## Power management of Desktop Computer System

The following steps indicate the settings required under Windows OS:

**WINDOWS 2OOO**

- Go to control panel
- Select Power Options
- Click on Power Schemes and select Minimal Power management option and set the following:
  - Turn off Monitor after 15 minutes
  - Turn off Hard disk after 15 minutes

**WINDOWS XP**

- Go to control panel
- Select Power Options
- Click on Power Schemes and select Minimal Power management option and set the following:
  - Turn off Monitor after 15 minutes
  - Turn off Hard disk after 15 minutes
  - System standby after 20 minutes
  - System Hibernate after 30 minutes

OR

- If your Keyboard has Sleep button by pressing this button the system will go to standby/ hibernate mode. This may be done at any time.
Sleep button function can be set as:

- Go to control panel
- Select Power Options Properties
- Click on Advanced
  - When I press the power button on my computer – Set shutdown
  - When I set as **Standby** or **Hibernate**
- To bring back the system to its original state, press 'wake up' button. If it does not exist, press boot / power button. The system restore to the original status.

**WINDOWS VISTA**

- Go to control panel
- Power Options Properties (Power Plans) has three power plans as below:
  - Balanced
    - ✓ Energy saving
    - ✓ Performance
  - Power Saver
    - ✓ High Energy Saving
    - ✓ Low performance

hdparm -B 1 -S 12 /dev/sda
Mostly applicable to SATA / IDE drives

b. Mount file-systems with appropriate options to minimize the write operations
   a. Noatime : To disable this change the mount entries for filesystems in /etc/fstab as shown below
   /dev/sdb1 / ext3 defaults,
   noatime 0 0)

c. The VM write back time : Change this setting to a higher value if you have a reliable power supply

   echo 1500 > /proc/sys/vm/dirty_writeback_centisecs

   Default value is 499

d. On client systems syslog entries are not very critical hence following changes can be made to syslog configuration to enable less disk writes. Edit the file and add a "-" in front of this line:

   * .info;mail.none;authpriv.none;cron.none
   /var/log/messages
   like this:
   *.info;mail.none;authpriv.none;cron.none
   /var/log/messages

e. In /etc/init.d/smartd change the following line
   #smartd_opts="—interval=1800"
   To
   smartd_opts="--interval=1800 -n standby,q"gfdg

f. In /etc/crontab comment out the following entry if not required
   01 * * * * root run-parts /etc/cron.hourly

3. Install packages cpufrequtils and pm-utils. Once installed commands such as pm-hibernate, pm-powersave, pm-restart, pm-shutdown, and pm-suspend can be used to change the system state

**Linux Power Management**

The power management features that control CPU and motherboard are controlled by either the newer ACPI standard or the older APM standard. ACPI allows the operating system to control most of the power-saving features of your box, whereas APM relies on the BIOS to control such features.

**1. DISPLAY CONTROL**

You may use the GUI features available in both KDE and GNOME windows manager for display control.

GNOME: System- > Preferences - > More Preferences - > Power Management
KDE: Control Centre- > Peripherals - > Display - > Power Control

The settings can also be mentioned in the configuration files
(/etc/X 11/xorg.conf or /etc/Xl1/XF86Config

In the "ServerLayout" section you need to add the lines

Option "StandbyTime" "5"
Option "SuspendTime" "5"
Option "OffTime" "8"

In the "Monitor" section add the line

Option "DPMS"

Make sure that screen savers are not used as they are not actually turning off the monitor. In addition to this it may be a better option to set the display through GUI tools.

**2. Disk and file System Management**

a. It is possible to use the hdparm program for power management. Check whether your disk supports this feature with following command
hdparm -i /dev/sda

Detailed description should be generated

To put the disk into the most aggressive power savings mode after 60 seconds of idle time use the following command

- **High Performance**
  - Low Energy Saving
  - High Performance
- Select Balanced Performance & Click on Change plan settings
  - Turn off display time - set - 15 minutes
  - Put the computer to sleep - set - 20 minutes
- Click on change advanced power setting
  - Click on change setting that are currently unavailable
    - ✓ Hard disk – set turn of hard disk – 15 minutes
    - ✓ Sleep – set sleep time – 20 minutes
    - ✓ Set for hibernate after how much time – 30 minutes
    - ✓

**OR**

If your Keyboard has Sleep button by pressing this button the system will go to sleep /hibernate mode. This may be done at any time. Sleep button function can be set as:

- Go to Control Panel

- Select Power Options Properties( Power Plans)
    - Balancrd
        - ✓ Energy saving
        - ✓ Performance
    - Power Saver
        - ✓ High Energy saving
        - ✓ High Performance
    - High Performance
        - ✓ Low energy saving
        - ✓ High Performance
- Select Balanced Performance and Click on Change plan settings
- Click on change advanced power setting
    - Click on Power Buttons and Lid
        - ✓ Power Button action
        - ✓ Sleep Button action – Set it to Sleep Mode or Hibernate
        - ✓ Start menu Power Button

- To bring back the system to its original state, press 'wake up' button. If it does not exist, by moving the mouse the system restores to the original status.

Note: If you have low disk space indication and you want to defragment your hard disk, then before doing so, pleased disable the Hibernation and defragment the HDD.

**4. Ethernet Card**

If high bandwidth is not being used, set the adapter to 100 megabit. Instead, you can use the following ethtool command:

ethtool -s eth0 autoneg off speed 100

**Note :**

1. To make sure that the commands mentioned herein are executed at boot time enter them in the file/ etc/rc.local after making sure that they work for your system.
2. Power safe features are hardware dependant and the results may vary from system to system

**References**

1. http: / /www.spencerstirling.com/computergeek/powersanving.html
2. http: // www.lesswatts.org/