

# **Cygwin/XFree86 User's Guide**

**Harold L Hunt, II**

## **Cygwin/XFree86 User's Guide**

by Harold L Hunt, II

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Bumped the revision number to 1.0.0 to indicate that all planned content is now present.

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Change the download directory from / to /tmp.

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Updated the Cygwin/XFree86 downloading instructions with the new archive names that are created by the XFree86 build-bindist script.

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# Chapter 1. Cygwin/XFree86 Overview

Cygwin/XFree86 is a port of XFree86 to Cygwin; Cygwin provides a UNIX-like API on the Win32 platform. As of 2001-07-01 the supported Win32 platforms are Windows 95, Windows 98, Windows Me, Windows NT 4.0, and Windows 2000.

# Chapter 2. Setting Up Cygwin/XFree86

## Cygwin/XFree86 Contents

Cygwin/XFree86 consists of two parts: Cygwin, a port of the GNU tools to Win32, and Cygwin/XFree86, a port of XFree86 to Win32. Both parts of Cygwin/XFree86 are needed to successfully run an X Server on a Win32 platform.

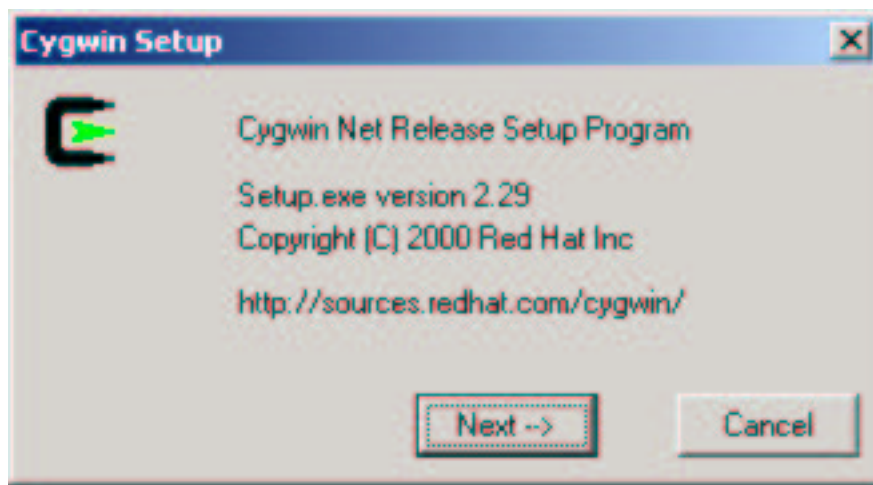
## Downloading Cygwin

Cygwin tools are, in the words of the Cygwin development homepage, <http://cygwin.com/>, “ports of the popular GNU development tools and utilities for Windows 95, 98, and NT. They function by using the Cygwin library which provides a UNIX-like API on top of the Win32 API.” Cygwin allows the compilation of the XFree86 source on Win32; several patches were made to the XFree86 source to make XFree86 actually compile and run under Cygwin; those patches have been merged into the XFree86 4.0 source tree.

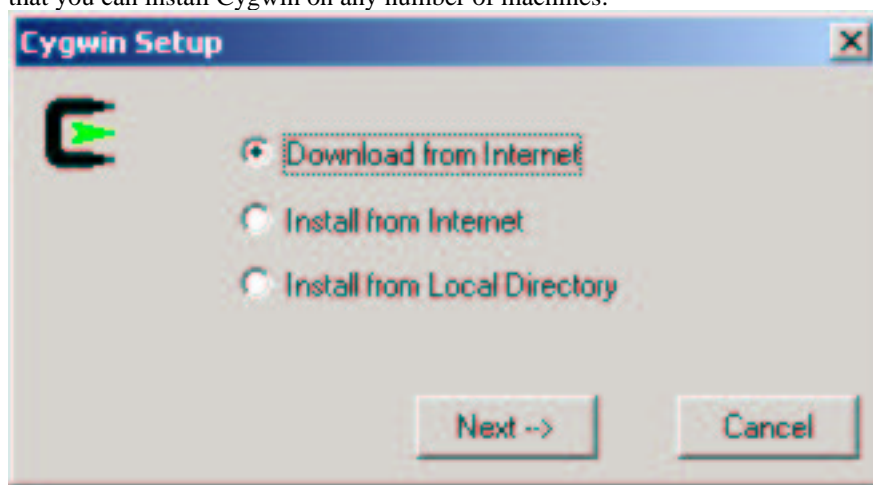
Cygwin has a nice setup program that downloads and installs the necessary Cygwin packages for you.

**Tip:** Be sure to use `setup.exe` version 2.13 or greater if you intend to save the downloaded packages to a Samba share; some versions of Samba have a problem with prior versions of `setup.exe`.

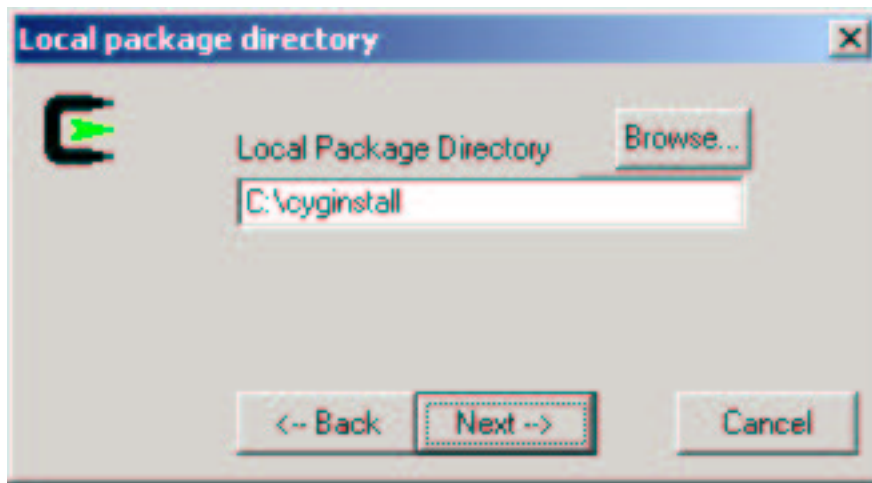
1. Open the Cygwin, <http://cygwin.com/> page in your web browser
2. Click the “Install Cygwin Now” link in the upper-right hand corner of the page; or, click the “Install” link next to “Latest net release:”, which should be near the top of the page in the main content area. This link downloads `setup.exe` from the primary Cygwin server; save `setup.exe` to the directory that you would like to store the downloaded packages in (e.g. `c:\cyginstall`); do not save `setup.exe` to `c:\cygwin`, as that is the default directory for the extraction and installation of the downloaded packages. At the time of writing, a full download of all Cygwin packages takes 25 MB of disk space.
3. Run `setup.exe`, you will see the welcome screen:



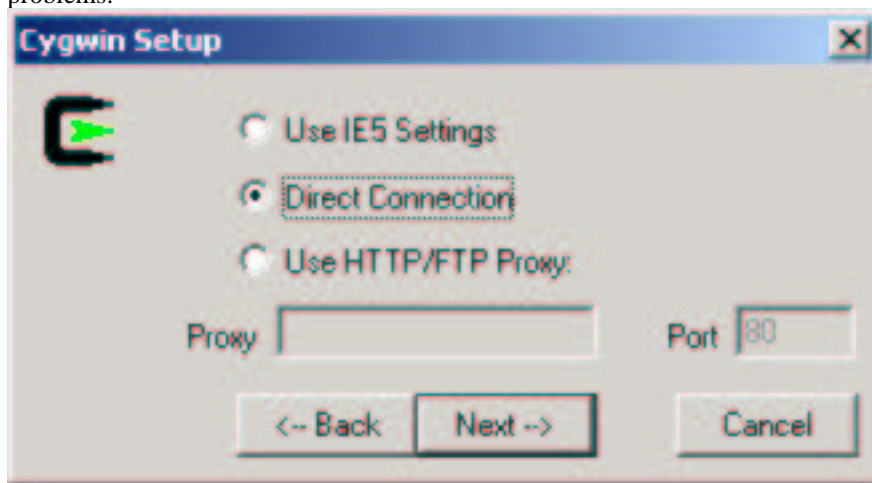
4. Click Next to proceed to the next screen
5. Choose, Download from Internet, this will save the package files to your download directory so that you can install Cygwin on any number of machines:



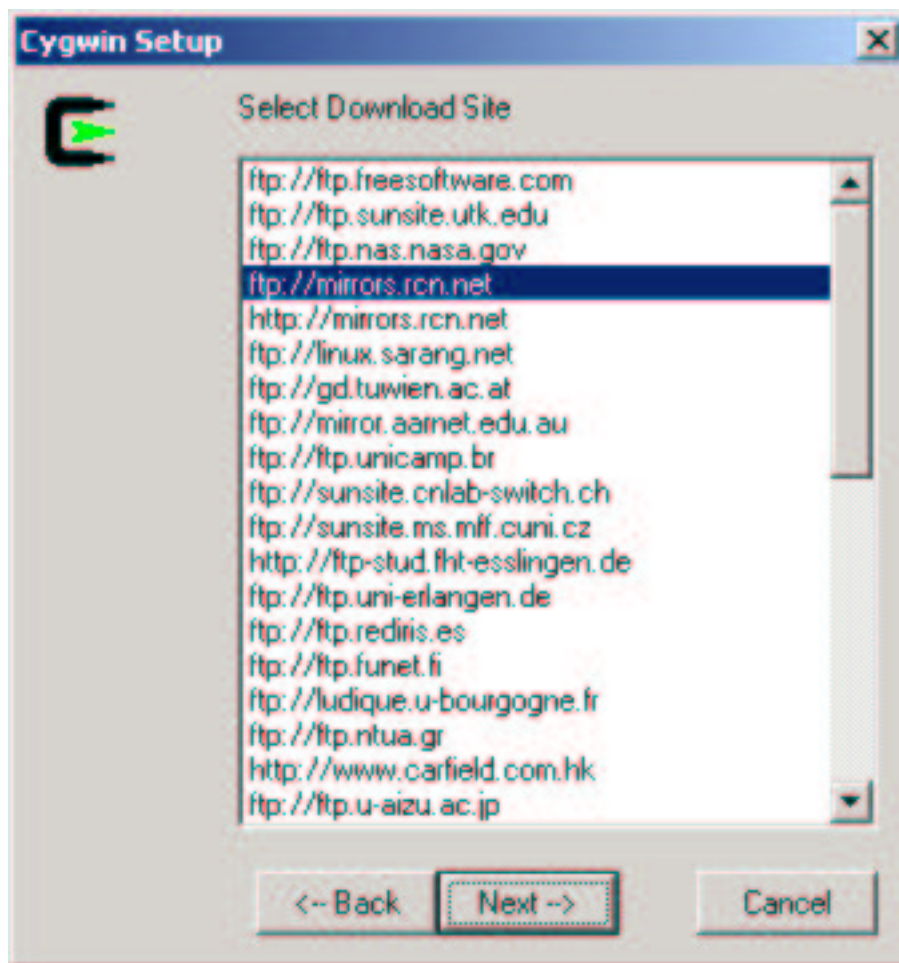
6. Click Next to proceed to the next screen
7. Local Package Directory should default to the directory that you ran setup.exe from:



8. Click **Next** to proceed to the next screen
9. Choose your proxy setup, or, just choose **Direct Connection** to limit the scope of download problems:

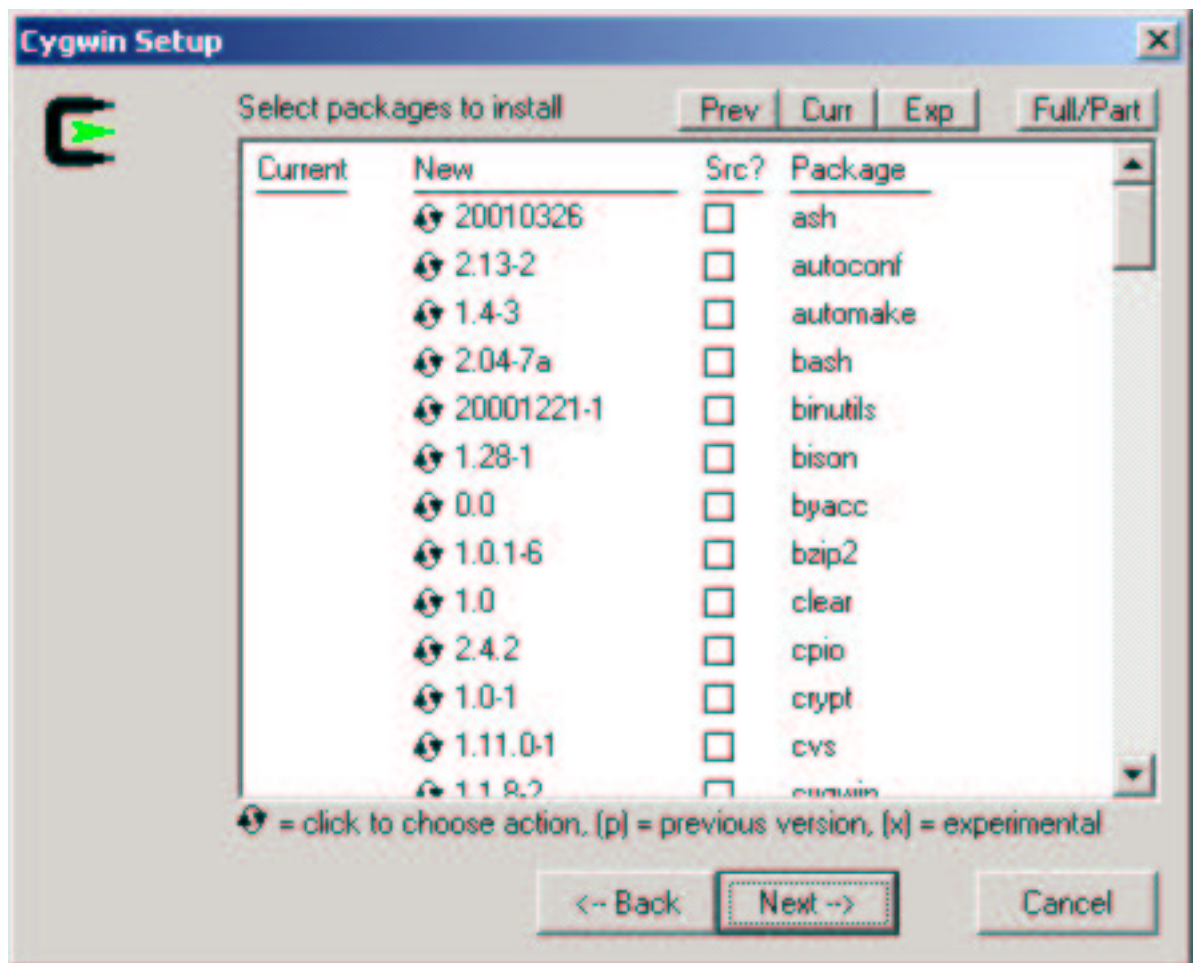


10. Click **Next** to proceed to the next screen
11. Select your nearest mirror for downloading:

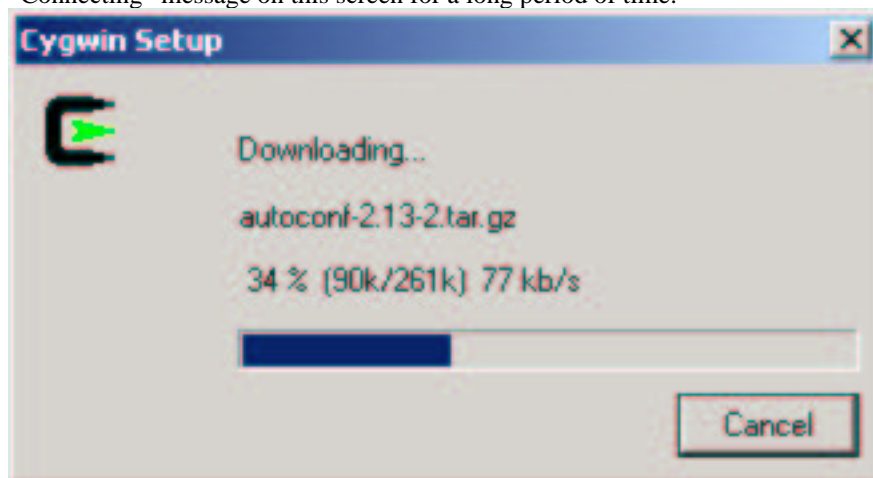


12. Click **Next** to proceed to the next screen; setup will download a list of available packages as it moves to the next screen
13. All packages, downloaded size of 56.1 MB as of 2001-04-19, are selected for download by default; I do not recommend changing the list of packages to download unless you really know what you are doing:

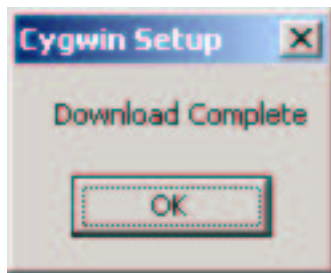




14. Click Next to begin the download process, you may want to try another mirror if you see a “Connecting” message on this screen for a long period of time:



15. You should receive a message that the download has completed; you now have all of the packages necessary for installation of Cygwin:

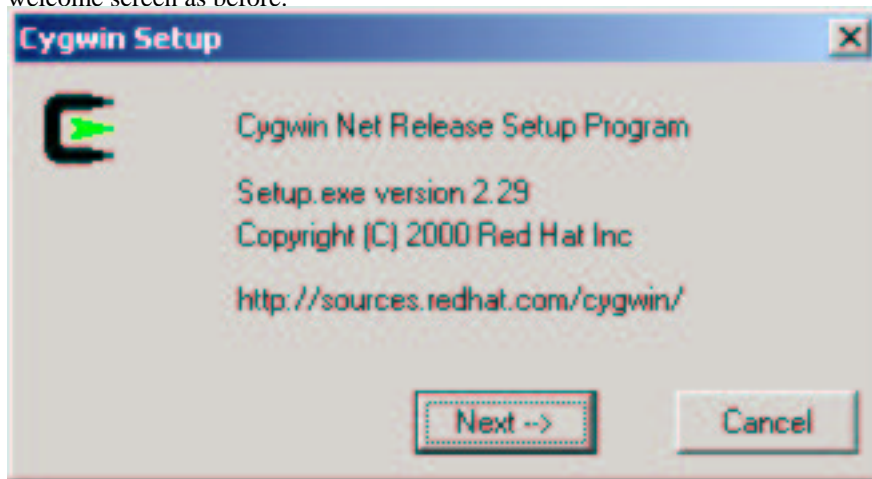


## Installing Cygwin

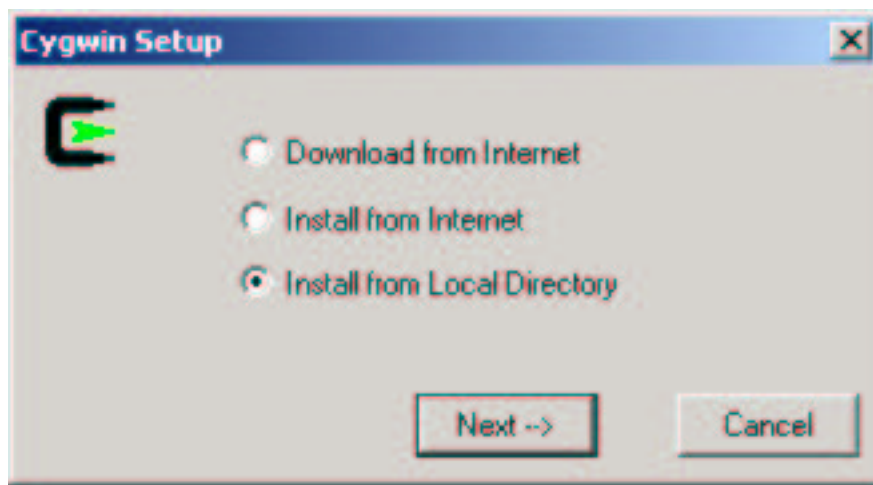
You may install the downloaded Cygwin packages on any number of the machines by simply copying your download directory to that machine, or making the download directory accessible via a network share, and following the installation steps below. The following installation steps assume that you are installing Cygwin on the same machine that you used to download the Cygwin packages.

Follow these steps to install Cygwin:

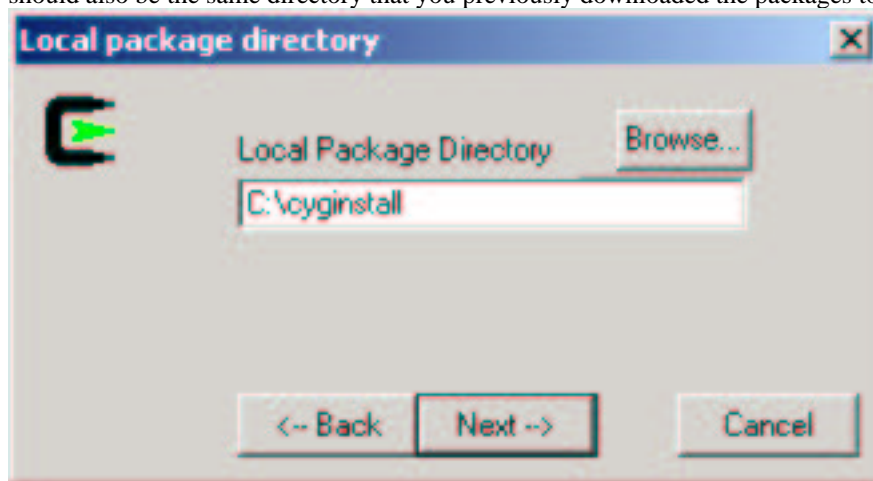
1. Run `setup.exe` from your download directory (e.g. `c:\cyginstall`), you will get the same welcome screen as before:



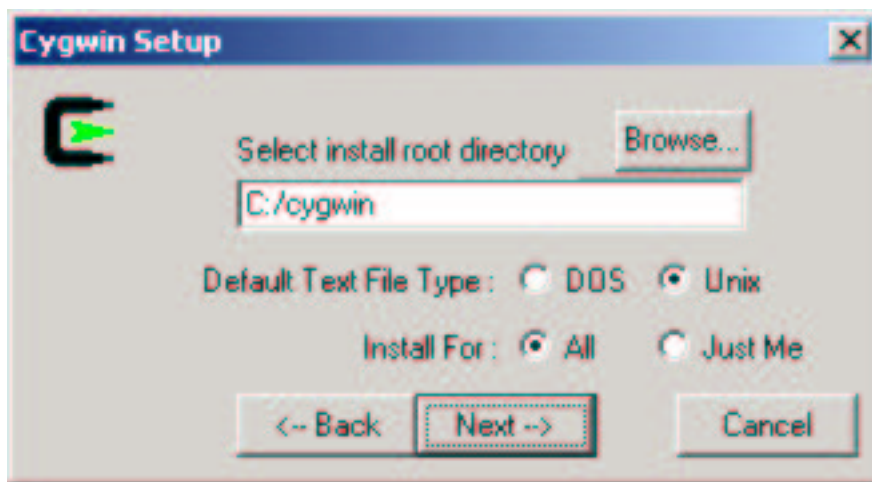
2. Click **Next** to proceed to the next screen
3. Choose **Install from Local Directory**:



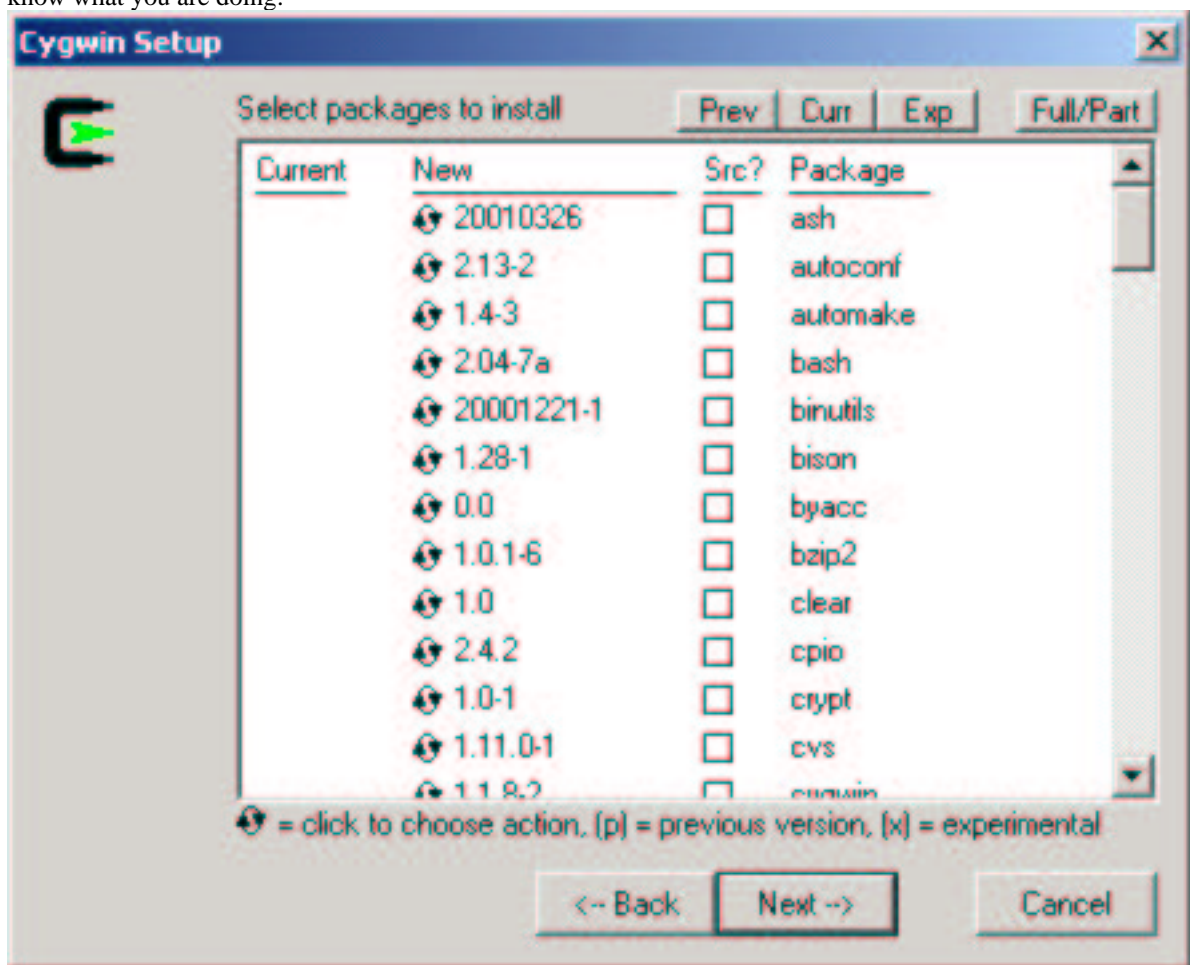
4. Click **Next** to proceed to the next screen
5. Local Package Directory should default to the directory that you ran `setup.exe` from, which should also be the same directory that you previously downloaded the packages to:



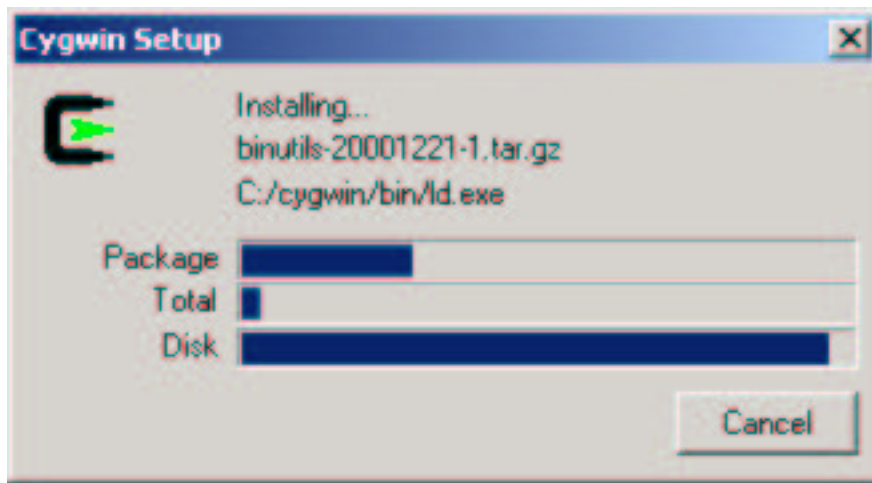
6. Click **Next** to proceed to the next screen
7. The default **Install Root** is `c:\cygwin`; this should be fine for most installations. Leave **Default Text File Type** as **UNIX**. If you have several users on your NT machine, and you are logged in with local administrative privileges, you may wish to set **Install For** to **All**, but the default of **Just Me** will work fine for single user machines.



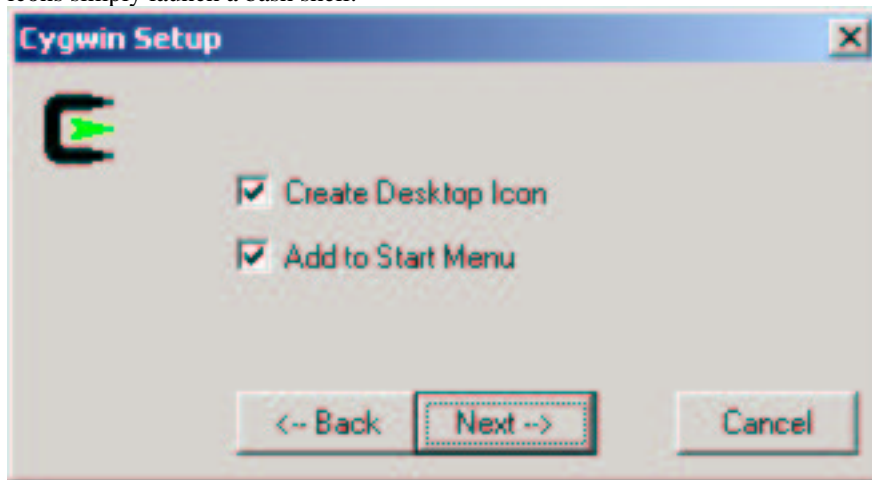
8. Click **Next** to proceed to the next screen
9. All downloaded packages, with an installed size of 175 MB as of 2001-04-19, are selected for installation by default; I do not recommend changing the list of packages to install unless you really know what you are doing:



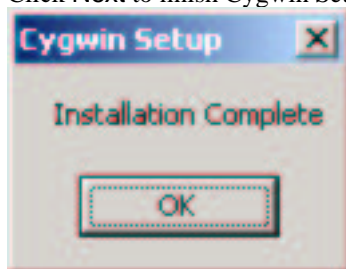
10. Click **Next** to proceed with the installation



11. I highly recommend allowing Cygwin Setup to create Desktop and Start Menu icons for you; these icons simply launch a bash shell:



12. Click Next to finish Cygwin Setup:



## Downloading Cygwin/XFree86

Cygwin/XFree86 is comprised of several binary tarballs.

Follow these steps to download Cygwin/XFree86 binaries:

1. Visit the Cygwin mirrors page (<http://cygwin.com/mirrors.html>) to find your closest mirror
2. The ftp url for your mirror site should take you to the `cygwin/` directory on the mirror
3. Download the following files from `xfree/xc-4-binaries/4.1.0`, saving them to the `tmp` directory in the root of your Cygwin installation directory (e.g. `c:\cygwin`). The full path that you save the files to will look like `c:\cygwin\tmp`. The compressed file size appears after each file; as of 2001-07-01 you will need approximately 30 MB of disk space to download the required files, your download size will vary if you choose to download any optional files.

**Downloading with a Web Browser:** Some web browsers automatically decompress saved files when you use the left mouse button to follow the link to a file; bunzip2 will report, "Data integrity error when decompressing.", when attempting to decompress a file that has been decompressed by your web browser. Prevent your files from being automatically decompressed by clicking the right mouse button on a file link and choosing a command such as Save Target As... or Save Link As... from the context sensitive menu. Better yet, download your files with a stand alone ftp client.

- `extract.exe.bz2` (119 KB; required, used by the installation script)
- `startup-scripts.tgz` (1.4 KB; required, example X Server and client startup scripts)
- `Xbin.tgz` (12.1 MB; required, executables for xterm, twm, etc.)
- `Xdoc.tgz` (35.2 KB; required, formatted documentation)
- `Xetc.tgz` (593 KB; required, configuration files for the X Server and programs in Xbin.tgz)
- `Xf100.tgz` (12.1 MB; optional, 100 dpi fonts (75 dpi fonts are used by default))
- `Xfcyr.tgz` (368 KB; optional, Cyrillic fonts)
- `Xfenc.tgz` (311 KB; required, font encodings)
- `Xfnts.tgz` (13.9 MB; required, 75 dpi fonts)
- `Xfsc1.tgz` (1.6 MB; optional, Speedo and Type1 scalable fonts)
- `Xfsrv.tgz` (248 KB; optional, X Font Server)
- `Xhtml.tgz` (703 KB; optional, documentation html format)
- `Xinstall.sh` (34 KB; required, XFree86 installation script)
- `Xjdoc.tgz` (107 KB; optional, XFree86 Japanese documentation)
- `Xlib.tgz` (95 KB; required, `X11R6/lib/` files)
- `Xman.tgz` (616 KB; required, **man** pages)
- `Xnest.tgz` (1.2 MB; optional, **Xnest** nested X Server)
- `Xprog.tgz` (553 KB; optional, additional files needed to compile programs for Cygwin/XFree86)
- `Xprt.tgz` (846 KB; optional, X Print (Xprt) server)
- `Xps.tgz` (5.9 MB; optional, documentation in Postscript format)
- `Xvfb.tgz` (1.3 MB; optional, X Virtual Frame Buffer (Xvfb) server)

- `xxserv.tgz` (1.3 MB; required, the Cygwin/XFree86 X Server)

4. Download of Cygwin/XFree86 binaries is now complete

## Installing Cygwin/XFree86

Cygwin/XFree86 binaries are installed by the `xinstall.sh` script.

Follow these steps to install Cygwin/XFree86 binaries:

1. Launch your Cygwin environment, using either the icon on your Desktop, the icon in your Start Menu, or by running `cygwin.bat` from your Cygwin directory (e.g. `c:\cygwin`); you should see a window like the following:

```
Harold@MyWindowsHost ~
$
```

2. Change the current directory to the `tmp` directory in your Cygwin root directory:

```
Harold@MyWindowsHost ~
$ cd /tmp

Harold@MyWindowsHost /tmp
$
```

3. Extract the `extract.exe.bz2` archive:

```
Harold@MyWindowsHost /tmp
$ bunzip2 extract.exe.bz2

Harold@MyWindowsHost /tmp
$
```

4. Copy the `extract.exe` file to `/bin`:

```
Harold@MyWindowsHost /tmp
$ cp extract.exe /bin

Harold@MyWindowsHost /tmp
$
```

5. Run the `Xinstall.sh` script. Follow the step-by-step instructions that the script provides:

```
Harold@MyWindowsHost /tmp
$ ./Xinstall.sh
```

```
Welcome to the XFree86 4.1.0 installer
```

You are strongly advised to backup your existing XFree86 installation before proceeding. This includes the /usr/X11R6 and /etc/X11 directories. The installation process will overwrite existing files in those directories, and this may include some configuration files that may have been customised.

If you are installing a version different from 4.1.0, you may need an updated version of this installer script.

Do you wish to continue? (y/n) [n] y

...

```
Harold@MyWindowsHost /tmp
$
```

#### 6. Copy startup-scripts.tgz to /usr/X11R6/bin:

```
Harold@MyWindowsHost /tmp
$ cp startup-scripts.tgz /usr/X11R6/bin
```

```
Harold@MyWindowsHost /tmp
$
```

#### 7. Change the current directory to /usr/X11R6/bin:

```
Harold@MyWindowsHost /tmp
$ cd /usr/X11R6/bin
```

```
Harold@MyWindowsHost /usr/X11R6/bin
$
```

#### 8. Extract startup-scripts.tgz:

```
Harold@MyWindowsHost /usr/X11R6/bin
$ tar -xzf startup-scripts.tgz
```

```
Harold@MyWindowsHost /usr/X11R6/bin
$
```

#### 9. Installation of Cygwin/XFree86 binaries is now complete.



# Chapter 3. Configuring Cygwin/XFree86

## Configuration Overview

Cygwin/XFree86 settings are configured primarily through command-line parameters passed to `xwin.exe`. Cygwin/XFree86 comes with a file called `startxwin.bat` that launches an X Server, a terminal, and a window manager.

## Command Line Parameters

Cygwin/XFree86, by default, runs in windowed mode with the largest window that will fit on your Windows desktop, using the best performing engine that is installed on your system; you do not need to pass any parameters to **XWin.exe** to use the default behavior. Below is the syntax for **XWin.exe** parameters.

### **XWin.exe**

```
[-screen screen_number width height ...]  
[-engine engine_number ]  
[-fullscreen [-depth depth_in_bits_per_pixel ] [-refresh refresh_rate_in_hertz ]]  
[-emulate3buttons timeout_in_milliseconds ]  
[-[no]winkill]  
[-[no]unixkill]
```

Below is an example command line for **XWin.exe**.

```
XWin.exe -screen 0 800 600 -fullscreen -depth 32 -refresh 85  
-emulate3buttons 100 -nowinkill -unixkill
```

# Chapter 4. Using Cygwin/XFree86

## Starting Cygwin/XFree86

There are several methods of starting the Cygwin/XFree86 X Server with a startup script that optionally starts initial clients and loads keyboard modifier maps. Several startup methods are described below.

### startxwin.bat

`startxwin.bat` - Use a MS-DOS batch file as the startup script. An example `startxwin.bat` is included in `startup-scripts.tgz`, which is extracted according to the instructions in the Section called *Installing Cygwin/XFree86* in Chapter 2. Run `/usr/X11R6/bin/startxwin.bat` by double-clicking it in Windows Explorer.

### startxwin.sh

`startxwin.sh` - Use an **sh** shell script as the startup script. An example `startxwin.sh` is included in `startup-scripts.tgz`, which is extracted according to the instructions in the Section called *Installing Cygwin/XFree86* in Chapter 2. Run `/usr/X11R6/bin/startxwin.sh` in a Cygwin shell:

```
Harold@MyWindowsHost ~  
$ sh /usr/X11R6/bin/startxwin.sh
```

### startx

`startx` - Use the standard XFree86 `startx` script with its attendant `~/.xinitrc` configuration file. First you need to create `~/.xinitrc` from the template in `/etc/X11/xinit/`:

```
Harold@MyWindowsHost ~  
$ cp /etc/X11/xinit/xinitrc ~/.xinitrc
```

Now you may customize `~/.xinitrc` and start Cygwin/XFree86 with:

```
Harold@MyWindowsHost ~  
$ cd /usr/X11R6/bin && startx
```

Or, you can run **startx** by first adding `/usr/X11R6/bin/` to the search path:

```
Harold@MyWindowsHost ~  
$ PATH=%PATH:/usr/X11R6/bin
```

```
Harold@MyWindowsHost ~  
$ startx
```

Or, you can run **startx** by first changing directories to `/usr/X11R6/bin/`:

```
Harold@MyWindowsHost ~
$ cd /usr/X11R6/bin

Harold@MyWindowsHost /usr/X11R6/bin
$ startx
```

## Switching Out of Cygwin/XFree86

Press **Alt-Tab** to switch from Cygwin/XFree86 to your Windows desktop or other running Windows applications.

## Stopping Cygwin/XFree86

When you are done running Cygwin/XFree86, press **Alt-F4** to shutdown the X server.

## Remote Sessions via XDMCP

Cygwin/XFree86 can be used login to a remote session using XDMCP (X Display Manager Control Protocol).

Start Cygwin/XFree86 with a command similar to the following to login to a remote session using XDMCP:

```
XWin.exe -screen screen_number widthxheightxdepth -query  
remote_host_ip_address -from local_host_ip_address
```

XDMCP is a complex system; further discussion of XDMCP is beyond the scope of this document.

## Displaying Remote Clients

Displaying remote X clients with Cygwin/XFree86 is nearly identical to displaying remote X clients with any other X Server. Simply follow the commands listed below.

On your Windows machine:

1. Launch Cygwin/XFree86
2. In an X terminal type `/usr/X11R6/bin/xhost remote_host_ip_address`
3. In an X terminal type `/usr/bin/telnet remote_host_ip_address`. Use the explicit path to ensure that Cygwin's telnet is run instead of Microsoft's telnet; Microsoft's telnet will crash on startup when run from Cygwin/XFree86.
4. Login to your remote machine via your telnet session
5. In your telnet session type, `DISPLAY=windows_host_ip_address:0.0`

6. In your telnet session type, **export DISPLAY**
7. In your telnet session type, **xterm&**. This will launch an xterm that should display in your Cygwin/XFree86 screen.
8. Launch other remote clients from the remote xterm window that you just opened; I recommend starting the remote clients in the background, by appending & to the command name, so that you don't have to open several remote xterm's.

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