

CREATING A VIRTUAL HOME LAB

AYODELE SONUGA

Virtualization Guide: Windows 11 & Windows Server 2022 on Apple Silicon (M1/M2/M3/M4)

Tools: UTM, Windows 11 ARM, Windows Server 2022 x64

1. Introduction & Prerequisites

This document provides a step-by-step walkthrough on setting up a virtualized lab environment on an Apple (M1/M2/M3/M4) chip.

Prerequisites:

- **Hardware:** Mac with (M1/M2/M3/M4) Chip (8GB RAM Minimum, 16GB Recommended).
- **Software:** UTM (Virtualization Software).
- **Images (ISOs):** * Windows 11 ARM64 ISO.
 - Windows Server 2022 x64 ISO.
 - SPICE Guest Tools (Drivers).

2. Installing the UTM Engine

1. What is UTM?

- UTM is a full featured system emulator and virtual machine host for iOS and macOS. It is based on QEMU. In short, it allows you to run Windows, Linux, and more on your Mac, iPhone, and iPad.

2. Visit mac.getutm.app.

3. Click **Download** to get the .dmg installer.



4. Open the .dmg from your “Download Folder” and drag **UTM** into your **Applications** folder.

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3. Creating the Windows 11 VM (Virtualization)

1. Visit <https://www.microsoft.com/en-us/software-download/windows11arm64>
2. Use dropdown arrow on “Select Download” → “Windows 11(Multi-edition ISO for Arm64)”.
3. Click on “Download Now”

A screenshot of the Microsoft download page for Windows 11. The top navigation bar includes 'Software Download', 'Windows', and 'Windows Insider Preview'. Below the navigation is a large blue header with the text 'Download Windows 11 for Arm-based PCs' and '(Current release: Windows 11 2025 Update | Version 25H2)'. A sub-header below it says 'Before installing, check the Windows release information status for known issues that may affect your device. If you're running a prior version of Windows, see the Upgrade to Windows 11 FAQ for additional information.' To the right of the main content area is a small image of a laptop displaying the Windows 11 desktop.

Download Windows 11 Disk Image (ISO) for Arm-based PCs

This option is for users that want to create a Windows 11 on Arm virtual machine on supported hardware using an ISO file or to install Windows 11 on Arm directly without a DVD or USB flash drive. The ISO file can also be used to manually create bootable installation media (USB flash drive) to install Windows 11 on Arm, but it may be necessary to include drivers from the device manufacturer for the installation media to be successfully bootable. This download is a multi-edition ISO which uses your product key to unlock the correct edition.

[Learn more](#) about using Windows 11 on Arm installation media.

✓ Select Download
[Windows 11 \(multi-edition ISO for Arm64\)](#)



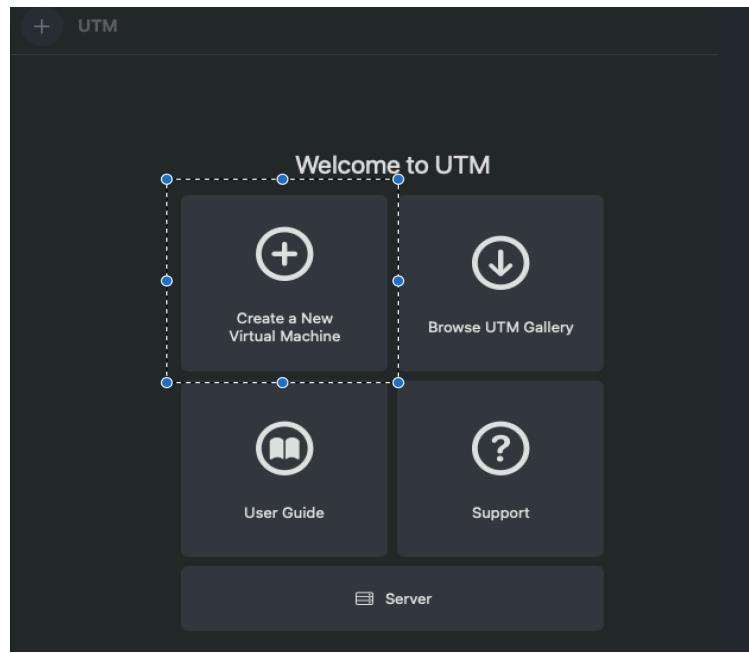
› Before you begin downloading an ISO

[Download Now](#)

4. Open UTM and click **Create a New VM**.

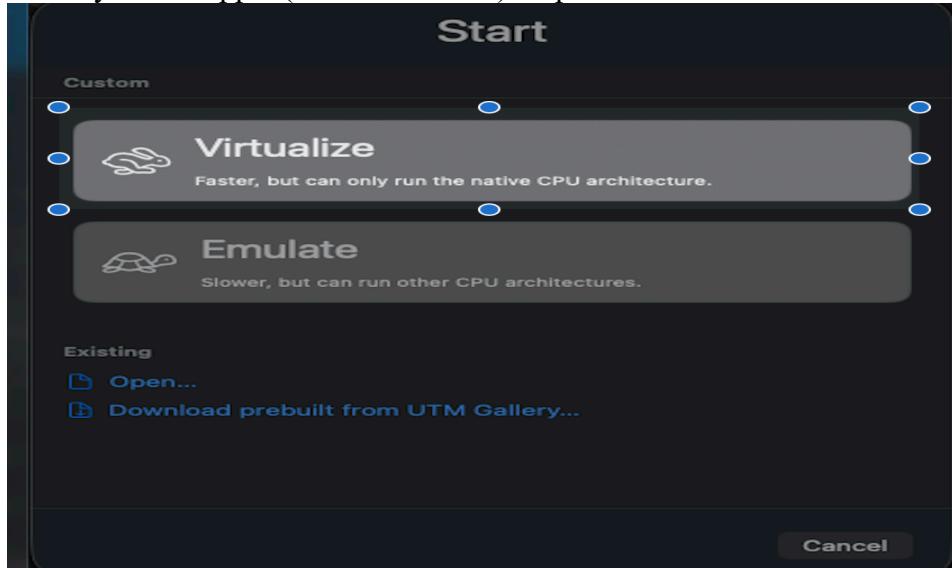
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- 5. Select **Virtualize > Windows**.

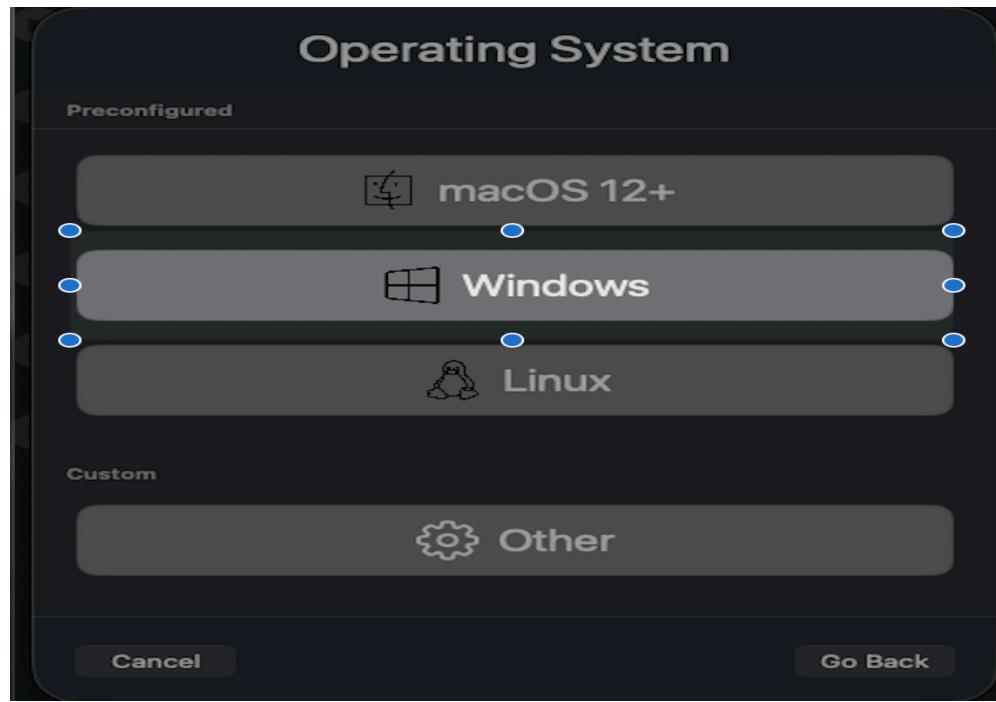
Note: We use "Virtualization" for Windows 11 because it supports ARM64 natively on an Apple (M1/M2/M3/M4) chip.



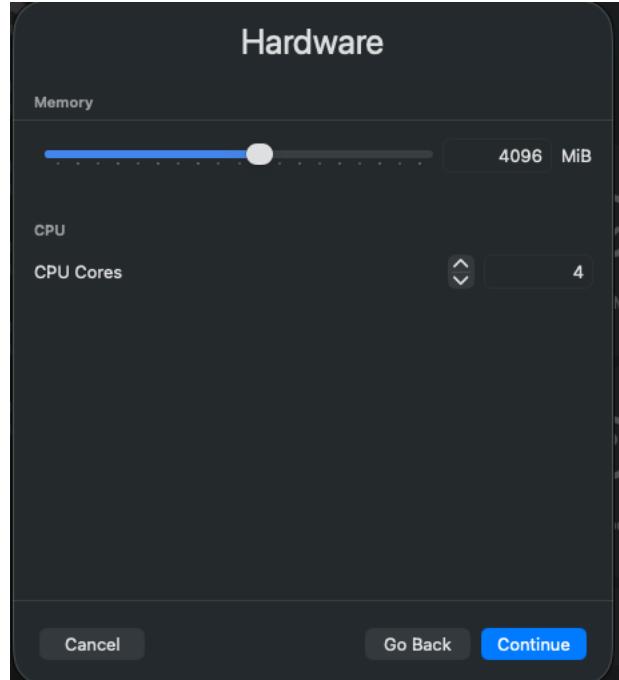
- 6. Select “Windows” as your operating system.

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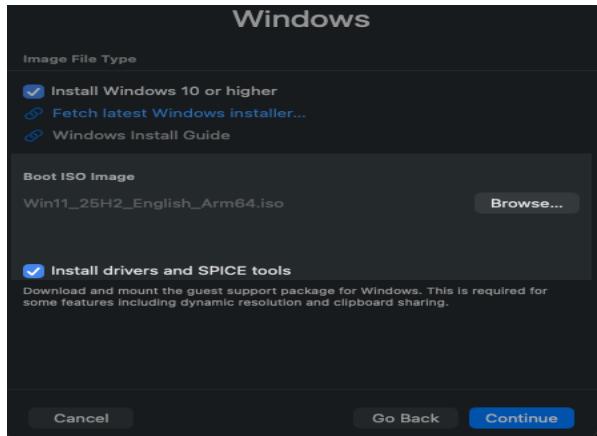
- Set RAM to 4096MB and CPU Cores to 4.



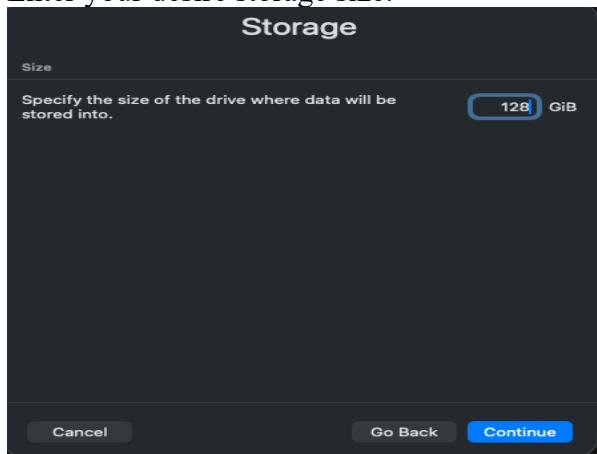
- Browse for your Windows 11 ARM64 ISO.
- Check "Install drivers and SPICE tools"

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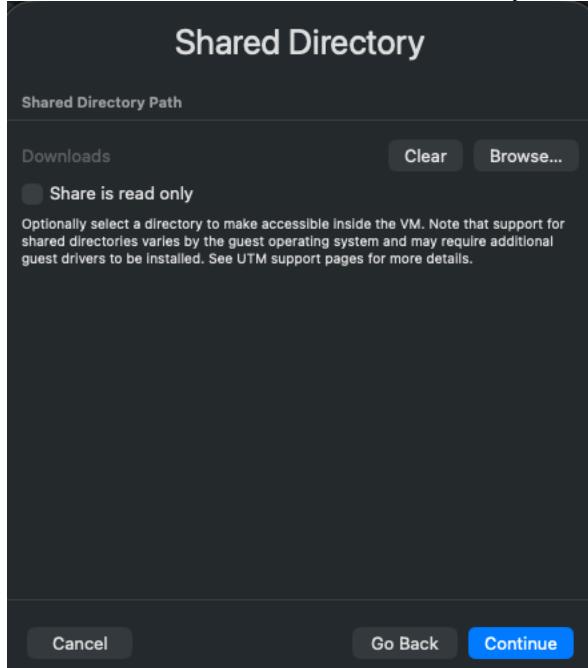
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10. Enter your desire storage size.



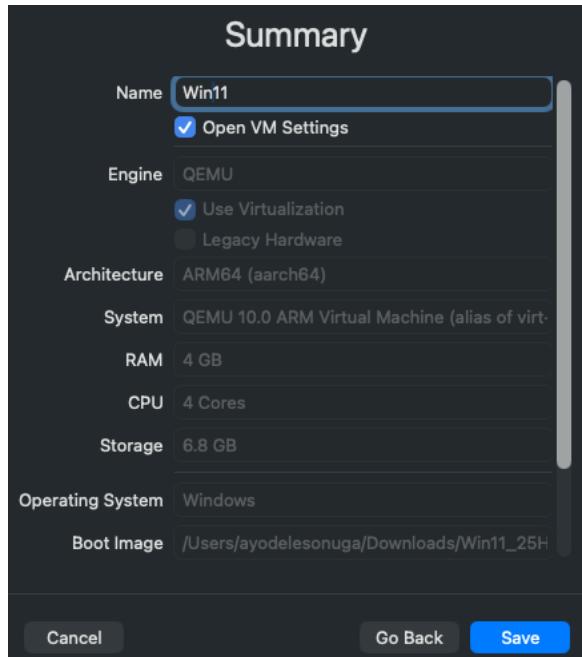
11. **OPTIONAL:** Choose a shared directory for the host machine with the VM.



12. In "Summary Tab" Rename your VM & check box "Open VM Settings"

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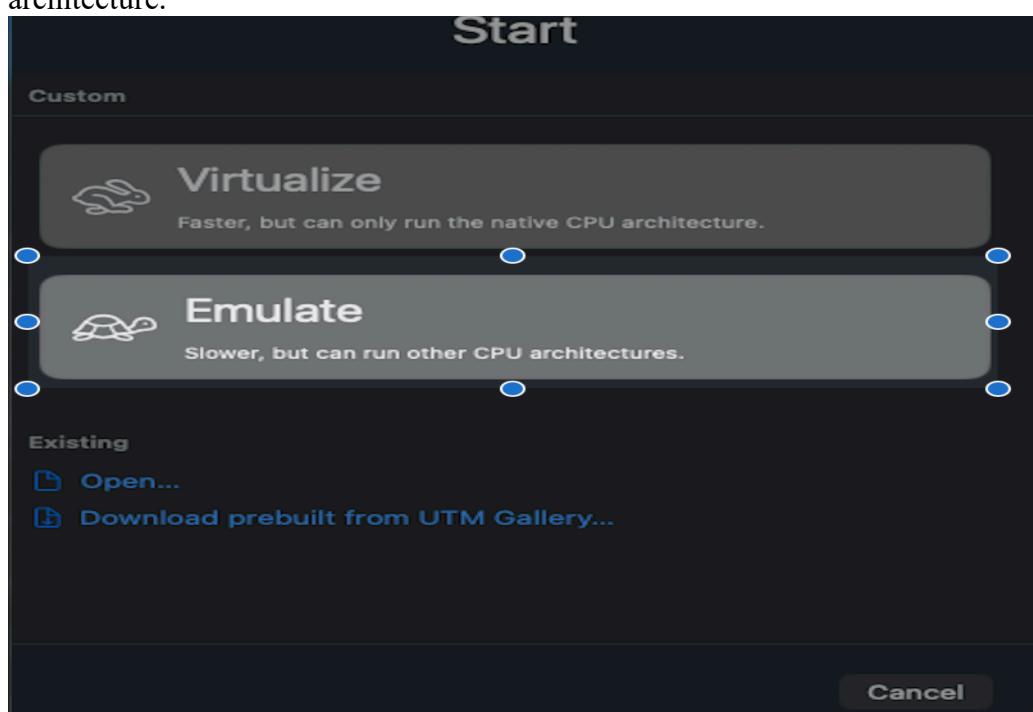


13. Click **Save** and start the VM.

4. Creating Windows Server 2022 (Emulation)

1. Visit <https://www.microsoft.com/en-us/evalcenter/download-windows-server-2022>
2. Click on ISO download “64-bit edition”
3. Click **Create a New VM > Emulate**.

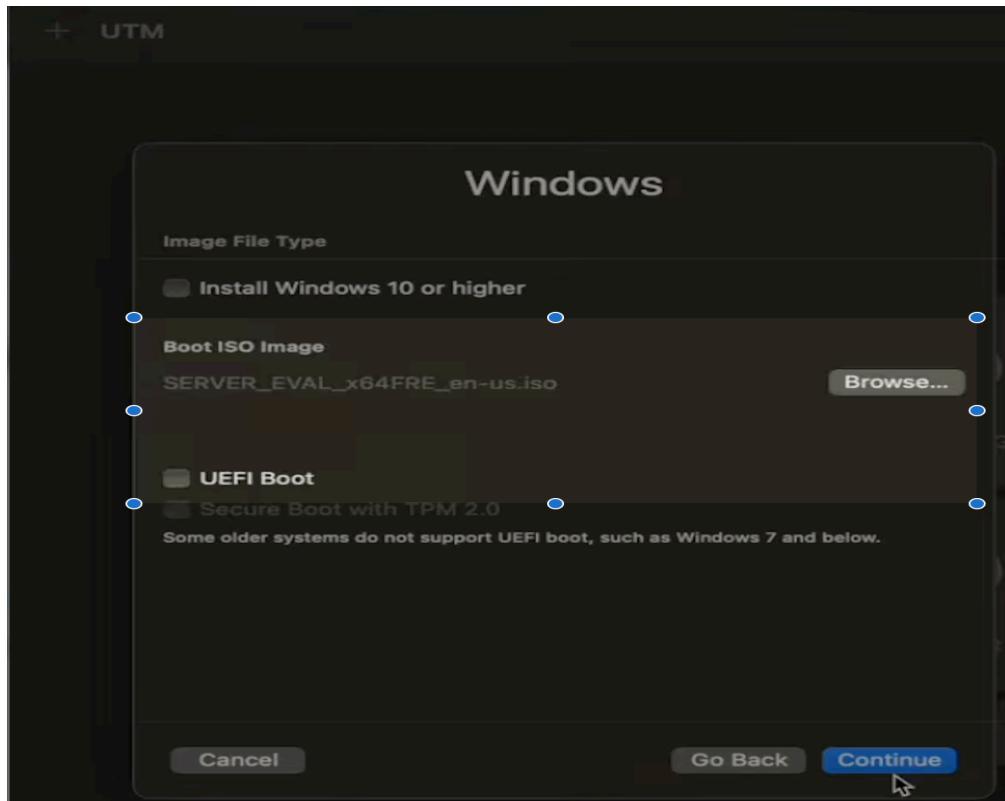
Note: Windows Server 2022 requires "Emulation" because it runs on x86_64 architecture.



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4. Select Windows and browse for the Server 2022 x64 ISO and **uncheck** “UEFI Boot”

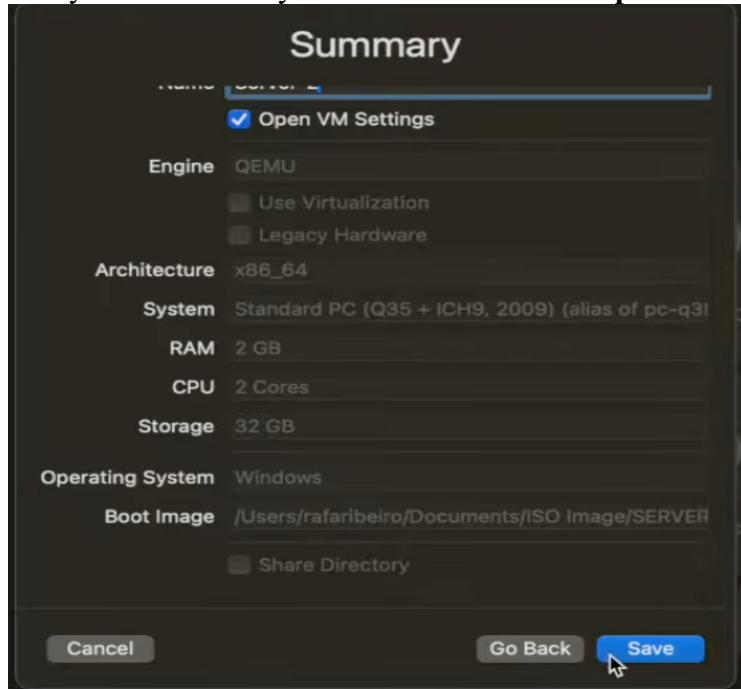


5. Under System, ensure Architecture is set to x86_64.
6. Set RAM to 4096MB.

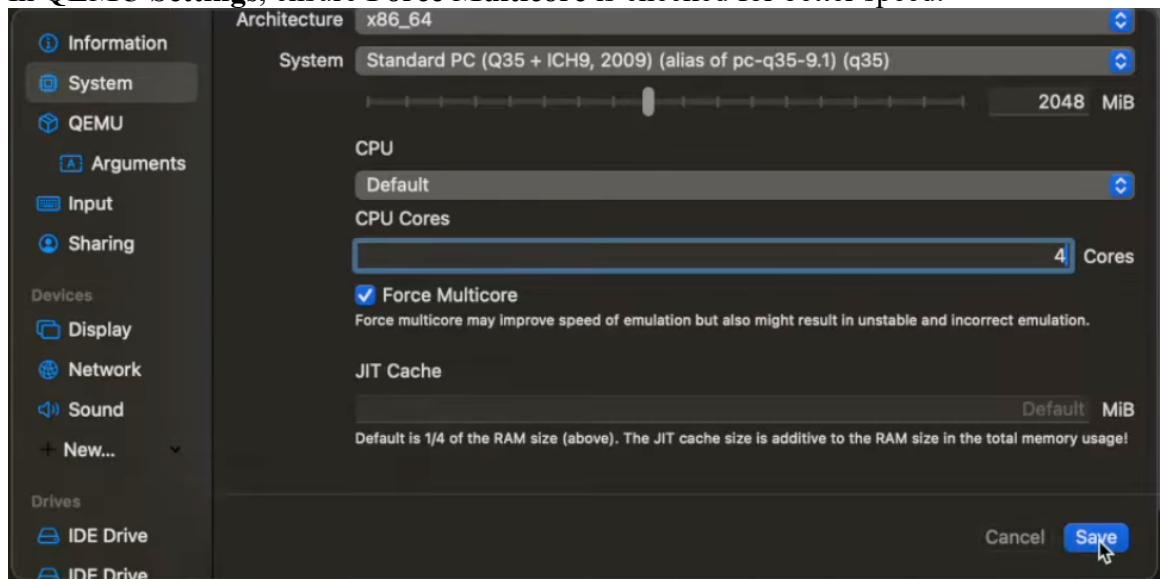
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7. In “Summary Tab” Rename your VM & check box “Open VM Settings”



8. Click Save and start the VM
9. In QEMU Settings, ensure Force Multicore is checked for better speed.

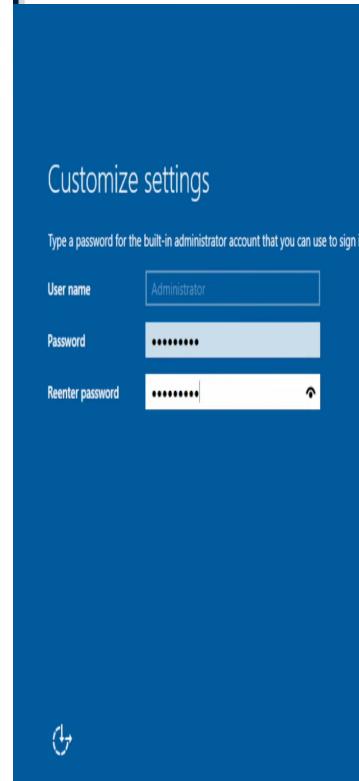
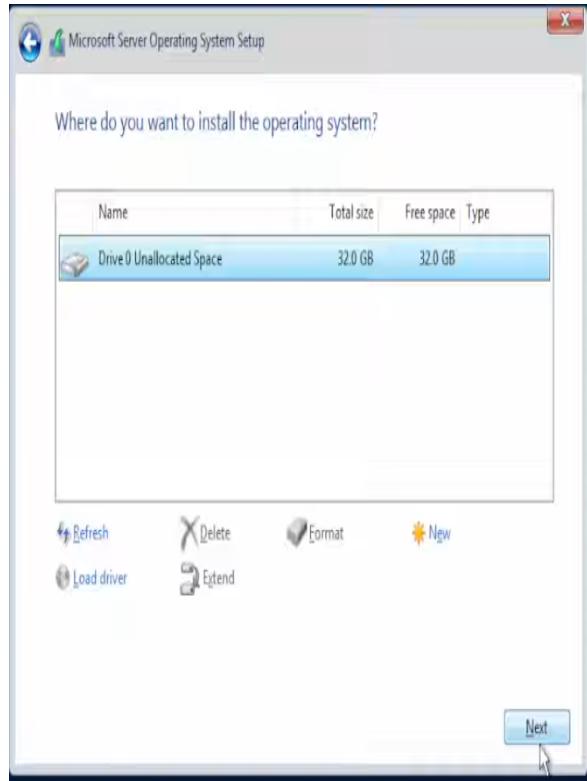
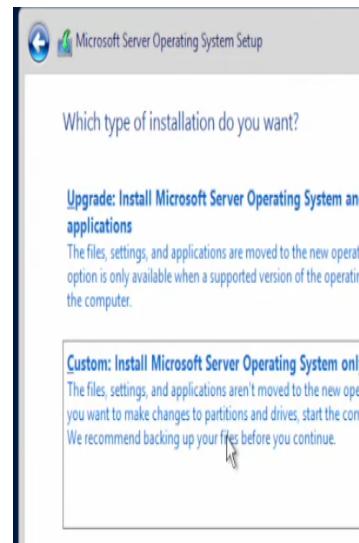
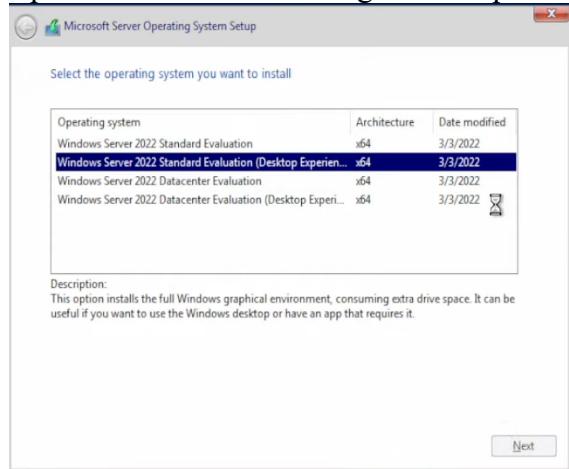


10. Click Save and start the VM

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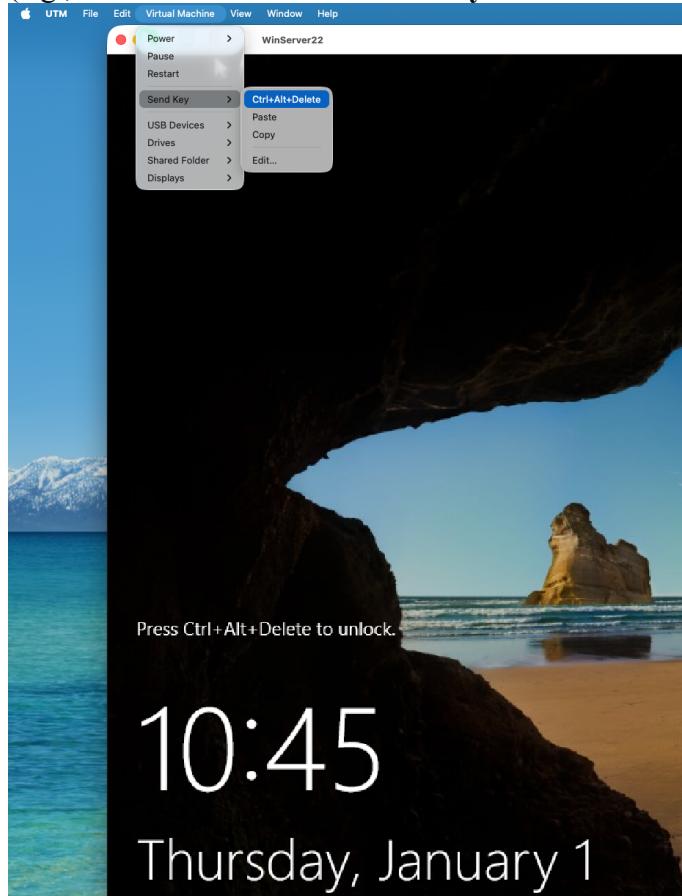
11. Important Screenshots during VM setup:



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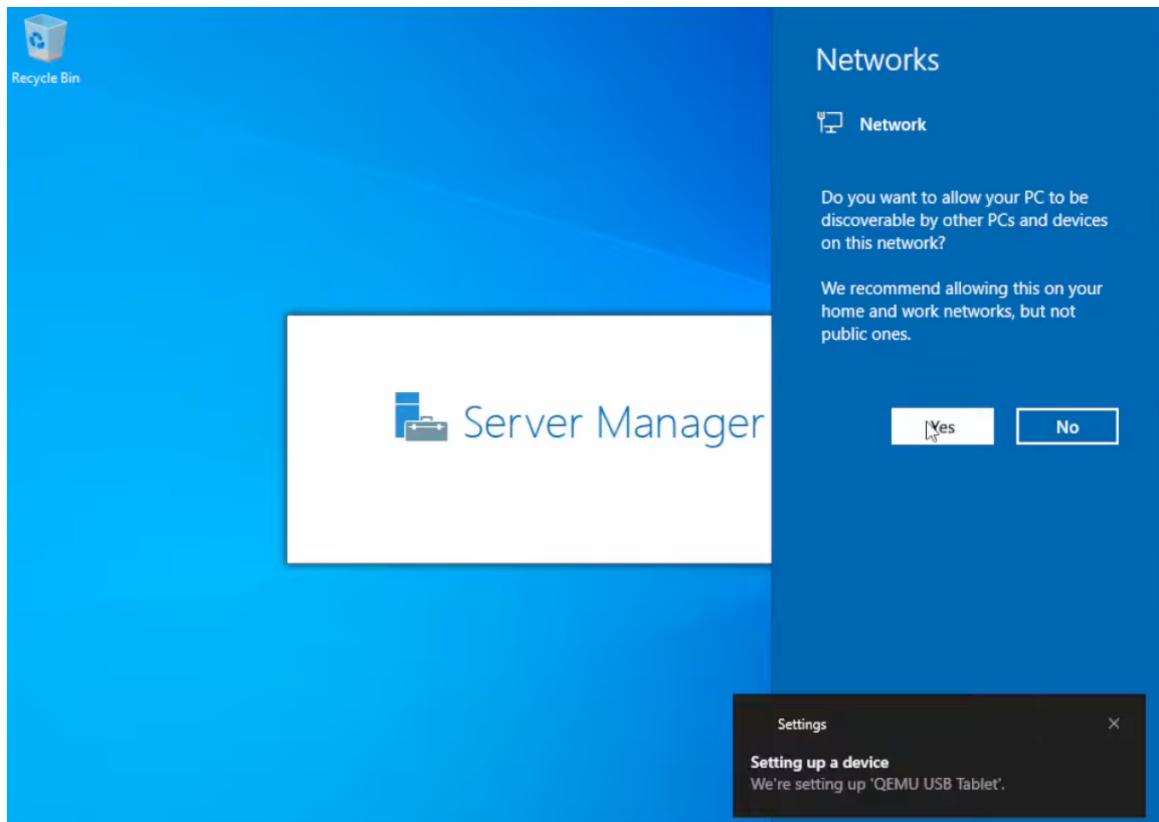
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NOTE: There is no direct Control +Alt + Del on Mac. To send “Ctrl+Alt+Del” to a Windows VM on a Mac, use the virtual machine software's menu (e.g., **Virtual Machine → Send Key → Ctrl-Alt-Delete**)



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***NOTE: CLEAR THE ISO IMAGE AFTER INSTALLATION FROM “CD/DVD”
DROPDOWN. THIS WILL PREVENT NEW INSTALLATION PROCESS DURING
RESTART.***