Modern Remote Desktop on Linux

Andrew Denner

Central Iowa Linux Users Group

March 2024

About me

- By Day, a Senior Scientific Software Developer
- By night, a linux user, and the president of the lug
- Social connectors:
  - Twitter/x: @adenner
  - Web: http://denner.co

The old ways—XRDP or VNC

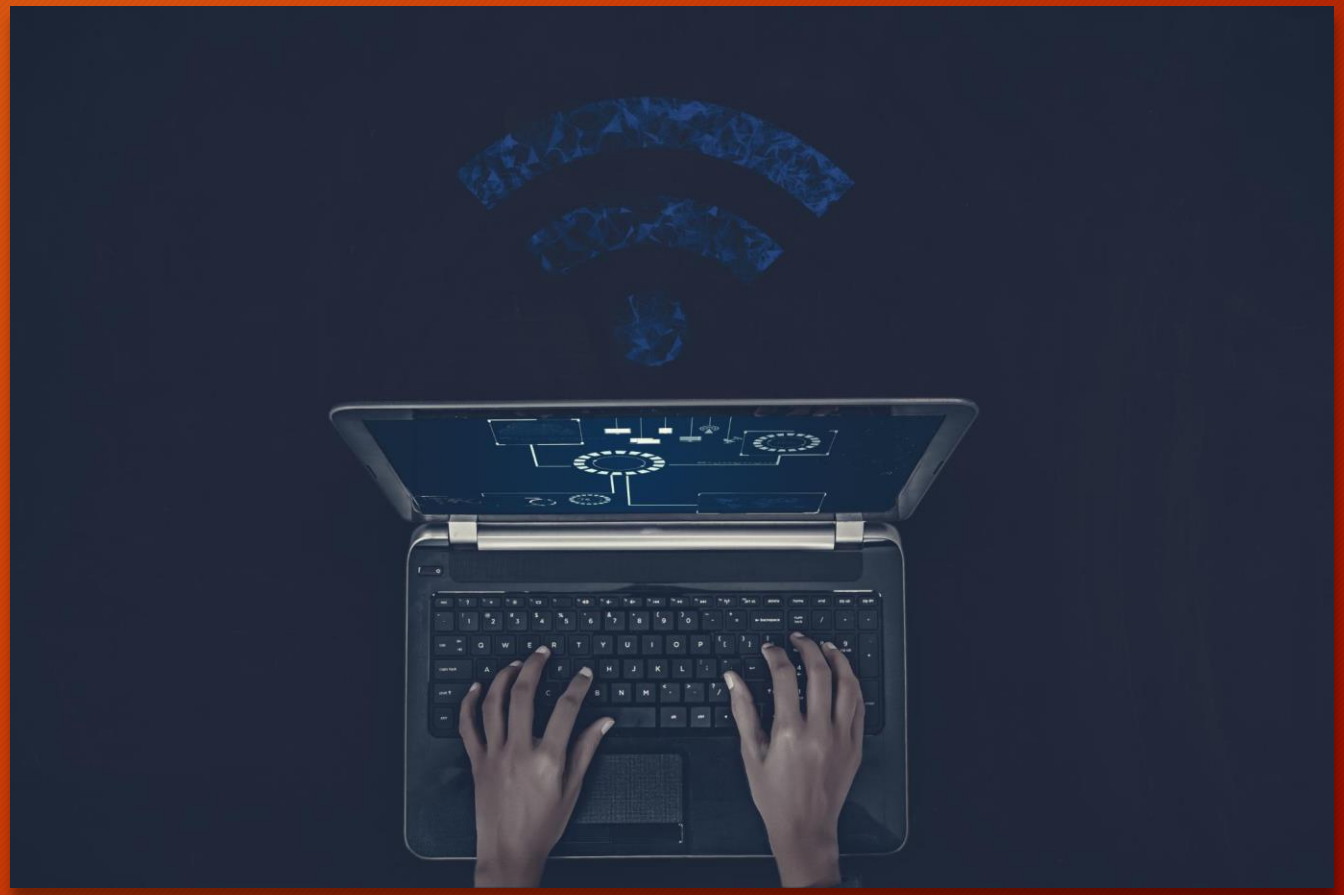
- VNC
- XRDP
- X over ssh

The History of VNC and How it Works

- VNC stands for Virtual Network Computing and was developed at the Olivetti Research Laboratory in Cambridge, England in the late 1990s.
- VNC allows a user to remotely control a computer over a network connection.
- The VNC server software runs on the computer that will be controlled, while the VNC viewer software is used to control that computer from another device.
- When a viewer connects to a VNC server, the server sends a copy of the screen to the viewer. Any input from the viewer is sent back to the server and executed on the server's machine.
- VNC operates on a client-server model, which means that a VNC server listens for incoming connections from VNC clients.
- There are many VNC server implementations available, including the open source RealVNC and TightVNC.

Drawbacks of VNC

- Inefficient as each command has to be sent individually which consumes a lot of bandwidth
- Security is a concern as VNC is vulnerable to attacks
- No audio support
- No file transfer support

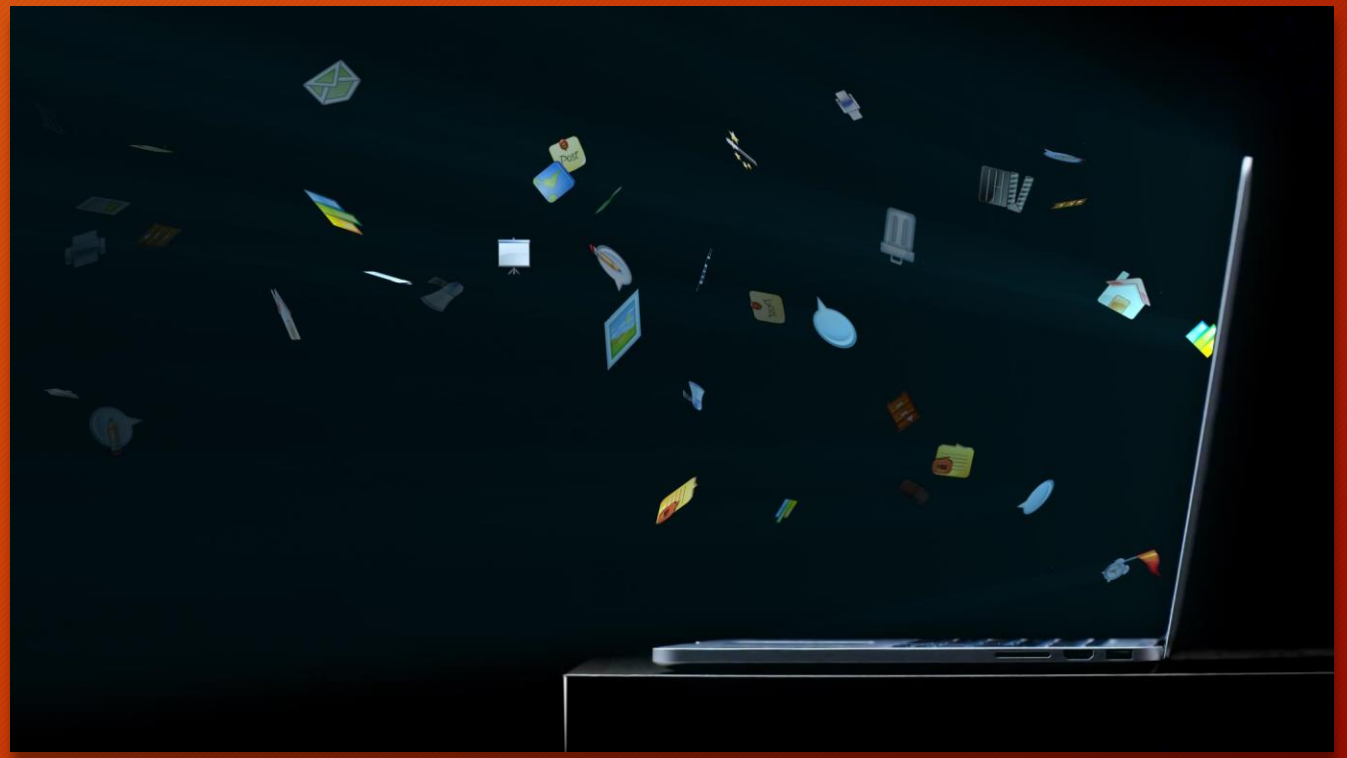


RDP—The “windows Solution”

- Based off of and extends ITU-T T.128 application sharing protocol
- Semantic protocol aware of controls fonts and other graphical primitives
- Better in low bandwidth situation

XRDP - An Alternative to VNC

- XRDP stands for X Remote Desktop Protocol
- XRDP is an open-source implementation of the Microsoft Remote Desktop Protocol (RDP)
- XRDP allows users to access a remote desktop environment running on a Linux system
- XRDP provides a graphical login to remote machines using Microsoft Remote Desktop Protocol (RDP)
- XRDP is preferred over VNC for its better security and performance

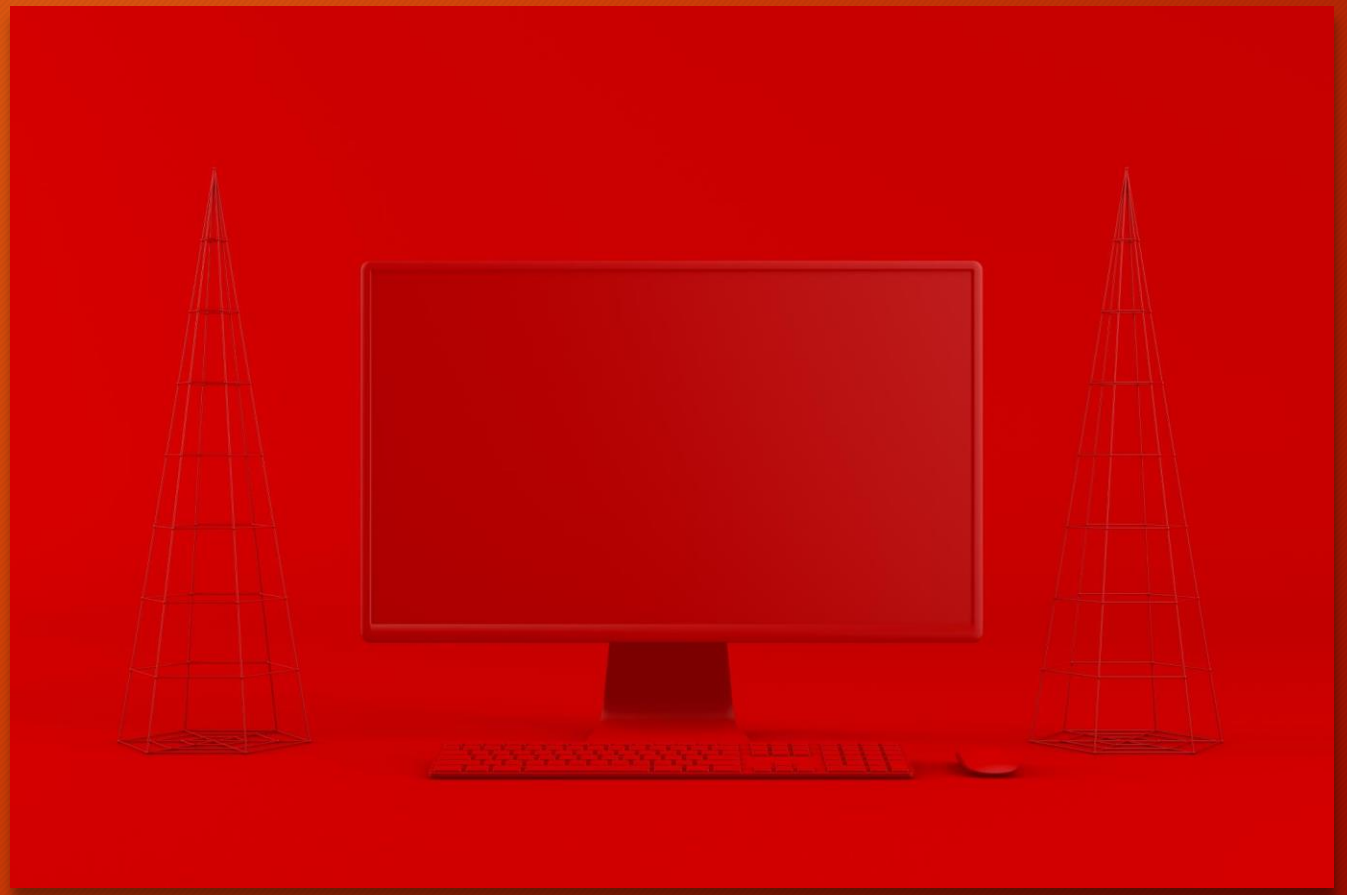


How RDP Protocol Works

- RDP stands for Remote Desktop Protocol
- Allows a user to remotely control a computer over a network connection
- RDP operates on a client-server model
- RDP encodes the desktop of the remote computer and sends it to the client
- Any input from the client is sent back to the server and executed on the remote system
- Audio and file transfer support is available in RDP

Comparing RDP to VNC

- RDP is preferred over VNC for better security and performance
- RDP provides audio and file transfer support which is not available in VNC
- VNC is inefficient as each command has to be sent individually which consumes a lot of bandwidth
- VNC is vulnerable to attacks as it lacks security features



So What is Xorg

- Graphics requests that are then drawn on the xorg server sends input requests back to client
- Server vs client reversed
- Not necessarily on the same machine
- Rather Chatty
- Old, unwieldy codebase that has been hard to get developers

Wayland

- No longer is Xorg… all the old tricks don’t work
- Still somewhat nacent but improving
- Goal is simplicity and ease of maintainability
- Biggest issue is there is no one xrdp solution currently most all windows managers are going rogue… see demo

NX No machine solution

- Non ”free” but still free as in beer
  - Free for personal use, but commercial use requires license
- RDP like desktop experience, allows for
- In theory should work with wayland, in actuality just forced over to xorg

How to reenable wayland

- echo ”$XDG_SESSION_TYPE”
  wayland
- Edit /etc/gdm3/custom.conf
- Systemctl restart gdm3

Long story short

- The wayland world is still a mess of support
- If true headless rdp matters to you, xorg works for now
- Or can do unattended login to start gnome et.al.
- This is why we can’t have nice things…