

SNMP4Nagios

User Guide

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SNMP4Nagios User Guide

by Peter Gritsch

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1. Introduction

SNMP4Nagios is a package of Nagios plugins which use SNMP to query hosts. While some of the plugins use standard MIBs, most are designed for vendor specific agents.

Unlike other Nagios plugins, they are able to scan hosts for objects which can be monitored. They also can keep performance logs and draw plots of these using Tobias Oetiker's RRD-Tool.

While not strictly necessary, *SNMP4Nagios* plugins should be most useful when embedded into site specific scripts to handle scanning and plotting.

1.1. Typographical conventions

Throughout this document those typographical conventions are used to mark various types of text.

| | |
|------------------------|--|
| <code>filepath</code> | File pathes are written in a fixed-width font. |
| <code>commands</code> | Commands are written in a fixed-width font. |
| commands | Commands when describing an input are in a bold, fixed-width font. |
| <code>output</code> | Output is written in a fixed-width font. |
| <i>variables</i> | Variables are written in the emphasized base font. |
| <i>variable output</i> | Variable output is written in an emphasized fixed-width font. |

1.2. System Requirements

The plugins use libraries from the following software packages:

- Net-SNMP, see <http://www.net-snmp.org/>
Note: Net-SNMP itself depends on other libraries. Currently there is no way of automatically testing if the development files of those libraries are actually installed. See [Section 3.2.1](#) for further information about known problems.
- RRDTool, see <http://oss.oetiker.ch/rrdtool/>.
Optional.

And obviously they are designed to be used with Nagios, see <http://www.nagios.org/>.

1.2.1. Versions of RRDTool

Systematic testing with various versions of RRDTool revealed that SNMP4Nagios is very picky about the librrd it uses. It was developed using 1.0.49 which is incidently the version which works best.

Under circumstances currently unknown version 1.0.50 builds shared objects (library files) which do not have a “.so” extension. This is not detected during configuration but building SNMP4Nagios fails. To work around this issue change into RRDTool’s library directory and create symbolic links with the correct names:

```
root@host# ln -s librrd.0.0.0 librrd.so
root@host# ln -s librrd.0.0.0 librrd.so.0
root@host# ln -s librrd.0.0.0 librrd.so.0.0.0
```

RRDTool version 1.2.12 has a problem with STACKS upon LINES. These plugins may fail to produce usable plots due to this issue:

- check_cisco_mem
- check_mail_server
- check_ucd_snmp_cpu
- check_ups_battery
- check_winf_cpuusage

RRDTool version 1.2.16 changed the way escape sequences are handled¹ ... and this breaks the *SNMP4Nagios* plugins.

RRDTool version 1.2.17 fixes that bug but has a problem selecting the right archive.²

Additionally libart (which is used by RRDTool 1.2.x) “is quite picky about the data it gets for drawing”³. This may result in “*** attempt to put segment in horiz list twice” messages.

For the time being RRDTool 1.0.49 is still strongly recommended.

¹<https://lists.oetiker.ch/pipermail/rrd-announce/2007-January/000091.html>

²<https://lists.oetiker.ch/pipermail/rrd-announce/2007-January/000001.html>

³<https://lists.oetiker.ch/pipermail/rrd-users/2006-February/010920.html>

1.3. Other Requirements

Before using the plugins, ensure that you meet the following prerequisites:

- Basic knowledge of SNMP
- Working knowledge of Nagios configuration

1.4. Licensing

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1.5. Downloading the Latest Version

The latest version of *SNMP4Nagios* is available at:

http://sourceforge.net/project/showfiles.php?group_id=156977

You may find further information on *SNMP4Nagios* on the project's homepage:

<http://snmp4nagios.sourceforge.net/>

2. History

SNMP4Nagios started when I wanted to monitor the hardware of a number of hosts. Previous experience had shown that remote execution via ssh was not performant enough and SNMP seemed to be the common denominator for most systems involved.

At first I developed shell scripts which used `snmpget`. This worked for a while, but around the 20th monitored machine the monitoring server was no longer able to cope with the load. Considering this a challenge, I started to rewrite the plugins using C. People kept asking “Can you monitor *whatever?*” and I kept answering “Configure SNMP and allow *the server* to access the agent, then I will check it.” and thus plugins for various platforms were developed.

2.1. What’s New?

2.1.1. Version 0.4, 2007-05-09

- Added plugins for Net-SNMP/lm-sensors.
- Added plugins for Cisco VPN Concentrators.
- Added memory check for Windows/SNMP Informant.
- Added memory check for Net-SNMP.
- Added support for “old-style” Cisco CPU usage.
Incompatible change: The scanner interface of `check_cisco_cpuusage` was changed to report whether the old or new OIDs should be queried.
- **Incompatible change:** The scanner interface of `check_cisco_mem` was changed to report an alternate memory pool.
- Fixed a lot of bugs.
- James T. Saint-Rossy contributed a patch which allows *SNMP4Nagios* to compile on Solaris 9. Thank you James!

2.1.2. Version 0.3, 2006-03-11

- Added “Nagios Plugins” style performance data.
- Added compile time option “--without-rrd”.
- Replaced non-portable functions (asprintf(), basename()).
- Improved configure output.

2.1.3. Version 0.2, 2006-02-05

- Using autoconf/automake build system.
- Support for new rrd_graph signature (i. e. RRDTool 1.2.x).

3. Compiling

3.1. Compiling and Installing RRDTool

Note: If a usable version of RRDTool is already installed on your system, you can skip this section.

It might be necessary to install the recommended version of RRDTool but leave another version in place. This can be achieved quite easily by building RRDTool with a non-standard “Prefix”. Provided the user has permission to write into the prefix directory, it does not even have to be installed by root.

```
nagios@host> ./configure --prefix=$RRD_PREFIX --enable-shared \  
> && make \  
> && make install
```

builds and installs RRDTool into \$RRD_PREFIX.

3.2. Compiling and Installing *SNMP4Nagios*

As of version 0.2 building *SNMP4Nagios* is based on GNU automake/autoconf.

```
nagios@host> ./configure \  
> && make \  
> && make install
```

is sufficient if all headers and libraries are found in standard directories.

Apart from the usual `configure` options there are a few options that can be used to customize the build:

--with-rrd Sets the prefix of the RRDTool installation. If `librrd` was installed as described above, then use **--with-rrd=\$RRD_PREFIX**.

Default: Look for the `rrd` header and library files in the system directories.

--without-rrd Configures *SNMP4Nagios* without RRDTool. Logging and plotting are disabled.

Default: RRDTool is used, logging and plotting are enabled.

--with-rrddir Sets the default directory where **logging** will put the RRD files.

Default: PREFIX/var/snmp4nagios/rrd

--with-pngdir Sets the default directory where **plotting** will put the PNG files.

Default: PREFIX/var/snmp4nagios/png

Throughout this manual paths will be referenced by the configure options used to set them. \$BINDIR is set with "--bindir", \$RRDDIR is set with "--with-rrddir" and so on.

For the full list of compile time options, run "./configure --help".

3.2.1. Compilation Problems

Currently those compilation problems are known:

"checking for snmp_sess_init... no."

Linking with Net-SNMP failed.

To compile *SNMP4Nagios* you need (the development versions of) Net-SNMP and all the libraries your version of Net-SNMP depends on. You can find out what those libraries are by running

```
nagios@host> net-snmp-config -libs
```

This returns the linker flags Net-SNMP requires.

Note: On some systems these files are not included in the "normal" package of a library but only in the "-devel"-version thereof.

As of now, Net-SNMP is known to possibly depend on these libraries:

| library | known package names |
|----------------|----------------------------|
| libbz2 | bzip2 |
| libcrypto | openssl, openssl-devel |
| libdl | glibc, glibc-devel |
| libm | glibc, glibc-devel |
| librpm | rpm, rpm-devel |
| librpmio | rpm, rpm-devel |
| libwrap | tcpd, tcpd-devel |
| libz | zlib, zlib-devel |

It still does not compile

Please send a mail to the *SNMP4Nagios* mailing list containing

- a description of the problem.
- name and version of the operation system.
- version of *SNMP4Nagios*.
- version of Net-SNMP.
- version of RRD-Tool (unless configured “--without-rrd”).
- output of “net-snmp-config -cflags”
- output of “net-snmp-config -libs”
- the file `config.log`.
- whatever you think could help solve the problem.

4. Using

All plugins give a short synopsis of their parameters when they are called with an invalid or missing parameter, which includes with no parameter at all. When called with the parameter “-h”, they give a more detailed help.

4.1. Types

The descriptions of parameters and outputs contain these types which should be used to interface to the plugins.

| | |
|----------|--|
| int | 32 Bit signed integer. |
| uint | 32 Bit unsigned integer. |
| float | floating point number, usually a 64 Bit double. |
| mwstring | String, possibly containing spaces. |
| string | String, not including spaces. When such a string is used in the output of a plugin, then it is guaranteed to contain no spaces. When it is used as input, then it should not contain spaces. |
| oid | Numeric SNMP Object ID. |

4.2. Passing Command Line Parameters

The plugins use very simple command line parsing functions. Therefore some features one might expect are not available.

- Single character options must not be grouped. “-T -1” is correct, “-T1” will not work.
- Values have to be passed as separate parameter. “-r 5” and “--retries 5” should work, “-r5” and “--retries=5” will not work.
- Multiple values which are used as one parameter have to be written as one parameter. “-W 75%,75%” is correct, “-W 75%, 75%” is wrong.

4.3. SNMP Communities

Currently only SNMP v1 and v2c are supported. Either uses the infamous “communities” for authorization. This offers little protection and you should consider using a management LAN or at least a packet filter where you configure your management station(s) to be the only computers to be able to access SNMP¹. Of course you should also change the default community strings “public” and “private”.

The plugins try to read the community string from:

1. the command line. To pass it directly use the parameter “-C”.
2. a **community file** which is given on the command line using the parameter “-F”.
3. the built-in community file `$HOME/.snmp4nagios/community`.
4. the built-in community file `home/.snmp4nagios/community`, where “home” is the home directory of the user running the plugin as given in `/etc/passwd`.
5. the built-in community file `/etc/snmp4nagios/community`.

The plugins will use the first community they find. If no community is given, then the program will use the community “public”.

4.3.1. Community Files

While communities are not very secure, they have still been considered worth protecting. Thus they should not be given on the command line. Even better: If they are kept in a default file, then your command line will probably get simpler.

Community files are simple text files which contain the community string. Only the first line of the file is read. You can create the default community file by issuing the commands:

```
nagios@host> mkdir $HOME/.snmp4nagios
nagios@host> chmod 700 $HOME/.snmp4nagios
nagios@host> echo "my-community" > $HOME/.snmp4nagios/community
```

For the rest of this document, it is expected that you got a working SNMP agent running on localhost and that you set up the *SNMP4Nagios* default community as described above. Issue the following command:

```
nagios@host> snmpwalk -v 2c \
> -c `cat $HOME/.snmp4nagios/community` localhost \
> .1.3.6.1.2.1.1
```

¹Yes, I am aware of ARP spoofing.

If this does not print some general information about your system, then there is something wrong with your SNMP setup.²

4.4. Output

Nagios only uses the first line of output which is insufficient for debugging. Therefore all error or log messages are sent to syslog, per default using the facility LOG_DAEMON.

4.5. Using the Scanner

The “scanner” is designed to find out which objects can be monitored on a given device.

If the test in the previous section succeeded³, then this should also work:

```
nagios@host> $BINDIR/check_if_by_snmp -S -H localhost
```

This should print a result like this:

```
OK index: 1 ; type: 24 ; aStat: 1 ; descr: lo
OK index: 2 ; type: 6 ; aStat: 1 ; descr: eth0
OK index: 3 ; type: 6 ; aStat: 2 ; descr: eth1
OK index: 4 ; type: 131 ; aStat: 2 ; descr: sit0
```

Each line of the result describes one entity which could be monitored using one Nagios service. The first column is always “OK” or “FAILED”. Plugins which can monitor several entities on a host (like multiple network interfaces) continue with pairs of names and values separated by semicolons.

The first line in the example above means:

- there is at least one interface which can be monitored.
- the first pair has the name “index:” and the value “1”.
- the second pair is “type:” and “24”. In the very case this means “softwareLoopback”.
- the third pair is “aStat:” and “1” i.e. “up”.
- the fourth pair is “descr:” and “lo”.

²Okay, you are right. You can use a different host, another community file and so on . . . But if you figured that out, you should also be able to figure out how to change the commands given further down in this document, shouldn't you?

³or you know how to change the command

This information is needed or at least useful when setting up a service check. The indices (sometimes there are several indices) are used to build the object IDs which are queried. The plugins will simply abort with an error if the indices are missing. The administrative status of an interface can be used to monitor only devices which are actually used. Monitoring an interface which is administratively down will always return a warning. Finally the description is useful for building the service name, at least with systems that return sensible interface descriptions.

A description of the name-value-pairs which are returned by a plugin is included with the description of each plugin in [chapter 7](#).

If the agent does not support the queried objects, then scanning returns the string “FAILED”.

The output is designed to be used by some higher level software to scan hosts for a multitude of services. An excerpt from a shell script doing this could look like this:

```
$BINDIR/check_if_by_snmp -S -H $HOST \  
| while read -r STAT IN IV S1 TN TV S2 SN SV S3 DN DV \  
do \  
    # IN, IV ... Index Name, Index Value \  
    # TN, TV ... Type Name, Type Value \  
    # SN, SV ... administrative Status Name, administrative Status Value \  
    # DN, DV ... Description Name, Description Value \  
    # S1, S2, S3 ... Semicolons \  
    test "$STAT" = "OK" \  
    && test "$IN" = "index:" \  
    && test "$S1" = ";" \  
    && test "$TN" = "type:" \  
    && test "$S2" = ";" \  
    && test "$SN" = "aStat:" \  
    && test "$S3" = ";" \  
    && test "$DN" = "descr:" \  
    && WriteInterfaceCheck "$IV" "$TV" "$SV" "$DV" \  
    || echo "Syntax error" 1>&2 \  
done
```

4.6. Using the Tester

Using the information from the scanner, one can run a test by issuing e. g.

```
nagios@host> $BINDIR/check_if_by_snmp -T -H localhost \  
> -i 2 -I eth0
```

which returns (in one line):

```
OK - eth0: I: 1410937 kO, 12672117 Pkt; O: 1339265 kO, 12722878 Pkt
|eth0;100000000;1;1444800491;12672117;0;1371407644;12722878;0
```

Please note that “eth0” in the result string as well as in the performance data is taken from the “-I” parameter and not read from the agent. This is to help dispatching performance data to the right archive.

The rest of the result string should be more or less self explaining. The performance data however usually needs some explanation which is given in the online help and the plugin description in this manual. For the network interface plugin the online help describes the performance data like this:

Performance data is provided in the format:

```
<addInf>;<speed>;<oStat>;<iOct>;<iPkt>;<iErr>;<oOct>;<oPkt>;<oErr>
```

where

```
addInf ... additional information.
speed ... estimated maximum speed of the interface
oStat ... operational status, c.f. RFC1573, pp. 28-29
iOct ... Input octet counter
iPkt ... Input packet counter
iErr ... Input error counter
oOct ... Output octet counter
oPkt ... Output packet counter
oErr ... Output error counter
```

4.6.1. “Nagios Plugins” Style Performance Data

Performance data as described in the [Nagios plug-in development guidelines](#) is supported as of *SNMP4Nagios* version 0.3. To enable this “Nagios Plugins” style use the command line option “-N”.

For instance issuing the command

```
nagios@host> $BINDIR/check_if_by_snmp -T -H localhost \
> -i 2 -I eth0 -N
```

returns (in one line):

```
OK - eth0: I: 1410937 kO, 12672117 Pkt; O: 1339265 kO, 12722878 Pkt
|'estimated speed'=100000000
'input octets'=1444800491c 'input packets'=12672117c 'input errors'=0c
'output octets'=1371407644c 'output packets'=12722878c 'output errors'=0c
```

For an explanation of the values please see the documentation of each plugin.

4.7. Using the Logger

As stated above, the plugins can keep performance logs. As a matter of fact, to make logging a part of their normal operation was a design goal. So plugins which support performance data also support the “-L” and “-P” options.

The archives are actual handled by RRDTool or more precicely by librrd which is a part thereof.

To keep a performance log of an entity simply add “-L” to the command line.

```
nagios@host> $BINDIR/check_if_by_snmp -T -L -H localhost \  
> -i 2 -I eth0
```

should give you the output described in [section 4.6](#) but it also creates or updates the file `$RRDDIR/localhost/check_if_by_snmp_eth0.rrd`

The filename is built from:

1. the RRD directory given on the command line (see [section 5.4.3](#)) or the compiled in default (see [section 3.1](#)).
2. a directory named after the hostname as passed by “-H” or the environment variable `$NAGIOS_HOSTNAME`⁴.
3. the name of the plugin. Note that this is compiled in and does not change if the plugin is renamed.
4. any “additional information” that is given (see [section 5.5](#)).
5. slashes (“/”), underscores (“_”) and suffixes (“.rrd”) as needed.

If the RRD archive does not exist, then it is initialized with the step and heartbeat given in each plugin’s documentation. Thus plugins should be called at “step” intervals, usually every five minutes.

4.8. Using the Plotter

Once performance logs have been created, they can be plotted using commands like:

```
nagios@host> $BINDIR/check_if_by_snmp -P -H localhost \  
> -i 2 -I eth0
```

This will yield a lot of output and is obviously designed to be used through some kind of front end. See [appendix A](#) for details about the output.

⁴c.f. http://nagios.sourceforge.net/docs/2_0/macros.html

Additionally several plot files are created, e. g.

`$PNGDIR/localhost/check_if_by_snmp_eth0_oct_24h_5m.png`

The filename is built from:

1. the PNG directory given on the command line (see [section 5.4.4](#)) or the compiled in default (see [section 3.1](#)).
2. a directory named after the hostname as passed by “-H” or the environment variable `$NAGIOS_HOSTNAME`.
3. the name of the plugin. Note that this is compiled in and does not change if the plugin is renamed.
4. any “additional information” that is given (see [section 5.5](#)).
5. information about the contents of the plot: Sometimes a plugin creates several types of plots. “check_if_by_snmp” for instance creates plots for the amount of data and the number of packets which were transferred and the number of errors encountered. These plots have the additional designations “oct”, “pkt” and “err” respectively.
6. the durations of the plotted period and the sample interval. So the example above covers a 24 hour period and uses one sample every five minutes.
7. slashes (“/”), underscores (“_”) and suffixes (“.rrd”) as needed.

5. Common Options

SNMP4Nagios plugins are designed to use as much common code as sensible. A wanted side effect is that they share many common parameters. These parameters will not be discussed with each plugin but in this section.

There are six basic modes: Scanning, testing, logging and plotting as discussed before, “version printing” and “help”.

Scanning, version printing and help are exclusive, that is the program will exit once the scan is complete or the version or help text is printed.

Testing, logging and plotting can be combined. While the plugins are actually designed to test and log at once, plotting should be done on demand. There could be thousands of checks, each running at five minute intervals. There is hardly the time to look at say one thousand plots per minute while creating them would put some serious load on most computers.

5.1. Version printing and Help

5.1.1. `--version, -V`

Prints the versions of the plugin and *SNMP4Nagios*, then exit.

5.1.2. `--help, -h`

Prints the help text of the plugin and exit.

5.2. General Options

Those options can be used in all four main modes (i.e. scanning, testing, logging and plotting).

5.2.1. --host, -H *HOSTNAME*

Name of the host which should be checked. A value for the hostname is required for logging and plotting. If it is not given using the command line parameter, then it is read from the environment variable `$NAGIOS_HOSTNAME`. If this is not set either, the program will abort with an error.

5.2.2. --address, -A *IP-ADDRESS*

Sets the IP address of the host which is to query. If this is not set, then the environment variable `$NAGIOS_HOSTADDRESS` is read. If this is set neither, then the hostname is used to make the connection.

5.2.3. --verbose, -v

Increase verbosity. This can be given several times, three is usually a good number for debugging. As usual messages are written to syslog.

5.2.4. --nagios-plugins-format, -N

Print performance data using the “Nagios Plugins” style.

5.3. For scanning and testing

Scanning and testing are the modes which actually use SNMP. Thus most network settings are used only in these modes. Note that “-H” is the exception to the rule. It can be used in these modes (where “-A” is preferred) but it is required with logging and plotting.¹

5.3.1. --scan, -S

Scans the host for services. This disables all other modes. Scanning is discussed more deeply in [section 4.5](#).

¹Instead of passing the hostname a/o address on the command line, they can be passed through the environment.

5.3.2. --test, -T

Test a given service. Testing is discussed more deeply in [section 4.6](#).

5.3.3. --snmp-v1, -1

Use the SNMP protocol version 1.

5.3.4. --snmp-v2c, -2

Use the SNMP protocol version 2c. This is the default.

5.3.5. --community, -C *COMMUNITY*

Use the SNMP community *COMMUNITY* (string).

5.3.6. --community-file, -F *FILENAME*

Read the SNMP community from the file *FILENAME*. For more details about community files see [section 4.3.1](#).

5.3.7. --retries, -r *RETRIES*

Number of times to retry a request given as an integer. Note that Net-SNMP uses increasing timeouts for retries.

5.3.8. --snmp-timeout, -t *TIMEOUT*

Timeout for the first SNMP request in milliseconds given as an integer.

5.4. For logging and plotting

5.4.1. `--log, -L`

Log performance data. If “-T” is also given, then the data is passed internally, otherwise it is read from the environment variable `$NAGIOS_SERVICEPERFDATA`.

Logging is discussed more deeply in [section 4.7](#).

5.4.2. `--plot, -P`

Create plots. See [section 4.8](#) for more details.

5.4.3. `--rrd-directory, -R DIRNAME`

RRD archives’ base directory. The filename of the archive is built by appending the hostname, the check’s name and—depending on the service—other information to *DIRNAME*. If this option is not given, then the compiled in default (see [section 3.1](#)) is used.

5.4.4. `--graph-directory, -G DIRNAME`

PNG plots’ base directory. The filename of the plots is build by appending the hostname, the check’s name and—depending on the service—other information to *DIRNAME*. If this option is not given, then the compiled in default (see [section 3.1](#)) is used.

5.5. Additional Information

Plugins which support both indices and logging and plotting need a way to distinguish between several entities of the same kind, e. g. multiple ethernet NICs. Obviously the indices would be a way to achive this, but they have a serious drawback: Indices may change, even at a simple reboot.

While this is bad enough—one might have to rescan a host after a boot—loosing the performance logs is certainly worse.²

To solve this problem scanning was designed to present persistent data where possible and the “additional information” was introduced.

²The logs are not actually lost but they might become inaccessible or data from one entity might be logged to the archive of another entity.

5.5.1. `--additional-info, -I ADDINF`

Additional information used to find the RRD archive and image pathes. See [section 4.8](#).

This string is used as a part of a filename. The plugins do not enforce any restriction about what characters it may contain—but the operating system would most likely object to e. g. “/”.

6. Notes about Platforms

Standardized MIBs provide some information about an agent. The more interesting stuff, especially when it comes to hardware monitoring, is usually available only through vendor specific MIBs.

The degree to which details are available vary strongly. Some agents only return “The physical hard drive in bay 5 is OK.” while others return details up to “The drive’s LED will be blinking for another 1.5 seconds.”

6.1. Brocade

If you have a SAN switch from Hewlett-Packard, then you might want to check if there is a Brocade device underneath.

```
nagios@host> snmpwalk -v 2c -c COMMUNITY -On IP \  
> SNMPv2-MIB::sysObjectID.0
```

If the result contains “.1.3.6.1.4.1.1588” then you are lucky.

One remarkable thing about those SAN switches is that as far as SNMP is concerned, fans, power supply units and temperature sensors are all the same—“sensors”. Together they form one table but for the sake of performance logging they are treated separately. Sharing one table is also the reason why the plugins to check those entities report “weired” indices.

6.2. Cisco

Cisco has developed a staggering amount of MIBs and their SNMP agents provide detailed information about just about every aspect of the devices operation.

The plugins should work with Catalyst OS as well as IOS. Some also work with PIX Security Appliances.

Note: It seems that Cisco PIXes support only SNMP version 1.

The cisco_vpn plugins are designed to work with the Cisco VPN Concentrator. I do not have access to a Concentrator any longer so these plugins are partially supported at best.

6.3. Compaq

Compaq (now Hewlett-Packard) provides SNMP agents for their ProLiant Servers¹ which provide very detailed information about those machines.

So far I have not figured out a way to monitor a HP StorageWorks Enterprise Virtual Array (except the Storage Management Appliance, that is).

6.4. Microsoft Windows

The SNMP agent of Microsoft Windows Server 2003 does not report cpu or memory usages. However there is a free (as in beer) version of “SNMP Informant”² by Garth K. Williams which can be used to query these.

6.5. Network Appliance

Network Appliance devices provide the highest number of values seen so far. Nevertheless they report only abstract values when it comes to hardware details, e. g. “There are no failed fans”.

Most remarkable however is the lack of support for SNMP Version 2c. The plugins have to be called with the parameter “-1”.

6.6. Net-SNMP and lm_sensors

A wide range of computers uses lm_sensors³ to monitor temperatures, voltages and fans. Net-SNMP provides access to lm_sensors data if it has been compiled with lm_sensors support.

There is however a catch: No thresholds are provided and reference values are only given as names. Therefore it takes some fiddling to set up these plugins.

¹That is, the plugins were only tested with ProLiant, others might work as well and feedback would be welcome.

²<http://www.snmp-informant.com>

³<http://www.lm-sensors.org/>

6.7. Uninterruptable Power Supplies

Uninterruptable Power Supplies are of course not a vendor, but they use a standard⁴ MIB and plugins were grouped like those of a vendor.

It depends on the device if and to what extent values are returned. It is even possible that inconsistent values are returned. For instance an UPS might return output voltage, current and power each 0, but an output load greater than 0.

So you will have to figure out yourself how far you can trust the performance data. Alarms and outputs (as in `check_ups_outputs`) should always work.

⁴<ftp://ftp.rfc-editor.org/in-notes/rfc1628.txt>

7. The Plugins

7.1. check_brocade_fan

The plugin checks if the SAN switch considers the speed of the given fan to be within the nominal range.

Scan result:

OK index: *INDEX* ; info: *INFO*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The fan's index which should be used with "-i". |
| <i>INFO</i> | mwstring | The name of the fan. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | Index of the fan which should be checked. |
|----|---------|--------------|-----|---|

Warning:

- The fan is unknown, faulty or absent.

Critical:

- The speed of the fan is not within the nominal range.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;speed
```

“Nagios Plugins” Style:

```
'current speed'=speed
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>speed</i> | int | Current speed in rounds per minute. |

7.2. check_brocade_overall

The plugin checks the overall status of a Brocade SAN switch.

Note: there is an ugly hack inside: The SNMP timeout is set higher because the devices used for testing tended to time out otherwise. And once they had timed out they took some time before recovering.

Scan result:

OK

Warning:

- the operational status is “offline” or “testing”.

Critical:

- the operational status is “faulty”.
- the POST diagnostics returned anything but “OK”.

Logging and Plotting:

Not supported.

7.3. check_brocade_port

The plugin checks one fibre channel port of a Brocade SAN switch.

Scan result:

OK index: *INDEX* ; pStat: *PSTAT* ; aStat: *ASTAT*

| | | |
|--------------|-----|--|
| <i>INDEX</i> | int | The fibre channel port's index which should be used with “-i”. |
| <i>PSTAT</i> | int | The physical status of the port. ¹ |
| <i>ASTAT</i> | int | The administrative status of the port. ² |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the port which should be checked. |
|----|---------|--------------|-----|--|

Warning:

- The port is administratively down.

Critical:

- The port is physically down and administratively enabled.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

¹c.f. SW-MIB::swFCPortPhyState available at e. g. <http://www.oidview.com/mibs/1588/SW-MIB.zip>

²c.f. SW-MIB::swFCPortAdmStatus

Performance data:

Default Style:

```
addinf;pStat;oStat;iWrds;oWrds;iFrms;oFrms
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'input words'=iWrds 'output words'=oWrds  
'input frames'=iFrms 'output frames'=oFrms
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>pStat</i> | int | Physical status of the port. |
| <i>oStat</i> | int | Operational status of the port. ³ |
| <i>iWrds</i> | uint | Input fibre channel word counter. |
| <i>oWrds</i> | uint | Output fibre channel word counter. |
| <i>iFrms</i> | uint | Input fibre channel frame counter. |
| <i>oFrms</i> | uint | Output fibre channel frame counter. |

7.4. check_brocade_psu

The plugin checks one power supply unit of a Brocade SAN switch.

Scan result:

OK index: *INDEX* ; info: *INFO*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The PSU’s index which should be used with “-i”. |
| <i>INFO</i> | mwstring | The information string of the PSU. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | Index of the power supply unit which should be checked. |
|----|---------|--------------|-----|---|

Warning:

- The PSU is unknown or absent.

³c. f. SW-MIB::swFCPortOpStatus

Critical:

- The PSU is not operating within its nominal range or faulty.

Logging and Plotting:

Not supported.

7.5. check_brocade_temp

The plugin checks if a Brocade SAN switch considers the temperature at a given sensor is within the nominal range.

Scan result:

OK index: *INDEX* ; info: *INFO*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The temperature sensor's index which should be used with “-i”. |
| <i>INFO</i> | mwstring | The name of the temperature sensor. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the sensor which should be checked. |
|----|---------|--------------|-----|--|

Warning:

- the temperature sensor is unknown, faulty or absent.

Critical:

- the temperature of the sensor is not within the nominal range.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;tempC
```

“Nagios Plugins” Style:

```
'current temperature'=tempC
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>tempC</i> | int | Current temperature in degree Celsius. |

7.6. check_cisco_cpuusage

The plugin checks the one minute and five minute averages of the cpu usage of a Cisco device.

Scan result:

OK index: *INDEX* [newOIDs|oldOIDs]

| | | |
|-----------------|-----|--|
| <i>INDEX</i> | int | The cpu’s index which should be used with “-i”. |
| newOIDs oldOIDs | | Whether the new OIDs (default) or the old OIDs (Option -o) should be used. |

Specific Parameters:

| | | | | |
|----|------------|---------------------|---------|--|
| -i | --index | <i>INDEX</i> | int | Index of the cpu which should be checked. |
| -o | --old-oids | | | Per default the plugin uses the “new” OIDs <i>cpmCPUTotal1minRev</i> and <i>cpmCPUTotal5minRev</i> . These OIDs are not supported by all devices. This option switches the plugin to using the old (deprecated) OIDs <i>cpmCPUTotal1min</i> and <i>cpmCPUTotal5min</i> . |
| -w | --warning | <i>WARN1, WARN5</i> | int,int | The one and five minute average cpu usages at which a warning is generated. |
| -c | --critical | <i>CRIT1, CRIT5</i> | int,int | The one and five minute average cpu usages at which a critical is generated. |

Warning:

- at least one average is greater than the appropriate warning threshold.

Critical:

- at least one average is greater than the appropriate critical threshold.

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

```
addinf;usage1;usage5
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'1 minute cpu usage'=usage1%;warn1;crit1  
'5 minute cpu usage'=usage5%;warn5;crit5
```

Values:

| | | |
|---------------|--------|---|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>usage1</i> | uint | Current one minute average of the cpu usage in per cent. |
| <i>usage5</i> | uint | Current five minute average of the cpu usage in per cent. |

7.7. check_cisco_fan

The plugin checks the overall status of one of a Cisco device’s fans.

Scan result:

OK index: *INDEX* ; descr: *DESCR*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The fan’s index which should be used with “-i”. |
| <i>DESCR</i> | mwstring | The description of the fan. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | The index of the fan which should be checked. |
|----|---------|--------------|-----|---|

Warning:

- the fan's status is "warning", "shutdown" or "not present".

Critical:

- the fan's status is "critical" or "not functioning".

Logging and Plotting:

Not supported.

7.8. check_cisco_if_load

The plugin checks the interface load of one of a Cisco device's network interfaces.

Scan result:

OK index: *INDEX* ; descr: *DESCR*

| | | | | |
|--------------|----------|---|--|--|
| <i>INDEX</i> | int | The interface's index which should be used with "-i". | | |
| <i>DESCR</i> | mwstring | The description of the interface. | | |

Specific Parameters:

| | | | | |
|----|------------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the interface which should be checked. |
| -w | --warning | <i>WARN</i> | int | Interface load at which a warning is returned (255 = 100%). |
| -c | --critical | <i>CRIT</i> | int | Interface load at which a critical is returned (255 = 100%). |

Warning:

- The interface load is greater than the warning threshold.

Critical:

- The interface load is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

```
addinf;load
```

“Nagios Plugins” Style:

```
'load'=load;warn;crit;0;255
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>load</i> | int | Interface load (0 to 255). |

7.9. check_cisco_mem

The plugin checks the status of one of a Cisco device’s memory pools.

Scan result:

OK index: *INDEX* ; alternate: *ALTER* ; name: *NAME*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The memory pool’s index which should be used with “-i”. |
| <i>ALTER</i> | int | The alternate memory pool’s type or zero if this pool does not have an alternate pool. |
| <i>NAME</i> | mwstring | The name of the memory pool. |

Specific Parameters:

| | | | | |
|----|------------|-------------------|------|---|
| -i | --index | <i>INDEX</i> | int | Index of the memory pool which should be checked. |
| -w | --warning | <i>WARN[%kM]</i> | uint | Memory pool usage at which a warning is returned. <i>Optional. Default: 75%.</i> |
| -c | --critical | <i>CRIT[%kM]</i> | uint | Memory pool usage at which a critical is returned. <i>Optional. Default: 85%.</i> |

Units:

| | |
|-------------|-------------------------|
| % | Per cent of pool size. |
| k | Kibibyte ⁴ . |
| M | Mebibyte. |
| <i>none</i> | Byte. |

Warning:

- The memory pool's usage is greater than the warning threshold.

Critical:

- The memory pool's usage is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;used;free;lFree
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'memory'=usedB;warn;crit;0;size
```

```
'largest free block'=lFreeB
```

⁴c.f. http://en.wikipedia.org/wiki/Binary_prefix

Values:

| | | |
|---------------|--------|---|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>used</i> | int | Used bytes in the pool. |
| <i>free</i> | int | Unused bytes in the pool. |
| <i>lFree</i> | int | Size (in bytes) of the largest continuous block of unused memory in the pool. |

7.10. check_cisco_pix_conns

The plugin checks the number of connections used on a Cisco PIX Security Appliances.

Scan result:

OK

Specific Parameters:

| | | | | |
|----|------------|-------------|-----|--|
| -w | --warning | <i>WARN</i> | int | Number of present connections at which a warning is returned. |
| -c | --critical | <i>CRIT</i> | int | Number of present connections at which a critical is returned. |

Warning:

- the current number of connections is greater than the warning threshold.

Critical:

- the current number of connections is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

conn

“Nagios Plugins” Style:

'connections'=*conn;warn;crit*

Values:

| | | |
|-------------|------|---------------------------------------|
| <i>conn</i> | uint | Number of connections currently used. |
|-------------|------|---------------------------------------|

7.11. check_cisco_psu

The plugin checks the overall status of one of a Cisco device’s power supply units.

Scan result:

OK index: *INDEX* ; descr: *DESCR*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The PSU’s index which should be used with “-i”. |
| <i>DESCR</i> | mwstring | The description of the PSU. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | Index of the PSU which should be checked. |
|----|---------|--------------|-----|---|

Warning:

- the PSU’s status is “warning”, “shutdown” or “not present”.

Critical:

- the PSU’s status is “critical” or “not functioning”.

Logging and Plotting:

Not supported.

7.12. check_cisco_temp

The plugin checks the temperature at one of a device's sensors.

Scan result:

OK index: *INDEX* ; descr: *DESCR*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The temperature sensor's index which should be used with "-i". |
| <i>DESCR</i> | mwstring | The description of the sensor. |

Specific Parameters:

| | | | | |
|----|------------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the temperature sensor which should be checked. |
| -w | --warning | <i>WARN</i> | int | Temperature of the sensor at which a warning is returned. |
| -c | --critical | <i>CRIT</i> | int | Temperature of the sensor at which a critical is returned. |

Warning:

- The sensor's status is "warning", "shutdown" or "not present".
- The temperature is greater than the warning threshold.

Critical:

- The sensor's status is "critical" or "not functioning".
- The temperature is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addInf;tempC;tempE
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'current temperature'=tempC;warn;crit  
'emergency shutdown temperature'=tempE
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | additional information (as given by the “-I” parameter). |
| <i>tempC</i> | uint | current temperature. |
| <i>tempE</i> | int | emergency shutdown temperature. |

7.13. check_cisco_voltage

The plugin checks the voltage at one of a Cisco device’s sensors.

Scan result:

OK index: *INDEX* ; descr: *DESCR*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The voltage sensor’s index which should be used with “-i”. |
| <i>DESCR</i> | mwstring | The description of the sensor. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the voltage sensor which should be checked. |
|----|---------|--------------|-----|--|

Warning:

- the sensor’s status is “warning”, “shutdown” or “not present”.

Critical:

- the sensor’s status is “critical” or “not functioning”.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;voltC;voltL;voltH
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'current voltage'=voltC
```

```
'low threshold voltage'=voltL 'high threshold voltage'=voltH
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | additional information (as given by the “-I” parameter). |
| <i>voltC</i> | int | current voltage in millivolt. |
| <i>voltL</i> | int | lower threshold voltage in millivolt. |
| <i>voltH</i> | int | higher threshold voltage in millivolt. |

7.14. check_cisco_vpn_conns

The plugin checks the number of connections (sessions) used on an a Cisco VPN Concentrator.

Scan result:

OK

Specific Parameters:

| | | | | |
|----|------------|----------------|-----|---|
| -w | --warning | <i>WARN[%]</i> | int | Number of present connections or percentage of available sessions at which a warning is returned. <i>Optional. Default: 90%.</i> |
| -c | --critical | <i>CRIT[%]</i> | int | Number of present connections or percentage of available sessions at which a critical is returned. <i>Optional. Default: 95%.</i> |

Warning:

- the current number of user sessions is greater than the warning threshold.

Critical:

- the current number of user sessions is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
actSC;actUS;maxUS;maxSC;l2lSC;manSC;remSC
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'active sessions'=actSC  
'active user sessions'=actUS;warn;crit;;maxUS  
'maximum sessions'=maxSC  
'LAN-to-LAN sessions'=l2lSC  
'management sessions'=manSC  
'remote access sessions'=remSC
```

Values:

| | | |
|--------------|------|---|
| <i>actSC</i> | uint | Number of currently active session. |
| <i>actUS</i> | uint | Number of currently active user sessions. This is not read from the device but the sum of the currently active LAN-to-LAN and remote access sessions. |
| <i>maxUS</i> | uint | Maximum user sessions. |
| <i>maxSC</i> | uint | Maximum concurrent sessions since reboot. |
| <i>l2lSC</i> | uint | Number of currently active LAN-to-LAN sessions. |
| <i>manSC</i> | uint | Number of currently active management sessions. |
| <i>remSC</i> | uint | Number of currently active remote access sessions. |

7.15. check_cisco_vpn_cpuusage

The plugin checks the cpu usage of a Cisco VPN Concentrator.

Scan result:

OK

Specific Parameters:

| | | | | |
|----|------------|-------------|-----|--|
| -w | --warning | <i>WARN</i> | int | Cpu usage at which a warning is returned. |
| -c | --critical | <i>CRIT</i> | int | Cpu usage at which a critical is returned. |

Warning:

- the current cpu usage is greater than the warning threshold.

Critical:

- the current cpu usage is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

usage

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'cpu usage'=usage%;warn;crit
```

Values:

| | | |
|--------------|------|-----------------------------|
| <i>usage</i> | uint | Cpu utilization in percent. |
|--------------|------|-----------------------------|

7.16. check_cisco_vpn_fan

The plugin checks whether a fan of Cisco VPN Concentrator has an alarm. If the fan does have an alarm a critical alert will be generated. The plugin never returns a warning.

Scan result:

OK index: *INDEX* ; descr: *DESCR*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The fan's index which should be used with "-i". |
| <i>DESCR</i> | mwstring | The description of the fan. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | Index of the fan which should be checked. |
|----|---------|--------------|-----|---|

Critical:

- The fan has an alarm.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf; speed
```

“Nagios Plugins” Style:

```
'current speed'=speed
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>speed</i> | uint | Current speed in rounds per minute. |

7.17. check_cisco_vpn_temp

The plugin checks whether a temperature sensor of Cisco VPN Concentrator has an alarm. If the sensor does have an alarm a critical alert will be generated. The plugin never returns a warning.

Scan result:

OK index: *INDEX* ; descr: *DESCR*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The sensor's index which should be used with "-i". |
| <i>DESCR</i> | mwstring | The description of the sensor. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the sensor which should be checked. |
|----|---------|--------------|-----|--|

Critical:

- The sensor has an alarm.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;tempC
```

“Nagios Plugins” Style:

```
'current temperature'=tempC
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>tempC</i> | int | Current temperature in Degree Celsius. |

7.18. check_cisco_vpn_thru

The plugin checks the throughput utilization of a Cisco VPN Concentrator.

Scan result:

OK

Specific Parameters:

| | | | | |
|----|------------|-------------|-----|---|
| -w | --warning | <i>WARN</i> | int | Throughput utilization at which a warning is returned. |
| -c | --critical | <i>CRIT</i> | int | Throughput utilization at which a critical is returned. |

Warning:

- the current throughput utilization is greater than the warning threshold.

Critical:

- the current throughput utilization is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

utilization

“Nagios Plugins” Style (some blanks replaced with linefeeds):

'cpu utilization'=usage%;warn;crit

Values:

| | | |
|--------------------|------|-----------------------------------|
| <i>utilization</i> | uint | Threshold utilization in percent. |
|--------------------|------|-----------------------------------|

7.19. check_cisco_vpn_voltage

The plugin checks whether a voltage sensor of a Cisco VPN Concentrator has an alarm. If the voltage sensor does have an alarm a critical alert will be generated. The plugin never returns a warning.

Scan result:

OK index: *INDEX* ; descr: *DESCR*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The voltage sensor's index which should be used with “-i”. |
| <i>DESCR</i> | mwstring | The description of the voltage sensor. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the voltage sensor which should be checked. |
|----|---------|--------------|-----|--|

Critical:

- The voltage sensor has an alarm.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;voltage
```

“Nagios Plugins” Style:

```
'current voltage'=voltage
```

Values:

| | | |
|----------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>voltage</i> | uint | Current voltage in millivolt. |

7.20. check_cpq_fan

The plugin checks the status of one of a Compaq computer's fans.

Scan result:

OK chassis: *CHASSIS* ; index: *INDEX* ; local: *LOCAL*

| | | |
|----------------|----------|--|
| <i>CHASSIS</i> | int | The fan's system chassis index which should be used with "-s". |
| <i>INDEX</i> | int | The fan's index which should be used with "-i". |
| <i>LOCAL</i> | mwstring | The location of the fan. |

Note: The scan only returns fans which are "present".

Specific Parameters:

| | | | | |
|----|------------------|----------------|-----|---|
| -s | --system-chassis | <i>CHASSIS</i> | int | Index of the system chassis of the fan which should be checked. |
| -i | --index | <i>INDEX</i> | int | Index of the fan which should be checked (within the system chassis). |

Warning:

- the presence of the fan is "other", "absent" or not valid.
- the condition of the fan is "other" or "degraded".

Critical:

- the fan is present and "failed".

Logging and Plotting:

Not supported.

7.21. check_cpq_fcaaccel

The plugin checks the status of one of a Compaq computer's external array accelerator.

Note: the same accelerator can be reported by all computers connected to the array.

Scan result:

OK index: *INDEX* ; slot: *SLOT*

| | | |
|--------------|-----|---|
| <i>INDEX</i> | int | the accelerator's storage box index which should be used with "-i". |
| <i>SLOT</i> | int | the accelerator's IO slot index which should be used with "-s". |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | Index of the storage box the accelerator resides in. |
| -s | --slot | <i>SLOT</i> | int | Index of the physical IO slot the accelerator resides in. |

Warning:

- the condition of the accelerator is "other" or "degraded".

Critical:

- the condition of the accelerator is "failed".

Logging and Plotting:

Not supported.

7.22. check_cpq_fcaeac

The plugin checks the of one of a Compaq computer's external array controllers.

Note: the same controller can be reported by all computers connected to the array.

Scan result:

OK index: *INDEX* ; slot: *SLOT* ; model: *MODEL*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The controller's storage box index which should be used with "-i". |
| <i>SLOT</i> | int | The controller's IO slot index which should be used with "-s". |
| <i>MODEL</i> | mwstring | The controller's model. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the storage box the controller resides in. |
| -s | --slot | <i>SLOT</i> | int | Index of the physical IO slot the controller resides in. |

Warning:

- the condition of the controller is “other” or “degraded”.
- the status of the controller is “other” or “redundantPathOffline”.

Critical:

- the condition of the controller is “failed”.
- the status of the controller is “failed” or “offline”.

Logging and Plotting:

Not supported.

7.23. check_cpq_fcacctrl

The plugin checks the status of one of a Compaq computer’s host controllers.

Scan result:

OK index: *INDEX* ; slot: *SLOT* ; model: *MODEL*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The HBA’s index which should be used with “-i”. |
| <i>SLOT</i> | int | The HBA’s slot index (informational). |
| <i>MODEL</i> | mwstring | The HBA’s model. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|-------------------|
| -i | --index | <i>INDEX</i> | int | Index of the HBA. |
|----|---------|--------------|-----|-------------------|

Warning:

- the condition of the controller is “other” or “degraded”.
- the status of the controller is “other” or “loop degraded”.

Critical:

- the condition of the controller is “failed”.
- the status of the controller is “failed”, “shutdown” or “loop failed”.

Logging and Plotting:

Not supported.

7.24. check_cpq_fcalogdrv

The plugin checks the status of one of a Compaq computer’s a logical drives on an external array controller.

Note: the same logical drive can be reported by all computers connected to the array.

Scan result:

OK index: *INDEX* ; drive: *DRIVE* ; faultTolerance: *FTOL*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The logical drive’s storage box index which should be used with “-i”. |
| <i>DRIVE</i> | int | The logical drive’s index which should be used with “-d”. |
| <i>FTOL</i> | mwstring | The logical drive’s fault tolerance. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the storage box the logical drive resides in. |
| -d | --drive | <i>DRIVE</i> | int | Index of the logical drive within the storage box. |

Warning:

- the condition of the logical drive is “other” or “degraded”.

Critical:

- the condition of the logical drive is “failed”.

Logging and Plotting:

Not supported.

7.25. check_cpq_fcaphydrv

The plugin checks the status of one of a Compaq computer’s physical drives on an external array controller.

Note: the same physical drive can be reported by all computers connected to the array.

Scan result:

OK index: *INDEX* ; drive: *DRIVE* ; place: *PLACE* ; bay: *BAY* ;
ser: *SER*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The physical drive’s storage box index which should be used with “-i”. |
| <i>DRIVE</i> | int | The physical drive’s index which should be used with “-d”. |
| <i>PLACE</i> | string | The placement of the drive. One of “other”, “int”, “ext” and “invalid”. |
| <i>BAY</i> | int | The number of the bay the drive is in. |
| <i>SER</i> | mwstring | The serial number of the drive. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | Index of the storage box the physical drive resides in. |
| -d | --drive | <i>DRIVE</i> | int | Index of the physical drive within the storage box. |

Warning:

- the status of the physical drive is “other” or invalid.
- the condition of the physical drive is “other”, “degraded” or invalid.
- the smart status of the physical drive is “other” or invalid.

Critical:

- the status of the physical drive is “threshExceeded”, “predictiveFailure” or “failed”.
- the condition of the physical drive is “failed”.
- the smart status of the physical drive is “replaceDrive”.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;read;writ;haRd;reRd;haWr;reRw
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'sectors read'=readc 'sectors written'=writc  
'hard read errors'=haRdc 'recovered read errors'=reRdc  
'hard write errors'=haWrc 'recovered write errors'=reRwc
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>read</i> | uint | Sectors read. |
| <i>writ</i> | uint | Sectors written. |
| <i>haRd</i> | uint | Hard read errors. |
| <i>reRd</i> | uint | Recovered read errors. |
| <i>haWr</i> | uint | Hard write errors. |
| <i>reWr</i> | uint | Recovered write errors. |

7.26. check_cpq_fcasp spare

The plugin checks the status of one of a Compaq computer's spare drives on an external array controller.

Note: the same spare drive can be reported by all computers connected to the array.

Scan result:

OK index: *INDEX* ; drive: *DRIVE* ; bay: *BAY*

| | | |
|--------------|-----|---|
| <i>INDEX</i> | int | The spare drive's storage box index which should be used with "-i". |
| <i>DRIVE</i> | int | The spare drive's index which should be used with "-d". |
| <i>BAY</i> | int | The number of the bay the drive is in. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the storage box the spare drive resides in. |
| -d | --drive | <i>DRIVE</i> | int | Index of the spare drive within the storage box. |

Warning:

- the status of the spare drive is "other", "degraded" or invalid.

Critical:

- the status of the spare drive is "failed".

Logging and Plotting:

Not supported.

7.27. check_cpq_ida

The plugin checks the status of one of a Compaq computer's IDA controller, any associated logical drives, physical drives and array accelerators.

Scan result:

OK index: *INDEX* ; model: *MODEL*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The controller's index which should be used with "-i". |
| <i>MODEL</i> | mwstring | The controller's model name. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|--------------------------|
| -i | --index | <i>INDEX</i> | int | Index of the controller. |
|----|---------|--------------|-----|--------------------------|

Warning:

- the status of the controller is "other" or "degraded".

Critical:

- the status of the controller is "failed".

Logging and Plotting:

Not supported.

7.28. check_cpq_phydrv

The plugin checks the status of one of a Compaq computer's physical drives on an IDA controller.

Scan result:

OK index: *INDEX* ; drive: *DRIVE* ; place: *PLACE* ; bay: *BAY* ;
ser: *SER*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The physical drive's controller index which should be used with "-i". |
| <i>DRIVE</i> | int | The physical drive's index which should be used with "-d". |
| <i>PLACE</i> | string | The placement of the drive. One of "other", "int", "ext" and "invalid". |
| <i>BAY</i> | int | The number of the bay the drive is in. |
| <i>SER</i> | mwstring | The serial number of the drive. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | Index of the controller the physical drive is connected to. |
| -d | --drive | <i>DRIVE</i> | int | Index of the physical drive. |

Warning:

- the status of the physical drive is "other" or invalid.
- the condition of the physical drive is "other", "degraded" or invalid.
- the smart status of the physical drive is "other" or invalid.

Critical:

- the status of the physical drive is "critical" or "predictiveFailure".
- the condition of the physical drive is "failed".
- the smart status of the physical drive is "replaceDrive".

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;read;writ;haRd;reRd;haWr;reRw
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'sectors read'=readc 'sectors written'=writc  
'hard read errors'=haRdc 'recovered read errors'=reRdc  
'hard write errors'=haWrc 'recovered write errors'=reRwc
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>read</i> | uint | Sectors read. |
| <i>writ</i> | uint | Sectors written. |
| <i>haRd</i> | uint | Hard read errors. |
| <i>reRd</i> | uint | Recovered read errors. |
| <i>haWr</i> | uint | Hard write errors. |
| <i>reWr</i> | uint | Recovered write errors. |

7.29. check_cpq_temp

The plugin returns how the current temperature of one of a Compaq computer’s temperature sensor compares to the given warning and critical thresholds.

Scan result:

```
OK chassis: CHASSIS ; index: INDEX ; tempT: TEMPT ; local: LOCAL
```

| | | |
|----------------|----------|---|
| <i>CHASSIS</i> | int | The temperature sensor’s system chassis index which should be used with “-s”. |
| <i>INDEX</i> | int | The temperature sensor’s index which should be used with “-i”. |
| <i>TEMPT</i> | int | The threshold temperature of the sensor. |
| <i>LOCAL</i> | mwstring | The location of the temperature sensor. |

Specific Parameters:

| | | | | |
|----|------------------|----------------|-----|--|
| -s | --system-chassis | <i>CHASSIS</i> | int | Index of the system chassis of the temperature sensor which should be checked. |
| -i | --index | <i>INDEX</i> | int | Index of the temperature sensor which should be checked. |
| -w | --warning | <i>WARN</i> | int | Temperature of the sensor at which a warning is returned. |
| -c | --critical | <i>CRIT</i> | int | Temperature of the sensor at which a critical is returned. |

Warning:

- the temperature is greater than the warning threshold.

Critical:

- the temperature is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addInf; tempC; tempT
```

“Nagios Plugins” Style:

```
'current temperature'=tempC; warn; crit 'threshold temperature'=tempT
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>tempC</i> | int | Current temperature. |
| <i>tempT</i> | int | Threshold temperature. |

7.30. check_cpq_thermal

The plugin returns the overall thermal status of a Compaq computer.

Scan result:

OK

Warning:

- the thermal status of the computer is “other” or “degraded”.

Critical:

- the thermal status of the computer is “failed”.

Logging and Plotting:

Not supported.

7.31. check_if_by_snmp

The plugin checks the status of a network interface.

Scan result:

OK index: *INDEX* ; type: *TYPE* ; aStat: *ASTAT* ; descr: *DESCR*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The index of the interface. |
| <i>TYPE</i> | int | The type of the interface ⁵ . |
| <i>ASTAT</i> | int | The administrative status of the interface ⁶ . |
| <i>DESCR</i> | mwstring | The description of the interface. |

⁵c.f. IANAifType-MIB.txt::IANAifType available e. g. as part of Net-SNMP.

⁶c.f. IF-MIB.txt::ifAdminStatus available e. g. as part of Net-SNMP.

Specific Parameters:

| | | | | |
|-----------------|----------------------|--------------|-----|---------------------|
| <code>-i</code> | <code>--index</code> | <i>INDEX</i> | int | Index of interface. |
|-----------------|----------------------|--------------|-----|---------------------|

Warning:

- the interface is administratively down.

Critical:

- the interface is administratively enabled and operationally down.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;speed;oStat;iOct;iPkt;iErr;oOct;oPkt;oErr
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'estimated speed'=speed  
'input octets'=iOctc 'input packets'=iPktc 'input errors'=iErrc  
'output octets'=oOctc 'output packets'=oPktc 'output errors'=oErrc
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>speed</i> | uint | Estimated maximum speed of the interface. |
| <i>oStat</i> | int | Operational status ⁷ . |
| <i>iOct</i> | uint | Input octet counter. |
| <i>iPkt</i> | uint | Input packet counter. |
| <i>iErr</i> | uint | Input error counter. |
| <i>oOct</i> | uint | Output octet counter. |
| <i>oPkt</i> | uint | Output packet counter. |
| <i>oErr</i> | uint | Output error counter. |

⁷c. f. RFC1573, pp. 28–29

7.32. check_mail_server

Ignore this one.

7.33. check_netapp_battery

The plugin checks the status of the NVRAM battery or batteries of a NetApp Filer.

Scan result:

OK

Warning:

- the battery status is “partiallyDischarged”, “nearEndOfLife” or “overCharged”.

Critical:

- the battery status is “fullyDischarged”, “notPresent” or “atEndOfLife”.

Logging and Plotting:

Not supported.

7.34. check_netapp_du

The plugin checks the disk usage of one of a NetApp Filer’s volumes.

Scan result:

OK index: *INDEX* ; name: *NAME*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The volume’s index which should be used with “-i”. |
| <i>NAME</i> | mwstring | The volume’s name. |

Specific Parameters:

| | | | | |
|----|------------|---------------|---------------|---|
| -i | --index | <i>INDEX</i> | int | The index of the volume which should be checked. |
| -w | --warning | ⁸ | ⁹ | The volume usage (size and number of files) at which a warning is returned. <i>Optional. Default: 75%,75%.</i> |
| -c | --critical | ¹⁰ | ¹¹ | The volume usage (size and number of files) at which a critical is returned. <i>Optional. Default: 85%,85%.</i> |

Units:

| | |
|-------------|--------------------------|
| % | Per cent of volume size. |
| k | Kibibyte ¹² . |
| M | Mebibyte. |
| G | Gibibyte. |
| <i>none</i> | Byte. |

Warning:

- The volume's usage (size a/o files) is greater than the warning threshold.

Critical:

- The volume's usage (size a/o files) is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

⁸*WARNS[%kMG],WARNF[%]*

⁹float[unit],float[unit]

¹⁰*CRITS[%kMG],CRITF[%]*

¹¹float[unit],float[unit]

¹²c. f. http://en.wikipedia.org/wiki/Binary_prefix

Performance data:

Default Style:

```
addinf;usedS;sizeS;usedF;sizeF
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'used space'=usedSMB;warnS;critS;0;sizeS
```

```
'used files'=usedF;warnF;critF;0;sizeF
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>usedS</i> | float | Used storage in mebibytes. |
| <i>sizeS</i> | float | Size of the storage in mebibytes. |
| <i>usedF</i> | float | Used number of files. |
| <i>sizeF</i> | float | Available number of files. |

7.35. check_netapp_fans

The plugin checks the number of failed fans of a NetApp Filer.

Scan result:

OK

Warning:

- One fan has failed.

Critical:

- Two or more fans have failed.

Logging and Plotting:

Not supported.

7.36. check_netapp_ops

The plugin reports operations' counters of a NetApp Filer. It never returns a warning or critical.

Scan result:

OK

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

nfs;cifs;http

“Nagios Plugins” Style:

'nfs operations'=nfs 'cifs operations'=cifs 'http operations'=http

Values:

| | | |
|-------------|------|--------------------------|
| <i>nfs</i> | uint | NFS operations counter. |
| <i>cifs</i> | uint | CIFS operations counter. |
| <i>http</i> | uint | HTTP operations counter. |

7.37. check_netapp_overall

The plugin checks the overall status of a NetApp Filer.

Scan result:

OK

Warning:

- the overall status is “other”, “unknown” or “nonCritical”.

Critical:

- the overall status is “critical” or “nonRecoverable”.

Logging and Plotting:

Not supported.

7.38. check_netapp_psus

The plugin checks the number of failed power supply units of a NetApp Filer.

Scan result:

OK

Critical:

- one or more power supply units have failed.

Logging and Plotting:

Not supported.

7.39. check_netapp_raiddrv

The plugin checks the status of one of the raid drives of a NetApp Filer.

Scan result:

OK volume: *VOLUME* ; group: *GROUP* ; drive: *DRIVE* ; shelf: *SHELF* ; bay: *BAY*

| | | |
|---------------|-----|--|
| <i>VOLUME</i> | int | The volume index which should be used with “-i”. |
| <i>GROUP</i> | int | The group index which should be used with “-g”. |
| <i>DRIVE</i> | int | The drive index which should be used with “-d”. |
| <i>SHELF</i> | int | The shelf number of the drive. |
| <i>BAY</i> | int | The bay number of the drive. |

Specific Parameters:

| | | | | |
|----|---------|---------------|-----|---|
| -i | --index | <i>VOLUME</i> | int | The volume index of the raid drive which should be checked. |
| -g | --group | <i>GROUP</i> | int | The group index of the raid drive which should be checked. |
| -d | --drive | <i>DRIVE</i> | int | The index of the raid drive which should be checked. |

Warning:

- the status of the raid drive is “reconstructionInProgress”, “parityReconstructionInProgress”, “parityVerificationInProgress” or invalid.

Critical:

- the status of the raid drive is “failed”.

Logging and Plotting:

Not supported.

7.40. check_netapp_spare

The plugin checks the status of one of a NetApp Filer’s spare drives.

Scan result:

OK drive: *DRIVE* ; shelf: *SHELF* ; bay: *BAY*

| | | |
|--------------|-----|---|
| <i>DRIVE</i> | int | The drive index which should be used with “-d”. |
| <i>SHELF</i> | int | The shelf number of the drive. |
| <i>BAY</i> | int | The bay number of the drive. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -d | --drive | <i>DRIVE</i> | int | Index of the spare drive which should be checked. |
|----|---------|--------------|-----|---|

Warning:

- The status of the spare drive is “addingspare”, “bypassed”, “unknown” or invalid.

Logging and Plotting:

Not supported.

7.41. check_netapp_temp

The plugin checks the temperature of a Filer.

Scan result:

OK

Critical:

- the temperature is greater than the maximum rated temperature.

Logging and Plotting:

Not supported.

7.42. check_netapp_vol

The plugin checks the name and status of one of a NetApp Filer's volumes.

Scan result:

OK index: *INDEX* ; name: *NAME*

| | | |
|--------------|--------|---|
| <i>INDEX</i> | int | The index of the volume which should be used with “-i”. |
| <i>NAME</i> | string | The name of the volume which should be used with “-n”. |

Specific Parameters:

| | | | | |
|----|---------|--------------|--------|--|
| -i | --index | <i>INDEX</i> | int | Index of the volume which should be checked. |
| -n | --name | <i>NAME</i> | string | Name of the volume which should be checked. |

Warning:

- The volume's name does not match the expected name. This may happen if volumes are added or deleted.
- the volume's quotas are off or initializing.

Logging and Plotting:

Not supported.

7.43. check_storage_by_snmp

The plugin checks the usage of some storage. “Storage” can be anything from file systems to real, swap and virtual memory.

Note: Implementation and interpretation of “hrStorageTypes” is vendor- and sometimes even software-specific.

Note: Linux notoriously reports mounted removable media like floppy discs and cd-roms as “hrStorageFixedDisk”.

Scan result:

OK index: *INDEX* ; type:*TYPE* ; descr: *DESCR*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The index of the storage which should be used with “-i”. |
| <i>TYPE</i> | oid | The object id of the storage type. ¹³ |
| <i>DESCR</i> | mwstring | The description of the storage entity. |

Specific Parameters:

| | | | | |
|----|------------|-------------------|-----|---|
| -i | --index | <i>INDEX</i> | int | The index of the storage which should be checked. |
| -w | --warning | <i>WARN[%kMG]</i> | int | The storage usage at which a warning is returned. <i>Optional. Default: 75%.</i> |
| -c | --critical | <i>CRIT[%kMG]</i> | int | The storage usage at which a critical is returned. <i>Optional. Default: 85%.</i> |

Units:

| | |
|-------------|------------------------|
| % | Per cent of pool size. |
| k | Kibibyte. |
| M | Mebibyte. |
| G | Gibibyte. |
| <i>none</i> | Byte. |

Warning:

- The storage’s usage is greater than the warning threshold.

Critical:

- The storage’s usage is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

¹³HOST-RESOURCES-TYPES.txt:hrStorageTypes available e. g. as part of Net-SNMP or in RFC 2790 (c. f. <ftp://ftp.rfc-editor.org/in-notes/rfc2790.txt>).

Performance data:

Default Style:

```
addinf;used;size
```

“Nagios Plugins” Style:

```
'used storage'=usedMB;warn;crit;0;size
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>used</i> | float | Used storage in mebibytes. |
| <i>size</i> | float | Size of the storage in mebibytes. |

7.44. check_ucd_lms_fan

Checks the value of a fan speed sensor which is monitored using lm_sensors.

Scan result:

OK index: *INDEX* ; name: *NAME*

| | | |
|--------------|----------|---|
| <i>INDEX</i> | int | The fan’s index which should be used with “-i”. |
| <i>NAME</i> | mwstring | The name of the fan. |

Specific Parameters:

| | | | | |
|----|------------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the fan which should be checked. |
| -w | --warning | <i>WARN</i> | int | Fan speed in RPM <i>below</i> which a warning is generated. |
| -c | --critical | <i>CRIT1</i> | int | Fan speed in RPM <i>below</i> which a critical is generated. |

Warning:

- The speed of the fan is below the given warning threshold.

Critical:

- The speed of the fan is below the given critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;speed
```

“Nagios Plugins” Style:

```
'current speed'=speed;warn;crit
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>speed</i> | int | Current speed in rounds per minute. |

7.45. check_ucd_lms_temp

The plugin checks a temperature which is monitored using lm_sensors.

Scan result:

OK index: *INDEX* ; info: *NAME*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The temperature sensor’s index which should be used with “-i”. |
| <i>NAME</i> | mwstring | The name of the temperature sensor. |

Specific Parameters:

| | | | | |
|----|------------|--------------|------|---|
| -i | --index | <i>INDEX</i> | int | Index of the temperature sensor which should be checked. |
| -w | --warning | <i>WARN</i> | uint | Temperature in milli deg C above which a warning is generated. |
| -c | --critical | <i>CRIT</i> | uint | Temperature in milli deg C above which a critical is generated. |

Warning:

- The temperature is above the given warning threshold.

Critical:

- The temperature is above the given critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;tempC
```

“Nagios Plugins” Style:

```
'current temperature'=tempC;warn;crit
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>tempC</i> | uint | Current temperature in degree Celsius. |

7.46. check_ucd_lms_voltage

The plugin checks the voltage measured with a sensor which is monitored using lm_sensors.

Scan result:

OK index: *INDEX* ; name: *NAME*

| | | |
|--------------|----------|--|
| <i>INDEX</i> | int | The voltage sensor’s index which should be used with “-i”. |
| <i>NAME</i> | mwstring | The name of the voltage sensor. |

Specific Parameters:

| | | | | |
|----|------------|--------------------|---------|--|
| -i | --index | <i>INDEX</i> | int | Index of the voltage sensor which should be checked. |
| -w | --warning | <i>WARNL,WARNH</i> | int,int | Voltage in milli Volt below which (<i>WARNL</i>) and above which (<i>WARNH</i>) a warning is generated. |
| -c | --critical | <i>CRITL,CRITH</i> | int,int | Voltage in milli Volt below which (<i>CRITL</i>) and above which (<i>CRITH</i>) a critical is generated. |

Warning:

- The voltage is below the lower warning threshold or above the higher warning threshold.

Critical:

- The voltage is below the lower critical threshold or above the higher critical threshold.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;voltC
```

“Nagios Plugins” Style:

```
'current voltage'=voltC;warnL:warnH;critL:critH
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>voltC</i> | uint | Current voltage in milli Volt. |

7.47. check_ucd_snmp_cpu

The plugin reports cpu counters using the UCD-SNMP-MIB. It never returns a warning or critical.

Scan result:

OK

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

```
user;nice;system;idle
```

“Nagios Plugins” Style:

```
'user'=userc 'nice'=nicec 'system'=systemc 'idle'=idlec
```

Values:

| | | |
|---------------|------|--|
| <i>user</i> | uint | Time the cpu spent with normal processes in jiffies. |
| <i>nice</i> | uint | Time the cpu spent with nice processes in jiffies. |
| <i>system</i> | uint | Time the cpu spent in kernel mode in jiffies. |
| <i>idle</i> | uint | Twiddling thumbs ¹⁴ . |

7.48. check_ucd_snmp_load

The plugin checks the load averages of a computer using the UCD-SNMP-MIB.

Scan result:

OK

¹⁴/usr/src/linux/Documentation/filesystems/proc.txt.

Specific Parameters:

| | | | | |
|----|------------|---------------|---------------|---|
| -w | --warning | ¹⁵ | ¹⁶ | one, five and 15 minute warning load average thresholds. |
| -c | --critical | ¹⁷ | ¹⁸ | one, five and 15 minute critical load average thresholds. |

Warning:

- at least one warning threshold is exceeded.

Critical:

- at least one critical threshold is exceeded.

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

```
load1;load5;load15
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'1 minute load'=load1;warn1;crit1  
'5 minute load'=load5;warn5;crit5  
'15 minute load'=load15;warn15;crit15
```

Values:

| | | |
|---------------|-------|----------------------------------|
| <i>load1</i> | float | one minute system load average. |
| <i>load5</i> | float | five minute system load average. |
| <i>load15</i> | float | 15 minute system load average. |

¹⁵*WARN1,WARN5,WARN15*

¹⁶float,float,float

¹⁷*CRIT1,CRIT5,CRIT15*

¹⁸float,float,float

7.49. check_ucd_snmp_mem

The plugin checks the memory usages of a computer using the UCD-SNMP-MIB.

Scan result:

OK

Specific Parameters:

| | | | | |
|----|------------|-------------|------|---|
| -w | --warning | <i>WARN</i> | uint | virtual (that is real plus swap) memory usage warning threshold. |
| -c | --critical | <i>CRIT</i> | uint | virtual (that is real plus swap) memory usage critical threshold. |

Warning:

- virtual memory usage is greater than the warning threshold.

Critical:

- virtual memory usage is greater than the critical threshold.

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

```
sTotal;sAvail;rTotal;rAvail;tTotal;tAvail;shared;buffer;cached
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'swap space'=sAvailKB;;;0;sTotal 'real memory'=rAvailKB;;;0;rTotal  
'available memory'=tAvailKB;warn;crit;0;tTotal  
'shared memory'=sharedKB 'buffered memory'=bufferKB  
'cache memory'=cachedKB
```

Values:

| | | |
|---------------|-----|---------------------------------|
| <i>sTotal</i> | int | total swap space. |
| <i>sAvail</i> | int | available swap space. |
| <i>rTotal</i> | int | total real/physical memory. |
| <i>rAvail</i> | int | available real/physical memory. |
| <i>tTotal</i> | int | total memory. |
| <i>tAvail</i> | int | total available memory. |
| <i>shared</i> | int | shared memory. |
| <i>buffer</i> | int | buffered memory. |
| <i>cached</i> | int | cache memory. |

7.50. check_ups_alarms

The plugin checks if an uninterruptable power supply has any current alarms.

Scan result:

OK

Critical:

- the ups has at least one current alarm.

Logging and Plotting:

Not supported.

7.51. check_ups_battery

The plugin checks the “battery” of an an uninterruptable power supply.

Scan result:

OK

Warning:

- the status of the battery is “batteryLow”.

Critical:

- the status of the battery is “batteryDepleted”.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
tbat;trem;crem;volt;curr;temp
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'time on battery'=tbat  
'estimated time remaining'=trem 'estimated charge remaining'=crem%  
'battery voltage'=volt 'battery current'=curr  
'battery temperature'=temp
```

Values:

| | | |
|-------------|-------|---|
| <i>tbat</i> | int | Time the ups has been running on battery in seconds. 0 if not applicable. |
| <i>trem</i> | int | Estimated time remaining in seconds ¹⁹ . |
| <i>crem</i> | int | Estimated capacity remaining in per cent. |
| <i>volt</i> | float | Battery voltage in Volt. |
| <i>curr</i> | float | Battery current in Ampere. |
| <i>temp</i> | int | Battery temperature in degree Celsius. |

7.52. check_ups_bypass

The plugin checks one bypass line of an uninterruptable power supply. It never returns a warning or critical.

¹⁹SNMP agents return *trem* in minutes. Thus this value will change in multiples of 60.

Scan result:

OK index: *INDEX* ; voltage: *VOLTAGE*

| | | |
|----------------|-----|--|
| <i>INDEX</i> | int | The bypass lines's index which should be used with “-i”. |
| <i>VOLTAGE</i> | int | The voltage at the bypass line in Volt. |

Specific Parameters:

| | | | | |
|----|---------|--------------|-----|---|
| -i | --index | <i>INDEX</i> | int | Index of the bypass line which should be checked. |
|----|---------|--------------|-----|---|

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

addinf;Ubyp;Ibyp;Pbyp

“Nagios Plugins” Style:

'bypass voltage'=*Ubyp* 'bypass current'=*Ibyp* 'bypass power'=*Pbyp*

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>Ubyp</i> | int | Present bypass voltage in Volt. |
| <i>Ibyp</i> | float | Present bypass current in Ampere. |
| <i>Pbyp</i> | int | Present bypass power in Watt. |

Note that some UPSes do not report all of the values.

7.53. check_ups_input

The plugin checks one input line of an uninterruptable power supply.

Scan result:

OK index: *INDEX* ; voltage: *VOLTAGE*

| | | |
|----------------|-----|---|
| <i>INDEX</i> | int | The input lines's index which should be used with "-i". |
| <i>VOLTAGE</i> | int | The voltage at the input line in Volt. |

Specific Parameters:

| | | | | |
|----|------------|--------------------|---------|---|
| -i | --index | <i>INDEX</i> | int | Index of the input line which should be checked. |
| -w | --warning | <i>WARNL,WARNH</i> | int,int | Lower and upper threshold for warnings. If the input voltage is less than the lower or greater than the upper threshold, then a warning is generated. <i>Optional. Default: Do not check.</i> |
| -c | --critical | <i>CRITL,CRITH</i> | int,int | Lower and upper threshold for criticals. If the input voltage is less than the lower or greater than the upper threshold, then a critical is generated. <i>Optional. Default: Do not check.</i> |

Warning:

- The input voltage is less than the lower or greater than the upper warning threshold value.

Critical:

- The input voltage is less then the lower or greater than the upper critical threshold value.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;Uin;Iin;Pin
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'input voltage'=Uin;warnL:warnH;critL:critH  
'input current'=Iin 'true input power'=Pin
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>Uin</i> | int | Present input voltage in Volt. |
| <i>Iin</i> | float | Present input current in Ampere. |
| <i>Pin</i> | int | Present true input power in Watt. |

Note that some UPSes do not report all of the values.

7.54. check_ups_output

The plugin checks one output line of an uninterruptable power supply.

Scan result:

OK index: *INDEX* ; voltage: *VOLTAGE* ; load: *LOAD*

| | | |
|----------------|-----|--|
| <i>INDEX</i> | int | The output line’s index which should be used with “-i”. |
| <i>VOLTAGE</i> | int | The voltage at the output line in Volt. |
| <i>LOAD</i> | int | The load (the percentage of power capacity of the UPS) used by the line. |

Specific Parameters:

| | | | | |
|----|------------|--------------|-----|--|
| -i | --index | <i>INDEX</i> | int | Index of the output line which should be checked. |
| -w | --warning | <i>WARN</i> | int | The load at which a warning is generated. <i>Optional.</i> <i>Default:</i> Do not check. |
| -c | --critical | <i>CRIT</i> | int | The load at which a critical is generated. <i>Optional.</i> <i>Default:</i> Do not check. |

Warning:

- The load is greater than the warning threshold value.

Critical:

- The load is greater than the critical threshold value.

Logging and Plotting:

Supported. RRD step = 5 minutes, RRD heartbeat = 11 minutes

Performance data:

Default Style:

```
addinf;Uout;Iout;Pout;load
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'output voltage'=Uout 'output current'=Iout  
'output power'=Pout 'load'=load%;warn;crit
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>Uout</i> | int | Present output voltage in Volt. |
| <i>Iout</i> | float | Present output current in Ampere. |
| <i>Pout</i> | int | Present output power in Watt. |
| <i>load</i> | int | Present power capacity used on this line in percent |

Note that some UPSes do not report all of the values.

7.55. check_ups_outputs

The plugin checks the source which is used for the outputs of an uninterruptable power supply.

Scan result:

OK

Warning:

- The power source is “bypass”, “battery”, “booster” or “reducer”.

Critical:

- The power source is “none”.

Logging and Plotting:

Not supported.

7.56. check_winf_cpuusage

The plugin checks the usage of one or all cpus of a Microsoft Windows computer using SNMP Informant. It never returns a warning or critical.

The agent does not use indices to address a certain cpu but string indexed OIDs. Therefore the plugin has an unusual interface.

Scan result:

OK name: *NAME*

| | | |
|-------------|--------|--|
| <i>NAME</i> | string | The cpu's name which should be used with “-n”. |
|-------------|--------|--|

Specific Parameters:

| | | | | |
|----|--------|-------------|--------|--|
| -n | --name | <i>NAME</i> | string | Name of the cpu which should be checked. |
|----|--------|-------------|--------|--|

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

```
addinf; pDPCT; pIntT; pPrivT; pProct; pUserT; dpcQpS; intpS
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'DPCs receiving and servicing'=pDPCT%  
'interrupts receiving and servicing'=pIntT%  
'privileged mode non-idle time'=pPrivT% 'not idle'=pProct%  
'user mode non-idle time'=pUserT%  
'DPCs queued per second'=dpcQpS 'Interrupts per second'=intpS
```

Values:

| | | |
|---------------|--------|--|
| <i>addinf</i> | string | Additional information (as given by the “-I” parameter). |
| <i>pDPCT</i> | uint | Percentage of time receiving and servicing DPCs. |
| <i>pIntT</i> | uint | Percentage of time receiving and servicing interrupts. |
| <i>pPrivT</i> | uint | Percentage of non-idle time spent in privileged mode. |
| <i>pProct</i> | uint | Percentage of time not idle. |
| <i>pUserT</i> | uint | Percentage of non-idle time spent in user mode. |
| <i>dpcQpS</i> | uint | DPCs queued per second during the sample interval. |
| <i>intpS</i> | uint | Interrupts per second. |

7.57. check_winf_mem

The plugin checks the memory usage of a Microsoft Windows computer using SNMP Informant.

Scan result:

OK

Specific Parameters:

| | | | | |
|----|------------|-------------|------|---|
| -w | --warning | <i>WARN</i> | uint | The pages in/out rate at which a warning is generated. <i>Optional. Default: 5.</i> |
| -c | --critical | <i>CRIT</i> | uint | The pages in/out rate at which a critical is generated. <i>Optional. Default: 10.</i> |

Warning:

- The pages in/out rate is greater than the warning threshold value.

Critical:

- The pages in/out rate is greater than the critical threshold value.

Logging and Plotting:

Supported. RRD step = 1 minutes, RRD heartbeat = 3 minutes

Performance data:

Default Style:

```
rAvail;commit;cached;cachPk;pFpS; pIps;pOps;pps;pNB;pPB;pPRB;
sCaRB;sCoRB;sCoTB;SDRB;SDTB
```

“Nagios Plugins” Style (some blanks replaced with linefeeds):

```
'physical memory available'=rAvailKB
'committed virtual memory'=commitB 'cached'=cachedB
'maximum cached since boot time'=cachPkB
'page faults per second.'=pFpS 'pages input per second.'=pIps
'pages output per second.'=pOps
'pages in/out per second.'=pps;warn;crit
'pool nonpaged'=pNBB 'pool paged'=pPBB
'pool paged resident'=pPRBB 'system cache resident'=sCaRBB
'system code resident'=sCoRBB 'system code total'=sCoTBB
'system driver resident'=sDRBB 'system driver total'=sDTBB
```

Values:

| | | |
|---------------|------|--|
| <i>rAvail</i> | uint | Physical memory available to processes, in kBytes. |
| <i>commit</i> | uint | Committed virtual memory, in bytes. |
| <i>cached</i> | uint | Cached bytes. |
| <i>cachPk</i> | uint | Maximum of cached bytes since boot time. |
| <i>pFpS</i> | uint | Page faults per second. |
| <i>pIps</i> | uint | Pages input per second. |
| <i>pOps</i> | uint | Pages output per second. |
| <i>pps</i> | uint | Pages in/out per second. |
| <i>pNB</i> | uint | Pool nonpaged bytes. |
| <i>ppB</i> | uint | Pool paged bytes. |
| <i>pPRB</i> | uint | Pool paged resident bytes. |
| <i>sCaRB</i> | uint | System cache resident bytes. |
| <i>sCoRB</i> | uint | System code resident bytes. |
| <i>sCoTB</i> | uint | System code total bytes. |
| <i>sDRB</i> | uint | System driver resident bytes. |
| <i>sDTB</i> | uint | System driver total bytes. |

8. Developing New Plugins

Developing new plugins is not too difficult. In any case you should only need to copy and change one of the `check_*.c` files, preferably `check_if_by_snmp.c` because this has additional comments regarding what needs to be modified.

You should never need to change any “helper” file.

Before you start coding, you should have collected the symbolic and numerical OIDs and the type, description and (if applicable) possible values for the objects which are provided by the appropriate MIB file.

8.1. The Helper Files

All helper headers contain at least some documentation about the symbols which are declared.

decoders.[ch] Provides a function mapping locations as returned by Compaq agents to the appropriate strings. You don't need to bother with this.

globals.[ch] Declares global variables and functions which have to be provided by the program.

nagiosif.[ch] Provides a few utility functions for the interface to nagios.

rrdif.[ch] Provides the interface to librrd. There are quite a few constants and functions declared there—you should really read the header file.

snmpif.[ch] Provides the interface to Net-SNMP.

strutils.[ch] Provides a few functions which have to do with strings.

syslogif.[ch] Provides utility functions to handle logging and error handling (which is: log the error and exit).

utilities.[ch] Provides functions which either read command line parameters or write some kind of message to stdout.

A. The Plotter Output Syntax

When used in plotter mode, the plugins write information about each plot which is generated to standard output. This output is designed to be parsed by some kind of wrapper which presents the plots in a more user friendly way.

A.1. Formal Syntax Definition

The formal syntax definition is written in ABNF¹.

```
output      = 1*(imagedata)

imagedata  = title start end-p image width height 1*(plotdata) end

plotdata   = dimension unit avg min max last

title      = "TITLE" ws string lf

start      = "START" ws integer lf

end-p      = "END" ws integer lf

image      = "IMAGE" ws string lf

width      = "WIDTH" ws integer lf

height     = "HEIGHT" ws integer lf

dimension  = "DIMENSION" ws string lf

unit       = "UNIT" ws string lf

avg        = "AVG" ws float lf
```

¹c.f. [ftp://ftp.rfc-editor.org/in-notes/rfc4234.txt](http://ftp.rfc-editor.org/in-notes/rfc4234.txt)

```

min      = "MIN" ws float lf
max      = "MAX" ws float lf
last     = "LAST" ws float lf
end      = "END" lf

string   = chars-nb *chars-b
          ; a string is a concatenation of one non blank character
          ; and any number of characters including blanks.

chars-nb = (%x21-FF)
          ; a non blank character is any character with an ASCII
          ; value greater 32 decimal.

chars-b  = (%x20-FF)
          ; a character including blank is any character with an
          ; ASCII value greater or equal 32 decimal.

integer  = ["-"] 1*(%x30-39)
          ; an integer is a optional minus followed by at least one
          ; decimal digit.

float    = ["-"] 1*(%x30-39) "." 1*(%x30-39)
          ; a float is a optional minus followed by at least one
          ; decimal digit followed by a dot followed by at least one
          ; decimal digit.

ws       = 1*(%d32)
          ; whitespace is one or more blank character (ASCII 32).

lf       = %d10
          ; line feed is one linefeed character (ASCII 10).

```

Notes about the syntax definition:

- ABNF strings are case-insensitive by definition, the plugins however use only capital letters for keywords. Therefore a parser does not have to implement case insensitive keyword matching.
- This definition does not rely on implicit white space, i. e. white space is only used inside string literals and where explicitly needed.

- The definition allows characters between $7E_{hex}$ and FF_{hex} to be used within strings. The plugins never use any character from this range, they may however have been parsed from the command line using the “-I” parameter.

A.2. Convenient Description

While ABNF may be the perfect tool to define the syntax of the plotter output, describing it is a lot simpler.

The output consists of several blocks each describing one image. Each block consists of lines where each line in turn consists of a keyword and a value separated by one or more blanks. There is one exception to the keyword-value pair rule, which is the “END” line without value, which ends one image block.²

Within each image block there are several “plot” blocks, each containing information about one plot i. e. one curve.

The semantics of the lines—in order of appearance—are:

TITLE descriptive title for the image. This is usually built from the name of the host, the indices a/o the additional information.

START the time at the start of the plotted range as timestamp³.

END the time at the end of the plotted range.

IMAGE the basename of the image, i. e. the name of the image without leading directories.

WIDTH the width of the image.

HEIGHT the height of the image.

DIMENSION the dimension of a plot. This is the first line of a plot block.

UNIT the unit of the following values.

AVG the average value during the time plotted.

MIN the minimum value during the time plotted.

MAX the maximum value during the time plotted.

LST the last value in the archive. This is the last line of a plot block.

END the last line of an image block.

²Two different cases where “END” is used may be considered a design error.

³Seconds since 1970-01-01 00:00:00 UTC

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