

TECHNICAL DESCRIPTION: SNOW INVENTORY VERSION 5

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1 INTRODUCTION

Snow Inventory discovers all computers in the IT environment, and presents the discovery result in the Snow Inventory Admin Console. Computers that are not yet inventoried can be easily identified using the built-in discovery views in the console. Also, all connected network equipment and mobile devices are discovered and displayed as discovered devices in the console.

Snow Inventory 5 provides the customers with the ability to keep their Snow Inventory Agents up to date with the latest product releases. Updates with new agent version(s) and/or new configuration settings for the different supported operating systems can be centrally managed using the Snow Inventory Admin Console.

For existing installations of Snow Inventory 3.x, the Snow Inventory Data Exporter is used for migration to Snow Inventory 5, see *User guide, Snow Inventory Data Exporter*.

1.1 WHAT'S NEW?

The following sections outline the key changes compared to Snow Inventory 3.x.

1.1.1 ADMIN CONSOLE

The Admin Console of Snow Inventory 5 is now accessed via the administration tool Snow Management and Configuration Center (SnowMACC) – a familiar user interface for administrators of Snow products.

1.1.2 SNOW INVENTORY AGENTS

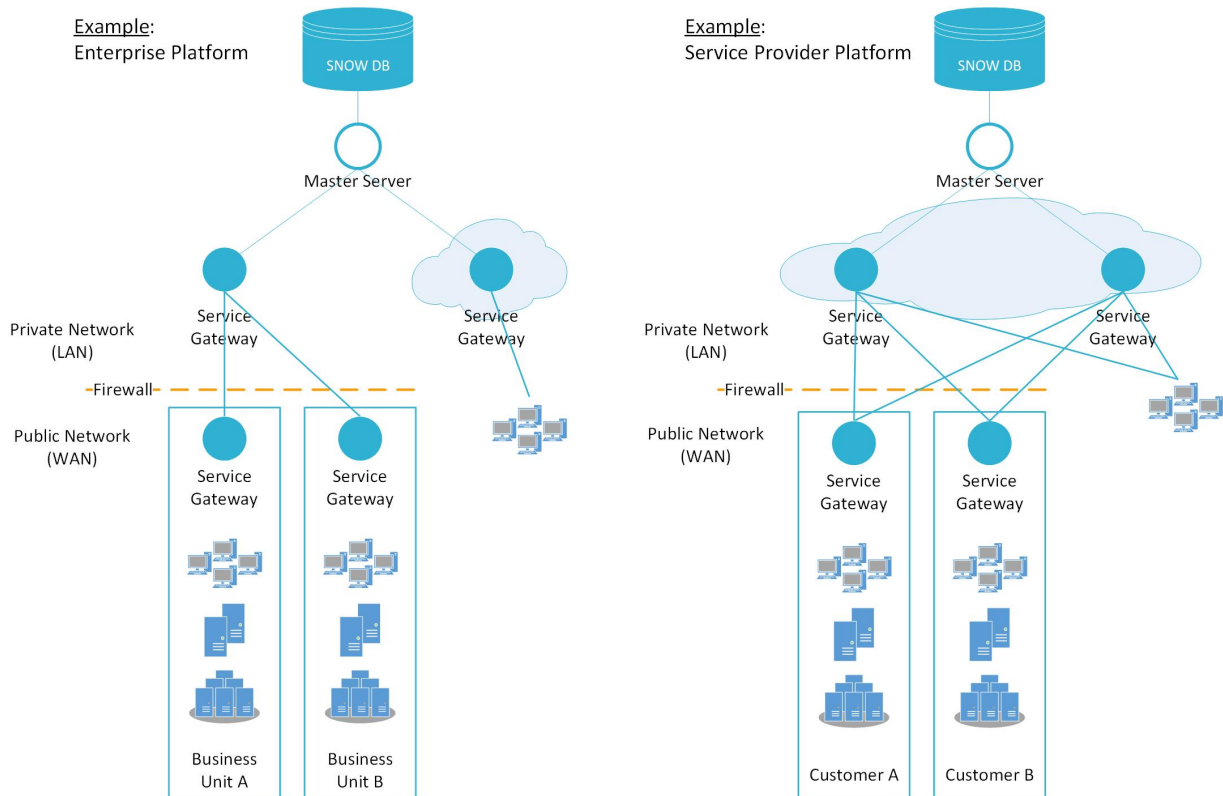
All Snow Inventory Agents have the same configuration format, regardless of what platform/operating system they are designed for, and they all have the same configuration user interface (XML).

1.1.3 RECEIVING AND PROCESSING INVENTORY DATA

The functionalities of the Inventory Data Receiver (IDR), Inventory Data Provider (IDP), and Active Directory Discovery (AD Discovery) are now included as out-of-the-box modules in the Snow Inventory 5 infrastructure.

2 PLATFORM OVERVIEW

The Snow Inventory infrastructure consists of one or more Inventory databases and Master Server instances, and Inventory Agents for one or several platforms. In more complex IT environments Service Gateway instances can be implemented for both load-balancing and scalability purposes. This makes it possible to have the Inventory Agents configured with multiple Service Gateways when sending and receiving data, to have fallback options if one of the Service Gateways is unavailable.



2.1 ARCHITECTURE

Snow Inventory Agent

Snow Inventory Agents are responsible for collecting software information, software usage (metering), hardware specifications, and user information from the computers and mobile devices within the organization. Each agent sends its inventory result to an Inventory Master Server instance for processing, either directly or via a Service Gateway instance.

Snow Integration Manager

Inventory information can be collected from third-party inventory tools and virtualization technologies via Snow Integration Manager using either purpose-built integration connectors or the universal connector (SnowXML) that enables discovery and inventory data to be imported from any source.

Service Gateway

To ensure high availability of Inventory Server, Service Gateway instances can be configured for load-balancing. Service Gateway instances could also serve as proxies in segmented networks or remote business units.

- Master Server** The Master Server instance receives the inventory data reported by the agents, processes the data and writes it into the Inventory database. Also, it processes and writes Discovery data to the database. The Master Server instance must have a direct connection to the Inventory database.
- Database** The Snow Inventory database is used for storing the inventory data reported by the Snow Inventory Agents. It is a Microsoft SQL Server database and there can only be one database per Master Server.

2.2 SNOW INTEGRATION CONNECTORS

Snow Integration Connectors can automatically consolidate data from multiple inventory tools into a single view of all software and hardware assets from across the network and beyond. All data imported through a Snow Integration Connector is automatically processed through the Software Recognition Service to ensure the accuracy of software titles, versions, and more.

2.3 COMMUNICATION

The Snow Inventory 5 infrastructure is backwards compatible. All the clients prior to the Snow Inventory Agents (i.e. Snow Inventory Clients) that can communicate with the Inventory Data Receiver (IDR) can continue doing so with the new Inventory 5 infrastructure. Also, the file forwarding features of Snow Integration Manager is compatible with the Inventory 5 Server receiving interface.

2.4 SECURITY

The Snow Inventory Agents encrypt the inventory data files (AES 128-bit encryption) before they are sent to the server infrastructure. The files are normally sent over HTTP, but can be configured to be sent over an encrypted HTTPS channel using any X.509 certificate for authentication.

All communication to and from the Snow Inventory servers can be secured using certificates. Server-side certificates are used to authenticate and identify the server, whereas client-side certificates are used to authenticate the client. The server-to-server communication can also be secured using certificates.

3 DISCOVERY

Computers and devices can be discovered using LDAP lookups in an Active Directory, or by using the following technologies for network discovery on specific IP address ranges:

- SNMP
- SSH
- WinRPC/WMI
- ICMP (“ping”)
- TCP/IP fingerprinting
- DNS lookup
- NIC manufacturer lookup

All discovery technologies are turned off by default when installing Snow Inventory Server. Each technology can be turned on individually and be configured for specific ports and IP-ranges as needed to enable full asset discovery

3.1 NON-INVENTORIED DEVICES

Computers that are not inventoried add uncertainty to what is installed and used in the environment, and what impact that could have on the license compliance of the organization.

With Snow Inventory, all computers and mobile devices in the IT environment are discovered. Any devices that are not yet inventoried, either by Snow Inventory Agents or using a Snow Integration Connector, are presented in the Snow Inventory Admin Console.

3.2 NETWORK DEVICES

In addition to computers and mobile devices, connected network equipment is also discovered and presented in the Snow Inventory Admin Console. The network management protocol SNMP is used for discovery of equipment like printers, routers, and switches.

Using the Snow Integration Connector for Discovery data from any source, data from already existing discovery tools can be integrated.

3.3 UNREACHABLE DEVICES

In order to mitigate the gap between discovered and inventoried devices, it is essential to be able to reach the device from an Inventory server (Master Server or Service Gateway). The Snow Inventory Admin Console has built-in views for presenting any device that is unreachable but exists in the Active Directory or third-party discovery tools. By using this information, Service Gateways can be set up to cover the entire estate.

4 DEPLOYMENT

The Snow Inventory Agents can be deployed via the Snow Inventory Admin Console (Windows Agent only), via an existing deployment infrastructure, or by using scripts.

4.1 ADMIN CONSOLE

Centralized deployment of Snow Inventory Agent for Windows can be performed from the Snow Inventory Admin Console. A Service Gateway or Master Server with network access to the target computer will perform the deployment, using specified credentials (typically a domain administrator account).

4.2 THIRD-PARTY TOOLS

For centralized deployment, installation packages (msi, pkg, deb, rpm) and shell scripts (sh) can be prepared by and ordered from Snow Support. The packages can then be deployed to the target computers using a deployment infrastructure of choice, for example Microsoft SCCM.

4.3 SCRIPTING

As an alternative to the two deployment technologies mentioned above, it is also possible to deploy the Inventory Agent to the target computers using scripts. For details of how to do this, see the Snow Inventory Agent *User Guide* for each platform.

5 INVENTORY & METERING

5.1 IDENTITY

Snow Inventory has a built-in identity logic that it applies to all inventoried computers. The identity is what makes the computer unique and ensures that the computer object in the database stays the same even if the computer is renamed or reinstalled with a new operating system. Furthermore, the identity is used to prevent creation of duplicate entries of the same device.

5.2 VIRTUALIZATION

There are many good reasons for organizations to adopt virtualization – lower costs, faster asset deployment, security, flexibility and more. However, virtualization introduces a complexity which must be addressed by the organization's Software Asset Management strategy.

The Snow Inventory Agent for Windows is able to scan and gather inventory data from environments using desktop, session, and application virtualization technologies, such as Microsoft Virtual Desktop Infrastructure, Citrix Virtual Apps, and VMware ThinApp.

The metering capabilities also makes it possible to get remote application usage details from session virtualization technologies like Microsoft Remote Desktop Services (RDS) and Citrix Virtual Apps.

5.3 DATACENTER

Snow Inventory Server is fully compatible with Snow Integration Manager, which can connect to multiple hypervisors to obtain correct information on the server environment. This includes obtaining information on datacenter/cluster configurations, physical servers and virtual machines and the relation between the virtual and physical assets. It also includes obtaining information on the different resources, such as processor/core counts and processor model, both from the physical and virtual level.

These environments are not static – new virtual machines are introduced, hardware resources assigned to virtual machines change, and virtual machines move between different physical servers. If a virtual machine is moved from one physical server to another, information on the relationship will be automatically updated in Inventory Server.

5.4 SNOW INVENTORY ORACLE SCANNER

The Oracle Management Option gives organizations control of their Oracle estate thanks to its ability to collect data and report on all server hardware and configuration, database products and editions, database options and associated usage, management packs and associated usage, feature usage and named users. It also enables orders to be managed and assigned to specific servers within the Oracle estate.

The Snow Inventory Oracle Scanner is a module included in the Snow Inventory Agent. It is disabled by default, but is easily activated via the Snow Inventory Admin Console and

configuration update capabilities, or when ordering the Snow Agent installation package from Snow Support.

5.5 CLOUD APPLICATION DISCOVERY AND METERING

The Snow Inventory Agent for Windows can report discovery of cloud application sites based on information from the internet browser installed on the computer. By matching the discovered sites to a defined set of rules, the agent can report usage of cloud applications, also known as Software as a Service (SaaS). The rules are distributed by the Data Intelligence Service (DIS) via Snow Update Service (SUS).

The option is disabled by default, but can easily be activated in the Snow Inventory Admin Console.

6 CONFIGURATION

The configuration files of both Inventory Server and the Snow Inventory Agents are based on the XML standard format.

6.1 SERVER CONFIGURATION

The Snow Inventory Server Configuration Manager provides an administrative interface for configuration and installation of Inventory Server.

Considering the scalability and load balancing aspects, the Inventory Server can be configured as a Master Server or a Service Gateway. Service Gateways forward all their data and requests to a Master Server for further processing, either directly or via another Service Gateway.

Snow Inventory Server can be configured to receive incoming requests both on HTTP and HTTPS protocols as per solution requirements.

The Snow Inventory Admin Console provides an overview of configuration settings, Server Endpoints, and Discovery interfaces for any configured Master Server or Service Gateway. The features like Active Directory (AD) Discovery and Network Discovery can be enabled/disabled and configured via the Admin Console.

6.2 AGENT CONFIGURATION

Snow Inventory Agents are available on Unix, Linux, macOS, and Windows as supported platforms. The agent configuration definition is platform independent.

6.2.1 CENTRALIZED MANAGEMENT

Agent configuration for all supported platforms is managed via Snow Inventory Admin Console. When an agent configuration has been changed and after confirmation by the user, the update is distributed to all targeted computers and applied automatically.

6.2.2 SCHEDULING

The Snow Inventory Agent for Windows runs as a service on the computer and can be configured to perform scheduled inventory scan on a daily, weekly, or monthly basis, or at startup or logon actions. The Snow Inventory Agents for Linux, macOS, and Unix are scheduled using the built-in native scheduling functionality of the operating system, e.g. Cron.

6.2.3 TUNING THE SCAN RESULT

The Snow Inventory Agent configuration provides the possibilities to fine-tune the scan result through a number of configuration options. Using the software settings configuration, one can include or exclude variables to tune the scan behavior, like directory path (include/exclude), file system (include/exclude) and file types (include). These various configuration options of the agent help to gather the desired data in an easy manner.

The scan behavior of the Snow Inventory Agent can be further fine-tuned using system settings. It provides a number of options to be enabled or disabled, including setting up

environment variables, HTTP settings, privacy settings, software metering, hardware and software scans, as per scan requirements.

For more details, refer to the *Configuration guide* for the Snow Agents.

6.2.4 SOFTWARE DENY

To prevent illegal and prohibited software from running on a computer, deny rules can be set in the Snow Inventory Agent configuration. A deny rule includes the path to the binary, file description, and company name as a signature to identify the process and terminate it. This feature is only available in the Snow Inventory Agent for Windows.

6.2.5 INVENTORY SCAN REPORTING

The Snow Inventory Agents support sending the inventory result file to multiple Inventory Servers, directly or via proxy, in a fallback manner. If sending the result file to the primary Inventory Server fails, then the agent tries the next server in sequence.

6.2.6 DROP LOCATION

For customers that wants to keep a copy of the scan result, the Snow Inventory Agent provides the drop location option. Every time an agent scans and sends the result file to a server, it will also copy the result file to a defined drop location folder. A drop location can be a UNC network location, a directory on a file system, or a web endpoint (directly or via proxy).

6.2.7 ORACLE ENVIRONMENTS

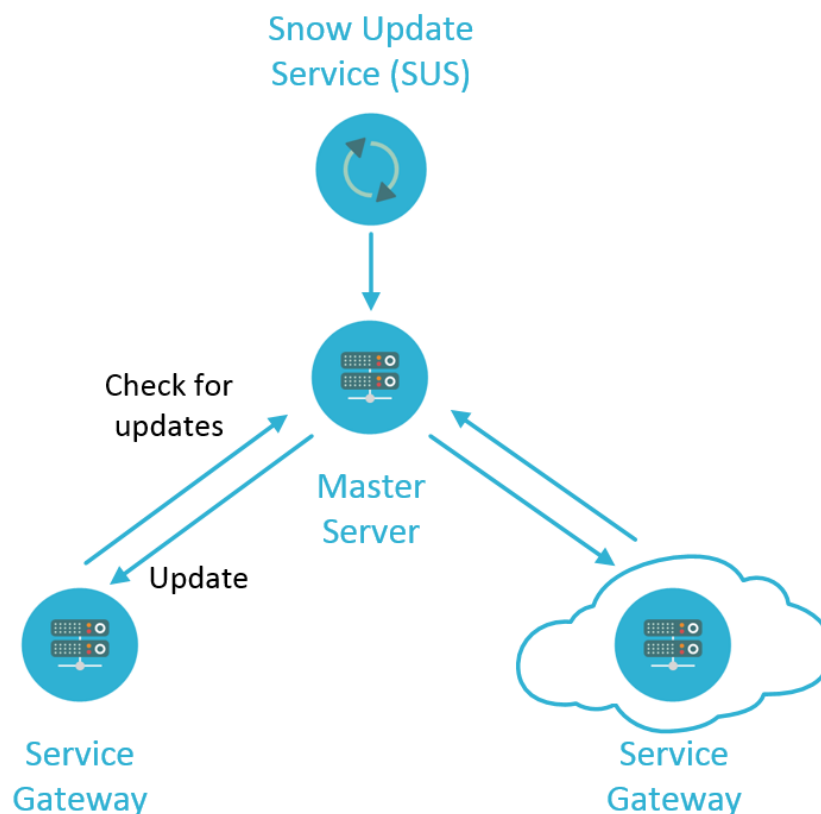
Scan of Oracle environments is performed using the Snow Inventory Oracle Scanner (SIOS) plug-in. The Oracle settings in the Snow Inventory Agent configuration include default credentials, and the possibility to include or exclude instances by using SID.

7 UPDATE

7.1 SERVER UPDATES

Snow Update Service (SUS) is used for updating the Snow Inventory infrastructure. SUS can be configured for automatic or manual updates, and will only update the Master Server.

The Service Gateways will frequently check with their target Master Server (or Service Gateway) for any updates, and then automatically download and apply them. The current Inventory Server versions of both Master Server and Service Gateways are displayed in Snow Inventory Admin Console.

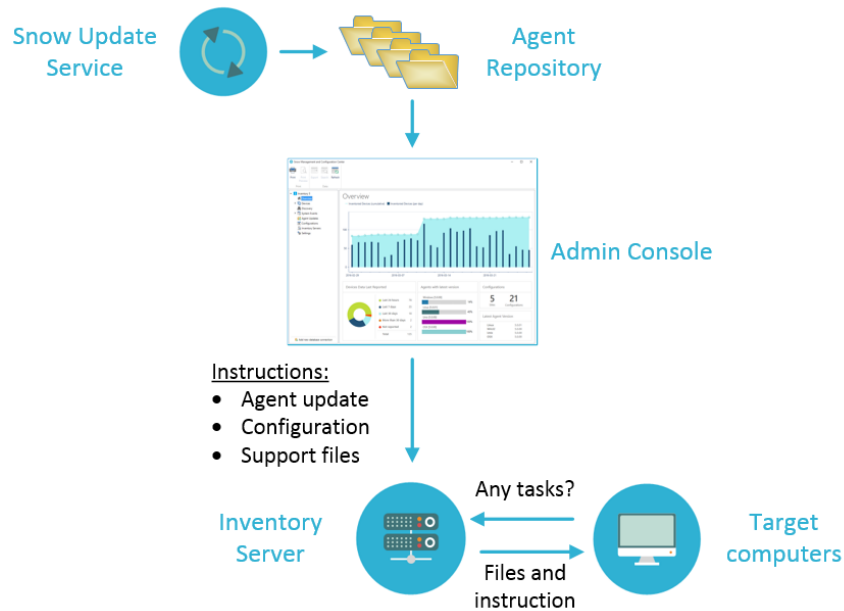


7.2 AGENT UPDATES

Once the Snow Inventory Agents are deployed to the devices, Snow Inventory provides the ability to keep the agents up-to-date over time. This is achieved through Snow Inventory Admin Console which provides an overview of agent versions, total number of agent configurations (sites, configurations) and latest agent version available for updating the environment.

An agent update job takes care of updating the agent version, agent configuration, and the support files (add or remove) located in the agent installation folder.

The Agent Repository is a file share where all agents are stored. New agent versions are automatically downloaded to the Master Server instance via the Snow Update Service (SUS), and made available in the Snow Inventory Admin Console. To install the updates on the agents, the administrator creates an agent update job where the computers targeted to receive the update are defined.



As part of the regular communication between the Snow Agent and the Master Server, the agent contacts the server to check for new instructions. If the computer is target for an update job, the agent fetches the update and the appended instruction. The instruction tells when the upgrade is to take place, and if downgrade is allowed.

Considering business critical production environments, the agent updates can be scheduled to be performed immediately or defined to be installed within a specified service maintenance window.