“Київський фаховий коледж зв’язку”

Циклова комісія Комп’ютерної інженерії

**ЗВІТ ПО ВИКОНАННЮ**

**ЛАБОРАТОРНОЇ РОБОТИ №8**

з дисципліни: «Операційні системи»

**Тема: “Збереження службових даних системи та її мережева конфігурація”**

Виконали студенти

групи КСМ-13а

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Перевірив викладач

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**Objectives:**

**1. Gaining practical skills in working with the Bash shell.**

**2. Familiarity with the basic structures for storing system data - processes, memory, log files and**

**kernel status messages.**

**3. Familiarity with the FHS standard.**

**4. Familiarization with the steps to configure the network.**

**Material support of classes**

**1. Computer such as IBM PC.**

**2. OS of the Windows family (Windows 7).**

**3. Virtual machine - Virtual Box (Oracle).**

**4. GNU/Linux operating system - CentOS.**

**5. Cisco Networking Academy website netacad.com and its online courses on Linux**

**The material was prepared by student Neroshchyn D.**

**Tasks for preliminary preparation.**

**1. Read the brief theoretical information for the laboratory and make a small dictionary**

**of basic English terms on the purpose of commands and their parameters.**

**2. Study the materials of the Cisco Academy online course "NDG Linux Essentials":**

**- Chapter 13 - Where Data is Stored**

**- Chapter 14 - Network Configuration**

**3. Take the NDG Linux Essentials quizzes on the following topics:**

**- Chapter 13 Exam**

**- Chapter 14 Exam**

**4. Based on the material reviewed, answer the following questions:**

**4.1 Pseudo file system:**

**The pseudo file system in Linux is a mechanism that represents information about various system resources and the current state of the system as a file structure. It allows you to access system resources using files or directories. It is a convenient way to interact with system parameters and monitor their status.**

**4.2. The /proc directory:**

**Users don't often access the /proc directory directly, as it contains system information that usually requires special knowledge to understand. However, information about the system, processes, resources, memory information, etc. can be obtained from this directory using common file readers such as cat, less, or grep.**

**4.3. Purpose of the /proc/cmdline, /proc/meminfo, and /proc/modules files:**

**/proc/cmdline: Contains parameters passed by the kernel during system boot.**

**/proc/meminfo: Provides statistics about the system's memory usage.**

**/proc/modules: Shows the loaded Linux kernel modules.**

**4.4. Purpose of the free command:**

**The free command displays information about memory usage and availability in the system. It shows total memory, free memory, used memory, and other memory information.**

**4.5. Log files:**

**Log files are used to record various events, user or system actions. For example, /var/log/messages contains general system information, /var/log/auth.log records authentication events.**

**4.6. The /var/log/dmesg file:**

**The /var/log/dmesg file contains the output of the Linux kernel about events that occurred during system boot.**

**4.7. FHS (Filesystem Hierarchy Standard):**

**FHS defines the structure of directories and files on a Linux system, which allows software developers and users to easily find the files they need to run their programs.**

**4.8. Basic commands for networking in Linux:**

**ifconfig: View information about network interfaces.**

**ip: A more modern alternative to ifconfig for configuring network interfaces.**

**route: Display and edit the routing table.**

**ping: Check the connection to others5. Prepare an electronic version of the initial report:**

**- Cover page, topic and purpose of the work**

**- Glossary of terms**

**- Answers to p.4.1 and p.4.5 from the preliminary preparation tasks**

**The material was prepared by student Malienko A.**

**Procedure.**

**1. Initial work in CLI-mode in the Linux OS of the Linux family:**

**1.1. Start the VirtualBox virtual machine, select CentOS and start it. Log in to the system**

**under the user: CentOS, login password: reverse (if you are performing the LP in 401 classroom) and start the terminal.**

**1.2. Start the Ubuntu\_PC virtual machine (if you are performing the PL task through the netacad academy)**

**1.3. Start your Linux operating system (if you are working on your own PC and have installed it) and launch the terminal.**

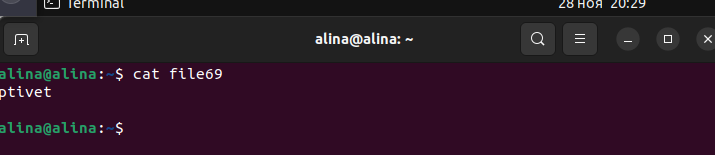
**2. Work through all the sample commands presented in the labs of the NDG Linux Essentials course - Lab 13: Where Data is Stored and Lab 14: Network Configuration. Create a table to describe these commands\*\*\*.**

|  |  |
| --- | --- |
| su | Substitute User or Switch User - command to switch to another user in a Unix-like operating system. |
| ls /proc. | List the contents of the /proc directory, which contains information about processes and system configuration |
| cat /proc/1/cmdline; echo | Display the command line arguments of the process with PID 1 (init process) and print a newline. |
| ps -p 1 | Display information about the process with PID 1. |
| cat /proc/cmdline | Display the command line arguments passed to the kernel during the boot process. |
| ping localhost > /dev/null | Send ICMP echo requests to the localhost and discard the output (redirect to /dev/null). |
| ping localhost > /dev/null & | Run the ping command in the background. |
| jobs | Display a list of jobs (background processes) in the current shell session |
| bg %1 | Move the job with job ID 1 to the background. |
| killall ping | Terminate all processes named "ping." |
| route | Display or manipulate the IP routing table. |
| grep 127.0.0.1 /etc/hosts | Search for the line containing "127.0.0.1" in the /etc/hosts file. |
| ping -c4 localhost | Send four ICMP echo requests to the localhost and display the results. |
| cat /etc/resolv.conf. | Display the contents of the resolver configuration file, which contains information about DNS resolution |

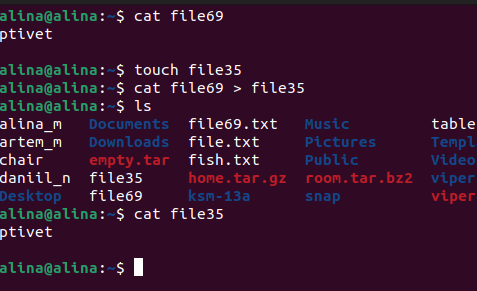
\*\*\*Скріншоти виконання команд в терміналі можна не представляти, достатньо коротко описати команди в таблиці.

3. Виконайте практичні завдання у терміналі (продемонструйте скріншоти):

- в даній лабораторній роботі використовувалась команда cat, дослідіть її можливості та опишіть для яких задач вона призначена;



- продемонструйте приклади, коли команда cat використовується для створення файлу, перегляду вмісту файлу, перенаправлення інформації у інший файл, склеювання декількох файлів в один;

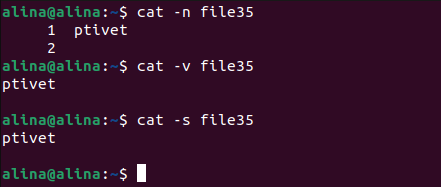


- які параметри команди cat треба використати, щоб пронумерувати рядки файлу, відобразити недруковані символи, видалити порожні рядки?

-v: Display whitespace characters.

-s: Remove empty lines.

-n: Number the lines.



- describe the capabilities of the dig command and give examples;

The command `dig` is a command-line utility used to obtain information about DNS queries.

- describe the capabilities of the netstat command and provide examples;

The `netstat` command displays information about network connections, routing tables, and other network-related parameters.

The material was prepared by student Mishin A.

Control questions.

1. The relationship of the cat and tac commands:

- cat: The command displays the contents of the file in the console in the usual order.

- tac: The command does the same thing, but prints the contents of the file in reverse order, that is, from the last line to the first.

2. The ss command:

- ss: The command displays network socket statistics, including information about open ports, connections, etc.

3. The difference between ps --forest and pstree:

- ps --forest: The ps command with the --forest option displays information about processes in a tree view, indicating the dependencies between them.

- pstree: This command also displays information about processes in a tree, but it does so directly, without the need for parameters.

4. Directories with system settings:

- /etc: The main directory where configuration files for many system services and programs are stored.

5. Directories with user programs:

- /usr/bin: The directory where the installed programs that are available to users are usually located.

6. Directories with system and privileged programs:

- /sbin: A directory containing executable files for system administration.

- /usr/sbin: The directory where executable files for system administration are located, which can also be accessible to users.

7. The purpose of the commands:

- ping: Used to check the availability of a node on the network and measure the response time.

- ifconfig: Command to display or configure network interfaces.

- traceroute: Traces the route to the target node, displaying all intermediate nodes.

8. Network interfaces in Linux:

- Students can see network interfaces by names such as eth0, wlan0, etc.

9. Displaying the parameters of a specific network interface using ifconfig:

- Students can use the ifconfig eth1 command to display the parameters of just one network interface, such as eth1.