**Laboratory work №5**

**Topic: "Linux commands for archiving and compressing data".**

**The goal of the work:**

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

2. Familiarity with basic commands for archiving and compressing data.

**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 for laboratory work and make a small dictionary

basic English terms for assigning teams and their parameters.

2. On the basis of the considered material give answers to the following questions:

2.1. What is the purpose of the commands tar, xz, zip, bzip, gzip? Make a brief description of each team and highlight it their main parameters. How to install them.

2.2. Here are three examples of how to archive and compress data with different commands.

3. Study Cisco Academy Online Course Materials:

- NDG Linux Unhatched (Chapter 19 - 22 all Topics)

- NDG Linux Essentials (Chapter 9 all Topics)

4. Take the NDG Linux Essentials course on the following topics:

- Chapter 09 Exam

- Midterm Exam (Modules 1 - 9)

5. Take the NDG Linux Unhatched course:

- Assessment

- End of Course FeedbackExternal tool

6. Prepare in electronic form the initial version of the report:

- Title page, topic and purpose of the work

- Glossary of terms

- Answers to item 2.1 and item 2.4 of the tasks for preliminary training.

**Progress.**

1. Initial work in CLI mode in Linux Linux family:

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

under the user: CentOS, password for login: reverse (if you perform LR in 401 aud.) and lower

terminal.

1.2. Start the Ubuntu PC virtual machine (if you are performing LR tasks through the netacad academy)

1.3. Start your Linux operating system (if you are running on your own PC and

installed) and start the terminal.

2. Study all the examples of commands presented in the laboratory work of the NDG Linux course Essentials:

- Lab 9: Archiving and Compression

3. Create a table of commands studied in paragraph 2 of the course of work as follows:

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

4. Familiarize yourself with the tar command and use it to:

- create a file with the extension .tar;

- create a file with the extension .tar, consisting of several files and directories at once;

- view the contents of the file;

- extract the contents of the tar file;

- create a tar archive file compressed with bzip;

- extract the contents of the tar bzip file;

- create an archive tar file compressed with gzip;

- extract the contents of the tar gzip file.

**Test questions**

1. Give a comparative description of compression and archiving processes.

2. What programs, other than those listed in the paper, can be used for compression and archiving files and directories in Linux? Give examples and a brief description.

3. Compare the compression algorithms used in the commands (programs) used in

Linux. Which of the algorithms can be considered the fastest and most efficient?

The gzip command uses the Lempel-Ziv data compression algorithm, while the bzip utilities use a different compression algorithm called Burrows-Wheeler block sorting, which can compress files smaller than gzip at the expense of more CPU time. These files can be recognized because they have a .bz or .bz2 extension instead of a .gz extension.

The xz and unxz tools are functionally similar to gzip and gunzip in that they use the Lempel-Ziv-Markov (LZMA) chain algorithm, which can result in lower decompression CPU times that are on par with gzip while providing the better compression ratios typically associated with the bzip2 tools. Files compressed with the xz command use the .xz extension.

4. Describe the compression and archiving software that can be used in yours

mobile phone.

Program SD Maid

5. Describe and compare software tools for compressing and (de) archiving data in the family OS Windows.

Examples of archivers are WinZIP, WinRAR, 7-zip, Power-Archiver, WinAce, Ark, Btar, AndroZip, FreeArc and others. The result of these programs is an archive file that contains compressed or uncompressed files and folders. Additional measures can be used in the archiving process to protect data from unauthorized access, such as setting a password to access data in the archive.

Depending on the algorithms used to compress and archive data, there are the following archive file formats: ZIP, RAR, TER, ARJ, CAB, LZH, ACE, 7z and others. Most often, especially on the Internet, use archive files in ZIP format.

6. Explain how data compression and archiving can be used to back up data.

The computer has limited memory, so it is extremely important for a programmer or anyone working in the field of computer technology to use this resource efficiently and rationally. When we have data that takes up a certain amount of memory, but we do not need it at the moment, we can compress or archive it, thus freeing up space (memory). The advantage of this option over the deletion option is that we can return this data at any time if necessary, so it turns out that we have reserved it.

In general, the computer OS itself can do regular archiving of information. This is required in case of system failure or complete failure.

***Conclusion:***