Microsoft

Step-by-Step Guide to Running Attunity Replicate for Microsoft Migrations

With additional steps for: Oracle to Azure SQL DB/MI

Prepared by

Data Migration Jumpstart Engineering Team

Advanced Solutions Delivery – Data & AI CTO

askdmjfordmtools@microsoft.com

dmjarchitects@microsoft.com

Revision 4

5/29/2019

Contents

1 Disclaimer

This document is provided “as-is”. Information and views expressed in this document, including URL and other Internet Web site references, may change without notice.

Some examples depicted herein are provided for illustration only and are fictitious. No real association or connection is intended or should be inferred.

This document does not provide you with any legal rights to any intellectual property in any Microsoft product. You may copy and use this document for your internal, reference purposes.

© 2019 Microsoft. All rights reserved.

2 Introduction

This document is meant to be used as a Quick Start Guide to migrate schema & data from Oracle to Azure SQL DB using Attunity Replicate for Microsoft Migrations tool. Complete details on the tool can be found at http://attunity.com/MicrosoftMigrations

For in-depth information, use the Attunity Replicate User and Reference Guide document.

3 Document Revisions

Rev No.	Author	Date	Comments
1	Rakesh Davanum	2018	First Revision
2	Jonathon Frost jfrost@microsoft.com	2019	Added disclaimer and contact Information
3	Oscar Zamora oscar.zamora@microsoft.com	05/23/2019	Expanded step information to include missing driver fix and additional steps to enable CDC for Oracle. Beautified document; added table of contents.
4	Oscar Zamora oscar.zamora@microsoft.com	05/29/2019	Added information about OCI driver for Oracle, as a required package for systems not having Oracle Server installed

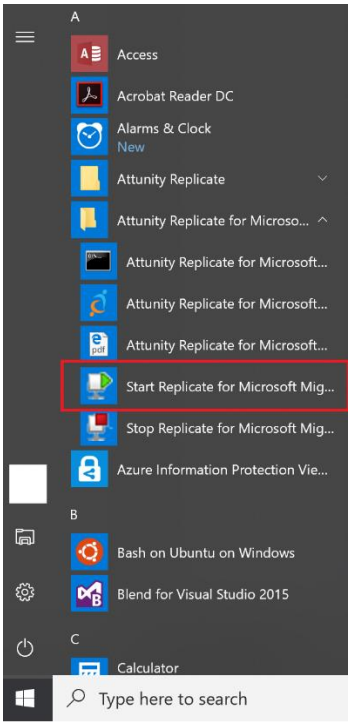
4 Steps

4.1 Download the tool

1. Download location: http://attunity.com/MicrosoftMigrations
2. Install on your machine

4.2 Start Attunity Services

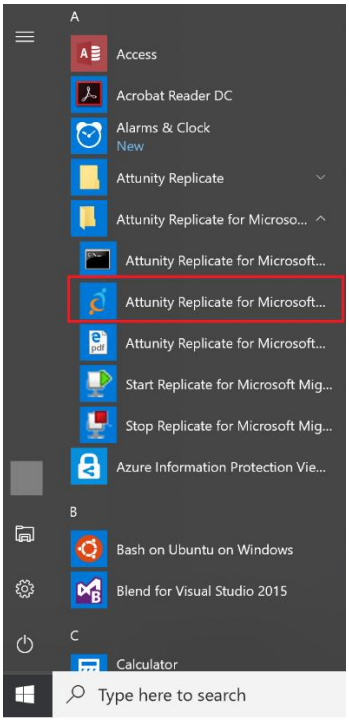
Start Replicate service if it is not already running. You can do this using the **Start Replicate for Microsoft Migrations** under **Attunity Replicate for Microsoft Migrations** program option.



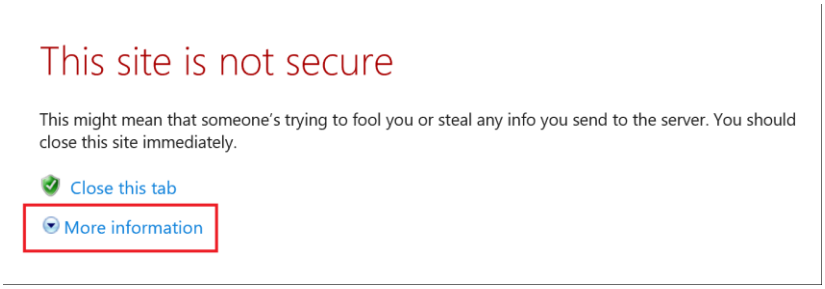
4.3 Access to the Attunity Web Console

Open the web console using **Attunity Replicate for Microsoft Migrations Console** program under **Attunity Replicate for Microsoft Migrations** folder. Open the web console

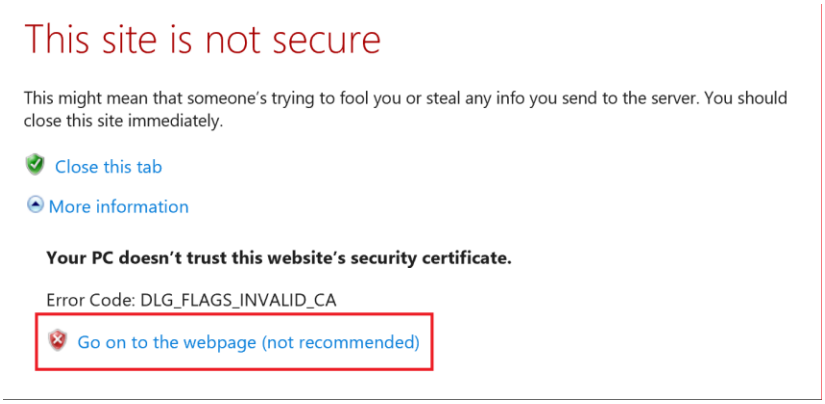
in **Internet Explorer** browser. If you wish to try with the Google Chrome browser or Microsoft Edge, ensure that that you open then in Incognito or InPrivate mode respectively.



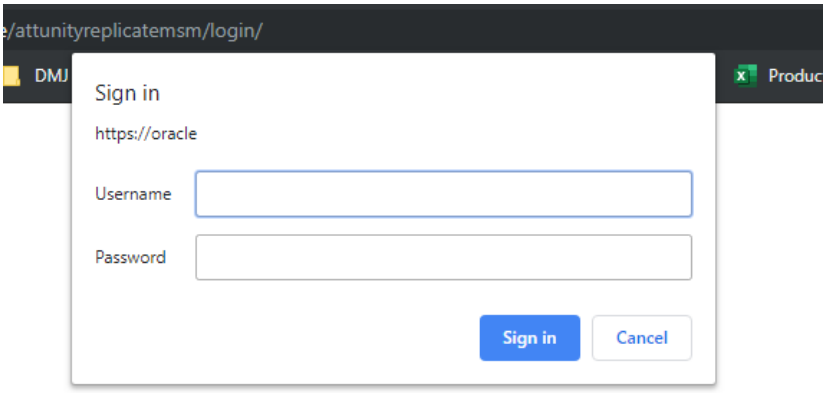
Expand the **More information** section if the browser gives a security warning



Click on **Go on to the webpage (not recommended).** This will bring up the home page of the tool.



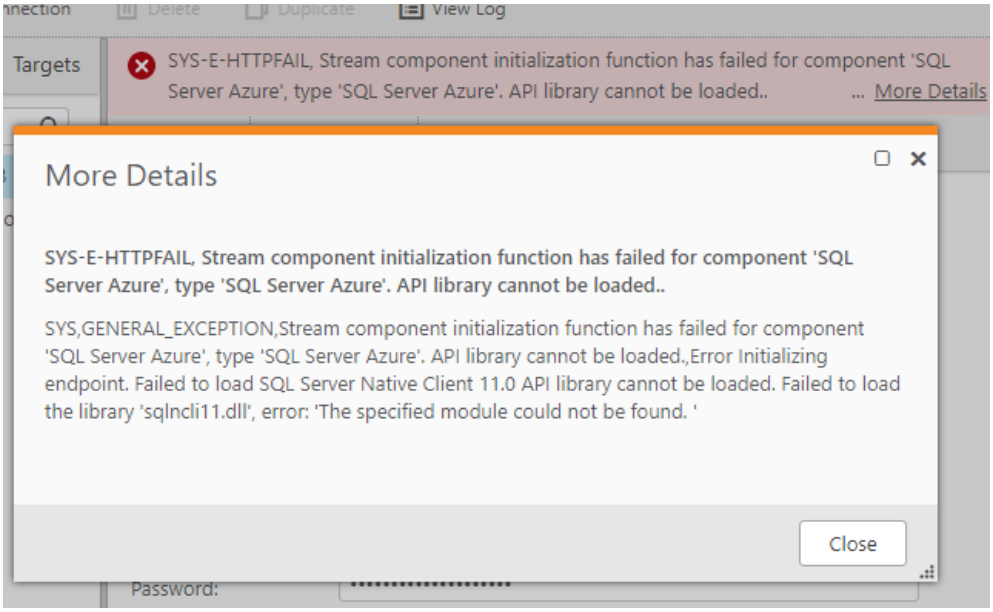
Log in with the local or domain user that grants administrator access to the local machines.



4.4 Review SQL Server Prerequisites

If the host running Attunity does not have SQL Server Installed, as of May of 2019, it is required to install the SQL Native Client in order to connect Azure SQL Database. The Attunity team is aware that the driver has been deprecated and will be updating the software to leverage a more up to date driver instead.

The error message you might get, if no driver has been found:

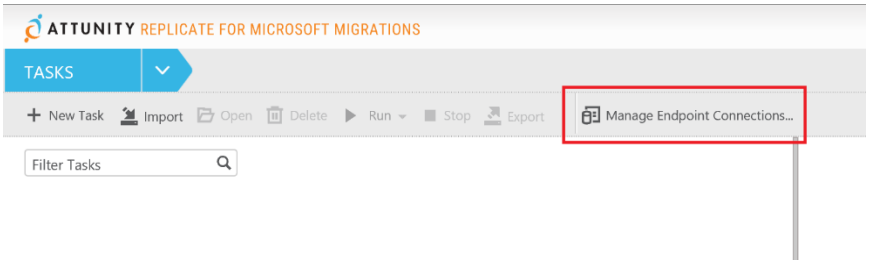


SQL Native Client can be downloaded from:

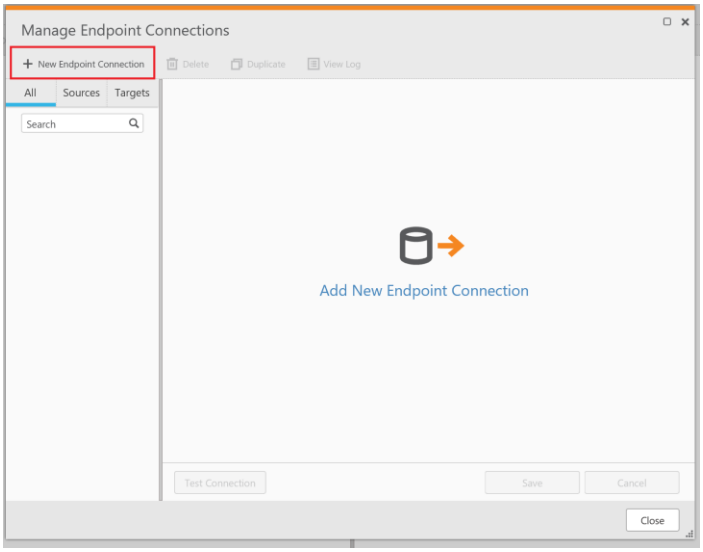
1. Click on: https://www.microsoft.com/en-us/download/confirmation.aspx?id=29065
2. Expand ⊕ Install Instructions
3. Locate Microsoft® SQL Server® 2012 Native Client, and download X64 or X86, depending on the local architecture.

4.5 Manage Endpoint Connections

Click on **Manage Endpoint Connections** button to add connection details of both the source & target databases

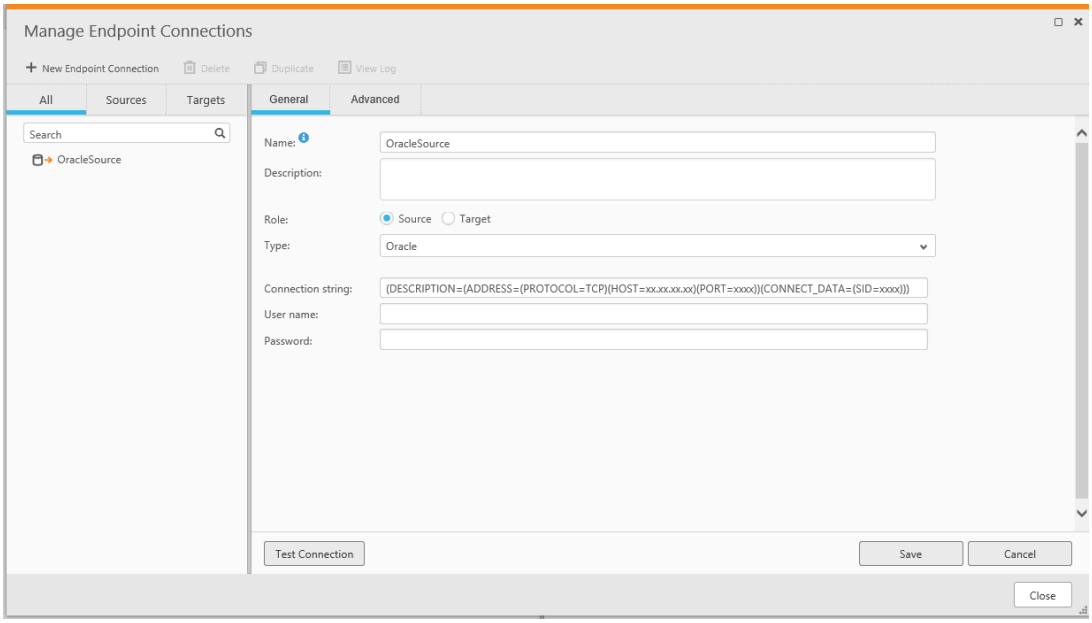


Click on **+ New Endpoint Connection** button.

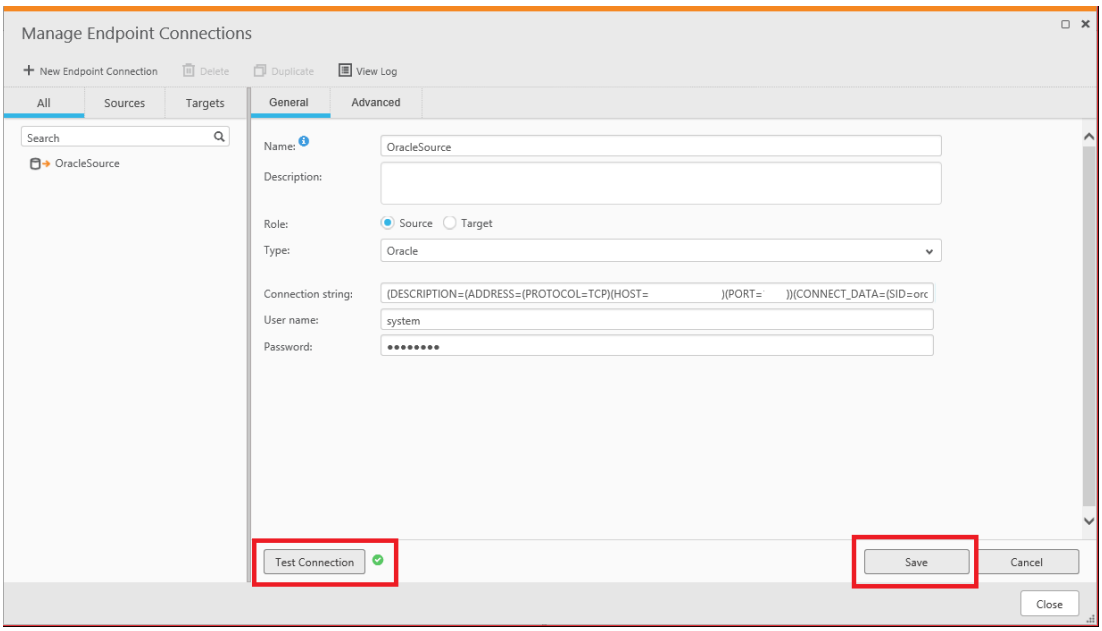


Provide the source connection details. Be sure to select **Role** as **Source** and **Type** as **Oracle.** Specify the **Username** and **Password**. Be sure to provide the **Connection string** in the below format (other formats did not work when I tried)

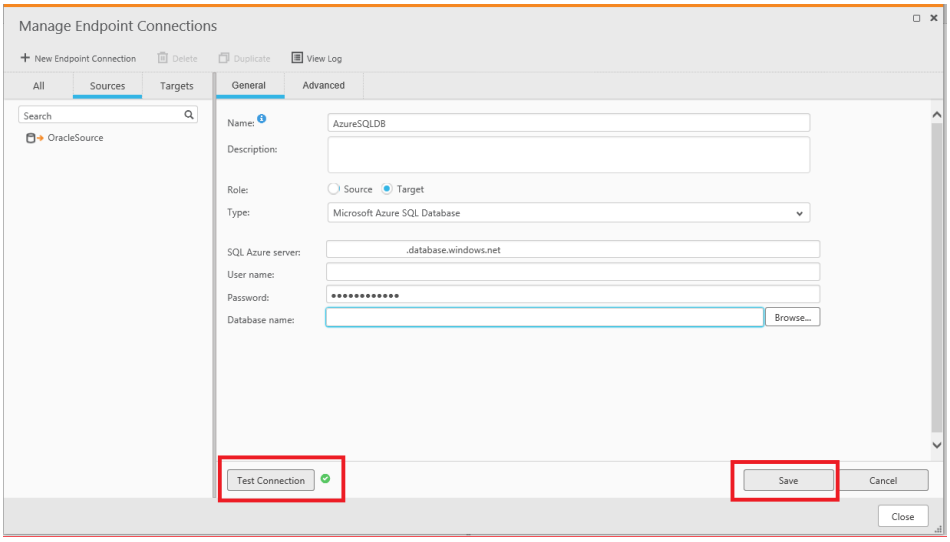
(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=xx.xx.xx.xx)(PORT=xxxx))(CONNECT_DATA=(SID=xxxx)))



Click on **Test Connection** after all the details are provided. Click on **Save** once the connection test is successful.



Follow the same procedure to add a **New Endpoint Connection** to provide target connection details. Select **Role** as **Target** and **Type** as **Microsoft Azure SQL Database.** Specify the connection details, test connection and save the endpoint information.



4.6 Review Oracle Prerequisites

Steps below ensure that Oracle is ready for data migration into Azure SQL Data Platform.

4.6.1 Review Archive Redo Logs

Check on the Oracle Database Instance:

```
SELECT log_mode FROM v$database;
```

'NOARCHIVELOG' means the requirement is not met. We need 'ARCHIVELOG'.

4.6.2 Enable Archive Redo Logs

Configuration (SYSDBA privileges required):

sqlplus <user>/<pswd> as sysdba

```
-- Shut down the database instance
-- wait for confirmation that the 'ORACLE instance shut down'
SHUTDOWN IMMEDIATE;

-- start a new instance and mount, but do not open the database
-- to enable or disable archiving, the database must be mounted
-- wait for confirmation that the 'ORACLE instance started'
STARTUP MOUNT;

-- change the database archiving mode
ALTER DATABASE ARCHIVELOG;

-- open the database for normal operations
ALTER DATABASE OPEN;

-- Force a switch of a log file in order to have at least one ID
ALTER SYSTEM SWITCH LOGFILE;
```

4.6.3 Review Supplemental login for Change Data Capture (CDC)

Check on the Oracle Database Instance:

```
SELECT supplemental_log_data_min FROM v$database;
```

We need 'YES'.

4.6.4 Enable Supplemental login for Change Data Capture (CDC)

```
Configuration (SYSDBA privileges required):
sqlplus <user>/<pswd> as sysdba
```

Option1:

```
-- change the database level supplemental logging
-- (this will cover all the tables with PKs and unique index)
-- (detection query will return 'IMPLICIT')
ALTER DATABASE ADD SUPPLEMENTAL LOG DATA (PRIMARY KEY, UNIQUE) COLUMNS;

-- change the table level supplemental logging
-- (run only for tables that do have data manipulation and do not have PKs nor unique index)
ALTER TABLE XXX ADD SUPPLEMENTAL LOG DATA (ALL) COLUMNS;
```

Option2:

```
-- change the database level supplemental logging
-- (this will cover all the tables)
-- (detection query returns 'YES' so Attunity is happy at this point)
ALTER DATABASE ADD SUPPLEMENTAL LOG DATA;

-- change the table level supplemental logging
-- follow the logic below to run only one statement for every table
If the table has a primary key:
ALTER TABLE xxx ADD SUPPLEMENTAL LOG DATA (PRIMARY KEY) COLUMNS;

Else If the table has a unique index:
ALTER TABLE xxx ADD SUPPLEMENTAL LOG GROUP (first unique index columns) ALWAYS;

Else:
ALTER TABLE xxx ADD SUPPLEMENTAL LOG DATA (ALL) COLUMNS;
```

4.6.5 Oracle OCI Driver

If the local machine has Oracle already installed, it is likely that the OCI driver is already available. If it is not the case, the OCI driver will need to be installed prior to the creation of a migration task.

- Search for "Instant Client Downloads for Microsoft Windows (x64) 64-bit", accept the license agreement, and download the Basic Package.
- Install the Basic Package.

If there the OCI driver is not installed, you might get a message like:

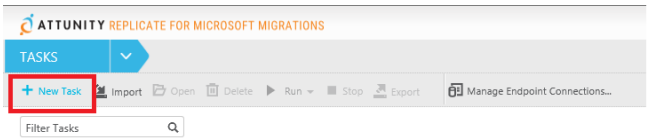
SYS-E-HTTPFAIL, Stream component initialization function has failed for component 'Oracle', type 'Oracle'. API library cannot be loaded..

SYS,GENERAL_EXCEPTION,Stream component initialization function has failed for component 'Oracle', type 'Oracle'. API library cannot be loaded.,Failed to load the library 'oci.dll', error: 'The specified module could not be found. '

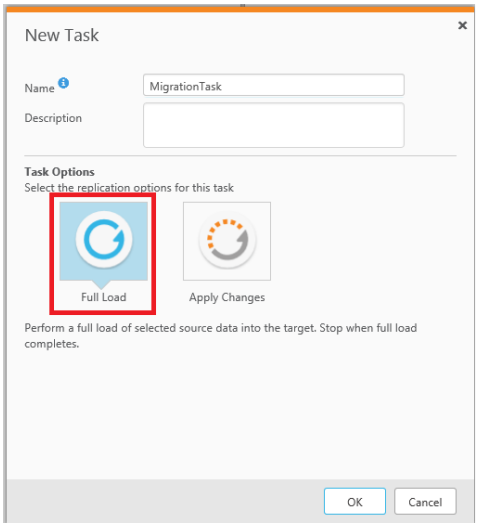
Note: If the Attunity application is not able to locate the Oracle driver on next step, even after installing, review the Oracle Home path on Windows to ensure that the Oracle Home folder has been included.

4.7 Create a New Migration Task

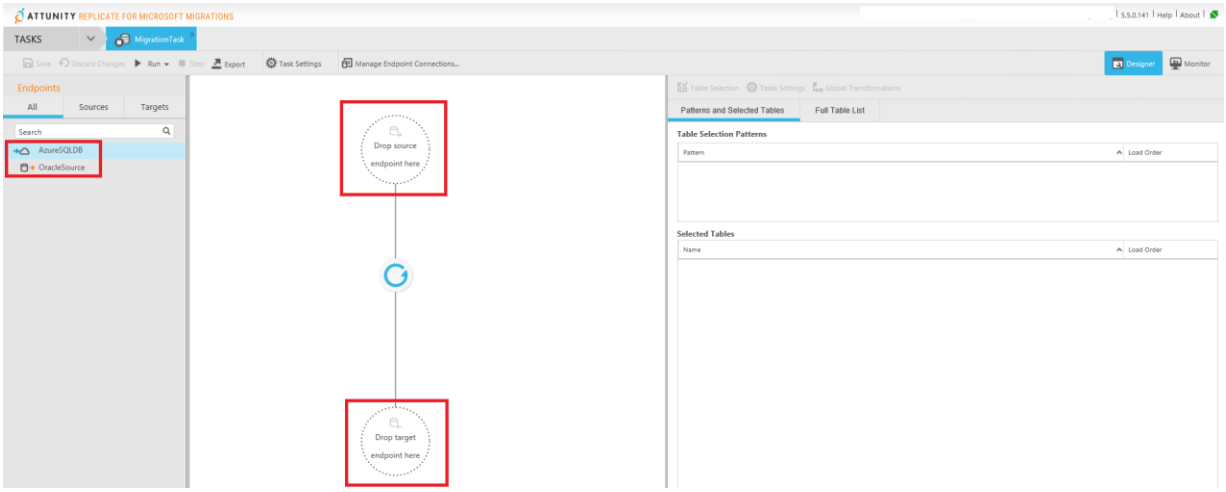
1.) Once the endpoints are setup, create a new task by clicking on the **+ New Task** button on the top ribbon.



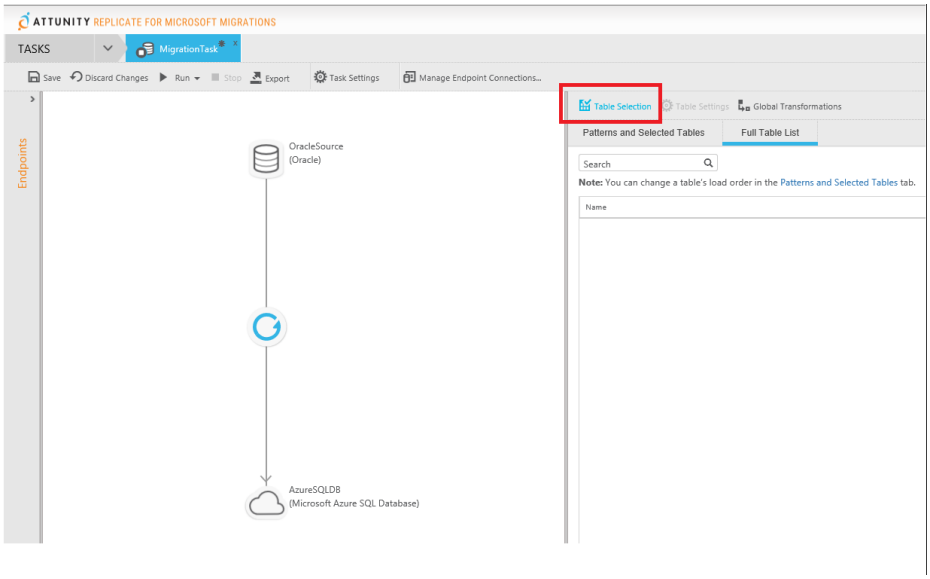
2.) In the New Task dialog box, make sure you choose only **Full Load** under **Task Options.** If any other task options are selected (ex: Apply Changes or Store Changes), be sure to un select them by clicking on the option (Blue color indicates selected and grey color indicates not selected). Specify a name for the task and click OK.



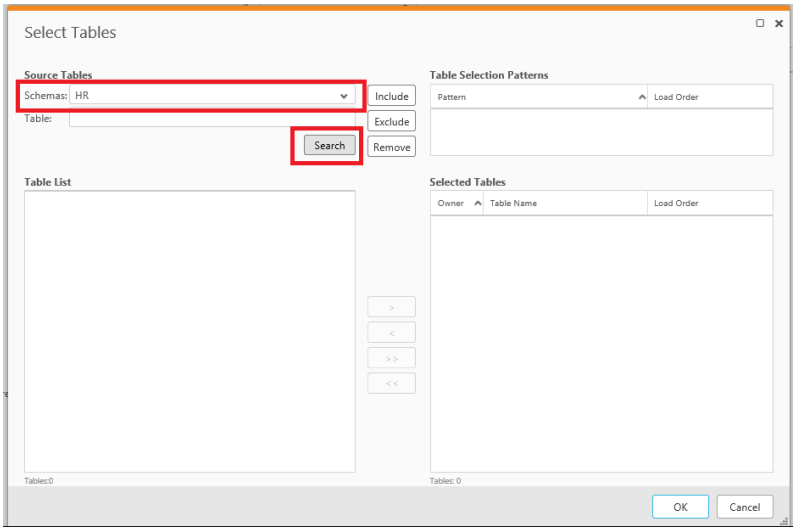
3.) The endpoints are shown on the left pane and a diagram is shown to represent the flow. Drag & drop the end points into the appropriate source & target locations on the diagram. (Oracle endpoint to the source location & Azure SQL DB endpoint to the target location).



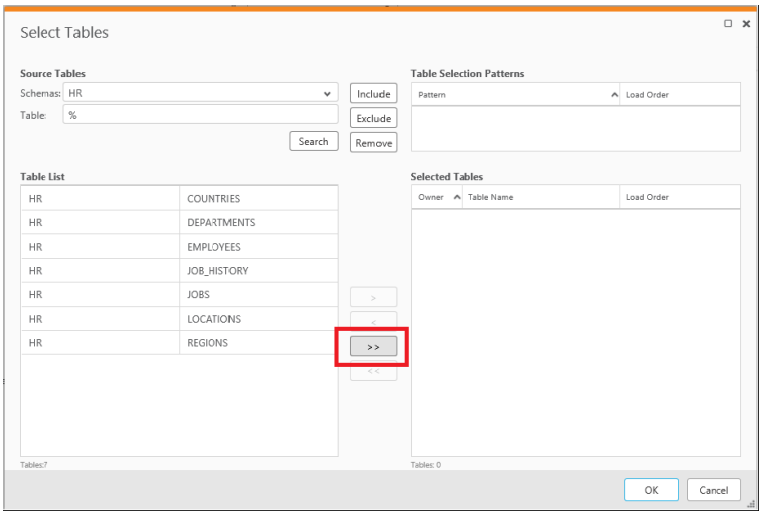
4.) Once the source & target endpoints are placed, click on the **Table Selection** button to select the schema & tables from the source to migrate.



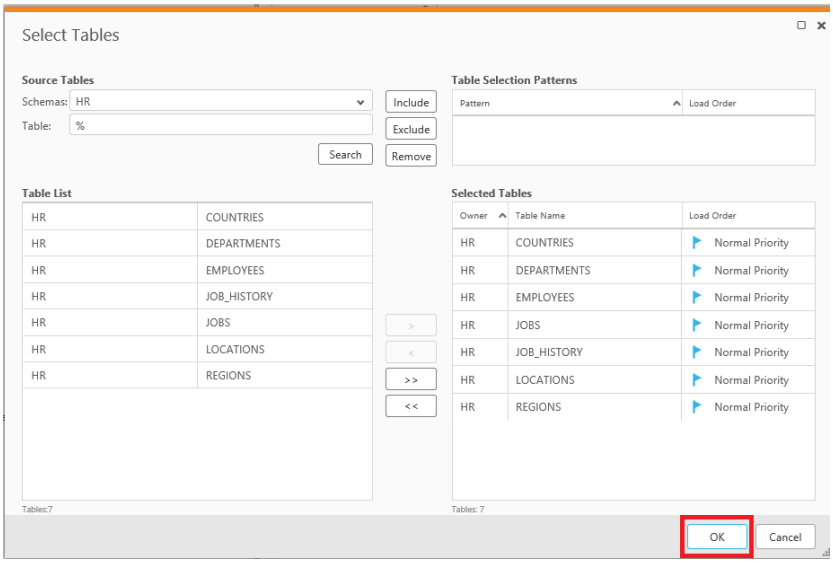
5.) In the Select Tables dialog box, select the **Schema** from the drop down and click on **Search** button to list all the tables under that schema.



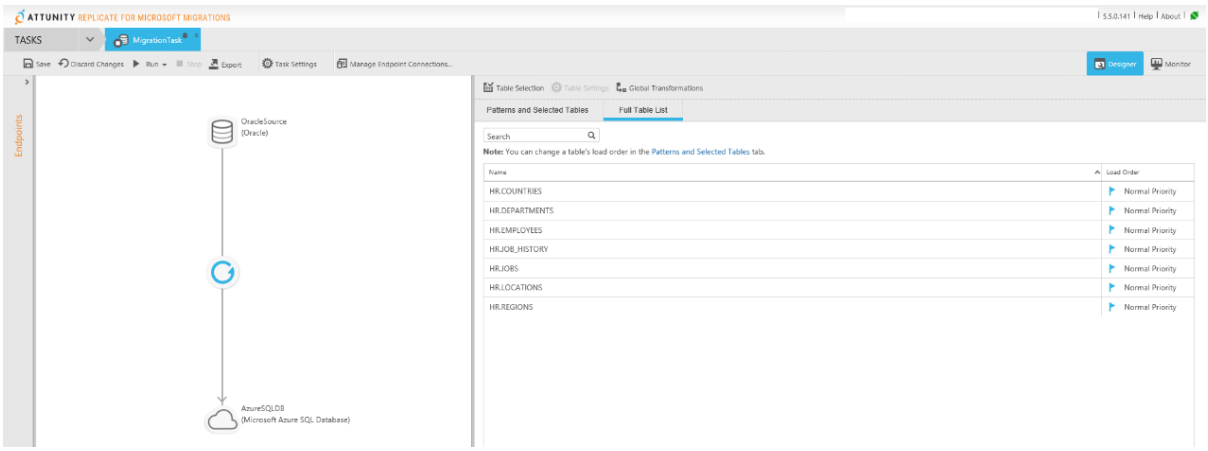
6.) Once the tables under the selected schema are listed, use the **>>** (add all) button to add all tables in the schema to the migration task. Alternatively, you can also select specific tables and add them to the migration task too.



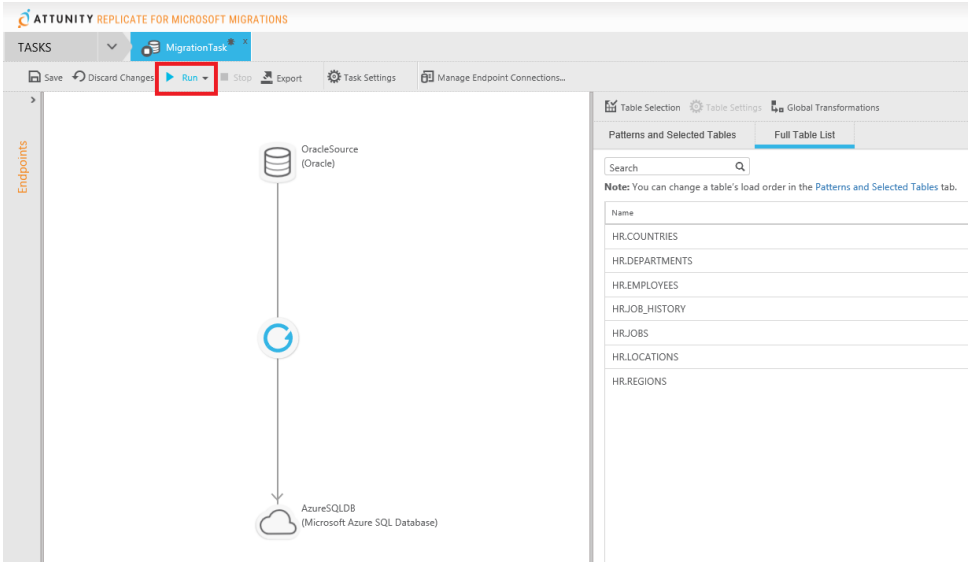
7.) Click on **OK** button after all the required tables are selected and added to the migration task.

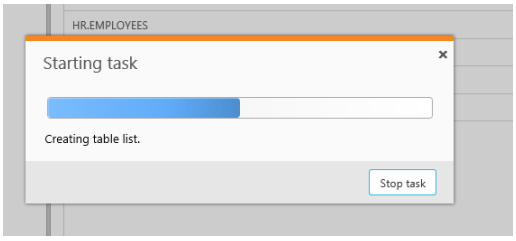


8.) The source, target and the list of tables selected for the migration task are displayed.



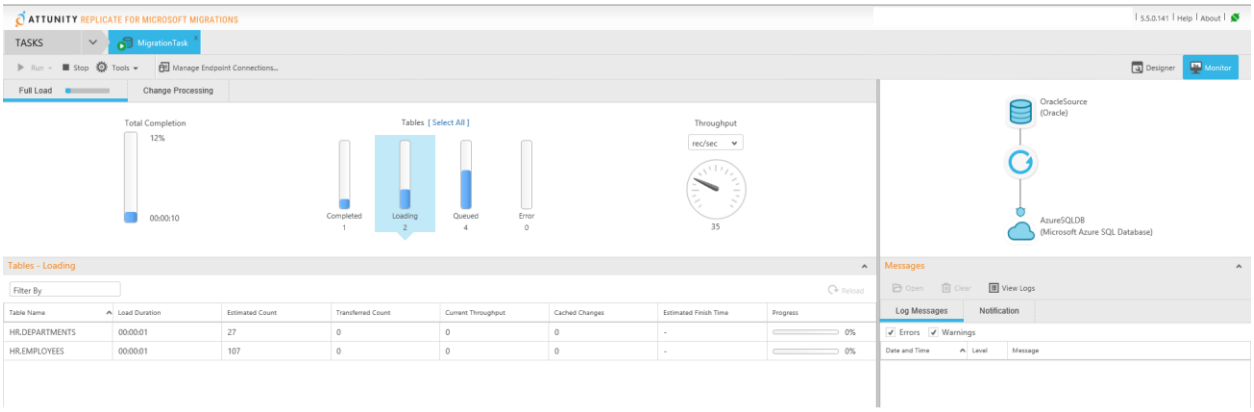
9.) Click on the **Run** button on the top ribbon to start the migration task





4.8 Monitor the Migration Process

Once the task has started, the view switches to the **Monitor** tab to display the detailed status of the migration task.



The summary of the migration task is displayed once the task completes.

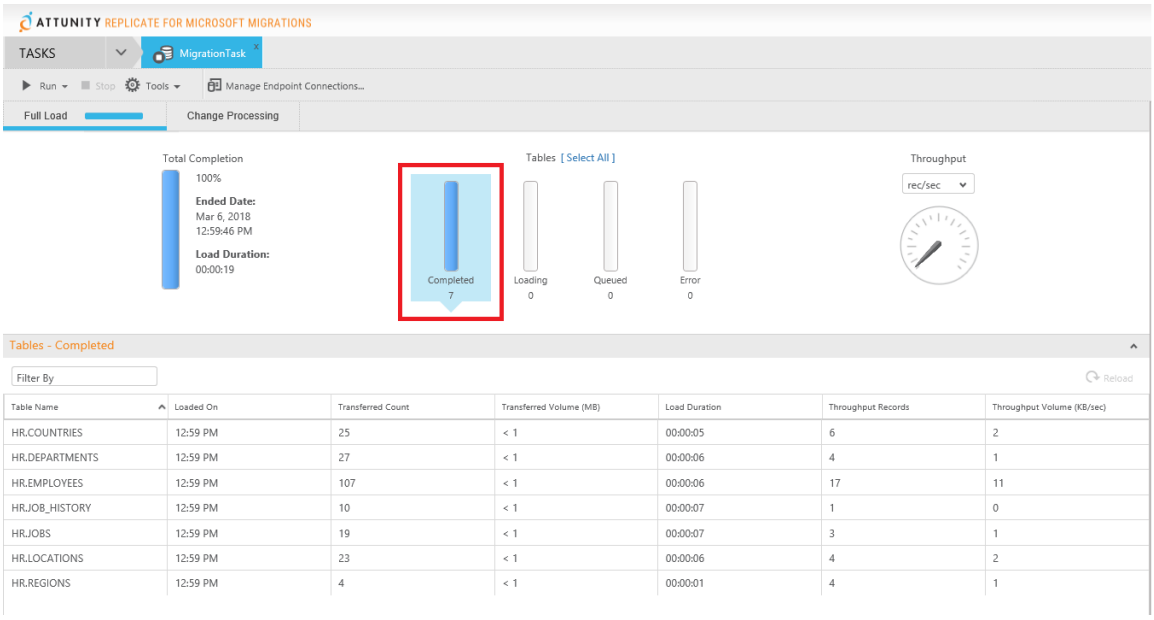
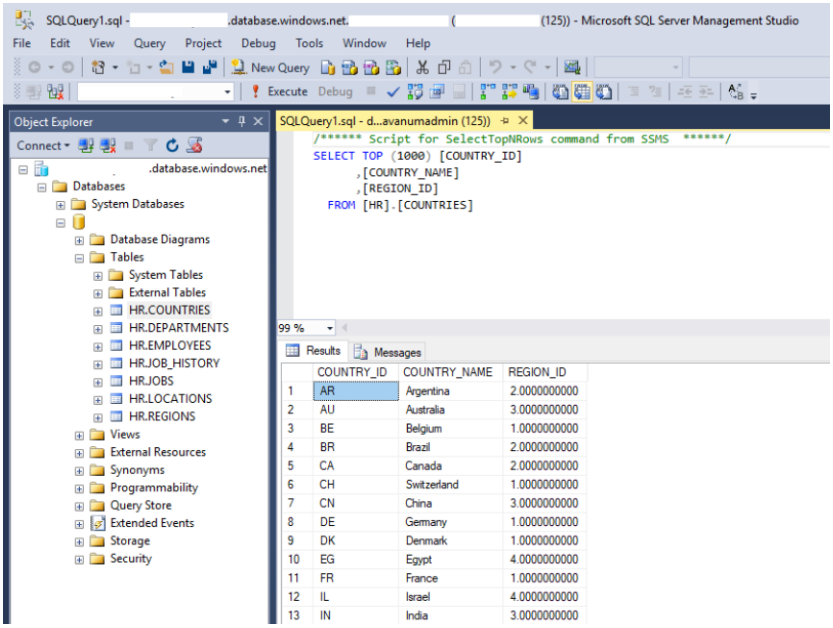


Table Name	Loaded On	Transferred Count	Transferred Volume (MB)	Load Duration	Throughput Records	Throughput Volume (KB/sec)
HR.COUNTRIES	12:59 PM	25	< 1	00:00:05	6	2
HR.DEPARTMENTS	12:59 PM	27	< 1	00:00:06	4	1
HR.EMPLOYEES	12:59 PM	107	< 1	00:00:06	17	11
HR.JOB_HISTORY	12:59 PM	10	< 1	00:00:07	1	0
HR.JOBS	12:59 PM	19	< 1	00:00:07	3	1
HR.LOCATIONS	12:59 PM	23	< 1	00:00:06	4	2
HR.REGIONS	12:59 PM	4	< 1	00:00:01	4	1

Once the data migration is complete, connect to the target Azure SQL DB using a different tool like SSMS and query a table to confirm that the data was transferred successfully from Oracle to Azure SQL DB.



	COUNTRY_ID	COUNTRY_NAME	REGION_ID
1	AR	Argentina	2.0000000000
2	AU	Australia	3.0000000000
3	BE	Belgium	1.0000000000
4	BR	Brazil	2.0000000000
5	CA	Canada	2.0000000000
6	CH	Switzerland	1.0000000000
7	CN	China	3.0000000000
8	DE	Germany	1.0000000000
9	DK	Denmark	1.0000000000
10	EG	Egypt	4.0000000000
11	FR	France	1.0000000000
12	IL	Israel	4.0000000000
13	IN	India	3.0000000000

5 Feedback and Suggestions

If you have feedback or suggestions for improving this data migration asset, please contact the Data Migration Jumpstart Team (askdmjfordmtools@microsoft.com). Thanks for your support!

Note: For additional information about migrating various source databases to Azure, see the Azure Database Migration Guide.

6 Additional Resources

Attunity Replicate additional resources can be found on these links.

- **Quick Start Guide**: https://microsoft.attunity.com/docs/DOC-1013-attunity-replicate-for-microsoft-migrations-user-and-setup-guide
- **Quick Start Video**: https://microsoft.attunity.com/videos/1001-quick-start-video
- **User Guide**: https://microsoft.attunity.com/docs/DOC-1013-attunity-replicate-for-microsoft-migrations-user-and-setup-guide
- **Release Notes**: https://microsoft.attunity.com/docs/DOC-1041-attunity-replicate-microsoft-migrations-release-notes