Porting Tizen to open-source hardware devices for beginners

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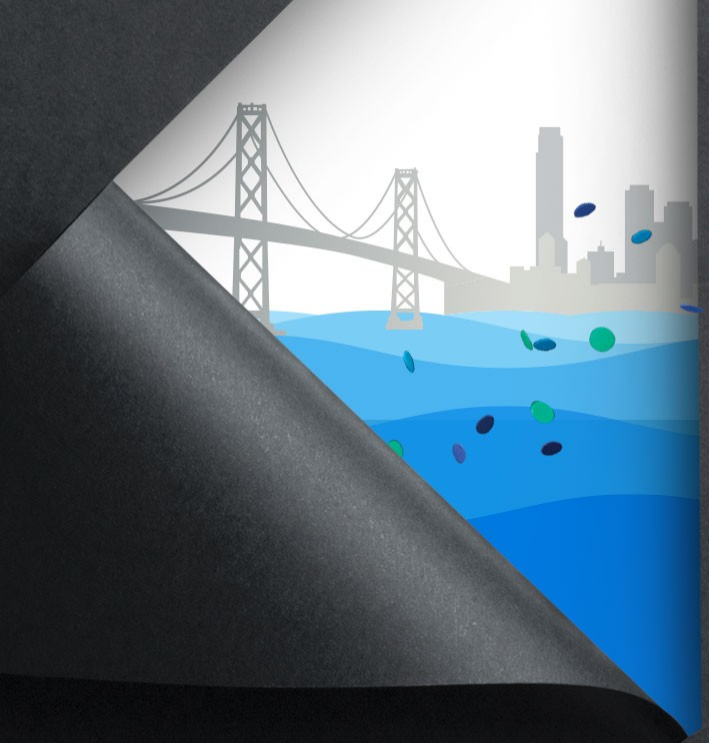
TIZEN™ DEVELOPER CONFERENCE 2014 SAN FRANCISCO

Agenda

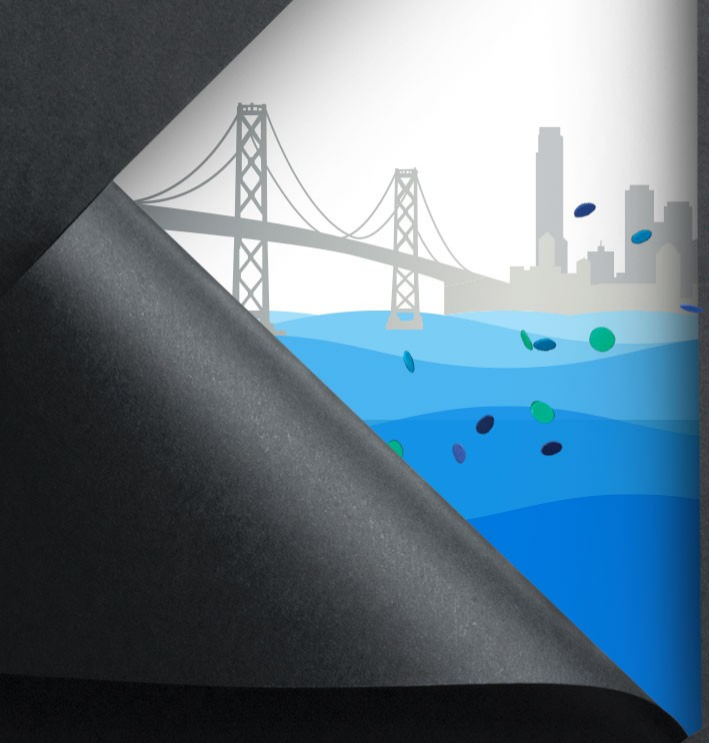
- Open-source hardware
- Popular SBCs
- Tizen-sunxi
- DIY Tizen tablet
- DIY Tizen laptop
- Porting Tizen



Open-source hardware

What is open-source hardware?

Why open-source hardware?



Popular SBC

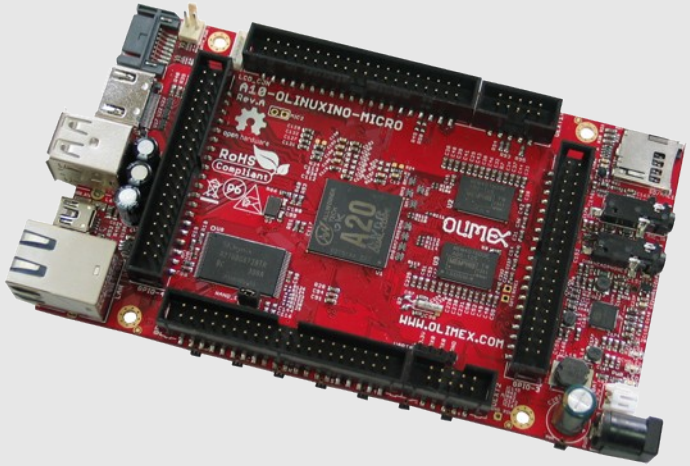
Top 20 hacker SBCs according to LinuxGizmos

Position	SBC	Position	SBC
1	**Raspberry Pi Model B**	11	**86Duino/86Duino One**
2	**BeagleBone Black**	12	**Odroid-XU**
3	**Odroid-U3**	13	**A20-OLinuXino-Micro**
4	**CubieTruck**	14	**Wandboard Quad**
5	**Banana Pi**	15	**Radxa Rock**
6	**Parallella**	16	**Hackberry A10**
7	**Cubieboard2**	17	**MinnowBoard**
8	**A10-OLinuXino-Lime**	18	**Arndale Octa**
9	**Galileo**	19	**SAMA5D3 Xplained**
10	**Udoo Quad**	20	**i.MX6 Rex**

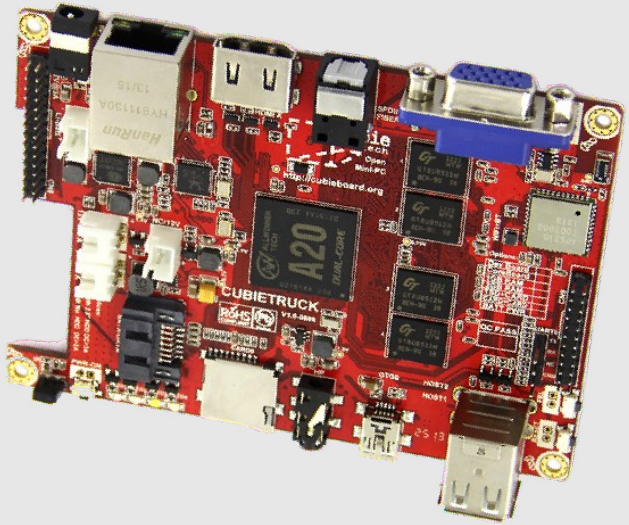
Allwinner

- No.1 in shipment of processors for Android tablets in 2013
- Supports open-source software and hardware

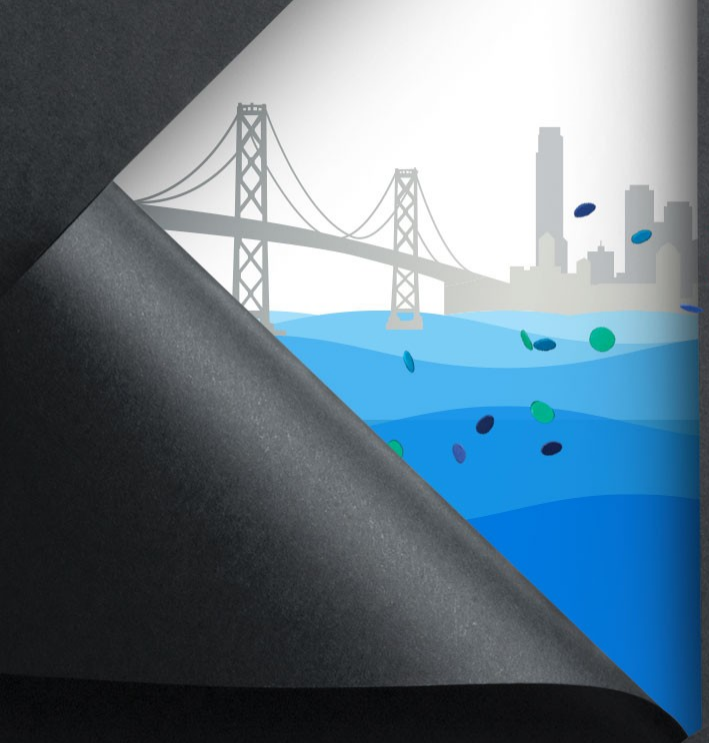
Popular budget SBC families with Allwinner CPU



OLinuXino



Cubieboard



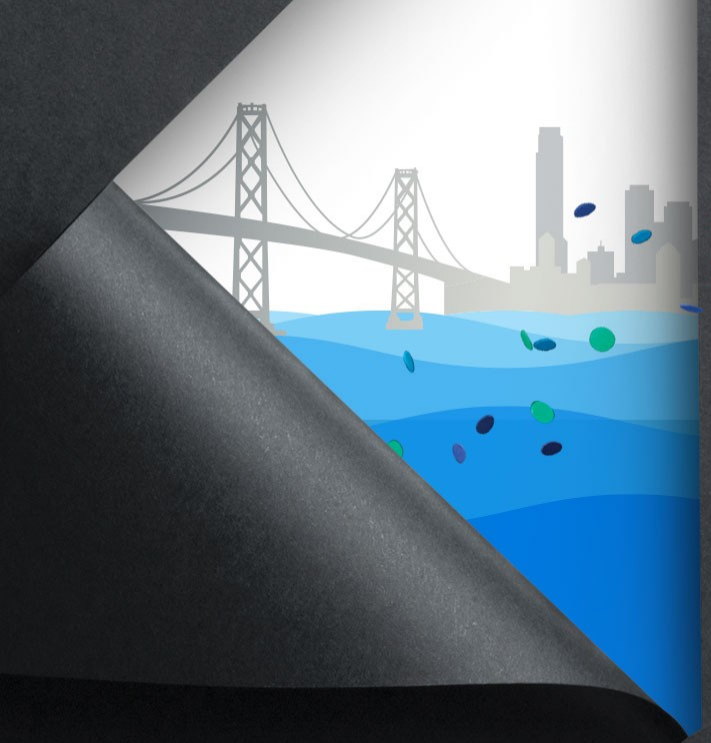
Tizen-sunxi

Tizen-sunxi

Community driven open-source port of Tizen with Linux-sunxi kernel for devices with Allwinner chipsets.

https://github.com/leon-anavi/tizen-sunxi

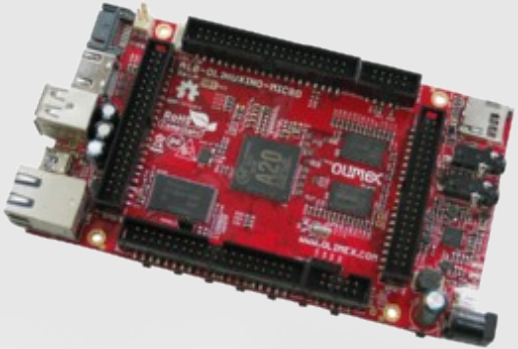
Download, copy and boot Tizen on Sunxi devices!



Do It Yourself Tizen tablet

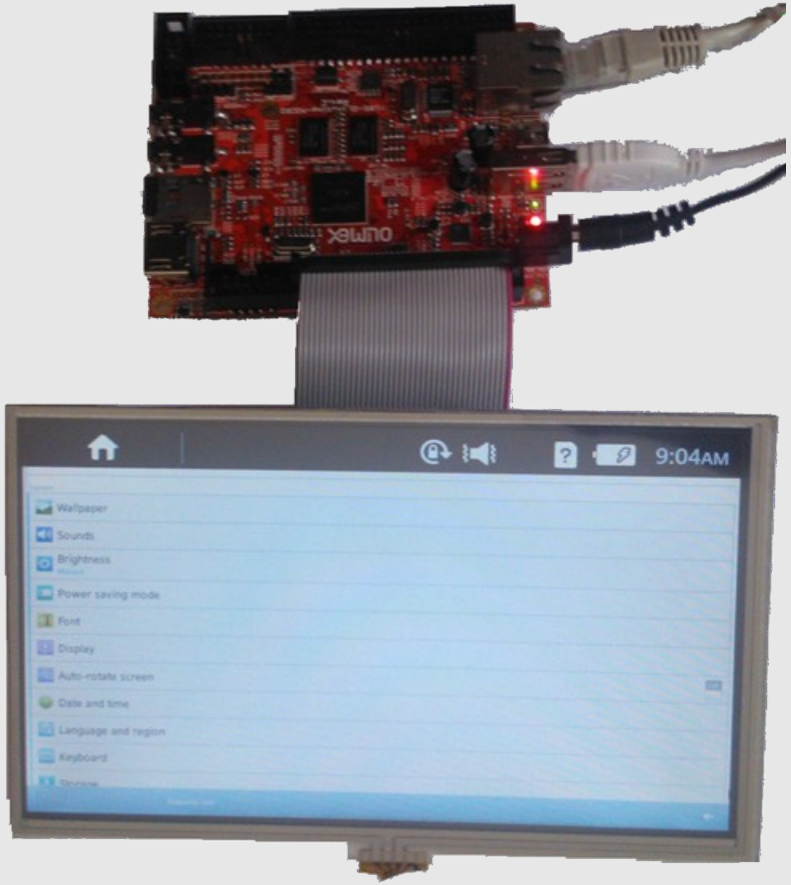
Key components for a Tizen tablet

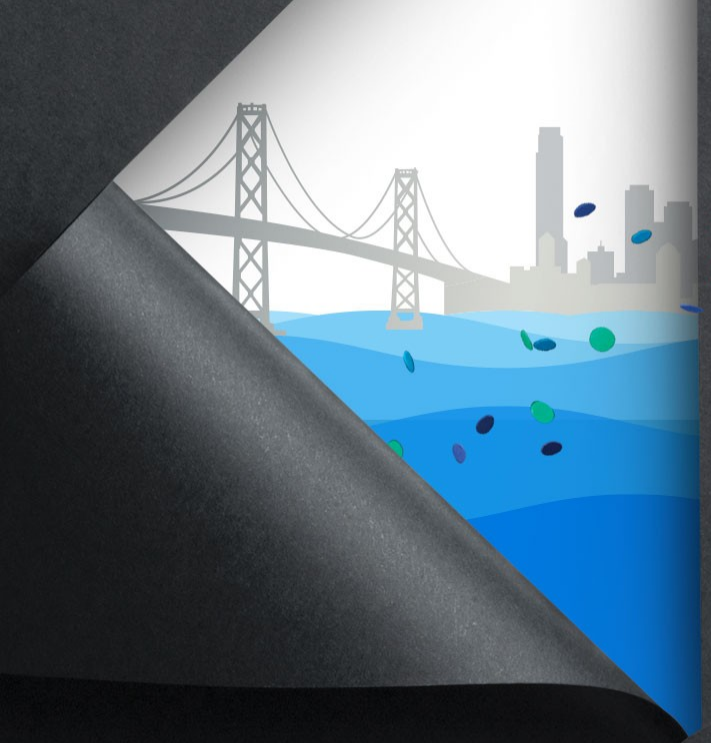
- SBC
- Display
- Power supply or battery



Please close your eyes.

Imagine the next iPad killer device...
made at home.


olimex
9:04AM
Wallpaper
Sounds
Brightness
Power saving mode
Font
Display
Auto-rotate screen
Date and time
Language and region
Keyboard

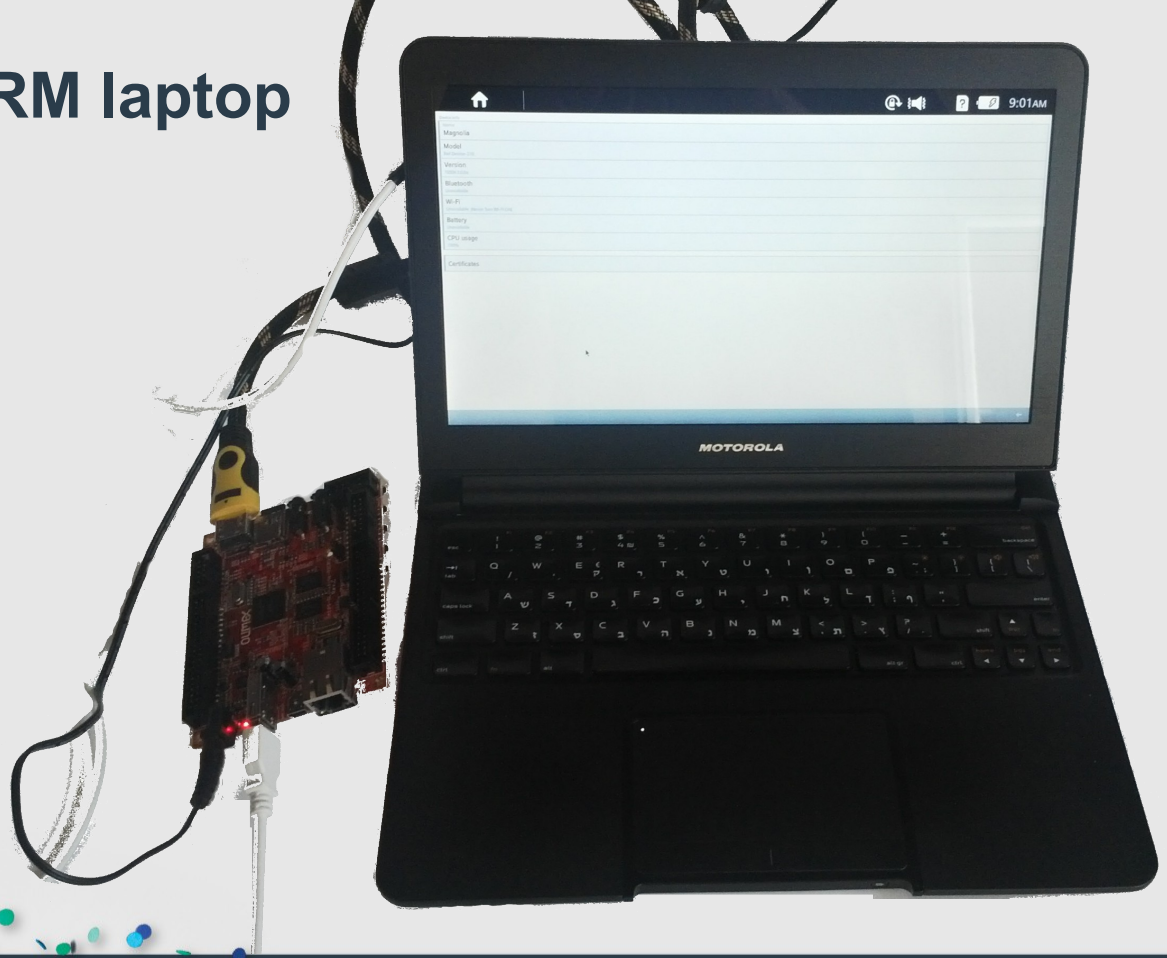


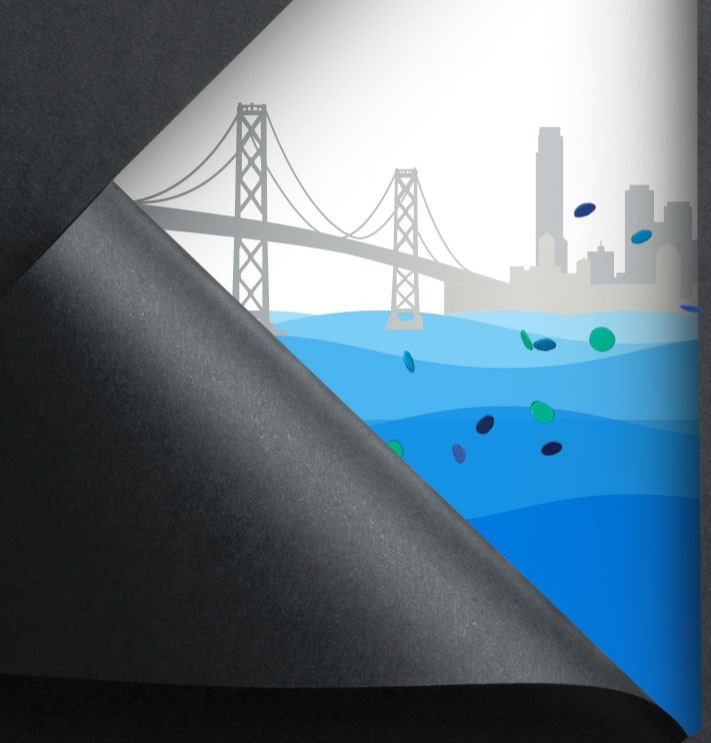
Do It Yourself Tizen laptop

Key components for a Tizen laptop

- SBC
- Motorola lapdock
- HDMI cable
- USB male to male cable
- Adapters

Tizen ARM laptop





Porting Tizen

Why should we port Tizen to new devices?

How to port Tizen to ARM devices?

- Build Linux kernel
- Build boot loader
- Create Tizen platform image
- Set up Tizen on microSD card or NAND

Build Linux kernel and boot loader following the recommendations of the hardware vendor!

For example: use Linux-sunxi kernel and U-Boot for Allwinner devices.

How to create Tizen platform image from scratch?

- **Set up development environment & install development tools**
  - Supported distributions: Ubuntu, Fedora, openSUSE, CentOS
  - Configure Gerrit access and Git
- **Get Tizen source code using Git**
- **Build RPM packages for ARMv7 using Git Build System (GBS)**
- **Create Tizen platform image**
  - Prepare kickstarter file
  - Create an image from the built RPM using GBS

```
gbs createimage --ks-file=tizen-sunxi.ks
```

How to set up Tizen on microSD card for ARM SBC?

- Create a single FAT32 and three ext4 partitions
- Copy the boot loader and the Linux kernel to the FAT32 partition
- Copy platform, data and UMS images to the other partitions

Configure display options for Sunxi devices

- The easy way: uEnv.txt

  For OLinuXino set disp.screen0_output_type to:
  - 0 - no display
  - 1 - LCD
  - 2 - TV
  - 3 - HDMI
  - 4 - VGA

- The hard way: compile FEX to binary configuration file

Debugging the boot process

Useful resources

- **Getting Started Guide**
  https://source.tizen.org/documentation/developer-guide/getting-started-guide
- **All-in-One Instructions for Creating Tizen Images from Scratch**
  https://source.tizen.org/documentation/developer-guide/all-one-instructions-creating-tizen-images-scratch
- **Porting Guide** https://wiki.tizen.org/wiki/Porting_Guide
- **Tizen Wiki** https://wiki.tizen.org/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