“Київський фаховий коледж зв’язку”
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ЗВІТ ПО ВИКОНАННЮ ЛАБОРАТОРНОЇ РОБОТИ №1

з дисципліни: «Операційні системи»

Тема: «Ознайомлення з робочим середовищем віртуальних машин та операційних систем різних сімейств»

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Київ 2022

Мета роботи:

1. Отримання практичних навиків роботи з середовищами віртуальних машин та операційними системами різних типів та сімейств – їх графічною оболонкою, входом і виходом з системи, ознайомлення зі структурою робочого столу, вивчення основних дій та налаштувань при роботі в системі.

Матеріальне забезпечення занять

1. ЕОМ типу IBM PC.
2. ОС сімейства Windows (Windows 7).
3. Віртуальна машина – Virtual Box (Oracle).
4. Операційна система GNU/Linux – CentOS.

Завдання для попередньої підготовки

Готував матеріал студент Кошіль Владислав

1. Прочитайте короткі теоретичні відомості до лабораторної роботи та зробіть невеличкий словник базових англійських термінів з питань класифікації ОС.

Термін англійською	Термін українською
Operating System	Операційна система
Host operating system	Головна ОС
Guest operating system	Гостьова ОС
Hipervizor	Гіпервізор

2. Прочитавши матеріал з коротких теоретичних відомостей дайте відповіді на наступні питання:

Готував матеріал студент Кошіль Владислав

2.1. Охарактеризуйте поняття «гіпервізор». Які бувають їх типи?

A hypervisor is software that allows you to create and manage virtual machines on a physical computer or server. The hypervisor provides resources to the virtual machine and isolates it from other virtual machines and the physical machine.

There are two types of hypervisors:

Type 1 or "native" hypervisor is software that runs directly on the physical machine, without installing an operating system. This type of hypervisor is also known as "bare-metal". Type 1 hypervisors are commonly used in cloud computing and large data centers.

Type 2 hypervisors are software that is installed on the operating system of a physical machine. This type of hypervisor is also known as "hosted". It can be installed on personal computers and servers, and is commonly used for software testing and virtualization of some applications.

Хід роботи

Готував матеріал студент Фещенко Эвгеній.

1.Подивіться ознайомчі відео та демонстраційні матеріали
2.Після перегляду відео дайте відповіді на наступні питання.

- Перерахуйте етапи для розгортання операційної системи на базі віртуальної машини VirtualBox.

To deploy an operating system based on a VirtualBox virtual machine, you can perform the following steps:

Install the VirtualBox software on a physical machine.
Create a new virtual machine in VirtualBox, specifying the name and type of operating system.
Configure the virtual machine, such as the amount of RAM, number of processors, virtual hard disk, and other settings.
Select the operating system image or operating system CD/DVD that will be used to install the operating system on the virtual machine.
Start the virtual machine and go through the operating system installation process, which is the same as on a physical machine.
After the operating system is successfully installed, you can configure the virtual network to connect to the Internet and other network devices.

- Чи є якісь апаратні обмеження при встановленні 32- та 64-бітних ОС?

  To install a 32-bit operating system, you must have a processor that supports the x86 or x86-64 architecture, as well as at least 1 GB of RAM and enough hard disk space.

  To install a 64-bit operating system, you need a processor that supports the x86-64 architecture (also known as AMD64 or Intel 64), as well as at least 2 GB of RAM and enough hard disk space.

  If your computer has a processor that does not support the x86-64 architecture, a 64-bit operating system cannot be installed. Some older computers may have such a processor.

- Які основні етапи при встановленні CentOS в текстовому режимі?
  - Booting from an image
  - Select the language
  - Install the disks
  - Setting up the network
  - Selecting packets
  - User configuration
  - Completing the installation

- Яким чином можна до установити графічні оболонки Gnome та KDE на CentOS, якщо вона вже встановлена в текстовому режимі (вкажіть необхідні команди та пакети)?

  To install the Gnome and KDE desktop environments on CentOS, run the following commands and packages:

  To install Gnome: sudo yum groupinstall "GNOME Desktop" sudo yum groupinstall "X Window System"

  To install KDE: sudo yum groupinstall "KDE Plasma Workspaces" sudo yum groupinstall "X Window System"

- Дайте коротку характеристику графічних інтерфейсів, що використовуються в різних дистрибутивах Linux відповідно до свого варіанту (порядковий номер по журналу), табл.2..

  GNOME offers users a user-friendly interface that is easy to navigate, with numerous customization options to suit individual preferences. It includes a vast array of software programs, and users can easily tailor it to their specific needs. In contrast, JWM (Joe's Window Manager) is a straightforward and highly customizable graphical interface that allows users to create a convenient panel of programs to suit their personal preferences.

Відповіді на контрольні запитання
Готував матеріал студент Кошіль Владислав та Фещенко Эвгеній

1. Compare type 1 and type 2 hypervisors, what is the difference between them and their scope?
Type 1 and type 2 hypervisors are programs used to virtualize computing resources. The main difference between them is their location. Type 1 hypervisors, also known as "direct" hypervisors, are installed directly on the physical hardware of the server, while type 2 hypervisors, known as "overlay" hypervisors, are installed as software on the operating system.

The main application of type 1 hypervisors is in large enterprises and data centers, where they are used to virtualize a variety of physical servers and computing resources. Type 2 hypervisors, on the other hand, are more suitable for desktop-level virtualization, such as software testing, website development and testing, or for use by home users.

2. Explain the concept of "GNU GPL", what is its main concept?
GNU GPL (General Public License) is a free software license that guarantees users the freedom to run, study, share, and modify the software. The license was developed by the Free Software Foundation (FSF) and is used for many free software programs, including the GNU operating system, Linux kernel, and various programming libraries and tools.

The main concept of GNU GPL is to promote the concept of software freedom and to ensure that users have the ability to use and modify the software as they see fit. The license achieves this by requiring that any software that uses GPL-licensed code must be released under the same GPL license terms. This "copyleft" approach ensures that the software remains free and that the users have the right to modify and share it.

3. What is the essence of open source software?
The essence of open source is that developers and users are allowed to view the source code of software, making it more transparent and accessible. Any developer can modify the source code and add functionality, which in turn allows the software to be developed and improved faster and more efficiently.

The basic idea of open source is that software is developed and maintained by a community of developers and users, which in turn contributes to the development and improvement of software, reducing its cost and increasing its quality.

4. What is a distribution kit?
Typically, a distribution kit includes the software itself, documentation, customization, additional components such as libraries or modules, and utilities that help you install and configure the program.

5. What system administration tasks can be implemented on the basis of Linux?
Manage users and groups

- Manage network settings
- Manage services
- Monitoring and diagnostics
- Ensuring security
- Backup and recovery
- File system management

6. What is the relationship between Android and Linux?
Android and Linux are related in that Android uses the Linux kernel as its core component. The Linux kernel provides the functionality of the Android OS, such as process, memory, and I/O management. However, the Android OS is not a full-fledged Linux-based OS, but a modified version with its own set of libraries and application development tools that allows it to be used on mobile devices. Thus, we can say that Android is a Linux-based OS that has been adapted for mobile devices.

7. What are the main features and scope of Embedded Linux?
The main features of Embedded Linux:

- Low hardware requirements. Embedded Linux can be used on small devices with limited memory and computing power.
- Open source. Embedded Linux is open source, which allows users to modify and improve the system to suit their needs.
- Advanced customization options. Embedded Linux can be customized for different needs and uses, allowing developers to create specialized devices with specific functionality.

- Availability of a large number of applications and development tools. Embedded Linux has access to a large number of applications and development tools that allow you to quickly create software for embedded devices.

Areas of application of Embedded Linux:

- Automotive. Embedded Linux can be used to develop electronic car control systems, such as distance sensors, rear view cameras, security systems, etc.
- Medical equipment. Embedded Linux can be used to create medical devices such as ECGs, patient monitoring and analyzers.
- Information systems. Embedded Linux can be used to develop small servers, routers, and other network devices.

8. How can I change the type of Linux boot: in text mode (level 3) or graphical mode (level 5)? What is the difference between CLI and GUI modes?

The process of changing the Linux boot type from graphical to text or vice versa depends on the specific Linux distribution and version are using but there are general steps that work on some systems:

- Boot your Linux system and wait for the bootloader screen to appear.
- Select the boot option you want to modify and press the "e" key to edit it.
- Locate the line that starts with "linux" or "linuxefi" and append the word "text" (for text mode) or "graphical" (for graphical mode) at the end of the line.
- Press "Ctrl + x" to boot using the modified boot option.

Key differences between CLI and GUI

- CLI allows users to manually enter a command to perform a desired task, while in GUI, users are provided with visuals to interat with the operating system, such as buttons, icons, images, etc.
- GUI tasks are easy to perform and good for beginners. The CLI, on the other hand, requires experience with commands and syntax.
- GUI systems require a mouse and keyboard, while CLI just requires a keyboard to work.
- Higher accuracy can be achieved in CLI compared to GUI.
- GUI has the advantage of flexibility where CLI systems are inflexible.
- GUI consumes more system space while CLI requires less system resources and space.
- The appearance of the CLI cannot be changed. On the contrary, the appearance of the GUI is adjustable.
- CLI is faster than GUI.

Висновки

In the course of completing the tasks of the laboratory work, we have studied the environment of virtual machines and operating systems of various types and families - their graphical shell, login and logout. Practical skills in working with Linux commands and setting up a virtual machine were gained.