stonebranch

Universal Task Documentation

Universal Automation Center support for Monitoring a Database Column

ut-sqlserver-exec-dbscript-for-oracle-sqlserver-windows

Associated Activities:

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CONFIDENTIALITY INFORMATION

Distribution list: Stonebranch Customer

Revision	Date	Author	Changes
00	20180905	Nils Buer	Initial Document (WIP)

Abstract:

This Universal Task allows to execute an oracle PLSQL block or an SQLSERVER T-sql statement. It uses an agentless connection via ODBC towards SQLSERVER and the oracle basic instant client to connect to an Oracle database.

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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 oracle PLSQL block or an SQLSERVER T-sql statement. It uses an agentless connection via ODBC towards SQLSERVER and the oracle basic instant client to connect to an Oracle database. The connection and execution of the sql statements is performed using the python *cx_oracle* and *pyodbc* modules.

Some details about the universal task to monitor a value in a database column

- The Universal Task supports SQLSERVER & Oracle
- MySql and PostgreSQL can be added in the future
- The Universal Task supports both Universal Agent for Linux/Unix and Windows (Note: This Universal Task has been tested only on Windows Universal Agent).
- You can select different log-levels e.g. Info and debug
- You can execute oracle PLSQL blocks and SQLSERVER T-SQL statements
- You can decide if the sql-output is provided in the standard out or not
- All Passwords are encrypted using Controller Credentials

3 Installation

3.1 Software Requirements for Windows Agent

Universal Template name: ut-sqlserver-exec-dbscript-for-oracle-sqlserver-windows

Related UAC XML Files for template and task: [1]

Requirements to remotely connect from a Windows agent to an Oracle and/or SQLSERVER:

- Python 3.7.0-amd64 installed on a windows server where a Universal Agent is installed.
- For Python the following modules are required:
  - *sys, for output re-direct processing*
  - *datetime, date and time stamps for messages*
  - *pyodbc to perform the ODBC connection*
  - *cx_Oracle – Oracle DB support*
  - *logging, for python loglevel support*
- Universal Controller V6.4.7.0 or higher
- Universal Agent V6.4.2.2 or higher installed on a Windows Server
- Microsoft ODBC driver V17 installed on the Windows SQLSERVER
- The Windows Server needs to have Visual Studio VS 2013 installed.

- The Windows Server needs to have oracle instant client Version 18.3.0.0.0 installed.

3.2 Installation Steps

The following describes the installation steps:

1. **Install Python 3.7.0/64bit (python-3.7.0-amd64) for Windows on any Windows Server running a Universal Agent.**

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

   Important Note:

   Install python with the options:

   - add python to windows path
   - Install for all users

2. **Add the required python modules**

   In a dos command shell run as Administrator:

   - *pip install pyodbc*
   - *pip install cx_oracle*
   - *pip install datetime*
   - *pip install logging*

   Note: The module *pyodbc* contain the commands to perform SQL commands via an ODBC connection a SQLSERVER database.
   The module *cx_oracle* contain the commands to perform PLSQL commands via the oracle basic Instant Client to an oracle database.

   It is assumed that the modules logging, sys, datetime are already available. If not install them via pip.

3. **Install the Microsoft ODBC driver V17 installed on the Windows SQLSERVER**
   https://docs.microsoft.com/de-de/sql/connect/odbc/download-odbc-driver-for-sql-server?view=sql-server-2017

4. **Install Visual Studio VS 2013 on the windows server**
   https://support.microsoft.com/en-us/help/3179560/update-for-visual-c-2013-and-visual-c-redistributable-package

5. **Install the oracle instant client Version 18.3.0.0.0**
   (http://www.oracle.com/technetwork/topics/winx64soft-089540.html

   Installation of oracle instant client:

   a. Download the Instant Client packages oracle instant client Version 18.3.0.0.0 for windows.
   http://www.oracle.com/technetwork/topics/winx64soft-089540.html

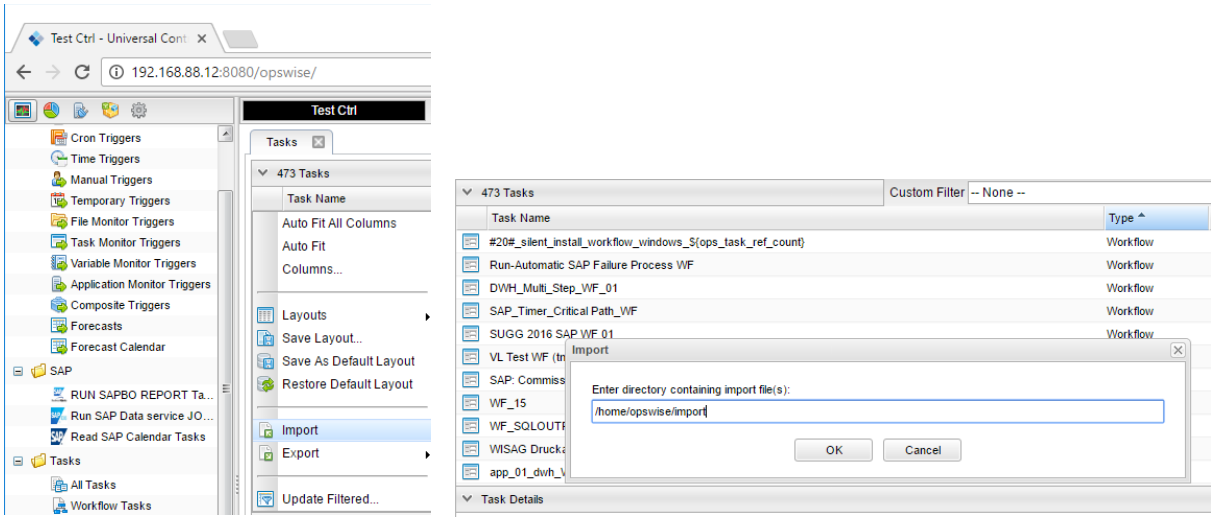
b. Unzip the packages into a single directory such as: C:\oracle\instantclient_18_3

c. Add this directory to the PATH environment variable. If you have multiple versions of Oracle libraries installed, make sure the new directory occurs first in the path

d. Download and install Microsoft Visual Studio 2013 redistributable https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads#bookmark-vs2013

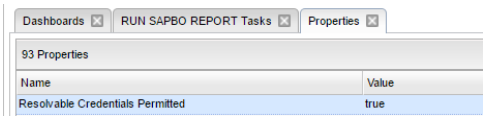
6. Import the Universal Task including the Universal Template to your Controller

Go to “All Tasks” and load via the Import functionality the Universal Task configuration into the Controller.



4 Universal Task Configuration

1. Activate: Resolvable Credentials in Universal Automation Center properties:



2. Fill Out the Universal Task for SQL script to be scheduled:

Oracle example:

The following PLSQL block should be scheduled:

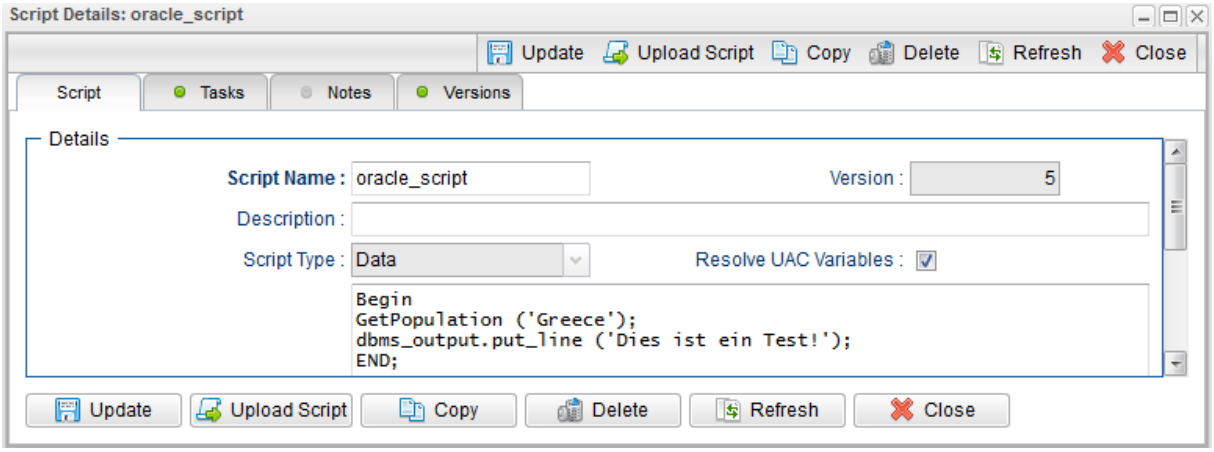
Begin

GetPopulation ('Greece');

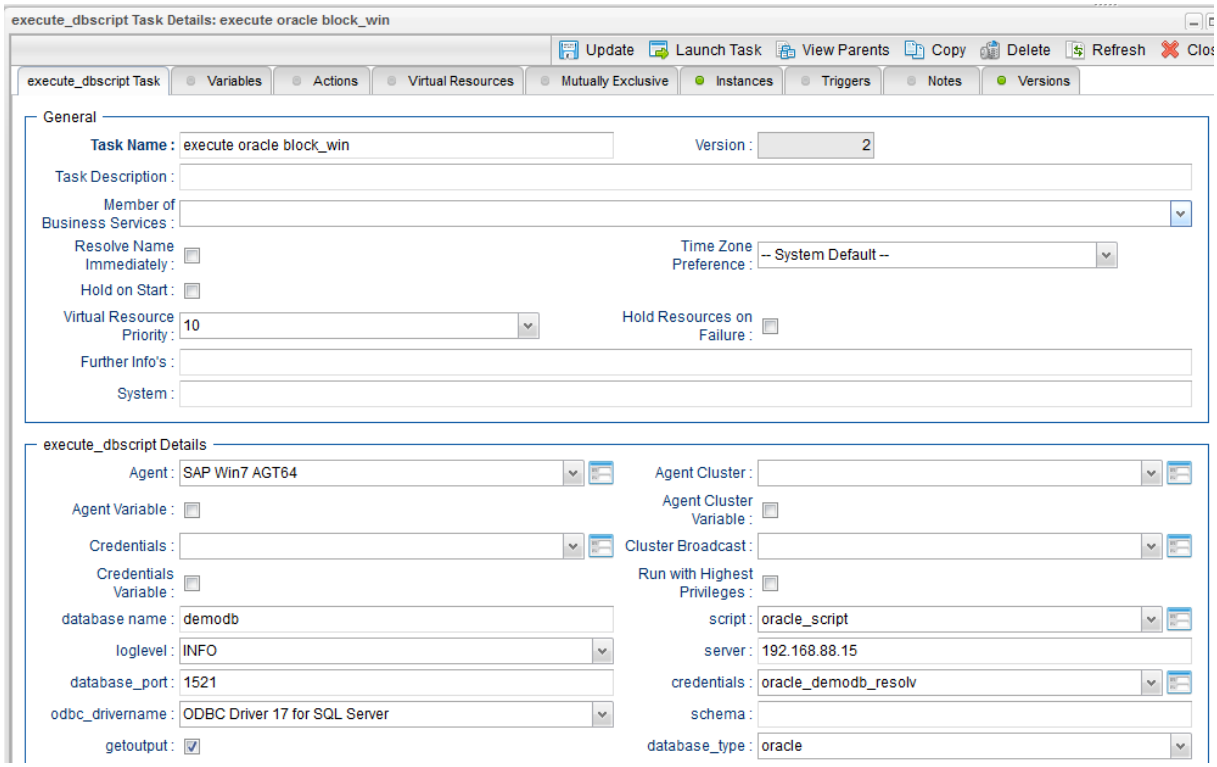
dbms_output.put_line ('Dies ist ein Test!');

END;

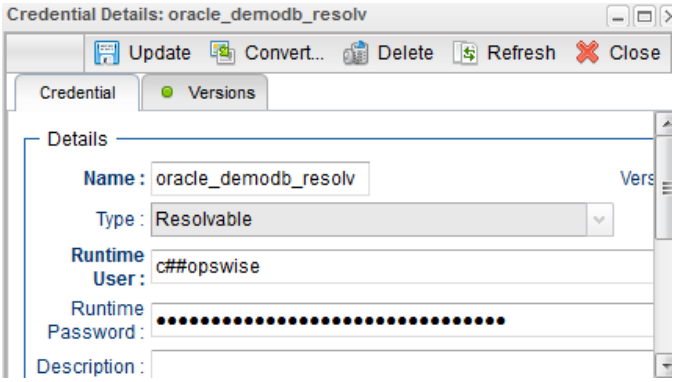
a) Fill out the script to be called
Note: in the script you can use Controller Variables.



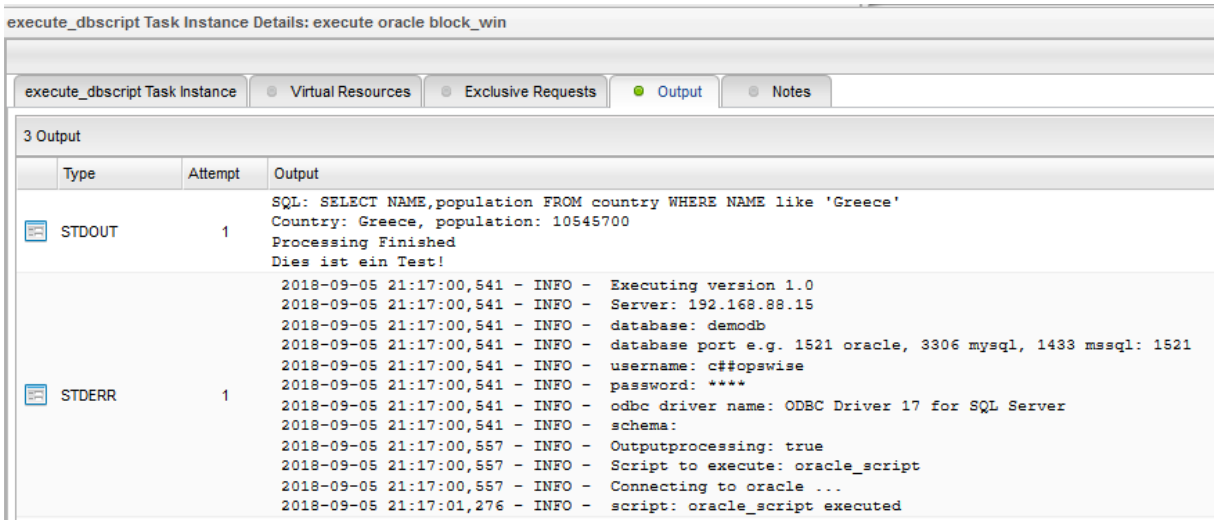
b) Fill out the Universal Task and assign the script to it



Credential for Universal Task:



Task Output:
Because the *getouput* field is checked, the STDOUT contains the *dbms_output of the stored procedure.*

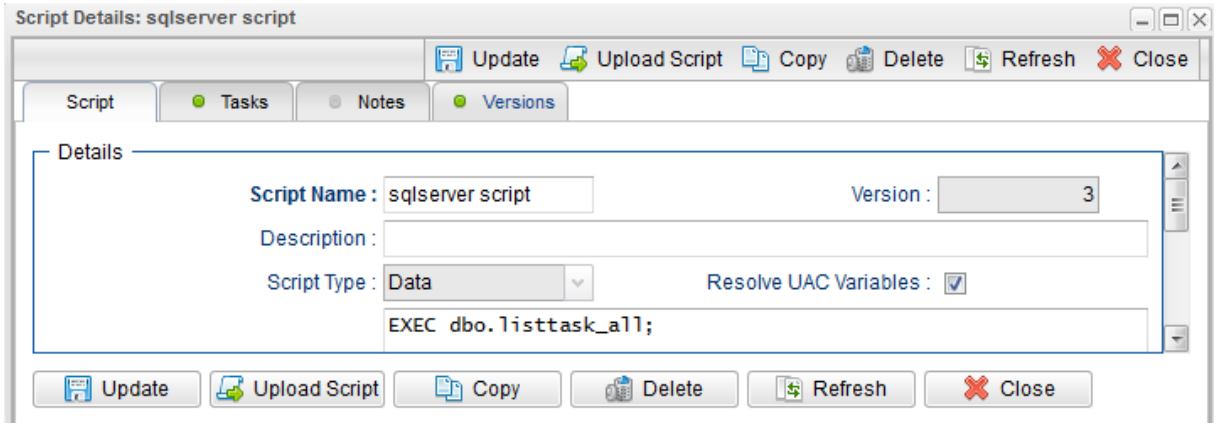


SQLSERVER example

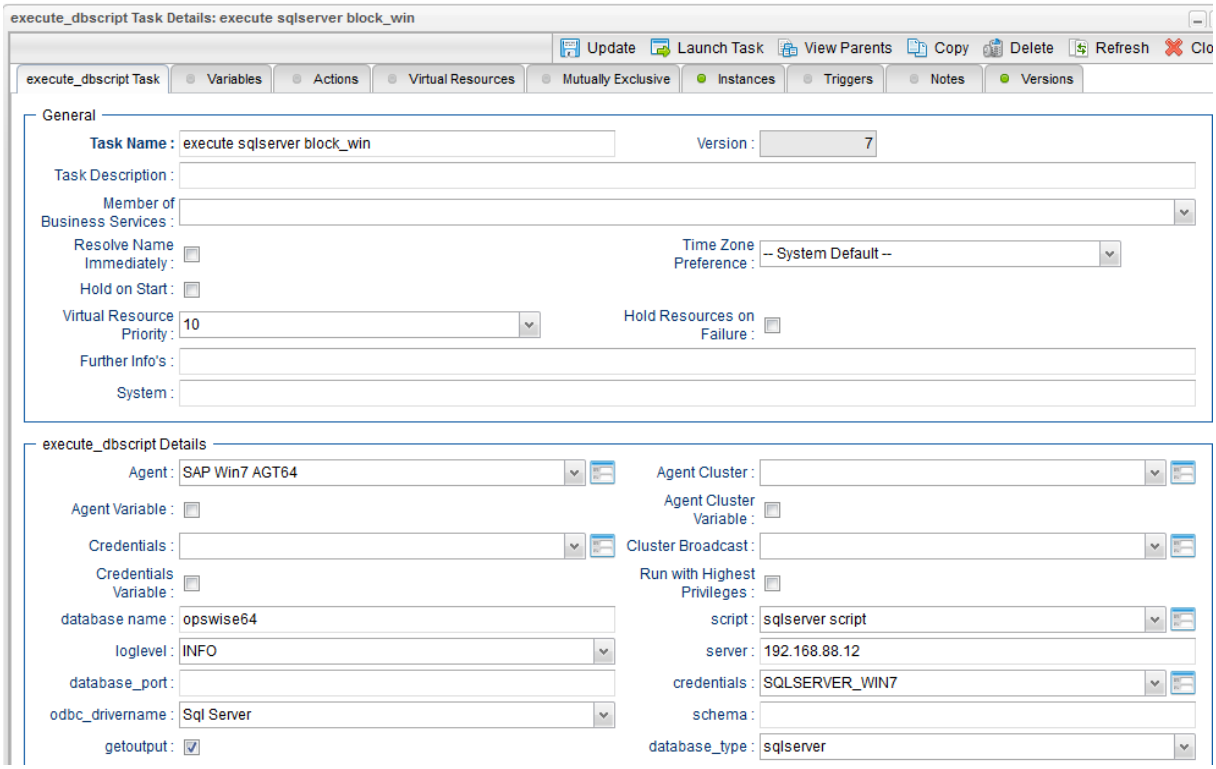
The following T-SQL block should be scheduled:

EXEC dbo.listtask_all;

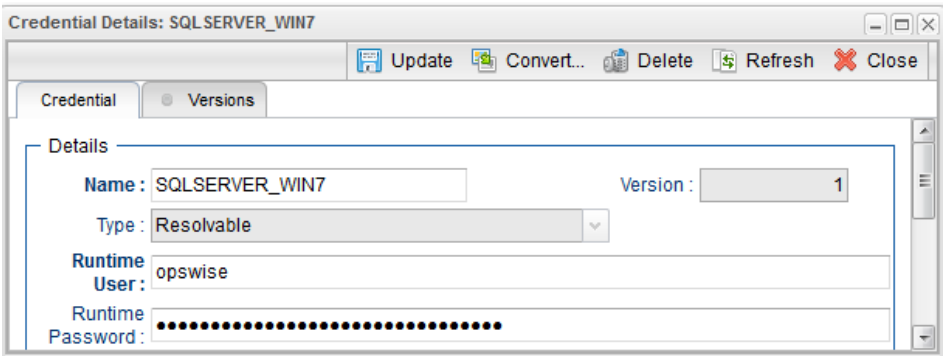
a) Fill out the script to be called
Note: in the script you can use Controller Variables.



b) Fill out the Universal Task and assign the script to it

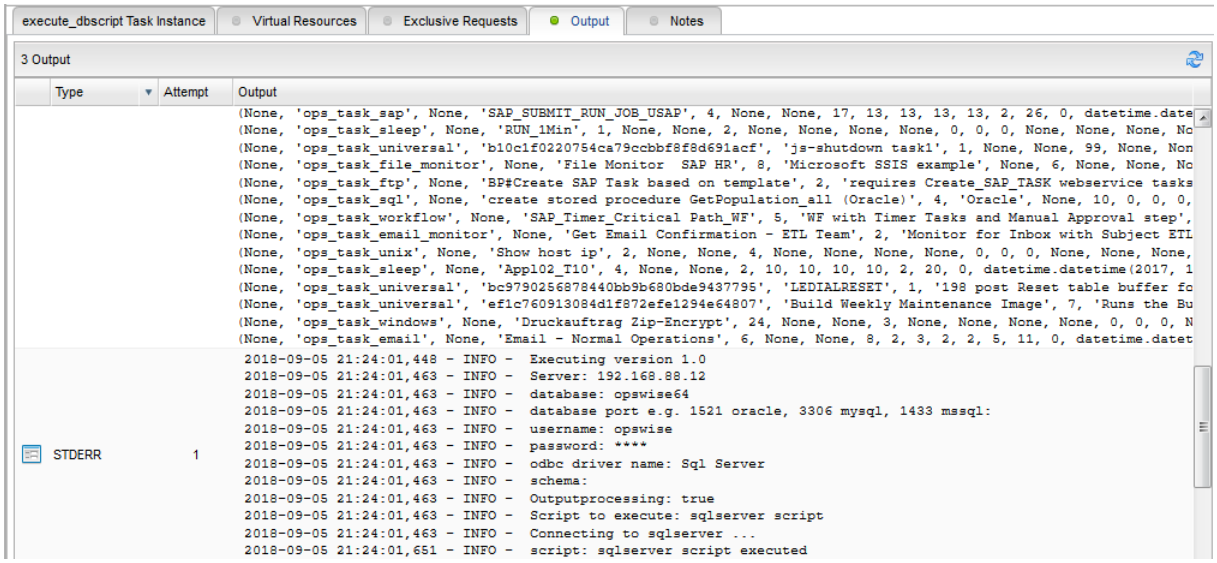


Credential for Universal Task:



Task Output:

Because the *getouput* field is checked, the STDOUT contains the *dbms_output of the stored procedure.*



Description:

Field	Description
DB credentials	Database Credentials
Database	Database or oracle service name (tnsnames.ora)
Table	Table in which the field to monitor is located
Column	Column in which the field to monitor is located
Script	The database script to execute
Database_port	Port of the database e.g. 1521 for oracle
Server	Database Servername e.g. localhost
Loglevel	log level: DEBUG, INFO, WARNING, ERROR, CRITICAL
Schema	Database Schema
getoutput flag	*If getouput* field is checked, the STDOUT contains the *dbms_output of the stored procedure. Otherwise not output is written to STDOUT*
odbc_drivername	*Only used for SQLSERVER (on linux you can check the odbc drivername in /etc/odbcinst.ini)*

5 Test Cases

The following basic test cases has been performed:

Case#	Assumed behavior	Result
Start a PLSQL block with a stored procedure (getoutput flag set)	PLSQL Procedure is executed. The *dbms_output* is written *STDOUT*	Correct
Start a PLSQL block with a stored procedure (getoutput flag not set)	PLSQL Procedure is executed. The *dbms_output* is not written to STDOUT	Correct
Execute an SQLSERVER procedure (getoutput flag set)	T-SQL Procedure is executed. *Procedure output is written to STDOUT*	Correct
Execute an SQLSERVER procedure (getoutput flag is not set)	T-SQL Procedure is executed. *Procedure output is not written to STDOUT*	Correct
Start a PLSQL block with wrong db port	Task fails with message: cx_Oracle.DatabaseError: ORA-12541: TNS:no listener	Correct
Start a PLSQL block with wrong server ip	Task fails with message: cx_Oracle.DatabaseError: ORA-12170: TNS:Connect timeout occurred	Correct
Start a PLSQL block with a non-existing plsql procedure	Task fails with message: PLS-00201: identifier 'GETPOPULATIONS' must be declared	Correct
Start a PLSQL block with wrong credentials	Task fails with message: cx_Oracle.DatabaseError: ORA-01017: invalid username/password; logon denied	Correct
Oracle client library path wrong	Task fails with message: cx_Oracle.DatabaseError: DPI-1047: 64-bit Oracle Client library cannot be loaded	Correct
Start a TSQL block with wrong ODBC connector	Task fails with message: pyodbc.InterfaceError: ('IM002', '[IM002] [Microsoft][ODBC Driver Manager] Der Datenquellenname wurde nicht gefunden, und es wurde kein Standardtreiber angegeben (0) (SQLDriverConnect)')	Correct
Start a TSQL block with wrong server ip	Task fails with message: pyodbc.OperationalError: ('08001', '[08001] [Microsoft][ODBC SQL Server Driver][DBNETLIB]SQL Server existiert nicht	Correct

	oder Zugriff verweigert. (17) (SQLDriverConnect)	
Start a TSQL block with a non-existing plsql procedure	Task fails with message: ERROR - ('42000', "[42000] [Microsoft][ODBC SQL Server Driver][SQL Server]Could not find stored procedure 'dbo.listtask_alls'.	Correct
Start a TSQL block with wrong credentials	Task fails with message: pyodbc.InterfaceError: ('28000', "[28000] [Microsoft][ODBC SQL Server Driver][SQL Server]Login failed for user ERROR - ORA-06550: line 3, column 1: PLS-00201: identifier 'GETPOPULATIONS' must be declared	Correct

6 Document References

This document references the following documents:

Ref#	Description
[1] XML extract of Universal Task	UAC XML extract of the Universal Template and Task