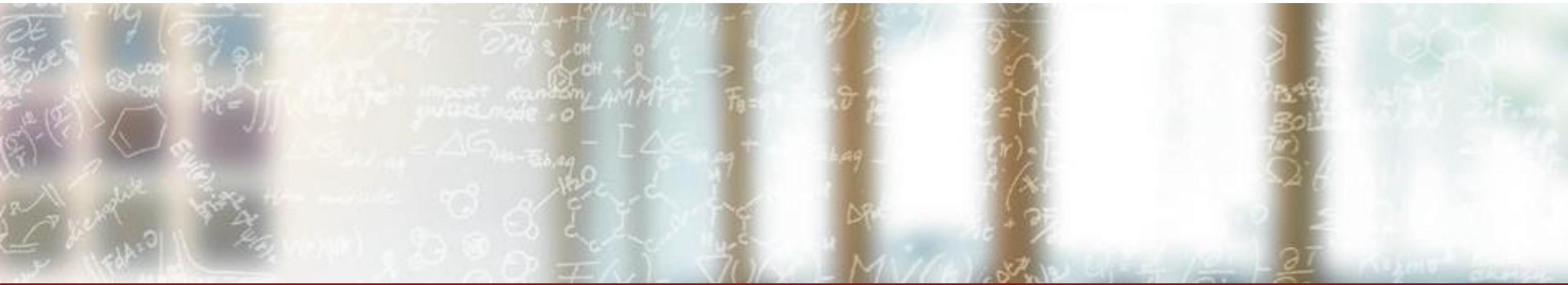




CSCS

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ParaView Client-Server on Piz Daint

Direct access to Piz Daint via ssh tunnel

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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**:

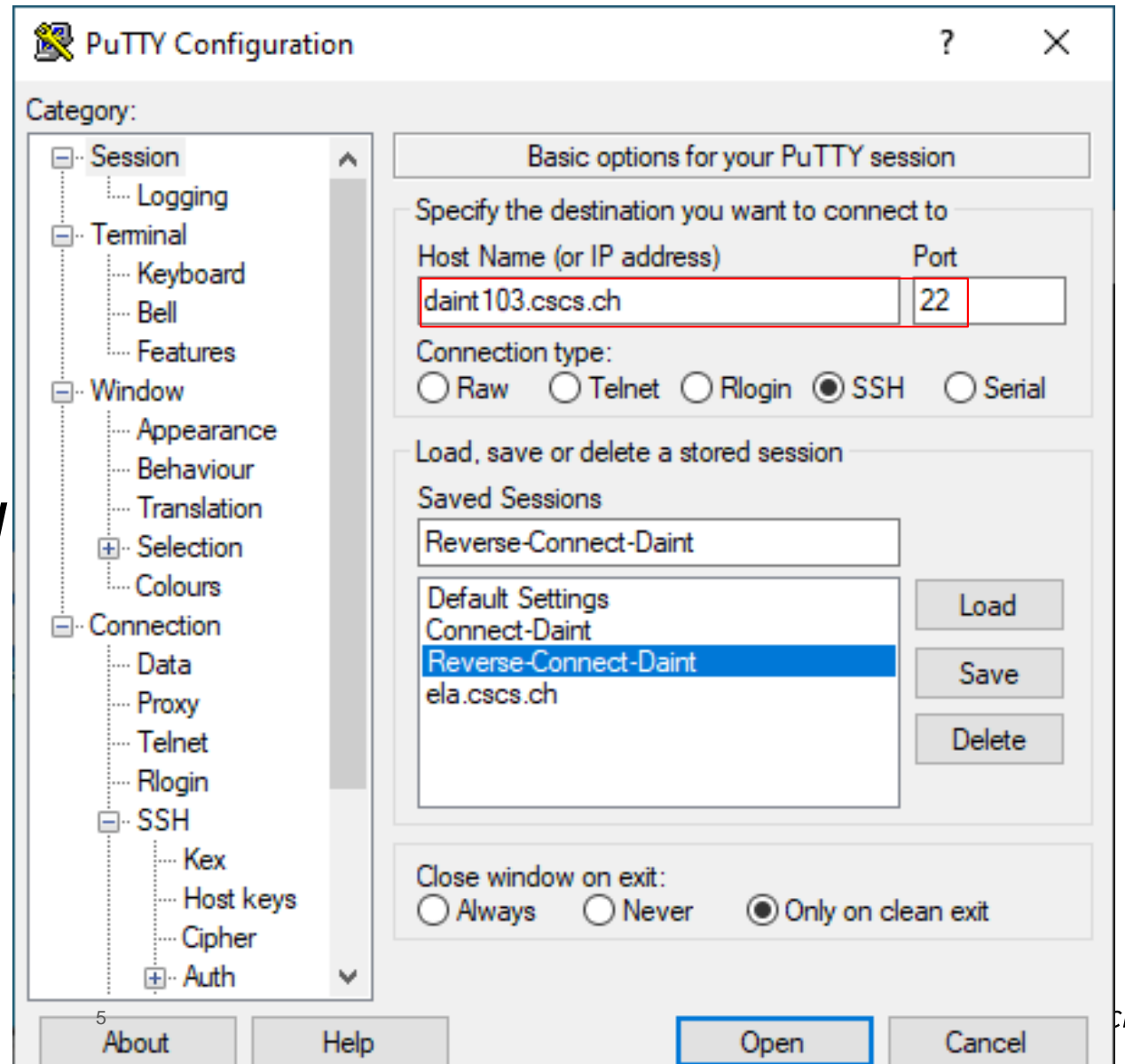
New session with the destination system

In this example:

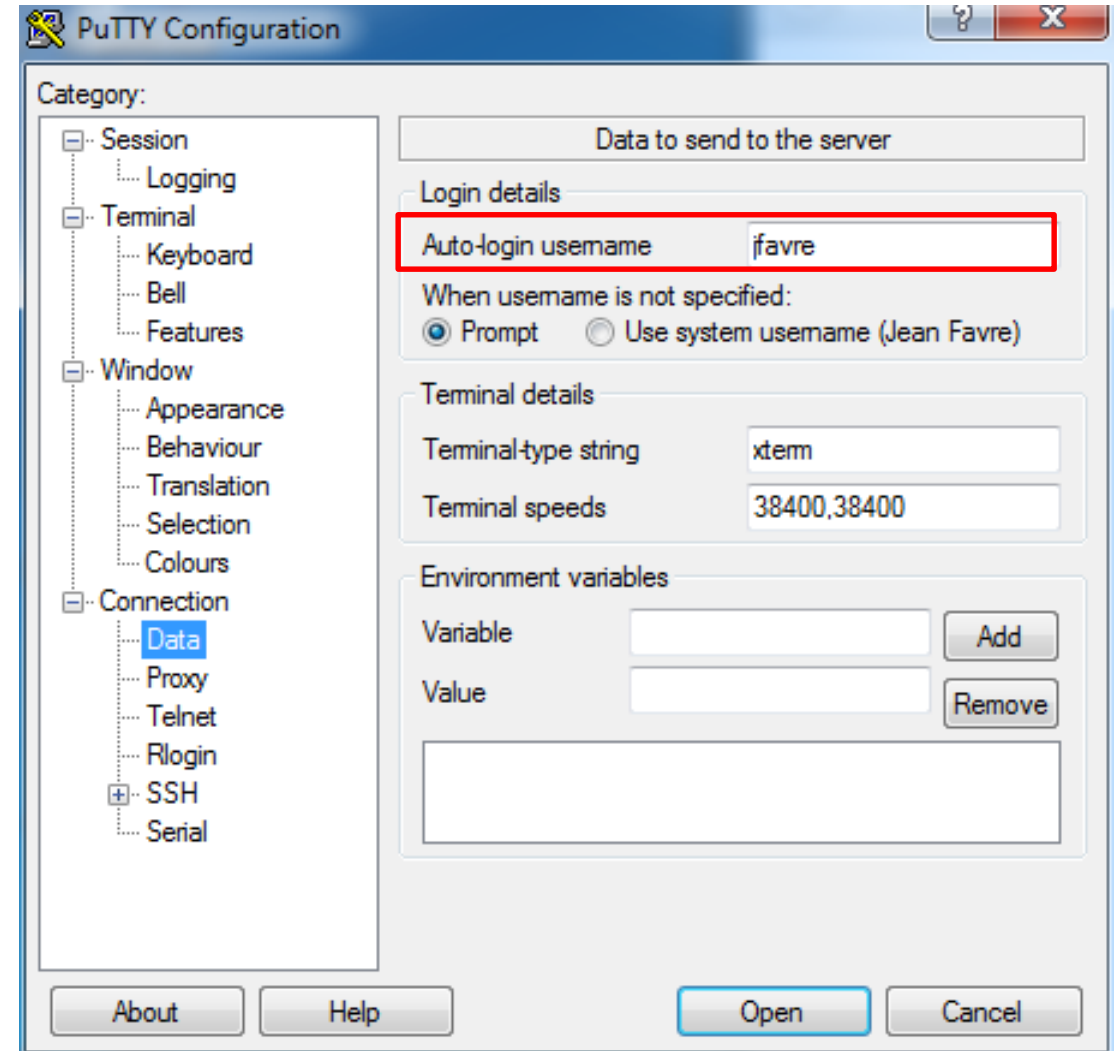
*Access to daint.cscs.ch
is saved as PuTTY session*

Reverse-Connect-Daint

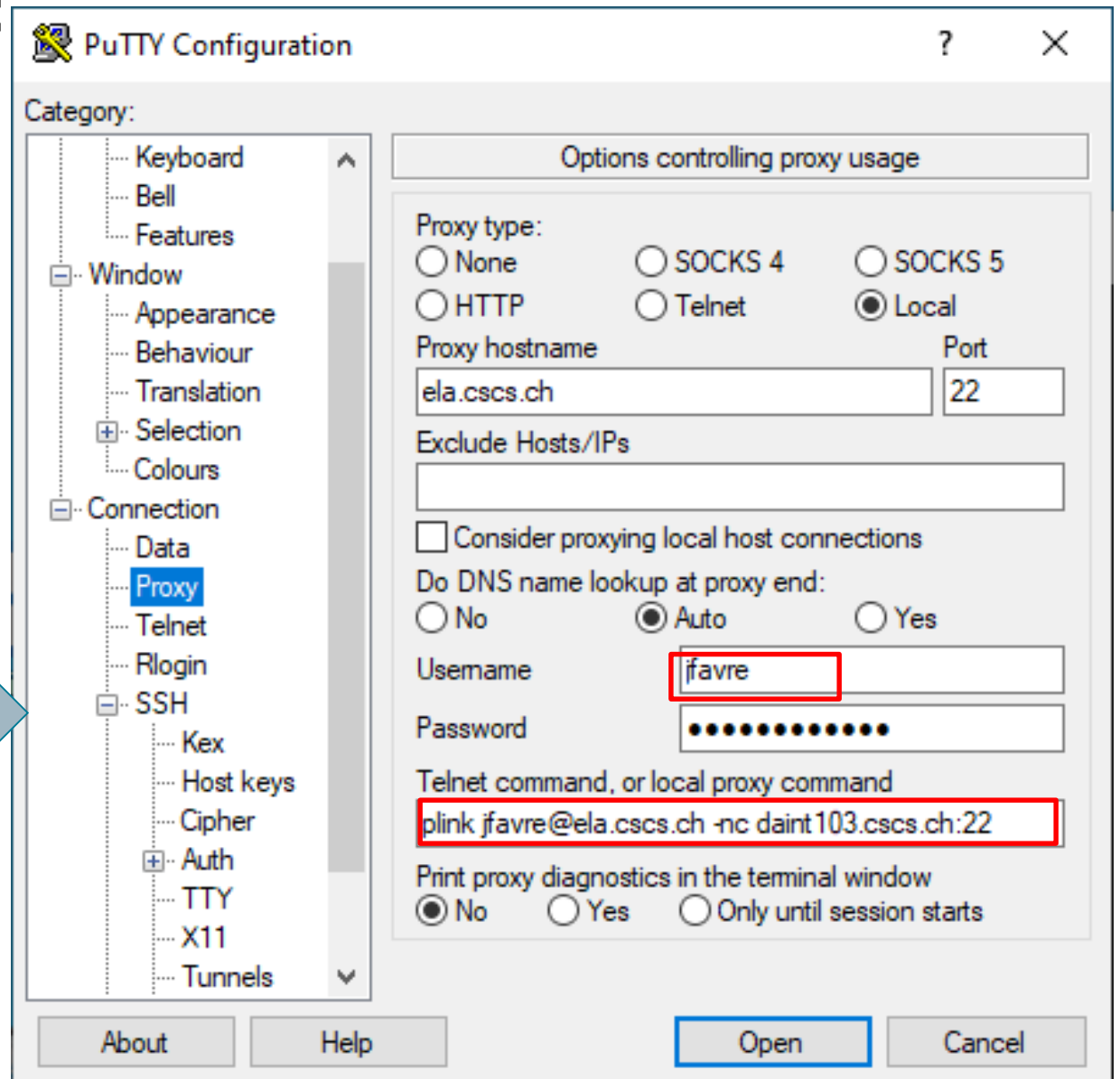
*since ParaView uses a method
called Reverse Connection,
whereby the server (on daint)
connects back to the client (on
your desktop)*



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 'Use the following command:' to the 'Proxy' category. The 'Options controlling proxy usage' section on the right contains the following settings:

- Proxy type: ☐ None, ☐ SOCKS 4, ☐ SOCKS 5, ☐ HTTP, ☐ Telnet, ☒ Local
- Proxy hostname: Port:
- Exclude Hosts/IPs:
- ☐ Consider proxying local host connections
- Do DNS name lookup at proxy end: ☐ No, ☒ Auto, ☐ Yes
- Username:
- Password:
- Telnet command, or local proxy command:
- Print proxy diagnostics in the terminal window: ☒ No, ☐ Yes, ☐ Only until session starts

Buttons at the bottom: About, Help, Open, Cancel.

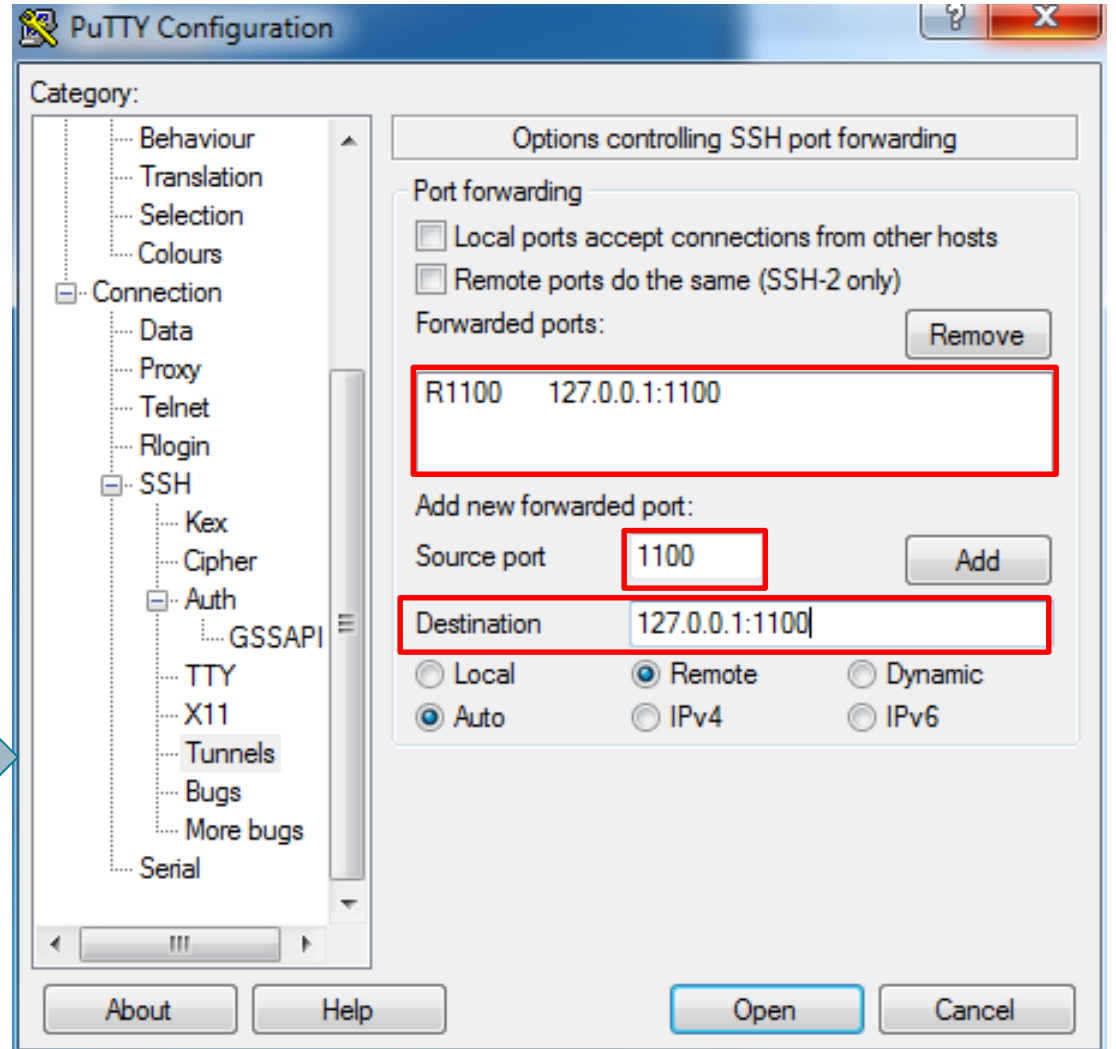


Use the following command:
“**plink <username>@ela.cscs.ch
-nc daint103.cscs.ch:22**”

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

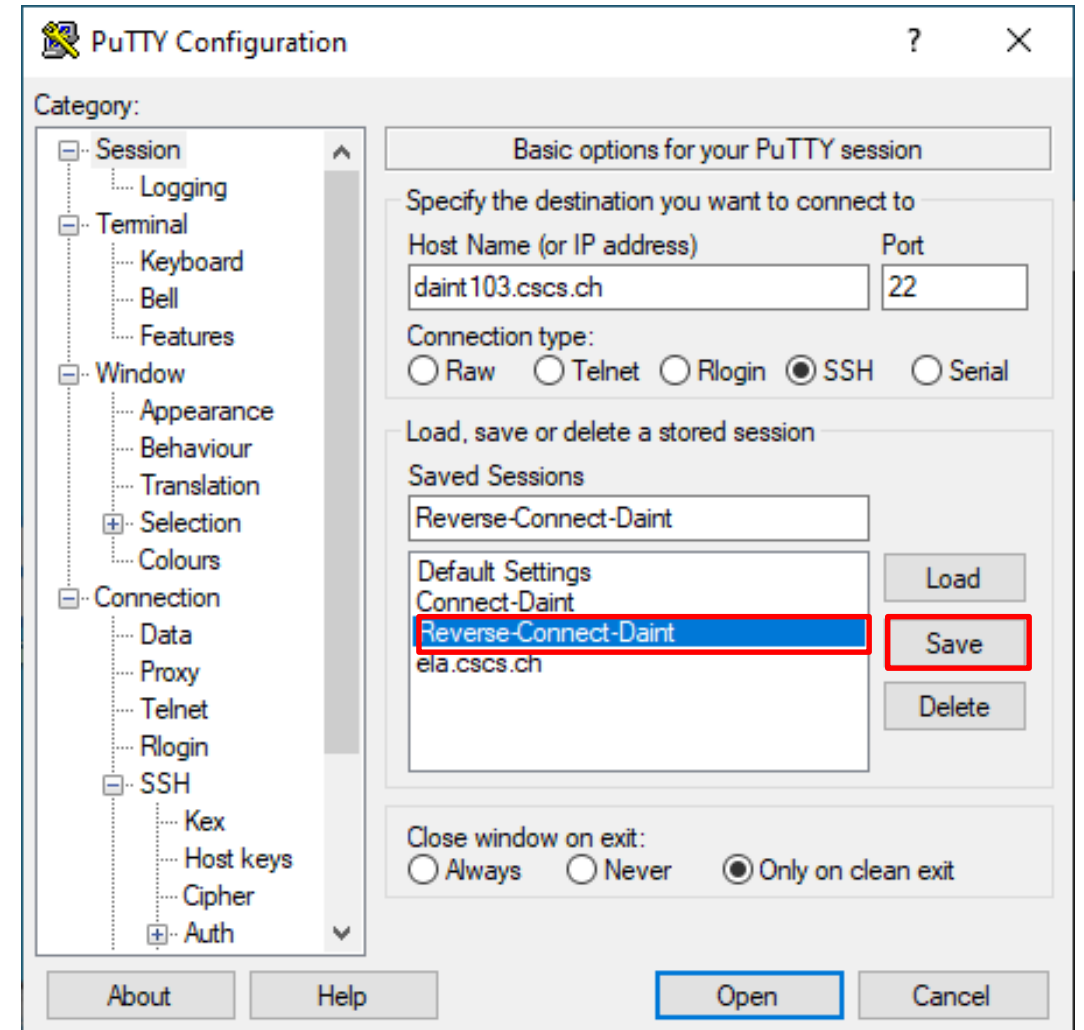
*Select Remote, use your
private userid number,
and define:*

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.

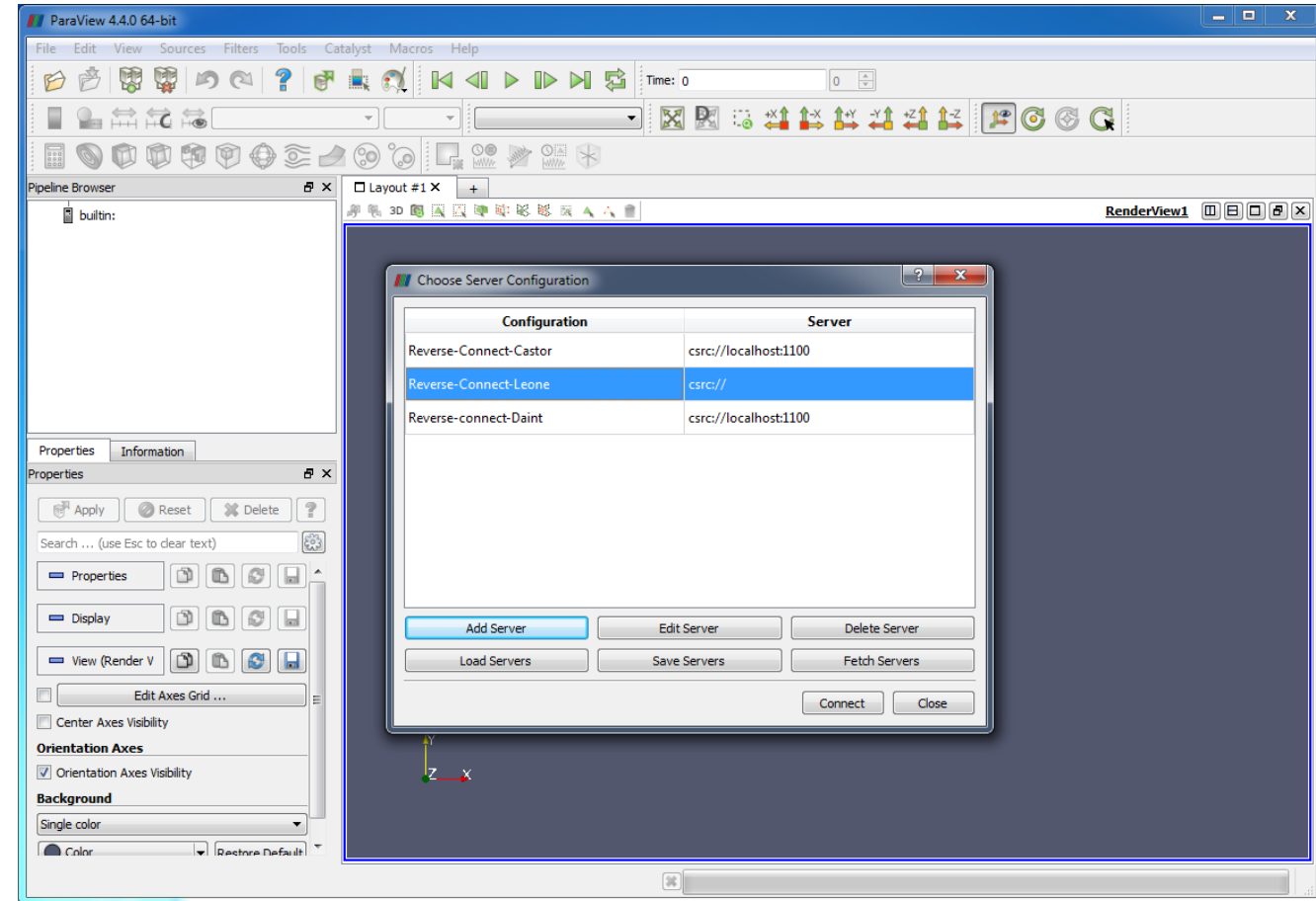
ParaView setup III

- 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

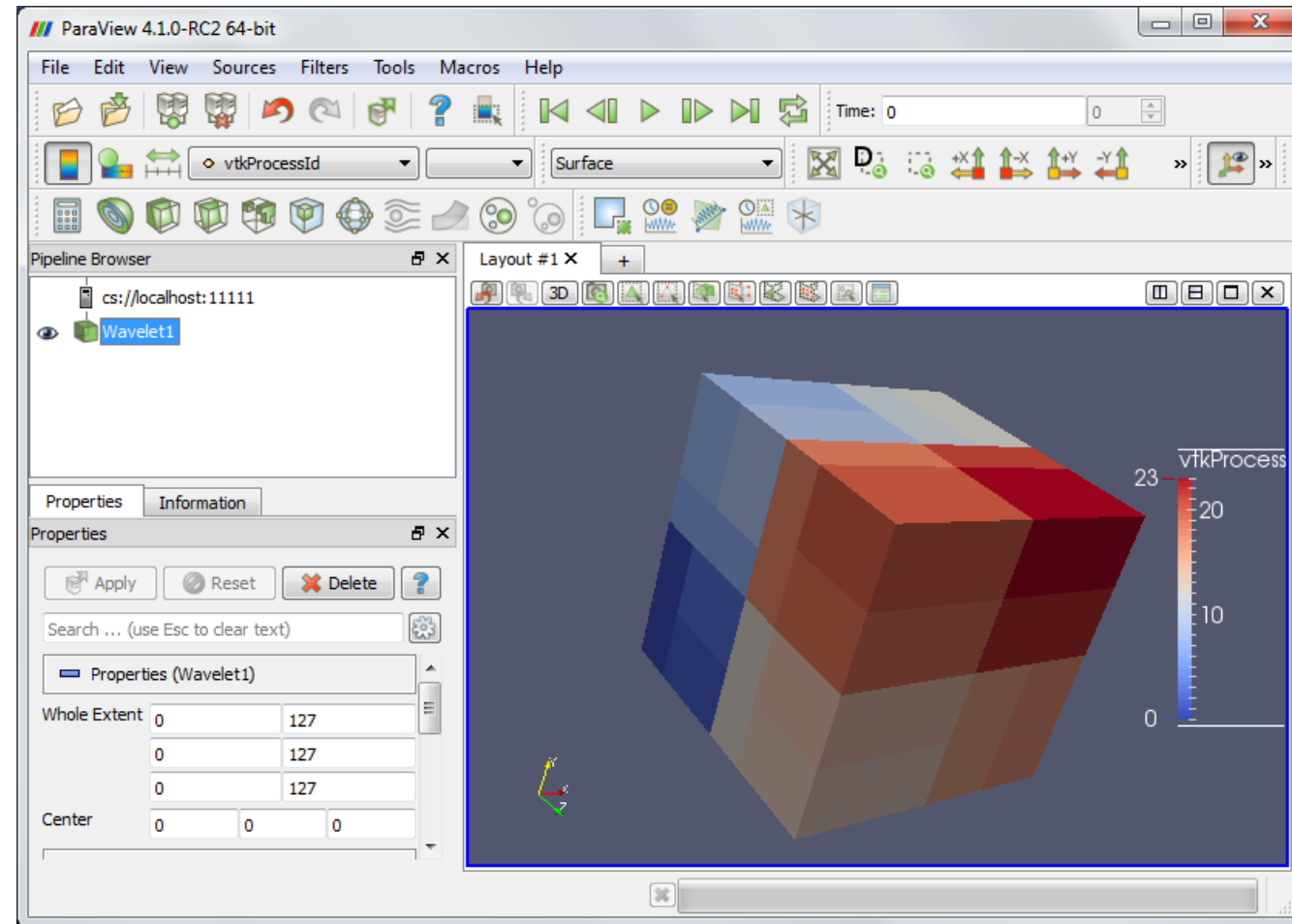
mc-partition with cpu-rendering



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

■ LINUX users

```
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"
```

```
=====
```

■ Windows users

```
plink -load Reverse-Connect-Daint  
"/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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