sor MINIHOWTOHow to use enlarged mouse cursors with the X

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X11−big−cursor MINIHOWTO

How to use enlarged mouse cursors with the X window system

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This document describes how to use enlarged mouse cursors with the X window system.

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1. Introduction

There are several reasons why the standard X mouse cursors are hard to track for some people:

- when running X on a notebook with low contrast LCD
- on normal screens when using high resolution, 1600x1280 e. g.
- for visually impaired persons even on normal hardware

In all cases it might help to use enlarged mouse cursors. Ideally this job should be done by a single X program that automatically enlarges every mouse cursor.

To my knowledge there is no simple way to write a utility like this, because the X protocol has no provision

to query mouse cursors. For more details see section Technical discussion below.

If we aim for a less general goal, though, something can be done:

There is a set of standard mouse cursors that can be found in the cursor font (try `xfd −fn cursor` to look at it). Most programs use these mouse cursors and the key idea is to replace the standard cursor font with an enlarged version.

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2. About this document

The motivation for this MINIHOWTO was a visually impaired co−student who asked me how to enlarge the mouse cursor under X. After I found out how this can be done, I wrote an initial version of this document. The knowledge about the method described here does not seem to be common, so I decided to share it and submitted this document as a Linux MINIHOWTO, despite the fact that it is *not specific to Linux at all*. As all other MINIHOWTOs it can be found in the home of of the Linux Documentation Project (LDP).

The master of this document is maintained in the SGML/linuxdoc format. This makes it possible to automatically provide versions in the following formats (which can be found in the same place as the master): html, text, LaTeX, DVI, PostScript, GNU info.

Shinobu Miyata has done a Japanese translation of this MINIHOWTO. It can be found in http://i11www.ira.uka.de/~schneid/jp/X11−big−cursor/.

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3. How to do it

Follow the steps detailed below. If you don't want to get and compile the bdfresize package yourself, you can skip to step 3 and download a magnified font instead of creating it.

1. get cursor.bdf, the source of the cursor font, from some X distribution, e. g. from ftp://ftp.x.org/pub/R6.3/xc/fonts/bdf/misc/cursor.bdf (if you don't find it there try an archie search or get it from my copy).
2. get, compile and install the bdfresize package from ftp://ftp.cs.titech.ac.jp/X11/contrib/Local/bdfresize−1.4.tar.Z (or from my copy):

   ```
   zcat bdfresize−1.4.tar.Z  | tar xf −
   cd bdfresize−1.4
   xmkmf
   make
   ```

   On Linux you probably have to use:

   ```
   make CCOPTIONS='−include /usr/include/bsd/bsd.h' clean all
   ```

3. create a directory and install a magnified cursor font in it (magnification factor 2 in this example):

   ```
   mkdir $HOME/fonts
   bdfresize −f 2 cursor.bdf | bdftopcf >$HOME/fonts/cursor2.pcf
   mkfontdir $HOME/fonts
   ```

I have prepared some cursor fonts with the following magnification factors: 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8 and 16. You can download one of them an copy it to `$HOME/fonts` if you don't want to use bdfresize.

4. modify your `.xinitrc` or `.xsession` file: before any X client (that uses cursors) is started the following commands must be executed:
```
xset +fp $HOME/fonts
xsetroot −cursor_name X_cursor
```

5. leave your X session and restart.

That's itnow all mouse cursors should have doubled in size.

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4. Notes and limitations

- X servers may have a limit for the maximum cursor size, especially if they use a hardware implementation for the mouse cursor. Others do not have such a limit. E. g. XF86_S3 3.3 works even with a 512x512 mouse cursor (rather slowly).
- The magnified cursor font must have the same name as the original font (the *font name* must be `cursor`, *file name* does not matter)that is no problem as `bdfresize` does not change the font name.
- The directory with the new cursor font must be placed before the directory with the standard cursor font in the the font paththis is accomplished with `xset +fp` (as opposed to `xset fp+`).
- Changes in `$HOME/fonts/` will be visible only after the command `mkfontdir $HOME/fonts; xset fp rehash` and only in newly started X clients (more exactly: for newly created cursors).
- `xset +fp path` may not work on a X−Terminal. In this case a font server (see the section How to use a fontserver) can be used if supported by the X−Terminal or some other method to install the font on the X−Terminal (this can generally only be done by your system administrator).
- The same approach can be used for `olcursor` and `decw$cursor` fonts and any other cursor font you may encounter.
- Cursor fonts produced by bdfresize don't look smooth, especially at larger magnification factors. It would be nice if someone could create better looking handcrafted version at some common sizes.

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5. Technical discussion

Is it possible to write a X program that enlarges cursors automatically?

(Partial) solution 1

Use the XTestCompareCursor from the XTEST extension. For all windows that the mouse pointer enters compare the cursor of this window with a set of `known' cursors (e. g. from the cursor font). If the cursor is found, replace it with an enlarged version, otherwise either leave it alone or substitute a standard cursor. This will only work where the XTest extension is available.

Solution 2

Write a proxy X server that relays all client requests unchanged to the real X server, except that it intercepts all requests corresponing to the `XCreate*Cursor` Xlib functions. `XCreate*Cursor` requests should be modified to use an enlarged cursor.

This proxy server simulates a new display, e. g. `:1`. All clients that connect to this display (e. g. `xterm −display :1`) are displayed on the real server (normally `:0`) and their mouse cursors are enlarged automatically. The mouse cursors of clients that connect to `:0` will remain *unchanged*.

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6. Other ideas how to make the mouse cursor more visible

Here are some ideas for rather simple X programs that might make mouse cursors easier to track.

- When a hot key is pressed display something (big cursor, small window, shaped window) at pointer position for 0.5s.
- use XRecolorCursor to change the mouse cursor color every 0.1s

A more demanding project would be **mouse trails** à la windoze, i. e. when the mouse is moved and the mouse cursor needs to be drawn in a different position, then the old mouse cursor does not disappear at once, but after a short delay. Mouse trails would be probably best implemented in a X server, but it might be feasible to do it as a X client, or better as a proxy server (see section Technical discussion for details).

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7. Related info

7.1 How to use a font server

A font server is a net service that provides a set of X11 fonts with a simple protocol. It can be queried which fonts it provides and will supply the font bitmap data on request.

You might want to use a font server to provide the X server with a modified cursor font, instead of telling it where to find the font on the file system.

This method is especially handy if you use several machines that don't share a common file system or if you use X terminals that support the font server protocol.

A font server program and associated tools comes with the X11R5+ distribution (AFAIK).

Setting up a font server

Read the manual pages *fs(1)*, *fslsfonts(1)* (or *xfs(1)*, *xfslsfonts(1)* under X11R6) and try itit isn't hard. Say, you are running the server on host `some.host.edu` on port 7100. You can test the setup with the command

```
fslsfonts −server some.host.edu:7100
```

To actually use the server issue the command

```
xset +fp tcp/some.host.edu:7100
```

which should return without an error message.

7.2 How to get the bdf source for some font

If you have set up a font server simply use `fstobdf` which comes with the font server.

Alternatively you may try `getbdf` which can dump any installed X11 font to a bdf file.
