Power saving

From ArchWiki

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Audio

By default, audio power saving is turned off by most drivers. It can be enabled by setting the power_save parameter to a time (in seconds) to go in idle.

Note: Toggling the audio card's power state can cause a popping sound or noticeable latency on some broken hardware.

Intel

```
/etc/modprobe.d/audio_power_save.conf
```

```
options snd_hda_intel power_save=1
```

ac97

```
/etc/modprobe.d/audio_power_save.conf
```

```
options snd_ac97_codec power_save=1
```

Bluetooth

Blacklist the `hci_usb` module if the driver is loaded automatically.

Disabling NMI watchdog

The NMI watchdog is a debugging feature to catch hardware hangs and cause a kernel panic. On some systems it can generate a lot of interrupts, causing a noticeable increase in power usage.

```
/etc/sysctl.d/disable_watchdog.conf
```

```
kernel.nmi_watchdog = 0
```

or add `nmi_watchdog` as a kernel parameter to disable it completely from early boot.

Disabling Wake-on-LAN

Wake-on-LAN can be a useful feature, but if you're not making use of it then it's simply draining extra power waiting for a magic packet while in suspend.

Disabling for one interface:

> **Note:** This should be combined with static naming of devices, the eth* names are not static.

```
/etc/udev/rules.d/disable_wol_eth0.rules
```

```
ACTION=="add", SUBSYSTEM=="net", KERNEL=="net0" RUN+="/usr/sbin/ethtool -s net0 wol d"
```

Disabling for all interfaces:

```
/etc/udev/rules.d/disable_wol.rules
```

```
ACTION=="add", SUBSYSTEM=="net", KERNEL=="eth*" RUN+="/usr/sbin/ethtool -s %k wol d"
```

PCI Runtime Power Management

```
/etc/udev/rules.d/pci_pm.rules
```

```
ACTION=="add", SUBSYSTEM=="pci", ATTR{power/control}="auto"
```

Wireless power saving

Enabling for a specific interface:

> **Note:** This should be combined with static naming of devices, the eth* names are not static.

/etc/udev/rules.d/wlan0_power_save.rules

```
ACTION=="add", SUBSYSTEM=="net", KERNEL=="wifi0" RUN+="/usr/sbin/iw dev wifi0 set power_save on"
```

Enabling for all interfaces:

/etc/udev/rules.d/wifi_power_save.rules

```
ACTION=="add", SUBSYSTEM=="net", KERNEL=="wlan*" RUN+="/usr/sbin/iw dev %k set power_save on"
```

Writeback Time

Increasing the VM dirty writeback time can help to aggregate I/O together - reducing disk writes, and decreasing power usage:

/etc/sysctl.d/dirty_writeback.conf

```
vm.dirty_writeback_centisecs = 1500
```

To do the same for journal commits with ext4 and some other filesystems, use `commit=15` as a parameter in fstab or with the `rootflags` kernel parameter.

Laptop Mode

/etc/sysctl.d/laptop_mode.conf

```
vm.laptop_mode = 5
```

SATA Active Link Powermanagement

```
echo min_power > /sys/class/scsi_host/host0/link_power_management_policy
```

USB Autosuspend

To enable USB autosuspend after 2 seconds of inactivity:

```
for i in `find /sys/bus/usb/devices/*/power/control`; do echo auto > $i; done;
```

```
for i in `find /sys/bus/usb/devices/*/power/autosuspend`; do echo 2 > $i; done;
```

Device Power Management

```
echo auto | tee /sys/bus/i2c/devices/*/power/control > /dev/null
echo auto | tee /sys/bus/spi/devices/*/power/control > /dev/null
```

View Power Setings

This function shows various power settings. Note you either must be root or you must have sudo.

```
function aa_power_settings ()
{
  sudo bash -c '
    for i in `find /sys/devices -name "bMaxPower"`;
    do
        for ii in `find $i -type f`;
        do
            bd=`dirname $ii`;
            busnum=`cat $bd/busnum`;
            devnum=`cat $bd/devnum`;
            title=`lsusb -s $busnum:$devnum`;
            echo -e "\n\n+++ $title\n  -$bd\n  -$ii";
            for ff in `find $bd/power -type f ! -empty 2>/dev/null`;
            do
                v=`cat $ff 2>/dev/null|tr -d "\n"`;
                [[ ${#v} -gt 0 ]] && echo -e " `basename $ff`=$v";
                v=;
            done | sort -g;
        done;
    done;
    echo -e "\n\n\n+++ Kernel Modules\n";
    for m in `command lspci -k|sed -n "/in use:/s,^.*: ,,p"|sort -u`;
    do
        echo "+ $m";
        systool -v -m $m 2> /dev/null | sed -n "/Parameters:/,/^$/p";
    done
  ';
}
```

See also

- CPU Frequency Scaling

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