

Data Transfer Pipeline – From Subject Registration to Data Access

New Data Organisation at BUCNI

All human MRI data falls under GDPR and requires secure and restrictive access, hence, data cannot be shared easily between studies or accessed by non-authorized researchers. To implement this at BUCNI, a new subject registering process and data access are now in place. The implementation is automatic and requires a new project setup and minimal operator input during the subject registration process.

New Project Setup (BUCNI Staff only)

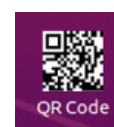
Every project (running or new) needs a project file that holds essential information about the study and the assigned project code (five-digit number starting with 20, e.g., 20003). The project file lives on the Camera PC (**PRISMA**) or Raspberry PI (**AVANTO**) and is used to generate a QR code for the subject registration. This file needs to be set up by BUCNI staff (i.e., Joerg, Letitia, or Winnie). The new project setup process is described in https://github.com/BUCNI/bucni_qr. **During this setup, the computer assigns the project code that the researcher and operator of the study needs to record.**

Subject Registration

Every new subject must be registered on the scanner using an individual QR code and the correct project code. **For every subject, a QR code needs to be generated. It cannot be reused for other subjects. If the steps to generate a code are not followed correctly, or the scanned QR code information in the registration form is changed, researchers will not have access to the transferred data!** If you think you might have changed any QR code-provided text inputs (any field which is **not** highlighted in yellow, e.g., names, age, date of birth, additional information, metric tic box; see picture below), **close** the Patient Registration window and start again!

To generate a QR code, follow the steps below.

1. Start the QR code program.
 - a. **Prisma**: Click on the QR code icon on the camera PC.
 - b. **Avanto**: Use the command line on the Raspberry PI, login as *bucniuser*, password is on the camera PC next to it.
2. Check the project number that has been assigned to your project (should start with 20 (e.g. 20555)). Then type "*bucni_qrcode PROJECTNUMBER*" and hit the **tab** key to auto-complete and then press **enter**.



```
bucniuser@buc34: /applications/github/stable/bucni_qr
bucniuser@buc34: /applications/github/stable/bucni_qr$ ./bucni_qrcode 20
```

3. You will see a QR code appear on the screen.

4. **On the scanner console**, open the patient registration window. **Check that the metric tick box is ticked, and don't click anything else.**
5. Using the QR code reader next to the scanner console, scan the QR code that you generated in Step 2.
6. **On the scanner console**: You will see that the QR code will automatically input information on the form. Edit only the yellow highlighted field as usual.
 - i. Patient ID from the scanner journal book
 - ii. Sex
 - iii. Height in centimetres (Prisma) or meters (Avanto)
 - iv. Weight in kilograms
 - v. Patient position: Head First Supine

IMPORTANT: Only change the fields highlighted below. The metric check box (PRISMA only) for height and weight must always be active, otherwise the automatic registration information will be corrupted!

7. Press Exam and proceed with the scan as usual.

The screenshot shows a 'Patient Registration' window with the following fields and controls:

- PATIENT** section:
 - Last name: 221019-114748
 - First name: (empty)
 - Patient ID: (highlighted in yellow)
 - Date of birth: 19/10/1992 [dd/MM/yyyy]
 - Sex: Male Female Other
 - Age: 30 Years
 - Height: (highlighted in yellow) cm
 - Weight: (highlighted in yellow) kg Metric
 - Additional info: (empty)
 - Details... button
- PROCEDURE** section:
 - Patient position: (highlighted in yellow)
- HOSPITAL** section:
 - Requesting physician: (empty)
 - Admission ID: (empty)
- Buttons: Preregister, Exam, Search, Cancel, Help
- Status bar: ISO_IR 100, 00:03, nc_epi2d@PrincipleInvestigator...

Sending the acquired data

The data should be sent via *mridatasort*. The physio data on the Prisma acquired with multiband will be transferred automatically and made accessible together with the images in the respective directory.

Data Access at BUCNI

To access the data, an **SFTP server login** is required. This is usually set up during the project meeting with Joerg Magerkurth. If you do not have a login, please use the BUCNI Clinics drop-in session to get a login. You will also require the Authenticator app (*Microsoft Authenticator* or *Google Authenticator*). Please remember the username and password as these will be necessary when retrieving your data.

- I. Retrieve your data on BUC02 (Mac at the reception) – this will change soon! (Switching to Linux)
 1. If the screen is locked, login as `bucniuser`, if not done so already.
 2. Open *CyberDuck*
 3. Connect using:
 - a. Host: `128.40.199.204`
 - b. Username: *your UCL email address*
 - c. Password: *your SFTP password*
 - d. Port: `22`
 4. To convert your data into “**nifti**” format, follow the steps below:
 - a. Open Terminal
 - b. Change into the directory that contains your data (type “`cd`”, then drag and drop the folder from the finder into the terminal window).
 - c. Type “`dcm2niix`” into the terminal and press enter.
 - d. This should convert your data into “**nifti**”.
 - e. After “**nifti**” have been created and transferred. Delete them from the folder as they take up space.
 5. Retrieve your data either using your personal USB/hard drive or a DVD.
 6. **Please note:** A DVD backup is not supported anymore and the backup of the data falls to the project group! However, if you would like to have a DVD back-up, DVDs will be provided at the reception.

II. Retrieve the data on your personal laptop or your office PC.

To retrieve the data conveniently, please install an SFTP client [FileZilla](#), [CyberDuck](#) or [WinSCP](#) on your machine.

In order to connect to the data server “buc12”, you will have to open a tunnel to the server via the BUCNI gateway “buc01”.

1. Connect to the BUCNI gateway on a [Linux or Mac](#):

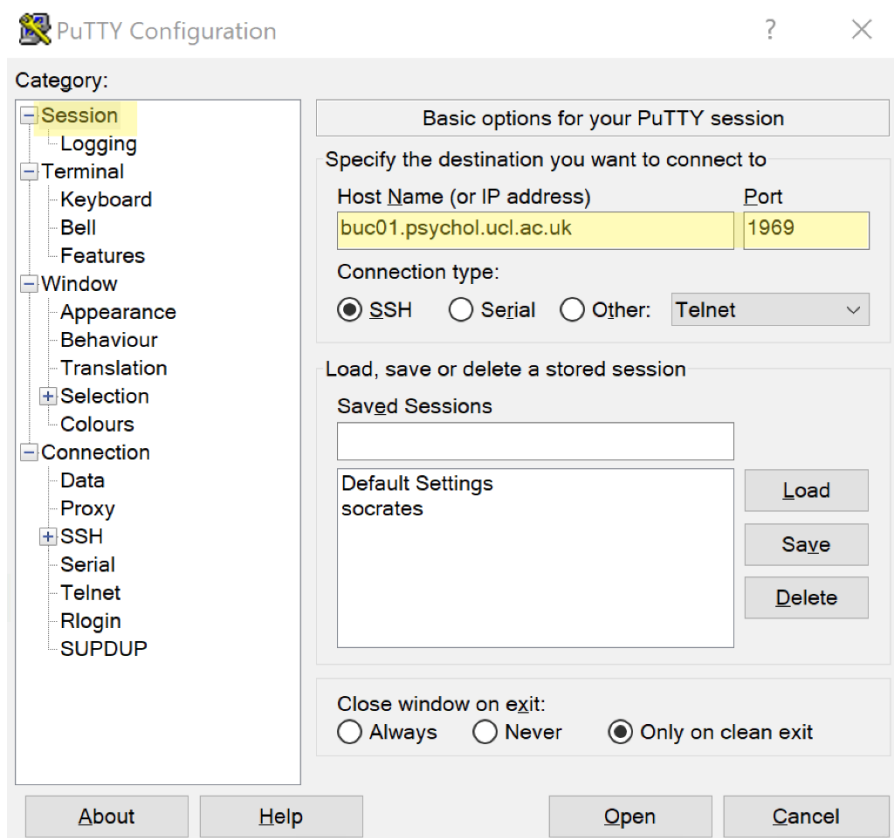
- a. To connect to *buc12* on a MAC or Linux machine, open your terminal.
- b. Type the following into a terminal, you will be asked for a code from your *Google/Microsoft Authenticator*.
- c. The terminal may remain blank, but if it does not show an error, it would mean that you are connected and you can continue to **Step 3**.

```
ssh -N -p 1969 -L 2222:buc12.psychol.ucl.ac.uk:22 UCLUSER@ucl.ac.uk@buc01.psychol.ucl.ac.uk
```

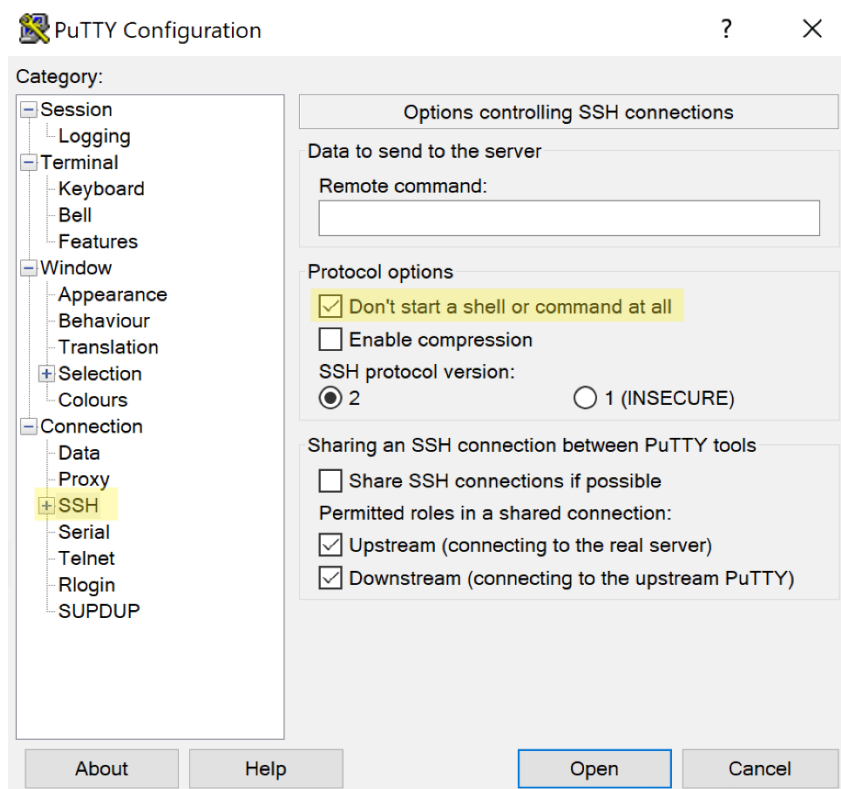
```
ssh -N -p 1969 -L 2222:buc12.psychol.ucl.ac.uk:22 YOURUCLEMAIL@buc01.psychol.ucl.ac.uk
```

2. Connect to the BUCNI gateway on [Windows](#):

- a. Install [PuTTY](#) and use the following settings:
 - 1) Go to **Session** and put in the host name and port:
 1. Host Name: *buc01.psychol.ucl.ac.uk*
 2. Port: *1969*

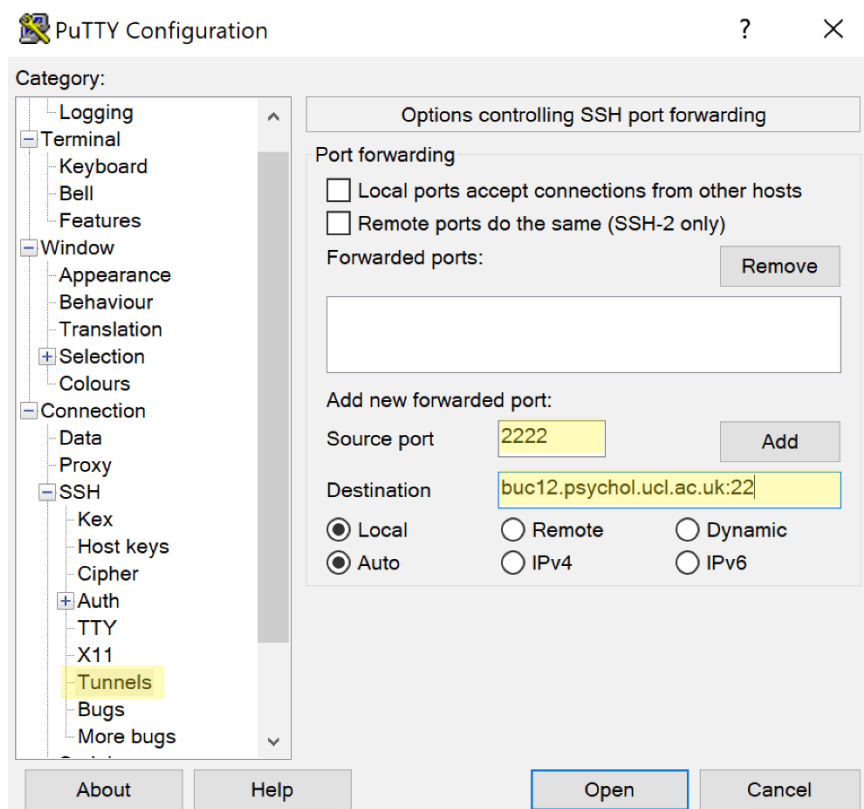


2) Go to **SSH** and tick on **“Don’t start a shell of command at all”**.

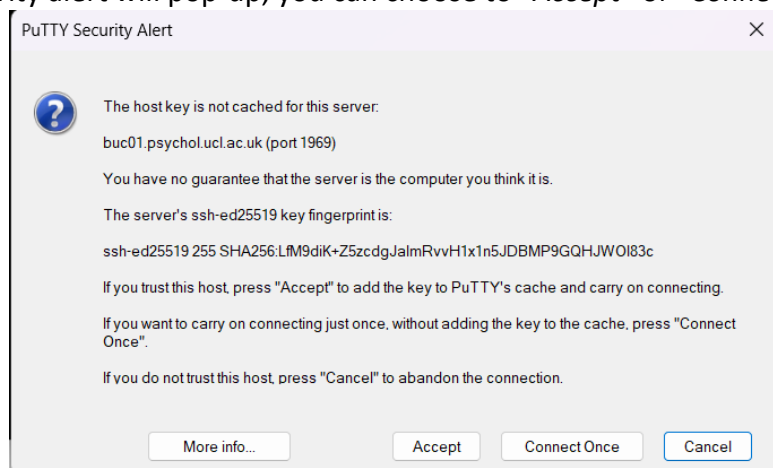


3) Expand **SSH** and select on **Tunnels** and insert the following information.

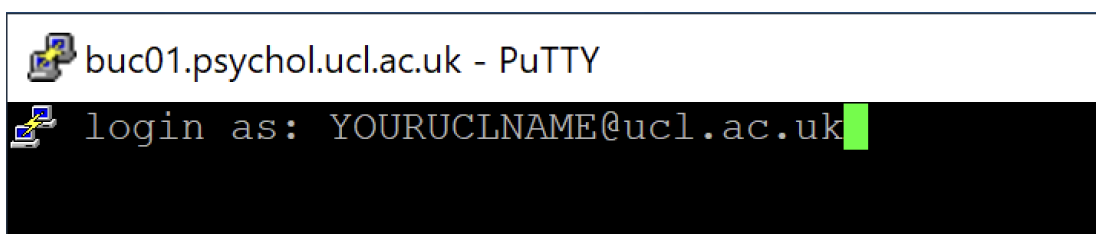
1. Source port: 2222
2. Destination: *buc12.psychol.ucl.ac.uk:22*
3. Click on Open



- 4) A security alert will pop-up, you can choose to “Accept” or “Connect Once”.



- 5) A terminal on PuTTY will open and login using your *UCL email address* and *gateway password*. It will ask for a code from your Google/Microsoft Authenticator.



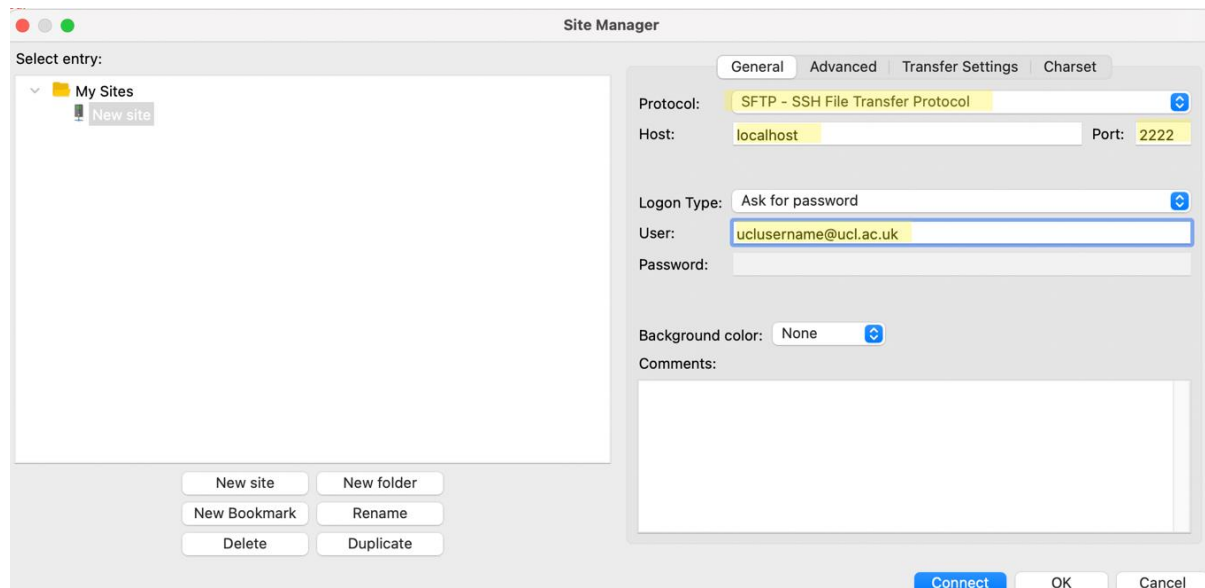
3. Retrieve your data.

- 1) Open your SFTP client (i.e., *CyberDuck*, *FileZilla*, *WinSCP*).
- 2) Connect to the data server using SFTP protocol (Example using FileZilla shown below):
 - a. Host: *localhost*
 - b. Username: *your UCL email address*
 - c. Password: *your SFTP password*
 - d. Port: *2222*
- 3) Retrieve your data.

Filezilla Example

Here is an example on how to connect using Filezilla and saving the connection.

- 1) Open File -> Site Manager
- 2) Click on “New Site”. You can rename the site if you like.
- 3) Insert the following information (highlighted in yellow below).
- 4) Click on “Connect”.
- 5) This should save the site for you so that you do not have to type it in every time.



File Manager using FileZilla