Remote Access to Linux (Unix) from MS Windows

Cygwin + TigerVNC (Remote Desktop)
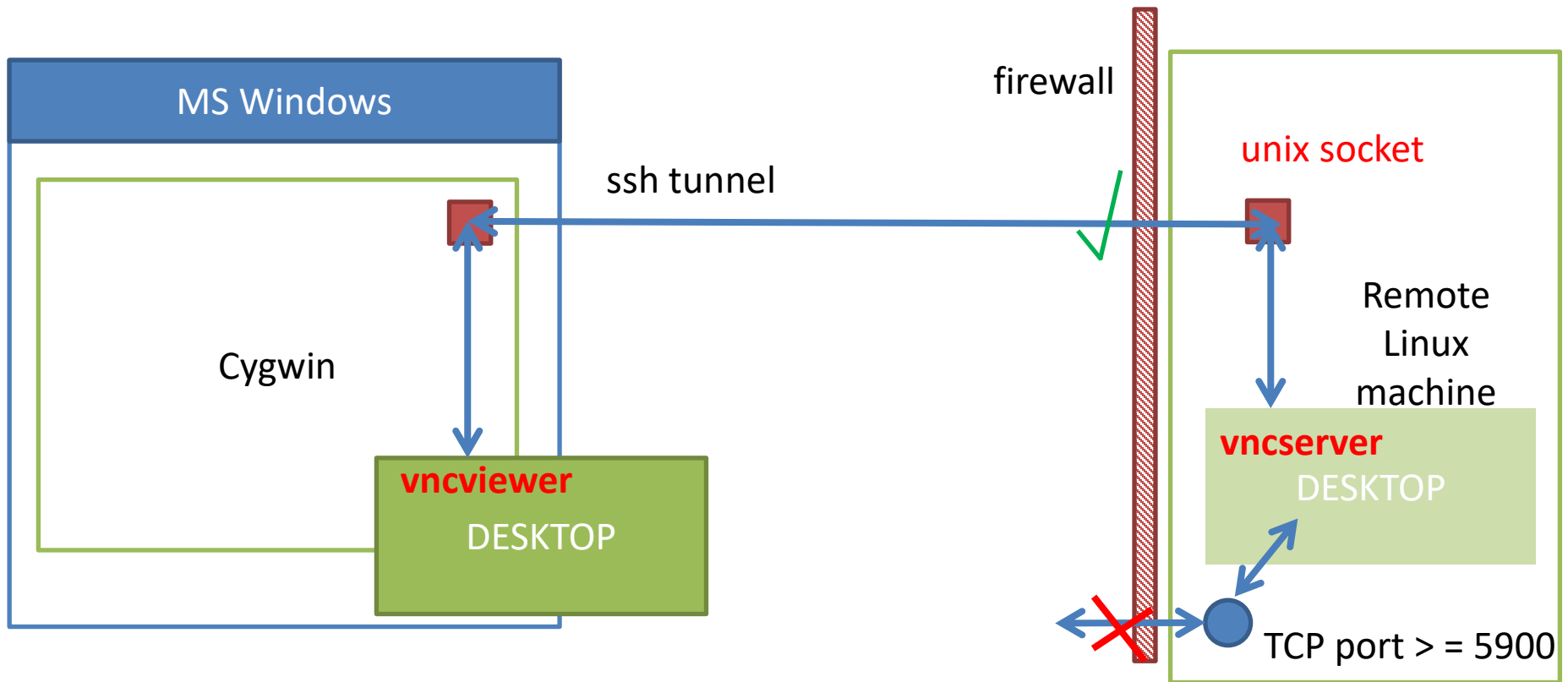
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VNC

MS Windows

firewall

unix socket

ssh tunnel

Cygwin

Remote
Linux
machine

vncviewer

DESKTOP
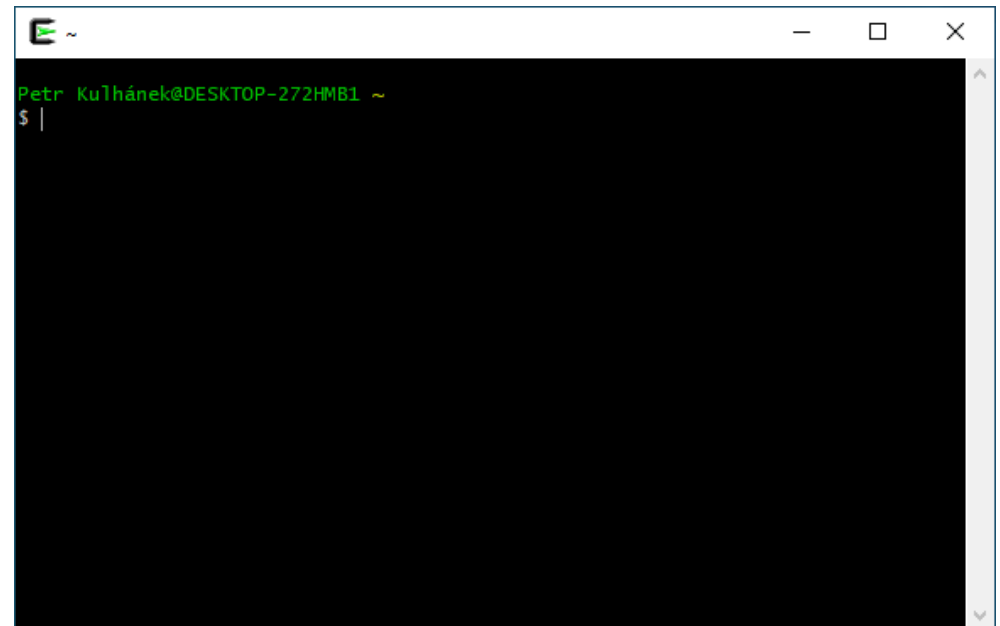
vncserver

DESKTOP

TCP port > = 5900

VNC

1. VNC implements a remote desktop access. Unlike export of display, the remote desktop is very fast and does not suffer as much latency.

2. VNC uses network ports 5900 and higher for network connection. Since these ports can be exploited by unauthorized persons, they are disabled by the firewall on the WOLF cluster. This measure greatly complicates the use of VNC.

3. Therefore, LCC support provides customized programs vncserver and vncviewer for easy and secure use:

    1. vncserver
        1. it starts a VNC server that listens on a Unix socket (TCP network connections on 5900 ports do not open)
        2. the access to the Unix socket is restricted to the user running the VNC server only
        3. the default desktop is JWM (works on all remote machines), on some machines it is possible to run full Ubuntu GNOME desktop (--fullgui option)
    2. vncviewer
        1. it establishes a ssh connection to the remote machine and creates a tunnel to the Unix socket on the remote machine
        2. starts VNC client that displays the remote desktop

Installation

Installing Cygwin

1. Run installer of Cygwin environment, https://www.cygwin.com/, setup-x86_64.exe
2. Use default settings
   1. Select download site from CZ (ending .cz)
   2. Select packages: Install the following packages :(View: full; Search: balíček, instead of Skip, choose the latest version)
      1. krb5-workstation
      2. openssh
      3. nc
3. Start the Cygwin terminal

Cygwin environment can be used for other purposes than exclusively for NCBR TigerVNC.

Installing VNC client

1. Following commands are performed in the Cygwin terminal on your computer.
2. Download the program installation package ncbr-tigervnc:

   ```
   $ scp username@wolf02.ncbr.muni.cz:~kulhanek/Documents/C2110/Software/ncbr-tigervnc-cygwin64.run .
   ```

3. Run the installer:

   ```
   $ bash ncbr-tigervnc-cygwin64.run
   ```

4. Check that vncviewer program is available:

   ```
   $ type vncviewer
   /usr/bin/vncviewer
   ```

space, dot

Comment:
- installer sets up Cygwin environment to use Kerberos protocol for META realm
  - installs file /etc/krb5.conf (always)
  - installs the file ~/.ssh /config (if it doesn't exist)

Additional Configuration

```
Petr Kulhánek@DESKTOP-272HMB1 ~
$ ssh kulhanek@wolf02.ncbr.muni.cz
```

You must explicitly specify the username.

You can add your username, that you use on remote Unix machines, to file **~/.ssh/config**. The configuration can also be changed for specific machines (Guests), see man ssh_config.

```
Host *
# ...
    SendEnv LANG LC_*
    HashKnownHosts no
    GSSAPIAuthentication yes
    GSSAPIDelegateCredentials yes
    User kulhanek
```

```
Petr Kulhánek@DESKTOP-272HMB1 ~
$ ssh wolf02.ncbr.muni.cz
```

It is not necessary to specify the username, it will be taken from config file. Also applies to scp.

Usage

Actual overview of all GUI sessions on a WOLF cluster can be obtained here:

https://wolf.ncbr.muni.cz » Internal part
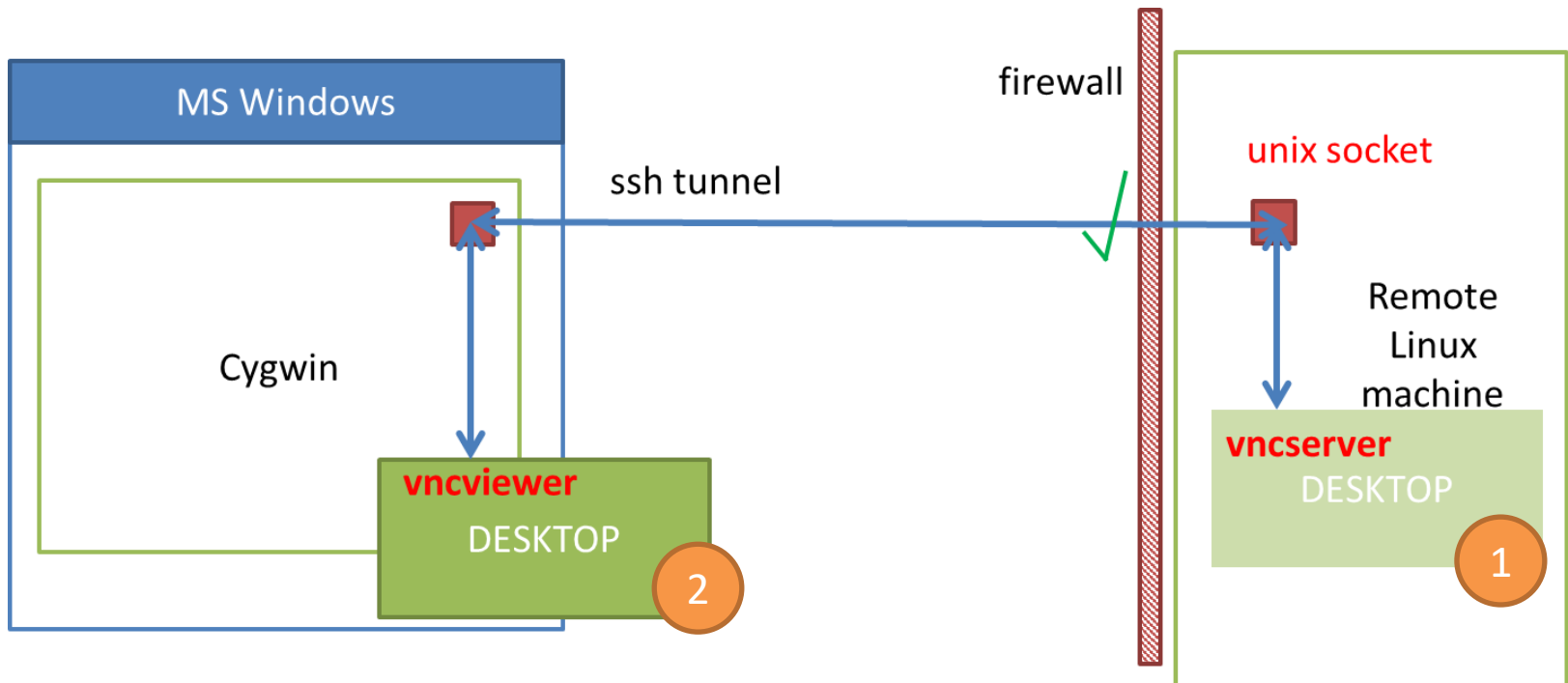
To log in, use the e-INFRA account that you use to log in to the WOLF cluster.

first run vncserver on unoccupied machines (green) and then on machines running fewer instances of the GUI sessions.

Manual Summary

1 Run vncserver on the REMOTE computer (using putty or ssh v Cygwin)

2 Run vncviewer on YOUR computer (in Cygwin)

1. Start VNC server

Following commands are performed in Cygwin terminal, **vncserver runs on remote machine**.

0. Verify
- that you have valid krb5 tickets (klist)
- or renew them
  - either MIT Kerberos for Windows (see previous presentations)
  - or in the Cygwin terminal with the command kinit username@META

1. Log in to the remote machine using ssh, e.g., to the node wolf02.ncbr.muni.cz

    [myPC]$ ssh wolf02.ncbr.muni.cz

2. Activate the tigervnc module

    [wolf02]$ module add tigervnc

3. Start a VNC server with full Ubuntu GNOME

    [wolf02]$ vncserver --fullgui

 or with a lightweight JWM desktop

    [wolf02]$ vncserver

1. Start the VNC server, cont.

```
[kulhanek@wolf02 ~]$ vncserver

>>> TigerVNC server started succesfully!
    Logs: ~/.vnc/wolf02.ncbr.muni.cz.1.startlog  ~/.vnc/wolf02:1.log

    VNCID:  kulhanek@wolf02.ncbr.muni.cz:1
```

to diagnose possible problems

VNC session identifier

Comments:
- After starting the VNC server, it is possible to terminate the ssh connection to the remote machine.
- It is not appropriate to run multiple VNC servers.
- An overview of running servers can be obtained using:
    $ vncserver -list
- The VNC server can be explicitly terminated (vncserver -kill <ID>, ID is printed by the -list option). ATTENTION! Any unsaved work will be lost.

2. Start VNC viewer

Following commands are performed in Cygwin terminal, **vncviewer is running on your computer**.

0. Verify
- that you have valid krb5 tickets (klist)
- or renew them
    - either MIT Kerberos for Windows (see previous presentation)
    - or in the Cygwin terminal with the command kinit username@META

1. Launch the VNC viewer. Use the VNCID listed when starting the VNC server as an argument.
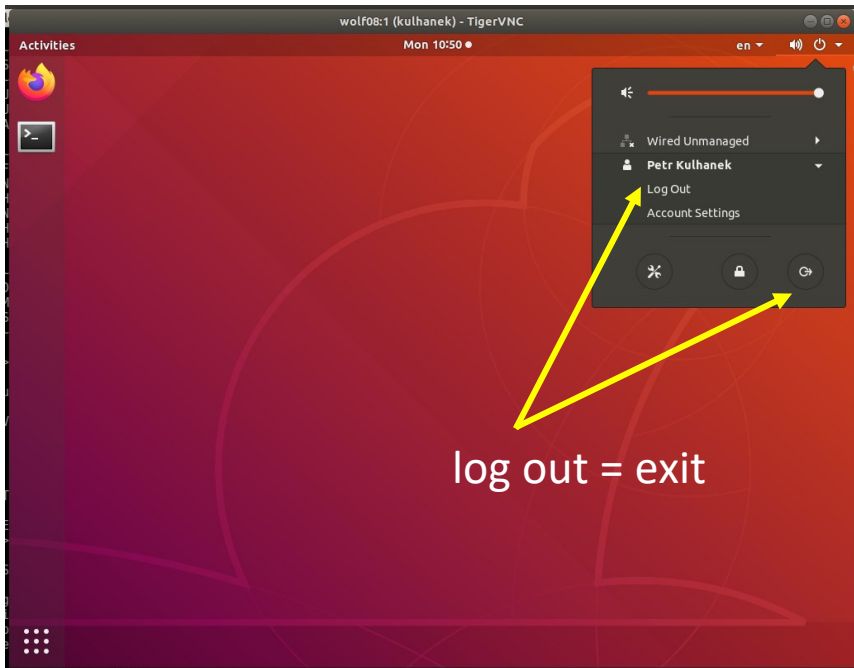
```
[myPC]$ vncviewer kulhanek@wolf02.ncbr.muni.cz:1
```

Exit vs Disconnect

You must always exit a VNC session when you are finished so that you do not block resources for other users.

1. The VNC server terminates when
   - you log out from the desktop (Gnome: Logout; JWM: Exit)
   - server can be explicitly killed (vncserver -kill), use this with precaution as it can result in data lost

2. Disconnection from the VNC server occurs when
   - network connection is lost
   - VNC viewer window is closed

3. To re-establish the connection, you must open the VNC viewer again with the same VNCID.

Exit vs Disconnect

vncviewer window close = disconnect

log out = exit
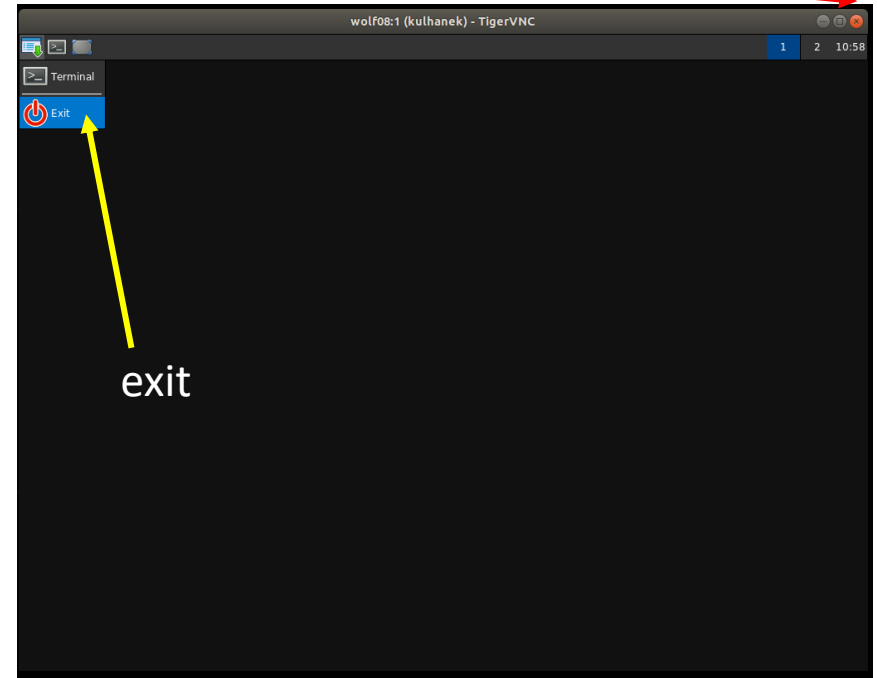
exit

You must always exit a VNC session when you are finished so that you do not block resources for other users.

Showcase of Ubuntu Desktop

Starting the VNC server, the terminal can be terminated

Start VNC viewer

Remote Desktop
Ubuntu GNOME

gimp

Possible Problems

1. Correct location of the ssh command in Cygwin is /usr/bin/ssh.

   ```
   Petr Kulhánek@DESKTOP-272HMB1 ~
   $ type ssh
   ssh je /usr/bin/ssh
   ```

2. Some antivirus protection software were reported to block this application. This can result in use of incorrect ssh command from the MS Windows environment (/cygdrive/c/WINDOWS/System32/OpenSSH/ssh).

3. Solution:
   - Use MS Defender, remove other antivirus solutions.
   - Create an exception in your antivirus program for network use by the ssh command from Cygwin.