

# How to Create a "Never-Run" VM Snapshot with VMware Fusion Player for Testing Automated Device Enrollment



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Whether testing Automated Enrollment workflow, app stability, or simply testing your automation scripts, it has always been Mac Admin's challenge to perform these tasks without compromising their daily driver. And yet, being able to repeatedly create and destroy your tests to confirm the correctness of your work is the key to success in managing Apple devices. Hence, it is incumbent upon all of us to become proficient in working with virtual machines. For training purpose, this article describes step by step process in creating a Big Sur virtual machine using VMware Fusion Player. Please obtain the licensed copy of VMware Fusion Pro if you intend to use this guide outside of your personal use.

#### **Requirements:**

- Serial number of a Mac computer enrolled in Apple Business Manager
- An MDM solution which supports Automated Enrollment.
- Mac computer with 16GB of Ram and minimum 100GB of free hard drive space.

#### The following was used for this guide:

- macOS Big Sur 11.3.1
- VMWare Fusion Player: https://my.vmware.com/web/vmware/evalcenter?p=fusion-player-personal



## Section 1: Download Install macOS Big Sur Full Installer App

If you have an older version of macOS running on your computer, then you may need to use an opensource tool such as installinstallmacos.py to download the installer:

https://github.com/munki/macadmin-scripts/blob/main/installinstallmacos.py

If you are currently running macOS Big Sur, then you will be able to use "softwareupdate" command in the terminal to download Install macOS Big Sur app.

1. Launch Terminal from /Applications/Utilities/ folder.



2. Type "softwareupdate --fetch-full-installer --full-installer-version 11.3.1" then press return.



Install macOS Big Sur.app will be saved in the Applications folder.



#### Section 2: Download and Install VMware Fusion Player

You first need to create VMware account before you can download the free version of Fusion Player.

1. Open Safari then launch the following web site: https://my.vmware.com/web/vmware/evalcenter?p=fusion-player-personal

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Installation & >       Licen         Configuration       Down         VMware Fusion         Use the following resources to let	nicad Troubleshooting > & Support	How to Buy >		Cookie Settings

2. Click Create an Account. Type your first name, last name, and your email address. Click Continue.





3. Fill out all information required to create VMware account.

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	Last name		G	oon									

4. After submitting, it will ask you to check your email to finish registration. Go to the email account that you register VMware with.





5. Open the email from VMware. Click Activate your VMware account.



6. Enter your password for your VMWare account and click Complete Activation.

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VMWare' CUSTOMER CONNE	ст		۲
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Password	••••••••••••••••••••••••••••••••••••••		
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7. Make note of the license keys. Click Manually download to download the dmg installer file.

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Thank you for registering for vieware i	rusion.			
four perpetual license and download ca mowledge bases and other resources,	an be found below. If you have o or contact your local authorized	uestions or need support, visit the VMware partner. Additional suppo	VMware Technology Network for product documentatio rt is also available for purchase within the VMware store	n,
License Information				
COMPONENT		LICENSE KEYS		
VMware Fusion Player – Personal Use		N523Q-2HJE7-48UJA-0UC	CAK-CU3J	
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8. Click Allow.

	Do you want to allow downloads on "my.vmware.com"?
	You can change which websites can download files in Websites Preferences.
License	
Macs)	Cancel Allow
	Manua

9. Navigate to your "Downloads" folder. Double-click VMware-Fusion-12.x.x-xxx.dmg to mount the image on your Desktop.

•••	< > Downloads	:≡≎  ~ ₼ <	2 ⊕ • Q
Favorites	Name	Size Kind	Date Added
🧑 AirDrop	VMware-Fusion-12.1.2-17964953.dmg	652.4 MB Disk Image	Today at 6:16 PM
ecents			
🙏 Applications			
Documents			
Ownloads			



10. Navigate to your Downloads folder. Double-click VMware-Fusion-12.x.x-xxx.dmg to mount the image on your Desktop.



11. Click Open button if warning appears before installation begins.



12. Enter your local admin password. Click OK.

to perform of the Applicat	one-time setup	including copying	je.
Enter your pas	sword to allow this	5.	
User Name:	David Yoon		
Password:			
		Cancel	K



13. Click Agree to proceed with the installation.

lease read and agree to these Terms & Conditions in order	r to use VMware Fusion 12.
VMWARE END USER LICENSE AGREEMENT	
PLEASE NOTE THAT THE TERMS OF THIS END USER LICE GOVERN YOUR USE OF THE SOFTWARE. REGARDLESS O	ENSE AGREEMENT SHALL F ANY TERMS THAT MAY
APPEAR DURING THE INSTALLATION OF THE SOFTWARE	
IMPORTANT-READ CAREFULLY: BY DOWNLOADING, INST	ALLING, OR USING THE
SOFTWARE, YOU (THE INDIVIDUAL OR LEGAL ENTITY) AO TERMS OF THIS END LISER LICENSE AGREEMENT ("FULLA	GREE TO BE BOUND BY THE
TO THE TERMS OF THIS EULA, YOU MUST NOT DOWNLO	AD, INSTALL, OR USE THE
SOFTWARE, AND YOU MUST DELETE OR RETURN THE UP	NUSED SOFTWARE TO THE
A REFUND OF THE LICENSE FEE, IF ANY, THAT YOU PAID	FOR THE SOFTWARE.
EVALUATION LICENSE. If You are licensing the Software for use of the Software is only permitted in a non-production period limited by the License Key. Notwithstanding any oth	or evaluation purposes, Your environment and for the ner provision in this EULA,
Save	Decline Agree

14. Enter the license keys from step 7, then click Continue.

I have a license key for VMware Fit H54AQ-CHU8Q H8HU2 001K4 3	usion 12. ₩8H5-
Need a license key?	
Buy a License Key	Get a Free License Key
Get the license for advanced features and commercial use.	Get the license for personal and non-commercial use only.
I want to try VMware Fusion 12 Pro	ofessional for 30 days.
I want to try VMware Fusion 12 Pr	ofessional for 30 days.

15. Enter your local admin password. Click OK.

Enter your pas	sword to allow this	i.	
User Name:	David Yoon		
Password:	•••••		
		Cancel	OK



16. You have successfully completed the VMware Fusion Player installation. Click Done.





## Section 3: Install macOS Big Sur virtual machine

We are going to install macOS Big Sur Virtual Machine in VMware Fusion Player using the "Install macOS Big Sur" app we downloaded from Section 1.

1. Launch VMware Fusion Player from the Applications folder.

• • •	< > Applications	≔≎		) v (
avorites	Name	∧ Date Modified	Size	Kind
AirDrop	QuickTime Player	Jan 1, 2020 at 3:00 AM	7.3 MB	Application
ecents	Reminders	Jan 1, 2020 at 3:00 AM	14.2 MB	Application
	Safari	Jan 1, 2020 at 3:00 AM	19.3 MB	Application
	> 🚞 Secure Desktop	Apr 13, 2021 at 3:01 PM		Folder
Documents	🔕 Siri	Jan 1, 2020 at 3:00 AM	2.3 MB	Application
Downloads	🌞 Slack	Yesterday at 10:22 PM	394.4 MB	Application
- Posourcos	📒 Stickies	Jan 1, 2020 at 3:00 AM	1.5 MB	Application
Resources	🚰 Stocks	Jan 1, 2020 at 3:00 AM	4.2 MB	Application
OneDrive	System Preferences	Jan 1, 2020 at 3:00 AM	2.7 MB	Application
	/ TextEdit	Jan 1, 2020 at 3:00 AM	2.6 MB	Application
Cloud	Time Machine	Jan 1, 2020 at 3:00 AM	1.2 MB	Application
iCloud Drive	🖶 TV	Jan 1, 2020 at 3:00 AM	79.6 MB	Application
	> 🔄 Utilities	Jan 1, 2020 at 3:00 AM		Folder
ocations	🛓 VLC	Dec 16, 2020 at 12:49 PM	137.2 MB	Application
ags	🛛 🔄 VMware Fusion	Mar 25, 2021 at 9:13 AM	1.25 GB	Application
Important	Voice Memos	Jan 1, 2020 at 3:00 AM	8.2 MB	Application
	Workspace ONE Intelligent Hub	Apr 13, 2021 at 2:54 PM	128.2 MB	Application

2. Click Add (+) at the top left corner. Select New.

•••+•			D B	Z
	Name	Status		



- 3. Go to the Finder.
- 4. Navigate to Applications folder, then drag Install macOS Big Sur app to Create a Virtual Machine window shown above.
- 5. Click Continue.

• • •	< > Applications	$\equiv \diamond$	₩ × Ĥ 🟈	
avorites	Name	A Date Modified	Size	Kind
🔊 AirDrop	Books	Jan 1, 2020 at 3:00 AM	85 MB	Application
Recents	Calculator	Jan 1, 2020 at 3:00 AM	5.6 MB	Application
Deekten	📅 Calendar	Jan 1, 2020 at 3:00 AM	15.2 MB	Application
Desktop	🔯 Chess	Jan 1, 2020 at 3:00 AM	7.3 MB	Application
🙏 Applications	> 🚞 Cisco	Apr 13, 2021 at 3:00 PM		Folder
Documents	CodeRunner	Apr 22, 2021 at 9:32 PM	280 MB	Application
	Contacts	Jan 1, 2020 at 3:00 AM	15.5 MB	Application
Downloads	📮 Dictionary	Jan 1, 2020 at 3:00 AM	2.8 MB	Application
Resources	FaceTime	Jan 1, 2020 at 3:00 AM	13.2 MB	Application
	Find My	Jan 1, 2020 at 3:00 AM	24 MB	Application
OneDrive	💣 Font Book	Jan 1, 2020 at 3:00 AM	7.1 MB	Application
Cloud	Google Chrome	May 8, 2021 at 12:47 AM	492.1 MB	Application
	Home	Jan 1, 2020 at 3:00 AM	5 MB	Application
	🚼 Image Capture	Jan 1, 2020 at 3:00 AM	3.2 MB	Application
ocations	🛛 💩 Install macOS Big Sur	May 11, 2021 at 7:46 PM	12.45 GB	Application
.00010113	😤 Keynote	Yesterday at 10:20 PM	700 MB	Application
lags	🗄 Launchpad	Jan 1, 2020 at 3:00 AM	703 KB	Application
	🗔 Mail	lan 1, 2020 at 3:00 AM	28.4 MB	Application





#### 6. Click Continue

Cho	ose Disc Image	Configuration	O Finish	
Choose an	operating system install	ation disc or image:		
â	Install macOS Big Sur macOS 11.0		Show in Fi	nder

7. Click Customize Settings.

The configure	Finish	now complete
The configura	ation of the virtual machine is	now complete.
Chose Disc	Configuration	Finish
or Image	comgaration	11120
	Virtual Machine Summary	,
Guest Ope	erating System macOS 11.0	
	New Hard Disk Capacity 80 G	В
	Memory 4 GB	
	Networking Share with my	Mac (NAT)
De	vice Summary 2 CPU cores, 0 Sound Card	CD/DVD, USB Controller,
To change the default virtu	al machine settings, click Cus	tomize Settings. To run the
v	Customize Settings	n.
Canaal		Go Back Einish



Save As: macOS 11.3.1
Tags:
Where: 📋 Virtual Machines 🕞 🗸
Some features will be limited when sharing a virtual machine. Sharing is only available when the virtual machine is saved in a shared folder.
Cancel
hange the default virtual machine settings, click Customize Settings. To run the

8. Rename the virtual machine to "macOS 11.3.1". Click Save.

9. Wait until Creating installation medium process is completed.

	The configu	<b>Finish</b> uration of the virtual machine i	s now complete.	
	Choose Disc or Image	Configuration	Finish	
	5	Creating installation medium a few minutes.	This may take	
			ler,	
To cł	nange the default vir	rtual machine settings, click C virtual machine now, click Fir	ustomize Settings. To run the	ł





10. Your virtual machine window will appear after the installation. Click Settings.

11. Click Processors & Memory.





- 12. Click the menu and select 4 Processor Cores.
- 13. Change the memory to minimum 8GB.
- 14. Click Show All.



15. Click Network Adapter.

iow All		macOS 11.3 Te	st: Settings		Add Device
ngs					
	×				
Sharing	Keyboard & Mouse	Processors & Memory	Display		
evices					
<u>C</u>	<u>o</u>	$\bigcirc$		28	
Hard Disk (SATA)	Hard Disk 2 (SATA)	CD/DVD (SATA)	Sound Card	USB & Bluetooth	Camera
6			Ŷ		
Encryption	Compatibility	Isolation	Advanced		
	Now All ngs Sharing evices Hard Disk (SATA) Encryption	ngs Sharing Keyboard & Mouse evices Hard Disk Part Disk 2 (SATA) Hard Disk 2 (SATA)	Isolation Instanting Isolation	Image: stating bind and stating bind and	Image: sharing     Image: sharing       Sharing     Image: sharing       Sharing     Image: sharing       Brace and Disk 2     Image: sharing       Hard Disk 2     Image: sharing       Hard Disk 2     Image: sharing       Image: sharing     Image: sharing    <

16. Deselect the checkbox to disable Connect Network Adapter.

Connect Network Adap	ter		
nis network adapter is configu	ired to use:		
Internet Sharing		The virtual machine shares the IP	address of the Mac
Share with my Mac	0	on the external network. The Mac Address Translation (NAT) for net	provides Network work traffic from
Bridged Networking		the virtual machine.	
Autodetect	0		
🔵 Wi-Fi	0		
Custom			
<ul> <li>Private to my Mac</li> </ul>	0		



			6
VIRTUAL MACHINES			
🖻 macOS 11.3.1			
	<b>macOS 11.3.1</b>	- 14.4	noto b

17. Close the Settings window then navigate to Virtual Machines Library window.

18. Launch macOS 11.3.1 virtual machine by double clicking the title. Click OK when side channel mitigation enabled prompt appears.





- 19. Wait until the virtual machine boots to recovery.

20. Choose your language then click  $\rightarrow$ .





- Image: Construction

  </t
- 21. Select Install macOS Big Sur. Click Continue.

- 22. Click Continue.
- 23. Click Agree.
- 24. Click Agree again.







25. Select Macintosh HD. Click Continue to begin the installation.

26. The installation will begin. Wait for your virtual machine to reboot.





27. After the virtual machine has restarted, you will see Select Your Country or Region window DO NOT PROCEED FURTHER!

Navigate to Virtual Machine menu and select Shut Down. Click Shut Down.

0 <b>• •</b> II E	-≪  > @ macOS 11.3.1 □
k	Fri 2:16
	Sele pipe Pipe Pipe Pipe Pipe Pipe Pipe Pipe Pipe Pipe Pipe Pipe Pipe Pipe
	Back
	Press the escape key to hear how to set up your Mac with VoiceOver.
	Press Command-Option-F5 to view accessibility options.



## Section 4: Create "Never Run" Snapshot

There are several tweaks you need to perform before creating a "Never Run" snapshot.

- 1. Navigate to Virtual Machine menu. Select Settings.
- 2. Click Network Adapter.

) 🔴 🔘 Sł	now All		macOS 11.3.1:	: Settings		Add Device
ystem Setti	ngs					
$\bigcirc$		×				
General	Sharing	Keyboard & Mouse	Processors & Memory	Display		
emovable D	evices					
		٢		<b>Y</b>		
Network Adapter	Hard Disk (SATA)	CD/DVD (SATA)	Sound Card	USB & Bluetooth	Camera	
ther						
?	6		<b>(</b>	Ô		
Startup Disk	Encryption	Compatibility	Isolation	Advanced		

- 3. Select the checkbox next to Connect Network Adapter.
- 4. Close the Settings window.

nis network adapter is conlige	irea to use:	
Internet Sharing		The virtual machine shares the IP address of the Mac
Share with my Mac	0	Address Translation (NAT) for network traffic from
Bridged Networking		the virtual machine.
Autodetect	0	
🔵 Wi-Fi	0	
Custom		
Private to my Mac	0	



- 5. Click Window menu and select Virtual Machine Library.
- 6. Right-click macOS 11.3.1, then hold the option key. You will notice that an additional menu will appear called Open Config File in Editor. Select it to launch the editor.



7. Scroll to the bottom of the code block in the editor

• • •	ग macOS 11.3.1.vmx — Edited∼
vmci0.id = "-693895361"	
monitor.phys_bits_used = "45"	
cleanShutdown = "TRUE"	
softPowerOff = "FALSE"	
usb_xhci:4.present = "TRUE"	
usb_xhci:4.deviceType = "hid"	
usb_xhci:4.port = "4"	
usb_xhci:4.parent = "-1"	
usb_xhc1:6.speed = "2"	
usb_xnc1:6.present = "IRUE"	
usb_xnc1:6.deviceType = "nub"	
usb_xhciif_parent = " 1"	
usb $xhci = 7$ speed = "4"	
usb vhci:7. present - "TRUF"	
ush xhci:7.deviceType = "hub"	
usb xhci:7.port = "7"	
usb xhci:7.parent = "-1"	
ehci:0.present = "TRUE"	
ehci:0.deviceType = "video"	
ehci:0.port = "0"	
ehci:0.parent = "-1"	
toolsInstallManager.updateCounter = "5"	,
usb:1.speed = "2"	
usb:1.present = "TRUE"	
<pre>usb:1.deviceType = "hub"</pre>	
isb:1.port = "1"	
usp:1.parent = "-1"	
satav:1.startconnected = "FALSE"	



- 8. For the next step, you will need a serial number of a Mac computer that is enrolled into Apple Business Manager.
- 9. Insert the following strings into the bottom of the code block:

hw.model = "MacBookPro11,4" serialNumber = "YOURSERIALNUMBER"



NOTE: hw.model can be changed to reflect your own Mac computer you are using. You can run the following commands in the terminal to get the right information: sysctl hw.model



Make sure to save (Command + Q) before existing the editor.



• • • •			6
VIRTUAL M	ACHINES		
a macOS	11.3.1		
	Start Up		
	Settings		
	Snapshots		
	Get Info		
	Show Windows		
	Open Latest Log File		
	Rename		
	Delete		

10. Navigate to Virtual Machine Library window. Right-click macOS 11.3.1 and select Snapshots.

11. Right click the Current State icon and select Take Snapshot.





- 12. Change the name to Never Run.
- 13. Click Take.

) 🕘 🕘 🖸 🛵		macOS 11.3.1: Snapshots	
	14	Click here to add notes	
		Powered off Cancel Take	
		Powered off	
?		0 snapshots, 0 bytes used	

21. Close the macOS 11.3.1: Snapshots window.



You have sucessfully created "Never Run" snapshot of macOS Big Sur 11.3.1.



#### Section 5: Test Your Automated Enrollment

If the serial number you used in Section 5 is not enrolled in Apple Business Manager, then the virtual machine will go through the normal setup process upon boot. However, if a serial number you used is from a Mac enrolled in Apple Business Manager, then the virtual machine will go through the Automated Enrollment process upon boot.

1. Navigate to Virtual Machine Library window.



• • • + ·		$\triangleright$	Ð	Z
VIRTUAL MACHINES				
macOS 11.3.1				
				-
	macOS 11.3.1	Add a	note he	ere
	macUS 11.0			

3. You should be able to go through the setup process and land on the Desktop.





- 4. To revert to the Never Run snapshot, navigate to Virtual Machine Library window.
- 5. Right-click macOS 11.3.1 and select Snapshots.



6. Right click Never Run snapshot and select Restore Snapshot.

••• • •	Ĩ	macOS 11.3.1: Snapshots	C
		Restore Snapshot	
		Never-Run Get Info	
		Today at 7:02 PM	
		Current State Powered off	
?		1 of 1 selected, 27.9 GB used	



7. When prompted to save the current state before restoring to the Never Run snapshot, you may choose "Don't Save" to discard any changes that may have occurred during the current session.



You have successfully restored your snapshot to Never Run state.

NOTE: If you have a different serial number that is assigned to another MDM (Dev or UAT environment), You can revisit step 14 of section 5 to inject different serial number after restoring the snapshot back to Never Run state.

```
....
                                                            a macOS 11.3.1.vmx — Edited
usb_xhci:6.deviceType = "hub"
usb_xhci:6.port = "6"
usb_xhci:6.parent = "-1"
usb_xhci:7.speed = "4"
usb_xhci:7.present = "TRUE"
usb_xhci:7.deviceType = "hub"
usb_xhci:7.port = "7"
usb_xhci:7.parent = "-1"
ehci:0.present = "TRUE"
ehci:0.doviceT
ehci:0.deviceType = "video"
ehci:0.port = "0"
ehci:0.parent = "-1"
toolsInstallManager.updateCounter = "5"
usb:1.speed = "2"
usb:1.present = "TRUE"
usb:1.deviceType = "hub"
usb:1.port = "1"
usb:1.parent = "-1"
sata0:1.startConnected = "FALSE"
hw.model = "MacBookPro11,4"
board-id = "Mac-06F11FD93F0323C5"
serialNumber = "DIFFERENTSERIAL"
```

If you'd like help implementing the solution in this white paper, we are ready to help; contact us at info@hcsonline.com or (866) 518-9672.

If you have corrections please send them to info@hcsonline.com. For more white papers, visit https://hcsonline.com/support/white-papers. For more information about HCS, visit https://hcsonline.com.