“Київський фаховий коледж зв’язку”

Циклова комісія Комп’ютерної інженерії

**ЗВІТ ПО ВИКОНАННЮ**

**ЛАБОРАТОРНОЇ РОБОТИ №2**

з дисципліни: «Операційні системи»

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

Виконали:

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**Мета роботи:**

1. Знайомство з гіпервізорами різного типу, віртуалізацією при роботі з операційними системами.
2. Отримання практичних навиків роботи в середовищах ОС Linux та мобільної ОС – їх графічною оболонкою, входом і виходом з системи, ознайомлення зі структурою рабочого столу, вивчення основних дій та налаштувань при роботі в системі.

**Матеріальне забезпечення занять** 1. ЕОМ типу IBM PC.

# 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 Титов О.*

**1.Прочитайте короткі теоретичні відомості до лабораторної роботи та зробіть невеликий словник базових англійських термінів з питань призначення команд та їх параметрів.**

1) ls - this command lists directory contents.2) cd /var/log - this changes the current directory. Note that it uses a forward slash.

3) grep - this finds text in a file. The grep command searches through many files at a time to find a piece of text you are looking for.

4) su - the su command changes the shell so that it is used as a super user. Until you use the exit command, you can continue to be the super user.

5) sudo - the sudo command is used when you just need to run something as a super user, you can use the sudo command.

6) pwd - one way to identify the directory you are working in is the pwd command. It displays the current working directory path and is useful when directory changes are made frequently.

7) passwd - though it looks similar to the pwd command, this command is very different. This command is used to change the user account password.

8) mv - the mv command moves a file or renames it.

9) cp - this command copies a file.

10) rm - This command is used to remove files in a directory or the directory itself. A directory cannot be removed if it is not empty.

4. **Дайте визначення наступним поняттям:**

1) The command line interface (CLI) is a simple text input system for entering anything from single-word commands to complicated scripts. Most operating systems have a CLI that provides a direct way of accessing and controlling the computer.

2) A GUI terminal is a program within the GUI environment that emulates a terminal window. GUI terminals can be accessed through the menu system. For example, on a CentOS machine, you could click on Applications on the menu bar, then System Tools &gt; and, finally, Terminal.  
3) A virtual terminal can be run at the same time as a GUI but requires the user to log in via the virtual terminal before they can execute commands (as they would before accessing the GUI interface).

- In open systems, a virtual terminal (VT) is an application service that:

- Allows host terminals on a multi-user network to interact with other hosts regardless of terminal type and characteristics

- Allows remote log-on by local area network managers for the purpose of management,

- Allows users to access information from another host processor for transaction processing, Serves as a backup facility.

**Хід роботи**

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

*Готував матеріал студент Нестолій Н.*

**1.1 Оберіть графічну оболонку для ОС сімейства Linux, яку ви хочете розглянути. Розгляньте структуру робочого простору користувача, та опишіть основні його компоненти.**

1) Applications menu:

Located beside the activities button. Shows standart Linux apps, has a list of different categories of applications (favorites, accessories,games etc), shows active app. Has an activities overview button. Provides quick access to different windows.

2) Places menu:  
Located in the top left corner of the screen. Places menu is a quick way to go to various locations on your computer and your local network. The Places menu allows you to open different items, such as desktop folder, home folder, bookmarks etc. Also has «recent documents» submenu and «search for files» action.

3) System menu:   
Located in the top right corner of the screen. System menu allows you to manage different settings, suspend, restart or power off you PC. Also allows switching users and logging out.

4) Activities overview:

Located in the top left corner of the screen. At the bottom of the overview, you will find the dash. The dash shows you your favorite and running applications. Click any icon in the dash to open that application; if the application is already running, it will have a small dot below its icon. Clicking its icon will bring up the most recently used window. You can also drag the icon onto a workspace.

Right-clicking the icon displays a menu that allows you to pick any window in a running application, or to open a new window. You can also click the icon while holding down Ctrl to open a new window.

When you enter the overview, you will initially be in the windows overview. This shows you live thumbnails of all the windows on the current workspace.

**1.2. Запуск програм. Дослідіть можливості запуску додатків різними способами (описати спосіб і поможливості показати скріншоти):**

1) Запуск програм через панель швидкого запуску

After you opened activities overview, check the vertical strip of the icons on the left side of the screen named Dash, then click the application’s icon to start it.

2) Запуск програм через пошук в меню

Move your mouse pointer to the Activities corner at the top left of the screen to show the Activities overview. This is where you can find all of your applications. Start typing the name of an application — searching begins instantly. Click the application’s icon to start it.

3) Запуск програм через віджет запуску

In GNOME, you can enable desktop items by opening the Overlay using the Super button on your keyboard or by clicking the Applications icon in the dock and then search for and open “Tweak Tool”. You can then toggle them on and off by clicking “Icons on Desktop” under the Desktop section.  
You may now add things to your Desktop. This can be done by dragging an item onto the Desktop or by right clicking an icon and selecting Copy to / Move to Desktop. Alternatively, click on the “Files” icon in the dock and then move the files you want to the Desktop folder (as shown in the image below). Please note, the Desktop folder is not visible in “Files” until you’ve enabled the Desktop icons.  
4) Запуск програм через глобальне меню  
  
**1.3 Вихід з системи та завершення роботи в Linux. Як виконати в графічному інтерфейсі наступні дії (наведіть скріни):**

1) Зміна користувача на root

- Login in as a regular user and open the terminal (command line) and edit the configuration text file «su -c 'gedit /etc/pam.d/gdm'»

- Locate the line that that read as follows - uth required pam\_succeed\_if.so user != root quiet

- Remove or comment out line by prefixing #.

# auth required pam\_succeed\_if.so user != root quiet\_success

- Save and close the editor.

2) Перезавантаження системи

If you want to do a full restart, click the system menu on the right side of the top bar, expand Power Off / Log Out, and Restart.  
3) Вимкнення системи

If you want to power off computer, click the system menu on the right side of the top bar, expand Power Off / Log Out, and Power Off.

***2 - Робота в середовищі мобільної ОС.***

*Готував матеріал студент Титов О.*

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

My phone uses MIUI 13 as an OS, with the same name of the GUI. It has simplistic design, which closely resembles Android, but with some features of an iOS GUI. The desktop has two modes: "Normal" in the style of the iOS desktop, where all apps are on the desktop, and "Apps menu" in the style of "pure" Android, in which all apps are hidden in a swipe-up app menu from the bottom to the top of the desktop, and on the desktop are the applications selected by the user. In addition, in the program menu, applications are divided into categories that can be edited or added.

* 1. **Опишіть меню налаштувань компонентів мобільного телефону.**

Standart settings menu of Android, with a few tweaks. Menu is intuitive. The name of each item is accompanied by a visual icon. All sections are divided into thematic blocks.

* 1. **Використання комбінацій клавіш для виконання спеціальних дій.**

MIUI has highly customizable shortcuts using gestures – you can turn them on or off in the settings menu, under Additional Settings. These shortcuts include: launching google assistant with press and hold the power button for 0.5s, taking a screenshot with sliding 3 fingers down, launching camera with double press the power button and some more.

* 1. **Вхід у систему та завершення роботи пристрою. Особливості налаштувань живлення батареї.**

Logging in the system can be done with touch ID on the power button (or on the back of phone, depends on your model) or with an Face ID. Also has options of graphic or simple password. Device can be completely shut down by holding down the power button and selecting «shut down». Xiaomi has few options for saving up the battery`s power – in settings, you can select «power saving» mode, which restricts background apps and disables some system features, or select «ultra power saving mode», which limits screen brightness and contrast, disables location services, and turns off nonessential apps.

# Відповіді на контрольні запитання:

*Готувала матеріал студентка Усенко С.*

1. **Наведіть приклади серверних додатків Linux для сервера баз даних, серверів розсилки повідомлень та файлообмінників.**

MySQL:

MySQL is an open source database management system that is typically installed as part of the popular LAMP stack (Linux, Apache, MySQL, PHP/Python/Perl). It uses the relational model and Structured Query Language (SQL) to manage data.

Openfire:

Openfire is an Instant Messaging and Group chat server, written in Java that uses XMPP (Extensible Messaging and Presence Protocol) server. Wikipedia reports, Openfire was previously called ‘Wildfire‘ and ‘Jive Messenger‘. The Application Software is developed by Jive Software and a community called ‘IgniteRealtime.org‘, and is Licensed under Apache License.

Samba:

Samba is a file sharing running Linux/Unix and the Windows operating system. Samba consists of client and server parts. The client part allows you to access network folders and Windows resources, and the server part, in turn, shares the Ubuntu folder with other machines, including Windows.

1. **Порівняйте оболонки Bourne, C, Bourne Again (Bash), the tcsh, Korn shell (Ksh) та zsh.**

Bourne:

The Bourne shell (sh) is a shell command-line interpreter for computer operating systems.

The Bourne shell was the default shell for Version 7 Unix. Unix-like systems continue to have /bin/sh—which will be the Bourne shell, or a symbolic link or hard link to a compatible shell—even when other shells are used by most users. Oftenly was named «unfriendly» for interactive use, but superior for scripting.

C:

The C shell (csh or the improved version, tcsh) is a Unix shell created by Bill Joy while he was a graduate student at University of California, Berkeley in the late 1970s. It has been widely distributed, beginning with the 2BSD release of the Berkeley Software Distribution (BSD) which Joy first distributed in 1978. Other early contributors to the ideas or the code were Michael Ubell, Eric Allman, Mike O'Brien and Jim Kulp. Was superior for interactive use, never been popular for scripting.

Bash:

Bash is a Unix shell and command language written by Brian Fox for the GNU Project as a free software replacement for the Bourne shell. First released in 1989, it has been used as the default login shell for most Linux distributions. Bash was one of the first programs Linus Torvalds ported to Linux, alongside GCC. A version is also available for Windows 10 via the Windows Subsystem for Linux. It is also the default user shell in Solaris 11. Bash was also the default shell in versions of Apple macOS from 10.3 (originally default shell was tcsh) to the 2019 release of macOS Catalina, which changed the default shell to zsh, although Bash remains available as an alternative shell. The Bash command syntax is a superset of the Bourne shell command syntax.

Tchs:

It is essentially the C shell with programmable command-line completion, command-line editing, and a few other features. Unlike the other common shells, functions cannot be defined in a tcsh script and the user must use aliases instead (as in csh). It is the native root shell for BSD-based systems such as FreeBSD.

tcsh added filename and command completion and command line editing concepts borrowed from the TENEX operating system, which is the source of the “t”. Because it only added functionality and did not change what was there, tcsh remained backward compatible with the original C shell. Though it started as a side branch from the original csh source tree that Bill Joy had created, tcsh is now the main branch for ongoing development.

tcsh is very stable but new releases continue to appear roughly once a year, consisting mostly of minor bug fixes.

Korn shell:

KornShell (ksh) is a Unix shell which was developed by David Korn at Bell Labs in the early 1980s and announced at USENIX on July 14, 1983.The initial development was based on Bourne shell source code. Other early contributors were Bell Labs developers Mike Veach and Pat Sullivan, who wrote the Emacs and vi-style line editing modes' code, respectively. KornShell is backward-compatible with the Bourne shell and includes many features of the C shell, inspired by the requests of Bell Labs users. KornShell complies with POSIX.2, Shell and Utilities, Command Interpreter (IEEE Std 1003.2-1992.)

Zsh:

he Z shell (Zsh) is a Unix shell that can be used as an interactive login shell and as a command interpreter for shell scripting. Zsh is an extended Bourne shell with many improvements, including some features of Bash, ksh, and tcsh. Zsh was at first intended to be a subset of csh for the Commodore Amiga, but expanded far beyond that. By the time of the release of version 1.0 in 1990 the aim was to be a cross between ksh and tcsh – a powerful "command and programming language" that is well-designed and logical (like ksh), but also built for humans (like tcsh), with all the neat features like spell checking, login/logout watching and termcap support that were "probably too weird to make it into an AT&T product".

1. **Для чого потрібен менеджер пакетів. Які менеджери пакетів ви знаєте у Linux?**

The package manager is a set of software in Linux that installs, configures, removes, and updates both individual packages (programs) and the entire system. Most popular package managers are Yum, RPM and dpkg.

1. **Які засоби безпеки використовуються в Linux?**

There are distributions loaded with hundreds or more than a thousand tools for security and for conducting audits, such as the Kali Linux, DEFT, Parrot Security, CIRClean, Buttercup, BleachBit etc.

1. **Чому використання віртуалізації зараз стало таким актуальним?**

Virtualization is needed for more dynamic management of the entire IT infrastructure of the company. Most often, this technology is used when performing various operations on servers in data centers. Virtualization allows you to simultaneously run several software applications and operating systems on one physical server. As a result, the servers are loaded at 90% of their capacity, while when using only one application, the load on them does not exceed 15-20% of the maximum. Thus, the company has the opportunity to spend less money on the purchase of servers.

1. **Як ви розумієте поняття контейнеризації?**

Containerization is the packaging of software code with just the operating system (OS) libraries and dependencies required to run the code to create a single lightweight executable—called a container—that runs consistently on any infrastructure. More portable and resource-efficient than virtual machines (VMs), containers have become the de facto compute units of modern cloud-native applications.

Containerization allows developers to create and deploy applications faster and more securely. With traditional methods, code is developed in a specific computing environment which, when transferred to a new location, often results in bugs and errors.

1. **Які переваги/недоліки використання програмного забезпечення з відкритим кодом?**

Pros:

1. Community open source is completely free to anyone to download, including source code, for evaluation.
2. Whether an open source package is being evaluated or integrated commercially, it has the same global community of users and developers available for asking questions and advice.
3. Open source communities are leery of proprietary standards, preferring instead to adhere to open standards around communication protocols and data formats
4. Because large open source software projects can literally have millions of eyes examining the source code, there is a much higher probability that more bugs are exposed compared to the code from a proprietary vendor with a far smaller development staff.

Cons:

1. Open source projects, even COSS, are complex packages of software that are not as closely aimed at markets of unskilled end users as is much proprietary software. Unskilled users will never look at the source code let alone compile it.
2. Increased business risk - Aside from Red Hat, large financially strong open source software vendors are few and far between. Although great products may come from smaller, more nimble companies, there is a significantly higher risk that they will not be there when you need them the most.
3. Reduced competitive advantage - If an enterprise is also a software vendor, then building products on open source code affects the revenue model for the enterprise’s software depending on the open source licensing agreement
4. **\*\*\*Скільки активних віртуальних консолей (терміналів) може бути у процесі роботи Linux по замовчуванню. Як їх викликати та між ними перемикатися? Наведіть приклади?**

There are typically seven virtual consoles you can use. If you're running a desktop system with X11, it usually starts in the seventh virtual console. To switch to the first virtual console, you'll have to press Alt + F1. If it doesn't work for you, try Ctrl + Alt + F1 instead. In a Linux system, a console is a keyboard and monitor connected directly to the system. This will replace the serial terminal on minicomputers and mainframe Unix systems. This will allow the system administrator to log in as root, where this may be restricted on remote terminals connected to the system.

1. **\*\*\*Яка віртуальна консоль (термінал) виконує функцію графічної оболонки?**

A console is a set of basic devices for inputting information into a computer (keyboard and mouse) and outputting information (monitor). Linux runs several so-called virtual consoles, of which only one can be connected to the real (physical) console at any given time (that is, it is active). From now on, the word ``console'' will refer to the virtual console.

Some of the consoles present information only in text form using screen fonts in computer video system formats. Such consoles are called text consoles. The Linux OS itself and the main auto-start applications (such as the shell) use the command line interface in such consoles. Other applications (such as the file manager Midnight Commander) may use a windowed interface, object selection and selection in menus and lists using the mouse or keyboard, and so on.

Other (graphical) consoles present information graphically using a Graphical User Interface (GUI). As a rule, work in such consoles occurs with the help of advanced graphical environments, such as GNOME or KDE.

1. **\*\*\*Чи можлива реєстрація в системі Linux декілька разів під одним і тим же системним ім’ям? Які переваги це може надати?**

Nothing prevents you from registering in the system several times under the same login name. Thus, you can access the same resources (your files) and organize parallel work on several tasks.

*Робота студентів групи КСМ-03Б Команда 2: Нестолій Н., Усенко С, Титов І.*

**Висновок:**

Під час виконання лабораторної роботи ми ознайомились з з роботою в середовищах ОС Linux та мобільної ОС – їх графічною оболонкою, входом ы виходом з системи, ознайомлення зі структурою робочого столу, вивчення основних дій та налаштувань при роботі в системі.