“Київський фаховий коледж зв’язку”

Циклова комісія Комп’ютерної інженерії

**ЗВІТ ПО ВИКОНАННЮ**

**ЛАБОРАТОРНОЇ РОБОТИ №1**

з дисципліни: «Операційні системи»

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

Виконали студенти

групи КСМ-03Б

Команда: Кучмій-Зікеєв

М.О., Зінченко І.О. та Звєрьков А.Г.

Перевірив викладач

Сушанова В.С.

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 10).

3. Віртуальна машина – Virtual Box (Oracle).

4. Операційна система GNU/Linux – CentOS.

**Завдання для попередньої підготовки**

***Готував матеріал студент Звєрьков А.***

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 |
| **Shared hosting** | Віртуальний хостинг |
| **Type 1 hypervisor** | Гіпервізор 1 типу |
| **Machine simulators** | Машинні симулятори |
| **Binary translation** | Двійковий переклад |
| **Type 2 hypervisors** | Гіпервізори 2 типу |
| **Host operating system** | Операційна система хоста |
| **Guest operating system** | Гостьова операційна система |
| **Graphical user interface** | Графічний інтерфейс користувача |
| **Сommand line interface** | Інтерфейс командного рядка |

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

***Готували матеріал студенти Кучмій-Зікеєв М., Звєрьков А., Зінченко І.***

2.1

2.2

***Готував матеріал студент Кучмій-Зікеєв М. Варіант 9 (Але заміна варіанту на 1, через повтор)***

***Готував матеріал студент Зінченко І. Варіант 4***

A **hypervisor** is an important piece of software that makes virtualization possible. It abstracts the guest machines and the OS they run on from the real hardware. Hypervisors create a virtualization layer that separates CPU/processors, RAM, and other physical resources from the virtual machines you create.

**KVM**is built into Linux as an optional feature. It allows you to turn the Linux kernel into a hypervisor. It has direct access to the hardware as well as the virtual machines it hosts. KVM is an open source hypervisor that contains all the features of Linux with many more added. This makes it one of the ***best choices*** for enterprise environments. Some of the highlights include dynamic migration, resource scheduling and control, and higher priorities.

For some time now, KVM has been part of the Linux kernel, so it evolves along with it. Works only in systems ***with hardware support for virtualization*** - on Intel and AMD processors.

***Advantages and disadvantages of KVM***

***The main advantages of a hypervisor are:***

***Independently distributed resources.*** Each virtual machine running under the control of KVM receives its own amount of RAM and permanent memory and cannot "climb" into other areas, which increases the stability of work;

***Broad guest OS support***. In addition to full support for UNIX distributions, including \*BSD, Solaris, Linux, it is possible to install Windows and even MacOS;

interaction with the kernel allows you to directly access the workstation hardware, which makes the work ***faster;***

***support of the giants of the software market*** allows the project to develop rapidly, covering an increasing number of hardware and OS, including the latest;

***simple administration*** - the ability to remotely manage via VNC and a large number of third-party software and add-ons.

***There were also some drawbacks:***

the relative youth of the hypervisor and the corresponding explosive growth lead to various problems, especially when adding support for new hardware and software environments;

the complexity of the settings, especially for an inexperienced user. True, most of the options can not be changed - they are configured optimally.

***Safety***

In KVM, each machine is a Linux process, so standard security policies are automatically applied to it, as well as isolation from other processes.

***Performance and scalability***

Scalability and performance of the complex due to tight integration with Linux. Thus, the hypervisor supports up to 16 processors and up to 256 GB of RAM in each virtual machine.

***Stability***

The software package is constantly being improved - if initially it supported only the Linux x86 platform, today the number of different platforms is in the tens. And thanks to cooperation with leading software manufacturers, the KVM hypervisor can be called the most stable and reliable on the market.

***Готував матеріал студент Звєрьков А. Варіант 3***

**Хід роботи**

1. Подивіться ознайомчі відео та демонстраційні матеріали з наступних напрямків:

1.1 GNU/Linux. Базові відомості.

1.2 Встановлення CentOS у VirtualBox.

1.3 Встановлення CentOS в текстовому режимі.

1.4 Встановлення оточення робочого столу Gnome в CentOS.

1.5 Встановлення оточення робочого столу KDE в CentOS.

1.6 The Shell (Linux)

1.7 Огляд графічних оболонок Linux

2. Після перегляду відео дайте відповіді на питання:

***Готував матеріал студент Кучмій-Зікеєв М.***

2.1

2.2

2.3

2.4

2.5

***Готував матеріал студент Кучмій-Зікеєв М. Варіант 9***

***Готував матеріал студент Зінченко І. Варіант 4***

***KDE*** is an international free software development community. As a central development hub, it provides the tools and resources that enable collaborative work on this kind of software. Notable products include KDE Plasma 5, KDE Frameworks, and many cross-platform applications such as Krita or digiKam designed to run on Unix and Unix-like desktops, and on Android.

Plasma is the default desktop environment on many Linux distributions, such as openSUSE, Manjaro Linux, Kubuntu, PCLinuxOS. KDE is a working shell with an integrated set of cross-platform applications for Linux, Windows, Solaris and Mac. In many ways, KDE (K Desktop Environment) is similar to Windows, so users feel at home when using it. As in Win OS, they access the menu by clicking on the left side of the panel. The software has one menu bar at the bottom of the screen, it can be changed at the user's request. With plasma desktops, KDE is the most attractive of all Linux desktops. Although KDE is sleeker in appearance and has more options than GNOME 2.x, XFCE, or LXDE, it is also more resource intensive. On the other hand, it requires less system resources than Unity and less RAM than GNOME

***Fluxbox*** is a simple and minimalist window manager for the X Window System. Fluxbox is based on Blackbox v.0.61.1 and is similar to it - same colors, window layout and full compatibility of themes and styles. It has minimal requirements for system resources and provides all the basic possibilities for organizing comfortable work. Fluxbox supports such functions as combining several windows in the form of tabs, editing menus, collapsing applications to the system tray, virtual desktops, flexible tools for grouping windows, customizing the appearance, binding hot keys. The fluxbox code is written in C++ and distributed under the MIT license.

On the outside, Fluxbox is a clean desktop with a toolbar containing the desktop title, clock, and list of running applications. By default, Fluxbox does not have its own icons on the desktop, but you can add them using idesk.

Programs are launched by selecting the appropriate item from the drop-down menu that appears after clicking the right mouse button anywhere on the desktop, or by typing the name of the program in the pop-up input panel, which is called either from the above-mentioned drop-down menu, or by pressing hot keys.

***Готував матеріал студент Звєрьков А. Варіант 3 (Але заміна варіанту на 2, через повтор)***

**Відповіді на контрольні запитання**

***Готував матеріал студент Зінченко І.***

1. ***Type 1 hypervisors*** themselves can also be forgiven by the OS, on top of which you can run virtual machines. The physical machine, depracing the hypervisor, will serve only as a method of virtualization. You can't win for anything else. Type 1 hypervisors are more important than ever in corporate environments. ***Type 2 hypervisor*** is placed in the middle of the operating system of the physical host computer. At the top of the type 1 hypervisors, they work without intermediary on the owner, the location of the hypervisors and may have one program run. Type 2 hypervisors ring vicorist in the middle with a small number of servers.

2. The ***GNU General Public License*** is one of the most popular free software licenses created by Richard Stallman for the GNU project. It is often abbreviated as GNU GPL or simply GPL. The purpose of the GNU GPL is to give a user the right to copy, modify, and distribute a program and an obligation that users of all programs derived from it will also receive those rights. The principle of "inheritance" of such rights is called "copyleft", a term proposed by Richard Stallman. Unlike the GPL, proprietary software licenses very rarely grant the user such rights, and mostly try to limit them, for example, by prohibiting the restoration of the source code.

3. Open source software (OSS) is a type of software in which the source code is released under a license in which the copyright holder grants users the right to use, study, modify and distribute the software to anyone and for any purpose. Open source software is a prime example of open collaboration.

Open source software development can offer different perspectives beyond that of a single company. A 2008 report by the Standish Group stated that the adoption of open source software models has resulted in savings for consumers of approximately $60 billion

4. A distribution is a set of files that are required to install utilities or software packages. An example of a distribution can be an installation disk with an operating system.

5. The main tasks of a system administrator (superuser) in Linux include:

installation (installation) of the OS; management of the OS loading process; setting operating modes of the OS; editing configuration files; mounting and dismounting of file systems; introduction and removal of OS users; software updates; OS kernel configuration; ensuring the reliable functioning of the OS; computer network configuration.

6. Android OS is a Linux-based mobile operating system that primarily runs on smartphones and tablets. The Android platform includes an operating system based on the Linux kernel, a GUI, a web browser and end-user applications that can be downloaded.

7. The term "embedded Linux®" includes the description of any variant of the open source Linux® operating system running on an embedded computer system, a specialized device or platform integrated into an overall larger product, such as a device or consumer electronics item . equipment.

8. They mainly differ in the graphics used in the operating system. To perform an operation on the CLI system, you need to write a command. On the other hand, GUI users are provided with visual aids (graphics) that include images and icons, making it easier for users to perform a task directly.

CLI systems require knowledge of commands to perform tasks, while GUI does not require knowledge, it can also work with beginners

**Висновки**

В ході виконання лабораторної роботи мною було досліджено основні компоненти та можливості гіпервізорів, більш

детально теоретично досліджено питання гіпервізорів KVM. Отримано практичні навики роботи з командами OC Linux, та налаштування