



# Accessing Remote Linux Server Graphical Applications from Your Desktop

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## OVERVIEW

Many administrators install full graphical desktops on their servers to allow for administration and installation of third-party applications. However, this results in the installation of many services that are not needed for their servers, causing potential performance loss.

This tech brief describes how to install a minimal server environment while still allowing for the use of graphical applications through a client securely connected to your server over the network via SSH.

## SETTING UP RED HAT ENTERPRISE LINUX SERVERS

A minimal install of Red Hat Enterprise Linux server will still allow you to export and use graphical applications. However, before you start your server, will need certain packages installed to make X11 forwarding possible. You can add these as part of your kickstart configuration file or install them using **yum**.

For Red Hat Enterprise Linux 5 and Red Hat Enterprise Linux 6, ensure your server has the following packages:

- `xorg-x11-xauth`
- `xorg-x11-fonts-*`
- `xorg-x11-utils`

After you install these packages, no extra services will be running on your system. You will also not have a graphical environment to use locally on the system. These packages give you the ability to export graphics over SSH to your client machine.

This list has been compiled to best work with most applications. The `xorg-x11-utils` package is optional, although many third-party installers will not run properly if they do not see some of the applications provided by this package. Also, `xorg-x11-fonts-*` is optional if the X server running on the client has all the desired fonts needed for the application to be used. However, it is recommended to install them on the server to ensure applications work properly on all clients.

The next step is to check the configuration of the SSH service running on the server. By default, the SSH server on Red Hat Enterprise Linux 5 and Red Hat Enterprise Linux 6 has variable X11 forwarding enabled in file `/etc/ssh/sshd_config` through variable **X11Forwarding yes**. Ensure that this has not been changed. If it has changed, set the variable to **yes** and restart the **sshd**. To do that, type:

```
# service sshd restart
```



## SETTING UP THE CLIENT MACHINE

The client machine is your desktop or laptop running Red Hat Enterprise Linux Workstation or Desktop, Microsoft Windows, or Apple OS X. This machine is where you will see and interact with the graphical application running on your server.

### SSH Client and X11 Server on Red Hat Enterprise Linux Workstation or Desktop

If you are running a Red Hat Enterprise Linux Workstation or Desktop, there is no extra configuration required. You are already running an X11 server, and you should have the SSH client already installed.

### SSH Client and X11 Server on Microsoft Windows

If you are running Microsoft Windows, you will need to install both an SSH client and an X11 server.

#### SSH Client

A free and commonly used SSH client for Windows is a program called PuTTY. PuTTY can be downloaded and installed from the following site: <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>.

Once on the site, browse to middle of the page for the Windows installer and install the following file:

#### For Windows on Intel x86

PuTTY:	<a href="#">putty.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
PuTTYtel:	<a href="#">puttytel.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
PSCP:	<a href="#">pscp.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
PSFTP:	<a href="#">psftp.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
Plink:	<a href="#">plink.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
Pageant:	<a href="#">pageant.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
PuTTYgen:	<a href="#">puttygen.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)

#### A .ZIP file containing all the binaries (except PuTTYtel), and also the help files

Zip file:	<a href="#">putty.zip</a>	(or by FTP)	(RSA sig)	(DSA sig)
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#### A Windows installer for everything except PuTTYtel

Installer:	<a href="#">putty-0.62-installer.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
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#### Checksums for all the above files

MD5:	<a href="#">md5sums</a>	(or by FTP)	(RSA sig)	(DSA sig)
SHA-1:	<a href="#">sha1sums</a>	(or by FTP)	(RSA sig)	(DSA sig)
SHA-256:	<a href="#">sha256sums</a>	(or by FTP)	(RSA sig)	(DSA sig)
SHA-512:	<a href="#">sha512sums</a>	(or by FTP)	(RSA sig)	(DSA sig)

*The latest development snapshot.* This will be built every day, automatically, from the current development code - in *whatever* state it's currently in. If you need a fix for a particularly crippling bug, you may well be able to find a fixed PuTTY here well before the fix makes it into the release version above. On the other hand, these snapshots might sometimes be unstable.

#### X11 Server

A free X11 server commonly used for Windows is program called Xming. Xming can be downloaded and installed from the following site: <http://www.straightrunning.com/XmingNotes/>.



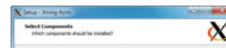
Once on the site, browse to the middle of the page and click the link under the **Public Domain Releases** section:

## Releases

Links and release status						
Website Releases	Version	State/Notes	Released	MD5 signatures	Size MB	
Xming	7.5.0.55	Website Release	18 Aug 2012	MD5 signatures	4.19	
Xming-portablePuTTY	7.5.0.55	Website Release	18 Aug 2012	MD5 signatures	1.65	
See Donations for how to obtain a Donor Password.						
Public Domain Releases	Version	State/Notes	Released	MD5 signature	Size MB	
Xming-fonts	7.5.0.47	Public Domain	15 Apr 2012	c4cea5aa3620c64680306fc83cece960	30.8	
Xming	6.9.0.31	Public Domain	4 May 2007	4cd12b9bec0ae19b95584650bba534a	2.10	
Xming-mesa	6.9.0.31	Public Domain	4 May 2007	e580debbf6110cfc4d8fc20beb541c1	2.50	
Website Snapshots	Version	State/Notes	Snapshot	MD5 signature	Size MB	
Snapshot Xming	7.5.0.56	Work in progress	18 Aug 2012 13:25	Not yet released	4.18	
See Donations for how to obtain a Donor Password.						

## Windows installers

Xming installers make it child's play to quickly install project components, interactively, with a few mouse clicks. They will also `install/uninstall`, silently, using command line parameters.



## SSH Client and X11 Server on Apple OS X

Apple OS X Lion (v10.7) comes with both a X11 server and an SSH client, so no extra configuration is required.

Apple OSX Mountain Lion (v10.8) no longer includes an X11 server. You will need to download XQuartz and install it from the link provided in the Apple Knowledge Base article located at <http://support.apple.com/kb/HT5293>.

## CONNECT CLIENT TO SERVER

### Connect Red Hat Enterprise Linux Workstation or Desktop

To use a Red Hat Enterprise Linux Workstation or Desktop to connect to your server, open a terminal and launch the `ssh` command with the `-X` option:

```
$ ssh -X <user>@<server address>
```

For example:

```
$ ssh -X root@example.redhat.com
```

### Connect Microsoft Windows

To connect to the server using Microsoft Windows, you must first start the X11 server and then connect the SSH client. The following procedure describes how to use the Xming X11 server in conjunction with the

PuTTY SSH client. If you use a different combination, refer to your documentation.

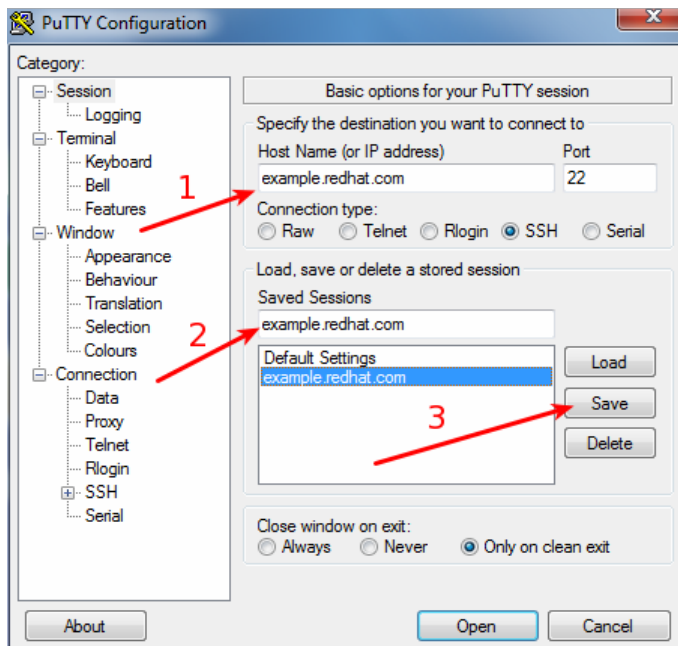
Begin by launching the X11 server. To launch Xming, navigate to **Start Menu -> All Programs -> Xming -> Xming**.

This will start the Xming X11 server. A small X icon will be shown in the task tray normally located on the lower left-hand side of the tool bar:

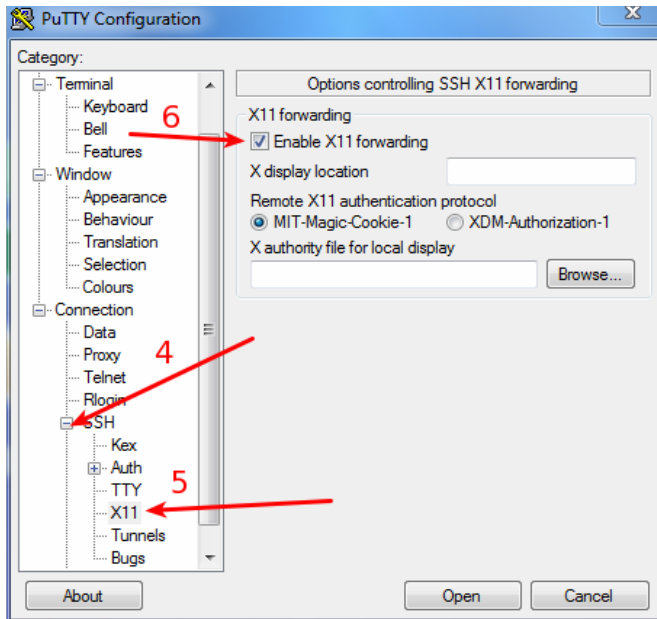


Next, properly connect the SSH client to the server. With PuTTY, you will need to set up a profile for your server and enable X11 forwarding.

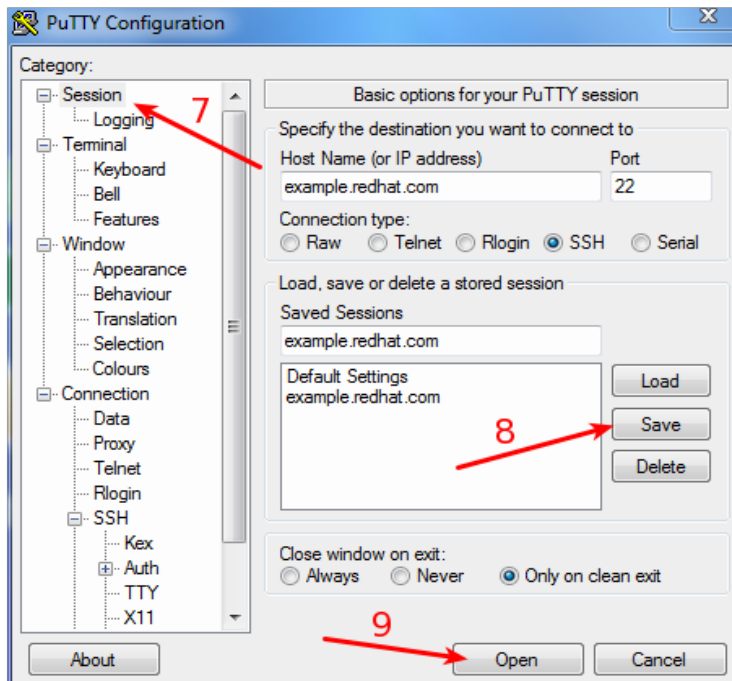
1. Create a profile for the server you will connect to.



2. Enable X11 forwarding for your new profile.



3. Save the changes to the new profile and connect to the server.



## Connect Apple OS X

On Apple OS X Lion (v10.7), open Finder and go to into the **Applications** -> **Utilities** folder. Double-click on the icon labeled **X11**. This will open a terminal window.

On Apple OSX Mountain Lion (v10.8), open Finder and go to into the **Applications** -> **Utilities** folder. Double-click on the icon labeled **XQuartz**. This will open a terminal window.

In the terminal window, use the **ssh** command with the **-X** option to connect to the server:

```
$ ssh -X <user>@<server address>
```

For example:

```
$ ssh -X root@example.redhat.com
```

## TEST X11 FORWARDING OVER SSH CONNECTION

Once the client is connected to the server, you can test the connection by running a graphical application from your SSH session. You should then see the graphical application appear on the desktop of your client.

One example application you can use to test is **xclock**. To install **xclock** on your server, run the following commands:

```
# yum install xorg-x11-apps
# xclock
```

If X11 forwarding is working, the **xclock** window you launch from the remote server will open on your local desktop. You can also test X11 forwarding using the command **xeyes**.

## FORWARDING X11 GRAPHICS AFTER RUNNING SU COMMAND

Some third-party applications require that you **su** into a system user to run the graphical installer. When you **su** into this user, this user does not immediately have the ability to forward graphics to your display. This means that when you launch the graphical application once you **su** into this user, it will fail.

To enable the **su** user to be able to forward graphics through your current SSH session to your client, perform the following steps each time you **su** into a user in a new SSH session:

1. Get an **xauth** key for the user by running the **xauth** command:

```
# xauth list ${DISPLAY#localhost}
```

For example:

```
[root@vm1 ~]# xauth list ${DISPLAY#localhost}
vm1/unix:10 MIT-MAGIC-COOKIE-1 ff32b870070d3b58998a4ebcbc4abf20
```

The **xauth** key to be used by the user is the entire line that is output by running the command above.

2. Next, **su** into the desired user.
3. Add **xauth** key to the user's **xauth** using the **xauth add <KEY>** command. For example:

```
[root@vm1 ~]# su - oracle
```

```
$ xauth add vm1/unix:10 MIT-MAGIC-COOKIE-1 ff32b870070d3b58998a4ebcbc4abf20
```

The user can now run X11 graphical commands and the graphics will appear on the client desktop.