Porting Tizen to open-source hardware devices for beginners

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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
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<thead>
<tr>
<th>Position</th>
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<tr>
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<td>Raspberry Pi Model B</td>
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<td>86Duino/86Duino One</td>
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<td>BeagleBone Black</td>
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<td>CubieTruck</td>
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<td>Parallella</td>
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<td>Galileo</td>
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<td>Udoq Quad</td>
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<td>i.MX6 Rex</td>
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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.
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**

- **Tizen Wiki**
  https://wiki.tizen.org/