Using Remote Desktop Virtualization w/ LC Clusters

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Cameron Harr
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
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?

- Desktop Cloud Virtualization
- 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:
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.
```

```
[guiapo:: harr1$ ssh -fN -Snone -D 1080 harr1@surface
Password:
[guiapo: harr1$]
```

```
VNC Viewer
VNC Server: surface59:5901
Encryption: Let VNC Server choose
```
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?