HP Asset Manager

Use of bulk import for software installations

invent

Legal Notices

Copyright Notices

Restricted Rights Legend

Confidential computer software.

Valid license from HP required for possession, use or copying.

Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Warranty

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services.

Nothing herein should be construed as constituting an additional warranty.

HP shall not be liable for technical or editorial errors or omissions contained herein.

The information contained herein is subject to change without notice.

Trademark Notices

- Adobe®, Adobe logo®, Acrobat® and Acrobat Logo® are trademarks of Adobe Systems Incorporated.
- Corel® and Corel logo® are trademarks or registered trademarks of Corel Corporation or Corel Corporation Limited.
- Java™ is a US trademark of Sun Microsystems, Inc.
- Microsoft®, Windows®, Windows NT®, Windows® XP, Windows Mobile® and Windows Vista® are U.S. registered trademarks of Microsoft Corporation.
- Oracle® is a registered trademark of Oracle Corporation and/or its affiliates.
- DB/2 is a registered trademark of I.B.M. Oracle Corporation and/or its affiliates.
- UNIX® is a registered trademark of The Open Group.

Introduction

This sizing guide is intended to assist you in implementing a fast import process of inventoried software into Asset Manager® using a Bulk import process.

It describes some modifications that you make and the improved results that you may experience. In tests done in the lab, 500 000 to 1 000 000 software installations could be imported in about 1 hour, with a single thread. Multi-threading import will show improved performance.

This document is intended for customers who have large amounts of data to import, especially a great number of software installations (> 100 000). In addition, customers who want to implement these modifications should already be familiar with both Connect-It and Asset Manager. It is also necessary that they have skills in SQL and integration tools.

This white paper is not designed to provide a real life example or a working example; it will however list possible methodologies that could be used and might be chosen accordingly by the team implementing the project. For example SQLLDR, BCP, direct SQL injection from an intermediate table on the DBMS.

Important:

Notice that as described, there are prerequisites that must be met to ensure that the Asset Manager database will have integrity constraints met.

All requirements are mandatory, if any of the requirements are not met, it will void the Asset Manager support on the Asset Manager database on which this white paper has been applied.

Note: The results of implementing these modifications in a production environment may vary based on a variety of factors, including hardware and software configurations; network hardware, software and traffic volume; other applications running on client and server machines, including the database; and expertise in tuning HP Discovery and Dependency Mapping Inventory, Connect-It, Asset Manager and various tools that will be used to perform the bulk import . All these factors are beyond the scope of this document.

Requirements

The following prerequisites must be satisfied to ensure that the Asset Manager database meets the integrity constraints.
Requirement 1- All software installations in the database must be set in the compact mode
Requirement 2 - Bulk import table
Requirement 3 - Comment field and document association
Requirement 4 - Bulk import table links
Requirement 5 - Denormalized fields from other tables in
Requirement 6 - None denormalized fields from amSoftInstall in other tables
Requirement 7 - Record ID 0 of
Requirement 8 - Database validity
Requirement 9 - Workflows
Requirement 10 - Customized structure
Requirement 11 - Connect-It scenario – Asset Manager

Notes:

All requirements are mandatory, missing any of them will void the Asset Manager support on the Asset Manager database; thus result in the incorrect application of this White Paper.

Application of the White Paper implies that the customer fully agrees with the policy that no implementation should be done directly on a production database without appropriate tests on a development database.

To ensure the database security, always keep backups of the production database through the DBMS specific backup tools.

The bulk technology import is permitted only on the amSoftInstall table; it cannot be applied to other tables regardless of whether it is linked to amSoftInstall or not.

Requirement 1- All software installations in the database must be set in the compact mode

All software installations in the database are in the compact mode (no software installation row in table amSoftInstall should be an overflow of any portfolio item in table amPortfolio).

For further information on an in-depth description of the compact software installation, refer to the following documentation:

1. For Asset Center 4.4.x “Software Installations: Enhancement Implementation Managing Software Installations out of amPortfolio table for large implementations”.
2. HP Asset Manager White Paper: Migrating customized compact software installations from AC 4.4.x to AM 5.x (“Migrating customized compact SI from AC 4.4.x to AM 5.x.pdf”) packaged with Asset Manager versions 5.x.
3. The Asset Manager 5.1x and 5.2x Software Assets manual, chapter Using the Software assets module, Section Software installations and utilizations management.
4. The Asset Manager 5.21 Release Notes manual, Chapter In this Version, Section Changes introduced in version 5.21/ Integration with HP Discovery and Dependency Mapping Inventory (as part of the Service Asset and Configuration Management integration): enhancements.
5. Other manuals referring to the compact software installation such as the Asset Manager 5.21 Service Asset and Configuration Management manual (AM521-SACM-EN.pdf) or documents not published yet at the time this White Paper is written.

To check out whether the software installations are in compact mode, connect to the Asset Manager Windows GUI as Admin and proceed with the following steps:

Step 1 : amModel check

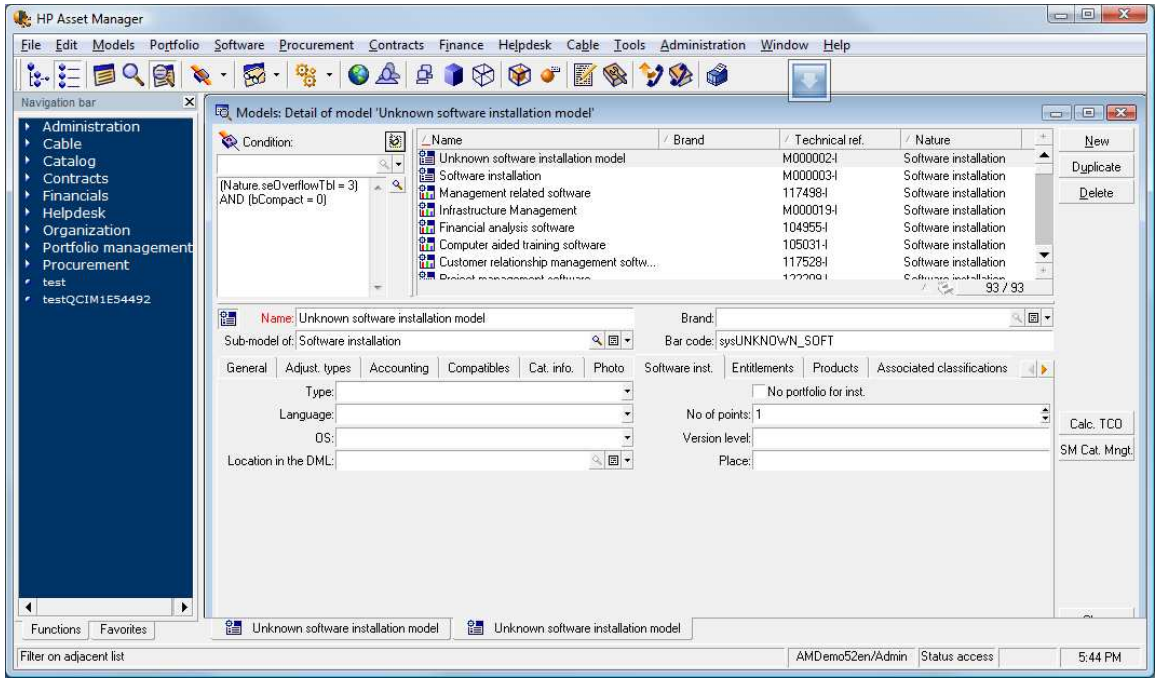
All models in the Asset Manager database associated with a nature generating software installations have the field bCompact set to 1.

To detect whether the Asset Manager database is compliant, one way is to use the appropriate filter on the amModel table:

(Nature.seOverflowTbl = 3) AND (bCompact = 0)

No record should appear in the list.

If this filter retrieves some records as shown in the following database, correct them accordingly to make all software installation compact.



Example of a non compliant database

Step 2 : amSoftInstall check

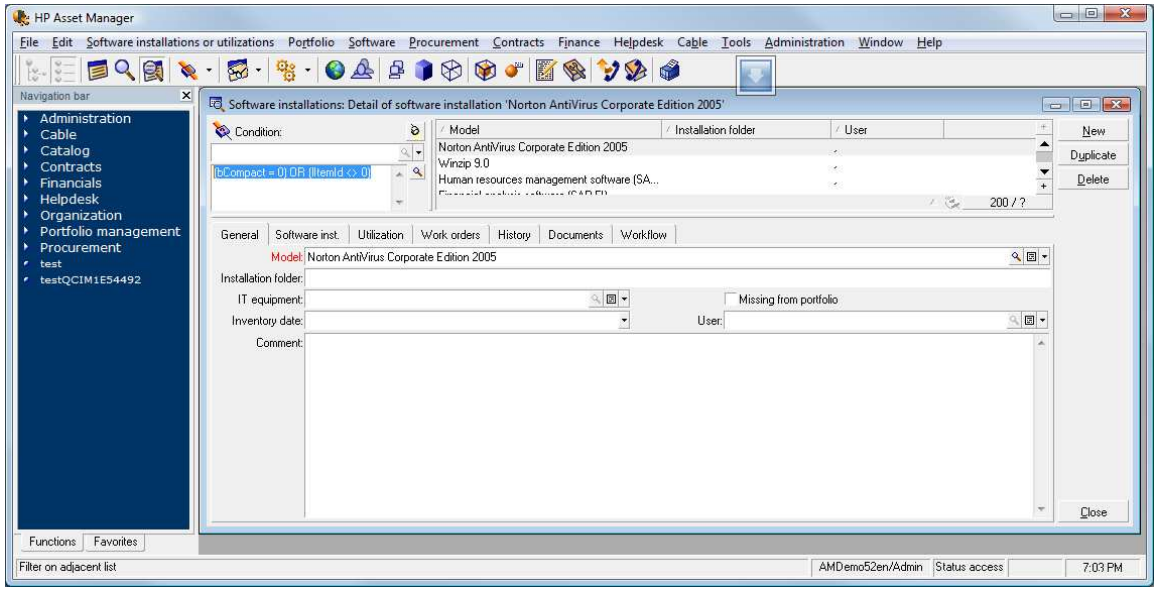
All Software installations (amSoftInstall overflow table) in the Asset Manager database must have the field bCompact set to 1.

To detect whether the Asset Manager database is compliant, one way is to use the appropriate filter on the amSoftInstall table (press the **Shift** key when opening the menu **Portfolio / Software installations or utilizations**), then apply the query filter:

(bCompact = 0) OR (llItemId <> 0)

No record should appear in the list.

If any record is displayed in the list, the Asset Manager Software installations have to be corrected to match the requirements.



Example of a non compliant database

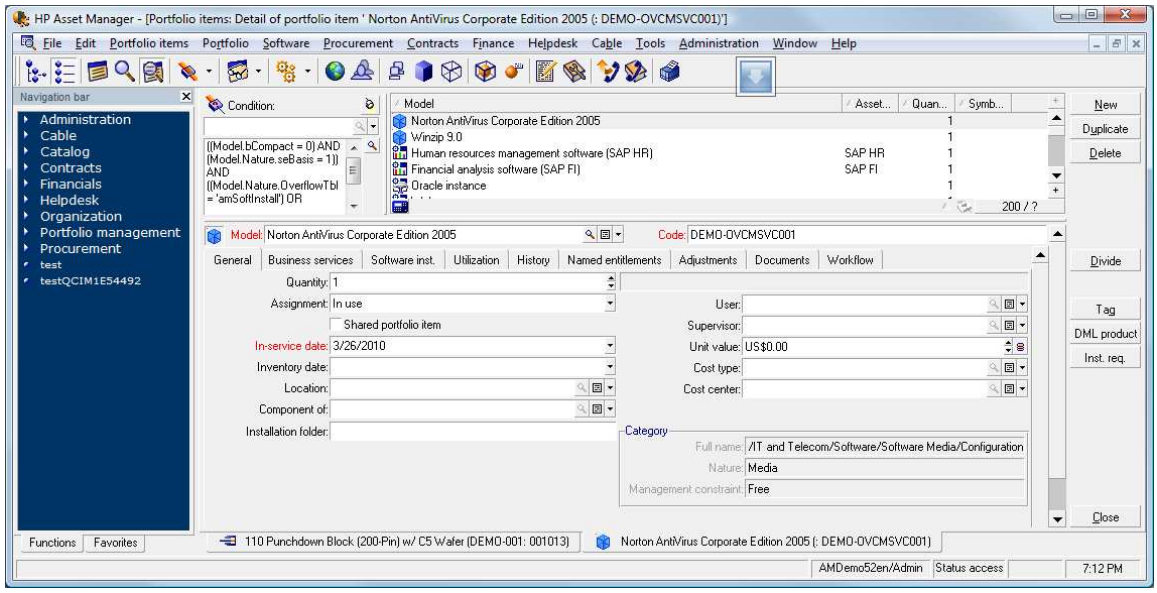
Step 3 : amPortfolio check

Press the **Shift** key when opening the **Portfolio/Portfolio items** menu

Apply the following query filter:

((Model.bCompact = 0) AND (Model.Nature.seBasis = 1)) AND ((Model.Nature.OverflowTbl = 'amSoftInstall') OR (Model.Nature.seOverflowTbl = 3))

Make sure no record is retrieved by this filter.



Example of a non compliant database

Requirement 2 - Bulk import table ID

Whatever program you choose to generate the software import file it is responsible for setting properly the ID key of the amSoftInstall table (lSoftInstId).

There are various possibilities. However, ID must be unique across the database. Each record (whatever table it belongs to) must have a unique ID.

Method 1 : reserve a specific ID range

The first methodology is to reserve an ID range for amSoftInstall by modification of the AM sequence (Oracle or DB2) or lastid table (MS SQL Server).

Then you are able to reuse the same ID range for each import. Each record must be unique. From a database ID utilization perspective, this method is the best.

However, IDs will have to be regenerated each time when the Application Designer command line tool (amdbal) is used to either defrag the database ID or compact the IDs.

Amdbal:

-idcompact : Perform the chosen ID compacting steps: p=preparation, v=virtual compacting, r=real compacting, f=finalization, c=closure, t<mn>=timeout in minutes.

-iddefrag : Defragmentation of record identifiers. nocheck=do not check broken links before defragmentation operation.

To reserve 100 Million rows for the software installations IDs, first, make sure no program are connected to the Asset Manager database.

Then after the ID range has been reserved, insert a record into the table of your choice through Asset Manager GUI and make sure that the ID generated is correct (within the 100 Million gaps).

Note: Asset Manager **LastId Diagnostic** of the database diagnostic function (accessed by **Action/ Diagnostics / repair database** menu of the Application Designer) can have a negative impact if the diagnosis is run right after the ID range has been reserved and could reset the ID range. Therefore, it is not recommended to perform that diagnosis shortly after implementing the ID range reservation for the amSoftInstall records.

Oracle / DB2 example

For Oracle database, the ID range is reserved by modifying the sequence AM parameter through SQL*Plus query tool which connects to the database as the schema owner.

Typically with Oracle from SQLPLUS connected as the schema owner:

```
SQL> select am.nextval from dual;

   NEXTVAL
---------
 153076612

SQL> Drop sequence AM;

Sequence dropped.

SQL> CREATE SEQUENCE "AM" INCREMENT BY 30 START WITH
  2      163076612 MAXVALUE 1.0E27 MINVALUE 1 NOCYCLE
  3      CACHE 20 NOORDER;

Sequence created.

SQL> select am.nextval from dual;

   NEXTVAL
---------
 163076612
```

The IDs range [153076612;163076612] will be reserved for the lsoftid values of amSoftInstall.

MS SQL server example

The ID range is reserved by editing the `LastId` parameter through an MS SQL server database query tool like MS SQL Server Management Studio.

```
INSERT INTO [AMDemo52en].[itam].[LastId]
        ([Value])
    VALUES
        (12345678)
go
select idseed from itam.lastid where value=12345678
go
idseed
-----------
3673
 (1 row(s) affected)
```

For an MS SQL Server, the IDs used for records will be the value of idseed *30. Therefore, to reserve 10000000 rows, you must add the value of the identity column (idseed) by 3333334 to reserve 100000020 rows). In this example, the new idseed will be 3673 + 3333334 = 3337007

```
Drop table [itam].[LastId]
go
Command(s) completed successfully.
select 3673+(100000029/30)
-----------
3337007
(1 row(s) affected)
CREATE TABLE [itam].[LastId](
  [IdSeed] [numeric](9, 0) IDENTITY(3337007,1) NOT NULL,
  [Value] [int] NULL
) ON [PRIMARY]
Go
Command(s) completed successfully.
To check:
INSERT INTO [AMDemo52en].[itam].[LastId]
        ([Value])
    VALUES
        (12345678)
go
(1 row(s) affected)
select idseed from itam.lastid where value=12345678
go
```

idseed

3337007

(1 row(s) affected)

Method 2 : generate dynamic IDs for software installations IDs

This method is probably simpler to use (The am.nextval can be used as the value to insert into an Oracle database, but it will lead to faster database ID growth. After the IDs have been exhausted in the database (2^31) the Application Designer command line tool (amdbal) will be used to either defrag the database ID or compact the IDs.

Note: ID defrag is faster but must be done when the database is offline.

Requirement 3 - Comment field and document association

No comment or document can be associated to any record of the amSoftInstall table.

Requirement 4 - Bulk import table links

Whatever program you choose to generate the software import file it is responsible for setting properly the links to the existing hardware and must generate valid values for all fields.

Among those fields:

- dtInvent
- dtLastModif
- dAssignment
- lParentPortfolioId
- lModelId
- lUserId
- lInventModelId (if used)
- lCanInstallId
- bCompact (must be inserted with the value 1)
- lItemId (must have the value 0)
- And all other fields and links from amSoftInstall must have valid values.

Requirement 5 - Denormalized fields from other tables in amSoftInstall

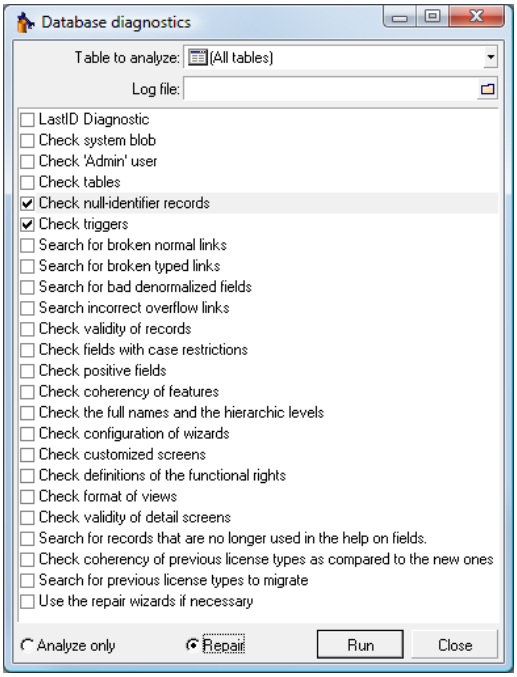
There are further considerations if the database has been customized to include some denormalized fields from other tables into amSoftInstall. The value of those fields must have a correct value generated by the bulk import program.

Requirement 6 - None denormalized fields from amSoftInstall in other tables

It is not permitted to use denormalized fields from amSoftInstall in other tables. Bulk import or direct SQL update on tables other than amSoftInstall will void the support of the database.

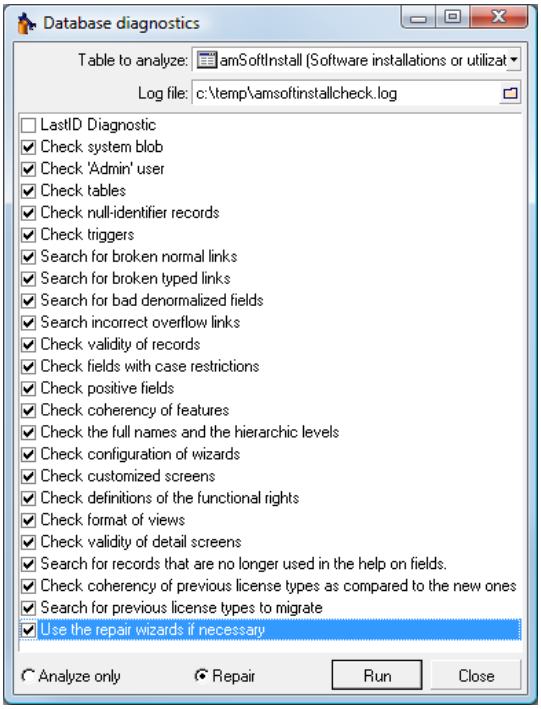
Requirement 7 - Record ID 0 of amSoftInstall

A record ID 0 must be inserted into amSoftInstall. This record can be inserted either along with the bulk import through the bulk import program with values pointing to no other linked records (all links set to 0), or inserted after or before the bulk import through the diagnostics and repair database function of the Application Designer (amdba).



Requirement 8 - Database validity

A **Diagnostics / repair database** function available in the Application Designer should detect no error when it is run on the amSoftInstall.



Requirement 9 - Workflows

No workflow should be associated to the amSoftInstall table or have actions on the amSoftInstall records.

Requirement 10 - Customized structure

Any change or customization to the amSoftInstall table should be made in accordance with all the given requirements in this document.

It is not permitted to

create a link between an existing and a new table of Asset Manager

Or update/insert/delete the data directly through any bulk import technology bypassing the Asset Manager APIs.

Requirement 11 - Connect-It scenario – Asset Manager GUI

Connect-It scenarios must be reconfigured to make sure they do not import redundant software installations which have already been imported through the bulk import tool.

No software installation in any scenario can be imported as being non-compact.

No model generating a software installation should be inserted or updated with a non-compact model type (table amModel, field bCompact must be inserted or updated with the value 0 only).

No record on amSoftInstall can be updated or inserted with the value of bCompact other than 0.

The bulk technology import is permitted only on the amSoftInstall table; it cannot be applied to other tables regardless of whether it is linked to amSoftInstall or not.

Asset Manager® Bulk Data Inventory Import Architecture

When the Bulk import will be used, four steps need to be executed sequentially:
The typical phases of a bulk import will be depicted with a customized scenario provided as an example. Generally speaking, implementation will vary depending on the reconciliations keys and information available in the scenario. The implementation and scripting will depend on your specific implementation or database engine and will be done at implementer's responsibility.

The SQL statements provided aim to show an example of approach for implementing direct SQL take on the example scenario and will not work with an OOB scenario. The implementation needs to be adapted and tested on a test system.

Software installations can be imported through a bulk import tool only if Asset Manager Software installations are set as "compact" (bCompact) in the database: no portfolio item is generated for ANY software installation, would it be one imported through bulk import or other software installations existing in Asset Manager Database. There are other requirements that must be met, refer to Chapter Requirements

Step 1 – Create a flat table that will be used to store software installations information before the bulk import.

Here is an example of a table creation script done for a customized scenario:

```
CREATE TABLE tmp_SoftInstall (Field1 VARCHAR2(32), Field2
VARCHAR2(27),dtLastUse DATE,dtInvent DATE,bSuiteComponent
number(1),InstIdentifier VARCHAR2(120),AssetTag varchar2(128),Language
VARCHAR2(80),SoftOS VARCHAR2(80),TechnicalInfo VARCHAR2(128),VersionLevel
VARCHAR2(64),lUseCount number(16),InventoryKey VARCHAR2(64),Device_Id
number(32),lModelId number(32), DDMIHOSTNAME VARCHAR2, lInventModelId
number(32));
```

Create AMI sequence (refer to previous section Method 1) : "reserve a specific ID range"

```
CREATE SEQUENCE "AMSI" INCREMENT BY 1 START WITH 153076612 MAXVALUE 1.0E27
MINVALUE 1 NOCYCLE;
```

Step 2 – Prepare a Connect Scenario for import of meta data and hardware into Asset Manager and Software installation into the flat table

Goal of the integration scenario

HP Connect-It scenario will import into Asset Manager

- All catalogs (employees and departments, locations, product, brands, models)
- Hardware data (computers, extension cards, printers, network devices…). Hardware data can also be understood as everything that will generate a portfolio item or asset in the Asset Manager database.

Connect-It will also import in directly the flat table created at step 1

- The software installation information from the inventory tool. This software installation import does not go through the AM API instead directly inserting data into a flat table, which is much faster. The software installation data in the flat table will then be processed and merged to amSoftInstall table by running a procedure against the AM database after completing the import (Step 4)

Best practices for optimizing Connect-It performance

There are best practices to optimize Connect-It performance for inventory data insertion into Asset Manager

- Import first meta data (models, natures) in a mono threaded way

- Then import hardware data and use Connect-It parallelization to augment the number of threads for records creation
- Use caching of models to avoid un necessary queries when inserting new hardware records
- Minimize the number of document produced by your source connector using the appropriate scheduled pointer

The DDMI to Asset Manager Connect-It scenario provided with Connect-It 9.20 and following version gives a very good example on these optimizations.

Modification of the out of the box scenario is necessary

You need to modify the provided scenario to create the Software installations directly in the flat table created at step 1.

You need to insert in this flat table the information that defines the software installations and that allows to link the software installations to computers and models in Asset Manager for the final merge.

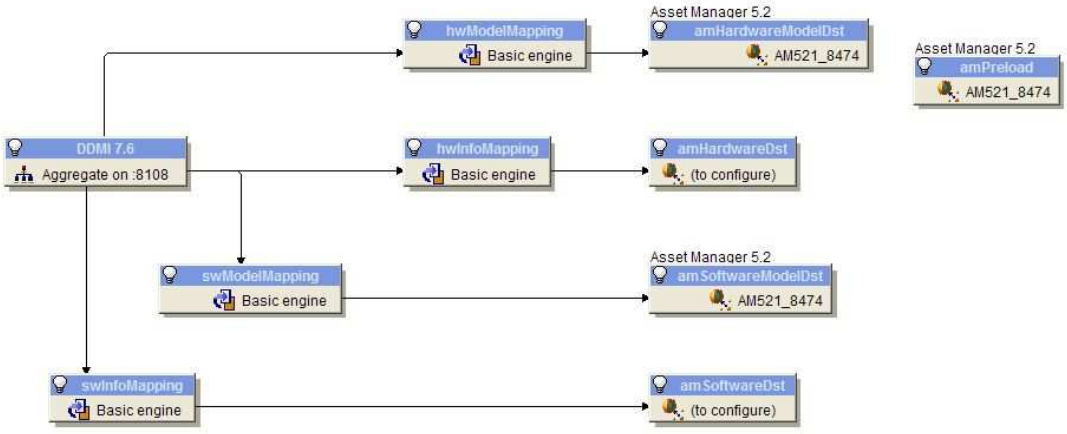
Keys for linking software installations and models:

- The keys for linking software installations to computers are multiple: BIOSASSETTAG, DDMIHOSTNAME and date of the software scan (dtSoftScan) of the computer.
- The software models linked to the software installs are found using a specific field of model: inventorykey that is a combination of fields in the DDMI database, in this scenario: "DDMI" & [$ParentDoc$.$ParentDoc$.SWSubComponents.SWVersion.Release.Application_ID] & "_" & [$ParentDoc$.$ParentDoc$.SWSubComponents.SWVersion.Release.Release_ID]

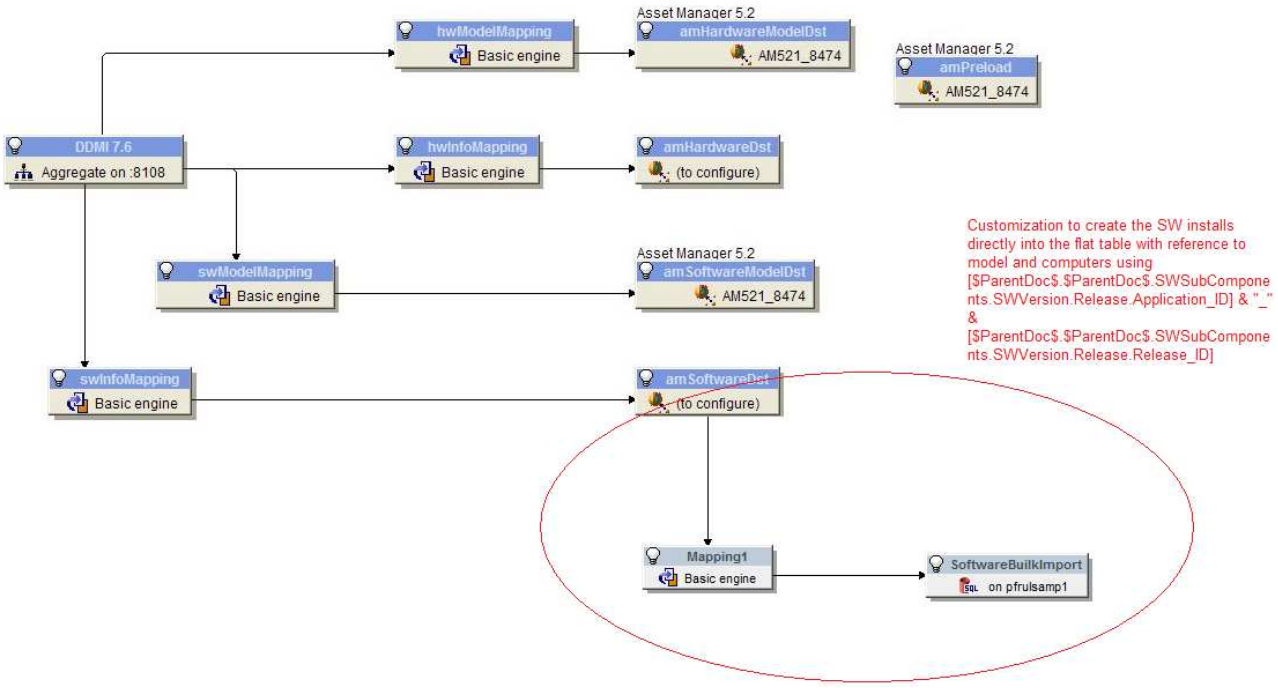
Here are some attributes that need to be loaded into the flat table

- Model Name, as created in Asset Manager
- Computer unique identifier
- Installation folder,
- Usage information
- Version level
- Scan date

Out of the box Connect-It 9.2 DDMI to Asset Manager integration scenario



Tailored for bulk import Connect-It scenario



Step 3 – Run Connect-It scenario.

After execution, hardware will be imported into Asset Manager and Software installations table will be imported into the flat table created at step 1

Step 4 - Use a bulk import tool to merge software installations into Asset Manager without going through APIs.

Delete duplicated records in the flat table

The export from inventory tool into the flat table may result into duplicated records (for instance if two instances of the same application were located on the same computer) that will cause errors during the bulk import phase. It is recommended to delete these duplicated records. The case where a "Per installation" licensing applies for an application will need to be considered because Asset Manager will, in the end, have a unique software installation

```
DELETE FROM tmp_softinstall WHERE rowid NOT IN (SELECT MIN(rowid) FROM
tmp_softinstall GROUP BY instidentifier);
```

Update the flat table with Asset Manager models ID and Computer ID

a) Updating model info for the flat table

The following SQL commands are used to complete the info of inventory model and software installation model for the records in the software installation flat table.

```
UPDATE tmp_softinstall a SET (lmodelid,linventmodelid)=(SELECT
c.lmodelfinalid,c.linventmodelid FROM amInventModel c WHERE
a.inventorykey=c.inventorykey);
DELETE FROM tmp_softinstall WHERE lmodelid IS NULL;
```

b) Updating device info for the flat table

Create an index for amComputer:

```
EXECUTE IMMEDIATE 'CREATE INDEX CPU_RECONCKEY ON amComputer (BIOSASSETTAG,
DDMIHOSTNAME, dtSoftScan) COMPUTE STATISTICS';
```

c) Execute the statement below to update the device info:

```
UPDATE tmp_softinstall a SET (lDeviceId)=(SELECT c.lItemId FROM amComputer
c WHERE a.AssetTag=c.BIOSAssetTag) and a.dtinvent=c.dtSoftScan and
a.DDMIHOSTNAME=c.DDMIHOSTNAME;
```

```
DELETE FROM tmp_softinstall WHERE lDeviceId IS NULL;
```

Prepare Asset Manager

Marking software installations in AM as disappeared

This SQL command is to mark software installations as “Disappeared”. Their state will be updated in the step to synchronize the amSoftInstall table with the interim software installation table.

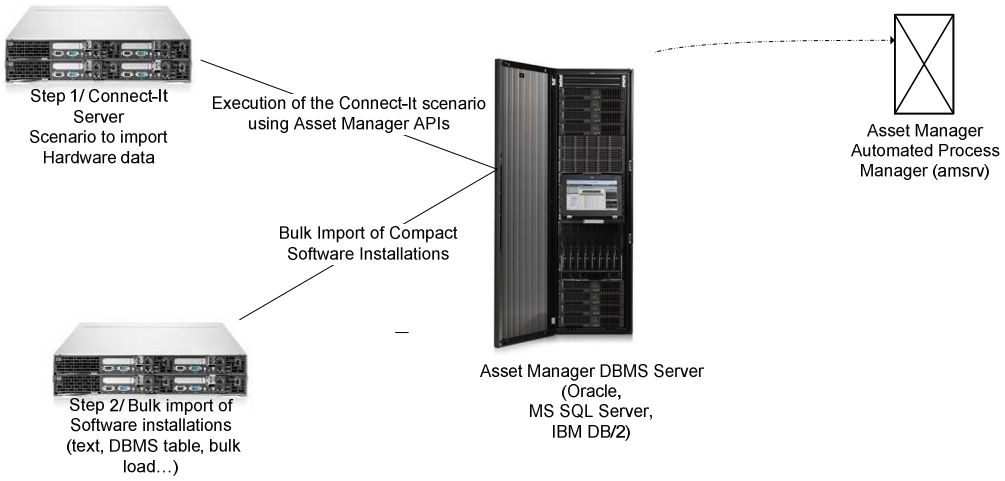
```
UPDATE amSoftInstall SET bDisappeared=1 WHERE seType=0 AND Type='DDMI' AND
EXISTS (SELECT 1 FROM tmp_softinstall a WHERE
amSoftInstall.lWorkstationId=a.lDeviceId);
```

Syncing amSoftInstall with the flat table

The following SQL commands are intended to synchronize all invetory software installation data to the amSoftInstall table.

```
MERGE INTO amSoftInstall t
USING tmp_SoftInstall s
ON (t.InstIdentifier=s.InstIdentifier)
WHEN MATCHED THEN
UPDATE SET t.bCompact=1, t.bDisappeared=0,
t.bSuiteComponent=s.bSuiteComponent,
t.dtInvent=s.dtInvent, t.dtLastUse=s.dtLastUse, t.Field1=s.Field1,
t.Field2='_Mod0',
t.Language=s.Language, t.lUseCount=s.lUseCount, t.seType=0,
t.SoftOS=s.SoftOS,
t.TechnicalInfo=s.TechnicalInfo, t.Type='DDMI',
t.Versionlevel=s.Versionlevel,
t.lModelId=s.lModelId, t. lWorkstationId=s.lDeviceId,
t.dtLastModif=SYSDATE, lcitiinventmodelid=s.linventmodelid
WHEN NOT MATCHED THEN
INSERT
(InstIdentifier,bCompact,bDisappeared,bSuiteComponent,dtInvent,dtLastUse,Fi
eld1,Field2,Language,
lUseCount,seType,SoftOS,TechnicalInfo,Type,Versionlevel,lModelId,
lWorkstationId, lSoftInstId,dtLastModif,lcitiinventmodelid)
VALUES
(s.InstIdentifier,1,0,s.bSuiteComponent,s.dtInvent,s.dtLastUse,s.Field1,'
_Mod0',s.Language,
s.lUseCount,0,s.SoftOS,s.TechnicalInfo,'DDMI',s.Versionlevel,s.lModelId,s
.lDeviceId,AMSI.NextVal,SYSDATE,s.linventmodelid)
```

Additionally the Asset Manager Automated Process Manager (amsrv) connects directly to the RDBMS server and might apply some workflows or other process on the Asset Manager database. There is no direct connection between the Connect-It server and the Asset Manager Automated Process Manager.



Troubleshooting

If anything is not correct, truncate the amSoftInstall table, then run the database repair function of the Application Designer to regenerate the 0 ID record in amSoftInstall.

HP Support will NOT help you with the implementation of this White Paper. The relevant services to implement this White Paper is provided by HP Professional Services Organization (HP PSO), and you will be charged with specific costs beyond the maintenance contract.

If for any reason a database is broken by incorrectly applying this White Paper, HP Support will ask to apply the Troubleshooting repair procedure truncating the amSoftInstall table. If this not enough to fix the issue HP Support organization will redirect the customer to the HP PSO which will cause further associated costs beyond the maintenance contract. No exception will be given for this rule.

Application of the White Paper implies that the customer fully agrees with the policy that no implementation should be done directly on a production database without appropriate tests on a development database.

HP will not be responsible in any way for a data loss or corruption that occurs if a customer encounters issues applying the enabled technology described in this white paper.

For more information

Please visit the HP Software support Web site at:

http://www.hp.com/managementsoftware/support

This web site provides contact information and details about the products, services, and support that HP Software offers.

HP Software online support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valuable support customer, you can benefit by being able to:

- Search for knowledge documents of interest
- Submit and track progress on support cases
- Submit enhancement requests online
- Download software patches
- Manage a support contract
- Look up HP support contacts
- Review information about available services
- Enter discussions with other software customers
- Research and register for software training

Note: Most of the support areas require that you register as an HP Passport user and sign in. Many also require an active support contract.

To find more information about support access levels, go to the following URL:

http://www.hp.com/managementsoftware/access_level

To register for an HP Passport ID, go to the following URL:

http://www.managementsoftware.hp.com/passport-registration.html

Limited responsibility clause

Asset Manager is integrated with several third-party applications. Examples: Database engines, Web servers, single sign-on software, load-balancing and clustering hardware and software solutions, reporting software such as Crystal Reports, etc.

Support for these applications is limited to their interface with Asset Manager. Support does not cover installation problems, setup and customization problems nor malfunctioning of the third-party application.

White papers contain examples of implementations that may work in your environment with or without customization. There is no guarantee that this will be the case. It could also be that some of the solutions covered by white papers appear as standard features in a future release of the software. When this is the case, there is no guarantee that you will be able to upgrade the solution you implemented based on the white paper to the equivalent standard feature.