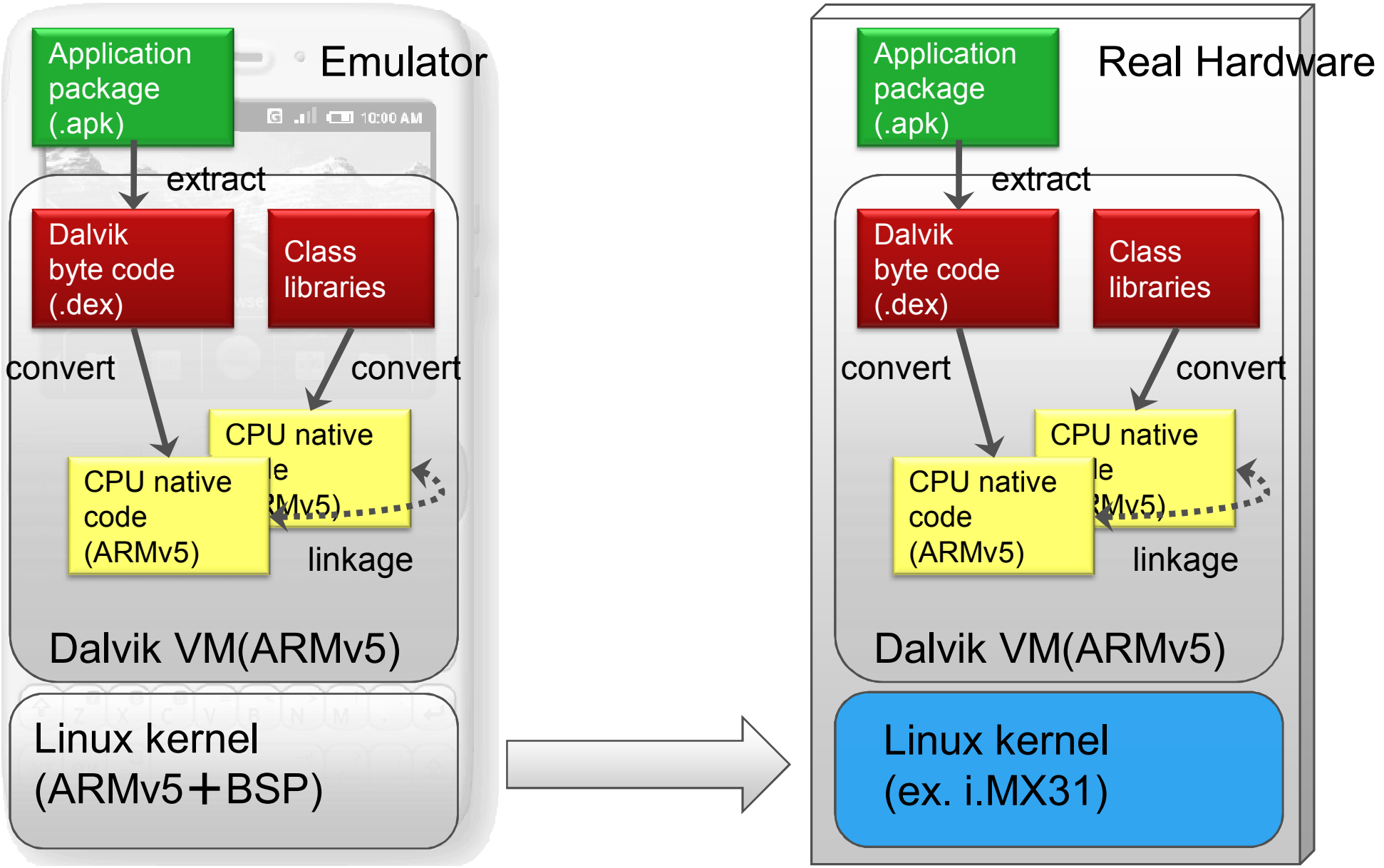
Development of Mobile Linux Open Platform

April 16, 2008

Jyunji Kondo
Fujitsu Software Technologies Limited

Ideas



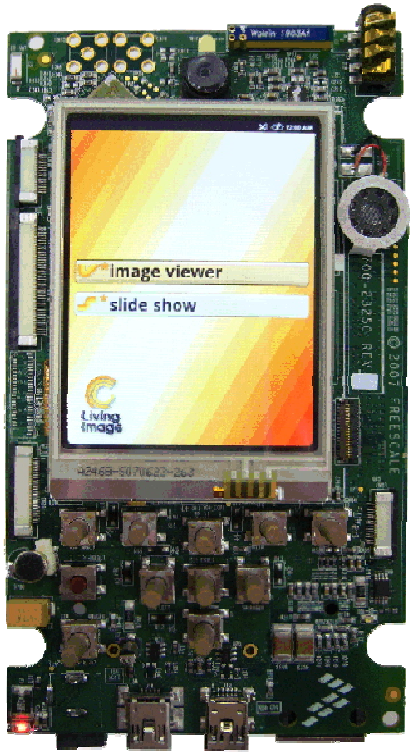
Main thesis

FUJITSU

"It's not so difficult
to just enable functions of
Android
using well-maintained
Linux BSP!"

Real Hardwares

FUJITSU



i.MX31 Product Development Kit

freescale semiconductor

Sandgate3-P

Sophia systems

Topics

FUJITSU

1. input device
2. sound
3. power management
4. telephony

Input device

FUJITSU

"If Linux BSP supports keyboards, mice, and touch screens as input device, Android can handle those."

Facts:

Android emulator supports keyboards and mice.

Internals:

Android watch all files under /dev/input/.

Input device

FUJITSU

"If Linux BSP supports keyboards, mice, and touch screens as input device, Android can handle those."

Hypothesis:

Touch screens can be handled with event interface of input device.

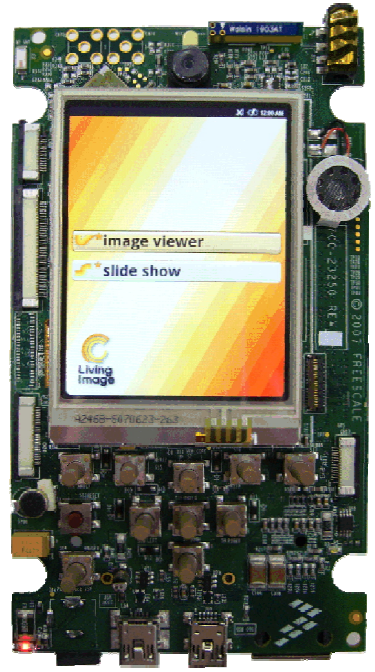
Result:

Achieved with small modification of input driver.

Input device

FUJITSU

"If Linux BSP supports keyboards, mice, and touch screens as input device, Android can handle those."



How:

- changing X-Y coordinate
  - X, Y direction
  - resolution
- changing event type
  - EV_ABS/ABS_PRESSURE → EV_KEY/BTN_TOUCH

Sound

FUJITSU

"If Linux BSP supports ALSA driver,
Android can play musics."

Facts:

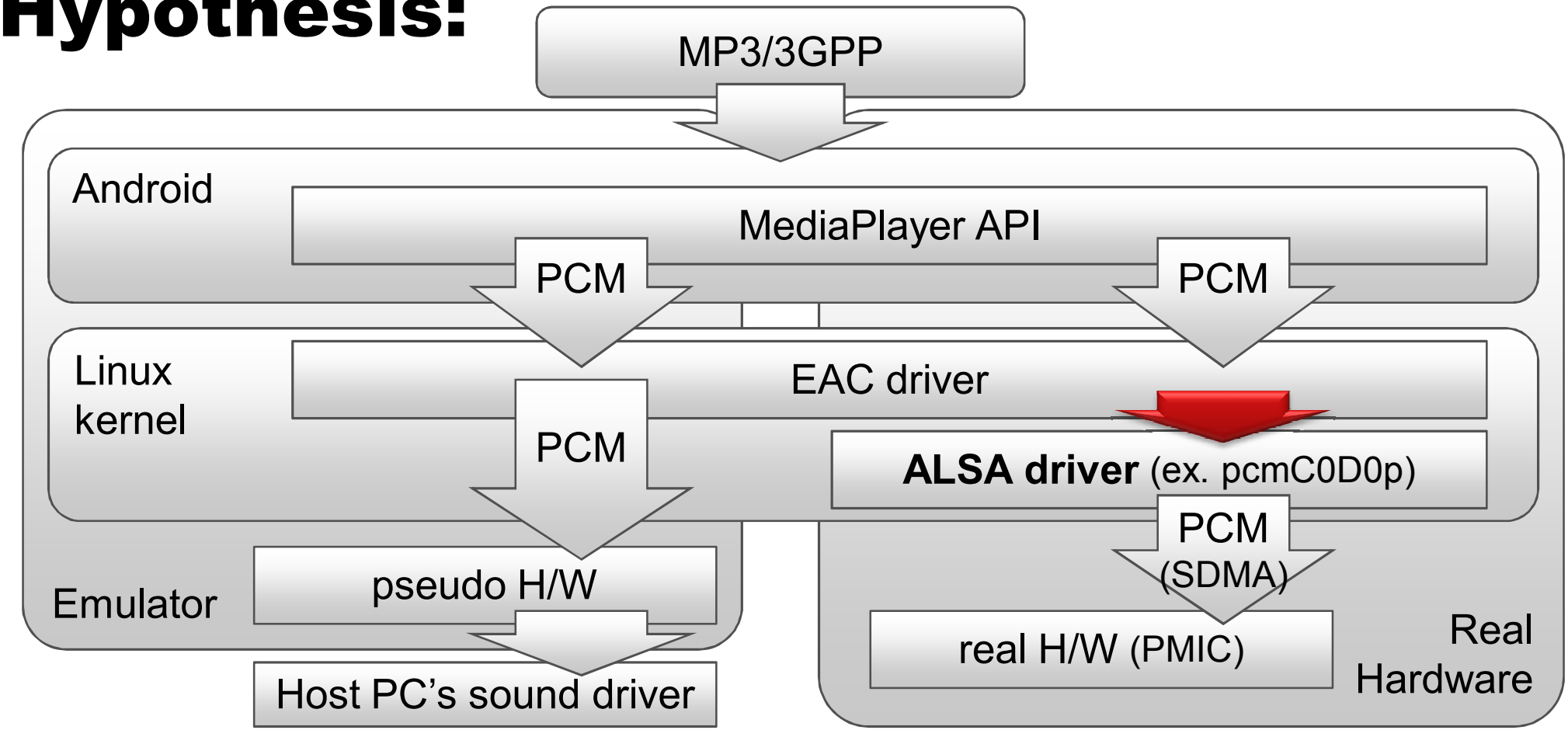
Android emulator can play music on PC.

Sound

FUJITSU

"If Linux BSP supports ALSA driver,
Android can play musics."

Hypothesis:



Power management

FUJITSU

"If Linux BSP supports to control **CPU clock** and **backlight brightness**, power management of android can be supported."

Facts:

Android provides 2 lock types

- partial wake lock
- full wake lock

Android also control backlight brightness

Power management

FUJITSU

"If Linux BSP supports to control **CPU clock** and **backlight brightness**, power management of android can be supported."

Internals:

Android operates sysfs files

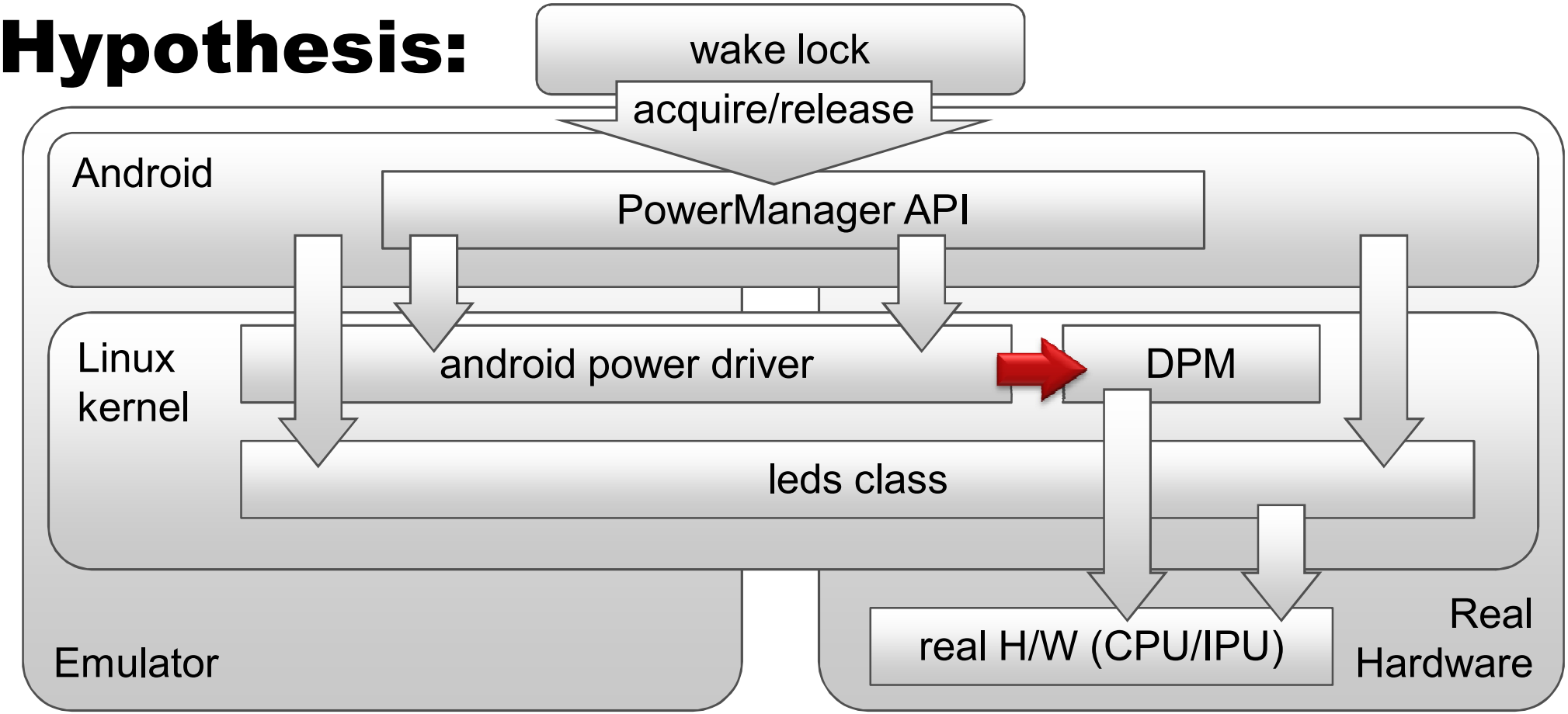
- */sys/android_power/acquire_full_wake_lock*
- */sys/android_power/acquire_partial_wake_lock*
- */sys/class/leds/keyboard-backlight/brightness*
- */sys/class/leds/lcd-backlight/brightness*
- */sys/class/leds/button-backlight/brightness*

Power management

FUJITSU

"If Linux BSP supports to control **CPU clock** and **backlight brightness**, power management of android can be supported."

Hypothesis:



Power management

FUJITSU

"If Linux BSP supports to control **CPU clock** and **backlight brightness**, power management of android can be supported."

How:

- CPU freq
  - defines 4 OPs and policies
    - 532M, 399M, 266M, 133M
  - throttle down every 3 seconds during no activities
- LCD backlight
  - become darker every 15 seconds.

Telephony

FUJITSU

"If Linux BSP can control baseband with serial I/F, you can make a phone call with android."

Facts:

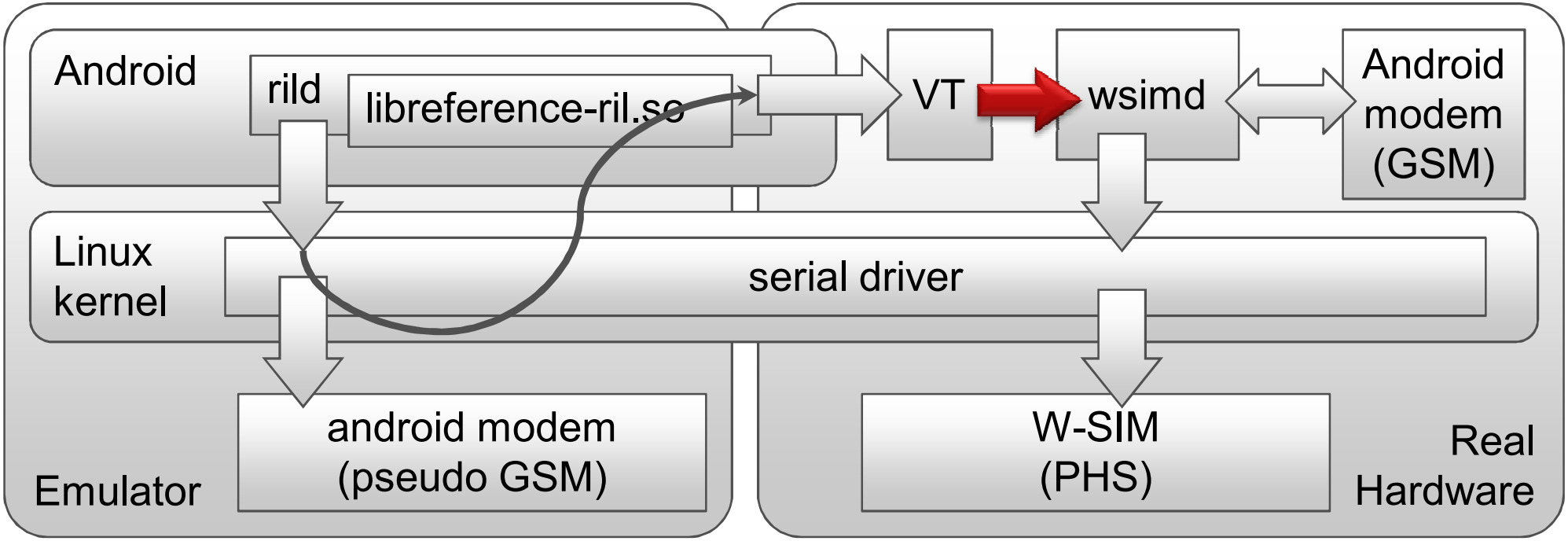
- Android emulator supports a pseudo GSM modem device.
- There is the rild (Radio I/F Layer Daemon).

Telephony

FUJITSU

"If Linux BSP can control baseband with serial I/F, you can make a phone call with android."

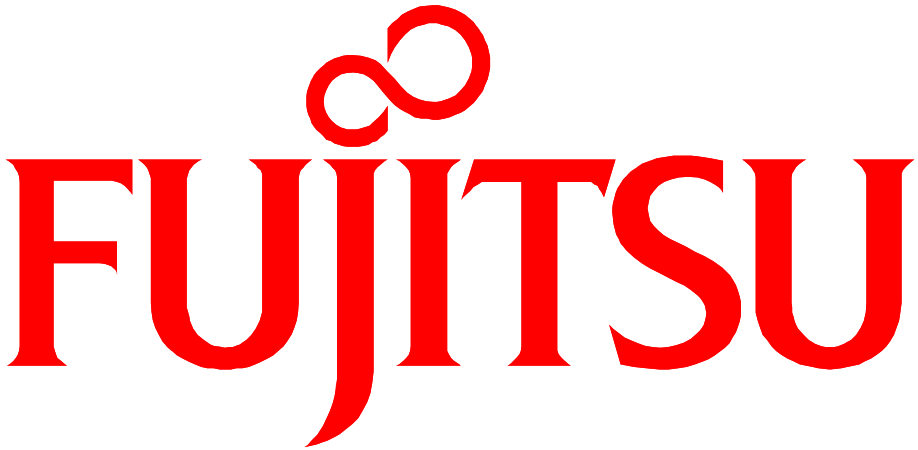
Hypothesis:



Conclusion

FUJITSU

"It's not so difficult
to just enable functions of
Android
using well-maintained
Linux BSP!"



THE POSSIBILITIES ARE INFINITE