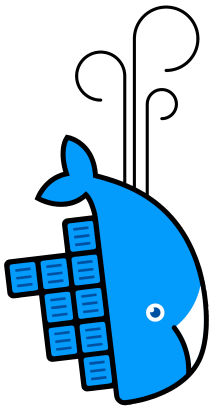

Remote Desktops

Methods of Acheiving A Graphical Remote Desktop

January 22, 2026

> "What we want is to see the child in pursiuit of knowledge, and not knowledge in pursuit of the child"
>
> George Bernard Shaw

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Note

This document is evolving, and you can add to it:
https://github.com/SeptembersEND/transcripts_from_the_ether

1 What this is

This is a brief overview of multiple methods to get a remote desktop on a headless server. There are multiple variables to pay attention to: the protocol or the method of getting graphics; and how the client connects (most notable being clientless[1]).

1.1 Software

This is some of the remote desktop software, from servers to clients, that exists.

Software	***Protocol***	***Type***	***Platform***
—	—	—	—
Remote Desktop	RDP	Client	Windows
FreeRDP	RDP	Client	Windows
Xrdp	RDP	Server	Xorg
—	—	—	—
RealVNC	VNC	Client	Mobile
RealVNC	VNC	Client/Server	Win/Xorg/MacOS
TigerVNC	VNC	Client	Mac
TigerVNC	VNC	Client/Server	Win/Xorg
TigntVNC	VNC	Client/Server	Win
TurboVNC	VNC	Client	Win/Xorg/Mac
TurboVNC[2]	VNC	Client/Server	Xorg
x11vnc[3]	VNC		
X2vnc	VNC	˜Server	Xorg
wayvnc	VNC	Server	Wayland

For multiple protocol software:

Software	Protocols	Type	Platform
—	—	—	—
Virt-Viewer	SPICE,VNC	Client	Xorg
Remmina	RDP,SPICE,VNC	Client	Xorg

[1] Clientless remote desktop software allows the client to connect to a server without a deticated client. Most notably this is done by creating a webserver. A very popular example is Apache Guacamole.

[2] You can find *OS Support* here, https://turbovnc.org/Documentation/OSSupport, and *Window Manager* compatibility information here, https://turbovnc.org/Documentation/Compatibility32.

[3] Currently unmaintained as of writing, https://github.com/LibVNC/x11vnc/issues/186.

1.2 Lore

I first needed to fall down this rabbit hole, when I wanted to create a graphical dockers image for testing. Then enventually need to create one for a local server.[4]

So this has become my personal repository of information on this matter.

2 RDP

RDP is a popular remote desktop protocol, developed by Microsoft. There are now open-source versions of this protocol, for example FreeRDP (a fork of rdesktop).

RDP uses a client to connect to a RDP server. So you will need both a client and a server to get this working, unless you choose to use clientless.

There are many differences between RDP and VNC, but it boils down to RDP being more advanced, for example: compression takes advantage of font knowledge and tracking of window states, audio redirection, file system redirection, and more.

For a list of features:
`https://en.wikipedia.org/wiki/Remote_Desktop_Protocol#Features`

2.1 Clients

2.1.1 Remote Desktop

This viewer is installed by default on Windows Pro, and is a Windows exclusive. It does make it easy for those who have access, to connect to RDP servers on other servers.

To use it all you need to do is to search for *Remote Desktop Connection* and type in the ip address, or hostname, and press connect. You can also access by using *Win+R* and typing *"mstsc"*.

2.2 Servers

2.2.1 Xrdp

"***Xrdp*** is a daemon that supports Microsoft's Remote Desktop Protocol (RDP)."[5] *Xrdp* can use two forwarding modes: *Xvnc*, uses a VNC server; or *xorgxrdp/X11rdp*, which communicates directly with the X server.

To install do the following:

[4] You can put systemd in a docker container, like shown here `https://spectrelabs.io/research/systemd-systemctl-inside-docker`. It seems to be much more difficult to add systemctl chroot.

[5] You can find more information on Xrdp from there site, `https://www.xrdp.org/`, or from other

```
# On debian, package:
# <https://pkgs.org/download/xrdp>
apt-get install xrdp

# RPM, package:
# <https://pkgs.org/download/xrdp>
yum install xrdp
dnf install xrdp

# Archlinux, install xorgxrdp to use that forwarding mode.
# Wiki: <https://wiki.archlinux.org/title/Xrdp>
pacman -S xrdp xorgxrdp

# OpenSUSE, guide:
#<https://support.scc.suse.com/s/kb/Configuring-xrdp-for-FIPS-compliance>
zypper install xrdp
```

In chroot/docker

You can also run this in a docker image. To do this you will either have to get systemd to work within the environment, or start it yourself. We will focus on the second one.

To start an xrdp server manually, you will need to run the following command. You could also use the *init.d* directory, to start it like a service, if it is present:

```
# Use command directly, in bash
xrdp-sesman && xrdp
## You can stop it like this
pkill xrdp
pkill xrdp-sesman

# Start service manually
/etc/ini.d/xrdp start
/etc/ini.d/xrdp stop
```

Connect to existing Xorg session

By default xrdp creates a new Xorg session when the server is started. This may not be what you would want. One way to connect to an existing X session is by using the x11vnc backend. This does require, however, the use of X11vnc.

You can use x11vnc directly with the following command:

```
x11vnc -nocdamage -display :0 -safer -once
```

You will also need to change xrdp's configuration file, in */etc/xrdp/xrdp.ini*, to something like the following:

```
# https://github.com/neutrinolabs/xrdp/issues/960
[xrdp1]
```

```
name=X11vnc
lib=libvnc.so
ip=127.0.0.1
port=5900
username=ask
password=ask
```

And also add the following to the sesmon config, in */etc/xrdp/*:

```
# https://github.com/neutrinolabs/xrdp/issues/960
[X11vnc]
param=x11vnc
param=-noxdamage
param=-display
parasm=:0
param=-safer
param=-once
```

If you want you can also set x11vnc in systemd unit file on boot:
https://gist.github.com/lightrush/e6c3310fd0795b03f19daa40abf674e1

3 VNC

VNC is a very simple desktop-sharing system that uses the Remote Frame Buffer (RFB) protocol.

VNC can use a lot of bandwidth, due to its simple design, and as such various methods have been devised to reduce the overhead. Tightvnc provided a comparison on their site:
https://www.tightvnc.com/archive/compare.html

3.1 Servers

3.1.1 x11vnc

To install x11vnc you can do it automatically (especially if you want some more advanced features), or manually.

The normal installation of x11vnc is increadibly easy, just download using your package manager:

```
# Debian package:
#   <https://pkgs.org/download/x11vnc>
apt-get install x11vnc

# RPM package:
#   <https://pkgs.org/download/x11vnc>
yum install x11vnc
dnf install x11vnc
```

You can also use domomg's x11vnc-setup script. It is also good to read to learn the commands for different distros for setup.

- https://github.com/LibVNC/x11vnc
- https://en.wikipedia.org/wiki/X11vnc
- https://libvnc.github.io/

4 Clientless

There are a couple of way to use clientless vnc. Here is a list:

Software	***Description***	***Protocols***
noVNC	open-source VNC browser client	VNC
Apache Guacamole	clientless remote desktop gateway	VNC,RDP,SSH

4.1 noVNC

noVNC is a cool open-source clientless VNC "client library and application". There are many projects and companies that use this in their products and projects.

To install and use *noVNC* there are a couple paths to take. You could 1) use the snap image, 2) install via npm (*npm install @novnc/novnc*) or 3) download and run manually, which can be done as follows:

```
# Download repository
git clone https://github.com/novnc/noVNC
cd noVNC

# Run script
#   vnc address: mostlikely 'localhost'
#   listen address: (127.0.0.1) for local. (0.0.0.0) for any.
./utils/novnc_proxy --vnc <vnc address>:<port> --listen <listen
    address>:<port>
```

It does require of course that you have another vnc server running, so take your pick.

References

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There are aproxamently 1586 words in this document.