



सत्यमेव जयते

डॉ. बी. के. गैरोला
महानिदेशक

Dr. B. K. Gairola

Director General
No.NIC/DG/SECY/2010-03

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January 6, 2010

Dear Sir,

The Climate Savers Computing Initiative (CSCI), is a non-profit group dedicated to reducing energy consumption of computers. Ministry of New and Renewable Energy has joined hands with CSCI and requested NIC to issue direction to all NIC units to enable power management settings in the computer systems. This brings into sharp focus, the huger amount of energy that can be saved by adopting power management settings in the computers.

This is with regard to the huge amount of energy that can be saved by activating the sleep/hibernate mode of computers when they are inactive for a sustained duration. More than half of the power in desktop PCs is wasted as heat. The computers have default settings to go to sleep/hibernate mode when not in use for a period. However in most of the systems this functionality is disabled. If the power management mode is enabled, roughly it is calculated that 290 KWh energy can be saved per computer annually. Our country is expected to have 47 million PCs by 2010 as per IDC report. This gives an idea of the amount of power that can be saved if power management mode is enabled. Normally in government offices, PCs remain switched on during all the working hours.

I am enclosing a note giving steps to enable the power management mode in PCs. I shall be grateful if you could ensure that the enclosed instructions are put in use by all PC users in your department. NIC officials in the Ministries/departments have already been briefed to help your organization in this regards.

With regards,

Yours sincerely,

O/o Secretary (E & F)

Dy. No. 287

Date 13/1/10

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15/1/10

Shri Vijai Sharma, IAS
Secretary, M/o Environment & Forests
Paryavaran Bhavan
CGO Complex, New Delhi-110 003

(B.K. Gairola)

Encl: As above

O/o J. S. (AKG)
Dy. No. 250
Date 15/1/10

J.S. (AKG)

O/o AS (MFF)
Dy. No. 1911/R
Dated 14-01-2010

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How do we go for Power Management of Desktop Computer System

The following steps indicate the settings required under Windows OS:

WINDOWS 2000

- 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 Properties
- 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 press the sleep button on my computer – can be 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 writeback 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/X11/xorg.conf or /etc/X11/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 time – 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)
 - Balanced
 - Energy Saving
 - Performance
 - Power Saver
 - High Energy Saving
 - Low Performance
 - High Performance
 - Low Energy Saving
 - High Performance
 - Select Balanced Performance & Click on Change plan settings
 - Click on change advanced power setting
 - Click on Power Buttons & 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, please 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 dependent and the results may vary from system to system

References

1. <http://www.spencerstirling.com/computergeek/powersaving.html>
2. <http://www.lesswatts.org/>