

# The SHARCNET Desktop

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# Why a Desktop

Non-interactive (longer running jobs)

- ▶ command line
- ▶ run later (batch scheduling)

Interactive (shorter pre/post-processing)

- ▶ graphical
- ▶ run immediately

Users can use their own computers, but this requires installing software on them and transferring data on and off SHARCNET.

## History (1/3)

2007/08 - High quality desktop machines installed at several institutions for local staff/students to do pre-/post-processing.

- ▶ 2 x 2-Core AMD Opteron 2218
- ▶ 500GB of local storage (RAID0)
- ▶ 8GB of RAM
- ▶ NVIDIA Quadro FX 4500 GPUs
- ▶ 24" monitors

Installed with CentOS 5. Divorced from SHARCNET systems (accounts and files). Switched to Fedora 10 and then upgraded to 13. Integrated with SHARCNET accounts (LDAP) and files (SSH Fuse). Remote access via NoMachine NX and SSH. Some on and some off external SHARCNET network.

## History (2/3)

2011/12 - Several new machines added. Some are placed in machine rooms as majority of access has been remotely and not in person.

- ▶ 2 x 4-Core Intel Xeon X5560
- ▶ 1.5TB of local storage (RAID0)
- ▶ 48GB of RAM
- ▶ NVIDIA Quadro FX 4800/AMD FirePro V9800 GPUs
- ▶ 24" monitors

Installed with Fedora 13 and upgraded to Fedora 17. Various bugs fixes (notably file-system lockup solved) and administrative improvements. NoMachine NX replaced with VNC. VirtualGL (accelerated OpenGL) and noVNC (VNC via browser) integrated.

## History (3/3)

2014 - Server-class virtual-container machine added.

- ▶ 1 x 8-Core Intel Xeon E5-2650
- ▶ 240GB of SSD image storage (RAID1)
- ▶ 64GB of RAM
- ▶ 2 x NVIDIA GRID K1
- ▶ 10Gb up-link to SHARCNET network
- ▶ IPMI (remote power, console, etc.)

Installed with Fedora 20. Configured with LXC Fedora 20 and CentOS 6 containers. Direct access to SHARCNET file system instead of SSH Fuse. Various administrative improvements (including rolling upgrades).

# Stable/Commercial VS Unstable/Open Source

## RHEL/CentOS

- ▶ infrequently updated/released
- ▶ good for commercial/binary software (stable libraries)
- ▶ bad for open-source/compiled software (old libraries)

## Fedora

- ▶ frequently updated/released
- ▶ bad for commercial/binary software (unstable libraries)
- ▶ good for open-source/compiled software (new libraries)

Problem is we need both. Solution is to virtualization. We can (relatively) easily run whatever (Linux) works best for the software.

# Where are we now

## Machines

- ▶ 8GB desktops are retired
- ▶ 48GB desktops are running last non-virtualized release (Fedora 20)
- ▶ 64GB server is running new virtualized releases (CentOS 6 and Fedora 20)

## Software

- ▶ cluster and commercial packages on CentOS 6 image
- ▶ recent open source packages on Fedora 20 image
- ▶ happy to install additional distro packages (email [help@sharcnet.ca](mailto:help@sharcnet.ca))

## How to connect

Sessions only last as long as connection (no persistence).

Settings issues when switching distributions, so remove `~/.config`, `~/.local`, and `~/.cache` first (on a cluster).

Web browser (more convenient, slower, and eats some keystrokes)

- ▶ noVNC via modern (HTML5) browser (blue icon on systems page)

Native client (have to install software, faster, passes more keys)

- ▶ VNC client supporting VeNCrypt X509 (recommend tigervnc)
- ▶ `<machine>.user.sharcnet.ca` (*user* required for X509 certificate)



# Some Software

## General purpose

- ▶ ParaView (general purpose visualization)
- ▶ VisIt (general purpose visualization)

## Specific

- ▶ XCrySDen (crystalline and molecular structures)
- ▶ VMD (molecular visualization)
- ▶ YT (volumetric astrophysics)

## Environments

- ▶ SciLab (like commercial MATLAB)
- ▶ RStudio (like commercial S Plus)
- ▶ iPython (interactive Python)
- ▶ Eclipse (integrated development environment)

# Where are we going

Converting existing 48GB machines to virtualized releases

- ▶ moving to machine room in early December
- ▶ re-imaging after finished imaging infrastructure work (possibly January)

Add support for persistent per-user virtualized sessions

- ▶ session will last for some fixed time after last connection

Further backend infrastructure work