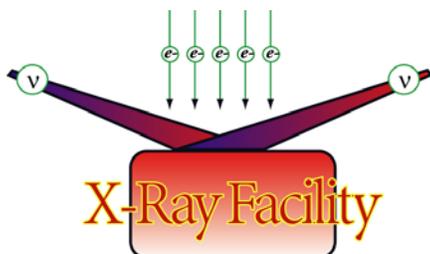


# X11vnc and Remote Monitoring

## Remote monitoring of Data Collection



*Procedure for remote monitoring and data  
collection using X11vnc*

**Keywords:** X11, X11vnc, Vnc, Virtual Network Computing, Remote, SSH, Secure connection, localhost, tunneling, x11tunnel, x-server, MarCCD, data collection, vncviewer, remote monitoring

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**Keywords:** X11, X11vnc, Vnc, Virtual Network Computing, Remote, SSH, Secure connection, localhost, tunneling, x11tunnel, x-server, MarCCD, data collection, vncviewer, remote monitoring

# X11vnc and remote data monitoring and collection

## *Procedure for remote monitoring and data collection using X11vnc*

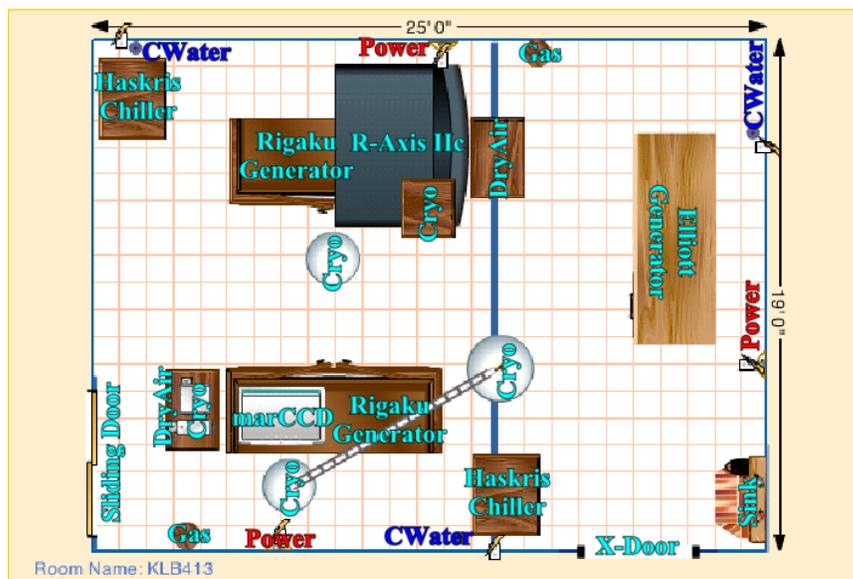
Document Version: 1.0 (May 27, 2010)

### Introduction

In early 2010 [X-Ray Crystallography Facility](#) needed to add remote monitoring of data collection from a Linux machine located in KLB 413 (see [Layout 1](#)). The following note describes the procedure for achieving this from another lab location or from user's home. A copy of this Note will be posted in [XRF web site](#) shortly after receiving suggestions from the users.

### Layout

#### Data Collection System Location (KLB 413)



*Layout 1 Location of Data Collection System in KLB 413*

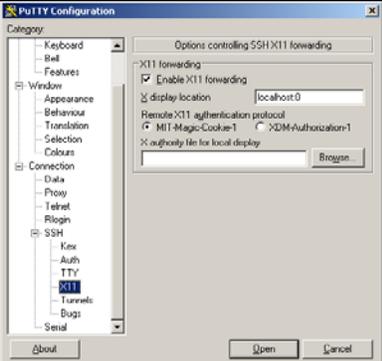
Data collection from MarCCD165 using the Linux workstation `spruce.sb.fsu.edu` has been very successful for the last decade. However, several users have expressed that they would like to have an option for keeping an eye on their data collection from their labs rather than visiting the x-ray facility. This request is relevant especially to those whose labs are located across the campus. In addition, occasionally the marCCD x-ray shutter stops

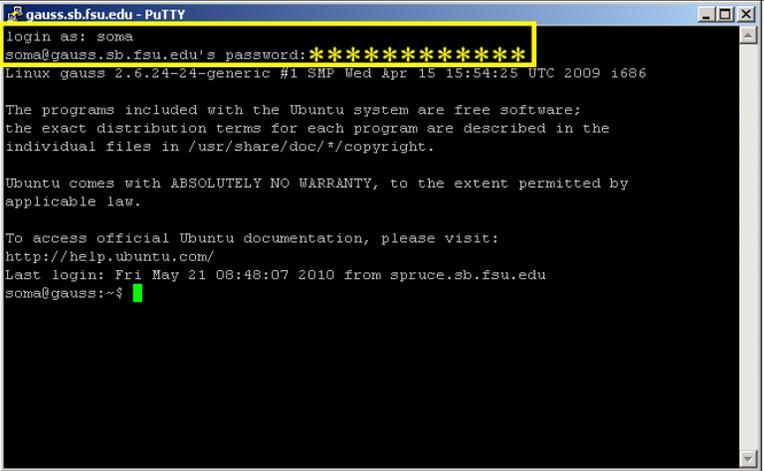
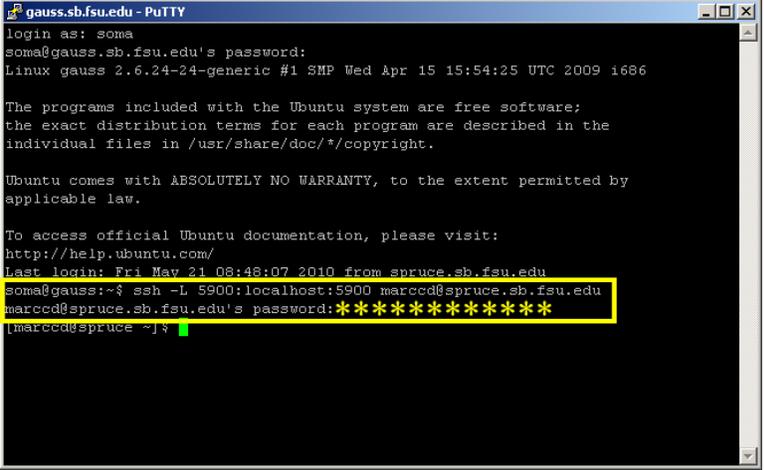
responding to data collection GUI and remain closed while the data collection and phi axis rotation progress resulting in the accumulation of empty image frames (no x-ray exposure).

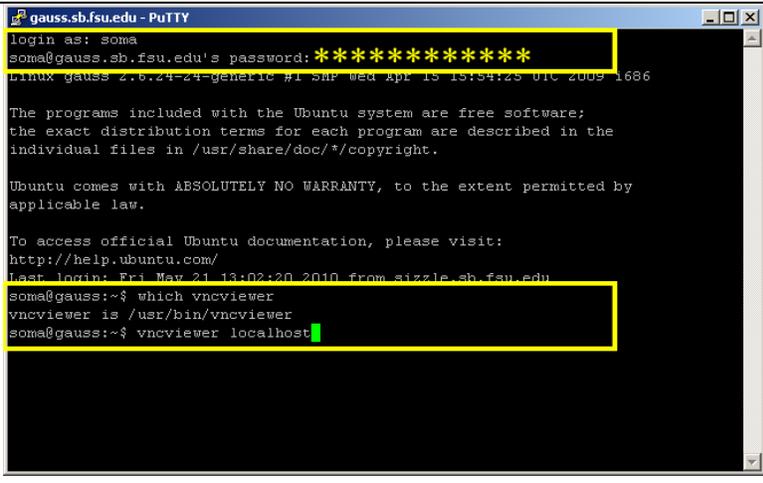
### Remote viewing and monitoring

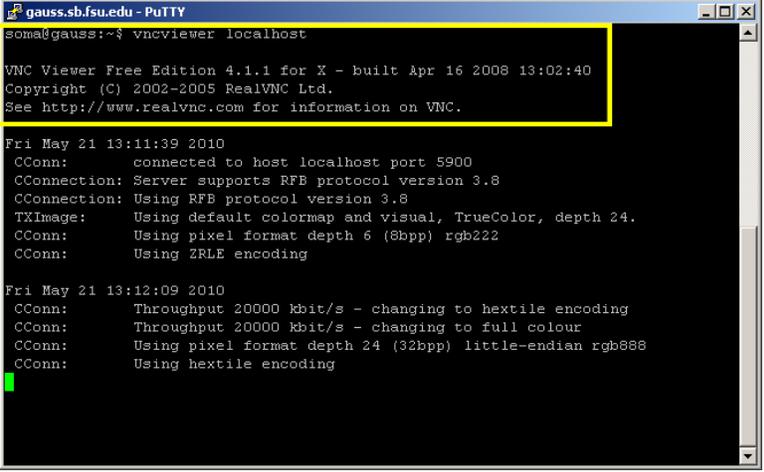
To alleviate these problems Computer Resources and XRF have come up with one solution: use X11vnc via secure shell to monitor the data collection remotely. Using this protocol people who have secure access to IMB computers **and** secure access to MarCCD data collection machine can remotely monitor the “live” data collection session. If needed, they can modify or correct errors if they detect any problems. Shown below is the way to do the remote monitoring.

#### Procedure for remote monitoring

Microsoft Windows Environment	
<p>If you are planning to use MS Windows operating system to monitor then,</p>	<p>Ensure the following:</p> <ul style="list-style-type: none"> <li>▪ Run one of the X-window servers for Microsoft Windows, like:                             <ul style="list-style-type: none"> <li>○ Xming or</li> <li>○ XWin32, etc</li> </ul> </li> <li>▪ Run one of the a SSH Clients for Microsoft Windows, like:                             <ul style="list-style-type: none"> <li>○ Putty or</li> <li>○ SSH, etc</li> </ul> </li> </ul>
<p>For Putty or SSH</p>	<ul style="list-style-type: none"> <li>▪ Enable X11 Forwarding</li> <li>▪ Make it as part of the default settings</li> </ul> 
<p>For Windows X-servers</p>	<ul style="list-style-type: none"> <li>▪ Run Xming or XWin32 X-Server in background</li> </ul> 
Linux Environment	
<p>If you are planning to use Linux then,</p>	<p>Many of above requirements are already available to you.</p>

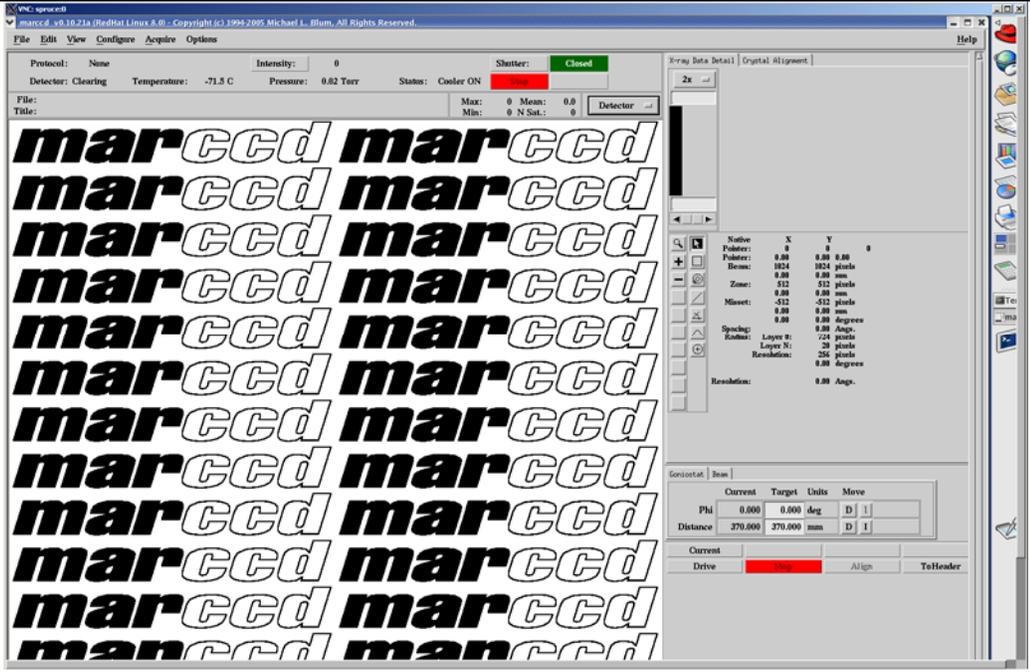
Common Procedure	
<p>Make a <b>first</b> secure connection to an IMB Linux machine with username and password (<i>gauss, in this example</i>)</p>	 <pre> gauss.sb.fsu.edu - PuTTY login as: soma soma@gauss.sb.fsu.edu's password:***** Linux gauss 2.6.24-24-generic #1 SMP Wed Apr 15 15:54:25 UTC 2009 i686  The programs included with the Ubuntu system are free software; the exact distribution terms for each program are described in the individual files in /usr/share/doc/*/copyright.  Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by applicable law.  To access official Ubuntu documentation, please visit: http://help.ubuntu.com/ Last login: Fri May 21 08:48:07 2010 from spruce.sb.fsu.edu soma@gauss:~\$                     </pre>
<p>From this Linux machine (<i>gauss, in this example</i>) make a secure connection to spruce by issuing the command shown in the next column</p>	<p style="text-align: center;"><code>ssh -L 5900:localhost:5900 <a href="mailto:marccd@spruce.sb.fsu.edu">marccd@spruce.sb.fsu.edu</a></code></p> <p>Once prompted for password, issue 'marccd' user password for spruce.sb.fsu.edu</p>  <pre> gauss.sb.fsu.edu - PuTTY login as: soma soma@gauss.sb.fsu.edu's password: Linux gauss 2.6.24-24-generic #1 SMP Wed Apr 15 15:54:25 UTC 2009 i686  The programs included with the Ubuntu system are free software; the exact distribution terms for each program are described in the individual files in /usr/share/doc/*/copyright.  Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by applicable law.  To access official Ubuntu documentation, please visit: http://help.ubuntu.com/ Last login: Fri May 21 08:48:07 2010 from spruce.sb.fsu.edu soma@gauss:~\$ ssh -L 5900:localhost:5900 marccd@spruce.sb.fsu.edu marccd@spruce.sb.fsu.edu's password:***** marccd@spruce ~]\$                     </pre>

<p>From spruce issue the command, startvnc</p>	 <pre>gauss.sb.fsu.edu - PuTTY login as: soma soma@gauss.sb.fsu.edu's password: Linux gauss 2.6.24-24-generic #1 SMP Wed Apr 15 15:54:25 UTC 2009 i686  The programs included with the Ubuntu system are free software; the exact distribution terms for each program are described in the individual files in /usr/share/doc/*/copyright.  Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by applicable law.  To access official Ubuntu documentation, please visit: http://help.ubuntu.com/ Last login: Fri May 21 08:48:07 2010 from spruce.sb.fsu.edu soma@gauss:~\$ ssh -L 5900:localhost:5900 marccd@spruce.sb.fsu.edu marccd@spruce.sb.fsu.edu's password: [marccd@spruce ~]\$ which startvnc /home/marccd/bin/startvnc [marccd@spruce ~]\$ startvnc &amp;  [1] 3817 [marccd@spruce ~]\$ 21/05/2010 01:06:49 passing arg to libvncserver: -listen 21/05/2010 01:06:49 passing arg to libvncserver: localhost ##### #00# #0 #0 ** WARNING ** WARNING ** WARNING ** WARNING ** #0 #0 #0 YOU ARE RUNNING X11VNC WITHOUT A PASSWORD!! #0 #0 #0 This means anyone with network access to this computer #0 #0 will be able to view and control your desktop. #0 #0 &gt;&gt;&gt; If you did not mean to do this Press CTRL-C now!! &lt;&lt;&lt; #0 #0 #00# #0 #0 You can create an x11vnc password file by running: #0 #0 #0 x11vnc -storepasswd password /path/to/passfile #0 #0 or x11vnc -storepasswd /path/to/passfile #0 #0 or x11vnc -storepasswd #0 #0 (the last one will use ~/.vnc/passwd) #0 #0 #0 and then starting x11vnc via: #0 #0 #0 x11vnc -rfbauth /path/to/passfile #0</pre>
<p>Now make a second secure connection to a Linux machine in IMB with username and password</p>	 <pre>gauss.sb.fsu.edu - PuTTY login as: soma soma@gauss.sb.fsu.edu's password: ***** Linux gauss 2.6.24-24-generic #1 SMP Wed Apr 15 15:54:25 UTC 2009 i686  The programs included with the Ubuntu system are free software; the exact distribution terms for each program are described in the individual files in /usr/share/doc/*/copyright.  Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by applicable law.  To access official Ubuntu documentation, please visit: http://help.ubuntu.com/ Last login: Fri May 21 13:02:20 2010 from sizzle.sb.fsu.edu soma@gauss:~\$ which vncviewer vncviewer is /usr/bin/vncviewer soma@gauss:~\$ vncviewer localhost</pre>

<p>From this Linux machine (gauss, <i>in this example</i>) issue the command <code>vncviewer localhost</code></p>	
---	--

Remote Desktop View

Now one will see the exact desktop of spruce as shown below



Now one can control the Desktop remotely as though one is sitting right in front of the console.

<p>After the monitoring and possibly correcting the errors just log-out of both the sessions.</p> <p>If there is need one can repeat the procedure as many times as needed.</p>	<p>Log out</p> <p>Repeat</p>
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## Hardware Information

### MarCCD 165

#### MarCCD 165

The Rigaku Osmic marCCD set-up consists of a 12 kW Rigaku RU-H2R Copper rotating anode generator with 0.3 x 3.0 mm<sup>2</sup> x-ray filament (cathode), Osmic Purple confocal multi-layer optics purged in helium gas, and an automated marCCD detector with an active area of 165mm diameter with a 0.079 mm resolution. The image can be read in three seconds and has two byte depth thus generating a grey scale image of ~8.4 MB size, a 10x eye piece and a c-mount photographic attachment for digital documentation. A Linux machine controls the data collection.

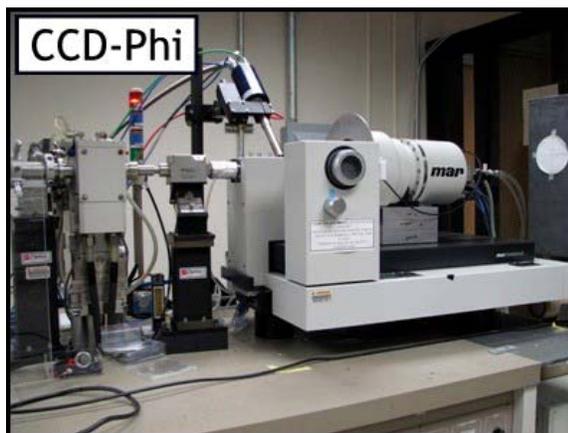


Figure 1 MarCCD165 with horizontal phi axis with cryo cooler

## Software Information

### X11vnc

X11vnc is a (server) version of vnc (Virtual Network Computing) that allows a user to see the real X11 display of a remote computer. Note that for a MS Windows environment there is really **one** display and therefore regular VNC will work. But for multi-user environment like Linux/UNIX there can be as many as X11 display one wants. So using regular VNC will allow the user to open **a** display on the remote machine and **that** display **is not** the one a user sitting at the console will see. However, X11vnc makes this possible.

[X11vnc](#) was developed by [Karl J. Runge](#) a physicist turned Sun Microsystems Software Engineer.

X11vnc version: x11vnc: 0.9.3 lastmod: 2007-09-30

### Vncviewer

[Vncviewer](#) is a (client) viewer for any [Virtual Networking Computing](#) server. The client version of this software is available for many platforms. The current version of Ubuntu version's details are given below:

VNC Viewer Free Edition 4.1.1 for X - built Apr 16 2008 13:02:40

## Conclusion

As explained in this Note, it is possible for a user who has secure account access to IMB Linux computer systems and secure access to MarCCD computer system to remotely monitor the data collection from their lab or home. If you have any further questions or comments please contact [Soma](#).