“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”**

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**Мета роботи:**

1. Отримання практичних навиків роботи з командною оболонкою Bash.
2. Знайомство з базовими структурами для збереження системних даних - процеси, память, лог-файли та повідомлення про стан ядра.
3. Знайомство зі стандартом FHS.
4. Знайомство з діями при налаштуванні мережі.

**Матеріальне забезпечення занять:**

1. ЕОМ типу IBM PC.
2. ОС сімейства Windows та віртуальна машина Virtual Box (Oracle).
3. ОС GNU/Linux (будь-який дистрибутив).
4. Сайт мережевої академії Cisco netacad.com та його онлайн курси по Linux

**Завдання для попередньої підготовки: *Created by Vlad Sapozhnyk***

Glossary of Terms

| **Name of the term** | **Translation** |
| --- | --- |
| implementation | реалізація |
| to store | зберігати |
| process management | управління процесами |
| memory management | управління пам'яттю |
| device drivers | драйвери пристроїв |
| logging | ведення журналу |
| to denote | для позначення |
| rotating | обертовий |
| deprecated | застарілий |

1. **Розкрийте поняття “псевдо файлової системи”, для чого воно потрібно системі?**

A “pseudo-file system” is a virtual file system that does not use physical storage media, such as a hard disk or SSD. Its operation imitates a file system, but the data is stored in RAM or generated dynamically.

“Pseudo-file systems” are used in Linux for various purposes, including:

* Access to system resources: Some “Pseudo-file systems” provide access to system resources, such as network interfaces, processes, or system statistics, in the form of files and directories.
* Information purposes: “pseudo-file system” can be used to provide information about the system or its configuration.
* Temporary data storage: “pseudo-file system” can be used to temporarily store data that does not require permanent storage on physical media.
* Debugging: “pseudo-file system” can be used for software debugging by providing access to internal data or program state.

“Pseudo-file systems” do not have a fixed structure and can be implemented in a variety of ways. Some common “Pseudo-file systems” on Linux include:

/proc: This “pseudo-file system” provides access to information about processes running on the system.

/sys: This “pseudo-file system” provides access to information about the hardware and system configuration.

/dev: This “pseudo-file system” provides access to devices such as hard disks, network interfaces, and ports.

/tmp: This is the path used to temporarily store data.

“Pseudo-file systems” are a valuable tool for Linux administration and development. They provide a simple and convenient way to access system resources, information, and data.

1. **Чому користувачі не так часто звертаються на пряму до каталогу /proc, яким чином з нього можна отримати інформацію?**

Users rarely access the /proc directory directly for several reasons:

* Complexity: The structure of the /proc directory can be complex and confusing for users who are not familiar with its internal organization.
* Inconvenience: Navigating through /proc manually with cd and ls can be awkward and time-consuming, especially when searching for specific information.
* Command line tools: There are more convenient and easier to use command line tools that are specifically designed to access information from /proc. These tools, such as ps, top, and uptime, provide well-structured and understandable output, making them more user-friendly for most users.
* Graphical interfaces: Many Linux distributions offer graphical user interfaces (GUIs) to access information from /proc. These tools, such as System Monitor and htop, visualize information from /proc in a convenient and easy-to-understand format, making them accessible to users who are not familiar with the command line.
* Abstraction:Most Linux administration programs and tools abstract access to /proc, hiding its complexity from users.These tools automatically interpret the data from /proc and present it in a more understandable and convenient format.

Getting information from /proc:

While directly accessing /proc can be tricky, there are several ways to get information from it:

* Command line: You can use various commands such as ps, top, uptime, cat, and grep to access specific data from /proc.
* Scripts:You can write your own scripts in a programming language such as Python or Bash to automate access and process data from /proc.
* GUI tools: You can use graphical tools such as System Monitor or htop to visualize and explore information from /proc.
* Third-party tools:There are many third-party tools that provide convenient access to information from /proc.These tools may have additional features and capabilities compared to the basic command line or GUI tools.

1. **\*Яке призначення файлів /proc/cmdline, /proc/meminfo та /proc/modules?**

The /proc/cmdline, /proc/meminfo, and /proc/modules files on Linux:

1. /proc/cmdline:

This file contains the command line that was used to boot the Linux kernel. It may contain boot parameters passed by the bootloader, such as the kernel name, kernel module options, and other configuration options.

Purpose:

Verify the boot parameters used at system startup.

Troubleshoot problems with kernel loading.

Analyze the kernel configuration.

2. /proc/meminfo:

This file contains detailed information about memory usage in the system. It shows the total amount of memory available, free memory, memory in use, cached memory, virtual memory, and other data related to memory usage.

Purpose:

Monitoring of memory usage in the system.

Identify memory problems, such as memory leaks or memory shortages.

Optimize memory usage in the system.

3. /proc/modules:

This file contains a list of kernel modules that are loaded on the system. It shows the name of each module, version, size, date loaded, and other details.

Purpose:

To check the loaded kernel modules.

Troubleshoot problems with kernel modules.

Remove or load kernel modules.

1. **\*Яке призначення команди free?**

The free command in Linux is used to display information about memory usage in the system.

It provides data on:

Total memory: The total amount of available memory on the system.

Memory in use: The amount of memory used by active processes and cache.

Free memory: The amount of available memory that can be used for new processes or caching.

Buffers: The amount of memory allocated for kernel buffers.

Cached memory: The amount of memory used to cache data and files.

Memory in use: The amount of memory used for memory sharing between processes.

Shared memory: The amount of memory allocated for memory sharing between processes.

Additional options:

-h: Displays information in a more readable format using prefixes (KiB, MiB, GiB, etc.).

-t: Displays memory usage information for each type of memory (e.g., anonymous, cached, buffers).

-m: Displays memory usage information in megabytes (instead of the default kilobytes).

-s: Displays general memory usage statistics only (instead of detailed information).

1. **\*Для чого потрібні лог-файли, наведіть приклади їх застосування?**

Log files, also known as log files, are text files that record events and messages that occur in a system or program. They are used for:

Tracking activity: Log files record user actions, system events, errors, and other informative data that helps administrators and developers track system behavior and identify problems.

Debugging: Analyzing log files can help in identifying and fixing errors, crashes, and other problems in a system or application.

Auditing: Log files can be used to record information about system access, configuration changes, and other activities, which can be useful for auditing and regulatory compliance.

Performance analysis: Log files can contain information about response times, resource utilization, and other data that can be used to analyze the performance of a system or application.

Diagnostics: Log files can contain information about network activity, database errors, and other events that can help diagnose problems with the network, databases, and other system components.

Examples of log file applications:

Web servers: Web servers record log files that contain information about website requests, HTTP errors, user IP addresses, and other data.

System logs: Operating systems write system logs that contain information about system boot, system events, kernel errors, and other data.

Program logs: Software applications often write log files that contain information about program usage, program errors, and other data.

Security logs: Security systems write log files that contain information about authorization attempts, security breaches, and other security-related events.

Network logs: Network devices write log files that contain information about network traffic, network errors, and other network-related data.

1. **\*\*Яке призначення файлу /var/log/dmesg?**

The /var/log/dmesg file on Linux is used to store the output of the dmesg command. This command displays Linux kernel messages that are generated while the system is booting and running.

1. **\*\*Для чого розроблено FHS?**

The Linux File System Hierarchy (FHS) is a standardized directory structure for organizing files and data in Linux operating systems. It is designed to provide consistency and predictability in the location of files across different Linux distributions.

1. **\*\*Які основні команди є у Linux для перегляду та конфігурації мережі**

View network information:

ifconfig (or ip a): Displays network interface information such as IP addresses, MAC addresses, subnet masks, and status.

route (or ip r): Displays the routing table used to route traffic to different networks.

ping : Checks the availability of a host on the network by sending ICMP packets to it.

nslookup : Converts hostnames to IP addresses and vice versa.

hostname : Displays or changes the system hostname.

Configure the network:

ifconfig (or ip a): Can be used to configure IP addresses, subnet masks, MAC addresses, and other network interface settings.

route (or ip r): Can be used to add, delete, and modify routes in the routing table.

dhclient : Automatically obtains the IP address, subnet mask, and other network parameters from a DHCP server.

nmtui : A graphical user interface for configuring the network.

netplan : A configuration file to describe the system's network settings.

Other useful commands:

dig : DNS client used to obtain information about DNS records.

tcpdump : A tool for capturing and analyzing network traffic.

mtr : A tool for monitoring packet routing and identifying network problems.

wireshark : A graphical tool for capturing and analyzing network traffic.

**Хід роботи. *Created by Max Karpenko***

**Контрольнi запитання: *Created by Dmytro Onufriiev***

**Висновок:**