

## Overview

This configuration guide describes the installation process of SNMP on Windows and Linux with the NetBorder Express Gateway.

The Simple Network Management Protocol (SNMP) is a UDP-based network protocol. It is used mostly in network management systems to monitor network-attached devices for conditions that warrant administrative attention.

The NetBorder Express Gateway supports read access (GetRequest, GetNextRequest) to the Management Information Bases (MIBS)

The default UDP and TCP ports for SNMP are: 161 for standard requests.

The gateway provides the necessary MIBS to see the following information via SNMP:

- T1/E1 configuration and status
- Analog interface configuration and status
- Call statistics

You will find the MIBS description files in ***\$INSTALLDIR/config/mibs***

**N**ote: ***\$INSTALLDIR*** refers to the following path in Linux: ***"/opt/Netborder/Express/Gateway"*** and in Windows: ***"C:\Program Files\Netborder\Express\Gateway"***

Here are the MIBS supported with their Object Identifiers (OID):

Text File	MIBS	OID
DS0-MIB.txt	DS0	.1.3.6.1.2.1.10.81
DS1-MIB.txt	DS1	.1.3.6.1.2.1.10.18
SANGOMA-IF-MIB.txt	sangomalf	.1.3.6.1.4.1.35987.1.1
GW-CALL-STATS-MIB.txt	gwcallStats	.1.3.6.1.4.1.35987.1.2

## Configuration

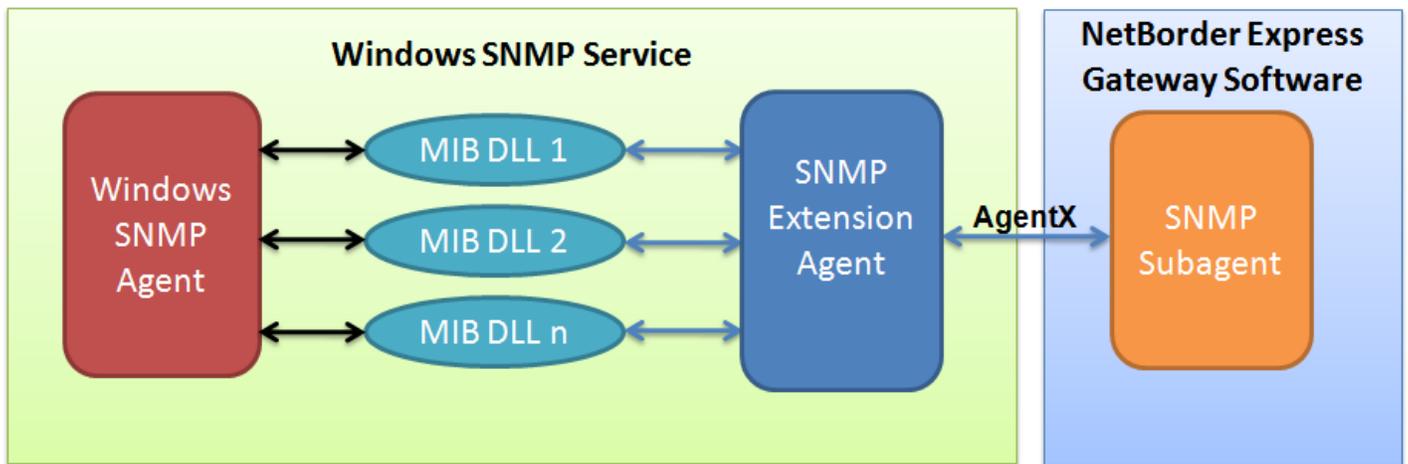
To configure the NetBorder Express Gateway SNMP subagent, the following parameters can be edited in the file `$INSTALLDIR/config/gw.properties`:

Parameter Name	Type	Default value	Description
<code>snmp.enable</code>	bool	FALSE	Defines whether or not the application will start snmp task.
<code>snmp.agentName</code>	string	paraxip-subagent	Name of the subagent used by Net-SNMP to initialize the library.
<code>snmp.agentx.IPAddress</code>	string	tcp:localhost:705	Defines the IP address, port and transport protocol used by the subagent and the master agent to communicate. A listening address takes the form: [transport-specifier:]transport-address. At its simplest, a listening address may consist only of a port number, in which case snmpd listens on that UDP port on all Ipv4 interfaces. Otherwise, the transport-address part of the specification is parsed according to the following table: 1- udp(default): hostname[:port] or IPv4-address[:port]; 2- tcp:hostname[:port], or IPv4-address[:port].
<code>snmp.agentx.requestTimeoutSec</code>	int	15	Defines the timeout duration in seconds of a request sent by an agentx agent to a subagent.
<code>snmp.mibs.supported.list</code>	string	ds0,ds1,sangomalf,gwCallStats	A comma separated list of all supported MIBS by the gateway. The format of this list is : mib1_name:mib1_rootoid,mib2_name:mib2_rootoid,.. . The mib_rootoid part of an element is optional; if not specified, the gateway will consider default root_oids values. Supported mibs are : ds0, ds1, sangomalf and gwCallStats.
<code>snmp.netsnmp.debugToken.list</code>	string	agentx/master	A comma separated list of the net-snmp debugging tokens that the user wants to activate when the logger net.snmp is set to DEBUG or TRACE.

## Windows Installation

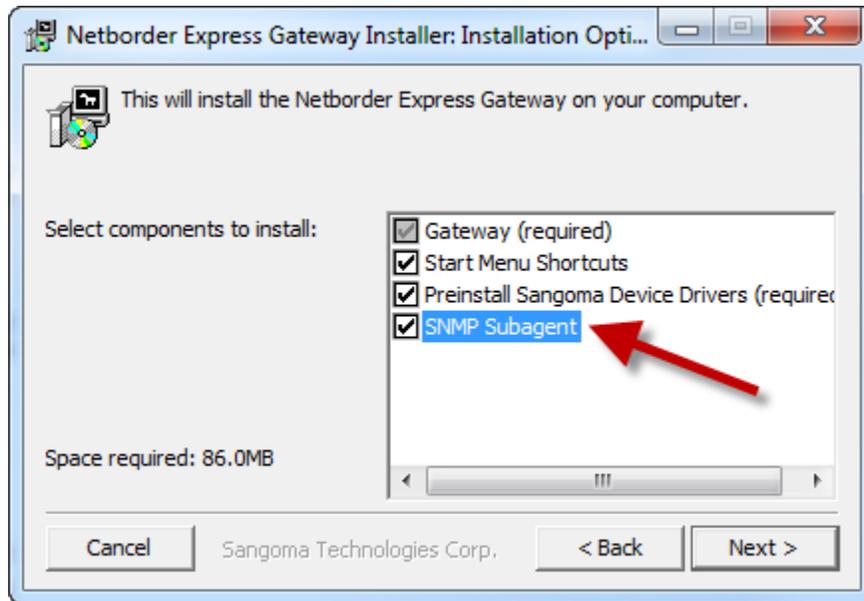
### Implementation Details

- NetBorder Express implements an SNMP Subagent that registers with the Windows SNMP Agent.
- For each supported MIB, a DLL file is created and registered with the SNMP Extension Agent.
- We use the AgentX protocol to communicate with the MIB DLL file via the Extension Agent.



## Requirements

- The Microsoft Windows SNMP Service must be installed on your system.
- To ensure that the SNMP subagent is installed with NetBorder Express, you must select the “**SNMP Subagent**” option in the installer program.

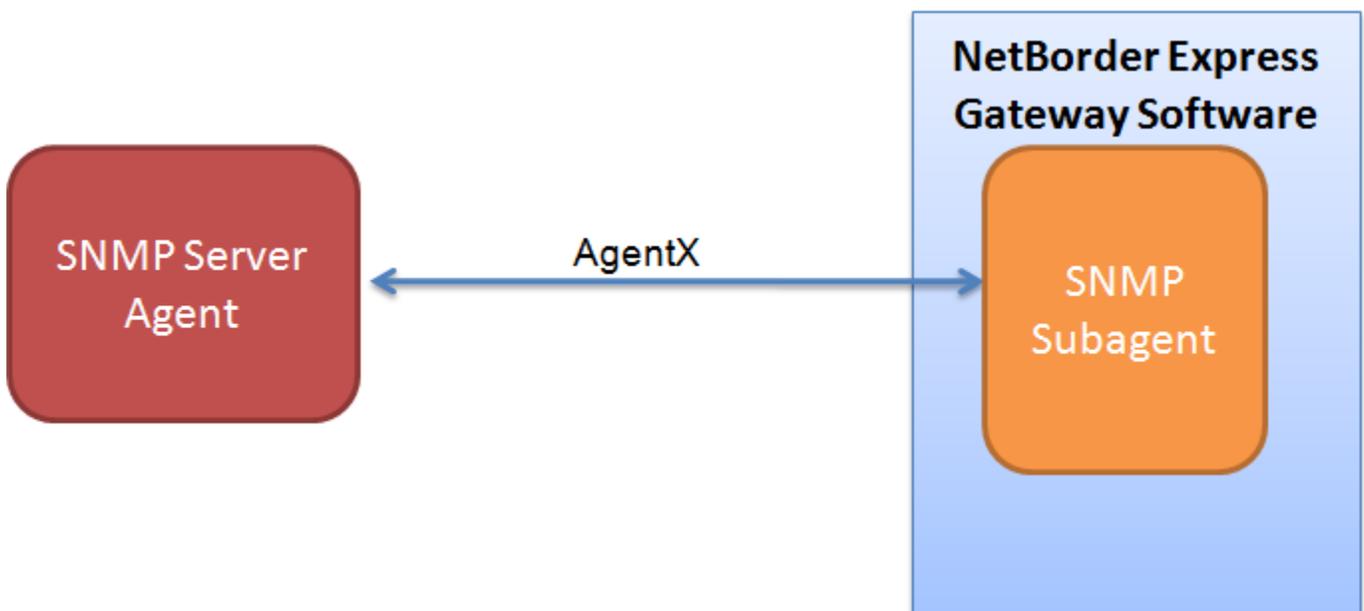


**N**ote: When the gateway is uninstalled, the Windows SNMP Service will be stopped in order to remove the SNMP Subagent.

## Linux Installation

### Implementation Details

- NetBorder Express implements an SNMP Subagent that registers with the SNMP Server Agent.
- The AgentX protocol is used to exchange MIBS data between the Server and the Subagent.



## Requirements

1. **Net-SNMP** package is installed on the system. Use YUM or any other package manager to verify/install it.

```
$ yum install net-snmp
```

2. We assume the **snmpd.conf** configuration file is located in the **/etc/snmp/** directory.

## Configuration of snmpd

The gateway provides the **configure-snmpd.sh** script to configure SNMP. It is automatically run upon installation of the gateway. The goal of this script is to add the configuration lines required by the SNMP Server agent to accept SNMP subagent connection requests.

If the configuration file `/etc/snmp/snmpd.conf` exists, the script will start by searching in the file if the necessary configuration lines are already there. If changes are made to `snmpd.conf`, **snmpd** is restarted after the script is executed.

Those lines are:

- **rocommunity public:** the gateway snmp subagent uses public community.
- **master agentx:** sets the snmpd process as a endpoint where subagents will connect.
- **agentxsocket xyz:** The address where subagents will send their connection requests. Default value for xyz is "tcp:localhost:705".

If any of those lines are missing, we append them to the end of the configuration file. If the **agentxsocket** line exists, we extract its **xyz** value and assign it as the value for the parameter "`snmp.agentx.IPAddress`" in the gateway configuration file `$INSTALLDIR/config/gw.properties`.

It is also possible that snmpd's configuration file defines views (for different groups of users) that specify the subtrees they are allowed to read and/or write to.

After a fresh install of Net-SNMP, those views will be defined like this:

	name	incl/excl	subtree
view	systemview	included	.1.3.6.1.2.1.1
view	systemview	included	.1.3.6.1.2.1.25.1.1

To expose all the gateway SNMP fields, two subtrees **MUST** be available to the SNMP clients:

- **.1.3.6.1.2.1.10** and **.1.3.6.1.4.1.35987**.

Since most of the time the default configuration still applies, the two following entries will be added to the `snmpd.conf` file by this script:

	name	incl/excl	subtree
view	systemview	included	.1.3.6.1.2.1.10
view	svstemview	included	.1.3.6.1.4.1.35987

The **OID 35987** is the registered Sangoma Technologies Corp. OID.

**N**ote: The user is responsible to update the advanced configuration information in the `snmpd.conf` file to make sure it is working

## Usage

**configure-snmpd.sh**

## Return codes

The application return 0 on success and a positive value if the application for the following reasons:

1. The **snmpd.conf** file is not located in the **/etc/snmp/** folder.

## Example

This screenshot displays the modifications appended to the `snmpd.conf` file after the `configure-snmpd.sh` script was executed.

```
#####
#
# Netborder Express Gateway - SNMP configuration requirements
#
# MBE Gateway has a builtin SNMP subagent that requires a SNMP Server agent
# with specific configuration lines. The following configuration lines or an
# equivalent must be present in this file for the MBE Gateway subagent to be
# able to connect to the agent.
#
# - rocommunity public: the public community must be defined.
# - master agentx: allow the SNMP agent to receive connection requests from
#   subagents using agentx protocol.
# - agentxsocket xyz: defines the agentx socket address where connection
#   requests will be sent by the subagent. The default value
#   for this field is tcp:localhost:705.
#
# If this configuration file uses views to define, for different group of users,
# the subtrees they are allowed to read and/or write to, two subtrees MUST be
# available to the SNMP clients: .1.3.6.1.2.1.10 and .1.3.6.1.4.1.35987. Those
# OID are the roots of the fields exposed by Netborder Express Gateway. Since
# most of the time the default configuration still applies, the two following
# entries will be added to the file:
#
# view    systemview    included    .1.3.6.1.2.1.10
# view    systemview    included    .1.3.6.1.4.1.35987
#
# The OID 35987 is the registered Sangoma Technologies Corporation OID. If those
# views does not match you configuration, please add views for those OID
# manually.
#
#####
rocommunity public
master agentx
agentxsocket tcp:localhost:705
view    systemview    included    .1.3.6.1.2.1.10
view    systemview    included    .1.3.6.1.4.1.35987
<END>
```

## Validate installation

1. Make sure snmpd is started

```
$ service snmpd status  
snmpd (pid 7883) is running...
```

2. Make sure NetBorder Express is started

```
$ service netborder-gateway status  
netborder-gateway (pid 7832) is running...
```

3. Go into the ***\$INSTALLDIR/bin*** folder and issue a snmp get command

```
$ netborder-snmpget -v 1 -c public localhost .1.3.6.1.2.1.10.18.6.1.1.  
...  
DS1-MIB::dsx1LineIndex.1 = INTEGER: 1
```

**N**ote: On uninstallation of the gateway, we do not remove or modify any **snmpd** configuration settings.