

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

To do this you need two pieces of software:

- (1) An **X server** running on your PC, and
- (2) A **secure shell** for making a network connection to a UNIX host.

There's a variety of software that can be used, but the approach described here uses freely available **Cygwin** software:

- (1) Cygwin/X
- (2) Cygwin/openssh

Cygwin has many other tools and utilities, but we only need the X server and the secure shell. Note that these directions apply only to a PC – you're on your own if you have a Mac!

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

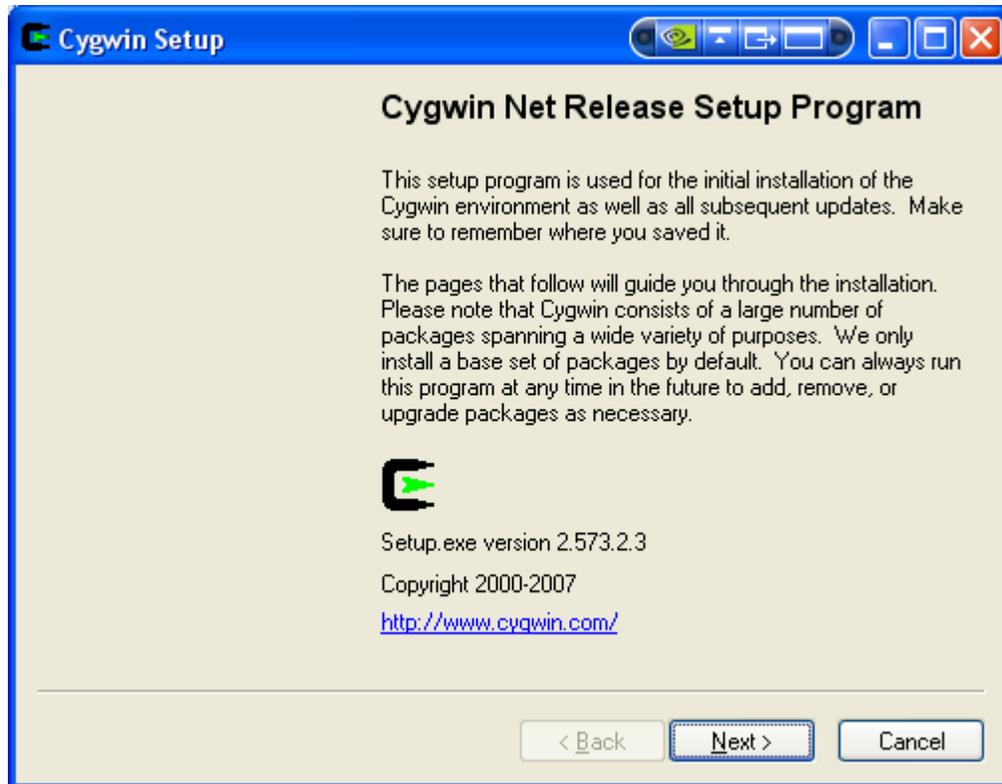
1. Install software:

1a. Create these folders:

C:\cygwin
C:\cygwin\install

1b. Download <http://cygwin.com/setup.exe> to **C:\cygwin**

1c. Run the Cygwin setup program: **C:\cygwin\setup.exe**

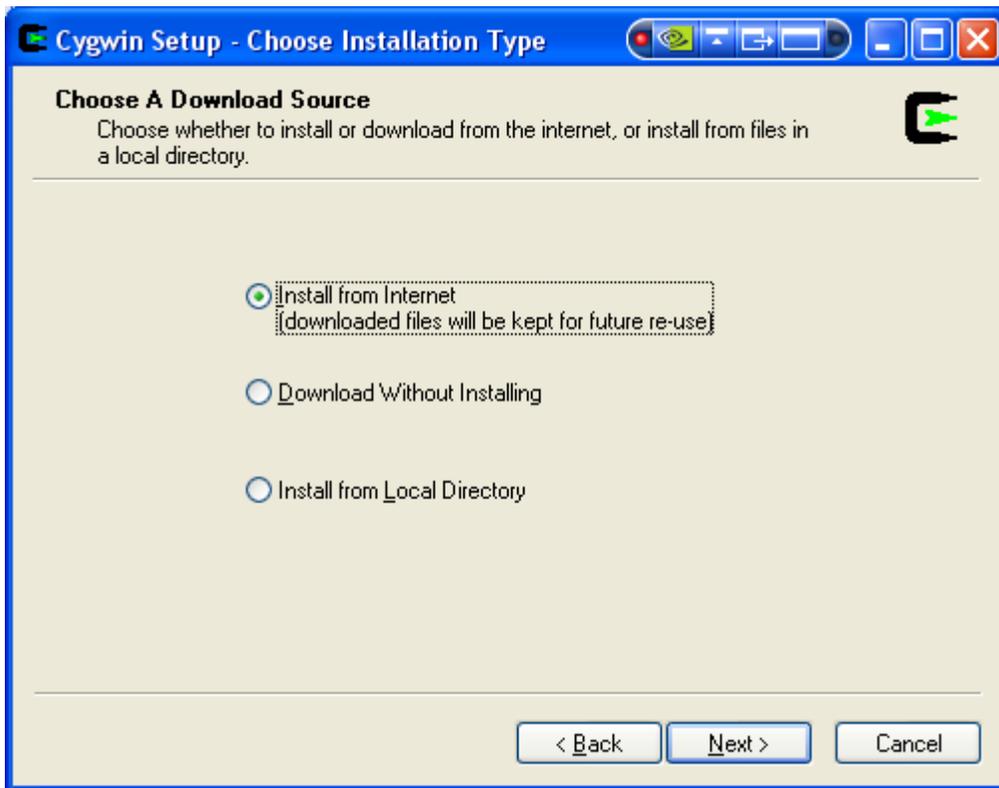


Select **Next >** ...

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

Select **I**nstall from Internet

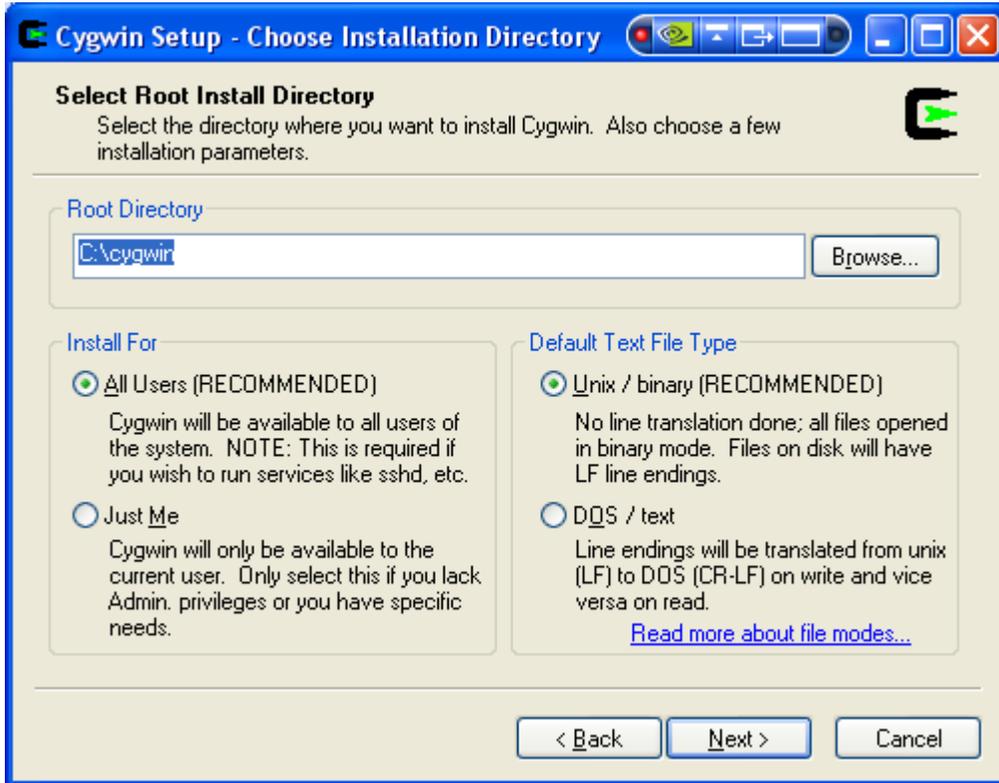


Select **N**ext > ...

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

Ensure **C:\cygwin** is listed as the **Root Directory**, then select **All Users**, **Unix ...**

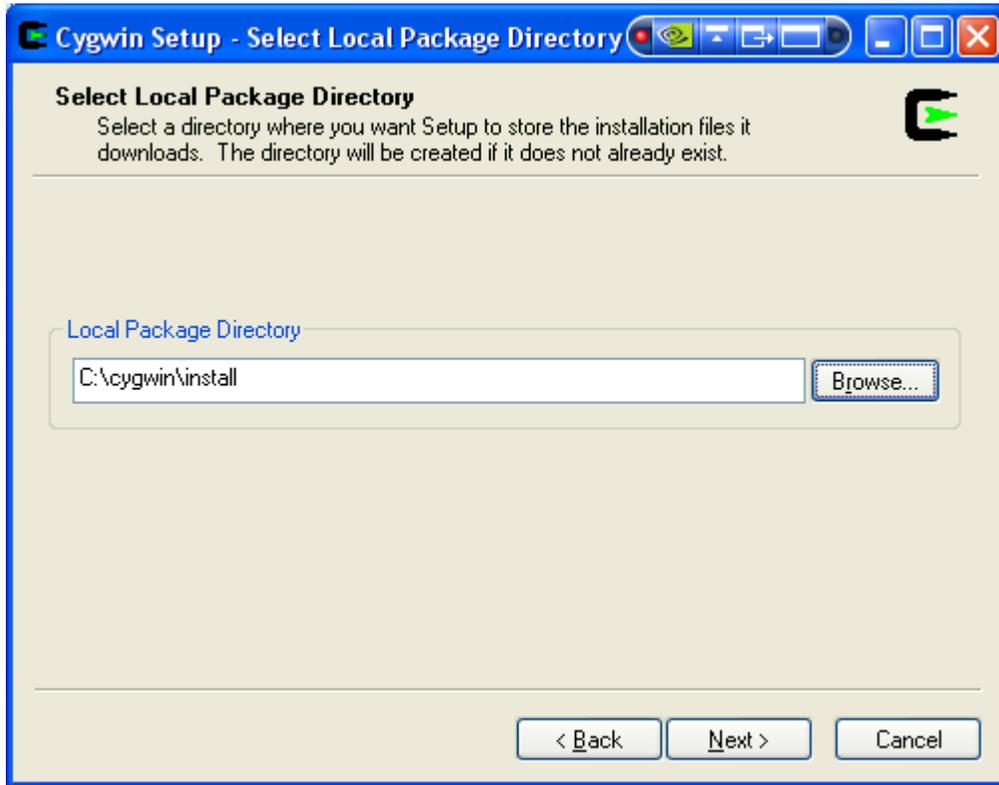


Select **Next >** ...

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

Enter **C:\cygwin\install** as the **Local Package Directory**

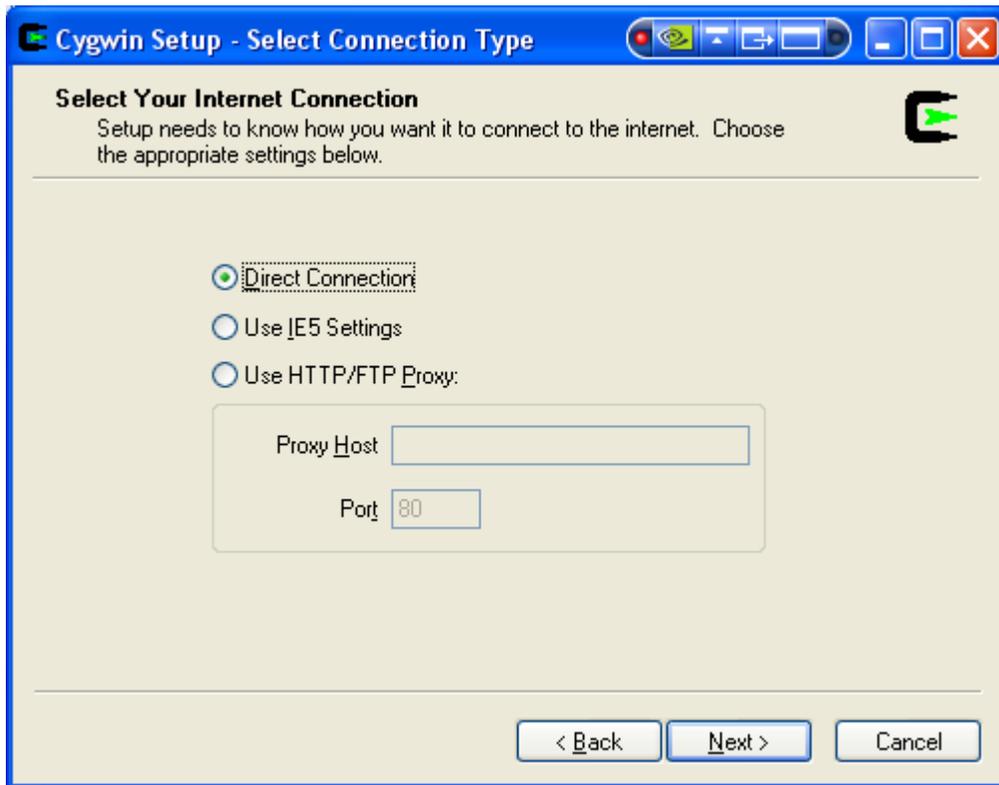


Select **Next >** ...

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

Select **D**irect Connection

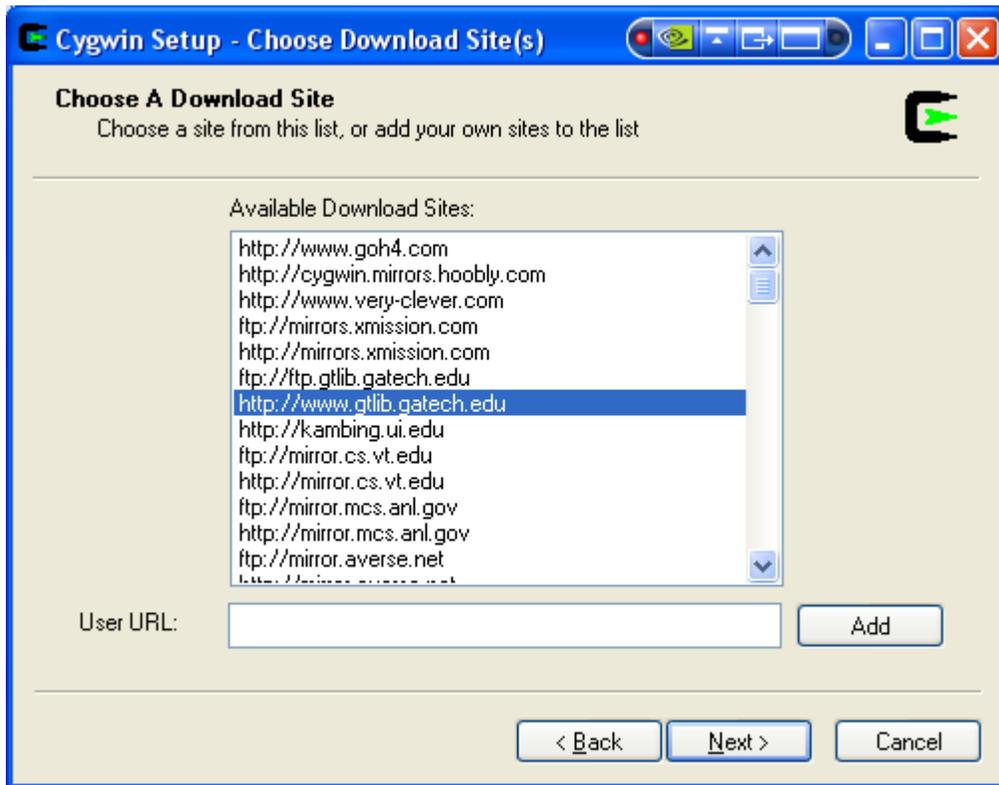


Select **N**ext > ...

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

Select a download site:

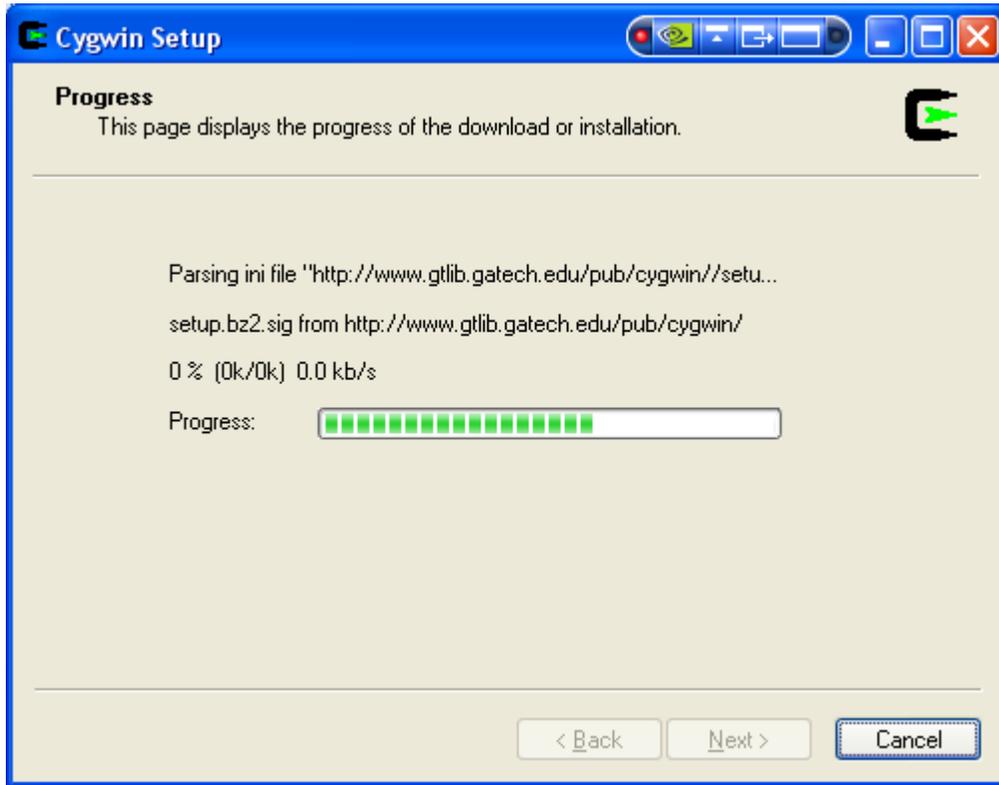


Select **Next >** ...

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

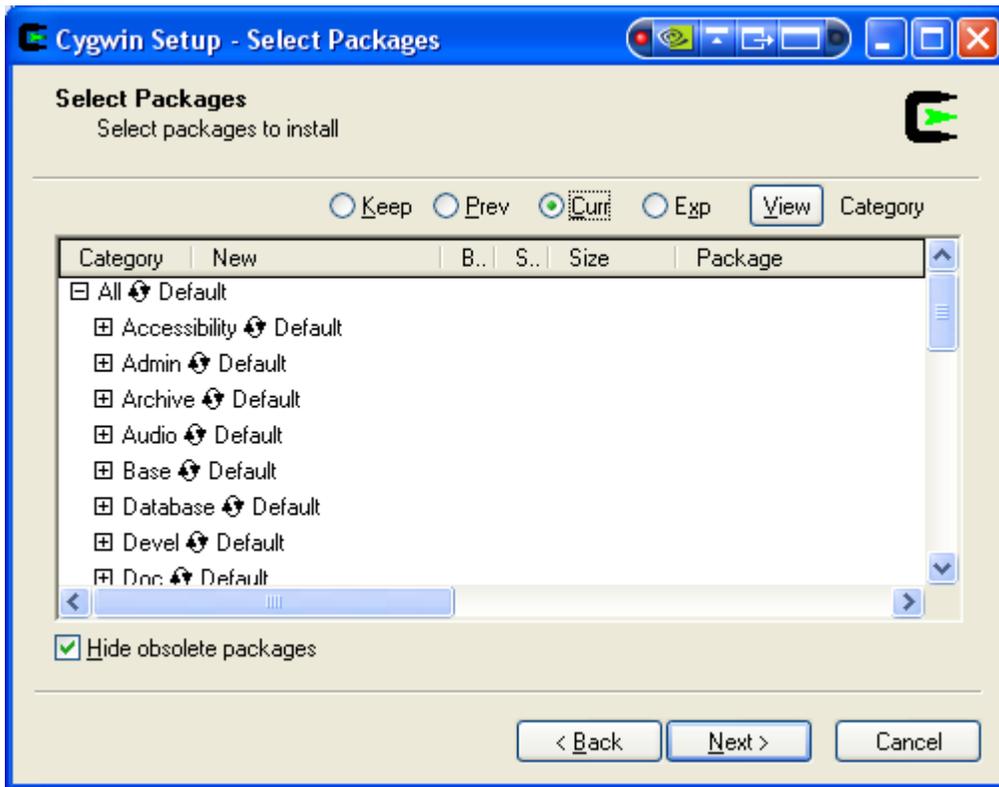
Setup will begin downloading ...



Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

Select **Curr**



Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

Note: the numbers below are the package revision and size. The current package at the time of your installation may be different (newer) than these.

Select these packages:

X11  **Default**
 1.1.0-3 **32k** **xinit: X.Org X server initializer**

Net  **Default**
 5.1p1-10 **580k** **openssh: The OpenSSH server and ...**

If you want to use the same text editor on your PC that we'll be using in class, select these packages:

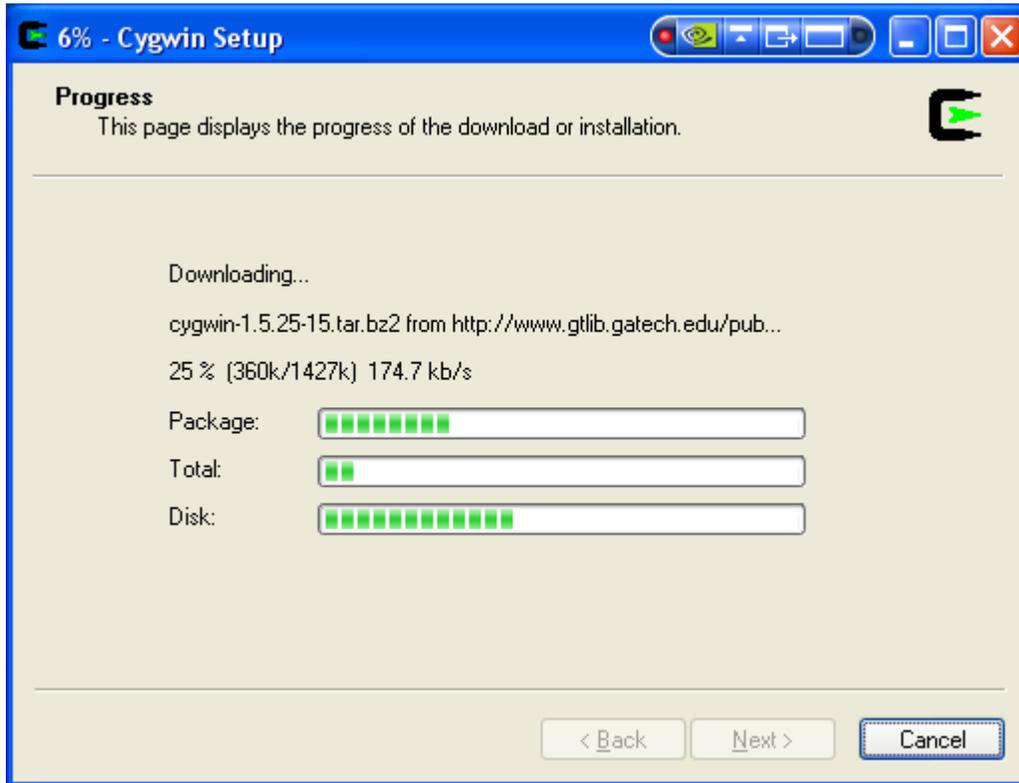
Editors  **Default**
 21.4.21-1 **6,637k** **xemacs: A powerful, highly ...**
 2007-04-27-1 **24,63409k** **xemacs-sumo: Xemacs standard ...**

... then select **Next >** ...

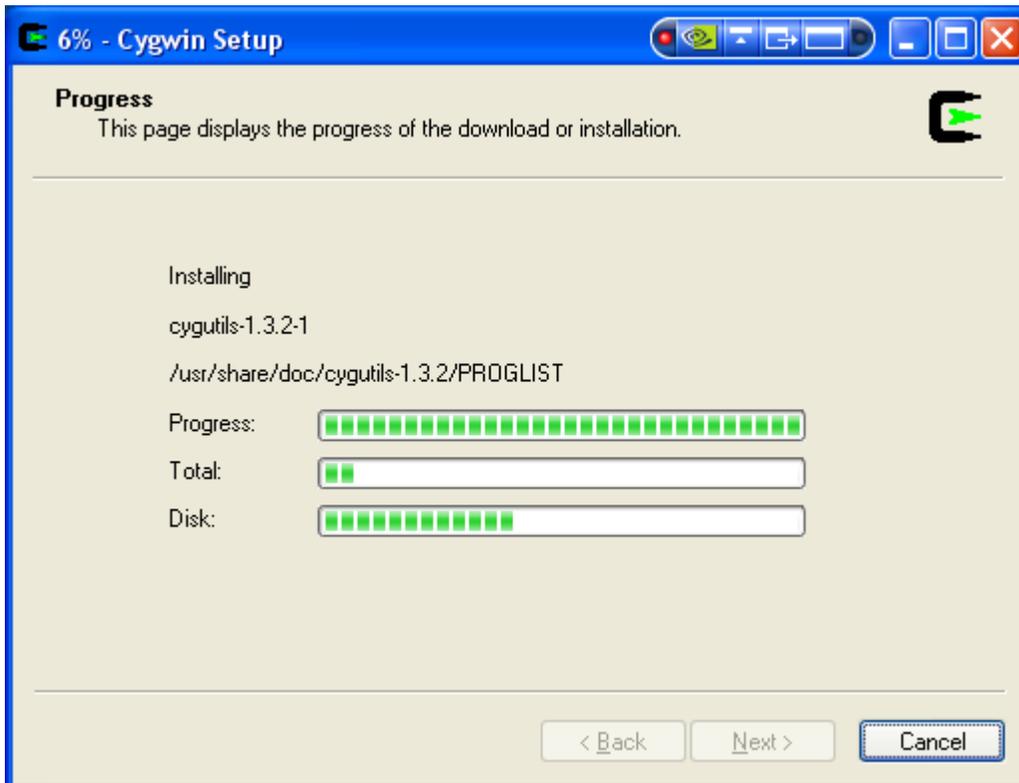
Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

The selected packages and any required support packages will be downloaded:



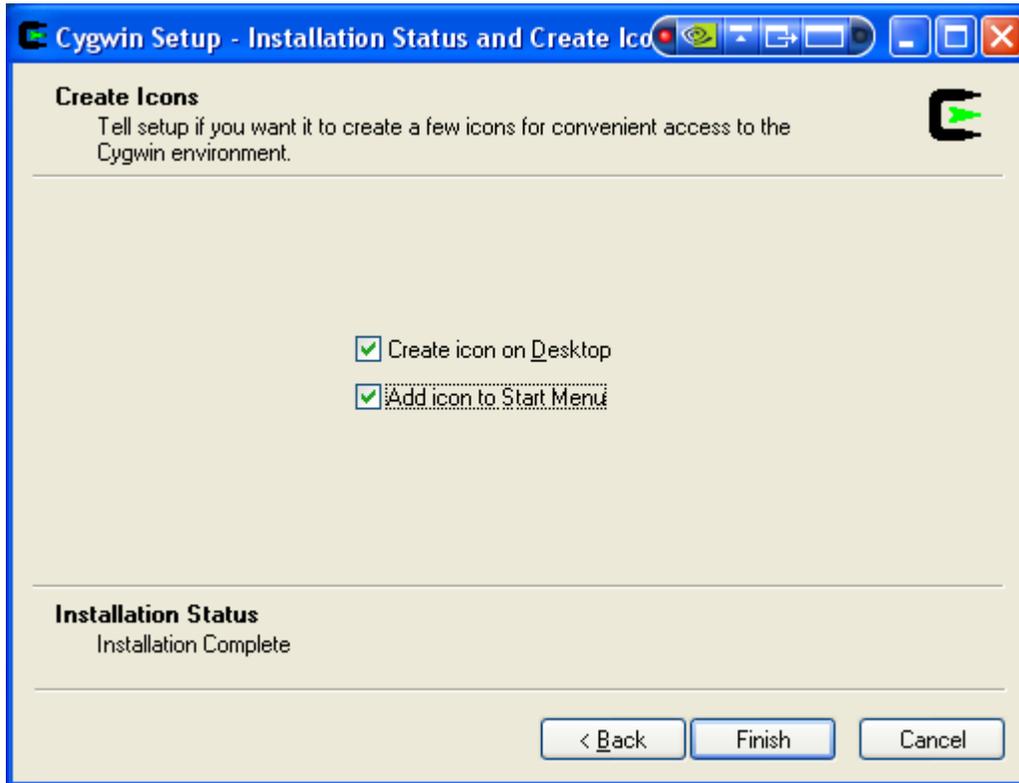
... then they will be installed (this will take some time):



Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

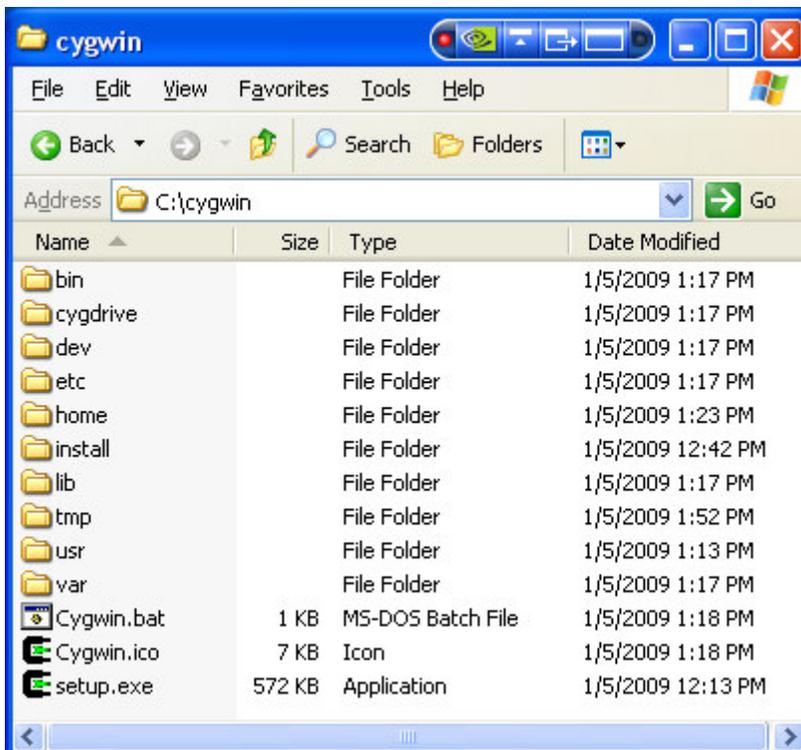
1. Install software: (continued)

When the installation is complete, select both checkboxes:



Select **Finish** ...

The **C:\cygwin** folder will have these entries:



Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

1. Install software: (continued)

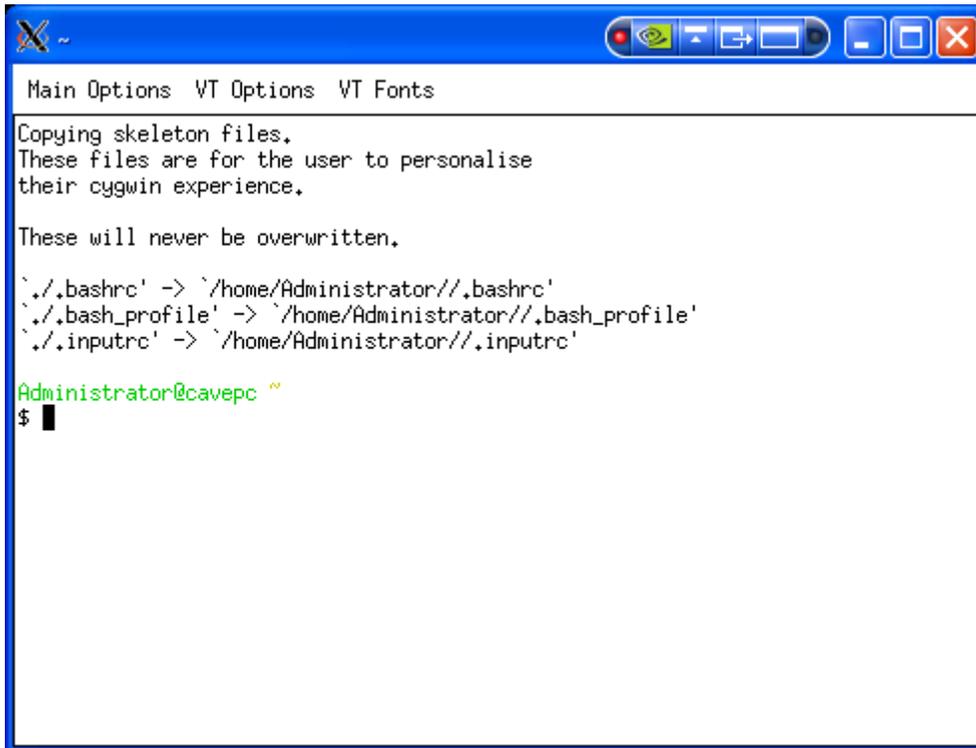
To add software packages later to an existing Cygwin installation, run **C:\cygwin\setup.exe** again and follow these same steps, choosing the additional packages you wish to install.

2. To run an X11 program on a UNIX host, displaying it on your PC:

Start the X server and open an xterm command interpreter (“shell”) window:

Start → All programs → Cygwin/X → Xwin server

The first time you do this, some “resource files” will be created (and inform Windows that yes, you wish to unblock this program). You will be presented with a BASH shell window:



```

X ~
Main Options  VT Options  VT Fonts
Copying skeleton files.
These files are for the user to personalise
their cygwin experience.

These will never be overwritten.

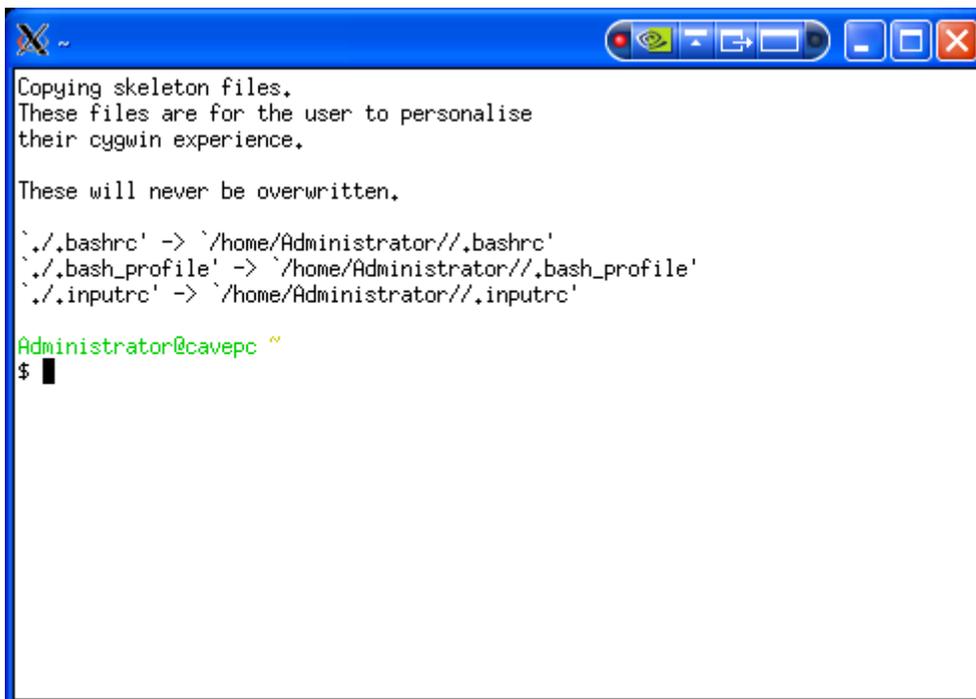
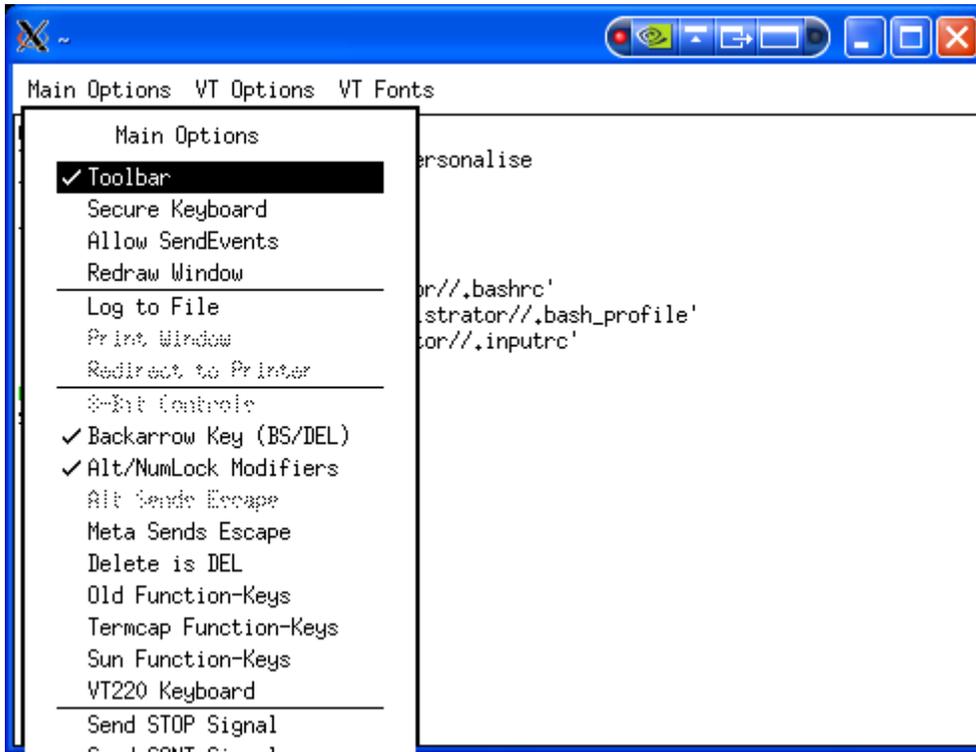
\'.bashrc' -> '/home/Administrator/\\.bashrc'
\'.bash_profile' -> '/home/Administrator/\\.bash_profile'
\'.inputrc' -> '/home/Administrator/\\.inputrc'

Administrator@cavepc ~
$ █
```

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

2. To run an X11 program on a UNIX host, displaying it on your PC: (continued)

You can remove the menubar by unchecking **Main Options** → **Toolbar**:



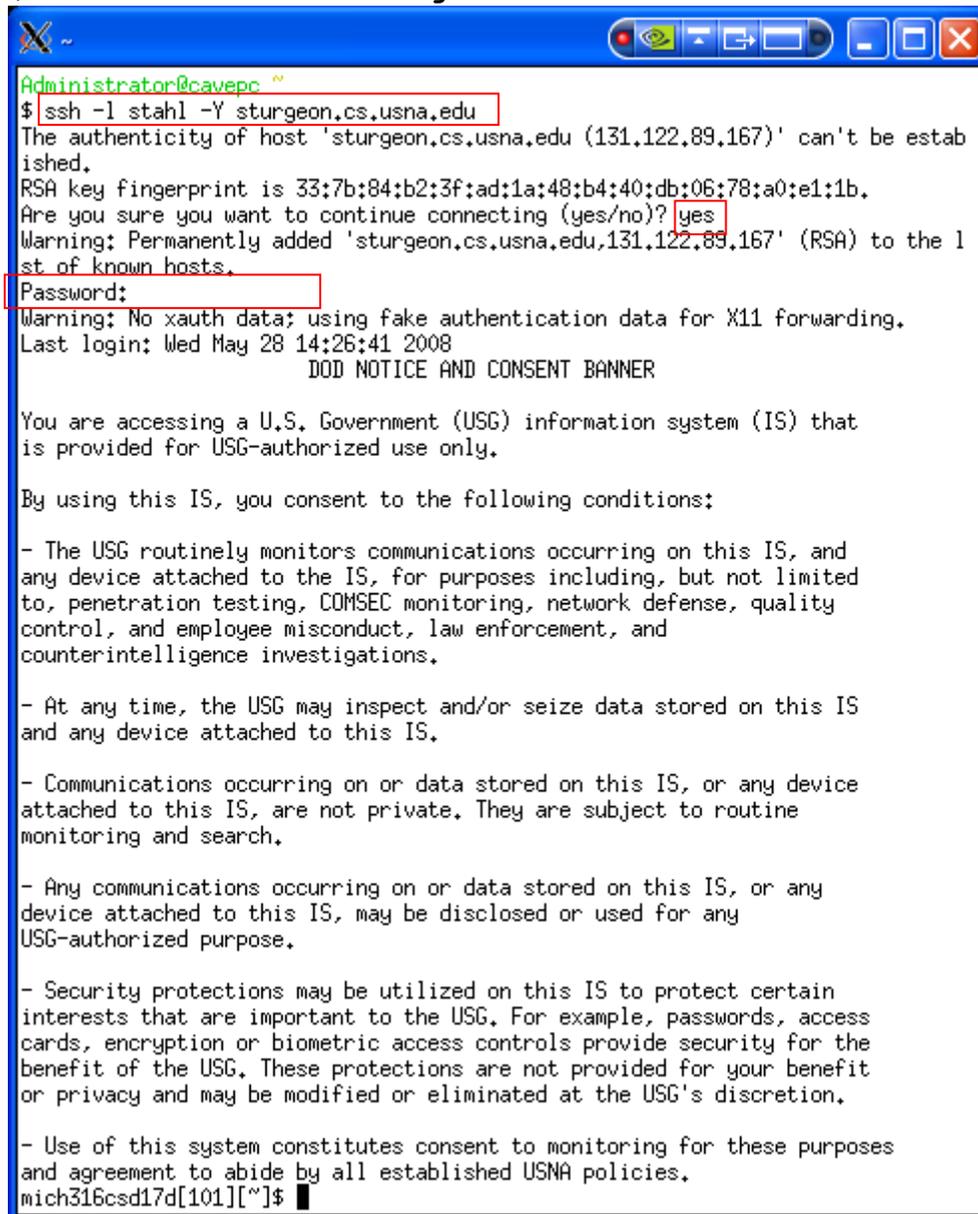
Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

2. To run an X11 program on a UNIX host, displaying it on your PC: (continued)

Choose a CS Department UNIX Lab host you wish to connect to. Hosts are listed on this web page: <http://www.cs.usna.edu/Restricted/ip.html> (for example, the host named `sturgeon.cs.usna.edu` in MI302).

At the BASH prompt (`$`) in the command window on the *local host* (your PC), login to the *remote host* using `ssh` with `x11 forwarding` to your PC's display. Use your NADN login name, the remote hostname you chose, answer **yes** to the security question, and enter your NADN password:

```
$ ssh -l stahl -Y sturgeon.cs.usna.edu
```



```
Administrator@cavepc ~
$ ssh -l stahl -Y sturgeon.cs.usna.edu
The authenticity of host 'sturgeon.cs.usna.edu (131.122.89.167)' can't be established.
RSA key fingerprint is 33:7b:84:b2:3f:ad:1a:48:b4:40:db:06:78:a0:e1:1b.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'sturgeon.cs.usna.edu,131.122.89.167' (RSA) to the list of known hosts.
Password:
Warning: No xauth data; using fake authentication data for X11 forwarding.
Last login: Wed May 28 14:26:41 2008
                DOD NOTICE AND CONSENT BANNER

You are accessing a U.S. Government (USG) information system (IS) that
is provided for USG-authorized use only.

By using this IS, you consent to the following conditions:

- The USG routinely monitors communications occurring on this IS, and
any device attached to the IS, for purposes including, but not limited
to, penetration testing, COMSEC monitoring, network defense, quality
control, and employee misconduct, law enforcement, and
counterintelligence investigations.

- At any time, the USG may inspect and/or seize data stored on this IS
and any device attached to this IS.

- Communications occurring on or data stored on this IS, or any device
attached to this IS, are not private. They are subject to routine
monitoring and search.

- Any communications occurring on or data stored on this IS, or any
device attached to this IS, may be disclosed or used for any
USG-authorized purpose.

- Security protections may be utilized on this IS to protect certain
interests that are important to the USG. For example, passwords, access
cards, encryption or biometric access controls provide security for the
benefit of the USG. These protections are not provided for your benefit
or privacy and may be modified or eliminated at the USG's discretion.

- Use of this system constitutes consent to monitoring for these purposes
and agreement to abide by all established USNA policies.
mich316csd17d[101][~]$
```

The usual login banner appears.

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

2. To run an X11 program on a UNIX host, displaying it on your PC: (continued)

You can now run programs on the remote Sun host, and display them on your local PC:

The BASH shell window at the upper left is running on the local host (PC). The bash shell command `ls -la` shows the contents of the directory. The XP window at the upper right shows this same directory. The `xterm` window on the lower left is running on the local host. We have logged in to a remote Sun UNIX host and have run a program named `gnuplot` on the remote host, displaying its output (a graph) on the local host.

The screenshot displays a Windows desktop environment with four windows:

- Top-left (xterm):** A terminal window showing the output of the `ls -la` command. The output lists files and directories including `bin`, `cygdrive`, `dev`, `etc`, `home`, `install`, `lib`, `tmp`, `usr`, and `var`.
- Top-right (cygwin):** A file explorer window showing the same directory structure as the terminal window. The address bar indicates the path `C:\cygwin`.
- Bottom-left (xterm):** A terminal window showing the output of the `gnuplot` command. It displays the GNUPlot version (3.7 patchlevel 3), copyright information, and instructions on how to access the online reference manual.
- Bottom-right (Gnuplot):** A window displaying a graph of the function $y = x^2$ for x ranging from 0 to 100. The x-axis is labeled from 0 to 100, and the y-axis is labeled from 0 to 10000. The plot shows a red curve starting at the origin and ending at (100, 10000).

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

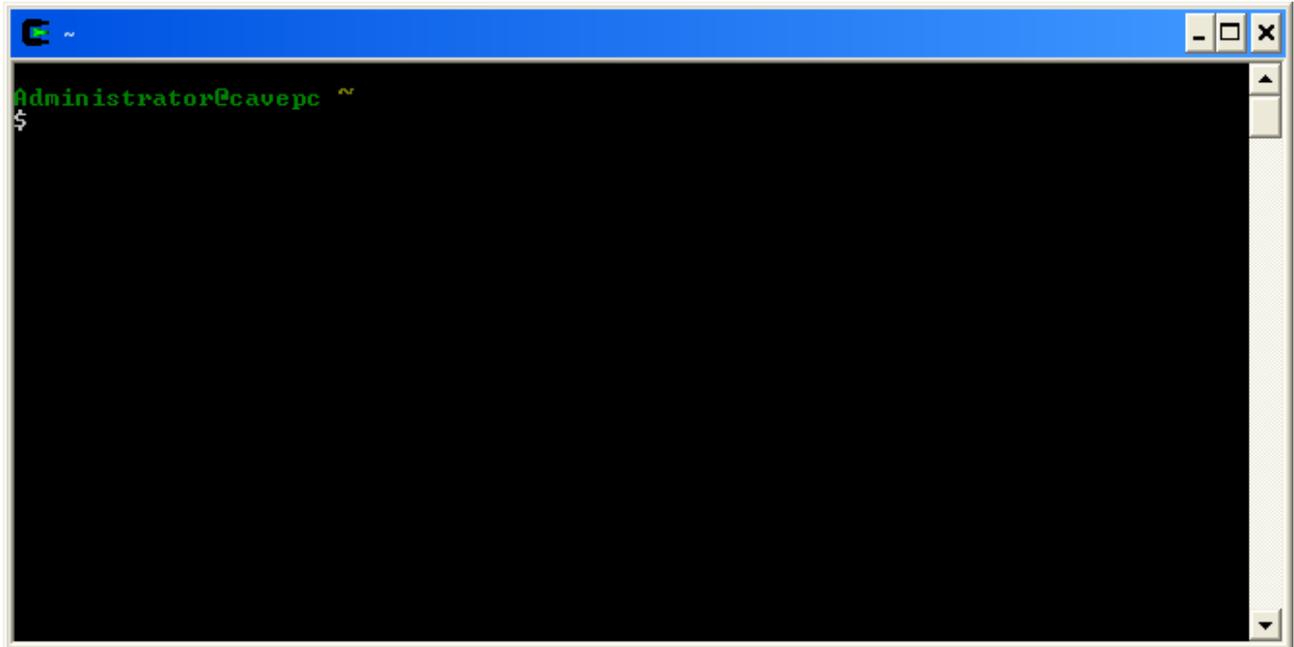
3. Other ways of starting the X server:

Doubleclick the Cygwin icon on the Windows desktop, or select

Start → All Programs → Cygwin → Cygwin bash shell

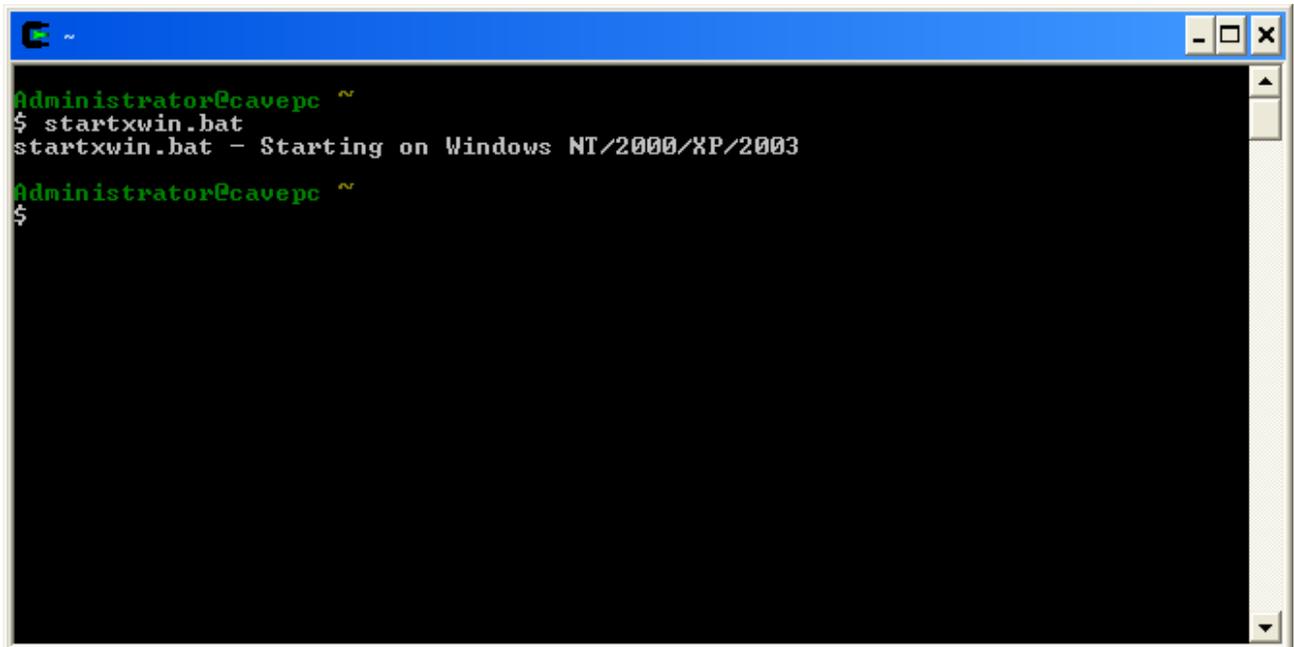


This will open a BASH command shell window:



Start the X server using either of these BASH shell commands:

\$ startxwin.bat **or** **\$ startxwin.sh**



Note that an xterm window will be opened.

Setup and Howto for running an X11 program on a UNIX host, displaying it on your PC

4. Shutting down the X server:

Right click the X server icon in the Windows toolbar tray and select Exit ...



Select **Exit**.