

# **Windows Client Operating System**

# Agenda

- Creating a Virtual Machine
- Types of Networking
- How to Install Windows Operating system
- Computer Hardware Basics
- Windows 10
- Windows 10 Versions and Releases
- Windows 10 Desktop
- Windows and One Drive
- Windows 10 and Edge
- Windows 10 and Cortana
- Windows 10 Getting Help
- Windows 10 Start Menu
- Windows 10 Installation
- Windows 10 Administration



# Agenda

- Windows Boot Process
- Windows 10-Minimum Requirement
- Enabling Hyper-V and Win 10 Installation
- Windows 10 Hyper-V
- Operating System Properties
- User Management
- Creating User from GUI
- Create Group from GUI
- Windows Updates
- Network Configuration
- Control Panel Items
- Basic Troubleshooting
- Performance monitor
- Event Viewer
- Remote Management



# Basic hardware requirements for Windows 10

- **Processor:**
  - 1 gigahertz (GHz) or faster processor or System on a Chip (SoC)
- **RAM:**
  - 1 GB for 32-bit or *2 GB for 64-bit*
- **Hard drive space:**
  - 16 GB for 32-bit OS or 20 GB for 64-bit OS
- **Graphics card:**
  - DirectX 9 or later with WDDM 1.0 driver
- **Display:**
  - 800x600 resolution



# Basic hardware requirements for Windows 11

- **Processor:**

- 1 gigahertz (GHz) or faster with at least 2 cores on a compatible 64-bit processor or System on a Chip (SoC)

- **RAM:**

- 4 GB or more

- **Storage:**

- 64 GB or larger storage device

- **System firmware:**

- UEFI, Secure Boot capable

- **TPM:**

- Trusted Platform Module (TPM) version 2.0

- **Graphics card:**

- DirectX 12 compatible graphics / WDDM 2.x

- **Display:**

- >9" with HD Resolution (720p)

- **Internet connection:**

- Internet connectivity is necessary to perform updates and to download and take advantage of some features.



# Windows 10 features

- Windows 10 is a versatile operating system that combines the best features of its predecessors with new functionalities.
- Key Features:
  - **Start Menu:** Reintroduced with a blend of traditional and modern UI elements.
  - **Cortana:** Integrated virtual assistant for voice commands and tasks.
  - **Microsoft Store:** Access to a wide range of apps, games, music, and movies.
  - **Continuum:** Smooth transition between desktop and tablet modes.
  - **Security:** Enhanced security features like Windows Defender, BitLocker, and biometric login with Windows Hello.
  - **Updates:** Regular updates for new features, security patches, and performance improvements.



# Windows 11 features

- **New Start Menu and Taskbar:**

- Centered Start Menu with a simplified design and Taskbar for a cleaner look.

- **Snap Layouts and Snap Groups:**

- Easily organize open windows into different layouts and quickly switch between them.

- **Virtual Desktops:**

- Create multiple desktops for different purposes (work, personal, gaming) and switch between them seamlessly.

- **Widgets:**

- Personalized feed with news, weather, calendar, and more, accessible directly from the Taskbar.

- **Microsoft Teams Integration:**

- Integrated Teams chat for quick access to messaging, calling, and video conferencing.



# Windows 11 features

- **Microsoft Teams Integration:**
  - Integrated Teams chat for quick access to messaging, calling, and video conferencing.
- **Enhanced Gaming Experience:**
  - DirectStorage for faster loading times and Auto HDR for improved visuals in games.
- **Redesigned Microsoft Store:**
  - User-friendly with a wider range of apps, including support for Android apps via the Amazon Appstore.
- **Improved Touch and Pen Support:**
  - Better touch interactions and enhanced pen functionality for tablets and 2-in-1 devices.
- **System Performance Improvements:**
  - Optimizations for better efficiency, battery life, and overall performance.
- **Security Enhancements:**
  - Advanced security features like hardware-based isolation, encryption, and malware protection.
- **New Settings App:**
  - Redesigned Settings app with a more intuitive and organized layout.





# Windows Client OS Versions and Release Dates

Windows Version	Release Date
Windows 1.0	November 1985
Windows 2.0	December 1987
Windows 3.0	May 1990
Windows 3.1	April 1992
Windows 95	August 1995
Windows 98	June 1998
Windows ME	September 2000
Windows XP	October 2001
Windows Vista	January 2007
Windows 7	October 2009
Windows 8	October 2012
Windows 8.1	October 2013
Windows 10	July 2015
Windows 11	October 2021



# Windows 10 Editions

Windows Edition	Purpose/Target Audience
Windows 10 Home	General consumer use with features like Cortana, Edge, and basic security updates.
Windows 10 Pro	Professionals and small businesses with features like BitLocker, Remote Desktop, and business updates.
Windows 10 Pro for Workstations	Advanced users needing high performance, ReFS file system support, and persistent memory.
Windows 10 Enterprise	Large organizations with advanced security, management, and deployment features like Device Guard and Credential Guard.
Windows 10 Education	Educational institutions with features similar to Windows 10 Enterprise, optimized for students and educators.
Windows 10 Mobile	Smartphones and small tablets with a touch-optimized interface.
Windows 10 Mobile Enterprise	Similar to Windows 10 Mobile but with added management and security features for businesses.
Windows 10 IoT Core	Internet of Things (IoT) devices with limited functionality focused on connected devices and sensors.



# Windows 11 Editions

Windows 11 Home	General consumer use with features like Microsoft Teams integration and enhanced gaming experience.
Windows 11 Pro	Professionals and small businesses with features like BitLocker and support for Azure Active Directory.
Windows 11 Enterprise	Large organizations with advanced security and management features.
Windows 11 Education	Educational purposes with features similar to Windows 11 Enterprise, optimized for students and teachers.
Windows 11 SE	Education sector, optimized for low-cost devices and streamlined for classroom efficiency.



# Windows One-Drive

- Windows OneDrive is a cloud storage service provided by Microsoft.
- It allows users to store files and data in the cloud, making them accessible from any device with an internet connection.

Key Features of OneDrive	
<b>File Storage</b>	Store documents, photos, videos, and other files in the cloud.
<b>Accessibility</b>	Access your files from anywhere, on any device (PC, Mac, smartphones, tablets).
<b>File Sharing</b>	Share files and folders with others, allowing collaboration in real-time.
<b>Syncing</b>	Automatically sync files between your devices, ensuring you always have the latest version.
<b>Security</b>	Files are encrypted both in transit and at rest, providing robust security.
<b>Integration with Microsoft 365</b>	Seamlessly integrates with Microsoft Office apps like Word, Excel, and PowerPoint for easy collaboration and editing.
<b>Version History</b>	Keep track of changes to your files and revert to previous versions if needed.
<b>Offline Access</b>	Access your files offline by syncing them to your device.

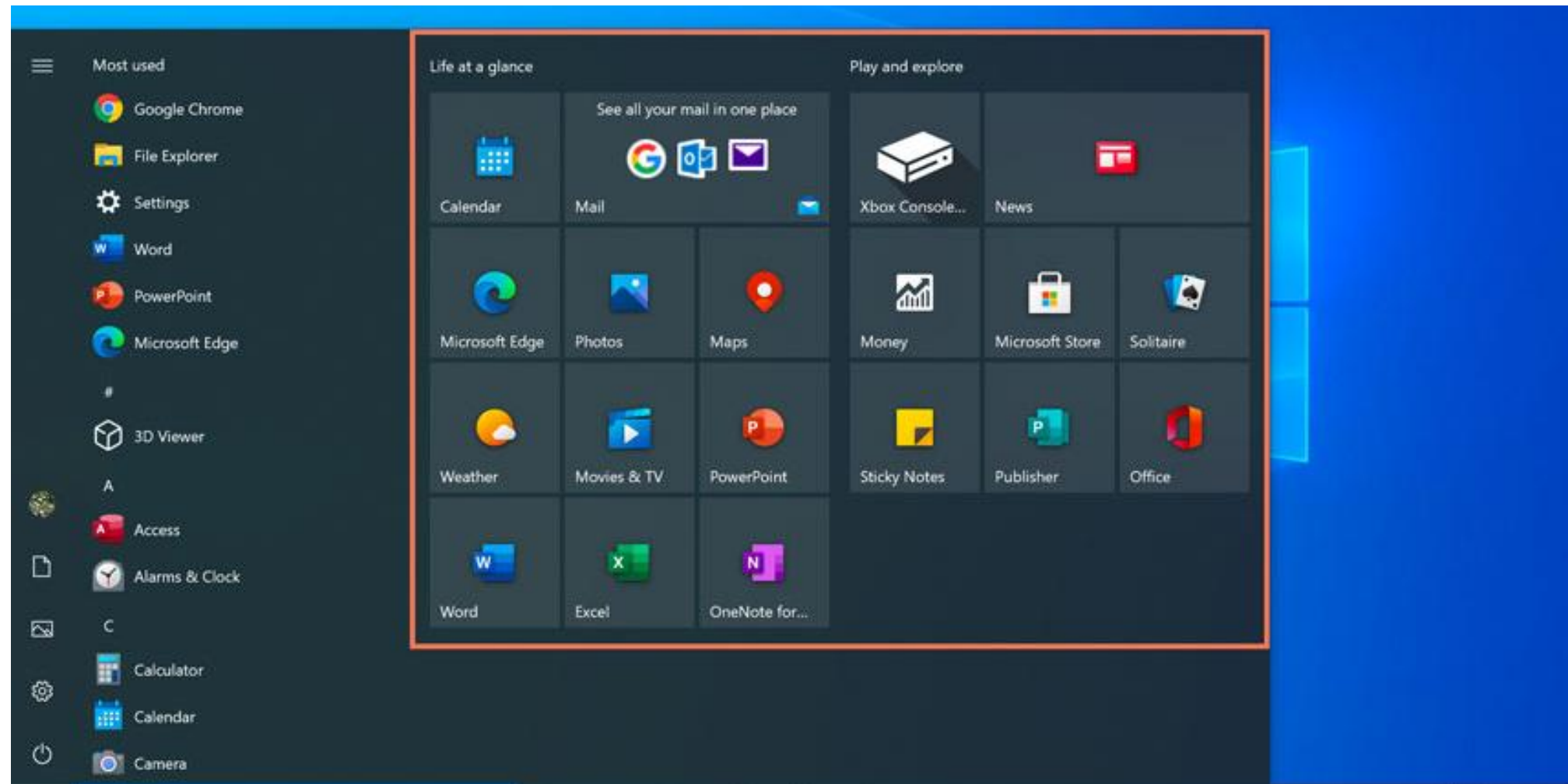


# Windows 10 Cortana

- Cortana is a virtual assistant developed by Microsoft that integrates with Windows operating systems and other Microsoft services.
- Key Features of Cortana:
  - ✓ Voice Commands
  - ✓ Information and Updates
  - ✓ Reminders and Alarms
  - ✓ Smart Home Integration
  - ✓ Calendar Management
  - ✓ Music and Entertainment
  - ✓ Email Assistance
  - ✓ Notebook Feature
  - ✓ Web Searches
  - ✓ Multi-Device Sync
  - ✓ Task Management
  - ✓ Security and Privacy



# Windows 10 Start Menu



# Windows 10 Administration

- **Control Panel:**

- Access to various system settings and configurations.

- **Device Manager:**

- Manages hardware devices and drivers.

- **Disk Management:**

- Tools for managing disk partitions and volumes.

- **Task Manager:**

- Monitors system performance and running applications.

- **Event Viewer:**

- Logs and reviews system events and errors.



# Windows 10 Administration

- **Computer Management:**

- Central hub for various administrative tools like Shared Folders, Local Users and Groups, and more.

- **Administrative Tools:**

- Includes tools like Performance Monitor, Component Services, and Windows Memory Diagnostic.

- **Local Group Policy Editor:**

- Manages group policies for users and computers.

- **Windows Update:**

- Manages updates and patches for the operating system.

- **Backup and Restore:**

- Tools for backing up and restoring files and system images.





# Windows Boot Process

Ways to boot the Windows OS

- **Cold boot**

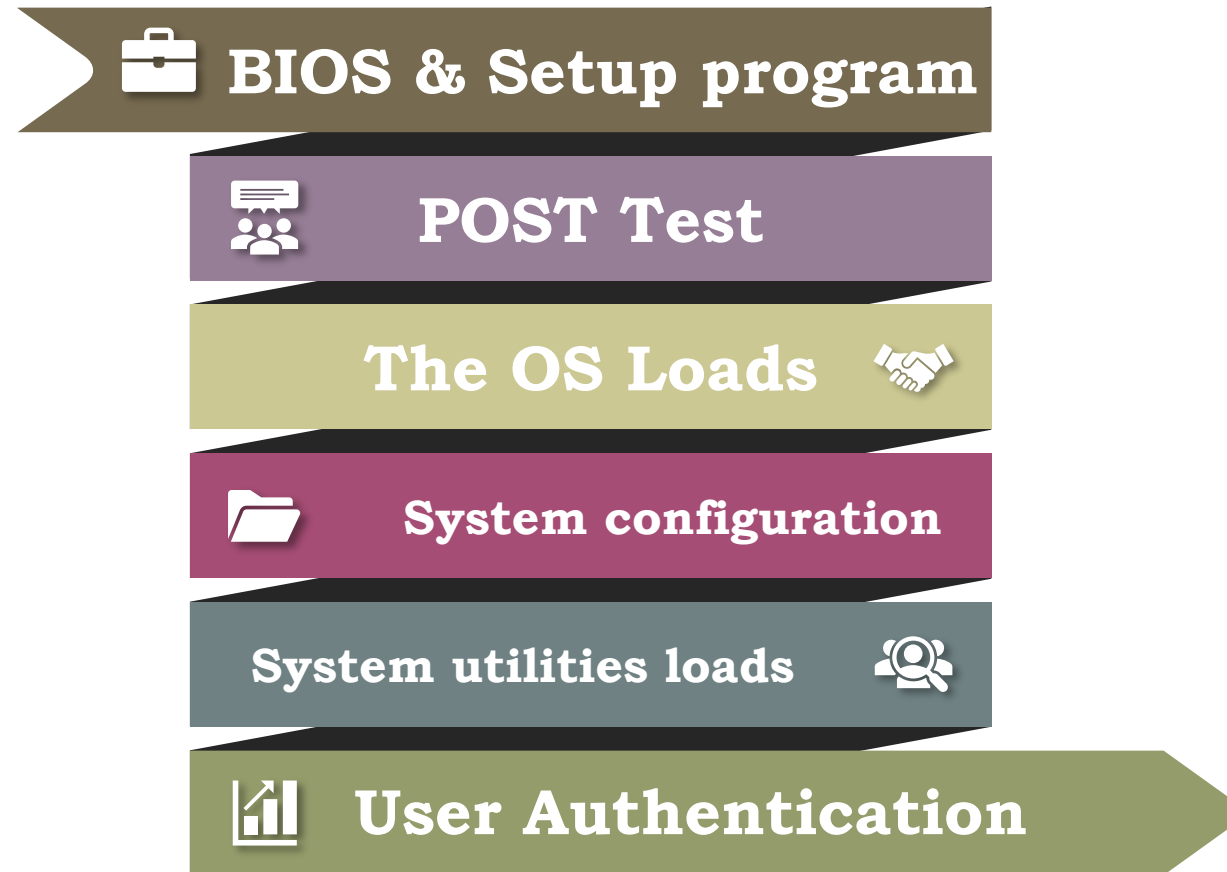
- When a computer starts for the 1st time, after power on button is pressed.

- **Hard/Warm boot**

- Computer restarts while powered on during the hard boot.
- This is useful while installing or uninstalling the software or updating the machine.



# Windows Boot Process



# Windows Boot Process (Step 1)

## BIOS/EFI

- **BIOS** = Basic Input Output System
  - perform a test POST test
  - Power On Self Test = checking of hardware devices
- **EFI** = Extensible Firmware Interface
  - UEFI = Unified Extensible Firmware Interface
  - its a software between OS & platform firmware (hardware)



# Windows Boot Process (Step 2)

## MBR

- Master Boot Record
- It contains the **address of operating system**
- The size of MBR is “**512 bytes**”.
- The MBR is limited to handling disk sizes up to 2 terabytes (TB).



# Windows Boot Process (Step 3)

## Volume Boot Sector

- Its a boot sector (by IBM), that contains necessary code to start the boot process.
- The Volume Boot Sector is the first sector of a partitioned storage device that contains code and data necessary to start the boot process for an operating system installed on that volume.



# Windows Boot Process (Step 4)

## **bootmgr.exe**

- It accesses the boot configuration data stored & uses the information to load the operating system and calls "winload.exe" or "winresume.exe"
  - **winload.exe**
    - This loads the necessary device drivers & the core part of the OS i.e, kernel (**ntoskrnl.exe**)
  - **winresume.exe**
    - its an OS file that resumes from hibernate boot mode.



# Windows Boot Process (Step 5)

## **ntoskrnl.exe**

- The kernel file getting called by bootmgr.exe.
- Full form is “Windows **NT** operating **s**ystem **kernel** **executable**”.
- ntoskrnl.exe is the kernel of the Windows operating system, which acts as the core part of the OS, managing interactions between hardware and software.
- It handles memory allocation and deallocation, ensuring that applications have access to the necessary memory resources.
- It manages running processes, ensuring they operate correctly and efficiently.



# Windows Boot Process (Step 6)

## HAL.DLL

- *Hardware Abstraction Layer. Dynamic Link Library*
- It is a crucial component of windows OS as it acts as a bridge between hardware & software to communicate efficiently.
- This means that the operating system can interact with hardware devices in a consistent manner, without needing to know the specifics of each device.
- By abstracting hardware details, hal.dll helps ensure system stability and compatibility across different hardware configurations.
- It optimizes hardware performance by managing low-level functions and ensuring efficient use of system resources.





# Windows Boot Process (Step 7)

## **SMSS.exe** - **S**ession **M**anager **S**ub-**S**ystem

- Its the 1<sup>st</sup> user mode process started by kernel.
- Once started, it creates additional paging files, env variables located at registry.
- This manager is responsible for starting the kernel and user mode of Win32 system.
- Including win32k.sys, winsrv.dll & csrss.exe (user mode)
- It is also responsible for doing any operations that are requested to be done at the start of the session. Like "autochk" & "convert".
- This manager also started the registry keys.
- After windows vista, SMSS creates a temporary instance of itself that launches the windows startup application (wininit.exe) and a second client/server runtime subsystem (csrss.exe) for dedicated session to start system process
- From here, the windows startup application starts the service control manager (services.exe)



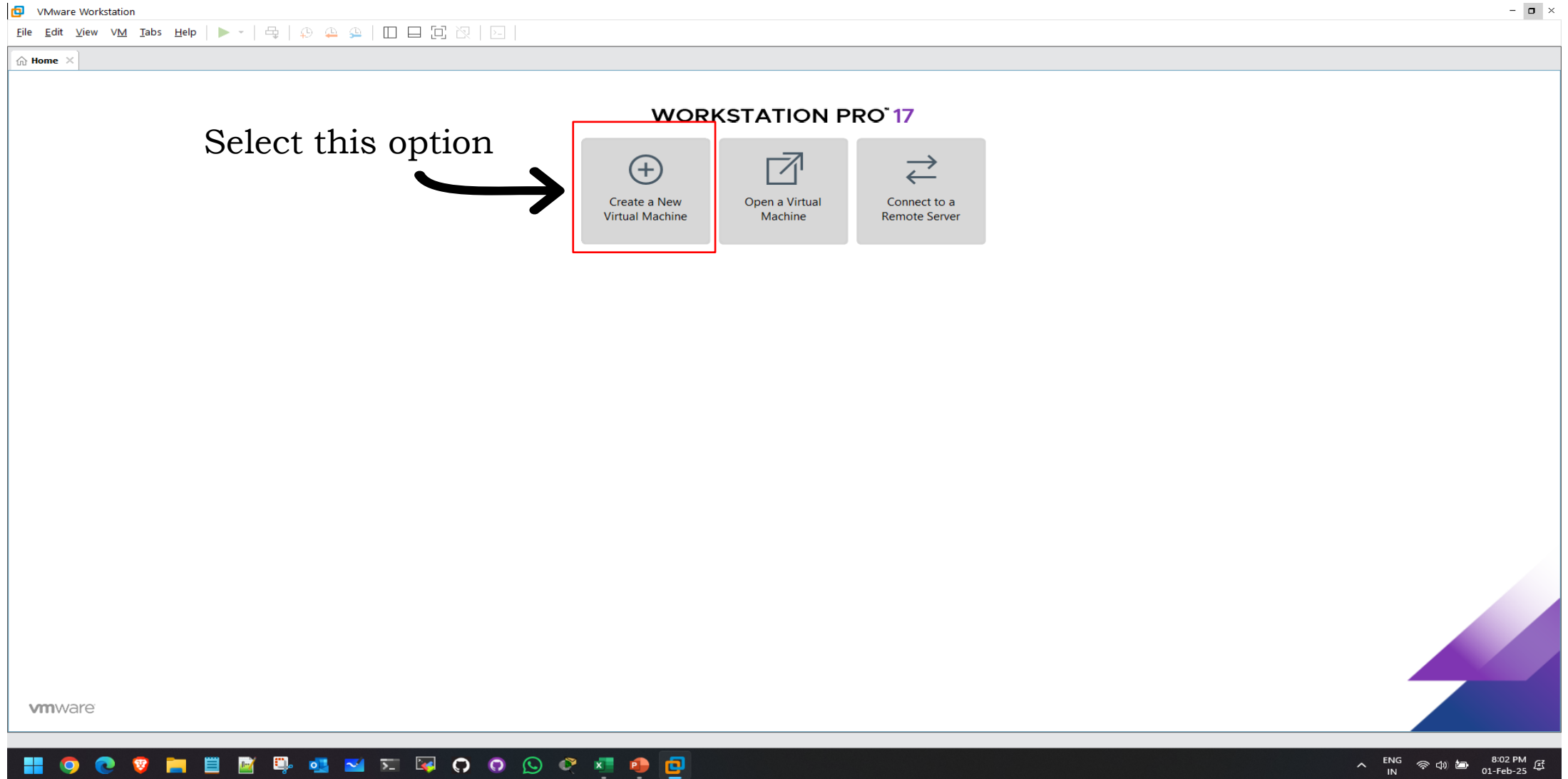
# Windows Boot Process (Step 8)

## CSRSS.exe

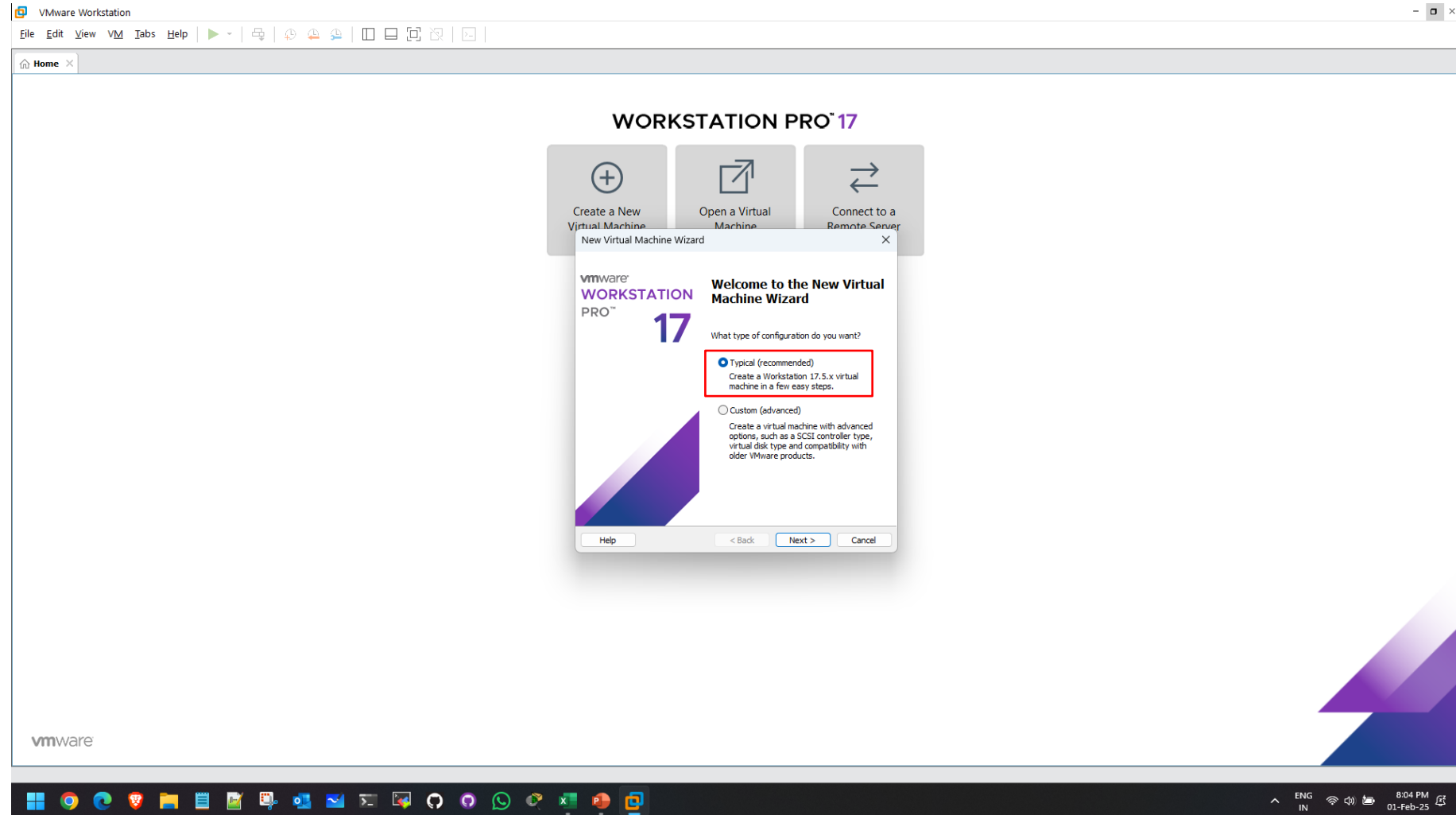
- Client/Server Runtime Sub-System
- Primarily, it will load the process & thread mgmt, console windows handling, side by side assembly & shutdown process.
- This is a very CRUICIAL process, as killing one process can lead to crash of the OS giving the **BSOD** (**B**lue **S**creen **o**f **D**eath).



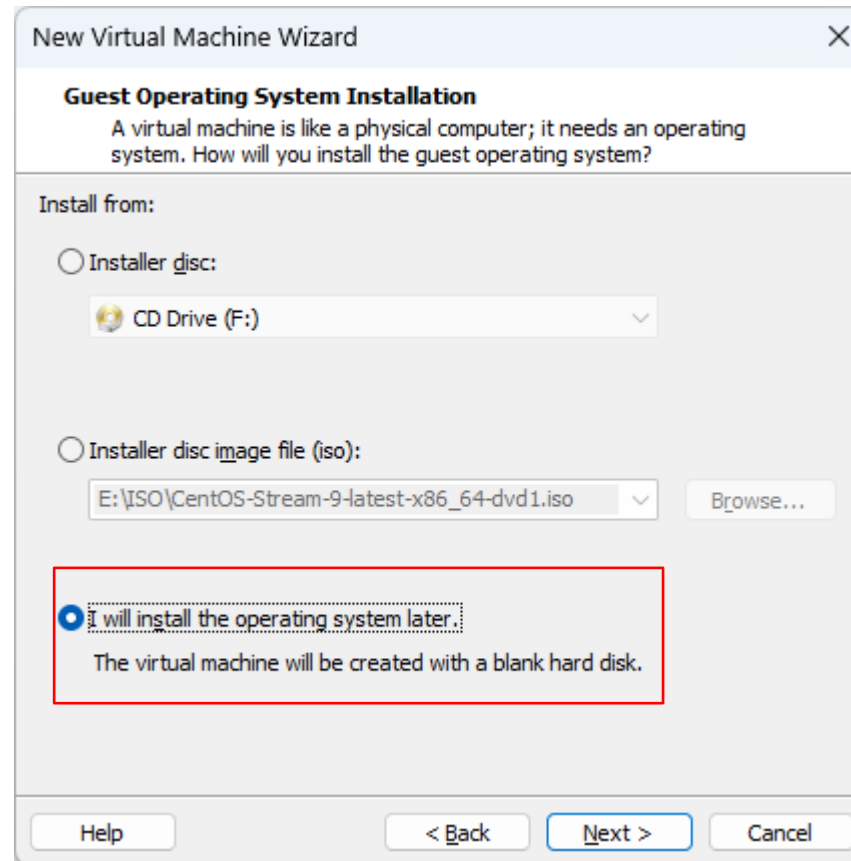
# Creating a Virtual Machine



# Select typical



# Select “I will install OS later”



# Select Microsoft Windows OS

New Virtual Machine Wizard

**Select a Guest Operating System**  
Which operating system will be installed on this virtual machine?

Guest operating system

☒ Microsoft Windows

☐ Linux

☐ VMware ESX

☐ Other

Version

Windows 10 x64

Help < Back Next > Cancel



# Select VM Name & location

New Virtual Machine Wizard

**Name the Virtual Machine**  
What name would you like to use for this virtual machine?

Virtual machine name:

Location:

The default location can be changed at Edit > Preferences.

< Back   Next >   Cancel

# Select HDD size

New Virtual Machine Wizard

**Specify Disk Capacity**  
How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB):

Recommended size for Windows 10 x64: 60 GB

☒ Store virtual disk as a single file

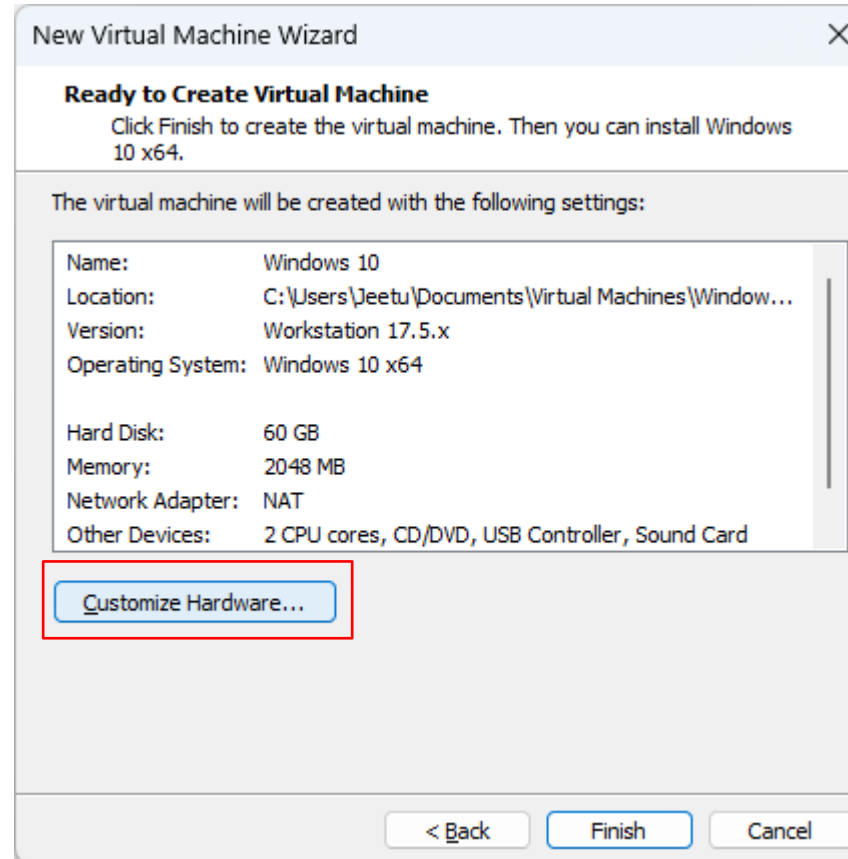
☐ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

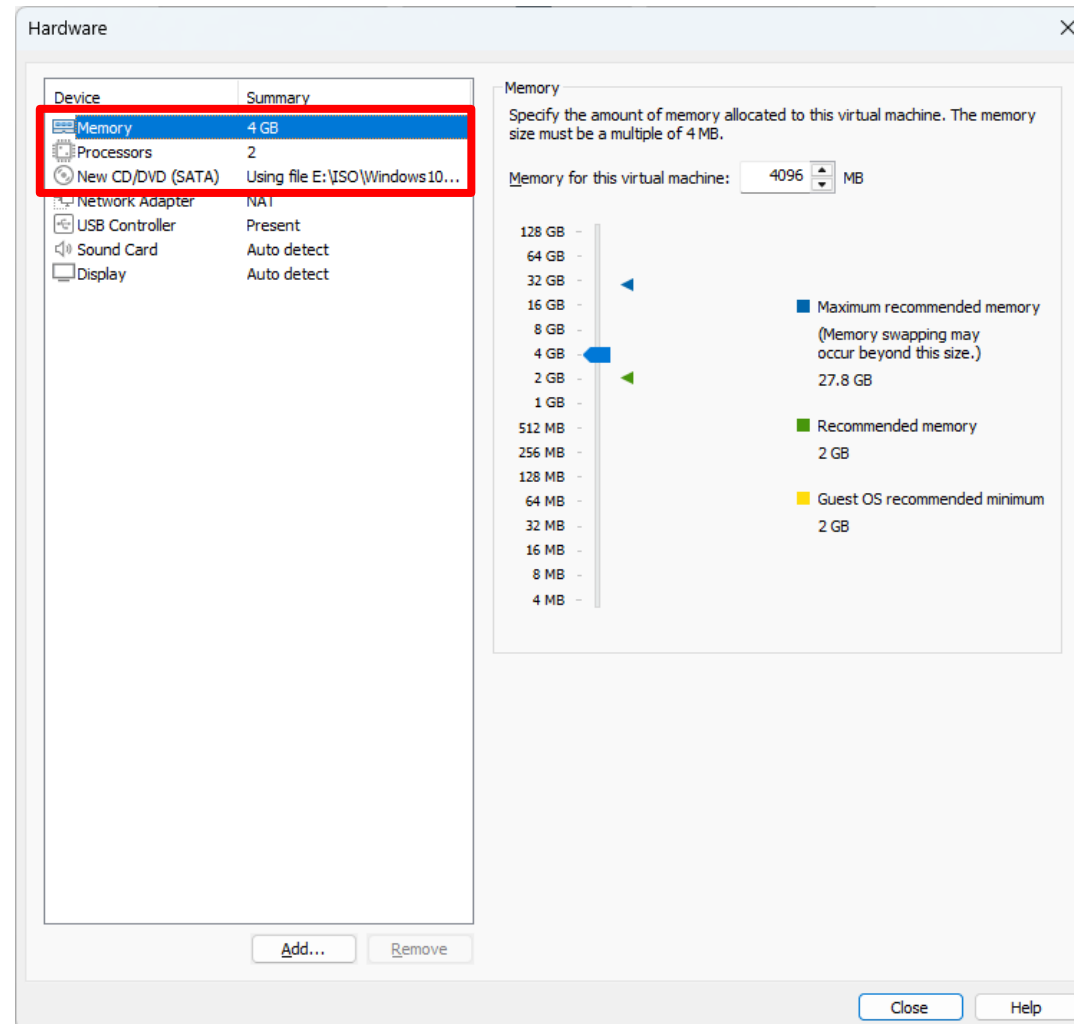
Help < Back Next > Cancel



# Customize hardware



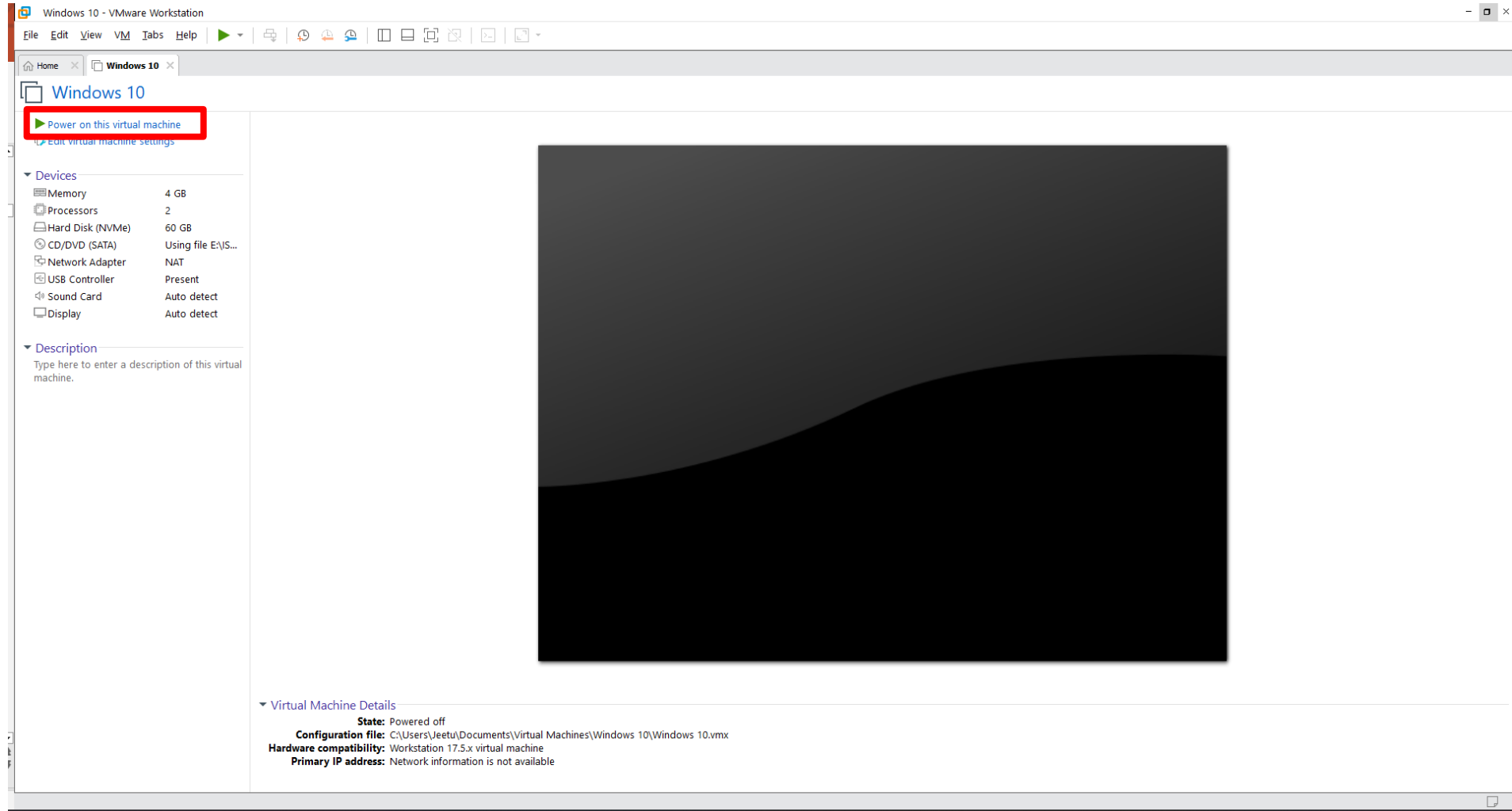
# Select RAM & Attach Win10 ISO



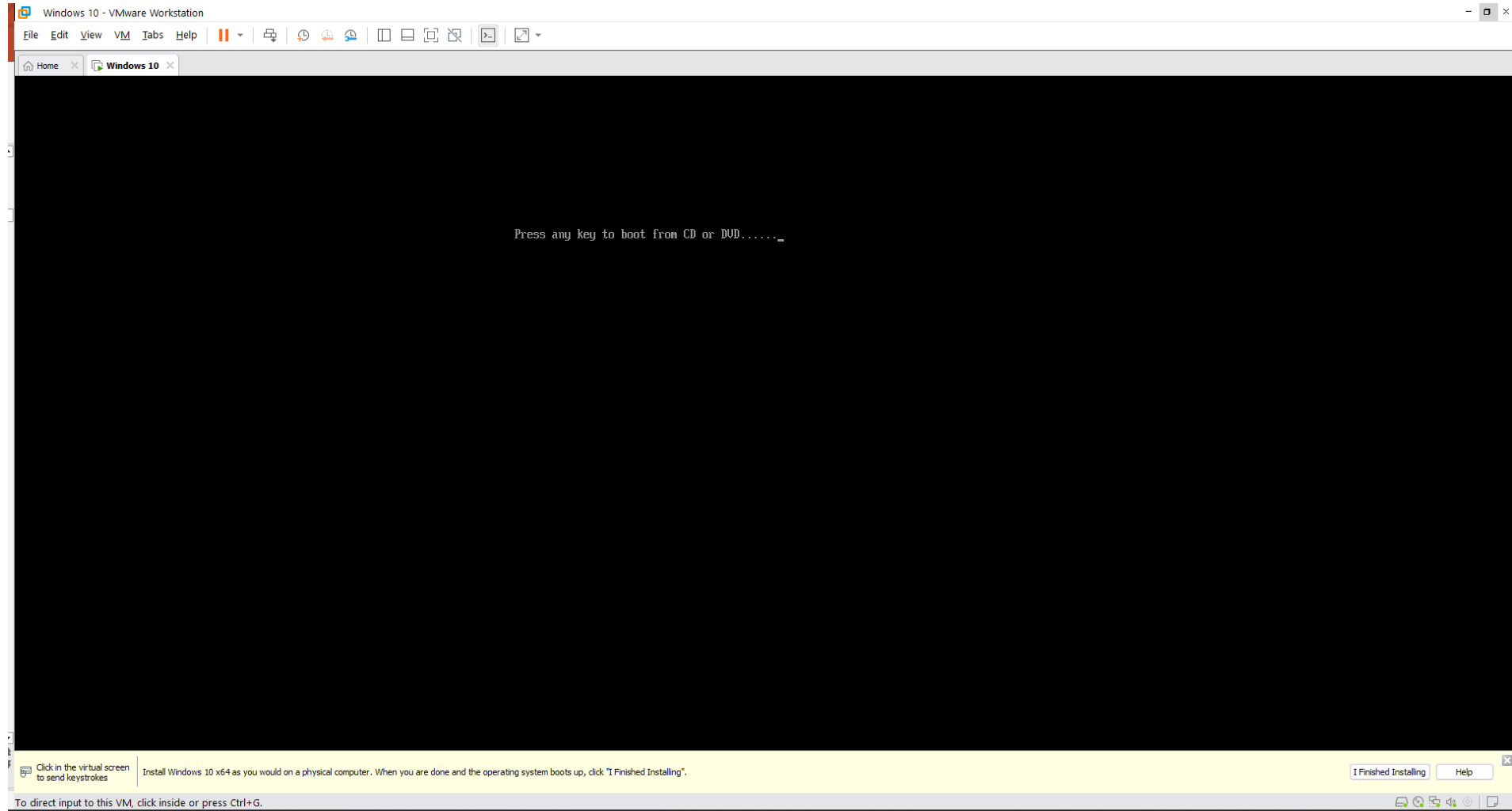
Then close and finish



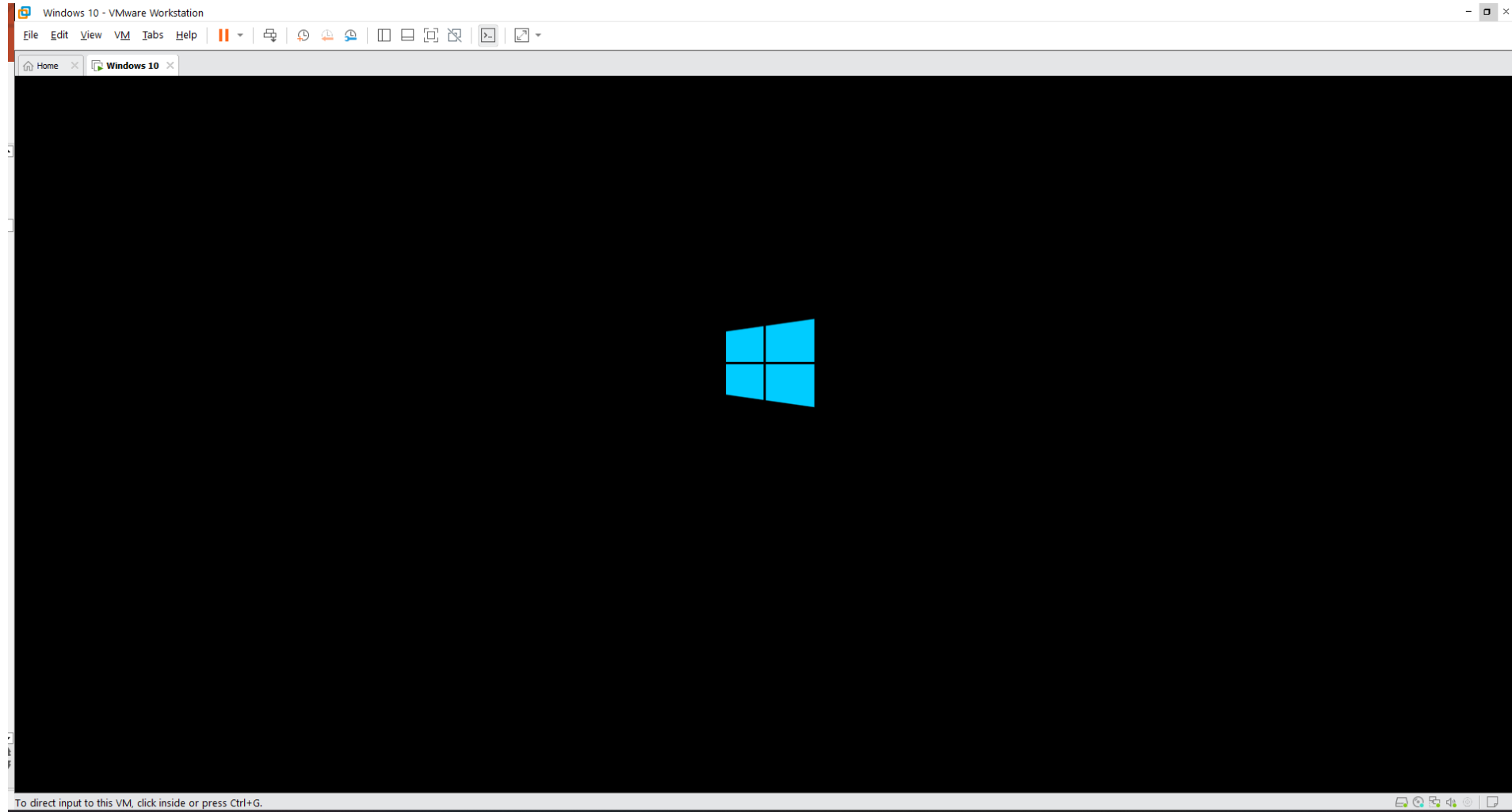
# Click on “Power On” to start VM



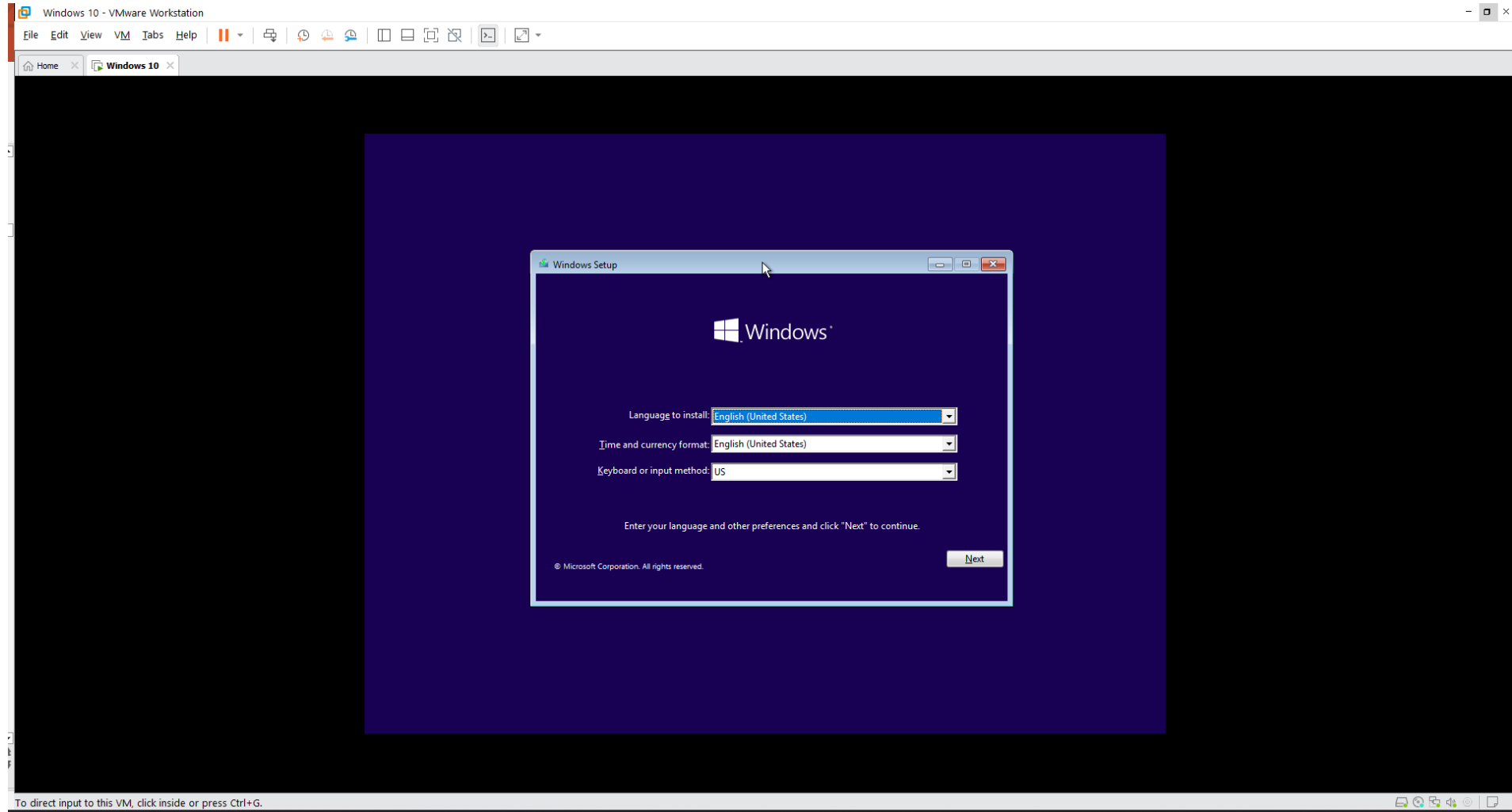
# Press any to key to boot



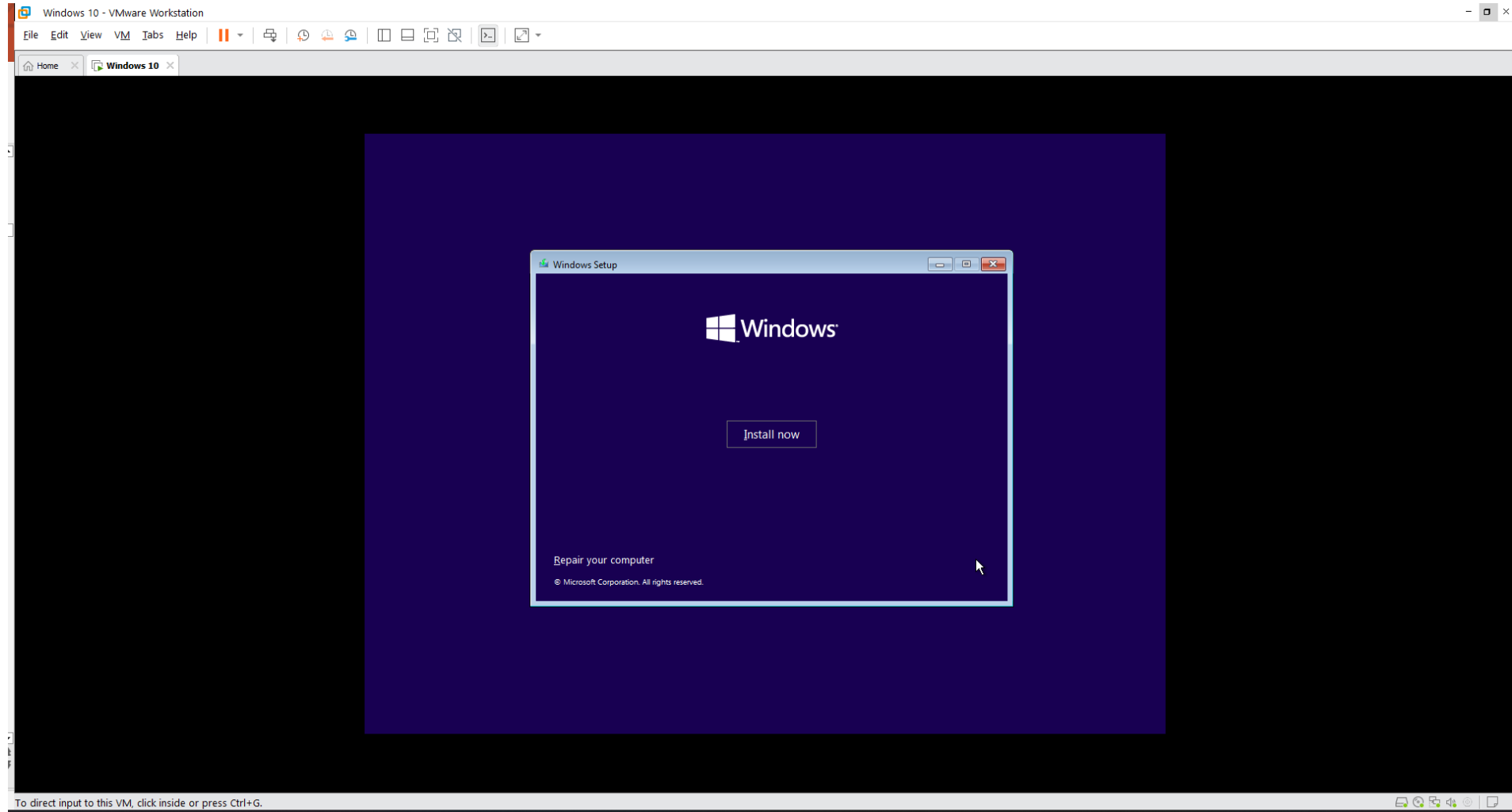
# Wait...



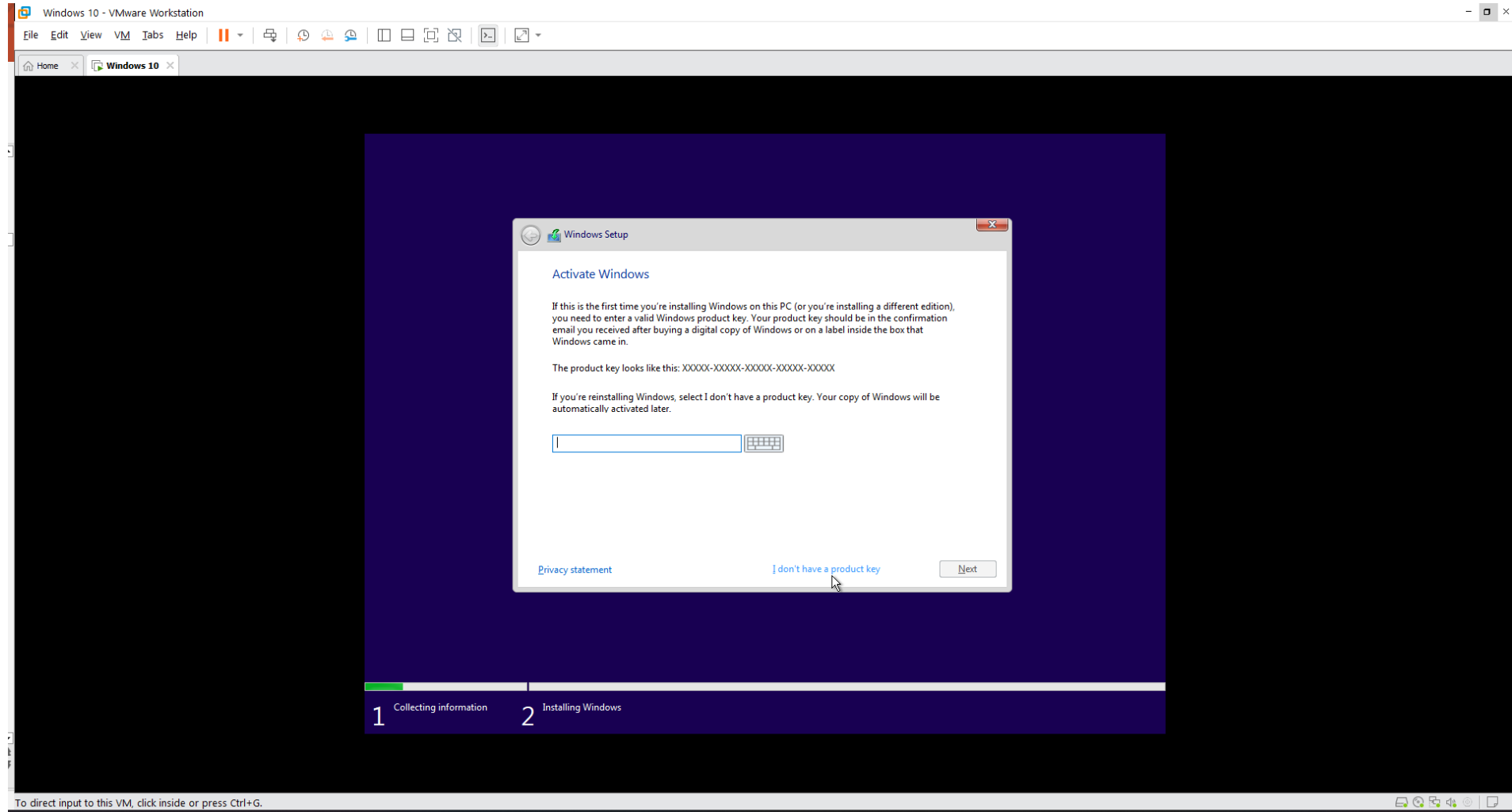
# Select valid options & click “Next”



# Click “Install”

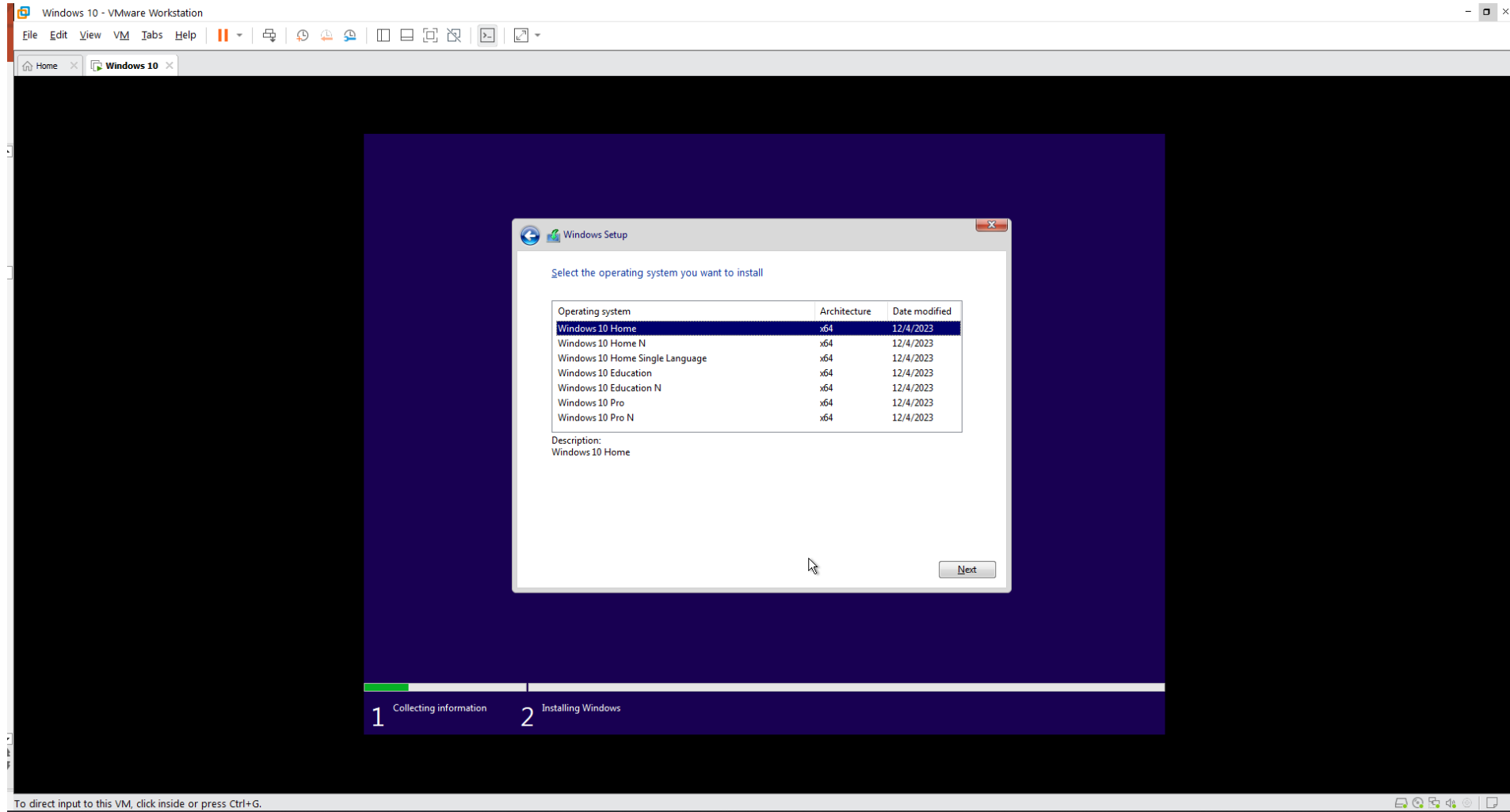


# Select “I don’t have a product key”

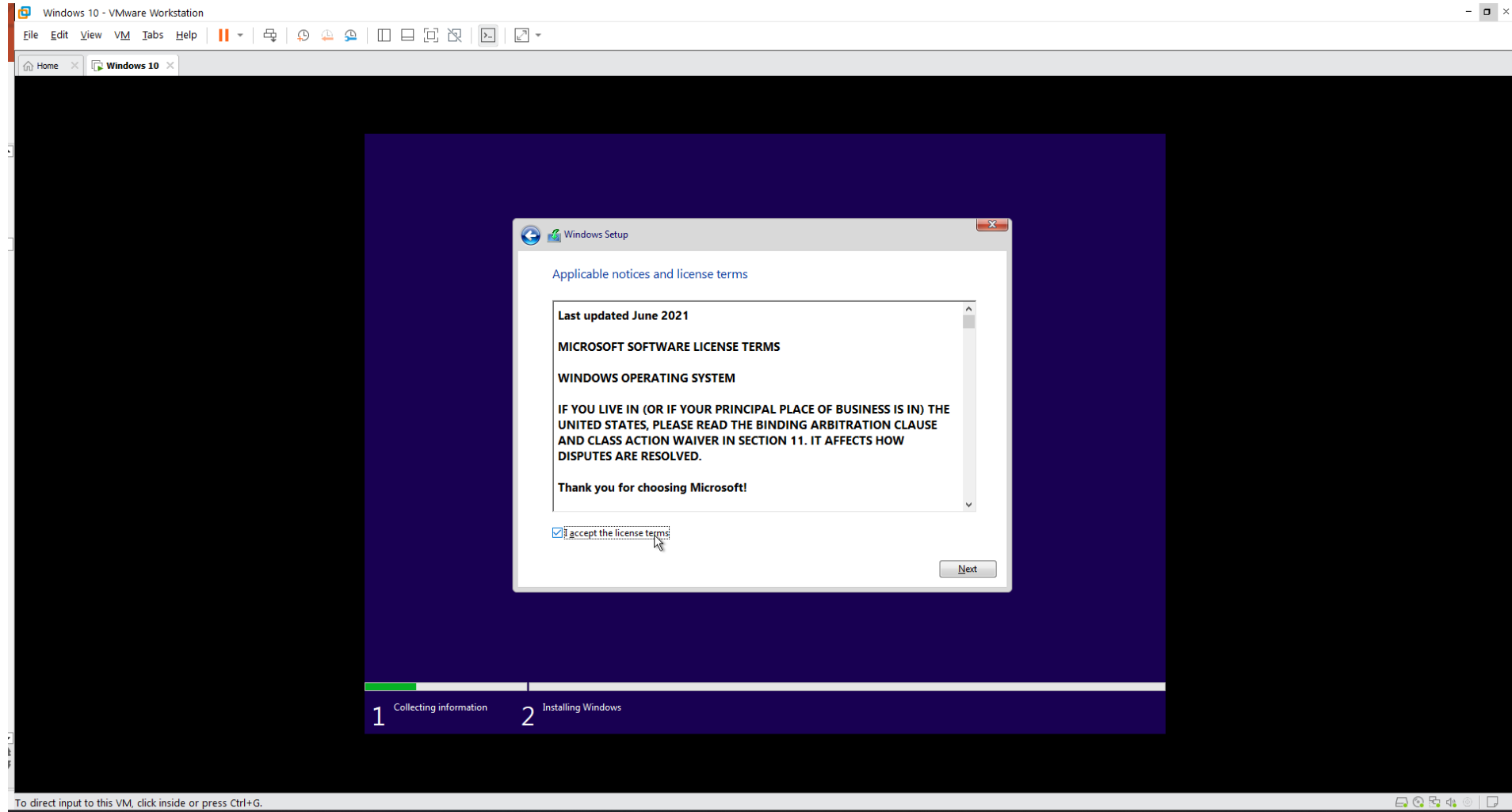




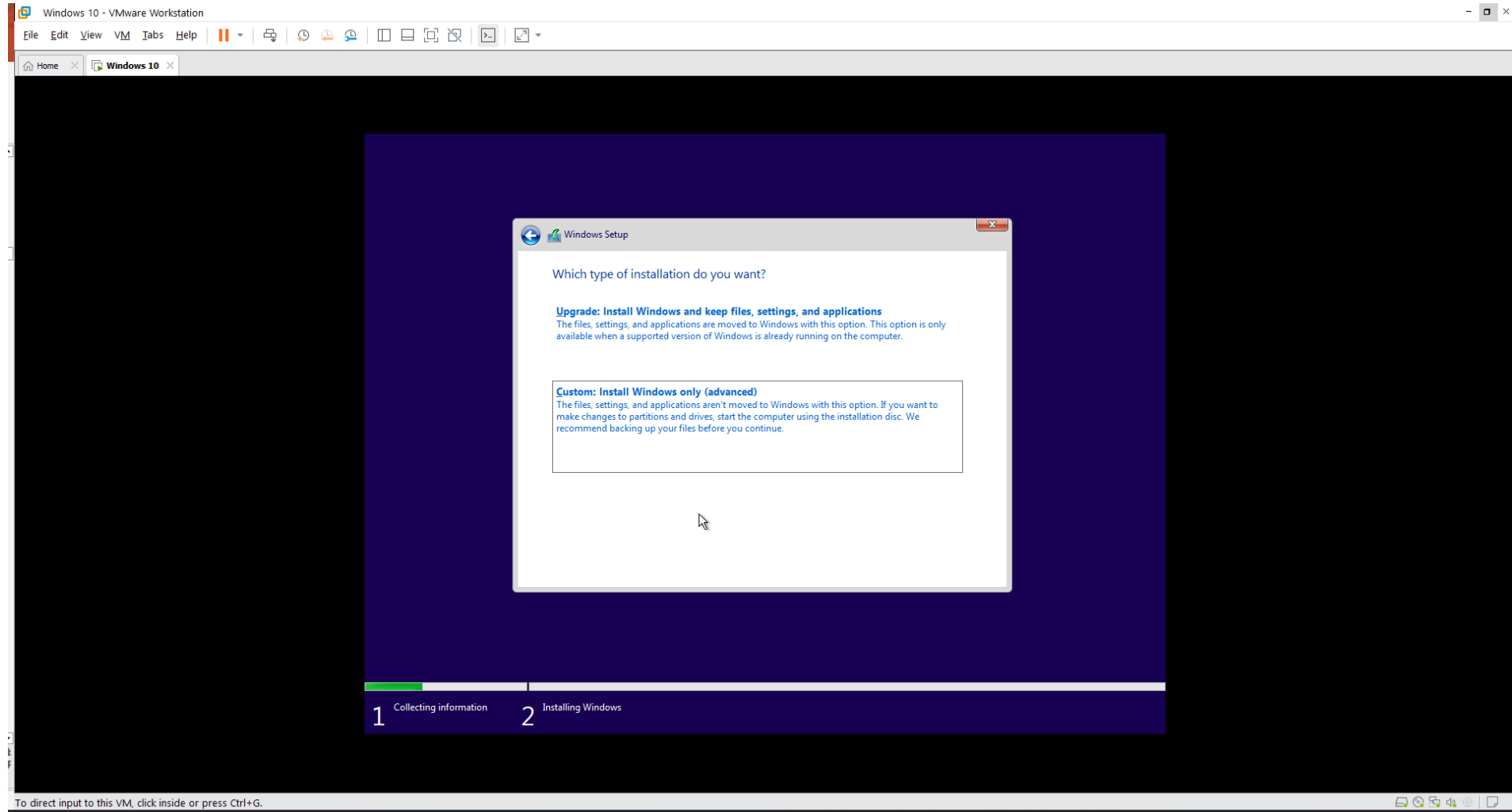
# Select the OS you want to install



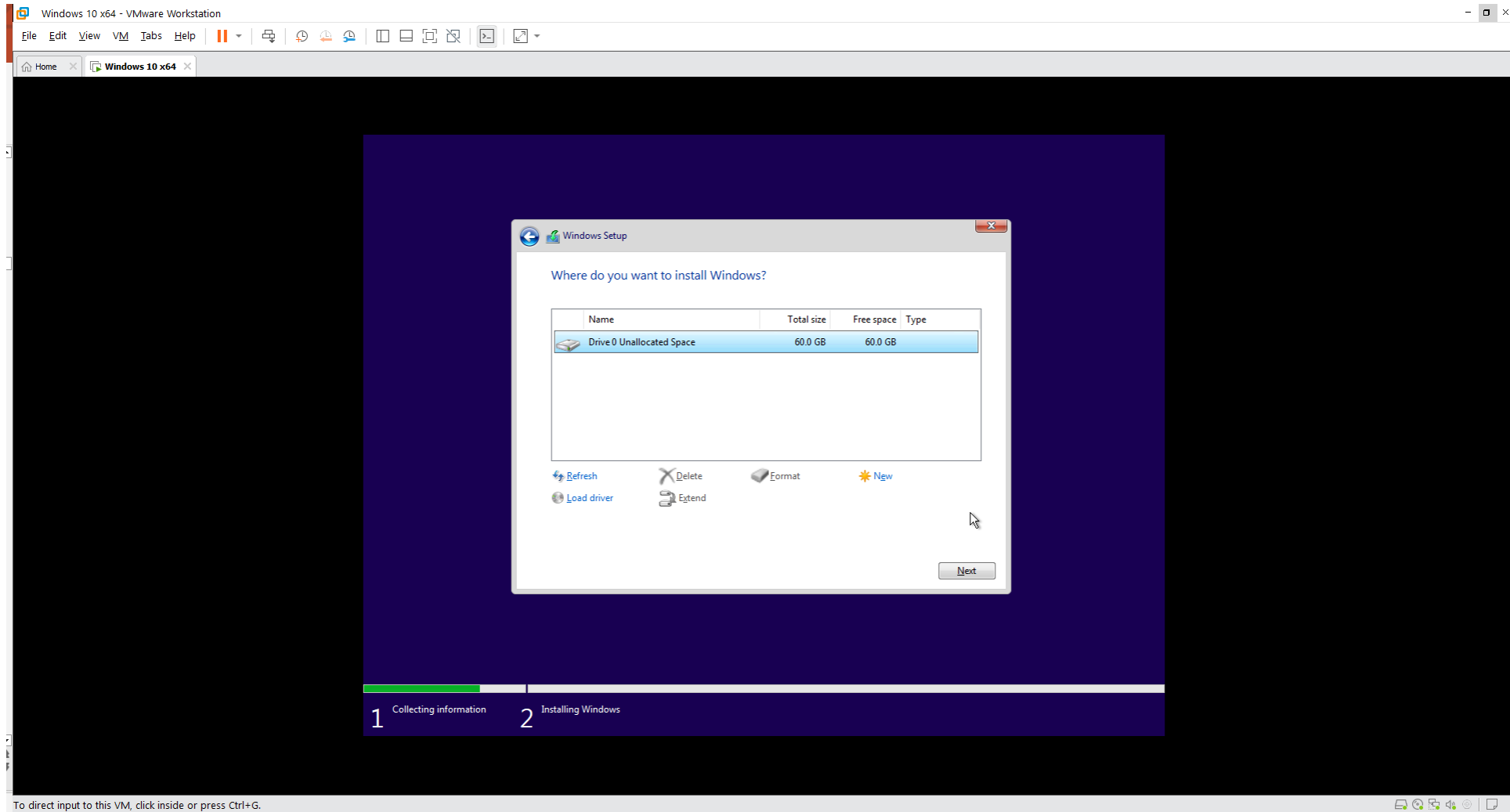
# Accept license



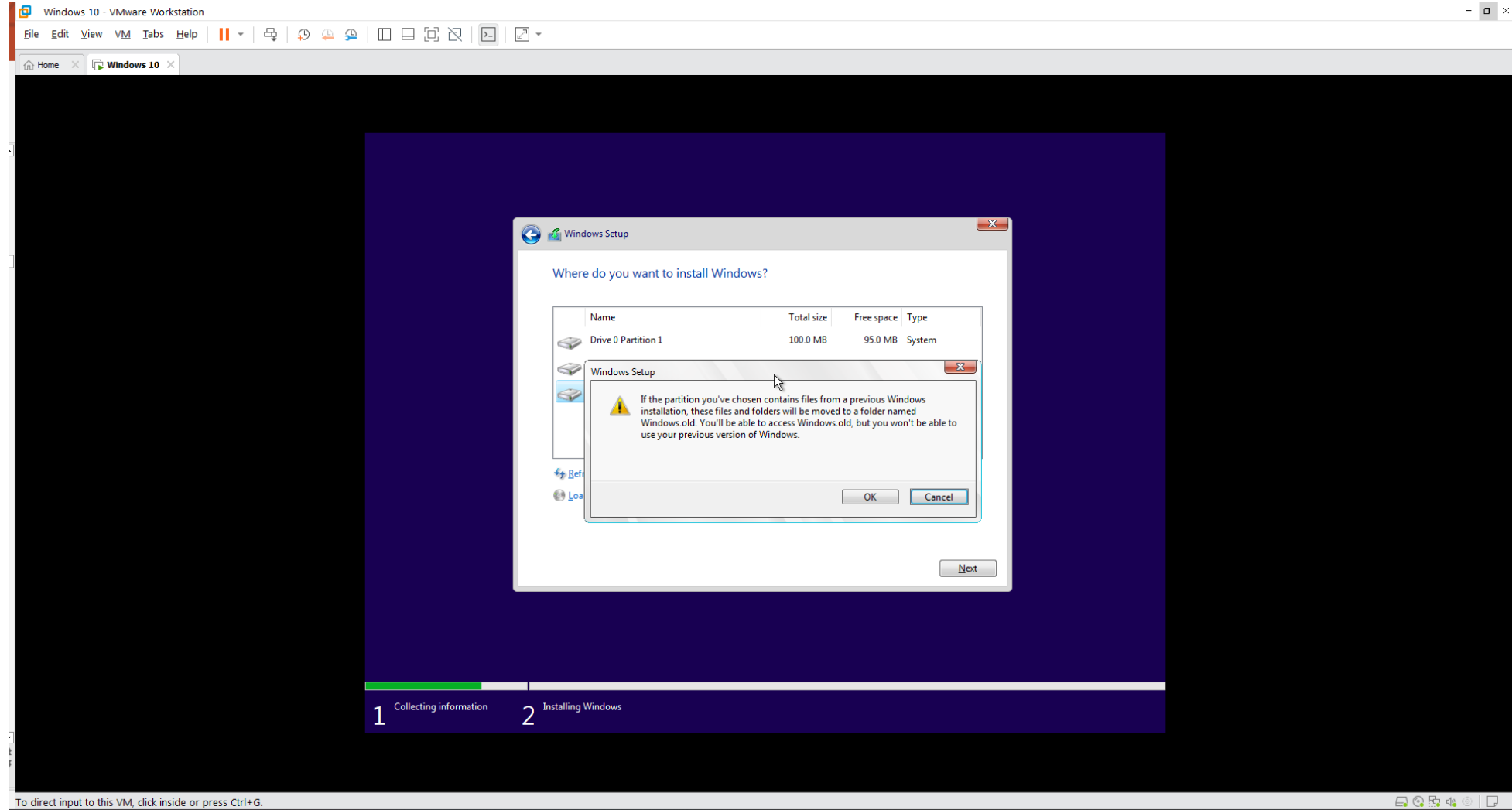
# Select “Custom...”



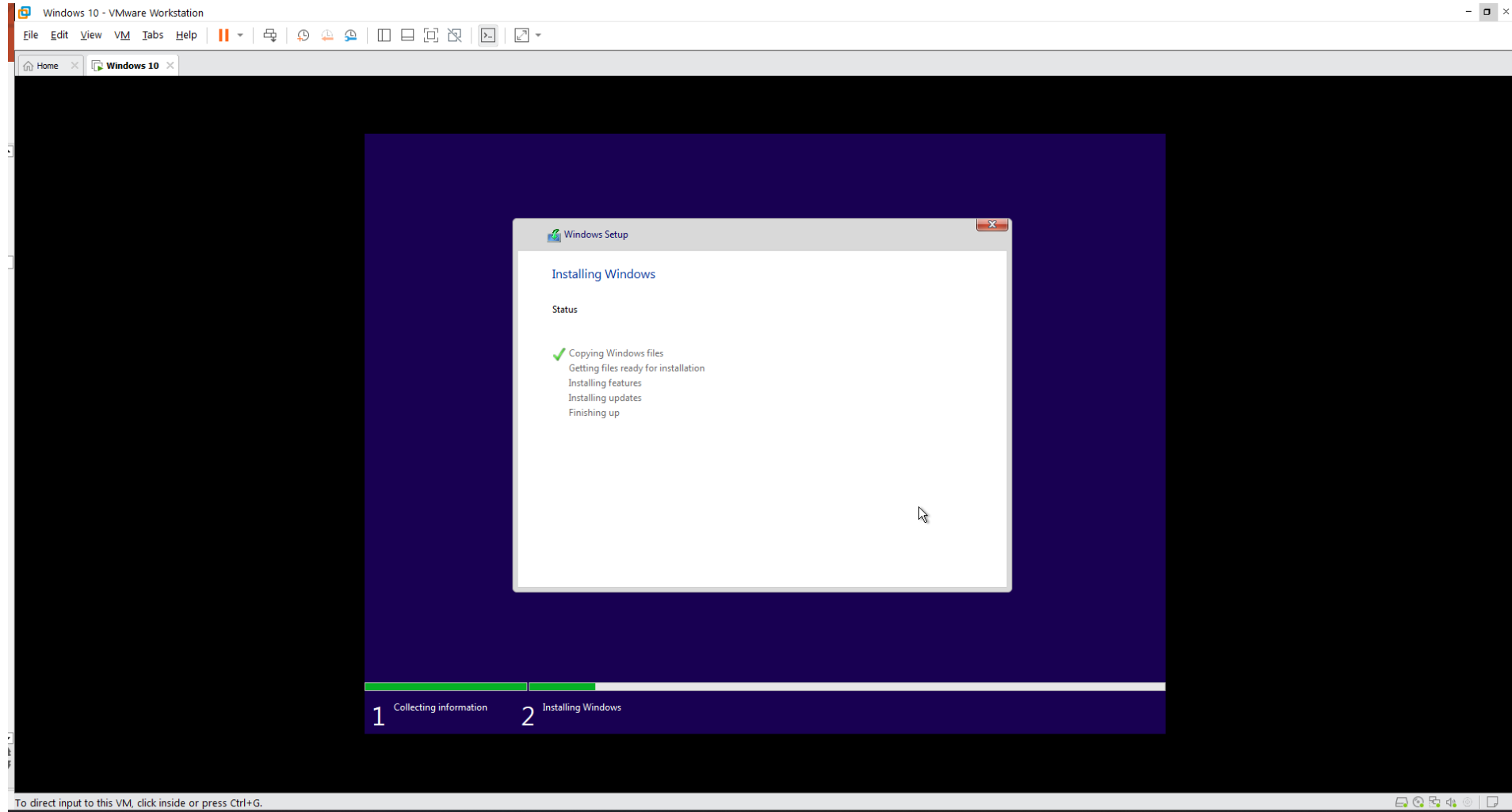
# Click Next:



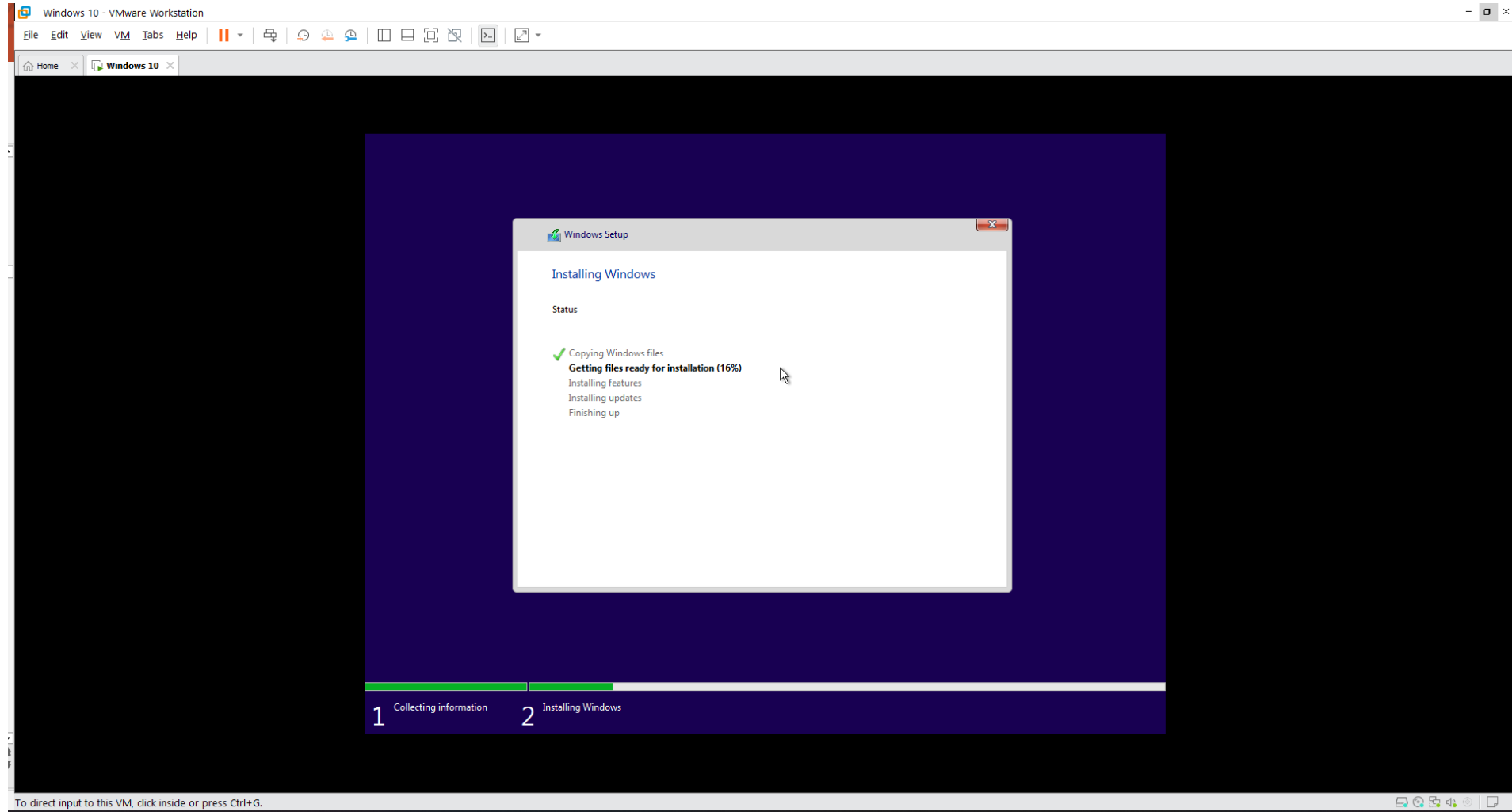
# Click OK:



# Wait until the OS is installed

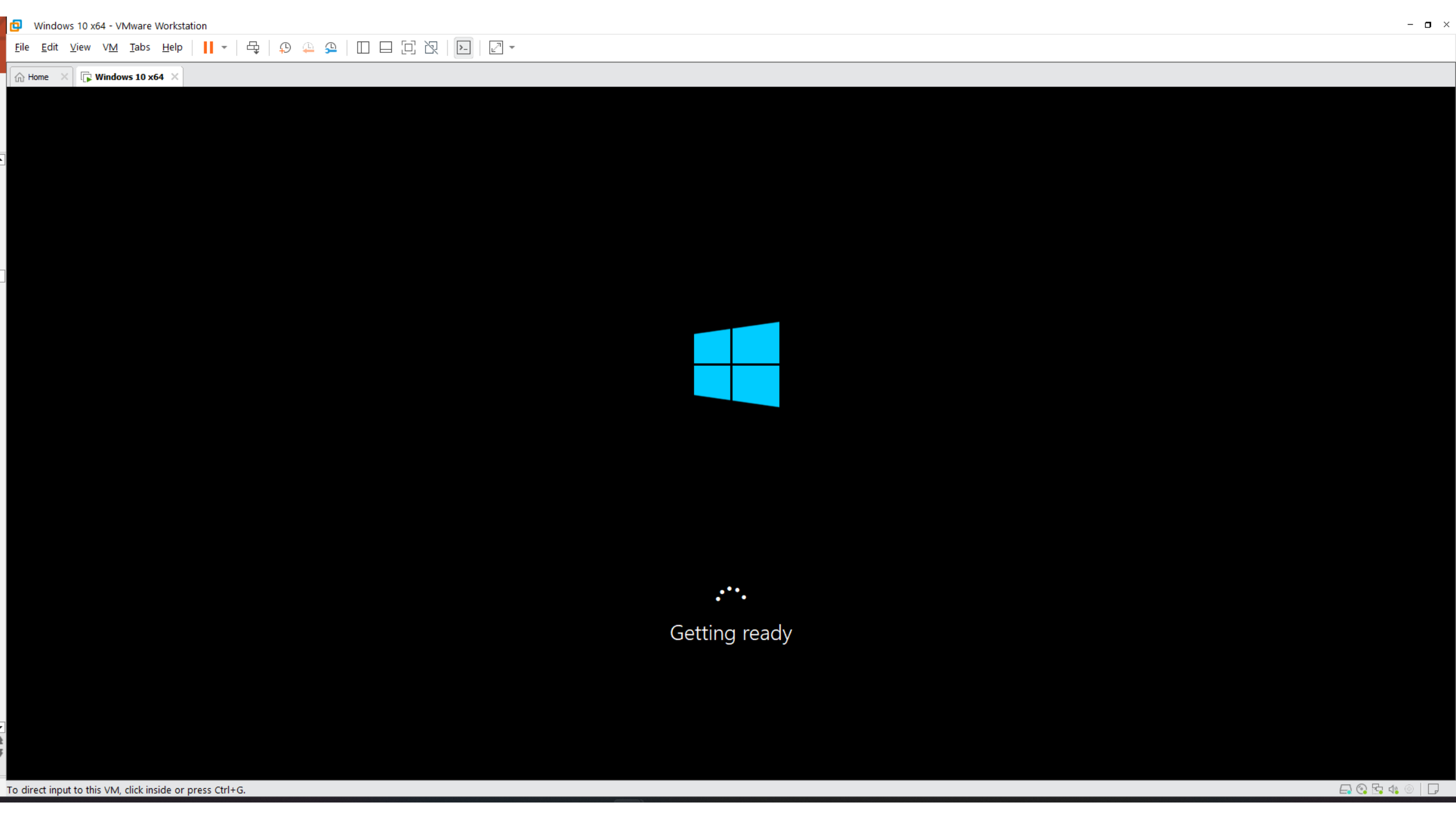


# Wait until the OS is installed



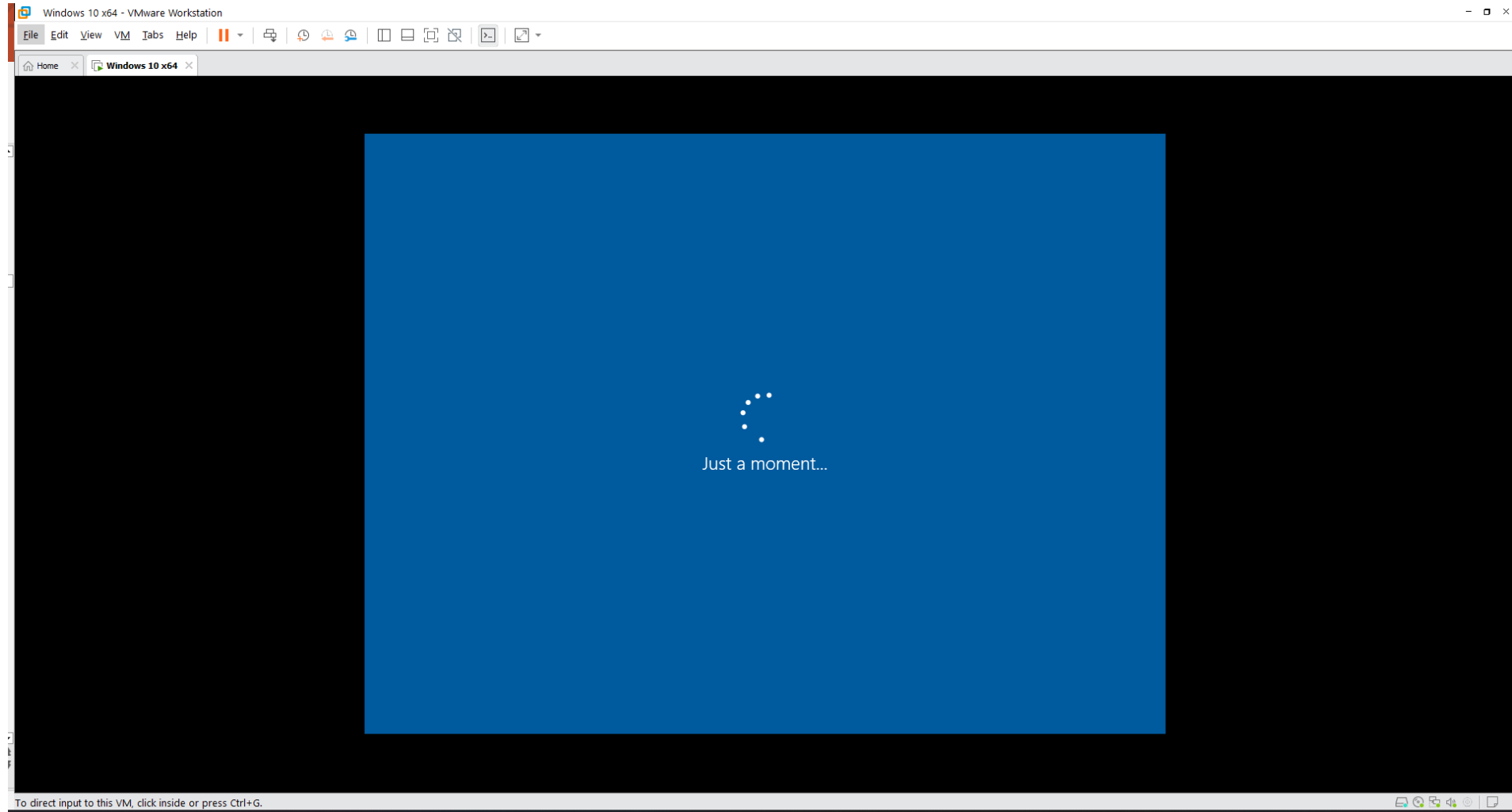
& click on restart



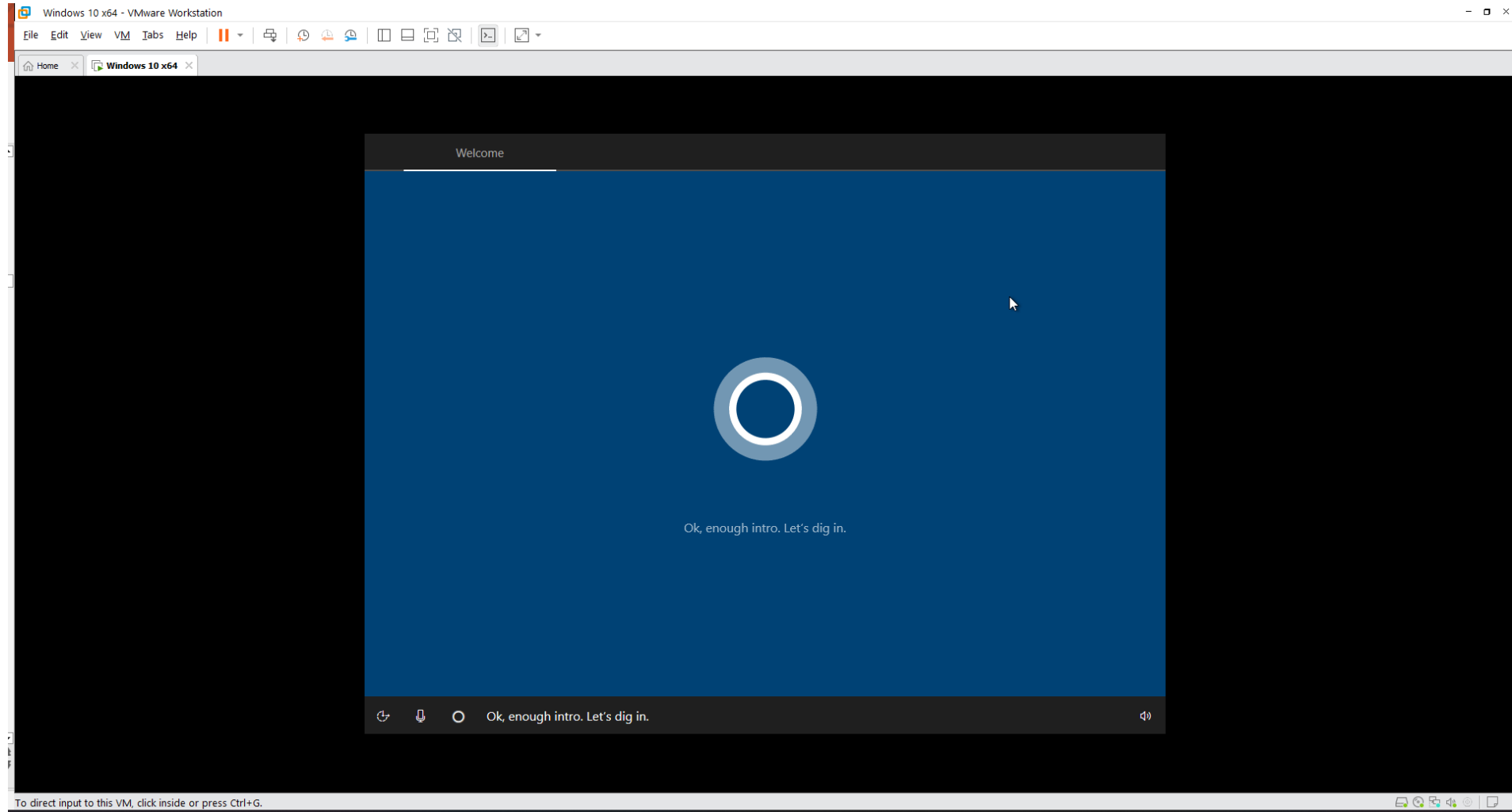




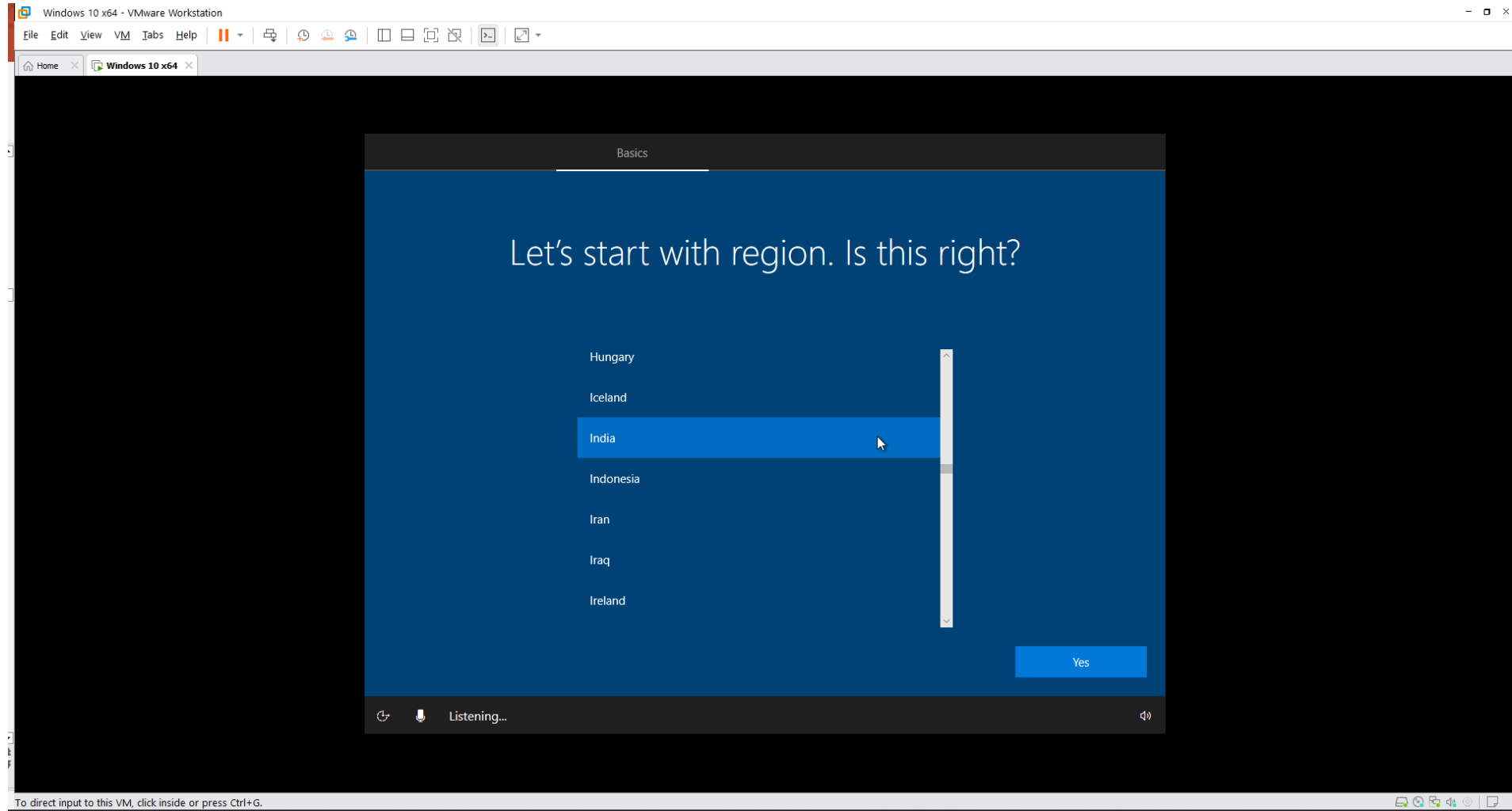
# Wait until the loading is over.



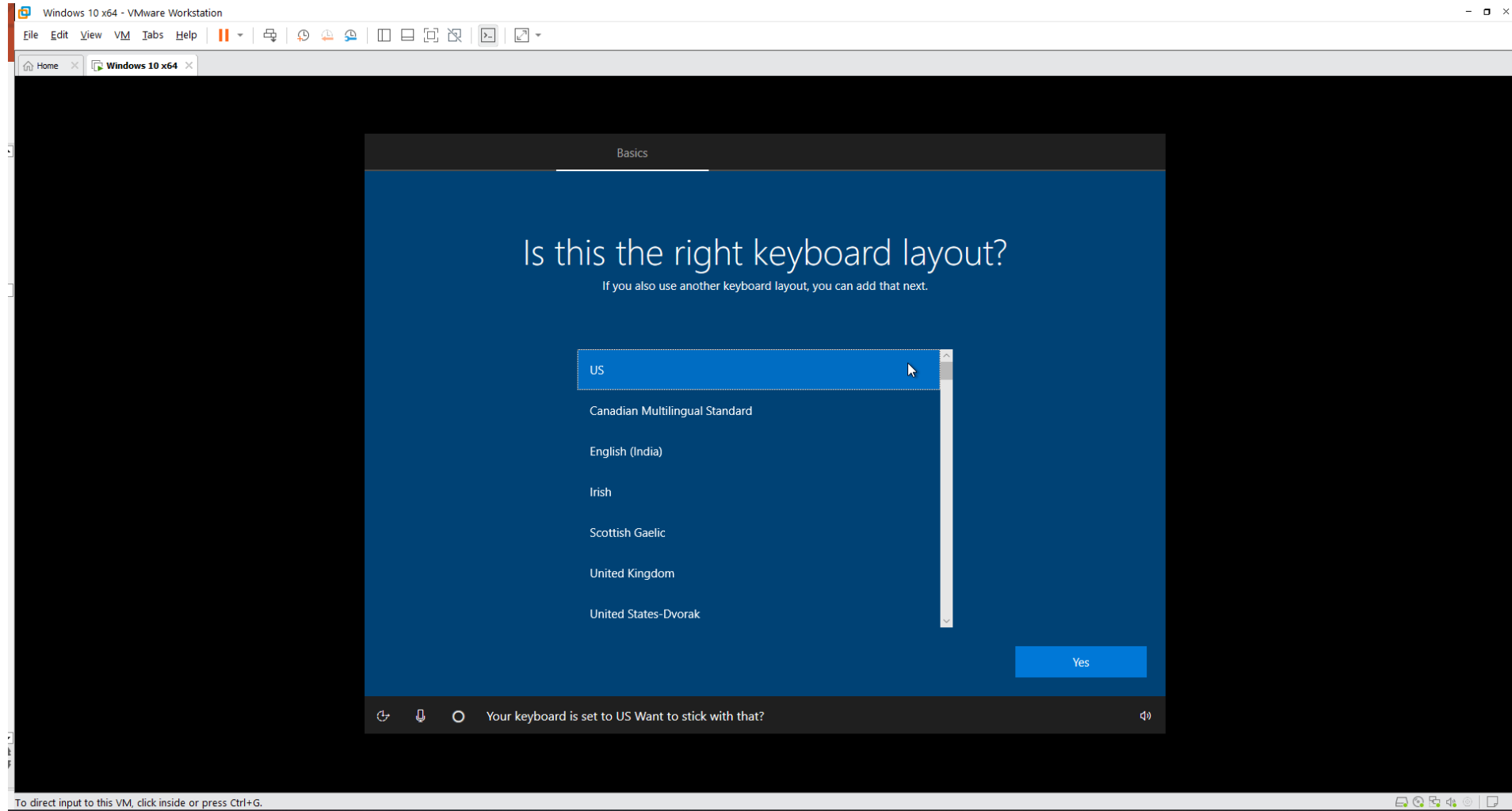
# Wait for Welcome speech.



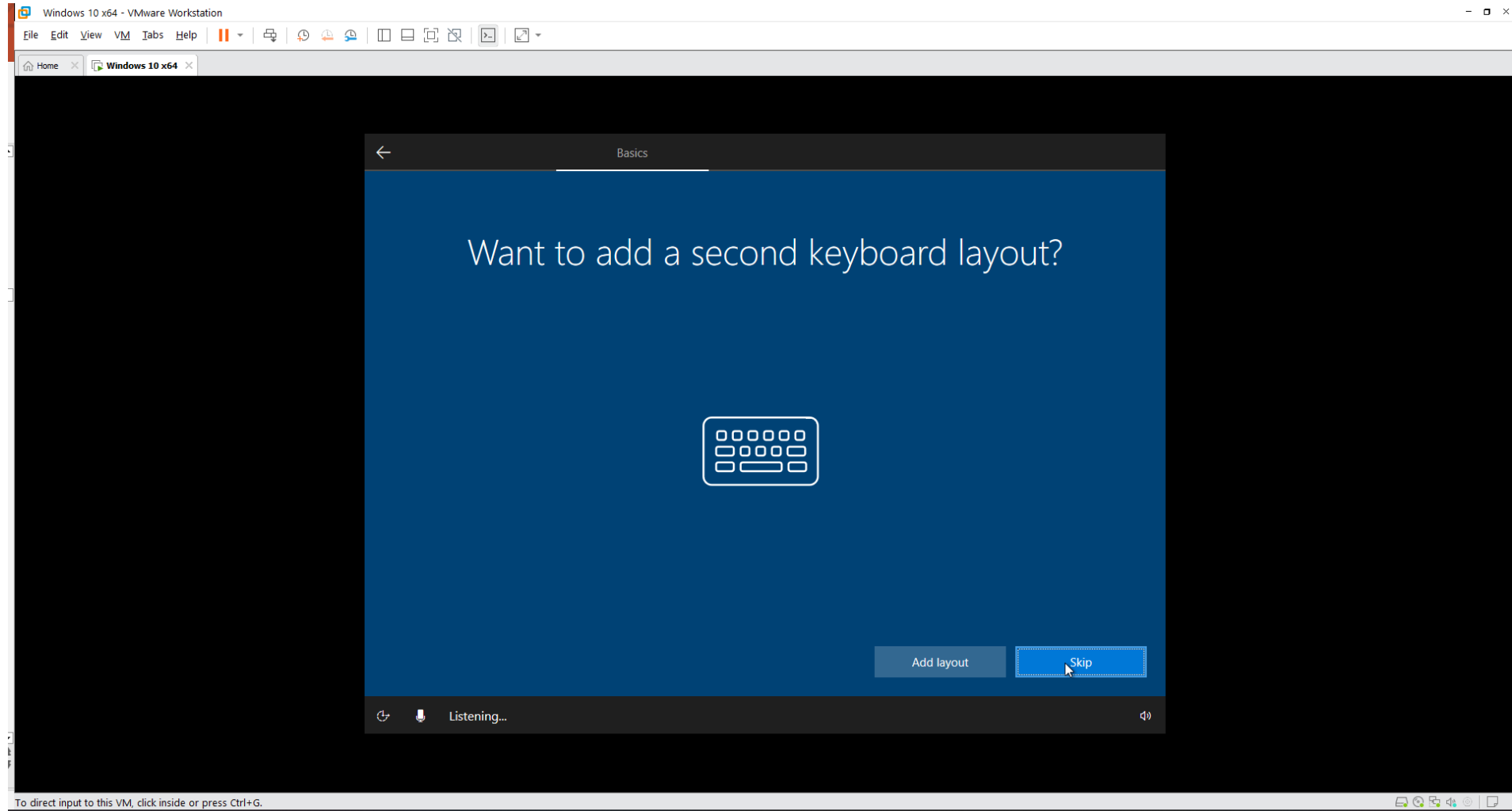
# Select India as your region



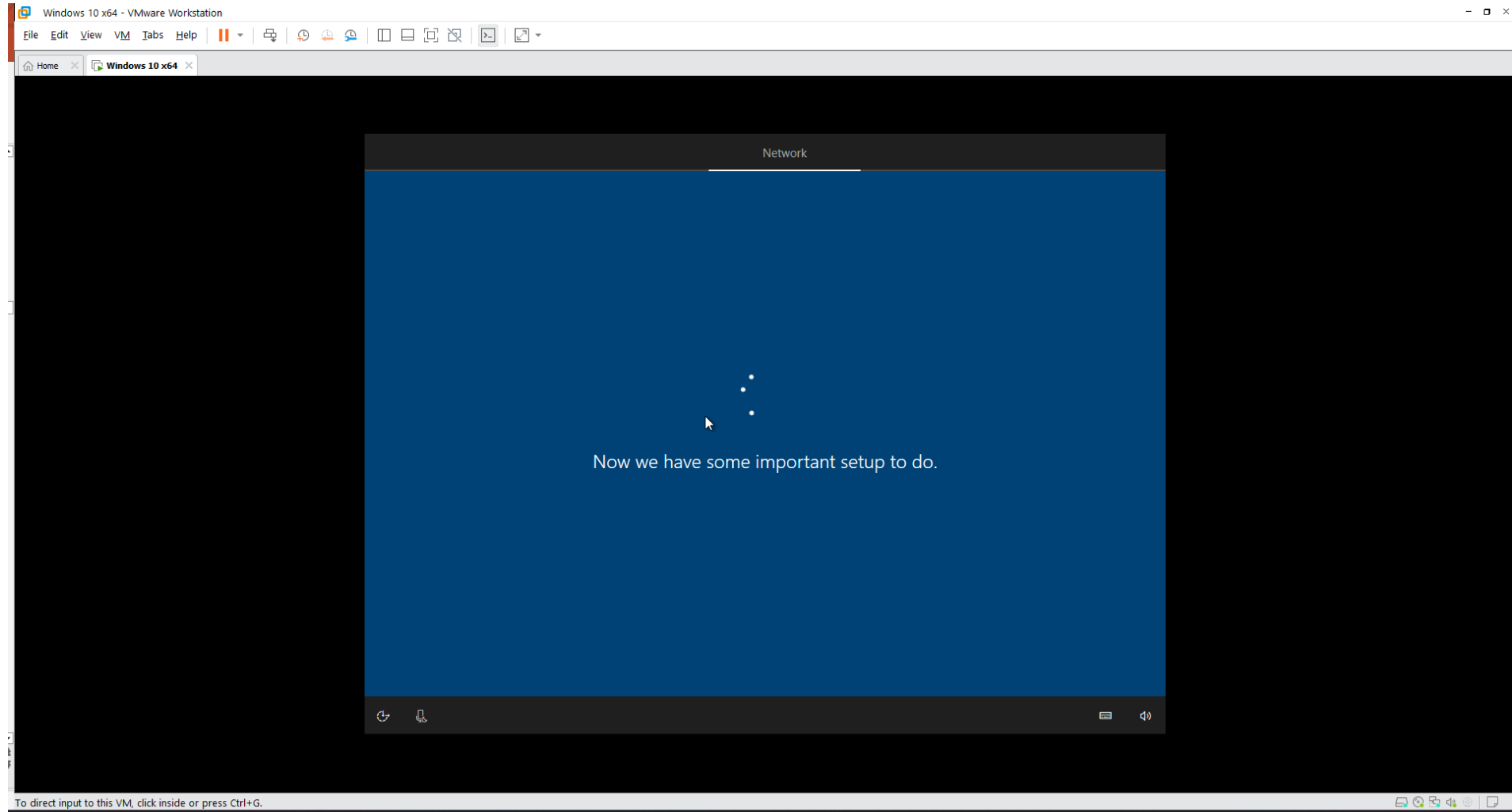
# Select keyboard



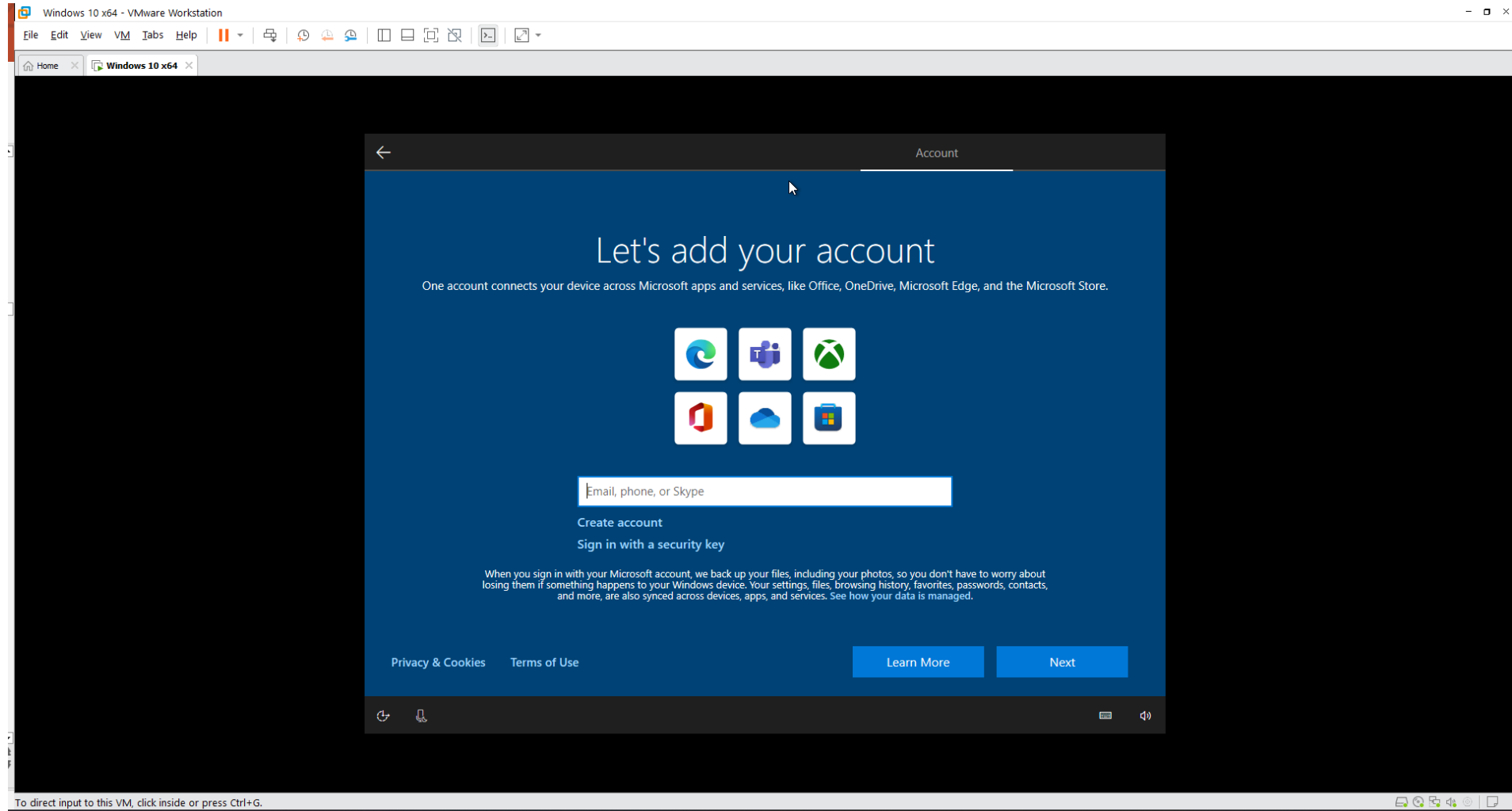
# Skip 2<sup>nd</sup> keyboard



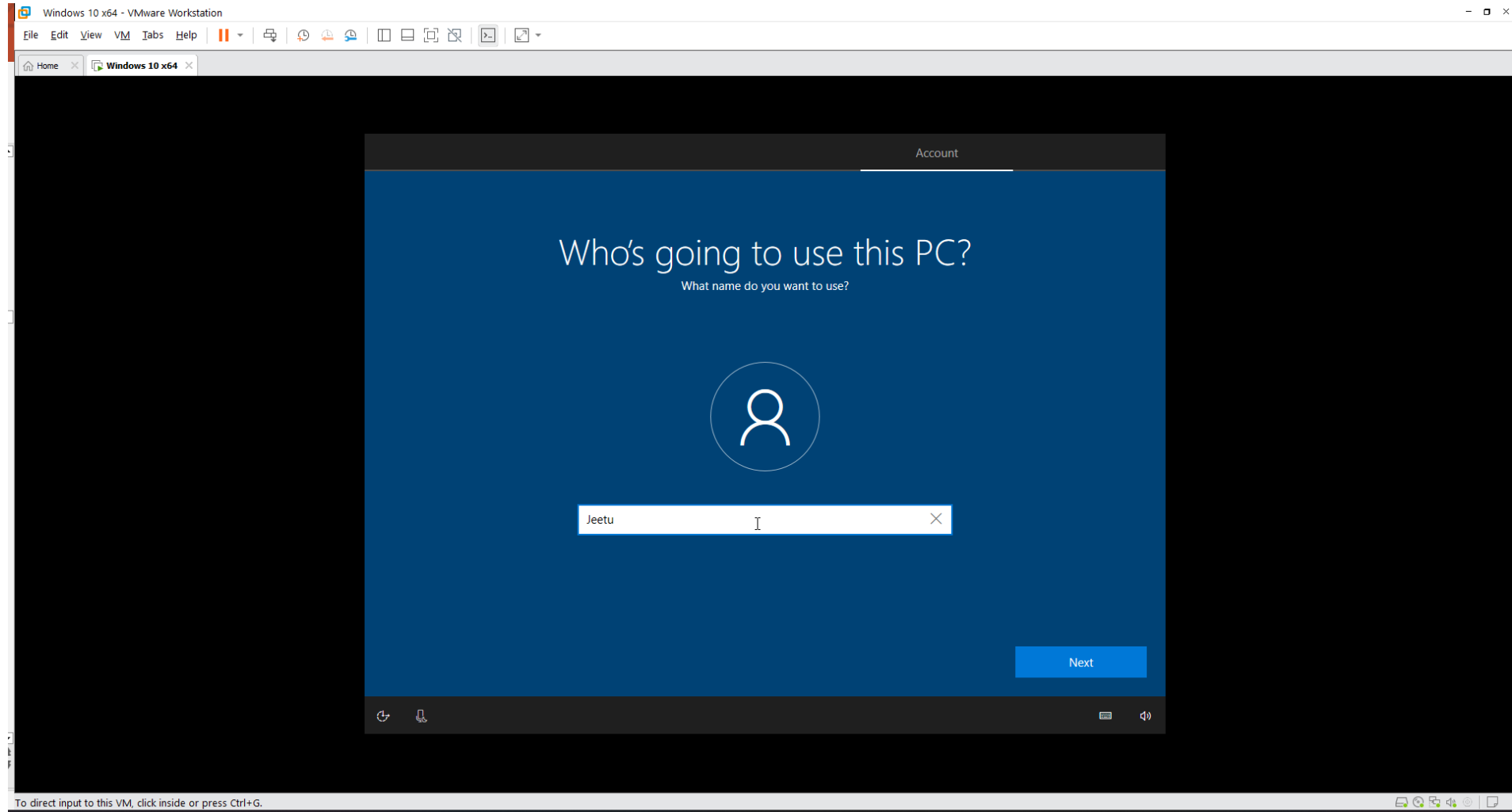
# Wait for the setup



# Disconnect your account, on this screen

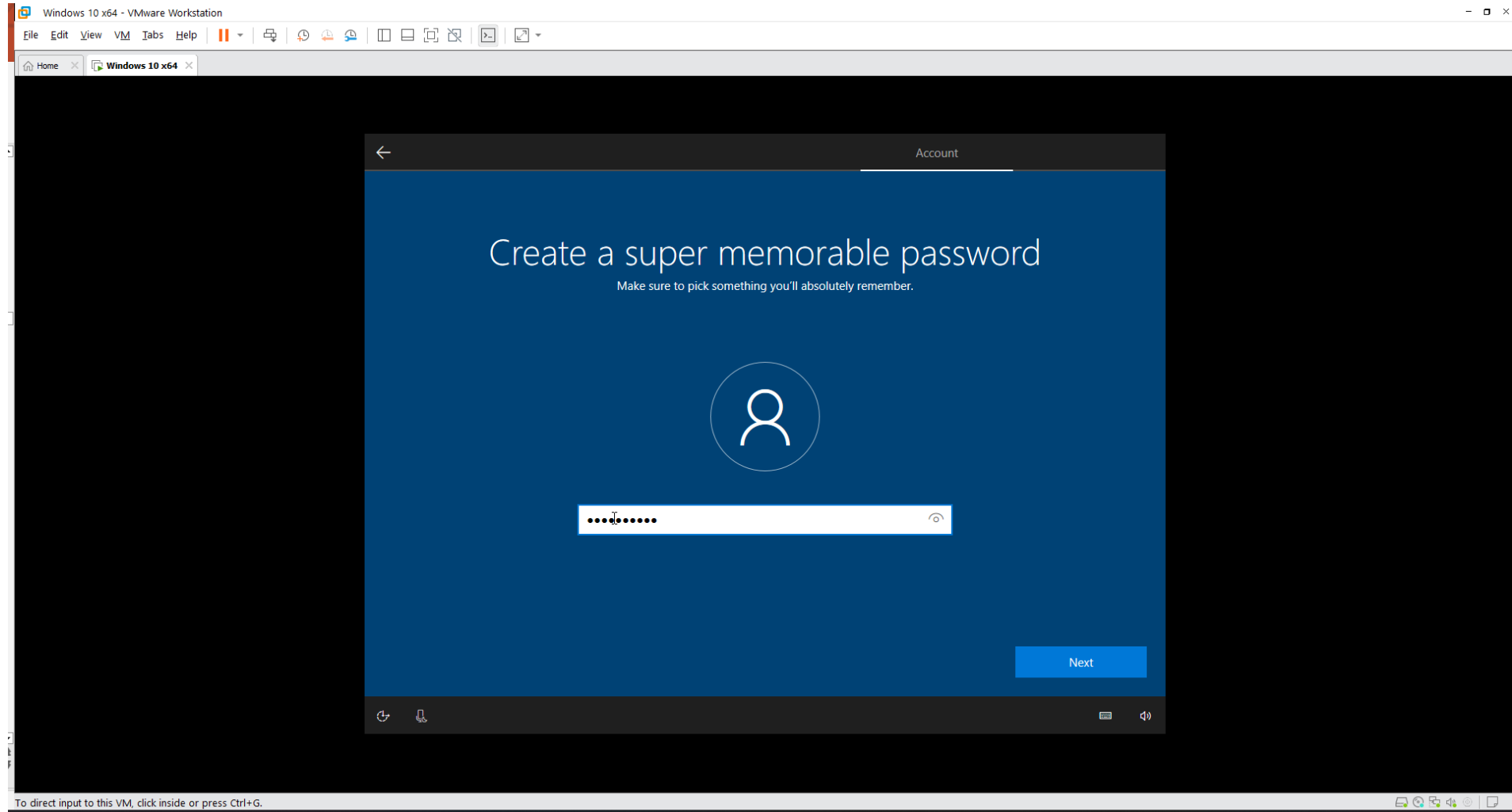


# Type your name

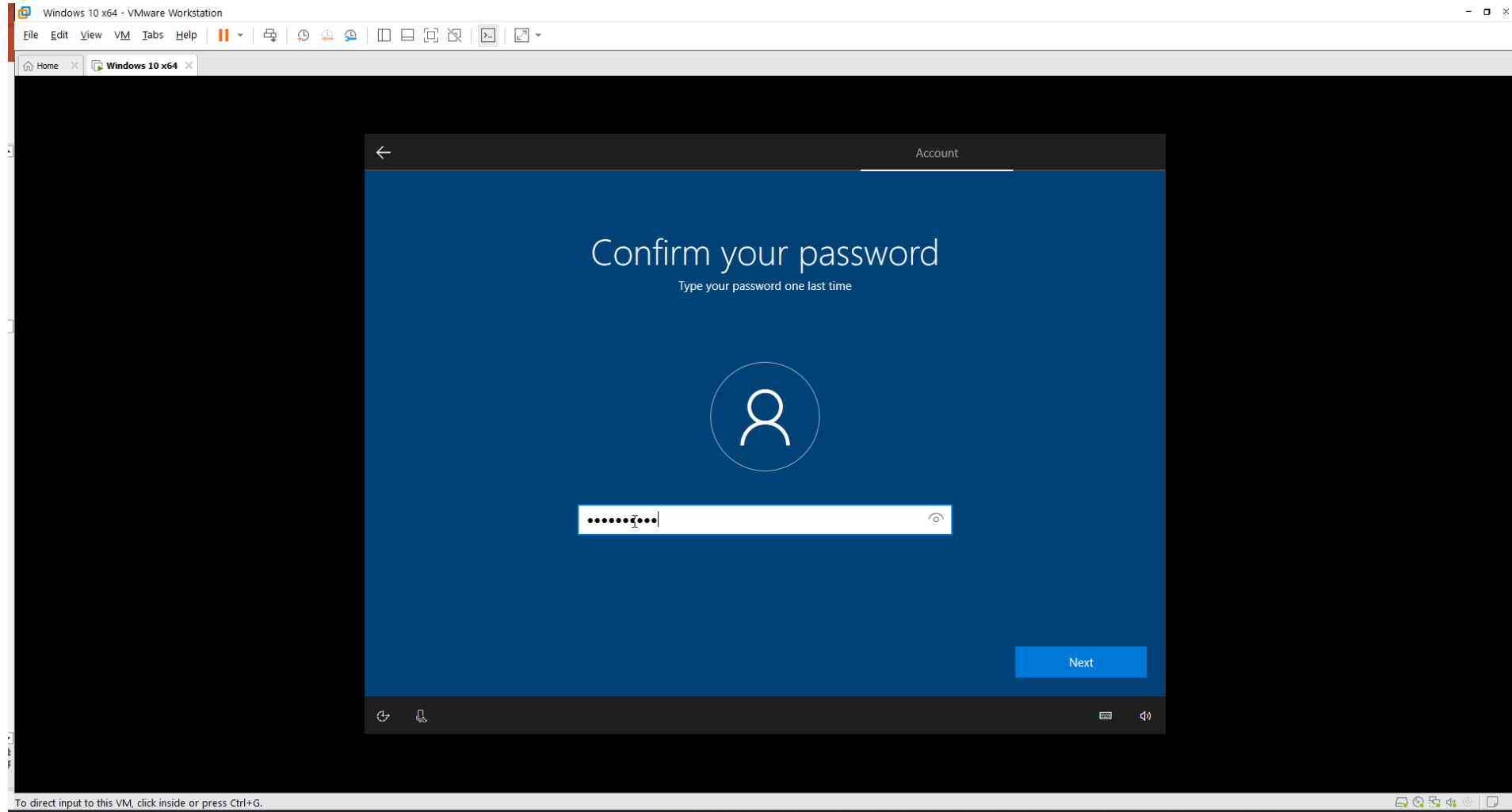




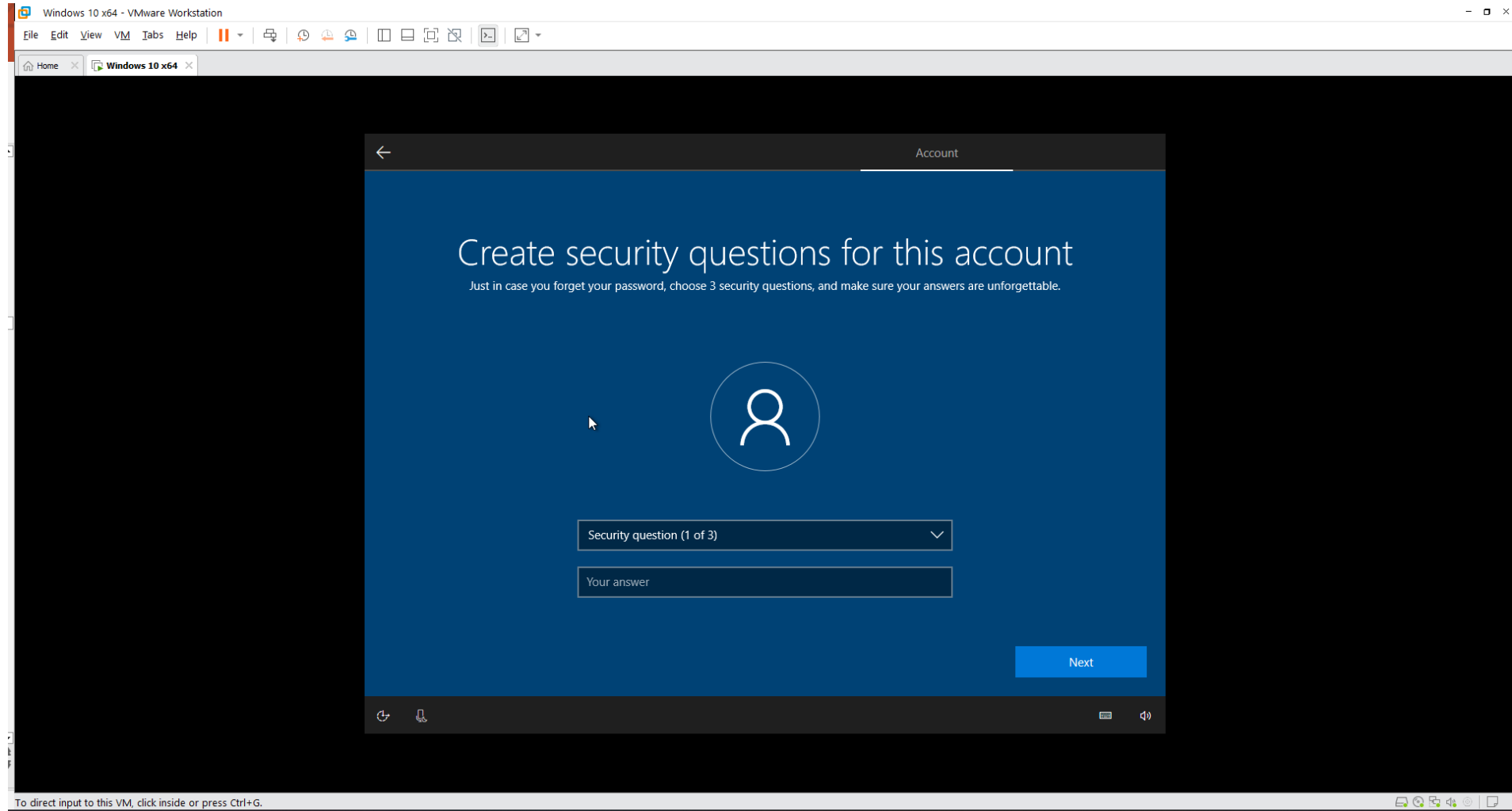
# Type a password



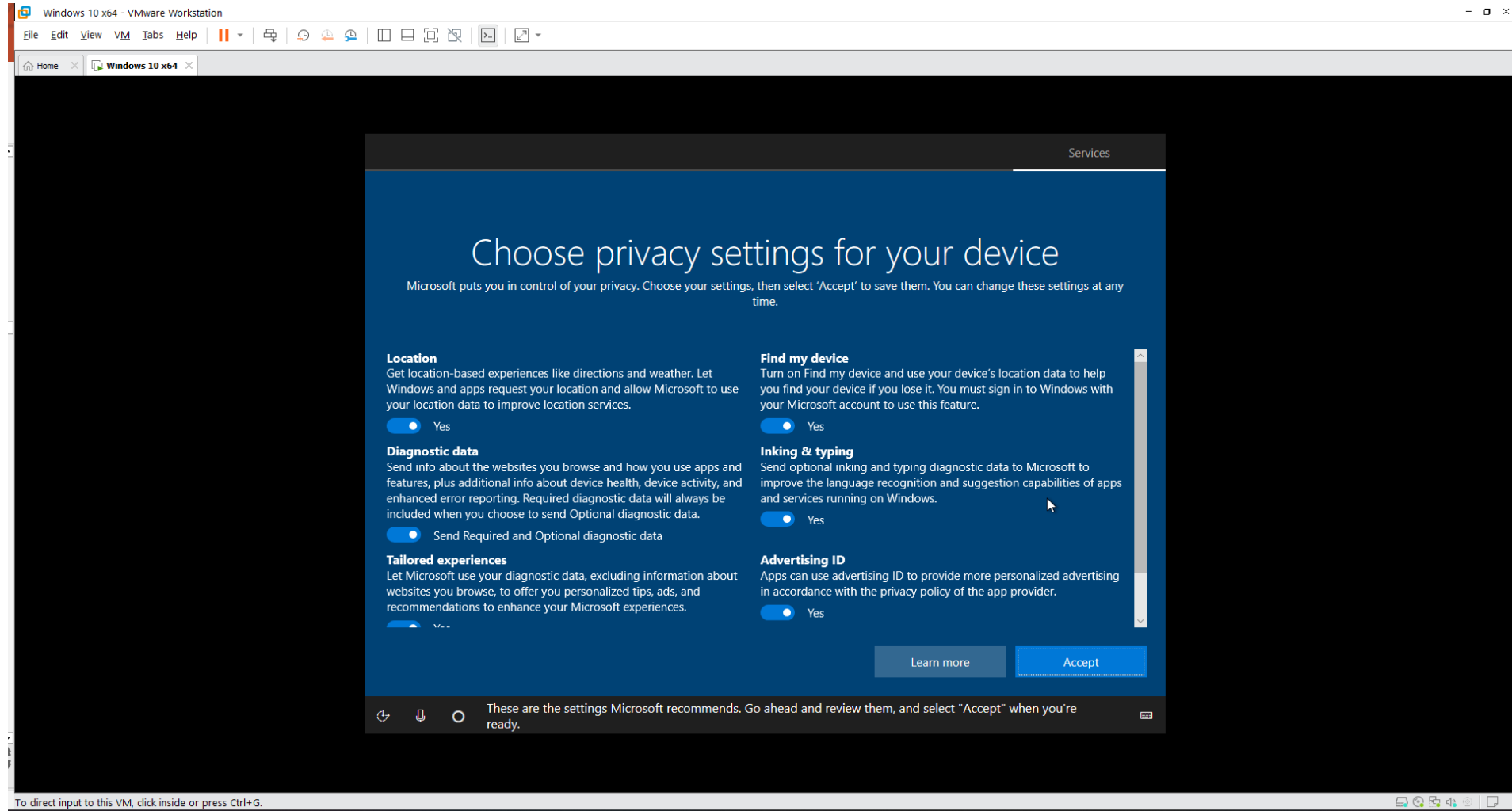
# Confirm your password



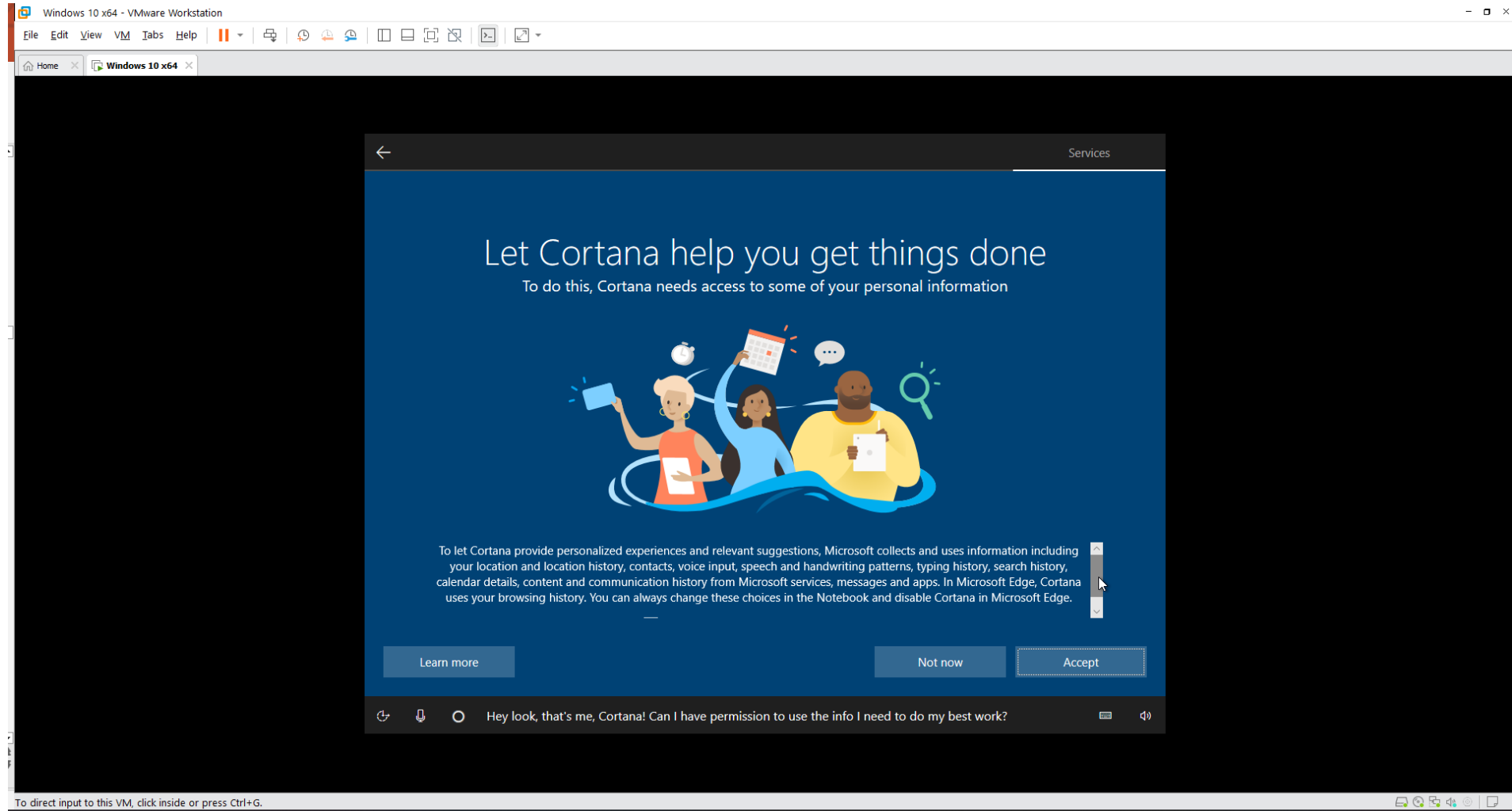
# Fill proper question & answers



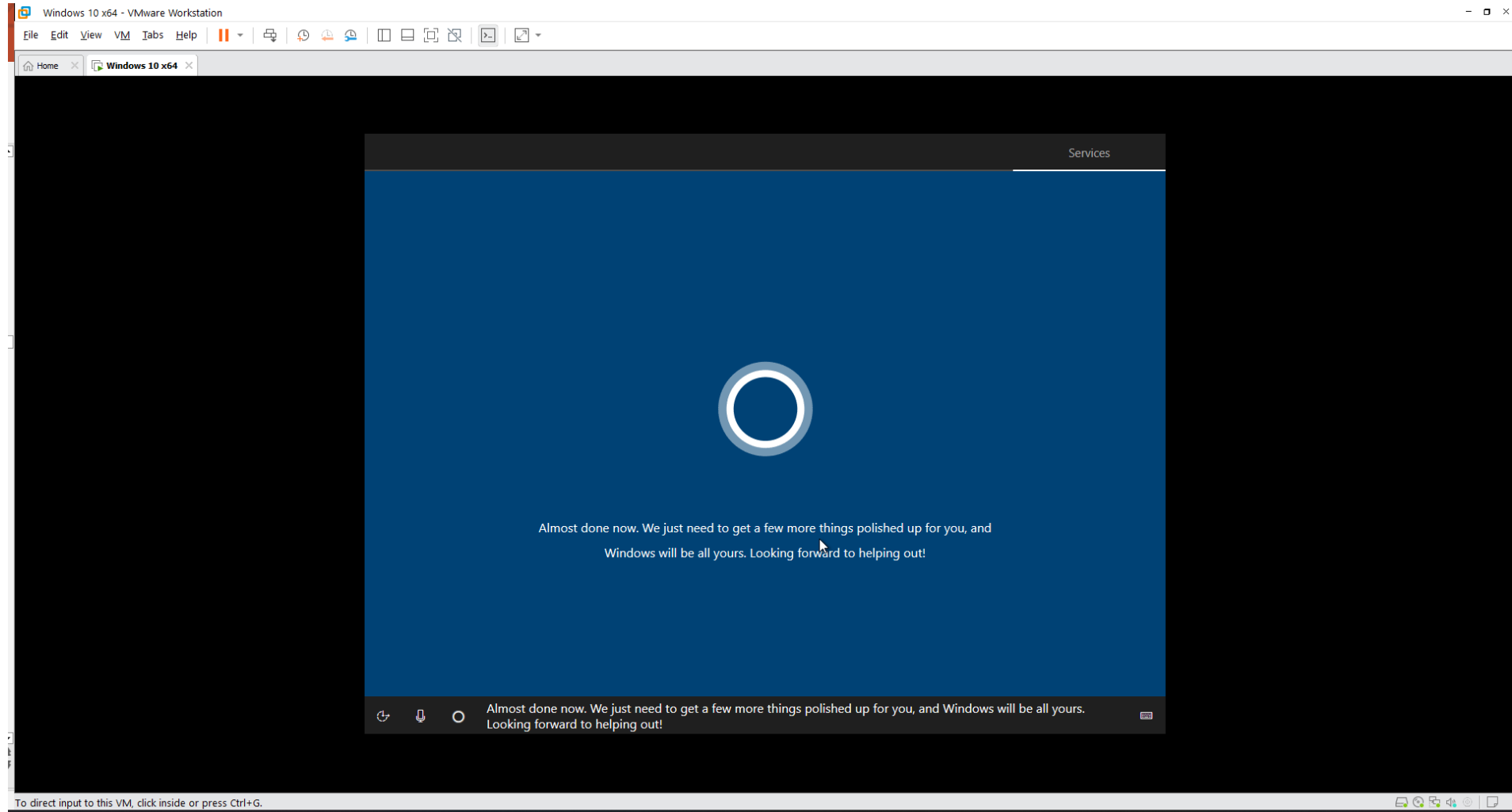
# Accept the settings

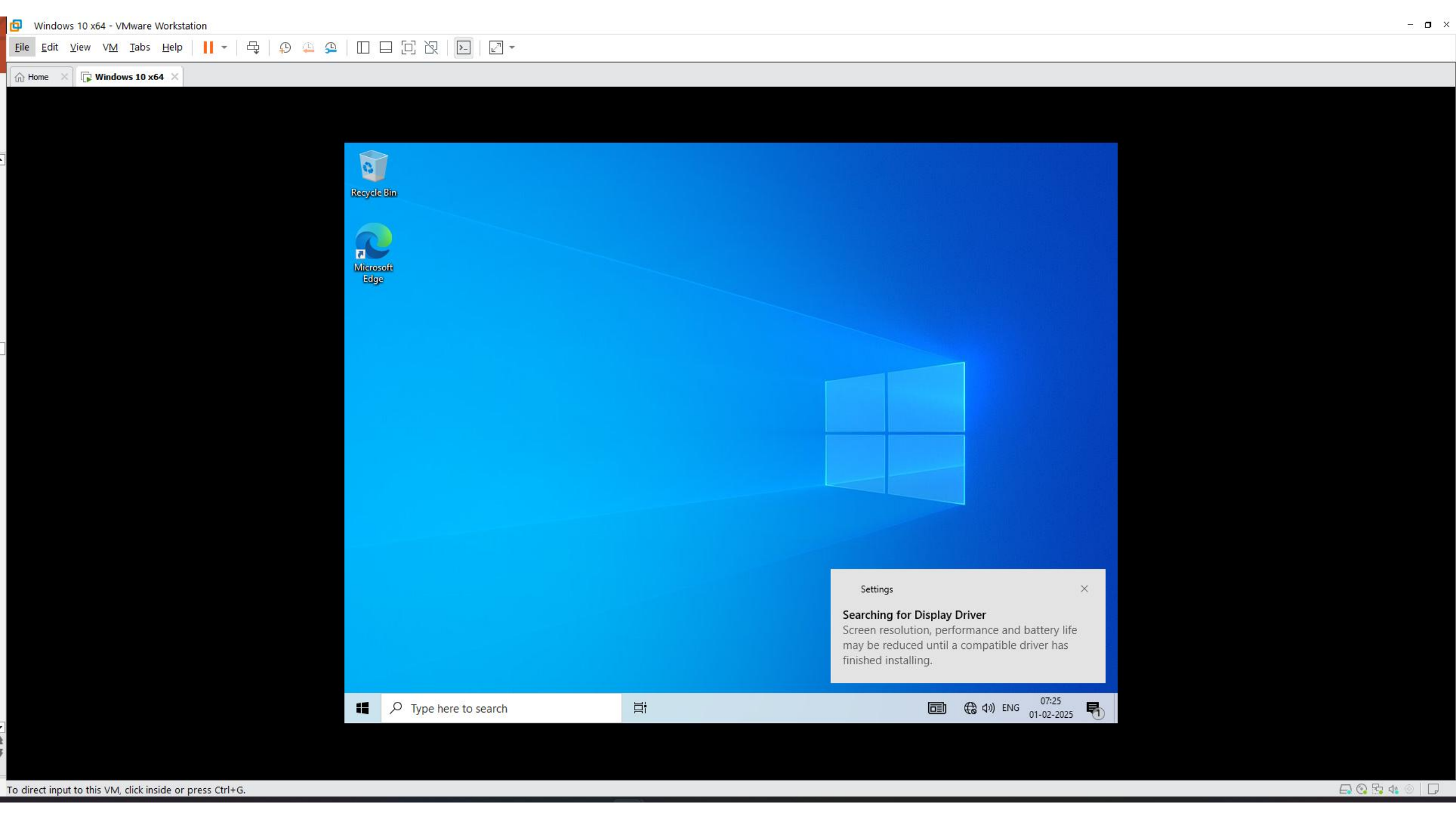


# Accept the Cortana permissions



# Wait...





Settings

**Searching for Display Driver**

Screen resolution, performance and battery life may be reduced until a compatible driver has finished installing.

# Hyper-V

- Its a **hypervisor**
- it both **type 1** & **type 2**
  - type 1 - Windows Server
  - type 2 - Windows Client
- We can either run VMWare Workstation or Microsoft Hyper-V at a time on a system.





# Check requirements Hyper-V

- **Windows 10** (Pro or Enterprise), or **Windows 11** (Pro or *Enterprise*)
- **64-bit Processor** with Second Level Address Translation (SLAT).
  - Second Level Address Translation (SLAT) is a hardware-assisted virtualization technology that improves the performance of virtual machines.
- CPU support for **VM Monitor Mode Extension** (VT-c on Intel CPUs).
  - VT-c (Virtualization Technology for Connectivity) on Intel CPUs, is a feature that enhances the performance and capabilities of virtualized environments
- Minimum of **4 GB memory**.



# Enabling Hyper-V - PowerShell

- Open a PowerShell console as Administrator.
- Run the following command:

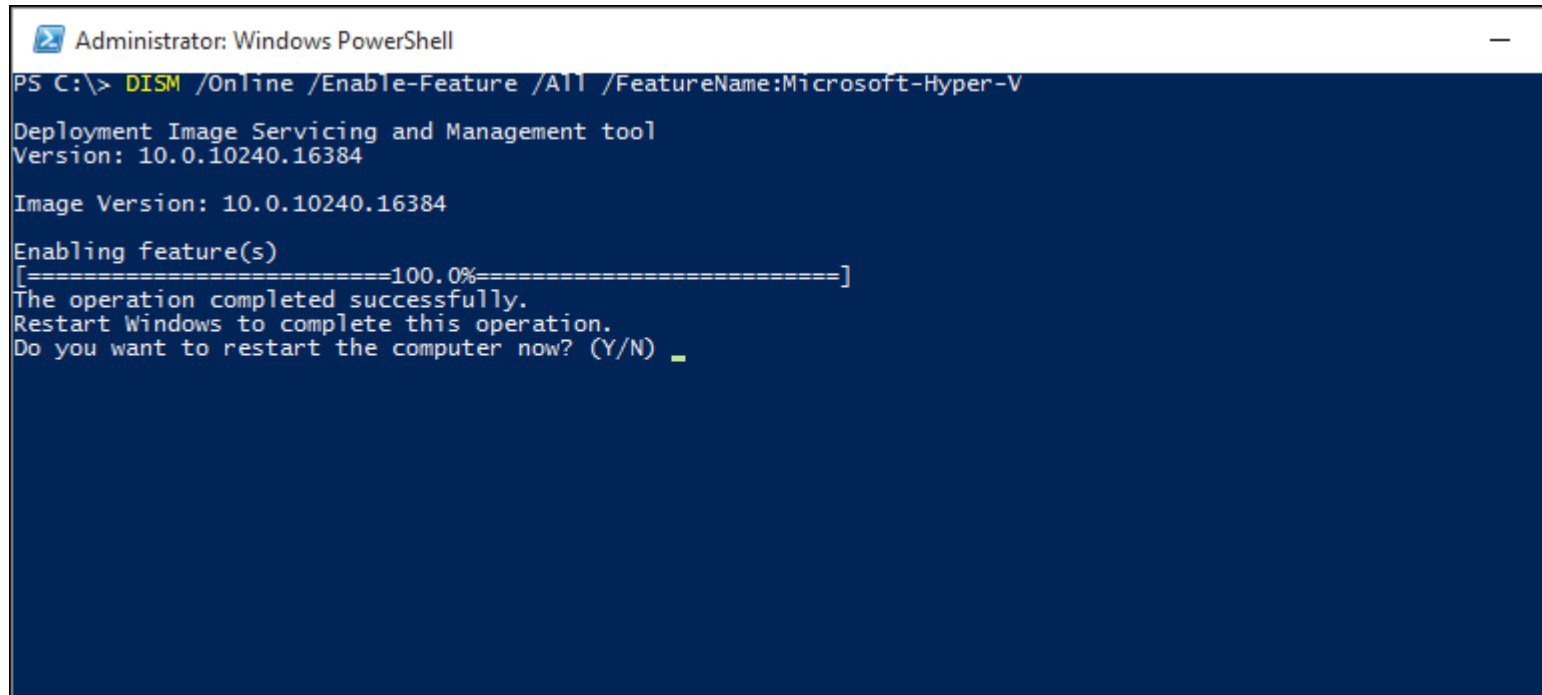
**Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V -All**



# Enabling Hyper-V – Command Prompt

- Open up a PowerShell or CMD session as Administrator.
- Type the following command:

**DISM /Online /Enable-Feature /All /FeatureName:Microsoft-Hyper-V**



```
Administrator: Windows PowerShell
PS C:\> DISM /Online /Enable-Feature /All /FeatureName:Microsoft-Hyper-V

Deployment Image Servicing and Management tool
Version: 10.0.10240.16384

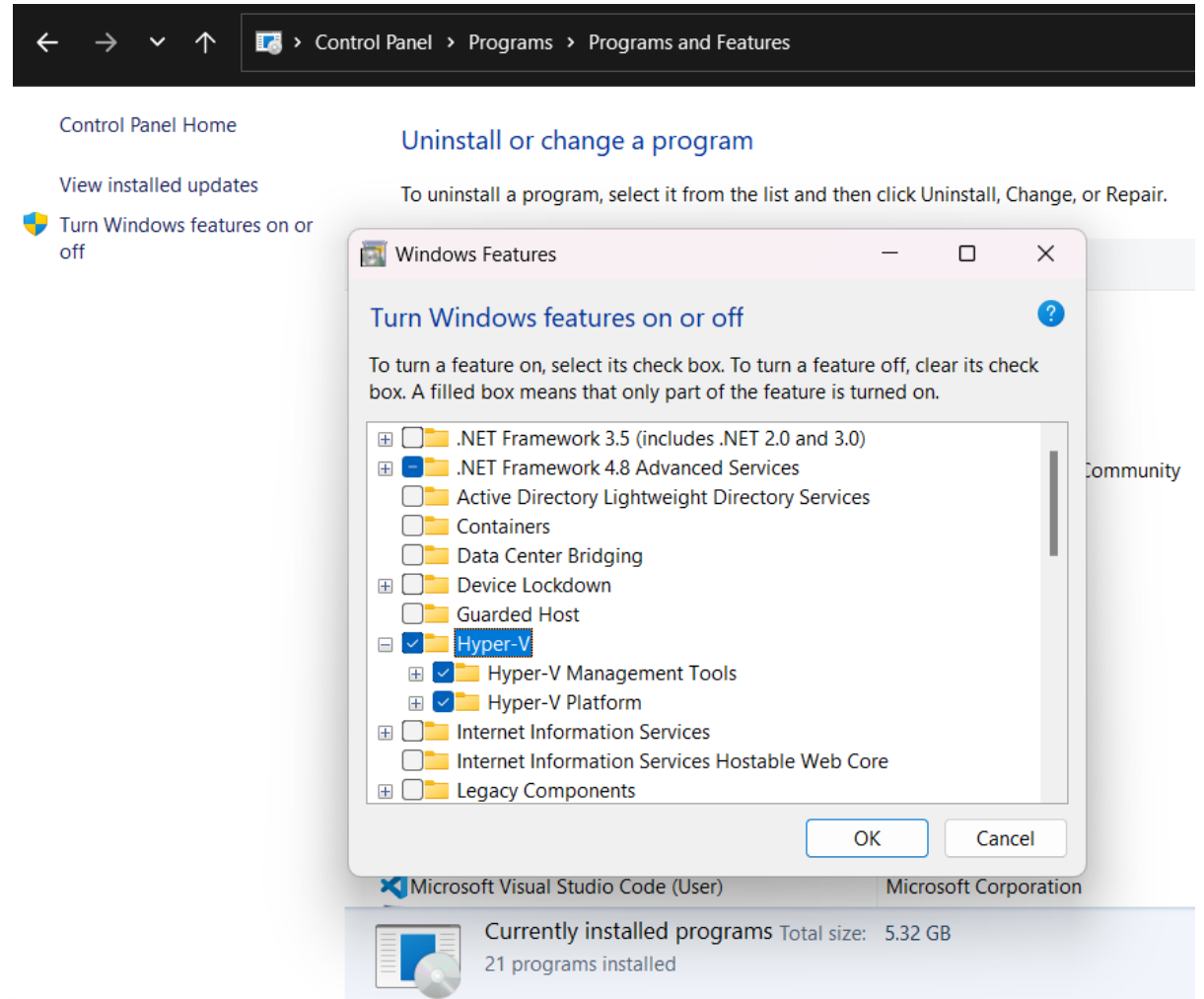
Image Version: 10.0.10240.16384

Enabling feature(s)
[=====100.0%=====]
The operation completed successfully.
Restart Windows to complete this operation.
Do you want to restart the computer now? (Y/N) _
```



# Enabling Hyper-V - Settings

- Navigate to the Control Panel.
- Select Programs, then Programs and Features.
- Select Turn Windows Features on or off.
- Select Hyper-V and then select OK.



# Operating System Properties

**System > About**

Workstation  
HP Pavilion Gaming Laptop 15-dk1xxx

Rename this PC

i

Device specifications

Copy ^

Device name

Workstation

Processor

Intel(R) Core(TM) i7-10750H CPU @ 2.60GHz 2.59 GHz

Installed RAM

32.0 GB (31.8 GB usable)

Device ID

00A9342A-A939-4C4E-A8EF-C62AE65D008B

Product ID

00329-10280-00000-AA885

System type

64-bit operating system, x64-based processor

Pen and touch

No pen or touch input is available for this display

Related links

[Domain or workgroup](#) [System protection](#) [Advanced system settings](#)

Windows specifications

Copy ^

Edition

Windows 11 Enterprise

Version

24H2

Installed on

24-Jan-25

OS build

26100.2894

Experience

Windows Feature Experience Pack 1000.26100.36.0

[Microsoft Services Agreement](#)

[Microsoft Software License Terms](#)

Support

Copy ^

Manufacturer

HP

Website

[Online support](#)



# Operating System Properties



## Product key and activation

Change product key or upgrade your edition of Windows



## Remote desktop

Control this device from another device



## Device Manager

Printer and other drivers, hardware properties



## BitLocker

Device encryption to help protect your data

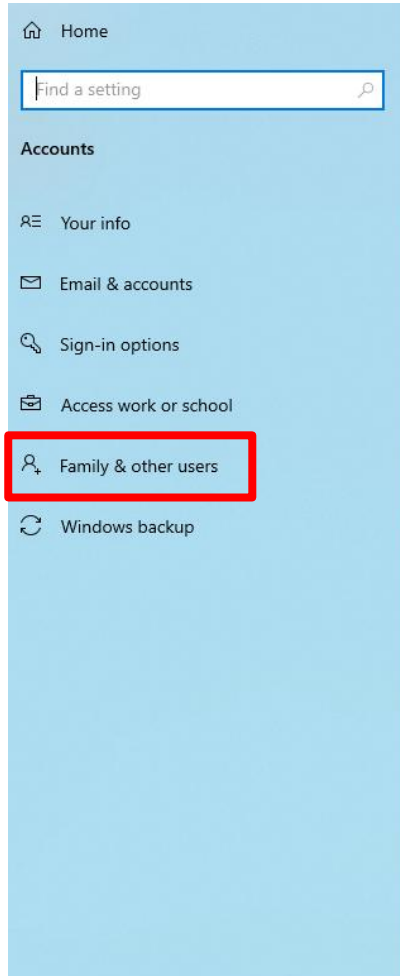


# User Management

- Windows allows **adding multiple user account** to use the same device, enabling each user to have their own settings, documents, and applications.
- User management on Windows 10 allows users to **add, remove, and manage** user accounts on their device.
- It also allows users to **set restrictions and controls** for each user.
- Managing user accounts:
  - **Set restrictions:** Set restrictions on web browsing, apps, and games.
  - **Set screen time:** Set how much time a user can spend on the computer and when.
  - **Make someone an administrator:** Give someone the ability to install programs and change system settings.
  - **Delete a user account:** Select the account, click Remove, and then click Delete account and data.



# Creating User from GUI



## Your info

You need to activate Windows before you can personalize your PC.

[Activate Windows now.](#)



**JEETU**

Local Account  
Administrator

Windows is better when your settings and files automatically sync. Use a Microsoft account to easily get all your stuff on all your devices.

[Sign in with a Microsoft account instead](#)

## Create your picture




Camera



Browse for one

 [Get help](#)

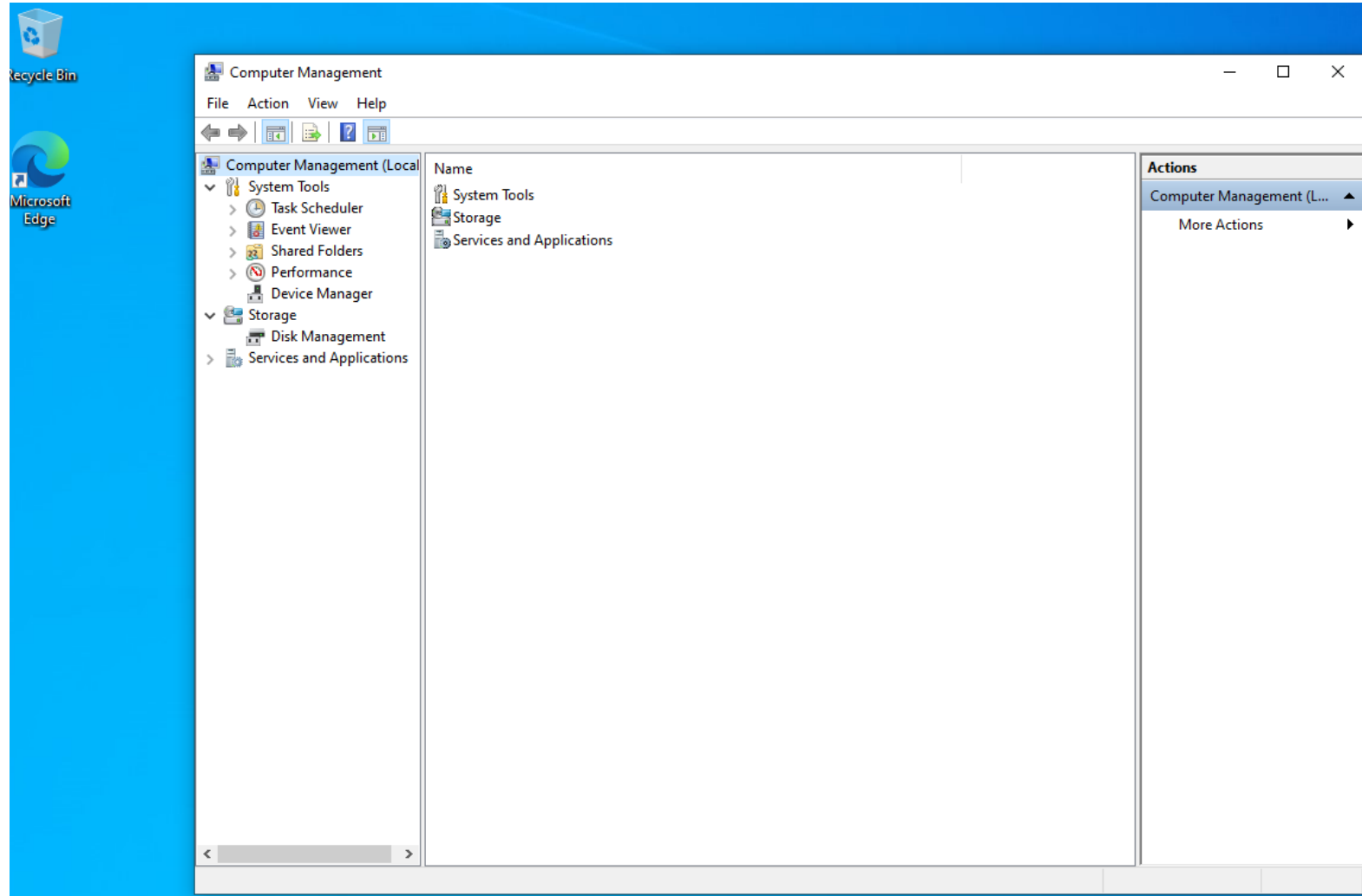
 [Give feedback](#)



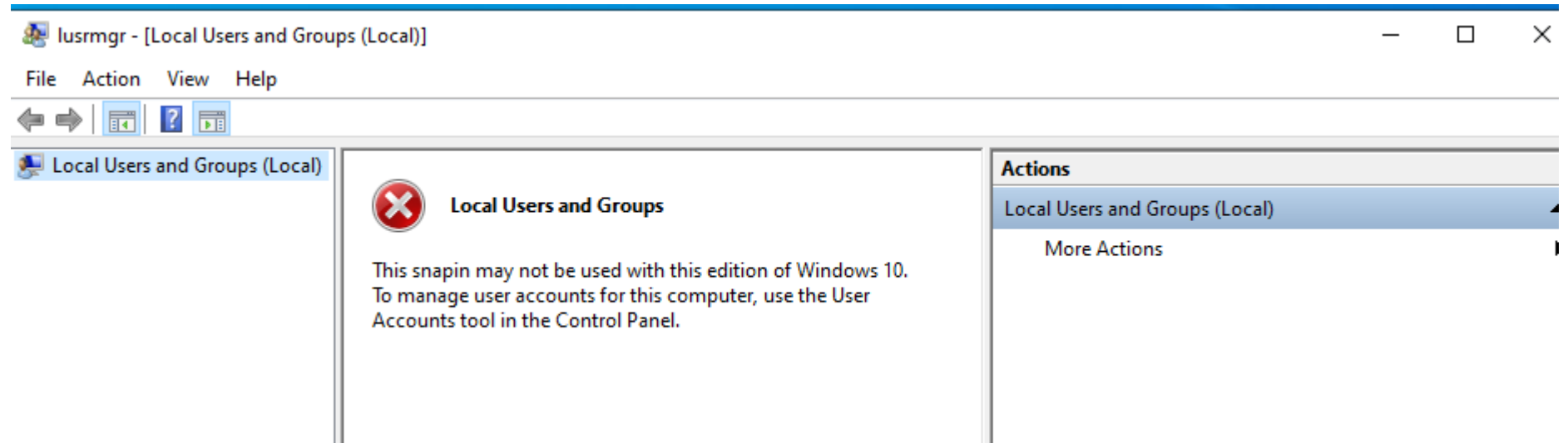
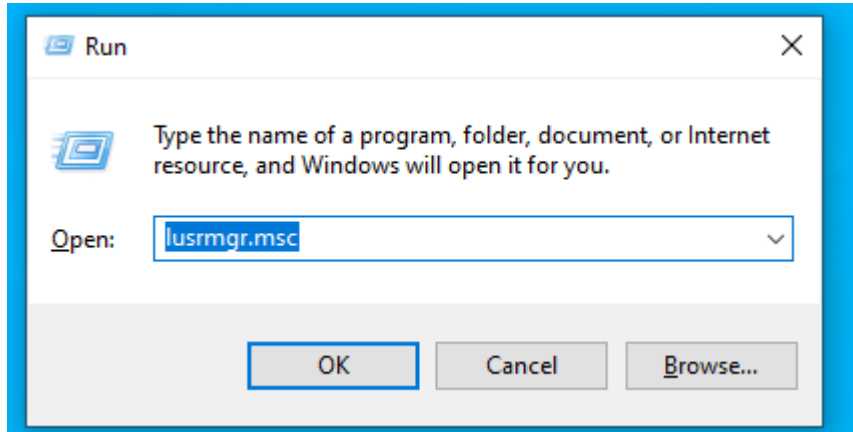


# Creating Group from GUI



















- Option not present in the Windows 10 Home edition.



# Command – Home Edition

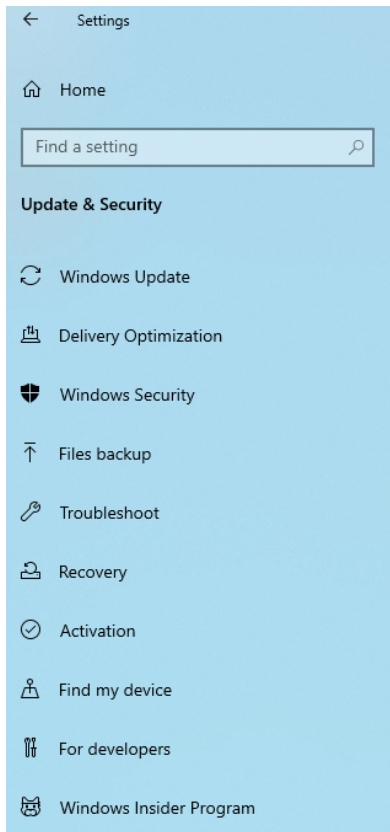


# Command – Enterprise Edition

Local Users and Groups (Local)		Name	Description
 Users  Groups		 Access Control Assistance Operators	Members of this group can re...
		 Administrators	Administrators have complete ...
		 Backup Operators	Backup Operators can overrid...
		 Cryptographic Operators	Members are authorized to p...
		 Device Owners	Members of this group can ch...
		 Distributed COM Users	Members are allowed to launc...
		 Event Log Readers	Members of this group can re...
		 Guests	Guests have the same access ...
		 Hyper-V Administrators	Members of this group have c...
		 IIS_IUSRS	Built-in group used by Internet...
		 Network Configuration Operators	Members in this group can ha...
		 OpenSSH Users	Members of this group may c...
		 Performance Log Users	Members of this group may s...
		 Performance Monitor Users	Members of this group can ac...
		 Power Users	Power Users are included for ...
		 Remote Desktop Users	Members in this group are gr...
		 Remote Management Users	Members of this group can ac...
		 Replicator	Supports file replication in a d...
		 System Managed Accounts Group	Members of this group are m...
		 User Mode Hardware Operators	Members of this group may o...
		 Users	Users are prevented from mak...
		 docker-users	Users of Docker Desktop
		 _vmware_	VMware User Group



# Windows Updates



## Windows Update



You're up to date

Last checked: Today, 07:32

Check for updates



### Get ready for Windows 11

To see if this PC can run Windows 11, check the hardware requirements or visit your PC manufacturer's website.

[Check hardware requirements](#) X



#### Get the latest updates as soon as they're available

Be among the first to get the latest non-security updates, fixes, and improvements as they roll out. [Learn more](#)



Off



#### Pause updates for 7 days

Visit Advanced options to change the pause period



#### Change active hours

Currently 08:00 to 17:00



#### View update history

See updates installed on your device



#### Advanced options

Additional update controls and settings



Looking for info on the latest updates?

[Learn more](#)

Related links

[Check Storage](#)

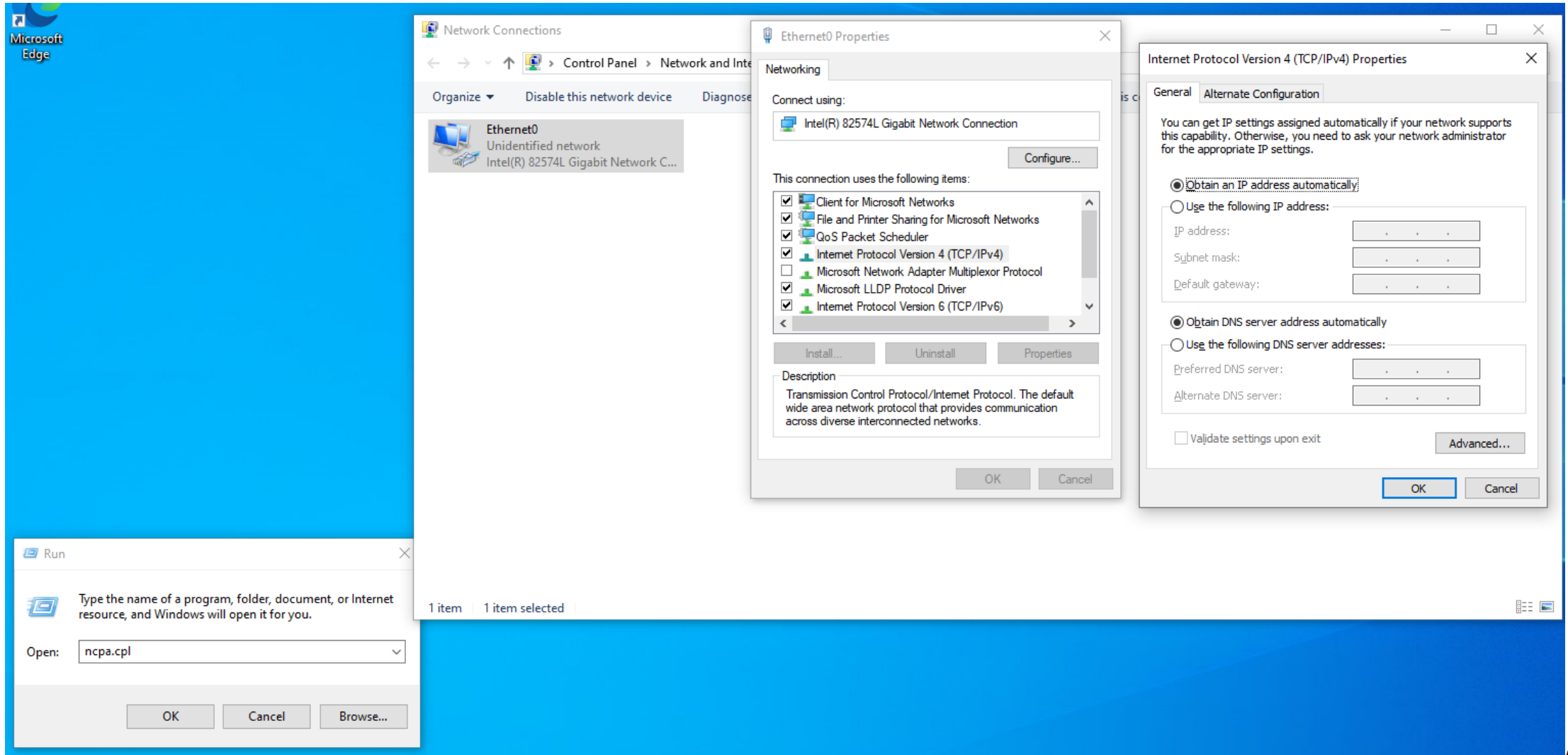
[OS build info](#)

[Get help](#)

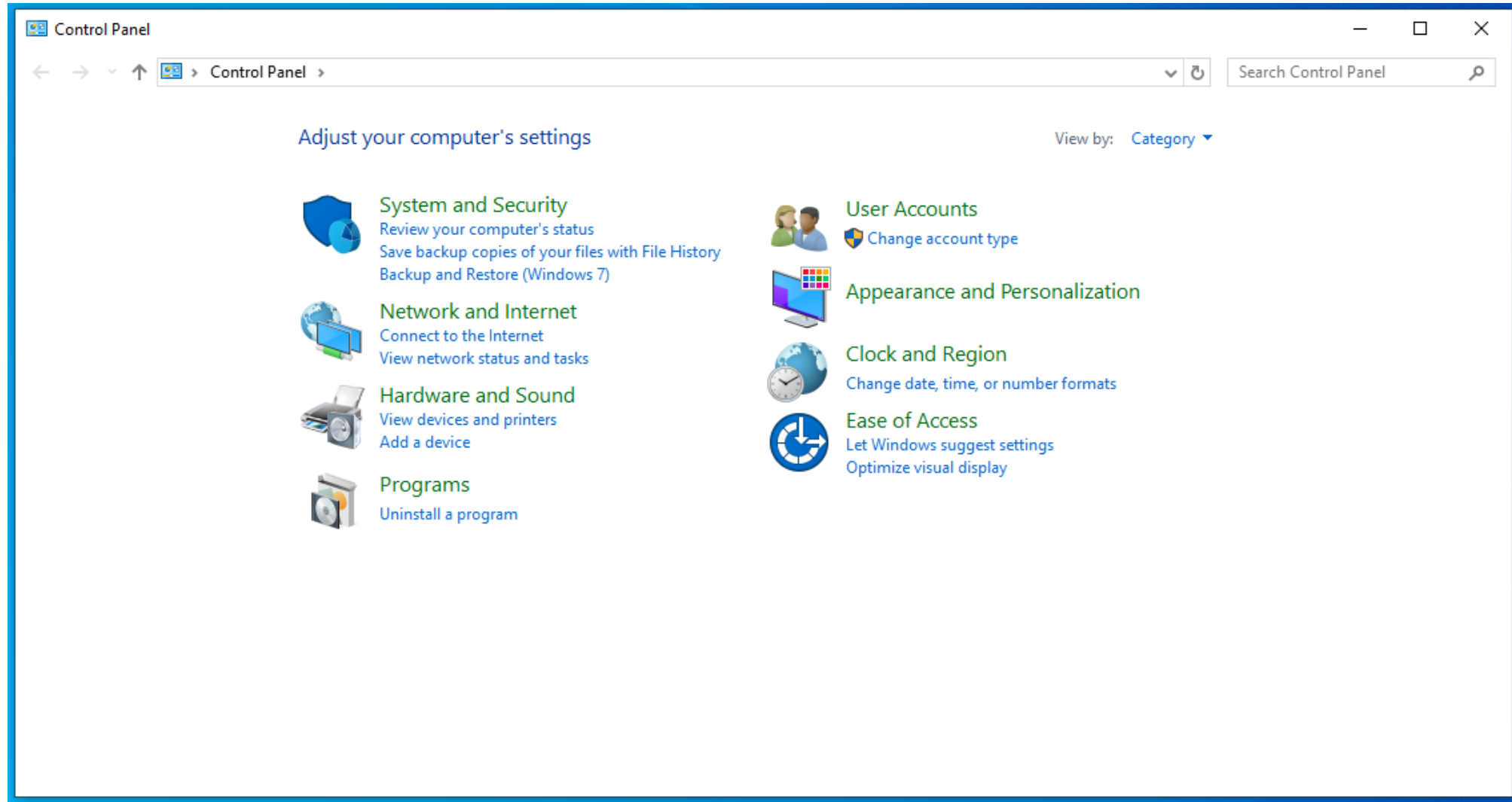
[Give feedback](#)



# Network Configuration

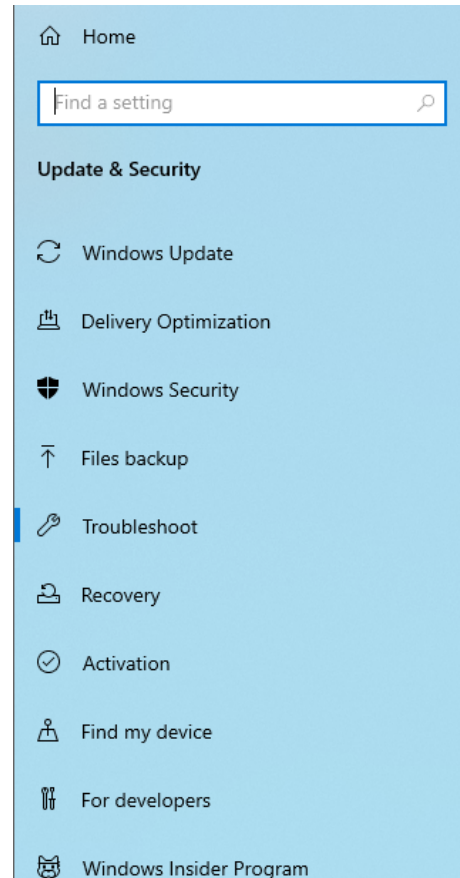


# Control Panel Items



# Basic Troubleshooting

- **Start > Settings > Update & Security > Troubleshoot > Additional troubleshooters**, and then select **Additional troubleshooters**.



## Troubleshoot

If something on your device isn't working, running a troubleshooter might help find and fix the problem for you.

### Recommended troubleshooting

Recommended troubleshooters can help improve your Windows experience. How much do you want Microsoft to help when we find issues on your device that troubleshooters might be able to fix?

Ask me before running troubleshooters ▾

You need to be connected to the internet to see recommendations.

No recommended troubleshooters right now

Last checked: never

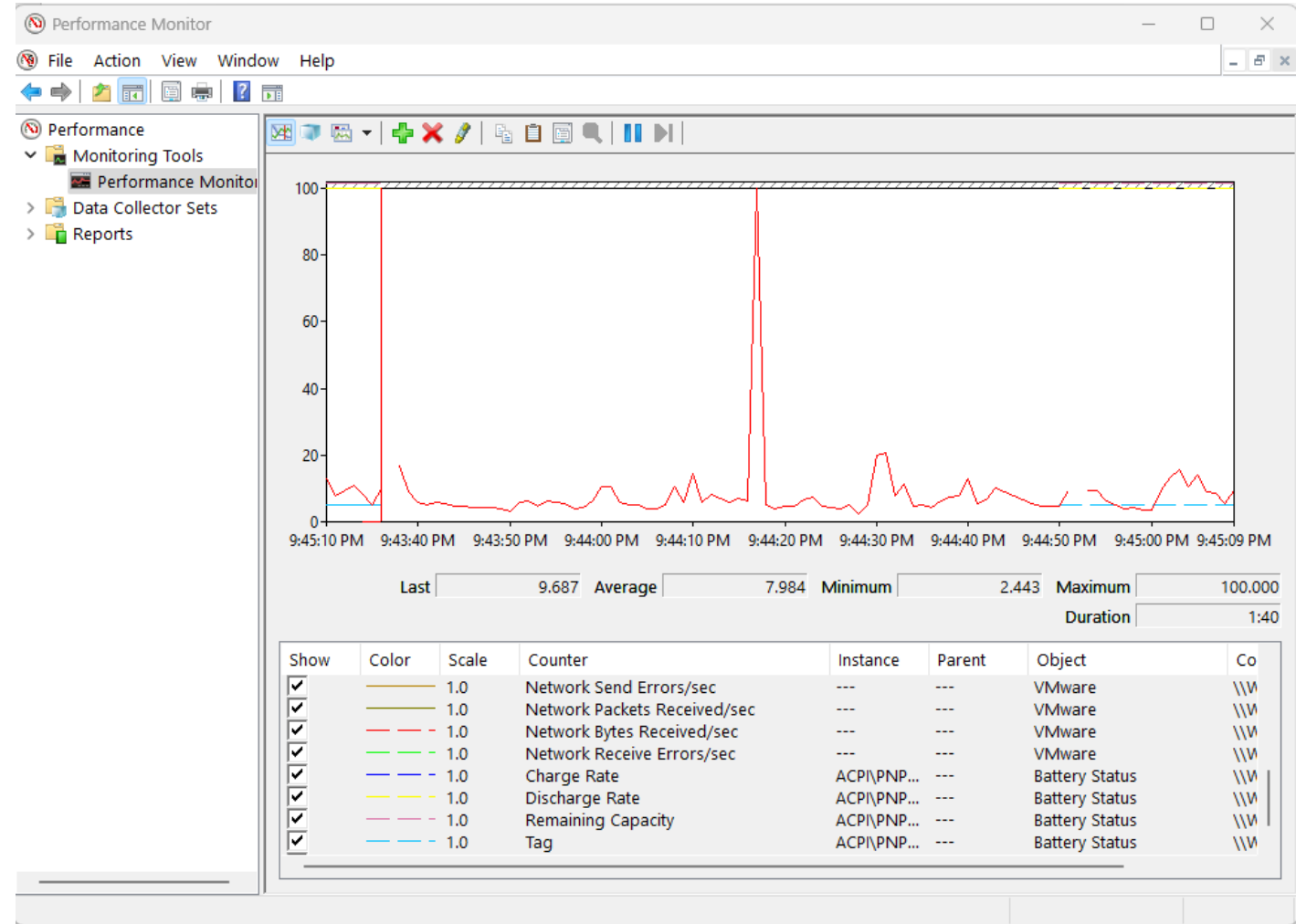
[View troubleshooting history](#)

[Additional troubleshooters](#)



# Performance monitor

- Performance Monitor is a built-in tool that allows you to track various system metrics like CPU usage, memory usage, disk activity, and network performance in real-time.
- It is accessed by opening the Start menu, searching for "Performance Monitor", and launching the application; you can also open it by typing "**perfmon**" in the Run dialog box.





# Event Viewer

The screenshot displays the Windows Event Viewer application. The left pane shows the 'System' log selected under 'Windows Logs'. The main pane shows a list of events, with Event 10016 from 'DistributedCOM' selected. The right pane shows the 'Actions' menu.

**System** Number of events: 4,847

Level	Date and Time	Source
Information	03-Feb-25 9:43:36 PM	Service Control Manager
Information	03-Feb-25 9:22:55 PM	WindowsUpdateClient
Information	03-Feb-25 9:22:55 PM	Service Control Manager
Information	03-Feb-25 9:22:43 PM	WindowsUpdateClient

**Event 10016, DistributedCOM**

**General** Details

The application-specific permission settings do not grant Local Activation permission for the COM Server application with CLSID {2593F8B9-4EAF-457C-B68A-50F6B8EA6B54} and APPID {15C20B67-12E7-4BB6-92BB-7AFF07997402} to the user WORKSTATION\Jeetu SID (S-1-5-21-1341496841-55697840-1495310029-1001) from address LocalHost (Using LRPC) running in the application container Unavailable SID (Unavailable). This security permission can be modified using the Component Services administrative tool.

Log Name: System  
Source: DistributedCOM  
Event ID: 10016  
Level: Warning  
User: WORKSTATION\Jeetu  
OpCode: Info  
Logged: 03-Feb-25 8:51:47 PM  
Task Category: None  
Keywords: Classic  
Computer: Workstation

**Actions**

- System
  - Open Saved Log...
  - Create Custom View...
  - Import Custom View...
  - Clear Log...
  - Filter Current Log...
  - Properties
  - Find...
  - Save All Events As...
  - Attach a Task To this Log...
  - View
  - Refresh
  - Help
- Event 10016, DistributedCOM
  - Event Properties
  - Attach Task To This Event...
  - Copy
  - Save Selected Events...
  - Refresh
  - Help



# Remote Management

- Tools for remote management:
  - **Remote Desktop Services:** Allows users to remotely access Windows desktops and applications.
  - **Server Manager:** A built-in tool that allows users to manage multiple servers from a single console.
  - **Windows Admin Center:** A browser-based app that allows users to manage Windows Servers on-premises.
  - **Microsoft Management Console (MMC):** A tool that allows users to manage roles and features on Windows Server.
  - **Windows PowerShell:** A tool that allows users to manage Windows-based systems remotely.





*That's all Folks!*