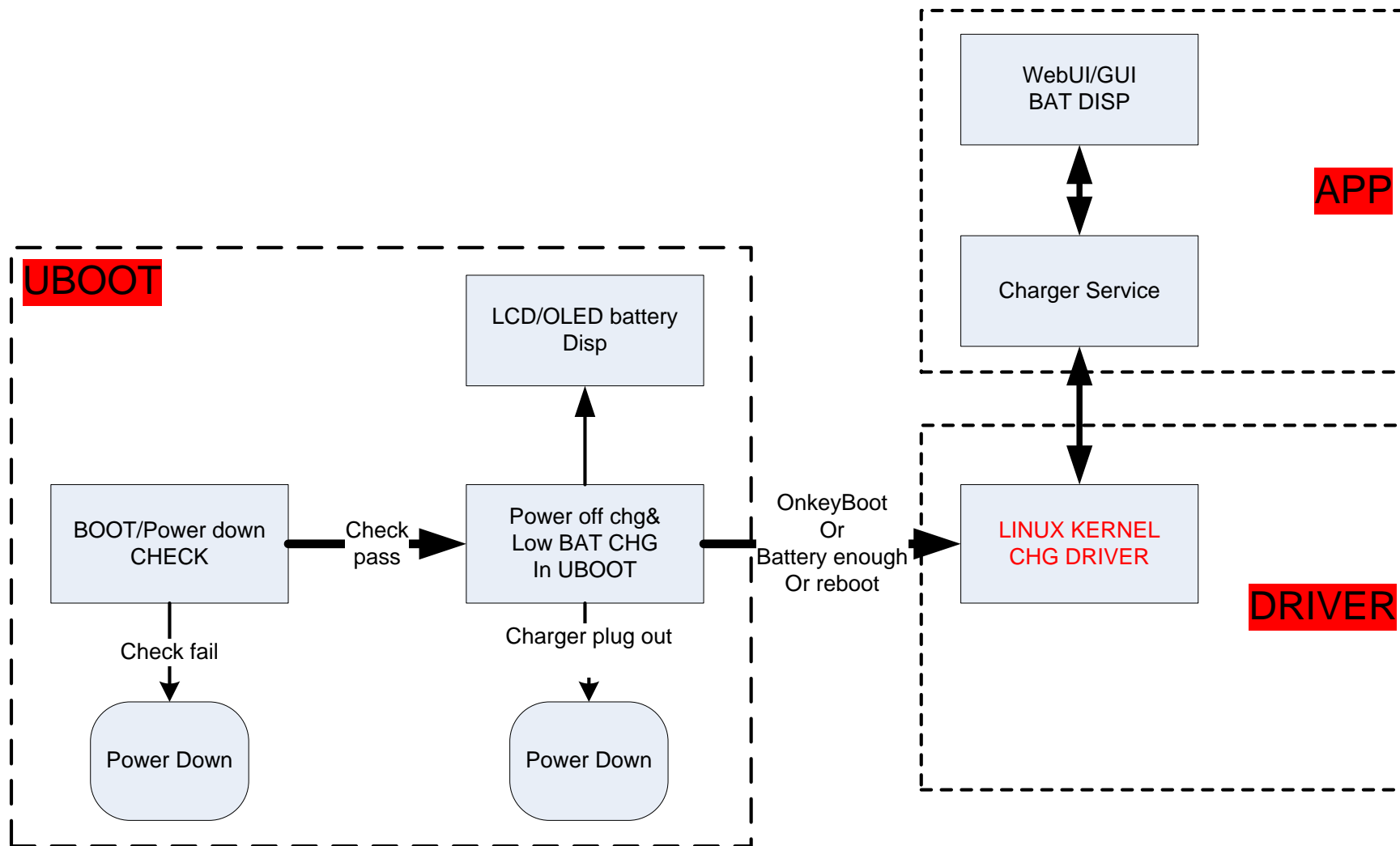




Marvell 88PM830 charger&fuel gauge solution

Overview



Uboot

- Boot/Powerdown check
 - PASS: e.g. long onkey detected, reboot
 - FAIL: e.g. LONG ONKEY detection failed, bat too low add charger not present
- Power off chg and Low bat chg
 - Power off chg until usb is plugged out or onkey detected
 - Low bat chg until SYS_BOOT_THRESHOLD is met
 - Invoke LCD/OLED function to disp battery status
- Code: uboot: driver/power/

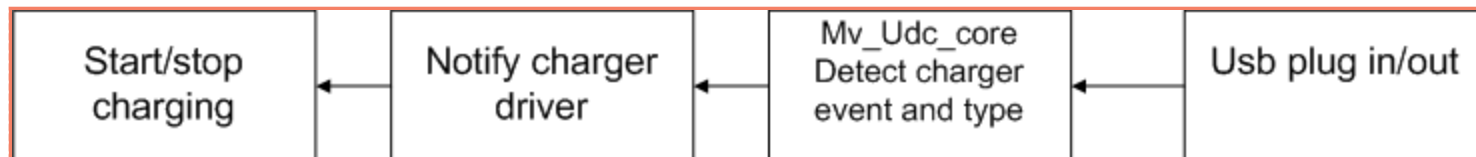
Linux charger&fuel gauge driver overview

- Codes,
 - Drivers/mfd/88pm830.c
 - Drivers/power/88pm830_charger.c
 - Drivers/power/88pm830_battery.c
- User interfaces,
 - Battery
 - Sys/class/power_supply/battery
 - Charger
 - /sys/class/power_supply/ac
 - /sys/class/power_supply/usb

LINUX PM830 Charger driver

- Driver work flow

- Triggered by USB plug in/out
- Charger type enumerated by Marvell USB driver



LINUX PM830 fuel gauge

- Fuel gauge model,
 - Battery capacity = $(\text{last_cc} + \text{delta_cc}) / \text{max_cc}$
 - Periodically read delta-cc and update battery capacity
 - Max_cc decided by battery capacity(e.g 1500mAh = $1500 * 3600 \text{mC}$)
 - delta cc is read from pm830 coulomb counter
 - last_cc is the CC-counter value in stored for last timer tick
- Error rate measured
 - Charge - 2.66%
 - Discharge - 5.08%

Charger service

- Code
 - `marvell/services/charger/charger.c`
- Function
 - Provide method to query charger&battery status
 - E.g. bat capacity, temperature
 - Broadcast msg thru UBUS to other modules which are interested in battery/chg status

What customers need to implement

- BAT OCV voltage ~ Capacity curve provided by BAT vendor
- BAT NTC resistor value ~ temprature curve provided by BAT vendor
- Other charger info

```
charger {  
    compatible = "marvell,88pm830-chg";  
    prechg-current = <120>; /* mA */  
    prechg-voltage = <3300>; /* mV */  
    prechg-timeout = <32>; /* minute */  
  
    fastchg-eoc = <100>; /* mA */  
    fastchg-voltage = <4200 4200 4050>; /* mV for STR, LTR, HTR */  
    fastchg-current = <900 500 900>; /* mA for STR, LTR, HTR*/  
    fastchg-timeout = <8>; /* hour */  
  
    over-voltage = <4500>; /* mV */  
}
```


Thanks