# Using Putty and ssh with Xming X11 Forwarding from Windows to display a remote GUI running in Linux

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Date last updated: 05-Feb-2024

Rich Montjoy, Angel Rivera
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+++ Objective +++

You are using a Windows PC and you want to see in your Windows display, a GUI program that is running in a remote Linux RHEL/CentOS server.

You can use Putty and/or ssh in Windows and enable X11 Forwarding.

The steps are:
- Step 1: Download and install Xming in Windows
- Step 2, Install Putty in Windows and enable X11 forwarding in Putty
- Step 3: Update the /etc/ssh/sshd_config file in Linux and restart ssh daemon
- Step 4: Install X11 GUI components in Linux, including xterm and/or xclock
- Step 5: In the Putty session, test the xclock GUI widget
- Step 6: Use ssh in Windows to test the xterm GUI widget

++ Related articles

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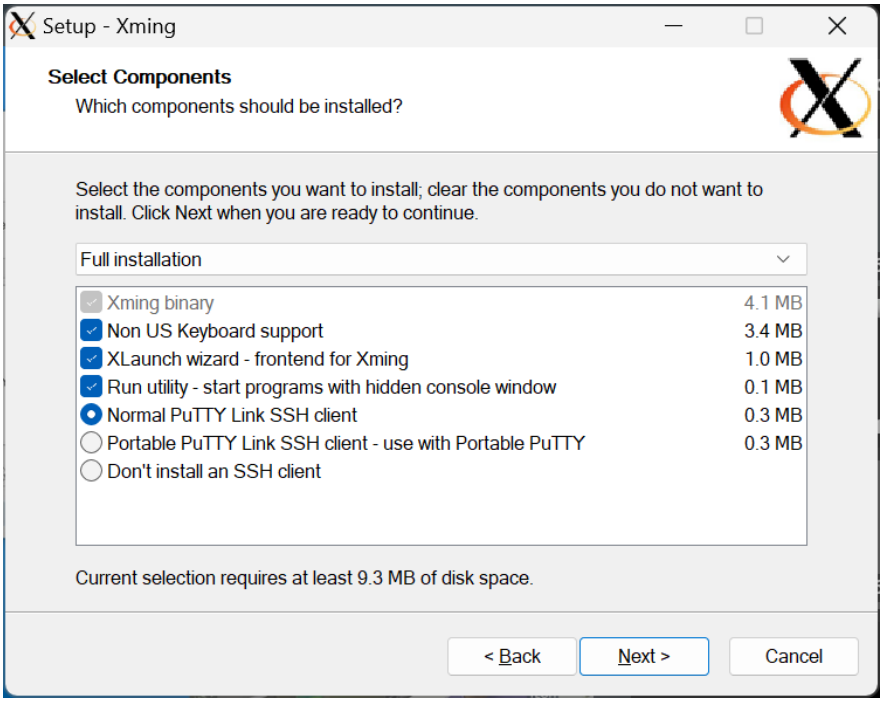
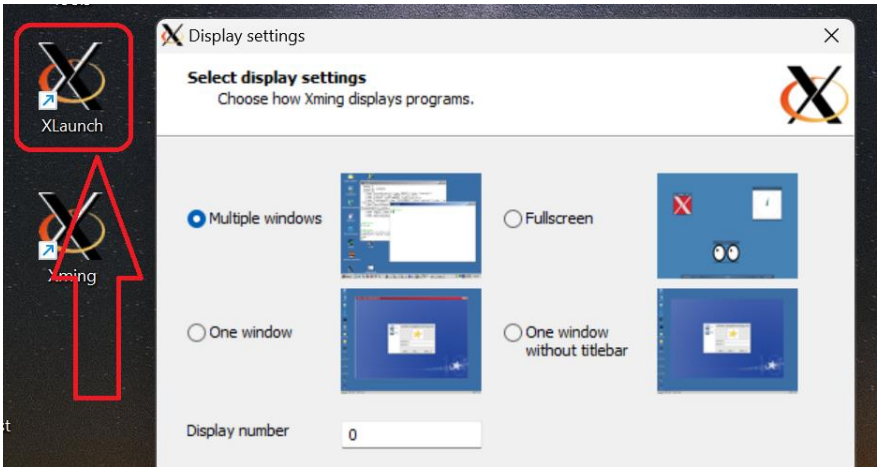
## +++ Step 1: Download and install Xming in Windows

Xming in Windows is an X11 forwarder, which allows to use Putty and ssh
https://sourceforge.net/projects/xming/
Xming X Server for Windows

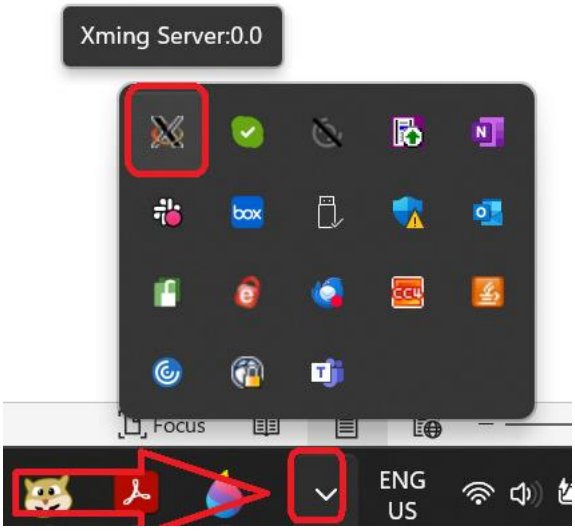
During the installation of "Xming-6-9-0-31-setup.exe" on 01-Feb-2024, these where the default components to install:




After the installation is complete, start:
XLaunch



Proceed to accept the defaults and finish.
Xming will be running in the background:



**+++ Step 2, Install Putty in Windows and enable X11 forwarding in Putty**

- Download and install Putty

http://www.putty.org/
Download PuTTY
PuTTY is an SSH and telnet client.

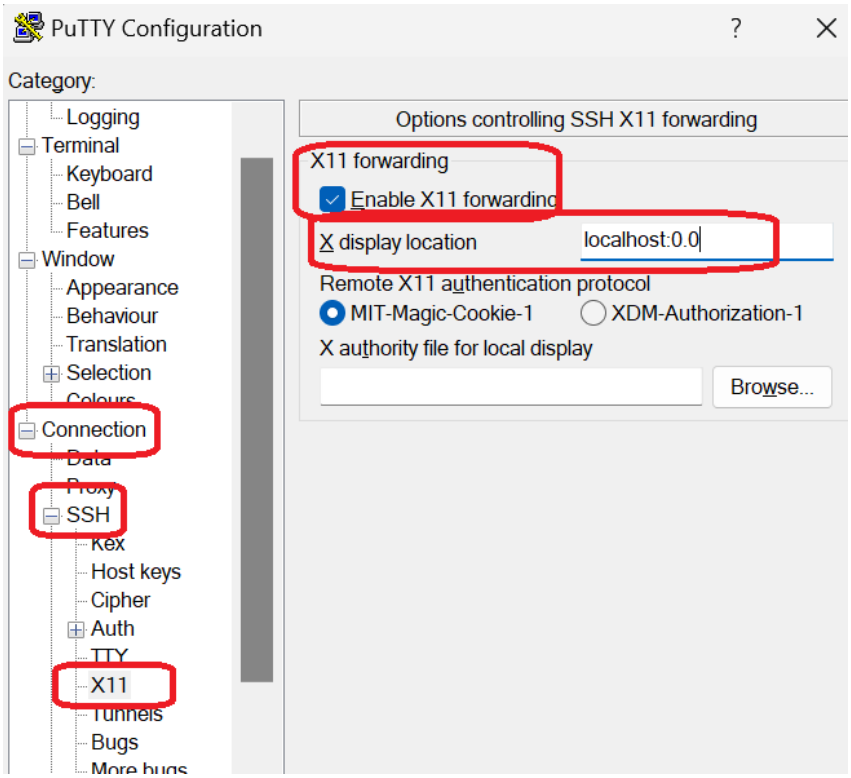
- Launch Putty and create a profile for the desired remote host.

- In the PuTTY Configuration dialog, go to:
  Connection > SSH > X11

Enable:
  X11 forwarding
  **(*) Enable X11 forwarding**

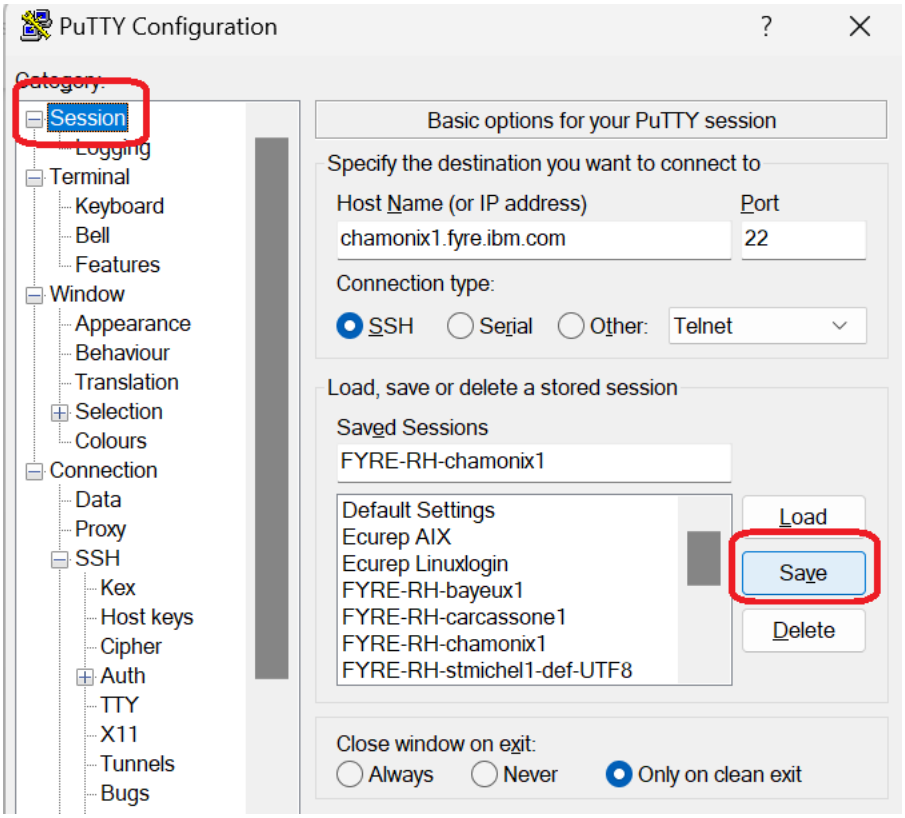
**And specify the "X display location"**
  **localhost:0.0**

Note: Putty will use this value for the environment variable DISPLAY, for example:
mqm@chamonix1.fyre.ibm.com: /home/mqm
$ echo $DISPLAY
localhost:11.0



Save the settings!!

From the Session screen, click:
Save



## +++ Step 3: Update the /etc/ssh/sshd_config file in Linux and restart the ssh daemon

**+ Modify file /etc/ssh/sshd_config**

As user:
root
… make some changes to the file:

```
vi /etc/ssh/sshd_config
```

Make sure that the following lines are set.

```
AllowTcpForwarding yes
AddressFamily inet
X11Forwarding yes
X11UseLocalhost yes
```

**+ Re-start the ssh daemon in Linux**

As user:
root
… re-start the ssh daemon.

```
systemctl restart sshd.service
```

## +++ Step 4: Install X11 GUI components in Linux, including xterm and/or xclock

### + X11 base code

As user:
  root
… install some additional packages on Linux using this command.

```
dnf groupinstall "Server with GUI"
```

This command installs a bunch of stuff, so it can take a while to complete.
This has to be done on the Linux server, otherwise you get a "can't open display" error message.

### + xterm widget (for a Terminal GUI)

Login as root:

```
# yum install xterm
```

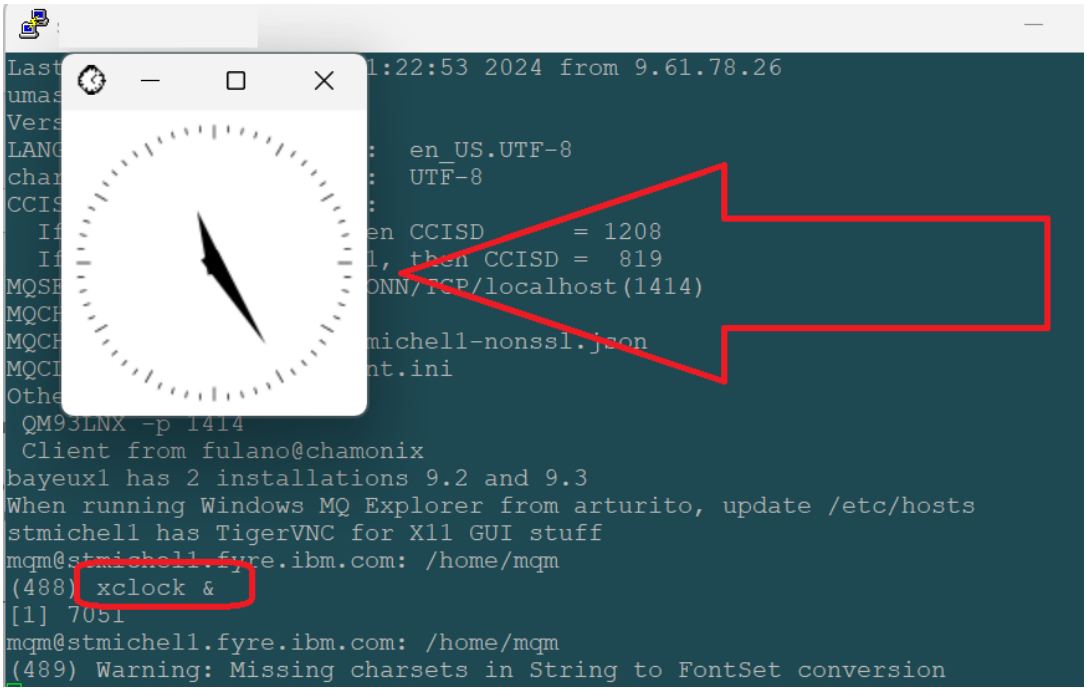
After the installation, you can confirm if xterm is installed:

```
# which xterm
/usr/bin/xterm
```

### + xclock widget (very small X11 widget, faster to display)

The utility "xclock" is not used by the MQ Explorer, BUT one extremely common problem when using VNC and X11 applications is due to the incorrect use of the DISPLAY environment variable.

The utility "xclock" is very fast (less than 5 seconds to run) and you can quickly confirm if the DISPLAY variable is setup correctly or not.
For example, if you run:
  xclock &
… and if within 10 seconds you see the xclock widget, then you are set to go!




But if you do not see the widget within 30 seconds, then the DISPLAY variable was not set properly and you can kill the xclock process that is running in the background.

In contrast, the MQ Explorer GUI make take 1 or 2 minutes to load and run, and thus, it is very frustrating that if the DISPLAY variable is not the correct one, then you may wait around 3 to 5 minutes without seeing the GUI.

Thus, the use of "xclock" can quickly accelerate your configuration of the DISPLAY variable.

https://access.redhat.com/solutions/3887371
Which package provides `xclock` and `xeyes` applications in RHEL8 and RHEL9?
SOLUTION VERIFIED - Updated March 8 2022 at 1:19 PM - English
Issue
How to install the xclock in Red Hat Enterprise Linux 8?
Unable to find xclock or xeyes applications in RHEL8 and RHEL9.
Resolution
The xclock or xeyes applications are provided by xorg-x11-apps package.
The xorg-x11-apps package has been provided in the CodeReady Linux Builder Repository(CRB) for RHEL8.
Steps to install the package in RHEL8

Step 1: Enable the CRB repository on the system:
# **subscription-manager repos --enable=codeready-builder-for-rhel-8-x86_64-rpms**
.
Step 2: To install the package:
# **yum install xorg-x11-apps**

## +++ Step 5: In the Putty session, test the xclock GUI widget

++ CAVEAT

The Putty session will setup the environment variable DISPLAY automatically FOR THE USER of the initial login to be used in the remote host.
However, if AFTER the 1st login, you do "su - userid" for a 2nd login, then that 2nd login will NOT have the proper value of the DISPLAY and the xclock or xterm tools will NOT work!!

+ Test the display of the graphical widget "xclock" within the VNC client.

The xclock GUI widget is great to confirm the settings for the X Windows System and the overall access via the VNC Client and the VNC Server.

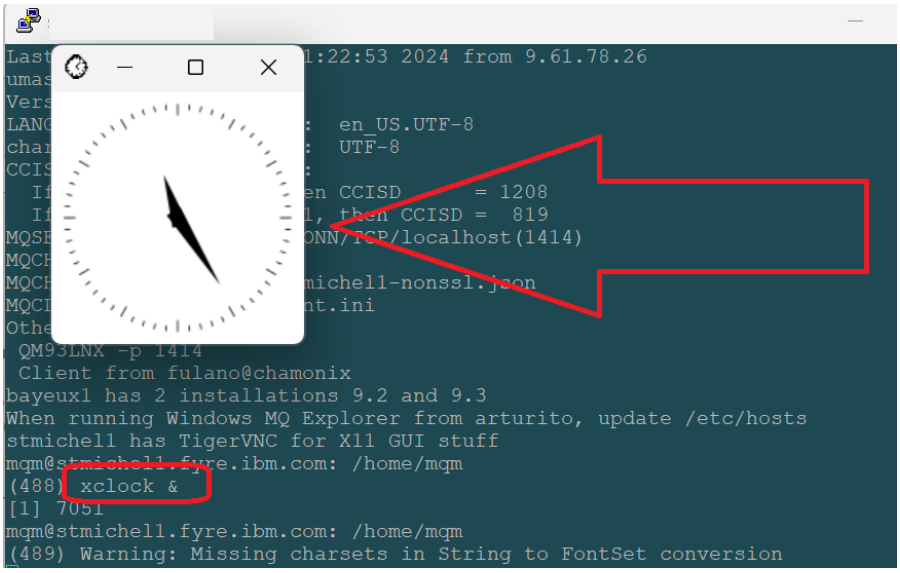
This test is EXTREMELY IMPORTANT!!

From the Terminal, login as an MQ user, such as "mqm:

Notes about DISPLAY:
- Putty is going to setup the DISPLAY environment variable in the Linux box!
The value will be:
  localhost:11.0
- Do not define DISPLAY in your .bashrc

Then issue the following and ensure to include the & (Ampersand) to send the widget to run in the background, in that way you can keep working on your session.
   **xclock &**

This showed a widget with a clock.



It is OK to ignore warnings about fonts, such as:
Warning: Missing charsets in String to FontSet conversion

The important thing is to see the clock!

Click on the X on the upper right corner of the xclock widget to close it.

This test is EXTREMELY IMPORTANT!!

Why? Because if you do NOT see the clock, then something is not right!
For example, the Xming, or X11 setup, the connection, the x-settings, etc have problems and you will waste a lot of time and energy if you skip the test for xclock and try to use the MQ Explorer GUI because if it does not show, then you just compounded enormously the diagnostic tasks!
Thus, by doing the test of xclock NOW (before using the MQ Explorer)
your diagnostic/troubleshooting tasks are greatly reduced!

If you do not see the xclock widget, then when you run "strmqcfg" to start the MQ Explorer, then you will not see the GUI for the MQ Explorer and you will wonder what went wrong.
.
One very common reason for not seeing the MQ Explorer GUI is that the X-Windows (X11) configuration is incorrect/incomplete.

Note: X-Windows (X11) is a GUI system that runs native in Unix boxes. It is NOT related to Microsoft Windows.

## +++ Step 6: Use ssh in Windows to test the xterm GUI widget

1. At a Windows command prompt set the Display variable:
   set DISPLAY=localhost:0.0

Note: If you do not set this variable on the Windows side you will get an error message 'can't open DISPLAY'

2. Connect via ssh.

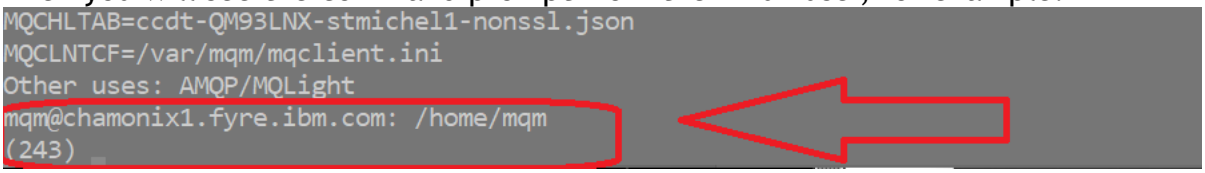
For example, login as user "mqm" in the remote host (need to replace "hostname" with the proper host name).
   ssh mqm@hostname.fyre.ibm.com -Y -vvv

The -Y says use trusted forwarding
The -vvv does verbose logging.

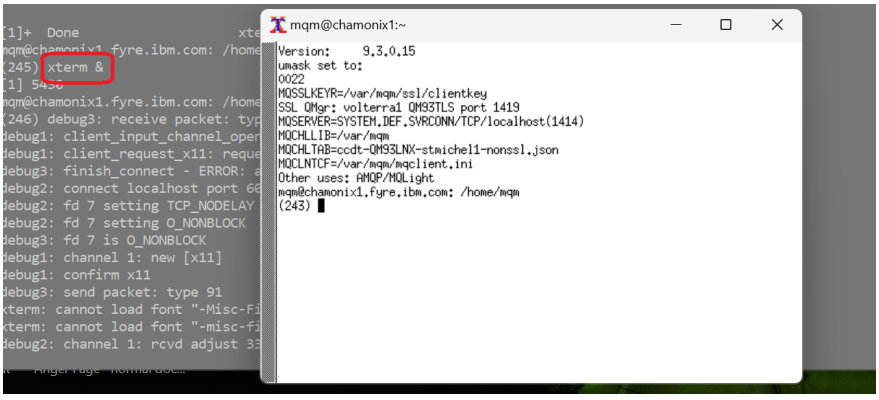
If this is the first time using ssh with that remote host, then you will be asked if you want to remember the fingerprint.

You will be asked for the password of the remote user.

Then you will see the command prompt from the Linux user, for example:




Enter:
   xterm &




You need to wait several seconds, and hopefully you will see the "xterm" widget displayed in your local Windows PC.

+++ end +++