

Command Line 2 : Server Communication

Goals

1. Connect to a server
2. Set up a Python environment on the server

Programme

- Basics of ssh
- Why Servers?
- Tutorial
 - The SSH Command
 - Security & Key authentication
 - SSH Connection
 - Install conda

Why servers?

Task Lookup servers

Advantages

...

Disadvantages

...

» [https://en.wikipedia.org/wiki/Server_\(computing\)](https://en.wikipedia.org/wiki/Server_(computing))

Tutorial

SSH

The SSH package connects to remote servers using:

- a remote server address `[host]`
- a remote username `[client]`
- a generated key file

Try Get the ssh manual

Example commands

```
ssh client@host
ssh ben@uantwerpen.be

ssh -l client
    host

ssh -i keygen_file \
    -l client \
    host
```

» [Tutorial on ssh keys](#)

Security & Key authentication

ssh-keygen command

```
ssh-keygen -t rsa
```

- SSH keys are used to protect servers
- They are harder to predict than passwords
- Once saved, they are quicker to use
- They need to be inserted by server admin

```
+---[RSA 2048]---+
|   .          ..00..|
|   . . . . . .0.X.|
|   . . 0.    ..+ B|
|   .   0.0    .+ ..|
|   ..0.S     0..   |
|   . %0=      .    |
|   @.B...      .    |
|   0.=. 0. . . .   |
|   .00  E. . . .   |
+---[SHA256]-----+
```

» [Documentation for generating keys on Windows](#)

Assemble SSH Command

User name

```
ssh -l client host
```

Authentication key

The key that you generated needs to be added to command

```
ssh -i ~/location/of/key_gen_file \  
-l client \  
host
```

Server Jumping

In some instance you will need to 'jump' from one server to another

```
ssh -J another_client@another_host \  
-i ~/location/of/key_gen_file \  
-l client \  
host
```

Connection

Learning Server Details

- Server Address : 10.118.157.177
- Jump Server client : student
- Jump server : srv2.flw.uantwerpen.be

Try Connect to the learning server

- open a terminal
- construct the ssh command
- check key, client name and host address

Example command

```
ssh -J another_client@another_host \  
-i ~/location/of/key_gen_file \  
-l client \  
host
```


Getting to work

Downloading conda

```
wget https://repo.anaconda.com/archive/Anaconda3-2020.07-Linux-x86_64.sh
```

Try Follow the online instruction to install conda

Start a jupyter notebook

```
jupyter notebook
```

Try Connect to the jupyter notebook

» [Documentation for conda install](#)

linking SSH ports

The SSH command can also link together ports using the `-L` flag.

Link local and remote ports

```
ssh -L port:localhost:port
```

```
ssh -L port:localhost:port \  
    -l client \  
    host
```

Example command

```
ssh -J another_client@another_host \  
    -i ~/location/of/key_gen_file \  
    -l client \  
    -L port:localhost:port \  
    host
```

Try: Add port linking to the above ssh command and connect to the jupyter notebook.

Extra: Saving Details in an SSH config file

The above commands can get quite long, so ssh offers a config file.

Create a config file locally

```
touch ~/.ssh/config
```

This simplifies connection

```
ssh learning_server
```

config file

```
Host jump_server
  HostName srv2.flw.uantwerpen.be
  User student
  IdentityFile ~/.ssh/id_rsa

Host learning_server
  HostName host_address
  User user_name
  IdentityFile ~/.ssh/id_rsa
  ProxyCommand ssh student@srv2_jump \
    -W %h:%p
```

Resources

- [Tutorial on ssh keys](#)
- [SSH Config Tutorial](#)
- [Documentation for conda install](#)
- [Documentation for generating keys on Windows](#)
- [Open SSH Manual](#)