“Київський фаховий коледж зв’язку”
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ЗВІТ ПО ВИКОНАННЮ ЛАБОРАТОРНОЇ РОБОТИ №4

з дисципліни: «Операційні системи»

Тема: «Команди Linux для управління процесами»

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Мета роботи:

1. Знайомство з базовими командами CLI-режиму в Linux.
2. Знайомство з базовими текстовими командами в термінальному режимі роботи **в** різних ОС.

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.

Завдання для попередньої підготовки

Готував матеріал студент Фещенко Эвгеній.

Прочитайте короткі теоретичні відомості до лабораторної роботи та зробіть невеликий словник базових англійських термінів з питань класифікації віртуальних середовищ.

Термін англійською	Термін українською
average	**середній**
utilities	**утиліти**
available	**доступний**
unavailable	**недоступний**

Дайте відповіді на наступні питання:

Готував матеріал студент Кошіль Владислав.

1. Які команди для моніторингу стану процесів ви знаєте. Як переглянути їх можливі параметри?

There are several commands you can use to monitor the status of processes in a Linux or Unix-based operating system. Here are some of the most commonly used ones:

1. “ps”: This command shows you a snapshot of the current processes running on the system. By default, it displays the processes running for the current user, but you can use various options to display information about all processes or filter by process name, user, and more.

To view the possible parameters of the “ps” command, you can use the “man ps” command. This will display the manual page for the ps command, which includes detailed information about its options and arguments.

2. “top”: This command provides a real-time, dynamic view of the processes running on the system, sorted by CPU usage by default. It can be useful for monitoring system performance and identifying processes that are using a lot of resources.

To view the possible parameters of the “top” command, you can use the “man top” command.

3. “htop”: This is an enhanced version of the “top” command that provides a more user-friendly interface and additional features such as scrolling, filtering, and process tree views.

To view the possible parameters of the “htop” command, you can use the “man htop” command.

4. “pidstat”: This command provides detailed statistics for individual processes, including CPU usage, memory usage, disk I/O, and more.

To view the possible parameters of the “pidstat” command, you can use the “man pidstat” command.

2. Чи може команда ps у реальному часі відслідковувати стан процесів?
The ps command is not designed to monitor processes in real-time. By default, it displays a snapshot of the current processes running on the system at the time the command is executed. However, you can use the watch command in combination with the ps command to create a real-time monitoring effect.

3. За якими параметрами можливе сортування процесів в команді top? Як переключатись між ними?
By default, it sorts the list of processes by CPU usage, but you can use various options to sort the list by different criteria. Here are some of the most commonly used sorting parameters in the top command:

%CPU: Sorts the list by CPU usage, with the most CPU-intensive processes at the top.

%MEM: Sorts the list by memory usage, with the most memory-intensive processes at the top.

TIME: Sorts the list by the total CPU time used by each process, with the longest-running processes at the top.

RES: Sorts the list by the resident set size (RSS) of each process, which is the portion of its memory that is held in RAM.

PID: Sorts the list by process ID number, with the lowest-numbered processes at the top.

To switch between sorting parameters in the top command, you can press the corresponding key on your keyboard. By default, the %CPU parameter is selected, so you can use the following keys to switch to other parameters:

Press M to sort by %MEM.

Press T to sort by TIME.

Press F to enter the field selection menu, where you can choose from a list of available fields to sort and display.

Press O to enter the column order menu, where you can reorder the displayed fields.

Press R to reverse the current sort order.

Press Q to quit the top command.

4. Які команди для завершення роботи процесів ви знаєте?
kill: This command sends a signal to a process, asking it to terminate. By default, it sends the SIGTERM signal, which asks the process to exit gracefully. If the process does not respond to the SIGTERM signal, you can use the -9 option to send the SIGKILL signal, which forcibly terminates the process.

xkill: This command provides a graphical interface for terminating processes. When you run the command, your cursor will turn into a skull-and-crossbones icon, and you can click on the window of the process you want to terminate.
Note that terminating a process forcibly with the SIGKILL signal can cause data loss or other problems if the process has open files or other resources that need to be cleaned up properly. It is generally recommended to use the SIGTERM signal first and only use the SIGKILL signal as a last resort.

Хід роботи

1. Дайте відповіді на наступні питання:

Готував матеріал студент Фещенко Эвгеній.

а) Як вивести вміст директорії /proc? Де вона знаходиться та для чого призначена? Охарактеризуйте інформацію про її вміст?

The **/proc** directory is a directory in Unix-like operating systems, such as Linux, that contains information about processes and system configuration in the form of files and subdirectories. It can be displayed with the **ls /proc** command. The **/proc** directory contains files with information about the processor, RAM, network connections, and file systems, as well as subdirectories with numbers corresponding to process PIDs.

б) Як вивести інформацію про поточні сеанси користувачів. Якою командою це можна зробити?

To view details of processes running in a user session, use the **-u** option along with the username of the desired user. To display information regarding the currently logged-in user's session, enter the command **ps -u $USER**.

в) Які дії можна зробити в терміналі за допомогою комбінацій Ctrl + C, Ctrl + D та Ctrl + Z?

- Ctrl + C: This combination stops the execution of the current command or program in the terminal.
- Ctrl + D: This combination tells the terminal that the end of the input file has been reached. If this combination is used at the beginning of a new line in the terminal, the terminal will exit.
- Ctrl + Z: this combination pauses the current command or program in the terminal. If the command or program cannot be resumed, it can be terminated with the kill command.

г) Чим відрізняється фоновий процес від звичайного. Де вони використовуються?

Processes can run in foreground and background modes. In foreground mode, the process blocks the terminal, while in background mode, the process runs in the background without blocking the terminal. Background processes are useful for performing tasks that do not require active user interaction, such as automatic backups or software updates. To run processes in the background, you can add the "**&**" symbol after the command in the terminal.

д) Опишіть наступні команди та поясніть що вони виконують – команда jobs, bg, fg.

- The jobs command displays a list of background processes that have been launched from the current terminal. The output contains the process number (job ID) and the process status (running, stopped, or terminated).
- The bg command allows you to resume a stopped background process and continue its operation in the background. You can use the job ID number or the job's process ID (PID) to specify which job to move to the background.

- The fg command allows you to switch to the background process and continue its execution in the normal (foreground) mode. You can use the job ID number or the job's PID to specify which job to bring to the foreground.

е) Якою командою можна переглянути інформацію про запущені в системи фонові процеси та задачі?

- The **jobs** command allows you to view a list of background processes that have been launched from the current terminal and their status.
- The **ps** command allows you to view a list of all processes running in the system. By default, ps displays a list of processes running in the current terminal, but you can use the command parameters to display information about processes running in other terminals or in the system as a whole.
- The **top** command allows you to view a list of processes that use the most system resources, such as CPU time and RAM. top displays a list of processes in real time and updates information about them every few seconds.

э) Як призупинити фоновий процес, як його потім відновити та при необхідності перезапусти?

To pause a background process you can use the keyboard shortcut **Ctrl + Z**. After you press this key combination, the process will be stopped and put into the "stopped" state. To resume a paused background process, you can use the **fg** command.