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Tasks for preliminary preparation

**2.** On the basis of the considered material, answer the following questions:

**2.1.** What commands for monitoring the status of processes do you know? How to view their possible options?

Performance monitoring and diagnostics of a Linux server is one of the most important parts of a system administrator's job. When performing any manipulations on the server, you must monitor what is happening on the server: what is the load on the system and whether there is an excess of resources. The good news is that there are hundreds of commands in Linux that can give you comprehensive information on resource consumption (memory, CPU, disks) and overall system load. Below are the commands that we will discuss in this article and explain how you can monitor the health of your system and make improvements accordingly.

Top

Top is the basic command that most system administrators use in their daily work. You don't need to install Top as it is already part of every Linux distribution. The command shows the running tasks, their CPU resource consumption, memory consumption and swap usage. You can do many things to get the result of your desire and need. It has a large number of options/keys that you can use to make your life easy.

Htop

htop is another top-like tool for monitoring your system processes. It comes with an interactive shell and you can stop the processes just by going to them and pressing the desired button. This is more convenient than using the top command, because this utility has different means of memory mapping and paging.

Free

Free is also pre-installed on Linux distributions to check memory usage. It also shows you buffers and cached memory. There are several formats such as KB, MB and GB. You just need to use the -m and -g options in the command.

NetHogs

Do you want to know where on the Internet your server opens connections and with what bandwidth? Then nethogs is your interactive tool to do the job. It shows all ports open to different IP addresses on the internet and keeps track of the amount of bandwidth (speed) on each open connection.

mytop

The Mytop tool allows you to monitor the performance of your Mysql databases and diagnose them. The command displays online (real-time) information like the watch command. The utility opens a connection to mysql and stays in the monitor state and executes a "SHOW FULL PROCESSLIST" query from time to time.

Iostat

The Iostat command tells you CPU and disk I/O statistics. Reads and writes appear as block reads and block writes. You can get your CPU idle percentage to check how long it has been idle for any heavy task.

Sar

The Sar command is somewhat similar to the Iostat command, but differs in that it tells you the I/O write for the last half hour, with other parameters such as system usage, I/O wait, and idle time percentage.

Lsof

As you know, in Linux every process opens a file on the backend, so if you want to check if a process is running or not, you have to check if the corresponding file for that process is opened in the appropriate section/directory. The LSOF command lets you know which files are open.

Vmstat

As the name suggests, this command is used to monitor virtual memory statistics. The best thing about this command is that it can enter the monitor state based on the interval specified in the command. It lets you know how much load, paging, and interrupts the server is handling during that time.

atop

Atop is a very important command for monitoring and diagnosing your server. It combines the features of both top and htop, plus the added feature of daily level logging. It highlights processes that have reached the threshold load limit.

**2.2.** Can the ps command monitor the status of processes in real time?

The ps command is used to display the state of processes as a snapshot, unlike Microsoft Windows, which displays the state of processes in real time. In Linux, if we want to view the processes in real time, we need to use the top command.

**2.3.** By what parameters is it possible to sort processes in the top command? How to switch between them?

The basic sorting of data is carried out by the level of CPU time usage, it is also%CPU. To sort by memory (%MEM) in top, just type Shift+M in top command mode. If you are interested in which of the processes is running the longest, press Shift + T, and you will see the information of interest in the TIME + column. You can sort the processes by their number (PID) by typing Shift+N on the keyboard.

To return to the sorting mode by the level of processor resource consumption, use the Shift + P combination.

Not all sorting methods can be set using “hot keys”. For example, to determine the processes that consume SWAP the most, use the field selection menu, which is called by the Shift+F combination.

Using the navigation keys, we find SWAP (or any other necessary parameter), using the “d” key we fix its addition to the general table of the top command (the symbol “\*” will appear next to confirm your choice). To set sorting by SWAP, here we press “s” and exit the menu (ESC). Ready!

You can make sure that the sorting works according to the given attribute by pressing “x”. The column with the corresponding feature will be highlighted (in bold).

**2.4.** What commands to terminate processes do you know?

Various methods are used to forcibly terminate active and background processes. As previously noted, an active process can be terminated by pressing the <CTRL><C> keys or the DEL key. To terminate the background process, the kill command is used, which has several formats: kill PID kill - signal PID kill%n This command can take a job number or a process identifier as an argument. For example, to kill a process with PID=237, execute the command kill 237, and to terminate the process with the number 20, execute the command kill%20