EM_MigrateProject Macro User's Guide

%EM_MigrateProject Macro

The EM_MigrateProject macro prepares SAS Enterprise Miner® project directories and files for movement between operating environments. This includes moving SAS Enterprise Miner projects to or from 32-bit and 64-bit systems, and to or from different Enterprise Miner supported operating systems. Even locale and encoding are converted in this process. The EM_MigrateProject macro also restores prepared projects to a usable form after the directories and files are moved to a new system.

Type: Macro

Requirements: Enterprise Miner 6.1 M2 or later; This includes Enterprise Miner releases based on SAS V9.2 M3 and SAS 9.3 or later

Syntax:

```
%EM_MigrateProject(
  Action= [ Restore|Prepare ],
  RootPath= [ project file path ],
  VERBOSE = < OFF|ON | >,
  CLEAN= < OFF|ON >
  INCVIEWS = < OFF|ON >
 );
```

Arguments:

Action = <Restore|Prepare>

This is a required parameter that specifies what action to take. The Prepare action searches the project directory tree and converts all the project files to a portable format. The Restore action searches the project directory tree and converts all the transport format objects to native format project files.

RootPath= <project file path>

This is a required parameter that specifies the absolute path for the target project. (Do not use quotes)

VERBOSE = <OFF|ON>

Verbose is an optional parameter that controls the amount of output in the log that the macro produces.

CLEAN= <OFF|ON>

CLEAN is an optional parameter that can be used to reduce the project size by removing files that have been converted. Making a backup of any mission critical project files before conversion is considered a best practice in all cases. When preparing, the CLEAN=ON option may save some space, thus some time, when moving large projects. This option deletes files that have been converted to transport objects. When restoring, CLEAN=ON will remove most of the transport objects which can simplify verifying project contents. Any detected errors or warnings forces CLEAN to OFF.

INCVIEWS= <OFF|ON>

INCVIEWS is an optional parameter that can be used to include the project data views in the migration process. Migrating the views in the project is not required unless you want to view explore or use the exported data from the nodes in a diagram --without-- rerunning the entire flow. An example of use would be, if you add a node to a diagram migrated without views, the entire flow up to the new node you wish to run will have to be re-run on the new system. When the flow is re-run, the exported data views for each node are recreated regardless of whether they were migrated. If you choose to include the data views in the migration process you should note that in some cases a project may contain SQL views that cannot be prepared regardless of your environment. Processing such views will always cause warnings and errors in the logs, however, these SQL views -- like the data views -- are not required for the restored project to be functional. If you choose to include views in the migration process, you will get errors in the logs if all of the required libnames and data sets are not available when you restore the project. Since the views are not required to browse the project results, failure to restore the views is only a warning for the EM_MigrateProject macro.

Orientation:

When migrating SAS Enterprise Miner projects from one system to another it is important to understand that these projects are basically composed of several parts; input data, project data and metadata.

All project data, including data source definitions, diagram workspaces, and reports are stored in the Server's file system. This includes all intermediate data sets, images, listings, and files. For example, if the root directory is C:\EM62Projects and the project name is PetFoodSales, the project directory will be C:\EM62Projects\PetFoodSales. All files in the project directory and its sub-directories are part of the project data.

All project metadata is saved to the SAS Metadata Server as SAS Enterprise Miner Project objects. These objects contain the name of the project, the name of the SAS server, and the name of the project directory.

If you are performing a migration install of SAS and SAS Enterprise Miner on the same Server machine and the same operating system, you don't need to use the EM_MigrateProject macro. The project data does not need to be processed or migrated to work with SAS Enterprise Miner. When the SAS migration and configuration of SAS Metadata Server objects is completed, you will likely be able to open projects that you created in SAS Enterprise Miner 5.2 - 6.2 without loss of functionality. That process is well documented and available on line from http://support.sas.com .

Migrating to a new server, a new operating system, or a new SAS topology without careful planning can invalidate the project metadata from the previous system.

Usage: Preparation

Start on your old system by examining your projects and deciding which need to be migrated. Make backups of the projects you plan to migrate.

Start SAS on your old system and load the EM_MigrateProject macro. This can be accomplished by submitting a %include for the EM_MigrateProject.sas file from your download package. For example if you saved the files you extracted from the downloaded zip file in a folder named C:\SAS_Downloads\EM_Util load the macro with:

```
%include "C:\SAS_Downloads\EM_Util\EM_MigrateProject.sas";
```

Then use the EM_MigrateProject macro to convert the project files to a portable format by submitting something like:

```
%EM_MigrateProject(Action=PREPARE ,RootPath=C:\MyOldFiles\EMProj\Test1 );
```

The macro attempts to set the macro variable SYSCC to 0 for success and non-zero for failure. However, the SAS log may display warnings or errors even though the macro returned 0. Search the SAS log for ERROR and WARNING. If possible, correct any problems and re-run the macro.

Move the whole project directory (Test1), including all subfolders and files, to the new system. A shared disk will speed up this process. Otherwise, packaging the directories and files with a utility like Zip seems to work well.

Usage: Restoration

Once the prepared project is in place on the new system, start SAS on this new system. Setup the libnames specified in the libdata data set or the EM_ProjPREPARELog.txt file found in the root folder. These files were created when the project was prepared on the old system.

Load the EM_MigrateProject macro by submitting a %include for the EM_MigrateProject.sas file from your download package. For example if you saved the files you extracted from the downloaded zip file in a folder named C:\SAS_Downloads\EM_Util load the macro with:

```
%include "C:\SAS_Downloads\EM_Util\EM_MigrateProject.sas";
```

Then run the macro on the new system to convert the project to a format suitable for the new system. For example:

```
%EM_MigrateProject(Action=RESTORE ,RootPath=D:\MyNewFiles\OldEMProj\Test1 );
```

Note the project directory, the last directory name in the RootPath, must be the same for both Prepare and Restore actions.

In the 'Restore' process at termination the macro attempts to set the macro variable SYSCC to 0 for success and non-zero for failure. However the log may display warnings and errors even though the macro returns 0. Search the SAS log for ERROR and WARNING. If you have included the optional data views in the process, some errors and warnings in view processing may be acceptable. If the libnames and data sets used in the original projects are not available when restoring the project data views, each view processed will generate warnings and errors in the SAS log. The correct libnames and data sets are also required in order to re-run the restored project but not to view the project or the node results. There may also be warnings from Procs Cport or Cimport for catalog entries that are no longer supported, like entry type DM_NEURL. These obsolete entries were only ever used if the nodes were run and the catalog is recreated at that time. As a result omitting these obsolete catalog entries should have no effect on the operation or performance of the restored project.

If you have successfully migrated your old system to the new system in the install process and you have used the EM_MigrateProject macro to convert your project files to the proper format for the new system and you have all the file paths and permissions correct, you should be able to start SAS Enterprise Miner and open the migrated project. If you have all the libnames and data sources correctly defined you should be able to run the project on the new system if you desire.

If you have not migrated your old system metadata to the new system in the install process you can still recreate project metadata. Once the project is restored by the EM_MigrateProject macro, to recreate the metadata for the migrated project, start SAS Enterprise Miner and create a new project with the same name as the migrated project, in this example, Test1. This will recreate the project metadata and open the migrated project.

Then, in the project startup code, you can add any libnames and system options required for a fully functional project.

Details:

General

It is important to understand that a project contains both the node results and the node properties describing how each node's results were achieved. The migration process preserves both. This means if you examine the Results for each node in a migrated project, they will be exactly the same as on the old system. However, if you run a flow in a migrated project diagram the results will be replaced with the results from the new system. Each release of Enterprise Miner provides new features and improvements. Even when it is possible to exactly follow the instructions or properties in a migrated project, training models on the new release should be expected to produce models significantly

different from those produced on the old system. If you require the new system to create models that are as close as possible to the models from the old system in most cases you will need to adjust the properties for some or all of the nodes in a flow. Such an effort can often be very close to that for creating a new project.

Data Access

Although the EM_MigrateProject macro prepares and restores the files in a project or even a group of projects, each SAS Enterprise Miner project has dependencies on input data files that are not contained in the project. While access to these data files is not strictly required to prepare a project, if you have selected to include views in the migration when restoring, the presence of the correct libnames in the restore process makes for a much cleaner and more easily verified process. See the INCVIEWS option for more information.

When preparing a project the EM_MigrateProject macro will attempt to create a SAS data set named libdata and add text in the EMProjPREPARELog.txt that describes the libnames and data sets required to restore the data views and run the migrated project.

After preparing a project, check the libdata data set or the EM_ProjPREPARELog.txt file in the root folder for the libnames and data sets required for restoring a fully functional project. If all the required libnames and data sets are not available when restoring a project, the project data views cannot be processed successfully. However, since the views are not required to browse the project results, failure to restore the views is only a warning.

If you are optionally restoring a project with views and get warnings, if the libdata data set and the EMProjPREPARELog.txt are not available or incomplete you can find the required libnames and data set names needed to restore the views by examining the EMProjRESTORELog.txt. Then add the libnames and re-run the restore to fully restore the views. The EMProjRESTORELog.txt will contain warning for each missing data set, for example:

```
WARNING: A project libname for, LIB1.PA97K1 is not found.
WARNING: A project libname for, LIB2.VA92K6 is not found.
WARNING: Unable to verify all libnames and data sources for project.
WARNING: Without access to original data some project data views may
not restore.
WARNING: View restore failed
/users/my/testproj/testdiag/Workspaces/EMWS/ids2_data.stc.
Restoring SAS data views competed RC= 4
```

File System Permissions

File system permissions on EM projects' files and folders can be an issue when migrating. If you are using an account different from the project owner in the migration process, before you begin you will

need to carefully consider the issues of file system permissions on both the source (old) system and your destination (new) system.

If each individual performs their own migration, file permissions are not usually a problem but in environments with hundreds of users and thousands of projects this may not be practical. If one account is used to migrate projects for many users or if an account different from the project owner is used to migrate a project, the permissions on the project file structure may need to be altered to grant write access to the identity running the macro and the identity that runs the macro will likely end up with ownership of the files when the project is restored. Ultimately the original owner of the project may not even have permission to some or all in the restored project unless they are explicitly restored.

Macro Output Files

When preparing a project, the macro will create two new data sets and a new text file in the root directory of the project. The two data sets are libdata.sas7bdata and Prepared.sas7bdat. The text file is named EMProjPREPARELog.txt.

Libdata.sas7bdat – contains information gathered from the project about the libnames and datasets required to run the project and to restore all the views. If these are not available where or when you restore, the views will not get restored and warnings will be issued.

Prepared.sas.7bdat – contains the path and classification of the files that were prepared for migration.

EMProjPREPARELog.txt – contains a short summary file describing the preparation process with messages and warnings the process may have generated.

When restoring, the macro creates two new files in the root directory, a text log and a data set. The data set, restored.sas7bdat, contains the classification and full path for all the processed project files. The text file, EMProjRESTORELog.txt, is a short summary file of the process and any warnings captured during the restore process.

Sample Macro Summary File

```
EM_MigrateProject: V4.9 Started 05MAY2014:14:05:05.07
RootPath = \\myserver\MigrateProject\Test_Proj\FileImport2
Action = PREPARE
CLEAN = OFF
VERBOSE = OFF
INCVIEWS = OFF
Creating project file list...
Creating project file list completed RC= 0
Saving project content data...
See \\myserver\MigrateProject\Test_Proj\FileImport2\Prepared.sas7bdat
Saving project content data completed RC= 0
Saving project data requirements...
See \\myserver\MigrateProject\Test_Proj\FileImport2\LibData.sas7bdat

Files accessed via File Import required to run this project include:

Diagram                NodeID                          Imported File Path
-------------------------------------------------------------------------
EMWS                   FIMPORT                \\dataserver\Data\HomeEquity.csv
-------------------------------------------------------------------------

Libnames and data sets required to run project include:

Diagram                NodeID                 Libname  Data set
-------------------------------------------------------------------------
EMWS                    IDS2                  SAMPSIO  HMEQ
-------------------------------------------------------------------------

Saving project data requirements completed RC = 0
Preparing data views...
Preparing data views completed RC= 0
Preparing text files...
Preparing text files completed RC= 0
Preparing SAS catalogs...
Preparing SAS catalogs completed RC = 0
NOTE: EM_MigrateProject: preparation completed.
```

Defining Migrated Projects in Enterprise Miner

If your situation precludes the migration of your old system's metadata during the installation of your new SAS system**,** it is still possible to manually define new metadata for migrated projects after they have been restored w**i**th the EM_MigrateProject macro.

Note: The location of your SAS Enterprise Miner projects should be coordinated with your SAS Administrator.

1. Log on to SAS Enterprise Miner
2. Click on "New Project"
3. Select the SAS Server where the project is accessible click "Next"
4. Enter the name and location of your migrated project
   Example:
   a. Project Name on old system = Test
   b. Project Name on new system must be Test

   c. Project copied to /home/<userid>/em_projects
5. SAS Server Directory must be the restored project root directory, /home/<userid>/em_projects
6. You should get the message "The selected project exists on the file system. It may have been created by another user, Do you want to continue?" – click "Yes"
7. Select a location for the project metadata -> click "Next"
8. Click "Finish" on the confirmation page
9. Your previously migrated diagram should open
10. Verify that your library references (libname statements) are correct in your project start code
11. You should now be able to view results or (re)run your diagram if you desire.

Disclaimer

This document provides both code and methodologies for illustrative purposes and due caution should be used in making any assumptions as to their utility or correctness. The use or mention here in of any vendor or product should not be misconstrued as a recommendation or endorsement. This is a very simple example and not intended to illustrate a real application. It should in fact be possible to find many more suitable ways to use the scoring code produced by SAS Enterprise Miner as well as any other software mentioned in this document.