

PM Policy and Implementation

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Agenda

- Policy
- Drivers
- Battery Display

Policy

- **Power state changes**
 - **Power button**
 - Action taken
 - Do not use hot keys to change power state
 - **Idle time out**
 - Different when plugged into AC?
- **Sleep state to enter**

Policy Continued

- What does the hard disk do at time out
- Lid action
- Back light & Screen brightness
 - Not ACPI defined
 - Can be SMI/Hot key controlled
 - Can be done with driver

Driver Model

PowerCFG Task bar program

Battery class driver: I/O owner

Smart Battery Driver: Converts calls to SB

SMB host controller: Arbitrates SMBus

EC driver: H/W interface to SMBus

Embedded Controller Driver

- EC H/W interface defined in ACPI specification
- Driver checks ACPI name space for existence and then addresses for EC
- SMBus commands can be done by common OS driver
 - No need for control methods or custom driver

SMBus Host Controller Driver

- Arbitrates SMBus
 - Multiple devices may live on the SMBus
- Makes calls to EC Driver API

Smart Battery Driver

- Translates Smart Battery commands to SMBus commands

I/O Call Battery Class Driver

- Owns I/O space for Battery Commands
- Only one driver may own an I/O block

Power Config Driver

- **Policy and default settings of policy done here**
 - Used by user to change policy
- **Task Bar program**
 - Battery/Power cord display

Power Config Options

- Powered by AC
 - Time out to standby
 - 1 min to 5 hour or never
 - Default to 20 minutes
 - Hard disk power off
 - 1 min to 5 hour or never
 - Default to 30 minutes

Power Config Options Continued

- Powered by Battery
 - Time out to standby
 - 1 min to 5 hour or never
 - Default to 1 minutes
 - Hard disk power off
 - 1 min to 5 hour or never
 - Default to 10 minutes

Power Config Options Continued

- Power Button
 - Standby or shutdown
- Hibernation
 - Save to disk
 - Save to Ram
- Close Lid Actions
 - Nothing, Standby, Shutdown

Power Config Options Continued

- **Pass word for return from standby**
 - **Enabled**
 - **Default no**
 - **Change**
- **Show power meter on task bar**
 - **Default yes**

Power Config Options Continued

- Alarms: Low and Critical
 - **Low**
 - Adjustable from 0 - 100% capacity
 - Default = 5%
 - Notification
 - Alarm Sound
 - Message Display: Default
 - **Action**
 - Standby or Shutdown
 - Default neither

Power Config Options Continued

- Alarms: Low and Critical
 - **Critical**
 - Adjustable from 0 - 100% capacity
 - Default = 3%
 - Notification
 - Alarm Sound
 - Message Display: Default
 - **Action**
 - Standby or Shutdown
 - Force standby

Power Config Options Continued

- Driver is replaceable
- Allows OEMs to customize policy
- We can help you with replacement

Battery Display Driver

- **Display remaining time & percentage (if discharging)**
 - **Displays each battery or combined (composite) battery**
 - User selectable
- **Shows battery information**
- **SMB Batt driver will send “At Rate” to battery if display driver passes it in.**
- **If no “At Rate” received, driver calls function 12**
 - **Average Time to Empty**

Battery Display Driver Continued

- **Battery Display Driver can be replaced**
- **Added functions:**
 - **Turn off non-ACPI devices to reduce power**
 - **Make function calls to ACPI devices to turn off?**
- **Display can be customized**

Summary

- Driver model is flexible
- Customization possible
- Policy is user settable
 - Profiles can be saved