The Unix Shell

The Secure Shell

Copyright © Software Carpentry 2011
This work is licensed under the Creative Commons Attribution License
See http://software-carpentry.org/license.html for more information.
$ pwd
Unix Shell

$ pwd
/users/vlad
$

Secure Shell
login as: vlad
Password: ********
login as: vlad
Password: ********
$

login as: vlad
Password: *******
moon>
login as: vlad
Password: ********
moon>

shell

remote shell
$ pwd
/users/vlad

$ ssh vlad@moon
Password:
$ pwd
/users/vlad

$ ssh vlad@moon
Password: ***
Access denied
Password:
$ pwd
/users/vlad

$ ssh vlad@moon
Password: ***
Access denied
Password: ********

moon> pwd
/home/vlad

moon> ls -F
bin/ cheese.txt dark_side/ rocks.cfg
$ pwd
/users/vlad

$ ssh vlad@moon
Password: ***
Access denied
Password: *******
moon> pwd
/home/vlad

moon> ls -F
bin/ cheese.txt dark_side/ rocks.cfg

moon> exit

$ exit

$ pwd
/users/vlad
$ ssh vlad@moon
Password: ********

moon> pwd
/home/vlad

moon> ls -F
bin/ cheese.txt dark_side/ rocks.cfg

moon> exit

$ pwd
/users/vlad

$ ls -F
bin/ data/ mail/ music/
notes.txt papers/ pizza.cfg solar/
solar.pdf swc/
```bash
$ scp vlad@moon:/home/vlad/cheese.txt
vlad@earth:/users/vlad

source file...
```
$ scp vlad@moon:/home/vlad/cheese.txt vlad@earth:/users/vlad

Source file...
...to destination directory
$ scp vlad@moon:/home/vlad/cheese.txt
    vlad@earth:/users/vlad

source file...
...to destination directory
source and destination are written as
user@computer:path
$ scp vlad@moon:/home/vlad/cheese.txt
   vlad@earth:/users/vlad

Password: *******

cheese.txt     100%  9  1.0 KB/s 00:00
$ scp vlad@moon:/home/vlad/cheese.txt  
    vlad@earth:/users/vlad  
$ scp -r vlad@moon:/home/vlad/dark_side  
    vlad@earth:/users/vlad  

- `r` indicates a directory and its contents
$ scp -r vlad@moon:/home/vlad/dark_side
    vlad@earth:/users/vlad
$ scp -r vlad@moon:/home/vlad/dark_side
    /users/vlad
$ pwd
/users/vlad
$ scp -r vlad@moon:/home/vlad/dark_side
    .

same destination path
$ ssh vlad@moon
Password: ********
moon> df -h

Filesystem    Size  Used  Avail  Use% Mounted On
/dev/sda1     7.9G  2.1G  5.5G   28%  /
/dev/sda2     791G  150G  642G   19%  /home

moon> df -h > usage.txt
moon> exit

$ scp vlad@moon:/home/vlad/usage.txt .

Password: ********

usage.txt              100%  134  1.0 KB/s 00:00
$ ssh vlad@moon 'df -h'

Password: ********

Filesystem  Size   Used   Avail  Use%  Mounted On
/dev/sda1   7.9G   2.1G   5.5G   28%   /
/dev/sda2   791G   150G   642G   19%   /home
$ ssh vlad@moon 'df -h'
Password: *******

Filesystem Size Used Avail Use% Mounted On
/dev/sda1 7.9G 2.1G 5.5G 28% /
/dev/sda2 791G 150G 642G 19% /home

$ ssh vlad@moon 'df -h' >> usage.log
Password: *******

$ ls -F

bin/ data/ mail/ music/
notes.txt papers/ pizza.cfg solar/
solar.pdf swc/ usage.log usage.txt

same result
$ echo "open sesame, please" | ssh vlad@moon 'cat > magic.txt'

Password: *******
$ echo "open sesame, please" | ssh
   vlad@moon 'cat > magic.txt'
Password: ********

remote shell receives stream from pipe
character stream
remote command receives input piped to ssh
    cat repeats input stream as output
redirection within remote shell
```bash
$ ssh vlad@moon 'ls -F /home/vlad'
Password: ********
bin/ cheese.txt dark_side/ rocks.cfg
$ echo "open sesame, please" | ssh vlad@moon 'cat > magic.txt'
Password: ********
$ ssh vlad@moon 'ls -F /home/vlad'
Password: ********
bin/ cheese.txt dark_side/ magic.txt rocks.cfg
```
$ ssh vlad@moon 'ls -F /home/vlad'
Password: ********
bin/ cheese.txt dark_side/ rocks.cfg

$ echo "open sesame, please" | ssh vlad@moon 'cat > magic.txt'
Password: ********

$ ssh vlad@moon 'ls -F /home/vlad'
Password: ********
bin/ cheese.txt dark_side/ magic.txt rocks.cfg

$ scp vlad@moon:/home/vlad/magic.txt .
Password: ********
login as: vlad
Password: ********

Unix Shell

Secure Shell

shell

remote shell
login as: vlad
Password: thriller
login as: vlad
Password: thriller
Unix Shell

Secure Shell

shell

remote shell
Unix Shell

Secure Shell

shell

remote shell
Secure Shell

- Encryption using public key
- Private key (only 1 copy)
- Cannot decrypt using public key

Remote shell

Unix Shell
login as: vlad
Password: *********

huxyo ew: xdvw
uqfcjmbn: lhiujdbj
$ ssh vlad@moon
The authenticity of host 'moon (10.1.2.3)'
can't be established.
RSA key fingerprint is
Are you sure you want to continue connecting
(yes/no)?  yes
Warning: Permanently added 'moon,10.1.2.3' (RSA)
to the list of known hosts.
Password: *******
moon>
while true:

... 

if time.mins == 30:
  ssh vlad@moon 'df -h' >> usage.log 

...
while true:
    ...
    if time.mins == 30:
        ssh vlad@moon 'df -h' >> usage.log
    ...
    ...

$ ssh vlad@moon 'df -h' >> usage.log
Password:
Connection closed by 10.1.2.3
$
Unix Shell

Secure Shell

user key pair 1

host key pair
only 1 copy
default if user has no user key pair

user key pair 2
$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/users/vlad/.ssh/id_rsa):
Enter passphrase (empty for no passphrase): *******
Enter same passphrase again: *******
Your identification has been saved in /users/vlad/.ssh/id_rsa.
Your public key has been saved in /users/vlad/.ssh/id_rsa.pub.
The key fingerprint is:
$ ssh vlad@moon
Enter passphrase for key
'./users/vlad/.ssh/id_rsa': ********
moon>
```bash
$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/users/vlad/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /users/vlad/.ssh/id_rsa.
Your public key has been saved in /users/vlad/.ssh/id_rsa.pub.
The key fingerprint is:
```
$ scp ~/.ssh/id_rsa.pub vlad@moon
Password: *********

$ ssh vlad@moon
Password: *********

moon> cat id_rsa.pub >> ~/.ssh/authorized_keys
moon> exit

$ cat ~/.ssh/id_rsa.pub | ssh vlad@moon
  'cat >> ~/.ssh/authorized_keys'
Password: *********

$ ssh-copy-id vlad@moon
Password: *********
```bash
$ ssh vlad@moon

moon>

while true:

    ...

    ...

    if time.mins == 30:
        ssh vlad@moon 'df -h' >> usage.log

    ...
```
created by

Elango Cheran

February 2011