Release Notes for X11R6.9 and X11R7.0

The X.Org Foundation
The XFree86 Project, Inc.

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Abstract

These release notes contains information about features and their status in the X.Org Foundation X11R6.9/X11R7.0 release. It is based on the XFree86 4.4RC2 RELNOTES document published by The XFree86™ Project, Inc. There are significant updates and differences in the X.Org release as noted below.

1. Introduction to the X11R6.9/X11R7.0 Release

This release constitutes the first major version release of the X Window System in over a decade. The main reasons for the major version bump from 6 to 7 is that we have moved from what has traditionally been a source codebase comprised of many different components brought together into a single monolithic tree to a source codebase where each of those same components found in the monolithic tree are now split into logical modules that can be developed, built and maintained separately, but still fit together coherently into the larger project. At the same time, we have moved away from the imake build system to an autotools build system. By making these changes we have opened the source code up to a new generation of developers that can continue to build upon the long tradition of the X Window System.

The reason for having simultaneous releases for both the monolithic and modular trees is to allow for a transition period as developers, builders and vendors incorporate the significant changes to how the tree is built and developed into their products and to allow time for additional platforms to be supported the modular tree. This initial modular release has support for Linux and Solaris. During the transition period, we expect both the monolithic and modular trees to coexist. For the monolithic tree, we expect that there will be maintenance releases in the X11R6.8.x and X11R6.9.x series as needed. However, the main development effort will move over to the new modular tree.

The X11R7.0 release is the first in the modular series. One of the advantages of the modular tree is that it allows for more rapid and independent updates of module components, so full maintenance releases will no longer be required for simple bug fixes. Rather, each module component maintainer can prepare new releases as needed. These module component releases will then be periodically "rolled up" into official X.Org Foundation releases. The next official release will be X11R7.1 and is expected in mid 2006.

For more information on the modularization effort see the Modularization Proposal `<URL:http://wiki.x.org/wiki/ModularizationProposal>`, and for help with how to build and develop in the new modular tree see Modular Developer's Guide `<URL:http://wiki.x.org/wiki/ModularDevelopersGuide>`.

We encourage you to submit bug fixes and enhancements to freedesktop.org's bug tracking system `<URL:https://bugs.freedesktop.org/>` using the xorg product, and to discuss them on <xorg@lists.freedesktop.org>.

The release numbering is based on the original MIT X numbering system. X11 refers to the version of the network protocol that the X Window system is based on: Version 11 was first released in 1988 and has been stable for 17 years, with only upward compatible additions to the core X protocol, a record of stability envied in computing. Formal releases of X started with X version 9 from MIT; the first commercial X products were based on X version 10. The MIT X Consortium and its successors, the X Consortium, the Open Group X Project Team, and the X.Org Group released versions X11R3 through X11R6.6, before the founding of the X.Org Foundation in early 2004.

The next section describes what is new in the latest version (6.9/7.0) compared with the previous full release (6.8). The other sections below describe some of the new features and changes between 3.3.x and 4.0. There are lots of new features, and we definitely don't have enough space to cover them all here.

2. Summary of new features in X11R6.9 and X11R7.0

This is a sampling of the new features in X11R6.9/X11R7.0. A more complete list of changes can be found in the ChangeLog file that is part of the X source tree.

- EXA support included

  EXA is a new accleration architecture to replace XAA, the current architecture. It is largely based upon KAA in KDrive, and is far more efficient at accelerating typical workloads on modern hardware, particularly involving the RENDER extension.

- FreeType was updated to version 2.1.9. But installing FreeType from X distributions would often or usually result in the replacement or use of "stale" versions of FreeType. On Linux, FreeBSD, Solaris 10, and SCO5, therefore, X11R6.9 will by default use the version of FreeType2 that is installed on the system. If your system doesn't come with an installed FreeType2 and you wish to use the version supplied with this distribution, please add:

  #define HasFreetype2 NO

  to config/cf/host.def.

- Updated Mesa and DRI from upstream sources
  - More OpenGL extensions
  - Support for Radeon r3xx/r4xx and PCI-Express chips
  - Support for mixed 32-bit and 64-bit clients on 64-bit machines.

- Individual extensions may be enabled or disabled on the command line using the -extension flag
- Improved chipset probing for IA64
- SecureRPC enabled on Linux by default
- Updated XRX support
- Fixes to rootless mode for Cygwin and Darwin ports
- Numerous K&R-to-ANSI C conversions

- Many Darwin fixes
- Updated XvMC support, enabling generic loading of hardware-specific drivers
- Added wsfb video driver for OpenBSD and NetBSD framebuffer consoles
- Numerous ATI driver updates from the GATOS project, including TV input support
- Improved ProPolice support
- Improved module loader support for Alpha chips
- Added mingw port for native Win32 builds
- Updated PCI scanning
- Experimental DRI support for Radeon 9500 and above
- Updated xterm to #207 from Thomas Dickey's xterm project `<URL:http://dickey.his.com/xterm/xterm.html>`
- Added evdev input driver for generic input handling on Linux
- Switched to libdl-based module loader
- MMX blending routines for the Render extension
- Initial support for running the Xorg server without root privileges
- Add DragonFly BSD support
- SGI Altix support
- Support for FreeBSD/powerpc
- Enhanced software Render core
- Support for more than 12 buttons in the generic mouse driver
- Better support for DRI on 64-bit platforms
- Solaris support updates:
    - enhanced mouse driver
    - agpgart support
    - experimental AMD64 support
    - kbd support
    - /dev/audio keyboard bell option
- Output-only windows
- Non-rectangular mergedfb desktops
- Update bundled fontconfig to 2.3.2
- Added gradient, solid fill, and convolution filter operations to Render
- Support for XGI chipsets in SiS video driver
- Xft updated to 2.1.7
- Include stack backtraces in logfiles when server crashes on glibc and Solaris systems
- Multiseat support

- xload made compatible with 64-bit kernels on Solaris
- Bundled Mesa upgraded to 6.4.1
- CAN-2005-2495 security fixes
- Shared libraries now built for libXau and libXdmcp
- GNU/kFreeBSD support

2.1 Updated keyboard mappings

The requirement for XKB data can, in the modular tree, be satisfied either by the traditional data set (the 'xkbdata' module), or by the dataset from the xkeyboard-config project (the 'xkbdesc' module). xkbdesc has numerous improvements relative to xkbdata: layouts have been cleaned up for consistency and universal multi-layout support, some new layouts have added, and some layouts have changed names to be more straightforward and ISO compliant. Some setups will need adjustments in order to use xkbdesc.

2.2 New loader mechanism

The loader now uses the standard libdl-based loader, instead of implementing its own ELF loading and parsing mechanism. This extends loadable server support to many platforms where it was not previously possible, such as MIPS, Motorola 68000, HP PA/RISC, et al. The core loader itself has also been significantly optimised.

2.3 Video driver enhancements

- SiS driver updates include
    - Support for EXA acceleration
    - Support for non-rectangular MergedFB, including RandR
    - Support for XGI chipsets
- New sisusb driver for USB-attached video
- ATI driver updates
    - Mach64 TV out support
- Rage 128 driver updates
    - Added dualhead support
- Radeon driver updates
    - Support for non-rectangular MergedFB
    - Support for EXA acceleration
    - Full 3D support for r3xx/r4xx series, and PCI-Express
    - Support for RN50/ES1000 chips
    - VIVO support merged from the GATOS project
    - Hostdata blit support for Xv videos and RENDER images
    - BIOS hotkey support
    - Tiled framebuffer support
- MGA driver updates

    - New BIOS parsing
- i810 driver updates
    - i915GM, i945G and E7221 support
    - Linux power management support (ACPI)
    - BIOS hotkey support
    - ShadowFB support
    - Improved DDC support
- SunFFB driver updates
    - XAA acceleration
- Savage driver updates
    - Support for PCI Savages
    - Added dualhead and DRI support
- Newport driver updates
    - XAA acceleration
- VIA driver updates
    - Unichrome Pro support
    - DRI support
- NV driver updates
    - DPMS support for GeForce4 and greater laptops
- VMWare driver updates
    - RandR support

3. Drivers

3.1 Video Drivers

X11R6.9/X11R7.0 includes the following video drivers:

Drivers marked with (*) are present in a preliminary form in this release, but are not complete and/or stable yet.

Drivers marked with (+) are for Linux/Sparc only.

Drivers marked with (-) are for Linux/mips only.

Darwin/Mac OS X uses IOKit drivers and does not use the module loader drivers listed above. Further information can be found in README.Darwin.

3.2 Input Drivers

X11R6.9/X11R7.0 includes the following input drivers:

Drivers marked with (*) are available for Linux only.

Drivers marked with (-) are available for X11R6.9 only.

Driver Name	Description	Further Information
apm	Alliance Pro Motion	README.apm
ark	Ark Logic	
ati	ATI	README.ati, README.r128, r128(4), radeon(4)
chips	Chips & Technologies	README.chips, chips(4)
cirrus	Cirrus Logic	
cyrix (*)	Cyrix MediaGX	README.cyrix
fbdev	Linux framebuffer device	fbdev(4)
glide	Glide2x (3Dfx)	glide(4)
glint	3Dlabs, TI	glint(4)
i128	Number Nine	README.I128, i128(4)
i740	Intel i740	README.i740
i810	Intel i8xx	README.i810, i810(4)
imstt	Integrated Micro Solns	
mga	Matrox	mga(4)
neomagic	NeoMagic	neomagic(4)
newport (-)	SGI Newport	README.newport, newport(4)
nsc	National Semiconductor	nsc(4)
nv	NVIDIA	nv(4)
rendition	Rendition	README.rendition, rendition(4)
s3	S3 (not ViRGE or Savage)	
s3virge	S3 ViRGE	README.s3virge, s3virge(4)
savage	S3 Savage	savage(4)
siliconmotion	Silicon Motion	siliconmotion(4)
sis	SiS	README.SiS, sis(4)
sisusb	SiS USB	sisusb(4)
sunbw2 (+)	Sun bw2	
suncg14 (+)	Sun cg14	
suncg3 (+)	Sun cg3	
suncg6 (+)	Sun GX and Turbo GX	
sunffb (+)	Sun Creator/3D, Elite 3D	
sunleo (+)	Sun Leo (ZX)	
suntcx (+)	Sun TCX	
tdfx	3Dfx	tdfx(4)
tga	DEC TGA	README.DECtga
trident	Trident	trident(4)
tseng	Tseng Labs	
vesa	VESA	vesa(4)
vga	Generic VGA	vga(4)
via	VIA	via(4)
vmware	VMware guest OS	vmware(4)

4. Overview of X11R6.9 and X11R7.0

On most platforms, X11R6.9/X11R7.0 has a single X server binary called `Xorg`. This binary can either have one or more video and input drivers linked in statically, or more usually, dynamically, and in that manner load the video drivers, input drivers, and other modules that are needed.

X11R6.9 has X server support for most UNIX® and UNIX-like operating systems on Intel/x86 platforms, plus support for Linux and some BSD OSs on Alpha, PowerPC, IA-64, AMD64, Sparc, and Mips platforms, and for Darwin on PowerPC. X11R7.0 has X server currently has support for Linux and Solaris, and is expected to have other platform support in X11R7.1.

Driver Name	Description	Further Information
aiptek(*)	Aiptek USB tablet	aiptek(4)
calcomp	Calcomp	
citron	Citron	citron(4)
digitaledge	DigitalEdge	
dmc	DMC	dmc(4)
dynapro	Dynapro	
elographics	EloGraphics	
evdev(*)	EvDev	
fpit	Fujitsu Stylistic Tablet PCs	fpit(4)
hyperpen	Aiptek HyperPen 6000	
js_x	JamStudio pentablet	js_x(4)
kbd	generic keyboards (alternate)	kbd(4)
keyboard	generic keyboards	keyboard(4)
microtouch	MicroTouch	
mouse	most mouse devices	mouse(4)
mutouch	MicroTouch	
palmax	Palmax PD1000/PD1100	palmax(4)
penmount	PenMount	
spaceorb	SpaceOrb	
summa	SummaGraphics	
tek4957	Tektronix 4957 tablet	tek4957(4)
ur98(*)	Union Reality UR-F98 headtracker	ur98(4)
void	dummy device	void(4)
wacom(-)	Wacom tablets	wacom(4)

4.1 Loader and Modules

The X server has a built-in run-time loader, which can load normal object files and libraries in most of the commonly used formats. The loader does not rely on an operating system's native dynamic loader support and it works on platforms that do not provide this feature. This allows for the modules to be operating system independent (although not, of course, CPU architecture independent) which means that a module compiled on Linux/x86 can be loaded by an X server running on Solaris/x86, or FreeBSD, or even OS/2.

A main benefit of this, is that when modules are updated, they do not need to be recompiled for every different operating system. The loader in version 6.9/7.0 has support for Intel (x86), Alpha and PowerPC platforms. It also has preliminary support for Sparc platforms.

The X server makes use of modules for video drivers, X server extensions, font rasterisers, input device drivers, framebuffer layers (like mfb, cfb, etc), and internal components used by some drivers (like XAA),

The module interfaces (both API and ABI) used in this release are subject to change without notice. While we will attempt to provide backward compatibility for the module interfaces as of the 4.0 release (meaning that 4.0 modules will work with future core X server binaries), we cannot guarantee this. Compatibility in the other direction is explicitly not guaranteed because new modules may rely on interfaces added in new releases.

Note about module security

> The X server runs with root privileges, i.e., the X server loadable modules also run with these privileges. For this reason we recommend that all users be careful to only use loadable modules from reliable sources, otherwise the introduction of viruses and contaminated code can occur and wreak havoc on your system. We hope to have a mechanism for signing/verifying the modules that we provide available in a future release.

4.2 Configuration File

The X server uses a configuration file as the primary mechanism for providing configuration and run-time parameters. The configuration file format is described in detail in the xorg.conf(5) manual page.

This release comes with a graphical configuration tool called "`xorgcfg`", which also has a text mode interface and can be used to create an initial configuration file. It can also be used to customise existing configurations.

Next in the order of configuration preferences is to use the Xorg server's ability to create a starting configuration file. Run as root:

```
Xorg -configure
```

and follow the instructions.

Finally, if all else fails, the trusty old standby text-based tool "`xorgconfig`" can also be used for generating X server config files.

At least one, and hopefully, all of these configuration options will give you a reasonable starting point for a suitable configuration file. With the automatic mechanism you might even find that you don't need one!

If you do need to customize the configuration file, see the xorg.conf manual page. You can also check the driver-specific manual pages and the related documentation (found at *tables below* (section , page) also.

4.3 Command Line Options

Command line options can be used to override some default parameters and parameters provided in the configuration file. These command line options are described in the Xorg(1) manual page.

4.4 XAA

The XFree86 Acceleration Architecture (XAA) was completely rewritten from scratch for XFree86 4.x and is used in X11R6.9/X11R7.0. Most drivers implement acceleration by making use of the XAA module. The Xorg server will accept modules built either for XFree86 4.4 servers or its own.

4.5 Multi-head

Some multi-head configurations are supported in X11R6.9/X11R7.0, primarily with multiple PCI/AGP cards.

One of the main problems is with drivers not sufficiently initialising cards that were not initialised at boot time. This has been improved somewhat with the INT10 support that is used by most drivers (which allows secondary card to be "soft-booted", but in some cases there are other issues that still need to be resolved. Some combinations can be made to work better by changing which card is the primary card (either by using a different PCI slot, or by changing the system BIOS's preference for the primary card).

4.6 Xinerama

Xinerama is an X server extension that allows multiple physical screens to behave as a single screen. With traditional multi-head in X11, windows cannot span or cross physical screens. Xinerama removes this limitation. Xinerama does, however, require that the physical screens all have the same root depth, so it isn't possible, for example, to use an 8-bit screen together with a 16-bit screen in Xinerama mode.

Xinerama is not enabled by default, and can be enabled with the `+xinerama` command line option for the X server.

Xinerama was included with X11R6.4. The version included in X11R6.9/X11R7.0 was completely rewritten for improved performance and correctness.

Known problems:

- Most window managers are not Xinerama-aware, and so some operations like window placement and resizing might not behave in an ideal way. This is an issue that needs to be dealt with in the individual window managers, and isn't specifically an X server problem.

4.7 DGA version 2

DGA 2.0 is included in 6.9/7.0. Documentation for the client libraries can be found in the XDGA(3) man page. A good degree of backwards compatibility with version 1.0 is provided.

4.8 DDC

The VESA® Display Data Channel (DDC™) standard allows the monitor to tell the video card (or on some cases the computer directly) about itself; particularly the supported screen resolutions and refresh rates.

Partial or complete DDC support is available in most of the video drivers. DDC is enabled by default, but can be disabled with a "Device" section entry: `Option "NoDDC"`. We have support for DDC versions 1 and 2; these can be disabled independently with `Option "NoDDC1"` and `Option "NoDDC2"`.

At startup the server prints out DDC information from the display, and can use this information to set the default monitor parameters, or to warn about monitor sync limits if those provided in the configuration file don't match those that are detected.

4.8.1 Changed behavior caused by DDC.

Several drivers uses DDC information to set the screen size and pitch. This can be overridden by explicitly resetting it to the and non-DDC default value 75 with the `-dpi 75` command line option for the X server, or by specifying appropriate screen dimensions with the "DisplaySize" keyword in the "Monitor" section of the config file.

4.9 GLX and the Direct Rendering Infrastructure (DRI)

Direct rendered OpenGL® support is provided for several hardware platforms by the Direct Rendering Infrastructure (DRI). Further information about DRI can be found at the DRI Project's web site `<URL:http://dri.sf.net/>`. The 3D core rendering component is provided by Mesa `<URL:http://www.mesa3d.org>`.

4.10 XVideo Extension (Xv)

The XVideo extension is supported in X11R6.7.x. An XvQueryPortAttributes function has been added as well as support for XvImages. XvImages are XImages in alternate color spaces such as YUV and can be passed to the server through shared memory segments. This allows clients to display YUV data with high quality hardware scaling and filtering.

4.11 X Rendering Extension (Render)

The X Rendering extension provides a 2D rendering model that more closely matches application demands and hardware capabilities. It provides a rendering model derived from Plan 9 based on Porter/Duff image composition rather than binary raster operations.

Using simple compositing operators provided by most hardware, Render can draw anti-aliased text and geometric objects as well as perform translucent image overlays and other image operations not possible with the core X rendering system.

Unlike the core protocol, Render provides no font support for applications, rather it allows applications to upload glyphs for display on the screen. This allows the client greater control over text rendering and complete access to the available font information while still providing hardware acceleration. The Xft library provides font access for Render applications.

4.11.1 The Xft Library

On the client side, the Xft library provides access to fonts for applications using the FreeType library, version 2. One important thing to note is that Xft uses the vertical size of the monitor to compute accurate pixel sizes for provided point sizes; if your monitor doesn't provide accurate information via DDC, you may want to add that information to `xorg.conf`.

To allow a graceful transition for applications moving from core text rendering to the Render extension, Xft can use either the core rendering requests or the Render extension for text. See the section on FreeType support in Xft for instructions on configuring X11R6.9/X11R7.0 to use an existing FreeType installation.

The Xft library uses configuration files, `/etc/fonts/fonts.conf` and `/etc/fonts/local.conf`, which contains information about which directories contain font files and also provides a sophisticated font aliasing mechanism. Documentation for that file is included in the Xft(3) man page.

4.11.2 Application Support For Anti-Aliased Text

Only four applications have been modified in X11R6.9/X11R7.0 to work with the Render extension and the Xft and FreeType libraries to provide anti-aliased text: xterm, xditview, x11perf and xclock. Migration of other applications may occur in future releases.

By default, xterm uses core fonts through the standard core API. It has a command line option and associated resource to direct it to use Xft instead:

- `-fa` family / `.VT100.faceName:` family. Selects the font family to use.

Xditview will use Xft instead of the core API by default. X11perf includes tests to measure the performance of text rendered in three ways, anti-aliased, anti-aliased with sub-pixel sampling and regular chunky text, but through the Render extension, a path which is currently somewhat slower than core text.

Xclock uses the Render extension to draw the analog face and shares the -fa option and faceName resources with xterm to select a font for the digital mode.

4.12 Other extensions

The XFree86-Misc extension has not been fully ported to the new server architecture yet. This should be completed in a future release.

The XFree86-VidModeExtension extension has been updated, and mostly ported to the new server architecture. The area of mode validation needs further work, and the extension should be used with care. This extension has support for changing the gamma setting at run-time, for modes where this is possible. The `xgamma` utility makes use of this feature. Compatibility with the 3.3.x version of the extension is provided. The missing parts of this extension and some new features should be completed in a future release.

4.13 xedit

Xedit has several new features, including:

- An embedded lisp interpreter that allows easier extension of the editor.
- Several new syntax highlight modes, and indentation rules for C and Lisp.
- Flexible search/replace interface that allows regex matches.
- Please refer to `xedit(1)` for more details.
- XPrint support.

4.14 Font support

Details about the font support in X11R6.9.x/X11R7.0.x can be found in the README.fonts document.

4.15 TrueType support

X11R6.7 came with two TrueType backends. The functionality from the 'X-TrueType' backend has been integrated into the 'FreeType' backend which is designed to transparently support all of the functionality from the 'X-TrueType' backend with the exception of the font encoding libraries; the 'FreeType' backend uses only the fontenc-based encoding system .

4.16 CID font support

Support for CID-keyed fonts is included in X11R6.9/X11R7.0 The CID-keyed font format was designed by Adobe Systems `<URL:http://www.adobe.com>` for fonts with large character sets. The CID-keyed font support in X11R6.9/X11R7.0 was donated by SGI `<URL:http://www.sgi.com>`. See the LICENSE document for a copy of the CID Font Code Public License.

4.17 Internationalisation of the scalable font backends

X11R6.9/X11R7.0 has a ''fontenc'' layer to allow the scalable font backends to use a common method of font re-encoding. This re-encoding makes it possible to uses fonts in encodings other than their their native encoding. This layer is used by the Type1 and FreeType backends.

4.18 Large font optimisation

The glyph metrics array, which all the X clients using a particular font have access to, is placed in shared memory, so as to reduce redundant memory consumption. For non-local clients, the glyph metrics array is transmitted in a compressed format.

4.19 Unicode/ISO 10646 support

What is included in X11R6.9/X11R7.0

- All ''-misc-fixed-*'' BDF fonts are now available in the ISO10646-1 encoding and cover at least the 614 characters found in ISO 8859-{1-5,7-10,14,15}, CP1252, and MES-1. The non-bold fonts also cover all Windows Glyph List 4 (WGL4) characters, including those found in all 8-bit MS-DOS/Windows code pages. The 8-bit variants of the ''-misc-fixed-*'' BDF fonts (ISO8859-1, ISO8859-2, KOI8-R, etc.) have all been automatically generated from the new ISO10646-1 master fonts.
- Some ''-misc-fixed-*'' BDF ISO10646-1 fonts now cover a comprehensive Unicode repertoire of over 3000 characters including all Latin, Greek, Cyrillic, Armenian, Gregorian, Hebrew, IPA, and APL characters, plus numerous scientific, typographic, technical, and backwards-compatibility symbols. Some of these fonts also cover Arabic, Ethiopian, Thai, Han/Kanji,

Hangul, full ISO 8859, and more. For the 6x13 font there is now a 12x13ja Kanji extension and for the 9x18 font there is a 18x18ja Kanji/Han/Hangul extension, which covers all ISO-2022-JP-2 (RFC 1554) characters. The 9x18 font can also be used to implement simple combining characters by accent overstriking. For more information, read Markus Kuhn's UTF-8 and Unicode FAQ `<URL:http://www.cl.cam.ac.uk/~mgk25/unicode.html>`.

- Mark Leisher's ClearlyU proportional font (similar to Computer Modern).
- ISO 10646/Unicode UTF-8 Level 1 support added to xterm (enabled with the `-u8` option).
- The Freetype backend (the `"freetype"` module) supports Unicode-encoded fonts.

4.20 Xlib Compose file support and extensions

A more flexible Compose file processing system was added to Xlib in X11R6.9/X11R7.0. The compose file is searched for in the following order:

1. If the environment variable **$XCOMPOSEFILE** is set, its value is used as the name of the Compose file.
2. If the user's home directory has a file named "`.XCompose`", it is used as the Compose file.
3. The old method is used, and the compose file is "<*xlocaledir*>/<*localename*>`/Compose`".

Compose files can now use an "include" instruction. This allows local modifications to be made to existing compose files without including all of the content directly. For example, the system's iso8859-1 compose file can be included with a line like this:

```
include "/usr/X11R6/lib/X11/locale/iso8859-1/Compose"
```

There are two substitutions that can be made in the file name of the include instruction. **%H** expands to the user's home directory (the **$HOME** environment variable), and **%L** expands to the name of the locale specific Compose file (i.e., "<*xlocaledir*>/<*localename*>`/Compose`").

For example, you can include in your compose file the default Compose file by using:

```
include "%L"
```

and then rewrite only the few rules that you need to change. New compose rules can be added, and previous ones replaced.

Finally, it is no longer necessary to specify in the right part of a rule a locale encoded string in addition to the keysym name. If the string is omitted, Xlib figures it out from the keysym according to the current locale. I.e., if a rule looks like:

```
<dead_grave> <A> : "\300" Agrave
```

the result of the composition is always the letter with the "\300" code. But if the rule is:

```
<dead_grave> <A> : Agrave
```

the result depends on how Agrave is mapped in the current locale.

4.21 Bitstream Vera fonts

X11R6.9 includes the Bitstream Vera family of typefaces in TrueType format. This family includes the "Bitstream Vera Sans", "Bitstream Vera Sans Mono" and "Bitstream Vera Serif" in Roman and Bold varients as well as the "Bitstream Vera Sans" and "Bitstream Vera Sans Mono" in Oblique and Bold Oblique. These fonts include all of the glyphs needed for ISO 8859 parts 1 9 and 15.

The license terms for the Vera fonts are inclued in the file `COPYRIGHT.Vera`>.

4.22 Luxi fonts from Bigelow and Holmes

The X distribution includes the ''Luxi'' family of Type 1 fonts and TrueType fonts. This family consists of the fonts ''Luxi Serif'', ''Luxi Sans'' and ''Luxi Mono'' in Roman, oblique, bold and bold oblique variants. The TrueType version have glyphs covering the basic ASCII Unicode range, the Latin 1 range, as well as the *Extended Latin* range and some additional punctuation characters. In particular, these fonts include all the glyphs needed for ISO 8859 parts 1, 2, 3, 4, 9, 13 and 15, as well as all the glyphs in the Adobe Standard encoding and the Windows 3.1 character set.

The glyph coverage of the Type 1 versions is somewhat reduced, and only covers ISO 8859 parts 1, 2 and 15 as well as the Adobe Standard encoding.

The Luxi fonts are original designs by Kris Holmes and Charles Bigelow from Bigelow and Holmes Inc., who developed the Luxi typeface designs in Ikarus digital format. URW++ Design and Development GmbH converted the Ikarus format fonts to TrueType and Type 1 font programs and implemented the grid-fitting "hints" and kerning tables in the Luxi fonts.

The license terms for the Luxi fonts are included in the file '`COPYRIGHT.BH`', as well as in the License document. For further information, please contact <design@bigelowandholmes.com> or <info@urwpp.de>, or consult the URW++ web site `<URL:http://www.urwpp.de>`.

5. Miscellaneous

This section describes other items of note for the X11R6.9/X11R7.0 release.

5.1 Legacy keyboard driver phase-out

The legacy keyboard driver is no longer compiled into the X server by default on certain platforms (including Linux). The newer `kbd` driver replaces the older built-in driver. It is suggested that, if the X server says that it cannot load the keyboard driver, then the `xorg.conf` file should be updated to use the new `kbd` driver, which can be done by changing the `Driver` line in the `InputDevice` section. For example,

```
Section "InputDevice"
        Identifier  "Keyboard0"
        Driver      "kbd"
EndSection
```

Note that the driver name is case-sensitive.

5.2 Socket directory ownership and permissions

The socket directories created in `/tmp` are now required to be owned by root and have their sticky-bit set. If the permissions are not set correctly, the component using this directory will print an error message and fail to start. Common socket directories that are known to be affected include:

```
/tmp/.font-unix
/tmp/.ICE-unix
/tmp/.X11-unix
```

These directories are used by the font server, `xfs`, applications using the Inter-Client Exchange protocol (ICE) and the X server, respectively.

There are several solutions to the problem of when to create these directories. They could be created at install time by the system's installer if the `/tmp` dir is persistent. They could be created at boot time by the system's boot scripts (e.g., the `init.d` scripts). Or, they could be created by PAM modules at service startup or user login time.

The solution chosen is platform dependent, and the system administrator should be able to handle creating those directories on any systems that do not have the correct ownership or permissions.

5.3 Composite exposes extra visuals

When the Composite extension is enabled via `xorg.conf` or the command line, a new visual is created. This visual is different from the other visuals used by X applications in that it includes an alpha component. It is used by the compositing manager and other Composite aware applications.

Most X applications ignore this visual since it is not useful to them; however some applications mistakenly try to use it, which will cause them to fail. An environment variable, `XLIB_SKIP_ARGB_VISUALS`, was added to the X11 library to hide this visual from applications that mistakenly try to use it. If an application fails only when the Composite is enabled, try setting this environment variable before starting the application.

Since Composite is not enabled by default, it is not expected that this issue will be visible to most users.

6. Deprecated components and removal plans

This section lists current plans for removal of obsolete or deprecated components in the X.Org releases. As our releases are open source, users who continue to require these can find the source in previous releases and continue to use these, but the X.Org Foundation and its volunteers have decided the burden of continued maintenance and distribution in the core X11 releases outweighs the benefits of doing so. In some cases, this is simply because no one has volunteered to do continued maintenance, so if software is listed here that you need, you can contact <xorg@lists.freedesktop.org> to volunteer to take over maintainership, either inside or outside of the Xorg release process.

Display Postscript (DPS)
: The DPS software is included and built by default (except as noted in README.dps) in the X.Org X11R6.8 release series. The software will be included, but not built unless specifically configured by the builder, in the X.Org X11R6.9 release series. At this time, X.Org does not plan to include any of the DPS software in X11R7.0 or later releases. For more information, see xc/programs/Xserver/hw/xfree86/doc/README.dps in the X.Org source release.

7. Attributions/Acknowledgements/Credits

This section lists the credits for the X11R6.9/X11R7.0 release. For a more detailed breakdown, refer to the ChangeLog file in the X.Org source tree, the ChangeLog's in or the 'cvs log' information for individual source files."

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