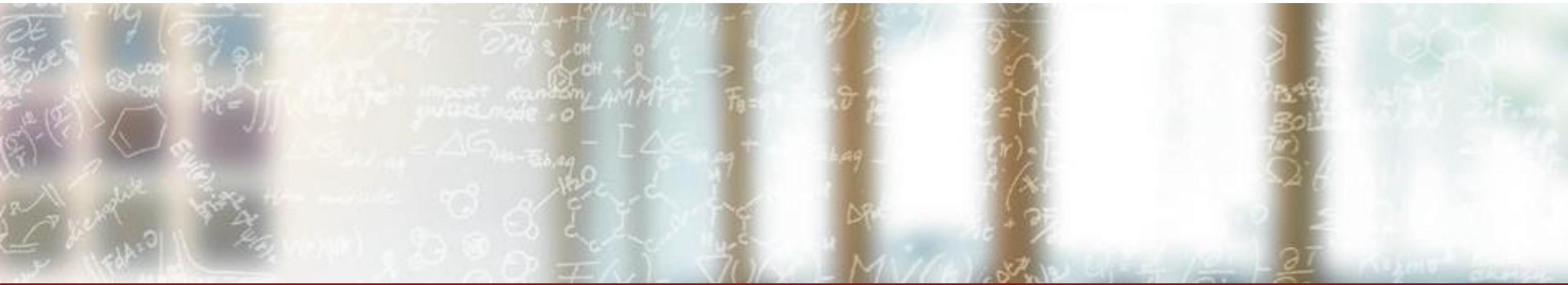




CSCS

Centro Svizzero di Calcolo Scientifico
Swiss National Supercomputing Centre

ETH zürich



ParaView Client-Server on Piz Daint

Direct access to Piz Daint via ssh tunnel

Jean M. Favre, CSCS

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Setup

- **Paraview provides an optimized communication between a remote (parallel) server and a desktop client. This is far more efficient than running ParaView inside a VNC desktop, or using ssh -X**
- **Access to your remote data is still enforced.**
- **A ParaView communication must be configured**
 - Client pre-compiled desktop version
 - Use ParaView server (pvserver) compiled on daint
 - Remote server configuration

Windows users

- **A Putty access must be configured**
 - PuTTY app
 - Private ssh key
 - Consult <https://user.cscs.ch/access/auth/#generating-ssh-keys>
 - Suggested reading
 - Putty Session for ParaView

Putty setup

- Create a new Putty Session (Next slide)
- Preliminary: You will need your userid number on daint:
 - ssh to daint. The userid can be seen with the command "id".
 - *For the rest of this document, we use userid=1100.*
- *Replace that number with your personal userid.*

Under PuTTY **Session**:

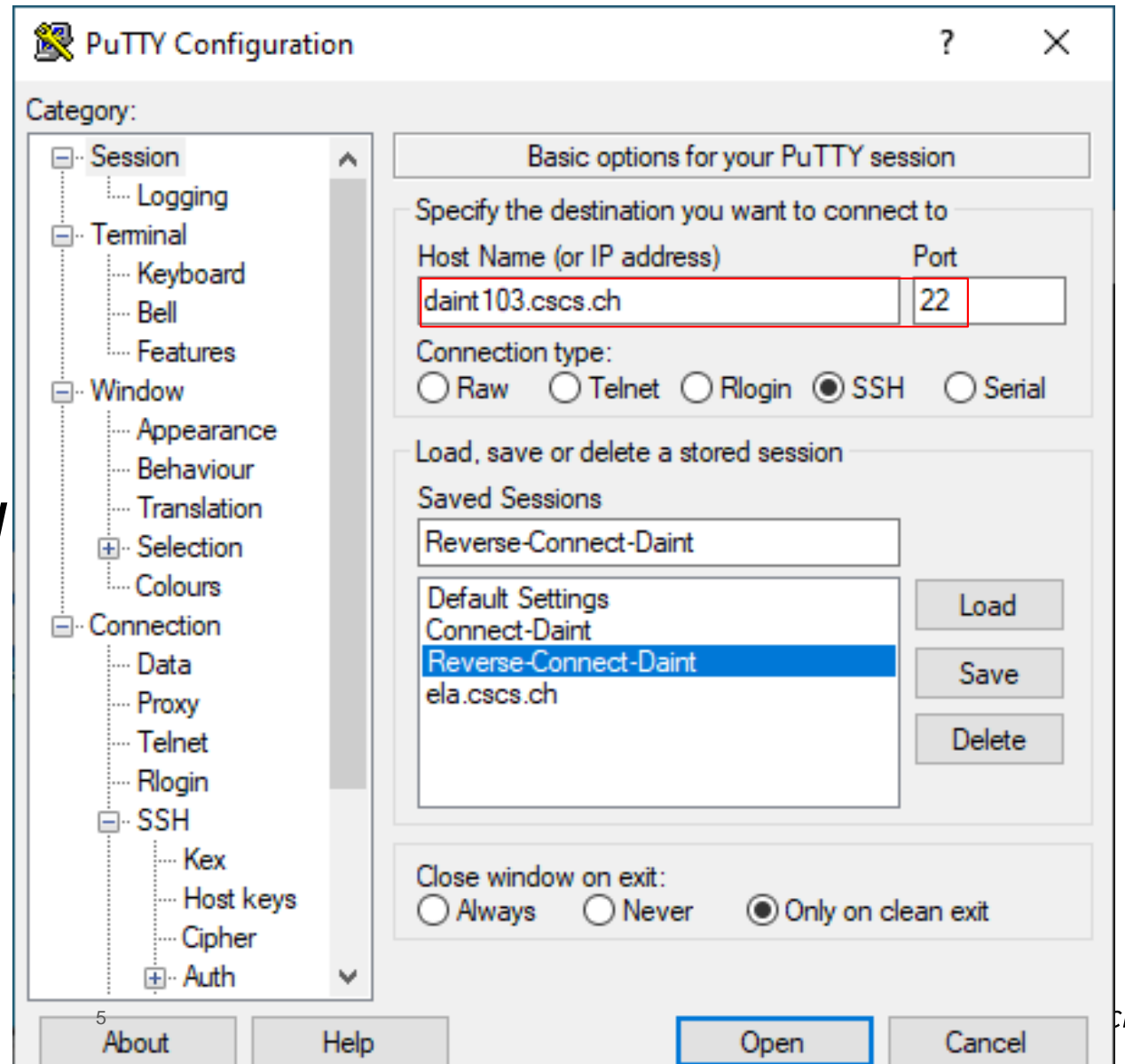
New session with the destination system

In this example:

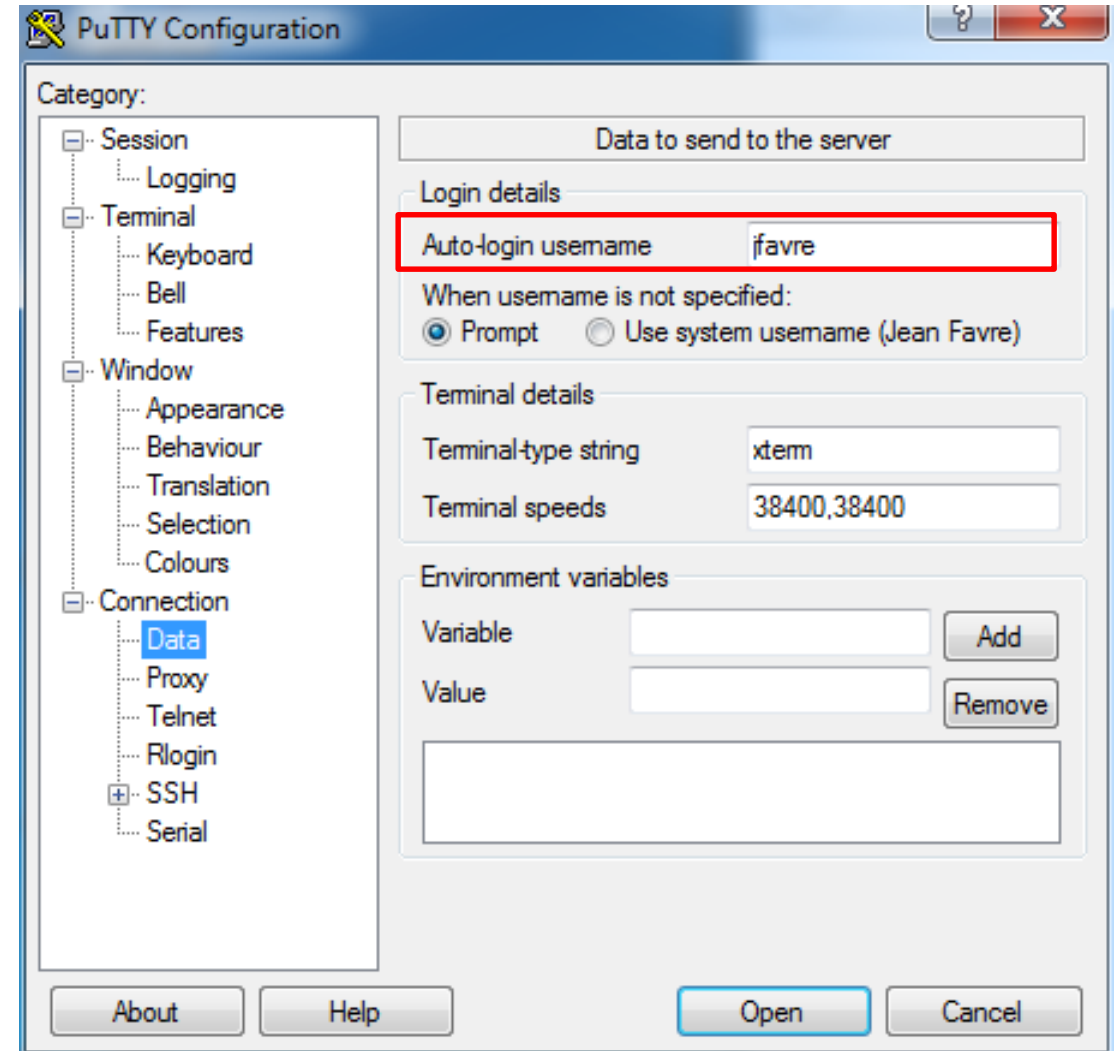
*Access to daint.cscs.ch
is saved as PuTTY session*

Reverse-Connect-Daint

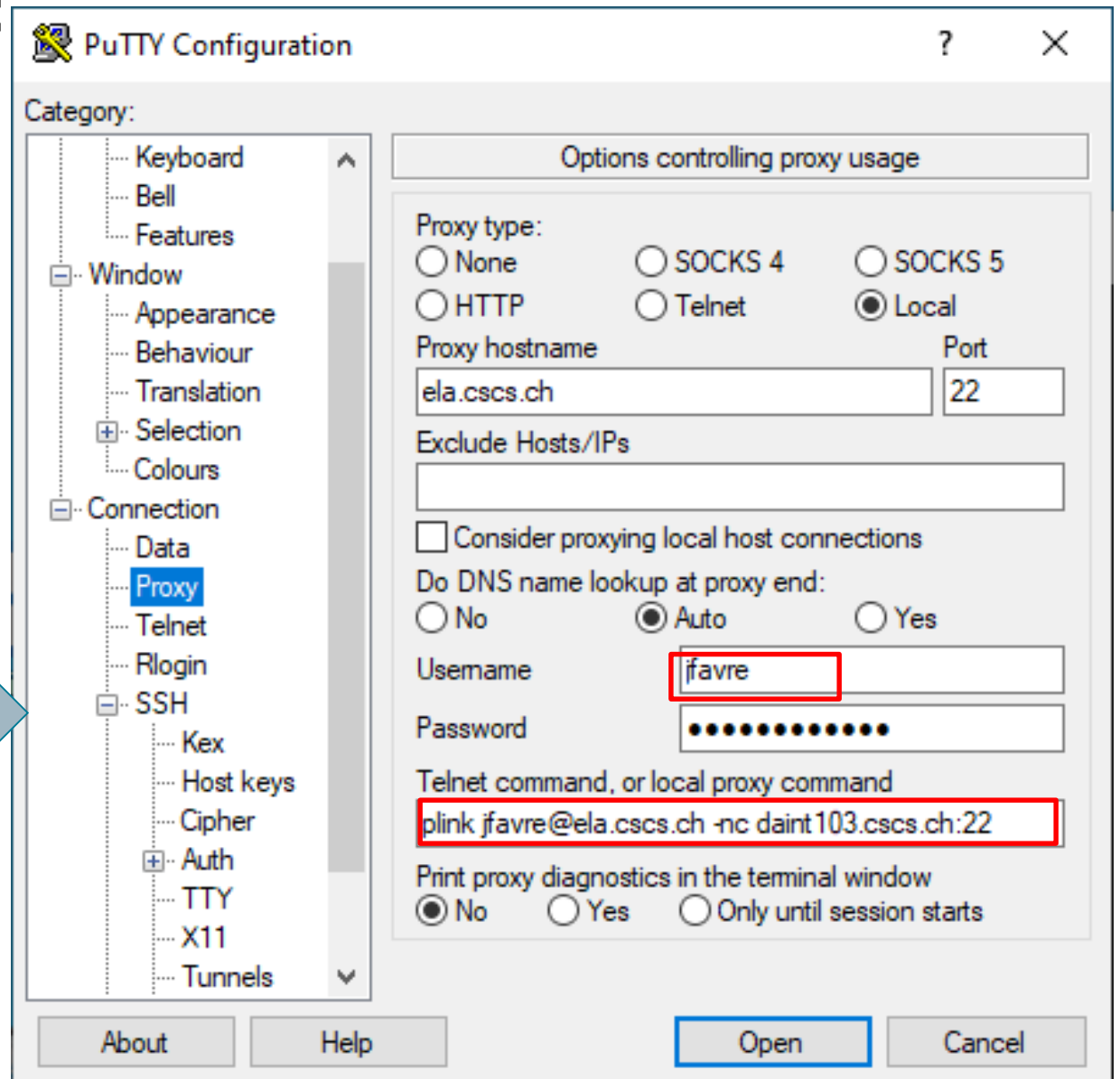
*since ParaView uses a method
called Reverse Connection,
whereby the server (on daint)
connects back to the client (on
your desktop)*



Under PuTTY **Connection – Data:**
Put your <username> on the auto-login tab.



Under PuTTY Connection – Proxy: Define the plink command.



The image shows the PuTTY Configuration dialog box. The 'Category' list on the left has 'Proxy' selected under the 'Connection' category. A blue arrow points from the text 'Define the plink command.' to the 'Proxy' category. The 'Options controlling proxy usage' section on the right is expanded. The 'Proxy type' is set to 'Local'. The 'Proxy hostname' is 'ela.cscs.ch' and the 'Port' is '22'. The 'Exclude Hosts/IPs' field is empty. The 'Consider proxying local host connections' checkbox is unchecked. The 'Do DNS name lookup at proxy end:' is set to 'Auto'. The 'Username' is 'jfavre' and the 'Password' is masked with dots. The 'Telnet command, or local proxy command' field contains the command 'plink jfavre@ela.cscs.ch -nc daint103.cscs.ch:22'. The 'Print proxy diagnostics in the terminal window' is set to 'No'. The 'Open' button is highlighted.

PuTTY Configuration

Category:

- Keyboard
- Bell
- Features
- Window
 - Appearance
 - Behaviour
 - Translation
- Selection
- Colours
- Connection
 - Data
 - Proxy**
 - Telnet
 - Rlogin
 - SSH
 - Kex
 - Host keys
 - Cipher
 - Auth
 - TTY
 - X11
 - Tunnels

Options controlling proxy usage

Proxy type:
☐ None ☐ SOCKS 4 ☐ SOCKS 5
☐ HTTP ☐ Telnet ☒ Local

Proxy hostname: ela.cscs.ch Port: 22

Exclude Hosts/IPs:

☐ Consider proxying local host connections

Do DNS name lookup at proxy end:
☐ No ☒ Auto ☐ Yes

Username: jfavre

Password:

Telnet command, or local proxy command:
plink jfavre@ela.cscs.ch -nc daint103.cscs.ch:22

Print proxy diagnostics in the terminal window
☒ No ☐ Yes ☐ Only until session starts

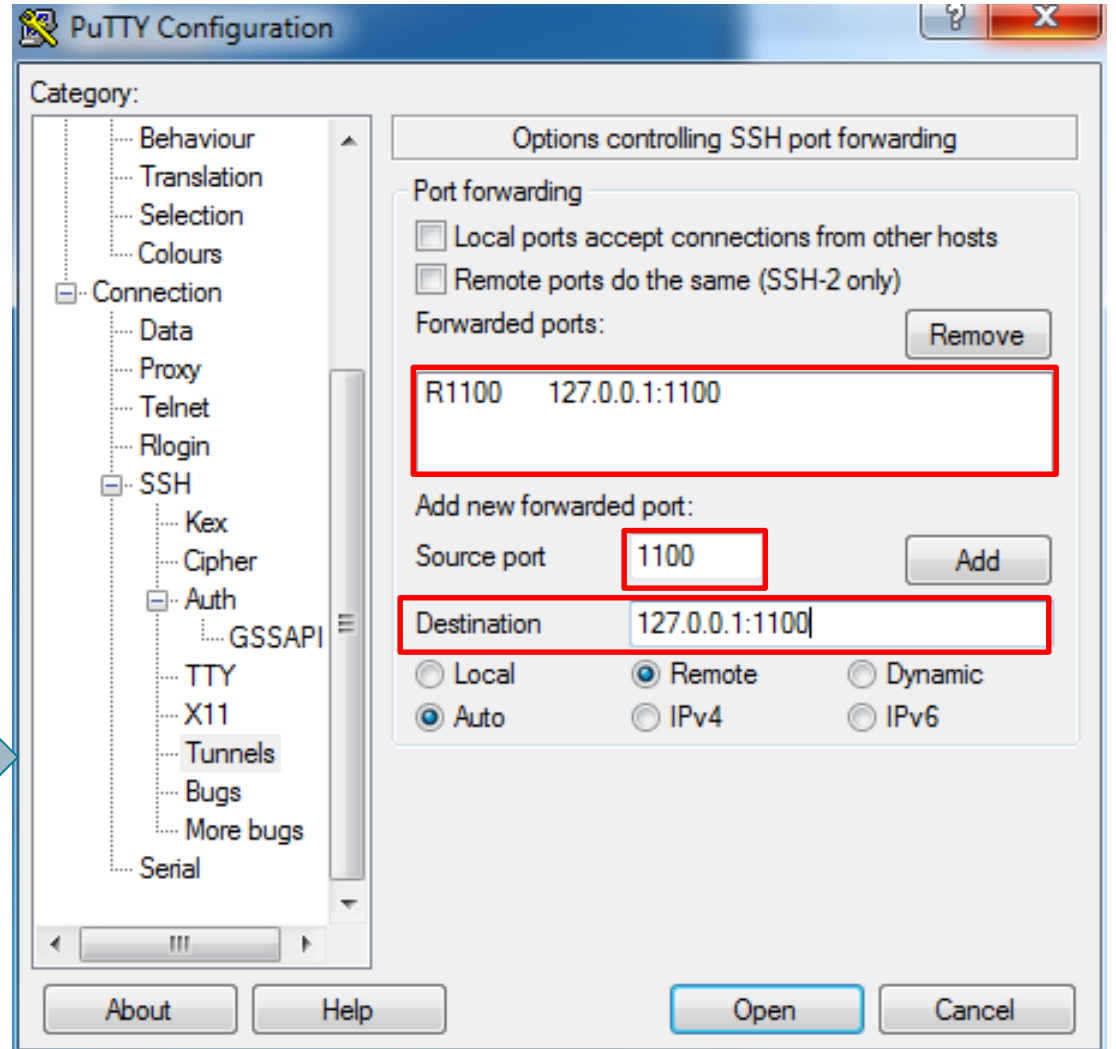
About Help Open Cancel

Use the following command:
“**plink <username>@ela.cscs.ch
-nc daint103.cscs.ch:22**”

Under PuTTY **Connection – SSH – Auth – Tunnels**: Define a single Remote tunnel from Daint

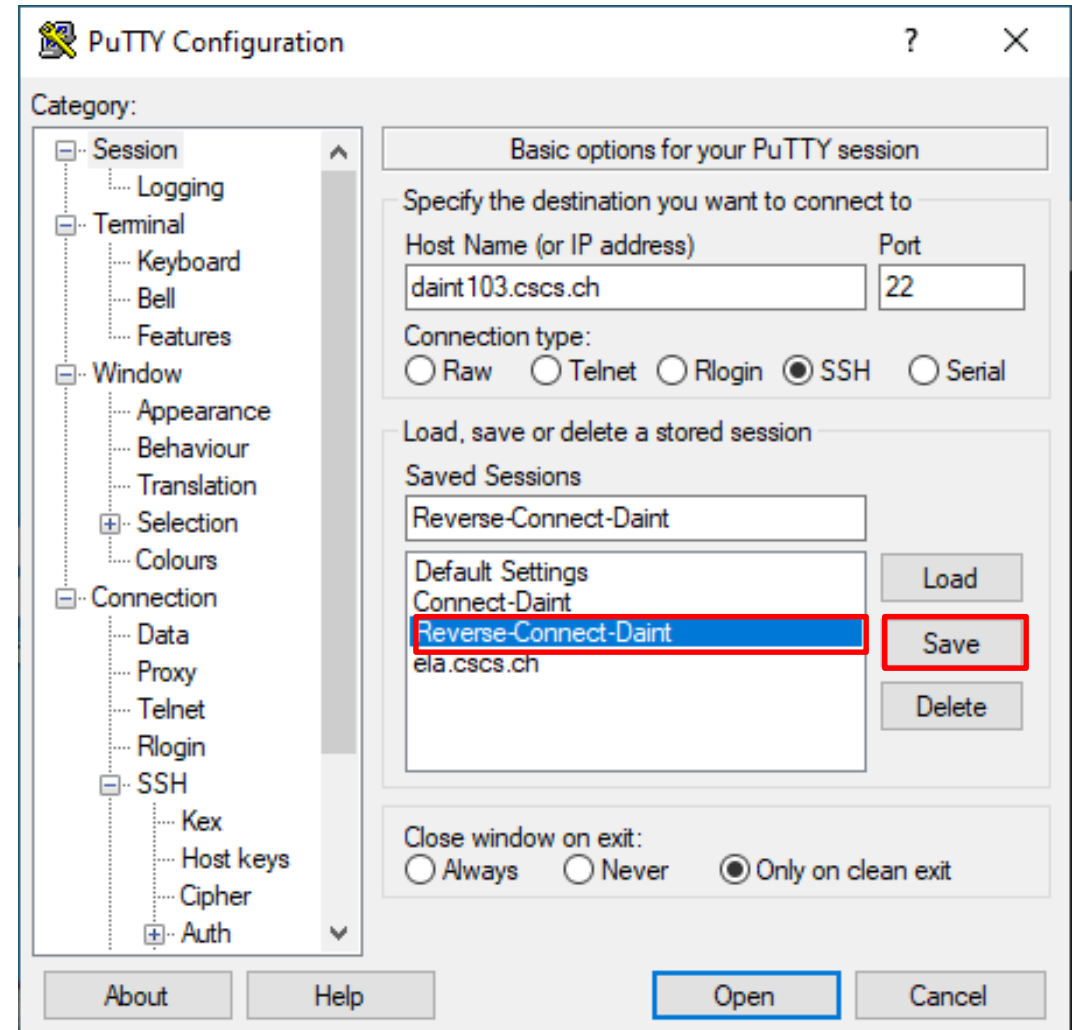
*Select Remote, use your
private userid number,
and define:*

Source port = userid
Destination = 127.0.0.1:userid



Save PuTTY Session:

- *Call it „Reverse-Connect-Daint“*



ParaView setup I

- Two server configuration files for daint, available at:
 - /apps/daint/UES/ParaView/server_daint_Windows.pvsc
 - /apps/daint/UES/ParaView/server_daint.pvsc
- must be copied to your desktop and edited.
- Change the name “jfavre” by your own username.

ParaView setup II

- Please note that the file “server_daint_Windows.pvsc” makes reference to another file "rc-submit-pvserver.sh".
- This is provided as a template. You should make a copy of this file to your remote private location, for example (on daint)
- `cp /apps/daint/UES/ParaView/rc-submit-pvserver.sh $HOME`
- This enables you to customize the shell script.

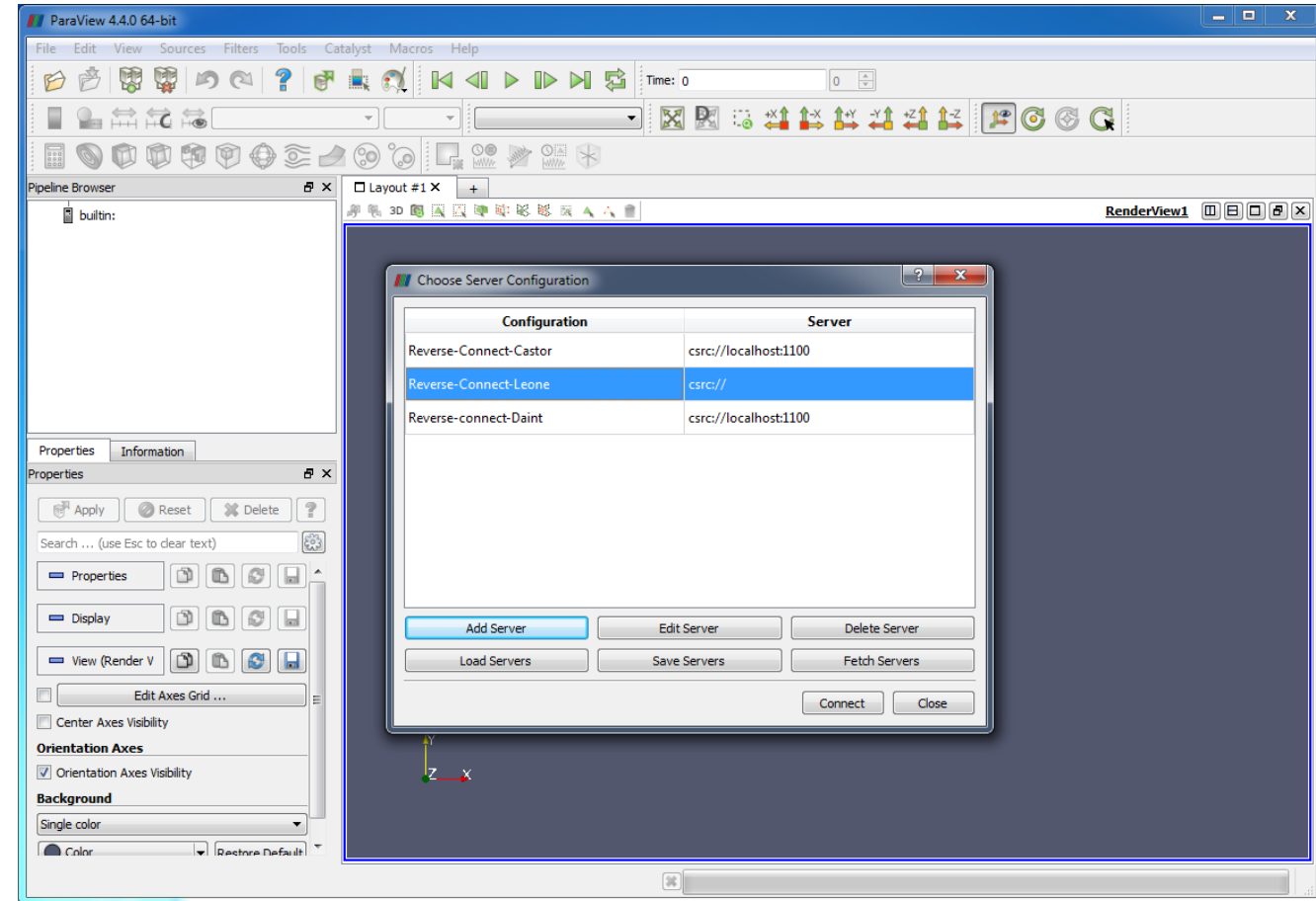
ParaView setup III

- edit “server_daint_Windows.pvsc” on your desktop and change the pathname of “rc-submit-pvserver.sh” inside it with the new pathname just created on daint.
- Follow up by editing the following lines:
 - <Option name="PV_SERVER_PORT" label="PV server port">
 - <Range type="int" min="1024" max="65535" step="1" default="1234"/>
- the default value is set to 1234. This should be changed with your private Unix userid on daint.
- Save and Exit the editor.

ParaView setup IV

- Start ParaView
- Menu File->Connect->Load Servers and select file

server_daint_Windows.pvsc



ParaView setup V

- Double-clicking on the configuration "Reverse-Connect-Daint", you will now be able to connect.
- Select options for your run.
- Be careful with:
 - Username
 - Double quotes ""
 - Path to script

Connection Options for "Reverse-Connect-Daint"

remote cluster	daint103.cscs.ch
SSH Username	jfavre
SSH command	"C:\Program Files\PuTTY\plink.exe"
The remote script which generates the SLURM job	/users/jfavre/rc-submit-pvserver.sh
Number of cluster nodes	1
Number of pvserver per node	8
Queue	debug
MemixNode	standard
VERSION	GNU-5.8
pvserver port	1100
job wall time	00:09:59
Session id	pvserver

OK Cancel

Console output (example of what you should see)

Accepting connection(s): rancate:11111

#SBATCH --job-name=pvserver

#SBATCH --nodes=1

#SBATCH --ntasks-per-node=8

#SBATCH --ntasks=8

#SBATCH --time=00:19:59

#SBATCH --partition=normal

#SBATCH --constraint=gpu

srun -n 8 -N 1 --cpu_bind=sockets pvserver -rc -ch=daint103.cscs.ch -sp=11111

Submitted batch job 123456789

Sanity check

Are you connected to a remote parallel server?

Check menu Help->About->connection information

gpu-partition with gpu-rendering



Client Information		Connection Information	
Item	Description		
Remote Connection	Yes		
Separate Render Server	No		
Reverse Connection	Yes		
Number of Processes	8		
Disable Remote Rendering	Off		
IceT	Off		
Tile Display	Off		
vtkIdType size	64bits		
Embedded Python	On		
Python Library Path	/opt/python/3.6.5.7/lib/python3.6		
Python Library Version	3.6.5 (default, Apr 15 2019, 18:26:21) [GCC 7.3.0 20180125 (Cray Inc.)]		
Python Numpy Support	On		
Python Numpy Path	/opt/python/3.6.5.7/lib/python3.6/site-packages/numpy		
Python Numpy Version	1.15.1		
Python Matplotlib Support	On		
Python Matplotlib Path	/apps/daint/UES/jenkins/7.0.UP01/gpu/easybuild/software/P...		
Python Matplotlib Version	2.2.2		
OpenGL Vendor	NVIDIA Corporation		
OpenGL Version	4.6.0 NVIDIA 418.39		
OpenGL Renderer	Tesla P100-PCIE-16GB/PCIe/SSE2		
Headless support	EGL		

Sanity check

Are you connected to a remote parallel server?

Check menu Help->
About->connection
information

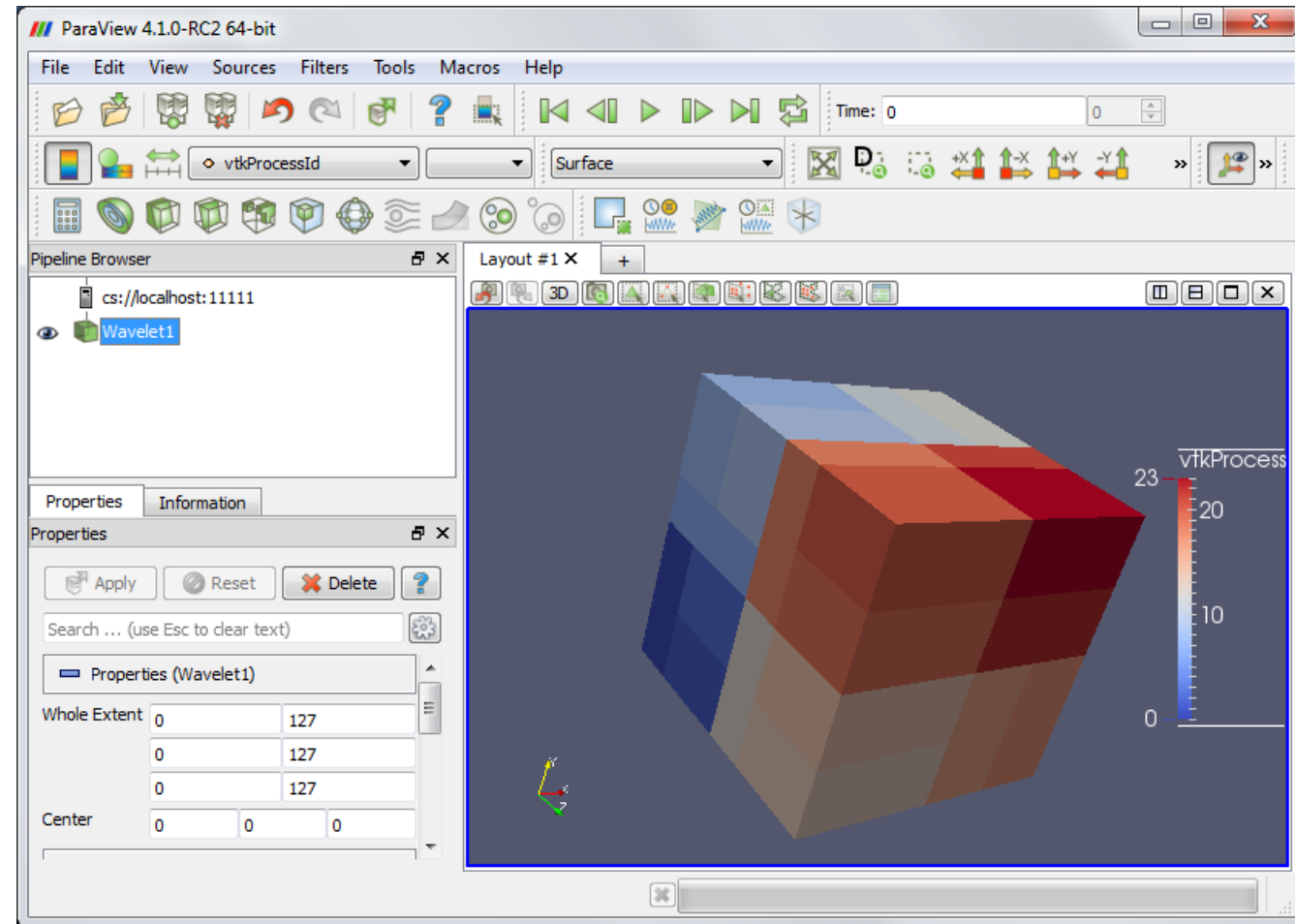
mc-partition with
cpu-rendering



Client Information		Connection Information	
Item		Description	
Remote Connection		Yes	
Separate Render Server		No	
Reverse Connection		Yes	
Number of Processes		8	
Disable Remote Rendering		Off	
IceT		Off	
Tile Display		Off	
vtkIdType size		64bits	
Embedded Python		On	
Python Library Path		/opt/python/3.6.5.7/lib/python3.6	
Python Library Version		3.6.5 (default, Apr 15 2019, 18:26:21) [GCC 7.3.0 20180125 (Cray Inc.)]	
Python Numpy Support		On	
Python Numpy Path		/opt/python/3.6.5.7/lib/python3.6/site-packages/numpy	
Python Numpy Version		1.15.1	
Python Matplotlib Support		On	
Python Matplotlib Path		/apps/daint/UES/jenkins/7.0.UP01/mc/easybuild/software/P...	
Python Matplotlib Version		2.2.2	
OpenGL Vendor		VMware, Inc.	
OpenGL Version		3.3 (Core Profile) Mesa 18.3.3	
OpenGL Renderer		llvmpipe (LLVM 8.0, 256 bits)	
Headless support		OSMesa	

Are you [really] connected to a remote parallel server?

- Check connection and parallelism with a Wavelet source, displaying variable “vtkProcessId”



Manual connection without a GUI

Terminal 1

Use pvpython, or the python shell in ParaView

```
>> from paraview.simple import *  
>> ReverseConnect("1100")
```

=====

Once connected:

- info =
 GetOpenGLInformation(location=servermanager.
 vtkSMSession.SERVERS)
- info.GetVersion() '4.6.0 NVIDIA 418.39'
- info =
 GetOpenGLInformation(location=servermanager.
 vtkSMSession.CLIENT)
- info.GetVersion() '4.5.0 NVIDIA 440.44'

Terminal 2

```
ssh -l jfavre -R 1100:localhost:1100  
daint103.cscs.ch "/users/jfavre/rc-submit-  
pvserver.sh pvserver 00:29:59 1 2 1100  
daint103.cscs.ch GNU-5.8 normal standard;  
sleep 6000"
```

=====

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