SNMP

straton user guide – Rev. 7

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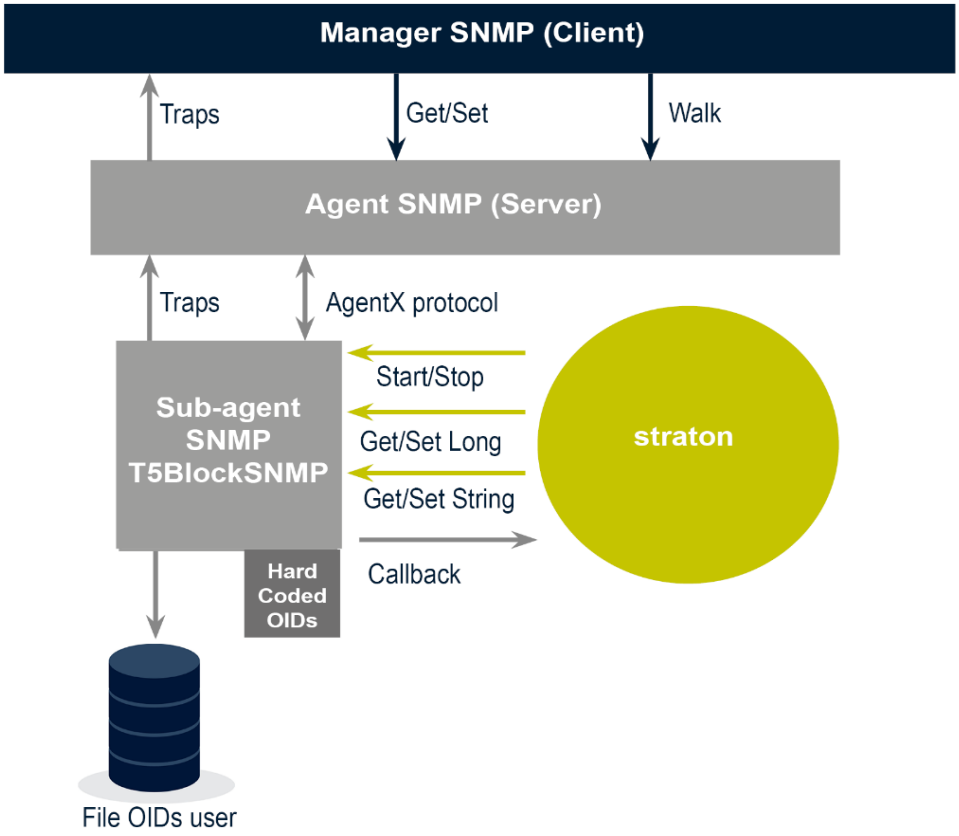
CP_R31_006_H

straton

Content

1. Main scheme



2. Getting started with Net-SNMP service

2.1. Windows platform

1. Install the net-snmp service “net-snmp-5.7.0-1.x86.exe” (see http://www.net-snmp.org)
2. Copy snmpd.conf and T5BlockSNMP.conf files in the net-snmp installation folder (ie: c:\usr\etc\snmp)
3. The file snmpd.conf must be modified to match with your agent address (see FAQ for snmpd.conf file)
4. Register SNMP service (command line with administrative rights: `snmp -register IP_ADDRESS_OF_AGENT`) (see the FAQs in case of problem)
5. Start the snmp service (command line with administrative rights: `net start "Net-SNMP Agent"` or in task manger tab services)
6. Optionally, add your oid files with T5 runtime installed in your PC agent
7. Start the t5 runtime
8. Now the T5 runtime provides all registered OID objects to your manager.

2.2. Linux platform

1. Install the Net-SNMP package on your Linux PC
2. (see http://www.net-snmp.org/docs/INSTALL.html)
3. Copy snmpd.conf and T5BlockSNMP.conf files in net-snmp installation folder (ie: /usr/share/snmp) (see the FAQs for snmpd.conf file)
4. Start the Net-SNMP service (command line: `service snmpd start`)
5. Optionally, add your *.oid files with T5 runtime installed in your PC agent
6. Start the t5 runtime

3. Running sub-agent SNMP

straton is in charge to start/stop the sub-agent SNMP.

Once the target is started the sub-agent communicates with main agent via the AgentX protocol. Sub-agent is a "plug-in" for the main agent.

The sub-agent adds OID objects in the main agent. All these added objects can be accessed by SNMP manager (the client) via the main agent (the server on the device) using the services snmpget, snmpset, snmpwalk…

By default, the sub-agent provides a list of OID objects (see the tab below).

User can add OID objects via oid files (the straton runtime loads all oid files in a specific folder to create a new set of OID in Main agent). The files are loaded when the sub-agent is started (see file format below).

When started, the sub-agent provides hard-coded OID and update their values by polling (every 5 seconds, but can be set) using the Callback (this has been set at init).

When started, the sub-agent can send trap to the main agent that will send traps to its manager.

3.1. Hard coded OIDs

There are two ways of adding OID in the master agent:

- First one is the hard coded OID, that are always added in the agent directly by the target (see below the list of hard coded OIDs):

OID value	Description	Type	Status	Trap when changed
1.3.6.1.4.1.45057	Company name	STRING	Read Only	Yes
1.3.6.1.4.1.45057.1.0.1	Application exists?	INTEGER	Read Only	Yes
1.3.6.1.4.1.45057.1.0.2	Application status	INTEGER	Read Only	Yes
1.3.6.1.4.1.45057.1.0.3	Timing max	INTEGER	Read Only	Yes
1.3.6.1.4.1.45057.1.0.4	Timing set	INTEGER	Read Only	Yes
1.3.6.1.4.1.45057.1.0.5	Nb of overflow	INTEGER	Read Only	Yes
1.3.6.1.4.1.45057.1.0.6	Application name	STRING	Read Only	Yes
1.3.6.1.4.1.45057.1.0.7	Application version	STRING	Read Only	Yes

- Second one is provided by customer OID files.

When started, the sub-agent loads a list of "oid" files (in the current directory of the target) and adds the OIDs from these files. See "File format" for the format of the oid files. These files must have oid extension.

3.2. File format

The OEM file has the current format:

```
a[,R][,T]:oid
```

; is a comment (must start the line)

Where "a" can take two values:

I for integer or S for string

R: indicates that OID will be in read only mode

T: indicates that changes on OID will send trap to the main agent (that will send trap to connected manager)

oid: is the oid index in company name (dot is separator) (ie 1.3.6.1.4.1.company) and will be added after the prefix above

Examples:

`S:2.1` will give a string and OID will be: 1.3.6.1.4.1.company.2.1 (in read/write mode and without sending traps)

`I:2.2` will give a integer and OID will be: 1.3.6.1.4.1.company.2.2 (in read/write mode and without sending traps)

`I,R:2.3` will give a integer and OID will be: 1.3.6.1.4.1.company.2.3 (in read-only mode and without sending traps)

`I,R,T:2.4` will give a integer and OID will be: 1.3.6.1.4.1.company.2.4 (in read-only mode and with sending traps)

Important:

OID name cannot begin with 1. value (reserved by COPALP)

Do not add something else after the OID name

Only lines with this syntax will be understand as OID object

`;` char must begin a comment line

3.3. Blocks supported

When the target has to set or get the OID values, STRATON provides a list of block to read or write OID values.

The T5 runtime provides 4 blocks to set and get OID objects in SNMP agent.

- SNMP_GetLong(BOOL bEnable, STRING oid)
- SNMP_SetLong(BOOL bEnable, STRING oid, LONG lValue)
- SNMP_GetString(BOOL bEnable, STRING oid)
- SNMP_SetString(BOOL bEnable, STRING oid, STRING sValue)

Possible returned values (parameter rc) are:

0	SNMP_GetXXX has been successful, the output value is valid SNMP_SetXXX has been successful (oid has been set with the new value)
1	Internal error during set/get operation
2	Type error during set/get operation (ex: the OID is string and block is SNMP_GetLong)
3	OID error during set/get operation: the OID is unknown
4	Read only error during set operation: the OID is read only

3.4. Private enterprise number

Registered OID Enterprise: COPALP uses the value 45057 (registered by IANA).

3.5. Configuration files for Net-SNMP

3.5.1. File snmpd.conf

This file is used to configure the SNMP master agent.

Listen for connections on all interfaces (both IPv4 *and* IPv6):

```
agentAddress udp:161,udp6:[::1]:161
```

There are two meanings for communicating with SNMP agent (with an SNMP manager):

- Version 2 and version 3 (version 3 uses data encryption and authentication).

Create a v3 user:

```
createUser rwUser SHA "password_rwUser" DES "password_DES"
```

where SHA "`password_rwUser`" is the authentication part

and DES "`password_DES`" is the crypting part

Remark: SHA seems to be more secure than MD5.

Encryption AES seems to be better than DES.

Create a v2 user:

```
view   systemonly  included   .1.3.6.1.2.1.1
view   systemonly  included   .1.3.6.1.2.1.25.1
rwcommunity public
rocommunity public  default    -V systemonly
```

Sending traps v1:

```
trapsink     ip_client public
```

Sending trap v2:

```
trap2sink    ip_client public
```

Sending traps v3 (crypted):

```
trapsess -v 3 -u rwUser -a SHA -A "password_rwUser" -x DES -X "password_DES" -l authPriv
ip_client
```

NB: authPriv instead of authNoPriv must be used, otherwise the data won't be encrypted

See (http://www.net-snmp.org/wiki/index.php/TUT:SNMPv3_Options):

Messages can be sent unauthenticated and unencrypted (noAuthNoPriv), authenticated but unencrypted (authNoPriv), or authenticated and encrypted (authPriv) by setting the securityLevel to use.

To configure SNMP as a master agent using agentX protocol to communicate with sub-agents:

```
master          agentx
agentXSocket    tcp:localhost:705
```

3.5.2. File T5BlockSNMP.conf

This file is used to configure the SNMP sub-agent (this one deals with exchanges between STRATON runtime and SNMP master agent).

One line to write:

```
agentXSocket    tcp:localhost:705
```

3.6. Useful links

About snmpd.conf (in French):

https://aresu.dsi.cnrs.fr/spip.php?article175

http://forums.monitoring-fr.org/index.php?topic=4711.0

http://irp.nain-t.net/doku.php/215snmp:50_plus

Library Net-SNMP:

http://www.net-snmp.org/

4. Frequently Asked Questions

ON LINUX PLATFORM, HOW TO KNOW THE STATE OF THE SNMP DEAMON (SNMPD) SERVICE?

Try the following command lines:

```
Fedora: systemctl status snmpd.service -l
Ubuntu: service snmpd status
```

ON LINUX PLATFORM, HOW TO FIND MISSING LIBRARIES?

On some systems there are newer versions of the libraries. For example librmp.so.3 is present in the

```
/usr/lib folder but librpm.so.1 isn't.
```

If a library is missing while launching the snmpd service or while launching the runtime, try to find it, without the version number, with the "find" or "grep" command and create a symbolic link:

```
error while loading librpm.so.1
find  /  -name  librpm.so*
cd  /*folder_where_the_library_is*/
ln  -s  librpm.so.3  librpm.so.1
```

I CAN'T CONNECT THE STRATON WORKBENCH TO THE LINUX RUNTIME?

Check the Communication Parameters (in the shell: `ifconfig`)

Try to disable the Linux firewall.

On Windows platform, snmp commands are not recognized.

Open a command prompt with administrative rights and try to launch:

```
snmptranslate -IR -Td IF-MIB::linkDown
```

If this is not recognized as a service, then add the C:\usr\bin folder in your system PATH.

On Windows 8: