## Emergency Shutdown Framework

**Objective:**

Prevent memory corruption on abrupt power off by shutting down the system with reduce power off time. System should power off in less than 2sec before the backup power goes off.

**Changes**:

Kernel

User space

Emergency shut down driver

Gpio IRQ

User mode Helper API

Shell Script to Sync and shutdown

A simple driver registers for interrupt triggered on abrupt power off, executes scripts to do

1. Send signal to modem to stop
2. Send TERM and Kill signal to stop all running daemons, this to stop access to memory.
3. Sync and unmount the filesystem
4. Shutdown the system.

To integrate changes.

1. Driver patch to be applied and driver can be enabled via config “EMERGENCY\_SHUTDOWN”
2. Device tree (DTS) file should update with GPIO pin number (“*gpioxz pin\_num”)* to detect interrupt.

Example:

shutdown {

compatible = "emergency-shutdown";

emgshutdown-pin = <&*gpioxz pin\_num* 0>

status = "okay”;

};

1. User space patch to add BB file and shell scripts. Script will execute required scripts to safe shutdown.

**Script with reduced power off time:**

emg-shutdown.sh script placed in target location “/etc/emg-shutdown” and a symbolic link created to “/bin/emg-shutdown”

This script will execute below commands/scripts to shutdown the system.

1. send modem stop signal

“/etc/rc6.d/K01modem-shutdown”

1. stop syslogd, to stop accessing the memory

“/etc/rc6.d/K20syslog stop”

1. send kill and TERM signal to all the process

“killall5 -15 && killall5 -9” (It will find the process from proc directory)

1. Unmount the file system

“/etc/rc6.d/S40umountfs” --- this script will do the below operations

* 1. deactivate the swap
  2. sync
  3. mount the file system as read only
  4. mount sysfs to /sys
  5. ubidetach
  6. unmount /sys

1. shutdown command “sys\_shutdown”

**killall5** is the SystemV killall command. It sends a signal to all processes except kernel threads and the processes in its own session, so it won't kill the shell that is running the script it was called from. Its primary (only) use is in the rc scripts found in the /etc/init.d directory.

**Test steps:**

1. Driver has test code under CONFIG\_DEBUG\_FS, shutdown can be triggered via command line with below commands

“echo 1 > /sys/kernel/debug/emergency\_shutdown”

Expected result:

System should unmount file system and shutdown the system with in 2sec.

Patch file location

1.

2.