Information for ISC Users

Michael Rohleder

05 March 2000

1. X11R6/XFree86 on Interactive Unix

This document provides some additional information about compiling and using X11R6 and XFree86 on your Interactive Unix, also referred to as ISC.

If you have any suggestions, comments, fixes or ideas regarding X11R6/XFree86 on Interactive Unix, send e-mail to

<michael.rohleder@stadt-frankfurt.de>

Bug Reports should be sent to

<XFree86@XFree86.Org>

Questions or anything else should be posted to the NewsGroup

comp.windows.x.i386unix

There is currently no support for shared Libraries so it will be filespace consuming if you want to build X11-clients with X11R6. Best you mix X11R6 Server with X11R5 and X11R4 clients. And only compile clients who need the new facilities provided in the X11R6 Libraries against them.

```
Please note:
       XFree86 Version 4.0 will be the last version which is known
       to compile on Interactive Unix.
       I've only tested this version on Interactive Unix, Version 4.1mu.
```

2. Things needed for compiling the sources

gcc

Use the highest number for x you found. Fresco will only build 2.6.3 and later. I'd tried gcc Version 2.5.8, 2.6.0, 2.6.2, 2.6.3 and 2.7.2. Current: 2.8.1

Since 2.6.3 the current source tree should be able to compile with a little bit more Optimization:
`#define DefaultCDebugFlags -O3 -fomit-frame-pointer` inside xf86site.def to overwrite the default -O2.

With 2.7.x you must specify `#define UsePosix YES` inside xf86site.def. This is necessary to build the sources successfully. Versions prior to 2.7.0 could define it, but don't need it for a clean build.

With 2.8.1 on Pentium CPU we can use special 586 Optimization. Try the following define inside your host.def.

```
#define DefaultGcc2i386Opt  \
          -O2 -march=pentium -mpentium -Wall -Wno-implicit-int \
          -fno-strength-reduce
/* default with 2.8.1, so not really needed
   -malign-loops=2 -malign-jumps=2 -malign-functions=2
*/
```

libg++-2.x.x
: The needed g++ Libraries for use with g++ 2.x.x. As this is only necessary for Fresco, it isn't needed anymore since X11R6.1.

binutils
: You could use the assembler and linker the assembler is most preferred,and the linker is needed at least if you want to link libFresco.a within a Program. Don't use strip and ar/ranlib, the first generates buggy binaries when stripping (at least on my machines) and the last requires the use of ranlib after creating an archive, this is not configured. Current: 2.8.1.0.15 (Used: as, ld, ar, strip)

gnu-malloc
: Due to better memory usage we should use GNU's malloc library on systems where possible.

  Enable `#define UseGnuMalloc YES` inside xf86site.def or within the Linkkit site.def.

  Enable and set `#define GnuMallocLibrary` to your needs, if it isn't like the default `-L/usr/local/lib -lgmalloc`.

inline-math (optional)
: This is the "original" inline-math package available at your favorite Linux Mirror.

  Use `#define UseInlineMath YES` inside host.def to enable it. Please note the changes section what else to do, to use this package.

3. Changes to the System Header Files

You have to change some of the standard header files supplied with your version of Interactive. You also need to change some of the include files in the gcc-lib/include directory.

Let us say the gcc-files are in directory

`/usr/local/lib/gcc-lib/i[345]86-isc[34].[0-9]/2.6.x`

referred to as `"gcc-lib"`

3.1 /usr/include/sys/limits.h

and `gcc-lib/include/sys/limits.h`

```
#ifndef OPEN_MAX
#ifdef ISC
#define OPEN_MAX        256
#else
#define OPEN_MAX        20
#endif
#endif
```

`OPEN_MAX` had to be increased to prevent Xlib Errors (max no. of clients reached).

3.2 /usr/include/sys/ioctl.h

surrounded by

```
#ifndef _IOCTL_H
#define _IOCTL_H
...
#endif
```

to prevent multiple includes.

3.3 /usr/include/errno.h

(and the corresponding gcc-include-file) add

```
#include <net/errno.h>
```

because of **EWOULDBLOCK** undefined in several places regarding lbx. Surround `/usr/include/net/errno.h` with

```
#ifndef _NET_ERRNO_H
#define _NET_ERRNO_H
...
#endif
```

to prevent multiple includes were `<net/errno.h>` is explicit included from the sources.

3.4 /usr/include/rpc/types.h

copy this file to `gcc-lib/include/rpc/types.h` and change the declaration of **malloc()** to

```
#if !defined(__cplusplus)
extern char *malloc();
#endif
```

Note that this is only necessary if you want to build Fresco

3.5 /usr/include/sys/un.h

such a file does not exist on Interactive. You may like to generate it, if you don't like a warning from depend. It isn't needed to compile the sources successfully.

You could use the following to produce it:

```
#ifndef X_NO_SYS_UN
struct  sockaddr_un {
        short   sun_family;             /* AF_UNIX */
        char    sun_path[108];          /* path name (gag) */
};
#endif
```

3.6 /usr/include/math.h

To use the Inline Math package you have to change your existing math.h. Please note, the way I include the new Header file, is different than suggested in inline-math's README.

Please add the following at the bottom of math.h, before the last #endif

```
#if defined(UseInlineMath)

/* Needed on ISC __CONCAT, PI */
#ifndef __CONCAT
/*
 * The __CONCAT macro is used to concatenate parts of symbol names, e.g.
 * with "#define OLD(foo) __CONCAT(old,foo)", OLD(foo) produces oldfoo.
 * The __CONCAT macro is a bit tricky -- make sure you don't put spaces
 * in between its arguments.  __CONCAT can also concatenate double-quoted
 * strings produced by the __STRING macro, but this only works with ANSI C.
 */
#if defined(__STDC__) || defined(__cplusplus)
#define __CONCAT(x,y)   x ## y
#define __STRING(x)     #x
#else   /* !(__STDC__ || __cplusplus) */
#define __CONCAT(x,y)   x/**/y
#define __STRING(x)     "x"
#endif  /* !(__STDC__ || __cplusplus) */
#endif

#ifndef PI
#define PI M_PI
#endif

#include "/usr/local/include/i386/__math.h"
#endif
```

4. make World

`BOOTSTRAPCFLAGS="-DISC [-DISC30 | -DISC40] -DSYSV [-Di386]"`

-DISC -DISC30
: these two defines are necessary to build the release I don't know if the build will succeed for ISC versions prior than 3.x

-DISC40
: are only for getting the ISC version and therefore set the HasSymLinks to Yes ('cause symbolic linking were only supported from Version 4.x using the S5L Filesystem)

  If you could use long filenames, you could enable the installation of expanded Manual Pages by including
  `#define ExpandManNames YES` inside xf86site.def.

  A build on ISC 4.x only needs -DISC40 defined in the BOOTSTRAPCFLAGS (-DISC30 will be included automatically).

  Note: due to some incompatibilities between ISC 4.0 and 4.1, the default is to build for ISC4.0, even if you build on 4.1. If you want to build only for 4.1 you should set `#define IscCompileVersion        410` inside your host.def.

  (the fchmod function isn't available on 4.0, so it won't compile, and binaries from 4.1 won't run cause of the unsupported System call The libraries build for 4.1 couldn't be used with 4.0 Systems, due to some functions not available on 4.0)

-DSYSV [-Di386]
: standard defines for SystemV Release3 on x86 platform. You don't need to explicitly define -Di386 because this is pre-defined in /lib/cpp.

5. linear Addressing

- Compiling ...

  You need the mmap-2.2.3 driver installed on your system. If you don't have the mmap-2.2.3 driver installed, you could use the driver source in the file

  ```
  xc/programs/Xserver/hw/xfree86/etc/mmapSVR3.shar
  ```

  or

  ```
  /usr/X11R6/lib/X11/etc/mmapSVR3.shar
  ```

  Build and install the driver as instructed. You'll need the file /usr/include/sys/mmap.h for compiling the X11R6/XFree86 source tree, with linear addressing enabled.

  ```
  The new loadable X Server is not tested to work without linear addressing.
  ```

- Using ...

  To use the linear address-mapping of the framebuffer you need the mmap Driver by Thomas Wolfram (Version 2.2.3) installed in your Kernel. If you have installed it, most servers will use linear addressing by default. Others may require setting the

  ```
  Option "linear"
  ```

  in your XF86Config. Check the appropriate manual pages for details. Maybe you need also the MemBase specified in XF86Config. Please refer to the appropriate README of your Card/Server, for **How to use...**

  I could only test these cards on Interactive UNIX

  - Spea/V7 Vega - clgd5428 - VLB - (old)

    with 32MB MainMemory installed I couldn't use it. My tests with different mappings into the address space results in no Graphics displayed or a spontaneous reboot.

  - ATI GUP - mach32 - VLB - (old)

    with 32MB MainMemory installed I could map the CardMemory at MemBase 0x07c00000. I could work with all clients until I try to activate a Motif 1.1.1 InputField inside a Motif Client like Mosaic-2.4 or xplan. This results in a crash of the XServer.

    ```
    !!! You could work around this !!!
    ```

    Expand your .Xdefaults with

    ```
    *blinkRate:                0
    *cursorPositionVisible:    false
    ```

    This bug seems to be fixed since 3.1.2, and therefore the workaround is not needed anymore.

  - ELSA Winner 2000PRO/X Revision G

    if you experience a Problem with this Card you could try to use the older Chipset Driver instead "newmmio".

    If you declare

```
Chipset "mmio_928"
```

inside your XF86Config, it may be alright again.

With the current XF86_S3 I don't encounter any problem.

- Diamond FireGL 1000

```
3Dlabs GLINT Permedia rev 1
3Dlabs GLINT Delta rev 1
```

6. Multibuffer Extension

This is an obsolete Extension. Anyway, if you want to include this Extension inside your build, you have to add: `#define BuildMultibuffer          YES` inside xf86site.def Please note, this Extension should be disabled when building the Loader Server.

7. Default Definitions

These are default options defined inside isc.cf. You can redefine them inside host.def.

Here is a sample host.def (the one I use for XFree86 4.0):

```
/* Disable the use of /var/X11  and /etc/X11 */
#define HasVarDirectory         NO
#define UseEtcX11               NO

/* Use inline Math from linux ;-) package inline-math-2.6.tar.gz */
/* should be available on your favorite linux ftp                */
# define UseInlineMath        YES

/* Use cbrt from liboptm.a (Interactive icc Compiler) */
# define HasCbrt              YES

/* Use GNUs MallocLibrary (and the Location for the Lib)             */
# define UseGnuMalloc         YES

/* Expand Manual Pages (needs S5L)                                   */
# define ExpandManNames               YES

/* if you have groff or the TextProcessingWorkbench - don't preformat*/
# define FormattedManPages      NO

/* XF86Setup Util */
# define HasTk                YES
# define HasTcl                       YES

/* use doctools */
# define HasSgmlFmt             YES
# define BuildAllDocs            YES
# define BuildLinuxDocText       NO
# define BuildLinuxDocPS         NO

#define GlxBuiltInMesa         YES
```

8. Installation

After your **make World BOOTSTRAPCFLAGS="...** succeed,

```
make install
```

to install in /usr/X11R6. Make sure you have enough space, and /usr/X11R6 exists either as a directory or a symlink to another directory maybe in another filesystem.

```
make install.man
```

to install the compressed nroff versions of the manual pages into /usr/X11R6/man. This directory will be generated if it doesn't exist.

```
You should tune the Kernel using the command-file

/usr/X11R6/lib/X11/etc/xf86install

This will increase the available pseudo devices,
some Tunable Parameters and install some files
to use inside sysadm. You could also install
some additional Fonts and Terminal files.
```

This is now a menu driven config tool for XFree86 on IUS For the first setup you should go from 1 to x step by step. Here is its main screen

```
X11R6 XFree86 Version (version)
--------------------------------------------------------------------------------



                    Check dependencies:                  1
                    Make XFree86 Label                   2
                    Install Remove script                3
                    Setup node.d + sdevice.d Files       4
                    Tune Kernel Variables                5
                    Tune PseudoTerminals                 6
                    Install xterm terminal entries       7
                    Install VGA font                     8
                    Save current KernelConfig            9

                    Exit                                 X


Your Choice [1-9]?<enter>:
```

You also should increase MAXUMEM to its maximum, else programs may die with:

```
X Error of failed request:  BadAlloc (insufficient resources for operation)
  Major opcode of failed request:  53 (X_CreatePixmap)
  Serial number of failed request:  37791
  Current serial number in output stream:  37822
  Widget hierarchy of resource: unknown
```

You could do this automatically with menu entry no. 5.

9. Using ...

- Xprt:

  The new Xprint Server is configured to use lpr as its print helper so you have to install and configure lpr to use Xprt.

- xpcterm:

  if you want to get the German 'Umlaut' inside your ISC X11R4 client xpcterm when you are using the ega/vga font. Set up the user's .Xdefaults to contain:

```
XEga*AT386.Translations: #override \
          Shift<Key>odiaeresis: string(0x99) \n\
               <Key>odiaeresis: string(0x94) \n\
          Shift<Key>adiaeresis: string(0x8e) \n\
               <Key>adiaeresis: string(0x84) \n\
          Shift<Key>udiaeresis: string(0x9a) \n\
               <Key>udiaeresis: string(0x81) \n\
          Shift<Key>ssharp: string(0x3f) \n\
           Meta<Key>ssharp: string(0x5c)  \n\
               <Key>ssharp: string(0xe1)
```

The only disadvantage is that you have to use `Alt` instead of `AltGr` to get the \ Backslash (on a German Keyboard)

You have to call your xpcterm with the option `-name XEga -fn ega`

- Switching between X11R5 and X11R6 configuration

  to compile X11-Clients as either R6 or R5 clients, should be as easy as you only switch the PATH components so that either `/usr/X11R6/bin/xmkmf` or `/usr/X386/bin/xmkmf` would make the new Makefile.

- ISC Streams Pipes

  The old path to the pipes on ISC's R4 `/tmp/.X11-unix` has changed to `/dev/X/ISC-CONN`. For compatibility reasons on ISC, the pipes in the new directory will be linked to a file inside the old. This will normally be a hard link, so it can't go across filesystems. On ISC Version 4.x this is now allowed. But you should use the new S5L on both filesystems. ISC30 systems should take care that the two directories are on the same FS. Else if you are using a ISC40 compiled binary, the Server could maybe abort due to a SIGSYS. We tried to catch this signal, so if it dumps please send me a note.

- Warnings you may see:

  - Since 3.2A, you could see a warning from pre X11R6.3 clients.

    ```
    Warning: Unable to load any usable fontset
    ```

    The case are the new gzipped fonts, but the Warning isn't serious.

  - If you start a server you may see the following message:

    ```
    _XSERVTransOpen: transport open failed for named/enigma:0
    _XSERVTransMakeAllCOTSServerListeners: failed to open listener for named
    ```

    This message either isn't critical. Interactive doesn't support this kind of connection.

10. Acknowledgements

All thanks should go to the members of the **XFree86 Team** for their great work and the **X Consortium** for their Public Release of X11R6, as to all who contribute to this excellent piece of free software.

CONTENTS

`$XFree86: xc/programs/Xserver/hw/xfree86/doc/sgml/isc.sgml,v 3.24 2000/03/06 22:59:25 dawes Exp $`