Release Notes for X11R7.7

The X.Org Foundation [https://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 X11R7.7 release.

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Introduction to the X11R7.7 Release

X11R7.7 as the eighth modular release of the X indo stem ™.

nli e X11R1 through X11R . X11R7. releases ere not built from one monolithic source tree but man indi idual modules. These modules are distributed as indi idual source code releases and each one is released hen it is read instead of onl hen the o erall indo s stem is read for release. The X11R7. releases ere made b rolling u the indi idual module releases into a collection that is often a ectionatel called the b the de elo ers.

The X11R7.7 release does not include all of the soft are formerl included in the re ious X indo stem releases. t is designed to be a reasonable baseline from hich to start hen building the indo s stem for the rst time for a ne installation distribution or ac age set. t does not ro ide a full des to en ironment e ecting a more feature rich set of a lications to be installed from one of the se eral e cellent des to en ironments a ailable for the X indo stem. The X.Org de elo ers continue to maintain and roduce ne releases of much of the soft are that as formerl in the main indo s stem releases but is no longer included in the atamari releases including man of the thena idgets des to a lications that ere ro ided as sam les in re ious indo s stem ersions.

Once their indo s stem build is established most builders atch for announcements of indi idual module u dates on the org-announce mailing list htt s lists. .org mailman listinfo org-announce and u date to those as needed.

There are no lans for an further releases of the X indo stem at this time onl releases of the indi idual modules are lanned for no .

For hel ith ho to build and de elo in the modular tree see the odular e elo er s uide htt s i i. .org i i odular e elo ers uide in th i i.

e encourage ou to re ort bugs and to submit bug es and enhancements ia the gitlab.freedes to .org code management s stem htt s gitlab.freedes to .org org . ore details on atch submission and re ie rocess are a ailable on the ubmitting atches htt s . .org i i e elo ment ocumentation ubmitting atches age of the X.Org i i.

The release numbering is based on the original T X numbering s stem. X11 refers to the ersion of the net or rotocol that the X indo s stem is based on ersion 11 as rst released in 1 and has been stable for nearl ears ith onl u ard com atible additions to the core X rotocol a record of stabilit en ied in com uting. Formal releases of X started ith X ersion from T the rst commercial X roducts ere based on X ersion 1 . The T X onsortium and its successors the X onsortium the O en rou X ro ect Team and the X.Org rou released ersions X11R through X11R . . ince the founding of the X.Org Foundation in earl man further releases ha e been issued from X11R .7 to the current module releases.

The ne t section describes hat as ne in the last full release 7.7 com ared ith the re ious full release 7. .

Summary of new features in X11R7.7

This is a sam ling of the ne features in X11R7.7. more com lete list of changes can be found in the hange og les that are art of the source of each X module.

e ents are no su orted for touch ads and touchscreens hich can re ort osition information on more than one nger ro iding in ut at the same time such as found on man tablets and recent la to s. These are e osed b Xorg ser er 1.1 and later ia the Xin ut e tension ersion . .

dditional features ere introduced in ersion .1 as su orted in Xorg ser er 1.11 including allo ing clients to trac ra e ents from in ut de ices additional detail in scrolling e ents so that clients ma erform smoother scrolling and additional constants in the Xlib-based libXi .

ore rogress has been made on the X.Org ocumentation moderni ation - the rest of the librar and rotocol s eci cations ha e been con erted to oc oo X from the ariet of formats the ere re iousl in and su ort for cross-lin ing bet een documents hase been added. On most s stems these documents ill be installed under `/usr/share/doc/`. The are also osted on the X.Org ebsite at htt s . .org releases X11R7.7

ob ects are no a ailable in ersion .1 of the nchroni ation nc e tension. These allo clients to create a ob ect that is either in triggered or not-triggered state and to erform actions hen the ob ect becomes triggered. hen a client re uests a fence be triggered the X ser er ill rst com lete all rendering from re ious re uests that a ects resources o ned b the fence s screen before changing the state so that clients ma s nchroni e ith such rendering. u ort for these has been added to both the `libxcb-sync` and `libXext` s.

ere added b X Fixes e tension ersion . . om ositing managers and des to en ironments ma ha e elements in articular screen locations such that for a single-headed dis la the corres ond to eas targets for e am le the to left corner. For a multi-headed en ironment these corners should still be semi-im ermeable. ointer barriers allo the a lication to de ne additional constraint on cursor motion so that these areas beha e as e ected e en in the face of multi le dis la s.

The X libraries ha e begun adding su ort for the X and X e tensions. This or is not et com lete in this release and not all of the functionalit a ailable through these e tensions is accessible ia the X s. ome of this e ort as funded b ast oogle ummer of ode ro ects.

. lease see the hange og les for indi idual dri ers there are far too man u dates to list here.

... and the usual assortment of correctness and crash es.

Overview of X11R7.7

On most latforms X11R7.7 has a single hard re-dri ing X ser er binar called . This binar can d namicall load the ideo dri ers in ut dri ers and other modules that are needed. currentl has su ort for inu olaris and some O s on l ha o er - ntel arc and latforms.

dditional s eciali ed X ser er binaries ma be found de ending on the latform and build con guration including

is a ro X ser er that uses one or more other X ser ers as its dis la de ices. t ro ides multi-head X functionalit for dis la s that might be located on di erent machines.

is a nested X ser er that o erates as both an X client and X ser er. is a client of the real ser er hich manages indo s and gra hics re uests on its behalf. is a ser er to its o n clients and manages indo s and gra hics re uests on their behalf. To these clients it a ears to be a con entional ser er.

is a X ser er that out uts to a indo on a re-e isting host X dis la . nli e hich is an X ro and thus limited to the ca abilities of the host X ser er is a full X ser er hich uses the host X ser er indo as a framebu er ia fast X mages.

is a irtual framebu er X ser er that can run on machines ith no dis la hard are and no h sical in ut de ices. t emulates a dumb framebu er using irtual memor .

is an X ser er that interacts ith the acO X nati e ua indo s stem dis la ing indo s on the ac des to and acce ting in ut from the ac s stem de ices allo ing X11 a lications to be used in a nati e ac des to session.

is an X ser er that runs under the g in en ironment interacting ith the icrosoft indo s nati e indo s stem dis la ing indo s on the indo s des to and acce ting in ut from the indo s s stem de ices allo ing X11 a lications to be used in a nati e indo s des to session.

Details of X11R7.7 components

Video Drivers

X11R7.7 includes the follo ing ideo dri ers

ark	r ogic
ast	Technolog
cirrus	irrus ogic
dummy	irtual o screen framebu er
fbdev	inu framebu er de ice fbde fbde . .html

geode	eode X and X	
glide	f oodoo 1 anshee	glide glide. .html
glint	labs T	glint glint. .html
i128	umber ine	R . 1 1 .t t i1 i1 . .html
intel	ntel ntegrated ra hics rocessors	R .intel intel.t t intel intel. .html
mach64	T ach	R .ati ati.t t
mga	atro	mga mga. .html
neomagic	eo agic	neomagic neomagic. .html
newport -	e ort	R .ne ort ne ort.t t ne ort ne ort. .html
nv		n n . .html
r128	T Rage1	R .r1 r1 .t t r1 r1 . .html
radeon	T Radeon	radeon radeon. .html
savage	a age	sa age sa age. .html
siliconmotion	ilicon otion	siliconmotion siliconmotion. .html
sis	i	R . i i .t t sis sis. .html
suncg6	un X and Turbo X	
sunffb	un reator lite	
tdfx	f oodoo anshee	tdf tdf . .html
tga	T	R . tga tga.html
trident	Trident	trident trident. .html
v4l	ideo inu	l l. .html
vesa		esa esa. .html
vmware	are guest O	m are m are. .html
voodoo	f oodoo 1	oodoo oodoo. .html
wsfb	or station Framebuffer	sfb sfb. .html

ri ers mar ed ith are resent in a reliminar form in this release but are not com lete and or stable et.

ri ers mar ed ith are for inu arc onl .

ri ers mar ed ith - are for inu mi s onl .

Input Drivers

X11R7.7 includes the follo ing in ut dri ers

`evdev(*)`	inu ernel e	e de e de . .html
`joystick`	o stic	o stic o stic . .html
`kbd`	generic e boards non-e de s stems	bd bd. .html
`mouse`	most mouse de ices non-e de s stems	mousedr mousedr . .html
`synaptics`	na tics touch ads	s na tics s na tics. .html
`vmmouse`	are irtual mouse	mmouse mmouse. .html
`void`	dumm de ice	oid oid. .html

ri ers mar ed ith are a ailable for inu onl .

Xorg server

Loader and Modules

The Xorg ser er relies on the o erating s stem s nati e module loader su ort for handling rogram modules. The X ser er ma es use of modules for ideo dri ers X ser er e tensions in ut de ice dri ers framebu er la ers and internal com onents used b some dri ers li e X X .

The module interfaces both and used in this release are sub ect to change ithout notice. hile e ill attem t to ro ide bac ard com atibilit for the module interfaces in stable releases e cannot guarantee this. om atibilit in the other direction is e licitl not guaranteed because ne modules ma rel on interfaces added in ne releases nor is com atibilit across stable release branches such as bet een Xorg 1.11 and 1.1 .

The Xorg ser er runs ith root ri ileges so the Xorg ser er loadable modules also run ith these ri ileges. For this reason e recommend that all users be careful to onl use loadable modules from reliable sources other ise the introduction of mal are and contaminated code can occur and rea ha oc on our s stem.

Configuration File

The Xorg ser er uses a con guration le as the rimar mechanism for ro iding con guration and run-time arameters. The con guration le format is described in detail in the org.conf org.conf. .html manual age.

ote that this release features signi cant im ro ements for running the ser er ithout a con guration le so man users ma nd that that the don t need a con guration le or ma rel on ust sni ets of con guration laced in the `xorg.conf.d` director .

f ou do need to customi e the con guration le see the org.conf manual age org.conf. .html . ou can also chec the dri er-s eci c manual ages and the related documentation found atdri er tables also.

The recommended method for generating a con guration le is to use the Xorg ser er itself. Run as root

```
Xorg -configure
```

and follo the instructions.

Command Line Options

ommand line o tions can be used to o erride some default arameters and arameters ro ided in the con guration le. ommand line o tions a ailable for use ith all X ser ers in this release are described in the Xser er 1 Xser er.1.html manual age. ommand line o tions s eci c to the Xorg ser er are described in the Xorg 1 Xorg.1.html manual age.

Multi-head

ome multi-head con gurations are su orted in X11R7.7. u ort for multi le cards ma re uire a ernel ith changes to su ort arbitration.

One of the main roblems is ith dri ers not su icientl initiali ing cards that ere not initiali ed at boot time. This has been im ro ed some hat ith the T1 su ort that is used b most dri ers hich allo s secondar card to be soft-booted but in some cases there are other issues that still need to be resol ed. ome combinations can be made to or better b changing hich card is the rimar card either b using a di erent slot or b changing the s stem O s reference for the rimar card .

Xinerama

is an X ser er e tension that allo s multi le h sical screens connected to multi le ideo de ices to beha e as a single screen. ith traditional multi-head in X11 indo s cannot s an or cross h sical screens. Xinerama remo es this limitation. Xinerama does ho e er re uire that the h sical screens all ha e the same root de th so it isn t ossible for e am le to use an -bit screen together ith a 1 -bit screen in Xinerama mode.

Xinerama is not enabled b default and can be enabled ith the `+xinerama` command line o tion for the X ser er. ote that enabling Xinerama ma disable certain other e tensions hich are not com atible ith Xinerama.

DDC

The is la ata hannel ™ standard allo s the monitor to tell the ideo card or in some cases the com uter directl about itself articularl the su orted screen resolutions and refresh rates.

artial or com lete su ort is a ailable in most of the ideo dri ers. is enabled b default but can be disabled ith a e ice section entr `Option`

"NoDDC". e ha e su ort for ersions 1 and these can be disabled inde endentl ith Option "NoDDC1" and Option "NoDDC2".

t startu the ser er rints out information from the dis la and can use this information to set the default monitor arameters or to arn about monitor s nc limits if those ro ided in the con guration le don t match those that are detected.

Changed behavior in handling information from DDC

The X ser er re iousl used information to detect screen si e and itch and com ute automaticall allo ing fonts and other elements to automaticall scale to a ro riate si es. This mechanism or ed reasonabl ell for man single-monitor cases but did not com ute accurate alues for multi-monitor cases or less common single-dis la setu s. Thus this autodetection has been remo ed and the X ser er no longer tries to com ute an a ro riate alue. ll users anting fonts h sical measurement units and other elements scaled a ro riatel for their dis la including users for hom autodetection re iousl or ed must no set or some other scaling factor e licitl either ia the X ser er -dpi o tion a setting in their gra hical enironment or an alternate scaling mechanism ro ided b their en ironment.

GLX and the Direct Rendering Infrastructure (DRI)

irect rendered O en su ort is ro ided for se eral hard are latforms b the irect Rendering nfrastructure R . Further information Rabout can be found at the R ro ect s eb site htt s dri.freedes to .org . The core rendering com onent is ro ided b esa htt s .mesa d.org .

Of note is that this release su orts building the X ser er using the s stem- ide libdrm. re iousl drm as e t in the ser er s tree and loaded as a module rather than using the standard O mechanisms for managing shared libraries of code. This re uires that the ser er be built using a ersion of libdrm of . . or ne er if it is to use R .

Terminate Server keystroke

The Xorg ser er has re iousl allo ed users to e it the ser er b ressing the e s . hile this function is still enabled b default in this release the e ma data usuall used ith Xorg from the e board-con g ro ect has been modi ed to not ma that se uence b default in order to reduce the chance that ine erienced users ill accidentall destro their or .

sers ho ish to ha e this functionalit a ailable b default ma enable it ia the X con guration o tion terminate:ctrl_alt_bksp . For instance the command can be used to enable this b running

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

The X on guration uide also includes an e am le org.conf.d le that sets the terminate:ctrl_alt_bksp o tion b default on all e boards an des to en ironments include X con guration o tions in their references to enable this as ell.

Grab debugging keystrokes

The Xorg ser er in this release ro ides arious functions that can be ma ed to e stro es to aid in the debugging of rograms ith errant in ut grabs.

The e s ms XF og rab nfo and XF og indo Tree are de ned to rint information to the Xorg log le on the current set of in ut grabs and the indo tree of the current dis la . default these are a ailable for use but not ma ed to an e .

The e s m XF ngrab forces the X ser er to release all acti e grabs hich ma lea e the clients holding them in an inconsistent state. XF lear rab goes further illing the client connection of an client holding an acti e grab hen it is ressed. These e stro es are intended to allo de elo ers to debug clients hich are not ro erl releasing grabs or ha e roblems occur hile in ut is grabbed. ince grabs are a fundamental art of the X client securit model these e stro es come ith ris s such as the abilit to b ass or ill screen loc s ithout no ing the ass ord and thus are not a ailable b default.

 sers ho are illing to acce t the securit ris and ish to enable this functionalit ma do so ia the X con guration o tion `grab:break_actions` .

The e board-con g data les included in this release ha e the grab disabling e s correctl disabled b default but ersions before e board-con g . had them enabled leading to the securit ris described abo e. hen u grading to the X ser er in this release be sure to also ensure e board-con g is a safe ersion. ore details about this issue ma be found in ad isories for - 1 - htt s ho-t.blogs ot.com 1 1 b-brea ing-grabs-c e- 1 - .html .

X Server startup state

The X ser ers in the X11R7.7 release no start b default ith an em t blac screen and do not dra the mouse cursor until a client sets the cursor image. To restore the classic beha ior of starting ith the gre ea e attern and cursor start the X ser er ith the `-retro` o tion.

Font support

 etails about the font su ort in X11R7.7 can be found in the Fonts in X11R7.7 document.

Default font installation directory

 re ious ersions of X installed font les under the `lib/X11/fonts` subdirector of the X installation director for instance in X11R releases`/usr/X11R6/lib/X11/fonts` as commonl used . This release uses the default installation ath of the `fonts` subdirector of the `datadir` setting from the autoconf con guration. For instance if the fonts are con gured ith **`./configure --prefix=/usr`** the ill be installed under subdirectories of `/usr/share/fonts/X11`. The font module con gure scri ts all ta e an o tion of `--with-fontrootdir=`*`PATH`* to o erride the default. f`--with-fontrootdir` is not s eci ed the`fontutil` g-con g le ill

be consulted to nd the `fontrootdir` s eci ed hen the `fontutil` module as installed.

Bitmap font compression methods

The X11R7.7 release su orts F format bitma fonts stored uncom ressed or com ressed ia the or rograms. To utili e b i com ression the `libXfont` and modules must be built ith the `--with-bzip2` all other methods are enabled b default.

To s ecif hich com ression method to use hen installing a font module from X11R7.7 the con gure scri ts acce t an o tion of `--with-compression=`*`TYPE`* here *`TYPE`* ma be `none compress gzip` or`bzip2`.

Type1 Font support

re ious ersions of X came ith t o ostscri t T e1 font bac ends. The functionalit from the T e1 bac end has been re laced b the T e1 su ort in the FreeT e bac end.

CID Font support

The - e ed font format as designed b dobe stems for fonts ith large character sets. The - e ed format is obsolete as it has been su erseded b other formats such as O enT e FF and su ort for - e ed fonts has been remo ed from X11.

Build changes and issues

Strict compilation flags

ost of the modules in this release use stricter com iler ags hen building ith the gcc clang Oracle olaris tudio or ntel com ilers. These ags both enable more arnings and romote some arnings to fatal errors in the build. f these ags cause our build to fail ou can disable the ags that turn these selected arnings into errors b adding `--disable-selective-werror` to the con gure command for the a ected module. f that is necessar for an X.Org modules lease re ort a bug in the ro ect for that module onhtt s gitlab.freedes to .org org

uilders see ing e en stricter com iler chec s can instead ass `--enable-strict-compilation` to the con gure command to ma e all arnings become errors.

Silent build rules

ost of the modules in this release use the `AM_SILENT_RULES` o tion of automa e 1.11. hen building the soft are most out ut ill sho an abbre iated format for the commands being run such as

```
CC xmen.o
```

To enable erbose out ut sho ing all the arguments to the commands being run add the ag `V=1` to the command line or add the ag `--disable-silent-rules` to the con gure command.

New configure options for font modules

The bitma font modules no acce t a con gure o tion of `--disable-all-encodings` to set the default for all encodings to o re uiring builders to then ass `--enable-<encoding>` ags for each encoding to be built.

New configure options for documentation in modules

s man more modules no contain documentation to be con erted from oc oo X to te t T ost cri t and or F formats ne standard o tions ha e been added to the con gure macros to control the build of these in the modules.

`--with-xmlto=yes|no`	nables or disables use of the htt s fedorahosted.org mlto command to translate oc oo X to other formats. ll oc oo X con ersions re uire use of this command.
`--with-fop=yes|no`	nables or disables use of the ache htt s mlgra hics.a ache.org fo command to translate oc oo X to ost cri t and F formats.
`--enable-docs=yes|no`	nables or disables the build and installation of all documentation e ce t traditional man ages or those co ered b the --enable-de el-docs and --enable-s ecs o tions.
`--enable-devel-docs=yes|no`	nables or disables the build and installation of documentation for de elo ers of the X.Org soft are modules.
`--enable-specs=yes|no`	nables or disables the build and installation of the formal s eci cation documents for rotocols and s.

Miscellaneous

This section describes other items of note for the X11R7.7 release.

Socket directory ownership and permissions

The soc et directories created in `/tmp` are no re uired to be o ned b root and ha e their stic -bit set. f the ermissions are not set correctl the com onent using this director ill rint an error message and fail to start. ommon soc et directories that are no n to be a ected include

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

These directories are used b the font ser er a lications using the nter-lient change rotocol and the X ser er res ecti el .

There are se eral solutions to the roblem of hen to create these directories. The could be created at install time b the s stem s installer if the `/tmp` dir is ersistent. The could be created at boot time b the s stem s boot scri ts e.g. the `init.d` scri ts . Or the could be created b modules at ser ice startu or user login time.

The solution chosen is latform de endent and the s stem administrator should be able to handle creating those directories on an s stems that do not ha e the correct o nershi or ermissions.

Deprecated components and removal plans

This section lists current lans for remo al of obsolete or de recated com onents in the X.Org releases. s our releases are o en source users ho continue to re uire these can nd the source in re ious releases and continue to use these but the X.Org Foundation and its olunteers ha e decided the burden of continued maintenance and distribution in the core X11 releases out eighs the bene ts of doing so. n some cases this is sim l because no one has olunteered to do continued maintenance so if soft are is listed here that ou need ou can contact `<xorg-devel@lists.x.org>` to olunteer to ta e o er maintainershi either inside or outside of the Xorg release rocess.

Future Removals

ersion	. is included in 7.7. ocumentation for the client libraries can be found in the X X . .man man age. should be considered de recated if ou are rel ing on it lease let us no hat ou need it for so e can nd better solutions. n this release su ort has been remo ed for all rendering and ma ing code lea ing ust mode setting and ra in ut de ice access.
n ut de ice disco er ia	Xorg ser er 1. started using the frame or htt s .freedes to .org i i oft are hal disco er connected in ut de ices recei e noti cation of hot lug e ents for them and to retrie e con guration arameters for them. The maintainers ha e since de recated so the X.Org de elo ers ha e begun re lacement ith alternati es. s a result con guration of in ut de ices ia `*.fdi` les is no longer su orted on inu latforms using ude and ma not be su orted on other latforms in future Xorg ser er releases.
ested and irtual X ser ers	s described in the section called O er ie of X11R7.7 this release contains se eral X ser ers that either dis la onto another X ser er or render into a irtual memor framebu er . These ma be re laced in a future release b use of the ser er ith the `xf86-video-nested` and `xf86-video-dummy` dri ers hich erform the same tas s.

Removed in this Release

nmaintained dri ers

This release no longer contains the follo ing dri ers due to lac of maintainers ith rele ant hard are. isting dri er ersions ma or ith current Xorg ser ers but the are not being acti el u dated to su ort Xorg dri er changes.

f -in ut-acecad cecad Flair

f -in ut-ai te i te tablet

f - ideo-a m lliance ro otion

f - ideo-chi s hi s Technologies

f - ideo-i7 ntel i7

f - ideo-rendition Rendition erite

f - ideo-s not iR or a age

f - ideo-s irge iR

f - ideo-sisusb i et -based

f - ideo-suncg1 un 1

f - ideo-suncg un

f - ideo-sunleo un eo X

f - ideo-suntc un T X

f - ideo-tseng Tseng abs

f - ideo- gi X

f - ideo- gi X olari

Attributions/Acknowledgements/Credits

This section lists the credits for the X11R7.7 release. For a more detailed brea do n refer to the hange og le in the source tree for each module the histor in the org ro ects in freedes to .org s git re ositories htt s gitlab.freedes to .org org or the `git log` information for indi idual source les.

The X indo stem has been a collaborati e e ort from its ince tion. Our a ologies for an one or organi ation inad ertentl o erloo ed. an indi iduals including ma or contributors ho or ed on X are re resented b their em lo ers in this list. f ou feel e ha e left an one out lease let us no .

These eo le contributed in some a to X11R7.7 since the release of X11R7.

a o Rantalainen
aron ulich
e e hdano
inus r er

aron lattner
bdoula e alsimou a e
dam ac son
dam T ac
drian un
lan oo ersmith
lan urr
lan ourihane
lban ro ae s
lbert amen
ldis er o a
lessandro uido
le eucher
le lotnic
le ander ola o
le andr hadchin
le andre ulliard
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