Release Notes for X11R7.6

The X.Org Foundation [http://www.x.org/wiki/XorgFoundation]

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Abstract

These release notes contain information about features and their status in the X.Org Foundation X11R7.6 release.

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Dedication

Two of the early leaders of the X Window System community were lost to cancer this year : Smokey Wallace, who led the DEC WSL team which created the initial implementation of X11, and Hideki Hiura from Sun Microsystems who helped design the X11R6 internationalization framework. This release is dedicated to their memory.

Introduction to the X11R7.6 Release

This release is the seventh modular release of the X Window System™. The next full release will be X11R7.7 and is expected in 2011.

Unlike X11R1 through X11R6.9, X11R7.x releases are not built from one monolithic source tree, but many individual modules. These modules are distributed as individual source code releases, and each one is released when it is ready, instead of only when the overall window system is ready for release. The X11R7.x releases are made by “rolling up” the individual module releases into a collection that is often affectionately called the “*katamari*” by the developers.

The X11R7.6 release does not include all of the software formerly included in the previous X Window System releases. It is designed to be a reasonable baseline from which to start when building the window system for the first time for a new installation, distribution, or package set. It does not provide a full desktop environment, expecting a more feature rich set of applications to be installed from one of the several excellent desktop environments available for the X Window System. The X.Org developers continue to maintain and produce new releases of much of the software that was formerly in the main window system releases but is no longer included in the katamari releases, including many of the Athena Widgets desktop applications that were provided as samples in previous window system versions.

Once their window system build is established, most builders watch for announcements of individual module updates on the xorg-announce mailing list [http://lists.freedesktop.org/mailman/listinfo/xorg-announce] and update to those as needed. The X.Org Foundation currently releases the X Window System katamari releases approximately once a year, but many modules, especially the X servers and drivers, are updated more frequently between those releases.

For help with how to build and develop in the modular tree see the Modular Developer's Guide [http://wiki.x.org/wiki/ModularDevelopersGuide] in the X.Org wiki.

We encourage you to report bugs using freedesktop.org's bug tracking system [https://bugs.freedesktop.org/] using the xorg product, and to submit bug fixes and enhancements to <`xorg-devel@lists.x.org`>. More details on patch submission and review process are available on the SubmittingPatches [http://www.x.org/wiki/Development/Documentation/SubmittingPatches] page of the X.Org wiki.

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 22 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. Since the founding of the X.Org Foundation in early 2004, many further releases have been issued, from X11R6.7 to the current 7.6.

The next section describes what is new in the latest full release (7.6) compared with the previous full release (7.5).

Summary of new features in X11R7.6

This is a sampling of the new features in X11R7.6. A more complete list of changes can be found in the ChangeLog files that are part of the source of each X module.

- *InputClass* sections in Xorg configuration files are used to apply configuration options to any input device matching specified rules, such as device path, type of device, device manufacturer, or other data provided by the input hotplug backend. Details can be found in the `INPUTCLASS` section of the xorg.conf(5) [xorg.conf.5.html] manual page.
- *Xorg configuration directories* are used to allow fragments of the X server configuration to be delivered in individual files. For instance, the input device driver

matching rules previously provided in HAL `.fdi` files are now provided as `InputClass` sections in `.conf` files in a `xorg.conf.d` directory.

- *udev* is now used by the X server on Linux systems for input device discovery and hot-plug notification. Other platforms continue to use the HAL framework for these tasks for now.
- *X protocol C-language Binding (XCB)* is now included in the katamari, and is required by several client-side modules, including `libX11`, **xlsatoms**, **xlsclients** and **xwininfo**. XCB is a replacement for Xlib featuring a small footprint, latency hiding, direct access to the protocol, improved threading support, and extensibility. More information can be found on the XCB website at http://xcb.freedesktop.org/.
- Major progress has been made on the X.Org Documentation modernization - most of the library and protocol specifications are now included in the modules for those libraries and protocols so they can be updated in sync with new versions, and many have been converted to DocBook XML from the variety of formats they were previously in. On most systems these documents will be installed under `/usr/share/doc/`. They are also posted on the X.Org website at http://www.x.org/releases/X11R7.6/.
- *Video and input driver enhancements*. Please see the ChangeLog files for individual drivers; there are far too many updates to list here.
- ... and the usual assortment of correctness and crash fixes.

Overview of X11R7.6

On most platforms, X11R7.6 has a single hardware-driving X server binary called **Xorg**. This binary can dynamically load the video drivers, input drivers, and other modules that are needed. **Xorg** has currently has support for Linux, Solaris, and some BSD OSs on Alpha, PowerPC, IA-64, AMD64, Intel x86, Sparc, and MIPS platforms.

Additional specialized X server binaries may be found depending on the platform and build configuration, including:

Xdmx	is a proxy X server that uses one or more other X servers as its display devices. It provides multi-head X functionality for displays that might be located on different machines.
Xnest	is a nested X server, that operates as both an X client and X server. **Xnest** is a client of the real server which manages windows and graphics requests on its behalf. **Xnest** is a server to its own clients, and manages windows and graphics requests on their behalf. To these clients, it appears to be a conventional server.
Xephyr	is a X server that outputs to a window on a pre-existing “host” X display. Unlike **Xnest** which is an X proxy, and thus limited to the capabilities of the host X server, **Xephyr** is a full X server which uses the host X server window as a “framebuffer” via fast SHM XImages.

Xvfb	is a virtual framebuffer X server that can run on machines with no display hardware and no physical input devices. It emulates a dumb framebuffer using virtual memory.
Xquartz	is an X server that interacts with the MacOS X native Aqua window system, displaying windows on the Mac desktop and accepting input from the Mac system devices, allowing X11 applications to be used in a native Mac desktop session.
Xwin	is an X server that runs under the Cygwin environment, interacting with the Microsoft Windows native window system, displaying windows on the Windows desktop and accepting input from the Windows system devices, allowing X11 applications to be used in a native Windows desktop session.

Details of X11R7.6 components

Video Drivers

X11R7.6 includes the following video drivers:

Driver Name	Description	Further Information
`apm`	Alliance Pro Motion	README.apm [apm.html]
`ark`	Ark Logic	
`ast`	ASPEED Technology	
`chips`	Chips & Technologies	README.chips [chips.html], chips(4) [chips.4.html]
`cirrus`	Cirrus Logic	
`fbdev`	Linux framebuffer device	fbdev(4) [fbdev.4.html]
`geode` (*)	AMD Geode GX and LX	
`glint`	3Dlabs, TI	glint(4) [glint.4.html]
`i128`	Number Nine	README.I128 [I128.html], i128(4) [i128.4.html]
`i740`	Intel i740	README.i740 [i740.html]
`imstt`	Integrated Micro Solns	
`intel`	Intel i8xx/i9xx	README.intel [intel.html], intel(4) [intel.4.html]
`mach64`	ATI Mach64	README.ati [ati.html]
`mga`	Matrox	mga(4) [mga.4.html]
`neomagic`	NeoMagic	neomagic(4) [neomagic.4.html]

`newport` (-)	SGI Newport	README.newport [newport.html], newport(4) [newport.4.html]
`nsc`	National Semiconductor	nsc(4) [nsc.4.html]
`nv`	NVIDIA	nv(4) [nv.4.html]
`r128`	ATI Rage128	README.r128 [r128.html], r128(4) [r128.4.html]
`radeon`	ATI Radeon	radeon(4) [radeon.4.html]
`rendition`	Rendition	README.rendition [rendition.html], rendition(4) [rendition.4.html]
`s3`	S3 (not ViRGE or Savage)	
`s3virge`	S3 ViRGE	README.s3virge [s3virge.html], s3virge(4) [s3virge.4.html]
`savage`	S3 Savage	savage(4) [savage.4.html]
`siliconmotion`	Silicon Motion	siliconmotion(4) [siliconmotion.4.html]
`sis`	SiS	README.SiS [SiS.html], sis(4) [sis.4.html]
`sisusb`	SiS USB	sisusb(4) [sisusb.4.html]
`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 Voodoo Banshee, 3, 4 & 5	tdfx(4) [tdfx.4.html]
`tga`	DEC TGA	README.DECtga [DECtga.html]
`trident`	Trident	trident(4) [trident.4.html]
`tseng`	Tseng Labs	
`v4l`	Video4Linux	v4l(4) [v4l.4.html]
`vesa`	VESA	vesa(4) [vesa.4.html]
`vmware`	VMware guest OS	vmware(4) [vmware.4.html]
`voodoo`	3Dfx Voodoo 1 & 2	voodoo(4) [voodoo.4.html]
`wsfb`	Workstation Framebuffer	wsfb(4) [wsfb.4.html]
`xgi`	XGI	xgi(4) [xgi.4.html]
`xgixp`	XGI XP	xgixp(4) [xgixp.4.html]

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.

Input Drivers

X11R7.6 includes the following input drivers:

Driver Name	Description	Further Information
`acecad`	Acecad Flair	acecad(4) [aiptek.4.html]
`aiptek(*)`	Aiptek USB tablet	aiptek(4) [aiptek.4.html]
`evdev(*)`	Linux kernel EvDev	evdev(4) [evdev.4.html]
`joystick`	Joystick	joystick(4) [joystick.4.html]
`kbd`	generic keyboards (non-evdev systems)	kbd(4) [kbd.4.html]
`mouse`	most mouse devices (non-evdev systems)	mousedrv(4) [mousedrv.4.html]
`synaptics`	Synaptics & ALP touchpads	synaptics(4) [synaptics.4.html]
`vmmouse`	VMWare virtual mouse	vmmouse(4) [vmmouse.4.html]
`void`	dummy device	void(4) [void.4.html]

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

Xorg server

Loader and Modules

The Xorg server relies on the operating system's native module loader support for handling program modules. The X server makes use of modules for video drivers, X server extensions, input device drivers, framebuffer layers, and internal components used by some drivers (like XAA & EXA).

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, 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.

Configuration File

The Xorg 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) [xorg.conf.5.html] manual page.

Note that this release features significant improvements for running the server without a configuration file, so many users may find that that they don't need a configuration file.

If you do need to customize the configuration file, see the xorg.conf manual page [xorg.conf.5.html] . You can also check the driver-specific manual pages and the related documentation (found at driver tables) also.

The recommended method for generating a configuration file is to use the Xorg server itself. Run as root:

```
Xorg -configure
```

and follow the instructions.

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) [Xorg.1.html] manual page.

Multi-head

Some multi-head configurations are supported in X11R7.6. Support for multiple PCI/AGP cards may require a kernel with changes to support VGA arbitration.

One of the main problems is with drivers not sufficiently initializing cards that were not initialized 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).

Xinerama

Xinerama is an X server extension that allows multiple physical screens connected to multiple video devices 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. Note that enabling Xinerama may disable certain other extensions which are not compatible with Xinerama.

DDC

The VESA® Display Data Channel (DDC™) standard allows the monitor to tell the video card (or in 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.

Changed behavior caused by DDC.

Several drivers use 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.

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 [http://dri.sf.net/]. The 3D core rendering component is provided by Mesa [http://www.mesa3d.org].

Of note is that this release supports building the X server using the system-wide libdrm. Previously, drm was kept in the server's tree and loaded as a module, rather than using the standard OS mechanisms for managing shared libraries of code. This requires that the server be built using a version of libdrm of 2.3.0 or newer if it is to use DRM.

Terminate Server keystroke

The Xorg server has previously allowed users to exit the server by pressing the keys **Control** + **Alt** + **Backspace**. While this function is still enabled by default in this release, the keymap data usually used with Xorg, from the xkeyboard-config project, has been modified to not map that sequence by default, in order to reduce the chance that inexperienced users will accidentally destroy their work.

Users who wish to have this functionality available by default may enable it via the XKB configuration option “`terminate:ctrl_alt_bksp`”. For instance, the **setxkbmap** command can be used to enable this by running:

```
setxkbmap -option "terminate:ctrl_alt_bksp"
```

The XKB Configuration Guide [input/XKB-Config.html] also includes an example xorg.conf.d file that sets the “`terminate:ctrl_alt_bksp`” option by default on all keyboards [input/XKB-Config.html#zap]. Many desktop environments include XKB configuration options in their preferences to enable this as well.

X Server startup state

The X servers in the X11R7.6 release now start by default with an empty black screen and do not draw the mouse cursor until a client sets the cursor image. To restore the classic behavior of starting with the grey weave pattern and × cursor, start the X server with the `-retro` option.

Font support

Details about the font support in X11R7.6 can be found in the “Fonts in X11R7.6 [fonts/fonts.html]” document.

Default font installation directory

Previous versions of X installed font files under the `lib/X11/fonts` subdirectory of the X installation directory (for instance, in X11R6 releases, `/usr/X11R6/lib/X11/fonts` was commonly used). This release uses the default installation path of the `fonts` subdirectory of the `datadir` setting from the GNU autoconf configuration. For instance, if the fonts are configured with **`./configure --prefix=/usr`**, they will be installed under subdirectories of `/usr/share/fonts/X11`. The font module configure scripts all take an option of `--with-fontrootdir=`*`PATH`* to override the default. If `--with-fontrootdir` is not specified, the `fontutil` pkg-config file will be consulted to find the `fontrootdir` specified when the `fontutil` module was installed.

Bitmap font compression methods

The X11R7.6 release supports PCF format bitmap fonts stored uncompressed or compressed via the **compress**, **gzip**, or **bzip2** programs. To utilize bzip2 compression, the `libXfont` and **mkfontscale** modules must be built with the `--with-bzip2` — all other methods are enabled by default.

To specify which compression method to use when installing a font module from X11R7.6 the configure scripts accept an option of `--with-compression=`*`TYPE`*, where *`TYPE`* may be `none`, `compress`, `gzip`, or `bzip2`.

Type1 Font support

Previous versions of X came with two Postscript Type1 font backends. The functionality from the “Type1” backend has been replaced by the Type1 support in the “FreeType” backend.

CID Font support

The CID-keyed font format was designed by Adobe Systems for fonts with large character sets. The CID-keyed format is obsolete, as it has been superseded by other formats such as OpenType/CFF and support for CID-keyed fonts has been removed from X11.

Build changes and issues

Silent build rules

Most of the modules in this release use the `AM_SILENT_RULES` option of GNU automake 1.11. When building the software, most output will show an abbreviated format for the commands being run, such as:

```
  CC xmen.o
```

To enable verbose output, showing all the arguments to the commands being run, add the flag `V=1` to the **make** command line or add the flag `--disable-silent-rules` to the configure command.

New configure options for font modules

The bitmap font modules now accept a configure option of `--disable-all-encodings` to set the default for all encodings to off, requiring builders to then pass `--enable-`<*encoding*> flags for each encoding to be built.

New configure options for documentation in modules

As many more modules now contain documentation to be converted from DocBook XML to text, HTML, PostScript, and/or PDF formats, new standard options have been added to the configure macros to control the build of these in the modules.

`--with-xmlto=`*yes*|*no*	Enables or disables use of the **xmlto** [https://fedorahosted.org/xmlto/] command to translate DocBook XML to other formats. All DocBook XML conversions require use of this command.
`--with-fop=`*yes*|*no*	Enables or disables use of the Apache **fop** [http://xmlgraphics.apache.org/fop/] command to translate DocBook XML to PostScript and PDF formats.
`--enable-docs=`*yes*|*no*	Enables or disables the build and installation of all documentation except traditional man pages or those covered by the --enable-devel-docs and --enable-specs options.
`--enable-devel-docs=`*yes*|*no*	Enables or disables the build and installation of documentation for developers of the X.Org software modules.
`--enable-specs=`*yes*|*no*	Enables or disables the build and installation of the formal specification documents for protocols and APIs.

Miscellaneous

This section describes other items of note for the X11R7.6 release.

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.

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.

Future Removals

DGA version 2	DGA 2.0 is included in 7.6. Documentation for the client libraries can be found in the XDGA(3) [XDGA.3.man] man page. DGA should be considered deprecated; if you are relying on it, please let us know what you need it for so we can find better solutions. In this release, support has been removed for all DGA rendering and mapping code, leaving just mode setting and raw input device access.
Input device discovery via HAL	The Xorg server currently uses the HAL framework [http://www.freedesktop.org/wiki/Software/hal] to discover connected input devices, receive notification of hotplug events for them, and to retrieve con-

figuration parameters for them. The HAL maintainers have deprecated HAL, so the X.Org developers have begun replacement with alternatives. As a result, configuration of input devices via HAL `*.fdi` files is no longer supported on Linux platforms using udev, and may not be supported on other platforms in future Xorg server releases.

Removed in this Release

Xprint	The Xprint server and extension were previously removed from X11R7.5. This release removes Xprint support from a number of client programs that still had it.
Xsdl server	The experimental Xsdl server has never been finished or maintained, and was removed in this release.
Unmaintained extensions	Support has been removed from the X servers for the following extensions, which were obsolete, not widely used, or not working: • Multi-Buffering

Attributions/Acknowledgements/Credits

This section lists the credits for the X11R7.6 release. For a more detailed breakdown, refer to the ChangeLog file in the source tree for each module, the history in the xorg product in freedesktop.org's git repositories [http://cgit.freedesktop.org/xorg/] or the '`git log`' information for individual source files.

The X Window System has been a collaborative effort from its inception. Our apologies for anyone or organization inadvertently overlooked. Many individuals (including major contributors) who worked on X are represented by their employers in this list. If you feel we have left anyone out, please let us know.

These people contributed in some way to X11R7.6 since the release of X11R7.5:

□□□
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Chris Dekter
Chris Humbert
Chris Wilson
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Christian Hartmann
Christian Zander
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Christopher James Halse Rogers
Cody Maloney
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