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Purpose of the document

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SOLEIL owns an infrastructure based on NoMachine technology to provide remote or on-site access to beamlines control to staff and SOLEIL users community. This document introduces the infrastructure and explains, step by step, how to connect to your beamline from home or from within the SOLEIL network.

General description of the service

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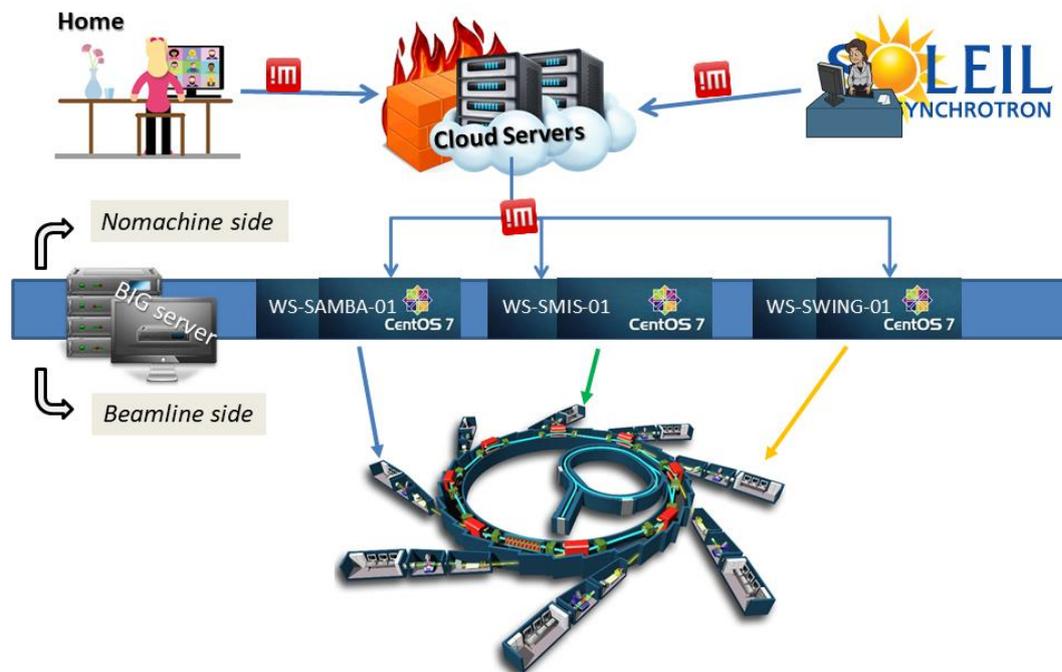
The connection to a beamline follows the scheme below. Starting from your home (top left) or your office (top right) you will be required to use NoMachine software or a web browser to connect to the NoMachine "Cloud Servers".

The connection is established by providing your credentials:

- The project number for users
- The LDAP identity (this may differ from SUNSET login) for staff

You will be able to choose one of the workstations you are entitled to access to, probably those of your beamline only.

These workstations are virtual, they are not running on the beamline hardware, they are generic machines running under CentOS 7 linux.



These virtual workstations are used only as access points to the lower part of the scheme: the beamline side. Once you are connected to one workstation you will dispose of a standardized desktop and tools.

From here you will be able to access your beamline computers: both those on the control network (RCL) by specifying their IP addresses and those on the *experience* network (REL) by their names or IPs.

Each beamline is different: methods and addresses have to be specified by the beamline staff.

Methods to simplify all these operations and to keep a list of connections exist and they are explained [at the end of the document](#).

Requirements

Access to the service is provided to SOLEIL staff permanently and to users [via a project number during its allocation time](#).

If a user or a project haven't access rights to at least one workstation, they will not be able to log in.

A scheduled project has access via its project number and password only during the scheduled time plus 1 day before and after.

Users can access through a web browser, or the client provided by NoMachine.

The client software is free of charge and provide a better experience, it requires installation and configuration.

Connection is presently possible from:

- the world wide web (outside SOLEIL);
- from SOLEIL network (RES);
- from within beamline network (REL);
- through a SOLEIL VPN connection.

Using the NoMachine Client

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The minimum client version required is 6. Two flavours are available: the « NoMachine Client» or the « Enterprise Client ».

We recommend to download and install the **Enterprise Client**, it's lighter. Clients exist for several versions of Windows, Linux and MacOS X.

- Enterprise Client NoMachine:
 - <https://www.nomachine.com/product&p=NoMachine%20Enterprise%20Client>

NoMachine client version 6 is still compatible with the infrastructure deployed for PX1 and PX2a beamlines (version 5).

NoMachine client version 7 is compatible with NoMachine Cloud server version 6.

Connection to the SOLEIL Remote Access Service (RAS)

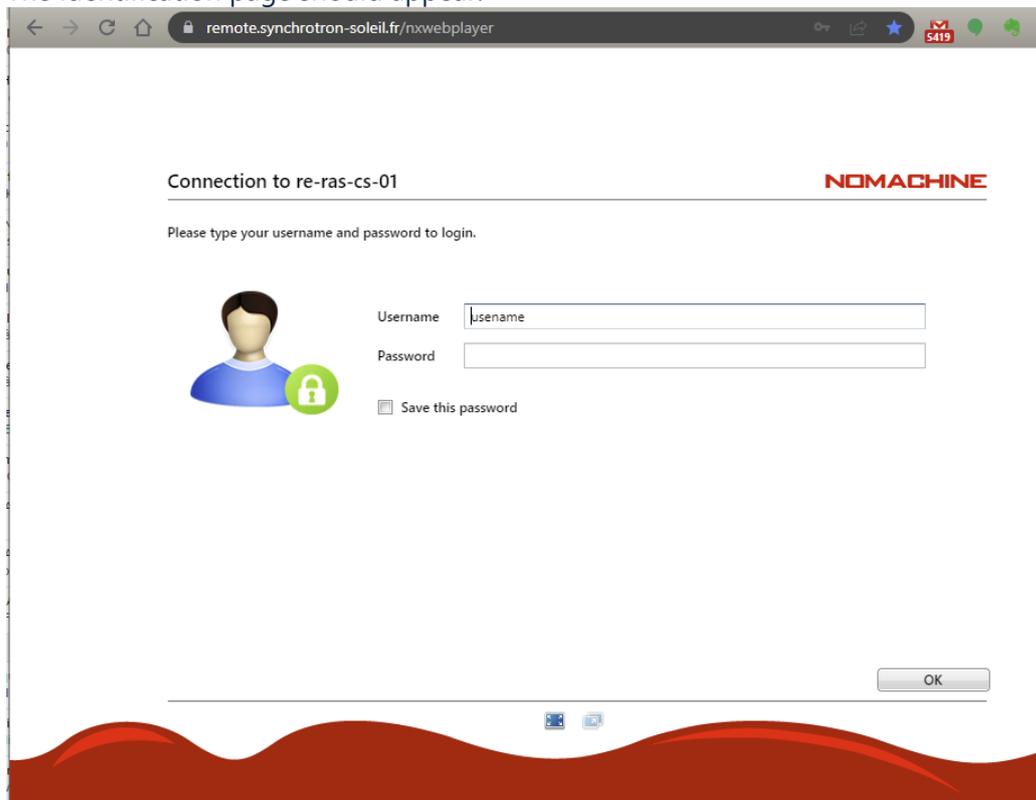
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The service is accessible from inside and outside SOLEIL via the address:

<https://remote.synchrotron-soleil.fr>

Use of a web browser

- Open a page at the address: <https://remote.synchrotron-soleil.fr>
- The identification page should appear:



Connection to re-ras-cs-01 **NOMACHINE**

Please type your username and password to login.

 Username

Password

Save this password

OK

- Enter your project credentials or those of « Réseau Expériences » (for SOLEIL staff: SUNSET, user office, experiments);
- Once connected you will face a list of workstations, those for which your account is enabled (and only those. !!)
- Workstations are named after the beamline they serve, some beamlines may own more than one workstation, chose the first one if not instructed by the staff to select a specific

workstation.

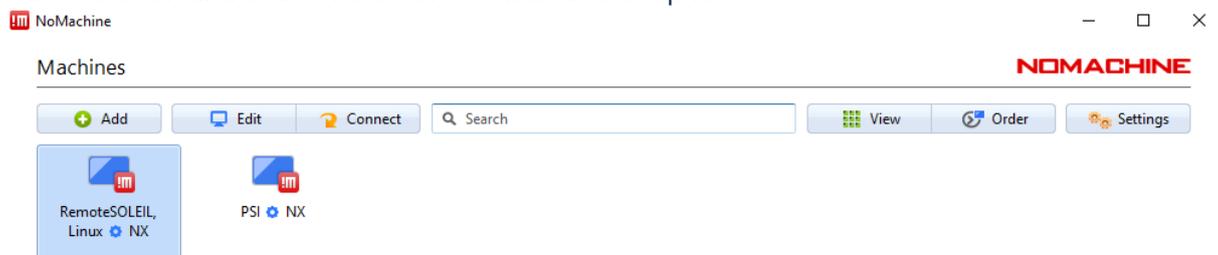


- It may happen that your account is not enabled for any workstation at the date of your connection: your connection will be refused.
- You can continue your reading at the section ["Connect to a working station"](#).

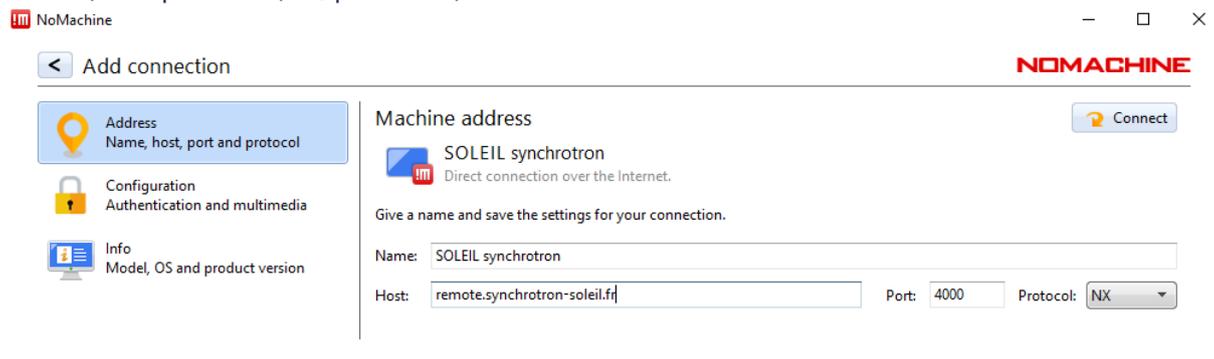
Use of a NoMachine Client

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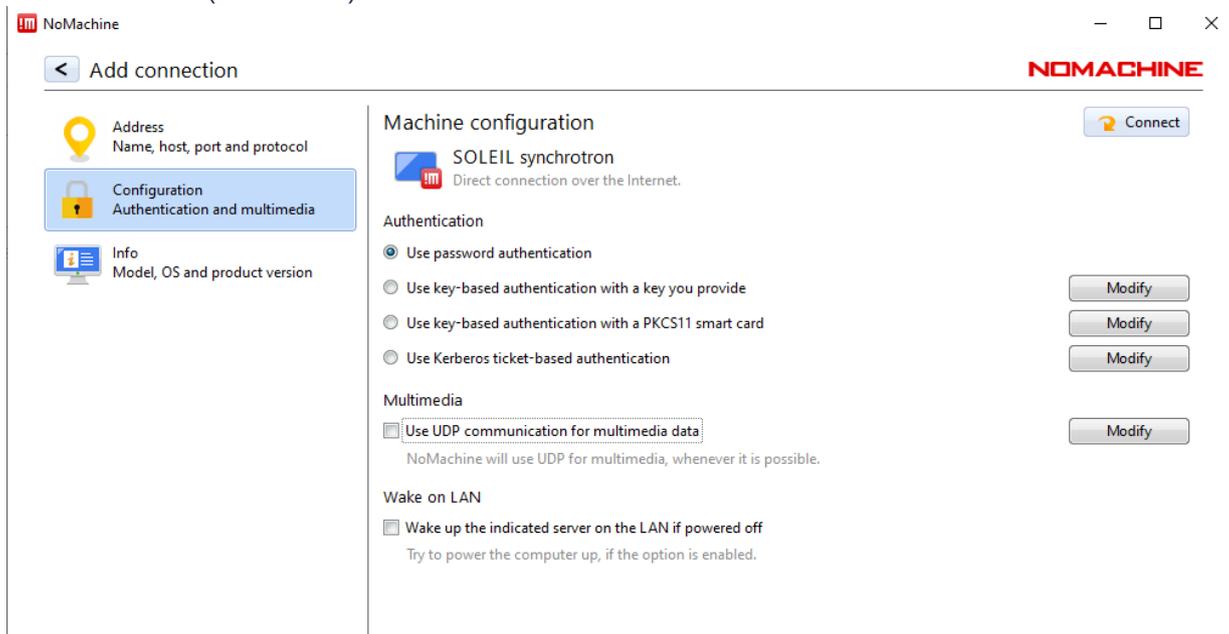
- The first time you will use it, the client has to be configured by creating a new connection that you will reuse each time
- Start the client and click on the icon "+ Add" at the top left :



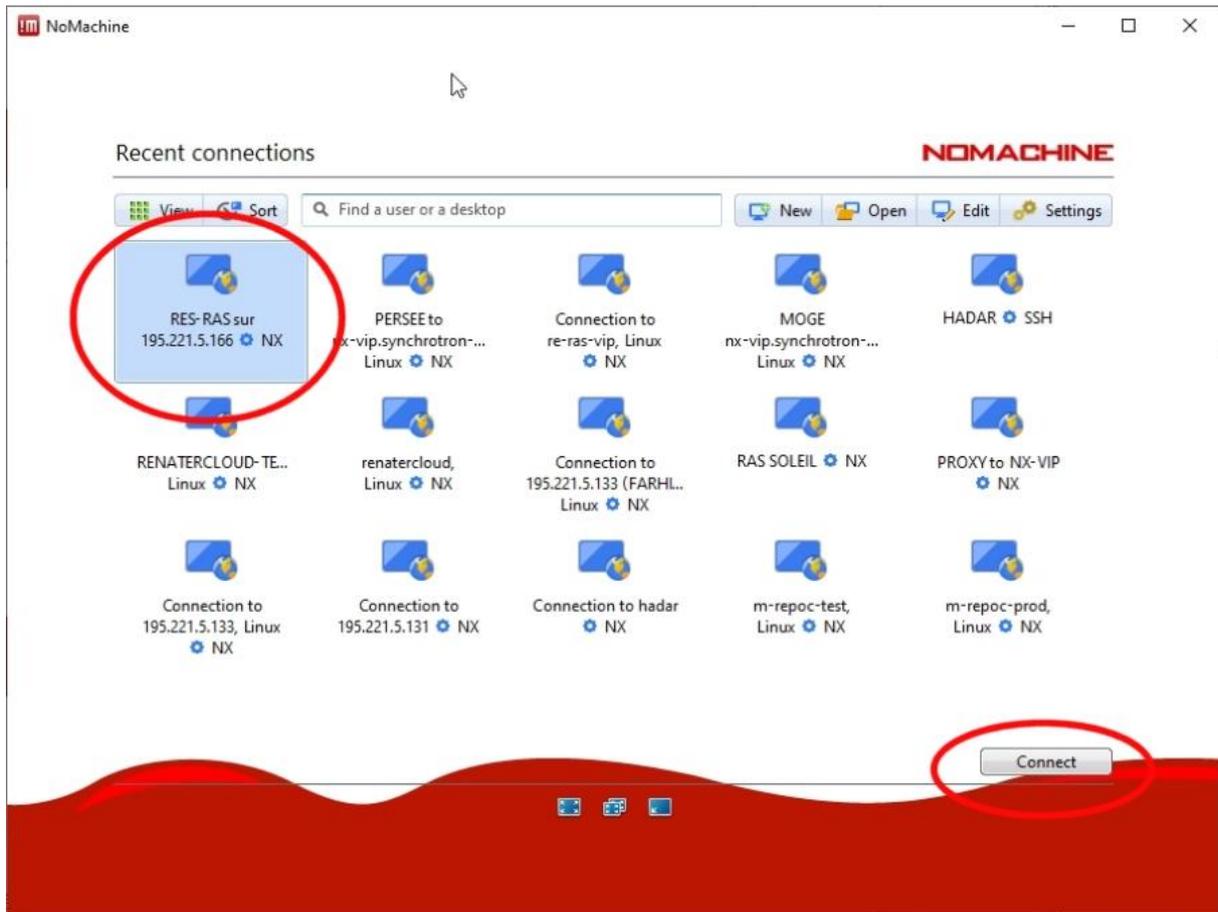
- Fill in the following page with name (whatever you like), host name (remote.synchrotron-soleil.fr) and protocol (NX, port 4000):



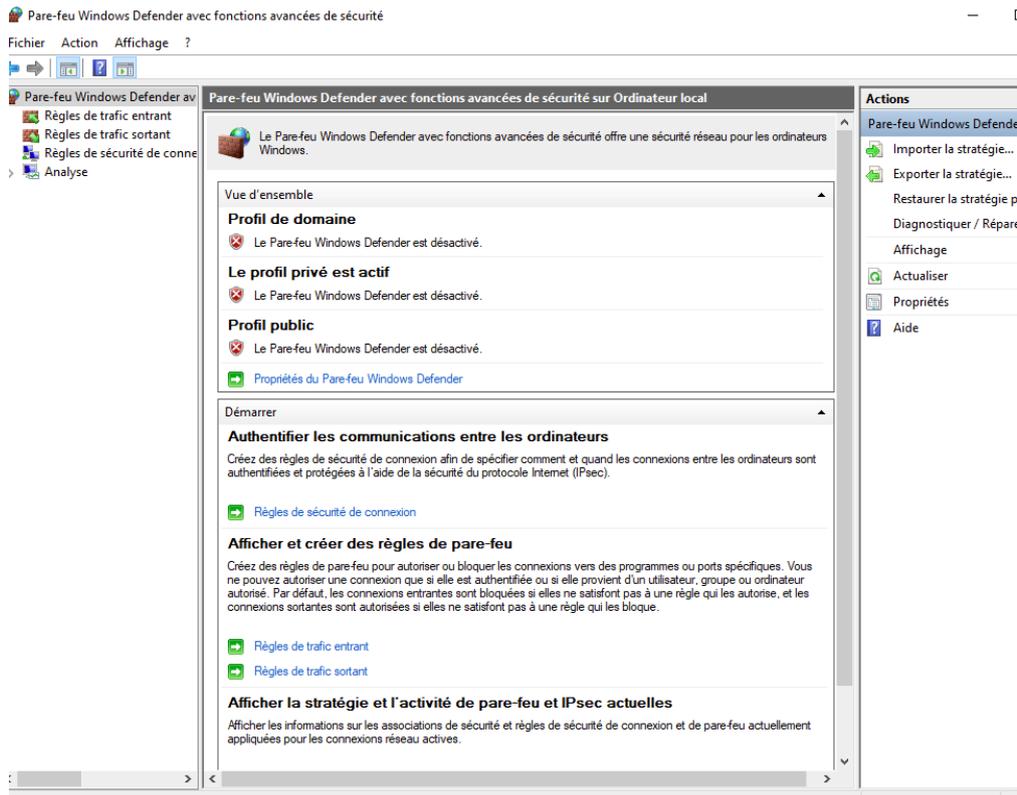
- Select configuration, then choose password authentication, uncheck UDP communication (do not use) :



- Once the configuration has been created, you can connect by double clicking or selecting the appropriate one and then choosing "connect".



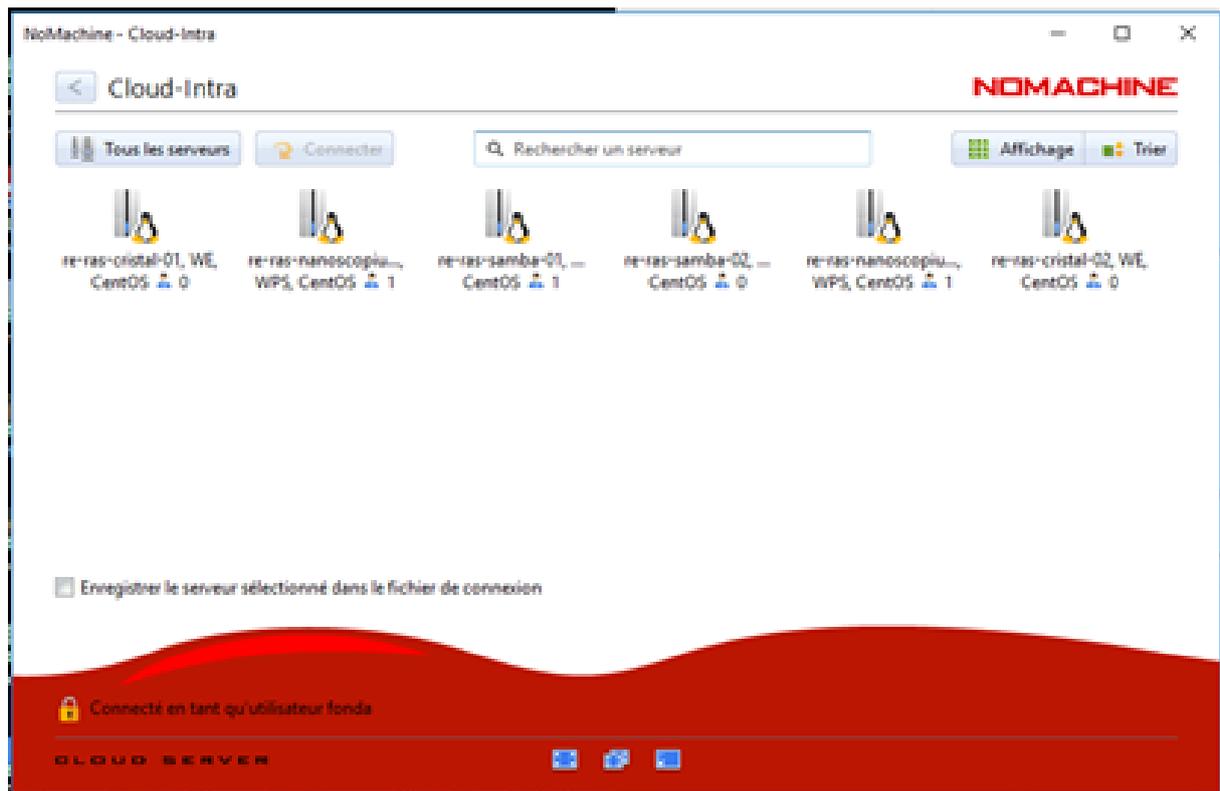
- You can continue your reading at the section "[Connect to a working station](#)".
- Your windows firewall must be disactivated or well configured or you may encounter problems in connecting.



Connect to a working station

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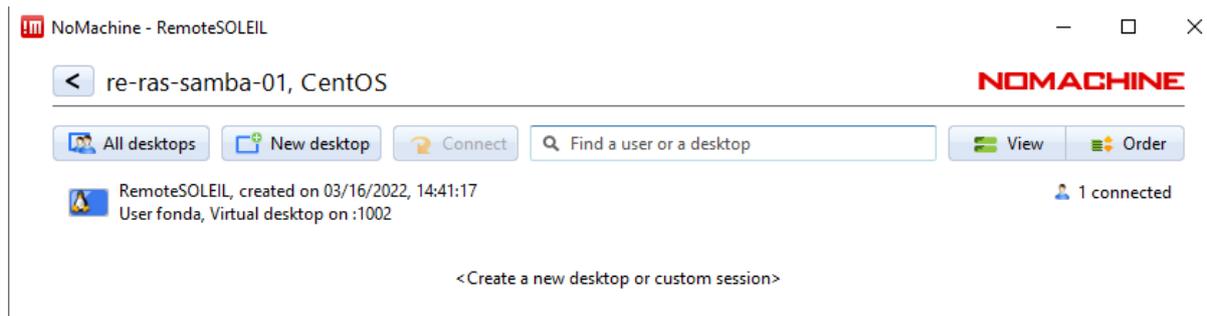
You are already connected to the cloud server via one of the previous procedures ([web](#) or [client](#)) and you face a list of possible workstations like in the following screenshot:



If necessary, choose to display "all servers" by clicking on the button at the left just on top of the servers list. In any case, only workstations where you have the right to connect to are displayed.

A beamline or a group may own more than one workstation.

When connecting to a workstation, if other desktops are already open, they will be listed as in the following image.



If less than four desktops appear, you will be able to create a new one by selecting *New desktop*.

You may also be able to connect to a session you own and let running previously or ask to the owner of another existing session to let you join him for working together by simply double clicking on the corresponding icon.

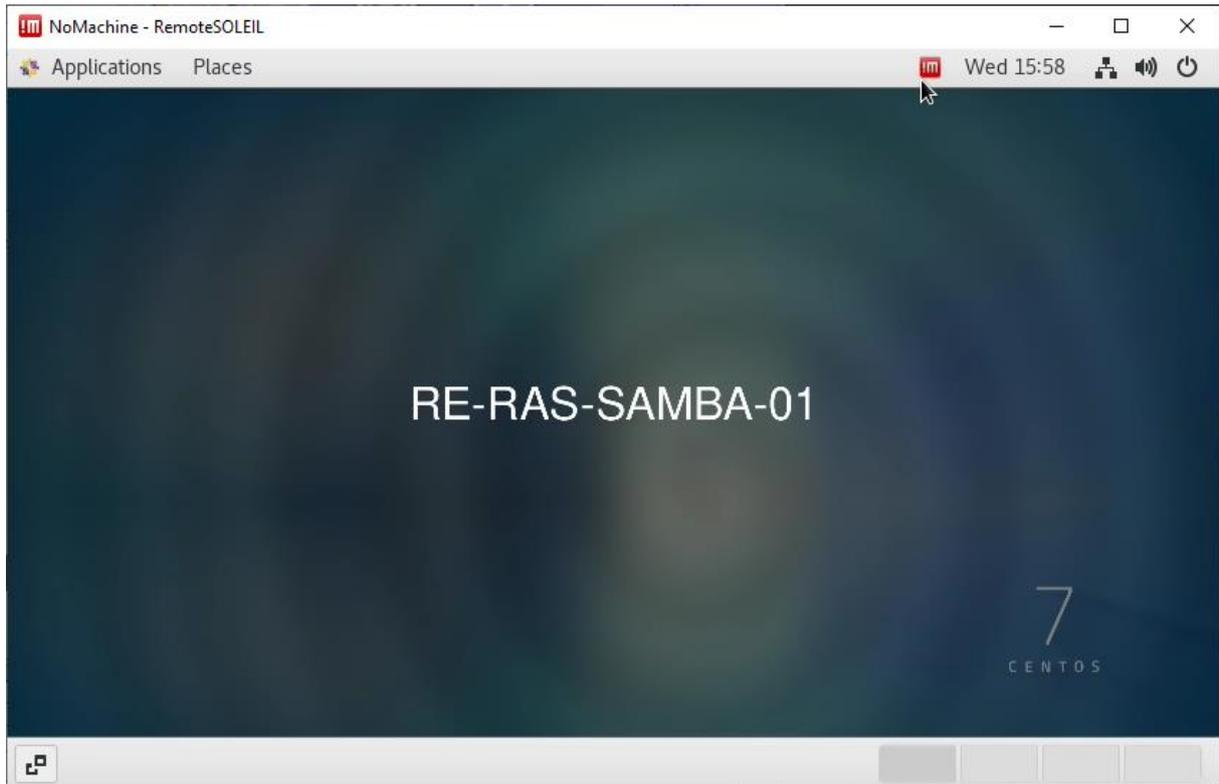
REMEMBER:

- Correctly select "all desktops" by clicking on the button on the left, above the list of desktops. Unless doing this, you will not see the desktops owned by other users on the same machine.

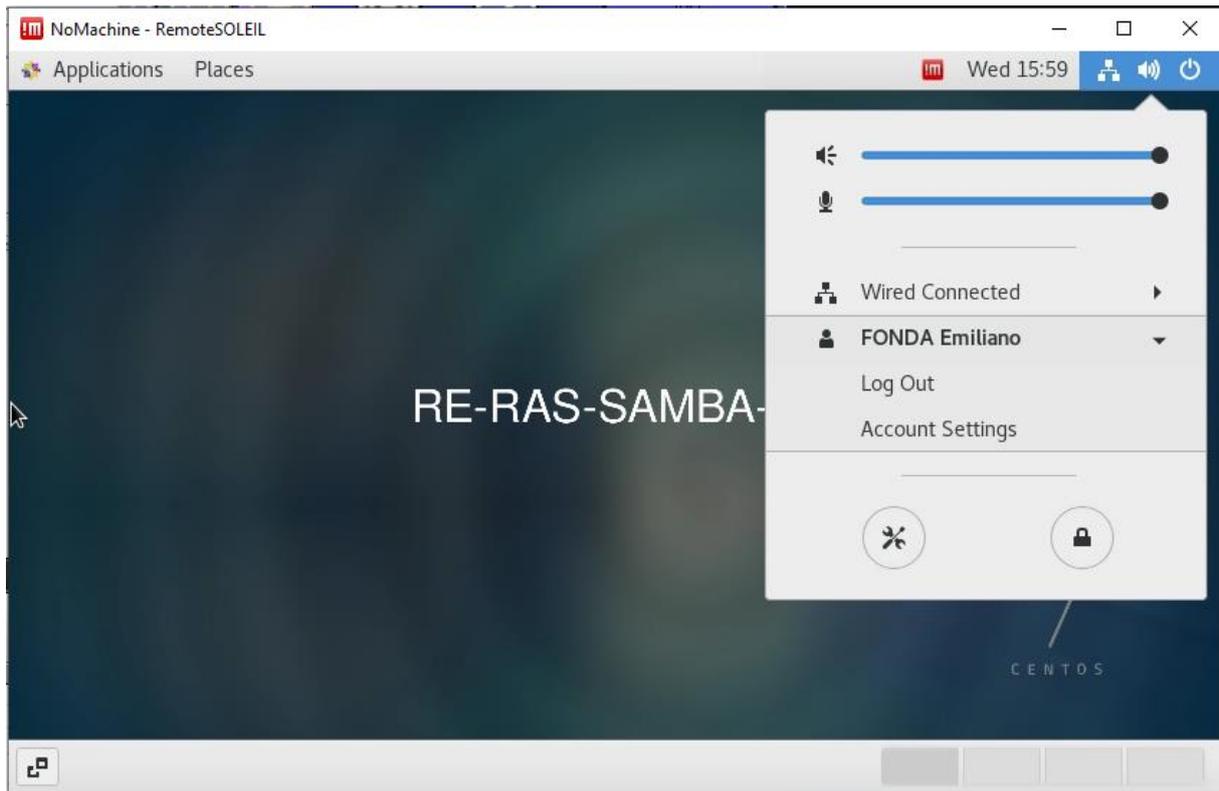
- **Disconnecting from NoMachine will not end your session:** you will have to log out properly from the workstation to end the session.
- When you disconnect from NoMachine closing the window (pressing the X for instance), your session remains alive, and you will be able to resume working from where you left. This means you still own one desktop, there is one less for the others.

Your desktop

The desktop is composed of an applications menu on the top left and a user menu on the top right. The latter can be used to log out.



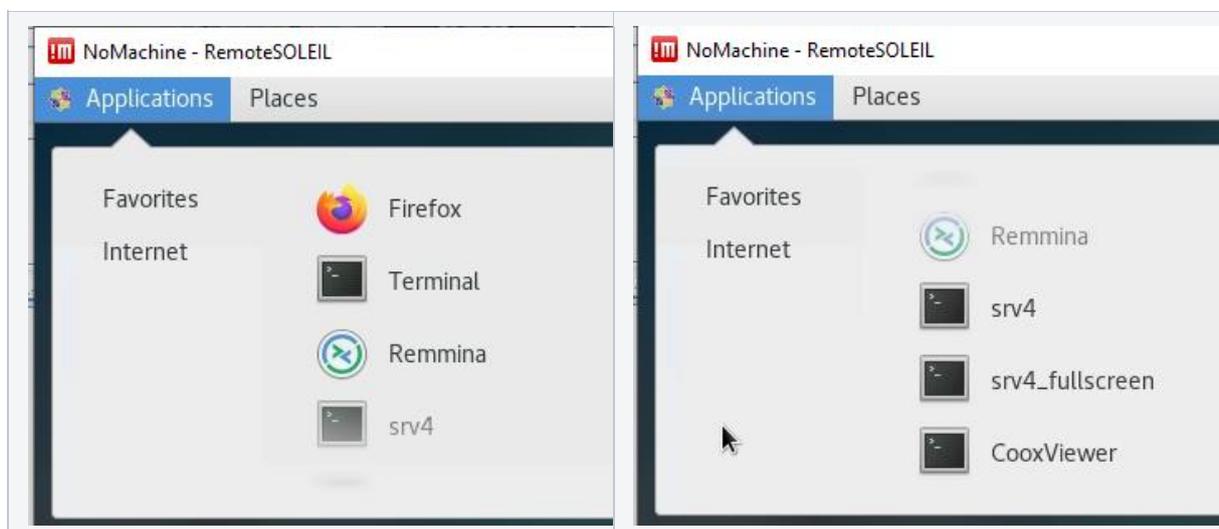
To log out and close the session, go to the shutdown symbol on the top right and then select your *username*, finally choose *Log Out*.



Another quick way to disconnect **but without closing the session** is **Ctrl-Alt-T**. In this case you will be able to reconnect to the same session afterwards and close it for good when finished working.

The Applications menu contains links to:

- a browser,
- a generic terminal
- Remmina (a list of connections shortcuts to all necessary terminals and PC)
- direct shortcuts to srv4 (in a resizable window or fullscreen), it's XDMCP.
- Coox Viewer for beamline graphical supervision.
- ssh_srv4 to open a ssh connection without retyping password to the *com-beamline* account on srv4 (the beamline control server)



Sharing a desktop

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If someone else wants to access your desktop, you will be notified on the top right of the screen by a NoMachine message.

You have to accept or refuse the connection unless your own username and password have been used.

Multiple users sharing the same project ID have the right to access all desktops opened under this ID (one identity owns all).

Important hints and tricks

Display and settings

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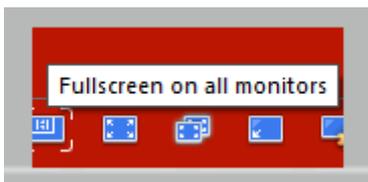
The NoMachine client can be configured to adapt resolution and keyboard shortcuts and layout. Many parameters are available through a menu that is often hidden.



To access the menu, you can move the cursor to the top right corner of the screen or use a combination of keys: **Ctrl-Alt-0** (0 is zero, not the letter O).

The menu contains options like full screen, full screen on all desktops (for multi-screen terminals) or permit to define a custom **desktop resolution**.

To use NoMachine in fullscreen mode over several displays use fullscreen on all monitors (the symbol with two monitors one on top of the other).



Keyboard

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It may happen that the keyboard is not correctly mapped. In this case you can open a terminal:

Then type the following command in (most of the times the keyboard defaults to the american (*us*) layout):

- **`setxkbmap -layout fr -options`** (*fr* may be replaced by any among *us, uk, de, it...*)

Owners of Apple computers may need specific setups, you can try the following variant:

- **`setxkbmap -layout fr -variant mac`**

Remark: the `-options` card is used to remove additional options that can be sent through X11 and that have proven to alter the correct keyboard layout.

Advanced: all variants and geometries available are listed in a read only file
:/usr/share/X11/xkb/rules/base.lst

- to obtain informations on your layout under the workstation you may use the following command:

```
setxkbmap -print
```

The output appears as a list of settings that can help you:

```
xkb_keymap {  
  xkb_keycodes { include "evdev+aliases(azerty)"  };  
  xkb_types   { include "complete"  };  
  xkb_compat  { include "complete"  };  
  xkb_symbols { include "pc+fr+inet(evdev)"  };  
  xkb_geometry { include "pc(pc104)"  };  
};
```

In this case the pc104 model has been used for XDMCP and the french (*fr*) layout (see [XDMCP](#)).

Network

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From the workstation desktop you can connect to two beamline networks (REL and RCL, where RCL is the control one).

To connect to a machine on the **RCL network** you have to know its **IP address** or use a shortcut provided by the beamline staff in Remmina (best option).

RUCHE or EXPERIMENTAL DATA STORAGE

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Please, remember this workstation is a simple gateway to control beamlines and it can be used also to connect to other computers dedicated to data analysis.

Do not perform data transfers, storage, computing on these workstations, they have not been conceived for these tasks.

Data transfer from the ruche to your preferred storage point can be realized via **Globus**.

Connection shortcuts and customization

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A list of pre filled connections has been prepared by beamline staff in Remmina.

To open Remmina look in the Applications menu.

Reserved to Beamline staffs

There is a protocol to prepare permanent links in Remmina and customize VMs: please follow this link [Remote Access : Comment personnaliser la liste des machines "cible" présentées dans remmina](#)

During customization, it's possible to address VNC connections to Igel terminals (TX), too.

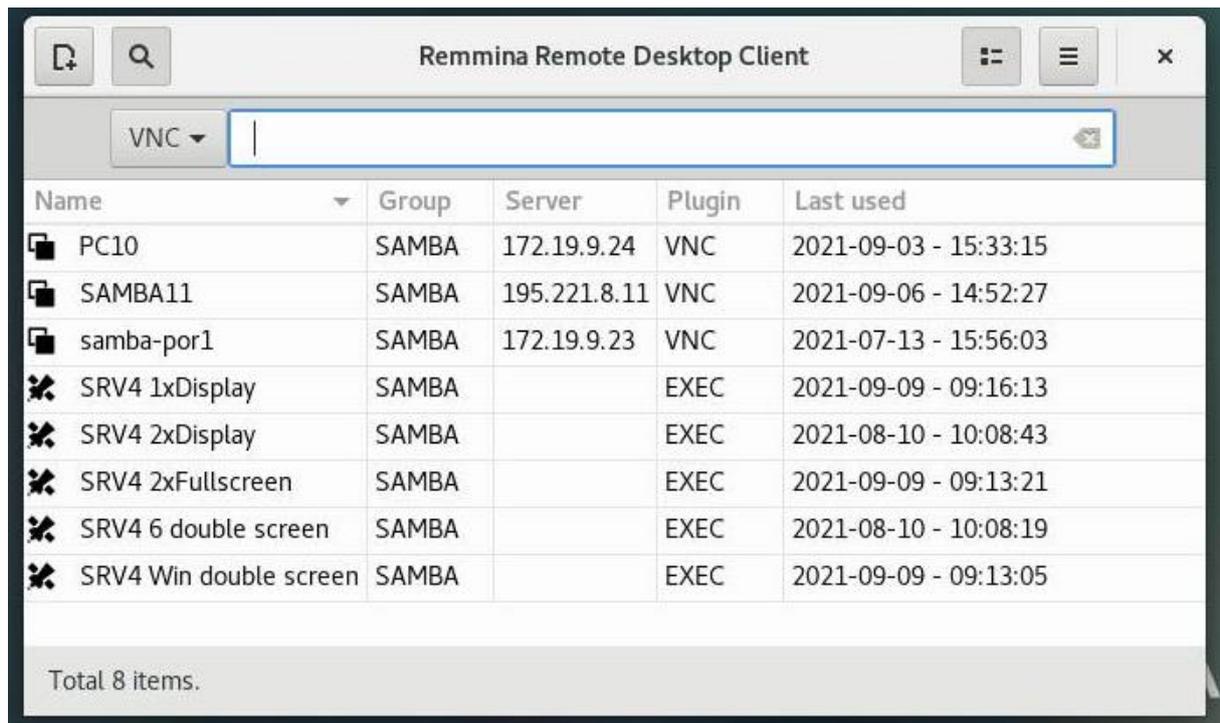
Remmina

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The application logo is the following:



Remmina shows you a pre filled or an empty list of connections. Below an old example for SAMBA beamline:



ssh

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To connect via SSH please open a terminal and use the standard commands like:

```
ssh -X -lusername beamline.server.ip.address
```

A shortcut for the srv4 host is provided in the form: *beamline-srv4*. For instance: `ssh -X com-cristal@cristal-srv4` will open a ssh connection to the cristal beamline srv4.

XDMCP

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XDMCP shortcuts to srv4 are ready and operational in the Applications menu. If other connections are needed for expert users, the following commands may be used.

Only for expert users:

To obtain a XDMCP connection to a XDMCP server in a window you can use the following external command (replacing the `xkblayout` for `fr`, `us`, `uk`, `de` as needed, see [Keyboard](#)):

```
Xephyr :1 -terminate -keybd
ephyr,xkbmodel=pc105,xkblayout=fr,xkbrules=evdev -query xxxBEAM LINE
NAMExxx-srv4 -screen 1920x1020 -title srv4
```

The chosen display size was 1920x1020 but can be modified as needed.

A fullscreen XDMCP adapting to your resolution can be obtained like this:

```
Xephyr :1 -terminate -keybd
ephyr,xkbmodel=pc105,xkblayout=fr,xkbrules=evdev -query xxxBEAM LINE
NAMExxx-srv4 -fullscreen -title srv4
```

You can create multiple Xephyr sessions, in this case `:1` should be replaced by a new session number (`:1`, `:2`, `:3` for session number 1, 2 and 3 respectively).

Remark: If a session `:1` already exists, you will be obliged to try with an higher number.

VNC

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Remmina let you connect via VNC or RDP to pre filled target machines. In most cases passwords and usernames have been hidden and pre filled.

To perform a VNC connection Remmina possess a VNC plugin, alternatively you could use tigerVNC Viewer (as shown in the figure below).



In both cases you should know username, password and IP address of the target machine.

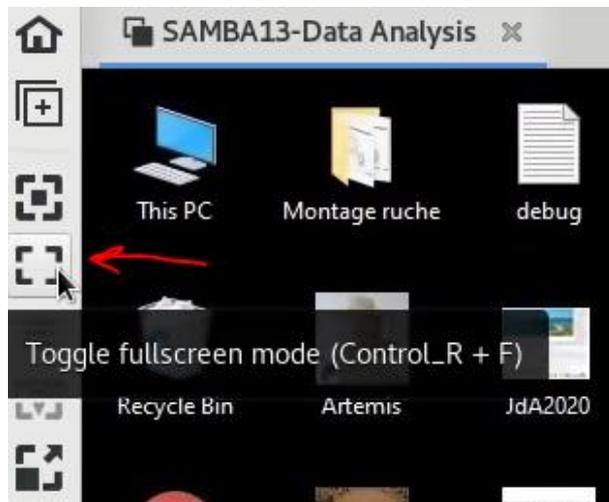
For connecting to standard REL machines do not set any username, just use **VNCREusr** as password.

For machines on the RCL network, username and password may differ, these are known to staff or support groups.

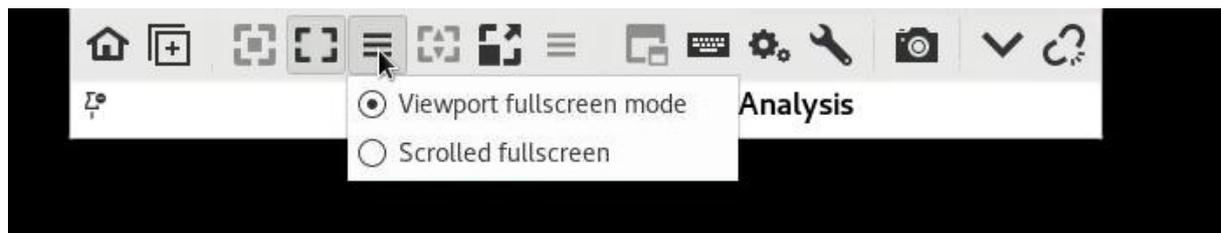
Using VNC on a single display machine when the remote machine has two displays

It can be very difficult to work from a single display station when the remote computer has two displays. One way to do it is to use the "scrolled fullscreen" option of your VNC client.

Open the connection as usual with remmina. Then toggle on the fullscreen (use the right Ctrl key + F that can be written as Ctrl_R+F) or click on the simbol:



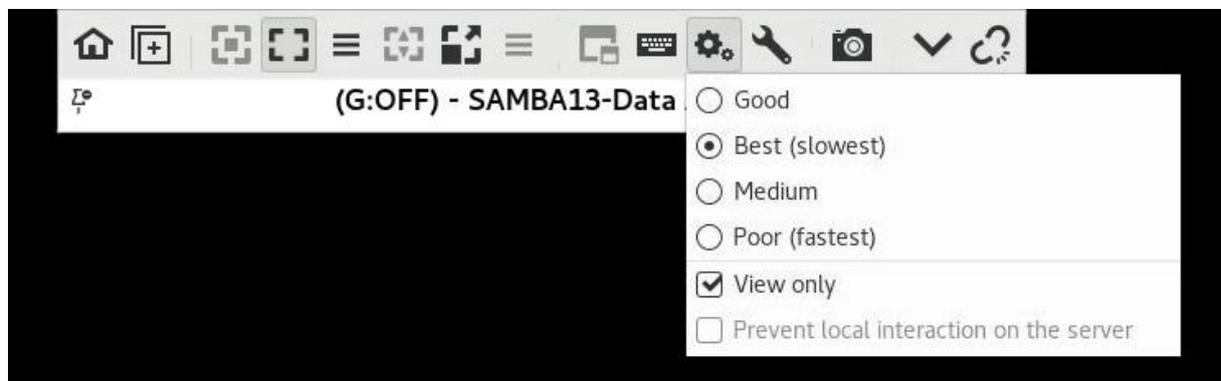
Then use the topbar that appears at top to activate the "Scrolled fullscreen"



At the bottom and eventually at your right will appear scrollbars that will let you move from one desktop to the other.

View only option

If you want to view a desktop without the fear of interfering with people operations, you can activate the "view Only" mode by opening the options menu as in the following picture:



Just tick the case "View only".

The "Best" to "Poor" options concern the image quality.

From a beamline: usage of a "Multi Service IGEL Terminal" to connect to NoMachine Service



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Every beamline may use a IGEL terminal to connect to the NoMachine service, why is it a good idea?

- you want to share the same desktop at the beamline and at home
- you want to support users like being close to them
- you want a session that remains open even when the terminal turns off or reboot

The terminal will be used as a NoMachine Client.

The login can be a personal one or (more appropriate for users) that of a project.

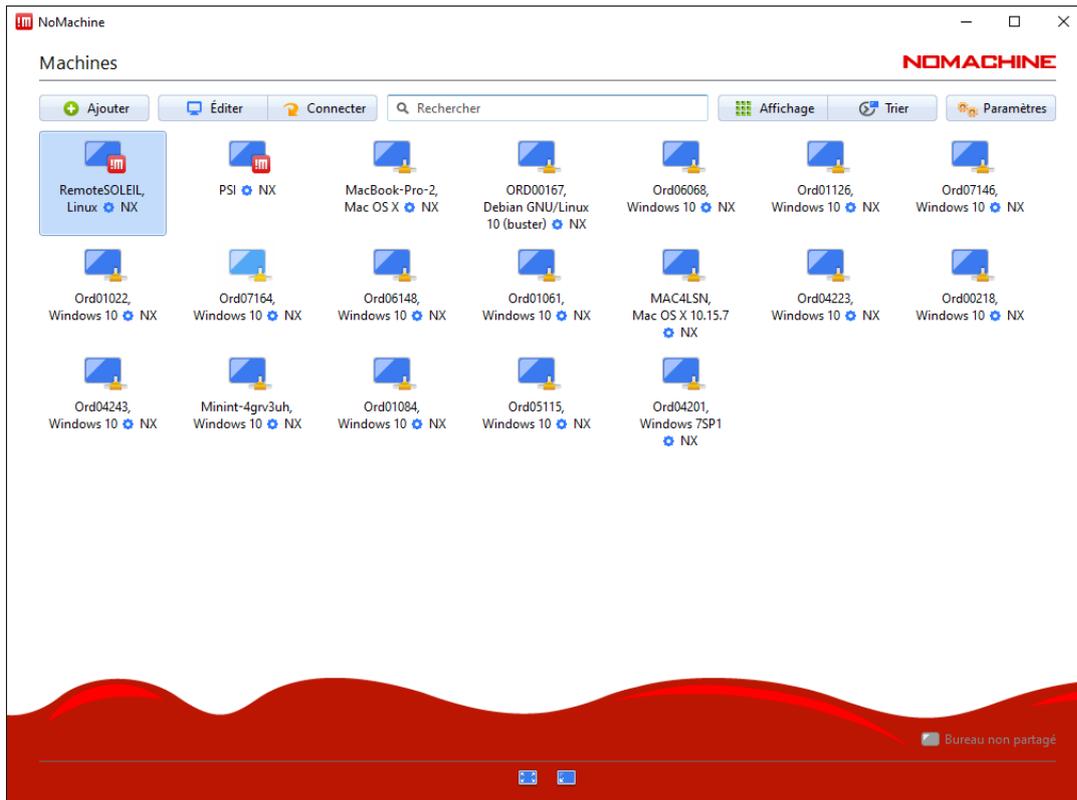
There are only a few special features when using an IGEL terminal:

- use Ctrl-ESC to reduce all sessions to icons (useful if you have several sessions open: XDMCP, NoMachine, Citrix)
- Use Ctrl-Alt-TAB to switch from one session to another
- The NoMachine options menu may be accessed as always via Ctrl-Alt-0 (← this is zero not O)

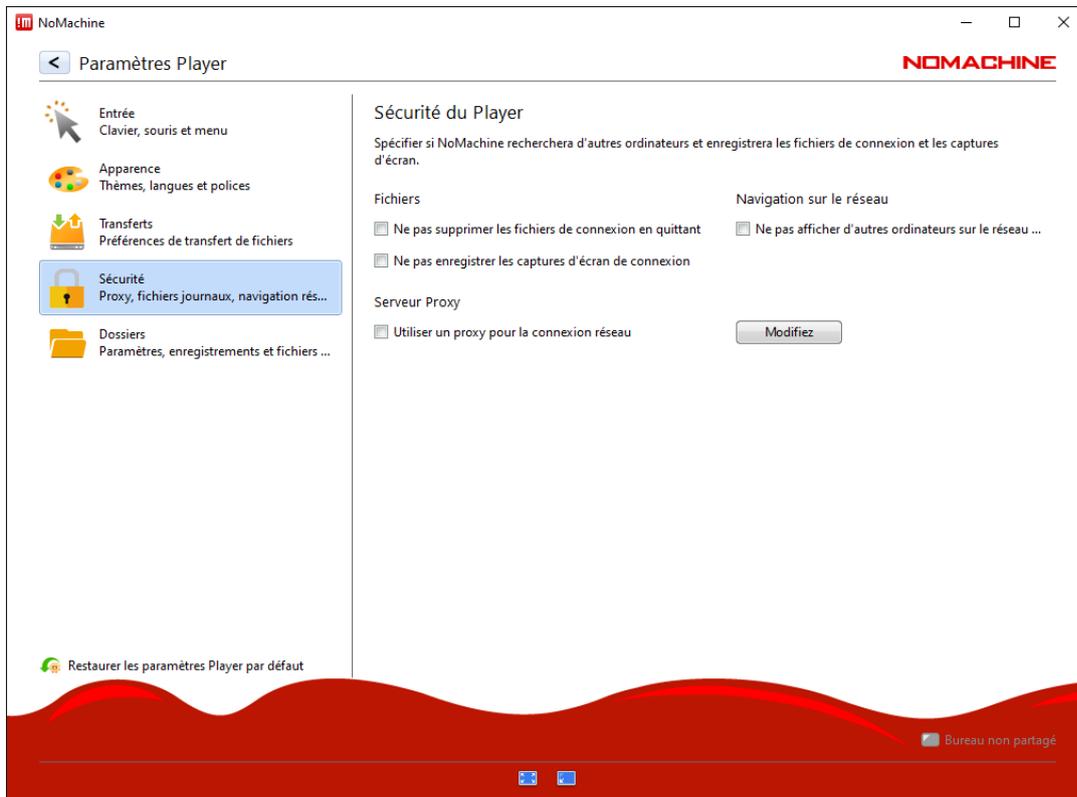
Too many computers appear when opening the NoMachine client

If you use a NoMachine client and you are annoyed by too many computers appearing from your network like in the following image, please follow these instructions to let only the bookmarks appear.

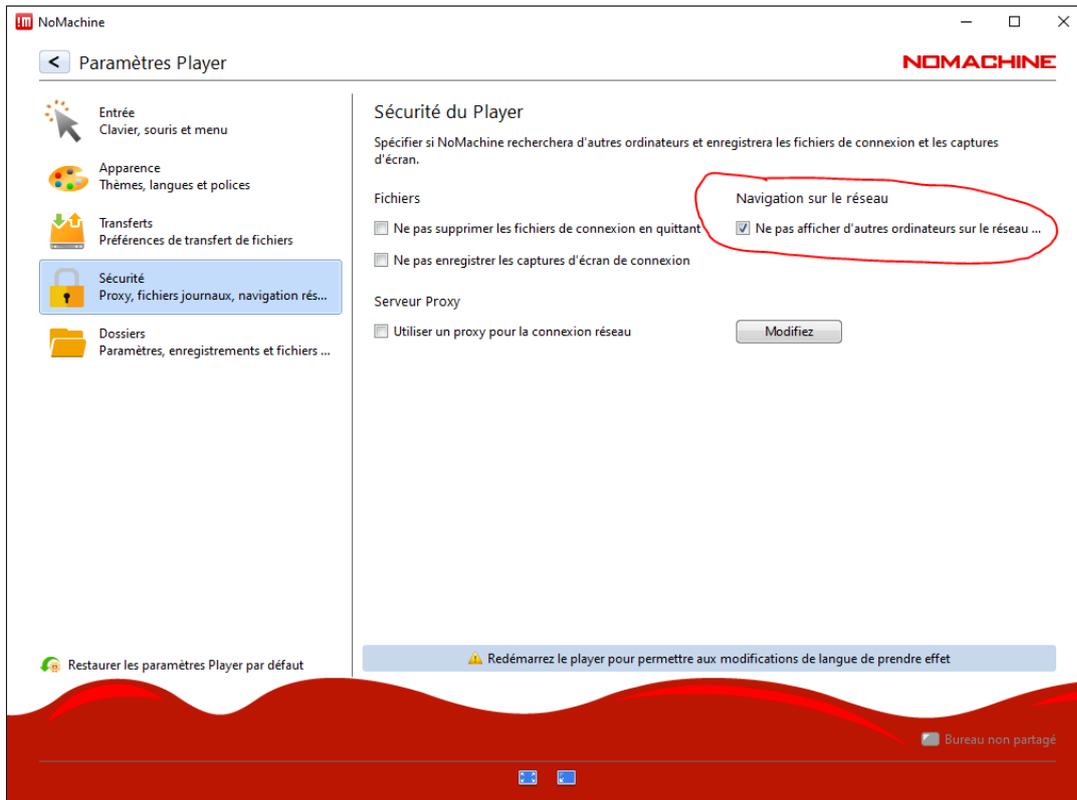
This will only happen to people with very large authorizations or in a network where a large number of "free" or personal Nomachine servers have been installed.



Go to Settings, then choose Security like in the following image:



Then check "Do not show other computers from the network":



Finally, you can go back to the main screen and realize that many fewer options are proposed:

