password for a Pro machine expires after 42 days, and you will receive a message alert when attempting to log in using the expired password. To reset your Pro machine's password, please follow the steps below:

- Navigate to the Pro Machine Alias for which you wish to reset the password.
- Change your tab selection to "Reset Password".
- Click on the "Reset Password" button. A prompt will appear to reconfirm the action.
- Click "Reset". Your password will be reset within 5 minutes.
- Copy the new password from the "Retrieve Credentials" page and use it to log in to your Pro machine.

Note: You cannot reset the password for your Pro machine if it is in the updating or stopped state. Ensure it is in Started state to reset the password.

Delete a Pro Machine

You can delete existing Pro Machines on the ArcGIS Image Dedicated website by selecting your machine from the Active Pro Machines list. After selecting your machine, a pop-up window appears. From this window, you can delete your machine. Before deleting a Pro Machine, make sure that you are deauthorizing your single or concurrent use licenses of ArcGIS Pro along with the extensions. If not, the licenses will still be in an authorized state, and you may not be able to authorize them in other machines without resetting them. If the Delete Machine button is greyed out, you must disable Delete Protection to delete the machine. To do this, browse to the Delete tab under Update Machine Properties and uncheck the delete protection box. Similarly, if you would like to protect your Pro Machine from accidentally getting deleted as an extra safety precaution, make sure the check box is enabled.

Administration

Email Notifications

To keep you informed about the management activities in your ArcGIS Image Dedicated account, such as the status of new dynamic imagery server or tiled imagery server creation jobs submitted, the status of processing and analysis jobs submitted (whether they have succeeded or failed), and if ArcGIS Image Dedicated Credits have gone negative or reached an exhaustion level, email notifications will be sent. These emails will be sent to the administrator who is the point of contact when subscribing to ArcGIS Image Dedicated.

There are different sets of email notifications, and you can manage your email subscriptions for each. This means you have the option to decide whether you would like to receive these emails or not. For example, processing and analysis jobs email notifications can be subscribed to or unsubscribed from. If you choose to unsubscribe, you won't receive any emails notifying you about the job status whenever you submit jobs.

However, there is another set of email notifications that cannot be unsubscribed, such as notifications to inform you about the server status whenever you submit a new server request or notifications about ArcGIS Image Dedicated Credits going low or negative.

Usage Reports

The usage reports of the dynamic imagery server, tile server, Pro Machine, and other processing and analysis services can be generated from the ArcGIS Image Dedicated website. These reports will help you understand the usage of these resources and, in turn, provides the costs associated with the resources used. To access usage reports, select the Reports tile from the website homepage; from there, select which service you would like a report on and complete the form with your specifications.

You can also view how many Image Dedicated credits you have left using the ArcGIS Image Dedicated website. To view your credit usage, click on your account name in the main ribbon of the website. A drop down will appear with the option to either sign out of the website or view credit usage. From there, click on Credit usage. In this view, you can see how many Image Dedicated credits are remaining and when this query was last updated.

Control Access Items

ArcGIS Online allows users to store and share a variety of items. Each item has a type, such as web maps, feature services, or web applications, as well as a set of type keywords that provide additional information about the characteristics of that item type. ArcGIS Online can be used to store and share this content among users of an organization or multiple organizations through groups. Each item has a unique identifier and a known URL independent of the user owning the item.

ArcGIS Image Dedicated uses access items to control who can access management and processing capabilities. Access items are created when an ArcGIS Online user with an administrator or publisher role subscribes to Image Dedicated and creates a dynamic imagery server or tiled imagery server. Whereas, in the case of processing and analysis services (such as creating a Pro Machine or performing processing and analysis jobs), the administrator can create a new access item or use an existing access

item in ArcGIS Online when enabling a Processing and Analysis Task from the Processing and Analysis chiclet in ArcGIS Image Dedicated Site.

As an administrator, you can provide access to the appropriate items to users and publishers in your organization for all management and processing capabilities.

There are three types of access items used in Image Dedicated for authentication. They are as follows:

- Admin Access Item
- Server Access Item
- P&A Access Item

Admin Access Item

The Admin Access Item allows a user to administer ArcGIS Image Dedicated for their ArcGIS Online organization. This was discussed in Registration.

Server Access Item

The Server Access Item controls access to servers that manage dynamic and tiled imagery. A user with access to this item can manage image services, update server properties, and delete servers. This access item is created when a dynamic or tiled imagery server is created.

To create a Server Access Item, you must check Create a Server Access Item on your ArcGIS Online account when filling out the server request form. Once this is done, the administrator can share the access item with other members of the organization that would like to manage and publish image services to the dynamic or tiled imagery server.

Complete the following steps to create a server access item:

1. Log in to ArcGIS Image Dedicated site.
2. Click the Dynamic Imagery or the Tiled Imagery tile, depending on which server you want to create (and your subscription).
3. Click + New Server to open a form that functions as a server creation request.
4. Fill out the required parameters in the form.
5. You will be asked for your permission to create a server access item in your ArcGIS Online account, which will be used by you to manage the dynamic or tiled imagery server. Check the box to confirm and submit the server creation request by clicking Submit Request. This will create a server access item in your ArcGIS Online account.

P&A Access Item

A P&A (or processing and analysis) access item is created in ArcGIS Online as an item when an administrator enables a P&A task in ArcGIS Image Dedicated Site.

Complete the following steps to enable a processing and analysis task and create an access item:

1. Verify that you are signed into the ArcGIS Image Dedicated Site and have necessary privileges to enable or disable P&A tasks.
2. Navigate to the Processing and Analysis chiclet and expand a folder by clicking on the expandable button to view all available processing and analysis services along with their respective tasks.

3. Choose to enable all tasks within a processing and analysis service simultaneously or enable a specific task that is relevant to your needs.
4. Each task is accompanied by a description detailing the type of processing and analysis it performs. Upon enabling a task, you will be prompted to either create a new access item or utilize an existing item for that specific task.
5. It is possible to update the access item of a task at any time by clicking on the "Update Item ID" button.

Designate a Group for ArcGIS Image Dedicated Access

If you need some of your team members to have access, then you can create a new group, share the item within the group, and add team members to that group so they can access it in ArcGIS Online. You can use an existing group if the membership is a good match with your intended ArcGIS Image Dedicated members. If not, you will need to create a new group in ArcGIS Online.

If you have a group with designated members already added to the group, the access items can be shared with the group from the item details page. You can have a single group or multiple groups for all the three access items and share the items with these groups, which will provide access to the other members in your organization to administer ArcGIS Image Dedicated, manage dynamic and tiled imagery, and processing and analysis capabilities. If you would like to share an access item with a group, you will need to edit group sharing abilities for that item.