

8 Sensor

Each sensor chip gets its own directory in the sysfs `/sys/devices` tree. To find all sensor chips, it is easier to follow the device symlinks from `/sys/class/hwmon/hwmon*`, where `*` is a real number (0,1,2,...).

The sensor readings are located either in `/sys/class/hwmon/hwmon*/` directory for virtual devices, or in `/sys/class/hwmon/hwmon*/device` directory for non-virtual devices. A file, called `name`, located inside `hwmon*` or `hwmon*/device` directories contains the name of the chip, which corresponds to the name of the kernel driver used by the sensor chip.

There is only one sensor reading value per file. The common scheme for naming the files that contain sensor readings inside any of the directories mentioned above is: `<type><number>_<item>`, where

- **type** - for sensor chips is "in" (voltage), "temp" (temperature), "fan" (fan), etc.,
- **item** - "input" (measured value), "max" (high threshold), "min" (low threshold), etc.,
- **number** - always used for elements that can be present more than once (usually starts from 1, except for voltages which start from 0). If files do not refer to a specific element they have a simple name with no number.

The information regarding sensors available on the host can be acquired using **sensor-detect** and **sensors** tools (lm-sensors package: <http://lm-sensors.org/>). **Sensors-detect** helps to determine which modules are necessary for available sensors. When modules are loaded the **sensors** program can be used to show the readings of all sensor chips. The labeling of sensor readings, used by this program, can be different from the common naming scheme (`<type><number>_<item>`):

- if there is a file called `<type><number>_label`, then the label inside this file will be used instead of `<type><number><item>` name;
- if there is no `<type><number>_label` file, then the program searches inside the `/etc/sensors.conf` (could be also `/etc/sensors3.conf`, or different) for the name substitution.

This labeling allows user to determine what kind of hardware is used. If there is neither `<type><number>_label` file nor label inside the configuration file the type of hardware can be determined by the name attribute (`hwmon*/device/name`). The actual names of sensors, which `zabbix_agent` accepts, can be obtained by running **sensors** program with `-u` parameter (**sensors -u**).

In **sensor** program the available sensors are separated by the bus type (ISA adapter, PCI adapter, SPI adapter, Virtual device, ACPI interface, HID adapter).

On Linux 2.4:

(Sensor readings are obtained from `/proc/sys/dev/sensors` directory)

- **device** - device name (if `<mode>` is used, it is a regular expression);
- **sensor** - sensor name (if `<mode>` is used, it is a regular expression);
- **mode** - possible values: `avg`, `max`, `min` (if this parameter is omitted, device and sensor are treated verbatim).

Example key: `sensor[w83781d-i2c-0-2d,temp1]`

Prior to Zabbix 1.8.4, the `sensor[temp1]` format was used.

On Linux 2.6+:

(Sensor readings are obtained from `/sys/class/hwmon` directory)

- **device** - device name (non regular expression). The device name could be the actual name of the device (e.g. `0000:00:18.3`) or the name acquired using `sensors` program (e.g. `k8temp-pci-00c3`). It is up to the user to choose which name to use;
- **sensor** - sensor name (non regular expression);
- **mode** - possible values: `avg`, `max`, `min` (if this parameter is omitted, device and sensor are treated verbatim).

Example key:

```
sensor[k8temp-pci-00c3,temp,max] or sensor[0000:00:18.3,temp1]
```

```
sensor[smc47b397-isa-0880,in,avg] or sensor[smc47b397.2176,in1]
```

Obtaining sensor names

Sensor labels, as printed by the `sensors` command, cannot always be used directly because the naming of labels may be different for each sensor chip vendor. For example, `sensors` output might contain the following lines:

```
$ sensors
in0:          +2.24 V (min = +0.00 V, max = +3.32 V)
Vcore:        +1.15 V (min = +0.00 V, max = +2.99 V)
+3.3V:        +3.30 V (min = +2.97 V, max = +3.63 V)
+12V:         +13.00 V (min = +0.00 V, max = +15.94 V)
M/B Temp:     +30.0°C (low = -127.0°C, high = +127.0°C)
```

Out of these, only one label may be used directly:

```
$ zabbix_get -s 127.0.0.1 -k sensor[lm85-i2c-0-2e,in0]
2.240000
```

Attempting to use other labels (like `Vcore` or `+12V`) will not work.

```
$ zabbix_get -s 127.0.0.1 -k sensor[lm85-i2c-0-2e,Vcore]
ZBX_NOTSUPPORTED
```

To find out the actual sensor name, which can be used by Zabbix to retrieve the sensor readings, run `sensors -u`. In the output, the following may be observed:

```
$ sensors -u
...
Vcore:
```

```
in1_input: 1.15
in1_min: 0.00
in1_max: 2.99
in1_alarm: 0.00
...
+12V:
in4_input: 13.00
in4_min: 0.00
in4_max: 15.94
in4_alarm: 0.00
...
```

So *Vcore* should be queried as *in1*, and *+12V* should be queried as *in4*.¹⁾

```
$ zabbix_get -s 127.0.0.1 -k sensor[lm85-i2c-0-2e,in1]
1.301000
```

Not only voltage (in), but also current (curr), temperature (temp) and fan speed (fan) readings can be retrieved by Zabbix.

¹⁾

According to [specification](#) these are voltages on chip pins and generally speaking may need scaling.

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