

Operating Systems

Bring Your Own, Linux, Windows, Frame Agent Setup Tool, BYO Images on Azure, AWS, GCP, IBM and Nutanix AHV

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Operating System

Customers can deploy their applications on Frame-provided OS images if using a public cloud infrastructure or bring your own (BYO) OS images. The following table describes the options and considerations for each option.

OS Image Source	Supported Infrastructures	Considerations
Bring Your Own (BYO)	Amazon Web Services, Google Cloud Platform, IBM Cloud VPC, Microsoft Azure, and Nutanix AHV	Requires preparation and registration of image BYO Azure images can be less than the 128 GiB Microsoft Azure images (30 GiB to 2048 GiB)
Frame-provided	Amazon Web Services, Google Cloud Platform, IBM Cloud VPC, and Microsoft Azure	Do not need your own OS image at Frame account creation

In both Frame-provided and BYO OS image options, customers are responsible for [OS licensing](#), [application licensing](#), and OS and application updates.

OS Template Image Guides

Once you have confirmed that the operating system you wish to bring is in the table of [Frame-supported operating systems](#), you can consult the appropriate OS template image guide.

- [Windows OS](#)
- [Linux \(Ubuntu\) OS](#)

Bring Your Own

Organizations have the ability to “bring your own” (BYO) images on their Frame cloud account(s) as template images. Once a template image is registered on their cloud account within Frame, administrators can create Frame accounts using the template image. Before selecting a BYO image guide from the list of infrastructure providers, please carefully review the requirements and considerations listed below.

Requirements

- You have a 64-bit version of Windows or Linux operating system. 32-bit OS images are not supported.
- You have **downloaded** the latest Frame Guest Agent (FGA) Installer (Windows) or Frame Guest Agent Workload Installer (Linux).
- You are using your own infrastructure ([Amazon Web Services](#), [Google Cloud Platform](#), [Microsoft Azure](#), and [Nutanix AHV](#)).
- For AWS, Azure, and GCP, you must be using one or more of the public cloud infrastructure instance types listed in the tables [here](#).
- Set your template image timezone to **UTC**. When users start a Frame session, the workload VM will be set, by default, to the correct timezone based on the user's browser locale.
- Ensure your template image VM network adapter is configured to obtain IP address from DHCP. If the IP address is a static IP address, the workload VMs (Sandbox, Utility Servers, test and production pool instances) created from your template image will not boot correctly.

Procedure

In order to register your template image with Frame, you will need to perform the following steps:

1. **Download** the Windows Frame Guest Agent (FGA) Installer or Linux Frame Workload Installer.
2. Prepare your **Windows** or **Linux** template image using the Frame installer in your chosen infrastructure.

3. Register your template image in the appropriate Cloud Account associated with the desired Frame Customer or Organization entity.

Linux

This document will provide you with instructions on how to prepare and register your own template image for use with Frame. Before moving forward with the preparation procedure, please ensure you have read through the general requirements on the [BYO image](#) page and considerations below.

Considerations

- Create a template VM running a supported version of Ubuntu from an ISO or from the AWS, Azure, or GCP Marketplace.

Create an Ubuntu Template Image VM

The following instructions assume you have an Ubuntu 24.04 ISO image in your desired infrastructure. If you already have an Ubuntu VM you wish to use as the starting point for your template VM, then you can skip to the installation of the Frame Guest Agent.

1. Create a VM using your Ubuntu ISO (mounted as a CD-ROM). The VM should have at least 2 vCPUs, 8 GB memory, 40 GiB disk, and a network interface.
2. Power on the VM and access the VM through the console or via ssh.
3. Choose your language.

Ubuntu Installer - Language

Ubuntu Installer - Language

2. If you are informed that there is an installer update available, choose "Continue" without updating to stay on version 20.04. You can always perform the updates later in the Sandbox.

Ubuntu Installer - Update

Ubuntu Installer - Update

3. Choose your Keyboard Configuration. Choose "Done" when complete.

Ubuntu Installer - Keyboard Configuration

Ubuntu Installer - Keyboard Configuration

4. Configure your Network Connections. Choose "Done" when complete.

Ubuntu Installer - Network Connections

Ubuntu Installer - Network Connections

5. Leave the Proxy Address field blank and choose "Done" (unless the VM needs to communicate to the Internet using an outbound proxy server).

Ubuntu Installer - Proxy Server

Ubuntu Installer - Proxy Server

6. Enter in your Archive Mirror address, if you have a preferred option. Choose "Done" when complete.

Ubuntu Installer - Archive Mirror

Ubuntu Installer - Archive Mirror

6. On the Guided storage configuration page, uncheck the Set up this disk as an LVM group option, then choose "Done".

Ubuntu Installer - Guided Storage

Ubuntu Installer - Guided Storage

7. On the Storage configuration page, choose "Done".

Ubuntu Installer - Storage Configuration

Ubuntu Installer - Storage Configuration

8. Confirm the "destructive action" (wiping/formatting the hard disk).

Ubuntu Installer - Confirm Disk Formatting

Ubuntu Installer - Confirm Disk Formatting

9. Provide computer/user information.

Ubuntu Installer - Profile Setup

Ubuntu Installer - Profile Setup

1. Install OpenSSH server.

Ubuntu Installer - OpenSSH

Ubuntu Installer - OpenSSH

11. Do not install any add-ons.

Ubuntu Installer - No Add-Ons

Ubuntu Installer - No Add-Ons

12. The installation will now begin.

13. When prompted, let the security updates install.

Ubuntu Installer - Install Complete

Ubuntu Installer - Install Complete

14. Reboot when prompted.

Ubuntu Installer - Reboot

Ubuntu Installer - Reboot

15. If prompted, press Enter to eject Ubuntu installation media.

Install Frame Guest Agent

1. Download the Frame Workload Installer (Linux) to your local machine (or within the template VM) from the [Downloads page](#).
2. Unzip the Frame Workload Installer.
3. Untar the Frame Workload Installer tar file.
4. If you need to upload the Frame Workload Installer, use `winscp` to transfer the Frame Workload Installer file folder (`frame_workload_installer_linux-2.0.0` folder) to the template VM. This assumes you have installed and enabled OpenSSH in your Ubuntu VM.
5. Login to the Linux VM using account specified during installation of the operating system. In the Linux VM, `ls -al` to verify the `frame_workload_installer_linux-2.0.0` folder exists. Change directory to the folder.
6. Run `sudo bash prepare.sh`. Elevate if prompted.

Frame Guest Agent Workload Installer - prepare.sh

Frame Guest Agent Workload Installer - prepare.sh

7. Upon completion, run `sudo bash install.sh`.

Frame Guest Agent Workload Installer - install.sh

Frame Guest Agent Workload Installer - install.sh

8. Upon completion, shut down the VM.

Tag Template

You will now need to tag the template VM, image, or snapshot (depending on the infrastructure) in order for Frame control plane to be able to recognize this template image. This process is exactly the same as what is required for tagging Windows template images.

Instructions for performing tagging, by infrastructure are at:

- [AHV](#)
- [AWS](#)
- [Azure](#)
- [GCP](#)
- [IBM](#)

Register Template Image

Once you have successfully created and tagged your template image(s) in your infrastructure, you will [register your template image](#).

AWS Marketplace

If you want to use Ubuntu 24.04 from AWS Marketplace you must accept the terms of AWS Marketplace Ubuntu Image

1. Go to the **AWS Marketplace**

[image.png](#)

2. Go to "**Discover products**" and search for the <Ubuntu version> (current supported version is 24.04)

image.png

3. Select the image you want to use, scroll down to the end of the page and click on **Subscribe**

image.png

That's it, you are set to use the image from AWS Marketplace

Windows

Considerations

- OEM versions of Microsoft Windows Operating Systems may contain third-party software which can potentially cause issues and undesired side effects when used in a hypervisor. Frame strongly recommends the use of a Microsoft-provided OS image (instead of an OEM version from a third party) or an OS image provided by the public cloud provider, if you are using a public cloud.
- Before registering the template image VM to Frame, Windows sysprep will need to be run to generalize the template image VM. The sysprep step will remove your template image VM from your domain. You will need to configure your Frame account for Windows Domain Join if you wish to have domain-joined workload VMs for your users.
- During image generalization with sysprep, there are certain conditions where Microsoft Store apps (AppX packages) could cause sysprep to fail. Please reference [this Microsoft article](#) for additional details.
- If you require HTTPS traffic from your workload VMs to pass through an authenticated (or unauthenticated) proxy server to reach the Internet, you will need to:
 - Configure the Frame Guest Agent proxy settings. Frame Guest Agent supports authenticated (username/password) and unauthenticated proxy servers, provided they can handle HTTPS and Secure WebSocket traffic. Refer to our [FGA Proxy Server documentation](#) page for further details.
 - Configure your Windows proxy server settings for your end user applications.
- Create a local Windows user account with local administrator privileges, if one does not exist in your template image. Do not use the reserved Frame local Windows users (added to local Windows Administrators group) and .
- Enable Microsoft RDP in your template image before installing the Frame Guest Agent to access the template image VM. Verify you can access your template image using RDP with your local Windows administrator user.
- Verify that your template image does not have a Windows recovery partition using Windows Disk Management. A recovery partition within the template image will prevent Frame from successfully increasing the disk size of the Sandbox, Utility server(s), and persistent desktop VMs. Remove the recovery partition using Windows .

Note: Image Optimization

- Third-party image optimizers can be used to optimize the efficient operation of the Windows image during Sandbox configuration.
- Some examples of third-party image optimizers that can be used with Frame are Citrix Optimizer, Best Practice Analyzer, VMware Windows OS Optimization Tool, or the community-supported WOSTT.
- These third-party tools are used with no warranty or support. Dizzion strongly recommends you create a backup of your Sandbox before running any of these optimizer tools.

Minimum Instance Type Configuration

End user experience is highly dependent on the underlying VM resources in combination with the demands of the operating system and user applications. For Windows OS, we recommend a minimum instance type configuration of:

- 2 vCPU
- 4 GB memory
- 45 GB disk

You may need to increase the vCPU count, memory, and disk space based on your use case(s), operating system, applications, and user experience expectations.

Supported Windows versions

Frame supports the following Windows operating system versions:

- Windows 10, 1909 and higher
- Windows 11, 21H2 and higher
- Windows Server 2019, 1809 and higher
- Windows Server 2022, Windows Server 2025

Prepare your Windows Template Image

- [AHV](#)
- [AWS](#)
- [Azure](#)

- **GCP**

Important: GPU Drivers

If you plan to use AMD or NVIDIA GPU-backed instance types, only use the Frame-verified drivers listed below. Frame cannot offer support for any other driver version or combinations. The following drivers have been validated:

Driver Version Details

AHV

- NVIDIA driver version: 527.41

AWS

- NVIDIA driver version: 513.46
- AMD driver version: 20.10.25.04

{ " " }

Azure

- NVIDIA driver version: { " " } (512.78)
- AMD driver version: { " " } (21Q2-1)

GCP

- NVIDIA driver version: 513.46

Register Template Image

Once you have successfully created and tagged your template image(s) in your infrastructure, you will [register your template image](#).

Frame Sysprep Helper Tool

The Frame Sysprep Helper Tool is designed to simplify the Microsoft Sysprep process by parsing errors reported by sysprep and immediately repairing them when possible. Sysprep is executed:

1. When a Windows template image is prepared.
2. Each time an administrator publishes a Sandbox in a domain-joined Frame account.

[image.png](#)

Frame Sysprep Helper Tool

Frame Sysprep Helper can be used in two ways:

1. As a desktop application for Sysprep testing.
2. As a console app, used in scenarios where administrators want to automate sysprep error-fixing during account publishing.

If you start the Sysprep Helper Tool as a desktop application on your Sandbox and Sysprep succeeds, you must reboot your instance.

Using Sysprep Helper Tool

The Sysprep Helper Tool is included as part of Frame Tools. The executable is located in . The tool can be used instead of Microsoft-provided Sysprep.exe when attempting to automatically resolve issues during Sysprep execution.

To use the Frame Sysprep Helper Tool when publishing a DJI-enabled Frame account, add default Sysprep type key in the Windows system registry.

Key **AdvancedSysprep**

- for standard Sysprep
- for Sysprep using Sysprep Helper Tool

You can also enable/disable this setting by using the checkbox in the Sysprep Helper UI.

If the registry entry is missing or the value is , generalization during publish will run the standard Sysprep process.

Publishing Process

Sysprep is executed during a publish of persistent desktops (in non-domain-joined and domain-joined Frame accounts) and non-persistent domain-joined Frame accounts. The following PowerShell script is executed:

Sysprep script will perform various cleanup tasks and then execute a final generalization task: Sysprep.exe with appropriate arguments.

The workflow:

1. Retrieves OS information
2. Checks activation status
3. Checks antivirus status
4. Removes existing user profiles

Logging

Frame Sysprep Helper logs can be found in: `C:\ProgramData\Nutanix\Frame\Logs\Sysprep-helper.txt`

Frame Agent Setup Tool (FAST)

The Frame Agent Setup Tool (FAST) is used to install Frame Agent, Frame drivers, and Frame tools on your template image. FAST is also used to keep the Frame components on your template image(s), Sandboxes, Utility server(s), and persistent desktops up-to-date, regardless of infrastructure or instance types being used.

When using FAST to prepare a template image for use in Frame, RDP will continue to function (unlike the Frame Guest Agent Installer). Once the template image is used by Frame to provision workload VMs in a Frame account, administrators will need to enable the [RDP Debug Mode](#) feature to access Frame-managed workloads via RDP.

Before using FAST to install, update, or remove Frame components, ensure that there is a valid backup of the VM. 2. FAST is not a package repair tool. If you encounter issues with broken MSI installations, you will need to repair MSI installations manually or use 3rd party software tools.

Requirements

In order for FAST to download the required Frame components for installation or update, the VM running FAST must be able to reach the following Internet FQDNs via tcp/443 (HTTPS), as discussed in [Networking Requirements](#):

1. download.visualstudio.microsoft.com
2. downloads.console.nutanix.com

Installation

FAST is included in Frame-provided Windows OS images in public cloud. If you are using a Frame-provided image, the FAST executable will be in the ``C:\ProgramData\Nutanix\Frametools`` folder.

1. Download the Frame Agent Setup Tool from the [Downloads page](#) into your template image or existing Sandbox, Utility Server, and/or persistent desktops.
2. Run the executable to launch the Frame Agent Setup Tool.

Usage

The FAST utility has two different views: Bundle View and Updater View. When you run FAST, it will search for the Frame Guest Agent and Server components. If Frame Guest Agent cannot be found (e.g. clean Windows OS image), FAST will start in **Bundle View**. If Frame Guest Agent is already installed, FAST will start in **Updater View**.

Bundle View

When FAST is started and determines the Frame Guest Agent is not present on the VM (such as when you are preparing a template image to be used in Frame):

1. A dialog prompt will open. Accept the terms and conditions and click the “Next” button to continue.
2. Click on **Select All** for all of the packages to be installed or install specific packages by checking the associated boxes. Frame Guest Agent and Frame Server will be installed automatically. Click the **Install** button to continue.

Each package will be downloaded and then installed, one by one. See the example below:

1. When all components are installed, you may either **Exit** the Frame Agent Setup Tool to perform additional tasks in the VM or **Reboot** the VM. The VM must be rebooted for the Frame components to take effect.

Updater View

When FAST is started and determines the Frame Guest Agent is present on the VM (Sandbox, Utility server, and/or Persistent Desktops), FAST will display the Updater view.

Enable or disable the **Show Early Access Components** if you wish to see or not see the components that have an Early Access version.

Single Component Installation

To install/update an individual component, click either on the appropriate action on the right side (Download or Download and Install). You can double click the component row to view the component version number (current and latest), release notes, and link to documentation. Click on **Download and Install** to begin the download and installation process or **Cancel** to return to the component list.

Multi-Component Installation

1. Select the desired component(s) for update or installation by checking the associated checkboxes.
2. Click the toggle located at the bottom of the window to acknowledge the machine has been backed up. 3. Click the "Download" or "Download and Install" icon at the upper left corner of the FAST application window. FAST will not update the Frame Agent and Frame Server components, if they are up to date. 4. Accept the prompt by clicking ****OK****. FAST will download and install the selected components.
5. When all components are updated, you can close the Frame Agent Setup Tool.

Package Statuses

In the Updater View, FAST will display the status of each package. Definitions for each of the package status are described in the following table.

Status	Description
Up to Date	A package found on the machine is already up-to-date with the latest version.
Update Required	An installed package requires an update. Failure to update could result in system instability or compatibility conflicts.
Update Available	An installed package has an optional update. While not required, this update could improve performance or add new features.
Not Installed	An optional package is not installed.

Command-Line Usage

You may want to automate Frame Agent Setup Tool to update all components of your Frame virtual machines programmatically. In that case, Frame Agent Setup Tool can be executed with various arguments to orchestrate installation and updates. For example, if you execute on the Windows command line:

```
FrameAgentSetupTool.exe getpackages
```

FAST will list all missing or obsolete packages.

Arguments

Name	Description
<code>`/?`</code>	Display help
<code>`getpackages`</code>	Display a list of all missing/obsolete packages
<code>`getpackages json`</code>	Display a list of all missing/obsolete packages in json format
<code>`install`</code>	Install all missing/obsolete packages
<code>`install only ...`</code>	Install only provided packages
<code>`install except ...`</code>	Install all missing/obsolete packages except provided packages
<code>`install frameimage`</code>	Install all system and Frame components
<code>`install only frameimage`</code>	Install only provided applications and all Frame system components
<code>`install except frameimage`</code>	Install all available application except listed ones after installation of Frame system components

Supported Applications & Drivers

In addition to the Frame Guest Agent and Frame Server, FAST installs and updates the following drivers and tools.

Name	Description
Frame Audio Driver	Enables Frame to properly interface with the audio card on the workload VM for use in a Frame session.
Frame Video Driver	Enables Frame to properly interface with the video card on the workload VM for use in a Frame session.
Liquidware ProfileDisk	Enables support for Frame Enterprise Profiles in a Frame session (non-persistent only).
Frame Pen Driver	Enables support for digital pen tablets in a Frame session (requires supported endpoint device).

Name	Description
Frame Printer Driver	Enables support for Frame Printer in a Frame session.
Frame Scanner Driver	Enables support for WIA scanners in a Frame session (requires supported endpoint device).
Frame SmartCard Driver	Enables support for CAC/SmartCards in a Frame session (requires supported endpoint device).
Frame USB Driver	Enables support for Generic USB in a Frame session (requires supported endpoint device).
Frame AD Helper	Tool for troubleshooting issues with joining a Frame workload VM to an Active Directory domain.
Frame Proxy Helper	Tool for configuring Frame Agent to function properly with proxy servers.
Frame Sysprep Helper	Tool for troubleshooting and automatically resolving issues related to Windows Sysprep.

FGA Proxy Helper Tool

The FGA must be able to communicate with the Frame control plane in order for Frame Platform to be able to orchestrate and broker users into these workload VMs. If your workload VMs must connect to an outbound proxy server to reach the Internet, you will need to configure (or update) the FGA Proxy Settings once the Frame Guest Agent is installed (or if your outbound proxy server information changes). The proxy settings apply **only** to the Frame Guest Agent. You will need to configure the Windows proxy server settings for Windows OS and your applications separately.

The Proxy Helper tool `FrameProxyHelper.exe` is located in the Frame Tools directory

`C:\ProgramData\Nutanix\Frame\Tools`.

Server: The IP address of the outbound proxy server.

Port: The desired port on the outbound proxy server.

If your proxy server requires basic authentication, select "Use following credentials for authentication" and enter the "Username" and "Password." You can then test the settings by clicking "Start test" and save them by clicking "Save Settings".

Manual installation and repair of the Frame Agent and its components

This guide outlines the process for installing and repairing the Frame Agent and its associated system components. It is beneficial for repairing or reinstalling the Agent on Persistent Desktops, as well as upgrading Frame components on the Sandbox.

Prerequisites: ▣

Dizzion strongly advises administrators to back up before proceeding.

Solution: ▣

1. Please make sure you create a backup before starting the installation or repair process.
2. Start a session or connect via Remote Desktop Protocol (RDP) if the Frame session is unavailable.
3. Open Terminal as an administrator.
4. Navigate to the Frame Tools directory by running:

```
cd C:\ProgramData\Nutanix\Frame\Tools
```

5. Execute the installation script:

```
.\FrameAgentSetupTool.exe install frameimage
```

This process installs all required system dependencies, including Frame drivers and updated components.

6. Reboot and Validate
After installation, reboot the system and verify the installation.

Handy to know; You can re-install and re-register all FAST components by holding the left Shift Key, and then running FAST

Troubleshooting

Logs

The Frame Agent Setup Tool generates a log file for troubleshooting which is located in:
C:\ProgramData\Nutanix\Framelogs

Take a look at these and if you need further assistance, open a [support ticket](#).

BYO Images on Amazon Web Services

This document will provide you with instructions on how to prepare and register your own template image in AWS for use with Frame. Before moving forward with the preparation procedure, please ensure you have read through the general requirements and considerations on the [Windows BYO image](#) page. We will outline additional details specific to AWS public cloud below.

Considerations

The base Frame Sandbox images in AWS are based on either the “Microsoft Windows Server 2019 Base” or “Microsoft Windows Server 2022 Base” operating system from the AWS Marketplace. The Sandboxes created from these Frame-provided images have the Frame Agent pre-installed and are a great starting point for admins to create the desired user experience. This is the default deployment workflow for Frame administrators.

In some cases, the enterprise IT department may already have a disk image that has been validated by the organization. It may be easier to deploy Frame, if this image is the base image for their Frame accounts. If you chose to bring your own image, you will need to upload and register that image as an AMI in your AWS subscription prior to installing the Frame Agent.

In rare instances, customers may want to build the BYO image themselves from the base AWS Marketplace images. This is also supported if you start with the “Microsoft Windows Server 2019 Base” or “Microsoft Windows Server 2022 Base” images in the AWS Marketplace. Community and third-party AWS Marketplace AMIs have not been tested.

Preparation

1. First, starting with a Windows Server 2019 or Windows Server 2022 AMI, create a VM in the AWS account you are going to use for Frame. When configuring your image, you must use a Windows OS user account with local Windows administrator privileges.

2. Use RDP to connect into your VM. Follow the [Installation](#) and [Usage](#) instructions to download the Frame Agent Setup Tool (FAST) and install the Frame Agent, drivers, and tools in your template image VM.
3. Once FAST has successfully installed the Frame Agent, drivers, and tools, reboot the VM to complete the installation of the Frame Agent. Use RDP to connect back into your VM.

For additional installation scenarios (e.g., proxy server configuration, command line arguments, review our [Frame Agent Setup Tool](/books/platform-administrators-guide/page/windows/frame-agent-setup-tool) documentation.

4. **(Optional)**: If a proxy server is required for all outbound traffic to the Internet from your private network, you will need to configure Frame Guest Agent to use your proxy server. Refer to our [FGA Proxy Helper Tool](#) documentation page for further details.
5. **(Optional)**: If you plan to use AMD or NVIDIA GPU-based instance types in AWS, make sure you install the appropriate [AMD](#) or [NVIDIA](#) GPU drivers in your template image VM.

Important Frame-verified GPU Drivers

The following driver versions have been validated for use with Frame workload VMs. Frame cannot offer support for any other driver version or combinations.

For **AWS**, use:

- NVIDIA driver version: 552.08
- AMD driver version: 23.10.02.02

6. **(Optional)**: Install your applications and finish image customization.
7. Once you have configured the image as desired, launch the Sysprep Helper tool.
 - Select Accept all prompts during Sysprep
 - change power option from quiet to shutdown
 - Click on "**Test Sysprep**" to start the process

After the sysprep process finished successfully the vm will be powered of automatically.

8. If the VM does not shutdown, then there was a problem with sysprep. Review the sysprep logs in to determine the source of the error.
10. When sysprep is successful, the VM will automatically power off. Verify that the VM has stopped in AWS Console.

Tag AMI

11. Create an image from your AWS instance.
12. Once the image is created, navigate to the list of images/AMIs in the AWS console. Click on the AMI you created in the previous step and assign a tag with the Key name and value to the AMI.
13. Add the second tag with the Key name and the value to the AMI.

AWS Console - Add Tags

Voilà! You have successfully created a template image to be registered in Frame for use to create your Frame workloads. You may prepare additional template images (e.g., different Windows OS versions, template images with different sets of applications) by simply repeating the procedure with a new image.

Registration

Now it's time to register your template image in Frame. See how to do this in our [Cloud Accounts > Template Images](#) guide.

BYO Images on Microsoft Azure

This document will provide you with instructions on how to prepare and register your own template image in Azure for use with Frame. Before moving forward with the preparation procedure, please ensure you have read through the general requirements and considerations on the [Windows BYO image](#) page. We will outline additional details specific to Azure public cloud below.

Considerations

- When creating a new template image for Azure, we recommend you start with the Microsoft-provided Windows 10, Windows 11, Windows Server 2019, or Windows Server 2022 images. Community and third-party Azure Marketplace VMs have not been tested.
- We recommend using 1909, 20H1, 20H2, or 21H1 editions of Windows 10 Pro/Enterprise. Windows 10 Enterprise multi-session images are not supported.
- Azure Generation 1 and 2 VMs are supported. If you plan to use Windows 11 with vTPM, you must use Azure [Generation 2](#) VMs.
- Limit Azure image/snapshot name to 50 characters to avoid deployment issues in Frame.
- You may bring your own image, but the procedure below assumes you have uploaded the image to Azure and verified that a Windows VM instance built using your image operates correctly in Azure.

Image Preparation

1. First, starting with a Windows 10, Windows 11, Windows Server 2019, or Windows Server 2022 image, create a VM in the Azure account you are going to use for Frame. When configuring your image, you must use a Windows OS user account with local Windows administrator privileges. For Windows 11 with vTPM, deploy a trusted launch VM as discussed in the Microsoft documentation page [Deploy a trusted launch VM](#) before proceeding to Step 2.

2. Use RDP to connect into your VM. Follow the [Installation](#) and [Usage](#) instructions to download the Frame Agent Setup Tool (FAST) and install the Frame Agent, drivers, and tools in your template image VM.
3. Once FAST has successfully installed the Frame Agent, drivers, and tools, reboot the VM to complete the installation of the Frame Agent. Use RDP to connect back into your VM.

For additional installation scenarios (e.g., proxy server configuration, command line arguments, review our [Frame Agent Setup Tool](#) documentation.

4. **(Optional)**: If a proxy server is required for all outbound traffic to the Internet from your private network, you will need to configure Frame Guest Agent to use your proxy server. Refer to our [FGA Proxy Helper Tool](#) documentation page for further details.
5. **(Optional)**: If you plan to use AMD or NVIDIA GPU-based instance types in Azure, make sure you install the appropriate [AMD](#) or [NVIDIA](#) GPU drivers in your template image VM.

Important Frame-verified GPU Drivers

The following driver versions have been validated for use with Frame workload VMs. Frame cannot offer support for any other driver version or combinations.

For **AWS**, use:

- NVIDIA driver version: 552.08
- AMD driver version: 23.10.02.02

6. **(Optional)**: Install your applications and finish image customization.
 6. Once you have configured the image as desired, launch the Sysprep Helper tool.
 - Select Accept all prompts during Sysprep
 - change power option from quiet to shutdown
 - Click on "**Test Sysprep**" to start the process

After the sysprep process finished successfully the vm will be powered of automatically.

8. If the VM does not shutdown, then there was a problem with sysprep. Review the sysprep logs in to determine the source of the error.

10. When sysprep is successful, the VM will automatically power off. Verify that the VM has stopped in Azure Console.

Tag Snapshot

To use the template image to create VMs (e.g., Sandbox VM), you need to snapshot the VM disk you prepared and label the snapshot for Frame. Use of a snapshot eliminates the need for Azure to run sysprep again when the new VM is created from the template image.

11. Navigate to the list of disks for the Azure VM.
12. Take a snapshot of the OS disk.
13. Make sure you choose "Standard_HDD" for storage type, leave the default encryption type, and select "Public endpoint" for connectivity method.
14. Once the image is created, navigate to the list of snapshots in the Azure Portal. Click on the snapshot you created in the previous step and assign a tag with the name and the value to the snapshot.
15. Assign a second tag with the name and the value to the snapshot.

Voilà! You have successfully created a template image to be registered in Frame for use to create your Frame workloads. You may prepare additional template images (e.g., different Windows OS versions, template images with different sets of applications) by simply repeating the procedure with a new image.

Registration

Now it's time to register your template image in Frame. See how to do this in our [Cloud Accounts > Template Images](#) guide.

BYO Images on Google Cloud Platform

This document will provide you with instructions on how to prepare and register your own template image in GCP for use with Frame. Before moving forward with the preparation procedure, please ensure you have read through the general requirements and considerations on the [Windows BYO image](#) page. We will outline additional details specific to GCP public cloud below.

Considerations

- When creating a new template image for GCP, we recommend you start with “Microsoft Windows Server 2019” or “Microsoft Windows Server 2022” x64 Datacenter editions with Desktop Experience from the Google Marketplace. Community and third-party Google Marketplace images have not tested.
- You may bring your own image, but the procedure below assumes you have uploaded the image to GCP and verified that a Windows VM instance built using your image operates correctly.

Preparation

1. First, starting with a Windows Server 2019 or Windows Server 2022 image, create a VM in the GCP project you are going to use for Frame. When configuring your image, you must use a Windows OS user account with local Windows administrator privileges.
2. Use RDP to connect into your VM. Follow the [Installation](#) and [Usage](#) instructions to download the Frame Agent Setup Tool (FAST) and install the Frame Agent, drivers, and tools in your template image VM.
3. Once FAST has successfully installed the Frame Agent, drivers, and tools, reboot the VM to complete the installation of the Frame Agent. Use RDP to connect back into your VM.

For additional installation scenarios (e.g., proxy server configuration, command line arguments, review our [Frame Agent](#) [Setup Tool](#) documentation.

4. **(Optional)**: If a proxy server is required for all outbound traffic to the Internet from your private network, you will need to configure Frame Guest Agent to use your proxy server. Refer to our [FGA Proxy Helper Tool](#) documentation page for further details.
5. **(Optional)**: If you plan to use NVIDIA GPU-based instance types in GCP, make sure you install the appropriate [NVIDIA](#) GPU drivers in your template image VM.

Important Frame-verified GPU Drivers

The following driver versions have been validated for use with Frame workload VMs. Frame cannot offer support for any other driver version or combinations.

For **AWS**, use:

- NVIDIA driver version: 552.08
- AMD driver version: 23.10.02.02

6. **(Optional)**: Install your applications and finish image customization.
 6. Once you have configured the image as desired, launch the Sysprep Helper tool.

- Select Accept all prompts during Sysprep
- change power option from quiet to shutdown
- Click on "**Test Sysprep**" to start the process

After the sysprep process finished successfully the vm will be powered of automatically.

8. If the VM does not shutdown, then there was a problem with sysprep. Review the sysprep logs in to determine the source of the error.

10. When sysprep is successful, the VM will automatically power off. Verify that the VM has stopped in GCP Console.

Create Image from VM

11. Click on the name of the stopped VM to get to the properties of the VM.

12. Scroll down and locate "Boot disk", click on the VM Name link under the "Name" column.

13. On the disk's properties page, click "Create Image" and then complete the **Create an Image** form:

- **Name:** Specify the name of the image.
- **Source:** Specify the source to be **Disk**.
- **Source disk:** Confirm the source disk.
- **Location:** Select the region or regions you want this image available in.
- **Description:** Specify a description for this image.
- **Labels:** Add the labels required by Frame to recognize this image as a Frame template image.
 - Key with value
 - Key with value

14. Click **Create** to create a GCP image from your VM disk with the required Frame labels.

Voilà! You have successfully created a template image to be registered in Frame for use to create your Frame workloads. You may prepare additional template images (e.g., different Windows OS versions, template images with different sets of applications) by simply repeating the procedure with a new image.

Label Image

If you already have a GCP Windows OS image that was already prepared and sysprepped, you can simply label the image using the following procedure in Google Console and use it in Frame.

15. Navigate to the machine image in the Google console (under Storage > Images) and locate the image associated with the virtual machine you created. Check the checkbox for the image, select SHOW INFO PANEL, and click on the LABELS tab.

16. Click on "+ ADD LABEL" and fill out the required fields and assign a label of Key and value , as shown below.

17. Add a label of Key and value .

18. Click "Save" when you have completed the form.

Registration

Now it's time to register your template image in Frame. See how to do this in our [Cloud Accounts > Template Images](#) guide.

BYO Images on IBM Cloud

[Windows BYO image](#) page. We will outline additional details specific to IBM Cloud public cloud below.

Considerations
