Installing Windows 10 as a Guest Operating System in VMware Fusion

Updated: 2021 - 2022 by Michael Bauer

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Mac owners often need to run their favorite Windows applications that are not supported on macOS, or need to test a new version of Windows before upgrading their PCs. VMware Fusion is a common method to run Windows on a Mac computer. Our Technical Writer, Michael Bauer, on the Boot Camp partition, or install Windows as a Virtual Machine (VM) on VMware Fusion VM. This blog post describes the step-by-step process of installing Windows 10 as a guest operating system using VMware Fusion and combine the advantages of both Windows and macOS operating systems.

Requirements

Before proceeding with installing VMware Fusion, check system requirements. In this section, I list the requirements for VMware Fusion 12. the latest version at the time of writing this blog post. If your macOS version is older than 10.15 Catalina, install an older VMware Fusion version supported by your macOS version.

The minimum requirements for VMware Fusion 12:

- Intel-based Mac manufactured in 2011 or later (except 2012 Mac Pro Quad Core with the Intel Xeon W3500 Processor, 2010 Mac Pro Quad Core, 2010 Mac Pro Eight-Core, and Twelve Core with a graphics card that supports Metal)
- Processor LZYX architecture must be Intel x86-64
- 8 GB of memory, but we recommend at least 8 GB of memory to install VMware Fusion on macOS Catalina and macOS 11 Big Sur and 16 GB of memory to install VMware Fusion on macOS Monterey 12 running on a guest OS. Apple requires at least 16 GB of memory
- 750 MB of free disk space to install VMware Fusion and additional disk space to store virtual machine files.
- Your macOS must be compatible with the VMware Fusion version you are going to install. VMware Fusion 12 can be installed on macOS 10.15 Catalina and macOS 11 Big Sur.

VMware Fusion 12 supports the following guest OS:

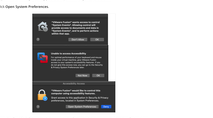
- Windows 10 **VMware.vmx.fusion12.0-dmg**

Windows 10 **vmware_10_2004_x64.iso**

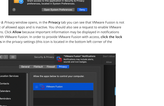
Now we are ready to start installation and configuration.

Installing VMware Fusion

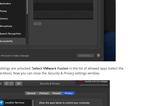
Boot macOS on your Mac. Locate the VMware Fusion installation file in Finder, and double click the file to open the installation wizard. On my case, VMware Fusion 12 Full Mac.dmg is the installer package.



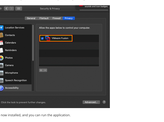
When you see the VMware Fusion installer window, double click the corresponding icon to install VMware Fusion.



Enter the credentials of your macOS user account to grant administration privileges to the installer, and click **OK** to continue.



Read the End User License Agreement (EULA), and click **Agree** to continue.



Define the location where to install VMware Fusion on macOS. If you don't have a license key, select the second option **I want to try VMware Fusion 12 Professional for 30 days**.

If you have a license key for VMware Fusion or VMware Fusion Pro, select the option **I have a license key for VMware Fusion 12 or VMware Fusion 12 Pro**. Enter the license key. The installation process begins. You can also enter a license key after finishing the installation in the graphical VMware Fusion user interface. In my case, I'm using a license key for VMware Fusion Pro.

Click **Continue** to proceed.

The macOS security notification messages pop up. You have to allow all access needed for macOS VMware Fusion to work properly.

"VMware Fusion" wants access to control "System Events". Allowing control will provide access to documents and data in the app "System Events", and to perform actions with that app.

Click **OK**.

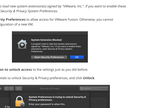
"Unable to access Accessibility. For optimal performance of your keyboard and mouse inside your virtual machine, give VMware Fusion access to your system's accessibility features. If you do not give this access now, you can do it in the Security & Privacy System Preferences.

Click **OK**.

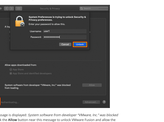
"VMware Fusion" would like to control this computer using accessibility features. Grant access to this application in Security & Privacy preferences, located in System Preferences.

Click **Open System Preferences**.

Once the Security & Privacy window opens, in the **Privacy** pan you can see that VMware Fusion is not selected in the list of allowed apps and in machine. You should also see a request to enable VMware Fusion to record your screen. Click the lock icon to make changes. Enter your macOS administrator credentials when you used with VMware Fusion in order to provide VMware Fusion with access, **click the lock to make changes** in the privacy settings title icon is located in the bottom left corner of the windows.



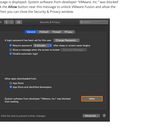
Now the privacy settings are unlocked. **Select VMware Fusion** in the list of allowed apps control the corresponding checkbox. Now you can close the Security & Privacy settings window.



VMware Fusion is now installed, and you can run the application.

Creating a VM and Installing a VM Guest OS

Open VMware Fusion in the Launchpad or click the icon in the Dock. In the main window of VMware Fusion, you can see the list of virtual machines. Click **+** to create a new VM. In the pop-up window, you are creating a virtual machine and installing a guest operating system. Open the folder containing the installation image in Finder, then drag and drop the Windows 10 ISO image to the area of the VMware Fusion window.



Create a New Virtual Machine. A new the installation wizard opens in VMware Fusion. The ISO installation image is already selected after the drag and drop.

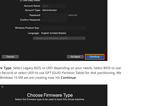
System Extension Blocked. The alert message is displayed.

A program tried to load new system extension signed by "VMware, Inc.". If you want to enable these extensions, open Security & Privacy System Preferences.

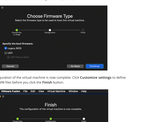
Click **Open Security Preferences** to allow access for VMware Fusion. Otherwise, you cannot continue the configuration of a new VM.

Click the lock icon to unlock access in the settings pop-up, enter credentials.

Enter your credentials to unlock Security & Privacy preferences, and click **Unlock**.



The following message is displayed. System software from developer "VMware, Inc." was blocked from loading. Click the **Allow** button near this message to unlock VMware Fusion and allow the required access. Then you close the Security & Privacy window.



Now you can go back to the VMware Fusion window and the new VM installation wizard. By default, VMware Fusion suggests using Easy Install to create a VM and install a guest operating system. Easy Install automates the installation process. However, it requires a Windows product key and it only works for the latest level of content. You can enter some settings such as a user name, password, the Windows product key, select the needed language. Then the entire process of VM creation and guest operating system installation is completed automatically by VMware Fusion.

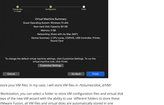
In my example, I'm not using Easy Install to fully control the VM creation and guest operating system installation process. Instead, I'm using the Customize Settings option to specify the needed options I selected **unselect the Use Easy Install checkbox**. Click **Continue**.

If you use Easy Install, then you can select one of the two provided options:

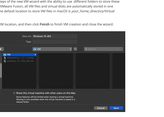
More Seamless. If you use this option, files over folders such as Desktop, Documents, and Downloads are automatically synchronized between the host and the guest operating system. VMware Tools. The Seamless option provides more convenience, including the ability to use the cmdy mode. You should use antivirus software because if a guest OS is infected, the shared files can be corrupted and the host OS can also virus. Read about vulnerabilities to learn more.

More Isolated. This option is better from the security point of view. Use Seamless are not shared between the host and guest. You can drag and drop files between the host OS and guest OS without enabling the operation.

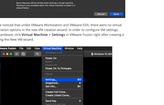
You can select one of these two options if Mac integration settings only at the step of creating a virtual machine. If you do not use Easy Install, I explain how to configure a VM created with the More Isolated option.



Choose Firmware. Select Legacy BIOS or UEFI (Apple Silicon). Legacy BIOS is the best option for MBR (Master Boot Record) or select UEFI to use GPT (GUID Partition Table) for disk partitioning. We use BIOS for our Windows 10 VM we are creating now. Hit **Continue**.



Finish. The configuration of the virtual machine is now complete. Click **Customize settings** to define the settings for the VM before you click the **Finish** button.



Select a folder to save your VM files. In my case, I set store VM files in /Volumes/vmdk_ATMM/

Note: In VMware Workstation, you can select a folder to store VM configuration files and virtual disk files at different times of the new VM wizard with the ability to use different folders to store these files. However, in VMware Fusion, all VM files and virtual disks are automatically stored in one folder by default. The default location to store VM files in macOS is /var/users/username/Virtual Machines/.

Hit **Save** to save VM location, and then click **Finish** to finish VM creation and close the wizard.

Probably you have noticed that unlike VMware Workstation and VMware ESXi, there were no virtual machine hardware options in the VMware Fusion wizard. To configure virtual hardware, open the virtual machine hardware settings, click **Virtual Machine > Settings** in VMware Fusion right after creating a new VM and closing the New VM wizard.

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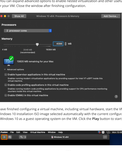
VM settings are displayed in a separate window. You can configure the virtual disk size (50 GB are recommended for Windows 10 by default), add configure processor and memory settings for our Windows 10 VM by clicking the **Processors & Memory** icon.

Select **Allow MS of memory** and **2 processor** cores for a VM in our Windows 10 (this configuration may vary). You can expand advanced options to enable nested virtualization and other useful features for your VM. Close the window after finishing configurations.



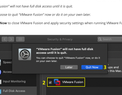
Once you have finished configuring a virtual machine, including virtual hardware, start the VM. Since we have attached the Windows 10 installation image, the machine will boot into the Windows 10 setup wizard. Follow Windows 10 as a guest operating system on the VM. Click the **Play** button to start a virtual machine.

You can see error message after an attempt to start a VM.

Could not open /dev/vmmon: Broken pipe. Please make sure that the kernel module 'vmmon' is loaded.

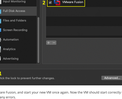
Transport (VMCI) error -7 - Fail connection has been broken.

These errors are displayed due to the security configuration of macOS. Issues related to macOS security settings require manual configuration. In order to fix this issue and avoid these errors when starting a VM, go to **Security & Privacy** settings once again. Click the **Apple** button, and click **System Preferences**.



In the Security & Privacy window, select the **Privacy** tab, then select **Full Disk access** in the left pane of the window. **Click the lock icon to unlock settings** (similarly as you did multiple times before).

Once settings become active, select the checkbox near VMware Fusion to allow full disk access for this virtualization application. If VMware Fusion is running now, a notification message is displayed.



You can choose "Quit and VMware Fusion" now or do it on your own later.

Click **Quit Now** to close VMware Fusion and apply security settings when running VMware Fusion next time.

Open VMware Fusion, and start your new VM once again. Now the VM should start correctly without displaying any errors.

Once the VM is booted from the Windows 10 installation ISO image, you should see the Windows setup GUI (graphical user interface). Installation of Windows 10 as a guest operating system on VMware Fusion is very similar to installation on a physical machine. We discovered the most interesting features from the internet and finishing the installation of Windows 10.

Select a language to install, time and currency format, and keyboard or input method. We use English (United States) in this example. Click **Next** at each step to continue.

Activate Windows. If you have bought the Windows 10 license, you can enter the product key now. If you have a license key, click **I don't have a product key**. Activation can be done later from the settings.

Select the Operating system you want to install. Select the needed Windows 10 edition. I select Windows 10 Pro for this guide.

There is a difference between Windows 10 editions and Windows 10 N or KN editions (N - Europe, KN - Korea). Microsoft was forced to remove some media-related technologies from Windows 10 editions for Europe (marked with the **N** letter. These Windows 10 N editions don't include Windows Media Player and related features, Windows 10 editions (without N in the name) include Windows Media Player, Music, Video, Voice, Video and Skype.

Windows 10 N and KN editions are provided without media technologies. You can download and install Windows Media Player and related features, Skype, and other media-related and VoIP-related features. Skype is provided after installing Windows 10 on your computer or smartphone.

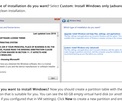
The product keys for Windows 10 Pro and Windows 10 Pro N are different (this rule is true for other Windows 10 editions, 10N editions).

Applicable notices and license terms. Read the license agreement and select the **I accept the license terms** checkbox.

Which type of installation do you want? Select **Custom: Install Windows only (advanced)** to perform a clean installation.

Where do you want to install Windows? Now you should create a partition table with the required partitions for Windows 10. Click **New** to create a new partition and accept the default size of all available space for one partition (1 MB settings). Click **New** to create a new partition and enter the partition size, then click **Apply**. Windows automatically creates the first 50 MB service partition prior to the primary partition for your data. Windows 10 requires additional service partition, and you can delete the service partition. It is especially useful when you upgrade the VMX partition disk with a limit of four partitions, but you need to use the same amount for your work without wasting one of the available partitions. However, you cannot simply select the 50 MB partition and click **Delete**.

In order to delete the 50 MB partition, first, delete your custom partition (the size of my partition is equal to Windows 10 50 GB). The name of my custom partition is Drive 2 Partition 2.



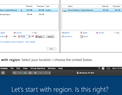
Then select the service partition (Drive 2 Partition 1, System Reserved) and click **Extend**. We extend the service partition to the maximum size (1 GB). Apply it by clicking **Apply**.

Now, we have a 50 GB primary partition and a 1 GB service partition. We can now create new partitions. Select Drive 2 Partition 2 (Primary), click **New**, and accept the default size of the new partition. Click **Apply**. Windows automatically creates the service partition.

Then select the service partition (Drive 2 Partition 1, System Reserved) and click **Extend**. We extend the service partition to the maximum size (1 GB). Apply it by clicking **Apply**.

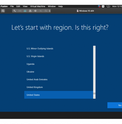
Now, we have a 50 GB primary partition and a 1 GB service partition. We can now create new partitions. Select Drive 2 Partition 2 (Primary), click **New**, and accept the default size of the new partition. Click **Apply**. Windows automatically creates the service partition.

Let's start with region. Select your location. I choose the United States.



Is this the right keyboard layout? Select the needed keyboard layout. I use the US keyboard layout for my Windows 10 installation.

Let's continue you do a second set. I disable the Internet connection until I finish Windows 10 installation and click **Don't have internet**. We can configure the internet connection and download latest updates later after finishing the installation.



There's more to discover when you connect to the internet. Windows 10 persistently asks you to enable an internet connection. However, we are not going to run on the internet until finishing installing the VMware guest operating system. Click **Continue with limited setup**.

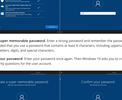
What going to use this PC? Enter a name for your PC. I have several Windows 10 performance machines, for example, user 1 like disconnected the internet and are not using the Microsoft account.

Create a user memorable password. Enter a strong password and remember the password. It is important for future logins, password recovery, encryption at least if BitLocker is installed, sensitive, financial data, digital, and special characters.

Confirm your password. Enter your password once again. Then Windows 10 asks you to create three security questions for the user account.

Choose privacy settings for your device. Disabled all settings that collect your data and send the data to Microsoft.

Let Cortana help you get things done. Select **Not now** to disable Cortana.



Windows 10 is now installed on the VMware guest operating system. You can see Windows desktop and other elements of the graphical user interface of Windows 10 in the window of VMware Fusion. Now, we are ready to install VMware Tools to improve Windows 10 higher performance and better guest OS user experience.

Installing VMware Tools

VMware Tools is a set of drivers and tools developed to improve VM performance and provide better user experience. Install the latest VMware Tools in this blog post.

While the VM is powered on and Windows 10 is running as a guest OS in VMware Fusion, click **Virtual Machine > Install VMware Tools**.

The following message is displayed: Click **Install** to connect the VMware Tools installer CD to the virtual machine.

Click **Install**.

A virtual 650 CD image is mounted in a guest OS. Open the autorun or run **setup64.exe** on a virtual CD to start the VMware Tools installer.

The installation wizard for VMware Tools opens. The welcome screen is displayed first. Hit **Next** at each step of the wizard to continue.

Choose Setup Type. Select **Typical** (the default option) that is suitable for most cases. You can customize the complete installation to install all program features of VMware Tools.

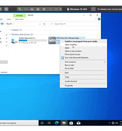
Ready to install VMware Tools. Click **Install** to start the process of VMware Tools installation.

Completed the VMware Tools Setup Wizard. You must restart your system for the VMware Tools configuration changes made to take effect. Click **Finish** to restart the VMware Windows 10 guest OS.

Configuring Shared Folders

Let's configure Shared Folders to better share files between host OS and guest OS in case we use the More Windows 10 virtual machines. Shared Folders allow you to copy files from a host OS to a guest OS and vice versa more conveniently. In addition, you can use drag and drop without the need to share files using a network connection or a USB storage device.

In VMware Fusion, go to **Virtual Machine > Settings**, then click **Sharing** to open the configuration of Shared Folders.



Select the **Enable Shared Folders** checkbox. Click + and select a folder that is accessible from your Mac and that you want to share with your Windows guest. In the bottom of the window, go to a **Shared Folders** section. Here, you can see the folder you selected. Select **Read-Only** if you want to share and provide write access in your guest Windows system.

Shared Folders are available in the Windows 10 guest OS. Open **Windows > Settings > Network and Internet > Sharing**. Click **Advanced sharing settings**. Turn on **Network discovery** and **File and printer sharing** for the current profile.

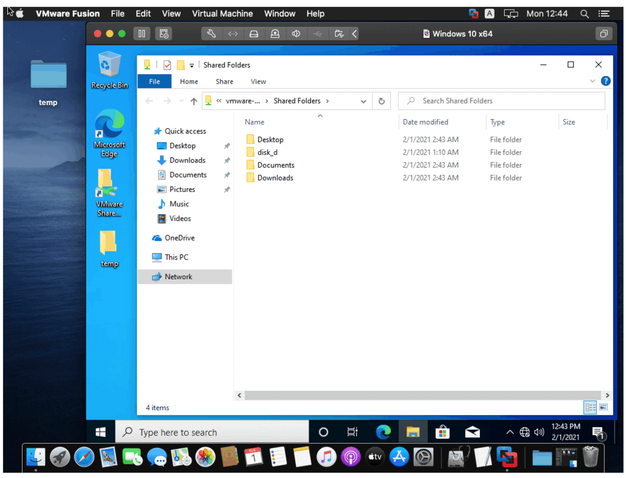
Open **This PC**. Shared folders are displayed in the **Network locations** section. Open the shared folder, and you can access files and folders. Create a new folder and a text file to check if you can write to the shared folder.

Open **Mirrored Folders** in the Windows 10 guest OS. Click **Add Shares**. Select the folder you want to share with your host OS. Enter a name for the folder. Select **Read-Only** if you don't want to share write access with the host OS.

Open **Finder** on your Mac. Go to **Shared**. Select the folder you shared from your Windows 10 guest OS. Click **Connect As...** to connect to the shared folder.

Enter your Windows 10 guest OS user name and password. Select **Remember this password in my keychain**. Click **Connect**.

Shared folder is mounted on your Mac. Open it. Create a new folder and a text file to check if you can write to the shared folder.



You can expand the guest OS window to the Full Screen mode (**View > Full Screen**) or enter the Unity mode (**View > Unity**) to see Windows 10 application windows in the macOS GUI as if you were using one common desktop environment. Suspend or shut down a VM when you want to close the VM and VMware Fusion. VMware Fusion is a powerful virtualization application. It also supports running Windows 10 installed on a Boot Camp partition as a virtual machine when you work in macOS as a host OS. VMware Fusion supports nested virtualization allowing you to run a VM inside a VM. Another advantage of VMs in VMware Fusion is the ability to copy VM files and run VMs on other Mac computers with VMware Fusion; Windows and Linux computers – with VMware Workstation or Player installed. With VM snapshots, you can test applications and roll back changes to one of the previous snapshots. You can use VMware Fusion to connect to ESXi hosts and vCenter Servers by clicking **File > Connect to Server**. VMware Fusion supports many guest operating systems, including different versions of Windows, Linux, and FreeBSD.

If you use Windows or Linux as a host OS, you can use VirtualBox or VMware Workstation to run macOS as a VM on your computer. Read another blog post to learn how to run macOS on VMware ESXi as a VM and blog posts about VMware Workstation and VMware vs VirtualBox comparison. If you run virtual machines on VMware ESXi, don't forget to back them up. To ensure comprehensive protection for your VMware vSphere VMs, download the Free Edition of NAKIVO Backup & Replication that includes licenses for 10 workloads and 5 Microsoft 365 accounts and is absolutely FREE for one year!

Conclusion

This blog post covers the installation of Windows 10 as a guest operating system running in VMware Fusion on Mac OS X. For this, you have to check system requirements, download installation images of VMware Fusion and Windows 10, install VMware Fusion, create a virtual machine, and install Windows 10 as a guest OS in VMware Fusion. If you want to use the default VM configuration for a Windows 10 VM, you can use Easy Install, which requires minimum user interaction, and automatically installs a guest OS. If you want full control over the installation process and to be able to configure everything manually, don't use Easy Install. VMware Fusion is a powerful virtualization application that provides you with a lot of configurable features.

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