

User Data Processing/Data Transfer Instruction

Beamline – BMIT

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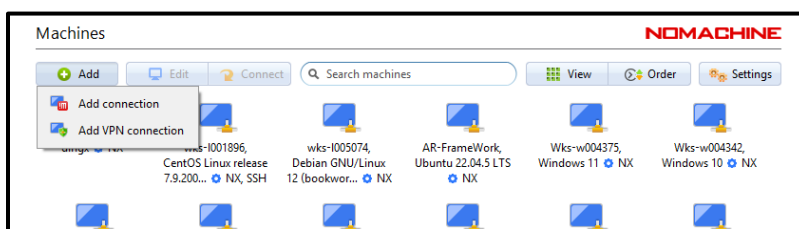
1. BMIT User Data Processing Server Booking:

- BMIT provides two servers (Computer name: OPI1117-001 and WKS-L004334) to the BMIT user community for data processing. Both servers are accessible remotely and onsite. Remote access is through NoMachine and onsite is in the BMIT computer lab in room 1117. **For WKS-L004334 booking, all Fridays are reserved for BMIT Staff ONLY.**
- Please contact BMIT associate scientist (Xiao Fan Ding, email: xiaofan.ding@lightsource.ca) to book the BMIT User Data Processing Servers for your data processing.
- Minimum booking unit is 1 day (24 hours), and the server will be available at 8 am (Saskatoon time) on the first booking day.
- Beamline scientist will prepare the data for the users on the server. **Please provide the project number** (prjXXXXXXXXX) when submitting your booking requests.
- If your data you are going to work on is not already on the BMIT Data Server, please send the data to a beamline scientist in advance or copy them to the server yourself.

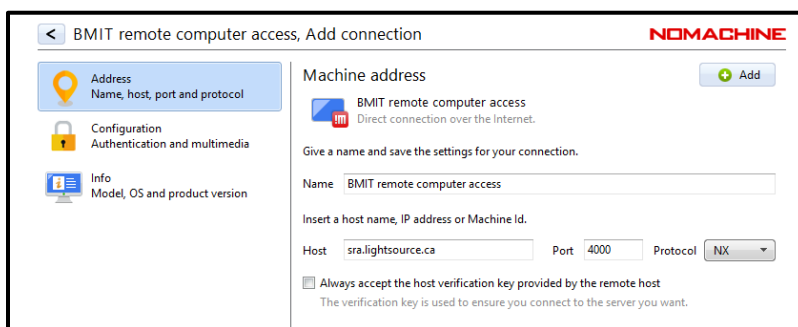
2. Remote Access of Data Processing Servers

a) NoMachine installation and setup your personal machine:

- Download the "[NoMachine Enterprise Client](#)" appropriate to your OS
- Install and start the client
- At the top left, click and select "Add connection"

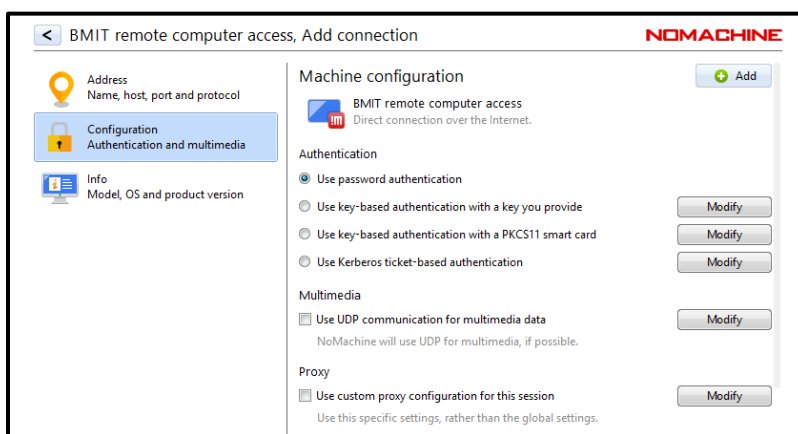


- In the address page, name the connection however you like and put Host: sra.lightsource.ca, Port: 4000, Protocol: NX



The screenshot shows the 'Add connection' dialog in NoMachine, specifically the 'Address' tab. The left sidebar has three options: 'Address' (selected), 'Configuration', and 'Info'. The main area is titled 'Machine address' and contains a text field for 'Name' with the value 'BMIT remote computer access'. Below this, there's a section 'Insert a host name, IP address or Machine Id.' with fields for 'Host' (sra.lightsource.ca), 'Port' (4000), and 'Protocol' (NX). At the bottom, there's a checkbox 'Always accept the host verification key provided by the remote host' which is checked.

- In the configuration page, choose to authenticate using a password, uncheck the UDP box, and do not use a proxy (unless you are on a proxied network)

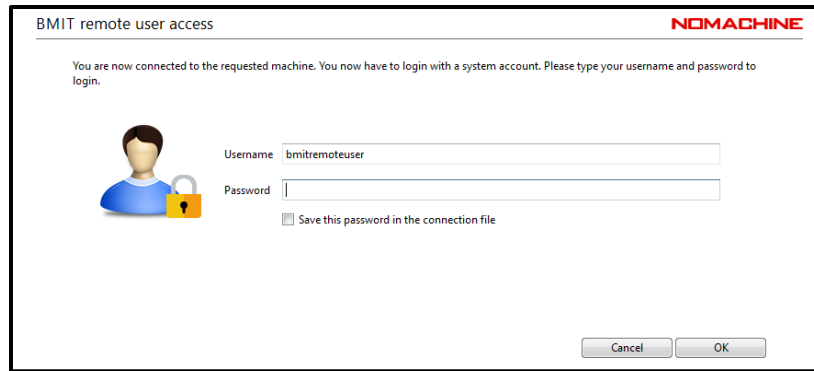


The screenshot shows the 'Add connection' dialog in NoMachine, specifically the 'Configuration' tab. The left sidebar has three options: 'Address', 'Configuration' (selected), and 'Info'. The main area is titled 'Machine configuration' and contains several sections: 'Authentication' with four radio buttons (the first, 'Use password authentication', is selected), 'Multimedia' with a checkbox 'Use UDP communication for multimedia data' which is unchecked, and 'Proxy' with a checkbox 'Use custom proxy configuration for this session' which is unchecked. Each section has a 'Modify' button to its right.

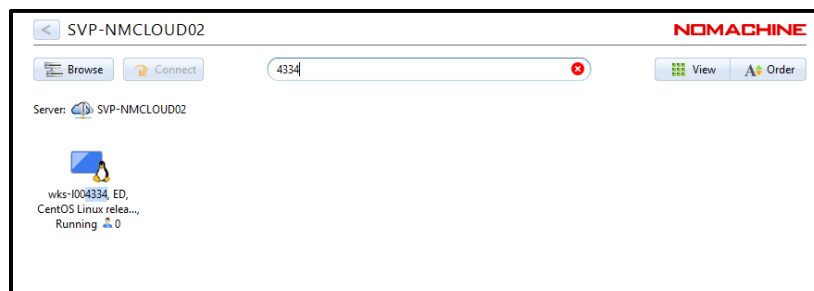
b) Access BMIT User Data Processing Server using NoMachine:

Double-click the new connection in NoMachine to launch it.

- Username: **bmitremoteuser** (or **bmitremoteuser2**)
- Password: will be reset by a beamline scientist and provided to you in a separate communication



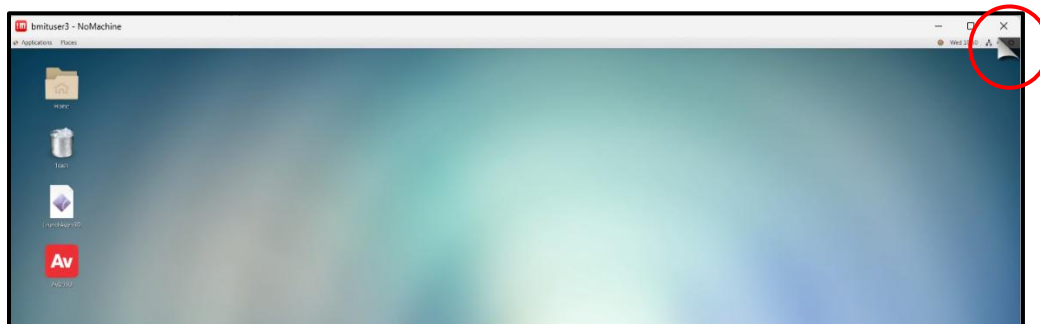
- At the top, you can search for **BMIT - OPI1117-001** or **wks-L004334**, depending on which you have booked. Double-click to launch a session.

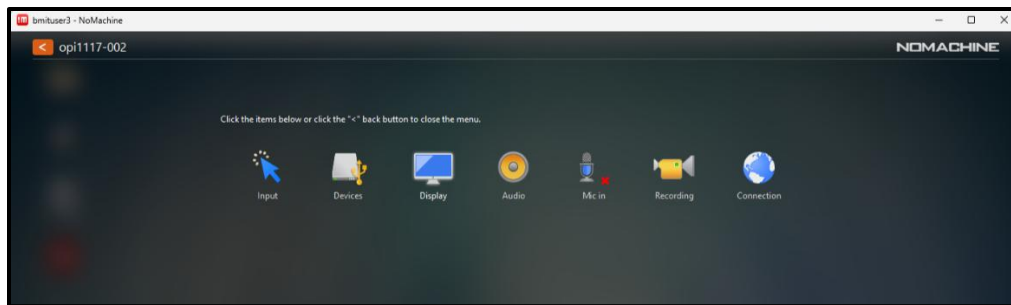


- The session will start on the secure desktop, requiring your username and password again.

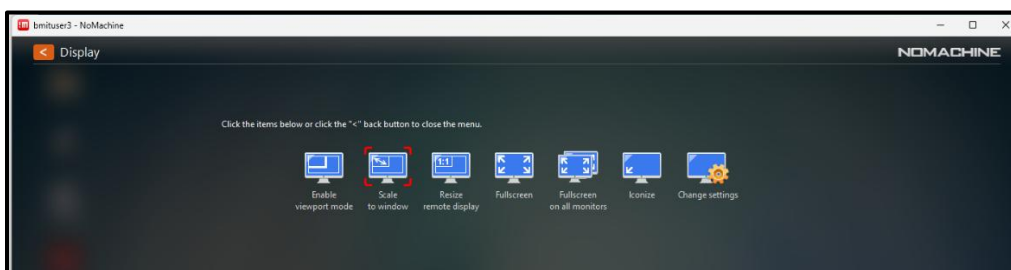
c) NoMachine display and disk settings:

If you move your cursor to the top right of the page, a dog-ear will appear allowing you to fiddle with your NoMachine settings:

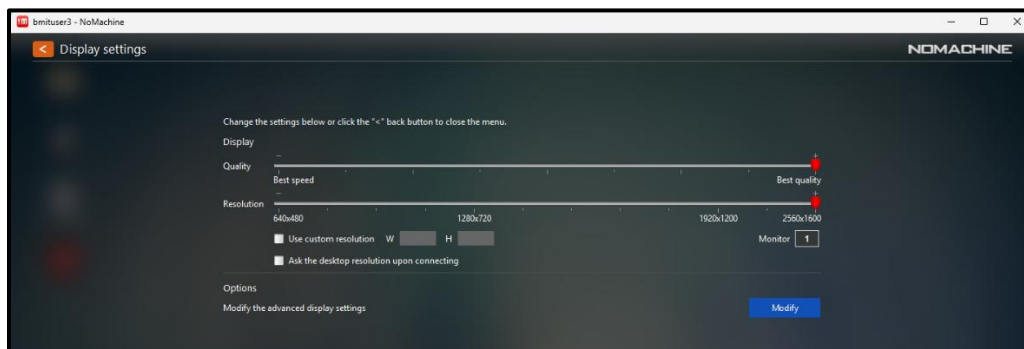




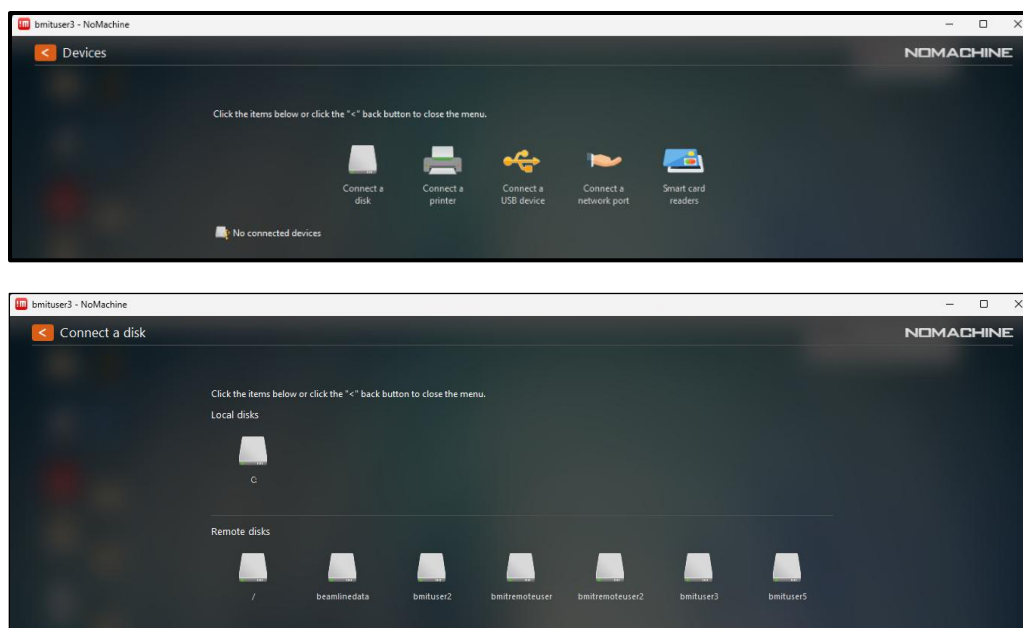
- In Display -> This allows you to configure display options to have a usable graphical output. It is recommended to choose scaling as the display and fit to window, but sometimes tall windows can be cropped.



- In Display -> Change settings -> This allows reducing display quality which may improve your connection to the remote computer when network is slow.



- In Connect disk -> Select "Devices" -> "Connect a disk" and in Remote disks double-click beamlinedata. A shortcut will be created on your local desktop or BMIT disk will appear in your file browser. Alternatively, double-clicking on your local folder will create a shortcut on the desktop of the remote computer. This method is suitable for transferring small files. For large size data transfer, please see section Data Transfer:..



d) Sharing remote user sessions:

The working session on the BMIT Data Processing Server can be accessed by multiple users via NoMachine using the same username and password at the same time. We recommend no more than 5 users on the server at the same time, since network, graphics and processor may become constrained under too many connections.

3. Onsite Access of Data Processing Servers

Both BMIT User Data Processing Servers (OPI1117-001 and WKS-L004334) are in the BMIT computer lab (room 1117 close to the BMIT entrance). The server names are labelled on monitors and keyboards.

4. Data Processing:

a) Available software

- ImageJ, Fiji, Tofu ez, Avizo, 3D Slicer, and python are available on both remote user computers
- Biomedisa is only available on WKS-L004334.

b) Accessing project folders

Shortcuts to data folders are on the desktop:

- The folder `prjXXXXXXXX-raw` includes all your raw data from your BMIT experiments and has been set for READ permission only
- The folder `prjXXXXXXXX-rec` is for all your processed data and has been set for both READ and WRITE permissions

The absolute directory of the user raw data on the BMIT data server is:

- `/beamlinedata/BMIT/projects/prjXXXXXXXX/raw`

The absolute directory of the processed data on the BMIT data server is:

- `/beamlinedata/BMIT/projects/prjXXXXXXXX/rec`

Both directories are located on CLS data server `/beamlinedata/BMIT/projects/`. “prjXXXXXXXX” is consistent with your proposal/permit number. Usually, the beamline scientist will already have created shortcuts of those two folders created on the desktop before your booked session. Users should **ONLY** save your data in their “rec” folder. Do **NOT** save any data/files on the Desktop, since the Desktop will be reset for the next user group.

c) CT reconstruction software `tofu-ez`:

To run `tofu-ez` on:

- Start a terminal, type `tofu ez`, and hit enter
- Input and output directories **must** be the absolute path and not the shortcuts on the desktop
- The temporary directory needs to be set somewhere in the project folder. A good place would be `/beamlinedata/BMIT/projects/prjXXXXXXXX/raw-preprocessed/ezufo-temp`

Users must only open one tofu ez session at a time.

Instructions and training materials could be found in the folder “BMIT training materials” on the desktop. Please contact the BMIT scientists supporting your beamtime if you need help with your data image processing.

5. End of Booking Server Cleanup:

- At the end of your booking session, there is no need to log out of the computer. Please close all windows and remove all their temporary files from the desktop.
- After your booking sessions, please inform beamline scientist whether your data processing is completed and data is ready for transfer, or you need to book the server again.

- Please be advised that **BMIT's data retention policy at the present time is 1 year**. Reconstructed data, or any data that is created to the rec folder, will be **deleted 90 days after file creation**. Make sure to ask beamline scientists to help facilitate data transfer.

6. Data Transfer:

All data can be transferred to users by the following two options:

a) Onsite data transfer:

- Users can copy their data using the dedicated data transfer computer **WKS-W002588** (Microsoft Windows 10 system). We highly recommend using **TeraCopy** to transfer your data which has been installed on that machine.

b) Online data transfer:

- **Globus** is used for transferring data online.
- Set up your computer as an endpoint for globus
 - Go to <https://www.globus.org/globus-connect-personal/>
 - Windows setup: <https://docs.globus.org/how-to/globus-connect-personal-windows/>
 - Mac OS X setup: <https://docs.globus.org/how-to/globus-connect-personal-mac/>
 - Linux setup: <https://docs.globus.org/how-to/globus-connect-personal-linux/>
- Find your data by in globus
 - Login to app.globus.org. You should select Canadian Light Source as your institution to login, and you will be prompted with the CLS user login page.
 - Once logged in, you can search for **Collection** and search for “**CLS Beamline Data**” end point
 - In the file manager view, you can then see projects/proposals that you are associated with in User Portal.
 - Clicking in the top right is a button to turn on “2-pane” mode, so a second endpoint, e.g., user’s personal computer with Globus personal installed, can be selected as a destination
 - Once a second endpoint is opened, you can select files to transfer, then click the blue “Start” button to copy data from one endpoint to another. You can select “Transfer & Time Options” to change options such as consistency checking.

*** Suggestions:**

1. Booking the server as soon as possible, for example one or two weeks before; In some busy months, the server could be fully booked very quickly.
2. We don't recommend users to book the server for a long period, for example booking most of the days in a month. We have very limited resources, currently only one remote server available for all BMIT users. We try to provide services as much as users request. Second, since our schedules could be more unpredictable in long term, the long-term booking schedule may not be guaranteed. In addition, we may have server maintenance, urgent software update or other requests happening, the beamline scientist will contact the current users accordingly.
3. Using NoMachine login, if you cannot connect to the server, please try to restart your computer, and then log in; or to install the latest version of the NoMachine.

Happy Data Processing!
