

Remote Access to Linux (Unix) from MS Windows

Native applications (Putty, WinSCP, VcXsrv)

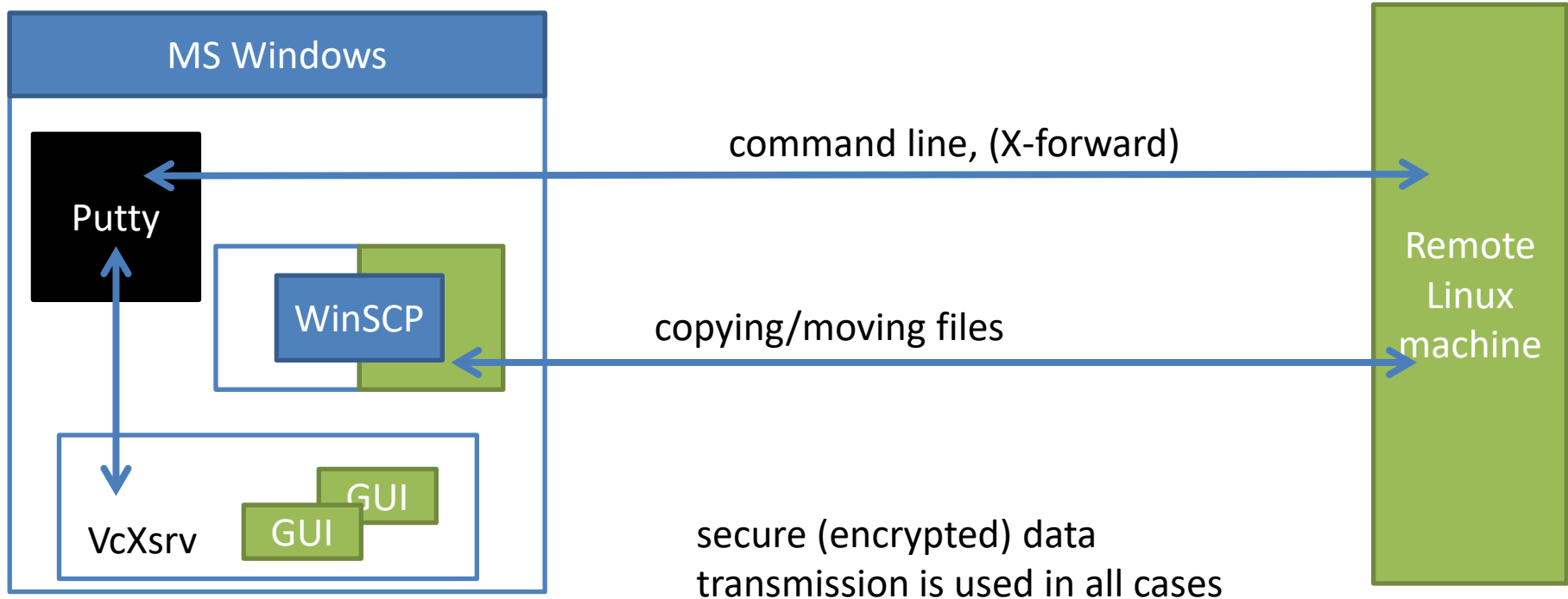
PS / 2020 Distance form of teaching: Rev1

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Native applications



Remote Access

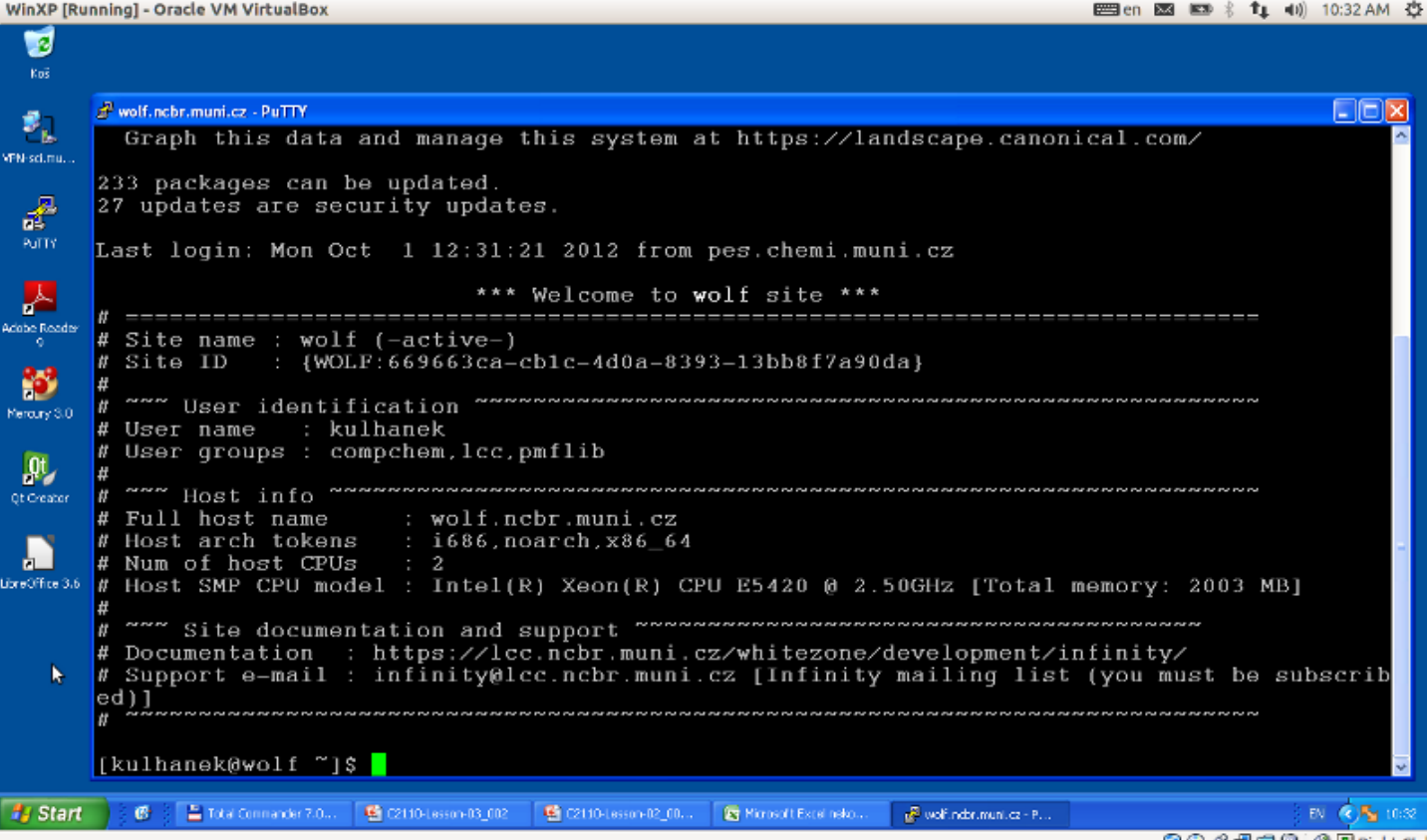
➤ Putty

Comment:

- ssh server must be running on the remote machine (activated by the administrator, runs on all nodes on the WOLF cluster).
- The security fingerprint must be confirmed the first time you log in to ssh server.
- In default setting, Putty cannot run graphics applications.

Putty

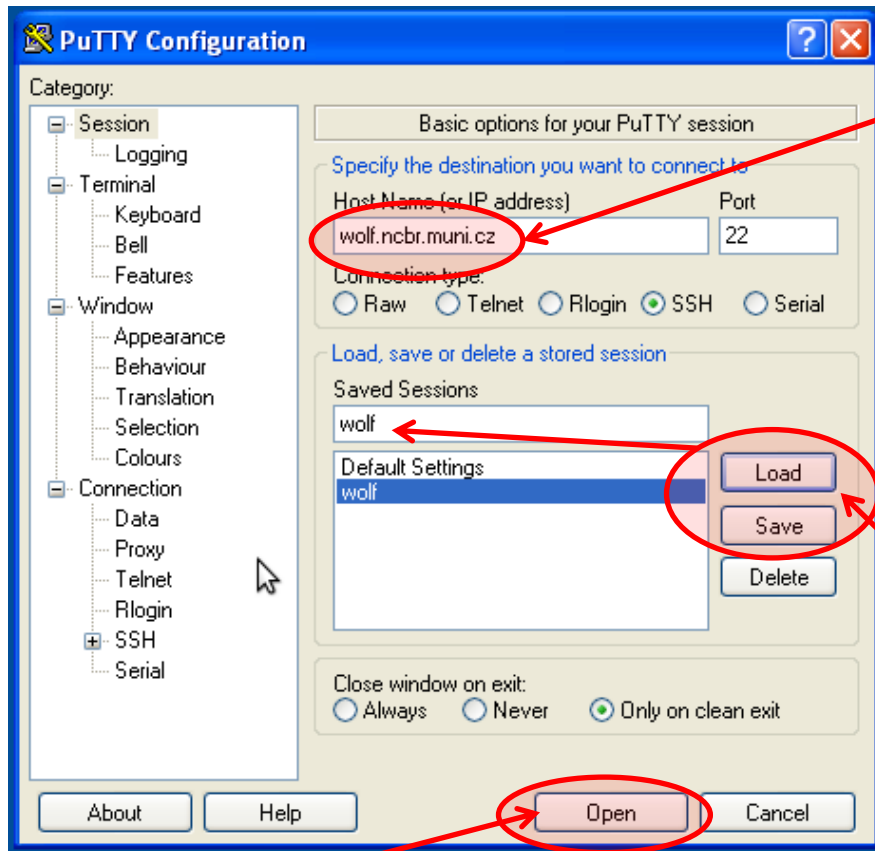
Putty <http://www.chiark.greenend.org.uk/~sgtatham/putty/>
Implementation of SSH (Secure Shell) for Windows, which allows remote connection to computers that support this protocol (mostly Unix type).



```
WinXP [Running] - Oracle VM VirtualBox
en 10:32 AM
wolf.ncbr.muni.cz - PuTTY
Graph this data and manage this system at https://landscape.canonical.com/
233 packages can be updated.
27 updates are security updates.
Last login: Mon Oct 1 12:31:21 2012 from pes.chemi.muni.cz

*** Welcome to wolf site ***
# =====
# Site name : wolf (-active-)
# Site ID : {WOLF:669663ca-cb1c-4d0a-8393-13bb8f7a90da}
#
# ~~~ User identification ~~~
# User name : kulhanek
# User groups : compchem,lcc,pmflib
#
# ~~~ Host info ~~~
# Full host name : wolf.ncbr.muni.cz
# Host arch tokens : i686,noarch,x86_64
# Num of host CPUs : 2
# Host SMP CPU model : Intel(R) Xeon(R) CPU E5420 @ 2.50GHz [Total memory: 2003 MB]
#
# ~~~ Site documentation and support ~~~
# Documentation : https://lcc.ncbr.muni.cz/whitezone/development/infinity/
# Support e-mail : infinity@lcc.ncbr.muni.cz [Infinity mailing list (you must be subscribed)]
#
[kulhanek@wolf ~]$
```

Putty - Connection



remote machine address

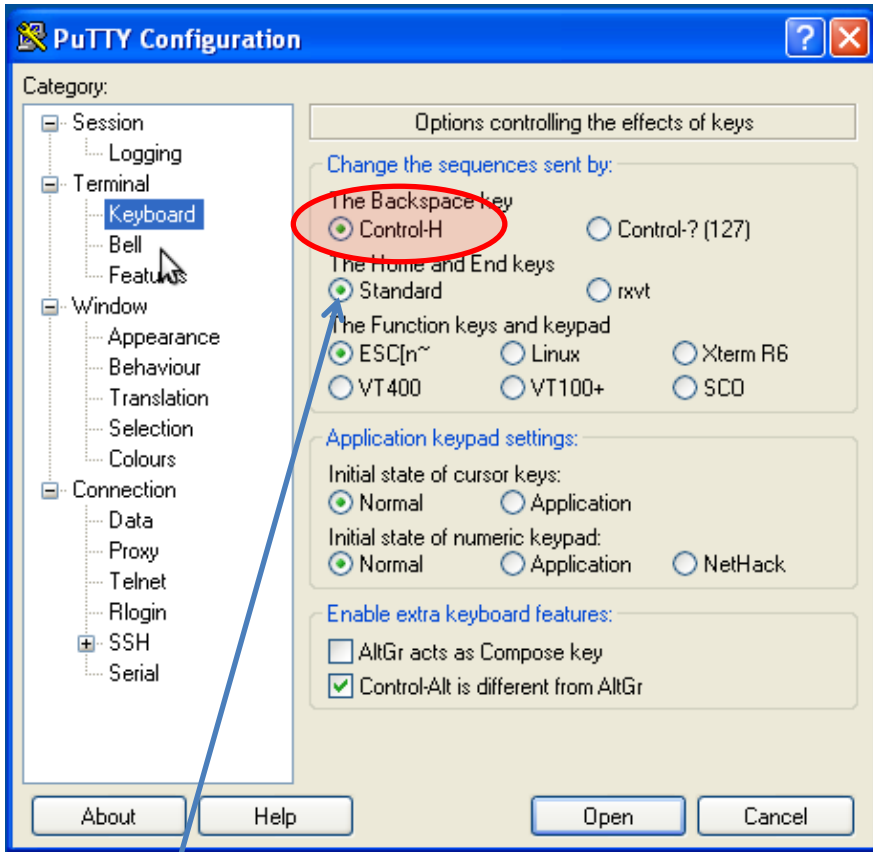
WOLF cluster: use nodes wolf02-wolf23 in domain ncbr.muni.cz (e.g., wolf02.ncbr.muni.cz)

More complex settings can be saved and easily restored in the future.

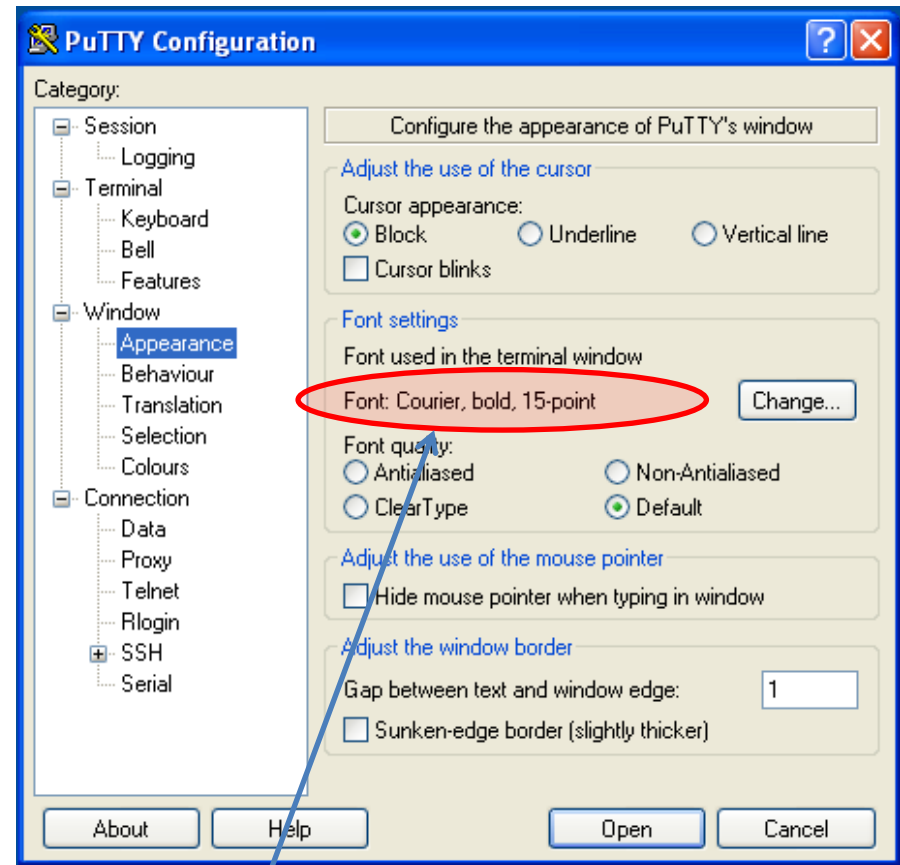
Opens the terminal:

- you will be asked to approve the fingerprint of ssh server (first login)
- you must enter a login name
- you must enter a password (input is not indicated, no asterisks, etc.)

Putty - Setting I

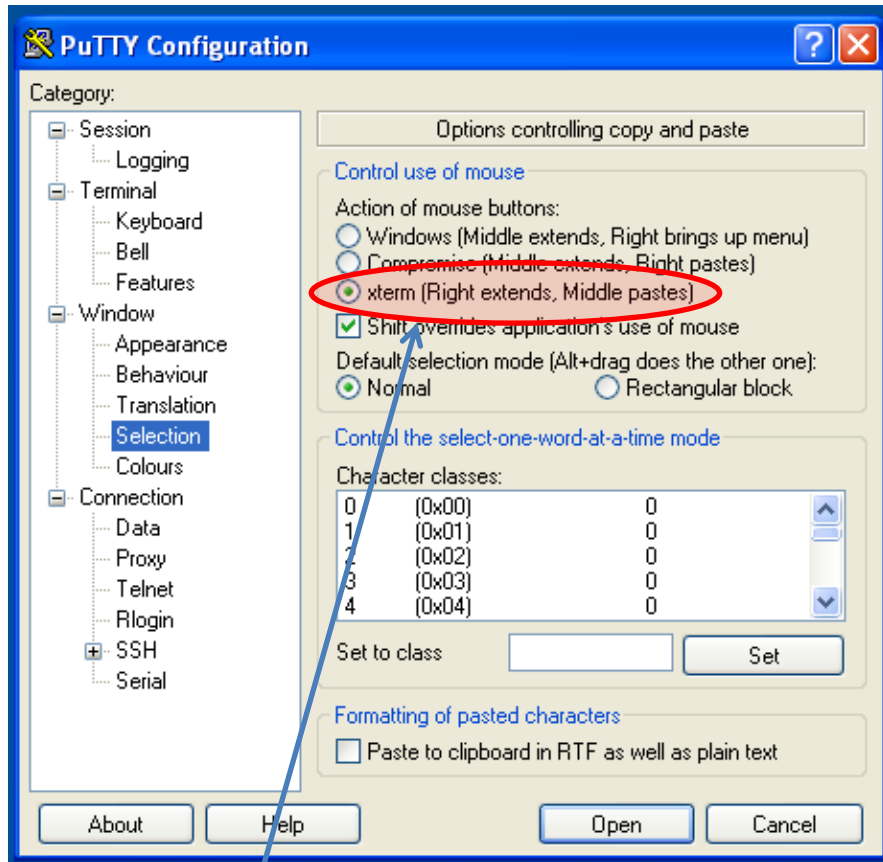


Proper operation of the backspace key.



Constant width font.

Putty - Setting II



selection by mouse compatible with
Unix terminals

Remote File Transfer

➤ WinSCP

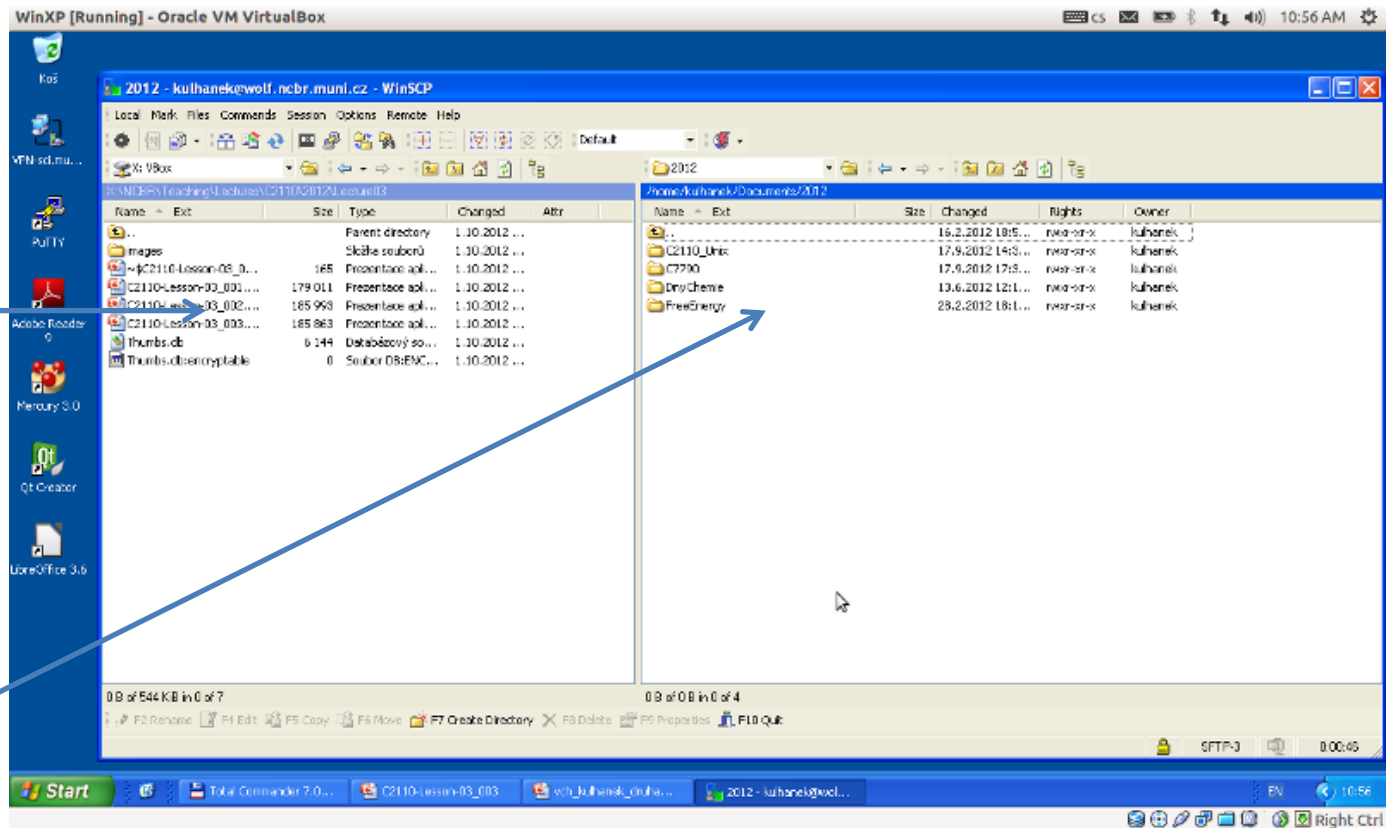
Comment:

- ssh server must be running on the remote machine.
- The security fingerprint must be confirmed first time you log in ssh server.
- Possible problems with text files.

WinSCP

WinSCP <http://winscp.net/eng/docs/lang:cs>

Program for file transfer between MS Windows and computers supporting SFTP or SCP protocols (mostly Unix and Linux type).



local machine

remote machine

Text files MS Win ↔ Linux

Text files created under MS Windows and Linux **are not** completely **compatible** because each operating system uses a different encoding of **end of line**.

Linux: \n (line feed 0x0A)

MS Windows: \r + \n (carriage return 0x0D, line feed 0x0A)

Programs **d2u** and **u2d** can be used to convert files. They are available on the WOLF cluster.

1) Activation of module cats

```
$ module add cats
```

2) Conversion MS Windows => Linux

```
$ d2u file.com
```

3) Conversion Linux => MS Windows

```
$ u2d file.log
```

Additional information:

<http://en.wikipedia.org/wiki/Newline>

X-server

➤ VcXsrv

VcXsrv <https://sourceforge.net/projects/vcxsrv/>

A program that provides an X-server, which is necessary for remote or local running of graphical applications.

1. Install the program VcXsrv.
2. Run the program.
 - Firewall: limit availability to a private network
 - When saving the configuration, it may be necessary to reselect the path for the users who have diacritics in the name.
 - Insert 0 into the field "Display number" (it will not allow more than one server to run)
 - Into box "Additional parameters for VcXsrv", insert

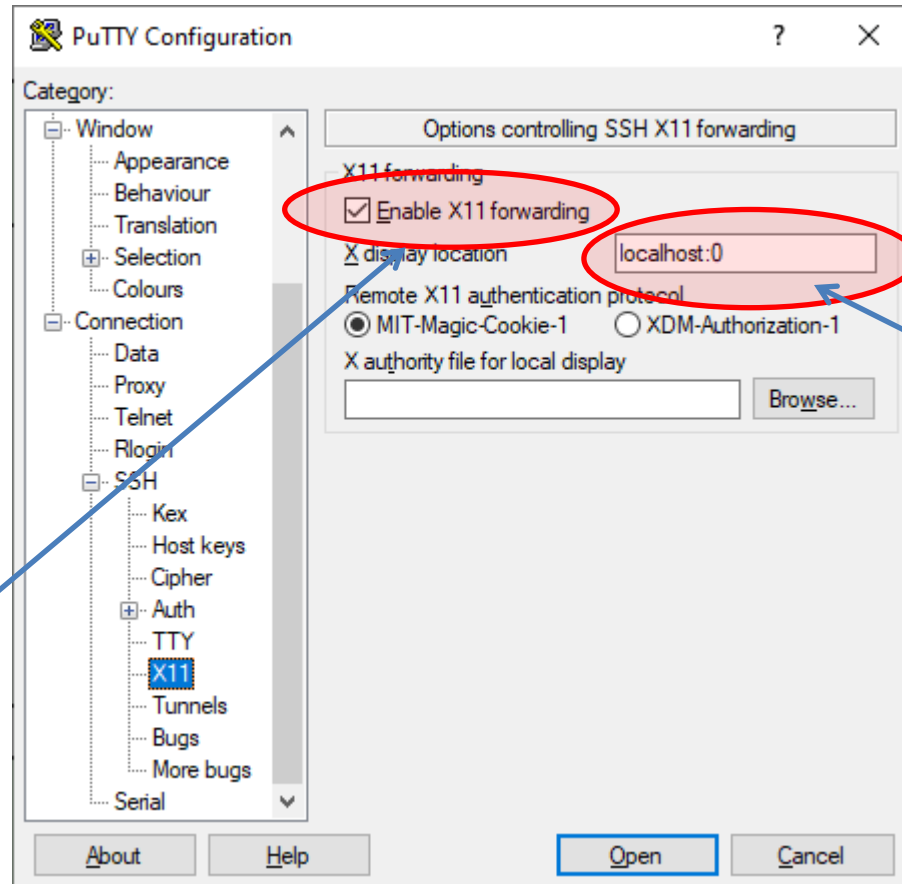
```
-xkbmodel pc105 -xkblayout us -xkbvariant qwerty, -xkboptions grp:lalt_lshift_toggle
```

VcXsrv - Usage

1. To run graphic applications from a remote machine (i.e., display export) it is necessary to activate X11 forwarding when connecting via ssh connection:
 1. `putty`
 1. see the next page for instructions
 2. `ssh (Cygwin)`
 1. `-X` option (capital X)

VcXsrv + Putty

1. To run graphical applications via Putty it is necessary to add X11 forwarding to the settings.



Activation of
X11 forwarding

local X11 server

Typical Way of Work

1. If you plan to run graphics applications (Nemesis, avogadro, vmd) available on the WOLF cluster, start the X server on your MS Windows workstation. The X server can be started only once, the run is indicated by the X icon in the status bar.
2. In the Putty terminal, log in to the remote machine. For the WOLF cluster, use the wolf02-wol23 nodes in the ncb.r.muni.cz domain, e.g., wolf02.ncbr.muni.cz
 - You can open several terminals.
 - You can run graphical applications on a remote machine. You access the data directly.
 - You run calculations on a cluster using a batch system.
3. Data policy
 - You hold the data on a WOLF cluster, you do not need to copy it to Win
 - The WinSCP program can be use for backups or archiving

Disadvantages:

- slowness/response of graphics applications

Example

```
wolf02.ncbr.muni.cz - PuTTY
# ~~~~~
Exported module      : nemesis:18.105.0c8fdb9
Module build        : nemesis:18.105.0c8fdb9:x86_64:single

[kulhanek@wolf02 ~]$ nemesis &
[1] 1441
[kulhanek@wolf02 ~]$
# =====
# NEMESIS
# ~~~~~
# Started at : 2020-04-12 11
# =====

[kulhanek@wolf02 ~]$
```

Putty:
running application
Nemesis (on
background &)

```
wolf02.ncbr.muni.cz - PuTTY
# ~~~~ Host info ~~~~~
# Full host name      : wolf02.ncbr.muni.cz
# Num of host CPUs    : 4 / Num of host threads : 4
# Host SMP CPU model  : Intel(R) Core(TM)2 Quad CPU Q8400 @ 2.66GHz [Total: 7.8 GB]
# Num of host GPUs    : 1
# Host GPU model #1   : GeForce GT 730 [Memory: 980.9 MB/GPU]
# Host arch tokens    : cuda, cuda20, cuda21, cuda35, i386, i686, noarch
#
# ~~~~ Site documentation and support ~~~~~
# Documentation       : https://
# Support e-mail      : support
#
>>> OpenGL renderer: system (llvmpipe (LLVM 9.0, 128 bits) / OpenGL 3.1 2.8)

[kulhanek@wolf02 ~]$
```

Putty:
second terminal

Project 1: NEMESIS - Molecular Modelling Package

File Edit Selection Structure Geometry Properties Graphics Mouse Tools Setup Help

Build panel
Basic General

Structures
Name SID Ator
Structure 1 1

Number of structures: 1

Active Profile
Active profile: Profile 1
Profile objects
Name
Light 1
Background 1
Standard Model 1
Freezed Atoms 1

Import XYZ file
Look in: /home/kulhanek
Computer
kulhanek
Name Size Type
awk Folder 1
C7790 Folder 1
C8862 Folder 5
Data Folder 1
Desktop Folder 1
DNY_CHEMIE Folder 9
Documents Folder 3
Downloads Folder 1
Durec Folder 6
intel Folder 1
MM Folder 1
pokus1 Folder 1
Procesy Folder 1
Projects Folder 1
Public Folder 1

File name:
Files of type: XYZ Files (*.xyz)

Delete atom Make bond
Break bond Delete bond
Optimize

select a connect atom (open val

Application Nemesis runs
on a remote machine
wolf02

Works directly with
files in the home
directory of the WOLF
cluster

Alternatives

- **Cygwin (<https://www.cygwin.com/>)**
- **MobaXterm (<https://mobaxterm.mobatek.net/>)**