

# USER GUIDE

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# 1 INTRODUCTION

This document describes how to install and run the Snow Inventory Agent for Unix.

The Snow Inventory Agent for Unix is part of the Snow Inventory solution and is used for inventory of Unix computers. It is a Java application that is locally installed on the computers that are to be inventoried. The benefit of having a locally installed agent on each computer is that inventory can be scheduled to occur on a regular basis always giving up-to-date information on hardware and software changes.

Once the agent is installed on the computer it is recommended to schedule it to run at a given interval. This can be achieved by using the built-in scheduling service in Unix or similar.

The Snow Inventory Agent for Unix gathers information about computer hardware and installed software packages from the built-in package manager in Solaris, AIX, and HP-UX. Inventory of Oracle database products using the Snow Inventory Oracle Scanner can be enabled as an option.

There is also a possibility to perform software inventory using scanning of running processes and file scanning of specified directories. This can be used as a complement since the package managers don't always have information on all installed software. Information returned from this scan is less descriptive than the information from the package managers. Software inventory using running processes is performed by default. For more information, see [Running processes repository](#).

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).

## 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 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 run the Snow Inventory Agent for Unix, the target computer is required to have Java Runtime Environment 6 (1.6), 7 or 8 installed. For enhanced scan performance, the recommendation is to use Java Runtime Environment 8.0.

#### **NOTE**

Due to an internal defect in Java, Java Runtime Environment 1.7.0\_7 must not be used. See [Known issues](#) for more information.

## 1.1.4 PRIVILEGES

There are two privilege options for running the agent, and each option is described in the sections below.

### 1.1.4.1 FULL PRIVILEGES

For full privileges, either a user with root privileges or a user with privileges to run the Java runtime with the **sudo** program is required.

### 1.1.4.2 PRINCIPLE OF LEAST PRIVILEGES

A user that has **sudo** rights to specific operating system commands depending on operating system, see table below. The sudoers file also need to have the **NOPASSWD** option set.

Example from sudoers file:

User **snow** has the rights to execute the commands with **sudo** and **no password**:

```
##
## User privilege specification
##
root ALL=(ALL) ALL
snow ALL=NOPASSWD: /usr/bin/ls -l /proc/*
snow ALL=NOPASSWD: /usr/bin/file
```

Operating system command	Description
<b>file</b>	sudo rights needed to get additional file information when performing software inventory
<b>ls</b>	Solaris needs this command to read the /proc file system when performing inventory on running processes.

For information on what commands the Snow Inventory Agent for Unix uses, see [Commands used by the agent](#).

When Oracle scan is enabled, additional permissions need to be granted. An Oracle database user is required for each database that is to be inventoried, and needs to be defined in the configuration file. Either the user is same for all databases and configured using the **<DefaultInstanceCredentials>** element, or the user can be unique and configured using the **<InstancesWithConfiguration>** element.

Example from sudoers file for Solaris:

User **snow** has the rights to execute the commands with **sudo** and **no password**:

```
##
## User privilege specification
##
root ALL=(ALL) ALL
snow ALL=NOPASSWD: /usr/bin/pwdx
```

## 2 INSTALLATION

The Snow Inventory Agent for Unix can be installed using a prepared script or using copies of the binary file.

The executable file of the Snow Inventory Agent for Unix is called **snowagent.jar**. It is an executable Java archive that performs inventory of hardware and software on the server where it is executed.

### 2.1 PREPARED INSTALLATION SCRIPT

Installation shell scripts are prepared by and ordered from Snow Support. The current configuration file needs to be provided before a script 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
- if the Snow Inventory Oracle Scanner should be included
- if previous versions of the Snow Inventory Client for Unix should be removed

The installation package can be copied to any folder on the target computer.

#### 2.1.1 INSTALL

1. Start a terminal
2. Convert the shell script to an executable script by running the command:

```
chmod +x snowagent-5.X.sh
```

3. To install, run the executable script by using the command:

```
sudo ./snowagent-5.X.sh --install-path <path>
```

#### NOTE

Replace 5.X with the correct version number of the agent that you are installing.

#### 2.1.2 UNINSTALL

During the installation an uninstall script is created. Follow the instructions for a manual uninstallation, see section below.

## 2.2 MANUAL INSTALLATION

This section describes how to manually install and uninstall the Snow Inventory Agent for Unix.

### 2.2.1 INSTALL

#### 2.2.1.1 UNIX

Install the agent in the path **/opt/snow/**.

1. Create the directory:

```
$ cd /opt
$ mkdir snow
```

2. Put the files **snowagent.jar** and the **snowagent.config** in the created directory. If Snow Inventory Oracle Scanner is to be used, also put the file **sios.jar** in the same directory.
3. Create a sub-directory called **data** under **opt/snow/** and set permissions:

```
$ sudo chmod 0755 data
```

#### 2.2.1.2 JAVA

If the server has the Java runtime in its path, the agent can be run as in the examples in the sections that follow. Otherwise the Java runtime needs to be added to the path, alternatively the Java runtime can be started with the path to the Java installation.

Use the commands below to show help and version of the agent:

```
$ sudo java -jar snowagent.jar -?
$ sudo java -jar snowagent.jar version
```

### 2.2.2 UNINSTALL

To uninstall the agent, use the script **uninstall.sh** located under **/opt/snow**. The script will remove the **opt/snow** directory including all files. The scheduling entry must be manually removed from crontab.

Run the script with the following command:

```
$ sudo /opt/snow/uninstall.sh
```

## 2.3 DEFAULT LOCATION OF FILES

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

File name	Directory	Description
snowagent.jar	<b>/opt/snow</b>	Binary file of the Snow Inventory Agent
sios.jar	<b>/opt/snow</b>	Binary file of the Snow Inventory Oracle Scanner
snowagent.config	<b>/opt/snow</b>	Configuration file of the Snow Inventory Agent
*.snowpack	<b>/opt/snow/data</b>	Inventory result file
snowagent.log	<b>/opt/snow/data</b>	Log file of the Snow Inventory Agent
snowagent.properties	<b>/opt/snow/data</b>	Properties file with information on, for example, installation date and last scan date

## 3 SCHEDULING

In Unix it is recommended to configure the Snow Inventory Agent to run at a given interval using the scheduler, i.e. crontab (or similar), to perform inventory, and transfer the result file to the Snow Inventory Server.

In the following example from root crontab file, the agent will run every day at 1:15 in the morning:

```
15 1 * * * nice -n 10 java -jar /opt/snow/snowagent.jar config=/opt/snow/snowagent.config
```

For business critical environments, the agent can be scheduled to run within the regular service maintenance windows for the servers.

### **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 example niceness is set to 10, but can of course be set to any suitable value

## 4 COMMAND LINE

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

```
(java -jar) [/opt/snow/]snowagent.jar [options] [<command> [<arguments>]]
```

Global option	Description
<b>-w &lt;dir&gt;</b>	Override working directory otherwise inherited from shell/environment
<b>-v</b>	Enable verbose mode, bump all logging to max level (enable all tags)
<b>-c snowagent.config</b>	Override the default location of the configuration file
<b>-data-dir &lt;dir&gt;</b>	Override data directory (regardless of configuration)
<b>-? or -h</b>	Print help text and exit

Command	Option	Description
<b>copyright</b>		Show copyright notice
<b>manifest</b>		Print the manifest in json format and exit
<b>scan</b>		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.
<b>send</b>		Send files from the data directory. Files that are successfully sent are deleted
<b>test</b>		Run a self-test. Check configuration and server connectivity, then exit with a 0 (if successful) otherwise with a non-zero exit code
<b>update</b>	<b>-package &lt;location&gt;</b>	Check for updates now, and install if any are found. Use an update package from a specific location
<b>version</b>		Print the current snowagent version and exit

## 5 SCANNING

### 5.1 AIX SERVERS

When scanning AIX servers, the Snow Inventory Agent is able to run an additional hardware scan in order to gather IBM licensing information. This hardware scan can be run at more frequent interval than the regular scan. For recommended scanning intervals, refer to your current license agreement.

With the following command, the Snow Inventory Agent will perform a hardware scan only, and write the result to a file, without sending it to a Snow Inventory server:

```
$ sudo java -jar /path/to/snowagent.jar scan -hw-only
```

Any created hardware scan result files will be sent to a Snow Inventory server during the next regular scan.

Depending on the interval of the scan, the number of result files allowed to be stored on the computer until the next scheduled run must be large enough. The number is set by using the system setting **send\_max\_scan\_result\_backlog\_count** in the configuration file.

### 5.2 MANUAL SCAN

Use the following command line to perform a check with the server for new updates, do an inventory of hardware and software on the server, and finally send the result to a Snow Inventory server:

```
$ sudo java -jar snowagent.jar
```

#### NOTE

When running the Snow Inventory Agent for Unix without arguments, a scan will still be run even if no connection to the Snow Inventory server is currently available.

### 5.3 RUNNING PROCESSES REPOSITORY

When software inventory is performed and includes running processes, information about these processes and the full path to the files will be stored in a running processes repository.

Each time a software scan is initiated a lookup of previously identified running processes is performed to determine if the software is still installed on the client. This will be done even if the process is not currently running at the time of the scan. The result is stored in an encrypted file named **tempdata.ser** which is placed in the storage path directory.

Information on new software will be added to the repository as they are discovered. When a software is removed from the client it will be removed from the repository as well.

## 6 KNOWN ISSUES

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.

## 7 APPENDIX

### 7.1 COMMANDS USED BY THE AGENT

The list shows the commands that are used by the Snow Inventory Agent for Unix. The agent searches for commands in **/sbin**, **/bin**, **/usr/sbin**, and **/usr/bin**. If none are found there, the agent fallbacks to using *which* to see if the command is in the **\$PATH** of the user.

- adb
- awk
- cstm (for PA RISC-based systems)
- cut
- df
- dmidecode
- domainname
- echo
- env
- file
- getconf
- grep
- hostid
- hostname
- ioscan
- kstat
- lparstat
- ls
- lsattr
- lsdev
- lslpp
- lsof
- lswpar
- machinfo (for Itanium-based systems)
- model
- mount
- pfiles
- pkg
- pkgchk
- pkginfo
- prtconf
- ps
- pwd
- setboot
- sh
- smbios
- sort
- sudo
- svmon
- swap
- swlist
- tail
- tr
- uname
- vmstat
- wc
- zonename

## 7.2 DESCRIPTION OF THE SCAN STEPS

The scan is performed in a number of steps. Each step results in a **result set** which is then passed on to the next step. In that way, the result set is refined until we have a final inventory result file that can be sent to Inventory server.

Description of the steps:

1. **Create initial list**

A basic list of software is created based on information from the package manager and the scan of running processes.

2. **Perform directory scan**

The scan starts with the **include rules**, and for each rule we check for any mount points in the file system. If a directory is mounted beneath the include path, we do the following checks:

- Is the file system of the mount point the same as that of the include path?
- Is the file system of the mount point included in the configuration as an allowed file system?

If either of these two checks are false, then the path to the mount point is added as an **exclude directory** to prevent the scan from including it.

3. **Perform file scan**

The agent looks for files beneath the include paths. Each found file is matched against the configured **exclude rules** to determine if it should be excluded from the result set, or not.

4. **Check file type**

The agent runs a system command to determine the file type of each file in the result set. For each file, the output of the command is then matched against the list of configured **file types**.

5. **Create snowpack file**

A snowpack file is created from the final result set.