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Intro to Comp Systems

Virtual Machine



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Introduction

What are Virtual Machines?

Virtual Machines (VMs) are sophisticated software-based constructs that mimic the hardware and operating system environment of a physical computer. This innovative technology allows organizations to run multiple operating systems and applications on a single physical machine, leading to enhanced flexibility, scalability, and optimized resource utilization. By decoupling the software environment from the physical hardware, VMs offer a unique advantage in the realms of server consolidation, development, testing environments, and running legacy applications that might otherwise require dedicated hardware.

Why would anyone want to use Virtual Machines?

Through VMs, organizations can streamline their IT infrastructure, reducing hardware costs while improving efficiency. The isolated nature of VMs also contributes to improved security, as individual virtual environments can be contained to prevent cross-contamination or security breaches. This isolation allows for more robust testing environments, where developers can experiment without risking broader system integrity. Furthermore, VMs have become a cornerstone of cloud computing, enabling the rapid deployment of applications and services with the flexibility to scale resources as demand fluctuates.

What am I trying to convey to the reader?

In this report, my objective is to guide you through the practical steps involved in creating, modifying, and managing virtual machines. I will specifically focus on Oracle's VM platform, illustrating the process with detailed screen captures for visual clarity. Each step will be thoroughly explained, ensuring that even those new to virtual machines can follow along and set up their own VM environments. By the end of this guide, you'll not only have a functional understanding of virtual machines, but also the confidence to implement them in your own projects.

Process & Order

- 1- I open the VMachine Oracle application, opening the Virtual Manager tab
- 2- I chose to create a new operating system. I type in a name (server1) for my machine and select the destination for said data. I then select the 2019 windows version and select next.
- 3- I set the size of Virtual Hard disk to 25 GB, then selected next.
- 4- It then opens the Hardware modifiers, in which I chose 4096 MB for Base Memory and edit the Processors amount to 2.
- 5- After selecting the Hardware, it opens the Virtual Manager, with the named machine (server1)
- 6- Before starting our emulator, I go into settings to then click the Network tab, and in Adapter 1 I switch the attached to "Internal Network" since I was doing this on my personal laptop and named it. (PublicNet)
- 7- I moved on to Adapter 2 and did the same as Adapter 1 but switched name to PublicNet1.
- 8- I switch to the Motherboard tab, make sure all the boot orders are enabled due to recognizing them as possible outlets, keep set to its default settings, and make sure the Base Memory matches what you originally set it to in step 4. (unless you want to modify such cap)
- 9- Then I go to the Processors tab and enable PAE/NX
- 10- Afterward I go the next tab "Acceleration", disable "Nested Paging"
- 11- I go to the Storage tab
- 12- From there, I choose the vm_windows emulator that was installed before hand
- 13- I then open the control panel on the emulator and go to Network & Sharing Center
- 14- I go through Network & Internet and the Network Connections to then select "Local Area Connections"

15- I right click “Local Area Connections” to later choose the properties option to then see the following IP address, Subnet mask, Default gateway, and the preferred DNS server

17- Installing Google

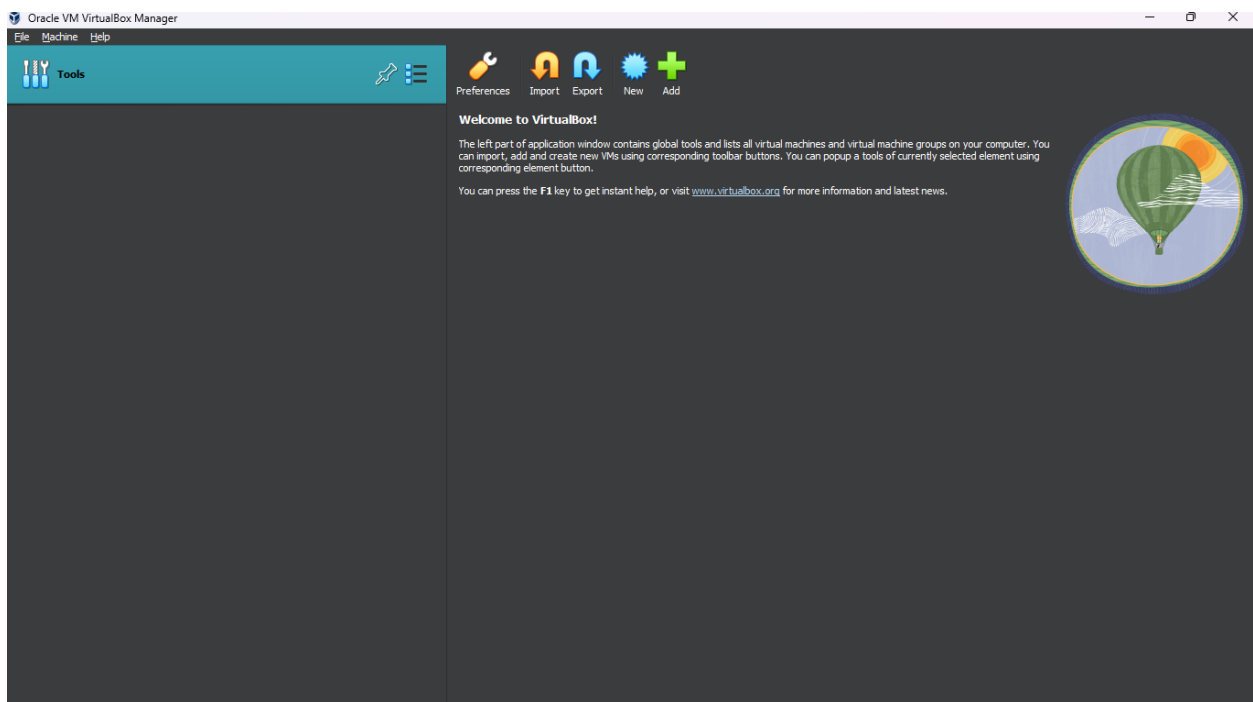
18- Opens Google

(Each step can be configured to the specific users, so some steps could be vetoed or modified to reach specific users interests or settings when using such Virtual Machines)

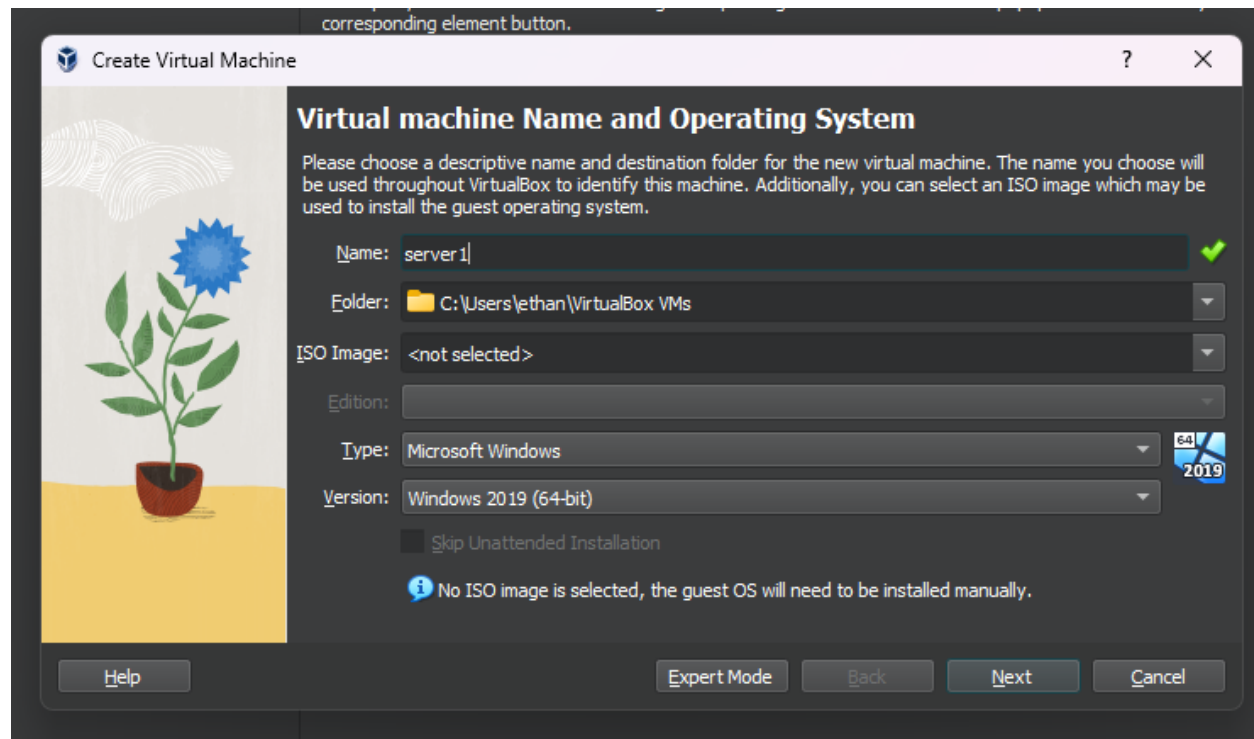
Note:

Some Virtual Machines may work differently from the one currently in use so this tutorial / steps may not be recommended when not using VM (VirtualBox) Oracle

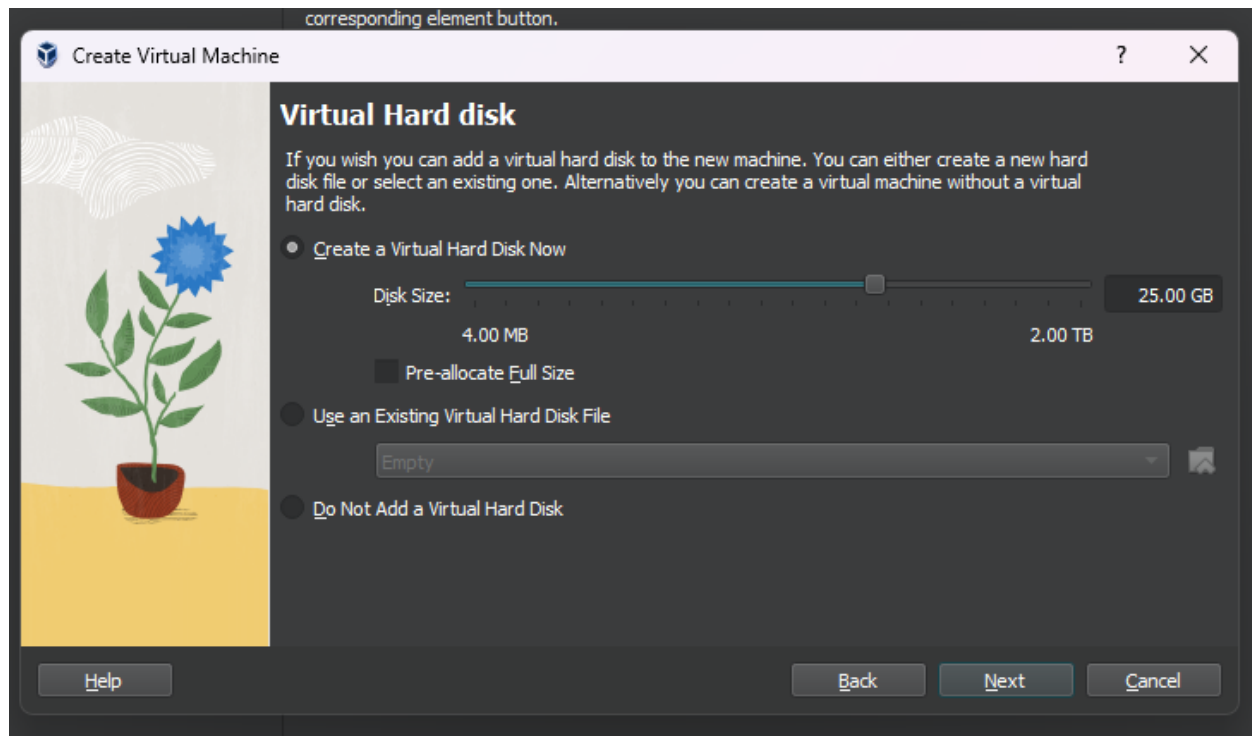
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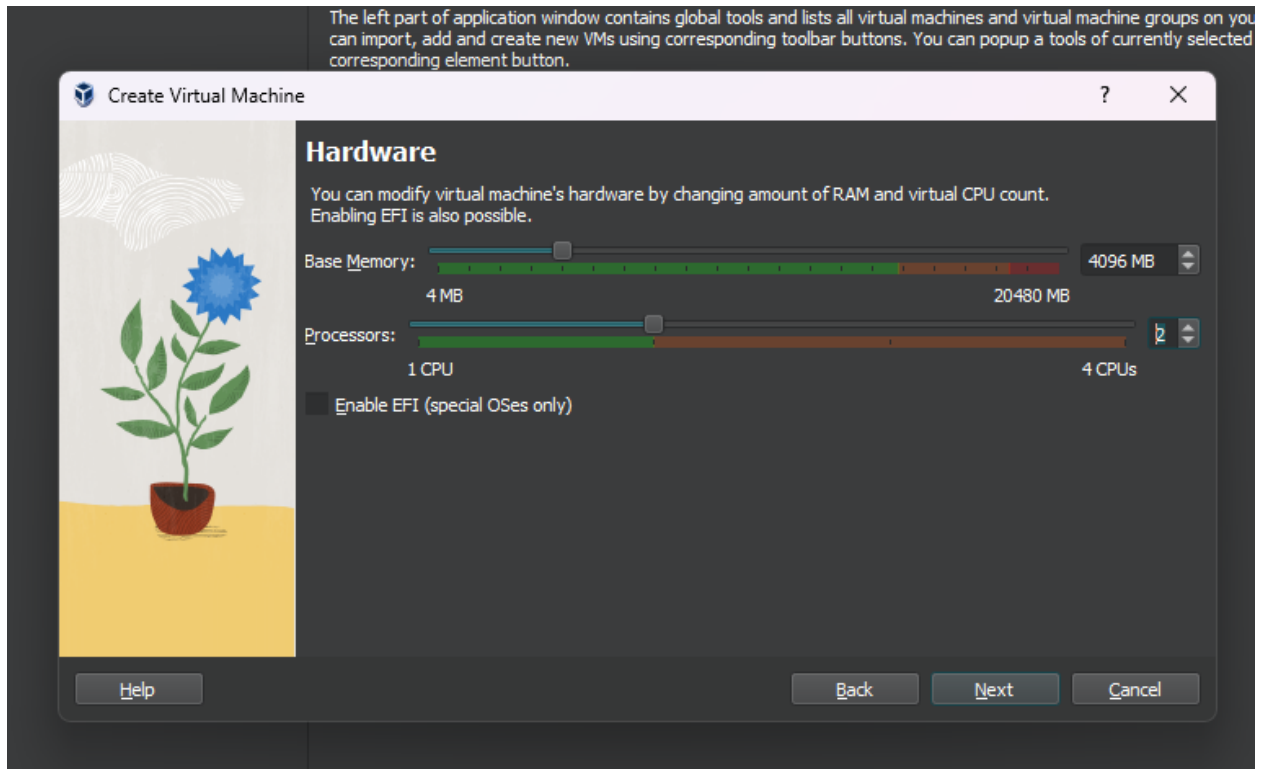
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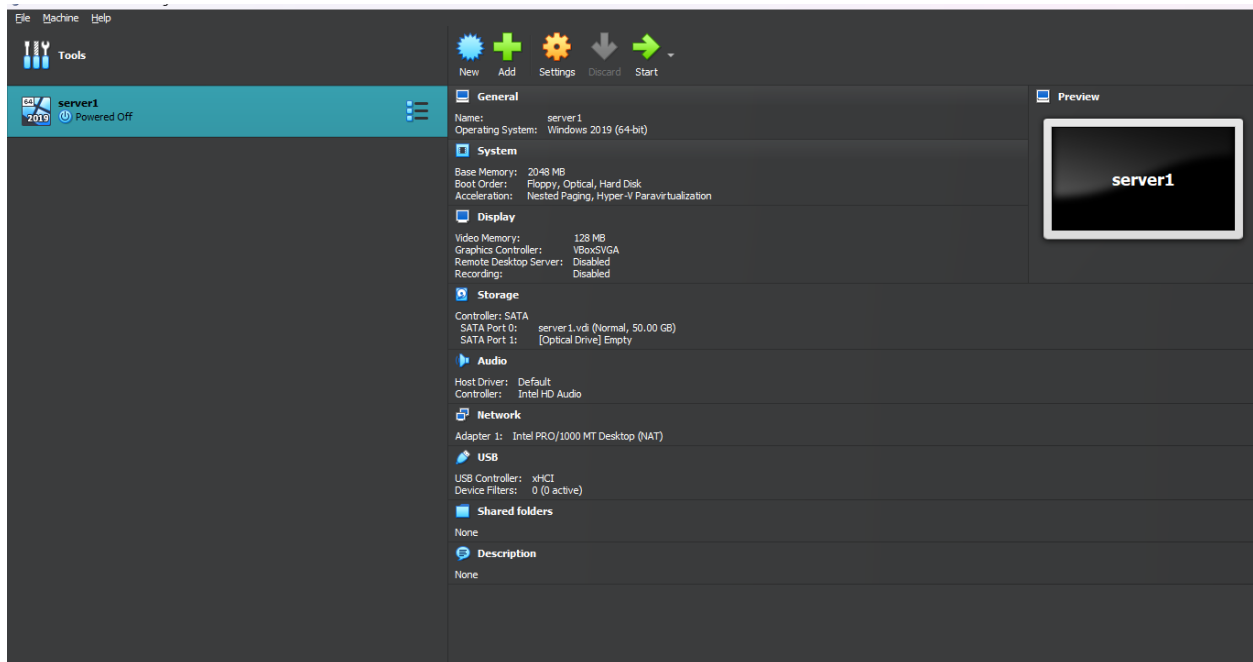
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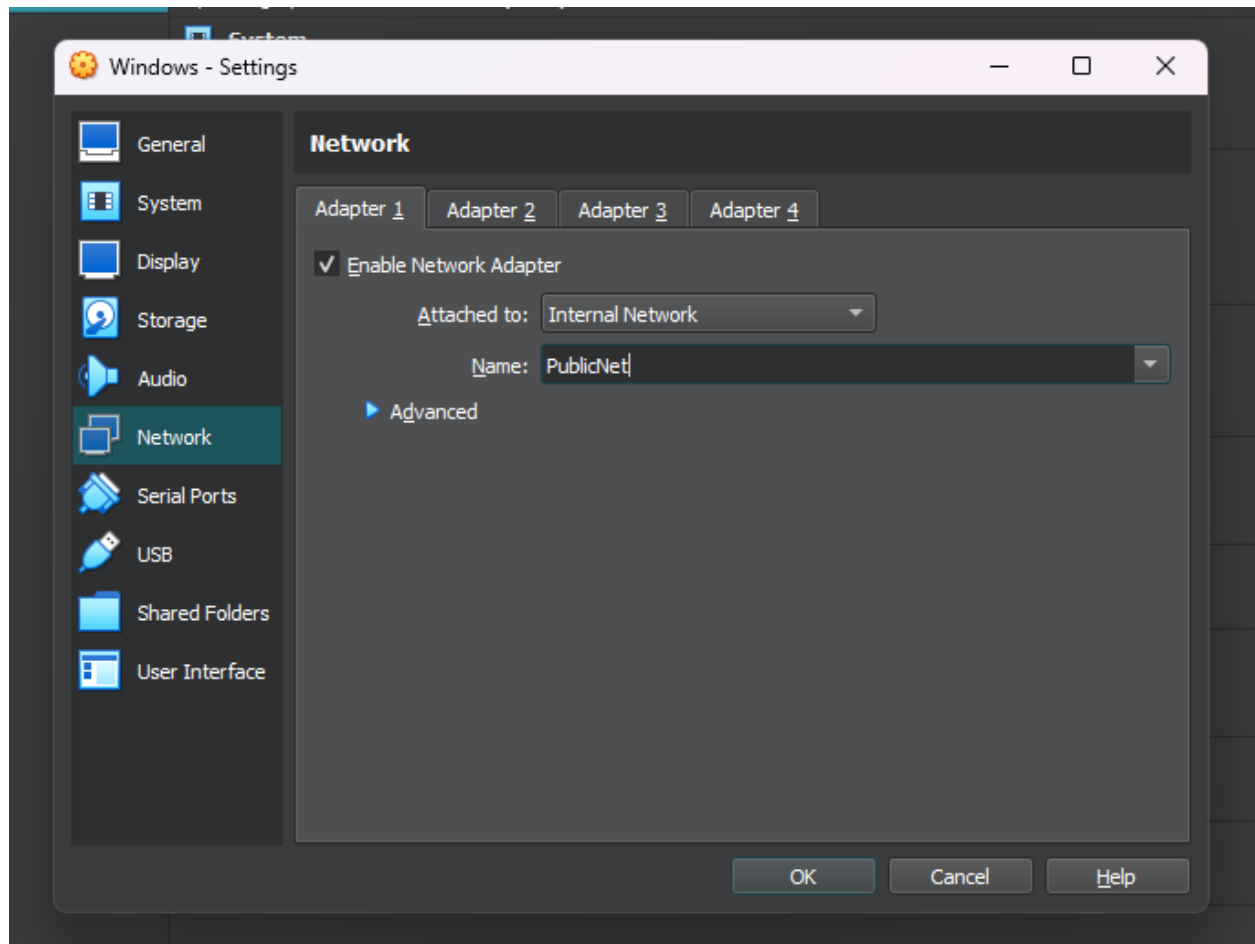
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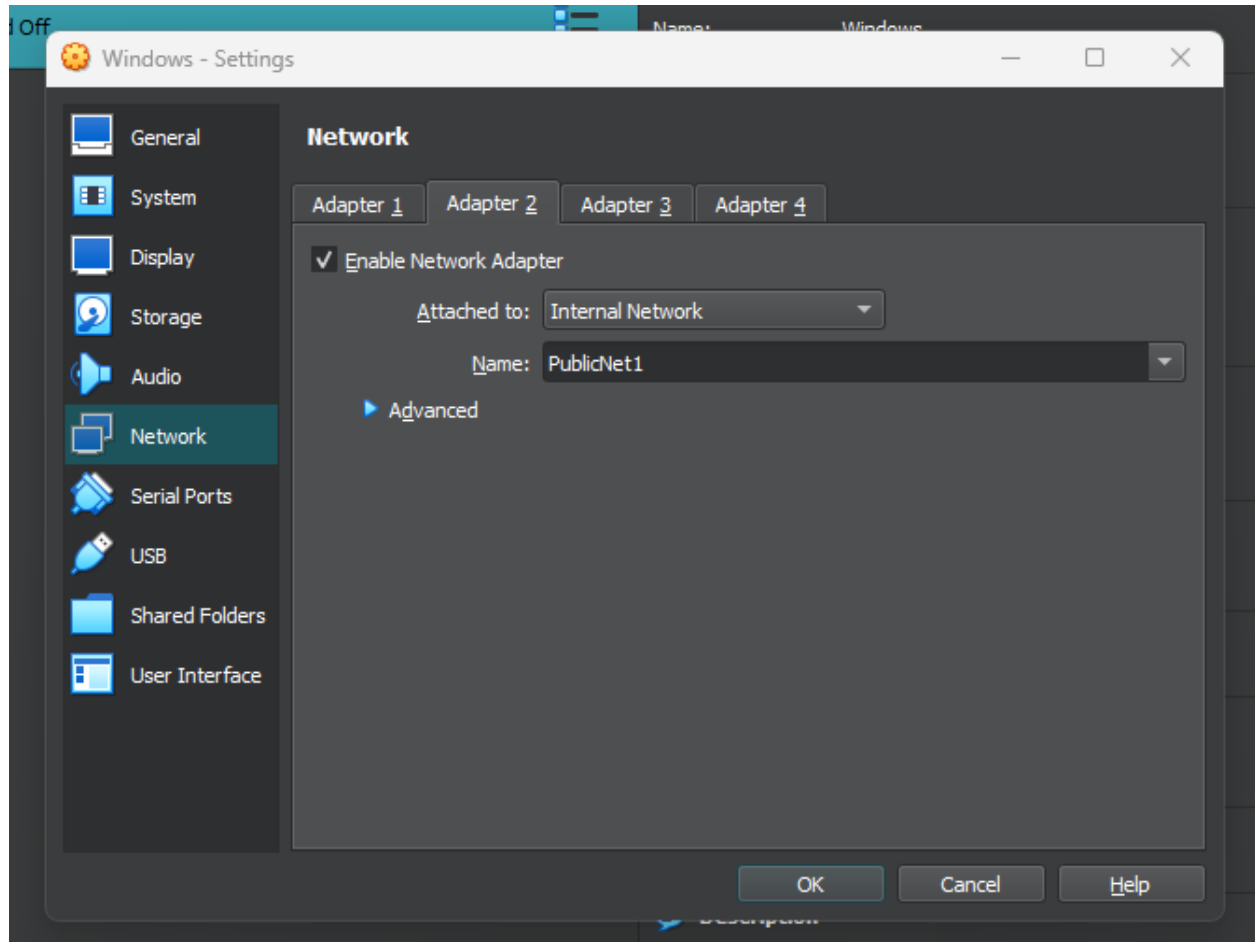
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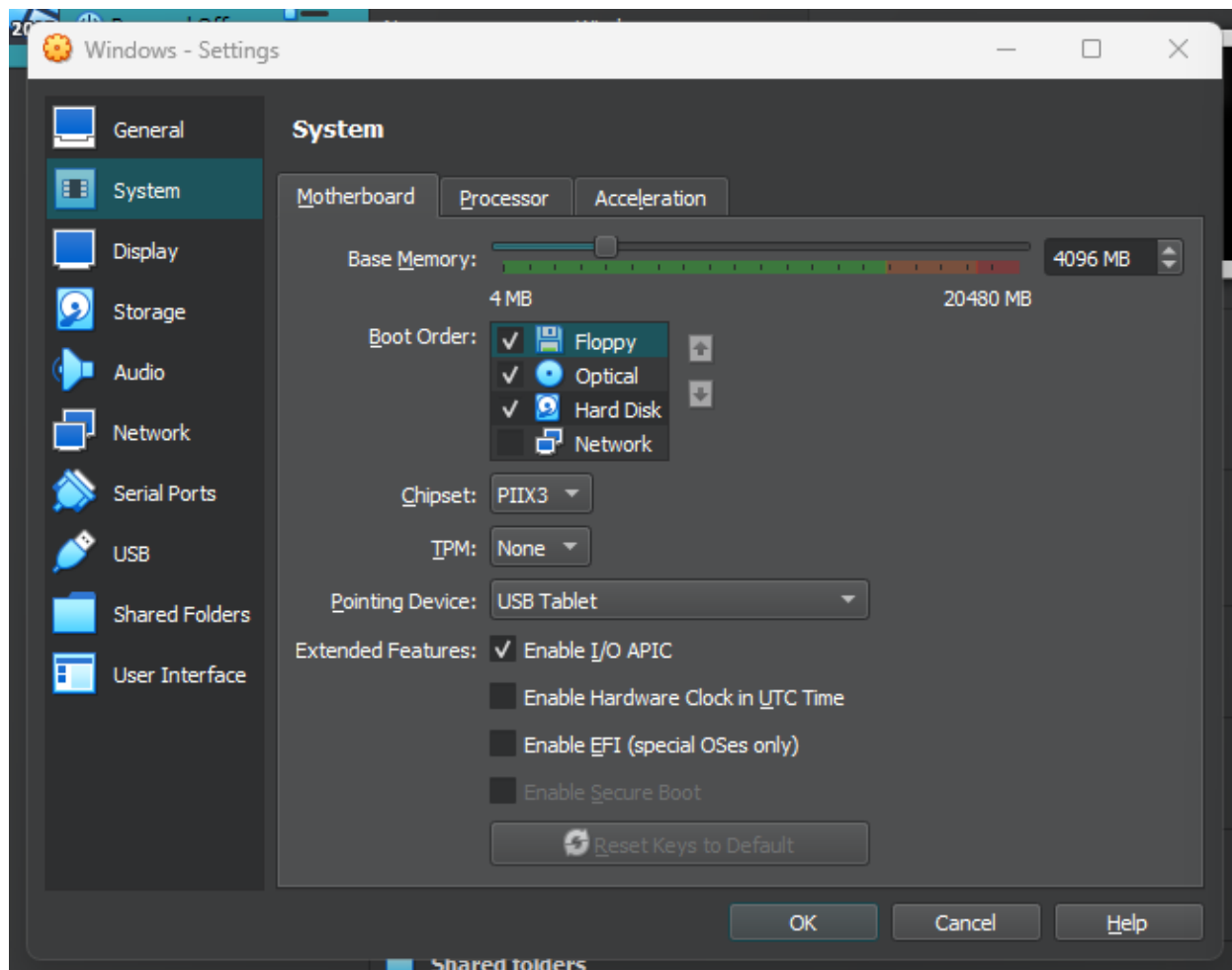
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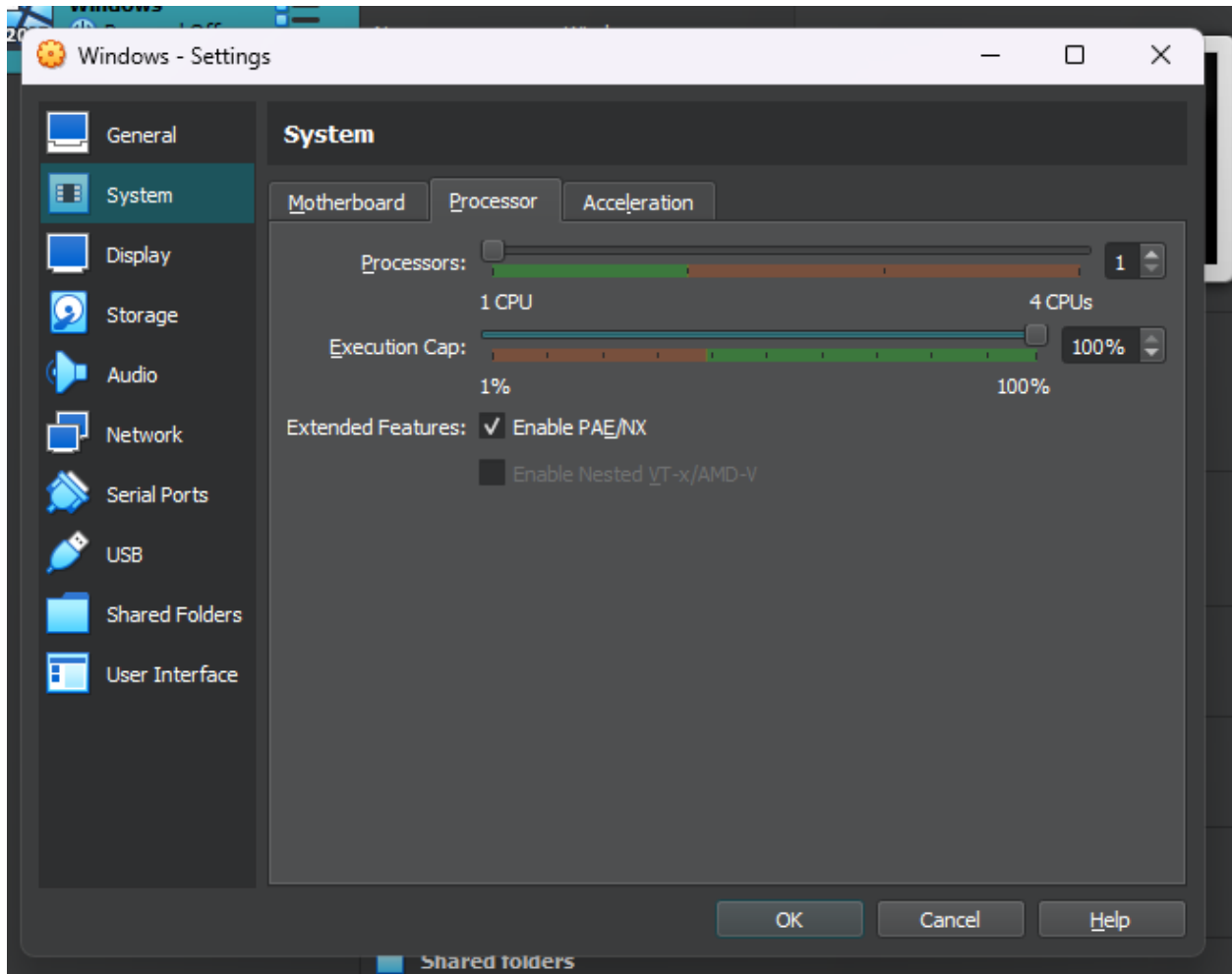


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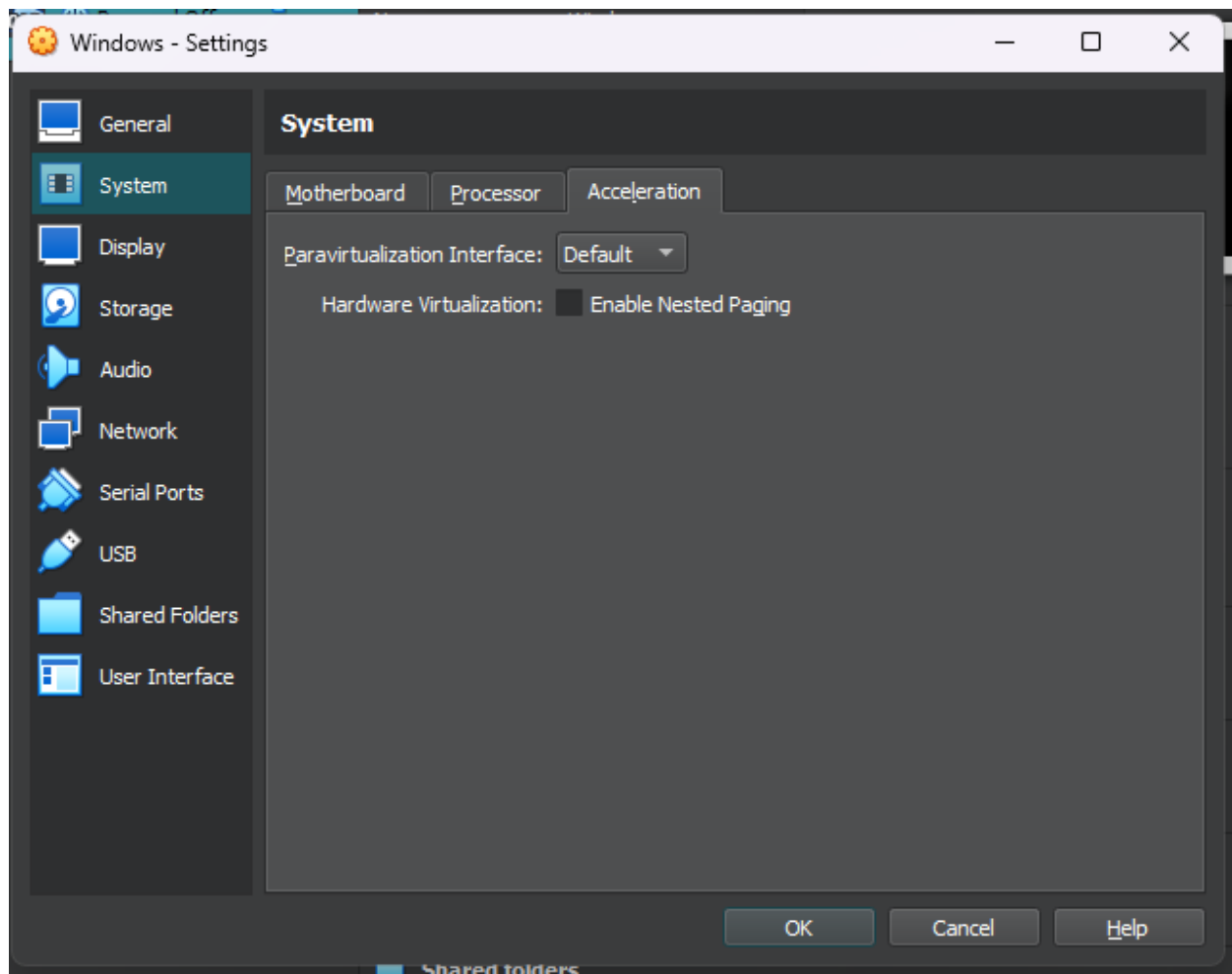


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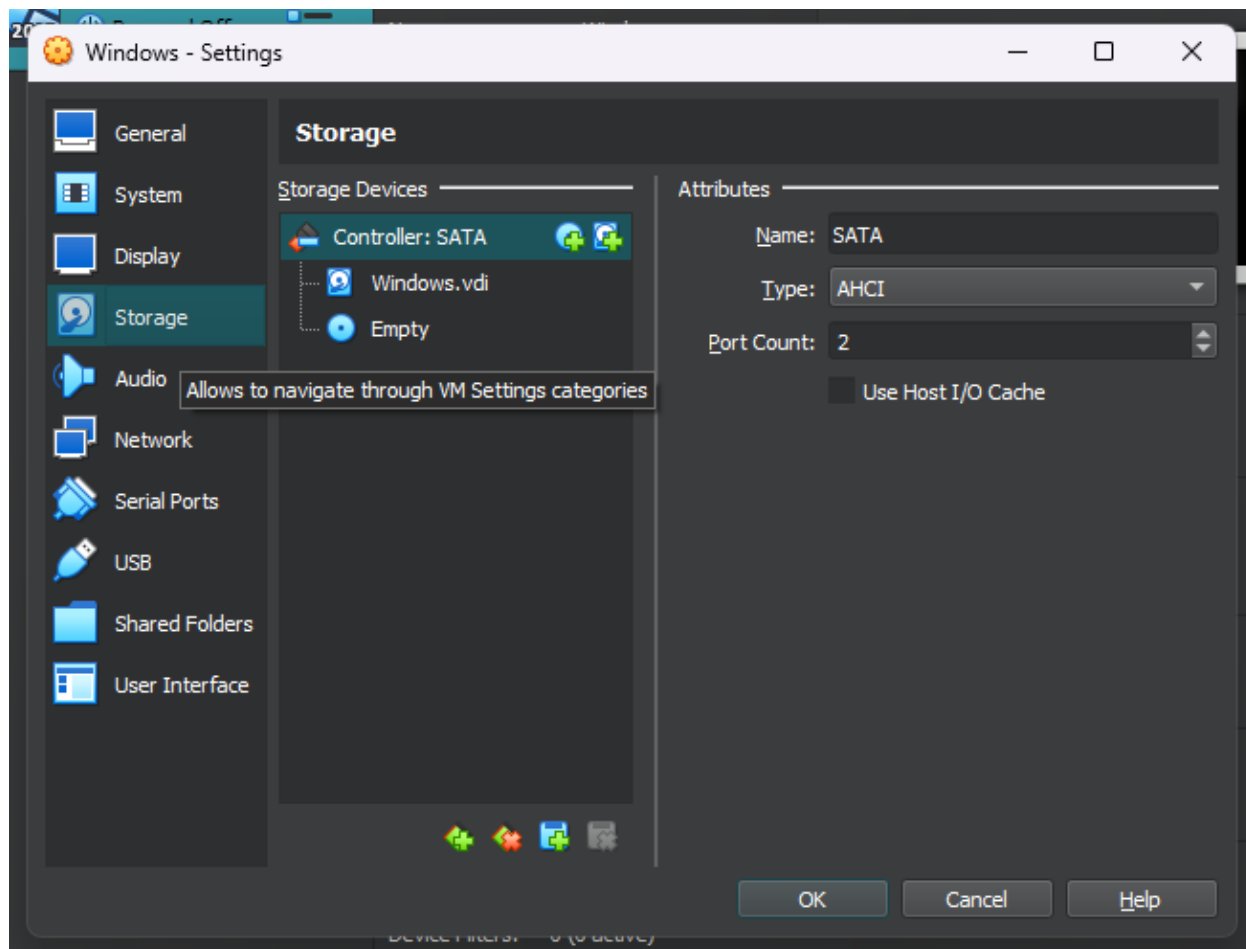




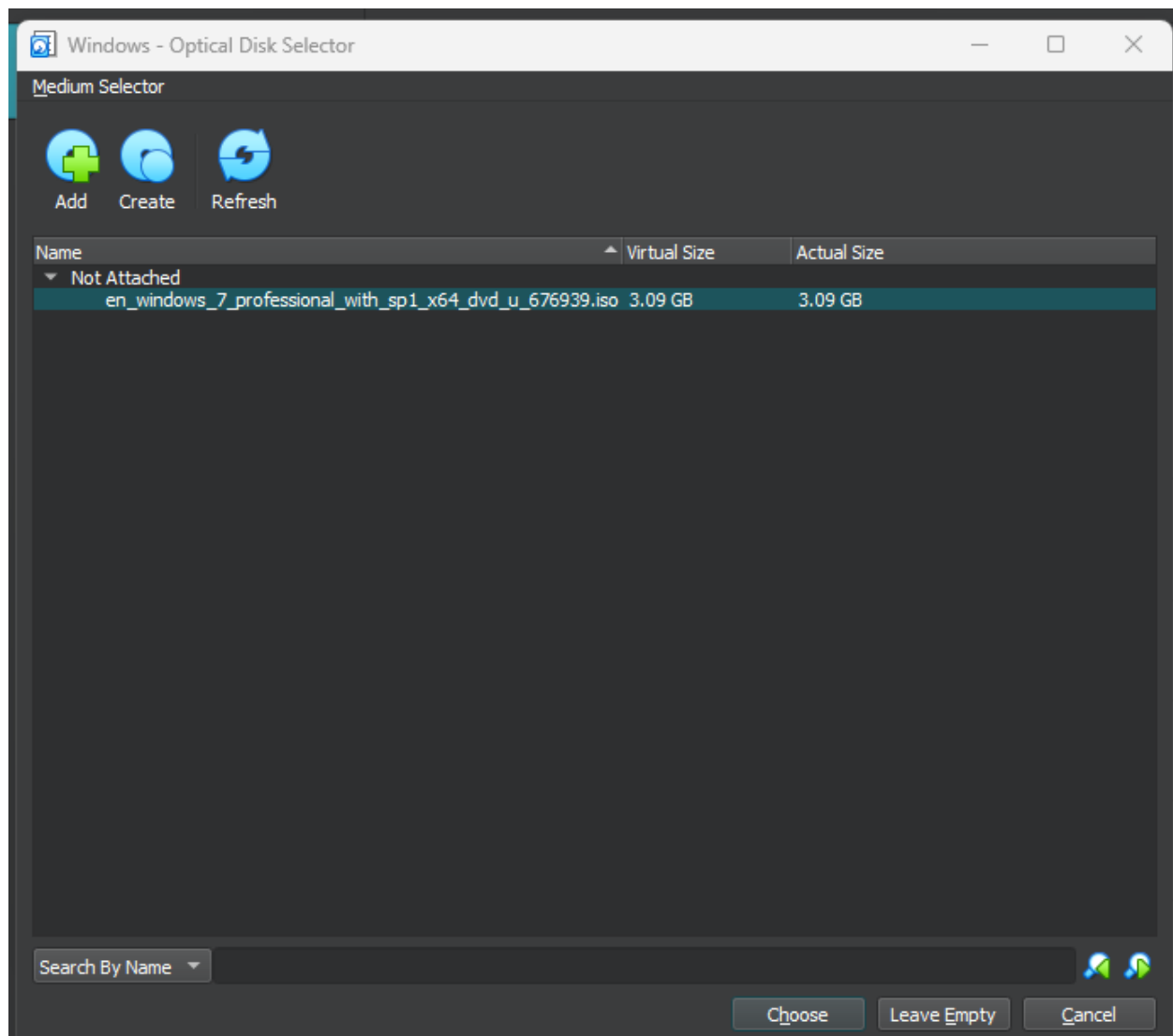
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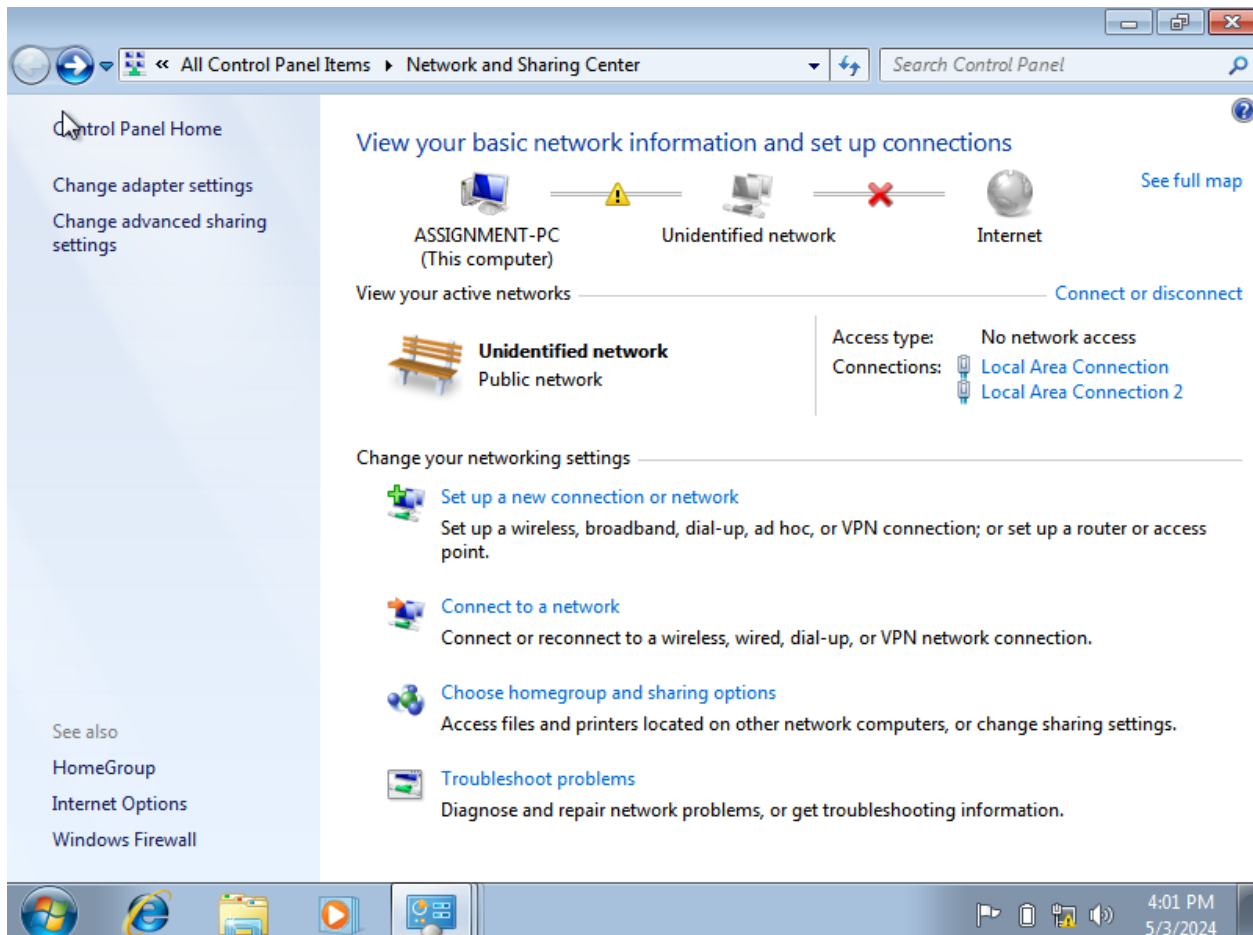
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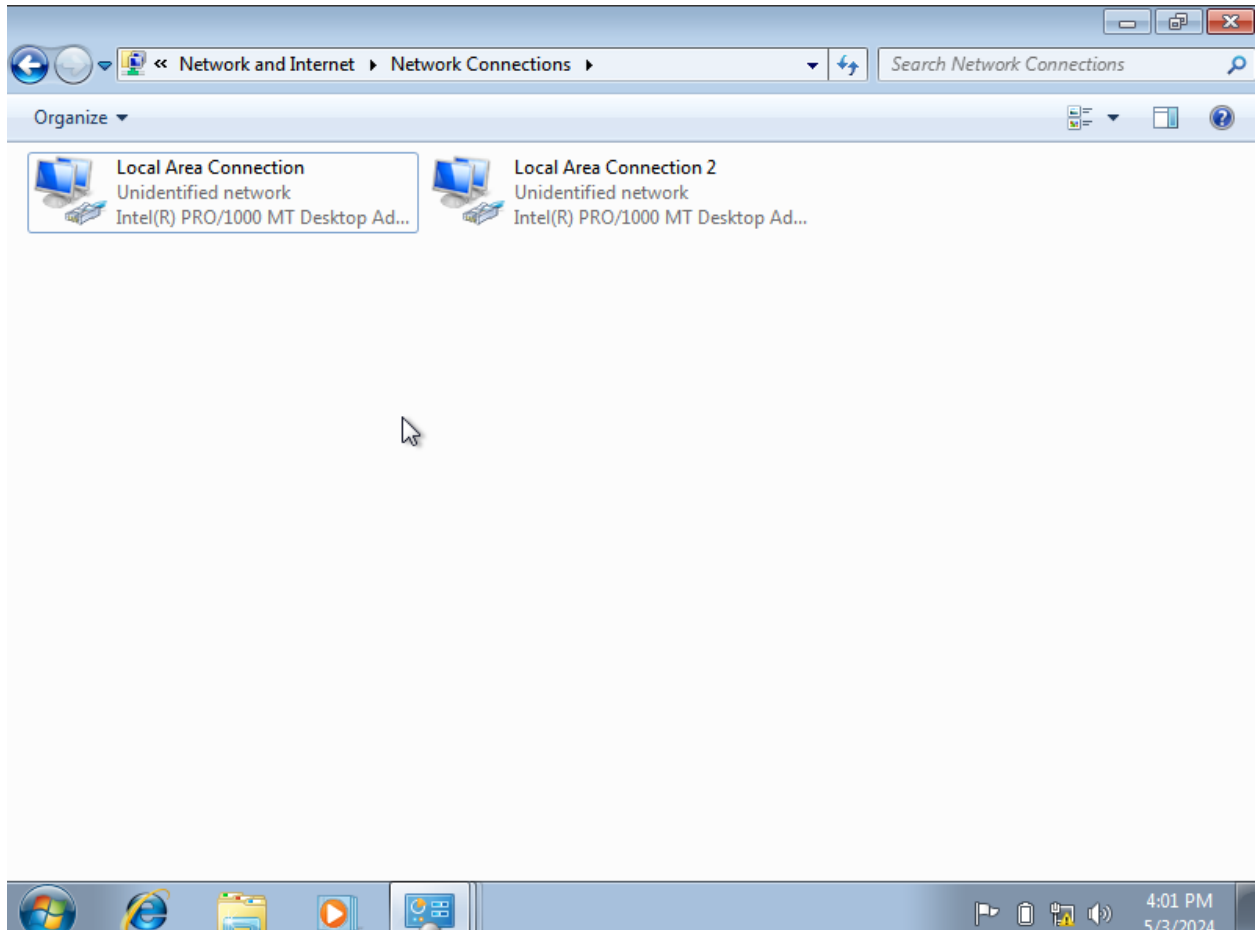


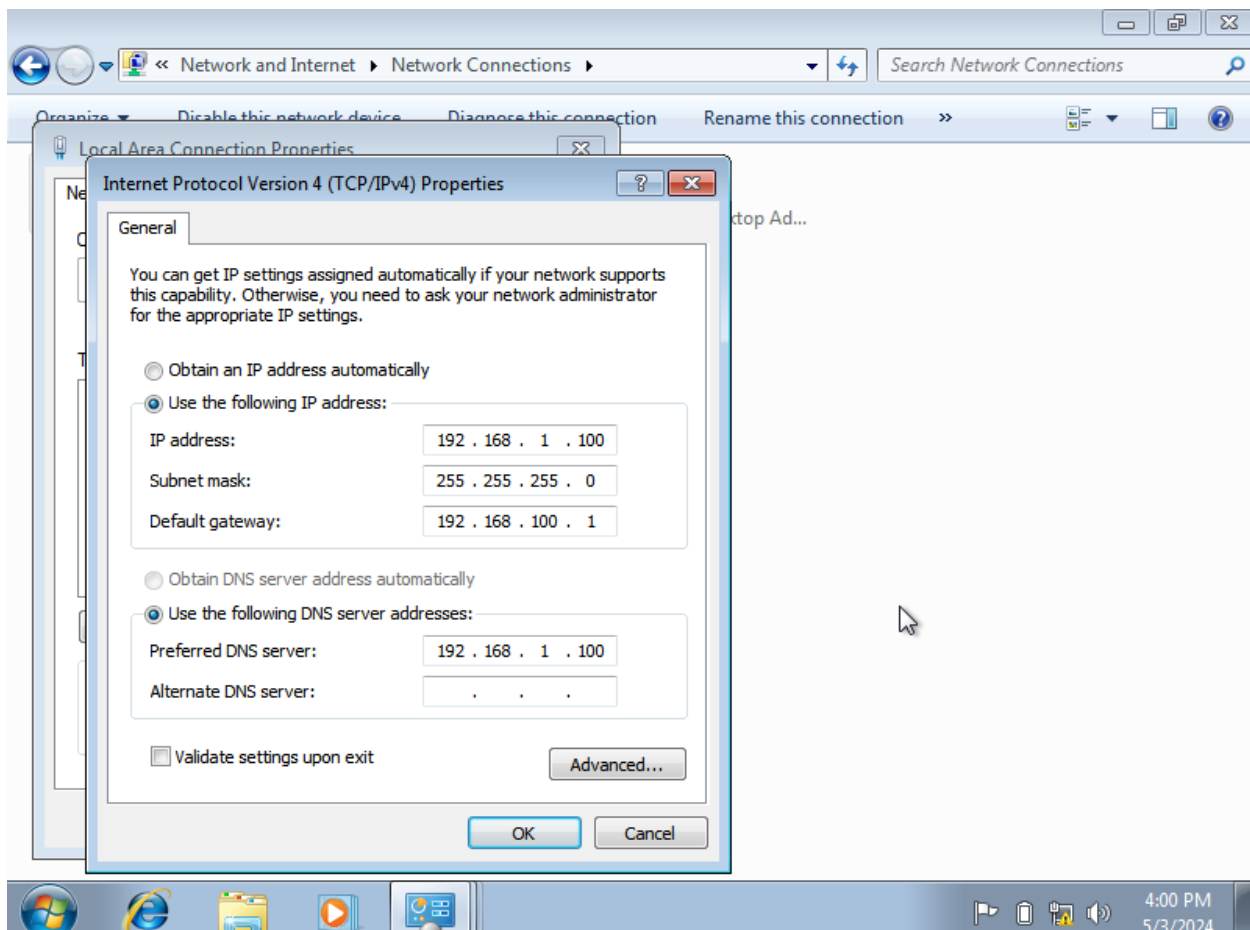
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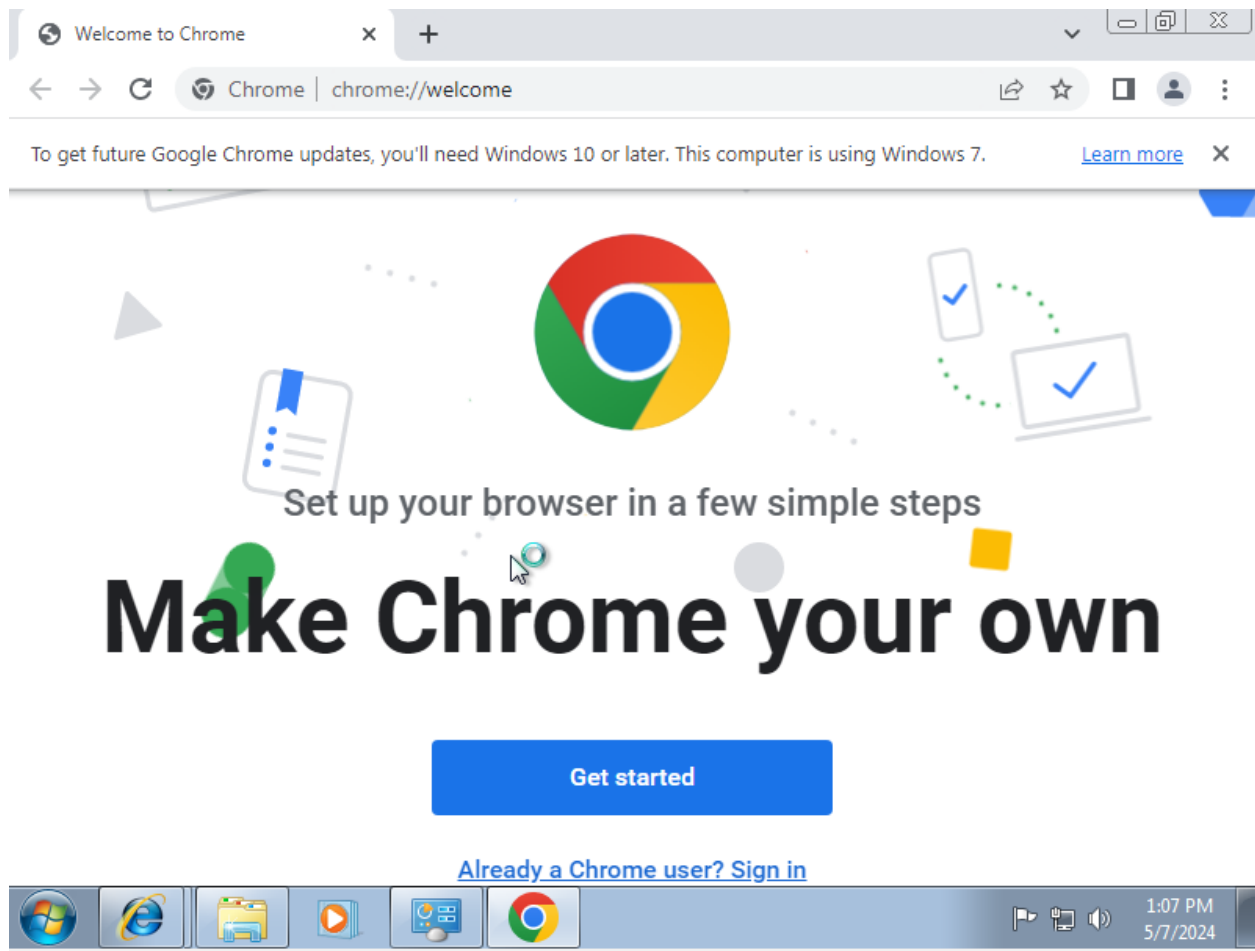


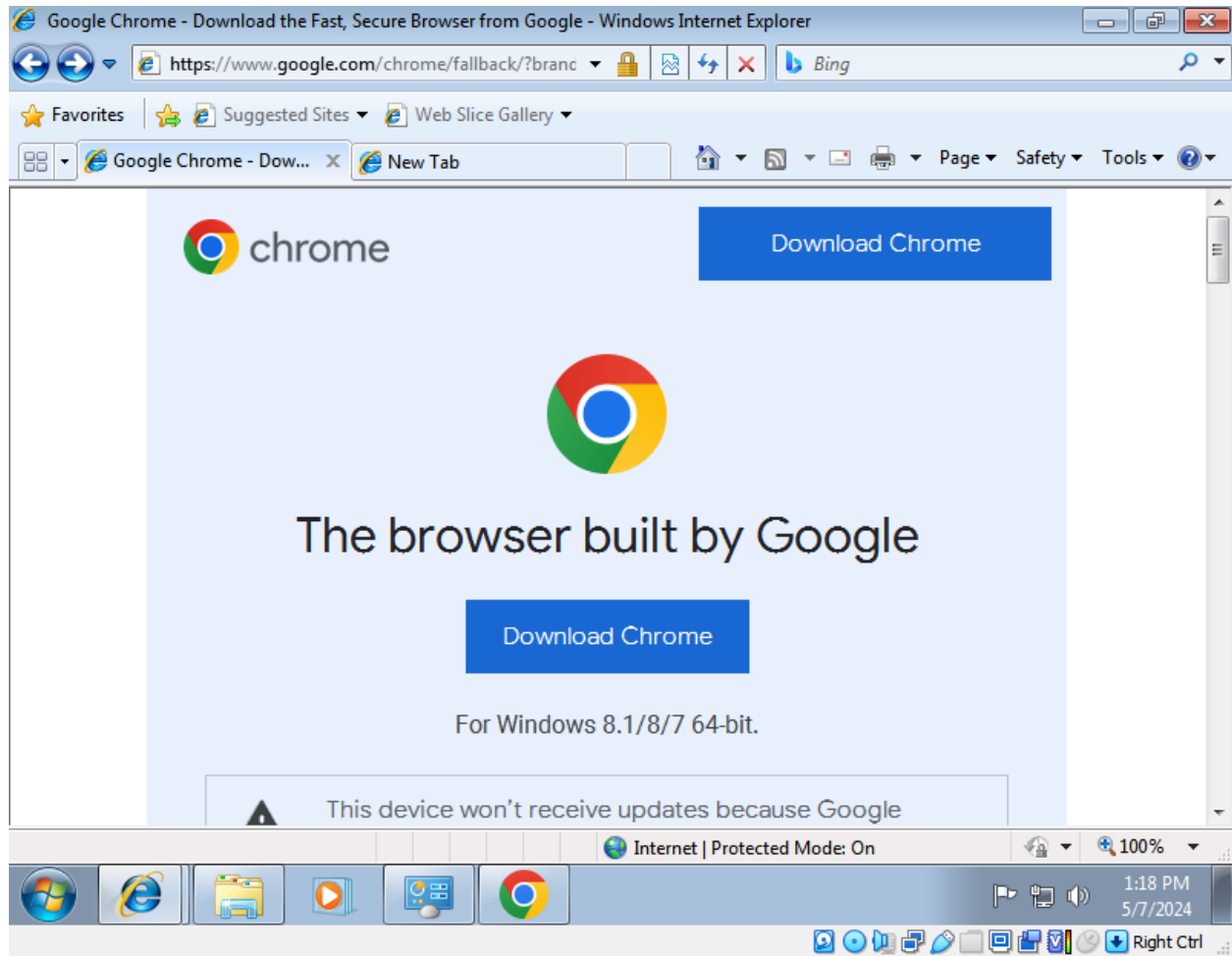
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Conclusion

In summary, the adoption of Virtual Machines (VMs) has profoundly transformed our approach to computing infrastructure and resource management. By offering a flexible and scalable platform, VMs empower businesses to maximize hardware utilization, cut operational costs, and streamline efficiency.

My journey through the process of setting up and customizing VMs provided me with invaluable insights into the intricate workings of this technology. Each step in the setup—whether configuring system resources or adjusting network parameters—revealed a new layer of complexity and understanding. The ability to experiment with various configurations, such as toggling between different network adapters and virtual switches, underscored the adaptability that VMs bring to diverse IT environments. This flexibility extends beyond technical configurations, influencing how businesses approach software development, data management, and cybersecurity.

Through hands-on experience, I began to see how the isolation capabilities of VMs contribute to enhanced security. By encapsulating distinct operating systems within virtual boundaries, VMs reduce the risk of cross-contamination and allow for safer testing environments. This isolation fosters a culture of innovation, enabling developers to test new software and applications without compromising the stability of critical systems.

Ultimately, the flexibility, security, and scalability inherent in Virtual Machines are driving a paradigm shift in how we think about computing infrastructure. They are not just tools for IT professionals; they are enablers of business growth, innovation, and resilience in a world that increasingly relies on digital solutions. My journey through this exploration has not only deepened my understanding of VMs but also reinforced their significance in shaping the future of technology.

Sources

[1]“Oracle revamps VirtualBox virtualization software with cloud integration and 3D app support,” SiliconANGLE, Oct. 12, 2022.

<https://siliconangle.com/2022/10/12/oracle-revamps-virtualbox-virtualization-software-cloud-integration-3d-app-support/> (accessed May 04, 2024).