



MY FIRST ANDROID™ PORT

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Agenda

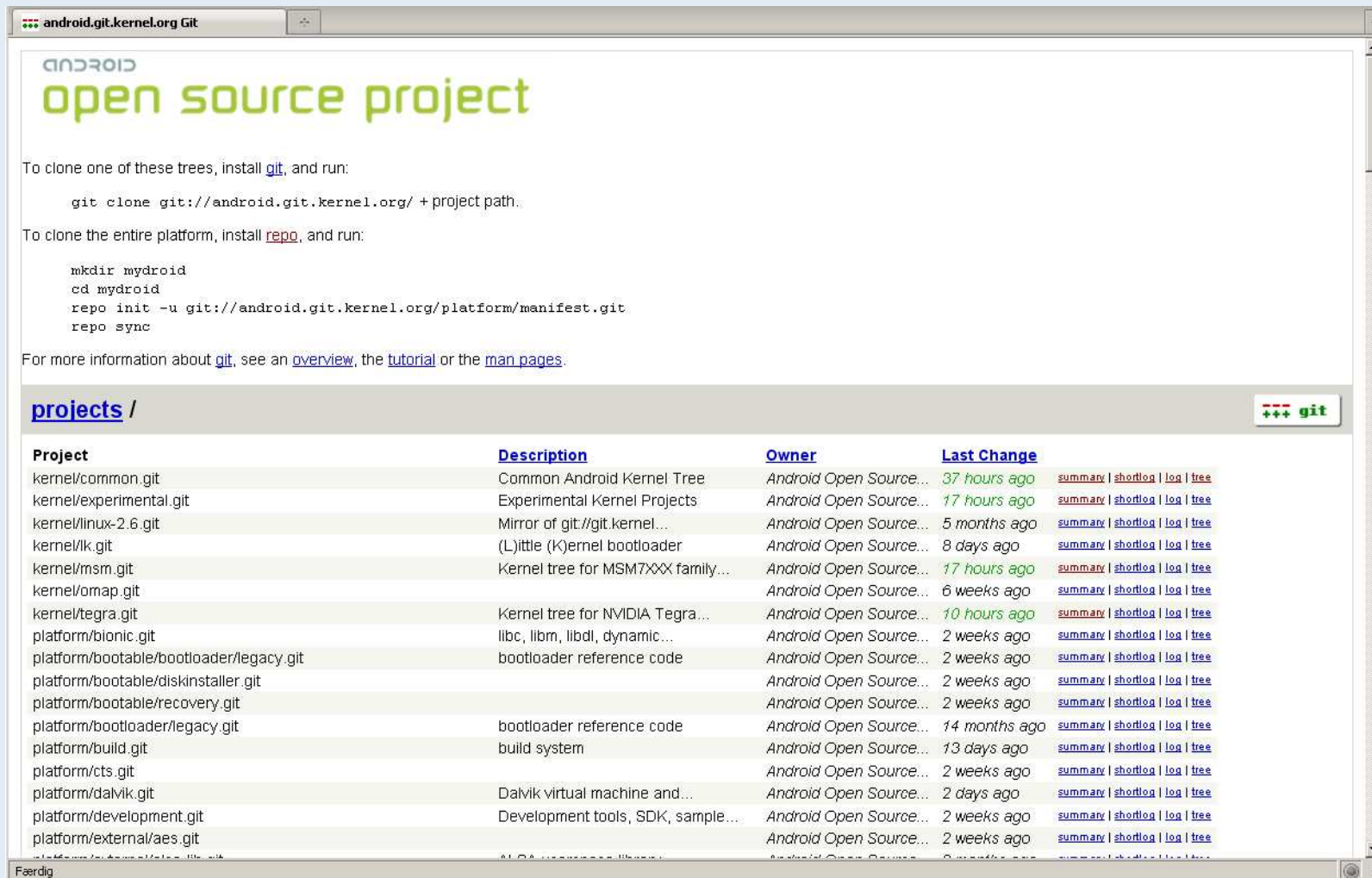
- Source
- Building
- Kernel
- Startup
- Hardware
- Debugging



Where to start

- developer.android.com
- source.android.com
- kandroid.org
- pdk.android.com
- android.git.kernel.org

android.git.kernel.org



android.git.kernel.org Git

ANDROID
open source project


To clone one of these trees, install [git](#), and run:

```
git clone git://android.git.kernel.org/ + project path.
```

To clone the entire platform, install [repo](#), and run:

```
mkdir mydroid
cd mydroid
repo init -u git://android.git.kernel.org/platform/manifest.git
repo sync
```

For more information about [git](#), see an [overview](#), the [tutorial](#) or the [man pages](#).

[projects /](#) 

Project	Description	Owner	Last Change
kernel/common.git	Common Android Kernel Tree	Android Open Source...	37 hours ago summary shortlog log tree
kernel/experimental.git	Experimental Kernel Projects	Android Open Source...	17 hours ago summary shortlog log tree
kernel/linux-2.6.git	Mirror of git://git.kernel...	Android Open Source...	5 months ago summary shortlog log tree
kernel/lk.git	(L)ittle (K)ernel bootloader	Android Open Source...	8 days ago summary shortlog log tree
kernel/msm.git	Kernel tree for MSM7XXX family...	Android Open Source...	17 hours ago summary shortlog log tree
kernel/omap.git		Android Open Source...	6 weeks ago summary shortlog log tree
kernel/tegra.git	Kernel tree for NVIDIA Tegra...	Android Open Source...	10 hours ago summary shortlog log tree
platform/bionic.git	libc, libm, libdl, dynamic...	Android Open Source...	2 weeks ago summary shortlog log tree
platform/bootable/bootloader/legacy.git	bootloader reference code	Android Open Source...	2 weeks ago summary shortlog log tree
platform/bootable/diskinstaller.git		Android Open Source...	2 weeks ago summary shortlog log tree
platform/bootable/recovery.git		Android Open Source...	2 weeks ago summary shortlog log tree
platform/bootable/legacy.git	bootloader reference code	Android Open Source...	14 months ago summary shortlog log tree
platform/build.git	build system	Android Open Source...	13 days ago summary shortlog log tree
platform/cts.git		Android Open Source...	2 weeks ago summary shortlog log tree
platform/dalvik.git	Dalvik virtual machine and...	Android Open Source...	2 days ago summary shortlog log tree
platform/development.git	Development tools, SDK, sample...	Android Open Source...	2 weeks ago summary shortlog log tree
platform/external/aes.git		Android Open Source...	2 weeks ago summary shortlog log tree

Færdig



android.git.kernel.org

android.git.kernel.org Git

ANDROID
open source project

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For more information about [git](#), see an [Ove](#)

projects /

Project

- kernel/common.git
- kernel/experimental.git
- kernel/linux-2.6.git
- kernel/lk.git
- kernel/msm.git
- kernel/omap.git
- kernel/tegra.git
- platform/bionic.git
- platform/bootable/bootloader/legacy.git
- platform/bootable/diskinstaller.git
- platform/bootable/recovery.git
- platform/bootloader/legacy.git
- platform/build.git
- platform/cts.git
- platform/dalvik.git
- platform/development.git
- platform/external/aes.git

android-2.6.32 (38 hours ago)

android-goldfish-2.6.29 (3 weeks ago)

android-2.6.29 (6 weeks ago)

android-2.6.27 (6 months ago)

android-goldfish-2.6.27 (12 months ago)

android-2.6.25 (15 months ago)

Common Android Kernel Tree [Atom](#) [RSS](#)

Main cache: 12 gets (0 hits + 12 misses): 0 sets, 12 failed sets.

Søg: dalvik

Project	Description	Age	Summary	Shortlog	Log	Tree
Android Open Source...	bootloader reference code	2 weeks ago	summary	shortlog	log	tree
Android Open Source...	bootloader reference code	2 weeks ago	summary	shortlog	log	tree
Android Open Source...	bootloader reference code	2 weeks ago	summary	shortlog	log	tree
Android Open Source...	bootloader reference code	14 months ago	summary	shortlog	log	tree
Android Open Source...	build system	13 days ago	summary	shortlog	log	tree
Android Open Source...	Dalvik virtual machine and...	2 weeks ago	summary	shortlog	log	tree
Android Open Source...	Development tools, SDK, sample...	2 weeks ago	summary	shortlog	log	tree
Android Open Source...	Android Open Source...	2 weeks ago	summary	shortlog	log	tree



android.git.kernel.org

The screenshot shows the website for the 'kernel/common.git' repository on android.git.kernel.org. The page includes instructions for cloning the repository using git and repo, a list of projects, and a detailed view of recent commits. The commit list includes details such as the time since the commit, the author's name, the commit message, and links for commit, diff, tree, and snapshot.

projects / kernel/common.git / shortlog

summary | shortlog | log | commit | commitdiff | tree
HEAD · prev · next

kernel/common.git

Time	Author	Commit Message	commit	commitdiff	tree	snapshot
38 hours ago	Nick Pelly	Bluetooth: Allow SCO/eSCO packet type selection for...	91f136913	android-2.6.32		
41 hours ago	Nick Pelly	Revert "Bluetooth: Change RFCOMM to use BT_CONNECT2..."	89f136882			
41 hours ago	Nick Pelly	Revert "Bluetooth: Fix removing of RFCOMM DLC timer..."	87f136872			
43 hours ago	Mike Lockwood	USB: gadget: android: Disable UMS when RNDIS ethernet...	88f136862			
2 days ago	San Mehat	android: logger: Add new system log for framework/syste...	60f136601			
6 days ago	Yongseok Koh	vmalloc: remove BUG_ON due to racy counting of VM_LAZY_FREE	09f136092	11f136114		
6 days ago	Mike Chan	power: wakelock: Print active wakelocks when has_wake_...	54f135544			
7 days ago	Mike Lockwood	usb: gadget: u_ether: Remove warning from gether_discon...	90f135901			
8 days ago	Nick Pelly	Revert "Bluetooth: Fix rejected connection not disconne..."	87f136871			
8 days ago	Steve Kondik	Add USB_ANDROID_RNDIS_WCEIS option.	69f135691			
9 days ago	Dima Zevin	mtd: nand: Allow NAND chip ids to be included standalone.	55f135551			
11 days ago	Mike Lockwood	USB: gadget: android: Fix special case for RNDIS ethern...	34f135341			
11 days ago	Mike Lockwood	USB: composite: Compute interface numbers correctly...	33f135331			
13 days ago	Mike Lockwood	USB: gadget: android: Specify USB_CLASS_COMM in device...				
13 days ago	Mike Lockwood	USB: gadget: Disable RNDIS function by default if CONFI...				
13 days ago	Mike Lockwood	USB: android: Use composite class driver for enabling...				
13 days ago	Mike Lockwood	USB: composite: Add class driver for enabling and disab...				
13 days ago	Arve Hønnervåg	disable staging/dream				
2010-02-09	San Mehat	mmc: core: Release delayed mmc work wakelock after...				
2010-02-08	Shan-Fu Chiou	pca963x: Phillips PCA963X 4-bit i2c led driver				
2010-02-08	Brian Swetland	HACK stay compatible with the emulated TLS register...				



Getting the source

- git
- repo
- Garrit





Starting with repo

```
$ repo init -u http://blue-kite.dk/repos/at91sam9g20-manifest.git/
```

```
<?xml version="1.0" encoding="UTF-8"?>
<manifest>
  <remote name="korg"
    fetch="git://android.git.kernel.org/"
    review="review.source.android.com" />
  <default revision="master"
    remote="korg" />

  <project path="build" name="platform/build" revision="b7c844e7cf05b4cea629178bfa793321391d21de" >
    <copyfile src="core/root.mk" dest="Makefile" />
  </project>

  <project path="common" name="kernel/common" revision="74fca6a42863ffacaf7ba6f1936a9f228950f657" />

  <project path="bionic" name="platform/bionic" revision="95604529ec25fe7923ba88312c590f38aa5e3d9e" />
  <project path="bootable/bootloader/legacy" name="platform/bootable/bootloader/legacy" />
  <project path="bootable/diskinstaller" name="platform/bootable/diskinstaller" />
  <project path="bootable/recovery" name="platform/bootable/recovery" />

  ...
</manifest>
```

```
$ repo sync
```



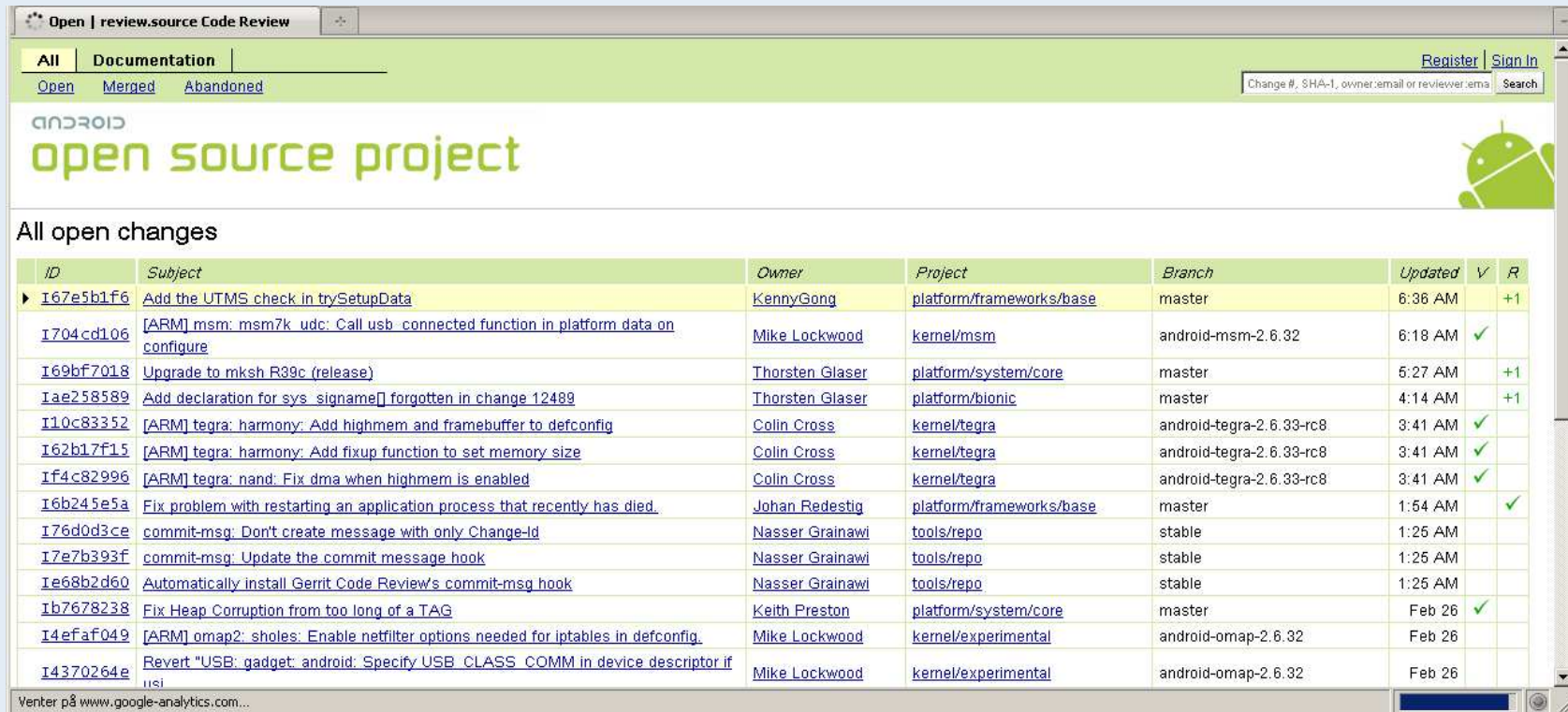
MyDroid

<code>.repo</code>	Files for repo
<code>bionic</code>	Androids C library
<code>bootable</code>	Bootloaders
<code>build</code>	Android build system
<code>common</code>	Linux kernel
<code>dalvik</code>	Dalvik virtual machine
<code>development</code>	Simulator and other development tools
<code>external</code>	Collection of libraries
<code>frameworks</code>	Frameworks for display, audio, camera, media ...
<code>hardware</code>	Drivers for hardware access
<code>packages</code>	Standard applications and providers
<code>prebuilt</code>	Binary host tools and other prebuilds
<code>system</code>	Basic Android system
<code>vendor</code>	Vendor specific code
<code>Makefile</code>	

Gerrit

```
$ repo start
$ repo upload
```

- review.source.android.com



<http://code.google.com/p/gerrit/>



Android build system

- Make
- out
- Default build
- Outputs
 - root
 - system
- Did it built?
- Did it boot?

Logcat Android.mk

```

LOCAL_PATH:= $(call my-dir)
include $(CLEAR_VARS)

LOCAL_SRC_FILES:= logcat.cpp

LOCAL_SHARED_LIBRARIES := liblog

LOCAL_MODULE:= logcat

include $(BUILD_EXECUTABLE)

...

```

Camera application Android.mk

```

LOCAL_PATH:= $(call my-dir)
include $(CLEAR_VARS)

LOCAL_MODULE_TAGS := user

LOCAL_SRC_FILES := $(call all-java-files-under, src)

LOCAL_PACKAGE_NAME := Camera
LOCAL_CERTIFICATE := media

include $(BUILD_PACKAGE)

# Use the following include to make our test apk.
include $(call all-makefiles-under,$(LOCAL_PATH))

```

Android kernel

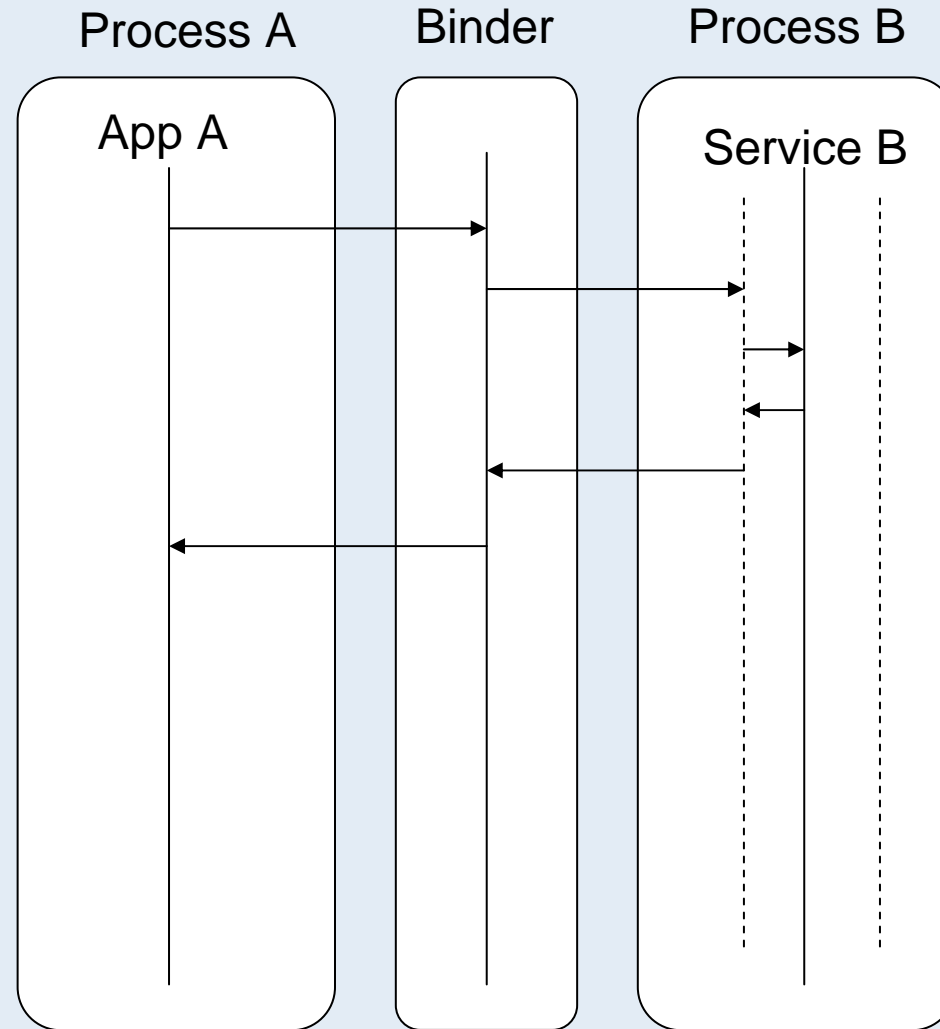
- Default branch android-2.6.27
- ~ 36.000 lines diff from v2.6.27
- YAFFS2 ~ 15.000
- Binder ~ 4.000
- Ashmem ~ 1.000
- Logger ~ 1.000
- USB, MMC, Bluetooth, Power, ...

ashmem

- Anonymous Shared Memory
- Share file descriptor and mmap
- Memory reclaim

Binder

- IPC
- Thread pools



Logger

- Cyclic log in kernel memory
- Header: PID, TID, timestamp
- Main /dev/log/main 64KB
 - Input: priority, tag and message
- Events /dev/log/events 256KB
- Radio /dev/log/radio 64KB
- log and logcat
- Great debug tool

Android boot

Init

- Mount of
 - /dev
 - /sys
 - /proc
- Startup of properties
- uevent handling
- Execute init.rc
- ...

Init.rc

```

on init

loglevel 3

# setup the global environment
export PATH /sbin:/system/sbin:/system/bin:/system/xbin

# create mountpoints and mount tmpfs on sqlite_stmt_journals
mkdir /sdcard 0000 system system
mount tmpfs tmpfs /sqlite_stmt_journals size=4m
# log "on init called at $(date)"

on boot

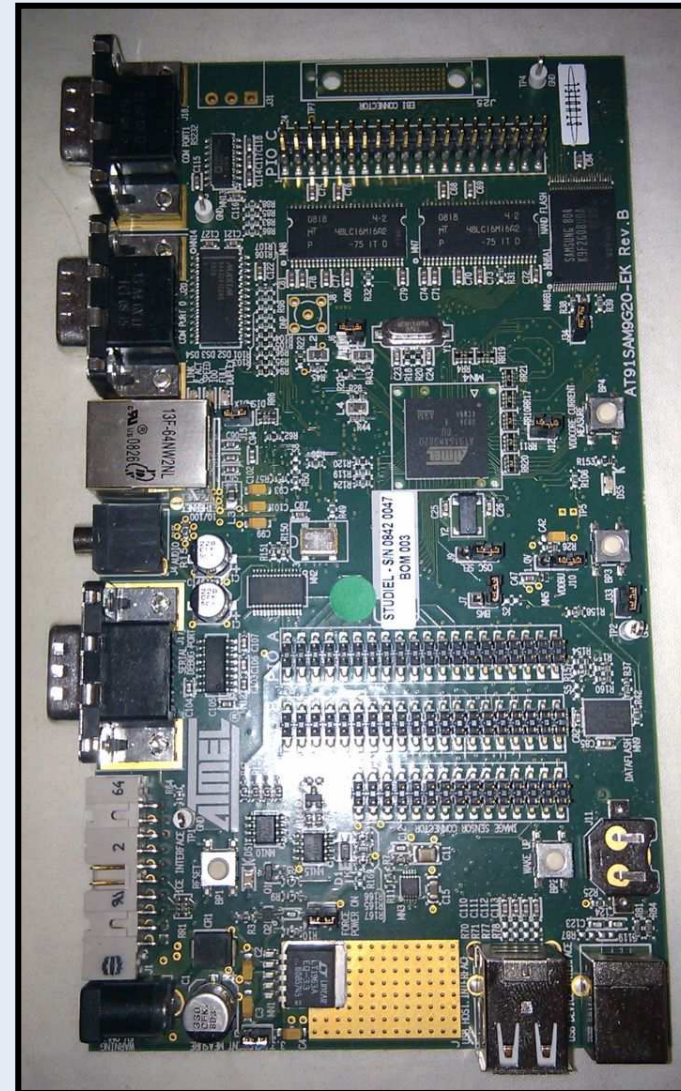
service servicemanager /system/bin/servicemanager
user system
critical
onrestart restart zygote
onrestart restart media

service zygote /system/bin/app_process -Xzygote /system/bin --
zygote --start-system-server
socket zygote stream 666
onrestart write /sys/power/state on
onrestart restart media

service media /system/bin/mediaserver
user media
group system audio camera graphics inet net_bt net_bt_admin
  
```

AT91SAM9G20-EK

- 400MHz ARM9 CPU
- 256 MB NAND flash
- 8 MB Dataflash
- 64 MB SDRAM
- Ethernet
- USB host and device
- RS232 debug ports
- No display
- No modem



Boot

- at91.com/linux4sam

Boot

WebHome - Linux4SAM - TWiki

Linux & Open Source related information for AT91 Smart ARM Microcontrollers

Search:

Print

LINUX4SAM

- Getting started
- Software tools
- AT91Bootstrap
- U-Boot
- Linux Kernel

Open source solutions

- OpenEmbedded / Angstrom
- BuildRoot

FAQ

- U-Boot FAQ
- BuildRoot FAQ

Tips & Tricks

- Wifi Solutions
- 9G20EK Audio Recording

NAVIGATION

LINUX4SAM

- Index
- Changes
- Notifications
- Statistics

Linux4SAM » WebHome

Welcome to Linux4SAM

Welcome to the main starting point for Linux OS on SAM products. Its aim is to centralize information about Linux kernel and open source projects on ATMEL AT91 Smart ARM-based Microcontrollers (aka SAM).

Our goal is to be an interface with open source projects that include AT91 support. We do not want to duplicate information but to link as much as possible to good resources available on the Web.

Keep an eye on this website as it has been designed for instant update. We will try to make it live with the open source community and update AT91SAM information in those pages. To keep yourself informed, add WebRss or WebAtom feeds in your usual news reader.

Questions, feedback, patches and enhancement are the way open source communities live. Go to [LinksToCommunities](#) page for a natural way to interact with material presented on this website.

Latests News

- [AT91SAM9M10 special page](#)

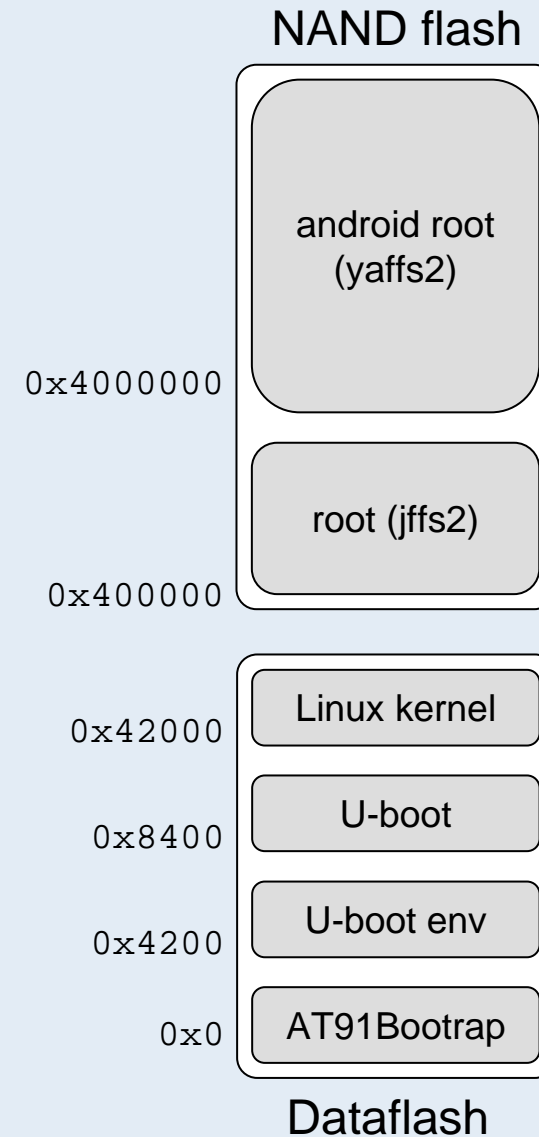
Base components

- [Getting started](#)
- [Software tools](#)
- [AT91Bootstrap](#)

Faerdig

Boot

- at91.com/linux4sam
- Prebuilt
 - U-boot
 - Linux kernel
 - Ångström root filesystem
 - opkg package manager



No input

- No display
 - Virtual frame buffer
 - android-vnc-server
 - `fbset -g 320 480 320 960 16 -rgba 5/11,6/5,5/0,0/0`
- No touch
 - Virtual touch driver
 - android-vnc-server

Debugging

- logcat
- GDB
- Code inspection
- Issues
 - pmem initialization
 - Battery
 - Screen power state

Resources

- blue-kite.dk/tech

Q&A

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