

Working Remotely with GIT

Find a repository

1. Find a repository online
2. Use <https://github.com/github/VisualStudio.git>
3. Use your created repository

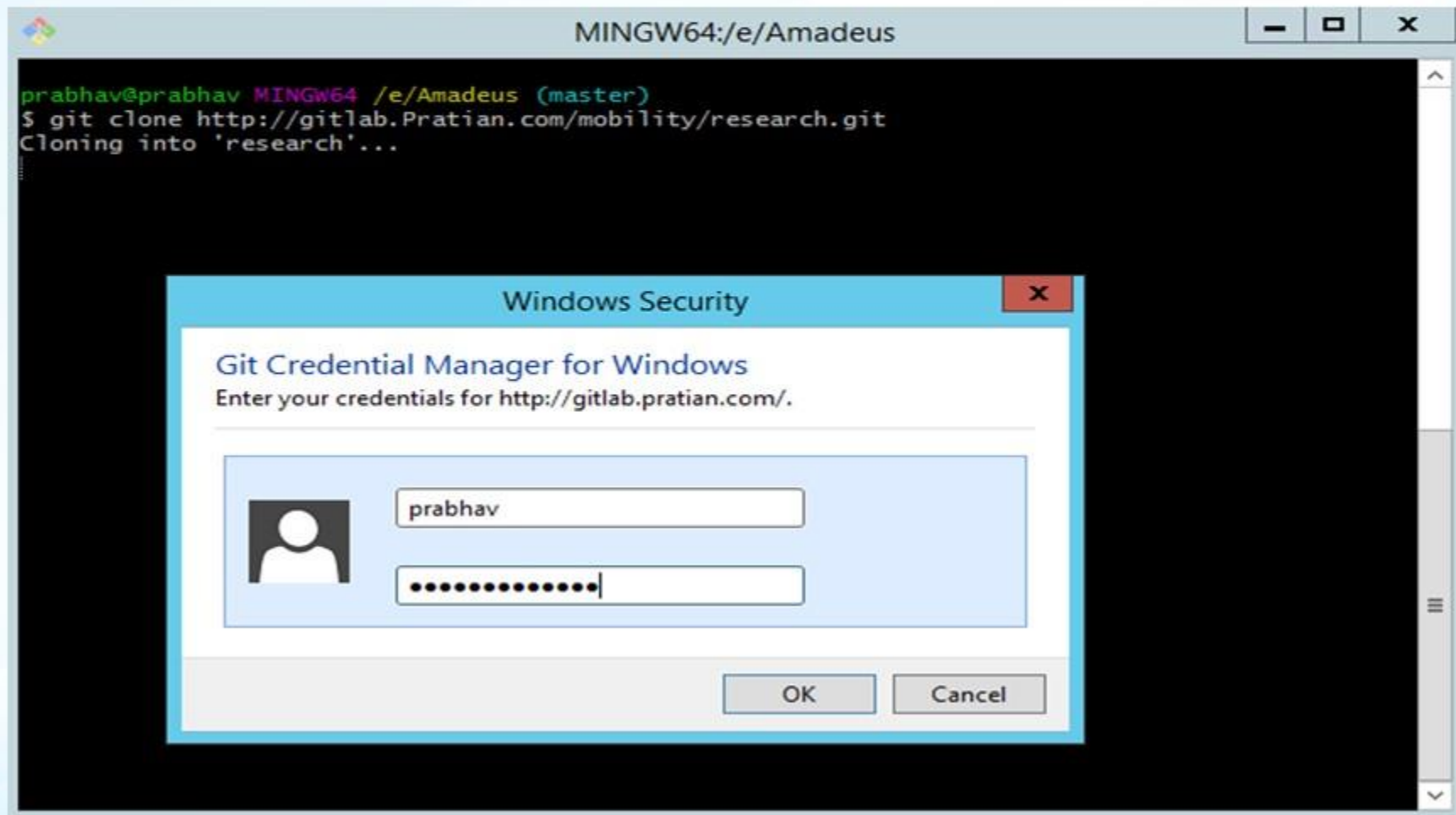
Clone a Remote Repository

```
git clone https://github.com/github/visualstudio.git
```

```
Prabhav.Agrawal@PT-PTL-001 MINGW64 ~/Desktop/Amadeus (master)
$ git clone git@gitlab.prabhav.com:root/Amadeus.git
Cloning into 'Amadeus'...
The authenticity of host 'gitlab.prabhav.com (172.30.11.237)' can't be established.
ECDSA key fingerprint is SHA256:BadczzXYJsqdVNmgn0Qi2DG+rAM+PVnXp67qQ3Htw2Y.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'gitlab.prabhav.com' (ECDSA) to the list of known hosts.
Enter passphrase for key '/c/Users/prabhav.agrawal/.ssh/id_rsa':
remote: Counting objects: 3, done.
remote: Total 3 (delta 0), reused 0 (delta 0)
Receiving objects: 100% (3/3), done.

Prabhav.Agrawal@PT-PTL-001 MINGW64 ~/Desktop/Amadeus
$ |
```

Cloning a Remote Repository



Cloning a Remote Repository

MINGW64:/e/Amadeus

```
prabhav@prabhav MINGW64 /e/Amadeus (master)
$ git clone http://gitlab.Pratian.com/mobility/research.git
Cloning into 'research'...
remote: Counting objects: 1837, done.
remote: Compressing objects: 100% (987/987), done.
remote: Total 1837 (delta 734), reused 1765 (delta 671)
Receiving objects: 100% (1837/1837), 35.76 MiB | 9.47 MiB/s, done.
Resolving deltas: 100% (734/734), done.
Checking out files: 100% (834/834), done.
```

```
prabhav@prabhav MINGW64 /e/Amadeus (master)
$
```

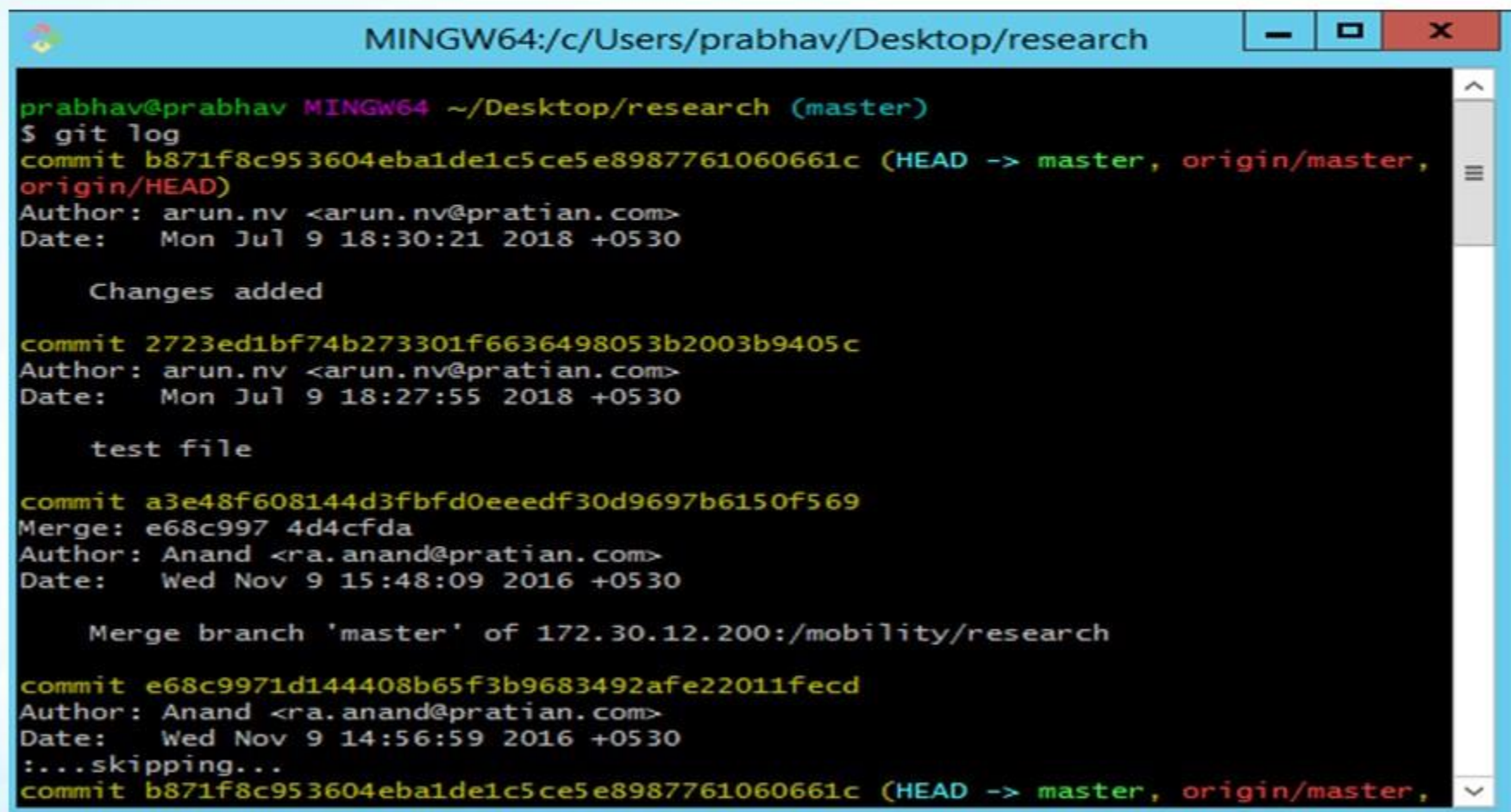

See Repository Statistics

- Let's see the logs
 - `git log`
- See the commits in online
 - `git log --oneline`
- See total number of commits
 - `git log --oneline | wc -l`
- See different branches and merges logs
 - `git log --oneline --graph`
- Get logs in short format
 - `Git log --format=short`
 - `Git shortlog`
 - Both of these will give the same output, i.e. the list of authors who has made the commit with commit messages and number of commits
- Let's see summary of number of commits by each author
- `Git shortlog -sne`

See Repository Statistics

- -n
- --numbered
- Sort output according to the number of commits per author instead of author alphabetic order.
- -s
- --summary
- Suppress commit description and provide a commit count summary only.
- -e
- --email
- Show the email address of each author.

See Repository Statistics



A screenshot of a Windows command prompt window titled "MINGW64:/c/Users/prabhav/Desktop/research". The window shows the output of the command "git log". The output displays a list of commits, including their hashes, branch information, author names, email addresses, and dates. The commits are listed in reverse chronological order. The first commit is "b871f8c953604eba1de1c5ce5e8987761060661c" by "arun.nv" on "Mon Jul 9 18:30:21 2018". The second commit is "2723ed1bf74b273301f6636498053b2003b9405c" by "arun.nv" on "Mon Jul 9 18:27:55 2018". The third commit is "a3e48f608144d3fbfd0eeedf30d9697b6150f569" by "Anand" on "Wed Nov 9 15:48:09 2016". The fourth commit is "e68c9971d144408b65f3b9683492afe22011fec" by "Anand" on "Wed Nov 9 14:56:59 2016". The output also includes a "Merge branch 'master' of 172.30.12.200:/mobility/research" message and a "test file" entry. The window has a standard Windows title bar with minimize, maximize, and close buttons.

```
prabhav@prabhav MINGW64 ~/Desktop/research (master)
$ git log
commit b871f8c953604eba1de1c5ce5e8987761060661c (HEAD -> master, origin/master,
origin/HEAD)
Author: arun.nv <arun.nv@pratian.com>
Date: Mon Jul 9 18:30:21 2018 +0530

    Changes added

commit 2723ed1bf74b273301f6636498053b2003b9405c
Author: arun.nv <arun.nv@pratian.com>
Date: Mon Jul 9 18:27:55 2018 +0530

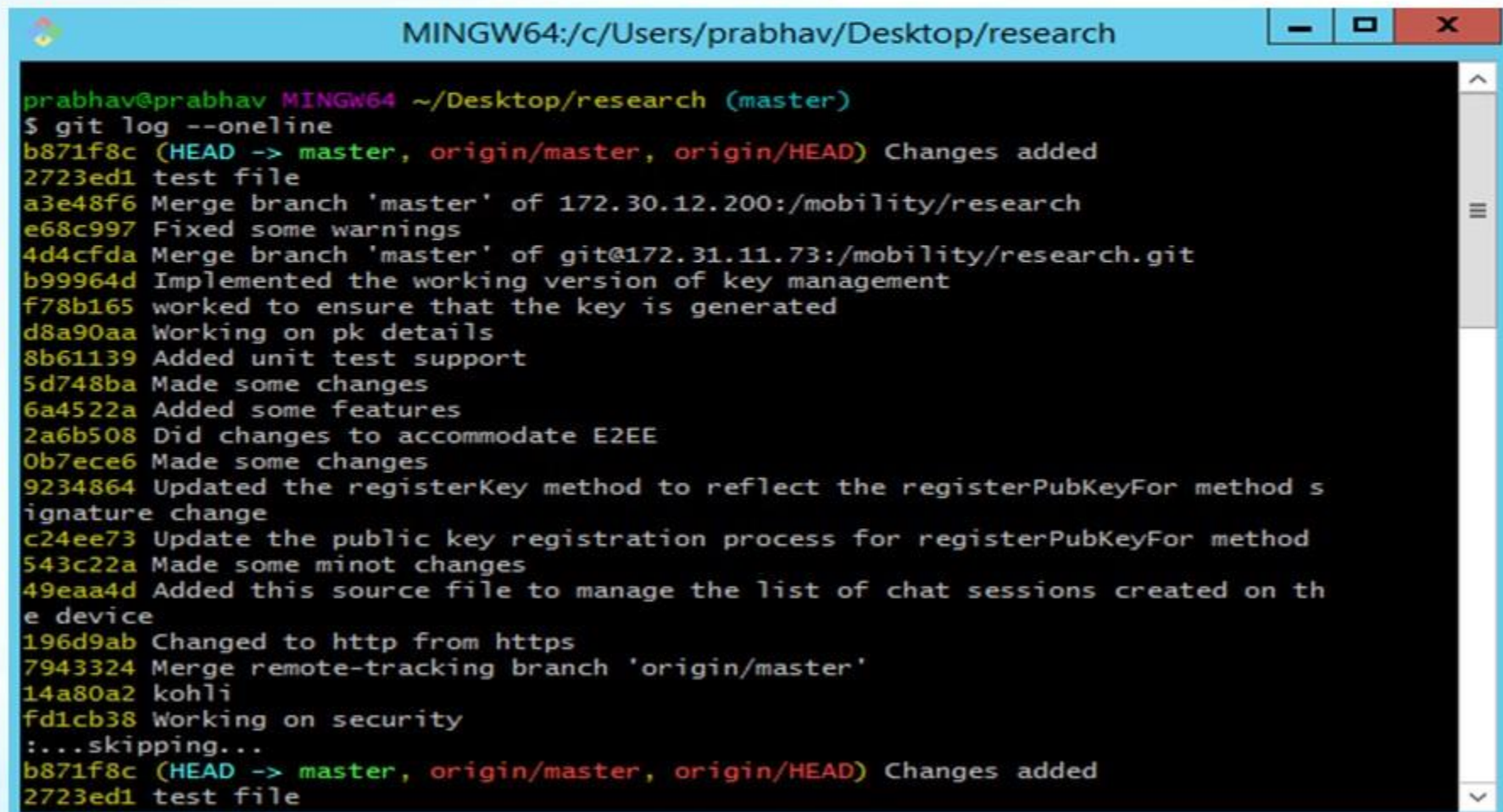
    test file

commit a3e48f608144d3fbfd0eeedf30d9697b6150f569
Merge: e68c997 4d4cfda
Author: Anand <ra.anand@pratian.com>
Date: Wed Nov 9 15:48:09 2016 +0530

    Merge branch 'master' of 172.30.12.200:/mobility/research

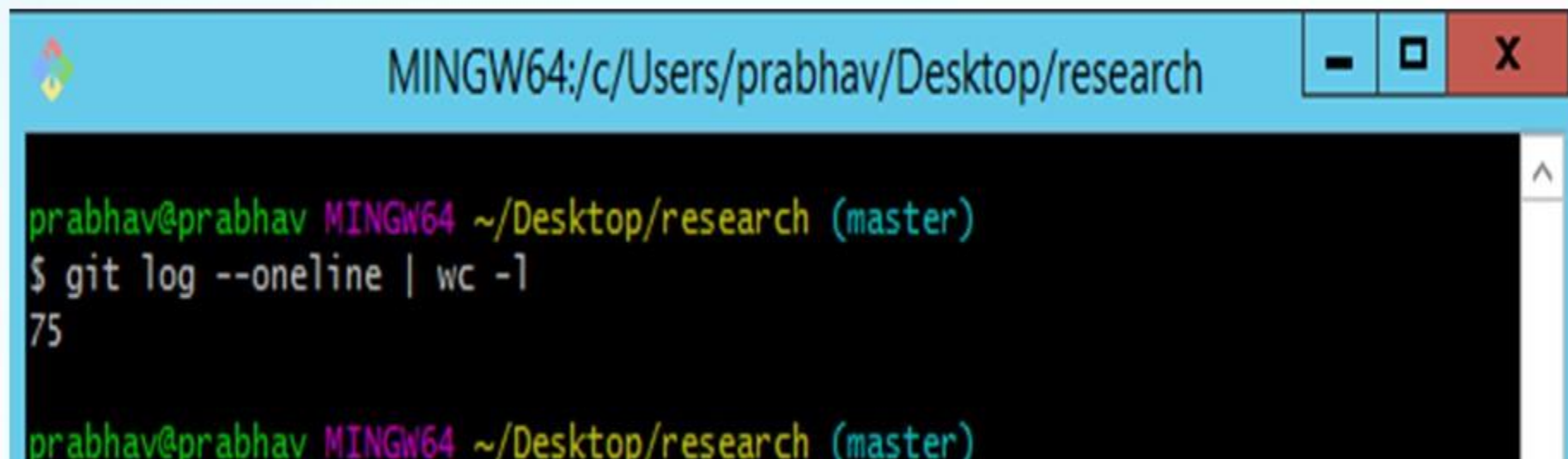
commit e68c9971d144408b65f3b9683492afe22011fec
Author: Anand <ra.anand@pratian.com>
Date: Wed Nov 9 14:56:59 2016 +0530
:...skipping...
commit b871f8c953604eba1de1c5ce5e8987761060661c (HEAD -> master, origin/master,
```


See Repository Statistics



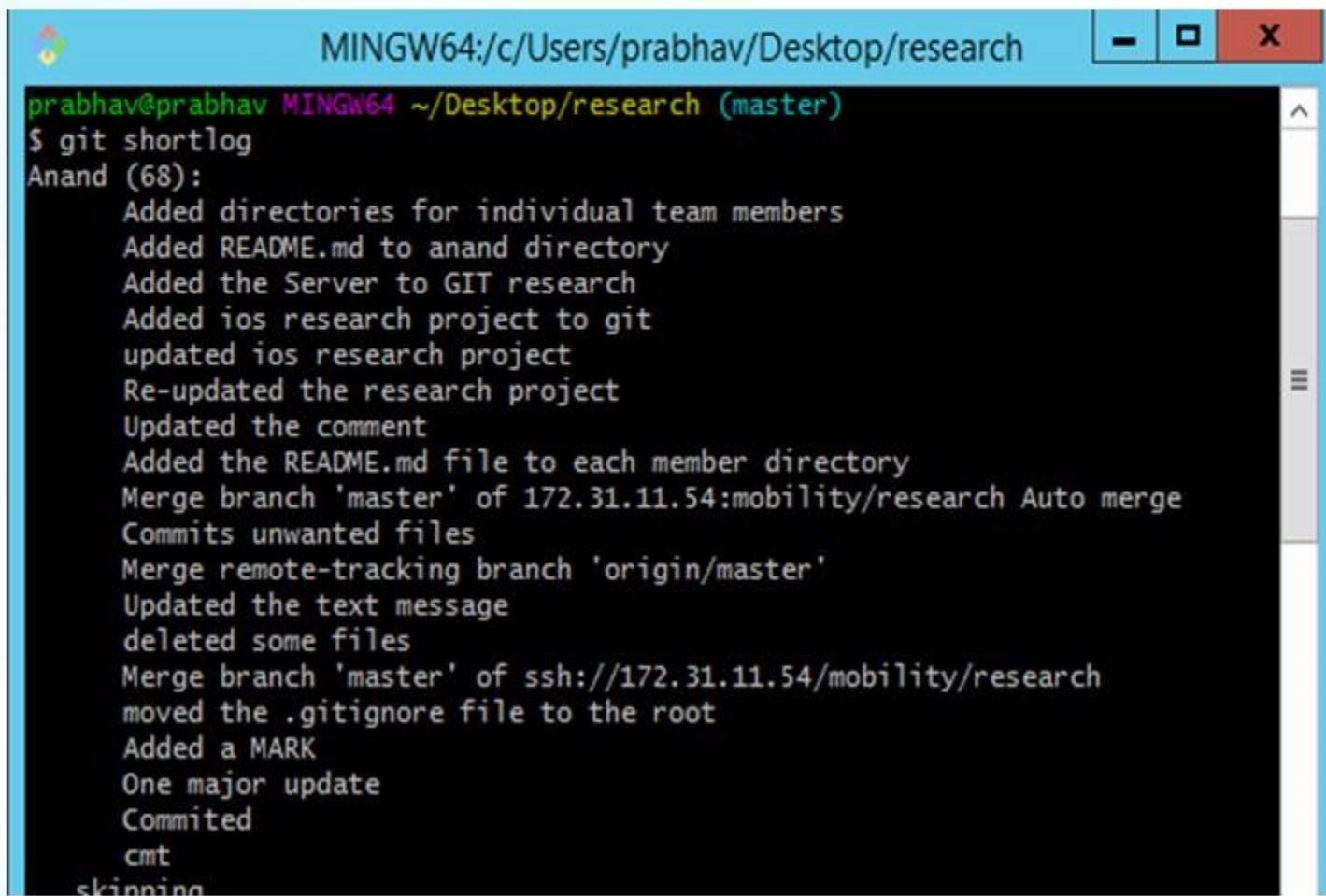
```
prabhav@prabhav MINGW64 ~/Desktop/research (master)
$ git log --oneline
b871f8c (HEAD -> master, origin/master, origin/HEAD) Changes added
2723ed1 test file
a3e48f6 Merge branch 'master' of 172.30.12.200:/mobility/research
e68c997 Fixed some warnings
4d4cfda Merge branch 'master' of git@172.31.11.73:/mobility/research.git
b99964d Implemented the working version of key management
f78b165 worked to ensure that the key is generated
d8a90aa Working on pk details
8b61139 Added unit test support
5d748ba Made some changes
6a4522a Added some features
2a6b508 Did changes to accommodate E2EE
0b7ece6 Made some changes
9234864 Updated the registerKey method to reflect the registerPubKeyFor method s
ignature change
c24ee73 Update the public key registration process for registerPubKeyFor method
543c22a Made some minor changes
49eaa4d Added this source file to manage the list of chat sessions created on th
e device
196d9ab Changed to http from https
7943324 Merge remote-tracking branch 'origin/master'
14a80a2 kohli
fd1cb38 Working on security
:...skipping...
b871f8c (HEAD -> master, origin/master, origin/HEAD) Changes added
2723ed1 test file
```

See Repository Statistics



```
prabhav@prabhav MINGW64 ~/Desktop/research (master)
$ git log --oneline | wc -l
75
prabhav@prabhav MINGW64 ~/Desktop/research (master)
```

See Repository Statistics



```
MINGW64:/c/Users/prabhav/Desktop/research
prabhav@prabhav MINGW64 ~/Desktop/research (master)
$ git shortlog
Anand (68):
    Added directories for individual team members
    Added README.md to anand directory
    Added the Server to GIT research
    Added ios research project to git
    updated ios research project
    Re-updated the research project
    Updated the comment
    Added the README.md file to each member directory
    Merge branch 'master' of 172.31.11.54:mobility/research Auto merge
    Commits unwanted files
    Merge remote-tracking branch 'origin/master'
    Updated the text message
    deleted some files
    Merge branch 'master' of ssh://172.31.11.54/mobility/research
    moved the .gitignore file to the root
    Added a MARK
    One major update
    Committed
    cmt
    skipping
```


See Repository Statistics

MINGW64:/c/Users/prabhav/Desktop/research

```
prabhav@prabhav MINGW64 ~/Desktop/research (master)
$ git shortlog -sne
68  Anand <ra.anand@pratian.com>
 2  Pratian GIT Administrator <gitadmin@pratian.com>
 2  arun.nv <arun.nv@pratian.com>
 2  skillassure <skillassure@192.168.0.177>
 1  Preeti <preeti.diwakar@pratian.com>
```

```
prabhav@prabhav MINGW64 ~/Desktop/research (master)
```

GitHub Graph

- GitHub provides number of statistics for us.
- Go to the repository
- Click on Graphs
- You will be able to see a lot of graphs based on contributors, code frequency, commit activity, etc.
- Click on Contributors
- Here you will be able to see Contributors graph.

Viewing Commits

- Let's see what was the last commit made
 - `git show HEAD`
 - `git log`
- See any specific commit
 - `Git show <number>`
- See the remote fetch and push URL
 - `Git remote -v`
 - V stands for verbose
- See the URLs, Do they look similar?
- These can actually be different. (e.g.)
 - Suppose you want to fetch from an https URL
 - But you want to push changes to ssh URL

Git Protocols

- **HTTP(S)**

- `https://github.com/jquery/jquery.git`
- 80/443
- Allows read/write or both access
- May or may not need password for auth
- These URLs are usually firewall friendly

- **git**

- `git://github.com/jquery/jquery.git`
- 9418
- Read only URL
- Allows only anonymous access
- These URLs are not firewall friendly

Git Protocols

- **ssh**
 - `git@github.com:jquery/jquery.git`
 - 22
 - Allows read/write or both access
 - Uses ssh key for auth
- **File**
 - `/Prabhav/code/jquery`
 - No protocols
 - Allows read/write or both access

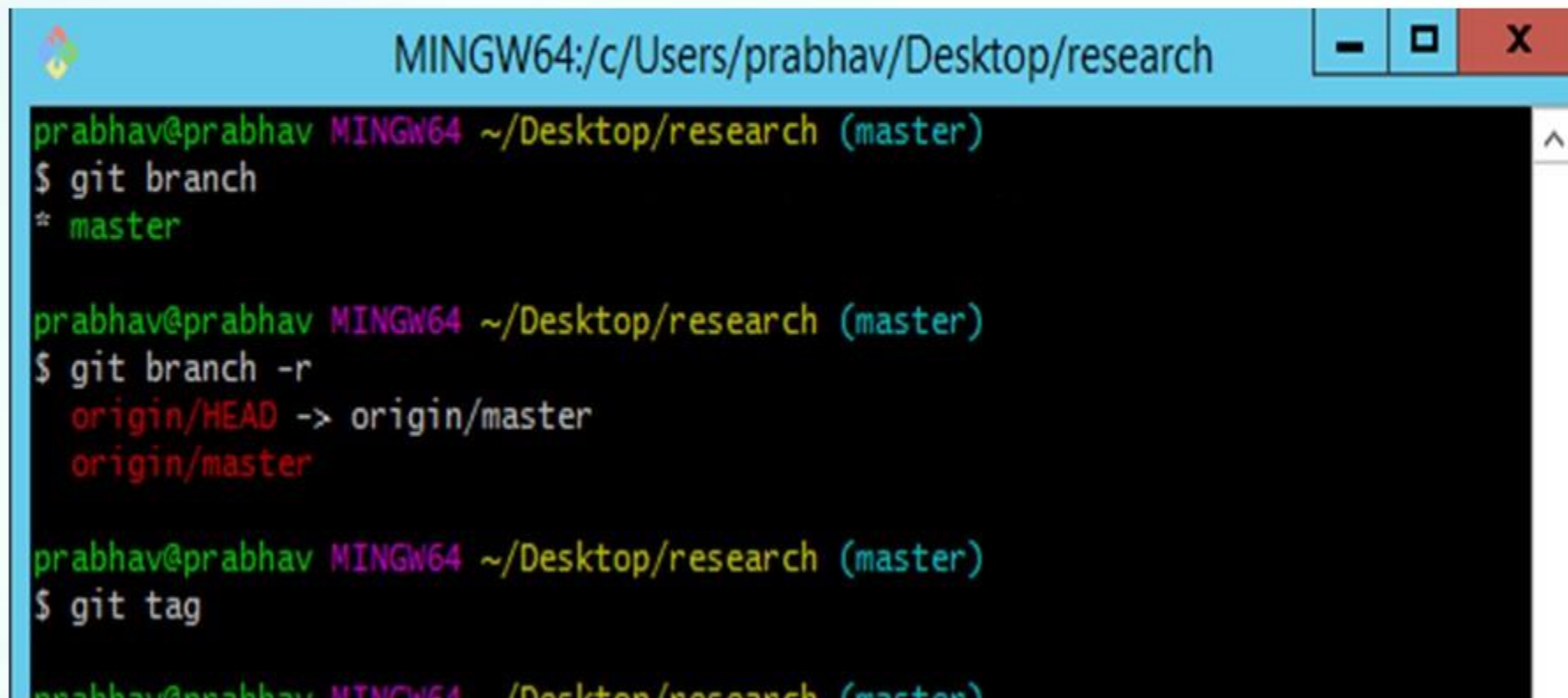
Git Config

- **Go to your Git Project directory.**
- `ls -a`
 - You will see `.git` directory.
- Inside `.git` directory you will be able to see config file
- `cat .git/config`
- Here you will be able to see a variety of configuration like URL, branch, etc.

Viewing Branches and Tags

- **See a local branch**
 - `git branch`
- **See remote branches**
 - `Git branch -r`
- **See tags**
 - `Git tag`

Viewing Branches and Tags



```
prabhav@prabhav MINGW64 ~/Desktop/research (master)
$ git branch
* master

prabhav@prabhav MINGW64 ~/Desktop/research (master)
$ git branch -r
origin/HEAD -> origin/master
origin/master

prabhav@prabhav MINGW64 ~/Desktop/research (master)
$ git tag

prabhav@prabhav MINGW64 ~/Desktop/research (master)
```

Fetching from a Remote

Now fork a repository in your GitHub Account.

Go to the folder which we used in “working locally with GIT session”

- **Add a remote destination to a local repository**
 - `git remote add origin <Repository URL>`
 - Add the http URL. Later we will see the ssh
- **Pull down any changes from remote repository**
 - `Git fetch`
- **See logs**
 - `git log`
 - You will see there is no changes incorporated
- **See remote logs**
 - `git log origin/master`
 - You will see that logs are there which are not merged with you working copy
- **Merge from origin master into my current branch**
 - `Git merge origin/master`

Fetching from a Remote

```
MINGW64:/e/Git

prabhav@prabhav MINGW64 /e/Git (master)
$ git remote -v

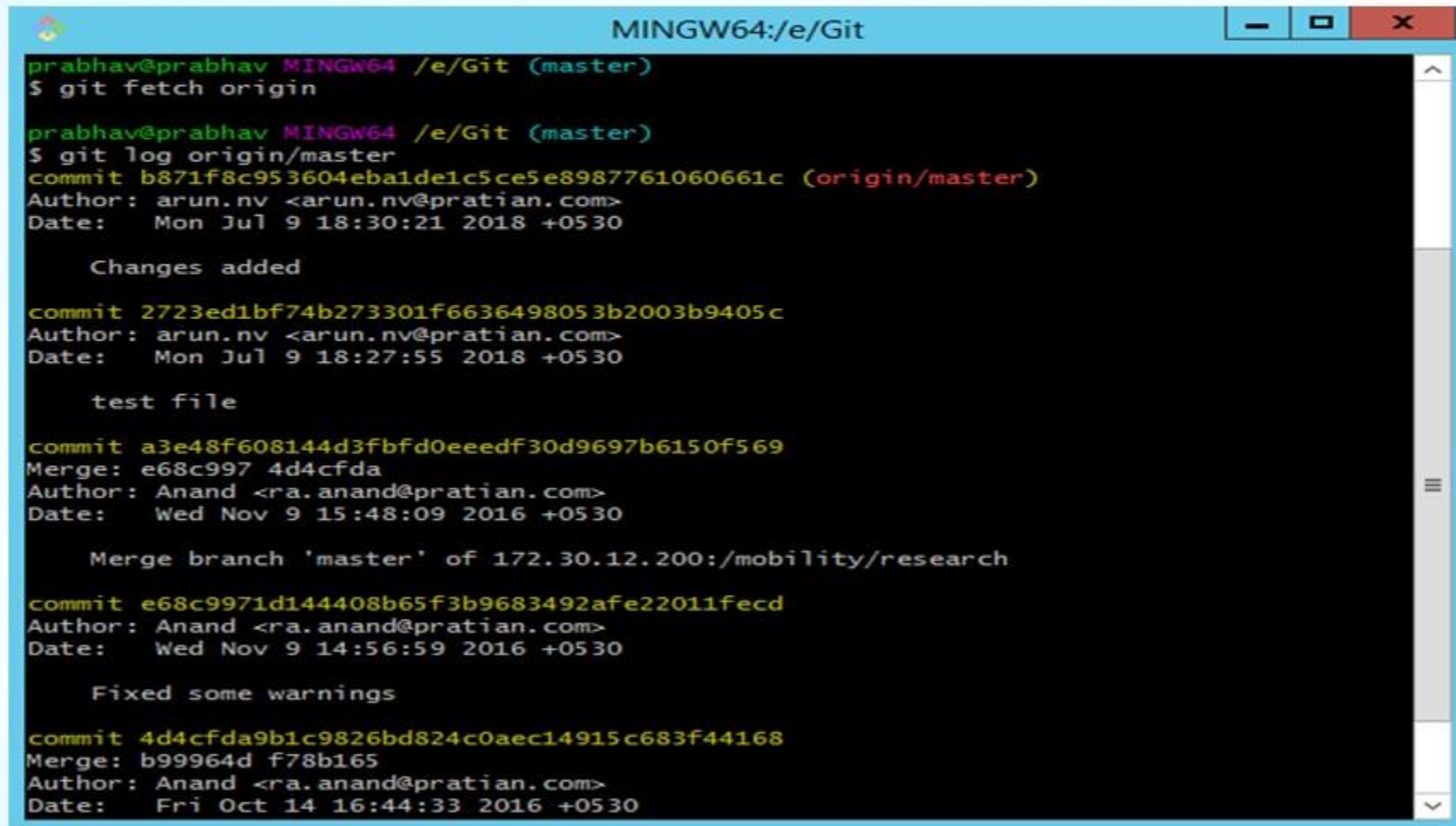
prabhav@prabhav MINGW64 /e/Git (master)
$ git remote add origin git@gitlab.Pratian.com:mobility/research.git

prabhav@prabhav MINGW64 /e/Git (master)
$ git remote -v
origin  git@gitlab.Pratian.com:mobility/research.git (fetch)
origin  git@gitlab.Pratian.com:mobility/research.git (push)

prabhav@prabhav MINGW64 /e/Git (master)
$ git fetch
The authenticity of host 'gitlab.pratian.com (172.30.11.225)' can't be established.
ECDSA key fingerprint is SHA256:QccGryoyLl5f+pJnpdptMOgj5Gl/Dd8Ez040Jl54X4Q.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'gitlab.pratian.com,172.30.11.225' (ECDSA) to the list of known hosts.
remote: Counting objects: 1837, done.
remote: Compressing objects: 100% (987/987), done.
remote: Total 1837 (delta 734), reused 1765 (delta 671)
Receiving objects: 100% (1837/1837), 35.76 MiB | 9.46 MiB/s, done.
Resolving deltas: 100% (734/734), done.
From gitlab.Pratian.com:mobility/research
* [new branch]      master      -> origin/master

prabhav@prabhav MINGW64 /e/Git (master)
```


Fetching from a Remote



A terminal window titled "MINGW64:/e/Git" with standard Windows window controls. The terminal shows a series of Git commands and their outputs. The user runs 'git fetch origin', then 'git log origin/master'. The log output shows three commits: one from 'arun.nv' (origin/master), one from 'arun.nv' (test file), and one from 'Anand' (Merge branch 'master' of 172.30.12.200:/mobility/research). The user then runs 'git log origin/master' again, showing the same three commits. Finally, the user runs 'git fetch origin', showing the same three commits. The terminal text is as follows:

```
prabhav@prabhav MINGW64 /e/Git (master)
$ git fetch origin

prabhav@prabhav MINGW64 /e/Git (master)
$ git log origin/master
commit b871f8c953604eba1de1c5ce5e8987761060661c (origin/master)
Author: arun.nv <arun.nv@pratian.com>
Date: Mon Jul 9 18:30:21 2018 +0530

    Changes added

commit 2723ed1bf74b273301f6636498053b2003b9405c
Author: arun.nv <arun.nv@pratian.com>
Date: Mon Jul 9 18:27:55 2018 +0530

    test file

commit a3e48f608144d3fbfd0eeedf30d9697b6150f569
Merge: e68c997 4d4cfda
Author: Anand <ra.anand@pratian.com>
Date: Wed Nov 9 15:48:09 2016 +0530

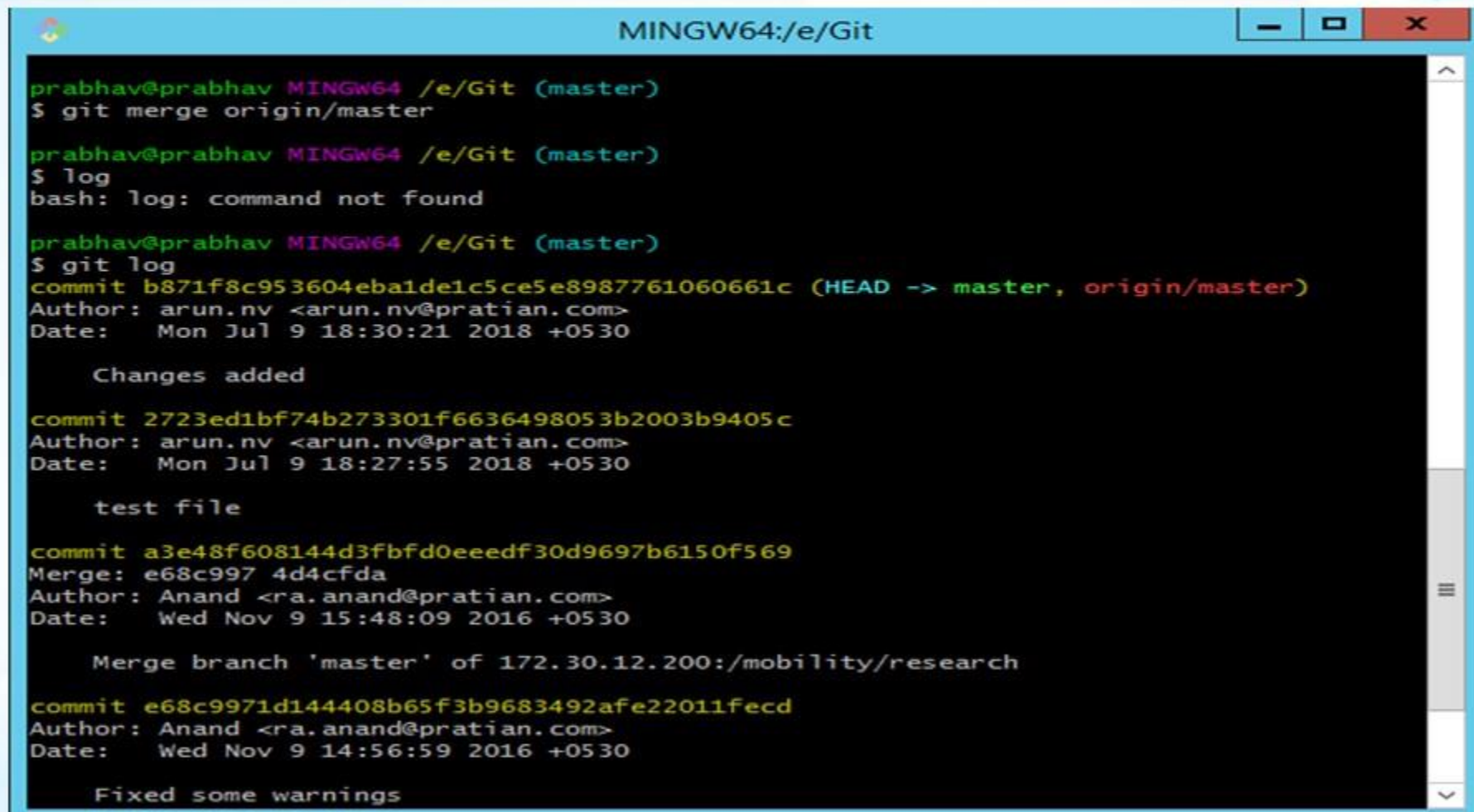
    Merge branch 'master' of 172.30.12.200:/mobility/research

commit e68c9971d144408b65f3b9683492afe22011fecb
Author: Anand <ra.anand@pratian.com>
Date: Wed Nov 9 14:56:59 2016 +0530

    Fixed some warnings

commit 4d4cfda9b1c9826bd824c0aec14915c683f44168
Merge: b99964d f78b165
Author: Anand <ra.anand@pratian.com>
Date: Fri Oct 14 16:44:33 2016 +0530
```

Fetching from a Remote



A terminal window titled "MINGW64:/e/Git" with standard Windows window controls. The terminal shows a series of Git commands and their outputs. The user runs 'git merge origin/master', then 'git log'. The log output shows three commits: a merge commit from HEAD to master, a commit by arun.nv, and a commit by Anand. The window has a scrollbar on the right and a small icon in the top-left corner.

```
prabhav@prabhav MINGW64 /e/Git (master)
$ git merge origin/master

prabhav@prabhav MINGW64 /e/Git (master)
$ log
bash: log: command not found

prabhav@prabhav MINGW64 /e/Git (master)
$ git log
commit b871f8c953604eba1de1c5ce5e8987761060661c (HEAD -> master, origin/master)
Author: arun.nv <arun.nv@pratian.com>
Date: Mon Jul 9 18:30:21 2018 +0530

    Changes added

commit 2723ed1bf74b273301f6636498053b2003b9405c
Author: arun.nv <arun.nv@pratian.com>
Date: Mon Jul 9 18:27:55 2018 +0530

    test file

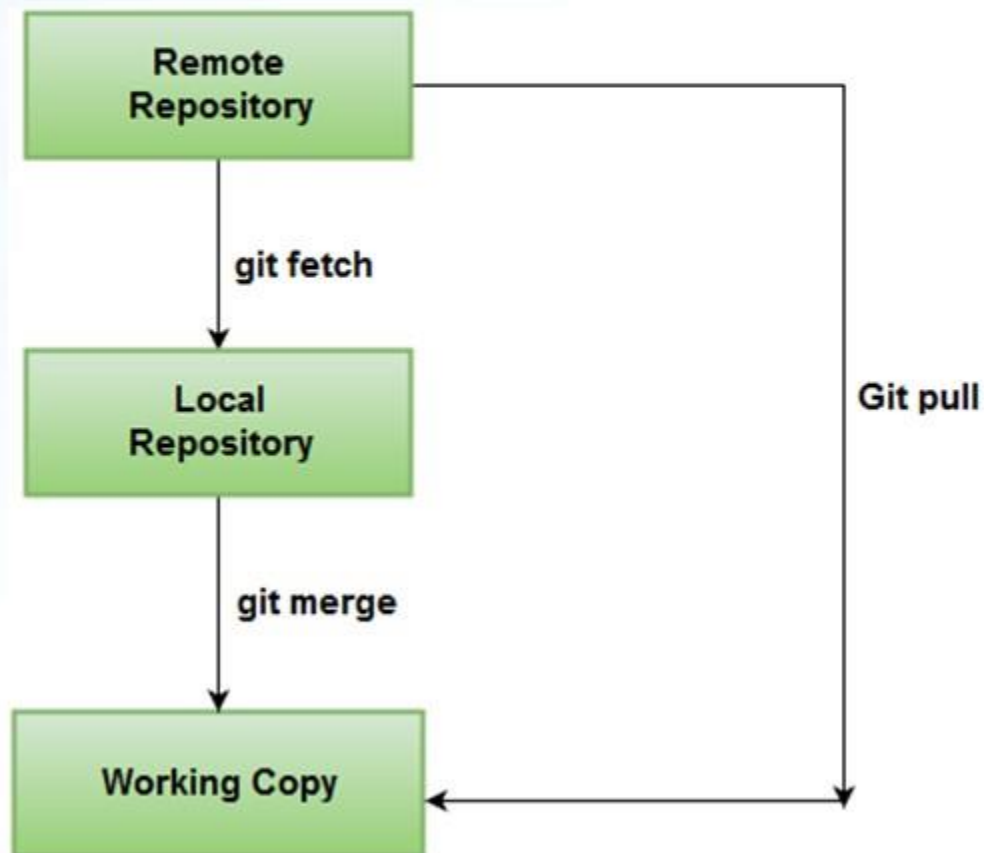
commit a3e48f608144d3fbfd0eeedf30d9697b6150f569
Merge: e68c997 4d4cfda
Author: Anand <ra.anand@pratian.com>
Date: Wed Nov 9 15:48:09 2016 +0530

    Merge branch 'master' of 172.30.12.200:/mobility/research

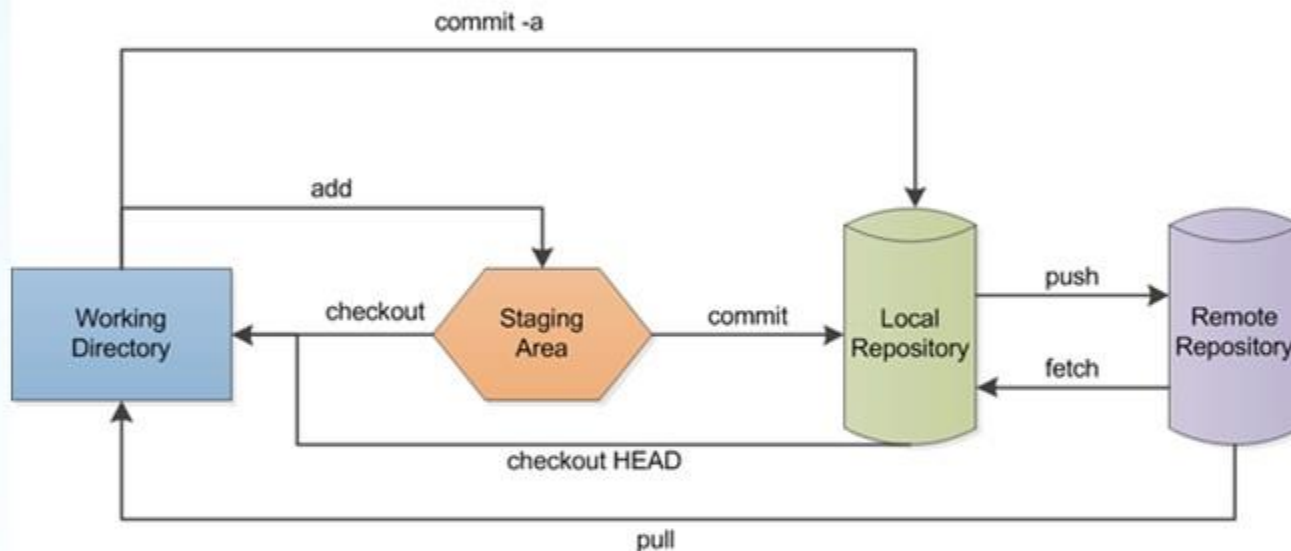
commit e68c9971d144408b65f3b9683492afe22011fecb
Author: Anand <ra.anand@pratian.com>
Date: Wed Nov 9 14:56:59 2016 +0530

    Fixed some warnings
```


Pulling from a Remote



Pulling from a Remote



`commit -a`: Directly commit modified and deleted files into the local repository (*no new files!*)

`add`: Add a file to the staging area.

`checkout`: Get a file from the staging area.

`checkout HEAD`: Get a file from the local repository

`commit`: Commit files from the staging area to the local repository

`push`: Send files to the remote repository

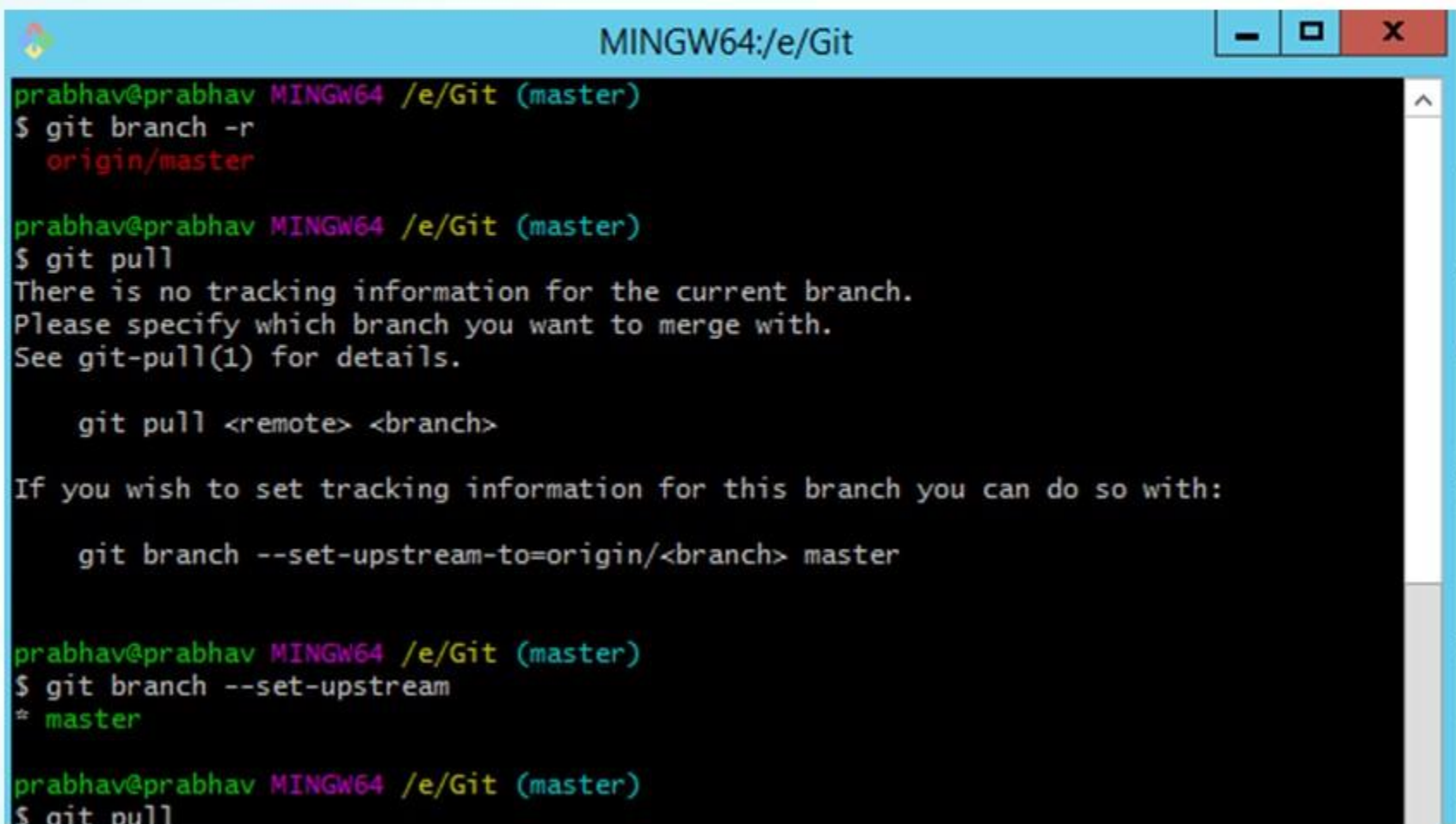
`fetch`: Get files from the remote repository

`pull`: Get files from the remote repository and put a copy in the working directory

Pulling from Remote

- **See the remote branch**
 - `git branch -r`
- **Pull down changes from remote repository**
 - `git fetch`; `Git merge origin/master`; **or** `Git pull`
 - You will find that there is no correspondence setup between my master branch and the origin master(remote)
- **Set upstream**
 - `git branch --set-upstream master origin/master`
- **Do a Pull again**
 - `git pull`

Pulling from a Remote



```
MINGW64:/e/Git
prabhav@prabhav MINGW64 /e/Git (master)
$ git branch -r
  origin/master

prabhav@prabhav MINGW64 /e/Git (master)
$ git pull
There is no tracking information for the current branch.
Please specify which branch you want to merge with.
See git-pull(1) for details.

    git pull <remote> <branch>

If you wish to set tracking information for this branch you can do so with:

    git branch --set-upstream-to=origin/<branch> master

prabhav@prabhav MINGW64 /e/Git (master)
$ git branch --set-upstream
* master

prabhav@prabhav MINGW64 /e/Git (master)
$ git pull
```

Pushing to a Remote

- **Edit your README.txt file**
 - Vim README.txt
- **Check Git status**
 - Git status
- **Add and commit the change**
 - Git -am "Adding"
- **Check Git status**
 - Git status
 - Git will say a message that your branch is ahead of "origin/master" by 1 commit.
 - That means there are pending changes to be pushed to remote.
- **Push changes to remote repository**
 - Git push
 - It will prompt for username and password

Pushing to a Remote

- **Push changes to remote repository. Without Username and Password**
- **Remove the remote**
 - `Git remote rm origin`
- **Check if you have remote repository**
 - `Git remote -v`
- **Now add the repository and add the ssh version**
 - `Git remote add origin <ssh GIT URL>`
- **Make some changes**
- **Push changes to remote repository**
 - `Git push`
 - It will not prompt for username and password because its using the ssh

Pushing to a Remote

```
MINGW64:/e/Git

prabhav@prabhav MINGW64 /e/Git (master)
$ ls
anand/  arun/  preeti/  README.md  REAMDE.txt  ritesh/  saikat/  sanjay/

prabhav@prabhav MINGW64 /e/Git (master)
$ vi README.md

prabhav@prabhav MINGW64 /e/Git (master)
$ git push
fatal: The current branch master has no upstream branch.
To push the current branch and set the remote as upstream, use

    git push --set-upstream origin master

prabhav@prabhav MINGW64 /e/Git (master)
$ git push --set-upstream origin master
Everything up-to-date
Branch 'master' set up to track remote branch 'master' from 'origin'.

prabhav@prabhav MINGW64 /e/Git (master)
$
```

Creating and Verifying Tags

- **Tag your repository. Tag the current master branch as v1.0**
 - `git tag v1.0`
- **See your tag**
 - `Git tag`
- **Add annotations with your tag**
 - `git tag -a v1.0_withMessage`
 - You will need to put the message.
 - You can also provide a `-m` to provide message directly
- **See your tag**
 - `Git tag`

Creating and Verifying Tags

- **Provide a signed tag**

- `git tag -s v1.0_signed`
- You will need to put the message.
- You will need to provide passphrase
- If signing failed
 - `gpg --list-key`
 - `gpg --gen-key`
 - `git config --global user.signingkey 86F87C475A6E68D050E3C772F3EBAF4A79F6A0BB`

- **See your tag**

- `Git tag`

- **Verify a tag**

- `git tag -v v1.0`
- `git tag -v v1.0_withMessage`
- `git tag -v v1.0_signed`

Pushing Tags to remote

- **Go to GitHub and see your created Tags**
- **Do a git push**
 - git push
 - You will notice that there are no tags when you browse through the UI
- **You will again notice that there are no tags**
 - By default git will not push tags.
- **Push git tags**
 - Git push -tags
 - It will push the tags to remote repository.
 - You will notice now tags are available when you browse through the UI
- **Tagging gives you stable points in your source code.**
 - E.g. You may want to tag individual release which was successful.

Thank You