Using Remote Desktop Virtualization w/ LC Clusters

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Agenda

- ## What is RealVNC

- ## What is DCV

- ## LC Implementations

- ## Using RealVNC

  - Demo

- ## Using DCV

  - Demo

What is RealVNC?

- **Commercial implementation of VNC (Virtual Network Computing)**
  - Founders were the inventors of VNC technology
  - "VNC Connect" is new product name

- **Client/Server software to obtain virtual desktop on a remote computer with good performance**

- **Enterprise-ready**
  - Security
  - Support
  - Robustness

VNC CONNECT

Why RealVNC @ LC?

- OTP and 256b encryption make John A. happy! 😇

- And…
  - Virtuald server makes connection mgmt easy
  - Used with DCV
  - Enterprise support
  - Performance
  - Platform availability
  - Inexpensive
    - I think that's enough!

RealVNC implementation @ LC

- For regular (non-GPU/GL) GUI work

- Only on Vis cluster **Login** nodes
  - Surface (czvnc), Rzhasgpu (rzvnc)
  - If you have need for this on SCF, let us know

- **New**: Can access Surface from anywhere w/o VPN!

- Server: vncserver-virtuald
  - Always use port 5999
  - Automatically assigns persistent session

- Client: RealVNC vncviewer (can't use generic)
  - Supported on Linux, OS-X, and Windows

What is DCV?

- **D**esktop **C**loud **V**irtualization

- VNC client that can do near-real-time 3D/GL graphics visualization

- Uses RealVNC as underlying client
  - dcvendstation / niceviewer looks like vncviewer
 - 59XX ports for 2D graphics and 73XX for 3D

DCV Implementation @ LC

- Only on Vis cluster **Compute** nodes

- Only 4 licenses for CZ & RZ combined
  - Let us know if we need more

- *dcvsession* on compute node:
  - Sets up session
    - Including options like screen size & resolution
  - **New**: Uses SOCKS proxy vs. port forward chains
  - Provides syntax aids to copy & paste

- Supported on Linux|Windows|MacOS

Using RealVNC

- Open vncviewer and connect to czvnc:5999
  - Use OUN/RSA-OTP for authentication

- For RZ and other details: https://hpc.llnl.gov/data-vis/vis-software/vnc-realvnc
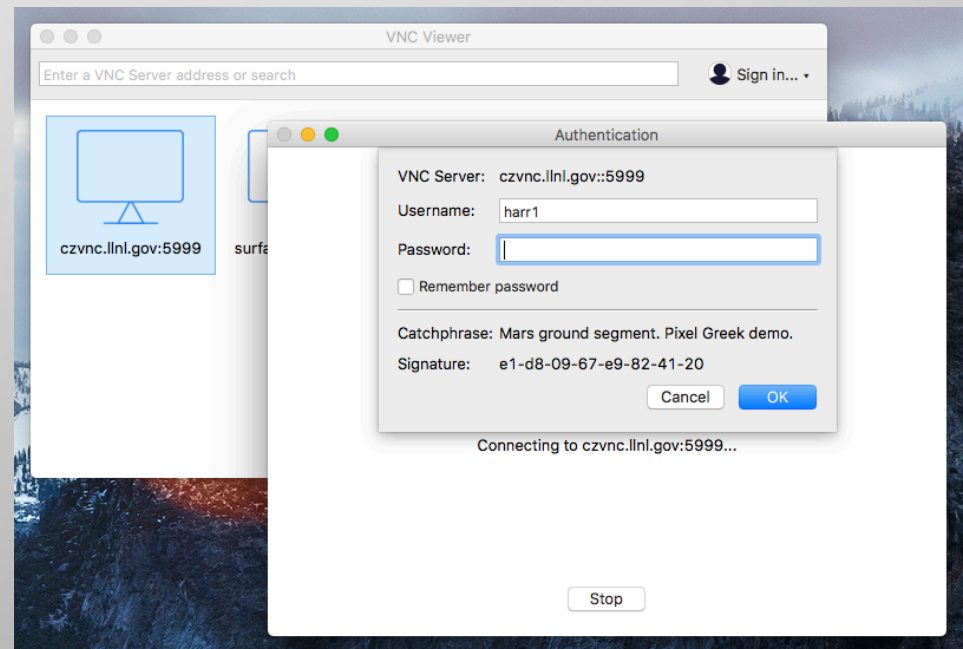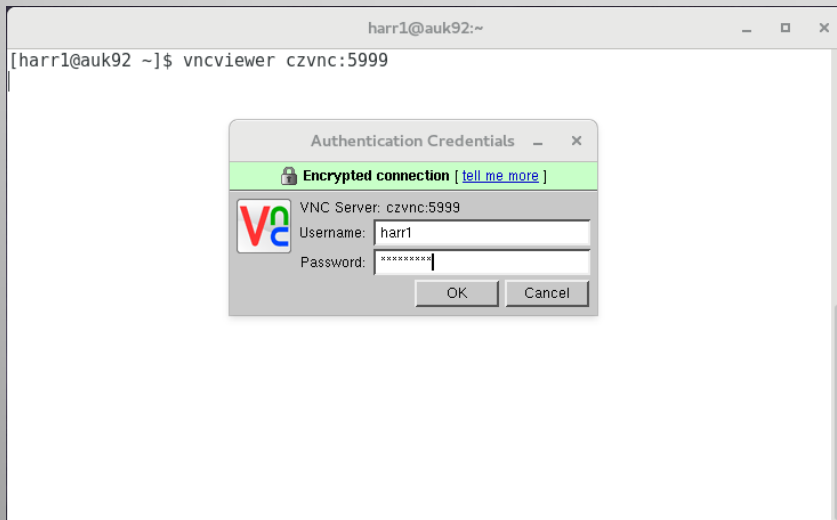
Using RealVNC (cont.)

- Sessions are persistent:

  - You can exit session and will be rejoined each connection attempt

  - To close persistent session, log out of virtual desktop
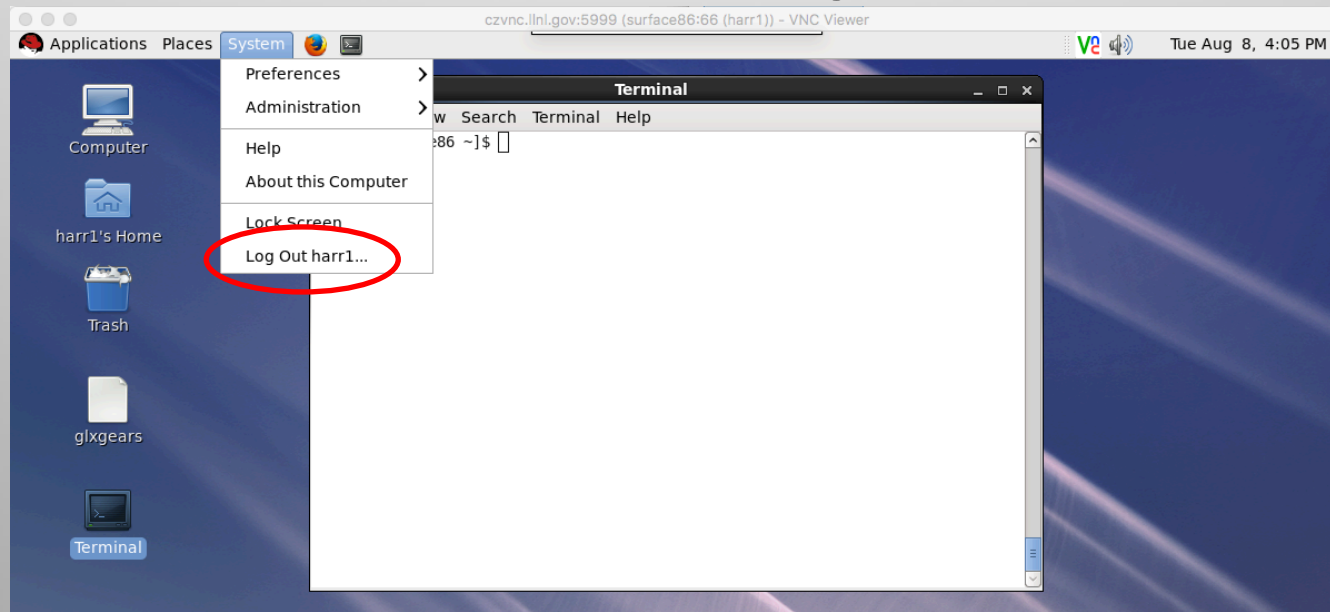
Using RealVNC (cont.)

- Change resolution
  - Add `RandR` to *.vnc/config.d/Xvnc* on **compute node**
    - Ex: `RandR=1200x1024,1600x1200`
    - First resolution will be your default
  - Type `xrandr –s <Resolution ID>` on compute node to dynamically change resolution and virtual screen size

- Kerberos integration available

RealVNC Demo

- ## Mac, Windows

- ## Surface, Rzhasgpu

- ## Need port forwarding for RZ
  - `<SSH cmd> -L 5999:rzhasgpu:5999 <user>@rzgw`

Using DCV

- Log in to cluster login node (czvnc, rzvnc)

- Use Slurm to allocate a compute/GPU node:
  - `$ salloc –N 1`
  - Epilog will clean up DCV session

- For RZ and other details:
  - https://hpc.llnl.gov/data-vis/vis-software/vnc-nice-dcv

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Using DCV (cont.)

- From compute node cmdline, run dcvsession

  - $ dcvsession –o <lin|osx|win> […]

    — '-g XXXXxYYYY' to change resolution

- Follow Instructions

  - Create .dcv file (one-time)

  - Start Proxy server

  - Run DCV client to allocated node

    — For OSX, Windows, can double-click the icon of your .dcv file

Using DCV (cont.)

```
[harr1@surface86 ~]$ salloc -N1
salloc: Granted job allocation 1544944
[harr1@surface59 ~]$ dcvsession -o osx -g 1280x1024
Starting X server...
Starting VNC Server...
############ Success! ###########

IMPORTANT: dcvsession now uses a local SSH proxy using a configuration file.
           On your desktop, create a new text file containing the following 3
           lines, then rename the file surface.dcv (You should see the icon
           reflect the DCV logo when '.dcv' files are properly associated.)
               [Options]
               ProxyServer=localhost:1080
               ProxyType=socks

NOTE:      The proxy server may persist until terminated manually or by a
           reboot. If you know the proxy server is already running, skip step 1.

  1) Set up a proxy server on your workstation by copying and pasting the
     following SSH command(s) to a terminal.

  $ ssh -fN    -D 1080 harr1@surface

  2) Double-click on the surface.dcv file on your desktop. In the RealVNC
     window that comes up, enter surface59:5901 in the "VNC Server" box and
     click the 'Connect' button.

[harr1@surface59 ~]$ ▯
```
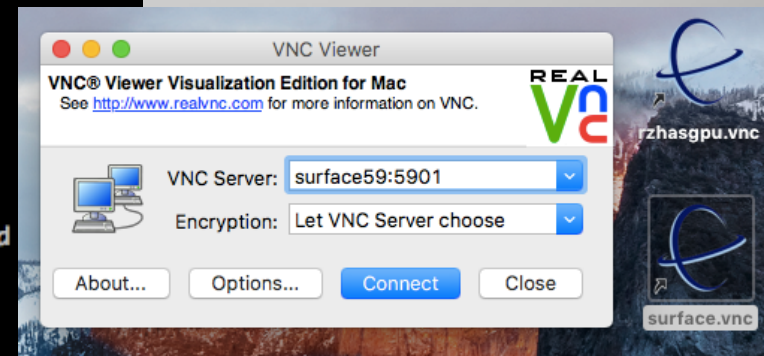
```
guapo:~ harr1$ ssh -fN -Snone  -D 1080 harr1@surface
Password:
guapo:~ harr1$ ▮
```

VNC Viewer

VNC® Viewer Visualization Edition for Mac
See http://www.realvnc.com for more information on VNC.

VNC Server: surface59:5901

Encryption: Let VNC Server choose

About...   Options...   Connect   Close

rzhasgpu.vnc

surface.vnc

DCV Demo

- Looks like RealVNC!

- Mac, Windows

- Surface, Rzhasgpu

- **Model:** Human Acetylcholinesterase (AChE) Inhibitor
  - "A Wrench in the Works of Human Acetylcholinesterase: Soman Induced Conformational Changes Revealed by Molecular Dynamics Simulations"
  - http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0121092
  - THANK YOU to Liam Kraus for setting up the model

Questions?