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N Kathleen van Dusen | April 3, 2025

Setting Up an Ubuntu Linux Virtual Machine on Windows 10/11 Using VMware Workstation

A Guide for IT students

April 3, 2025

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Dear Kathleen, ✅

Enclosed is our report, titled *Exploring How to Set Up an Ubuntu Virtual Machine on Windows 10/11 Using VMware Workstation: A Guide for Students and Developers in North America and Europe* for COMM 1000. This report provides a comprehensive guide on installing and configuring an Ubuntu virtual machine using VMware Workstation, while also discussing challenges and alternative solutions.

We would like to acknowledge the assistance of various tools and individuals in the preparation of this report. Artificial intelligence tools, including ChatGPT, were instrumental in drafting and refining our content. Additionally, guidance from other instructors, the use of editing software, and spell checkers contributed significantly to the quality and accuracy of our work.

Get them to read the rest of the report. Point out some things beyond the first few pages. In another paragraph, acknowledge any other help; AI, ANOTHER Instructor, Editing software, spell check too. This report was authorized by you and is being submitted on March 24, 2025. Its purpose is to help students and developers successfully complete the installation process while understanding the practical applications of virtualization in IT education and professional settings. We outline system requirements, software acquisition, step-by-step installation, and common troubleshooting solutions. Additionally, the report includes diagrams to enhance comprehension.

If you have any questions or feedback, please feel free to contact us at jwu45@nait.ca or dkinganjatou1@nait.ca. You may also reach us by phone at 403-421-1111.

Sincerely,

Kyootee Puhtootee

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Enclosure: Report – How to Set Up an Ubuntu Linux Virtual Machine on a Windows 10/11 OS Using VMware Workstation

Executive Summary

The report begins with an overview of virtualization, its benefits, and why Ubuntu Linux is a preferred choice for development and learning. It outlines essential system requirements, including a 64-bit processor, sufficient RAM, and administrative access, to ensure smooth installation and performance.

The methodology includes secondary research from industry documentation, technical guides, and practical implementation. The findings detail a step-by-step process for installing VMware Workstation, configuring virtual machine settings, and installing Ubuntu Linux. The report also addresses troubleshooting techniques for common issues such as performance optimization, networking errors, and storage constraints.

The analysis and discussion section explores the benefits of virtualization, practical use cases for IT students, and alternative solutions such as Windows Subsystem for Linux (WSL2). The report also discusses the future implications of virtualization, including advancements in cloud-based computing, AI-driven automation, and enhanced security measures.

In conclusion, setting up an Ubuntu virtual machine using VMware Workstation is a valuable skill that enhances technical proficiency and provides a secure environment for software testing and development. By following this guide, users can successfully implement virtualization for academic and professional purposes.

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# Introduction

## Purpose

The purpose of this report is to provide a comprehensive and structured guide for setting up an Ubuntu Linux virtual machine using VMware Workstation on a Windows 10/11 system. It aims to help students, IT professionals, and developers integrate Linux-based environments into their workflows for software development, cybersecurity testing, and network management.

## Scope

This report focuses on the technical process of setting up an Ubuntu virtual machine using VMware Workstation. It includes system requirements, step-by-step installation procedures, and configuration settings to ensure an optimized virtual environment. Additionally, it covers common troubleshooting steps and explores an alternative approach using Windows Subsystem for Linux (WSL2).

## Limitations

This report specifically discusses VMware Workstation and Ubuntu as the virtualization software and guest operating system, respectively. Other hypervisors, such as VirtualBox or Hyper-V, and alternative Linux distributions are not covered in detail. Additionally, performance optimizations for high-intensity workloads are beyond the scope of this report.

## Assumptions

The report assumes that users have access to a Windows 10/11 computer with sufficient hardware capabilities, administrative privileges for software installation, and basic knowledge of operating systems.

## Methods

The findings in this report are based on secondary research from industry documentation, technical guides, and direct testing of Ubuntu installation within VMware Workstation. The step-by-step procedures were validated through practical implementation to ensure accuracy and ease of use.

# Background

## Context

Virtualization is a key technology in modern computing. It allows users to run multiple operating systems on a single physical machine. This is especially useful for software development, testing, training, and security research. Instead of buying another computer, users can create a virtual machine (VM) to try a different operating system without changing their main setup. In education, especially for IT students, virtualization makes it easy to explore different systems and learn technical skills in a safe environment (Choi, 2024). Ubuntu, a widely used Linux distribution, provides an open-source environment suitable for development and IT education.

## Overview of Virtualization

Virtualization involves the creation of virtual instances of computer systems, which function as separate environments within a host machine. VMware Workstation is a leading virtualization tool that enables users to run multiple operating systems simultaneously (Oven, 2023, pp. 11–24). It provides robust hardware emulation, networking configurations, and resource management tools, making it a preferred choice for students, developers, and IT professionals.

# Setting Up the Virtual Machine

## Overview

This section provides a step-by-step explanation of how to install VMware Workstation and set up an Ubuntu Linux virtual machine. The instructions are written for beginners and follow a simple and clear process.

## System Requirements

To download and install VMware workstation, the following system specifications are recommended:

### Table 1: Recommended equipment and material

|  |  |
| --- | --- |
| **Item** | **Requirement** |
| Operating System | Windows 10 or 11 |
| Processor | 64-bit x86/AMD64 CPU (2011 or later) |
| RAM | Minimum 2GB (4GB or more recommended) |
| Storage | At least 1GB of free disk space |
| Admin Privileges | Required for installation |
| Internet Connection | Stable connection required for download |

Source: *Memory Requirements for Host Systems*, 2025

## Installing VMware Workstation

To download VMware Workstation, open a web browser and navigate to the [Free Downloads - Support Portal - Broadcom support portal](https://support.broadcom.com/group/ecx/free-downloads).. You need to make an account before downloading. In the search box, type “VMware Workstation” and click “Show results.” From the list, choose either “VMware Workstation Pro” or “VMware Workstation Player,” depending on what you need.

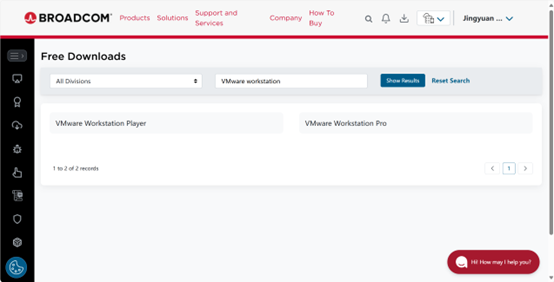
Figure 1: Locating VMware Workstation

图形用户界面, 应用程序, 电子邮件

AI 生成的内容可能不正确。

Source: (2025). Broadcom.com. https://access.broadcom.com/default/ui/v1/signin/

Figure 2: Setting VMware Workstation for download



Source: (2025). Broadcom.com. https://access.broadcom.com/default/ui/v1/signin/

Choose the version for Windows. Agree to the terms and click “Download.” If it is your first time using the site, a message will pop up asking for extra verification. Click “Yes” and fill in your name and address. After that, the download will start by itself.

Figure 2: Downloading VMware Workstation

图形用户界面, 文本, 应用程序, 电子邮件

AI 生成的内容可能不正确。

Source: (2025). Broadcom.com. https://access.broadcom.com/default/ui/v1/signin/

When the download is done, find the .exe file. Right-click it and choose “Run as administrator.” If you see a pop-up from User Account Control, click “Yes.” The setup will open. Click “Next,” then read and accept the license agreement. Click “Next” again (Sander van Vugt, 2013).

Choose “Typical” if you want the default setup or choose “Custom” if you want to change something. Pick where you want to install the program, then click “Next.” Choose if you want shortcuts on your desktop and if you want automatic updates, then click “Next.”

Click “Install” to begin. Wait for the installation to finish. When it is done, click “Finish.” If asked, restart your computer.

To open VMware Workstation, find the shortcut on your desktop or in the Start menu and double-click it.

## Setting Up Ubuntu Linux VM

### Configuring Virtual Machine Settings

1. **Launch VMware Workstation:** Open the application from the Start menu or desktop shortcut.
2. **Create a New Virtual Machine:** Click *Create a New Virtual Machine* and select *Typical (recommended)*.
3. **Select Installation Media:** Choose *Installer disc image file (ISO)* and browse to locate the downloaded Ubuntu ISO file.
4. **Name the Virtual Machine & Storage Location:** Assign a name (e.g., "Ubuntu VM") and specify the file location for virtual machine storage.
5. **Allocate Resources:** Assign at least 4GB RAM, 2 CPU cores, and 20GB or more of disk space.

### Installing Ubuntu on the Virtual Machine

1. **Start the Virtual Machine:** Click *Power on this virtual machine* to launch the Ubuntu installer.
2. **Select Installation Type:** Choose *Install Ubuntu* and follow on-screen instructions.
3. **Partition the Virtual Disk:** Select *Erase disk and install Ubuntu* (affects only the VM).
4. **Create a User Account:** Set up a username, password, and preferred system settings.
5. **Complete Installation:** Click *Install Now* and wait for the process to finish. Restart when prompted.

### Post Installation Configuration

1. **Update System Packages:** Open the terminal and run sudo apt update && sudo apt upgrade to ensure all packages are up to date.
2. **Install VMware Tools:** Run sudo apt install open-vm-tools-desktop for enhanced performance and display resolution scaling.
3. **Configure Networking:** Ensure network adapter settings in VMware are set to NAT or Bridged mode for internet connectivity.
4. **Customize System Settings:** Install additional software, configure preferences, and enable security updates as needed.

Figure 1: I'm an Image Caption!

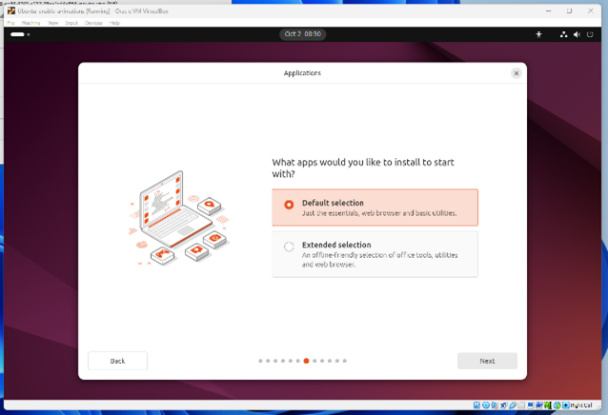


Figure 2: I'm an Image Caption!

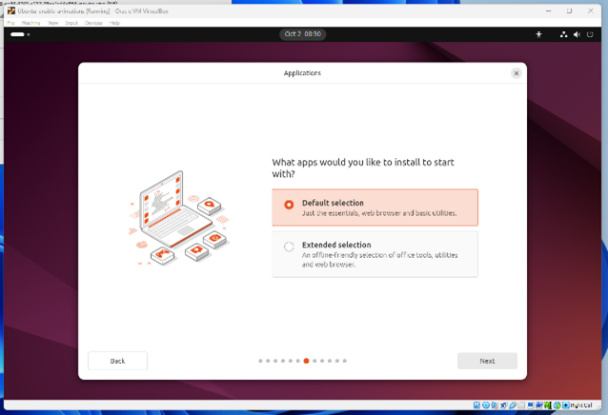


Figure 3: I'm an Image Caption!

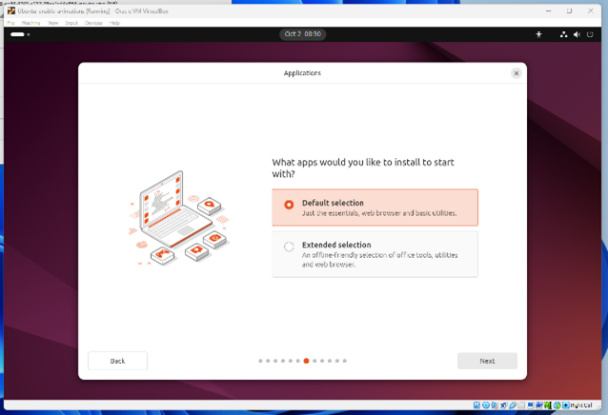


Figure 4: I'm an Image Caption!

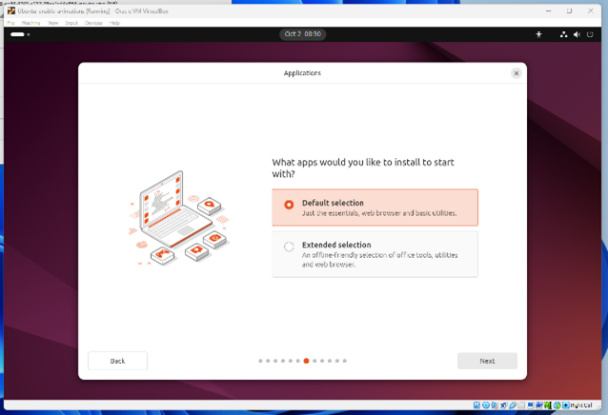
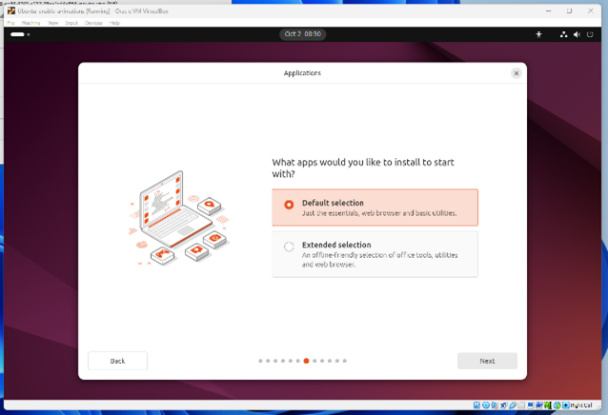


Figure 5: I'm an Image Caption!



Source: flutter. (2024). *Ubuntu Installation Process*. GitHub. <https://github.com/flutter/flutter/issues/155982#issuecomment-2387958637>

## Summary

This section explained how to install VMware Workstation on a Windows 10 or 11 system. It included steps such as downloading the installer from the official Broadcom portal, running the installation as an administrator, and choosing the default setup options. These steps provide users with the necessary foundation to begin creating and managing virtual machines on their system.

This section outlined the step-by-step process of setting up an Ubuntu virtual machine in VMware Workstation, from installation to configuration. By following these instructions, users can successfully create a stable virtual environment for development, testing, and IT education.

# Analysis and Discussion

## Overview

Virtualization has gained widespread adoption in IT due to its efficiency, cost-effectiveness, and security benefits. However, challenges such as performance limitations, networking complexities, and compatibility issues can arise. This section explores solutions to these problems and the future implications of virtualization technology.

## Benefits of Virtualisation

Virtualization offers several advantages for both individuals and organizations:

* **Cost Savings:** Reduces hardware expenses by allowing multiple virtual machines to run on a single physical computer.
* **Flexibility:** Enables users to test different operating systems and software configurations without affecting the host machine.
* **Security:** Virtual environments provide isolated spaces for testing, minimizing risks to the main system.
* **Scalability:** Organizations can efficiently manage computing resources by allocating virtual machines dynamically.

## Use Cases for IT Students

For IT students, virtualization plays a crucial role in their academic and professional development:

* **Software Development:** Virtual machines allow students to create and test applications in different operating environments (Ali & Meghanathan, 2011, p. #).
* **Cybersecurity Training:** Many cybersecurity courses use virtualized environments to simulate attack scenarios safely (Ali & Meghanathan, 2011, p. #).
* **Network Configuration and Testing:** Students can practice setting up and managing virtual networks before working on real infrastructure. (page 12 and 13)
* **Operating System Experimentation:** Provides hands-on experience with Linux, Windows, and other OS distributions. (Swift et al., 2003)

## Challenges and Solutions

* **Performance Optimization:** Virtual machines can sometimes run slower due to resource allocation constraints. To mitigate this, users should allocate sufficient RAM and CPU cores and enable hardware virtualization in BIOS settings. Installing VMware Tools further enhances performance by enabling seamless integration with the host OS.
* **Networking Configuration Issues:** Some users experience network connectivity problems when setting up their virtual machines. Switching between NAT and Bridged mode can resolve common networking issues. Configuring static IP addresses or using DHCP services can further stabilize network performance.
* **Storage and Disk Management:** Virtual machines require adequate disk space to function efficiently. Users should allocate sufficient storage and consider enabling disk compression or increasing disk size dynamically within VMware Workstation.

## Alternative Solutions (WSL2)

For users who require a lightweight alternative to full virtualization, Windows Subsystem for Linux (WSL2) offers a viable solution:

* **Performance Efficiency:** WSL2 runs Linux natively within Windows without the overhead of a virtual machine.
* **Seamless Integration:** Allows users to run Linux command-line tools alongside Windows applications.
* **Limitations:** WSL2 lacks full graphical user interface (GUI) support by default, though it can be configured with additional tools.

## Future Implications

The future of virtualization is evolving rapidly, with several key trends shaping its development:

* **Cloud-Based Virtualization:** More organizations are adopting cloud-hosted virtual machines, reducing the need for powerful local hardware, and enabling remote access to virtualized environments.
* **Integration with AI and Automation:** AI-driven virtualization solutions can optimize system resources dynamically, improving efficiency and reducing manual configurations.
* **Enhanced Security Features:** With cyber threats on the rise, virtualized environments are incorporating better encryption, isolation techniques, and monitoring tools to ensure secure operations.

## Summary

This section discussed the benefits of virtualization, its relevance for IT students, common challenges and solutions, and alternative options like WSL2. It also explored emerging trends that will shape the future of virtualization technology.

# Conclusion

Setting up an Ubuntu virtual machine using VMware Workstation is a valuable skill for students and IT professionals, providing a versatile environment for software development, cybersecurity testing, and system administration. This report outlined the step-by-step installation process, discussed common issues and their solutions, and highlighted the future potential of virtualization technologies. By mastering virtual machine deployment and management, users can leverage powerful tools to enhance their learning and professional growth in the ever-evolving IT landscape.

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