**Topic: "Network configuration, system and user protection in Linux"**

Performed by students RPZ-93B group

**Team:** Бушовська О.В, Білобровенко О.С., Скворцов Д.Є.

**The purpose of the work:**

1. Familiarize yourself with the basic tools for storing system data - processes, memory, log files and kernel status messages.
2. Introduction to the Filesystem Hierarchy Standard.
3. Familiarity with the basic steps when setting up a network.

**Material support of classes**

1. Computer type IBM PC.

2. Windows family of operating systems (Windows 7).

3. Virtual machine - Virtual Box (Oracle).

4. GNU / Linux operating system - CentOS.

5. Cisco Network Academy website netacad.com and its online Linux courses

**Tasks for preliminary preparation.**

1. Read brief theoretical information about laboratory work and make a small glossary of basic English terms on the purpose of team assignments and their parameters.

|  |  |
| --- | --- |
| **Name** | **Description** |
| Thread | is a set of sequentially executed processor instructions that use the common address space of the process. |
| Computer memory | a part of a computer, physical device, or storage medium used in computing systems over a period of time. |
| Logs (log files) | these are files that contain system information about the operation of the server or computer and certain actions of the user or program. Sometimes a Ukrainian-language analogue of the term magazine is also used. |

1. **On the basis of the considered material give answers to the following questions:**
   1. **Explain the concept of "pseudo file system", why does the system need it?**

For example – procfs - is a special file system used in UNIX-like operating systems. Allows you to access information from the kernel about system processes. Needed to run commands like ps, w, top. It is usually mounted on /proc. procfs creates a two-level representation of process spaces. At the top level, processes are directories named according to their pid (Process ID). Also at the top level is a link to the directory corresponding to the process making the request; it may have a different name on different operating systems.

* 1. **Why do users not so often go directly to the / proc directory, how can I get information from it?**

Perhaps users are reluctant to choose, because procfs almost does not perform its original function - process management. There is no interface for sending commands, the file system only provides detailed information about the processes (and in some places allows you to change some options.

* 1. **What is the purpose of the / proc / cmdline, / proc / meminfo and / proc / modules files?**
* **/proc/cmdline** - it is a read-only file that contains complete process information from the command line. If the process has been swapped in addition to memory, or the process is a zombie process, then this file has no content. The file ends with a null character instead of a newline character.
* **/proc/meminfo** -is used by to report the amount of free and used memory (both physical and swap) on the system as well as the shared memory and buffers used by the kernel.
* **/proc/modules files -** this file displays a list of all modules loaded into the kernel. Its contents vary based on the configuration and use of your system.
  1. **What is the purpose of the free command?**

The free command provides information about the total amount of the physical and swap memory, as well as the free and used memory.

* 1. **Why do you need log files, give examples of their use?**

Their purpose is to record the operations performed on the machine for permanent analysis by the administrator. Regular viewing of logs allows you to identify errors in the system as a whole, select a service or site (specially identified errors that do not occur when viewed in), diagnose malicious activity, and collect site visit statistics.

* 1. **What is the purpose of the / var / log / dmesg file?**

System boot log (helps to debug the system in case it does not boot, saves the main system events (for example, hardware failures));

* 1. **What is FHS designed for?**

Organize the structure of directories and files in the GNU/Linux operating system. And the second reason that the FSH standard was created is to develop a standard that is suitable for all Unix-like operating systems. What are the basic commands in Linux for viewing and configuring the network.

* 1. **In which files is stored information about users and their groups. How to view them.**

All user information is usually stored in the /etc/passwd and /etc/group files.

1. **Learn Cisco Academy Online Course Materials:**

* NDG Linux Essentials (Chapter 13-15 all Topics)

1. **Take the NDG Linux Essentials course on the following topics:**

* Chapter 13 Exam
* Chapter 14 Exam
* Chapter 15 Exam

1. **Prepare the initial version of the report in electronic form:**

* Title page, topic and purpose of the work
* Glossary of terms
* Answers to paragraphs 2.1-2.3 of the tasks for preliminary training

**Progress.**

* 1. Initial work in CLI mode in Linux Linux family:
  2. Start the VirtualBox virtual machine, select CentOS, and start it. Log in under the user: CentOS, login password: reverse ***(if you are performing LR in room 401)*** and lower the terminal.
  3. Start the Ubuntu\_PC virtual machine ***(if you are performing LR tasks through the netacad academy)***
  4. Start your Linux operating system ***(if you are running your own PC and have it installed)*** and start the terminal.
  5. Study all the examples of commands presented in the laboratory work of the ***NDG Linux Essentials course:***
* ***Lab 13: Where Data is Stored***
* ***Lab 14: Network Configuration***
* ***Lab 15: System and User Security***
  1. Create a table of commands studied in paragraph 2 of the work in the following form:

|  |  |
| --- | --- |
| Command name | Its purpose and functionality |
|  |  |
|  |  |
|  |  |
|  |  |

**Test questions**

1. What is the difference between the *ps --forest* and *pstree commands* ?
2. In which directories are the system settings stored?
3. In which directories can you find the programs installed in the system available to the user?
4. In which directories can you find installed system programs and programs designed to run by superuser?
5. Explain the purpose of the ping, ifconfig, traceroute commands.
6. What are the network interfaces in Linux called?
7. How to use the ifconfig command to display the parameters of only one network interface (for example, eth1) and not all?
8. Why aren't passwords explicitly stored in configuration files?
9. Why is it not recommended to perform daily operations using a root account?
10. What is the difference between the mechanisms for obtaining special privileges su and sudo?

**Conclusion:**