How to access information in sysfs

Contents

A quality version of this page, approved on *24 January 2020*, was based off this revision.

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1 Article purpose

This article provides some information about the sysfs pseudo filesystem usage from the user space.

2   Sysfs (/sys) pseudo filesystem

Sysfs provides a mean to export kernel data structures, their attributes, and the linkages between them to the user space.

Please refer to sysfs part of pseudo filesystem page.

3 Sysfs usage

Linux kernel provides a documentation[1] about the rules for sysfs usage.

Some examples are also described below with two different approaches for using sysfs entries from the user space:

- Linux application in C language
- bash script.

3.1 Example from Linux application

The below example is a typical sequence for using sysfs entry (here a PWM component):

- open a file descriptor of the sysfs entry file

```
10  len=snprintf(buf, sizeof(buf), "/sys/class/pwm/pwmchip0/pwm%d/duty_cycle", pwm_channel
);
11  fd = open(buf, O_RDWR);
```

- if fd is correctly opened, write/read value in the file: pay attention to the "text" format

```
12  if (fd < 0)
13  {
14      perror("pwm/duty_cycle");
15      return fd;
16  }
```

- read: store data to buffer

```
18  read(fd, buf, sizeof(buf));
```

- write: write data from buffer

```
20  len = snprintf(buf, sizeof(buf), "%d", 900000);
21  write(fd, buf, len);
```

- close file descriptor

```
30  close(fd);
```

3.2 Example for shell command / bash script

Operations on sysfs entries can be done by using command lines (i.e. *echo* for writing, *cat* for reading).

In this way, it is possible to use a bash script to execute a configuration sequence, similarly to what a user would do by typing multiple shell commands.

An example is provided in How_to_use_PWM_with_sysfs_interface.

4 References

- Documentation/admin-guide/sysfs-rules.rst

System File System (See https://en.wikipedia.org/wiki/Sysfs for more details)

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Pulse Width Modulation