

Zweite Generation der Ginzinger Embedded Linux Distribution. Basierend auf Mainline Linux Kernel 5.4. und 5.10 (i.MX8M)

## 1 Hardware Unterstützung

- NPTL (Native POSIX Thread Library)
- Compiler Optimierung: O2
- Linker Optimierung: hash=both, O1
- Konsole: automatisch (kernel argumente)

### i.MX28:

- ARMv5TEJ
- EABI (embedded-application binary interface)
- softfloat

### i.MX53:

- ARMv7-A
- EABI (embedded-application binary interface)
- hardfloat: vfpv3/neon (FPU Register)

### i.MX6:

- ARMv7-A
- EABI (embedded-application binary interface)
- hardfloat: vfpv3/neon-fp16 (FPU Register)

### i.MX6 UltraLite/ULL:

- ARMv7-VE
- EABI (embedded-application binary interface)
- hardfloat: vfpv4/neon (FPU Register)

### i.MX8M:

- ARMv8-A
- AArch64 ABI

### i586:

- x86 i586

## 2 Qt Creator

- qt-creator-v8.0.2

- Qtv5.15.11-lts-lgpl

- Kompatibel: Debian: 11, 12, Ubuntu: 22.04, 24.04 (latest)

## 3 GINZINGER UPDATE MECHANISMUS

- ge\_update\_V7.16
- Einfache Erzeugung von Update-Images
- Automatische Erkennung der System-Konfiguration (system-type, ...)
- Patch- oder Full-Updates für Patch-Versions-Nummer
- Konfigurierbare Update-Regeln (down-date, re-date, up-date)

- Zusätzliche Checks
- Automatische Display-Rotation
- Unterstützung für Update von MMC/SD-Karten
- Unterstützung Kernel-Parameter für rootfs-, data- und flag-partition
- Unterstützung rootfs-Filesysteme: squashfs, ubifs, jffs2 auf ubi

- Unterstützung data-Filesysteme: jffs2 und ubifs
- Unterstützung für Update vom internen Flash (Daten Partition)
- Verwendung von squashfs statt cramfs für Update Images auf i.MX6, i.MX6UL und i.MX8
- Unterstützung für Headless Devices (ohne Framebuffer)

## 4 KERNEL SOURCE

- linux-5.4.267-ge-24.02 <sup>1,2,3,4,5</sup>
- linux-5.10.72-imx-ge-24.02 <sup>6</sup>

## 5 PROJECT TEMPLATES

- |   |  |  |
|---|--|--|
| <ul style="list-style-type: none"> <li>• EMPTY</li> <li>• c</li> <li>• cpp</li> </ul> | <ul style="list-style-type: none"> <li>• nodejs <sup>2,3,4,6</sup></li> <li>• qtcore</li> <li>• qtgui</li> </ul> | <ul style="list-style-type: none"> <li>• qt-quick <sup>3,4,6</sup></li> <li>• tflite-label-image <sup>2,3,4,6</sup></li> <li>• tflite-python-label-wav <sup>2,3,4,6</sup></li> </ul> |
|---|--|--|

## 6 SOFTWARE PAKETE FÜR GELIN-PROJEKTE

- |  |   |  |  |
|--|---|--|--|
| <ul style="list-style-type: none"> <li>• audio_base</li> <li>• audio_tools</li> <li>• busybox</li> <li>• ca_certs</li> <li>• can_utils</li> <li>• datafs_async</li> <li>• datafs_ext4_data_mode_orde</li> <li>• display_eglfskms <sup>3,6</sup></li> <li>• dosfstools</li> <li>• e2fsprogs</li> <li>• firmware_pan9028</li> <li>• firmware_rtl8192cu</li> <li>• firmware_tiwli18xx</li> <li>• fonts_X11</li> <li>• fonts_base</li> <li>• fonts_dejavu</li> <li>• fonts_liberation</li> <li>• gdbserver</li> <li>• ge_ethmgr</li> <li>• ge_update <sup>1,2,3,4,6</sup></li> </ul> | <ul style="list-style-type: none"> <li>• ge_wlanmgr</li> <li>• gpg2</li> <li>• gpio_tools</li> <li>• gstreamer</li> <li>• gstreamer_bayer2rgbneon <sup>2,3,4</sup></li> <li>• gstreamer_v4l2</li> <li>• hotplugd</li> <li>• i2c_tools</li> <li>• libgecan_tools</li> <li>• linrpcd2</li> <li>• mariadb</li> <li>• mtdutils</li> <li>• mtdutils_test</li> <li>• nodejs <sup>2,3,4,6</sup></li> <li>• packages_common_helper.sh</li> <li>• python3 <sup>2,3,4,6</sup></li> <li>• qt_common</li> <li>• qt_display_auto</li> <li>• qt_display_common</li> <li>• qt_display_eglfskms <sup>3,6</sup></li> </ul> | <ul style="list-style-type: none"> <li>• qt_display_linuxfb</li> <li>• qt_misc</li> <li>• qt_plugins_3d <sup>3,6</sup></li> <li>• qt_plugins_bearer</li> <li>• qt_plugins_canbus</li> <li>• qt_plugins_imageformats</li> <li>• qt_plugins_input_misc</li> <li>• qt_plugins_location</li> <li>• qt_plugins_multimedia</li> <li>• qt_plugins_qmldebug <sup>3,4,6</sup></li> <li>• qt_plugins_sensors</li> <li>• qt_plugins_sql</li> <li>• qt_plugins_webview <sup>6</sup></li> <li>• qt_qmlmodules_3d <sup>3,6</sup></li> <li>• qt_qmlmodules_bluetooth <sup>3,4,6</sup></li> <li>• qt_qmlmodules_charts <sup>3,4,6</sup></li> <li>• qt_qmlmodules_common <sup>3,4,6</sup></li> <li>• qt_qmlmodules_graphicaleffec <sup>3,6</sup></li> <li>• qt_qmlmodules_location <sup>3,4,6</sup></li> <li>• qt_qmlmodules_multimedia <sup>3,6</sup></li> </ul> | <ul style="list-style-type: none"> <li>• qt_qmlmodules_nfc <sup>3,4,6</sup></li> <li>• qt_qmlmodules_qml <sup>3,4,6</sup></li> <li>• qt_qmlmodules_qt_labs <sup>3,4,6</sup></li> <li>• qt_qmlmodules_quick2 <sup>3,4,6</sup></li> <li>• qt_qmlmodules_sensors <sup>3,4,6</sup></li> <li>• qt_qmlmodules_test <sup>3,4,6</sup></li> <li>• qt_qmlmodules_webchannel <sup>3,4,6</sup></li> <li>• qt_qmlmodules_webengine <sup>6</sup></li> <li>• qt_qmlmodules_webkit <sup>3,4,6</sup></li> <li>• qt_qmlmodules_websockets <sup>3,4,6</sup></li> <li>• qt_qmlmodules_webview <sup>6</sup></li> <li>• qt_quick <sup>3,6</sup></li> <li>• qt_touchscreen</li> <li>• qt_webengine <sup>6</sup></li> <li>• rng</li> <li>• rootfs_base</li> <li>• splashscreen</li> <li>• splashscreen_logo</li> <li>• ssh_client</li> <li>• ssh_server</li> </ul> |
|--|---|--|--|

- telnet\_server
- tensorflow\_lite<sup>2,3,4,6</sup>
- tensorflow\_lite\_cpu<sup>2,3,4,6</sup>
- terminfo

- tpmtools
- tslib
- tslib\_tools
- tslib\_uinput

- ubiutils
- valgrind\_callgrind<sup>2,3,4,5,6</sup>
- valgrind\_common<sup>2,3,4,5,6</sup>
- valgrind\_full<sup>2,3,4,5,6</sup>

- valgrind\_memcheck<sup>2,3,4,5,6</sup>
- wlan
- zoneinfo

## 7 QUELLEN PAKETE

### 7.1 TOOLCHAIN

- binutils-2.40
- gcc-12.3.0
- gettext-tiny-0.3.2

- glibc-2.38-44-gd37c2b20a478746<sup>2,3,4,5,6</sup>
- gmp-6.3.0

- isl-0.26
- linux-5.4.272
- mpc-1.2.1

- mpfr-4.1.1
- ncurses-6.4-20230603

### 7.2 BUILDROOT

- acl-2.3.2
- alsa-lib-1.2.11
- alsa-utils-1.2.11
- at-3.2.5
- attr-2.5.2
- aubio-0.4.9
- aumix-2.9.1
- autoconf-2.72
- autoconf-archive-2023.02.20
- automake-1.16.5
- avahi-0.8
- bayer2rgb-neon-bc950b3398ba034<sup>2,3,4,6</sup>
- berkeleydb-5.3.28
- binutils-2.40
- bison-3.8.2
- bluez5\_utils-5.72
- bluez5\_utils-headers-5.72

- boost-1.83.0
- brotli-1.1.0
- bubblewrap-0.8.0
- busybox-1.36.1
- bzip2-1.0.8
- c-ares-1.27.0
- ca-certificates-20230311
- cairo-1.17.4
- can-utils-2023.03
- cifs-utils-6.15
- cmake-3.28.3
- cramfs-2.1
- crda-4.15
- cryptsetup-2.7.1
- cups-2.4.7
- cups-filters-1.28.17
- cyrus-sasl-2.1.28
- dbus-1.14.10

- dbus-glib-0.112
- dbus-triggerd-ba3dbec805cb707c<sup>2,3,4,6</sup>
- dejavu-2.37
- dhystone-2
- dnsmasq-2.90
- dosfstools-4.2
- dtc-1.7.0
- e2fsprogs-1.47.0
- elfutils-0.189
- ethtool-6.6
- evemu-2.7.0
- evtest-1.35
- expat-2.6.2
- faad2-2.11.1
- fakeroot-1.32.1
- fbdump-0.4.2
- fbgrab-1.5

- fcgiwrap-99c942c90063c73734e56<sup>2,3,4,6</sup>
- ffmpeg-4.4.4
- fftw-double-3.3.10
- firmware-imx-8.20<sup>6</sup>
- flac-1.4.3
- flatbuffers-2.0.0<sup>1,2,3,4,6</sup>
- flex-2.6.4
- fmt-10.2.1
- fontconfig-2.14.2
- freetype-2.13.2
- gawk-5.3.0
- gcc-final-12.3.0
- gcc-initial-12.3.0
- gdb-13.2
- genext2fs-1.5.0
- gengetopt-2.23<sup>2,3,4,6</sup>
- gettext-tiny-0.3.2

- ghostscript-10.02.1
- ghostscript-fonts-8.11
- glib-networking-2.76.0
- glibc-2.38-44-gd37c2b20a478746<sup>1,2,3,4,6</sup>
- glibmm-2.76.0
- glmark2-2023.01<sup>3</sup>
- gmp-6.3.0
- gnupg2-2.4.5
- gnutls-3.8.3
- gperf-3.1
- gst1-libav-1.22.9
- gst1-plugins-bad-1.22.9
- gst1-plugins-base-1.22.9
- gst1-plugins-bayer2rgb-neon-b6<sup>2,3,4,6</sup>
- gst1-plugins-good-1.22.9
- gst1-plugins-ugly-1.22.9
- gstreamer1-1.22.9
- gutenprint-5.3.4
- gzip-1.13
- harfbuzz-8.3.1
- hostapd-2.10
- hotplugd-14993
- htop-3.3.0
- i2c-tools-4.3
- icu-73-2
- ifplugd-0.28
- imagemagick-7.1.1-21
- imx-gpu-viv-6.4.3.p2.4-aarch64<sup>6</sup>
- imx-mkimage-lf-6.1.36\_2.1.0<sup>6</sup>
- inotify-tools-3.20.2.2
- inputevent-daemon-0.1.3
- intltool-0.51.0
- iperf3-3.14
- iproute2-6.7.0
- iptables-1.8.9
- isl-0.26
- iw-5.19
- jasper-2.0.33
- jbig2dec-0.19
- jimctl-0.81
- jitterentropy-library-3.4.1
- jpeg-turbo-2.1.5
- jq-1.7.1
- json-c-0.17
- kbd-2.5.1
- kmod-31
- lame-3.100
- lapack-3.10.1<sup>1,2,3,4,6</sup>
- latencytop-0.5
- lcms2-2.16
- ldd-crostool-ng-1.24.0
- leveldb-1.23
- libaio-0.3.113
- libao-1.2.0
- libargon2-20190702
- libassuan-2.5.7
- libatomic\_ops-7.8.2
- libbacktrace-9b7f216e867916594<sup>6</sup>
- libbsd-0.11.7
- libcap-2.69
- libcap-ng-0.8.4
- libcurl-8.7.1
- libdaemon-0.14
- libdrm-2.4.120
- libepoxy-1.5.10
- liberation-2.1.5
- libestr-0.1.11
- libevdev-1.13.1
- libevent-2.1.12
- libfastjson-0.99.9.1
- libfcgi-2.4.2
- libffi-3.4.4
- libftdi-0.20
- libgcrypt-1.10.3
- libgecan-1529
- libglib2-2.76.1
- libglu-9.0.3<sup>3</sup>
- libgpg-error-1.48
- libgpiod-1.6.4
- libhid-0.2.16
- libhttpparser-2.9.4
- libiberty-2.41
- libical-1.0.1
- libjpeg-9f
- libkrb5-1.21
- libksba-1.6.6
- liblog4c-localtime-1.0
- liblogging-1.0.6
- libmd-1.1.0
- libmicrohttpd-0.9.77
- libmms-0.6.4
- libmnl-1.0.5
- libmodbus-3.1.10
- libmpeg2-0.5.1
- libnftnl-1.2.6
- libnl-3.9.0
- libnptl-1.7
- libnspr-4.35<sup>3,4,6</sup>
- libnss-3.97<sup>3,4,6</sup>
- libogg-1.3.5
- libopenh264-2.4.0
- libopenssl-3.2.1
- libpcap-1.10.4
- libpng-1.6.42
- libpsl-0.21.5
- libpthread-stubs-0.5
- libqrencode-4.1.1
- libseccomp-2.5.5
- libsigc-3.4.0
- libsndfile-1.2.2
- libsocketcan-0.0.12
- libsoup-2.74.3
- libsoup3-3.4.4
- libssh2-1.11.0
- libsysfs-2.1.1
- libtasn1-4.19.0
- libtheora-1.1.1
- libtirpc-1.3.4
- libtool-2.4.6
- libtraceevent-1.8.2
- libtracefs-1.8.0
- libuboot-ge-env-15951
- libunistring-1.1

- liburcu-0.14.0
- liburiparser-0.9.7
- libusb-1.0.26
- libusb-compat-0.1.8
- libuv-1.48.0
- libv4l-1.24.1
- libvncserver-0.9.14
- libvorbis-1.3.7
- libvpx-1.13.1
- libwebsockets-4.3.3
- libwpe-1.14.2
- libxcb-1.15
- libxkbcommon-1.4.0
- libxml-parser-perl-2.47
- libxml2-2.12.6
- libxslt-1.1.39
- libyaml-0.2.5
- libzip-1.10.1
- libzlib-1.3.1
- linrpcd-2-16699
- linux-headers-5.10.213<sup>6</sup>
- linux-headers-5.4.272<sup>1,2,3,4,5</sup>
- linux-zigbee-0.3.1
- linuxconsoletools-1.8.1
- live555-2021.05.03
- log4cplus-2.1.0
- logrotate-3.21.0
- lrzsz-0.12.20
- ltrace-82c66409c7a93ca6ad2e456<sup>1,2,3,4,5</sup>
- lttng-libust-2.12.0
- lvm2-2.03.14
- lz4-1.9.4
- lzip-1.23
- lzo-2.1.0
- lzop-1.04
- m4-1.4.19
- mariadb-10.11.6
- matchbox-1.2
- matchbox-common-0.9.1
- matchbox-desktop-0.9.1
- matchbox-fakekey-0.3
- matchbox-keyboard-0.1.1
- matchbox-lib-1.12
- matchbox-panel-0.9.3
- mdadm-4.2
- memstat-1.0
- memtester-4.5.1
- mesa3d-24.0.4<sup>1,2,3,4,5</sup>
- meson-1.3.1
- minizip-4.0.3<sup>6</sup>
- mmc-utils-e1281d4de9166b7254ba<sup>1,2,3,4,5</sup>
- mosquito-2.0.18
- mpc-1.2.1
- mpfr-4.1.1
- mpg123-1.32.3
- mtid-2.1.6
- mtdev-1.1.6
- mxt-app-15949
- nano-7.2
- nasm-2.16.01<sup>5</sup>
- ncurses-6.4-20230603
- net10-1.2.1<sup>2,3,4</sup>
- neard-0.19
- netcat-openbsd-1.218
- netsnmp-5.9.3
- nettle-3.9.1
- nfs-utils-2.6.4
- nftables-1.0.8
- nftables-python-1.0.8<sup>1,2,3,4,6</sup>
- nghhttp2-1.58.0
- nginx-1.24.0
- ninja-1.11.1.g95dee.kitware.jo<sup>1,2,3,4,6</sup>
- nodejs-bin-20.11.1<sup>2,3,4,6</sup>
- nodejs-src-20.11.1<sup>2,3,4,6</sup>
- ntp-4.2.8p17
- numactl-2.0.16<sup>5,6</sup>
- oniguruma-6.9.9
- openblas-0.3.26<sup>1,2,3,4,6</sup>
- opencv3-3.4.19
- openjpeg-2.5.0
- openvpn-2.6.10
- oprofile-1.4.0
- opus-1.4<sup>3,4,6</sup>
- p11-kit-0.25.3
- patchelf-0.13
- pcre-8.45
- pcre2-10.42
- php-8.2.16
- pixman-0.42.2
- pkgconf-1.6.3
- popl-1.19
- pppd-2.5.0
- pptp-linux-1.10.0
- protobuf-21.12
- pwgen-2.08
- python-attrs-23.2.0<sup>1,2,3,4,6</sup>
- python-beniget-0.4.1<sup>1,2,3,4,6</sup>
- python-calver-2022.6.26<sup>1,2,3,4,6</sup>
- python-cython-0.29.36<sup>1,2,3,4,6</sup>
- python-dateutil-2.8.2<sup>1,2,3,4,6</sup>
- python-distlib-0.3.8<sup>2,3,4,6</sup>
- python-editables-0.5<sup>1,2,3,4,6</sup>
- python-flit-core-3.9.0
- python-gast-0.5.4<sup>1,2,3,4,6</sup>
- python-hatch-fancy-pypi-readme<sup>1,2,3,4,6</sup>
- python-hatch-vc-0.4.0<sup>1,2,3,4,6</sup>
- python-hatchling-1.21.0<sup>1,2,3,4,6</sup>
- python-iniconfig-2.0.0<sup>1,2,3,4,6</sup>
- python-installer-0.7.0
- python-mako-1.3.0<sup>1,2,3,4,5</sup>
- python-markupsafe-2.1.3<sup>1,2,3,4,5</sup>
- python-numpy-1.25.0<sup>1,2,3,4,6</sup>
- python-packaging-23.2
- python-pandas-1.5.3<sup>1,2,3,4,6</sup>
- python-paths-spec-0.12.1<sup>1,2,3,4,6</sup>
- python-pillow-10.2.0<sup>1,2,3,4,6</sup>
- python-pip-23.3.2<sup>1,2,3,4,6</sup>
- python-pluggy-1.3.0<sup>1,2,3,4,6</sup>
- python-ply-3.11<sup>1,2,3,4,6</sup>

- python-py-1.11.0 <sup>1,2,3,4,6</sup>
- python-pybind-2.11.1 <sup>1,2,3,4,6</sup>
- python-pycryptodomex-3.19.1
- python-pypa-build-1.0.3
- python-pyparsing-3.1.1 <sup>1,2,3,4,6</sup>
- python-pyproject-hooks-1.0.0
- python-pytest-7.4.4 <sup>1,2,3,4,6</sup>
- python-pythran-0.15.0 <sup>1,2,3,4,6</sup>
- python-pytz-2023.3.post1 <sup>1,2,3,4,6</sup>
- python-scipy-1.11.4 <sup>1,2,3,4,6</sup>
- python-setuptools-69.0.3
- python-setuptools-scm-8.0.4 <sup>1,2,3,4,6</sup>
- python-six-1.16.0 <sup>1,2,3,4,6</sup>
- python-toml-0.10.2 <sup>1,2,3,4,6</sup>
- python-trove-classifiers-2023. <sup>1,2,3,4,6</sup>
- python-typing-extensions-4.9.0 <sup>1,2,3,4,6</sup>
- python-wheel-0.40.0
- python3-3.11.8
- qemu-8.1.1 <sup>2,3,4,6</sup>
- qjson-0.9.0
- qpdf-10.5.0
- qt53d-5fd3906445ac95bf1cca6e7a <sup>3,6</sup>
- qt5base-e44097b63d17ba3178a637 <sup>3,6</sup>
- qt5charts-841083c263f16f8acb81 <sup>3,6</sup>
- qt5connectivity-c5f35f89e975c2 <sup>3,6</sup>
- qt5declarative-b3aaf1482c48bbc <sup>3,6</sup>
- qt5graphicaleffects-e6e1e58ec2 <sup>3,6</sup>
- qt5imageformats-9044695f4b1acd <sup>3,6</sup>
- qt5location-ebdf5b38da6e3fe0a1 <sup>3,6</sup>
- qt5multimedia-76f84c545429a1b9 <sup>3,6</sup>
- qt5quickcontrols-e62b8b6d2f45a <sup>3,4,6</sup>
- qt5quickcontrols2-74e8db97fdb9 <sup>3,4,6</sup>
- qt5scriptf237e324508dcf0dbabd <sup>3,4,6</sup>
- qt5sensors-35eb5ac7eaef4745a38 <sup>3,4,6</sup>
- qt5serialbus-f9f7eee60adac72fc <sup>3,4,6</sup>
- qt5serialport-c9abfcd5d88cb43c <sup>3,4,6</sup>
- qt5svg-a9752b00a03438de8e5b080 <sup>3,4,6</sup>
- qt5tools-32912a06aadfc3dcbc34e <sup>3,6</sup>
- qt5webchannel-8c842152da613f94 <sup>3,6</sup>
- qt5webengine-5.15.10 <sup>6</sup>
- qt5webengine-chromium-0ad28143 <sup>6</sup>
- qt5webengine-chromium-catapult <sup>6</sup>
- qt5webkit-5.212.0-alpha4
- qt5websockets-6a4991250793cd38 <sup>6</sup>
- qt5webview-87577dde04ed219bda7 <sup>6</sup>
- qt5xmlpatterns-30e6c84fe2752cd <sup>6</sup>
- quazip-1.4
- qwt-6.1.6
- readline-8.2
- rng-tools-6.16
- rppppoe-3.15
- rpcbind-1.2.6
- rsync-3.2.7
- rsyslog-8.2312.0
- rt-tests-2.5 <sup>5,6</sup>
- ruby-3.3.0
- sdl-1.2.15
- sdl2-2.28.5
- sdl\_mixer-d1725fcb7c4e987aeb7 <sup>6</sup>
- sdl\_net-620b0ba7dd84a0fdbd4cc <sup>6</sup>
- slirp-4.7.0 <sup>2,3,4,6</sup>
- snappy-1.1.10
- socat-1.8.0.0
- softether-4.30-9700-beta
- sox-7524160b29a476f7e87bc14fdd <sup>6</sup>
- spawn-fcgi-1.6.4
- spidev\_test-4.10 <sup>1,2,3,4,5</sup>
- spidev\_test-5.8 <sup>6</sup>
- splashscreen-splashscreen\_V2. <sup>1,2,3,4,5</sup>
- sqlite-3.44.2
- squashfs-4.6.1
- sshpass-1.10
- strace-6.7
- sudo-1.9.15p5
- swig-4.1.1 <sup>1,2,3,4,6</sup>
- sysstat-12.7.5
- tar-1.34
- tcpdump-4.99.4
- tensorflow-lite-v2.8.0 <sup>2,3,4,6</sup>
- fflite-abseil-cpp-997aaf3a2830 <sup>1,2,3,4,6</sup>
- fflite-clog-d5e37adf1406 <sup>1,2,3,4,6</sup>
- fflite-cpuinfo-5916273f79a2 <sup>1,2,3,4,6</sup>
- fflite-eigen-085c2fc5d53f <sup>1,2,3,4,6</sup>
- fflite-farmhash-0d859a811870 <sup>1,2,3,4,6</sup>
- fflite-fft2d-1.0 <sup>1,2,3,4,6</sup>
- fflite-flatbuffers-v1.12.0 <sup>1,2,3,4,6</sup>
- fflite-gemmlowp-fda83bdc38b1 <sup>1,2,3,4,6</sup>
- fflite-ruy-e6c1b8dc8a8b <sup>1,2,3,4,6</sup>
- tiff-4.6.0
- tim-vx-19e4e86651109966d519187 <sup>6</sup>
- tmux-3.3a
- tpm2-tools-5.2
- tpm2-tss-3.2.2
- tpm2-tss-engine-1.2.0
- trace-cmd-3.2
- tremor-7c30a66346199f3f09017a0 <sup>6</sup>
- tslib-1.23
- tzdata-2024a
- ubiexdump-13895
- uboot-tools-2021.07
- unifdef-2.12
- unzip-6.0
- usb\_modeswitch-2.6.1
- util-linux-2.39.3
- valgrind-3.22.0 <sup>2,3,4,5,6</sup>
- vorbis-tools-1.4.2
- vx-delegate-07bb4353ba6b0275c5 <sup>6</sup>
- waf-2.0.26
- wavpack-5.6.0
- wayland-1.22.0
- wayland-protocols-1.32
- webp-1.3.2
- wget-1.21.4
- whetstone-1.2
- wireless-regdb-2023.09.01
- wireless\_tools-30.pre9
- wlansimplescan-r274

- woff2-1.0.2
- wpa\_supplicant-2.10
- wpebackend-fdo-1.14.2
- wpewebkit-2.44.1
- x11vnc-0.9.16
- xapp\_bdfopcf-1.1.1
- xapp\_mkfontscale-1.2.2
- xapp\_xauth-1.1.2
- xapp\_xbacklight-1.2.3
- xapp\_xev-1.2.5
- xapp\_xeyes-1.2.0
- xapp\_xhost-1.0.9
- xapp\_xinput-1.6.4
- xapp\_xkbcomp-1.4.6
- xapp\_xkbvd-1.1.5
- xapp\_xkbprint-1.0.6
- xapp\_xlogo-1.0.6
- xapp\_xmessage-1.0.6
- xapp\_xmodmap-1.0.11

- xapp\_xset-1.2.5
- xapp\_xsetmode-1.0.0
- xapp\_xsetpointer-1.0.1
- xapp\_xsetroot-1.1.3
- xcb-proto-1.15.2
- xcb-util-0.4.1
- xcb-util-image-0.4.1
- xcb-util-wm-0.4.2
- xdata\_xbitmaps-1.1.3
- xdg-dbus-proxy-0.1.5
- xfont\_encodings-1.0.7
- xfont\_fontalias-1.0.5
- xfont\_font-cursor-misc-1.0.4
- xfont\_font-misc-misc-1.1.3
- xfont\_font-util-1.4.0
- xkeyboard-config-2.38
- xlib\_libICE-1.1.1
- xlib\_libSM-1.2.4
- xlib\_libX11-1.8.7

- xlib\_libXScrnSaver-1.2.4
- xlib\_libXau-1.0.11
- xlib\_libXaw-1.0.15
- xlib\_libXcomposite-0.4.6
- xlib\_libXcursor-1.2.1
- xlib\_libXdamage-1.1.6
- xlib\_libXdmcp-1.1.4
- xlib\_libXext-1.3.5
- xlib\_libXfixes-6.0.1
- xlib\_libXfont-1.5.4
- xlib\_libXfont2-2.0.6
- xlib\_libXft-2.3.8
- xlib\_libXi-1.8.1
- xlib\_libXinerama-1.1.5
- xlib\_libXmu-1.1.4
- xlib\_libXpm-3.5.17
- xlib\_libXrandr-1.5.3
- xlib\_libXrender-0.9.11
- xlib\_libXres-1.2.2

- xlib\_libXt-1.3.0
- xlib\_libXtst-1.2.4
- xlib\_libXv-1.0.12
- xlib\_libXxf86vm-1.1.5
- xlib\_libfontenc-1.1.7
- xlib\_libxcvt-0.1.2<sup>4</sup>
- xlib\_libxkbfile-1.1.2
- xlib\_libxshmfence-1.3.2
- xlib\_xtrans-1.5.0
- xmlstarlet-1.6.1
- xorgproto-2023.2
- xterm-389
- xutil\_util-macros-1.20.0
- xvkbd-4.1
- xz-5.4.5
- zic-2024a
- zip-3.0
- zstd-1.5.5