**University of Illinois at Urbana-Champaign**
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**Theoretical and Computational Biophysics Group**
**Computational Biophysics Workshop**

# TCBG Resources for Remote Visualization


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A current version of this tutorial is available at
http://www.ks.uiuc.edu/Training/Tutorials/
Join the `tutorial-l@ks.uiuc.edu` mailing list for additional help.

# Contents

# 1 Introduction

TCBG's remote visualization infrastructure provides remotely-situated users with workstation-like access to locally stored data. By connecting to a remote visualization session over the network, users can interact graphically with data through a standard "desktop" interface, as if physically working at a local machine. The procedure for utilizing TCBG remote visualization resources is presented in this tutorial.

# 2 Download VNC Client Software

Remote visualization sessions are accessed through VNC client software. TCBG recommends DCV Endstation, available for download through the following links, or by visiting:
`http://www.ks.uiuc.edu/Development/Computers/remoteviz/`

**DCV 2014.0 (hardware video compression, dynamic display resizing)**
Click to download:



**DCV 2013.0 (software video compression only)**
Click to download:



Alternative client softwares are available for mobile devices.
(May negatively impact streaming performance.)
Click to download:

# 3 Check Resource Availability

Dedicated TCBG remote visualization servers currently include:

- **vegas**.ks.uiuc.edu
- **riga**.ks.uiuc.edu
- **albuquerque**.ks.uiuc.edu
- **rafah**.ks.uiuc.edu
- **osaka**.ks.uiuc.edu
- **madrid**.ks.uiuc.edu
- **oslo**.ks.uiuc.edu
- **lima**.ks.uiuc.edu
- **havana**.ks.uiuc.edu

Software licenses limit the number of remote visualization sessions that may run concurrently. Each server may host only one session at a given time.

To check the number of licenses available, as well as the servers in use, enter the following command from any TCBG machine:

```
$ dcvcheck
```

Vacant machines are available to host remote visualization sessions.

```
[cartman@venezia ~]$ dcvcheck

3 DCV licenses currently available

Current DCV users, machines, and session start date/time:
stan@vegas.ks.uiuc.edu 1/0 at 05/01 10:36
kenny@rafah.ks.uiuc.edu 1/0 at 05/19 12:19
kyle@albuquerque.ks.uiuc.edu 1/0 at 05/22 15:42
butters@riga.ks.uiuc.edu 1/0 at 05/23 13:41
```

Figure 1: Check available resources with *dcvcheck*.

# 4 Initiate a Remote Visualization Session

Remote visualization sessions may be run in single- or multi-user modes.

**Single-User Session**
Single-user sessions allow private access to remote visualization machines. Only the user who initiates a session may connect (session owner), and no additional users may be subsequently added to the session. Use this type of session to work individually.

To initiate a single-user session, log on to a vacant remote visualization machine and enter the following command:

```
$ dcvstart
```

**Multi-User (Collaborative) Session**
Collaborative sessions allow multiple users to access a remote visualization machine, where they interact within a single shared session. One user initiates the session (session owner), and additional users may connect directly. Guest connections with view-only access are allowed with approval from the session owner. Use this type of session to work in a group, or with collaborators.

To initiate a collaborative session, the session owner logs on to a vacant remote visualization machine and enters the following command:

```
$ dcvstartcollab
```

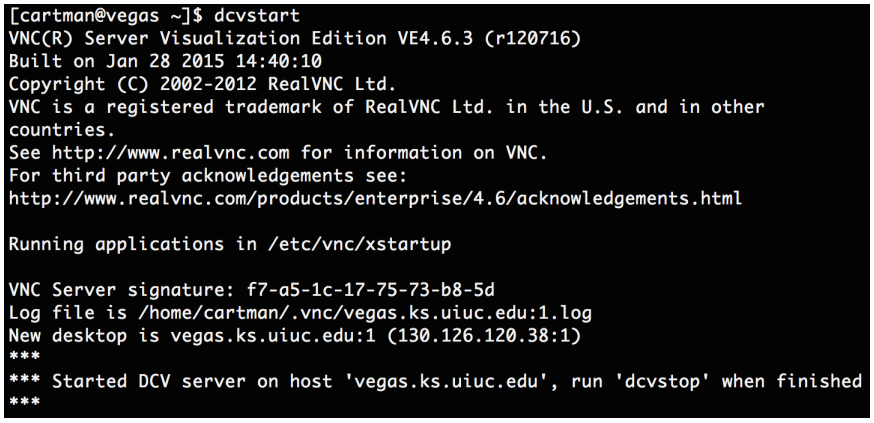


Figure 2: Initiate a session with *dcvstart* or *dcvstartcollab*.

# 5 Connect to a Remote Visualization Session

To connect to a remote visualization session, run DCV Endstation or alternative VNC client software. On TCBG workstations, use the following command to launch DCV Endstation:

```
$ dcvviewer
```

Connect to the server hosting your remote visualization session with your TCBG username/password, or username: guest/no password. If you receive a warning regarding a change in the VNC server signature, simply click *Yes* to accept.

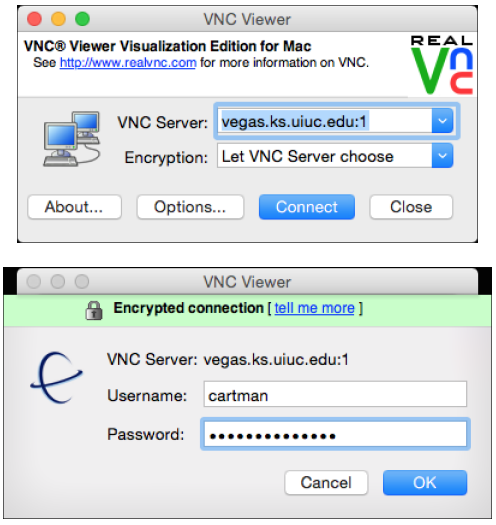


Figure 3: Connect to a session with VNC client software.

Once connected, choose *Full screen mode* on the VNC toolbar for an optimal viewing experience, mimicking a true "desktop" interface.

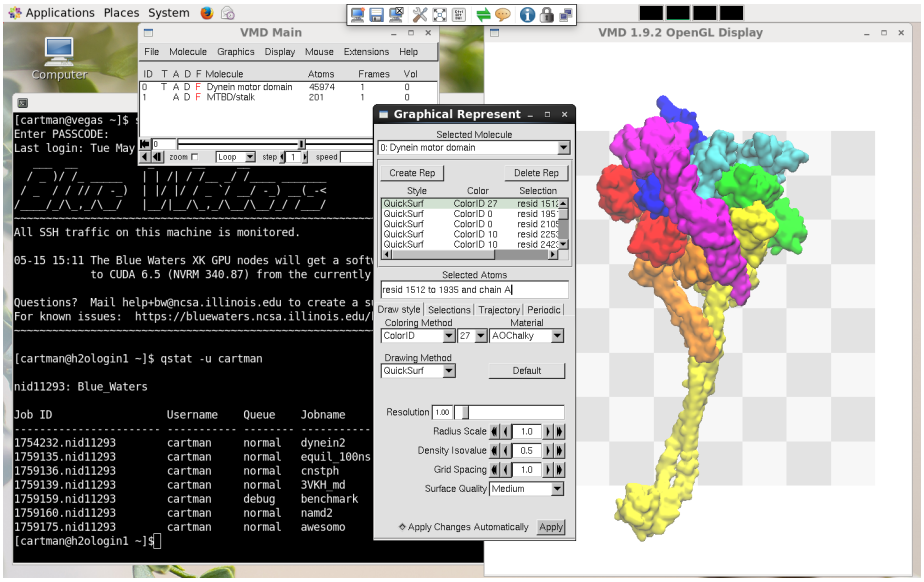


Figure 4: Remote visualization provides a "desktop" interface

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The session owner must approve guest connections by clicking *Accept* in a pop-up notification that appears in the lower right corner of the visualization window. Guest access is restricted to view-only unless special permission to grant interactive is configured ahead of time (contact TCBG sysadmin).

QuickStart instructions for collaborators/guests can be found at:
`http://www.ks.uiuc.edu/Development/Computers/remoteviz/`

# 6 Connect from Behind a Strict Firewall

When attempting to connect to a remote visualization session from a location that is behind a strict firewall, you may encounter issues. In such cases, creating an ssh tunnel through a machine on the UIUC network has been found to provide a suitable workaround.

For example, to create an ssh tunnel to the remote visualization server **vegas.ks.uiuc.edu** through TCBG's external gateway **login.ks.uiuc.edu**, enter the following command on your local machine as a single, continuous line, substituting your TCBG username:

```
$ ssh ‘seq 7300 7399 | awk ’{print " -L " $1":vegas.ks.uiuc.edu
:"$1}’‘ -L 5901:vegas.ks.uiuc.edu:5901 cartman@login.ks.uiuc.edu
```

```
ssh `seq 7300 7399 | awk '{print " -L " $1":vegas.ks.uiuc.edu:"$1}'` -L 5901:vegas.ks.uiuc.edu:5901 cartman@login.ks.uiuc.edu
```

Figure 5: Create an ssh tunnel through a machine on the UIUC network.

Instead of connecting directly to the server hosting your remote visualization session, connect to **localhost:1** to access the server through the ssh tunnel.

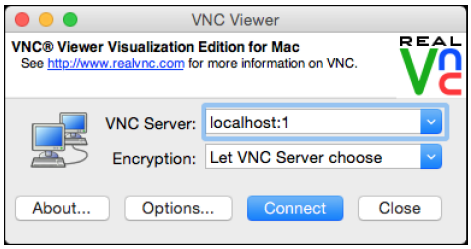


Figure 6: Connect to localhost:1 to access the host server through the ssh tunnel.

# 7 Terminate a Remote Visualization Session

Interactive users and guests may exit the session by selecting *Close connection* on the VNC toolbar or by simply closing the VNC client software. Session owners must manually terminate remote visualization sessions when finished to free up resources for other users. To end a session, enter the following command on the host server:

```
$ dcvstop
```


Figure 7: Terminate a session with *dcvstop*.