

Отчет по лабораторной работе № 3 по курсу “Фундаментальная информатика”

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Отчет сдан « » _____ 20__ г., итоговая
оценка _____

Подпись преподавателя

1. Тема: Операционная Сети в ОС UNIX

2. Цель работы:

Изучить справочный материал и дополнительную литературу. Прослушать лекцию, посетить консультацию.

Собственноручно проделать основные примеры и продемонстрировать владение сетевыми средствами преподавателю. Обязательно выполнить не менее двух заданий связи с внешней средой. Запротолировать содержательное подмножество сеанса, за исключением команд, дающих нетекстовый вывод, и непротоколируемых пунктов 6, 7, 9-10 с учетом замечаний преподавателя. Оформить отчет на бланке.

3. Задание (вариант № номер варианта, если есть):

Приобретение основных навыков работы с сервером в ОС UNIX

4. Оборудование (студента):

Процессор AMD ryzen 7 5800U 8x 3.9GH с ОП 16384 Мб, НМД 512Гб. Монитор 1920x1080

5. Программное обеспечение (студента):

Операционная система семейства: *linux*, наименование: *ubuntu*, версия *18.10 cosmic*
интерпретатор команд: *bash* версия *4.4.19*.

Система программирования -- версия --, редактор текстов *emacs* версия *25.2.2*

Утилиты операционной системы --

Прикладные системы и программы --

Местонахождение и имена файлов программ и данных на домашнем компьютере --

6. Идея, метод, алгоритм решения задачи (в формах: словесной, псевдокода, графической [блок-схема, диаграмма, рисунок, таблица] или формальные спецификации с пред- и постусловиями)

Подключиться к удаленному серверу, с помощью команд *scp*, *tar*, *gzip* взаимодействовать с сервером

7. Сценарий выполнения работы [план работы, первоначальный текст программы в черновике (можно на отдельном листе) и тесты либо соображения по тестированию].

- 1) открыть *wsl*
- 2) подключиться к удаленному серверу

- 3) передать файла на удаленный сервер
- 4) скачать файлы с удаленного сервера
- 5) создать архив
- 6) передать архив на удаленный сервер
- 7) распаковать архив на удаленном сервере

8. Распечатка протокола (подклеить листинг окончательного варианта программы с тестовыми примерами, подписанный преподавателем).

Протокол компьютера:

```
root@LAPTOP-HO30I6QD:/mnt/c/Users/Кирилл# su newuser
newuser@LAPTOP-HO30I6QD:/mnt/c/Users/Кирилл$ cd
newuser@LAPTOP-HO30I6QD:~$ ls
1   Lab_works java privetremix.mp4 test
1.txt c++      lab3 script1.bash test1.bash.save
newuser@LAPTOP-HO30I6QD:~$ cd lab3
newuser@LAPTOP-HO30I6QD:~/lab3$ touch server.txt
newuser@LAPTOP-HO30I6QD:~/lab3$ scp server.txt
jojithebest@shell.xshellz.com:/home/j/jojithebest
jojithebest@shell.xshellz.com's password:
server.txt                               100% 0 0.0KB/s 00:00
newuser@LAPTOP-HO30I6QD:~/lab3$ scp
jojithebest@shell.xshellz.com:/home/j/jojithebestusage: scp [-346BCpqrTv] [-c cipher] [-F
ssh_config] [-i identity_file]
        [-J destination] [-l limit] [-o ssh_option] [-P port]
        [-S program] source ... target
newuser@LAPTOP-HO30I6QD:~/lab3$ scp jojithebest@shell.xshellz.com:/home/j/jojithebest
.
usage: scp [-346BCpqrTv] [-c cipher] [-F ssh_config] [-i identity_file]
        [-J destination] [-l limit] [-o ssh_option] [-P port]
        [-S program] source ... target
newuser@LAPTOP-HO30I6QD:~/lab3$ scp jojithebest@shell.xshellz.com:/home/j/jojithebest
.
jojithebest@shell.xshellz.com's password:
Permission denied, please try again.
jojithebest@shell.xshellz.com's password:
scp: /home/j/jojithebest: not a regular file
newuser@LAPTOP-HO30I6QD:~/lab3$ scp
jojithebest@shell.xshellz.com:/home/j/jojithebest/server.txt .
jojithebest@shell.xshellz.com's password:
server.txt                               100% 0 0.0KB/s 00:00
newuser@LAPTOP-HO30I6QD:~/lab3$ ls
arc.tar.gz for_pc.txt for_server.txt server.txt
newuser@LAPTOP-HO30I6QD:~/lab3$ tar server.txt
tar: invalid option -- 'e'
Try 'tar --help' or 'tar --usage' for more information.
newuser@LAPTOP-HO30I6QD:~/lab3$ tar server.tar server.txt
tar: invalid option -- 'e'
Try 'tar --help' or 'tar --usage' for more information.
newuser@LAPTOP-HO30I6QD:~/lab3$ tar server server.txt
tar: invalid option -- 'e'
Try 'tar --help' or 'tar --usage' for more information.
newuser@LAPTOP-HO30I6QD:~/lab3$ tar --help
Usage: tar [OPTION...] [FILE]...
```

GNU 'tar' saves many files together into a single tape or disk archive, and can restore individual files from the archive.

Examples:

```
tar -cf archive.tar foo bar # Create archive.tar from files foo and bar.
tar -tvf archive.tar       # List all files in archive.tar verbosely.
tar -xf archive.tar        # Extract all files from archive.tar.
```

Local file name selection:

```
--add-file=FILE      add given FILE to the archive (useful if its name
                      starts with a dash)
-C, --directory=DIR  change to directory DIR
--exclude=PATTERN    exclude files, given as a PATTERN
--exclude-backups    exclude backup and lock files
--exclude-caches     exclude contents of directories containing
                      CACHEDIR.TAG, except for the tag file itself
--exclude-caches-all exclude directories containing CACHEDIR.TAG
--exclude-caches-under exclude everything under directories containing
                      CACHEDIR.TAG
--exclude-ignore=FILE read exclude patterns for each directory from
                      FILE, if it exists
--exclude-ignore-recursive=FILE
                      read exclude patterns for each directory and its
                      subdirectories from FILE, if it exists
--exclude-tag=FILE    exclude contents of directories containing FILE,
                      except for FILE itself
--exclude-tag-all=FILE exclude directories containing FILE
--exclude-tag-under=FILE exclude everything under directories
                      containing FILE
--exclude-vcs         exclude version control system directories
--exclude-vcs-ignores read exclude patterns from the VCS ignore files
--no-null             disable the effect of the previous --null option
--no-recursion        avoid descending automatically in directories
--no-unquote          do not unquote input file or member names
--no-verbatim-files-from -T treats file names starting with dash as
                      options (default)
--null               -T reads null-terminated names; implies
                      --verbatim-files-from
--recursion           recurse into directories (default)
-T, --files-from=FILE get names to extract or create from FILE
--unquote             unquote input file or member names (default)
--verbatim-files-from -T reads file names verbatim (no escape or option
                      handling)
-X, --exclude-from=FILE exclude patterns listed in FILE
```

File name matching options (affect both exclude and include patterns):

```
--anchored           patterns match file name start
--ignore-case         ignore case
--no-anchored         patterns match after any '/' (default for
                      exclusion)
```

- no-ignore-case case sensitive matching (default)
- no-wildcards verbatim string matching
- no-wildcards-match-slash wildcards do not match '/'
- wildcards use wildcards (default for exclusion)
- wildcards-match-slash wildcards match '/' (default for exclusion)

Main operation mode:

- A, --catenate, --concatenate append tar files to an archive
- c, --create create a new archive
- d, --diff, --compare find differences between archive and file system
- delete delete from the archive (not on mag tapes!)
- r, --append append files to the end of an archive
- t, --list list the contents of an archive
- test-label test the archive volume label and exit
- u, --update only append files newer than copy in archive
- x, --extract, --get extract files from an archive

Operation modifiers:

- check-device check device numbers when creating incremental
 archives (default)
- g, --listed-incremental=FILE handle new GNU-format incremental backup
- G, --incremental handle old GNU-format incremental backup
- hole-detection=TYPE technique to detect holes
- ignore-failed-read do not exit with nonzero on unreadable files
- level=NUMBER dump level for created listed-incremental archive
- n, --seek archive is seekable
- no-check-device do not check device numbers when creating
 incremental archives
- no-seek archive is not seekable
- occurrence[=NUMBER] process only the NUMBERth occurrence of each file
 in the archive; this option is valid only in
 conjunction with one of the subcommands --delete,
 --diff, --extract or --list and when a list of
 files is given either on the command line or via
 the -T option; NUMBER defaults to 1
- sparse-version=MAJOR[.MINOR]
 set version of the sparse format to use (implies
 --sparse)
- S, --sparse handle sparse files efficiently

Overwrite control:

- k, --keep-old-files don't replace existing files when extracting,
 treat them as errors
- keep-directory-symlink preserve existing symlinks to directories when
 extracting
- keep-newer-files don't replace existing files that are newer than
 their archive copies
- no-overwrite-dir preserve metadata of existing directories
- one-top-level[=DIR] create a subdirectory to avoid having loose files

extracted

- overwrite overwrite existing files when extracting
- overwrite-dir overwrite metadata of existing directories when extracting (default)
- recursive-unlink empty hierarchies prior to extracting directory
- remove-files remove files after adding them to the archive
- skip-old-files don't replace existing files when extracting, silently skip over them
- U, --unlink-first remove each file prior to extracting over it
- W, --verify attempt to verify the archive after writing it

Select output stream:

- ignore-command-error ignore exit codes of children
- no-ignore-command-error treat non-zero exit codes of children as error
- O, --to-stdout extract files to standard output
- to-command=COMMAND pipe extracted files to another program

Handling of file attributes:

- atime-preserve[=METHOD] preserve access times on dumped files, either by restoring the times after reading (METHOD='replace'; default) or by not setting the times in the first place (METHOD='system')
- clamp-mtime only set time when the file is more recent than what was given with --mtime
- delay-directory-restore delay setting modification times and permissions of extracted directories until the end of extraction
- group=NAME force NAME as group for added files
- group-map=FILE use FILE to map file owner GIDs and names
- mode=CHANGES force (symbolic) mode CHANGES for added files
- mtime=DATE-OR-FILE set mtime for added files from DATE-OR-FILE
- m, --touch don't extract file modified time
- no-delay-directory-restore cancel the effect of --delay-directory-restore option
- no-same-owner extract files as yourself (default for ordinary users)
- no-same-permissions apply the user's umask when extracting permissions from the archive (default for ordinary users)
- numeric-owner always use numbers for user/group names
- owner=NAME force NAME as owner for added files
- owner-map=FILE use FILE to map file owner UIDs and names
- p, --preserve-permissions, --same-permissions extract information about file permissions (default for superuser)
- same-owner try extracting files with the same ownership as exists in the archive (default for superuser)
- s, --preserve-order, --same-order member arguments are listed in the same order as

the files in the archive
--sort=ORDER directory sorting order: none (default), name or
inode

Handling of extended file attributes:

--acls Enable the POSIX ACLs support
--no-acls Disable the POSIX ACLs support
--no-selinux Disable the SELinux context support
--no-xattrs Disable extended attributes support
--selinux Enable the SELinux context support
--xattrs Enable extended attributes support
--xattrs-exclude=MASK specify the exclude pattern for xattr keys
--xattrs-include=MASK specify the include pattern for xattr keys

Device selection and switching:

-f, --file=ARCHIVE use archive file or device ARCHIVE
--force-local archive file is local even if it has a colon
-F, --info-script=NAME, --new-volume-script=NAME
run script at end of each tape (implies -M)
-L, --tape-length=NUMBER change tape after writing NUMBER x 1024 bytes
-M, --multi-volume create/list/extract multi-volume archive
--rmt-command=COMMAND use given rmt COMMAND instead of rmt
--rsh-command=COMMAND use remote COMMAND instead of rsh
--volno-file=FILE use/update the volume number in FILE

Device blocking:

-b, --blocking-factor=BLOCKS BLOCKS x 512 bytes per record
-B, --read-full-records reblock as we read (for 4.2BSD pipes)
-i, --ignore-zeros ignore zeroed blocks in archive (means EOF)
--record-size=NUMBER NUMBER of bytes per record, multiple of 512

Archive format selection:

-H, --format=FORMAT create archive of the given format

FORMAT is one of the following:

gnu	GNU tar 1.13.x format
oldgnu	GNU format as per tar <= 1.12
pax	POSIX 1003.1-2001 (pax) format
posix	same as pax
ustar	POSIX 1003.1-1988 (ustar) format
v7	old V7 tar format

--old-archive, --portability
same as --format=v7
--pax-option=keyword[:=value][,keyword[:=value]]...
control pax keywords
--posix same as --format=posix

-V, --label=TEXT create archive with volume name TEXT; at
list/extract time, use TEXT as a globbing pattern
for volume name

Compression options:

-a, --auto-compress use archive suffix to determine the compression
program
-I, --use-compress-program=PROG
filter through PROG (must accept -d)
-j, --bzip2 filter the archive through bzip2
-J, --xz filter the archive through xz
 --lzip filter the archive through lzip
 --lzma filter the archive through xz
 --lzop filter the archive through lzop
 --no-auto-compress do not use archive suffix to determine the
compression program
-z, --gzip, --gunzip, --ungzip filter the archive through gzip
 --zstd filter the archive through zstd
-Z, --compress, --uncompress filter the archive through compress

Local file selection:

 --backup[=CONTROL] backup before removal, choose version CONTROL
-h, --dereference follow symlinks; archive and dump the files they
point to
 --hard-dereference follow hard links; archive and dump the files they
refer to
-K, --starting-file=MEMBER-NAME
begin at member MEMBER-NAME when reading the
archive
 --newer-mtime=DATE compare date and time when data changed only
-N, --newer=DATE-OR-FILE, --after-date=DATE-OR-FILE
only store files newer than DATE-OR-FILE
 --one-file-system stay in local file system when creating archive
-P, --absolute-names don't strip leading '/'s from file names
 --suffix=STRING backup before removal, override usual suffix ('~'
unless overridden by environment variable
SIMPLE_BACKUP_SUFFIX)

File name transformations:

 --strip-components=NUMBER strip NUMBER leading components from file
names on extraction
 --transform=EXPRESSION, --xform=EXPRESSION
use sed replace EXPRESSION to transform file
names

Informative output:

 --checkpoint[=NUMBER] display progress messages every NUMBERth record
(default 10)

- checkpoint-action=ACTION execute ACTION on each checkpoint
- full-time print file time to its full resolution
- index-file=FILE send verbose output to FILE
- l, --check-links print a message if not all links are dumped
- no-quote-chars=STRING disable quoting for characters from STRING
- quote-chars=STRING additionally quote characters from STRING
- quoting-style=STYLE set name quoting style; see below for valid STYLE values
- R, --block-number show block number within archive with each message
- show-defaults show tar defaults
- show-omitted-dirs when listing or extracting, list each directory that does not match search criteria
- show-snapshot-field-ranges show valid ranges for snapshot-file fields
- show-transformed-names, --show-stored-names show file or archive names after transformation
- totals[=SIGNAL] print total bytes after processing the archive; with an argument - print total bytes when this SIGNAL is delivered; Allowed signals are: SIGHUP, SIGQUIT, SIGINT, SIGUSR1 and SIGUSR2; the names without SIG prefix are also accepted
- utc print file modification times in UTC
- v, --verbose verbosely list files processed
- warning=KEYWORD warning control
- w, --interactive, --confirmation ask for confirmation for every action

Compatibility options:

- o when creating, same as --old-archive; when extracting, same as --no-same-owner

Other options:

- , --help give this help list
- restrict disable use of some potentially harmful options
- usage give a short usage message
- version print program version

Mandatory or optional arguments to long options are also mandatory or optional for any corresponding short options.

The backup suffix is '~', unless set with --suffix or SIMPLE_BACKUP_SUFFIX.
The version control may be set with --backup or VERSION_CONTROL, values are:

- none, off never make backups
- t, numbered make numbered backups
- nil, existing numbered if numbered backups exist, simple otherwise
- never, simple always make simple backups

Valid arguments for the --quoting-style option are:

literal
shell
shell-always
shell-escape
shell-escape-always
c
c-maybe
escape
locale
clocale

This tar defaults to:

```
--format=gnu -f- -b20 --quoting-style=escape --rmt-command=/usr/sbin/rmt
```

```
--rsh-command=/usr/bin/rsh
```

```
newuser@LAPTOP-HO30I6QD:~/lab3$ tar --totaks -cvf server.tar server.txt for_pc.txt  
tar: unrecognized option '--totaks'
```

Try 'tar --help' or 'tar --usage' for more information.

```
newuser@LAPTOP-HO30I6QD:~/lab3$ tar --totals -cvf server.tar server.txt for_pc.txt  
server.txt
```

```
for_pc.txt
```

Total bytes written: 10240 (10KiB, 1.3MiB/s)

```
newuser@LAPTOP-HO30I6QD:~/lab3$ gzip -9 server.tar
```

```
newuser@LAPTOP-HO30I6QD:~/lab3$ ls
```

```
arc.tar.gz for_pc.txt for_server.txt server.tar.gz server.txt
```

```
newuser@LAPTOP-HO30I6QD:~/lab3$ ls -la
```

```
total 24
```

```
drwxrwxr-x 2 newuser newuser 4096 Sep 19 13:08 .
```

```
drwxr-xr-x 13 newuser newuser 4096 Sep 19 12:42 ..
```

```
-rw-rw-r-- 1 newuser newuser 226 Sep 19 10:49 arc.tar.gz
```

```
-rw-r--r-- 1 newuser newuser 10 Sep 19 10:48 for_pc.txt
```

```
-rw-rw-r-- 1 newuser newuser 6 Sep 19 10:42 for_server.txt
```

```
-rw-rw-r-- 1 newuser newuser 163 Sep 19 13:07 server.tar.gz
```

```
-rw-rw-r-- 1 newuser newuser 0 Sep 19 13:00 server.txt
```

```
newuser@LAPTOP-HO30I6QD:~/lab3$ gzip -d server.tar.gz
```

```
newuser@LAPTOP-HO30I6QD:~/lab3$ gzip -l server.tar
```

```
newuser@LAPTOP-HO30I6QD:~/lab3$ ls -la
```

```
total 24
```

```
drwxrwxr-x 2 newuser newuser 4096 Sep 19 13:09 .
```

```
drwxr-xr-x 13 newuser newuser 4096 Sep 19 12:42 ..
```

```
-rw-rw-r-- 1 newuser newuser 226 Sep 19 10:49 arc.tar.gz
```

```
-rw-r--r-- 1 newuser newuser 10 Sep 19 10:48 for_pc.txt
```

```
-rw-rw-r-- 1 newuser newuser 6 Sep 19 10:42 for_server.txt
```

```
-rw-rw-r-- 1 newuser newuser 214 Sep 19 13:07 server.tar.gz
```

```
-rw-rw-r-- 1 newuser newuser 0 Sep 19 13:00 server.txt
```

```
newuser@LAPTOP-HO30I6QD:~/lab3$ scp server.tar.gz
```

```
jojithebest@shell.xshellz.com:/home/j/jojithebest
```

jojithebest@shell.xshellz.com's password:

```
server.tar.gz 100% 214 1.5KB/s 00:00
```

```
newuser@LAPTOP-HO30I6QD:~/lab3$ scp
```

```
jojithebest@shell.xshellz.com:/home/j/jojithebest/for_pc.txt .
```

jojithebest@shell.xshellz.com's password:

```
for_pc.txt          100% 10  0.1KB/s  00:00
newuser@LAPTOP-HO30I6QD:~/lab3$ ls
arc.tar.gz for_pc.txt for_server.txt server.tar.gz server.txt
newuser@LAPTOP-HO30I6QD:~/lab3$
```

Протокол сервера:

```
root@LAPTOP-HO30I6QD:~# su newuser
newuser@LAPTOP-HO30I6QD:/root$ cd
newuser@LAPTOP-HO30I6QD:~$ ssh jojithebest@shell.xshellz.com
jojithebest@shell.xshellz.com's password:
Linux xshellz-free 5.10.0-12-amd64 #1 SMP Debian 5.10.103-1 (2022-03-07) x86_64
Welcome back to xShellz Free Server.
```

```
      _//_\\
     ,  //".
    /      \
   _/        |
  (.-,--.    |
Hmmm,        /o/ o \  /
Interlicious \_ \ / ^\
 \  ( _'--' .-)
   / '-. |
  ( , '-. |
   '-,--\_ )|-.

```

Users of the Rizon IRC Network: Please connect to the sli.rizon.net server using the shell.xshellz.com vhost.

Use xshellzhhelp to list all available commands.

Thanks for using xShellz Shell Services.

Start with typing: xshellzhhelp

[IMPORTANT]: This server is now using only one IP: 158.69.251.105

```
jojithebest@xshellz-free:~$ pwd
/home/j/jojithebest
jojithebest@xshellz-free:~$ ls
arc.tar for_pc.txt for_server.txt server.txt
jojithebest@xshellz-free:~$ rm arc.tar
jojithebest@xshellz-free:~$ rm for_pc.txt
jojithebest@xshellz-free:~$ rm for_server.txt
jojithebest@xshellz-free:~$ ls
server.txt
jojithebest@xshellz-free:~$ pwd
/home/j/jojithebest
jojithebest@xshellz-free:~$ ls
server.tar.gz server.txt
jojithebest@xshellz-free:~$ gzip -d server.tar.gz
jojithebest@xshellz-free:~$ ls
server.tar server.txt
jojithebest@xshellz-free:~$ tar -xvf server.tar
```

```
server.txt
for_pc.txt
jojithebest@xshellz-free:~$
```

9. Дневник отладки должен содержать дату и время сеансов отладки и основные события (ошибки в сценарии и программе, нестандартные ситуации) и краткие комментарии к ним. В дневнике отладки приводятся сведения об использовании других ЭВМ, существенном участии преподавателя и других лиц в написании и отладке программы.

№	Лаб. или дом.	Дата	Время	Событие	Действие по исправлению	Примечание
1	лаб	20.09.2020	17:20	Не смог подключиться к удаленном серверу	Перезагрузил систему	Мне грустно

10. Замечания автора по существу работы
Замечаний нет

11. Выводы

Было очень интересно взаимодействовать с сервером, архивировать и разархивировать файлы. Работа была не сложная, но изначально не понял теорию. По ходу выполнения работы пришлось изучить дополнительную информацию, которой не было на занятии. Думаю, что данные навыки очень полезны в современном мире, так как очень часто приходится взаимодействовать с серверами. Недочёты при выполнении задания могут быть устранены следующим образом: --

Подпись студента
