

Universal Task Documentation

Universal Automation Center support for scheduling SAP Data Service 4.x

ut-sap-bods-v4-2-etl-linux

Associated Activities:

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00	20180725	Nils Buer	Initial Document (WIP)

Abstract:

This Universal Task allows to execute an SAP Data Services “ETL” Job using the “AL_RWJobLauncher.exe” utility which comes with the SAP Data Services installation.

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1 Disclaimer

No support and no warranty are provided by Stonebranch GmbH for this document and the related Universal Task. The use of this document and the related Universal Task is on your own risk.

Before using this task in a production system, please perform extensive testing.

Stonebranch GmbH assumes no liability for damage caused by the performance of the Universal Tasks

2 Introduction

The here described Universal Task allows to execute an SAP Data Services “ETL” Job using the “AL_RWJobLauncher.exe” utility which comes with the SAP Data Services installation.

The tool is explained in the attached document [1] from page 45 onwards.

Some details about the universal task for SAP Data Services:

- It is based on the “AL_RWJobLauncher.exe” which is part of the Data Services Install
- The Data Services Server needs to have Python 2.7 or 3.x installed
- The Data Service Server needs to have a Universal Agent installed
- For Data Services on Windows Server a separate Universal Task is available in the Marketplace
- The Universal Task will provide the same error and trace information as the SAP Data Services Management Console.
- You can select different log-levels e.g. Info and debug
- You can configure all connection Parameters via the Universal Task
- For all Parameters an exception handling has been implemented
- Restriction: Currently only “Enterprise Security” is supported

2.1 Software Requirements

Universal Task name: *Run SAP Data Service Job*

Related UAC XML Files for template and task: [2]

Software used:

- SAP Data Service 4.2 SP7 (tested on)
- Universal Controller 6.4.x
- UA 6.4.x installed on the SAP Data Services Server
- Python 2.7.12 for Linux installed on the SAP Data Services Server
- For Python the following modules are required:
 - *re* for Regular expression operations to parse the log and trace files
 - *sys*, for output re-direct processing
 - *datetime*, date and time stamps for messages
 - *logging*, for python logging
 - *glob* to support Unix style pathname pattern

Note: All Module are standard modules.

In case a module is missing install it with the python installer pip e.g. pip install re

2.2 Installation Steps

The following describes the installation steps:

1. Check that Python is installed on SAP Data Services Server

Command: python -V (Note: Capital V)

If not check here:

Official Download link: <https://www.python.org/downloads/>

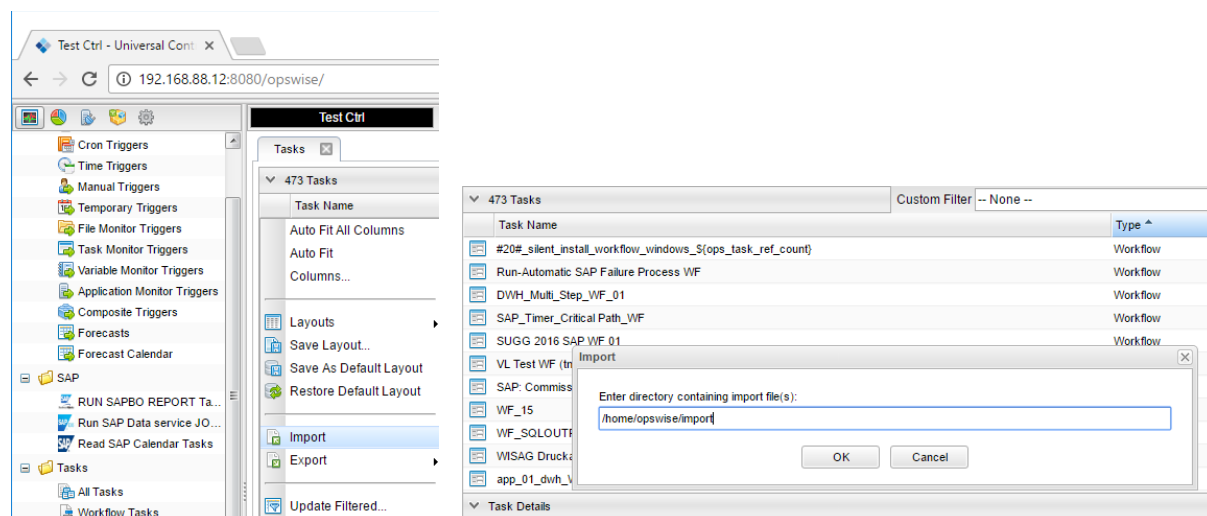
2. Install the Universal Agent on the SAP Data Services Server

Download the latest Universal Agent from the Stonebranch Customer Portal and install the Universal Agent on the SAP Data Services Server.

Please refer to the Universal Agent Installation Manual [3] for details.

3. Import the Universal Task including the Universal Template to your Controller

Go to “All Tasks” and load via the Import functionality the Universal Task configuration XML files into the Controller. The files to import can be found here: [2]



3 Universal Task Configuration

1. Activate: Resolvable Credentials in Universal Automation Center:

Dashboards ☒ RUN SAPBO REPORT Tasks ☒ Properties ☒

93 Properties

Name	Value
Resolvable Credentials Permitted	true

2. Fill Out the Universal Task for each Data Service Job to be scheduled:

General

Task Name : Run DS JOB "New_Job" Linux **Version :** 14

Task Description :

Member of Business Services :

Resolve Name Immediately : ☐

Hold on Start : ☐

Virtual Resource Priority : 10 **Hold Resources on Failure :** ☐

Further Info's :

System :

Run SAP Data service JOB_Linux Details

Agent : \${SAP_BODS_LINUX_AGENT} **Agent Cluster :**

Agent Variable : ☒ **Agent Cluster Variable :** ☐

Credentials : ☐ **Cluster Broadcast :**

Credentials Variable : ☐

Jobserver Hostname : walldorf **port :** 3500

path to AL_RWJobLauncher : /home/opswise/work/bods/data/apps/IPS/dataservices/bin **jobname :** Load_entire_DW

parameters : -w **server_log_path :** /home/opswise/work/bods/data/apps/IPS/dataservices/log/jobse...

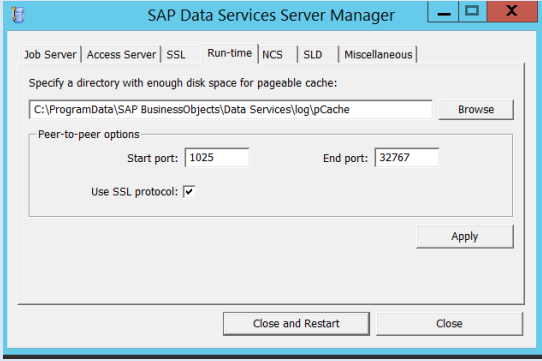
jobdir : /home/opswise/work/bods/data/apps/IPS/dataservices/log **poll interval :** -t30

tracedir : /home/opswise/work/bods/data/apps/IPS/dataservices/log/jobse... **loglevel :** DEBUG

AL_RWJobLauncher : AL_RWJobLauncher.sh

Description:

Field	Required	Description
Agent	Mandatory	Universal Agent installed on the SAP Data Services Server. This Agent runs the AL_RWJobLauncher.exe CLI.
Jobserver Hostname	Mandatory	Name of the Jobserver, which runs the Data Services Job. The Jobserver can be looked up in the SAP Data Service Management Console under: Administrator -> Batch
Job server port	Mandatory	Port of the Jobserver, which runs the Data Services Job. The Jobserver Port can be looked up in the SAP Data Service Management Console under: Administrator -> Batch

Field	Required	Description
Path to AL_RWJobLauncher.exe	Mandatory	Location, where the AL_RWJobLauncher.exe is installed on the SAP Data Services Server.
Jobdir	Mandatory	<p>Directory, where the Job execution files are exported to. The directory must contain the following files:</p> <p><Jobname>.txt and <jobname>.bat</p> <p>In the example above the files have the names:</p> <ul style="list-style-type: none"> • <i>Load_entire_DW.txt</i> • <i>Load_entire_DW.bat</i> <p>How to find the Location?</p> <p>Open the data services Manager Tab: Run-time.</p> <p>The jobdir is the directory without pCache.</p> 
tracedir	Mandatory	<p>Directory, where the trace and log files are located.</p> <p>The directory should contain trace/error files, which look as followed:</p> <p><i>trace_MM_DD_YYYY_HH_MM_SS_...</i></p> <p><i>error_MM_DD_YYYY_HH_MM_SS_...</i></p>
Server_log_path	Mandatory	<p>Path to the server log.</p> <p>It should contain the file:</p> <p><i>server_eventlog_YYYY-MM-DD.txt</i></p>
loglevel	Mandatory	logging settings DEBUG, INFO, WARNING, ERROR, CRITICAL
Poll interval	Mandatory	Interval in seconds, how often the Data Services Server is polled to get the current Job status.
Jobname	Mandatory	Name of the Data Services Job. It can be looked up in the SAP Data Service Management Console under: Administrator -> Batch

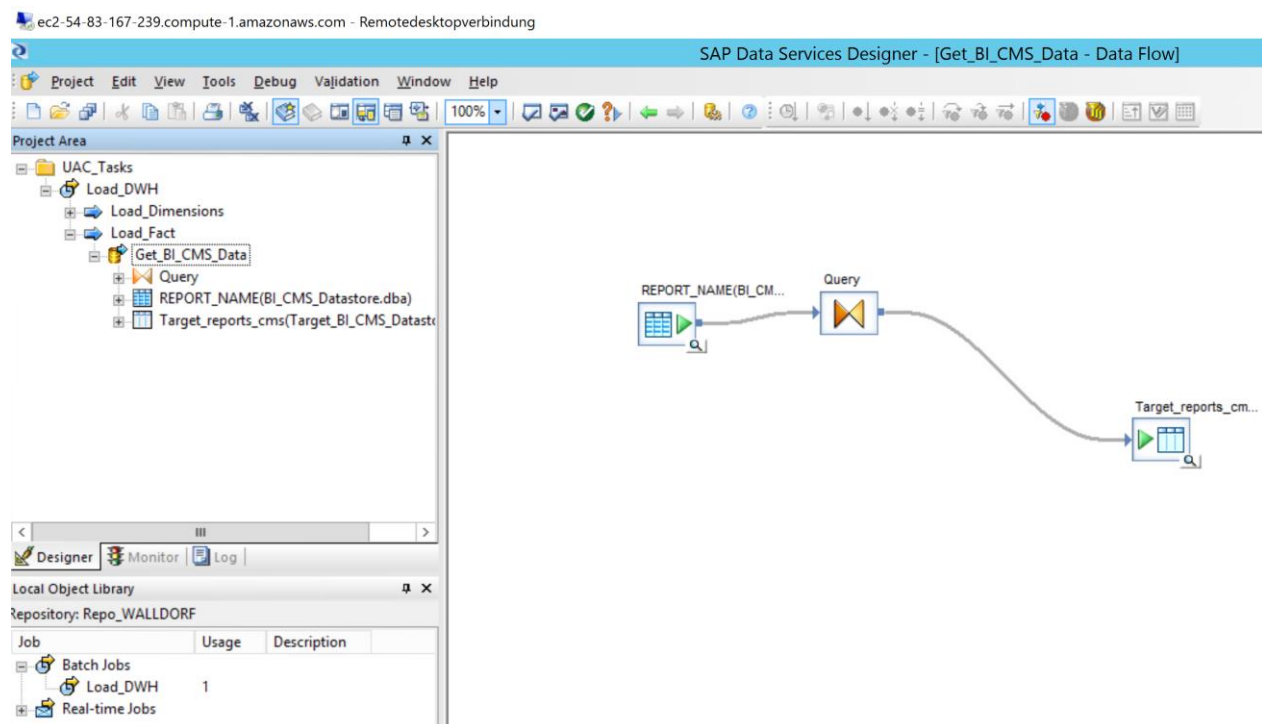
4 SAP Data Services

The following describes how to run a Data Services Task. The Data Services Data Flow (Step 1) is only shown for completeness. So that that Scheduling Operations team members with limited SAP Data Services Knowledge understand the concept.

Step:

1. Job Configuration in Data Service Designer:

Configure the SAP Data Services ETL job in the Data Service Designer.



2. Export job execution command in SAP Data Service Management Console

SAP Data Services Management Console

Administrator

Batch > Export Execution Command

Repository: Repo_WALLDORF

Export Execution Command

Job: Load_entire_DW

Export

File name: Load_entire_DW

Job Server or Server Group: WALLDORF:3500

Export Job Server:

Enable auditing: ☒

Disable data validation statistics collection: ☐

Enable recovery: ☐

Recover from last failed execution: ☐

Use password file: ☒

Collect statistics for monitoring: ☐

Collect statistics for optimization: ☐

Use collected statistics: ☒

Export Data Quality reports: ☐

Distribution level: Job

Substitution Parameters

[Add Overridden Parameter](#)

Reset Export

3. Configure the universal task to run the exported job in UAC

Universal Task

Run SAP Data service JOB_WIN Task Details: Load_entire_DW_4

Update Launch Task View Parents Copy Delete Refresh Close

Run SAP Data service JOB_WIN Task Variables Actions Virtual Resources Mutually Exclusive Instances Triggers Notes Versions

General

Task Name: Load_entire_DW_4 Version: 45

Task Description: SAPBODS

Member of Business Services:

Resolve Name Immediately: ☐

Hold on Start: ☐

Virtual Resource Priority: 10 Hold Resources on Failure: ☐

Further Info's:

System:

Run SAP Data service JOB_WIN Details

Agent: \${WIN_AGT_SAPBO} Agent Cluster:

Agent Variable: ☒ Agent Cluster Variable: ☐

Credentials: Credentials Variable: ☐

Cluster Broadcast:

Run with Highest Privileges: ☐

Jobserver Hostname: Walldorf job server port: 3500

path to AL_RWJobLauncher: C:\Program Files (x86)\SAP BusinessObjects\Data Services\bin Jobname: Load_entire_DW

RW Job launcher parameters: -w server_log_path: C:\ProgramData\SAP BusinessObjects\Data Services\log\Job...

jobdir: C:\ProgramData\SAP BusinessObjects\Data Services\log loglevel: DEBUG

tracedir: C:\ProgramData\SAP BusinessObjects\Data Services\log\Job...

Pollinterval: -130

4. Launch the Universal Task

Launch the Universal Task.

Run SAP Data service JOB_WIN Task Instance Details: Load_entire_DW_4

Update Re-run Retrieve Output... Delete Refresh Close

Run SAP Data service JOB_WIN Task Instance Virtual Resources Exclusive Requests Output Notes

General

Instance Name: Load_entire_DW_4 Reference Id: 112
 Task: Load_entire_DW_4 Invoked By: Manually Launched
 Task Description: SAPBODS
 Member of Business Services: Execution User: ops.admin
 Resolve Name Immediately: ☐ Calendar: System Default
 Virtual Resource Priority: 10 Hold Resources on Failure: ☐
 Further Info's:
 System:

Status

Status: Success Exit Code: 0
 Status Description:
 Operational Memo:
 Trigger Time: Launch Time: 2018-02-20 09:56:58 +0100
 Queued Time: 2018-02-20 09:56:58 +0100
 Start Time: 2018-02-20 09:56:47 +0100 End Time: 2018-02-20 09:57:00 +0100
 Duration: 13 Seconds CPU Time: 734
 Process ID: 6624

Run SAP Data service JOB_WIN Details

Agent: WALLDORF Agent Cluster:
 Agent Variable: ☐ Agent Cluster Variable: ☐
 Credentials: ☐ Run with Highest Privileges: ☐
 Credentials Variable: ☐ job server port: 3500
 Jobserver Hostname: Walldorf jobname: Load_entire_DW
 path to AL_RWJobLauncher: C:\Program Files (x86)\SAP BusinessObjects\Data Services\bin
 server_log_path: C:\ProgramData\SAP BusinessObjects\Data Services\log\JobS...
 RW Job launcher parameters: -w
 jobdir: C:\ProgramData\SAP BusinessObjects\Data Services\log
 Pollinterval: -t30

5. Verify job execution in SAP Data Service Management Console

SAP Data Services Management Console

Administrator Home

Batch

Repository: Repo_WALLDORF

Batch Job Status Batch Job Configuration Repository Schedules

Job name: All batch jobs Wildcard search string (optional)

Display: ☐ Last execution of job ☒ Last ☐ All executions From: To: Days

Search

Batch jobs history (Jobs: Executed job All batch jobs in last 5 days.)

Select	Status	Job name	System configuration	Job Server	Job Information	Start time	End time	Duration
<input type="checkbox"/>	Success	Load_entire_DW		Walldorf:3500	Trace,Monitor,Error,Performance Monitor	Feb 20, 2018 9:56:52 AM	Feb 20, 2018 9:56:59 AM	7s

Batch > Log Viewer

Repository: Repo_WALLDORF

Job Trace Log Job Monitor Log Job Error Log

Log: trace_02_20_2018_09_56_50_2_8210c99e_4bf8_4d5e_997a_e552eb59984a.txt Job Server: Walldorf:3500

Job name: Load_entire_DW

```
(14.2) 02-20-18 09:56:51 (18384:16628) JOB: Reading job <8210c99e_4bf8_4d5e_997a_e552eb59984a> from the repository; Server version is <14.2.7.1156>; Repository version is <14.2.7.0000>.
```

```
(14.2) 02-20-18 09:56:51 (18384:16628) JOB: Current directory of job <8210c99e_4bf8_4d5e_997a_e552eb59984a> is <C:\Program Files (x86)\SAP BusinessObjects\Data Services\bin>.
```

```
(14.2) 02-20-18 09:56:52 (18384:16628) JOB: Starting job on job server host <Walldorf>, port <3500>.
```

```
(14.2) 02-20-18 09:56:52 (18384:16628) JOB: Job <Load_entire_DW> of runid <201802200956521838416628> is initiated by user <admin>.
```

```
(14.2) 02-20-18 09:56:52 (18384:16628) JOB: Processing job <Load_entire_DW>.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) JOB: Optimizing job <Load_entire_DW>.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) JOB: Job <Load_entire_DW> is started.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) WORKFLOW: Work flow <Load_Dimension> is started.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) WORKFLOW: Work flow <Load_Dimension> is completed successfully.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) WORKFLOW: Work flow <Load_Fact> is started.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) WORKFLOW: Work flow <Data_Flow> is started.
```

```
(14.2) 02-20-18 09:56:56 (18024:15540) DATAFLOW: Process to execute data flow <UAC_SAP_DataFlow> is started.
```

```
(14.2) 02-20-18 09:56:58 (18024:15540) DATAFLOW: Data flow <UAC_SAP_DataFlow> is started.
```

```
(14.2) 02-20-18 09:56:58 (18024:15540) DATAFLOW: Cache statistics determined that data flow <UAC_SAP_DataFlow> uses 0 caches with a total size of 0 bytes, which is less than (or equal to) 3753902080 bytes available for caches in virtual memory. Data flow will use IN MEMORY cache type.
```

```
(14.2) 02-20-18 09:56:58 (18024:15540) DATAFLOW: Data flow <UAC_SAP_DataFlow> using IN MEMORY Cache.
```

```
(14.2) 02-20-18 09:56:59 (18024:15540) DATAFLOW: Data flow <UAC_SAP_DataFlow> is completed successfully.
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```
(14.2) 02-20-18 09:56:59 (18384:16628) JOB: Job <Load_entire_DW> is completed successfully.
```

Note: The Log and trace file in the SAP Data Service Management Console should be the same as in the output of the Universal Task.

The following shows the Universal Task Output:

Output

```
2018-02-20 09:56:48,117 - INFO - Executing version 0.4 with the following parameters
2018-02-20 09:56:48,132 - INFO - ##### Parameters:
2018-02-20 09:56:48,132 - INFO - server_log_path: C:\ProgramData\SAP BusinessObjects\Data Services\log\JobServer_1
2018-02-20 09:56:48,132 - INFO - jobdir: C:\ProgramData\SAP BusinessObjects\Data Services\log
2018-02-20 09:56:48,132 - INFO - tracedir: C:\ProgramData\SAP BusinessObjects\Data Services\log\JobServer_1\bi4_cms_dsn_dba
2018-02-20 09:56:48,132 - INFO - rwdirdir: C:\Program Files (x86)\SAP BusinessObjects\Data Services\bin
2018-02-20 09:56:48,132 - INFO - parameters: -w
2018-02-20 09:56:48,132 - INFO - poll: -t30
2018-02-20 09:56:48,132 - INFO - host: Walldorf
2018-02-20 09:56:48,132 - INFO - port: 3500
2018-02-20 09:56:48,132 - INFO - jobname: Load_entire_DW
2018-02-20 09:56:48,148 - INFO - jobname_file: C:\ProgramData\SAP BusinessObjects\Data Services\log\Load_entire_DW.txt
2018-02-20 09:56:48,148 - DEBUG - Directory found C:\Program Files (x86)\SAP BusinessObjects\Data Services\bin
2018-02-20 09:56:48,148 - DEBUG - Directory found C:\ProgramData\SAP BusinessObjects\Data Services\log
2018-02-20 09:56:48,148 - DEBUG - Directory found C:\ProgramData\SAP BusinessObjects\Data Services\log\JobServer_1
2018-02-20 09:56:48,148 - DEBUG - Directory found C:\ProgramData\SAP BusinessObjects\Data Services\log\JobServer_1\bi4_cms_dsn_dba
2018-02-20 09:56:48,148 - INFO - ##### Processing Start #####
2018-02-20 09:56:48,148 - DEBUG - Agent Home DIR: C:\Program Files\Universal\UAGSrv
2018-02-20 09:56:48,148 - DEBUG - Dir changed to AL_RWJobLauncher Home DIR: C:\Program Files (x86)\SAP BusinessObjects\Data Services\log\JobServer_1
2018-02-20 09:56:48,148 - DEBUG - cmd = AL_RWJobLauncher.exe "C:\ProgramData\SAP BusinessObjects\Data Services\log\JobServer_1" -w
2018-02-20 09:57:00,496 - INFO - Collecting tracefile for job=Load_entire_DW, with guid=8210c99e_4bf8_4d5e_997a_e552eb59984a
2018-02-20 09:57:00,528 - INFO - ##### Tracefile: C:\ProgramData\SAP BusinessObjects\Data Services\log\JobServer_1\bi4_cms_dsn_dba\
2018-02-20 09:57:00,528 - INFO - ##### Trace Log start:
2018-02-20 09:57:00,528 - INFO - (14.2) 02-20-18 09:56:51 (18384:16628) JOB: Reading job <8210c99e_4bf8_4d5e_997a_e552eb59984a> from the repository; Server version is <14.2.7.0000>.
```

```
(14.2) 02-20-18 09:56:51 (18384:16628) JOB: Current directory of job <8210c99e_4bf8_4d5e_997a_e552eb59984a> is <C:\Program Files (x86)\SAP BusinessObjects\Data Services\bin>.
```

```
(14.2) 02-20-18 09:56:52 (18384:16628) JOB: Starting job on job server host <Walldorf>, port <3500>.
```

```
(14.2) 02-20-18 09:56:52 (18384:16628) JOB: Job <Load_entire_DW> of runid <201802200956521838416628> is initiated by user <admin>.
```

```
(14.2) 02-20-18 09:56:52 (18384:16628) JOB: Processing job <Load_entire_DW>.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) JOB: Optimizing job <Load_entire_DW>.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) JOB: Job <Load_entire_DW> is started.
```

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(14.2) 02-20-18 09:56:54 (18384:16628) WORKFLOW: Work flow <Load_Dimension> is started.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) WORKFLOW: Work flow <Load_Dimension> is completed successfully.
```

```
(14.2) 02-20-18 09:56:54 (18384:16628) WORKFLOW: Work flow <Load_Fact> is started.
```

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(14.2) 02-20-18 09:56:59 (18024:15540) DATAFLOW: Process to execute data flow <UAC_SAP_DataFlow> is completed.
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(14.2) 02-20-18 09:56:59 (18384:16628) WORKFLOW: Work flow <Load_Fact> is completed successfully.
```

```
(14.2) 02-20-18 09:56:59 (18384:16628) JOB: Job <Load_entire_DW> is completed successfully.
```

```
2018-02-20 09:57:00,528 - INFO - ##### Trace Log End #####
2018-02-20 09:57:00,528 - INFO - ##### Processing Done #####
2018-02-20 09:57:00,528 - DEBUG - Collecting error log for job: Load_entire_DW, with guid=8210c99e_4bf8_4d5e_997a_e552eb59984a
2018-02-20 09:57:00,528 - INFO - No error found in: C:\ProgramData\SAP BusinessObjects\Data Services\log\JobServer_1\bi4_cms_dsn_dba\
```

5 Test Cases

The following basic test cases has been performed:

Case#	Assumed behavior	Result
Start Job in SAP BODS with all Parameters correctly entered	Job finishes with status success. In the Output the entire logfile is available	Correct
Wrong Jobname	IOError: [Errno 2] No such file or directory: 'C:\\ProgramData\\SAP BusinessObjects\\Data Services\\log\\Load_entire_DWs.txt'	Correct
Wrong path to AL_RWJobLauncher	ERROR - Directory not found: C:\\Program Files (x86)\\SAP BusinessObjects\\Data Services\\binx	Correct
Wrong jobdir	ERROR - Directory not found: C:\\ProgramData\\SAP BusinessObjects\\Data Services\\logx	Correct
Wrong tracedir	ERROR - Directory not found: C:\\ProgramData\\SAP BusinessObjects\\Data Services\\log\\JobServer_1\\bi4_cms_dsn__dbax	Correct
Wrong server_log_path	ERROR - Directory not found: C:\\ProgramData\\SAP BusinessObjects\\Data Services\\log\\JobServer_1x	Correct
Wrong Servername	ERROR - something is wrong with Walldorf:3500. Exception is [Errno 11001] getaddrinfo failed	Correct
Wrong Job Server Port	ERROR - something is wrong with Walldorf:3501. Exception is [Errno 10061] No connection could be made because the target machine actively refused it	Correct

6 Document References

This document references the following documents:

Ref#	Description
[1] 01_ds_42_mgmt_cons_en.pdf	Description of the <i>AL_RWJobLauncher.exe</i> tool
[2] XML extract of Universal Task	UAC XML extract of the Universal Template and Task <ul style="list-style-type: none">ops_task_universal_e05a420e7efb4ec6bace0e32ab053badops_unv_tmplt_808d3dc1638b468c8871473c73094af9
[3] Universal Agent 6.4.x Installation - Upgrade - and Applying Maintenance.pdf	Installation Manual for the Universal Agent