Licensing ArcGIS Desktop in Cloud Environments

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ArcGIS Desktop Licensing in Cloud Environments and On-premise Hypervisors

Executive Summary

ArcGIS Desktop's license enablement technology, when used on virtual machines and in the cloud, have previously been unreliable due to the volatile nature of the hardware identifiers in cloud and virtual environments.

With the release of ArcGIS License Manager 2019.2, and further in release 2020.0, Esri is pleased to announce cloud supported license abilities. This ability to run in select cloud and on-premise hypervisor environments includes the following:

1. Named User licensing for ArcGIS Pro via ArcGIS Online
2. Single Use ArcGIS Desktop for ArcMap & ArcGIS Pro (ArcGIS License Manager not required)
3. Concurrent Use ArcGIS Desktop for ArcMap and ArcGIS Pro configured through ArcGIS License Manager.
4. Named User licensing for ArcGIS Pro via ArcGIS Enterprise (uses ArcGIS License Manager as part of the configuration).

Details regarding configuration, support, and limitations for each license type can be found in the relevant sections below.

ArcGIS Licensing Technology

ArcGIS Desktop's license enablement technology for Single Use and Concurrent Use utilize Flexera's technology to create a unique machine identifier (UMN) based on a variable set of physical hardware identifiers (e.g. boot disk serial number, primary ethernet MAC address). The UMN is used as an anchor to the single machine on which the Single Use license or Concurrent Use License Manager is enabled to "bind" the software license to the hardware. While these machine identifiers are static, and unique to each physical device, they are dynamic and variable on virtual devices. This means that Single Use and Concurrent Use licenses, when used on virtual machines in the cloud, have not been reliable due to the volatile nature of the hardware identifiers in cloud environments.

With the release of ArcGIS License Manager 2019.2, ArcGIS Desktop 10.8, and ArcGIS Pro 2.5, our licensing incorporates increased support for licensing in select cloud and on-premise hypervisor environments. (This functionality extends to ArcGIS License Manager 2020.0)

Supported Cloud Environments and On-premise Hypervisors

This ability to license ArcGIS Desktop in Cloud environments and in on-premise virtual machines includes caveats since not all cloud and virtual machines are created equally. Details regarding configuration, support, and limitations for each license type can be found in the relevant sections of this document.

The following table displays tested and supported instance types in various cloud platforms for the ArcGIS License Manager.

Operating System	Amazon EC2	Microsoft Azure	Google Cloud Services*
Windows Server 2019	✓	✓	X
Windows Server 2016	✓	✓	X
Windows Server 2012 R2	✓	✓	X
Windows 10	X	✓	X
Windows 8.1	X	✓	X
RedHat Enterprise 7u6	✓	✓	X
RedHat Enterprise 6u10	✓	✓	X
SuSE 11 update 4	X	X	X

*****Google Cloud Services and SuSE** *are not tested or supported by Esri. Subsequent information in this document will* **exclude** *references to Google Cloud Services.*

Note: It is expected that supported operating systems for ArcMap and ArcGIS Pro available within Google Cloud Services should work providing requirements for CPUs, RAM, and other conditions are met. Use of Google Cloud Services is at the users risk only.

The following table displays tested and supported on-premise virtualized hypervisor platforms:

On-Premise Hypervisor	Windows 10 x64	Windows Server 2012 R2	Windows Server 2016	Windows Server 2019	RedHat Linux Enterprise 6.10	RedHat Linux Enterprise 7.7
VMWare vSphere 6.5	✓	✓	✓	✓	✓	✓
VMWare vSphere 6.7	Untested	Untested	Untested	Untested	Untested	Untested
Microsoft Hyper-V	✓	✓	✓	✓	✓	✓
VMWare Workstation 10	Untested	Untested	Untested	Untested	Untested	Untested
VMWare Workstation 12.5	Untested	Untested	Untested	Untested	Untested	Untested
VMWare Workstation 15	Untested	Untested	Untested	Untested	Untested	Untested
Citrix XenServer	Untested	Untested	Untested	Untested	Untested	Untested
Citrix XenDesktop (7.6 LTSR CU7, 7.15 LTSR CU4)	Untested	Untested	Untested	Untested	Untested	Untested
Citrix XenApp (7.6 LTSR CU7, 7.15 LTSR CU4)	Untested	Untested	Untested	Untested	Untested	Untested
Citrix Virtual Apps & Virtual Desktop 7 1808.2	Untested	Untested	Untested	Untested	Untested	Untested
Linux KVM	X	X	X	X	X	X
Oracle MV Virtualbox	X	X	X	X	X	X

Note: It is expected that supported operating systems for ArcMap and ArcGIS Pro available within untested or Esri-unsupported on-premise hypervisors as listed above, should work providing requirements for CPUs, RAM, and other conditions are met. Use of these hypervisors is at user's risk.

For more information on cloud and virtualization support with FlexNet Publisher, please refer to the Flexera whitepaper on [understanding virtualization features in FlexNet Publisher](#).

Note: Esri's support of various cloud and on-premise virtualization environments may differ to the complete support by Flexera. Please refer to the above tables on Esri's supported cloud and on-premise virtualized environments

Named User Enablement via ArcGIS Online

The ArcGIS Online Named User license enablement is based on unique user identity, not on unique machine identifiers. The Named User Identity license enablement and management capabilities are built into ArcGIS Online. This is a key benefit of ArcGIS Online as a cloud-based system. Named Users can login into ArcGIS Online anytime, anywhere, from any supported device.

Note: ArcMap does not support the Named User enablement mode in either ArcGIS Online or ArcGIS Enterprise.

ArcGIS Pro in a Cloud Environment
License enabled by Named User in ArcGIS Online

Assign ArcGIS Pro license to Named Users in ArcGIS Online

Login

ArcGIS Pro

- License is assigned to Named User in ArcGIS Online or ArcGIS Enterprise
- Single user may login on up to 3 simultaneous devices
- License may be "taken off-line"

Single Use Enablement

Beginning with the ArcMap 10.8 and ArcGIS Pro 2.5 releases, ArcGIS product installations on cloud and on-premise hypervisor instances will function the same as physical machine installs. Actions such as rebooting an instance or cycling the power on/off will no longer break the binding of the licenses. Note that the "breaking" of licenses is where the software will not see the hardware or licensed environment as the same as the hardware originally installed and authorized to run on and therefore the software will cease to work.

The tables below show the results of typical operations performed in cloud and on-premise virtualization environments, and the resulting effect on Single Use licensing with ArcGIS Desktop products (ArcMap 10.8 and ArcGIS Pro 2.5 and newer).

Operation	Amazon AWS
Reboot instance	Licenses OK
Clone an image/create an AMI	Licenses Break
Move instance to another available zone/subnet/VPC/Region/another account*	Licenses Break

* Moving an instance requires an administrator to create another instance which breaks licensing.

Operation	Azure
Reboot instance	Licenses OK
Capture and then create a new instance //single process for cloning/copying.	Licenses Break

Operation	Hyper-V Windows
VM restart via turn-off/shutdown	Licenses OK
VM host reboot	Licenses OK
Save/start	Licenses OK
Pause/resume	Licenses OK
Reset/hard reboot (includes hard reboot if VM freezes)	Licenses OK
Checkpoint/revert to checkpoint (same as saving a snapshot)	Licenses Break
VM rename	Licenses OK
VM import/export or move VM to Hyper-V on existing or other system	Licenses Break

* Behavior confirmed with FlexNet Publisher documentation.

Operation	vSphere Windows
VM restart via turn off/shut down	Licenses OK
VM host reboot	Licenses OK
Take a snapshot and restore from a snapshot	Licenses Break
VM copy or clone	License Break
Move VM	Untested

Concurrent Use Enablement

Beginning with the release of ArcGIS License Manager 2019.2, a license manager installed on a cloud or on-premise hypervisor instance will function the same as a physical machine install. Subsequently, any ArcMap or ArcGIS Pro version installed on a cloud instance, virtual machine, or physical machine[1] will be able to connect and check out Concurrent Use licenses. The borrow of licenses is also supported with ArcMap 10.8 and ArcGIS Pro 2.5 and later[2].

The tables below show the results of typical operations performed in cloud and on-premise virtualization environments, and the resulting effect on Concurrent Use licensing with ArcGIS License Manager 2019.2 and newer.

Operation	Amazon AWS
Reboot instance	Licenses OK
Clone an image/create an AMI	Licenses Break
Move instance to another available zone/subnet/VPC/Region/another account*	Licenses Break

Moving an instance requires an administrator to create another instance which breaks licensing.

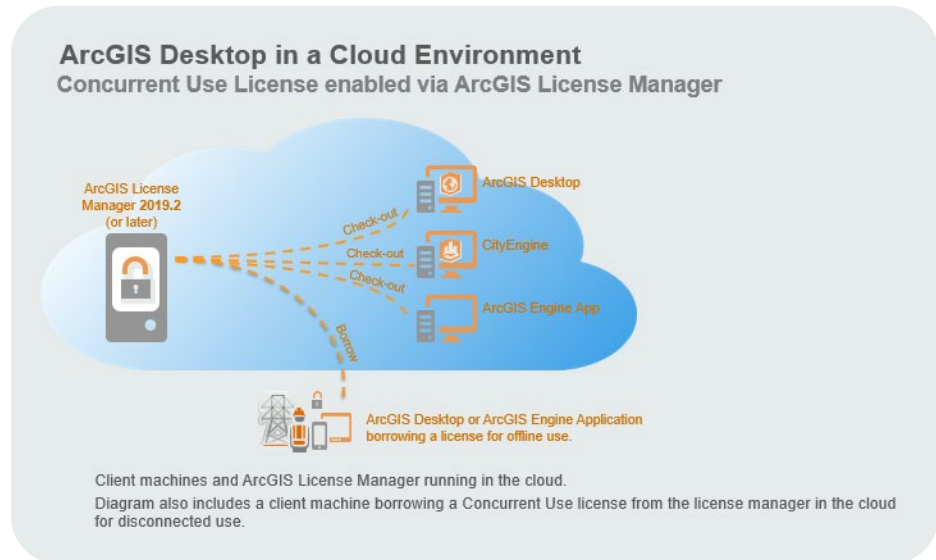| Operation	Azure
Reboot instance	Licenses OK
Capture and then create a new instance //single process for cloning/copying.	Licenses Break

Operation	Hyper-V Windows	Hyper-V RedHat Linux Enterprise
VM restart via turn-off/shutdown	Licenses OK	Licenses OK
VM host reboot	Licenses OK	Licenses OK
Save/start	Licenses OK	Licenses OK
Pause/resume	Licenses OK	Licenses OK
Reset/hard reboot (includes hard reboot if VM freezes)	Licenses OK	Licenses OK
Checkpoint/revert to checkpoint (same as saving a snapshot)	Licenses Break	Licenses OK*
VM rename	Licenses OK	Licenses OK
VM import/export or move VM to Hyper-V on existing or other system	Licenses Break	Licenses Break

Behavior confirmed with FlexNet Publisher documentation.

Operation	vSphere Windows	vSphere RedHat Linux Enterprise*
VM restart via turn off/shut down	Licenses OK	Licenses OK
VM host reboot	Licenses OK	Licenses OK
Take a snapshot and restore from a snapshot	Licenses Break	Licenses OK*
VM copy or clone	Licenses Break	Licenses Break
Move VM	Untested	Untested

Behavior confirmed with FlexNet Publisher documentation.

Note: Please refer to the appropriate cloud or hypervisor vendor's documentation for functions available and for official terminology of functions.

ArcGIS Desktop in a Cloud Environment
Concurrent Use License enabled via ArcGIS License Manager

ArcGIS License Manager 2019.2 (or later)

Check-out — ArcGIS Desktop
Check-out — CityEngine
Check-out — ArcGIS Engine App
Borrow

ArcGIS Desktop or ArcGIS Engine Application borrowing a license for offline use.

Client machines and ArcGIS License Manager running in the cloud.
Diagram also includes a client machine borrowing a Concurrent Use license from the license manager in the cloud for disconnected use.

Named User licensing of ArcGIS Desktop via ArcGIS Enterprise in the cloud

Named User Enablement for ArcGIS Pro can also be achieved on-premise via ArcGIS Enterprise 10.8 (or higher). Using ArcGIS Enterprise to manage ArcGIS Pro licenses requires you to setup ArcGIS License Manager 2020.0 (or higher) which can reside on any host within the cloud, on a virtual machine, or on a physical host[1]. This is similar to using Concurrent Use licenses, but with the added benefits of the identity model.

As with ArcGIS Online, this option works well for ArcGIS Pro, but not ArcMap which does not utilize Named User licensing. Please see the relevant documentation for ArcGIS Enterprise to learn more about configuration of ArcGIS Enterprise using an ArcGIS License Manager.

ArcGIS Pro 2.5 in a Cloud Environment
Named User License Enabled via ArcGIS Enterprise 10.8
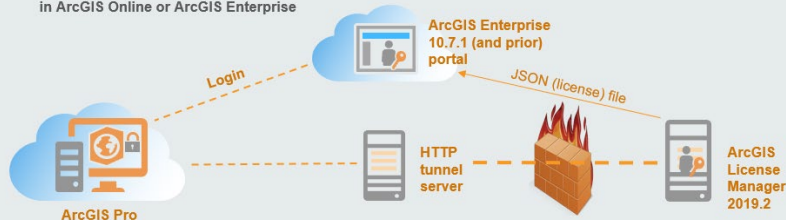& ArcGIS License Manager 2020.0
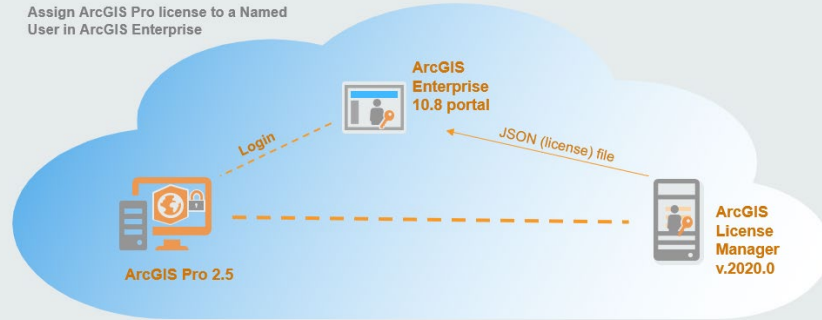
- License is assigned to Named User in ArcGIS Online or ArcGIS Enterprise
- ArcGIS Pro validates license assignment (ArcGIS Enterprise portal) and availability (ArcGIS License Manager)
- Single user may login on up to 3 simultaneous devices
- License may be used off-line for up to 30 days once authenticated through ArcGIS Enterprise portal

Note that the installed help included with ArcGIS License Manager 2019.2 is incorrect in noting how to configure a license file for Named User licensing via ArcGIS Enterprise. The document incorrectly states that Named User license files can be bound to a VM_GENID or VM_UUID. Through version 2019.2, only MAC Addresses can be used to bind the license file. Please see ArcGIS License Manager 2019.2 online [product documentation](#) for corrected instructions. ***ArcGIS License Manager 2020.0 can bind the license file using MAC Address or the recommended VM_UUID for cloud and on-premise hypervisors.***

ArcGIS Pro in a Cloud Environment
Named User License Enabled via ArcGIS Enterprise 10.7.1 (& prior)
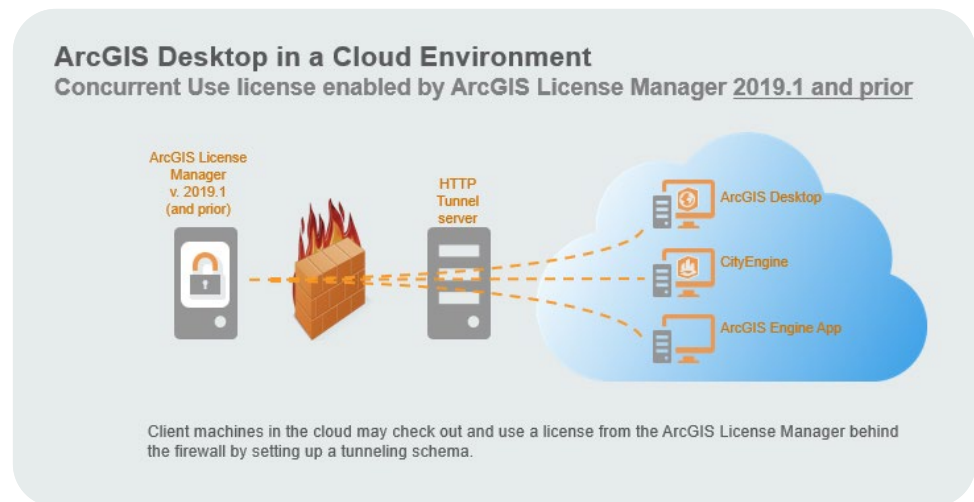& ArcGIS License Manager 2019.2 (& prior)

- License is assigned to Named User in ArcGIS Online or ArcGIS Enterprise
- ArcGIS Pro validates license assignment (ArcGIS Enterprise portal) and availability (ArcGIS License Manager)
- Single user may login on up to 3 simultaneous devices
- License may be "taken off-line"

Concurrent Use licensing for prior versions of ArcGIS Desktop in the cloud & On-premise hypervisors

Running the License Manager 2019.1 and prior in the cloud or virtual environments is not supported. However, it is possible to use ArcGIS Desktop (ArcMap and ArcGIS Pro) clients in these environments with Concurrent Use licenses.

ArcGIS License Manager 2019.1 and prior must be installed outside the cloud environment which eliminates any issues binding the licenses to the (static) machine identifiers. This setup requires the extra step of tunneling[1] from the cloud to your network through your firewall where the ArcGIS License Manger resides.

ArcGIS Desktop in a Cloud Environment
Concurrent Use license enabled by ArcGIS License Manager 2019.1 and prior

Client machines in the cloud may check out and use a license from the ArcGIS License Manager behind the firewall by setting up a tunneling schema.

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[1]*Tunneling or the opening of ports in the firewall may be required to connect to the cloud-hosted or Virtualized ArcGIS License Manager from a non-cloud-hosted client install. If you are not the network system administrator for your organization, you should consult with them about the best approach for creating such a tunnel to ensure security is maintained.*

[2]*Note: ArcGIS Pro and ArcGIS Desktop clients may have difficultly borrowing licenses from ArcGIS License Managers running in Amazon EC2. This is due to the different subnetworks that the client and server are in. Esri recommend, as a workaround, to edit the local machine hosts file to add the fully qualified domain name of the License Manager. See details in this KB article: https://support.esri.com/en/technical-article/000022982.*

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