

USER GUIDE

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1 INTRODUCTION

This document describes how to install and run the latest version of Snow Inventory Agent for Linux; Some functionality described in this document may work differently or not at all in previous versions.

The Snow Inventory Agent for Linux is part of the Snow Inventory solution, and is used for inventory of Linux computers. The agent scans the computer and saves the collected data to a compressed and encrypted file, which is sent to a Snow Inventory server (Master Server or Service Gateway).

For detailed information on the configuration of the agent, refer to the document *Snow Inventory Agent Configuration Guide*.

1.1 PREREQUISITES

1.1.1 DEPENDENCY ON OTHER SNOW PRODUCTS

This version of the Snow Inventory Agent can only be used in a Snow Inventory Server 5.0 environment.

1.1.2 SUPPORTED OPERATING SYSTEMS

For information on supported operating systems, see [Snow System Requirements](#) document, in the Snow Knowledge Base, which is available for customers and partners.

1.1.3 JAVA RUNTIME ENVIRONMENT

To be able to inventory Oracle database products by using the Snow Inventory Oracle Scanner (SIOS), the target computer is required to have Java Runtime Environment 6 (1.6), 7 or 8 installed.

NOTE

The Java Runtime Environment (JRE) 1.7.0_07 contains a defect with the consequence that the Oracle inventory does not work. Any server running JRE 1.7.0_07 must upgrade to a later version for the Snow Inventory Oracle Scanner to work properly.

1.1.4 HARDWARE INVENTORY

To gather hardware information, the Snow Inventory Agent for Linux uses the **dmidecode** command which needs to be installed on the target computers.

1.1.5 PRINCIPLE OF LEAST PRIVILEGES

The list shows the commands that are used by the Snow Inventory Agent for Linux. The user running the agent needs to have access to all of the commands.

The agent searches for commands in **/usr/bin** , **/bin** , **/usr/sbin** , **/sbin**, and **/usr/local/bin**.

- awk
- crontab
- dmesg
- dmidecode
- dnsdomainname
- dsconfig
- env
- findmnt
- grep
- httpd
- ifconfig
- java
- javac
- last
- ldconfig
- lsb_release
- lspci
- modprobe
- mount
- proc
- ps
- rpm
- sed
- sh
- systemd-detect-virt
- uname
- wc
- yes

NOTE

The minimum **sudo** version required by the Snow Inventory Agent for Linux is **sudo 1.7.8**. If the agent needs to be run with an older version, the recommendation is running as root.

EXAMPLE

Sudoers configuration

In this example;

- the user **snow** has permissions to run all commands in the **SNOWAGENT** list as any other user (including root),
- the **Cmd_Alias** creates an alias for one or several commands. It is a comma-separated list where all commands must be written on one and the same row,
- the Inventory agent will only use **sudo** for commands that are prefixed by **NOPASSWD:** since it runs "non-interactive".

```
Cmd_Alias SNOWAGENT = /usr/bin/awk, /usr/bin/dmesg,  
/usr/sbin/dmidecode, /usr/bin/env, /usr/bin/findmnt, /usr/bin/grep,  
/usr/sbin/ifconfig, /usr/bin/java, /usr/bin/javac, /usr/bin/last,  
/usr/sbin/ldconfig, /usr/bin/lsb_release, /usr/sbin/lspci, /usr/sbin/modprobe,  
/usr/bin/mount, /usr/bin/ps, /usr/bin/rpm, /usr/bin/sed,  
/usr/bin/systemd-detect-virt, /usr/bin/wc, /usr/bin/uname,  
/usr/bin/dnsdomainname
```

```
snow ALL=(ALL) NOPASSWD: SNOWAGENT
```

NOTE

If a command is configured in sudoers to be run without providing a password, that path will be used before the search path of the agent.

2 INSTALLATION

The Snow Inventory Agent for Linux can be installed using prepared packages or using copies of the binary files.

The files of the Snow Inventory Agent for Linux are one executable file called **snowagent** and one configuration file called **snowagent.config**. These two files are by default located in the `/opt/snow` directory. To see a command line summary of the executable, use the following command from a command prompt:

```
/opt/snow/snowagent -?
```

2.1 INSTALLATION PACKAGES

Installation packages are prepared by and ordered from Snow Support. The current configuration file needs to be provided before any RPM or DEB package can be prepared. If no configuration file exists, certain information is needed in order to create one.

Required information:

- address to the Snow Inventory Server, including port number
- site name

Optional information:

- name of the configuration file
- cron scan time (default is "daily")
- if the Snow Inventory Oracle Scanner should be included
- if previous versions of the Snow Inventory Client for Linux should be removed

The installation package can be copied to any folder, but preferable to the root folder. The install command must be run from the folder where the package is located, while the uninstall command can be run from any folder.

During the installation of the agent an application argument will be automatically added to cron:

```
nice -n 10 /opt/snow/snowagent
```

2.1.1 PREPARED RPM PACKAGE

This section describes how to install and uninstall an RPM package using a terminal. Run the commands with superuser privileges, which can be obtained by using for example **sudo**.

2.1.1.1 INSTALL

Execute the rpm command with the argument **-i**, for example:

```
sudo rpm -i snowagent-5.2.0-1.i386.rpm
```

2.1.1.2 UNINSTALL

Execute the rpm command with the argument **-e**, for example:

```
sudo rpm -e snowagent
```

2.1.2 PREPARED DEB PACKAGE

This section describes how to install and uninstall a DEB package using a terminal. Run the commands with superuser privileges, which can be obtained by using for example **sudo**.

2.1.2.1 INSTALL

Execute the dpkg command with the argument **-i**, for example:

```
sudo dpkg -i snowagent_5.2.0-1_i386.deb
```

2.1.2.2 UNINSTALL

Execute the dpkg command with the argument **-r**, for example:

```
sudo dpkg -r snowagent
```

2.2 MANUAL INSTALLATION

This section describes how to manually install and uninstall the Snow Inventory Agent for Linux. All directory path references reflect a default installation. Run all commands with superuser privileges, which can be obtained by using for example **sudo**.

2.2.1 INSTALL

1. Copy the following files to **/opt/snow** directory on the computer:
 - **snowagent**
 - **snowagent.config**
 - **sios.jar** (optionally)
 - **snowcron**
 - **snowcron.conf**
2. Schedule **snowagent** by using a scheduler, or use the **snowcron** script to schedule with cron (see [Scheduling](#)).
3. Update installation date and last scan date in **.hst.lg** with the following command line:

```
echo "InstallDate=$(date '+%Y-%m-%d %H:%M:%S') " &gt; /opt/snow/data/.hst.lg
```

2.2.2 UNINSTALL

1. Remove any scheduling of **snowagent** – use the same scheduler as it was installed with.
For **snowcron**, use the following command line:

```
sudo snowcron -r /opt/snow/snowagent
```

2. Delete all installed files, data files, and temporary files with the following command line:

```
sudo rm -fR /opt/snow
```

2.3 DEFAULT LOCATION OF FILES

The table shows the default locations of the binary files and log files of the agent after an installation using a prepared package.

Table 1. Default location of files

File name	Directory	Description
snowagent	/opt/snow	Binary file of the Snow Inventory Agent
sios.jar	/opt/snow	Binary file of the Snow Inventory Oracle Scanner
snowagent.config	/opt/snow	Configuration file of the Snow Inventory Agent
*.snowpack	/opt/snow/data	Inventory result file
snowagent.log	/opt/snow/data	Log file of the Snow Inventory Agent
.hst.lg	/opt/snow/data	Log file for information on installation date and last scan date

Temporary files are by default located in the **/tmp/snow** directory and will be deleted when no longer needed.

3 SCHEDULING

Cron scheduling of the Snow Inventory Agent for Linux is added (or removed) using the program **snowcron**. To avoid multiple scheduling occurrences, any change in scheduling is automatically preceded by a removal of the current scheduling.

For a full specification of the scheduling feature, see the comment in the beginning of the **snowcron** script file located in **/opt/snow**.

Note that **snowcron** needs to be run with superuser privileges, which can be obtained by using for example **sudo**.

3.1 DEFINE SCHEDULING

To define scheduling by using a **snowcron** configuration file (**snowcron.conf**), add time and date fields, or period, to the file.

Configuration file examples:

```
# run snowagent at four twenty in the morning every day
20 4 * * *

# run snowagent at nine in the evening first day of the month
0 21 1 * *

# run snowagent at nine fifteen in the evening every Sunday
15 21 * * 0

# run snowagent hourly
hourly
```

3.1.1 ADD SCHEDULING

To add scheduling by using the **snowcron** configuration file, specify that file in the **snowcron** command, for example:

```
cd /opt/snow
./snowcron -f /opt/snow/snowcron.conf /opt/snow/snowagent
```

3.1.2 REMOVE SCHEDULING

To remove scheduling:

```
cd /opt/snow
./snowcron -r /opt/snow/snowagent
```

4 COMMAND LINE

The command line format for the Snow Inventory Agent for Linux is:

```
snowagent [options] [<command> [<arguments>]]
```

Some command lines require superuser privileges. To temporarily gain superuser privileges, send the command line as an argument to the command **sudo**.

```
sudo snowagent test
```

Table 2. Global options

Global option	Description
-w <dir>	Override working directory otherwise inherited from shell/environment
-v	Enable verbose mode, bump all logging to max level (enable all tags)
-c snowagent.config	Override the default location of the configuration file
-data-dir <dir>	Override data directory (regardless of configuration) When this option is used, only the directory of inventory result file will be changed. The log file will still be placed in the default location.
-log-dir <dir>	Override log directory (regardless of configuration)
-? or -h	Print help text and exit

Table 3. Commands

Command	Option	Description
copyright		Show copyright notice
manifest		Print the manifest in json format and exit
scan		Scan the current device and create a snowpack file in the target destination (as set by configuration). This will start a scan regardless of any schedule or other configuration. It will not start a scan if there's a running scan in progress. After the scan has completed the agent will exit. The scan result is not automatically sent.
send		Send files from the data directory. Files that are successfully sent are deleted
test		Run a self-test. Check configuration and server connectivity, then exit with a 0 (if successful) otherwise with a non-zero exit code
update	-package <location>	Check for updates now, and install if any are found. Use an update package from a specific location
version		Print the current snowagent version and exit

5 SCANNING

The agent scans the computers regularly, which by default is once every 24 hours. By configuration, it is possible to schedule when the agent should scan; for example at 01:00 AM every day, at 4:05 AM every Sunday, or at 00:30 AM on the first day of every month.

Using the system setting **env.allowonlyonescanperday**, the agent will check when the last scan was performed before it starts a new. If it was run the same day, no new scan will be performed. This means that a scheduled scan will never be performed more frequently than once a day. This check is not done when a scan is run from the command line.

When the scan is completed, the agent sends the inventory file with all scan data to the Snow Inventory Server. If the agent for any reason cannot send data to the server, it will by default try again every time it is run. The inventory data file is stored until the data has been sent successfully. Total number of inventory files that can be stored is decided by the system setting **send.max_scan_result_backlog_count** in the configuration file.

To exclude directories or files from the scan, use the **<Software><Exclude>** element in the configuration.

To exclude bind mounts from the scan, use the system setting **software.scan.ignore_bind_mounts** in the configuration. This setting works for all distributions that support the command **findmnt -P**.

NOTE

Ideally an inventory agent should be configured not to disturb or consume system resources that are needed for business critical applications running on the server. To achieve this in a Unix environment one would typically use the nice program to set the process priority to low. In the examples that follow niceness is set to 10, but can of course be set to any suitable value.

NOTE

Use of the system settings **software.scan.ignore_bind_mounts** requires **util-linux** version 2.20 or later to be installed.

5.1 FILE SYSTEMS

Snow Inventory Agent for Linux gathers information by scanning the file systems. Based on the file system scan result, additional meta-information on installed software is collected from the package managers. This means that meta-information from the package managers will only be collected for the software that has been inventoried by the file system scan.

The system settings **software.scan.dpkg** and **software.scan.rpm** are used for enabling collection of information from the Debian and Red Hat package managers respectively. Both settings are enabled by default in the configuration file.

All file systems are scanned except for those listed for exclusion in the agent configuration file (**<Software><Exclude><FileSystem>**). Also, the file systems in the table that follows are all excluded from the scan by default, and cannot be included using the include criteria.

NOTE

The user account that runs Snow Inventory Agent for Linux must have read access to the file areas that it scans.

Table 4. File systems excluded from the inventory scan

Excluded file systems				
binfmt_misc	fuse.gvfsd-fuse	nfs4	rpc_pipefs	vmblock
cifs	fuse.vmware-vmblock	none	smbfs	vmhgfs
devpts	fuseblk	panfs	sysfs	
devtmpfs	nfs	proc	tmpfs	

5.2 RUNNING PROCESSES

The system setting **software.scan.running_processes** is used to gather information about running processes on the inventoried server. The functionality is enabled by default, but can be disabled by adding the system setting to the agent configuration file, and then setting it to false.

The scan identifies the running processes and adds them to the file systems scan result. In the scan result sent to the Inventory server, there is no distinction between the software inventoried by the running processes scan and the software inventoried by the file systems scan.

Together with the configuration of file system scanning and package manager scanning, the configuration of running processes makes it possible to create a customized agent configuration that provides resource efficient inventory coverage.

NOTE

When the agent is run with superuser privileges, information on all processes running on server will be gathered. Otherwise, only the processes that are running as the user running the snowagent will be gathered.

5.3 MANUAL SCAN

When a change has been made or if a scan needs to be run for support reasons, a scan can be manually initiated outside of the regular schedule.

In the examples that follow, **sudo** is used. However, **sudo** is not required if the user running the **snowagent** has access to the commands as described in [Principle of least privileges](#).

5.3.1 SCAN OF ONLINE COMPUTERS

Use the commands below to trigger the agent to start a manual scan of the current computer and send the scan result to a server endpoint as defined in the agent configuration file. A manual scan will start regardless of any schedule or other configuration. However, if there is a scan already running, a manual scan will not start.

Scan and send the scanning result:

```
sudo snowagent
```

5.3.2 SCAN OF OFFLINE COMPUTERS

In scenarios where a computer is offline, or cannot communicate with a Snow Inventory Server, a “one time scan” can be performed.

1. Copy the binary files of the agent to a directory on a USB memory stick.
2. On the offline computer to be scanned:
 - a. Insert the memory stick into the USB port.
 - b. In a command prompt, navigate to the folder where the binary files are placed.
 - c. Run the following command to make the agent perform an instant scan of the current computer:

```
sudo snowagent scan
```

The scan result is put in a subdirectory on the USB memory stick.

3. Move the USB memory stick to an online computer with access to Snow Inventory.
4. On the online computer, run the following command to make the agent send the scan result to a server endpoint, as defined in the agent configuration file:

```
sudo snowagent send
```

6 TROUBLESHOOTING

6.1 PRIVILEGES

Details about what privileges the commands are run with are shown in the log file of the agent (**snowagent.log**). The log shows both when the user running the agent has all the privileges it needs to run the commands, as well as any insufficient privileges to read running processes.