

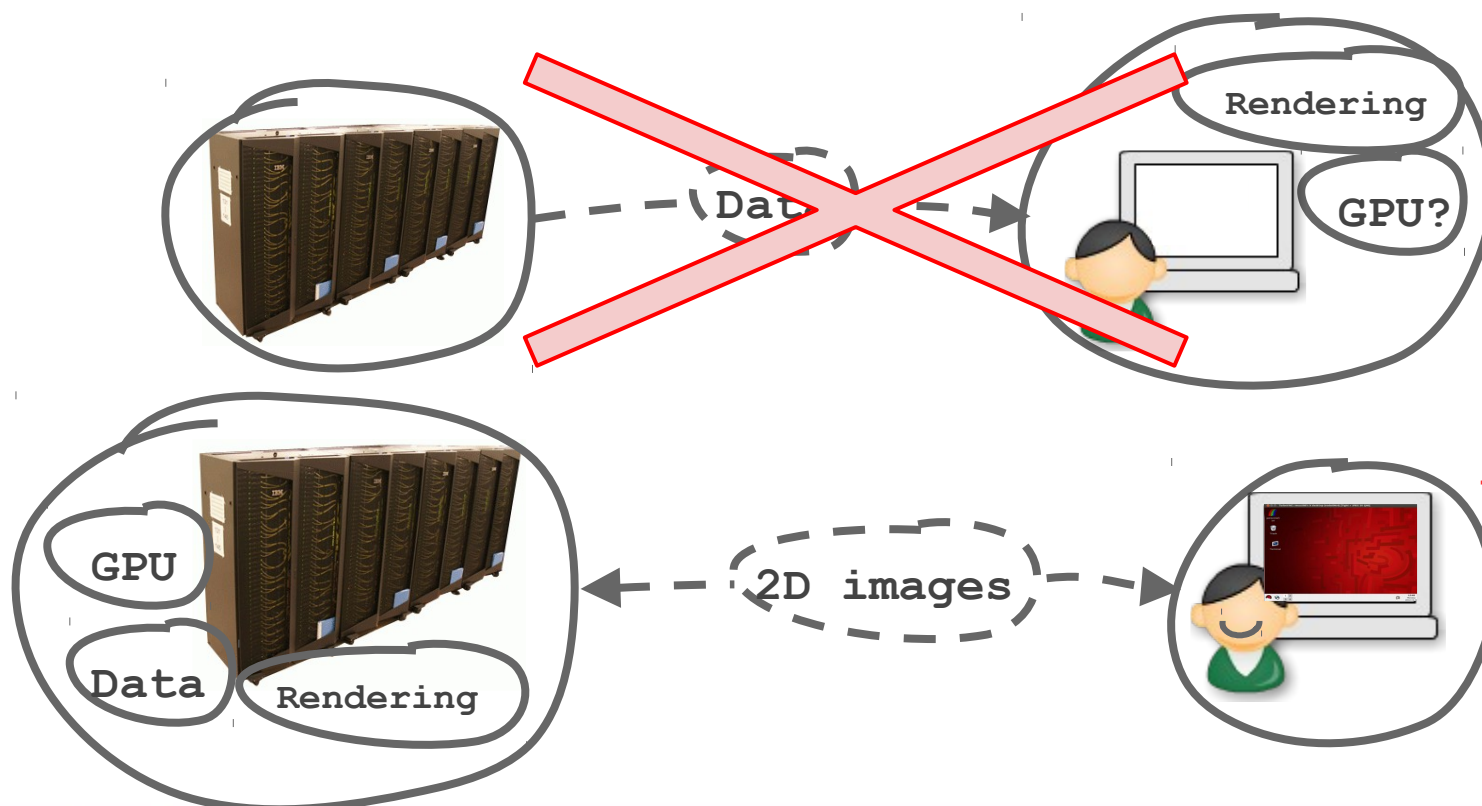


Remote Visualization Service

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



- **Clusters:**

- **Galileo** (2 login nodes, 4 viz/service nodes)
 - Processors: 16 cores Intel(R)
 - GPU: 2 NVIDIA Tesla K40 per node
 - RAM: 128 GB/node
- **PICO** (big data, 2 viz nodes, 2 fat nodes)
 - Processors: 20 cores Intel(R)
 - GPU:GPU: 2 NVIDIA Tesla K40 per node
 - RAM: 128 / 512 GB/node
- The infrastructure is **scalable**: more nodes can be added will be around 60 nodes with Nvidia K80
- **Common home** and **scratch** filesystem mounted by login node, compute nodes and visualization nodes
- One GPFS partition shared between Galileo login and Pico

- **VNC** remote servers can be either launched as processes on login node (**ssh**) or scheduled as batch job request (**PBS**)
- **Galileo**
SSH:
 - **Login 03--06**
 - Subject to interactive cpu-time limitation (10 min)
- **PBS**
 - Visual queue, 12 hour max wall time, 32 GB max memory occupation (cgroup limited)
- **PICO**
PBS
 - Visual queue, 12 hour max wall time, no cgroups
- Number of concurrent displays a user can create is limited to **2**.

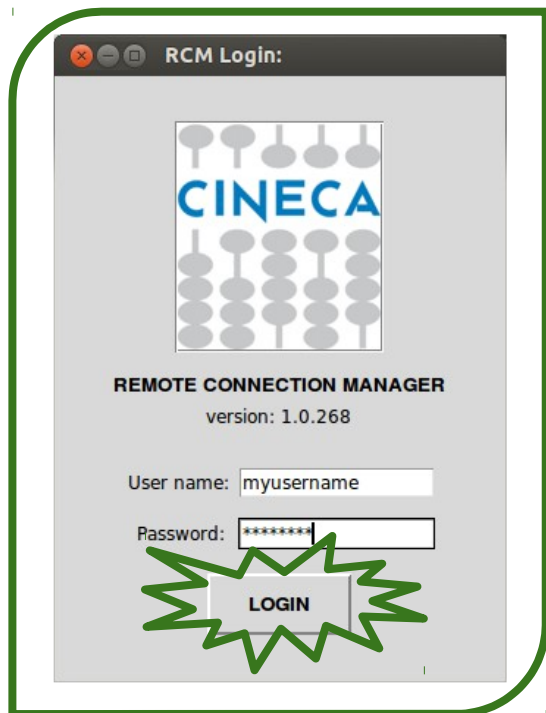
- **TurboVNC**: free remote control software package that support VirtualGL. TurboVNC performs very well on high-latency, low-bandwidth networks.
- **VirtualGL**: open source package that gives any Unix or Linux remote display software the ability to run OpenGL applications with full 3D hardware acceleration. 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

Requirements

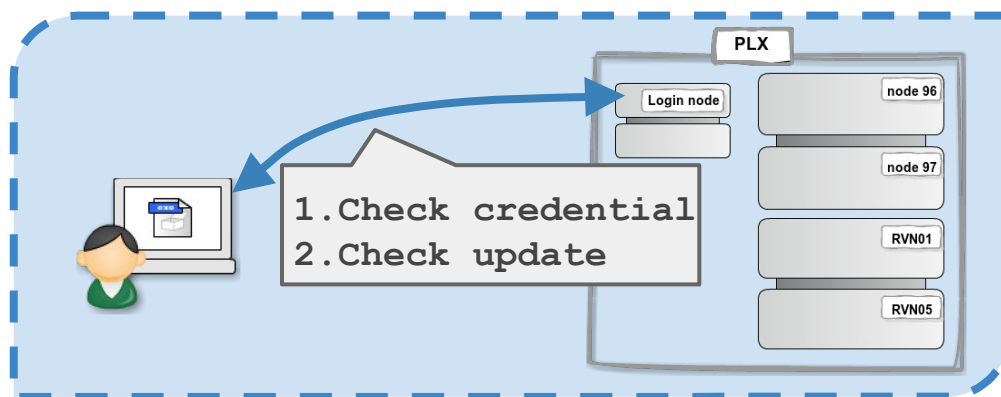
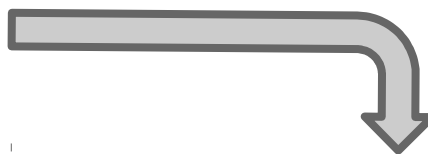
- To use the remote visualization service you need:
 - valid cluster user
 - username authorized to use the service (superc@cineca.it)
 - Internet connection
 - Pc with linux (most of the popular distributions), windows or mac on which install the RCM

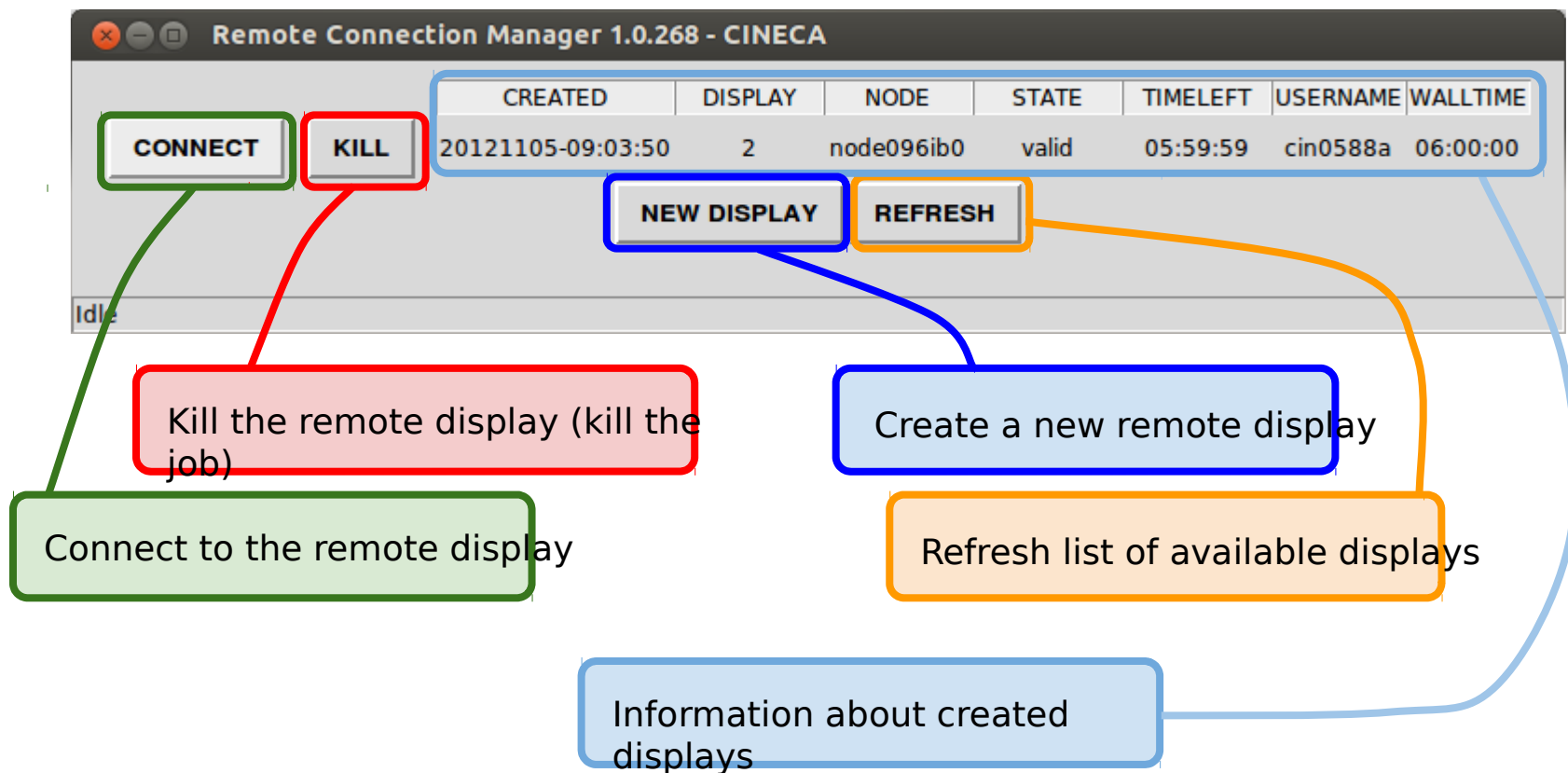
USER

SYSTEM



A screenshot of the RCM Login window. The window title is "RCM Login:". It features the CINECA logo, which consists of a grid of circles with the word "CINECA" in blue. Below the logo, it says "REMOTE CONNECTION MANAGER" and "version: 1.0.268". There are two input fields: "User name:" with the text "myusername" and "Password:" with masked characters "*****". A green jagged starburst highlights a "LOGIN" button at the bottom.





RCM - New display (1)

USER

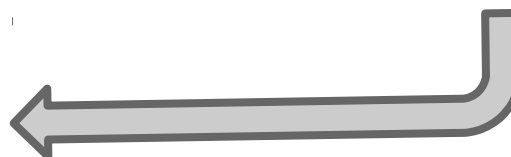
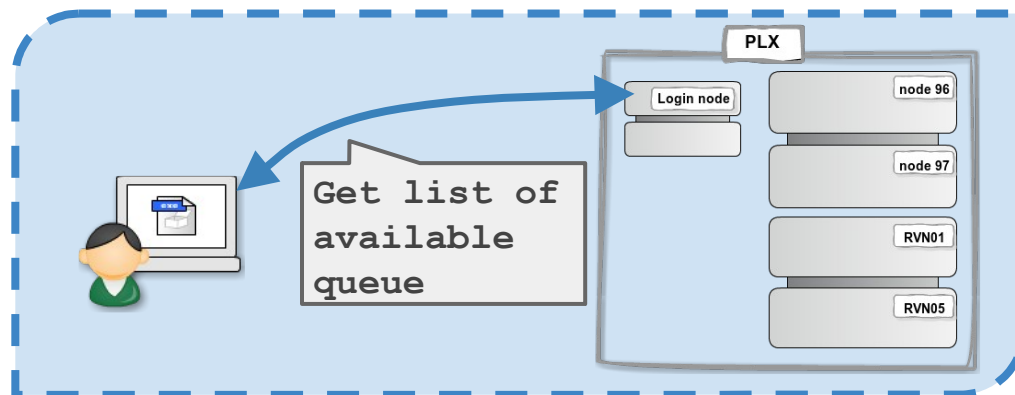
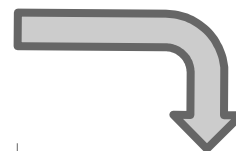
SYSTEM

Connection Manager 1.0.268 - CINECA

No display available. Press 'NEW DISPLAY' to create a new one.

NEW DISPLAY

REFRESH



Remote Connection Manager

Select a queue:

Choose display dimensions:

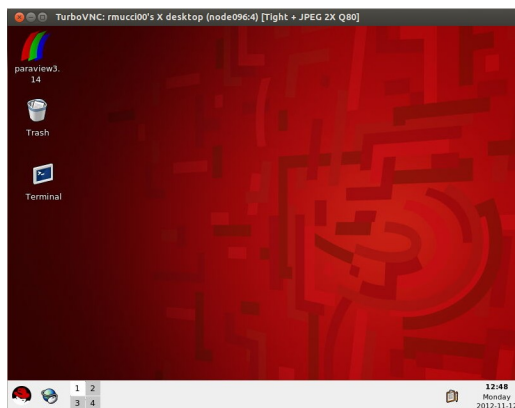
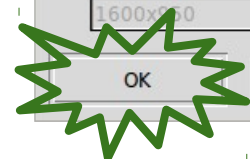
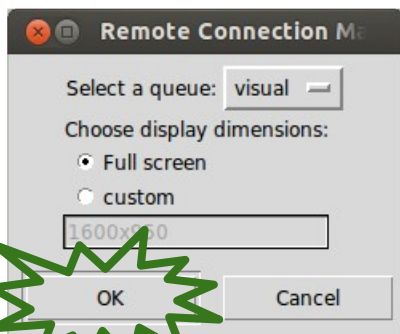
- ☒ Full screen
- ☐ custom

OK Cancel

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)

PLX

Login node

node 96

node 97

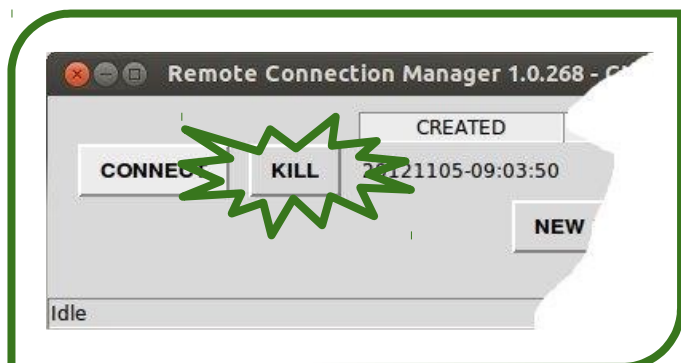
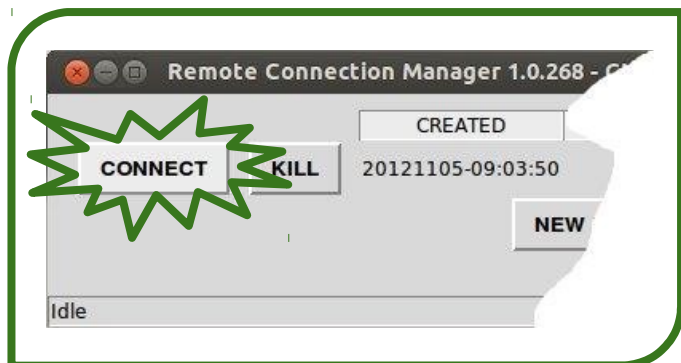
RVN01

RVN05

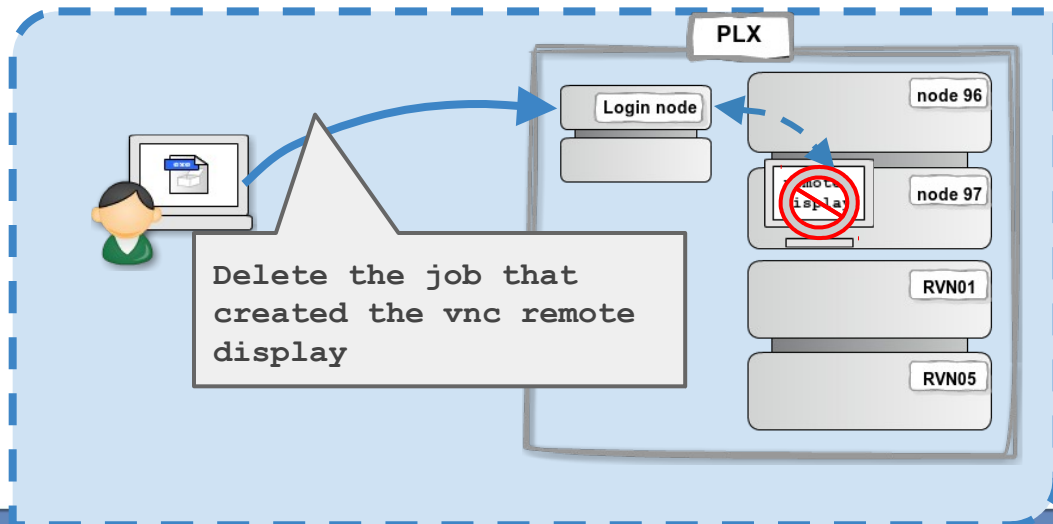
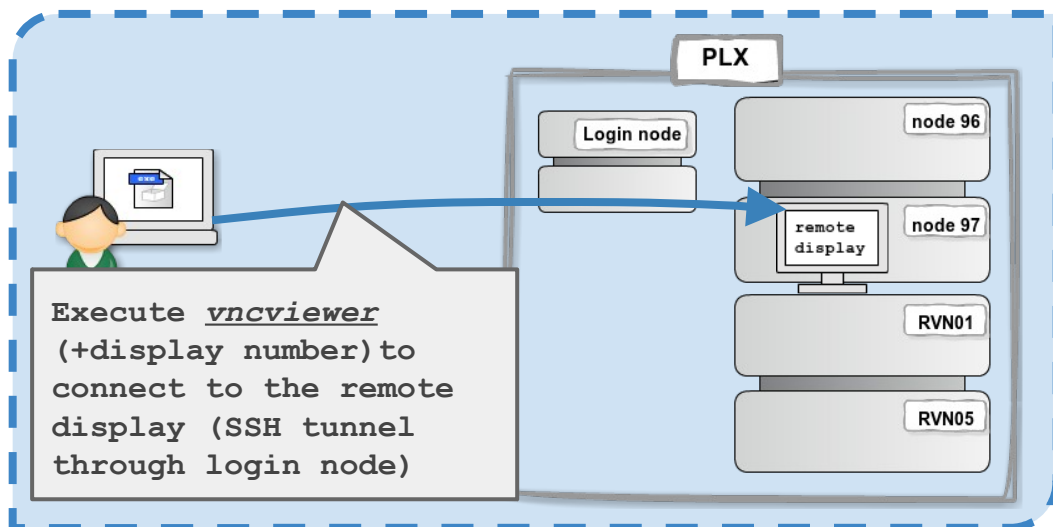


RCM - Connect & Kill

USER



SYSTEM



- **Paraview** - <http://www.paraview.org/>
- **Blender** - <http://www.blender.org/>
- **Tecplot** - <http://www.tecplot.org/>
- **Vapor** - <http://www.vaa3d.org/>
- **StartCCM+** (under license)- http://www.cd-adapco.com/products/star_ccm_plus/
- **VMD**
- **Chimera**
- **Matlab**

- RCM user documentation and download page:
<http://www.hpc.cineca.it/services/remote-visualisation>
- Service enabling request and problem report: [s
uperc@cineca.it](mailto:superc@cineca.it)
- VirtualGL: <http://www.virtualgl.org/>
- TurboVNC:
[http://virtualgl.svn.sourceforge.net/viewvc/virtualgl/vnc/trunk/doc
/index.html](http://virtualgl.svn.sourceforge.net/viewvc/virtualgl/vnc/trunk/doc/index.html)
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Thank you for your attention!

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