

Student Experience with Web-GIS Architecture and Services

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Links in presentation: <https://arcg.is/4ljg6rj>



FLEMING

Different Types of Web GIS Users:



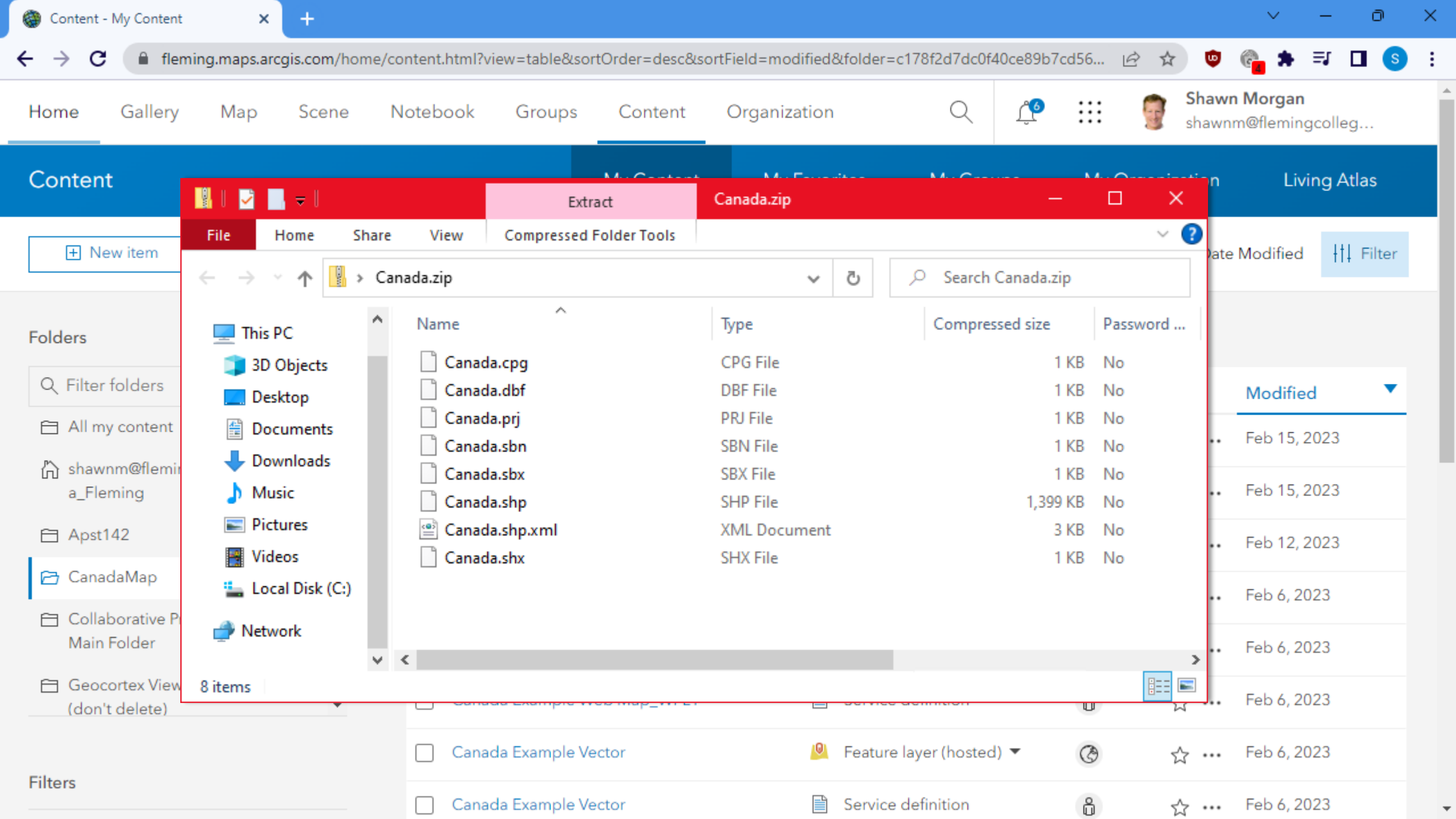
Users of GIS solutions



Introduction to GIS
concepts



Managing and Creating
GIS solutions



JSON Items “File” of AGOL

- Item ID
- Standard Metadata
- Tools and Commands
- Asset Links

The screenshot shows the ArcGIS Item page for a feature layer titled "GIS: where are we from 2019-2020". The page is divided into several sections:

- Header:** Includes navigation tabs (Home, Gallery, Map, Scene, Groups, Content, Organization) and a secondary navigation bar (Overview, Data, Visualization, Usage, Settings).
- Item Overview:** Displays the item title, a thumbnail image, and a brief summary. A yellow arrow points from the "Item ID" bullet point to the item ID in the URL bar: `45f00d29fd9c439b837a13f38904f7a3`.
- Description:** A section for adding an in-depth description of the item. A yellow arrow points from the "Standard Metadata" bullet point to this section.
- Layers:** A section showing the layers associated with the item. A yellow arrow points from the "Asset Links" bullet point to the "WhereAreWeFrom" layer.
- Tools and Commands:** A sidebar on the right containing various actions: "Open in Map Viewer", "Open in Scene Viewer", "Open in ArcGIS Desktop", "Publish", "Create View Layer", "Export Data", "Update Data", and "Share". A yellow arrow points from the "Tools and Commands" bullet point to this sidebar.

Apst142

3

CanadaMap

8



Canada Example Vector

Type: Service Definition | Item ID: 8563dd



Canada Example Vector

Type: Feature Service (Hosted) | Item ID: bbf879



Canada Example Web Map

Type: Web Map | Item ID: c8e7fa



Canada Example Web Map_WFL1

Type: Service Definition | Item ID: 89477b



Canada Example Web Map_WFL1

Type: Feature Service (Hosted) | Item ID: e2aa42



CanadaMapDirectLuna

Type: Map Service | Item ID: 08cfed



Luna Canada Example via Proxy

Type: Feature Service | Item ID: 00c3c9



ShawnmCanadaLunaLayer

Type: Feature Service | Item ID: 146432

Canada Example Vector

Description (View Item Details)



```
1 {  
2   "id": "bbf87936fc924a0ea7b15de5c2fd6519",  
3   "owner": "shawnm@flemingcollege.ca_Fleming",
```

<input type="checkbox"/>	Title								
<input type="checkbox"/>	ShawnmCanadaLunaLayer		Feature layer v			...	Feb 1		
<input type="checkbox"/>	CanadaMapDirectLuna		Map Image Layer			...	Feb 1		
<input type="checkbox"/>	Luna Canada Example via Proxy		Feature layer v			...	Feb 1		
<input type="checkbox"/>	Canada Example Web Map		Web Map			...	Feb 6		
<input type="checkbox"/>	Canada Example Web Map_WFL1		Feature layer (hosted) v			...	Feb 6		
<input type="checkbox"/>	Canada Example Web Map_WFL1		Service definition			...	Feb 6		
<input checked="" type="checkbox"/>	Canada Example Vector		Feature layer (hosted) v			...	Feb 6		
<input type="checkbox"/>	Canada Example Vector		Service definition			...	Feb 6		

```
30   -171.21953733329067,  
31   36.2818344832018  
32   ],  
33   [  
34   -10.415320352023407,  
35   83.60400068002806
```

```
{
  "operationalLayers": [
    {
      "id": "WhereAreWeFrom_6736",
      "layerType": "ArcGISFeatureLayer",
      "url": "https://services1.arcgis.com/pMeXRvgWC1LJZr3s/arcgis/rest/services/WhereAreWeFrom/FeatureServer/0",
      "visibility": true,
      "opacity": 1,
      "title": "where are we from",
      "itemId": "45f00d29fd9c439b837a13f38904f7a3",
      "popupInfo": {
        "title": "WhereAreWeFrom: {studentname}",
        "fieldInfos": [
          {
            "fieldName": "OBJECTID",
            "label": "OBJECTID",
            "isEditable": false,
            "tooltip": "",
            "visible": false,
            "stringFieldOption": "textbox"
          },
          {
            "fieldName": "studentname",
            "label": "Student Name",
            "isEditable": true,
            "tooltip": "",
            "visible": true,
            "stringFieldOption": "textbox"
          },
          {
            "fieldName": "fsa",
            "label": "Forward Sortation Area",
            "isEditable": true,
            "tooltip": "",
            "visible": true,
            "stringFieldOption": "textbox"
          }
        ]
      }
    }
  ]
}
```

The ITEM JSON for a Feature Layer points to the Services Directory URL where the data can be accessed

<https://developers.arcgis.com/documentation/core-concepts/web-maps/#the-web-map-specification>

Canada Example Web Map_WFL1 x | ArcGIS Online Assistant x | Canada_Example_Web_Map_WFL1 x +

← → ↺ services1.arcgis.com/pMeXRvgWCILJZr3s/arcgis/rest/services/Canada_Example_Web_Map_WFL1/FeatureServer

ArcGIS REST Services Directory

Home > services > Canada_Example_Web_Map_WFL1 (FeatureServer) | API Reference

JSON

Canada_Example_Web_Map_WFL1 (FeatureServer)

View In: [Map Viewer](#)

Service Description: Shared to ArcGIS Online as a Web Map

Service ItemId: e2aa4255adf34e9bb5859a77d95ffee3

Has Versioned Data: false

Max Record Count: 2000

Supported query Formats: JSON

Supports applyEdits with GlobalIds: False

[All Layers and Tables](#)

Layers:

- [Canada Detailed](#) (0)
- [Canada](#) (1)

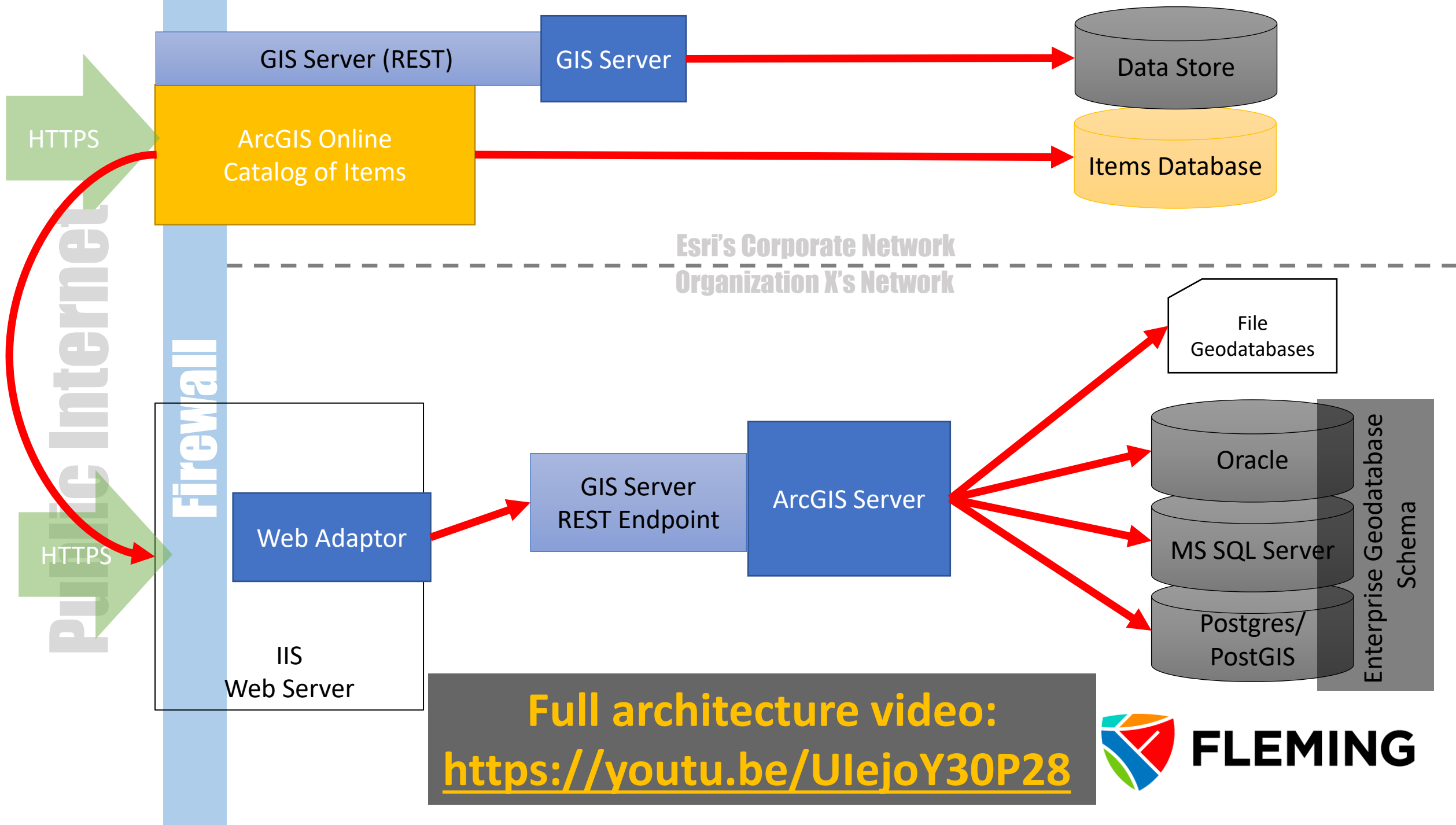
Description:

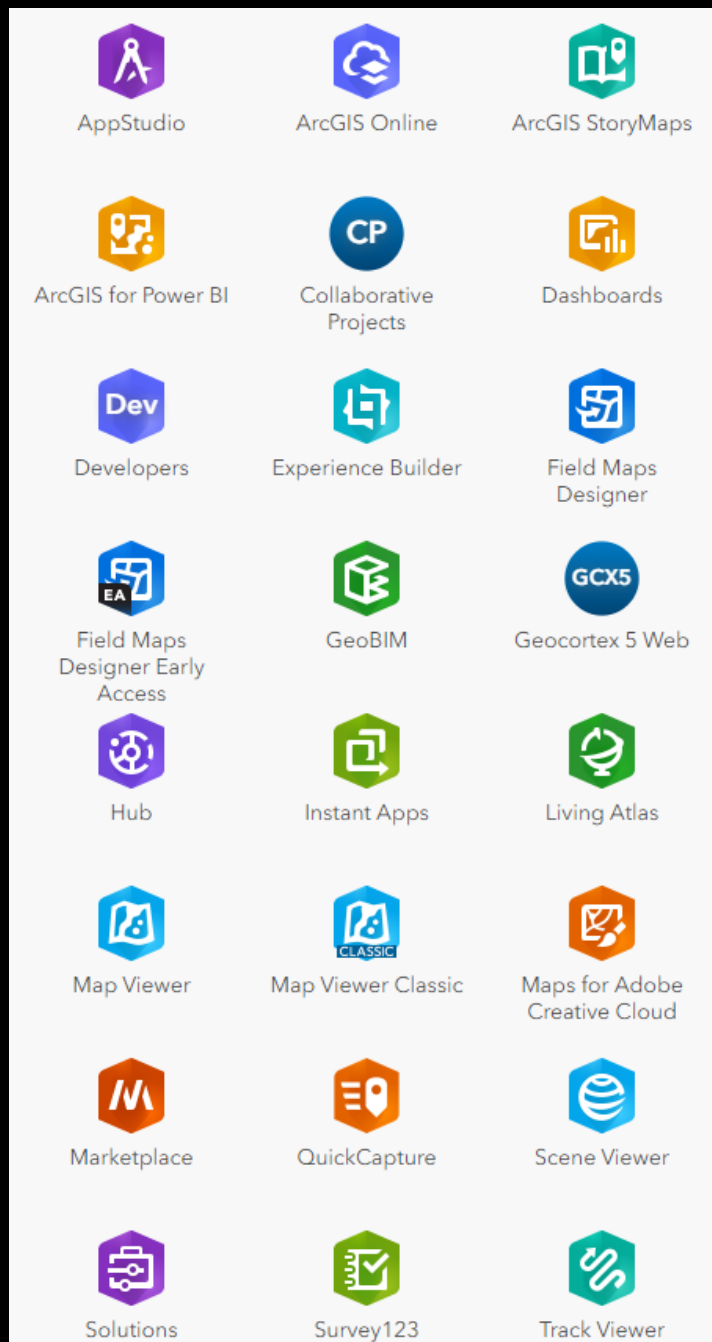
Copyright Text:

Spatial Reference: 102100 (3857)

Initial Extent:

This “REST” endpoint is
Where the data are accessed
Using a special URL called a
“REST Request”

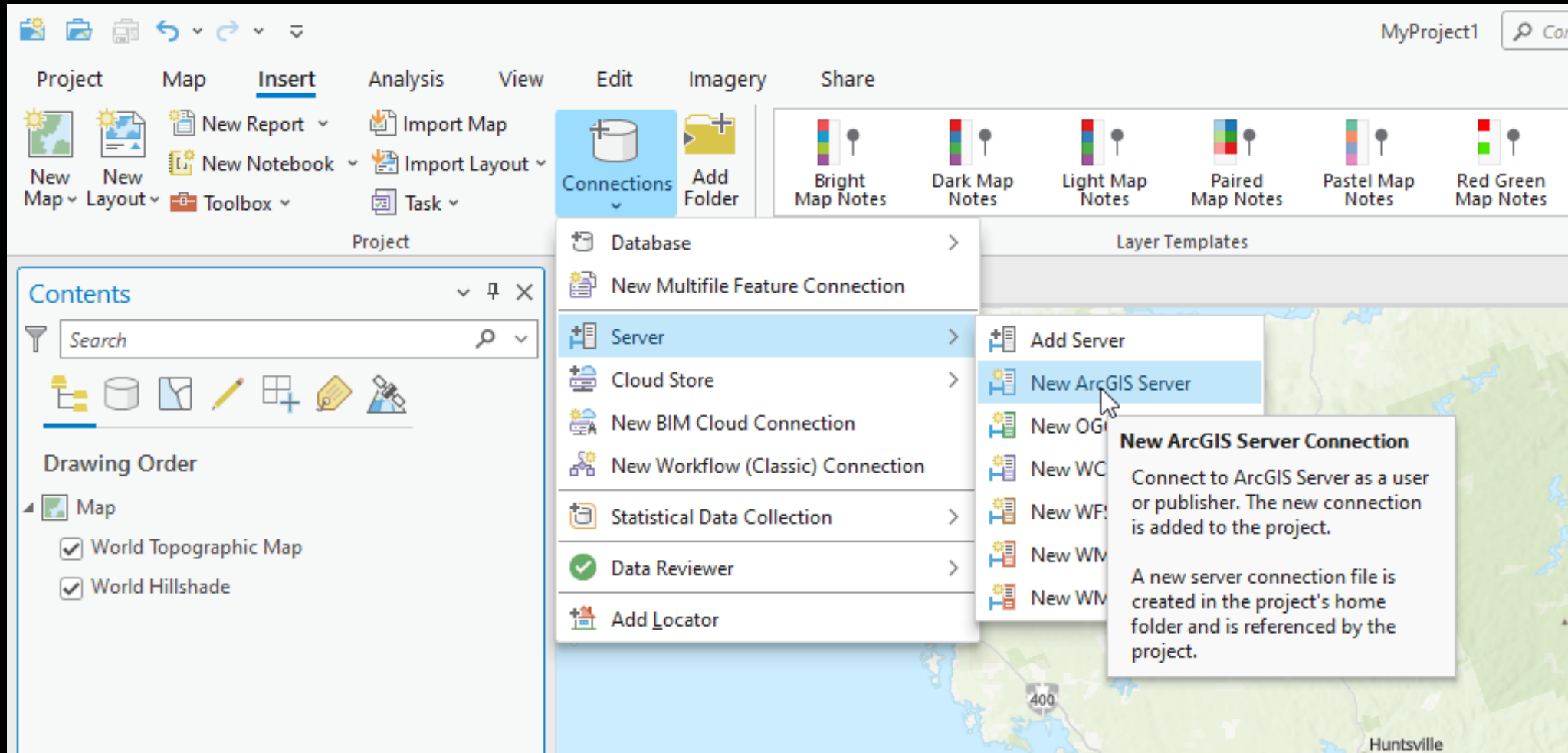




All the “configurable” apps use the ITEM reference to access the Services Directory REST Endpoint and underlying Data

You can even configure apps to point directly to the REST endpoint

Learn How Map Services Work



How-to video: <https://youtu.be/nIRIZN9ECwY>

Web GIS: Level Up Student Experiences

01

ArcGIS Online: Use
Hosted Feature
Layers and Maps

02

ArcGIS Server:
Publish Map
Services, Use
these in ArcGIS
Online

03

ArcGIS Server:
Administer and
Manage the
environment

04

ArcGIS Enterprise:
Publish,
administer,
manage and
configure

How to provide an administration experience Without risk to your academic environments?



ArcGIS Server Manager

Enter your ArcGIS Server username and password:

Username:

Password:

Login

ArcGIS REST Services Directory

[Home](#) > [services](#)

[JSON](#) | [SOAP](#)

Folder: /

Current Version: 11.0

View Footprints In: [ArcGIS Online Map Viewer](#)

Folders:

- [Utilities](#)

Services:

- [SampleWorldCities](#) (MapServer)

Supported Interfaces: [REST](#) [SOAP](#) [Sitemap](#) [Geo Sitemap](#)



Fleming ITS
Appropri...



ArcGIS Serve
Manager



ArcGIS Serve
REST API (h..



Canada.zip



Logins.txt



Folder: / - Profile 1 ...



ArcGIS Server Mana...



ENG

6:33 PM

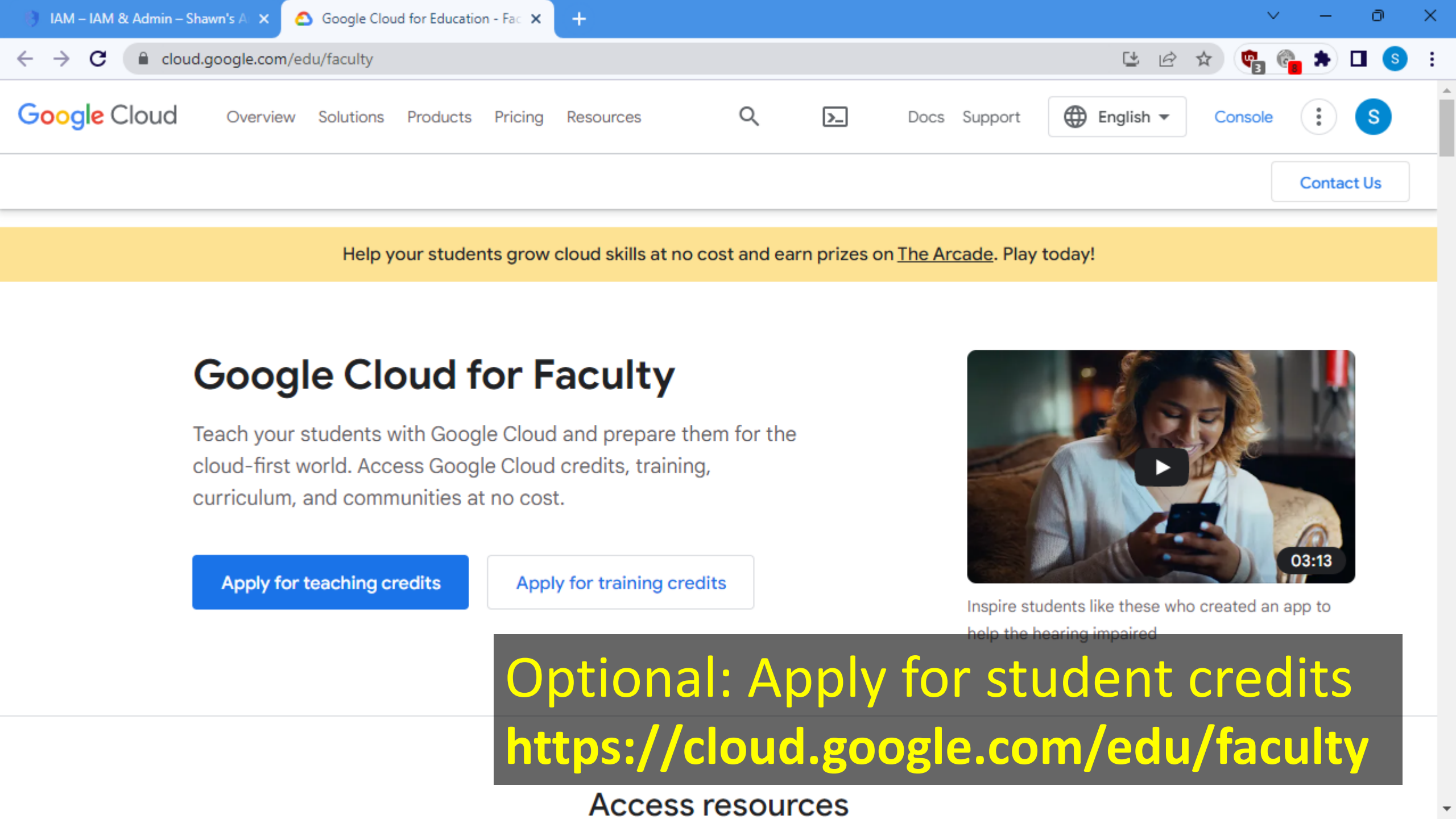
5/9/2023



Hands-on Administrative Experience

- Use cloud-based environment virtual-machines (AWS or GCP)
- Configure a Windows VM with ArcGIS Server as a base
- Create Image for students to start with your configured VM
- Students copy and start their own VM using your base
- Students configure their own network, provide a domain and SSL certificate
- Students then can explore the software as a full “administrator”



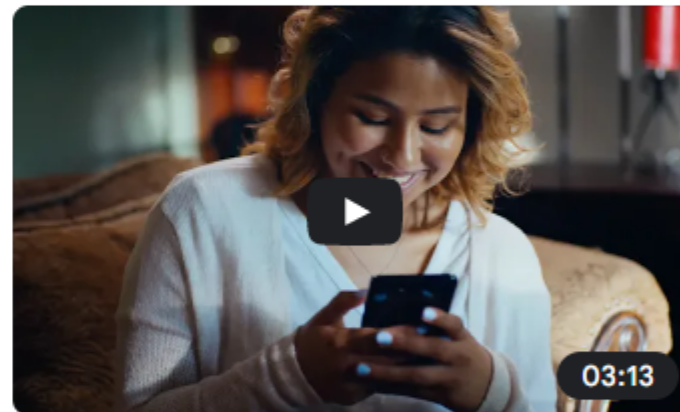


Google Cloud for Faculty

Teach your students with Google Cloud and prepare them for the cloud-first world. Access Google Cloud credits, training, curriculum, and communities at no cost.

[Apply for teaching credits](#)

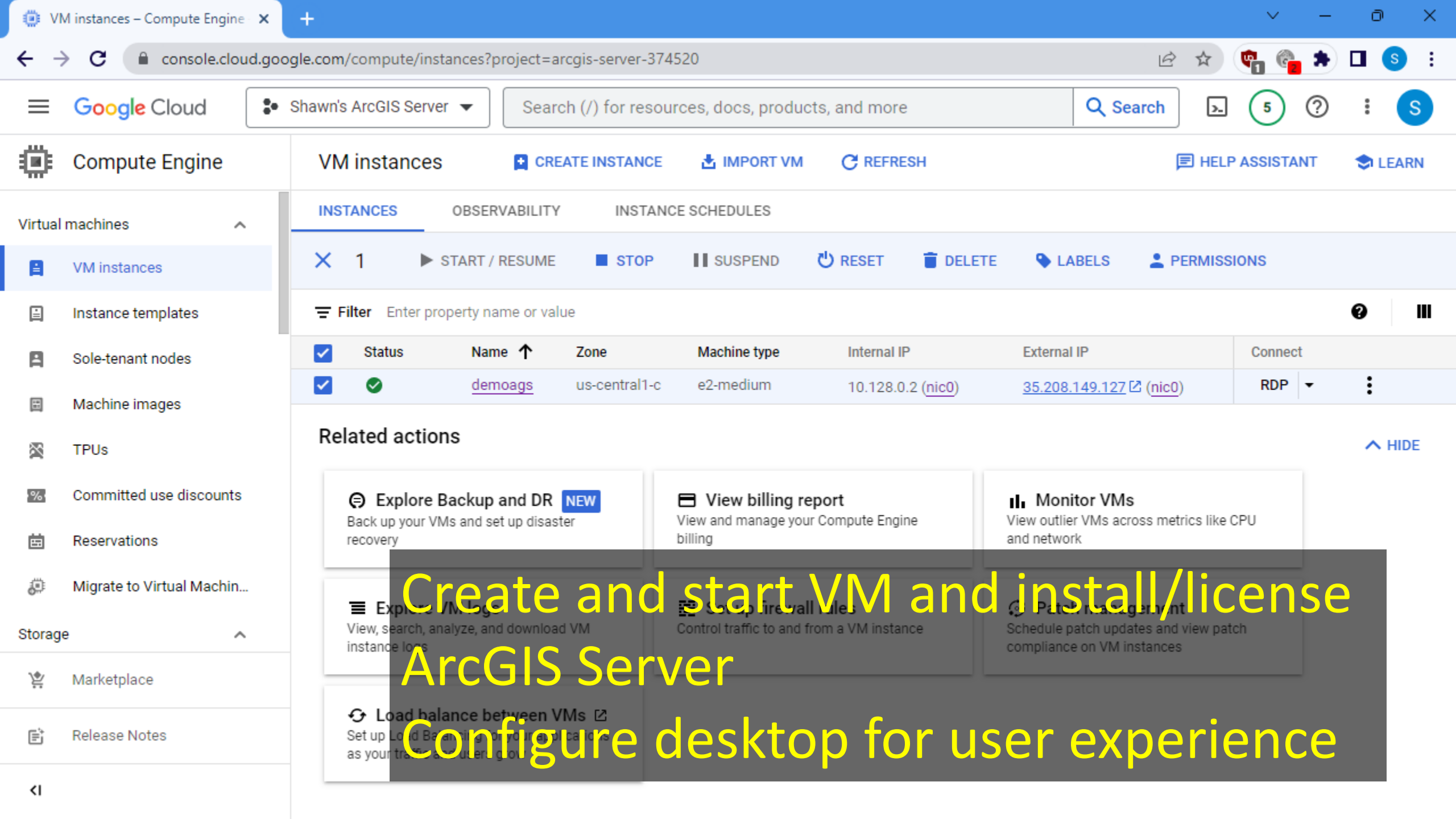
[Apply for training credits](#)



Inspire students like these who created an app to help the hearing impaired

Optional: Apply for student credits
<https://cloud.google.com/edu/faculty>

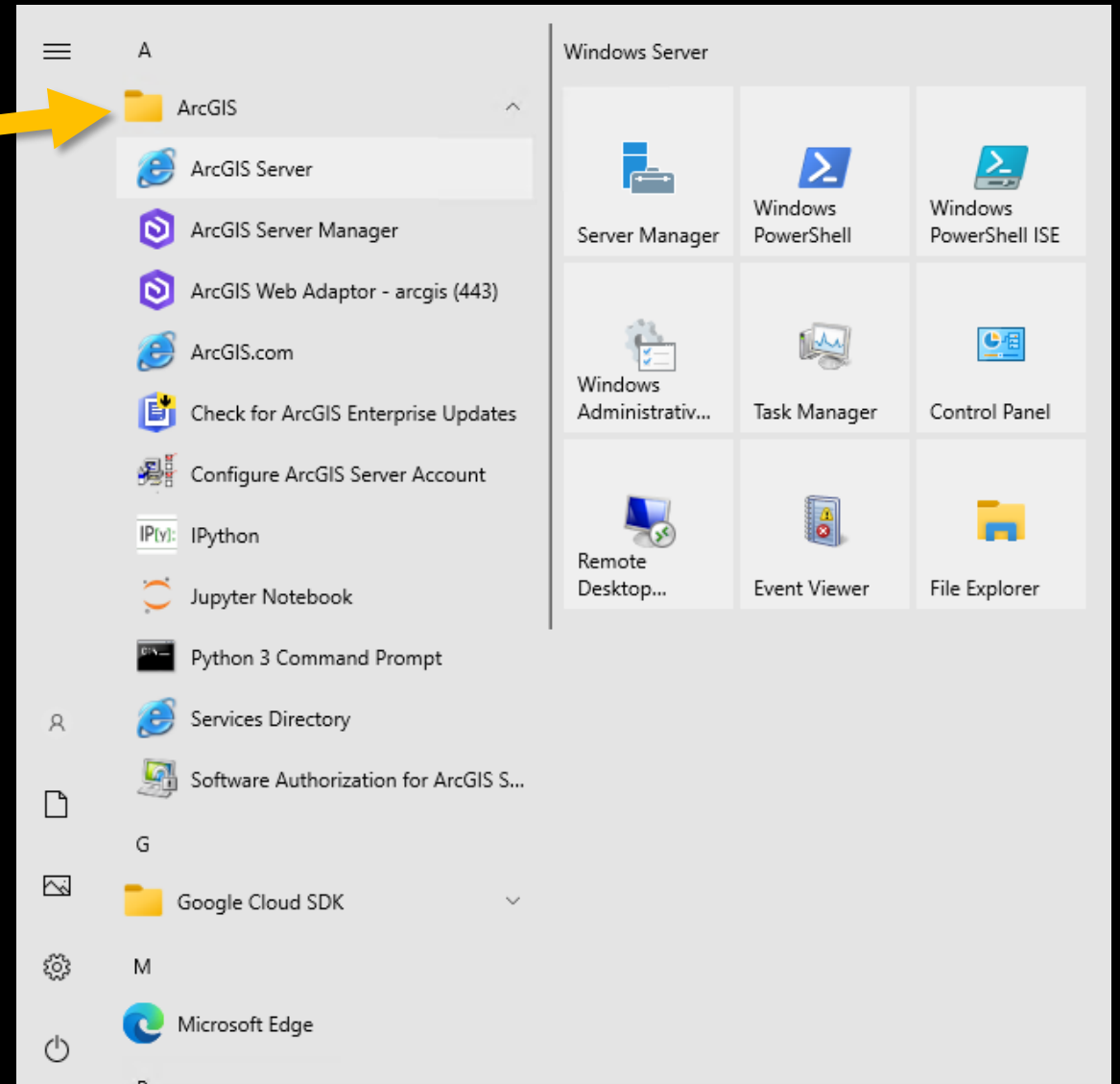
Access resources



Create and start VM and install/license
ArcGIS Server
Configure desktop for user experience

Install and license
ArcGIS Server
(non-federated)

Students will get a
copy of this Virtual
Machine as an
IMAGE



Installing ArcGIS Server Walkthrough: <https://youtu.be/7EpK-c6dJCg>
Installing Web Adaptor Walkthrough: <https://youtu.be/vUJF-MjlccY>

Prepare the VM for your students

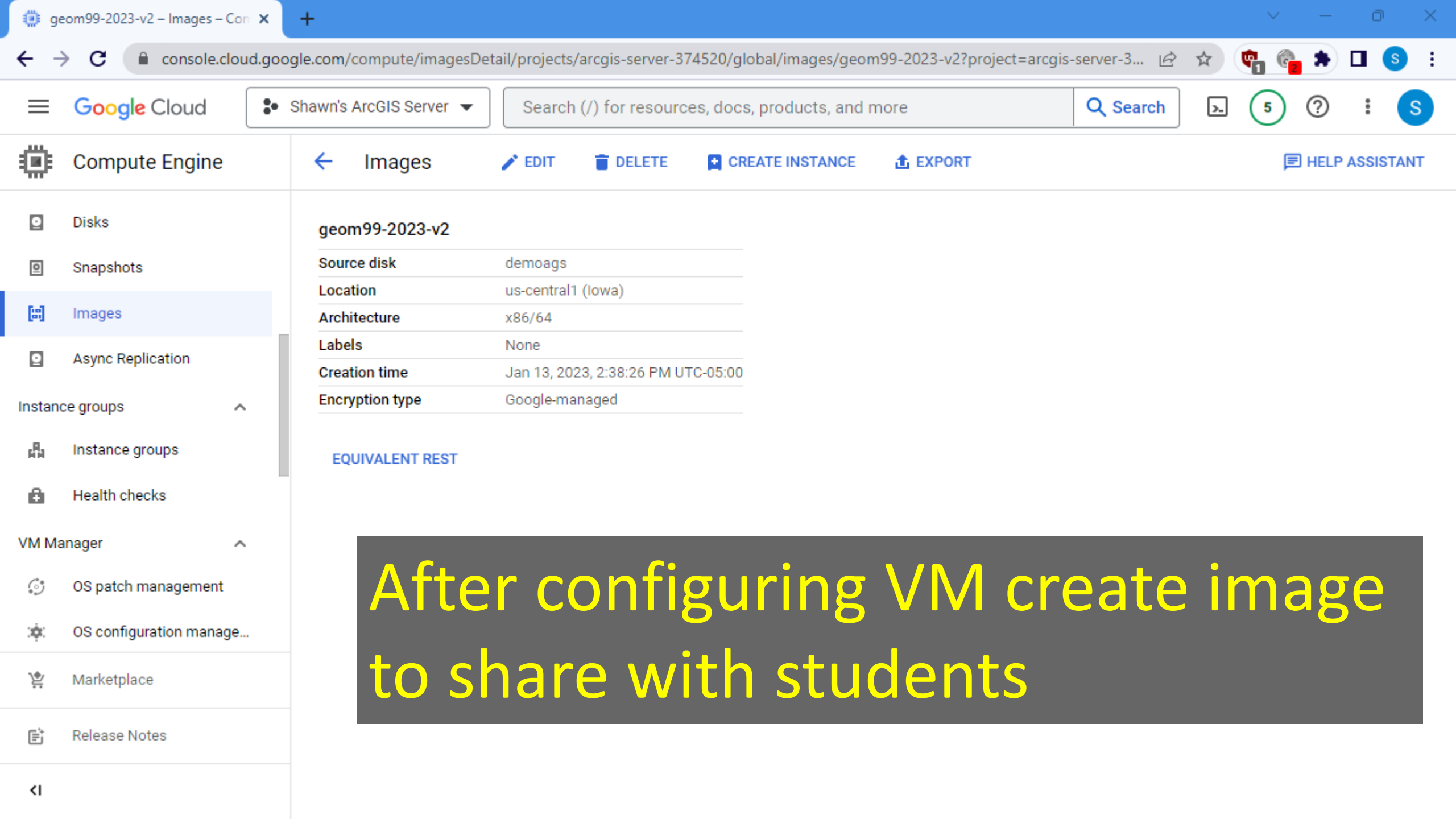
College
Computing
Policy PDF

ArcGIS Server
Manager link

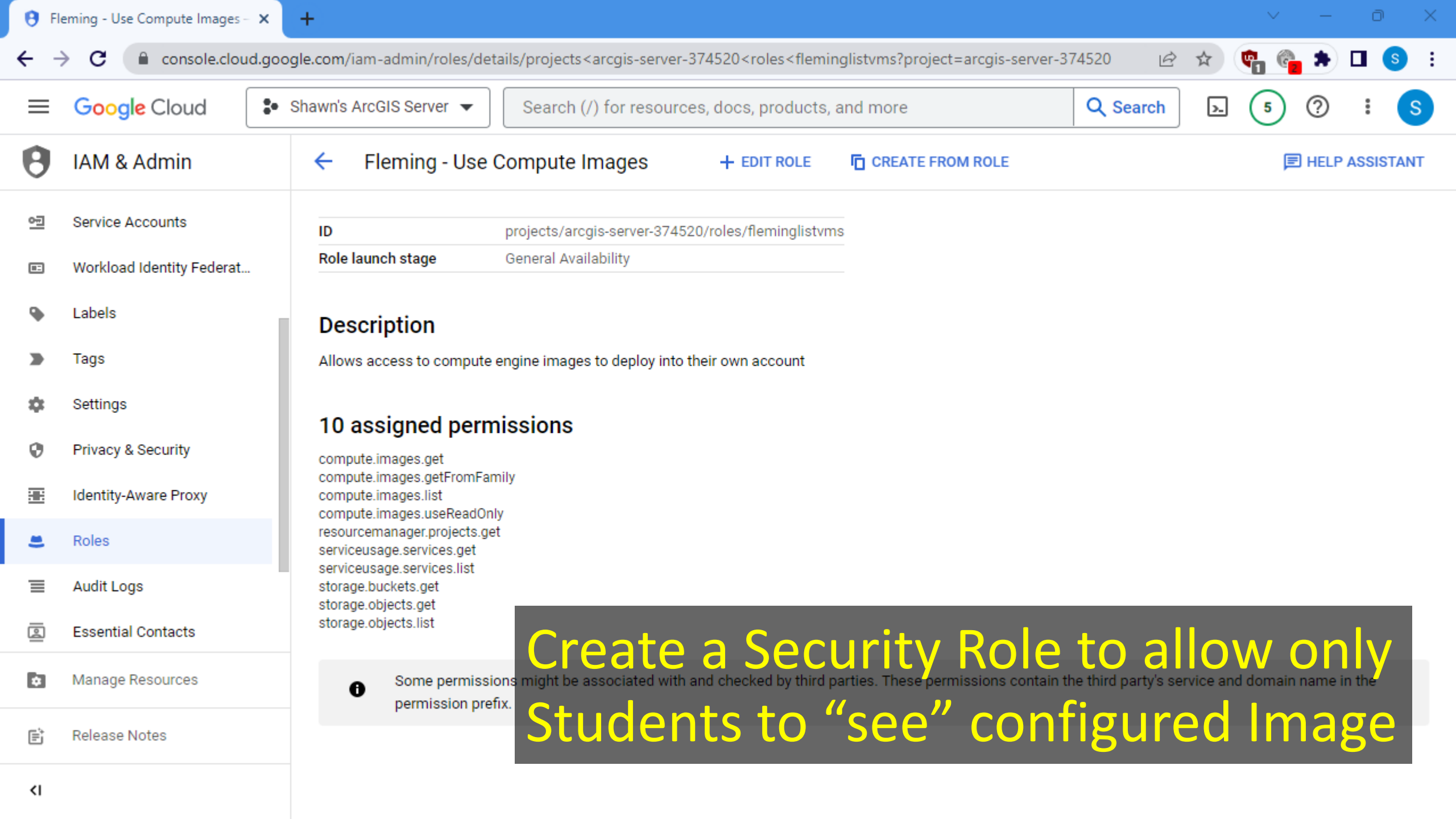
ArcGIS Services
Directory (REST)
link

Lab Exercise
Shapefile

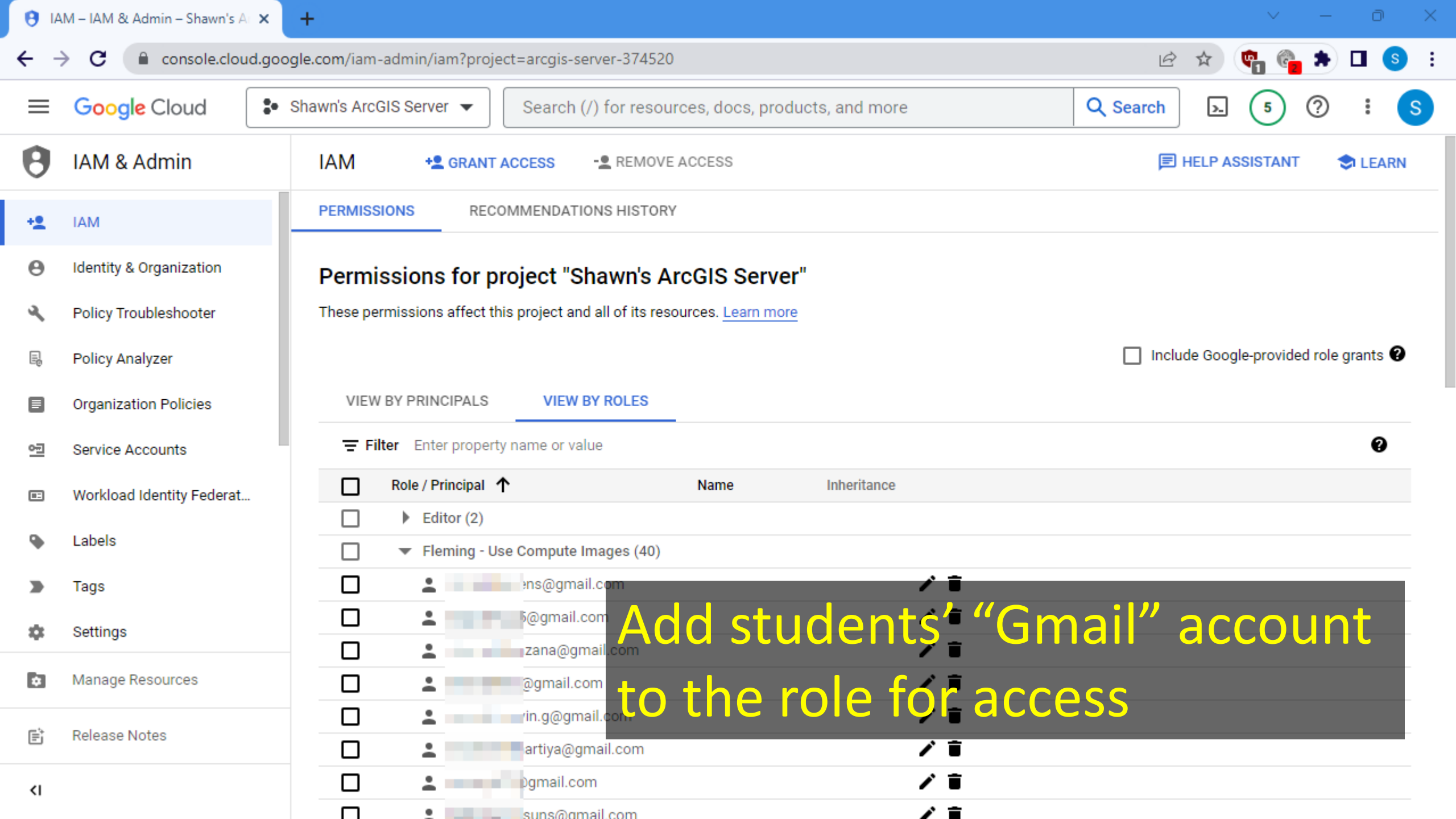




After configuring VM create image to share with students



Create a Security Role to allow only
Students to "see" configured Image



Permissions for project "Shawn's ArcGIS Server"

These permissions affect this project and all of its resources. [Learn more](#)

☐ Include Google-provided role grants

VIEW BY PRINCIPALS

VIEW BY ROLES

Filter Enter property name or value

<input type="checkbox"/>	Role / Principal	Name	Inheritance
<input type="checkbox"/>	Editor (2)		
<input type="checkbox"/>	Fleming - Use Compute Images (40)		
<input type="checkbox"/>	ens@gmail.com		
<input type="checkbox"/>	5@gmail.com		
<input type="checkbox"/>	zana@gmail.com		
<input type="checkbox"/>	@gmail.com		
<input type="checkbox"/>	in.g@gmail.com		
<input type="checkbox"/>	artiya@gmail.com		
<input type="checkbox"/>	d@gmail.com		
<input type="checkbox"/>	suns@gmail.com		

Add students' "Gmail" account to the role for access

Geom99-ArcGIS Server on GCP Creating an image and logging in on Google Cloud Platform



Contents

Getting GCP Credit and Creating your First Project.....	2
Create a GCP Project (if needed)	2
Run a GCP Virtual Machine to test ArcGIS Server.....	3
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Open ArcGIS Server REST Service directory with self-signed certificate	26

Students are provided with step-by-step instructions

Week 7 and 8: ArcGIS Server on Google Cloud Platform

☐ Start your own ArcGIS Server on GCP

Start Start using your own ArcGIS Server hosted on the Google Cloud Platform (GCP). You first will request a \$50 academic credit from google using the instructions which should cover all your use here.

- Video 1: Requesting credits (should have been completed last week): <https://youtu.be/...>
- Video 2: Creating and using the provided image: <https://youtu.be/...>
- Video 3: Using DuckDNS to create free DNS entry pointing to temporary IP address: <https://youtu.be/...>
- Video 4: Optional step to obtain SSL certificate, see recommended section of checklist!

Key Details

VM Image Username and Password Defaults:

Windows Username: `student`

Windows Password: *reset using instructions provided*

ArcGIS Server Username: `siteadmin`

ArcGIS Server Password: `...`

It's running, now what?

Now that it is running "play" with your VM, testing out different items. Just remember, once your VM is shut down it will no longer respond to requests (since it isn't listening when off!). Continue with the checklist here, as they require this service to be running to complete.

Close

Students are also provided an overview
In a LMS checklist, walk-through videos
and support during scheduled labs

Duck DNS

×

+

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→

↺

www.duckdns.org/domains

🔍

🗑️

🔗

★

🛡️2

🌐5

⚙️

📺

🔵S

⋮

Duck DNS

spec

about

why

install

faqs

logout

logged in with

Duck DNS

account

type

token

token generated

created date

success: ip address for geom99.duckdns.org updated to 35.208.149.127

domains

3/5

http://

sub domain

.duckdns.org

add domain

domain

current ip

ipv6

changed

geom99

35.208.149.127

update ip

update ip

update ip

0 years ago

delete domain

1 year ago

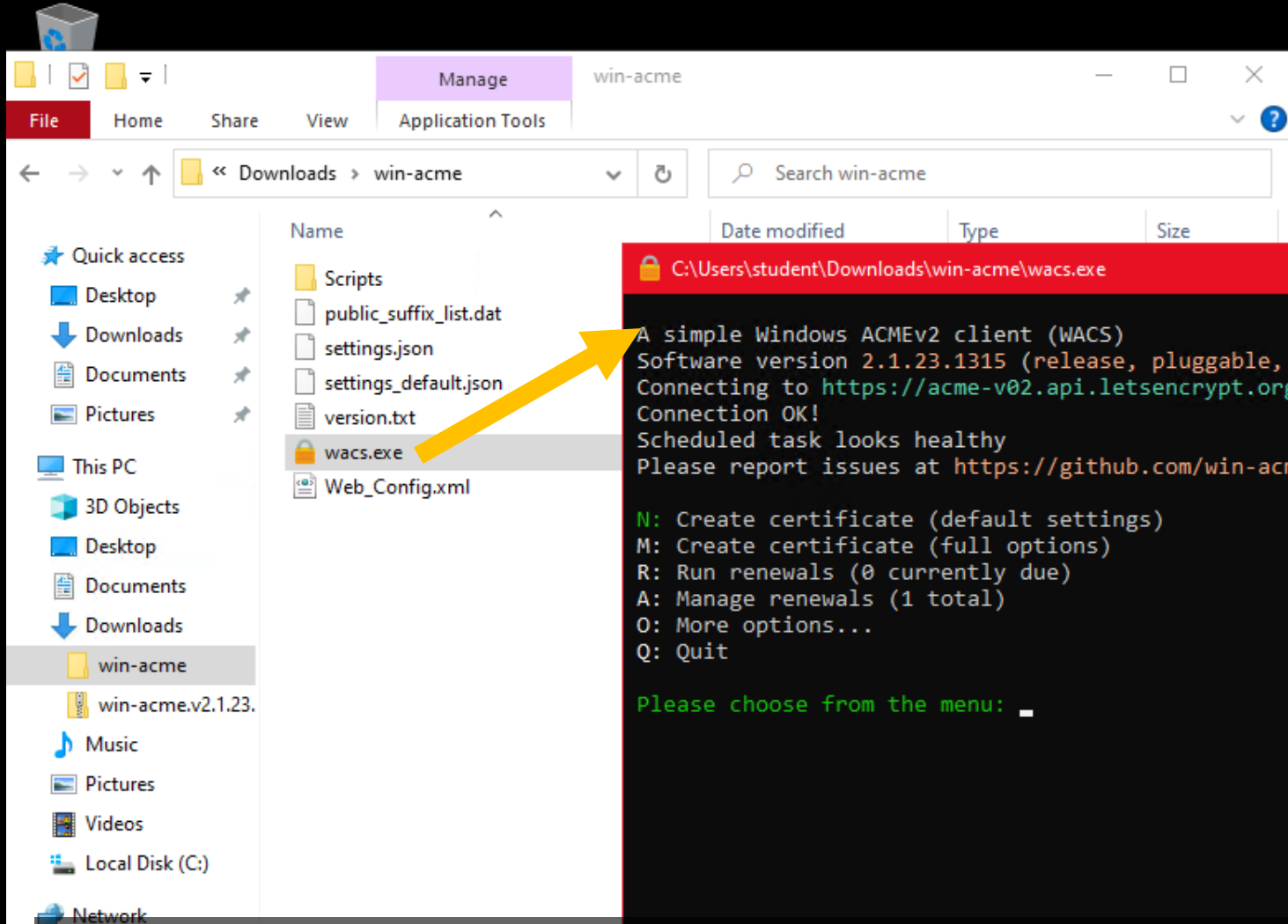
delete domain

2 years ago

delete domain

This site is protected by reCAPTCHA and the Google [Privacy Policy](#) and [Terms of Service](#) apply.

Students use DuckDNS to have domain name for dynamically-assigned IP address



Students must use LetsEncrypt to get an SSL certificate
How to video: <https://youtu.be/V2o07DMyNkc>

What Now?

- Students have their own fully-functioning live ArcGIS Server to explore
- They can publish various types of data to the server
- Use these published services in ArcGIS Online, explore all functionality and options in the publishing and maintenance
- They also experience the versatility of cloud enterprise architecture

Publishing to ArcGIS Server Walkthrough:

<https://youtu.be/nIRlZN9ECwY>



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Thank You

Resources and Links in presentation: <https://github.com/shawnmflemingc/faq/esriwebgis.md>

Shortened URL: <https://arcg.is/41jg6rj>

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