



SG6 - HPC

Using machines of CentraleSupélec DCE* for Lab-1 (*Data Center for Education)

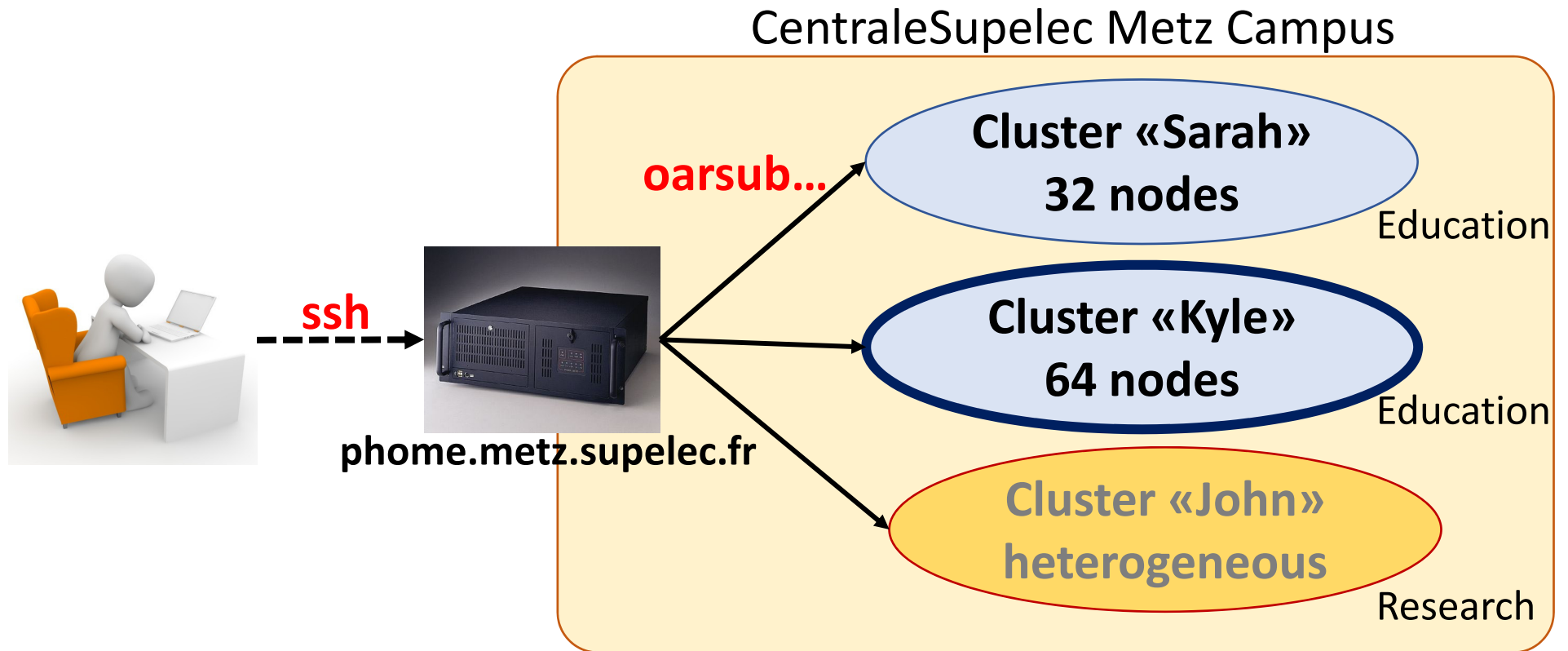
Stéphane Vialle



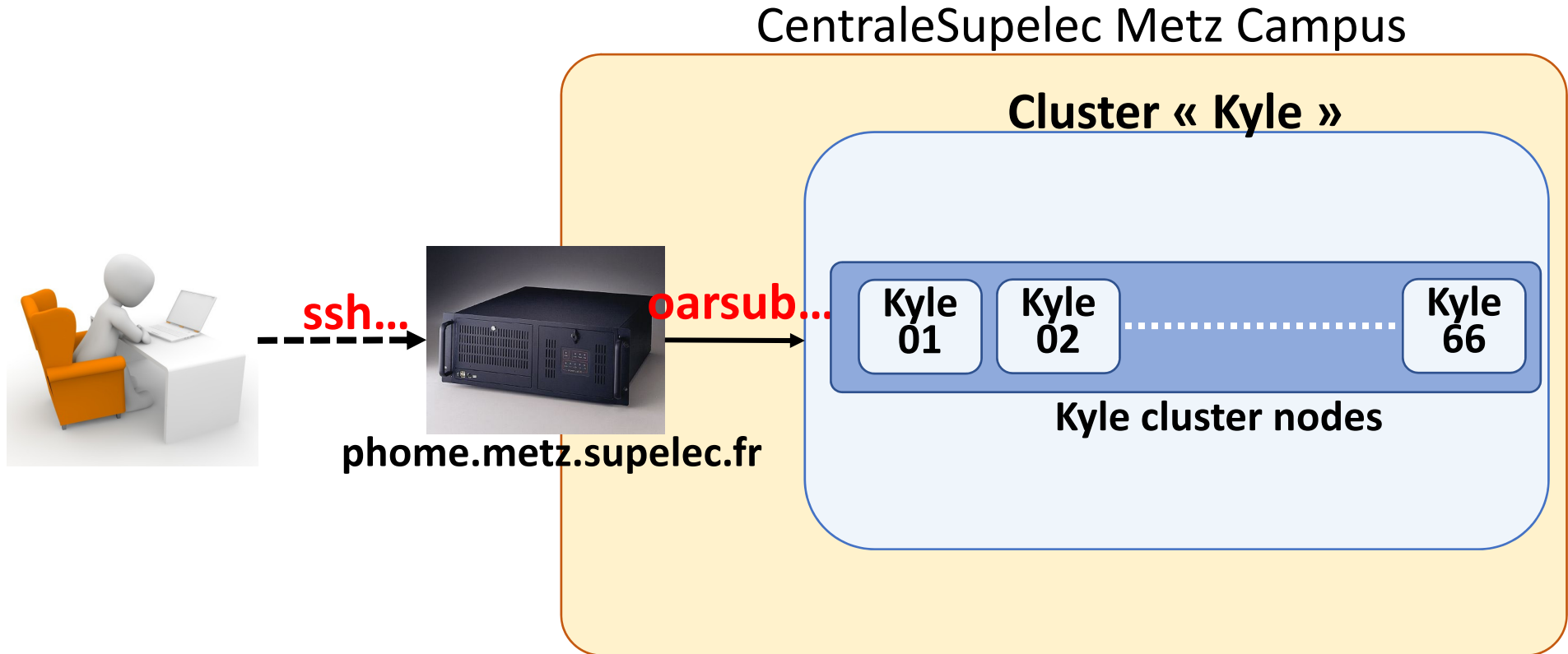
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- **DCE architecture and access**
 - Connection
- **Source files installation**
 - File copy & unzip
- **Source file compilation and execution**
 - Makfile & make & execution
- **Source file edition and re-compilation**
 - nano or vi/vim & make

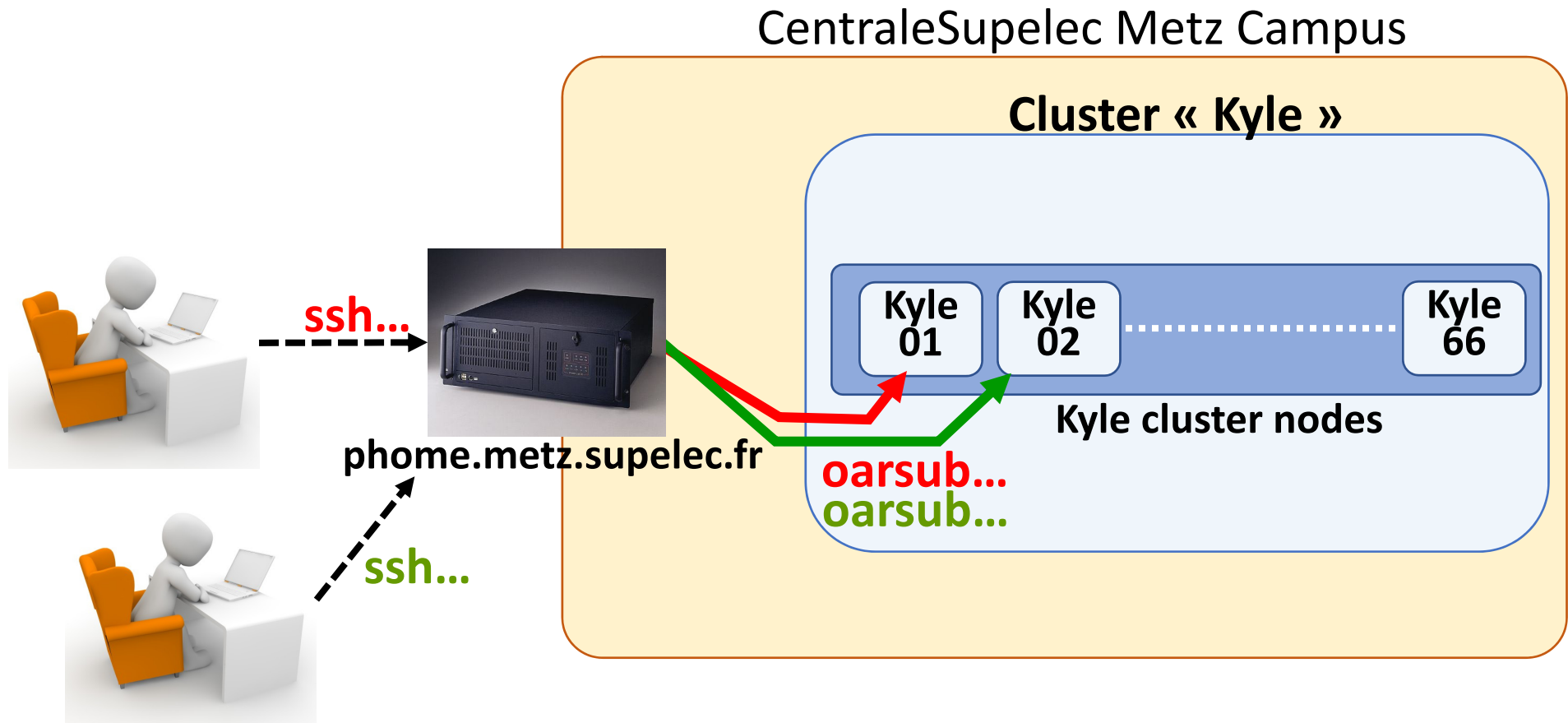
CPU clusters



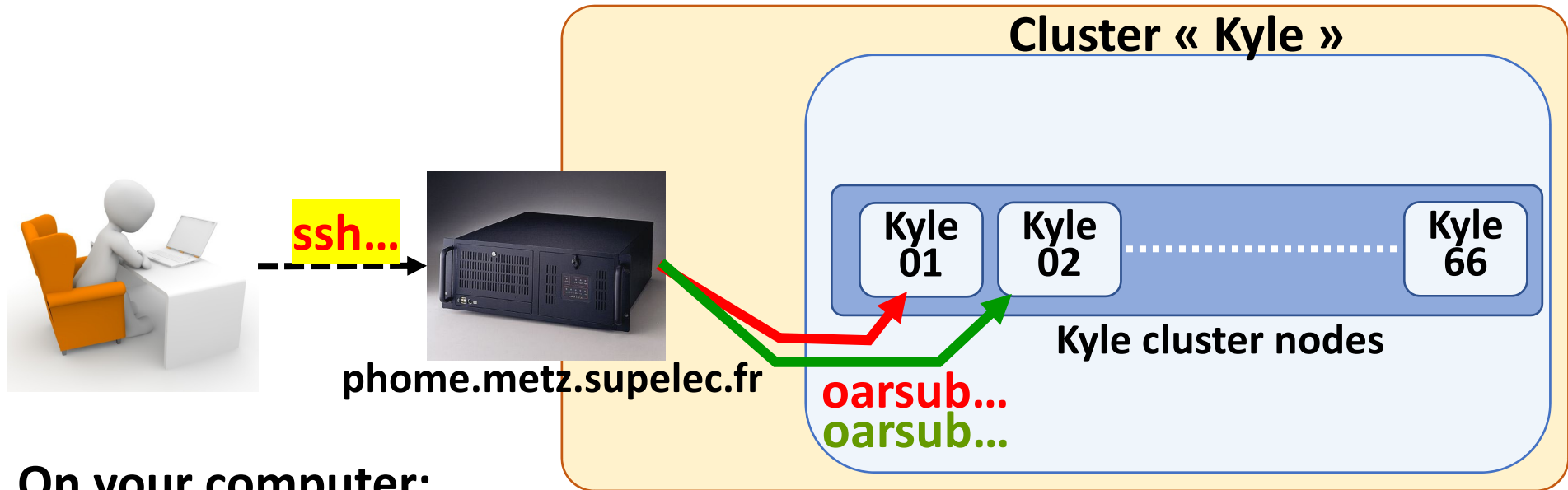
Configuration for Distributed Spark TP



Configuration for Distributed Spark TP



DCE connection commands

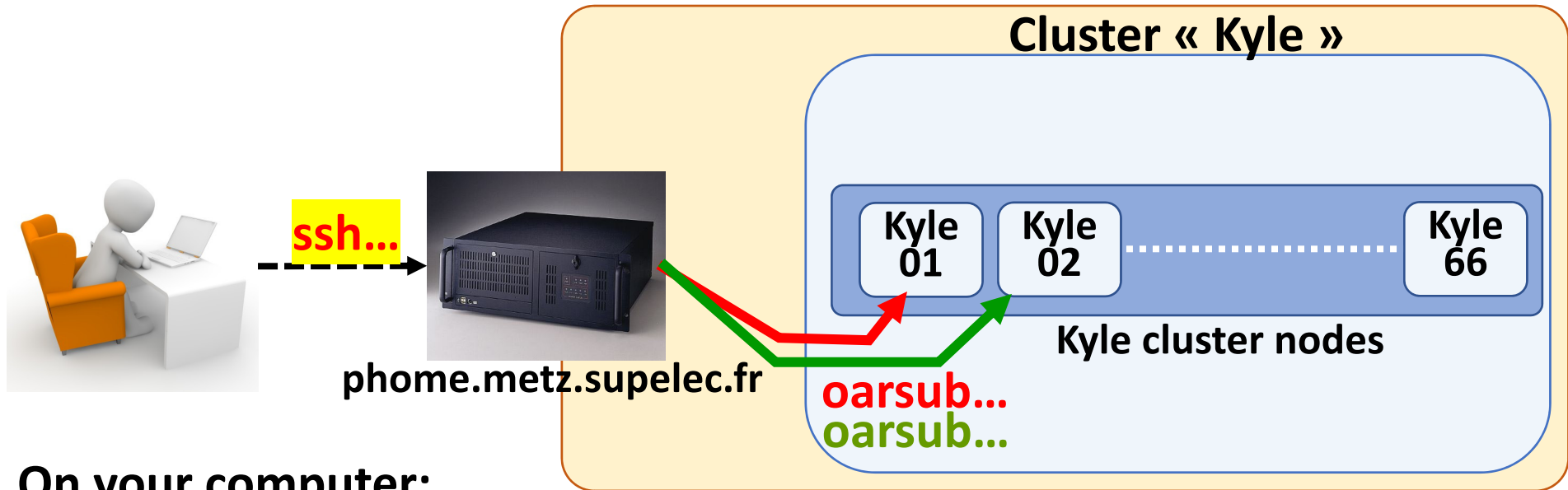


On your computer:

Linux →

- Group 1 `ssh phome.metz.supelec.fr -l cpucs11_n` From `cpucs11_1` up to `cpucs11_19`
- Group 2 `ssh phome.metz.supelec.fr -l cpucs12_n` From `cpucs12_1` up to `cpucs12_19`
- Group 3 `ssh phome.metz.supelec.fr -l cpucs13_n` From `cpucs13_1` up to `cpucs13_19`
- Group 4 `ssh phome.metz.supelec.fr -l cpucs14_n` From `cpucs14_1` up to `cpucs14_19`

DCE connection commands



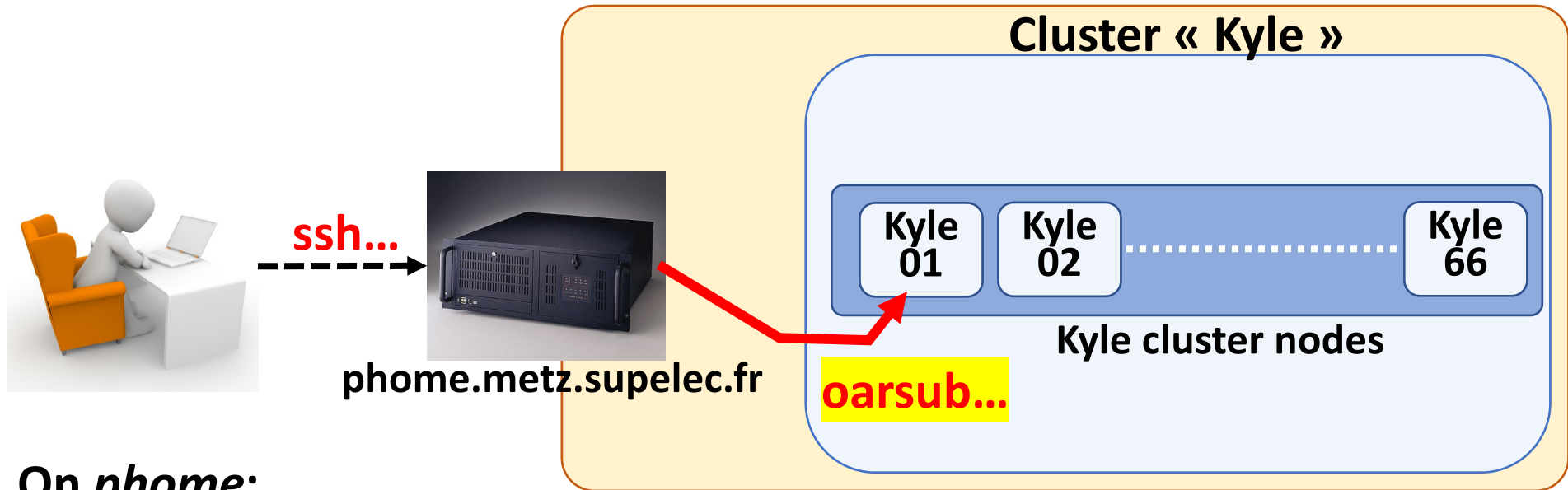
On your computer:

- Windows** →
- Download & Instal « **putty** »
 - « Session » menu : **phome.metz.supelec.fr**
connection type : **ssh** (port 22)
 - « Connection » menu: set **Enable TCP keepalives**
set **30s** between keepalives

Group **k** `ssh phome.metz.supelec.fr -l cpucs1k_n`

From *cpucs1k_1*
up to *cpucs1k_19*

DCE connection commands



On *phome*:

hostname → « sammy »: *phome* name inside our campus network

oarstat → lists running and waiting jobs/session on the clusters

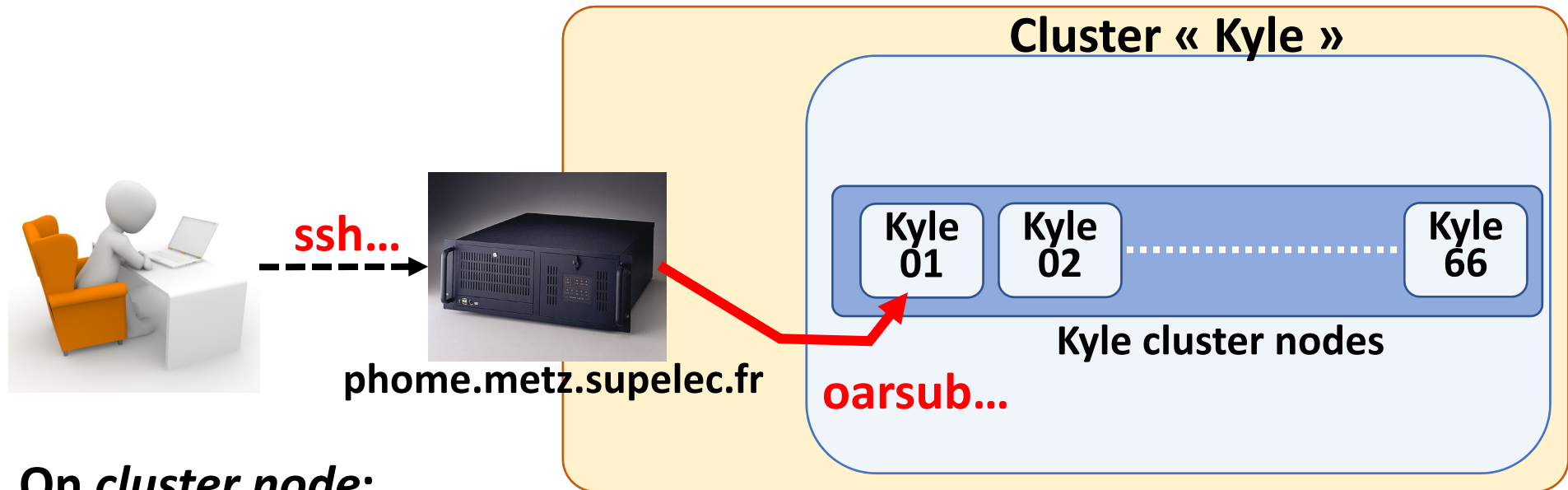
oardel *jobId* → can remove your job from the OAR queue

oarsub → submits a job or requires an interactive session

```
oarsub -p "cluster='kyle'" -l nodes=1,walltime=4:00:00 -I
```

→ logged on a cluster node

DCE connection commands



On cluster node:

hostname → « kyle~~xx~~ » from *kyle01* up to *kyle66*

If *hostname* returns « sammy » :

- you are still logged on sammy (frontal machine) !!
- your oarsub command has failed...
- re-try

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2 - Source files installation

Copy & Unzip

pwd *Print Working Directory*

→ You should be in your home directory:

Ex: `/usr/users/cpucs11/cpucs11_1`

cp ~vialle/tmp/SG6-TD1-MatrixProduct.zip . *Copy a file*

→ Your home directory contains a new file:

`SG6-TD1-MatrixProduct.zip`

do not forget the « . »

unzip SG6-TD1-MatrixProduct.zip *Unzip a file*

→ Your home directory contains a new sub-directory:

`SG6-TD1-MatrixProduct/`

cd SG6-TD1-MatrixProduct *Change Directory*

→ Enter into `SG6-TD1-MatrixProduct/`

cd ..

→ go in the parent/upper directory

ls *List (current directory)*

→ `Makefile.c` `init.c` `kernel.c` `main.c`

Copy your files from/to your laptop

ls *List (current directory)*

→ **Makefile.c** **init.c** **kernel.c** **main.c**

1 - Your linux account (cpucs1k_n) is « mounted » on any nodes of Kyle cluster and on phome/sammy frontal server:

- Your files are available on any machine
- Your files can modified from any machine

2 – If you want you can copy your files from/to your laptop using for example:

- **scp** under linux
- **Winscp** under Windows

From your laptop you have to target the frontal machine **phome.metz.supelec.fr**

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Makefile & make

ls *List (current directory)*

→ Makefile.c init.c kernel.c main.c

more Makefile *Print the content of the file 'Makefile'*

→ A 'Makefile' contents:

- The compilation configuration (compiler to use, compilation options to use, name of the source files...)
- The commands to execute to compile the source files

make *Compile the source files according to the 'Makefile' rules*

ls *List (current directory)*

→ Makefile.c **MatixProduct** init.c kernel.c main.c

./MatrixProduct -h *Print the application options*

./MatrixProduct -k 1 *Run the application with « kernel » version 1*

Application execution

ls *List (current directory)*

→ Makefile.c **MatixProduct** init.c kernel.c main.c

./MatrixProduct -h *Print the application options*

./MatrixProduct -k 1 *Run the application with « computing kernel »
version 1*

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Editors

ls *List (current directory)*

→ Makefile.c **MatixProduct** init.c kernel.c main.c

2 alphanumerical editors are available on Kyle nodes:

- *nano* : for beginners
- *vi* (or *vim*) : if you know their commands...

nano kernel.c *Edit the kernel.c source file*

Rmk : commands are listed on bottom of the window

« ^ » means « Ctrl »

Save before to exit the editor !!

When you have modified your source files:

→ you need to recompile your application

→ enter **make**

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End