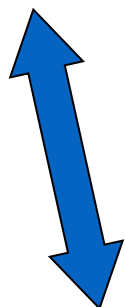


# The Unix Shell

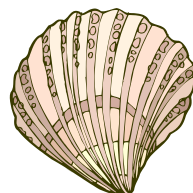
The Secure Shell



\$ pwd

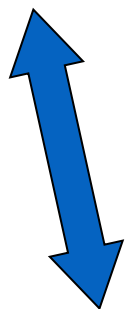


shell

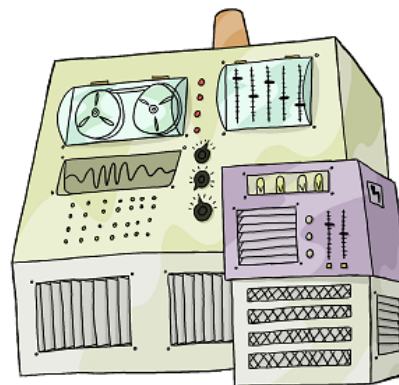
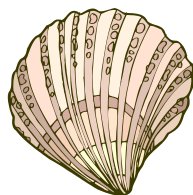




```
$ pwd  
  
/users/vlad  
  
$
```



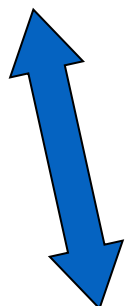
shell



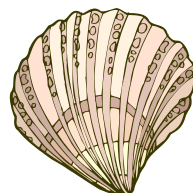


login as: vlad

Password: \*\*\*\*

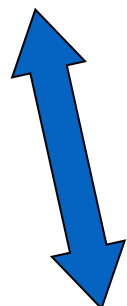


shell

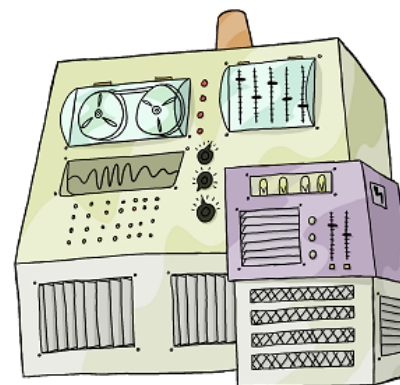
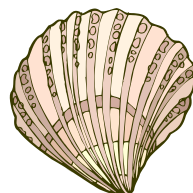




```
login as: vlad  
Password: ****  
$
```

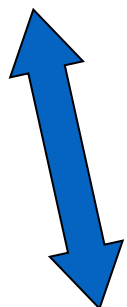


shell

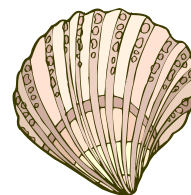
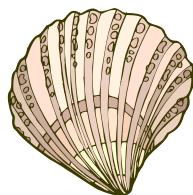




```
login as: vlad  
Password: ****  
moon>
```



shell



remote shell



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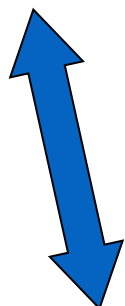
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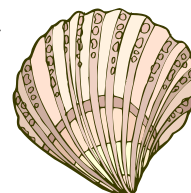
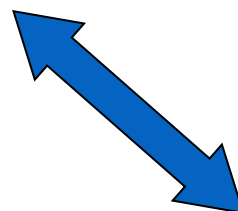
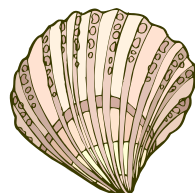
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```
login as: vlad  
Password: *****  
moon>
```



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
```

```
$ 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/
```






```
$ 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
```

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

```
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: ****
```

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



```
$ 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:** \*\*\*\*\*

character stream

remote shell receives stream from pipe

remote command receives input piped to ssh

cat repeats input stream as output

redirection within remote shell



```
$ 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/  
rocks.cfg
```

*magic.txt*

before

after







```
$ 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: *****
```

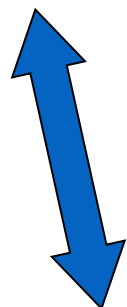
before

after

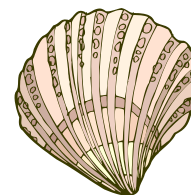
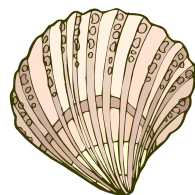




```
login as: vlad  
Password: *****
```



shell

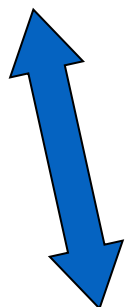


remote shell

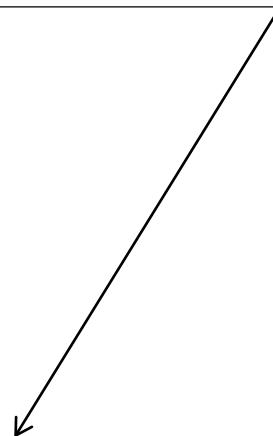
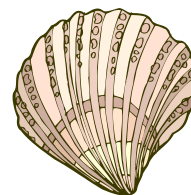
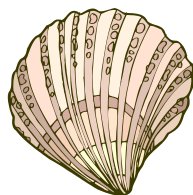




```
login as: vlad  
Password: thriller
```



shell



remote shell



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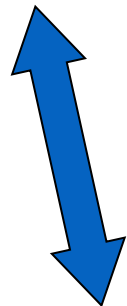
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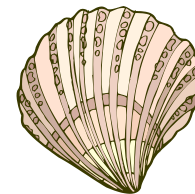
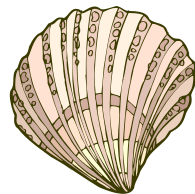
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```
login as: vlad  
Password: thriller
```

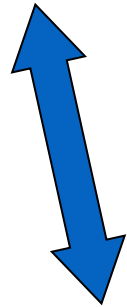


shell

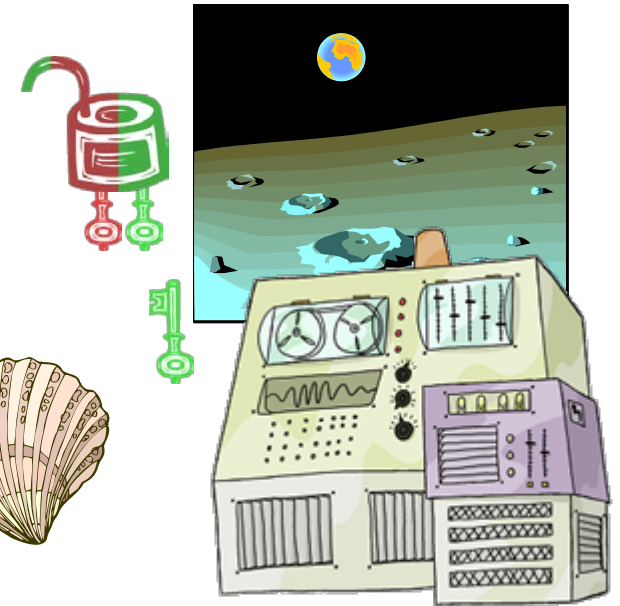
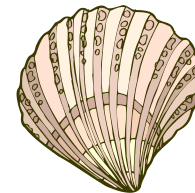
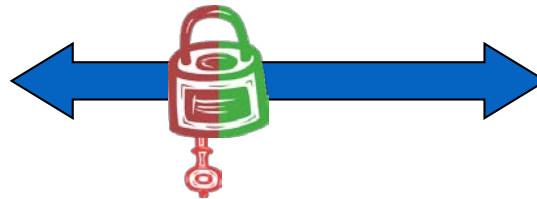
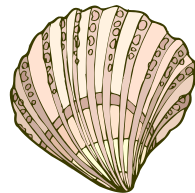


remote shell

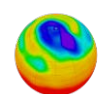




shell



remote shell



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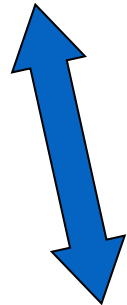
software carpentry



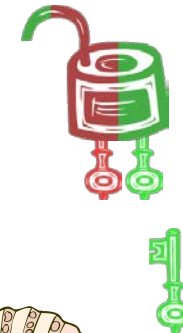
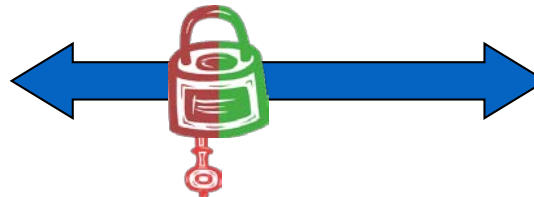
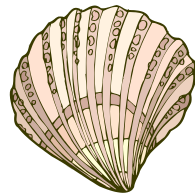
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shell



remote shell



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software carpentry  
if insertFile(settings.doc  
ext = doc.createTextNo

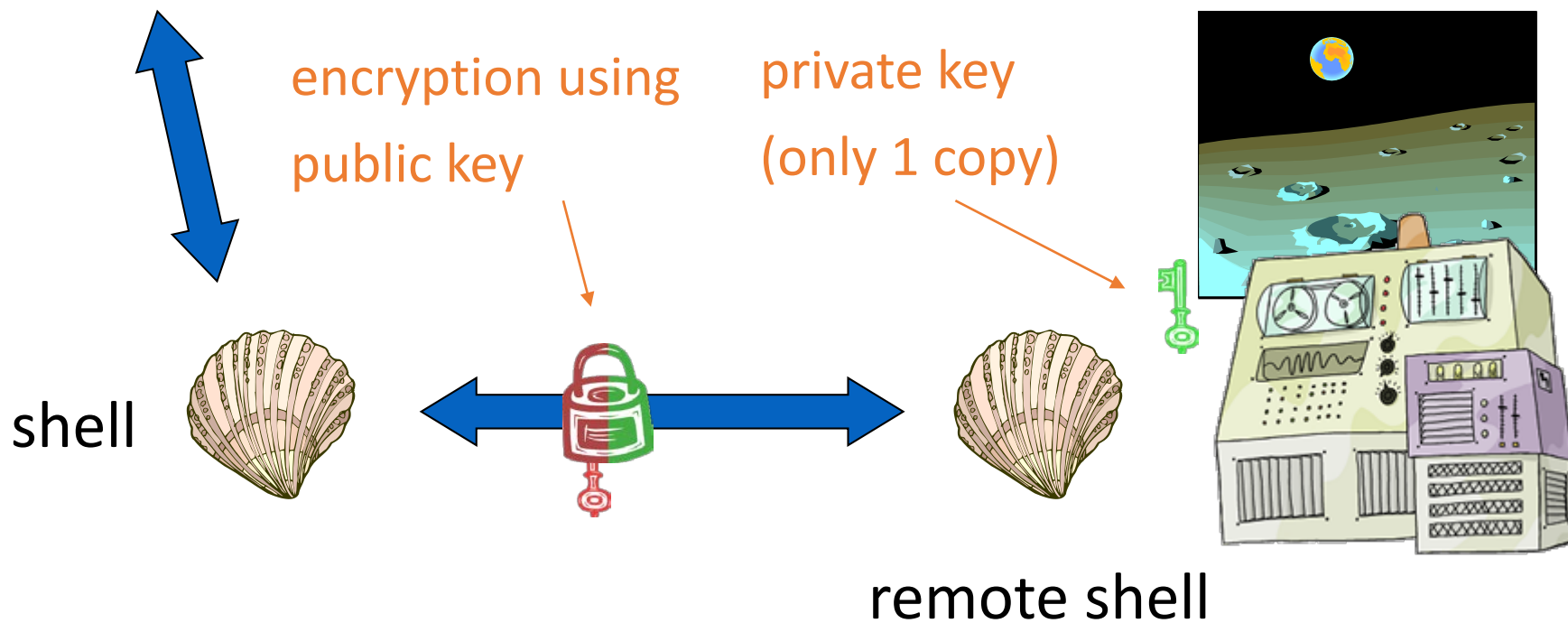
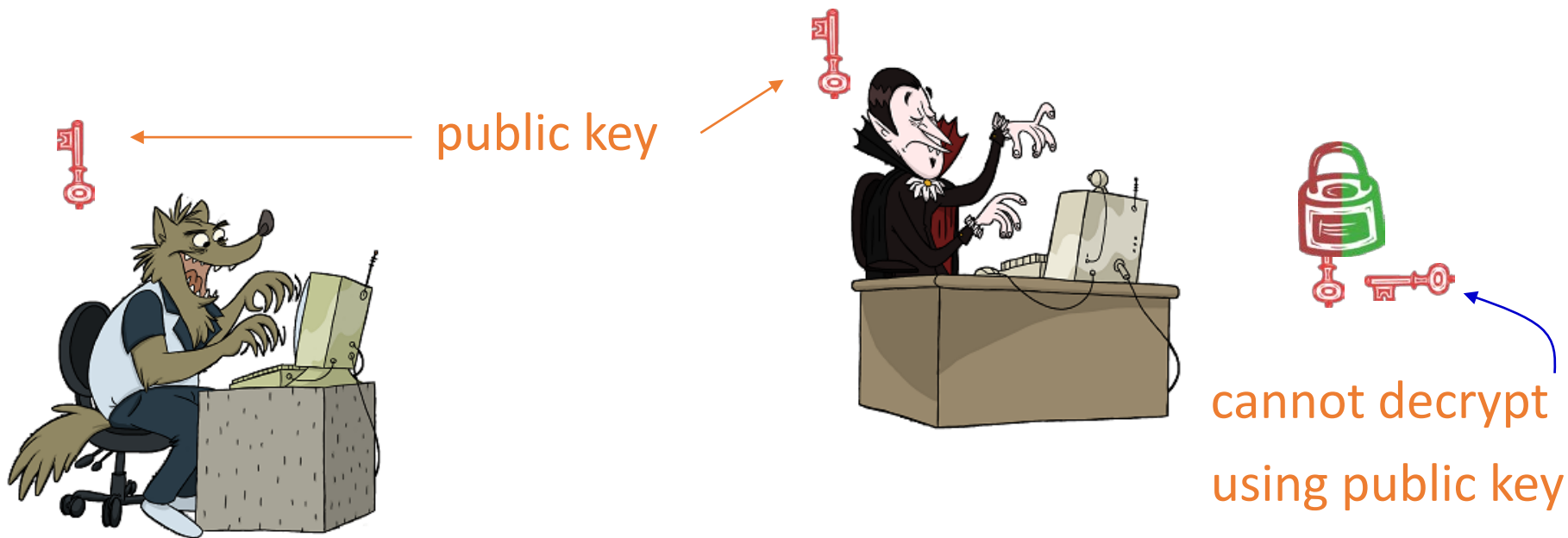


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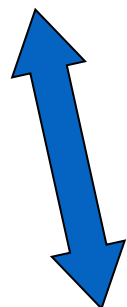




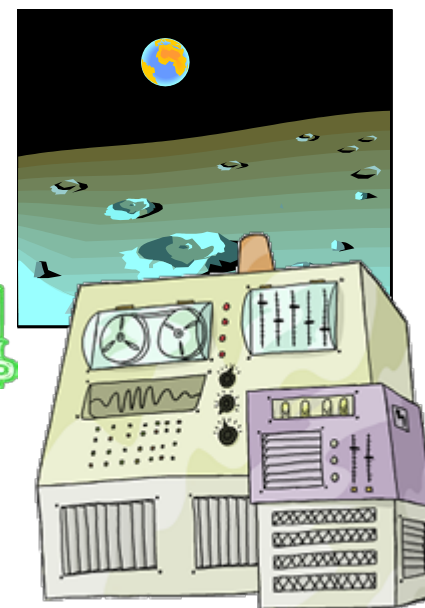
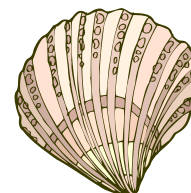
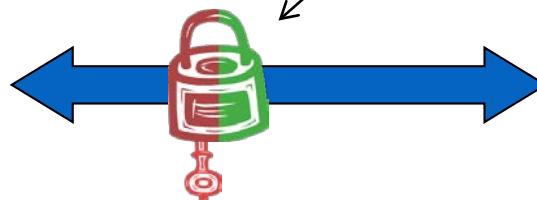
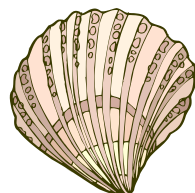
login as: **vlad**  
Password: **\*\*\*\*\***



huxyo ew: xdvw  
uqfcmjbn: lhiujdbj



shell



remote shell



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software carpentry



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```
$ ssh vlad@moon
```

```
The authenticity of host 'moon (10.1.2.3)'  
can't be established.
```

```
RSA key fingerprint is
```

```
f1:68:f5:90:47:dc:a8:e9:62:df:c9:21:f0:8b:c5:39.
```

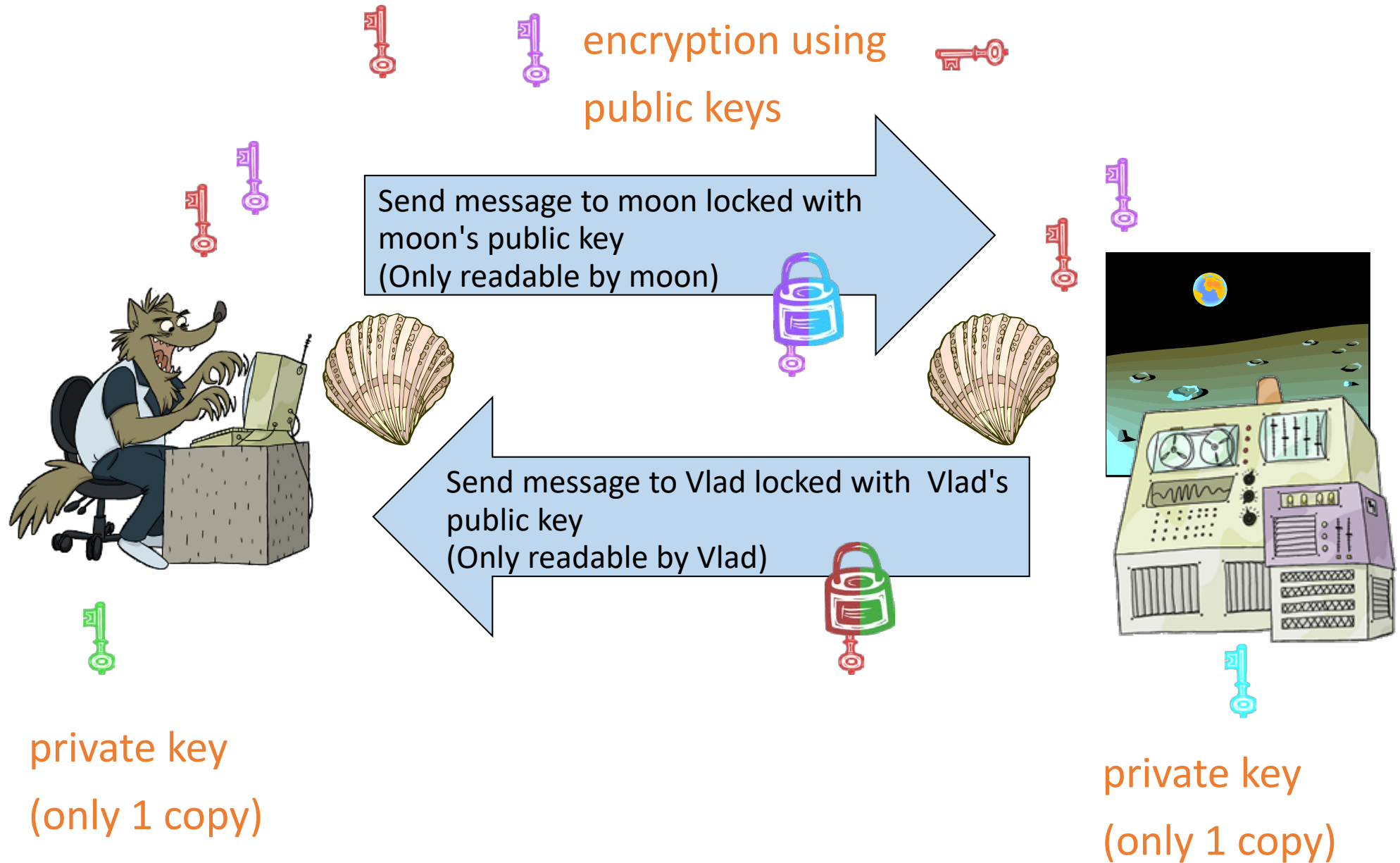
```
Are you sure you want to continue connecting  
(yes/no)? yes
```

```
Warning: Permanently added 'moon,10.1.2.3' (RSA)  
to the list of known hosts.
```

```
Password: *****
```

```
moon>
```

## encryption using public keys





created by

Elango Cheran

February 2011



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# The ssh agent

- Stores secret keys in memory.
- Avoids repeated typing of the pass phrases.
- Can talk to a forwarding mechanism.  
For example:
  - your workstation → jasmin-login1 → jasmin-sci1
  - jasmin-login1 does not have the private key
  - authentication traffic forwarded from end to end:
    - jasmin-sci1 sends challenge
    - workstation sends response, proving your identity

# The ssh agent (continued)

- To start the agent and load your secret key:
  - Linux: session manager should start agent for you. Use ssh-add to load key (if not done automatically when ssh first used).
  - Windows: launch Pageant and click "add key".
  - Enter your pass phrase.
- For authentication forwarding:
  - Linux: use "ssh -A" (often the default)
  - Windows: in PuTTY, go to Connection → SSH → Auth, and "Allow agent forwarding"

# Exercise

1. Ssh to user01@10.23.23.254. password pyth0nrules.
2. Use ls, pwd and other commands to prove to yourself it's a different computer.
3. Logout (use exit or ^D)
4. Use scp to copy some files to the remote computer.
5. Login again and ls the files.
6. Logout
7. Use ssh to run df on the remote computer.

