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## **Maintenance for the Minimalist**

### **A SAS Administrator's Guide to Supporting a Windows SAS Metadata Environment**

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## **ABSTRACT**

Upon maintaining a SAS environment, there are a few essential tasks an administrator should perform. Depending on the environment, for compliance reasons, an audit of login activity might need to be retained. In the event of a disaster, a hardware failure or something worse, a backup of the SAS metadata is needed for recovery purposes. For a quick restore of individual objects and for migration purposes, the export program includes a process to export all objects with one script. Base SAS 9.2®, SAS Management Console 9.2® and SAS Data Integration Studio 4.2® provide new opportunities that allow for these three items to be maintained. The SAS administrator can combine these new approaches with some qualities of the previous version's methodologies. Combining the new and old techniques, a complete, minimalistic approach to maintenance that has been set-up at Community Care Behavioral Health is illustrated.

## **INTRODUCTION**

After upgrading from SAS 9.1®, SAS Management Console 9.1® and SAS Data Integration Studio 3.4® to SAS 9.2, SAS Management Console 9.2 and SAS Data Integration Studio 4.2, it became evident that some of the previous version's maintenance processes would not work in the new environment. With SAS Management Console 9.2, the SAS Metadata Server log information is in a different format. A new backup wizard is included in SAS Management Console 9.2. A new executable for exporting all objects programmatically is available for use with SAS Data Integration Studio 4.2.

Not all features of the 9.1 processes have to be totally eliminated. Some scripts from the previous version actually compliment the new processes. By combining some of the old SAS 9.1 maintenance procedures with the new and improved SAS 9.2 programs and wizard, the SAS administrator can set-up a maintenance process that covers the basic needs of any site using the SAS Business Intelligence products.

## **AUDITING**

For compliance and auditing reasons, it is necessary for Community Care to parse the SAS logs for login activity. After upgrading to SAS 9.2, due to structure changes in the SAS Metadata Server log, the log parsing techniques outlined in a document downloaded from the SAS Support website for SAS 9.1 were deemed obsolete. This document outlined a process that created a SAS data set from the log. Upon opening a support ticket, I was informed that there is a new process for parsing the logs. SAS Support directed me to request the *SAS 9.2 Enterprise Business Intelligence Audit and Performance Measurement Instrumentation* package. <http://support.sas.com/rnd/emi/EbiApm92/index.html>

The *SAS 9.2 Enterprise Business Intelligence Audit and Performance Measurement Instrumentation* package encompasses the whole suite of SAS 9.2 Enterprise Business Intelligence. At Community Care, we have a portion of the SAS Business Intelligence suite which includes SAS Management Console and SAS Data Integration Studio. Therefore, for auditing purposes at Community Care, the entire package was too comprehensive. After reviewing the package instructions and experimenting with the installation, I was able to extract what was needed for our auditing purposes. Using a portion of the auditing and performance package, I was able to re-engineer a log parsing process similar to what was used with the previous version of SAS. The scripts included in the package ultimately create a SAS data set from the SAS Metadata Server logs. At Community Care, the final output of the log parse process is a Microsoft Windows Excel spreadsheet.

Below are the high level steps that were taken at Community Care to install, customize and implement the auditing package in our SAS environment. Depending on the complexity of your SAS components, the steps will differ.

Request the *SAS 9.2 Enterprise Business Intelligence Audit and Performance Measurement Instrumentation* package from the following link:

<http://support.sas.com/rnd/emi/EbiApm92/index.html>

Read the documentation and unzip the package as directed. Community Care extracted the entire package and used only a portion of the extracted files.

The default folder upon extraction for the files is Ebiapm92. After extracting the compressed file, ensure the AuditLogs and Data\artifacts folder are created in the Ebiapm92 folder. Edit the setEnvLogs.bat and setEnvLogs.sas in the Ebiapm92 root folder to coincide with your environment variables. The readSASLogs.bat batch file calls the SAS programs to move and read the SAS Metadata Server logs. The script places the moved logs in the AuditLogs folder. The data in the logs is parsed and appended to a SAS data set named audit\_transactions in the Data\artifacts folder. Community Care schedules the readSASLogs.bat batch file to run in Windows Task Scheduler.

The final output for Community Care is Microsoft Excel. Code Sample 1 is an example of placing the audit log data in a Microsoft Excel spreadsheet. A library is defined to point to the Data\artifacts folder where the audit\_transactions SAS data set resides.

```
LIBNAME ARTIFACT BASE "E:\SAS_9.2\EBIAPM92\DATA\ARTIFACTS";

ODS NORESULTS;
ODS HTML BODY='C:\CODE-LIBRARY\SAS_ETL\DOCS\AUDIT_LOG.XLS'
HEADTEXT="<STYLE>.TD {MSO-NUMBER-FORMAT:\@}</STYLE>";

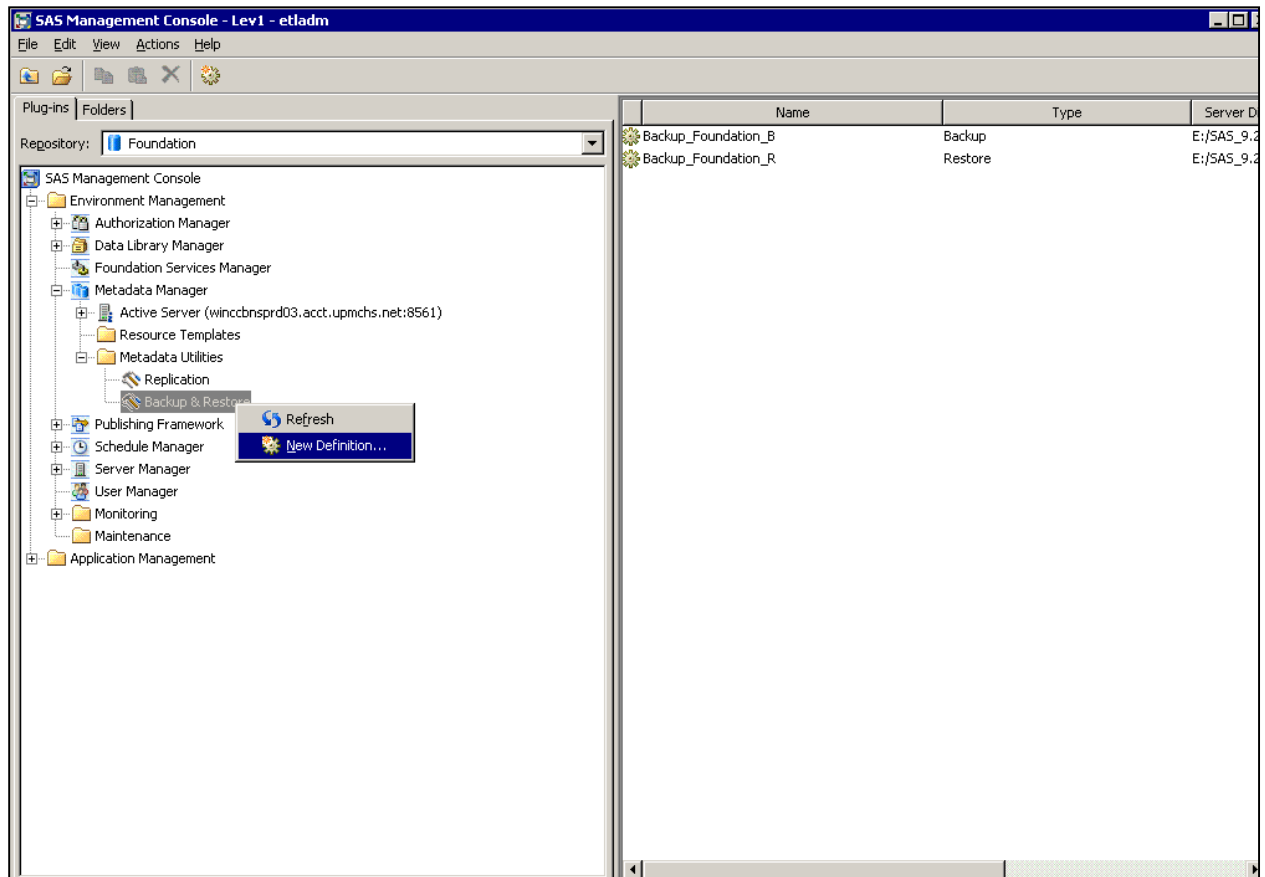
PROC PRINT DATA=ARTIFACT.AUDIT_TRANSACTIONS NOOBS LABEL;
WHERE DATEPART(A_DATETIME) >= TODAY()-3;
VAR A_DATETIME A_ACTIVEUSERID A_CLIENTIPADDR A_CLIENTPORT A_RECORDT A_RECORDEVENT;
RUN;
ODS HTML CLOSE;
ODS LISTING;
ODS RESULTS;

ODS LISTING CLOSE;
```

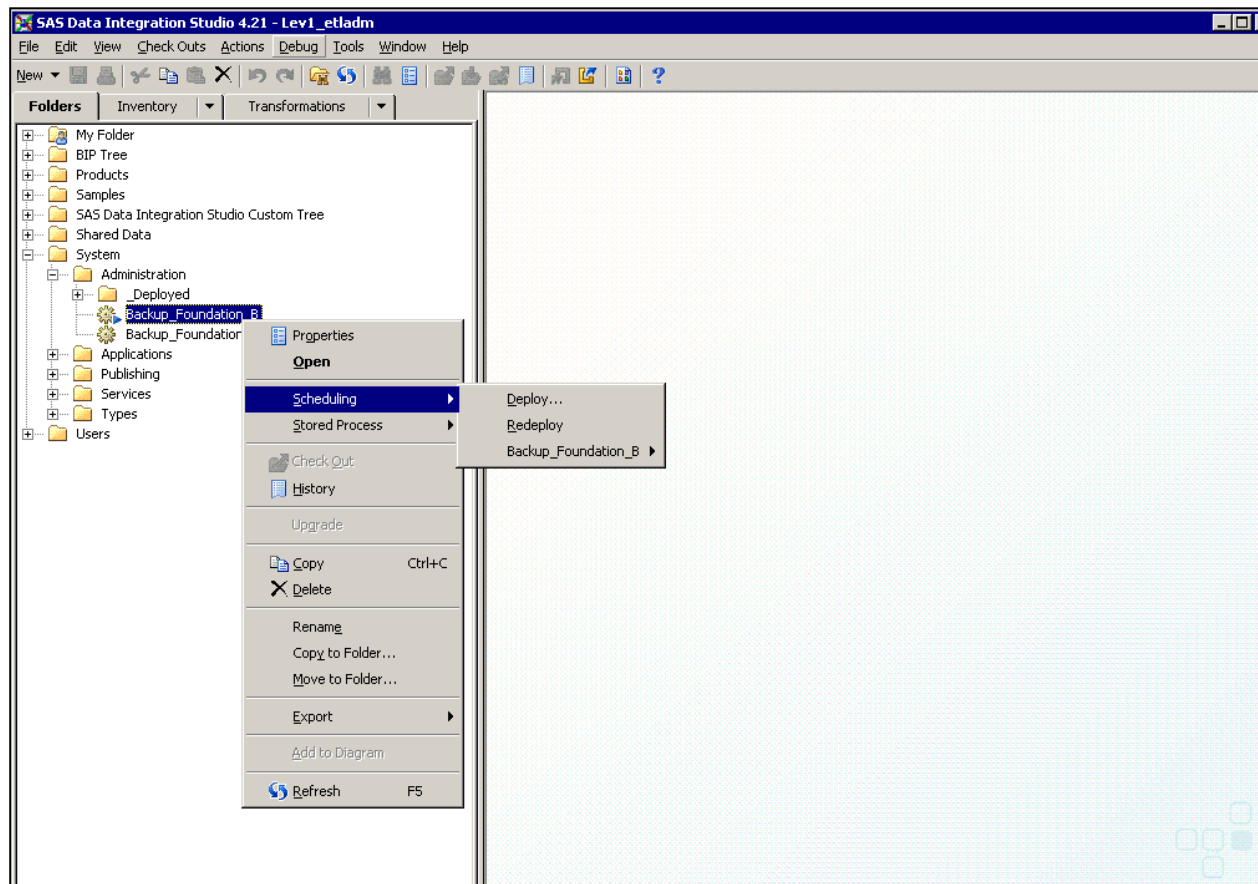
**Code Sample 1. Output to Microsoft Excel Spreadsheet**

## BACKUP METATDATA WITH WIZARD

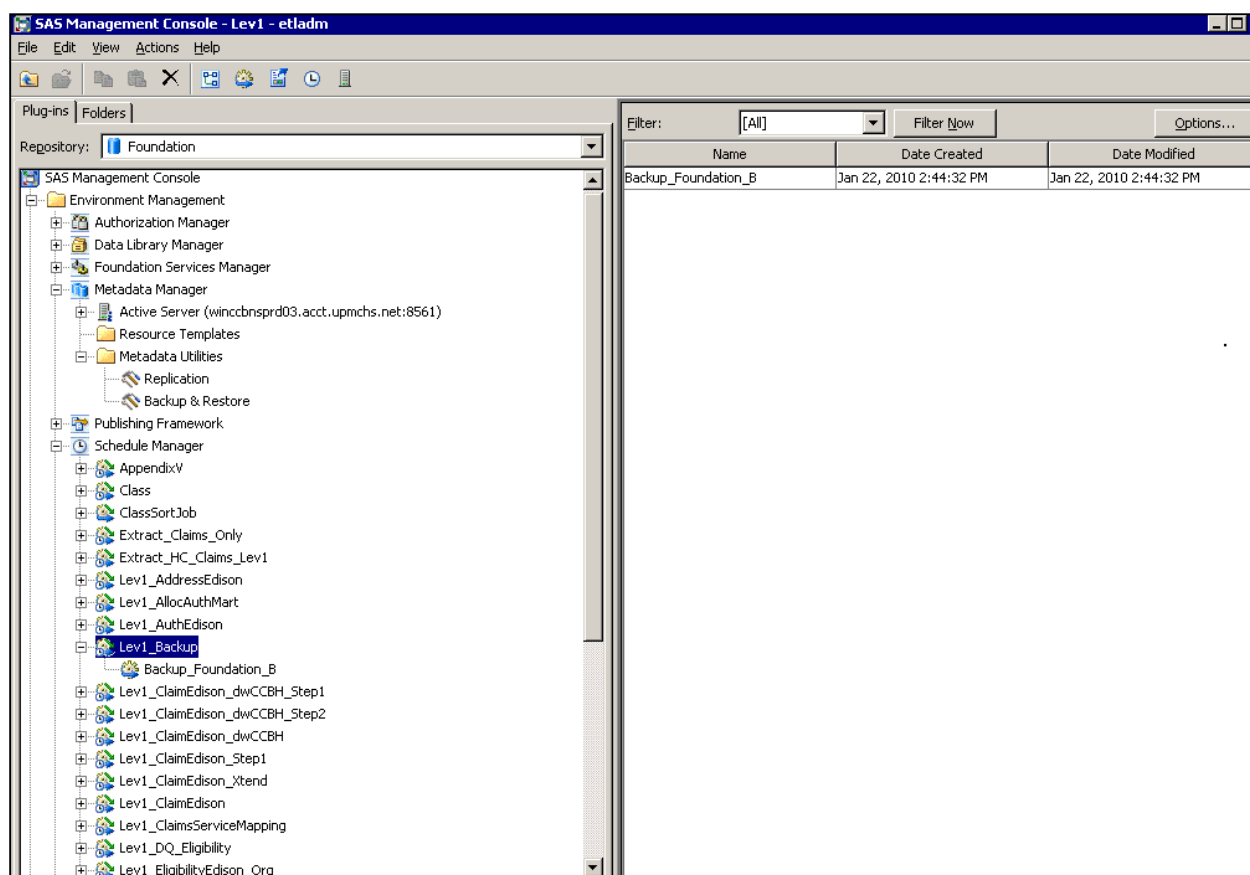
In addition to the new and improved auditing process for SAS 9.2, a backup wizard is included in SAS Management Console 9.2. When using the wizard, the backup is configured in SAS Management Console in the Metadata Utilities folder. The wizard creates a backup and restore job, appending a B and R to the job name respectively, see Display 1. These jobs backup and restore all metadata repositories. The created jobs are accessed and deployed in SAS Data Integration Studio, see Display 2. This allows the job to be added to a flow and scheduled in SAS Management Console to then be run using Platform Process Manager, see Display 3. I would recommend scheduling the backup job, only. The restore job will be used as needed and run manually.



Display 1. SAS Management Backup Wizard



Display 2. Deploy SAS Backup Job



**Display 3. Schedule SAS Backup Job**

### INCORPORATING PRIOR VERSION BACKUP SCRIPTS

Prior to SAS Management Console 9.2, repository backups were performed using a script provided to Community Care by SAS at installation time, BackupRepositories.sas. This script uses the %OMABACKUP SAS macro to backup the repositories. The script also includes commands to backup configuration files. Scripting was also included to retain compressed, historical copies of the backups. I combined the backup wizard job with the configuration file copy and compress logic that was included in the manual SAS 9.1 backup script. The key components of the code used in the script are displayed in Code Sample 2. You will need to tailor this to your SAS environment.

Using the new wizard and portions of the SAS 9.1 script, all previous logic is not lost. The new backup wizard makes creating the backup of metadata repositories a snap. One deploys and schedules the backup job through SAS Data Integration Studio and SAS Management Console, respectively. This job is then scheduled to run in Platform Process Manager. Using some of the logic from the prior backup process takes the job created by the backup wizard a few steps further, backing up configuration files and compressing the files into a zip file. This secondary process can be scheduled in the Windows Task Scheduler after the backup wizard process finishes.

```
set installdir=C:\Program Files\SAS

set configdir=C:\SAS\DIServer

copy %configdir%\Lev3\SASMeta\MetadataServer\omaconfig.xml
%configdir%\Lev3\SASMeta\MetadataServer\SASBackup\omaconfig.xml

copy %configdir%\Lev3\SASMeta\MetadataServer\adminUsers.txt
%configdir%\Lev3\SASMeta\MetadataServer\SASBackup\adminUsers.txt

copy %configdir%\Lev3\SASMeta\MetadataServer\trustedUsers.txt
%configdir%\Lev3\SASMeta\MetadataServer\SASBackup\trustedUsers.txt

copy %configdir%\Lev3\SASMeta\appserver_autoexec.sas
%configdir%\Lev3\SASMeta\MetadataServer\SASBackup\appserver_autoexec.sas

copy %configdir%\Lev3\SASMeta\sasv9.cfg
%configdir%\Lev3\SASMeta\MetadataServer\SASBackup\sasv9.cfg

set yr=%date:~-4,4%

set mon=%date:~-10,2%

set day=%date:~-7,2%

set hr=%time:~0,2%

set min=%time:~3,2%

c:

cd c:\Program Files\WinZip

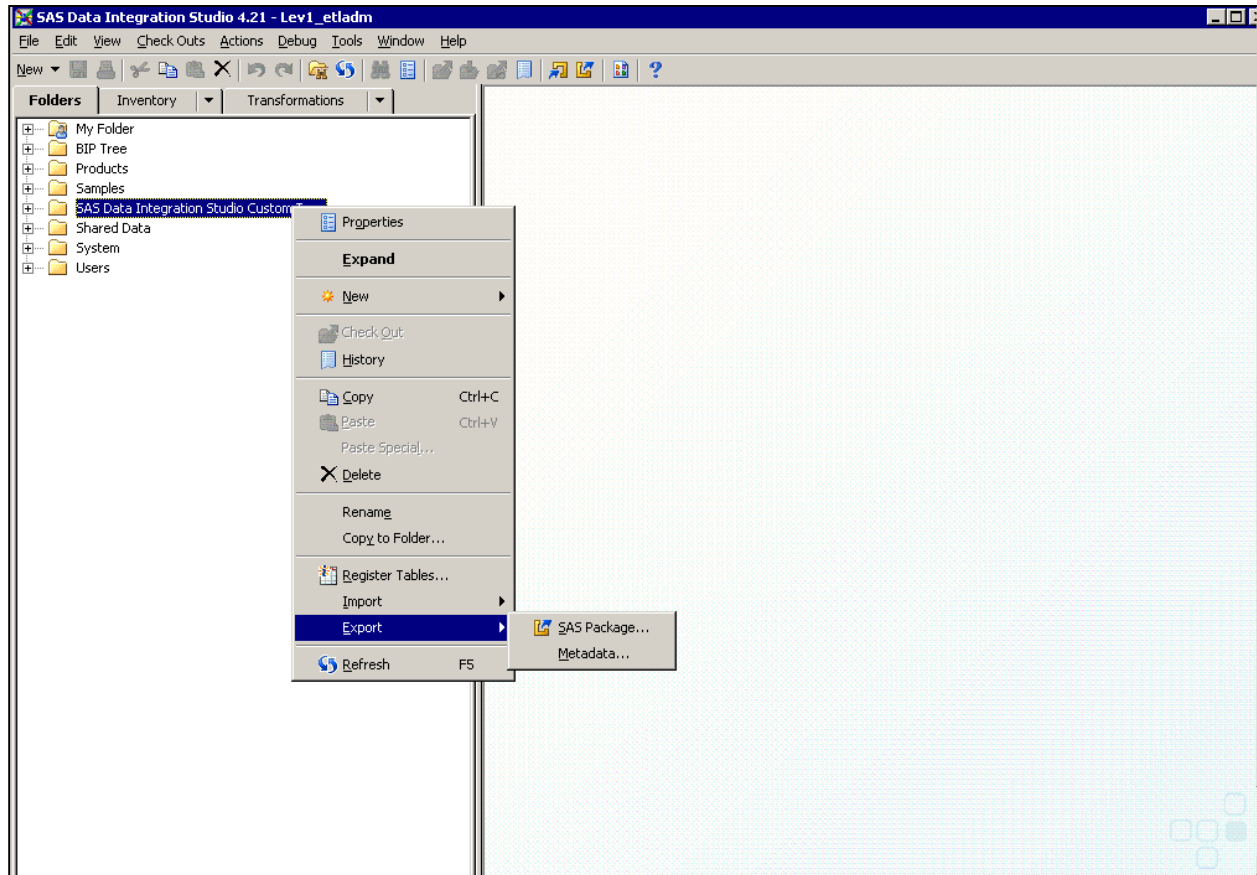
winzip32.exe -min -a -r "%configdir%\Zips\BackupRepositories_%yr%%mon%%day%_%hr%%min%.zip"
"%configdir%\Lev3\SASMeta\MetadataServer\SASBackup\*"

winzip32.exe -min -a -r "%installdir%\Zips\vpd.properties_%yr%%mon%%day%_%hr%%min%.zip"
"%installdir%\Gen1\_vpddb\vpd.properties"
```

**Code Sample 2. Backup Configuration Files and Compress Files**

## EXPORT METADATA

For recovery and migration purposes, as in previous versions of SAS Data Integration Studio, one is able to export folders or individual objects using the interactive graphical user interface, see Display 4.



Display 4. Manual Export in SAS Data Integration Studio

The new export program, ExportPackage.exe, included with SAS 9.2, is especially useful for recovery purposes. This program allows one to script batch exports. When recovering from a full backup, the entire repository must be restored. If a developer needs an earlier version of a single object, the export allows one to pick and choose what object is to be imported without having to overwrite the entire repository. As in previous versions of SAS Data Integration Studio, the Export program in SAS Data Integration Studio can be run adhoc on individual objects or complete folders. The advantage of ExportPackage.exe for maintenance purposes is the ability to place the export in a batch job that can be run unattended. The export can be done in conjunction with other maintenance tasks. The link below provides information on the ExportPackage.exe program and it is where I learned about this new feature. This document is directed towards using export for promotion between environments, which is another function of export.

<http://support.sas.com/resources/papers/sgf2008/migratemetadata.pdf>

To configure the export program in a batch job one must ensure that there is a connection profile for the user that schedules and runs the export task. The "Name" used in creating the connection profile is used with the switch, -profile. Code Sample 3 is an example of the syntax using the ExportPackage.exe program with a connection profile for use in a batch job.



```
"C:\Program Files\SAS\SASPlatformObjectFramework\9.2\ExportPackage.exe"  
  
-profile "C:\Documents and Settings\%username%\Application  
Data\SAS\MetadataServerProfiles\Levletladm"  
  
-package c:\code-library\sas_etl\export\Lev2_SharedData.spk -objects "/Shared Data"
```

**Code Sample 3. Export Batch File Syntax**

## PUTTING THE MINIMALIST'S PLAN IN PLACE

Using the SAS Management Console backup wizard, the main metadata repository backup is created. The logic for the other three maintenance processes, the audit scripts, the secondary backup process and the export program can be placed in batch files.

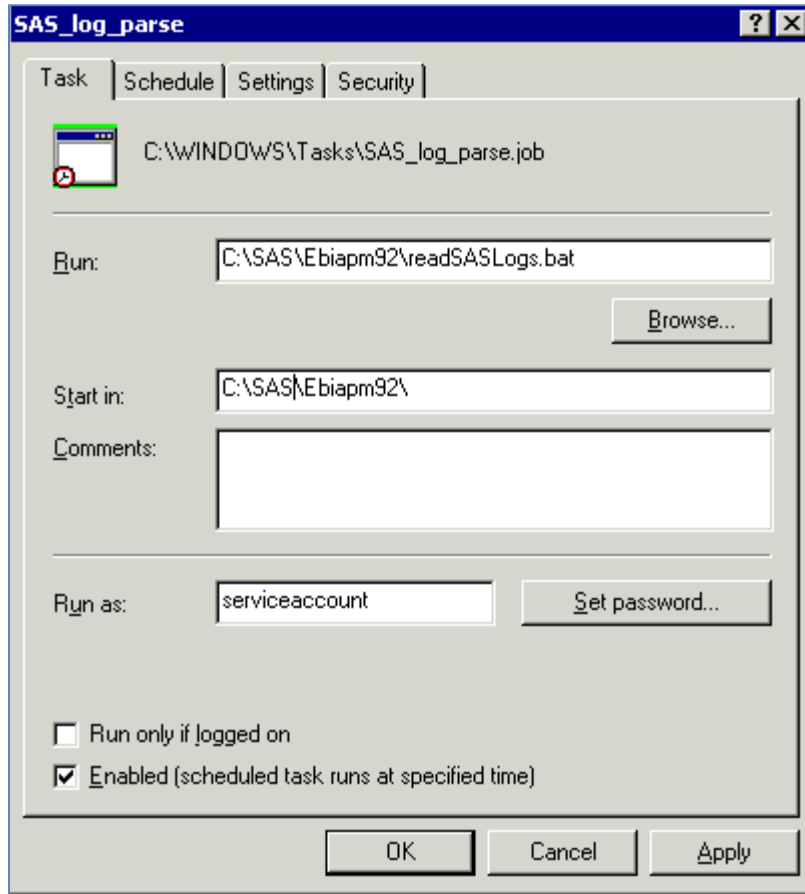
As a new SAS Metadata Server log is started daily, the audit script needs to be configured to move and parse the previous day's logs. This data is then appended to a SAS data set. The audit pieces can be pulled from *SAS 9.2 Enterprise Business Intelligence Audit and Performance Measurement Instrumentation* package. The readSASLogs.bat file can be scheduled to run nightly. The audit process places log information in a SAS data set that can be used in a user friendly report.

The backup wizard makes creating a metadata repository backup simple. The backup is configured in SAS Management Console. The deployment is done in SAS Data Integration Studio and scheduling happens in SAS Management Console. Using Platform Process Manager, the backup job can be run on a daily basis. The additional logic from SAS 9.1 to backup the configuration files, compress the backup files and keep a history can be added to a batch file. This should be scheduled to run after the completion of the repository backup.

The new ExportPackage.exe allows one to automate the export of objects for quick recovery. For the export to be automated, one must have a connection profile for the account that will run the scheduled export process job. This too can be placed in a batch file. Another purpose of the export files is migration.

The backup wizard job is scheduled in SAS Management Console and Platform Process Manager. The three batch files, the audit scripts, the secondary backup process and the export can be scheduled in Windows Task Scheduler, see Display 5. Please be cognizant of the account used to schedule the tasks. This account should be a service account unattached to an actual user.





Display 5. Schedule Script in Task Scheduler

## CONCLUSION

Using various components of SAS 9.1 and SAS 9.2 and the associated SAS Data Integration Studio and SAS Management Console, this document summarizes the minimum a SAS administrator can do to maintain the auditing and disaster recovery of a small SAS Business Intelligence configuration. The example configuration at Community Care is comprised of SAS Management Console and SAS Data Integration Studio. The three step process includes a nightly parse of the audit logs using a portion of the *SAS 9.2 Enterprise Business Intelligence Audit and Performance Measurement Instrumentation* package. The abridged auditing process produces an audit trail of login activity. There is a nightly backup of the metadata, configured using the backup wizard. The administrator can then lift code from the BackupRepositories.sas program to backup the configuration files, compress the backups and store a history of the files. The ExportPackage.exe program allows for easy backup and recovery of individual objects. Of course the most important part of any disaster recovery process is to test the actual recovery of a repository or object and make sure it works.

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## **CONTACT INFORMATION**

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