

Facultatea Calculatoare, Informatica si Microelectronica
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Medii Interactive de Dezvoltare a Produselor Soft

Lucrarea de laborator#2

Version Control Systems si modul de setare a unui server

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Version Control Systems si modul de setare a unui server

Prerequisites:

IDEs: Command Line Interface (CLI) | CLI Editors - nano, vim, emacs

Limbaje de programare: bash, C/C++

Frameworks:

Technologii: Version Control Systems | The power of vim

Timp: 4-8 ore

Obiective:

Intelegerea si folosirea CLI (basic level)

Administrarea remote a masinilor linux machine folosind SSH (remote code editing)

Version Control Systems (git || bitbucket || mercurial || svn)

Compileaza codul C/C++/Java/Python prin intermediul CLI, folosind compilatoarele gcc/g++/javac/python

Conditii Generale:

Se considera ca ai trecut cu succes laboratorul daca ai urmat toti pasii din:

[Submission Process](#)

Technical Prerequisites:

Conexiunea la un remote server folosind SSH (Drept server remote, poate fi folosit atit un server real, cit si o masina virtuala *virtual machine*)

VCS pe remote server

CLI text editor (vi, vim, emacs or nano) cu pluginurile necesare (if necessary)

Compilers/interpreters necesare pe remote server (gcc, g++, openJDK, python, ruby)

Laboratory Requirements: Trebuie folosit drept VSC [github](#) sau [bitbucket](#)

3 Laboratory work implementation

Создание открытого SSH-ключа

```
$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/c/Users/Admin/.ssh/id_rsa):
Created directory '/c/Users/Admin/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /c/Users/Admin/.ssh/id_rsa.
Your public key has been saved in /c/Users/Admin/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:0HYfIODGifNfulR+iCNbhb/G6fJLneHYDoJZW6fSL7g Admin@DESKTOP-ADJRK00
The key's randomart image is:
+----[RSA 2048]-----+
|
|  . . .
| + o . .
| o = o . .
| + o o . .
| . S = +
| = % O o
| + @oX. *
| =o*=*
| . E*=oo
+-----[SHA256]-----+
```

Теперь ключ следует отослать администратору Git-сервера. Для этого нужно скопировать содержимое файла .pub и отправить его по электронной почте.

```
Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interacti
$ ls ~/.ssh/
id_rsa id_rsa.pub

Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interacti
$ cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQACvdQSTHH++CY7wByu1XNzG/BYhvnfwsRyso1
Y21+1EXB6QFhOGVjh1DvAMMrVknCyZHhpZRgu+UJYDTVXemwGAuQ+KPTFzIH09KUwYRN2qYH18

Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interacti
$ cat ~/.ssh/id_rsa
-----BEGIN RSA PRIVATE KEY-----
MIIIEowIBAAKCAQEAr3UEkxx/vgm08AcrpVzcxcvwIb538LEcrKNRwSTNDB0eZqvW
K7e7Kwrn0jLEpiGjU4tTKjW0RjHn077721cKDyaXyynoFpYa0ou1ARi7WPN3P0AU
kIcYv8d+7qEPsRhgUHeHV1XngW6XUAJNvn1jK57VGyVjd/iCFd/xHPm+/01I3dbh
60dFxKi8X2NtFtRFwekBYTh1Y4dQ7wDDK1ZJ3MmR4aWUyLVlCWAO1V3psBgLkPi
j0xscyB6PS1MGEdqmB9f0i7GRyCyiz0ETem0Ve1YzXnzWcbP7eCvnZ1CyQ31Tg38
a1MUguGkGVkaN+zuE8qJ4RKfZz486ZC5BeJ8NwIDAQABAoIBACuZ6r8cd+qLuYeQ
YJpBT2PrdRyB1pCrkrKcC07zEoBzx6NABILsr4hst1sw3qNiLJIwR0Rv9qEe+bs2
9KN3J7rIHMSQT2p9dsDnkt1o5fWe2v100U1xJQdTbgmi4KFjq1uTuIBNirAxaUyq
peM2iZRNbhHG3FEB4mHJ0s021G2IqZbwcpzUUIJmiPoB6LvwIppw6td57UXNU1o5
14/sKJCEoGxlmqRL38YDK9pVCGVvPGiNUPBsvk0qjd4svQFMHV+P+5eZ/cZKrwBE
wy1itqQIJ3vPwyGfIR5e1wsx3r0403Ym03Lln2hhyuXVK8FjF1S6VJgZ0sa0p9CX
w46/qgECyEA6I/qR0b4VfMC03b3ahaUh7+kzMnuJtQQJ5vwcJ3enT5XdVh4kHiI
kkuA9r+Y+V155fms8yGB9vxu2ISG0MDem3GxvZPHTgjeHo0kpGLVMTea8vUDFqWI
wehKzQmtMjaguUsjKRfDcj7wGGx/CpoahPE0iGrEkg4HFUK7A2etYIECgYEAwSPL
8ms/fc/n8PeiK5QyJoz0iAF0aaJb61avGEi1g2GIZZ+kT9KmnMJLCZDwq0RMU869
7Vun5jax7AYMKm2I7CQcQQtjxRLGKFVCu/98McbFLagTNP4UW2zyYVvMh9u+gp8
3TBj0NqDTb+GYSBm+cDBjt0cLXqsqYCs9p+ygLCcGyBY1pkNL1wwIQukUh7DR0rQ
TFgc7sptxLaCLJ3Ft1jRvsRYzDoKHjE1iWgzWg+Kup2VL1hmTheCjP2e8kk5t20S
B8V5ANmywopvJ6SeMy7zhSViyDXUjFGImUjgVmD1/I47Giv0/6gtu0MmYVPKbgHR
ZP7HwdnLVXzVbNw4osFgQKBgQCN+TFFRuUKJ71Yzb/BBxQCcHkVutiAICAvk63s
T05Y4GYyRbK0FqXxD4W3R3sSeocdCB1nFHWmZ2JMnH1u6su+wiDrRnsVj+JoHZyL
s5dow70ICR5iyyJdWt9qWJGreJ3MYc89j0czELV6fnJajUYFC2N9EB45dDbd9r+u
HuBJawKBgCFBQEhrhOgwH1X89wmUM+gwCcxghOEICa0IsBe5MM2N5JGJ8g5o160Y3
qRevq1arDVTTHmBdwBuBwo1Njr8Q0bjKBob5X+Lhu/0AhQ71SVw/YMydg2GQN2dX
S9QCow3arqpwi1uCCfx+zQDWhuboV2W3MT5khHraMGmdwFrF1LQA
-----END RSA PRIVATE KEY-----

Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interacti
$ |
```

Команда git status - определения состояния файлов. Система Git обнаружила папку неотслеживаемых файлов.

```
$ git status
On branch master
Your branch is up-to-date with 'origin/master'.
Untracked files:
  (use "git add <file>..." to include in what will be committed)

    Android/

nothing added to commit but untracked files present (use "git add" to track)
```

Чтобы начать слежение за новым файлом, воспользуйтесь командой git add.

```
$ git add *.*
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/compiler.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/gradle.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/misc.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/modules.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/runConfigurations.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/gradle/wrapper/gradle-wrapper.properties.
The file will have its original line endings in your working directory.
```

Теперь команда status покажет, что эти файлы являются отслеживаемыми и проиндексированными

```
$ git status
On branch master
Your branch is up-to-date with 'origin/master'.
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

    new file:   Android/Lab#5.doc
    new file:   Android/Lab#5.pdf
    new file:   Android/MyApplication2/.gitignore
    new file:   Android/MyApplication2/.idea/compiler.xml
    new file:   Android/MyApplication2/.idea/copyright/profiles_settings.xml
    new file:   Android/MyApplication2/.idea/gradle.xml
    new file:   Android/MyApplication2/.idea/misc.xml
    new file:   Android/MyApplication2/.idea/modules.xml
    new file:   Android/MyApplication2/.idea/runConfigurations.xml
    new file:   Android/MyApplication2/app/.gitignore
    new file:   Android/MyApplication2/app/build.gradle
    new file:   Android/MyApplication2/app/proguard-rules.pro
    new file:   Android/MyApplication2/app/src/androidTest/java/listsorfe/ru/myapplication/ExampleInstru
    new file:   Android/MyApplication2/app/src/main/AndroidManifest.xml
    new file:   Android/MyApplication2/app/src/main/ic_launcher-web.png
    new file:   Android/MyApplication2/app/src/main/java/listsorfe/ru/myapplication/Main2Activity.java
    new file:   Android/MyApplication2/app/src/main/java/listsorfe/ru/myapplication/Main3Activity.java
    new file:   Android/MyApplication2/app/src/main/java/listsorfe/ru/myapplication/MainActivity.java
    new file:   Android/MyApplication2/app/src/main/res/layout/activity_main.xml
    new file:   Android/MyApplication2/app/src/main/res/layout/activity_main2.xml
    new file:   Android/MyApplication2/app/src/main/res/layout/activity_main3.xml
    new file:   Android/MyApplication2/app/src/main/res/mipmap-hdpi/ic_launcher.png
    new file:   Android/MyApplication2/app/src/main/res/mipmap-mdpi/ic_launcher.png
    new file:   Android/MyApplication2/app/src/main/res/mipmap-xhdpi/ic_launcher.png
    new file:   Android/MyApplication2/app/src/main/res/mipmap-xxhdpi/ic_launcher.png
    new file:   Android/MyApplication2/app/src/main/res/values-w820dp/dimens.xml
    new file:   Android/MyApplication2/app/src/main/res/values/colors.xml
    new file:   Android/MyApplication2/app/src/main/res/values/dimens.xml
```

Теперь, когда область индексирования настроена нужным вам образом, можно зафиксировать внесенные туда изменения.

```
$ git commit -m "Android"
[master 5499b3d] Android
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/compiler.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/gradle.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/misc.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/modules.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/.idea/runConfigurations.xml.
The file will have its original line endings in your working directory.
warning: LF will be replaced by CRLF in Android/MyApplication2/gradle/wrapper/gradle-wrapper.properties.
The file will have its original line endings in your working directory.
38 files changed, 627 insertions(+)
create mode 100644 Android/Lab#5.doc
create mode 100644 Android/Lab#5.pdf
create mode 100644 Android/MyApplication2/.gitignore
create mode 100644 Android/MyApplication2/.idea/compiler.xml
create mode 100644 Android/MyApplication2/.idea/copyright/profiles_settings.xml
create mode 100644 Android/MyApplication2/.idea/gradle.xml
create mode 100644 Android/MyApplication2/.idea/misc.xml
create mode 100644 Android/MyApplication2/.idea/modules.xml
create mode 100644 Android/MyApplication2/.idea/runConfigurations.xml
create mode 100644 Android/MyApplication2/app/.gitignore
create mode 100644 Android/MyApplication2/app/build.gradle
create mode 100644 Android/MyApplication2/app/proguard-rules.pro
create mode 100644 Android/MyApplication2/app/src/androidTest/java/listsorfe/ru/myapplication/ExampleInstru
create mode 100644 Android/MyApplication2/app/src/main/AndroidManifest.xml
create mode 100644 Android/MyApplication2/app/src/main/ic_launcher-web.png
create mode 100644 Android/MyApplication2/app/src/main/java/listsorfe/ru/myapplication/Main2Activity.java
create mode 100644 Android/MyApplication2/app/src/main/java/listsorfe/ru/myapplication/Main3Activity.java
create mode 100644 Android/MyApplication2/app/src/main/java/listsorfe/ru/myapplication/MainActivity.java
create mode 100644 Android/MyApplication2/app/src/main/res/layout/activity_main.xml
create mode 100644 Android/MyApplication2/app/src/main/res/layout/activity_main2.xml
create mode 100644 Android/MyApplication2/app/src/main/res/layout/activity_main3.xml
create mode 100644 Android/MyApplication2/app/src/main/res/mipmap-hdpi/ic_launcher.png
create mode 100644 Android/MyApplication2/app/src/main/res/mipmap-mdpi/ic_launcher.png
create mode 100644 Android/MyApplication2/app/src/main/res/mipmap-xhdpi/ic_launcher.png
create mode 100644 Android/MyApplication2/app/src/main/res/mipmap-xxhdpi/ic_launcher.png
create mode 100644 Android/MyApplication2/app/src/main/res/values-w820dp/dimens.xml
create mode 100644 Android/MyApplication2/app/src/main/res/values/colors.xml
create mode 100644 Android/MyApplication2/app/src/main/res/values/dimens.xml
create mode 100644 Android/MyApplication2/app/src/main/res/values/strings.xml
create mode 100644 Android/MyApplication2/app/src/main/res/values/styles.xml
create mode 100644 Android/MyApplication2/app/src/test/java/listsorfe/ru/myapplication/ExampleUnitTest.java
create mode 100644 Android/MyApplication2/build.gradle
create mode 100644 Android/MyApplication2/gradle.properties
create mode 100644 Android/MyApplication2/gradle/wrapper/gradle-wrapper.jar
create mode 100644 Android/MyApplication2/gradle/wrapper/gradle-wrapper.properties
create mode 100644 Android/MyApplication2/gradlew.bat
create mode 100644 Android/MyApplication2/settings.gradle
```

Их нужно отправить в репозиторий. Это делается простой командой `git push`.

```
$ git push
warning: push.default is unset; its implicit value has changed in
Git 2.0 from 'matching' to 'simple'. To squelch this message
and maintain the traditional behavior, use:

  git config --global push.default matching

To squelch this message and adopt the new behavior now, use:

  git config --global push.default simple

When push.default is set to 'matching', git will push local branches
to the remote branches that already exist with the same name.

Since Git 2.0, Git defaults to the more conservative 'simple'
behavior, which only pushes the current branch to the corresponding
remote branch that 'git pull' uses to update the current branch.

See 'git help config' and search for 'push.default' for further information.
(the 'simple' mode was introduced in Git 1.7.11. Use the similar mode
'current' instead of 'simple' if you sometimes use older versions of Git)

Counting objects: 72, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (50/50), done.
Writing objects: 100% (72/72), 1.54 MiB | 250.00 KiB/s, done.
Total 72 (delta 3), reused 0 (delta 0)
remote: Resolving deltas: 100% (3/3), done.
To git@github.com:EfrosEugeniu/MIDP5.git
 594443f..5499b3d master -> master
```

Команда `git branch` запущенная без аргументов выводит на экран список имеющихся веток.

Я создаю ветку `test`. Эта операция выполняется командой `git branch test`.

```
Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interactive de dezvoltare a produselor s
$ git branch
* master

Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interactive de dezvoltare a produselor s
$ git branch test

Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interactive de dezvoltare a produselor s
$ git branch
* master
  test
```

Узнаю, куда именно нацелен указатель веток, что позволяет команда `git log` с параметром `--decorate`.

Указатель `HEAD` нацелен на ветку `master`.

```
Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interactive de dezvoltare a produselor soft/MDIP (master)
$ git log --decorate
commit 5499b3d2a3931b47809b0854d4c39ca1882b2f80 (HEAD -> master, origin/master, test)
Author: Efros Eugeniu <sorfe@list.ru>
Date: Tue Jan 3 17:09:53 2017 +0200

    Android

commit 594443fc374c4feb145fa31a2fef1f30e560224a
Author: Efros Eugeniu <sorfe@list.ru>
Date: Mon Jan 2 16:57:51 2017 +0200

    Prim adaug

commit 6beb23947d4daca53794308c6a4c8c92dfff4ee2
Author: Efros Eugeniu <sorfe@list.ru>
Date: Sun Dec 25 15:52:00 2016 +0200

    First commit
```

Переход на существующую ветку реализует команда `git checkout`. Перейдем на ветку `test`. Указатель `HEAD` нацелен на ветку `test`.

```
Admin@DESKTOP-ADJRK00 MINGW64 /е/Книги Частное Програм/3_6 Medii interactive de dezvoltare a pro
$ git checkout test
Switched to branch 'test'

Admin@DESKTOP-ADJRK00 MINGW64 /е/Книги Частное Програм/3_6 Medii interactive de dezvoltare a pro
$ git log --decorate
commit 5499b3d2a3931b47809b0854d4c39ca1882b2f80 (HEAD -> test, origin/master, master)
Author: Efros Eugeniu <sorfe@list.ru>
Date: Tue Jan 3 17:09:53 2017 +0200

    Android

commit 594443fc374c4feb145fa31a2fef1f30e560224a
Author: Efros Eugeniu <sorfe@list.ru>
Date: Mon Jan 2 16:57:51 2017 +0200

    Prim adaug

commit 6beb23947d4daca53794308c6a4c8c92dfff4ee2
Author: Efros Eugeniu <sorfe@list.ru>
Date: Sun Dec 25 15:52:00 2016 +0200

    First commit
```

Создаю изменения в одном из файлов :

```
Admin@DESKTOP-ADJRK00 MINGW64 /е/Книги Частное Програм/3_6 Medii interactive de dezvoltare
$ git status
On branch test
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   HTML/style.css

Untracked files:
  (use "git add <file>..." to include in what will be committed)

        Android/MyApplication2/gradlew

no changes added to commit (use "git add" and/or "git commit -a")
```

Теперь команда `status` покажет, что этот файл является отслеживаемым и проиндексированным.

```
Admin@DESKTOP-ADJRK00 MINGW64 /е/Книги Частное Програм/3_6 Medii interactive de dezvoltare
$ git add *.*
warning: LF will be replaced by CRLF in HTML/style.css.
The file will have its original line endings in your working directory.

Admin@DESKTOP-ADJRK00 MINGW64 /е/Книги Частное Програм/3_6 Medii interactive de dezvoltare
$ git status
warning: LF will be replaced by CRLF in HTML/style.css.
The file will have its original line endings in your working directory.
On branch test
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   HTML/style.css

Untracked files:
  (use "git add <file>..." to include in what will be committed)

        Android/MyApplication2/gradlew
```


Переход на существующую ветку реализует команда `git checkout`. Перейдем на ветку `master`

Указатель `HEAD` нацелен на ветку `master`.

```
Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interactive de dezvoltare
$ git checkout master
M      HTML/style.css
Switched to branch 'master'
Your branch is up-to-date with 'origin/master'.

Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interactive de dezvoltare
$ git log --decorate
commit 5499b3d2a3931b47809b0854d4c39ca1882b2f80 (HEAD -> master, origin/master, test)
Author: Efros Eugeniu <sorfe@list.ru>
Date:   Tue Jan 3 17:09:53 2017 +0200

    Android

commit 594443fc374c4feb145fa31a2fef1f30e560224a
Author: Efros Eugeniu <sorfe@list.ru>
Date:   Mon Jan 2 16:57:51 2017 +0200

    Prim adaug

commit 6beb23947d4daca53794308c6a4c8c92dfff4ee2
Author: Efros Eugeniu <sorfe@list.ru>
Date:   Sun Dec 25 15:52:00 2016 +0200

    First commit
```

ВЫПОЛНИМ СЛИЯНИЕ С ВЕТКОЙ `test`.

```
Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interactive de dezvoltare
$ git merge test
Updating 5499b3d..5022dc1
Fast-forward
 HTML/style.css | 2 +-
 1 file changed, 1 insertion(+), 1 deletion(-)

Admin@DESKTOP-ADJRK00 MINGW64 /e/Книги Частное Програм/3_6 Medii interactive de dezvoltare
$ git status
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)

Untracked files:
  (use "git add <file>..." to include in what will be committed)

    Android/MyApplication2/gradlew

nothing added to commit but untracked files present (use "git add" to track)
```

Concluzie

В данной лабораторной работе были изучены методы работы с системой `Git`.