ESRI EXTERNAL

Getting Started with ArcGIS for Microsoft Planetary Computer

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Contents

1.0	Introduction	4
2.0	Configuring ArcGIS for Microsoft Planetary Computer	4
Т	ab 1 Basics	7
	Project Details	7
	Instance Details	7
	Administrator Account	7
Т	b 2 (Virtual Machine Settings)	8
	Disk Settings	8
	Networking	8
	Configure Virtual networks	8
Т	b 3 (Management Settings)	9
	Configure management options for your VM	9
3.0	Starting and Stopping the Virtual Machine	.14
3.1	Managing Your Virtual Machine	.15
3.2	Deleting the Virtual Machine	.15
3.3	Accessing the ArcGIS Pro Virtual Desktop	.15

1.0 Introduction

ArcGIS for Microsoft Planetary Computer is a new offering from Esri that brings hundreds of ready-to-use analysis tools from ArcGIS to the Microsoft Planetary Computer so users can observe and monitor the planet. ArcGIS for Microsoft Planetary Computer spins up a virtual ArcGIS Pro virtual machine on demand in the cloud that offers all the capabilities the user has licensed for ArcGIS Pro—including its raster analytics tools, geoprocessing tools, publishing tools, as well as any extensions the user has purchased.

With ArcGIS for Microsoft Planetary Computer, users can apply image processing and raster analytics tools from ArcGIS Pro to support workflows such as:

- Suitability assessment to find the best sites for conservation and agriculture
- Change detection to locate areas impacted by disasters, identify new urban development, monitor sea level changes, and update trend forecasts
- Susceptibility analysis to identify areas at risk of fires, floods, and other disasters
- Al and machine learning workflows like land cover classification and object detection

2.0 Configuring ArcGIS for Microsoft Planetary Computer

The Microsoft (MS) Planetary Computer is an Analysis platform that allows for Analysts to leverage cloud computer services and a catalog of petabytes of Earth Science data layers. To access these resources using ArcGIS, you will need to have your own Azure cloud account. Please see the Microsoft Azure documentation or technical support team if you need help setting up and configuring that account before you proceed.

Creating a New ArcGIS for Microsoft Planetary Computer Instance

a) Navigate the <u>azure marketplace</u> and search for the "ArcGIS for Microsoft Planetary Computer". This should bring you to a page with the ArcGIS for Microsoft Planetary Computer card. Click on "Get it now"



<u>Fig 2a.</u>

b) This initializes your setup – and lets you continue the process when you accept the terms of use.



<u>Fig 2b.</u>

Hit "Continue". This takes you to the ArcGIS for Microsoft Planetary Computer landing page.

c) Hit "Create" next to the ArcGIS for Planetary computer drop down selector as shown.

≡ Mic	rosoft Azure	P Search resources, services, and docs (G+/)						
Home >	Home >							
ArcGIS	ArcGIS for Microsoft Planetary Computer 🖈 …							
Esri, Inc.	Esri, Inc.							
esri	esri ArcGIS for Microsoft Planetary Computer \heartsuit Add to Favorites							
	Plan ArcGIS for Microso	ft Planetary Comp V						
Overview	Overview Plans Usage Information + Support Ratings + Reviews							
ArcGIS for	ArcGIS for Microsoft Planetary Computer spins up a virtual ArcGIS Pro virtual machine on demand in the cloud that offers all the capabilities the user has licensed for ArcGIS							
Pro—inclu	Pro—including its raster analytics tools, geoprocessing tools, publishing tools, as well as any extensions the user has purchased.							
Access pe	Access petabytes of analysis-ready geospatial data							
Query and	Query and filter the Planetary Computer data catalog by location, time, and metadata, and access analysis-ready Earth observation data from ArcGIS Pro to support a range of							
your analy	your analyses							
Eliminate	the need for infrastru	cture						
Work with	the data where it lives–	—no need to download it. Make your derived products accessible across the ArcGIS system.						
Explore G	UI-and-scripting based	d tools						
In additior	to APIs and Python no	tebooks, access powerful and intuitive no-code experience using tools and experiences within ArcGIS Pro.						
Analyze d	ata with speed and at	scale						
Speed up a	analysis such as change	e detection, time-series analysis, and deep learning. Access tools and chain together raster functions via a push button experience or APIs.						
Perform or	a-the-fly processing or a	apply it globally and persist the results.						
Share you	r results as stories, ma	aps and apps						
Share insig	hts with members of yo	our organization. Create compelling, interactive apps and use storytelling tools that translate complex analyses into approachable, easy-to-						
use web ar	nd mobile applications t	that can be accessed by the public or restricted to critical stakeholders.						
Leverage	your existing ArcGIS in	nvestment						
Maximize	your existing GIS Profes	sional user type and ArcGIS Image Analyst licenses to unlock an ArcGIS Pro virtual machine residing at the heart of the Microsoft Planetary						
Computer	Pay only for the compu	uting required to run your analysis.						

d) This will direct you to the solution template/wizard to create your new instance. Here you will see Four tabs at the top: Basics, Virtual Machine Settings, Management Settings, and Review + Create. This is the configuration sequence you will follow as you step through the template.

Home > ArcGIS for Microsoft Planetary Computer >						
Create ArcGIS for Microsoft Planetary Computer						
Basics Virtual Machine Set	tings Management Settings Review + create					
Project details						
Select the subscription to mana manage all your resources.	ge deployed resources and costs. Use resource groups like folders to	o organize and				
Subscription * ①	Imagery4AMPC_AZ	\sim				
Resource group * i	(New) test1	\checkmark				
	Create new					
Instance details						
Region * 🛈	West Europe	\checkmark				
Virtual Machine name * 🕕	vin-ampc-vm	\checkmark				
Size * 🕕	1x Standard NC8as T4 v3					
	8 vcpus, 56 GB memory					
	Change size					
Administrator account						
Username * 🛈	vinayivt	\checkmark				
Password * ①	••••••	~				
Confirm password *	••••••	✓				

<u>Fig 2d.</u>

Tab 1 Basics

Below is some additional information to help the user understand the options that are available in this configuration tab.

Project Details

Subscription

Pick the Azure subscription you would like to use for this project (VM). This is also the account that will be billed by Microsoft (for use of this instance).

Resource Group

This is usually defined by an administrator, if the account has predetermined permissions or policies. Or you can just create new, and provide a resource group (think of it like a folder)

Instance Details

Regions – This option is non-selectable. Because the Planetary Computer data catalog resides only in the West Europe Region, creating and using a Virtual Machine in the same region eliminates latency in data transfer and removes data movement charges.

Virtual Machine Name –Here's where the user names the VM. A pre-defined name is selected by default.

Size – The default (NV8as_V4) instance is an 8-core 28GB RAM, dedicated Graphics Processing Unit (GPU) instance. Some Analysis tasks may require higher level computing instances. If you prefer more compute resources, you can click "Change size" option. This selection provides a list of compatible and recommended instances for you to choose.

Administrator Account

This is a new administrator account that is needed for this virtual windows machine, and includes the credentials (username, password) you will be using to log into the virtual machine.

Home > ArcGIS for Microsoft Plane	etary Computer >						
Create ArcGIS for Mi	icrosoft Planetary Computer						
, ,							
Basics Virtual Machine Settings	Management Settings Review + create						
Project details							
Select the subscription to manage de	ployed resources and costs. Use resource groups like folders to organize and						
manage all your resources.							
Subscription * ①	Imagery4AMPC_AZ V						
	(blow) test1						
Resource group "	Create new						
Instance details							
Region * 🛈	West Europe V						
Virtual Machine name * 🕕	vin-ampc-vm 🗸						
Size * 🕕	1x Standard NC8as T4 v3						
	8 vcpus, 56 GB memory						
	Change size						
Administrator account							
Username * 🛈	vinayivt 🗸						
Password * ①	· · · · · · · · · · · · · · · · · · ·						
Confirm password *	······						
Denvious							
Previous Next Re	eview + create						



Scroll down and hit Next

Tab 2 (Virtual Machine Settings)

Disk Settings

For this portion of the template, the default settings should be adequate for most users, however, you may configure the options if needed. (At a later point through azure console users can attach their own disks)

Networking

Public IP Address (default in most cases)

Unless otherwise indicated by your organization, you should use the default setting for this option.

System administrators may want to consider restricting the inbound IPs to enhance performance. This can be done using the Azure user dashboard.

Configure Virtual networks

For this portion of the template, the default settings should be adequate for most users, in some cases however, there is some organization-specific information that needs to be entered here. In most cases, these were pre- configured by your System Administrator when your Azure account was established and is associated with the selected resource group from Tab 1, in which case you do not have to make any changes

Virtual Network – you can pick an existing network or create a new network if you have the appropriate organizational permissions.

Subnet –This is part of the virtual network configuration and should be pre-defined by your System Administrator.

Home > ArcGIS for Microsoft Planeta	ary Computer >						
Create ArcGIS for Microsoft Planetary Computer							
Basics Virtual Machine Settings	Management Settings Review + create						
Disk Settings							
Azure VMs have one operating system disks. The size of the VM determines th	disk and a temporary disk for short-term storage. You can attach additional data e type of storage you can use and the number of data disks allowed.						
OS Disk Type * 🛈	Premium SSD (locally-redundant storage)						
Virtual Machine OS Disk Size 🛈	512 ~						
Virtual Machine Data Disk Size 🕕	512 🗸						
Networking							
Define network connectivity for your vir	rtual machine by configuring network interface card (NIC) settings.						
Public IP address 🕕	(new) arcgis4mpcPublicIp						
	Create new						
Configure virtual networks							
Virtual network * 🛈	(new) arcgis4mpc-vn						
	Create new						
Subnet * 🕕	(new) subnet-1 (10.0.0/24)						
Previous Next Revi	iew + create						

<u>Fig 2f.</u>

Scroll down and hit next

Tab 3 (Management Settings)

Configure management options for your VM

A note about auto-shutdown. It is **highly recommended** that you keep this setting selected. Auto shutdown is used to make sure a user does not accidentally let an instance run longer than it should, which can lead to unwanted compute costs. Provide an email id where you would want to receive notifications about your instance

	· · · · ·							
\equiv Microsoft Azure	𝒫 Search resources, services, and docs (G+/)							
Home > ArcGIS for Microsoft Planetary Computer >								
Create ArcGIS for Microsoft Planetary Computer								
Basics Virtual Machine Settings	Management Settings Review + create							
Configure management options for you	r VM.							
Enable Automatic Updates ①								
Enable auto-shutdown 🕕								
Auto-shutdown settings								
Auto-shutdown time * 🛈	18:00							
Time zone * 🕕	(UTC) Coordinated Universal Time							
Send email notifications ①								
Email address * 🕕	vinayv@esri.com 🗸							
Previous Next Revi	ew + create							

<u>Fig 2g.</u>

Scroll down and hit the "Next: Review + create" button to move to the next template tab

Tab 4: Review + Create

This tab allows for you to see your settings, and confirm they are correct. They are automatically validated by the system for any errors.

Microsoft Azure	${\cal P}$ Search resources, services, and docs (G+/)							
ome > ArcGIS for Microsoft Plan	etary Computer >							
Create ArcGIS for Microsoft Planetary Computer								
Basics								
ubscription	Imagery4AMPC_AZ							
lesource group	test1							
legion	West Europe							
'irtual Machine name	vin-ampc-vm							
ize	Standard_NC8as_T4_v3							
Isername	vinayivt							
assword	**********							
/irtual Machine Settings								
OS Disk Type	Premium SSD (locally-redundant storage)							
'irtual Machine OS Disk Size	512							
'irtual Machine Data Disk Size	512							
ublic IP address	arcgis4mpcPublicIp							
omain name label	-							
irtual network	arcgis4mpc-vn							
ubnet	subnet-1							
ddress prefix (Subnet)	10.0.0/24							
Aanagement Settings								
uto-shutdown time	18:00							
ime zone	(UTC) Coordinated Universal Time							
mail address	vipaw@esri.com							

<u>Fig 2h.</u>

Hit the "Create" button to complete the process. It may take upto five minutes for the new virtual machine to be completed.

Once done - hit "Go to resource group"



<u>Fig 2i.</u>

This will take you to your resources for the instance.



Fig 2j.

Click on the Virtual machine (vina-ampc-vm in Figure 2k). It's the name you specified when creating the instance

There is any neight in the control of any the inter								
Showing 1 to 7 of 7 records. Show hidden types ①								
□ Name ↑↓	Туре ↑↓							
arcgis4mpc-vn	Virtual network							
arcgis4mpcPublicIp	Public IP address							
vin-ampc-vm	Virtual machine							
🗌 🛢 vin-ampc-vm-DataDisk	Disk							
🗌 🜇 vin-ampc-vm-nic	Network Interface							
🗌 🛢 vin-a <mark>m</mark> pc-vm-OSDisk	Disk							
🗌 🌍 vin-ampc-vmnsg-rdp	Network security group							

Fig 2k.

This takes you to the dashboard, where you can manage your instance, delete your instance, start your instance, connect to your instance and so on.

You can click on connect at this point (highlighted in Fig 2L. below)



<u>Fig 2L.</u>

3.0 Starting and Stopping the Virtual Machine

You can start or stop the VMs whenever you choose. Ideally, you might want to stop a machine when it is not in use to prevent incurring unwanted cost and start it up again when you would like to work. Follow these steps to start and stop your virtual machine:

- a) Navigate to your portal. <u>https://portal.azure.com/</u>
- b) Either click on the resource (as in Figure 2K) and follow steps to start your instance and remote in or click on the VM name as in Figure 3b below

← → C 🌲 portal.azure.com/#home							
	ources, services, and docs (G+/)						
Azure services							
+	!		2	۲		SQL	
Create a resource	Virtual Resource machines groups	Marketplace	Quickstart Center	App Services	Storage accounts	SQL database	
Resources Recent Favorite							
Name			Туре				
Vin-ampc-vm	vin-ampc-vm	*	Virtual	machine			
(🔊) test1		Resource group					
👤 vinayampcdem	◎ View 🕨 Start 🤇 Re	estart ···	Virtual	machine			
💓 vinayvsplanetai	displavNa : ArcGIS For MPC	- Virtual Mac	Resour	ce group			
📍 Imagery Sales 1			Subscr	iption			
(i) mub1	Resource details		Resour	ce group			
esri-ampc	Type Virtual machine		Resour	ce group			
imageryresourc	Location		Resour	ce group			
arcgis4mpc-31	West Europe		VM im	age definition			
See all	Subscription Imagery4AMPC_AZ						
	Resource group	_					

<u>Fig 3b.</u>

c) This will take you to the instance portal to manage the instance.

E Microsoft Azure	Search resources, services, and docs (0	5+/)			Þ.	G	0	» O	ନ	vina4764@esri.com ESRI (ESRIIS.ONMICROSOFT.COM)
Home > esriarcgis-4mpc-template-20230804120701 Overview > test1 >										
vin-ampc-vm ☆☆										>
✓ Search «	💋 Connect 🖒 Start 🤇 Restart	🔲 Stop 🔯 Capture 📋 Delete 🖒 Refresh	ı 🚺 Open in mo	obile 🔗 Feedback	🛃 CLI ,	/ PS				
Overview	\mathbf{A}									
Activity log										JSON View
Access control (IAM)	Resource group (<u>move</u>) : <u>test1</u>		0	perating system	: Window	vs (Windo	ws Server	2022 Dat	acenter)	
Tags	Status : Running		Si	ze	: Standar	d NC8as 1	F4 v3 (8 vo	pus, 56 G	iB memor	y)
Diagnose and solve problems	Location : West Euro	oppe	Pi	ublic IP address	: <u>137.117</u>	.176.120				
Disgnose and some problems	Subscription (move) : Imagery4	AMPC AZ	V	Irtual network/subnet	t : <u>arcgis4r</u>	mpc-vn/su	Ibnet-1			
Settings	Subscription ID : 17d6e IVa	-2C35-4C12-DUC6-3C0U898U90C1	U	ns name	: Not con	nigurea				
Networking			n	eartri state	1					
💋 Connect	Tags (<u>edit</u>) : displayN	lame : ArcGIS For MPC - Virtual Machine								
🐁 Windows Admin Center										
a Disks	Properties Monitoring Ca	pabilities (8) Recommendations Tutorials								
📮 Size	Virtual machine		a	Networking						
Ø Microsoft Defender for Cloud	Computer name	vin-ampc-vm	î	Public IP address		137.117.1	76.120 (1	Vetwork i	nterface vi	in-ampc-vm-nic)
Advisor recommendations	Operating system	Windows (Windows Server 2022 Datacenter)		Public IP address ((IPv6)					
Extensions + applications	Image publisher	esri		Private IP address		10.0.0.4				
	Image offer	arcgis-4mpc		Private IP address	(IPv6)	-				
Availability + scaling	Image plan	a4mpc-byol-31		Virtual network/su	ubnet	arcgis4m	pc-vn/sub	net-1		
Configuration	VM generation	V2		DNS name		Configure	2			
🐍 Identity	VM architecture	x64								
Properties	Agent status	Ready	-	Size		Ctandard	NC9as TA			
Cocks	Agent version	2.7.41491.1088		VCPLIe		o standard	INCO85 14	V.5		
	Host group	None		VCPUS		0				

Fig 3c.

- d) Hit "Connect", as shown in Figure 3c above. here's where you can download the remote desktop protocol (RDP) connection file to your local machine.
- e) once downloaded, you can connect to the new virtual machine by keying in your Administrator credentials that you specified when creating the instance.

3.1 Managing Your Virtual Machine

- a) Navigate to your Azure portal webpage (portal.azure.com)
- b) Select "Virtual Machines". You should now see the machine you created using the Configuration template listed.
- c) Click on the instance; a new dashboard will appear that gives you control of the virtual machine. Here you can modify settings, start the instance, delete the instance, review logs, attach disks, etc.

3.2 Deleting the Virtual Machine

When you have completed your Analysis using the ArcGIS virtual machine, you can delete your instance using the same portal dashboard where you started and connected to the machine.

3.3 Accessing the ArcGIS Pro Virtual Desktop

When you create an ArcGIS for Planetary Computer Machine and log into the account, you will see what looks like a typical windows desktop configuration. However, there are still some steps to complete before you can begin your Analysis.

a) Just like on a normal desktop machine, ArcGIS for Microsoft Planetary Computer requires an ArcGIS PrO license for the software to work. However, Users can use their existing licenses from an existing ArcGIS pro system. All license types are applicable:

single user, concurrent user, or named user license. The license level can be Basic, Standard or Advanced and can include any ArcGIS Pro extensions for additional processing such as such as Image Analyst. The type of license the user connects to this system will determine the functionality that is available for processing in this environment.

- b) The C drive configured for the virtual machine contains two folders with specialized tools and connection files designed to work with the Planetary Computer data.
 - ACSFiles This folder contains the pre-created cloud storage connection files (ACS) that identify the public datasets available at Microsoft's <u>Planetary</u> <u>Computer Data Catalog</u>, so they are visible to the users directly within the Catalog view. These are cloud region specific, so can only be used in this setting.
 - Image_Mgmt_Workflows This folder contains the raster templates needed to build mosaic datasets and analyze the data catalog files within this ArcGIS pro instance.

Note: Do not delete or rename the folders mentioned above.