



Remote Visualization Service

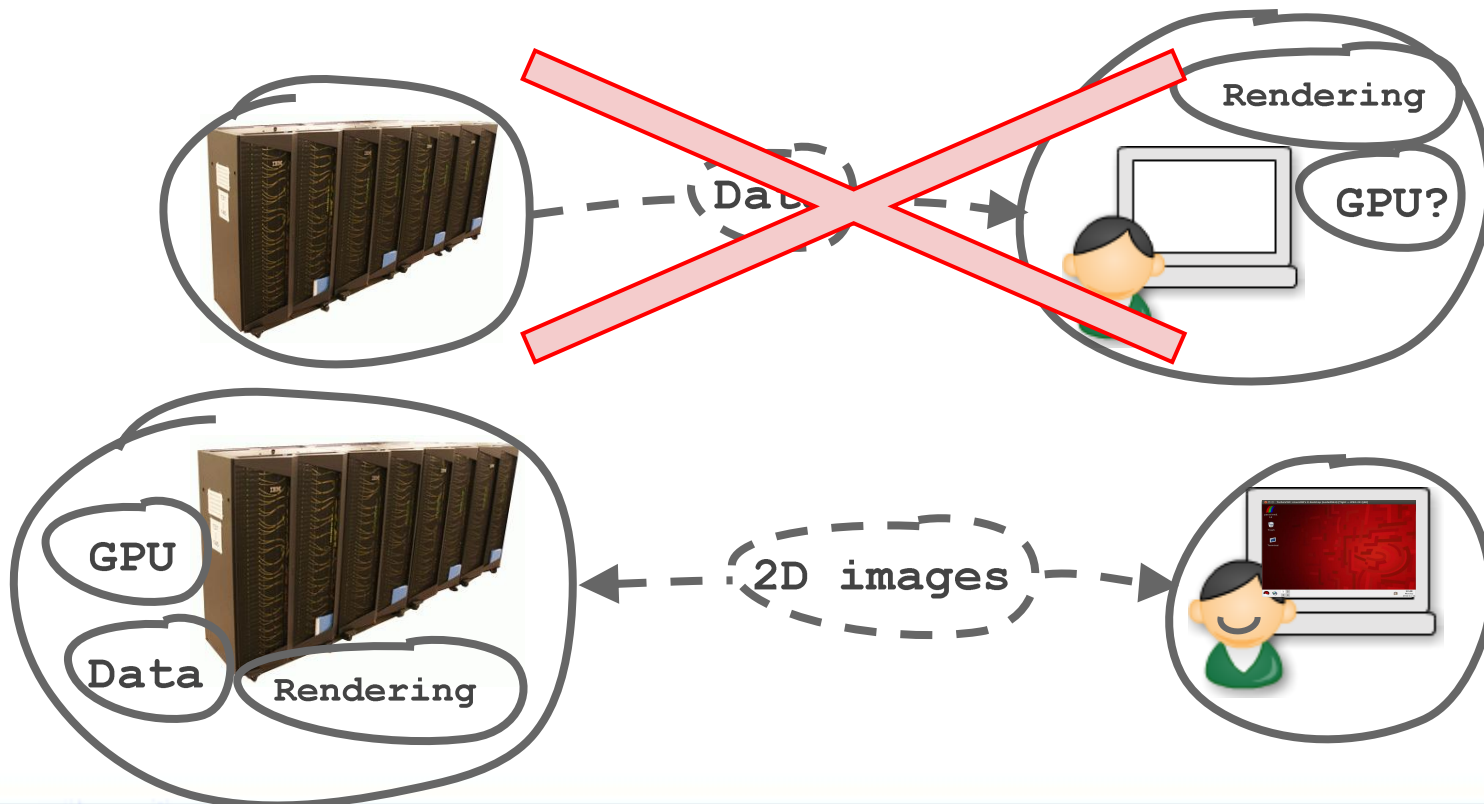
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- Perform scientific visualization on large amounts of data produced on CINECA HPC systems
 - without moving data
 - using high performance machine



- **NODES:**
 - **2 PLX compute nodes (96, 97) (no inbound connection):**
 - Processors: 2 six-cores Intel(R) Xeon(R) CPU E5645 2.40 GHz per node
 - GPU: 2 NVIDIA Tesla M2070Q per node
 - RAM: 48 GB/node
 - **2 RVN (01,05) (inbound connection and login allowed):**
 - Processors: 2 Quad-core Intel(R) Xeon(R) CPU X5570 2.93GHz per node
 - GPU: 2 NVIDIA QuadroPlex 2200 S4
 - RAM: 128 GB/node
 - The infrastructure is **scalable**: more nodes can be added
 - **Common home** and **scratch** filesystem mounted by login node, compute nodes and RVN nodes

- **PBS SCHEDULER:** VNC remote display are created through batch jobs
- **Queues:**
 - **visual** (*shared* resources on nodes 96/97):
 - default queue for standard users (nodes with 48 GB each)
 - **rvn_visual** (*shared* resources on nodes RVN05/01):
 - queue for specific users who need more RAM (node with 128 GB each)
 - **reserved** queue (*dedicated* resources on a node)
 - industrial users can request to reserve a node not to share resources with other users.
- Remote Display **WallTime** limit set to 6 hours.
- Number of concurrent displays a user can create is limited to **2**.

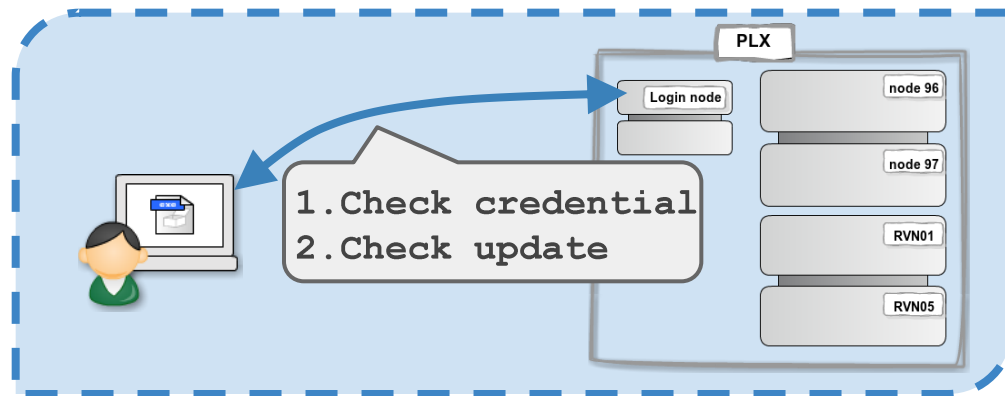
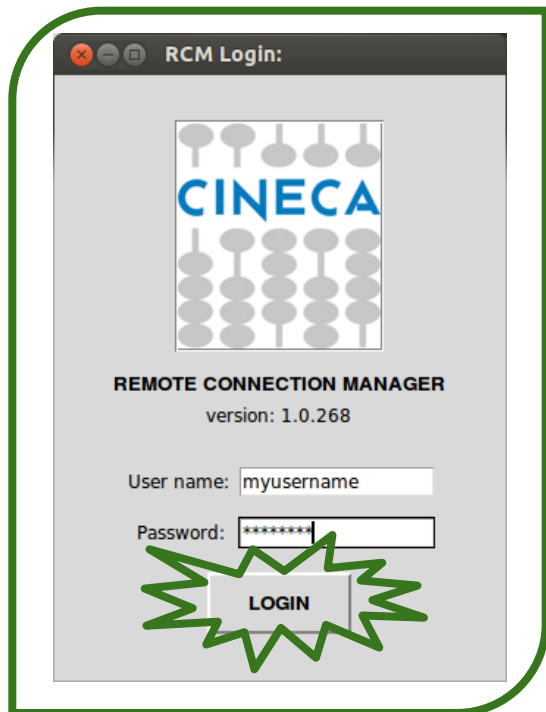
- **TurboVNC**: free remote control software package that support VirtualGL. TurboVNC performs very well on high-latency, low-bandwidth networks.
- **VirtualGL**: open source package that gives any Unix or Linux remote display software the ability to run OpenGL applications with full 3D hardware acceleration. It optimizes user experience of remote 3D applications by rendering on remote GPU while streaming only the 2D result images.
- **Remote Connection Manager (RCM)**: python cross platform application developed by Cineca that simplifies and automates the steps needed for setting up a VNC connection to the visualization nodes (job submission for VNC server start, ssh tunneling, vnc client connection) and managing it (reconnection, list, close). It makes automatic all the step needed to **create**, **connect** and **kill** remote displays

- To use the remote visualization service you need:
 - valid PLX user
 - username authorized to use the service (superc@cineca.it)
 - Internet connection
 - Pc with linux (most of the popular distributions), windows or mac on which install the RCM

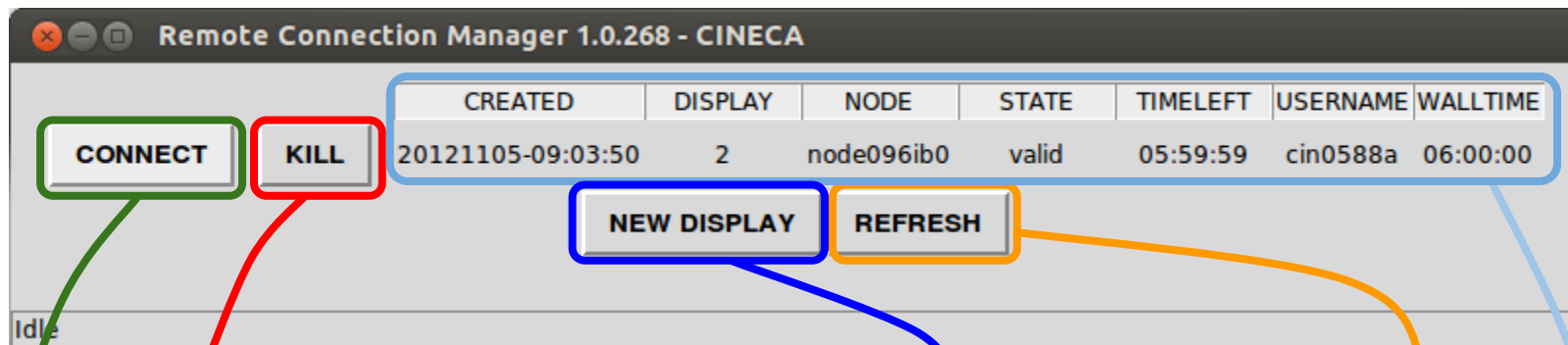
RCM - Login

USER

SYSTEM



RCM - Display info



Kill the remote display (kill the job)

Connect to the remote display

Create a new remote display

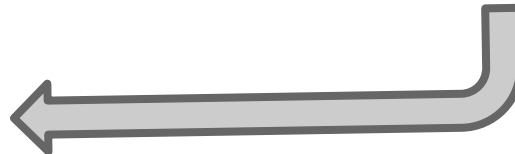
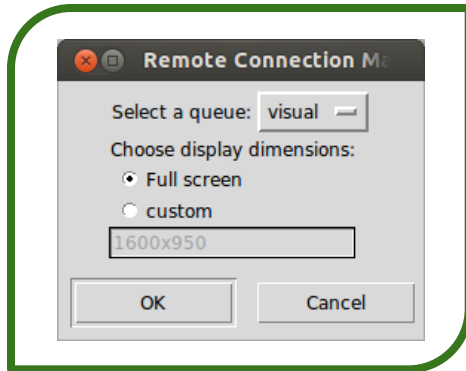
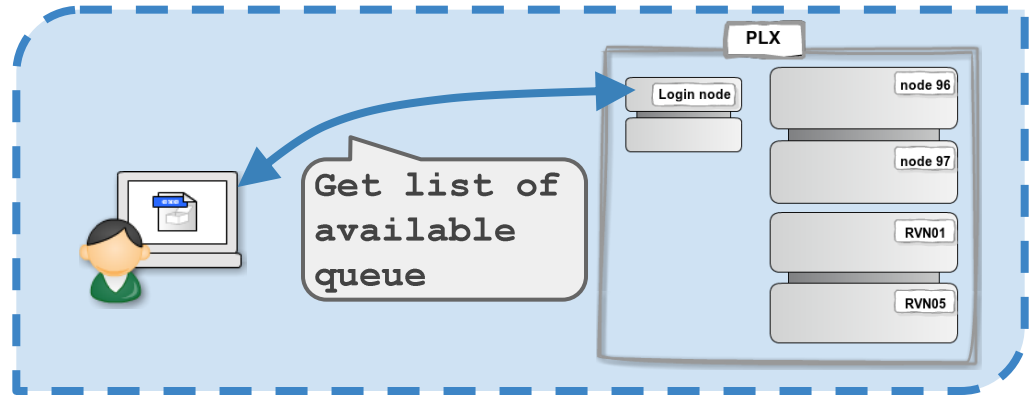
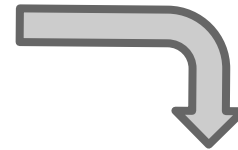
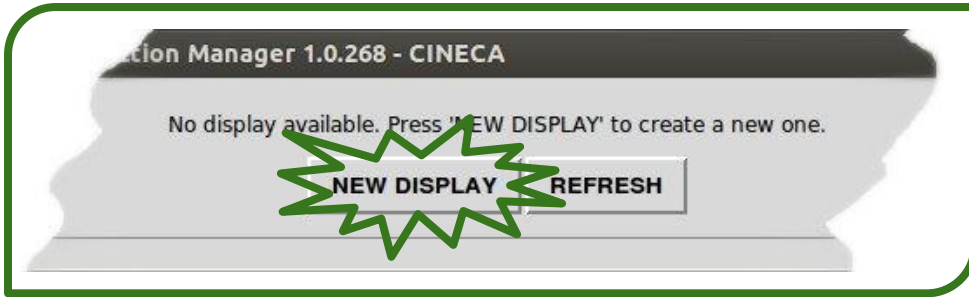
Refresh list of available displays

Information about created displays

RCM - New display (1)

USER

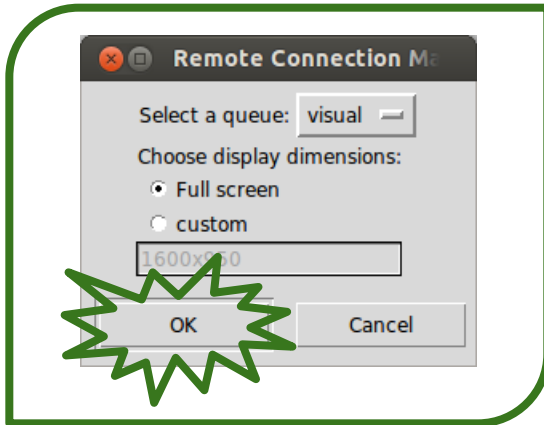
SYSTEM



RCM - New display (2)

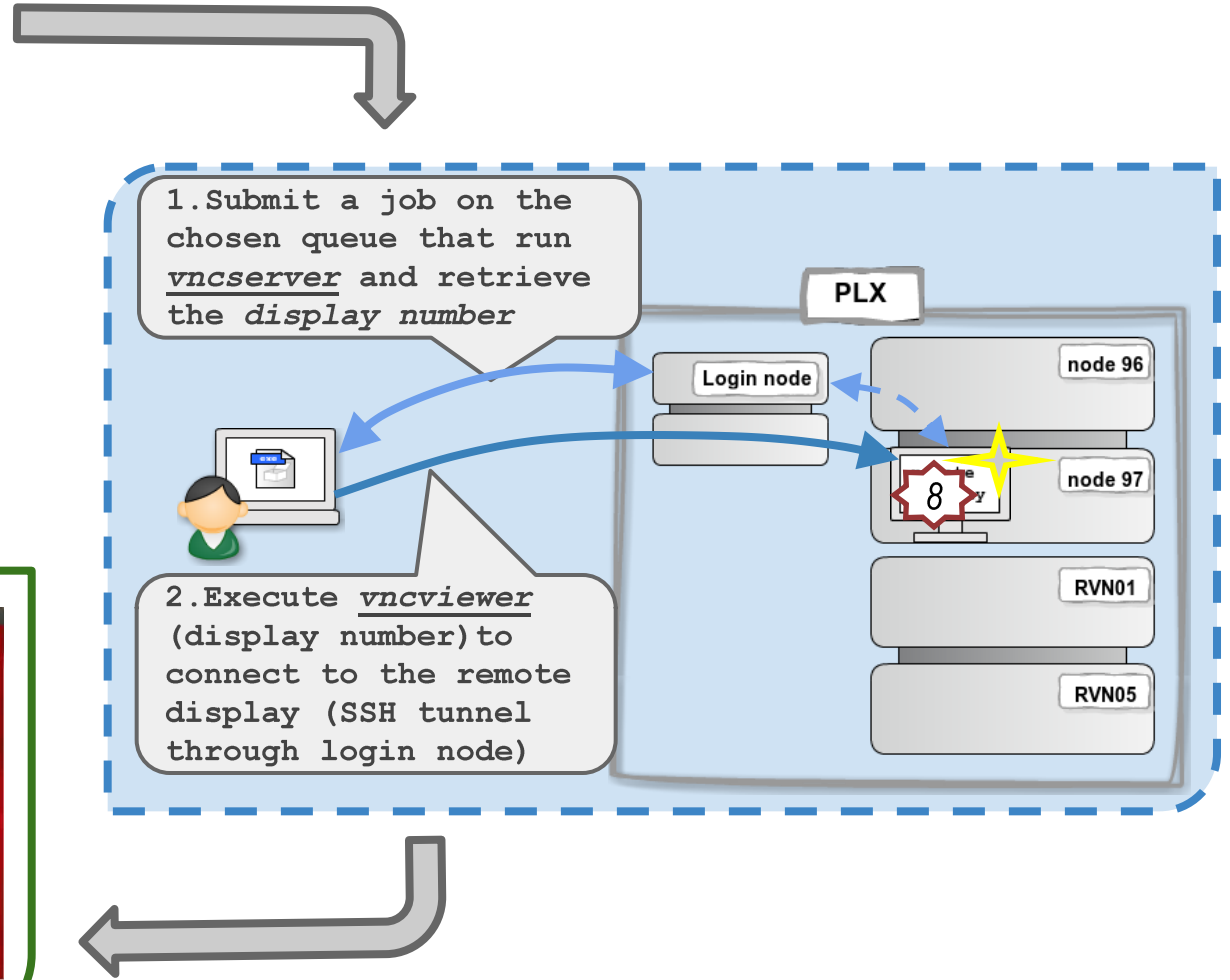
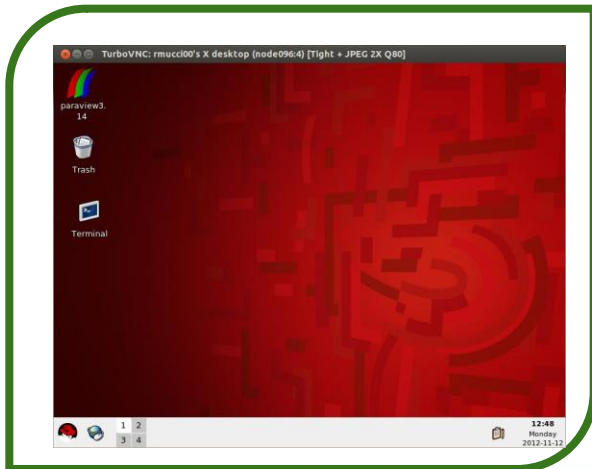
USER

SYSTEM



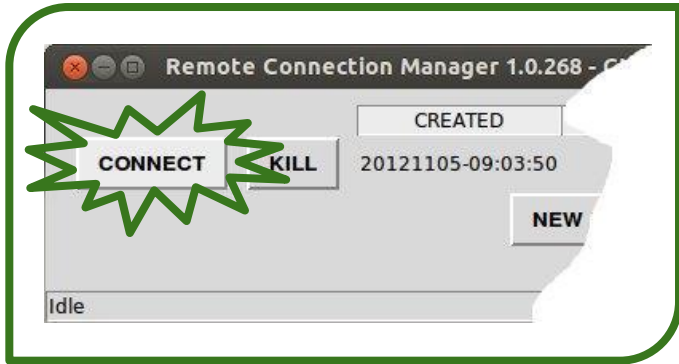
1. Submit a job on the chosen queue that run vncserver and retrieve the *display number*

2. Execute vncviewer (display number) to connect to the remote display (SSH tunnel through login node)

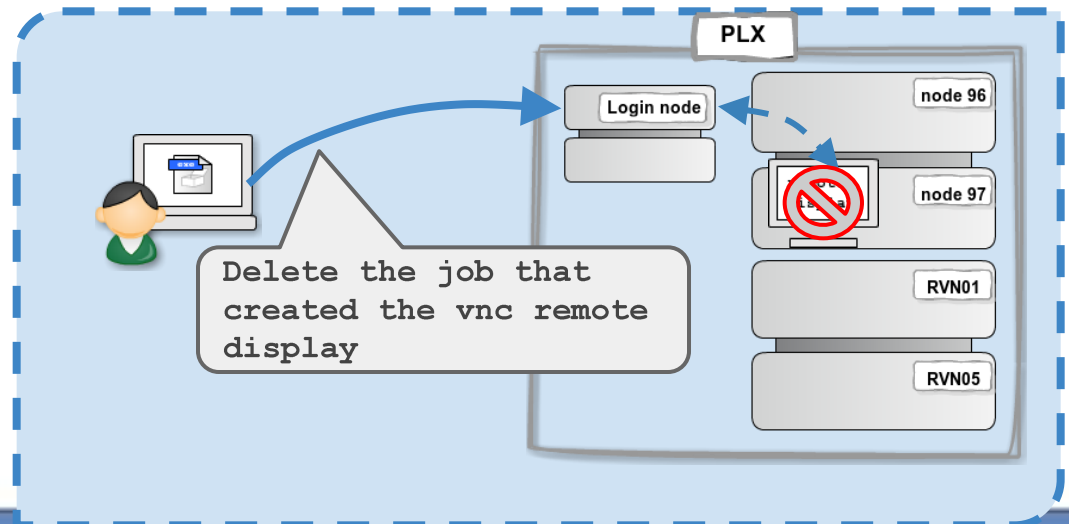
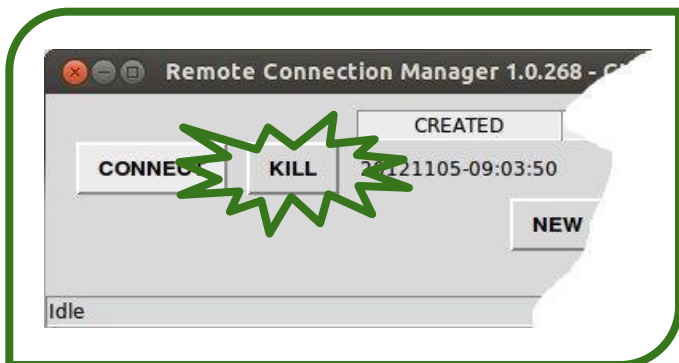
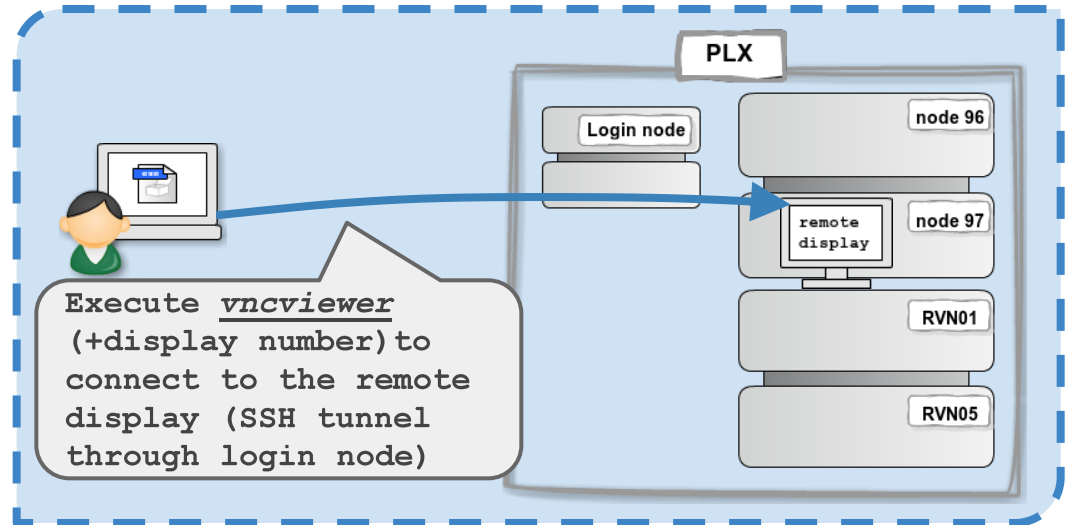


RCM - Connect & Kill

USER



SYSTEM



- **Paraview 3.14** - <http://www.paraview.org/>
- **Blender** - <http://www.blender.org/>
- **Vaa3D** - <http://www.vaa3d.org/>
- **Tecplot** (under license) - <http://www.tecplot.org/>
- **StartCCM+** (under license)- http://www.cd-adapco.com/products/star_ccm_plus/
- **Ansys** (under license) - <http://www.ansys.com>

- RCM user documentation and download page:
<http://www.hpc.cineca.it/content/remote-visualization>
- Service enabling request and problem report: superc@cineca.it
- IBM PLX user guide: <http://www.hpc.cineca.it/content/ibm-plx-gpu-user-guide>
- VirtualGL: <http://www.virtualgl.org/>
- TurboVNC:
<http://virtualgl.svn.sourceforge.net/viewvc/virtualgl/vnc/trunk/doc/index.html>

Thank you for your attention!

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"You're not allowed to use
the sprinkler system to keep
your audience awake."