



Asset Tracking Inventory use case

White Paper

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ABOUT ALTIRIS

Altiris, Inc. is a pioneer of IT lifecycle management software that allows IT organizations to easily manage desktops, notebooks, thin clients, handhelds, industry-standard servers, and heterogeneous software including Microsoft Windows*, Linux*, and UNIX*. Altiris automates and simplifies IT projects throughout the life of an asset to reduce the cost and complexity of management. Altiris client and mobile, server, and asset management solutions natively integrate via a common Web-based console and repository. For more information, visit www.altiris.com.

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Altiris, Inc.
588 West 400 South
Lindon, UT 84042

Phone: (801) 226-8500
Fax: (801) 226-8506

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CONTENTS

Introduction	1
Overview of Asset Tracking	2
"Anytime" Asset Tracking Inventory	2
Benefits of OOB Asset Tracking	3
Tracking Software Asset Information	3
Troubleshooting a Missing Agent	3
Tracking hardware asset information	4
Accessing Assets.....	5
Altiris Database and Reports.....	6
Altiris Database Schema	6
Exercise 1: Use OOB Management to Track Inventory	9
Exercise 2: Use Network Discovery to discover Inventory	13

INTRODUCTION

This document presents a use case for hardware asset tracking and inventory. This document shows how Intel® Active Management Technology (Intel® AMT) and the Altiris Agent work together to expand the ability to inventory assets through out of band communication — available through Intel AMT capabilities even if PC power is off, the OS is down, or hardware (such as a hard drive) has failed. The audience for this document is IT professionals and service providers.

OVERVIEW OF ASSET TRACKING

This document explains how Asset Tracking Inventory works when using the Altiris Agent to manage PCs with Intel® Core™2 processor with vPro™ technology and PCs with Intel® Centrino®2 with vPro™ technology.

"Anytime" Asset Tracking Inventory

Enterprises are under significant pressure to know how many software licenses to pay for, how many assets to keep on maintenance contracts, which assets need recertification, and which need updating, securing, or upgrading. Unfortunately, acquiring the necessary hardware and software inventory information is one of the main challenges in managing PCs, as this information is typically lost or unavailable when a PC is powered down, reconfigured, or inoperative.

PCs with Intel® vPro™ technology and Altiris Inventory Solution enable reliable, accurate inventory of hardware and software assets — including version information (useful for field replaceable units, or FRUs) and component model numbers and manufacturer. IT administrators can now locate assets anytime, day or night, regardless of PC power state or the health of the operating system (OS). This out-of-band (OOB) or "anytime" inventory capability reduces the number of deskside visits previously required to take manual inventories, and helps eliminate their associated costs. (Managed PCs must be plugged into a power source and connected to the network.)

When IT administrators can maintain accurate, up-to-date hardware and software inventories, they can make better decisions about their computing infrastructure, which in turn helps them lower costs and reduce risks.

Benefits of OOB Asset Tracking

Benefits of OOB asset tracking include:

- Avoid difficult and time-consuming manual hardware and software inventory methods.
- Conduct more accurate inventory of common hardware items like such as hard drive make and model, memory size and speed, CPU type and speed, BIOS configuration information and version information, and so on.
- Conduct more accurate inventory of common software items such as virus software version, management software version, and OS version (to help with software compliance).
- Help reduce duplicate licensing and support fees via more accurate inventories.
- Help companies comply with government regulations on reporting the capital assets the business really has.
- Enables IT admins to make more accurate projections of future hardware and software needs.

Tracking Software Asset Information

Intel AMT also includes protected memory in which third-party vendors can store information, such as software version information, .DAT files, and so on. This information can also be collected and used to improve the accuracy of software inventories.

Troubleshooting a Missing Agent

Another benefit of out-of-band asset tracking is being able to identify possible causes for a management agent not responding within a reasonable time. For example, you can use verify network communication to the PC and identify the PC's power state. This can help eliminate possible reasons that the agent is not responding because the PC is powered off. The agent can be checked to determine if it has been disabled, or if the operating system has been reinstalled, or if the system is off, but still connected to the network.

Intel AMT also has a hardware-based, out-of-band agent presence-checking feature which generates an OOB event (and alert, if specified by IT policy) when an agent misses its specified check-in. For more information about this feature, refer to the Intel vPro technology white paper, available on the Intel Web site.

TRACKING HARDWARE ASSET INFORMATION

Intel AMT Inventory is a hardware based inventory collection. It's outside the operating system and does not provide operating system details, but focuses strictly on the system's hardware. With Intel vPro, a person can discover and wake up a system, send a command and get a more detailed inventory of what hardware (or software) that system has. For the actual hardware reporting this information is easily managed within the Altiris CMDB solution.

Hardware asset information is automatically updated every time the system goes through power-on self-test (POST). Intel AMT collects the inventory information and stores it directly into protected NVRAM (nonvolatile random access memory) located in the Intel chipset (not on the hard drive). The BIOS captures hardware data into the SMBIOS tables located within the chipset. Once obtained, the hardware asset data is available through the Intel AMT capabilities, even if the PC is powered off.

Each time an Intel AMT-enabled PC boots, hardware asset data (listed below) is updated and stored in protected memory.

Thus if a variance occurs between PC boots, an event is logged in the persistent Intel AMT event log and, if specified by IT policy, an alert is sent to the Altiris console. In addition, should a replacement part be needed, the exact data of the difference can be uploaded to the Altiris console.

Motherboard:

- Manufacturer
- Product
- Version
- Serial Number
- Asset Tag

CPU:

- Manufacturer
- Type
- Family
- Speed

Memory:

- Manufacturer
- Speed
- Size
- Serial Number
- Asset Tag

Hard Drive:

- Model
- Serial Number
- Size

Accessing Assets

Assets can be accessed in different ways, depending on the MEBx settings for Intel vPro technology and the provisioning mode being used (enterprise or SMB mode). You can access assets through:

- **Altiris Out of Band Management Task Server Task:** a task or a task within a job can be setup to capture the inventory and insert the data into the Altiris CMDB. Altiris can generate various reports and collections from this data.
- **Altiris Real Time System Manager Solution:** RTSM can interface with Intel AMT and pull up the inventory data. RTSM does not place it in any kind of database, but is a live representation of the data pulled from Intel AMT's protected memory. See the Altiris Real-Time system Manager Solution 6.2 Reference Guide for more information.
- **Network Discovery** populates the Intel AMT inventory tables. This information can be found in Device Classifications.
- **Web User Interface:** using the common address of `http://<IP_Address>:16992` (non-TLS) or `http://<IP_Address>:16993` for TLS enabled systems a user interface can be accessed to not only control the Intel ME (for Intel AMT and Intel vPro), but also access the Intel AMT Inventory directly.

Altiris Database and Reports

This discussion briefly describes the database schema and explains how Altiris stores the Intel AMT hardware asset information.

All database tables contain an `_id` column and a column named `_ResourceGuid`.

The ID column is dynamically created sequentially as data is inserted into the table. Generally the ID column isn't used in normal reporting.

The `_ResourceGuid` column ties the row data to a specific resource or Intel AMT-enabled PC. The resource grid column ties row data not only to a specific PC, but to all other data collected for that system. This allows other data available through other Altiris Solutions to be available throughout the database. The `_ResourceGuid` is unique for every PC in the Notification Server infrastructure.

Altiris Database Schema

The Altiris database schema is as follows:

- `Inv_AMT_Base_Board` : This contain details about the motherboard of the system.
 - Manufacturer — of the motherboard.
 - Product — Unique product identifier for the motherboard.
 - Version — if applicable, the version of the motherboard.
 - Serial Number — This is considered the main serial number for the system.
 - Asset Tag — If available, this is the asset tag of the motherboard.
 - Replaceable.
- `Inv_AMT_BIOS` : This specific details about the system's BIOS
 - BIOS Vendor : Who manufactured the BIOS.
 - BIOS Version : Vender-specific version for the BIOS.
 - BIOS Release Date : When the BIOS was released to production.
- `Inv_AMT_Computer_System`
 - Manufacturer.
 - Name : The full make and model of the system.
 - Version.
 - Serial Number : The main system serial number (possibly same as in the `Base_Board` serial number field).
 - UUID : The universal unique identifier (UUID) of the system.

- Inv_AMT_FRU : FRU (field replaceable unit) data is stored directly in the Intel vPro technology protected memory. You can access this data via Altiris solutions even when the PC is powered off, the OS is down, or hardware (such as a hard drive) has failed. The purpose of this data is to eliminate desktide visits by allowing you to remotely access inventory information anytime. In turn, this helps you remotely identify the various details about the unit so that a replacement can be ordered without requiring a desktide visit just to obtain part numbers and other applicable information requested by the vendor.
 - Vender ID
 - Device ID
 - Revision ID
 - Proglf
 - SubClass
 - BaseClass
 - Subvender ID
 - Subsystem ID
 - Device Location
 - Row_ID
- Inv_AMT_Media_Device : This includes all media drives including DVD/ROM drives, floppy drives, flash drives, etc.
 - Model Number — The device's model information (ie: Plextor DVD/R PX-755A for a DVD/ROM).
 - Volume SerialNumber — If available the serial number of the media devices drive volume.
 - Size — If applicable the size of the media drive.
 - Row_ID — Used for device identification per PC. For example if the target PC has two hard drives and a DVD/ROM, They would be sequentially marked as drives 0, 1, and 2.
- Inv_AMT_Memory_Device : This includes RAM information for the system.
 - Size — The amount of memory for the memory stick.
 - Form Factor — Memory interface.
 - Type — The type of RAM.
 - Type Details.
 - Speed — The BUS speed of the memory.
 - Manufacturer — Maker of the RAM. Often this information is not captured in a recognizable form.
 - Serial Number — Serial number of the specific RAM module.
 - Asset Tag — If available the asset tag of the specific RAM module.
 - Part Number — Manufacturer's part number for the hardware (RAM).
 - Row_ID — Used for sequential module information per device.

- **Inv_AMT_Network_Info** : Contains network specific information stored by Intel AMT. Since Intel AMT accesses the network even when power is off this information will be available whether the system is on or off. If the OS has loaded and made a DHCP request both Intel AMT and the OS should be synchronized. The following information is typical Network information:
 - IP Address.
 - Subnet Mask.
 - Default Gateway.
 - Primary DNS.
 - Secondary DNS.
 - Domain Name — This should be synchronized between Intel AMT and the host OS.
 - Host Name — This should be synchronized between Intel AMT and the host OS
 - Is DHCP— Is DHCP enabled both in Intel AMT and the OS? This state changes depending on whether the OS is running or not.
 - Is VLAN Enabled.
 - VLAN Tag — Associated VLAN tag if enabled.
 - Is PING Enabled.
 - Provisioning Mode — This is the Intel AMT operational mode (enterprise or SMB).
 - _Username — The Intel AMT username.
 - _Password — The Intel AMT administrator password.
 - _DiscDomain — The domain the system was a part of when Intel AMT was provisioned.
- **Inv_AMT_NV_RAM_Data** : This is the data Altiris writes back to the NVRAM and does not include other vendor information. This is written into NVRAM by Network Discovery.
 - Discovery Date
 - MAC Address
- **Inv_AMT_Processor** : Information about the system's processor:
 - Device ID.
 - Maximum Clock Speed.
 - Current Clock Speed.
 - Status — Used if there are more than one processor on the system.
 - Type.
 - Family — Type of processor such as Intel® Centrino®2 processor or Intel Core 2 processor.
 - Upgrade Information.
 - Socket Population — Provides the socket ID, starting with 0.
 - Socket Designation — Socket type.
 - Manufacturer.
 - Version — This is the type of CPU.
 - Row_ID — Used as the previous Row_ID columns in preceding tables.

Exercise 1: Use OOB Management to Track Inventory

OOB management allows you to define a Task Server task that will obtain Intel AMT hardware inventory. Used with the Altiris Inventory Solution, OOB management lets you capture an inventory even when a PC's power is off.

This exercise shows how to get an inventory for a PC (or collection of PCs). This involves running the single task for capturing Inventory, though this server-based task can be added as part of a larger Job.

Remember that, as an Intel AMT-enabled PC powers up, Intel AMT automatically populates the SMBIOS tables during the boot process with hardware data detected during power-on self-test (POST).

Follow these steps to get hardware-asset information for a PC or collection of PCs:

1. In the Altiris Console go to **Manage > Jobs > Task Management**.
2. Browse to **Tasks and Jobs > Server Tasks > Out of Band Management >** and select **Get Intel® AMT Inventory** (see Figure 1).

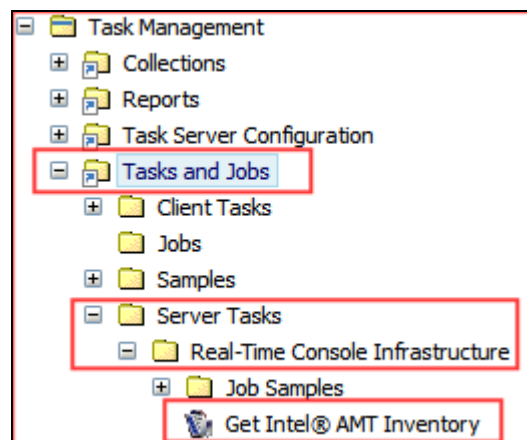


Figure 1: Select Get Intel AMT Inventory

3. Click **Run Now** at the top of the right pane.
4. Enter a run name for this inventory (for tracking purposes).
5. Select the resource link **Select computers** (see Figure 2).

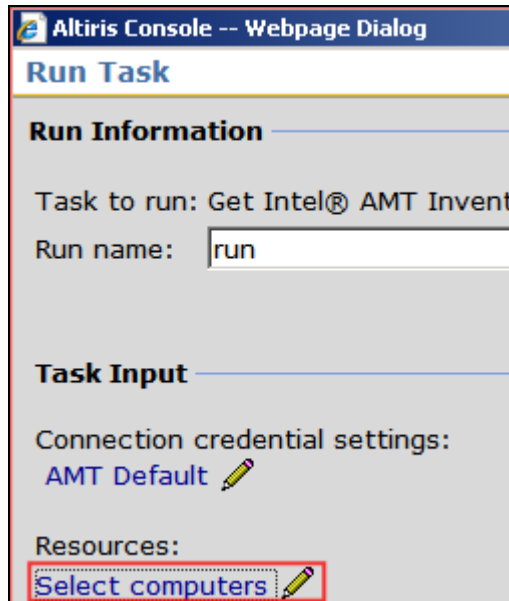


Figure 2. Enter run name and specify task resources

6. Select collections or PCs as needed (see Figure 3). The selected systems will be moved to the right side of the screen. Each PC in each collection and all individually selected PCs will have this task run on them.

7. Click **OK** to return to the Run Task page.

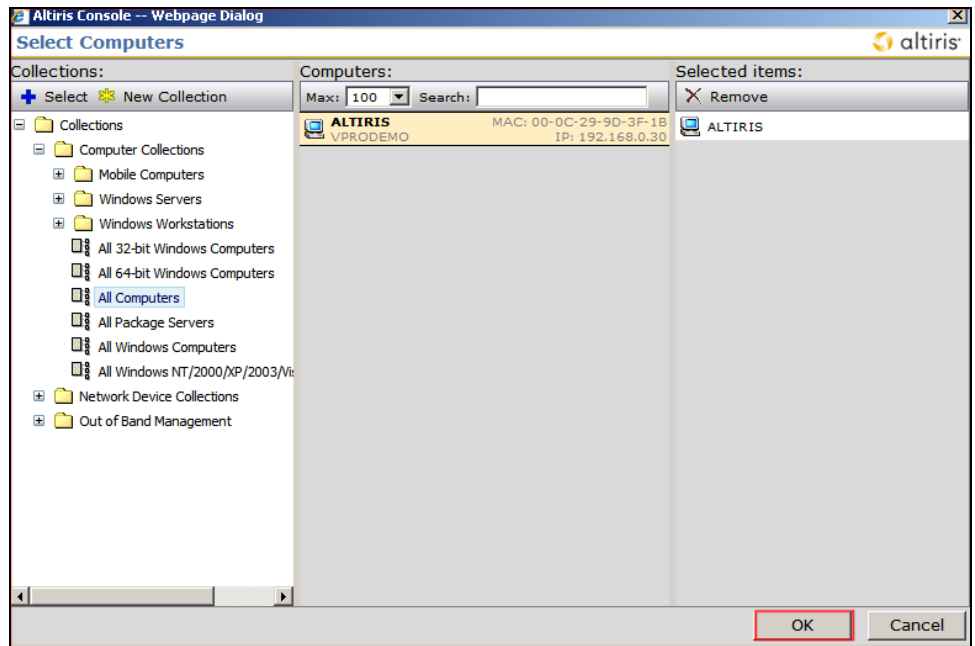


Figure 3. Select computers or systems to inventory

8. Click **Run Now** to execute the task.

You can track the status of the inventory in the lower-right pane.

For each PC being inventoried, the Altiris Notification Server queries the system for the hardware inventory data stored in Intel AMT memory. The Altiris inventory files are generated by RTCI when the inventory information is collected. The NSE is created dynamically by RTCI and then placed in the queues located at `\\<NS>WSCap\vtqueue`.

The NS data loader takes these files, processes them, and inserts the data into the appropriate tables. Altiris solutions can then generate an inventory report.

9. Select **Reports > All Reports** (see Figure 4).



Figure 4. Select All Reports

10. Expand **Platform Administration > Out of Band Management**.
The last four reports are Altiris-generated reports that contain the hardware inventory information.
11. Select each report to view information about the inventory and assets of the system (see Figure 5)

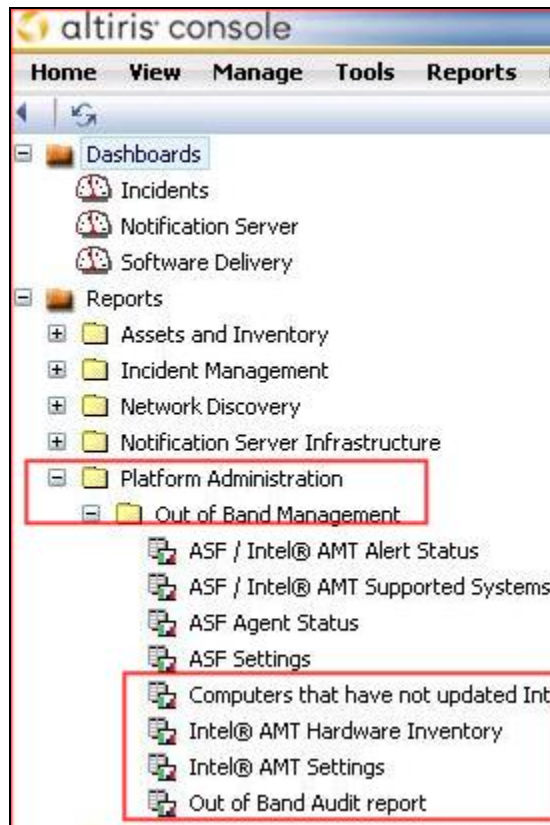


Figure 5. View reports

If the Intel AMT inventory task is submitted across the entire environment, the reports will display a contrast in the database. This contrast can be used to locate the systems that have checked in that day and the systems that have not checked in. This information can then be used to determine if the systems that have not checked in are still active assets or if they are retired.

Exercise 2: Use Network Discovery to discover Inventory

You can also use network discovery features to capture hardware asset information stored by Intel AMT. Follow these steps to use network discovery for a hardware asset inventory:

1. Go to **Solution Settings > Network Discovery > Network Discovery Settings**.
2. In the right pane, under **Resource Creation Settings**, select the hardware that needs to be captured during the discovery process (see Figure 6)

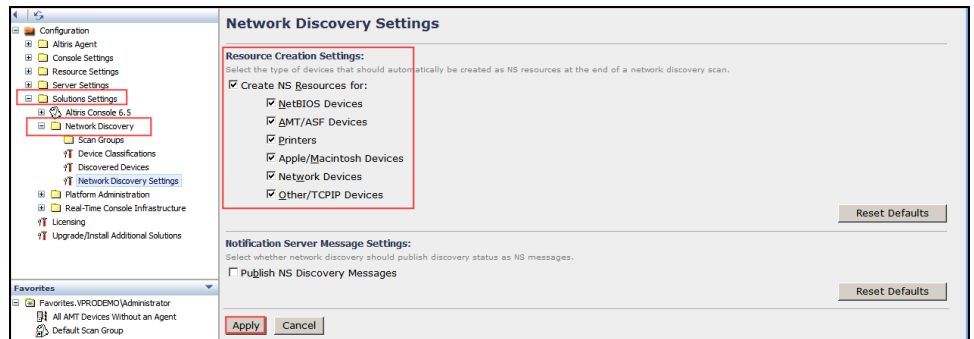


Figure 6. Select Network Discovery Settings

3. Select Default Scan Group.
4. Select the Advanced Tab.
5. Under AMT options check the checkbox for Collect AMT Inventory (see Figure 7).

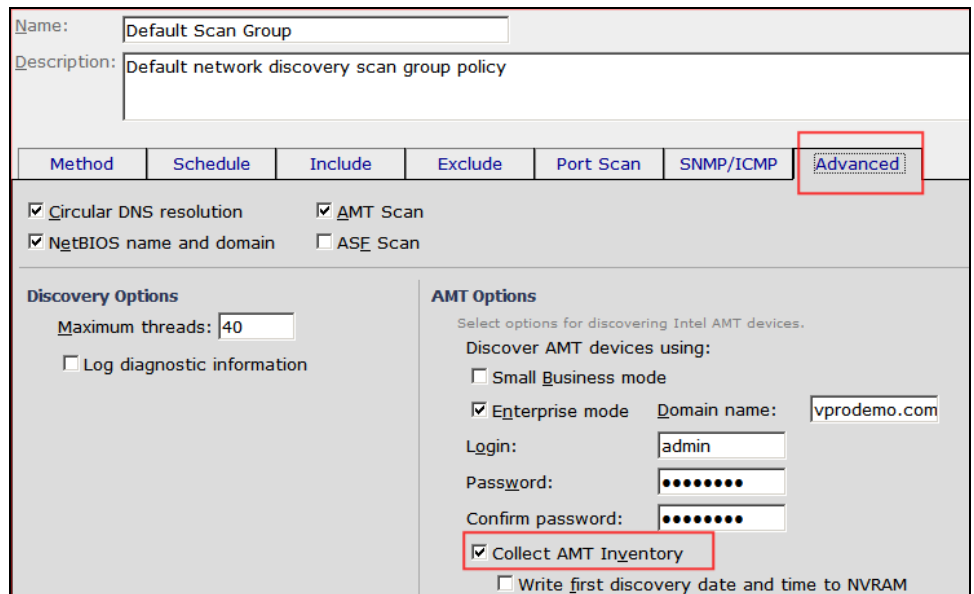


Figure 7. Collect AMT Inventory

6. Select the Method tab.
7. Under Address ranges, choose the range of IP address to scan for clients.
8. Click **Apply**.
9. Click **Discover Now** at the top right of the display (see Figure 8).

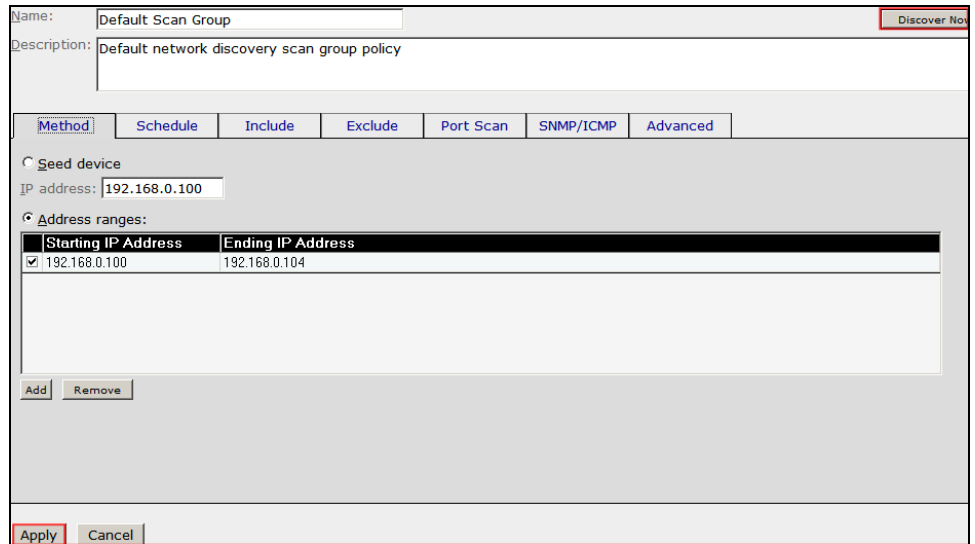


Figure 8. Discover clients

10. Select **Solution Settings > Network Discovery > Device Classifications** to view the types of hardware inventory in the discovered client(s) (see Figure 9).

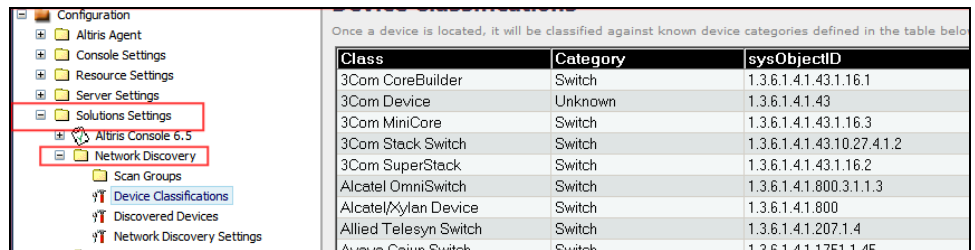


Figure 9.2 Select Device classification