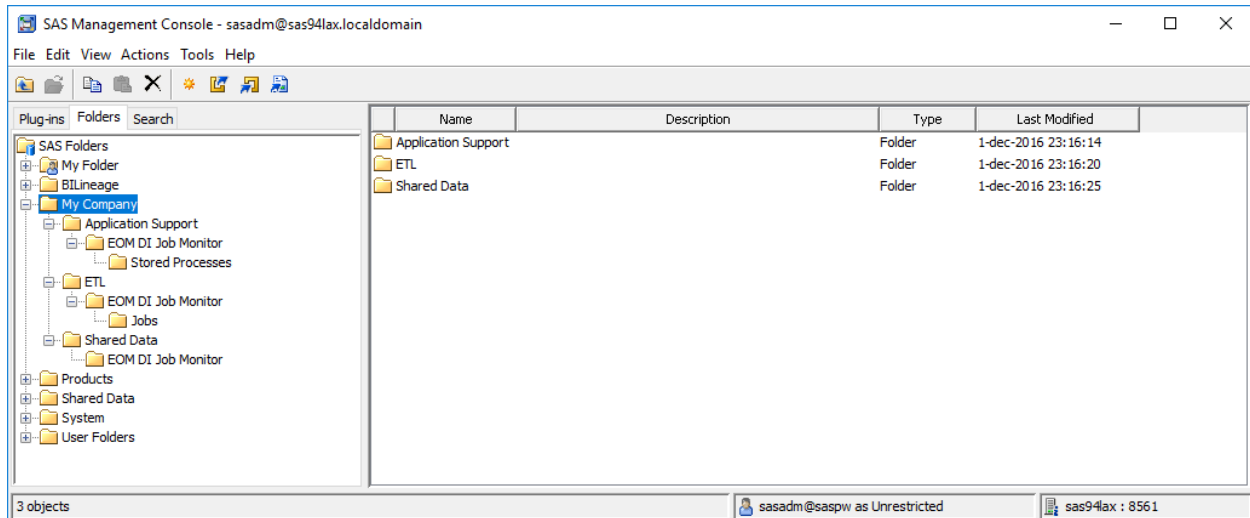


EOM DIMon 3.1 Installation Instructions for Linux

Bart Heinsius
May 21, 2017

Proposed metadata folder structure:

It is common practice to have separate SAS metadata folders for ETL programs, SAS Reports/SAS Stored Processes, and data. This document assumes installation in the SAS Metadata folder *My Company* shown here:



DIMon Batch Component Installation Instructions

Important note: When copying files from the installation package to the Linux file system, ensure that the files have the Linux file format on the Linux file system (LF as line termination string).

The steps below should be executed by a user account with sufficient permissions. For OS-related commands the SAS Installation User is advised. For SAS-related steps an Administrator user with an OS account (not sasadm@saspw) is advised.

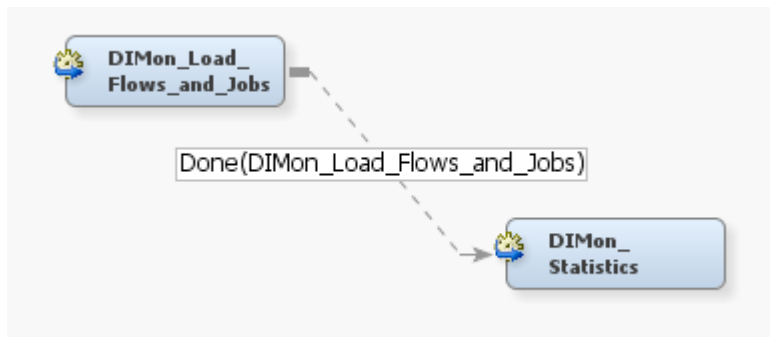
Nr	Instruction												
1	<p>Use SAS Management Console to create a SAS/SHARE or DBMS library with libref DIMON assigned to your SAS DI Application Server to store the DIMon tables. Specify the /My Company/Shared Data/EOM DI Job Monitor folder as the Location. Your batch user needs UPDATE access to the tables in this library. Your SAS General Server User (e.g., sassrv) needs READ access to the tables in this library.</p> <p>Notes:</p> <ul style="list-style-type: none"> - If you use a different libref than "DIMON" for your DIMon tables, add the following line to file "<sasappsrvcontextdir>/BatchServer/autoexec_usermods.sas": <pre>libname dimon (<your libref>);</pre> <ul style="list-style-type: none"> - For MySQL you need the following system variables in my.cnf: <pre>sql_mode='ANSI_QUOTES' # allow " as an identifier quote character (next to backtick) lower_case_table_names=1 # allow case-insensitive table names</pre> <ul style="list-style-type: none"> - For MySQL you need to assign the SAS library to MySQL with PRESERVE_TAB_NAMES=NO - If you experience slow performance when using the Postgres data store, please follow instructions for optimization at http://support.sas.com/kb/52/585.html - Using the BASE SAS engine is not recommended because of file locking issues. If you must, add the FILELOCKWAIT= option to the libname statement to prevent data set locking issues. 												
2	<p>Create the required tables using the appropriate script for your database provided in the installation package folder "SASBatch\SQL":</p> <table border="1"> <thead> <tr> <th>Engine</th><th>Script</th></tr> </thead> <tbody> <tr> <td>SAS/SHARE or BASE SAS</td><td>dimon_create_tables_sas.sas</td></tr> <tr> <td>Postgres</td><td>dimon_create_tables_postgres.sql</td></tr> <tr> <td>MySQL</td><td>dimon_create_tables_mysql.sql</td></tr> <tr> <td>MS SQL Server</td><td>dimon_create_tables_sqlserver.sql</td></tr> <tr> <td>Oracle</td><td>dimon_create_tables_oracle.sql</td></tr> </tbody> </table>	Engine	Script	SAS/SHARE or BASE SAS	dimon_create_tables_sas.sas	Postgres	dimon_create_tables_postgres.sql	MySQL	dimon_create_tables_mysql.sql	MS SQL Server	dimon_create_tables_sqlserver.sql	Oracle	dimon_create_tables_oracle.sql
Engine	Script												
SAS/SHARE or BASE SAS	dimon_create_tables_sas.sas												
Postgres	dimon_create_tables_postgres.sql												
MySQL	dimon_create_tables_mysql.sql												
MS SQL Server	dimon_create_tables_sqlserver.sql												
Oracle	dimon_create_tables_oracle.sql												

3	<p>Using SAS Management Console, register the tables that were created in step 2 in SAS metadata folder "/My Company/Shared Data/EOM DI Job Monitor".</p> <p>Deselect the following options when registering the tables:</p> <ul style="list-style-type: none"> - Enable case-sensitive DBMS object names - Enable special characters within table or column object name
4	<p>Using SAS Management Console, import SAS metadata package "SASBatch\SASPackages\dimon-batch.spk" from the installation package to SAS metadata folder "/My Company/ETL/EOM DI Job Monitor/Jobs". Map the tables to the tables you registered in step 3.</p>
5	<p>From the Linux shell, copy all files from installation package folder "SASBatch\SASSteps" to folder "<sasappsrvcontextdir>/SASEnvironment/SASCode/Steps" on your SAS DI Application Server.</p>
6	<p>From the Linux shell, create directory "<sasappsrvcontextdir>/SASEnvironment/SASCode/dimon" on your SAS DI Application Server. Copy all files from installation package folder "SASBatch\SASCode" to this directory.</p>
7	<p>From the Linux shell, copy all files from installation package folder "SASBatch\BatchServer\Linux" to "<sasappsrvcontextdir>/BatchServer" on your SAS DI Application Server.</p> <p>By default, your DI jobs will be submitted with a customized -log option, possibly ignoring options you may have set yourself. Please read Appendix A. Batch Logging to see if this affects your installation and how to change it if you wish.</p> <p>To facilitate debugging you can set <code>DIMONDEBUG=YES</code> in <code>dimon_usermods.sh</code>, which creates the file <code>/tmp/dimon-debug-\$(USER).txt</code> containing a list of environment variables.</p>
8	<p>From the Linux shell, make a backup copy of file "<sasappsrvcontextdir>/BatchServer/sasbatch.sh" on your SAS DI Application Server.</p>
9	<p>From the Linux shell, edit <code><sasappsrvcontextdir>/BatchServer/sasbatch.sh</code> on your SAS DI Application Server:</p> <p>Insert before line:</p> <pre>exec "\$SAS_COMMAND" -noxcmd -lrecl 32767 "\$@" "\${USERMODS_OPTIONS[@]}"</pre> <p>the following lines:</p> <pre># EOM DI Monitor - prolog -- begin . \$APPSERVER_ROOT/BatchServer/dimon_pre.sh # EOM DI Monitor - prolog - end</pre> <p>Insert after line:</p>

	<pre>exec "\$SAS_COMMAND" -noxcmd -lrecl 32767 "\$@" "\${USERMODS_OPTIONS[@]}"</pre> <p>the following lines:</p> <pre># EOM DI Monitor - epilog -- begin DIMON_JOBRC=\$? . \$APPSERVER_ROOT/BatchServer/dimon_post.sh exit \$DIMON_JOBRC # EOM DI Monitor - epilog - end</pre> <p>replace line:</p> <pre>exec "\$SAS_COMMAND" -noxcmd -lrecl 32767 "\$@" "\${USERMODS_OPTIONS[@]}"</pre> <p>with</p> <pre>"\$SAS_COMMAND" -noxcmd -lrecl 32767 \${DIMON_CMDLINEARGS} "\${USERMODS_OPTIONS[@]}"</pre> <p>Note that the word exec is removed in the second line; this is not a typo.</p>
10	<p>From the Linux shell, add the following line to file "<code><sasappsrvtctxtdir>/BatchServer/autoexec_usermods.sas</code>":</p> <pre>options fullstimer;</pre>
11	<p>From SAS (e.g., Enterprise Guide or started from the Workspace Server directory in interactive line mode (-nodms)), check to see whether the APPSERVER_ROOT environment variable is available in your SAS batch programs. You can do this by submitting the following SAS code on your SAS DI Application Server:</p> <pre>%put %sysget (APPSERVER_ROOT);</pre> <p>If you see a valid path in the log then you are done with this step. If you see the following message in the log:</p> <pre>WARNING: The argument to macro function %SYSGET is not defined as a system variable.</pre> <p>Then add the following line to file Linux file "<code><sasappsrvtctxtdir>/appservercontext_env_usermods.sh</code>":</p> <pre>export APPSERVER_ROOT</pre>
12	<p>Using SAS DI Studio, run DI Studio job "/My Company/ETL/EOM DI Job Monitor/Jobs/DIMon_Load_Flows_and_Jobs" that you imported in step 4, on your SAS DI Application Server.</p> <p>You can ignore the warning that there are transformations that may be out of order in the job.</p>
13	<p>Using SAS DI Studio, deploy the SAS DI Studio jobs imported in step 4 for scheduling on your SAS DI Application Server.</p>

Use the SAS Management Console Schedule Manager plug-in to create a flow named "DIMon_Refresh" in metadata location "/My Company/ETL/EOM DI Job Monitor/Flows" with Scheduling Server "Platform Process Manager", containing the following deployed jobs:

1. DIMon_Load_Flows_and_Jobs
2. DIMon_Statistics



Schedule the flow to run daily, as the first step in your nightly batch.

-- END OF INSTRUCTIONS DIMON BATCH COMPONENT

DIMon Web Application Installation Instructions

The instructions below apply to both Linux and Windows Operating Systems (OS).

Nr	Instruction												
1	Using SAS Management Console, import SAS metadata package "Webapp\SASPackages\dimon-webapp.spk" into SAS metadata folder "/My Company/Application Support/EOM DI Job Monitor/Stored Processes". Assign the Stored Processes to run on your SAS Web Application Server (if you have that).												
2	On the OS, copy the content of folder "Webapp\SASWebServer" to directory "<SASConfigDir>/Lev1/Web/WebServer/htdocs/" on your SAS Web Application (mid-tier) Server.												
3	On the OS, copy the content of folder "Webapp\SASMacro" to directory "<sasappsrvcontextdir>/SASEnvironment/SASMacro" on your SAS Web Application Server.												
4	On the OS, edit file "<sasappsrvcontextdir>/SASEnvironment/SASMacro/dimon_usermods.sas" on your SAS Web Application Server and review all settings, especially: <table><tr><th>Setting</th><th>Description</th><th>Default value</th></tr><tr><td>libname</td><td>Optional alternative allocation of dimon library</td><td>none</td></tr><tr><td>sproot</td><td>Folder where dimon-webapp.spk was imported to</td><td>/My Company/Application Support/EOM DI Job Monitor/Stored Processes</td></tr><tr><td>webroot</td><td>Relative URL path to where the webapps components were copied to in step 2</td><td>/eom/dimon</td></tr></table>	Setting	Description	Default value	libname	Optional alternative allocation of dimon library	none	sproot	Folder where dimon-webapp.spk was imported to	/My Company/Application Support/EOM DI Job Monitor/Stored Processes	webroot	Relative URL path to where the webapps components were copied to in step 2	/eom/dimon
Setting	Description	Default value											
libname	Optional alternative allocation of dimon library	none											
sproot	Folder where dimon-webapp.spk was imported to	/My Company/Application Support/EOM DI Job Monitor/Stored Processes											
webroot	Relative URL path to where the webapps components were copied to in step 2	/eom/dimon											
5	If you chose a different metadata location in Step 1 than the default ("/My Company/Application Support/EOM DI Job Monitor/Stored Processes"), on the OS, update file "<SASConfigDir>/Web/WebServer/htdocs/eom/dimon/index.html" to reflect that in the sections marked yellow below:												

```

1 <!DOCTYPE HTML>
2 <html lang="en-US">
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="refresh" content=
6     "1;/SASStoredProcess/do?_program=/My+Company/Application+Support/EOM+DI+Job+Monitor/Stored+Processes/dimon">
7   <script type="text/javascript">
8     var parms = window.location.search.substr(1);
9     window.location.href =
10       "/SASStoredProcess/do?_program=/My+Company/Application+Support/EOM+DI+Job+Monitor/Stored+Processes/dimon"
11       + ( parms == "" ? '' : '&' + parms );
12   </script>
13   <title>Page Redirection</title>
14   </head>
15   <body>
16     <!-- Note: don't tell people to 'click' the link, just tell them that it is a link. -->
17     If you are not redirected automatically, follow this <a href=
18       '/SASStoredProcess/do?_program=/My+Company/Application+Support/EOM+DI+Job+Monitor/Stored+Processes/dimon'>link to the EOM DI
19       Monitor</a>
20   </body>
21 </html>

```

6 Start the EOM DI Job Monitor web application by navigating your browser to <http://your-sasweb-server:7980/eom/dimon/> (Linux) or <http://your-sasweb-server/eom/dimon> (Windows). Login if necessary. You should see the DIMon_Refresh flow that you scheduled before:

Trigger Type	Trigger Condition ¹	Flow	Flow Run ID	#	Status	RC	Start Time	End Time	Elapsed Time	Gantt	Trend last 90 days	User
Time Event	31DEC17:10:00:00	DIMon_Refresh			Scheduled							

Last refreshed on 30DEC17:21:42:51 / sasdemo@sas94lax2.localdomain. This request took 0.14 seconds
¹ Trigger Condition is in local time.

-- END OF INSTRUCTIONS DIMON WEB APPLICATION COMPONENT

Appendix A. Batch Logging

To facilitate real-time monitoring, the `dimon_pre.sh` script stores the fully qualified name of the SAS log file that your SAS batch job will be submitted with, in its tables (DIMON_JOB_RUNS). This requires that `dimon_pre.sh` knows the log file name that your SAS batch program will use before your SAS batch program actually executes. It turns out that the log file name is not always clear at this point in time in the batch execution process.

The following section explains how the batch SAS log file name is determined. After that, `dimon` options are given to manipulate the logfile name for your situation.

How the batch SAS log file name is determined

The log file name is specified in the `-log` option in the command that SAS Management Console's Schedule Manager plugin composes when a job is scheduled, for example:

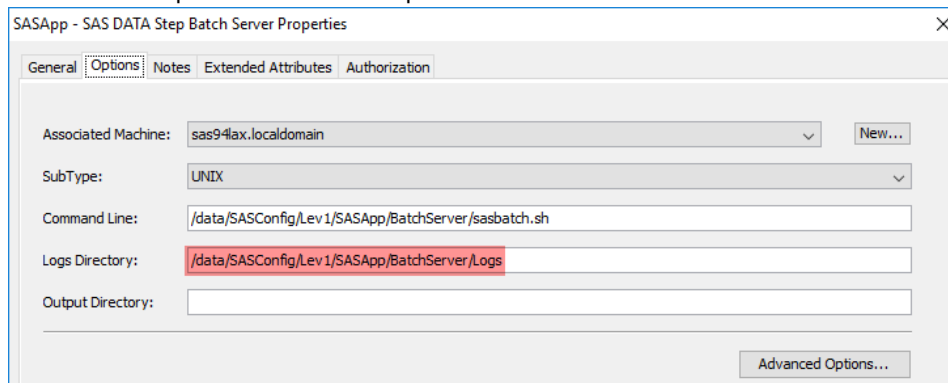
```
/data/SASConfig/Lev1/SASApp/BatchServer/sasbatch.sh -log
/data/SASConfig/Lev1/SASApp/BatchServer/Logs/DIMon_DIMon_Load_Flows_and_Jobs_#Y.#m.#d_#H.#M.#s.log
-batch -noterminal -logparm "rollover=session" -sysin
/data/SASConfig/Lev1/SASApp/SASEnvironment/SASCode/Jobs/DIMon_Load_Flows_and_Jobs.sas
```

Schedule Manager composes the log file name from:

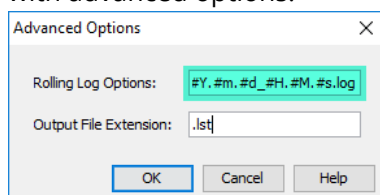
- SAS DATA Step Batch Server Properties
- SAS Management Console's Schedule Manager settings

In a default SAS installation with SAS configuration directory `/data/SASConfig/Lev1` these are:

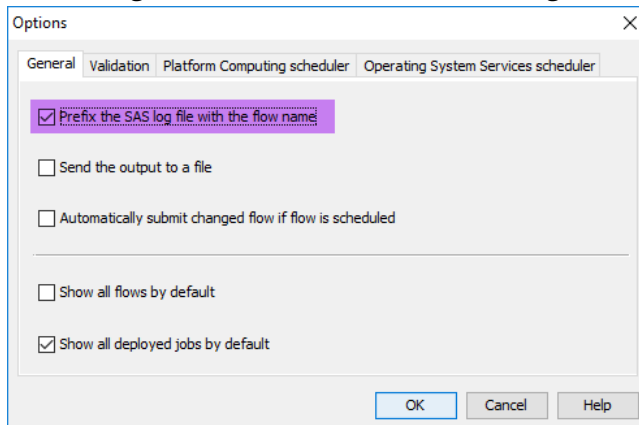
- SAS DATA Step Batch Server Properties:



with advanced options:



- SAS Management Console's Schedule Manager settings:

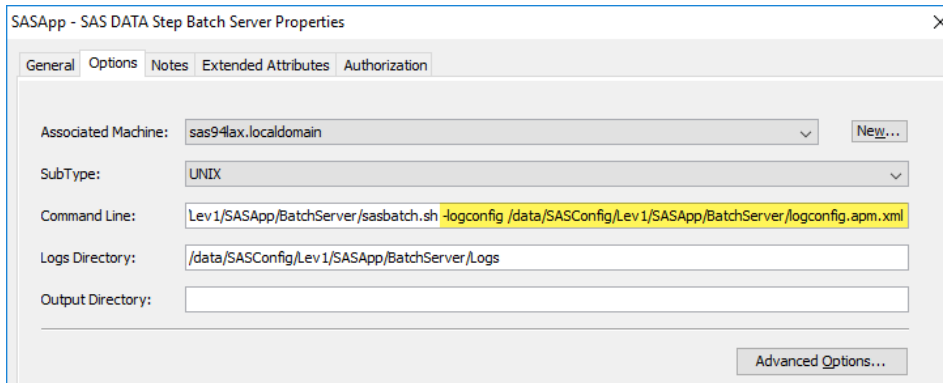


, to compose the following log file name for deployed job DIMon_Load_Flows_and_Jobs job in the DIMon flow:

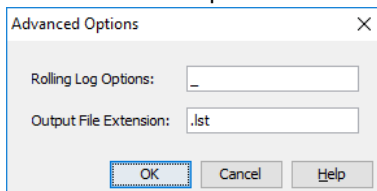
```
/data/SASConfig/Lev1/SASApp/BatchServer/sasbatch.sh -log
/data/SASConfig/Lev1/SASApp/BatchServer/Logs/DIMon_DIMon_Load_Flows_and_Jobs_#Y.#m.#d_#H.#M.#s.log
-batch -noterminal -logparm "rollover=session" -sysin
/data/SASConfig/Lev1/SASApp/SASEnvironment/SASCode/Job/DIMon_Load_Flows_and_Jobs.sas
```

Together with the `-logparm "rollover=session"` option, the SAS executable resolves `#Y.#m.#d_#H.#M.#s` to an actual year, month, day, hour, minute, and second when executed.

If you configured your SAS DATA Step Batch Server to use the SAS Logging Facility, following the official SAS instructions you will have changed the SAS DATA Step Batch Server Command Line property to something like:



with advanced options:



Now the command that Schedule Manager composes is:

```

/data/SASConfig/Levl/SASApp/BatchServer/sasbatch.sh -logconfig
/data/SASConfig/Levl/SASApp/BatchServer/logconfig.apm.xml -log
/data/SASConfig/Levl/SASApp/BatchServer/Logs/DIMon_DIMon_Load_Flows_and_Jobs_ -batch -noterminal
-logparm "rollover=session" -sysin
/data/SASConfig/Levl/SASApp/SASEnvironment/SASCode/Jobs/DIMon_Load_Flows_and_Jobs.sas

```

The actual log file name is now determined by the following section in logconfig.apm.xml:

```

<!-- Batch File Appender, match the output log file name to the input -log statement -->
<appender class="FileAppender" name="BatchFileAppender">
  <param name="Append" value="false"/>
  <param name="Unique" value="true"/>
  <param name="FileNamePattern" value="%S{App.Log}%d{yyyy.MM.dd_hh.mm.ss}.log"/>
  <layout>
    <param name="ConversionPattern" value="%m"/>
  </layout>
</appender>

```

where %S{App.Log} is resolved to the -log command line option

(/data/SASConfig/Levl/SASApp/BatchServer/Logs/DIMon_DIMon_Load_Flows_and_Jobs_ in this example) and %d{yyyy.MM.dd_hh.mm.ss} is resolved to an actual year, month, day, hour, minute, and second.

Options for dimon

Dimon supports the following options for manipulating the logfile name.

Option name	DIMON_SASLOGFILE_RESOLVE_YMDHMS
Valid values	YES, NO
Default value	YES
Description	When this option is set to YES and the rolling log options for the SAS DATA Step Batch Server contain the string "#Y.#m.#d_#H.#M.#s", then "#Y.#m.#d_#H.#M.#s" is replaced by an actual YYYYMMDD_HHMMSS value.

Option name	DIMON_SASLOGFILE_PREPEND_JOBID_FLOWID_USER
Valid values	YES, NO
Default value	YES
Description	When this option is set to YES, the SAS batch logfile name is prefixed by the LSF Job Id, LSF Flow ID, and the user that executes the SAS batch job. Example: 1074_52_sasdemo_DIMon_DIMon_Statistics_20170129_230456.log

Option name	DIMON_SASLOGFILE_APPEND_DATETIME
Valid values	YES, NO

Default value	YES
Description	<p>When this option is set to YES and the rolling log option for the SAS DATA Step Batch Server ends with an underscore, <YYYYMMDD_HHMMSS>.log is appended to the SAS batch log file name. This is typical when ARM logging is configured and the logfile name is set in the logconfig.xml file. In addition to setting this option to YES you need to remove %d{yyyy.MM.dd_hh.mm.ss} from the FileNamePattern in your logconfig.xml as shown here:</p> <pre><!-- Batch File Appender, match the output log file name to the input -log statement --> <appender class="FileAppender" name="BatchFileAppender"> <param name="Append" value="false"/> <param name="Unique" value="true"/> <param name="FileNamePattern" value="%S{App.Log}"/> </appender></pre>