Ministerul Educaţiei şi Tineretului al Republicii Moldova

Universitatea Tehnică a Moldovei

Facultatea Calculatoare Informatică şi Microelectronică
Catedra Automatica şi Tehnologii Informaţionale

Raport

MIDPS

Lucrarea de laborator Nr. 2

Tema: Version Control Systems si modul de setare a unui server

A efectuat: studentul grupei TI-141: **Buldumac Vasile**

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1. **Scopul lucrarii**

Însușirea noțiunii de Version Control Systems și a modului de setare a unui server.

2. Obiectivele lucrarii

a) Înțelegerea și folosirea CLI (basic level)
b) Administrarea remote a mașinilor linux machine folosind SSH (remote code editing)
c) Version Control Systems (git || mercurial || svn)
d) Compilează codul C/C++/Java/Python prin intermediul CLI, folosind compilatoarele gcc/g++/javac/python

3. Efectuarea lucrării de laborator

3.1. Task-uri implementate

Basic Level (nota 5 || 6):

- conectează-te la server folosind SSH
- o compilează cel puțin 2 sample programs din setul HelloWolrdPrograms folosind CLI
- o execută primul commit folosind VCS

Normal Level (nota 7 || 8):

- inițializează un nou repositoriu
- configurează-ți VCS
- crearea branch-urilor (creează cel puțin 2 branches)
- commit pe ambele branch-uri (cel puțin 1 commit per branch)

Advanced Level (nota 9 || 10):
- setează un branch to track a remote origin pe care vei putea sa faci push (ex. Github, Bitbucket or custom server)
- resetează un branch la commit-ul anterior
- merge 2 branches
- conflict solving between 2 branches

Bonus Point:

- Scrie un script care va compila HelloWolrdPrograms projects: c, cpp, java, pyton, ruby.

3.2. Realizarea lucrării de laborator

- conectează-te la server folosind SSH

```
nipons@nipons-X751LA:~/MIDPS$ ssh-keygen -t rsa -C "camudlub@gmail.com"
Generating public/private rsa key pair.
Enter file in which to save the key (/home/nipons/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/nipons/.ssh/id_rsa.
Your public key has been saved in /home/nipons/.ssh/id_rsa.pub.
The key fingerprint is:
36:a8:b7:8a:79:3d:72:ea:13:05:a5:41:b8:3b:6b:eb camudlub@gmail.com
The key's randomart image is:
+--[ RSA 2048]----+
|    oo..         |
|   . .o          |
|    ...          |
|   .   ..        |
|    . .. S        |
|  o .. . .        |
|   o.o.          |
|   oo+.+.         |
| oE++*..          |
+-----------------+
```

```
nipons@nipons-X751LA:~/MIDPS$ xclip -sel clip < ~/.ssh/id_rsa.pub
nipons@nipons-X751LA:~/MIDPS$ ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQChGQ+xoKV1k+
vk2Hm4MJ283um1uyF4owLnl417FJP4NH1WoHFVfurwPbKxzkez8hX5UyXt9jUgPiJhwjMpcZKLLwnqVT
s6zt1/hHoeyoXaZD50uuDBzk7gK1f+umXZLkuXdDtFLcCbzdiR4jSThvvqWMEmI8MSWmJmcYvrjoq0Bb
lmT+Orn7d9wXbbv/3skYJKz44LyKUBTp9m3G1yJyEQjkL0ypSisT1QvDzJmZxFQyf7mZvQ8q9XGk0nsn
saxrh05i17cnU/Eh/Y7//NJY8JvzGlekCzwl3QkfMzJ9k+8lUCGNr9e1tK+FA11rlVsmixi6rR9go8uk
DgcKq190SR camudlub@gmail.com
```

```
nipons@nipons-X751LA:~/MIDPS$ ssh-add ~/.ssh/id_rsa
Identity added: /home/nipons/.ssh/id_rsa (/home/nipons/.ssh/id_rsa)
nipons@nipons-X751LA:~/MIDPS$ ssh git@github.com
The authenticity of host 'github.com (192.30.252.130)' can't be established.
RSA key fingerprint is 16:27:ac:a5:76:28:2d:36:63:1b:56:4d:eb:df:a6:48.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'github.com,192.30.252.130' (RSA) to the list of know
n hosts.
PTY allocation request failed on channel 0
Hi buldumac! You've successfully authenticated, but GitHub does not provide shel
l access.
Connection to github.com closed.
nipons@nipons-X751LA:~/MIDPS$
```

Add SSH key

- compilează cel puțin 2 sample programs din setul HelloWolrdPrograms
folosind CLI

```python
import sys
import os

cfile = open('cfile.c', 'w')
cppfile = open('cppfile.cpp', 'w')
pyfile = open('pyfile.py', 'w')
rbfile = open('rbfile.rb', 'w')
javafile = open('javafile.java', 'w')

forcfile = '''

#include <stdio.h>

int main() {
    printf("Hello World!\\n");
    return 0;
}

'''

forcppfile = '''
#include <iostream>
using namespace std;
int main() {
    cout << "Hello World!" << endl;
    return 0;
}
'''
```

```python
forpyfile = 'print(\'Hello World!\')'
forrbfile = 'puts "Hello World!"'
forjavafile = '''
class HelloWorld {
    public static void main(String args[]) {
        System.out.println("Hello World!");
    }
}
'''

cfile.write(forcfile)
cppfile.write(forcppfile)
pyfile.write(forpyfile)
rbfile.write(forrbfile)
javafile.write(forjavafile)

cfile.close()
cppfile.close()
pyfile.close()
rbfile.close()
javafile.close()

os.system('''

    g++ cfile.c -o cfile && ./cfile &&
    g++ cppfile.cpp -o cppfile && ./cppfile &&
    python3 pyfile.py &&
    ruby rbfile.rb &&
    javac javafile.java && java HelloWorld

''')
```

```
nipons@nipons-X751LA:~/MIDPS/Hello$ ls
cfile     cppfile      HelloWorld.class  mainf.py    pyfile.py
cfile.c  cppfile.cpp  javafile.java      mainf.py~  rbfile.rb
nipons@nipons-X751LA:~/MIDPS/Hello$
nipons@nipons-X751LA:~/MIDPS/Hello$
nipons@nipons-X751LA:~/MIDPS/Hello$
nipons@nipons-X751LA:~/MIDPS/Hello$
nipons@nipons-X751LA:~/MIDPS/Hello$
nipons@nipons-X751LA:~/MIDPS/Hello$ python3 mainf.py
Hello World!
Hello World!
Hello World!
Hello World!
Hello World!
nipons@nipons-X751LA:~/MIDPS/Hello$ █
```

- execută primul commit folosind VCS

```
nipons@nipons-X751LA:~/MIDPS$ git add .
nipons@nipons-X751LA:~/MIDPS$ git status
В ветке master
Изменения для закрепления:
  (используйте "git reset HEAD <file>..."  чтобы убрать из буфера)

        new file:    Hello/HelloWorld.class
        new file:    Hello/cfile
        new file:    Hello/cfile.c
        new file:    Hello/cppfile
        new file:    Hello/cppfile.cpp
        new file:    Hello/javafile.java
        new file:    Hello/mainf.py
        new file:    Hello/mainf.py~
        new file:    Hello/pyfile.py
        new file:    Hello/rbfile.rb

nipons@nipons-X751LA:~/MIDPS$ git commit -m "Hello World in C, C++..."
[master eb78559] Hello World in C, C++...
 10 files changed, 146 insertions(+)
 create mode 100644 Hello/HelloWorld.class
 create mode 100755 Hello/cfile
 create mode 100644 Hello/cfile.c
 create mode 100755 Hello/cppfile
 create mode 100644 Hello/cppfile.cpp
 create mode 100644 Hello/javafile.java
 create mode 100644 Hello/mainf.py
 create mode 100644 Hello/mainf.py~
 create mode 100644 Hello/pyfile.py
 create mode 100644 Hello/rbfile.rb
```

Normal Level (nota 7 || 8):

- inițializează un nou repositoriu

```
nipons@nipons-X751LA:~/MIDPS$ mkdir newRep
nipons@nipons-X751LA:~/MIDPS$ cd newRep && git init
Инициализированный пустой репозиторий Git в /home/nipons/MIDPS/newRep/.git/
nipons@nipons-X751LA:~/MIDPS/newRep$ ls
nipons@nipons-X751LA:~/MIDPS/newRep$ 
```

- configurează-ți VCS

```
nipons@nipons-X751LA:~/MIDPS/newRep$ git config --list
user.name=Oleg Buldumac
user.email=camudlub@gmail.com
github.user=buldumac
github.usersdsd=buldumac
github.token=a548e3e137969ad412c40fcbae254b56de8bb090
core.repositoryformatversion=0
core.filemode=true
core.bare=false
core.logallrefupdates=true
nipons@nipons-X751LA:~/MIDPS/newRep$ git config user.name "Buldumac Oleg Oleg"
nipons@nipons-X751LA:~/MIDPS/newRep$ git config --list
user.name=Oleg Buldumac
user.email=camudlub@gmail.com
github.user=buldumac
github.usersdsd=buldumac
github.token=a548e3e137969ad412c40fcbae254b56de8bb090
core.repositoryformatversion=0
core.filemode=true
core.bare=false
core.logallrefupdates=true
user.name=Buldumac Oleg Oleg
nipons@nipons-X751LA:~/MIDPS/newRep$ 
```

- crearea branch-urilor (creează cel puţin 2 branches)
- commit pe ambele branch-uri (cel puţin 1 commit per branch)

```
nipons@nipons-X751LA:~/MIDPS$ git branch
* master
nipons@nipons-X751LA:~/MIDPS$ git checkout -b unu_branch
Перешел к новой ветке 'unu_branch'
nipons@nipons-X751LA:~/MIDPS$ git branch
  master
* unu_branch
nipons@nipons-X751LA:~/MIDPS$ git checkout -b doi_branch
Перешел к новой ветке 'doi_branch'
nipons@nipons-X751LA:~/MIDPS$ git branch
* doi_branch
  master
  unu_branch
nipons@nipons-X751LA:~/MIDPS$ git branch -v
* doi_branch eb78559 Hello World in C, C++...
  master     eb78559 Hello World in C, C++...
  unu_branch eb78559 Hello World in C, C++...
```

Advanced Level (nota 9 || 10):

- setează un branch to track a remote origin pe care vei putea sa faci push (ex. Github, Bitbucket or custom server)

```
Counting objects: 4, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 335 bytes | 0 bytes/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To git@github.com:buldumac/MIDPS.git
 * [new branch]      unu_branch -> unu_branch
nipons@nipons-X751LA:~/MIDPS$
nipons@nipons-X751LA:~/MIDPS$ git checkout doi_branch
Перешел к ветке 'doi_branch'
nipons@nipons-X751LA:~/MIDPS$ git checkout doi_branchs
error: pathspec 'doi_branchs' did not match any file(s) known to git.
nipons@nipons-X751LA:~/MIDPS$ echo 'Test doi_branch' > doi_branch.txt
nipons@nipons-X751LA:~/MIDPS$
nipons@nipons-X751LA:~/MIDPS$
nipons@nipons-X751LA:~/MIDPS$ git status
В ветке doi_branch
Несопровождаемые файлы:
  (используйте "git add <file>..." чтобы включить то, что должно быть зак
)

        doi_branch.txt

нет изменений, добавленных в коммит, но существуют несопровождаемые файлы
ьзуйте "git add" чтобы добавить файлы для сопровождения)
nipons@nipons-X751LA:~/MIDPS$ git add .
nipons@nipons-X751LA:~/MIDPS$ git commit -m 'Text doi branch'
[doi_branch 9bb7250] Text doi branch
 1 file changed, 1 insertion(+)
 create mode 100644 doi_branch.txt
nipons@nipons-X751LA:~/MIDPS$ git push -f origin doi_branch
Counting objects: 5, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 330 bytes | 0 bytes/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To git@github.com:buldumac/MIDPS.git
 * [new branch]      doi_branch -> doi_branch
nipons@nipons-X751LA:~/MIDPS$
```

- resetează un branch la commit-ul anterior

```
nipons@nipons-X751LA:~/MIDPS$ git log --graph --all --oneline
* 9bb7250 Text doi branch
| * 8d96c23 Text pentru unu_branch
|/
* eb78559 Hello World in C, C++...
* 91ee828 update
* 12f093e mod new
nipons@nipons-X751LA:~/MIDPS$ git branch
* doi_branch
  master
  unu_branch
nipons@nipons-X751LA:~/MIDPS$ git reset --hard
HEAD is now at 9bb7250 Text doi branch
```

- merge 2 branches

```
nipons@nipons-X751LA:~/MIDPS$ echo "drive = true" >> my.txt
nipons@nipons-X751LA:~/MIDPS$ git add . && git commit -m "my"
[doi_branch a668295] my
 1 file changed, 1 insertion(+)
nipons@nipons-X751LA:~/MIDPS$ git checkout unu_branch
Перешел к ветке 'unu_branch'
nipons@nipons-X751LA:~/MIDPS$ ls
abc.txt  Hello  newRep  unu_branch.txt
nipons@nipons-X751LA:~/MIDPS$ echo "drive = false" >> my.txt
nipons@nipons-X751LA:~/MIDPS$ ls
abc.txt  Hello  my.txt  newRep  unu_branch.txt
nipons@nipons-X751LA:~/MIDPS$ git add . && git commit -m "my"
[unu_branch c84f981] my
 1 file changed, 1 insertion(+)
 create mode 100644 my.txt
nipons@nipons-X751LA:~/MIDPS$ git checkout master
Перешел к ветке 'master'
nipons@nipons-X751LA:~/MIDPS$ git merge unu_branch
Обновление eb78559..c84f981
Fast-forward
 my.txt           | 1 +
 unu_branch.txt | 1 +
 2 files changed, 2 insertions(+)
 create mode 100644 my.txt
 create mode 100644 unu_branch.txt
nipons@nipons-X751LA:~/MIDPS$ git merge doi_branch
Автоматическое слияние my.txt
КОНФЛИКТ (добавить): Конфликт слияния в my.txt
Automatic merge failed; fix conflicts and then commit the result.
nipons@nipons-X751LA:~/MIDPS$ 
```

Concluzie

În urma realizării laboratorului nr.2 la tema: ”Version Control Systems si modul de setare a unui server”, am însuşit modul de utilizare a CLI, de administrarea remote a maşinilor linux machine folosind SSH.

Am efectuat conexiunea la un remote server folosind SSH (drept server remote, am folosit o maşină virtuală). În continuare compilând programele din lista dată şi efectuând primul commit, folosind VCS.

Am creat 2 branch-uri(unu_branch si doi_branch) asupra cărora am efectuat un commit din nou.

La fel am creat un script ”**mainf.py**”¸prin intermediul căruia am compilat HelloWolrdPrograms projects din lista dată: c, cpp, java, pyton, ruby.

În timpul efectuării laboratorului am lucrat cu comenzi ca :

git init, git status, git add, git branch, git checkout, git commit, git config etc.