

Embedded lightweight unix

- ELWIX – its free now!

Universal embedded system

<http://www.elwix.org/>

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Since 2004 like proprietary OS



ELWIX

- Give best practices and features from *BSD
- Works with latest features and protocols
- Shipped with full driver support builtin kernel
- Not needed additional modules, but exist support for custom kernel loadable modules.
- Use for many various applicances, like access control, security surveillance, radio devices network routing, customer access systems, appliacion servers and etc...

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- Minimal requirement for full armed system with all features:

48MB – free space

64MB – RAM

i486 – CPU instructions for x86

* Also supported arm, powerpc, mips

- Advanced SMP network stack
- Extended WiFi support with many custom features for throughput and long-range radio links

ELWIX

- Added many own drivers and features
- Ability to boot from DOS and FAT
- No partitions needed
- System configs stored in XML
- Option for ultra safety system updates*
- Option for ultra safety critical OS config updates, in order to prevent connectivity lost**

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- Extremely easy full or partial update or upgrade installed system

Update – update current version with last or healthy programs

upload with tftp or scp 2 files and replace::

kernel.gz or elwix-firmware.sys on flash drive and reboot

- *Upgrade – upgrade system to new version of OS*

dd if=elwix_1.1_i386_64MB.img of=<this is flash drive like /dev/ad0>

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- OS Structure

Boot stage – *raw disk image*

Kernel - *kernel.gz*

1st stage RomFS embedded in kernel – **builtin**

2nd stage RootFS embedded in firmware
module - *elwix-firmware.sys*

Init boot - *RC system*

Attach and load system software packages - **optional**

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- **Install system**

Use:: `dd if=elwix_1.1_i386_64MB.img of=<disk>`

or other tool for raw write disk sectors from image file

- **Add optional software or packages**

Upload elwix package in `/elwix/cf` directory and reboot :-), for deinstall remove file from `/elwix/cf` and reboot ... easy right?

- **Soon I provide elwix toolchain for compiling custom packages from anyone***

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- **What contains RomFS**

Static linked BSD major system programs in one big fat binary

All needed programs for first aid and rescue next boot operations

The size of this filesystem is 5MB injected into kernel and secure fs (RO)

- **After kernel attach and mount RomFS**

Small hidden part of code prepare to attach second filesystem OS image.

If not found second system firmware image. Boot process stops and starts emergency shell in single user mode.

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- **What contains RootFS, entire code base**

All userland programs, libraries and data for system included in firmware

Dynamic linked, compressed and secured filesystem (RO) access.

Include many additional programs like arping, bmon, hping, sudo and etc ... ;-)

- **After RomFS attach and mount RootFS**

Start real init boot rc scripts ...

Note: for “**restore to defaults**” in /elwix/altroot/backup contains backuped default system /etc files

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- **Init boot RC process - rc.init**
 - check disk problems and mounts /tmp 8MB and /var 16MB like memory drives
 - if exist additional package filesystem mount to /elwix/cf
 - populate /var contents from /elwix/altroot/var
 - setup sysctl options
 - syncing password database and if lock user login unlock it
 - set localhost interface and hostname
 - set mgmt vlan tagged 4093 rescue interface with 10.254.254.254/30
 - if supplied additional packages. Attach and mount each one to /system
 - Run all marked for start services in rc.S

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- **Disk filesystem contains**

elwix-firmware.sys – elwix firmware

/boot – boot directory with kernel.gz file

/altroot – alternative location for /var and backup factory default /etc

/cf – location for additional packages

/etc – active system configs

/exports – mount point if HDD backend store exists

/home – place for all users home directories

/root – root home

/tftpboot – upload tftp place

/local – all custom local patches*

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Thank you!

Q & A ???

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