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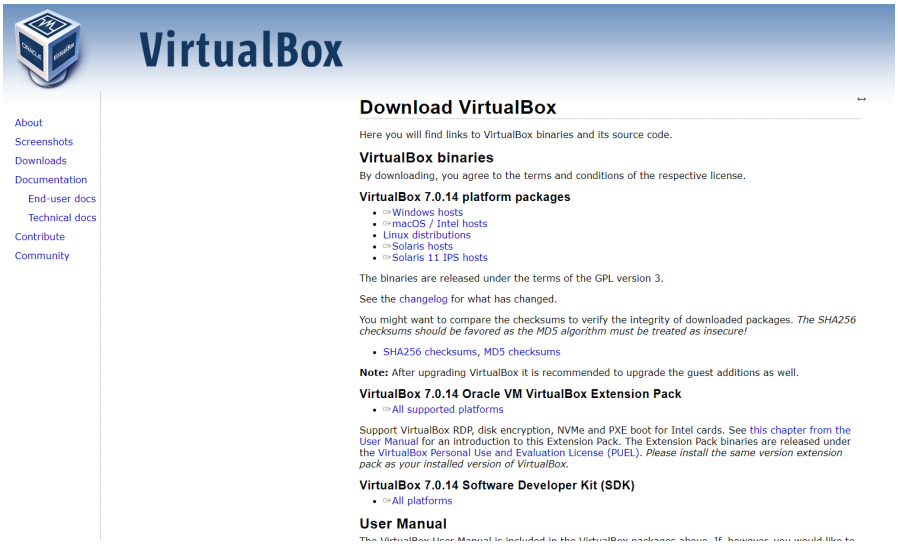
Creating an Active Directory Domain

Even though I have experience doing this in the past, I wanted to take full control this time when creating an Active Directory Domain within a Windows Server. While the task by itself sounds challenging, the whole process was made easier and more rewarding with the help of VirtualBox. By leveraging the power of virtualization, I was able to simulate a network environment and practice essential IT skills in a safe and controlled environment. Setting up the domain involved configuring the server, creating user accounts, and implementing group policies to manage network resources effectively. Overall, this project helped me deepen my understanding of network administration and sharpen my troubleshooting skills.

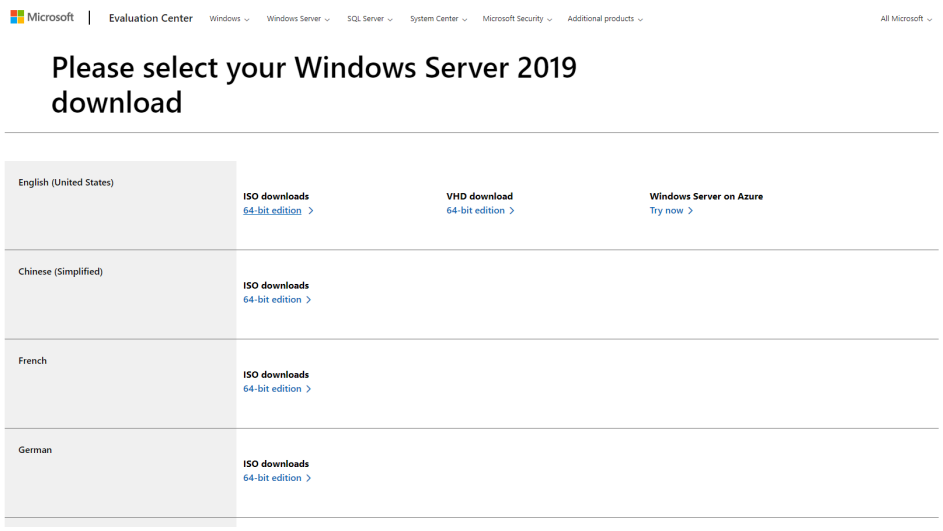
Setting Up Windows Server in Oracle VirtualBox



1. Installing VirtualBox
   VirtualBox is an open-source virtualization software that allows you to run multiple operating systems simultaneously on a single physical computer. It acts as a hypervisor, which is a software layer that enables you to create and manage virtual machines (VMs). VirtualBox supports a wide range of guest operating systems, including Windows, Linux, macOS, and Solaris, making it a versatile tool for developers, IT professionals, and hobbyists alike. With VirtualBox, you can create isolated environments for testing software, running legacy applications, or experimenting with new operating systems, all without affecting your main system configuration. The installation is straightforward for the most part. After going to the VirtualBox website (https://www.virtualbox.org/) and

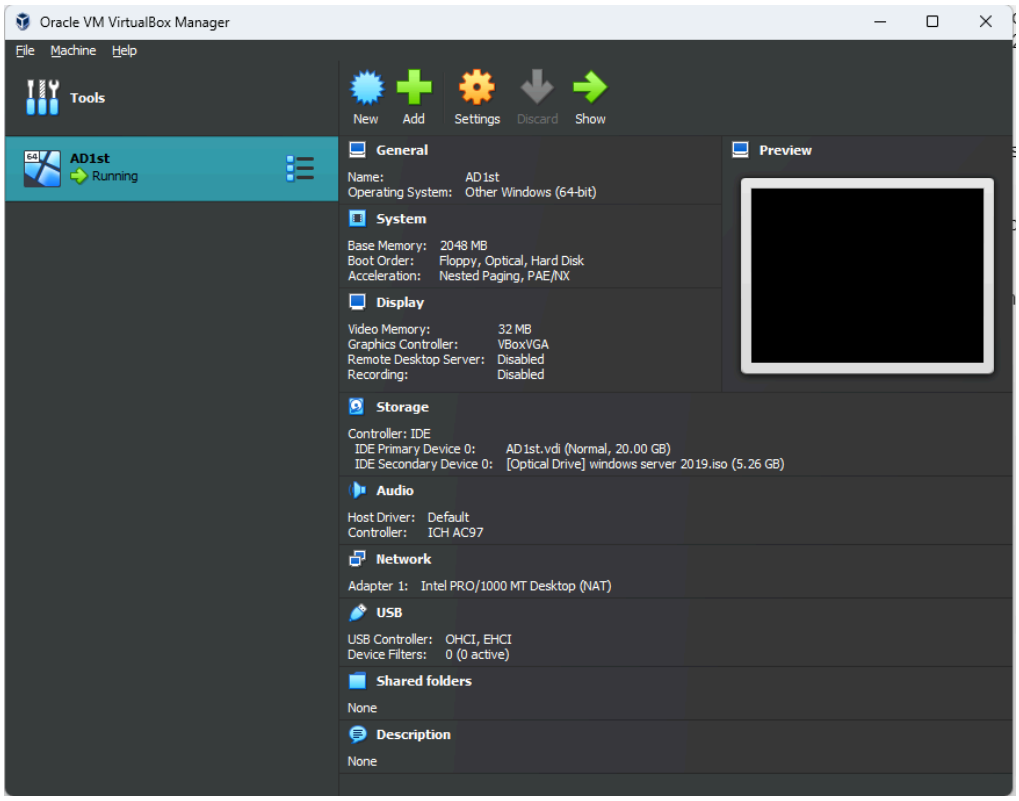
downloading the appropriate version for your operating system, I had to run the installer and follow the on-screen instructions to complete the installation.

2. Downloading Windows Server 2019
Windows Server 2019 is a server operating system developed by Microsoft as part of the Windows NT family. It is the successor to Windows Server 2016 and was released in October 2018. Windows Server 2019 includes several new features and improvements, such as enhanced security with Windows Defender Advanced Threat Protection (ATP), improved performance and scalability with support for up to 64 processor sockets and 256 logical processors, and added support for Kubernetes, a popular container orchestration platform. Windows Server 2019 was designed to help organizations manage their on-premises and cloud infrastructure more efficiently and securely. When it comes to downloading it for the virtual machine, there was an extra step that included registering for a free trial with Microsoft for the operating system. Afterward, I obtained a legitimate copy of the Windows Server 2019 ISO file from the Microsoft website.



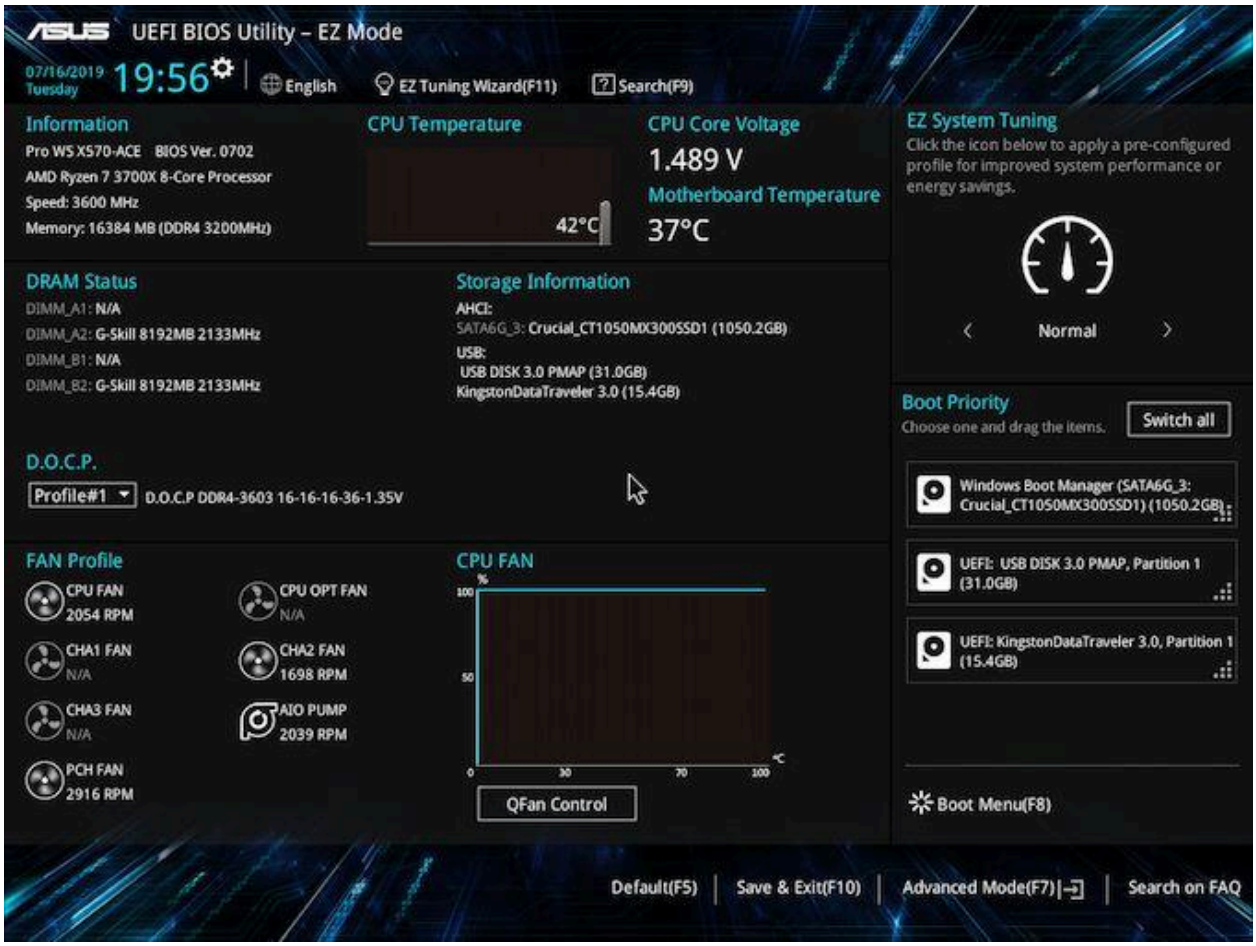
3. Creating the VM

The next step in the process was creating the virtual machine itself. I began by opening VirtualBox and clicking on the "New" button in the toolbar. I created a name for the virtual machine (AD1st) and selected the type and version as "Microsoft Windows" and "Windows Server 2019 (64-bit)" respectively. I allocated 2048MB or 2GB of RAM for the VM. Choose to create a new virtual hard disk, select the type, and choose a size for the virtual hard disk. I elected to have 20 GB allocated for the memory space. Open VirtualBox and click on the "New" button in the toolbar. The next steps include select the settings option on the newly created VM in VirtualBox. Under the "System" tab, ensure that the "Enable EFI (special OSes only)" option is unchecked. In the "Storage" tab, click on the empty disk icon under "Controller: IDE" and select "Choose a disk file." Navigate to the location of the Windows Server 2019 ISO file and select it.



4. BIOS Virtualization

When I attempted to start the VM, I received error messages regarding virtualization not being allowed on my computer. Then I realized that I had to enable the feature within my BIOS settings.I did this by first accessing BIOS/UEFI settings by restarting my computer and entering the BIOS/UEFI settings. This is typically done by pressing a key during the boot process, such as F2, Del, Esc, or F10. The key to press varies depending on your computer's manufacturer. I located Virtualization Settings and once I was in the BIOS/UEFI settings, I navigated to the "Advanced CPU Configuration" section and clicked on an option related to virtualization technology. I selected the virtualization option (SVM Mode or VT-x) and change the setting to "Enabled." Afterwards I saved, exited, and restarted my computer. Enabling SVM Mode or VT-x in the BIOS/UEFI settings is essential for running virtualization software like VirtualBox, VMware, or Hyper-V, as it allows the virtualization software to access hardware features that enhance virtual machine performance and functionality.



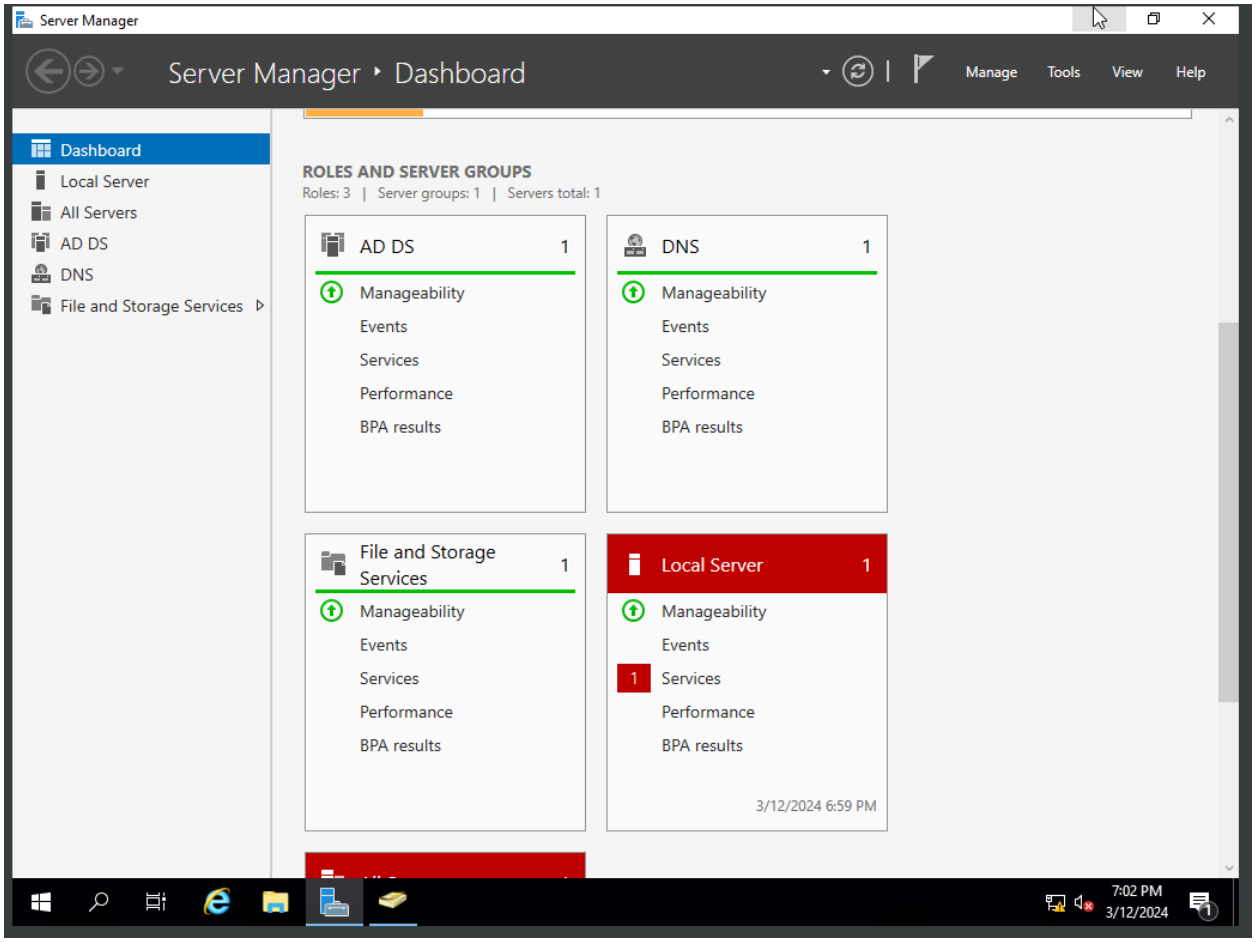
5. Installing Windows Server 2019
   To continue the process, I started the VM within VirtualBox and followed the on-screen instructions to install the Windows Server 2019 operating system. When prompted, I selected the appropriate options for language, time and currency format, and keyboard or input method. For the most part, it was very similar to installing any other type of OS.

Creating the Active Directory Domain

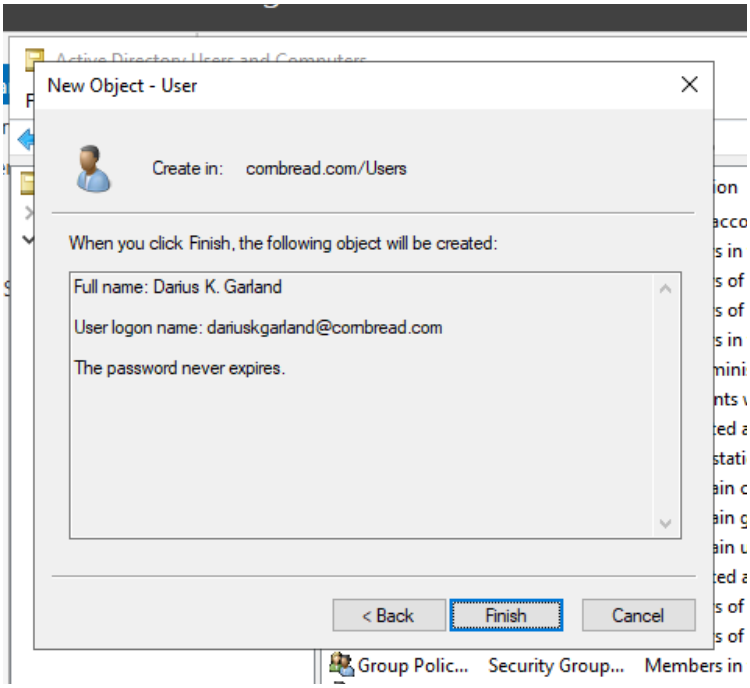
Active Directory is a directory service developed by Microsoft for Windows domain networks. It serves as a central database that stores information about network resources such as computers, users, groups, and devices. Active Directory provides authentication and authorization mechanisms, allowing administrators to control access to resources based on user or group permissions. It also enables the management of networked resources, including the deployment of software, the enforcement of security policies, and the maintenance of a consistent user environment. Active Directory is essential for organizing and managing a network efficiently, especially in large enterprise environments.

Once I was logged onto the VM and Windows Server 2019, I was instantly met with the Server Manager application. I then proceeded to configure a domain within the Active Directory.

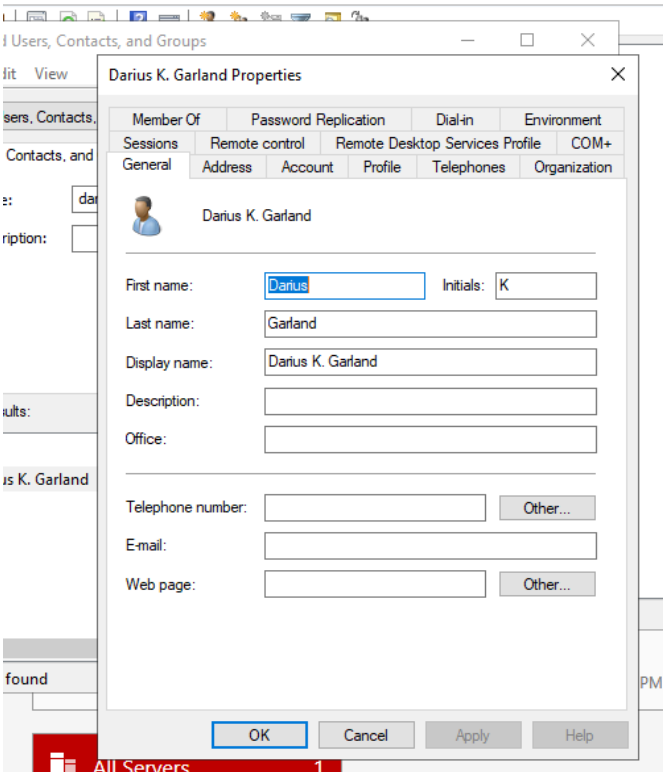
For the initial step I clicked on "Add roles and features." I selected the "Active Directory Domain Services" role and proceeded with the installation, ensuring to include the required features like Group Policy Management. After the AD DS role was installed, I used the Server Manager to promote the server to a domain controller. I selected the option to add a new forest since this was the first domain controller in the environment. I entered the desired domain name and set the Directory Services Restore Mode (DSRM) password. During the promotion process, I chose to install the DNS Server role as well, which is necessary for Active Directory to function properly. I configured the DNS settings to ensure that the server's DNS pointed to itself. After verifying the NetBIOS domain name and the paths for the AD DS database, log files, and SYSVOL, I proceeded with the promotion. The server restarted automatically to complete the promotion process.



Once the server restarted, I logged in with my domain administrator credentials. I verified that the Active Directory Domain Services were running and checked the DNS settings to ensure they were correct. I also verified that the domain controller was replicating properly with other domain controllers in the network.



With the domain controller set up, I used the Active Directory Users and Computers option in the drop-down menu to create user accounts. This allowed me to start managing permissions and access control within the domain.



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Conclusion, Lessons Learned, & Plans for the Future

Through creating a virtual machine, setting up an Active Directory Domain, and managing users and permissions within that domain, I've gained a deeper understanding of network administration concepts and practices. Working with VirtualBox and Windows Server 2019 allowed me to simulate real-world network environments, which was invaluable for honing my skills in system configuration and troubleshooting. I learned how to effectively create and manage virtual machines, which is essential for testing software, running multiple operating systems, and maintaining a flexible IT infrastructure.

Setting up an Active Directory Domain taught me the importance of centralized management in network environments. By creating users and groups and assigning permissions, I could control access to resources and ensure security across the network. This hands-on experience not only reinforced my knowledge of Active Directory concepts but also improved my ability to navigate and utilize management tools like Active Directory Users and Computers and Group Policy Management Console. Overall, this project was a valuable learning experience that enhanced my technical skills and prepared me for more complex networking challenges in the future. For further practice and experimental reasons, I will be attempting to automate certain tasks within Active Directory in a later project.