“Київський фаховий коледж зв’язку”

Циклова комісія Комп’ютерної та програмної інженерії

**ЗВІТ ПО ВИКОНАННЮ**

**Лабораторна робота №2**

з дисципліни: «Операційні системи»

**Тема: “Знайомство з інтерфейсом та можливостями ОС Linux”**

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Команда “Better call Chekh”:

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Перевірив викладач

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Київ 2023

**Мета роботи:**

1. Знайомство з інтерфейсами ОС Linux.

2. Отримання практичних навиків роботи в середовищах ОС Linux та мобільної ОС – 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.

5. Сайт мережевої академії Cisco netacad.com та його онлайн курси по Linux

**Завдання для попередньої підготовки**

***Готував матеріал студент Кравченко Т.І. та доповнив Бродзінський Є.В.***

***Tasks for preliminary preparation.***

1. Прочитайте короткі теоретичні відомості до лабораторної роботи та зробіть невеликий словник

базових англійських термінів з питань призначення команд та їх параметрів:

|  |  |
| --- | --- |
| Термін англійською | Термін українською |
| **Command Line Interface (CLI)** | Інтерфейс командного рядка |
| **GUI Terminal** | Графічний термінал |
| **Central Processing Unit (CPU)** | Центральний процесор |
| **Desktop Applications** | Програми для робочого столу |
| **Distribution** | Дистрибутив (версія операційної системи) |
| **Performance** | Продуктивність |
| **Binary Translation** | Двійковий переклад |
| **Machine Simulators** | Машинні симулятори |
| **Guest Operating System** | Гостьова операційна система |
| **UNIX-like Operating System** | Операційна система, подібна до UNIX |

2. Вивчіть матеріали онлайн-курсу академії Cisco “NDG Linux Essentials”:

- Chapter 3 - Working in Linux

- Chapter 4 - Open Source Software and Licensing

3. Пройдіть тестування у курсі NDG Linux Essentials за такими темами:

- Chapter 03 Exam

- Chapter 04 Exam

4.

* CLI mode is a text-based interface that allows users to interact with a computer system by entering commands and parameters through the command line, without using a graphical interface. In this mode, users can perform various tasks, manage the system, and execute commands to manage applications and resources. The CLI allows more control and capabilities compared to the GUI.
* A GUI-based terminal is a program or window in the graphical user interface of a computer system that mimics the functionality of a traditional text terminal or command line. It allows users to execute commands and interact with the operating system by entering text commands, similar to working in a regular text terminal, but using a graphical interface for user convenience.
* A virtual terminal is an emulation of a text terminal or command line on a computer system that allows users to interact with the system through a text interface even when they are using a graphical interface. Virtual terminals can be run and used in parallel with a graphical environment, and they allow you to run commands, check system status, and perform other text operations without having to switch to full-screen text mode.

5. Підготувати в електронному вигляді початковий варіант звіту:

- Титульний аркуш, тема та мета роботи

- Словник термінів

- Відповіді на п.5 та п.6 з завдань для попередньої підготовки

**Хід роботи.**

***Готували матеріал разом* Кравченко Т.І.(1.1-1.3) , Тунда Р.О.(2.3-2.4), Бродзінський Є.В. (2.1-2.2)**

1. Робота в графічному режимі в ОС сімейства Linux (робота з інтернет-джерелами):

1.1. Оберіть графічну оболонку для ОС сімейства Linux, яку ви хочете розглянути. User Workspace Structure in the GNOME Environment, like in other Linux graphical desktop environments, consists of several key components for convenient access to programs, files, and system settings. The main components of the GNOME shell include:

"Applications" Tab:

The "Applications" tab is one of the key elements of the user workspace. Clicking on it opens a menu that contains subcategories for launching installed programs and applications.

In this menu, applications are categorized, making it easier to search for and launch the necessary applications.

"Places" Tab:

The "Places" tab provides access to various sections of the system. It contains quick links to various locations in the file system, such as the user's home directory, documents, downloads, network resources, and more.

This helps users quickly find and open files and folders directly from the desktop.

"System" Menu:

The "System" menu provides access to system options and settings. It includes submenus for managing the system, configuring settings, shutting down or rebooting the computer, system information, and other useful tools.

This menu allows users to control system parameters and perform other operations to configure the system.

"Activities Overview" Navigation Space:

The "Activities Overview" navigation space is typically activated by pressing the "Super" key (usually the key with the Windows or Command logo on the keyboard). It provides a full-screen overview of all running programs and open windows, as well as quick access to searching for programs and files.

In the "Activities Overview," users can quickly switch between workspaces, launch applications, or open new windows.

These components of the GNOME user workspace make working with the operating system more convenient and organized, allowing easy access to various resources and system functions.

1.2. Launching Programs. Explore the ways to start applications by describing the methods and possibly providing screenshots:

* Launching programs through the quick launch panel.
* Launching programs through the menu search.
* Launching programs through a launch widget.
* Launching programs through the global menu.

1.3. Logging out of the system and shutting down in Linux. Explain how to perform the following actions in the graphical interface and provide screenshots:

* Changing the user to root.

- System Reboot

- System Shutdown

2. Work in a mobile OS environment.

2.1. Опишіть головне меню вашої мобільної ОС, який графічний інтерфейс вона використовує?

The main menu of the iOS mobile operating system used on Apple devices utilizes a graphical interface based on several key components, including the home screen. The iOS home screen is referred to as "Springboard," and it serves as the primary workspace of the device. The main components of the iOS home screen include:

1. **Apps**: The iOS home screen features app icons. Users tap on these icons to open the corresponding apps and programs. Apps can be organized into folders or placed directly on the home screen.
2. **Control Center**: At the top of the home screen, there is typically a Control Center panel that provides information about the time, network status, battery level, and other useful icons and indicators. Users can also interact with the Control Center to perform various actions, such as enabling Wi-Fi or Bluetooth.
3. **Widget Panels**: On the left side of the iOS home screen, there are widget panels that contain useful information, quick actions, and notifications. Widgets can be added and customized by the user to display relevant data.
4. **Dock**: The bottom part of the home screen contains the "dock," which includes app icons that users can access from any screen. The dock also includes an "App Store" icon for accessing the app store and other useful tools.
5. **Search**: Typically, the home screen has a search feature that allows users to quickly find apps, contacts, messages, and other information on the device.

The iOS graphical user interface is highly intuitive and user-friendly, making it easy for users to interact with various features of Apple devices. The home screen, known as Springboard, serves as the central hub for accessing all apps and functions.

2.1.Describe the main menu of your mobile OS, what GUI does it use?

Since my mobile device has IOS, I will describe IOS and the graphical interface of this OS:

The main menu of the mobile OS iOS uses a graphical interface that includes the following components:

1)Dock: At the bottom of the screen, there is a static panel (dock) with icons of core apps and quick access to them.

2)Home Screen: This is the starting page where app icons and widgets are placed. You can organize them in specific orders and create categories.

3)Control Center: Located at the top of the screen, this panel allows for quick control of functions such as Wi-Fi, Bluetooth, "Do Not Disturb" mode, brightness adjustment, and more.

4)Notifications: They appear at the top of the screen in the form of notifications and are then stored in the Notification Center.

5)Search: The built-in search application allows you to find content on your device and on the internet.

6)App Store: The "App Store" app allows you to download and install new applications.

2.2. Describe the mobile phone component settings menu.

Menu of settings of mobile phone components with OS IOS:

1)Dock: At the bottom of the screen, there is a static panel (dock) with icons of core apps and quick access to them.

2)Home Screen: This is the starting page where app icons and widgets are located. You can organize them in specific orders and create categories.

3)Control Center: Located at the top of the screen, this panel allows quick control of functions such as Wi-Fi, Bluetooth, "Do Not Disturb" mode, brightness adjustment, and more.

4)Notifications: They appear at the top of the screen as notifications and are then stored in the Notification Center.

5)Search: The built-in search app allows you to find content on your device and the internet.

6)App Store: The "App Store" app allows you to download and install new applications.

7)Sound and Haptics: Adjust sound settings, choose ringtones, configure vibrations, and customize message alert sounds.

8)Display & Brightness: Customize display settings, brightness, auto-brightness, and the True Tone feature.

9)Touch ID or Face ID and Passcodes: Manage authentication methods, set up passwords, PIN codes, Touch ID, or Face ID for device unlock and app authorization.

10)Accessibility: Includes various general options such as "Accessibility," keyboard settings, accessories, profiles, and VPN.

11)Apps: Configure settings for individual apps, change permissions, and access to features.

12)Battery: Check battery usage statistics and manage power consumption.

13): Manage privacy settings, permissions for apps and services.

14)iTunes & App Store: Adjust settings for App Store downloads, automatic app updates, and use your Apple ID account.

15)General: Displays device information, including software version, serial number, and available storage space.

2.3. Using keyboard shortcuts to perform special actions.

iPhone has several keyboard shortcuts that allow you to perform various special actions and quick operations. Here are some of the most useful keyboard shortcuts:

Screen capture (Screenshot):

Press the Volume + button and the Sleep/Wake button (located on the top of the device or on the side, depending on the model) at the same time.

The screen will pop up instantly and the picture will be saved in the photo gallery.

Canceling the last action (Undo) in the text editor:

You need to tap the screen twice (consecutively) and the "Cancel" option will appear.

Restoring an undone action (Redo) in a text editor:

Tap the screen three times (consecutively) and the Restore option will appear.

Opening the recently used apps switcher:

Swipe up and hold in the center of the screen range (for iPhones without a Home button).

Opening quick access to the camera:

On the lock screen, double-click the camera icon in the lower-left corner (for iPhones without a Home button).

Closing the program and returning to the main screen:

Click the Home button (if your model has one).

Start the Siri assistant:

Press and hold the Sleep/Wake button (or the Volume + button if your device doesn't have a Sleep/Wake button).

Change Do Not Disturb mode:

Press and hold the Sleep/Wake icon in the top center of the screen, then select Do Not Disturb.

Opening the notification center:

Swipe down from the top of the screen.

Note that some of these keyboard shortcuts may vary depending on your iPhone model and iOS version.

2.4. Sign in and shut down the device. Features of battery power settings.

On the iPhone, as on other iOS devices, logging in and shutting down the device involves several basic operations. Here are more details about these operations and the features of battery power settings:

Turn on iPhone:

To turn on your iPhone, press and hold the Sleep/Wake button (located on the top or side, depending on the model) for a few seconds. After that, the Apple logo will appear on the screen and the device will start.

Unlock iPhone:

To unlock your iPhone and access the Home screen, simply tap on the screen and swipe down from the top edge of the screen (on models with Face ID) or press and hold the Sleep/Wake button or the Volume + button (on models with Touch ID ).

Closing programs and returning to the main screen:

On your device's home screen, simply press the Home button (if your model has one) or swipe up from the bottom of the screen.

iPhone shutdown:

To turn off iPhone, press and hold the Sleep/Wake button and one of the volume buttons at the same time for a few seconds. After that, a "Turn off" slider will appear on the screen, which you need to drag to the right to turn off the device.

Battery power:

To adjust battery power settings on iPhone, go to Settings > General > Battery. Here you can view battery usage statistics, turn off the Battery Optimization function, and use other options to save charge.

Also, in the "Battery" section, you will find information about the consuming applications that affect the battery the most, and the ability to disable background updates for some applications that you consider necessary.

These features help you to use your iPhone conveniently and use its battery power efficiently.

**Відповіді на контрольні запитання**

***Готував матеріал студент Тунда Р.О.***

1.Examples of Linux Server Applications:

* Database Servers: MySQL, PostgreSQL, Oracle Database, MongoDB.
* Mail Servers: Postfix, Sendmail, Exim, Dovecot (for IMAP/POP3).
* File Servers: vsftpd (FTP server), Samba (for file sharing in networks), ProFTPD, Pure-FTPd.

2.Comparison of Shells:

Bourne Shell (sh): Simple and limited in features. Has a basic set of functions.

C Shell (csh): Has syntax similar to C. Fewer features compared to Bash.

Bourne Again Shell (Bash): The standard shell for most Linux systems. Has a powerful syntax and many built-in features.

TENEX C Shell (tcsh): An extended version of the C Shell with additional features and command editing capabilities.

Korn shell (Ksh): A powerful shell with syntax similar to C. Has some extensions compared to Bash.

Z Shell (zsh): A highly advanced shell with multifunctional capabilities, including plugins and auto-completion.

3.Package Manager is used to manage the installation, updating, and removal of software packages on a Linux system. The advantages of package managers include automatic resolution of dependencies, ease of software installation and updates, and a convenient way to manage software.

Examples of package managers in Linux:

APT (Advanced Package Tool): Used in Debian and related distributions like Ubuntu.

YUM (Yellowdog Updater, Modified): Used in Red Hat, CentOS, and Fedora.

DNF (Dandified YUM): A newer package manager used in Fedora.

Pacman: Used in the Arch Linux distribution.

Zypper: Used in openSUSE.

4.Linux Security Tools include:

File Permissions and Ownership: Managing user/group permissions for files and directories.

Firewall (e.g., iptables or firewalld) for controlling network rules.

SELinux and AppArmor for restricting program access to resources.

File and Connection Encryption (SSH, HTTPS).

Auditing and Event Logging for monitoring the system for potential threats.

Antivirus Software for protection against viruses and malware (in some cases).

5.Virtualization has become popular due to factors such as:

Resource Efficiency: Virtualization allows better utilization of computational resources by dividing one physical server into multiple virtual machines.

Deployment Speed and Scalability: Virtual machines can be easily created, cloned, and scaled, simplifying the management of computing environments.

Isolation and Security: Virtual machines are isolated from each other, enhancing infrastructure security.

Backup and Recovery: Convenient backup and recovery of virtual machines.

Testing and Development: Virtual environments are ideal for software testing and development.

6.Containerization is a method of virtualization where individual applications and their dependencies run in isolated containers. They share the host OS kernel but have their own file systems and separate resources. Containers are lighter than virtual machines and offer easy application deployment and management.

7.Advantages of Open-Source Software:

Free Licensing: Typically, open-source software can be used and distributed for free.

Access to Source Code: Users can view and modify the source code, providing greater flexibility and control.

Active Developer Community: Open-source software often has a large community of developers and users who provide support and updates.

Security Auditability: Due to open-source nature, software can be audited for security.

8.

In Linux, there can be multiple active virtual consoles (terminals) by default. Typically, there are 6 terminals, labeled from F1 to F6. To switch between them, you can use key combinations like "Ctrl+Alt+F1" through "Ctrl+Alt+F6." For example, "Ctrl+Alt+F1" will switch you to the first terminal, "Ctrl+Alt+F2" to the second, and so on.

9.The graphical user interface in Linux typically runs on virtual console F7.

10.Yes, it is possible to register multiple times in a Linux system under the same username. This can be useful, for example, for remote SSH login from different devices or for multiple users working concurrently under the same account, such as on a remote desktop. Each login session for the same username will have its own separate processes and resources, and they do not interact with each other.

**Conclusions:**

***In the course of the laboratory work, we conducted research and familiarized ourselves with the main aspects of the interfaces and capabilities of the Linux operating system. Practically, we learned the skills of running programs in Linux using various methods, such as the quick launch panel, menu search, launch widgets and the global menu. The possibility of logging in as root, rebooting and shutting down the system in the graphical interface was investigated.***

***Aspects of working in the mobile operating system were also considered. Practical skills of working in the Linux OS and mobile OS were obtained, as well as to deepen the understanding of the basic principles of working with the command line and graphical interface.***