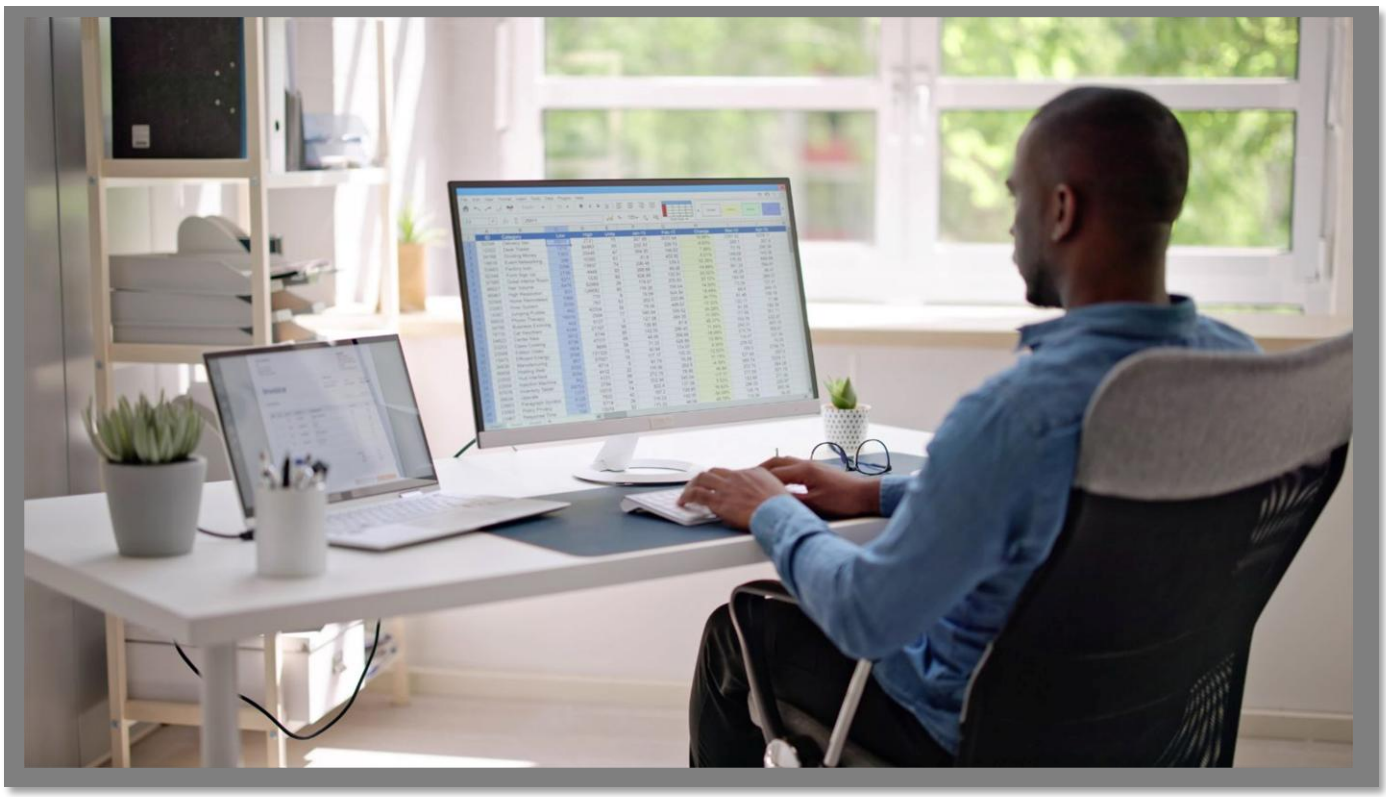
Arbutus Connectors

Amazon DynamoDB
CONFIGURATION GUIDE



ARBUTUS
Powerful Analytics Simplified

Contents

Arbutus Connector – Amazon DynamoDB

A. Introduction

The purpose of this Guide is to provide assistance with configuring the Arbutus Amazon DynamoDB Connector using the ODBC Data Source Administrator. The configuration process can involve several technical steps that require a good understanding of IT systems and database management.

To make the most of this guide, it's advisable to have a good understanding of database connectivity, driver installation, and system settings. The ODBC Data Source Administrator, which is used as part of the configuration process, allows for the setup and management of data sources, enabling applications to access data from various database systems.

Due to the complexity and potential impact of these configurations, it is recommended that only those individuals with IT or database expertise undertake this task. In addition, it should also be understood that each client's network environment is different. A one-size-fits-all approach is rarely effective, as what works well in one environment may not be suitable in another.

B. About Amazon DynamoDB

Amazon DynamoDB is a fully managed NoSQL database service that provides fast and predictable performance with seamless scalability. It is designed to handle large amounts of data and deliver consistent, single-digit millisecond latency, making it ideal for applications that require quick and reliable access to data, such as mobile apps, gaming, and IoT (Internet of Things) applications. Amazon DynamoDB integrates seamlessly with other AWS services, e.g., Amazon Redshift and Amazon S3. However, each of them, including Amazon DynamoDB, serve distinct purposes within AWS.

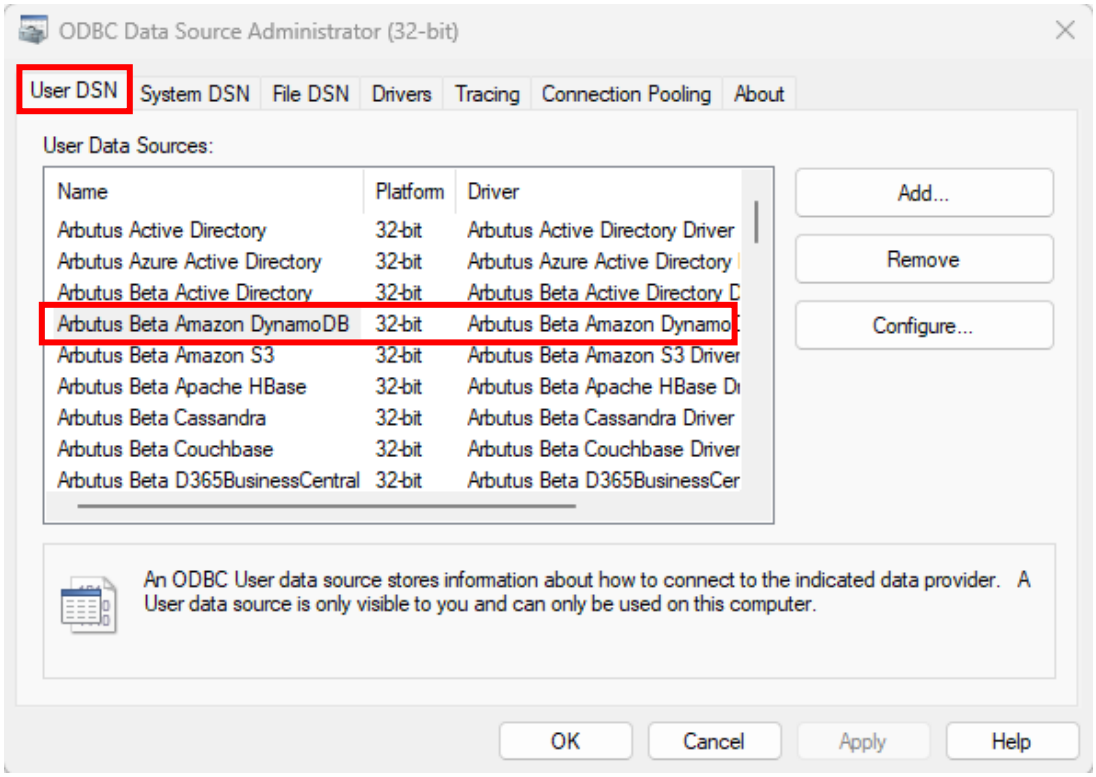
Data is stored as items (records) in tables, where each item consists of a Primary Key and Attributes (additional data fields stored in a flexible schema).

C. Determining if the Connector exists prior to configuring

Installation of the Arbutus Amazon DynamoDB Connector is done at the time of installing the Arbutus software. For more information on this, please see the **Overview Guide Document**.

Once the Connector has been installed, the next step is to configure it.

Prior to configuring it, you can check to see if the Connector has been installed by opening the **32-bit ODBC Data Source Administrator**, pictured below, and clicking the **User DSN** tab. Included below is information on how you can access the **ODBC Data Source Administrator**.



- If the Arbutus Amazon DynamoDB Connector appears in the list, it can be considered as installed.
- If it is not listed, it is likely that you did not select it during the installation or modification of the Arbutus software. In this case, it is recommended to reinstall the Arbutus software and choose the **Modify** option when prompted. For more details, please refer to the **Overview Guide Document**.

Below is the file path to access and run the ODBC Data Source Administrator application:

C:\Windows\SysWOW64\odbcad32.exe

Alternative, you can also try locating and opening the **ODBC Data Source Administrator** application by doing a search on your desktop application.

D. Configuring the Connector after it has been installed

Once you have verified that the Arbutus Connector has been installed, it is time to configure it.

This process is done using the **ODBC Data Source Administrator**. It can be described as **"editing the DSN configuration"**.

DSN, Drivers, and Data Sources
What is a DSN? DSN stands for Data Source Name, and is a unique name used to create a data connection to a database using open database connectivity (ODBC). A DSN is a data structure that contains the information required to connect to a database. It is essentially a string that identifies the source database, including the driver details, the database name, and often authentication credentials and other necessary connection parameters. DSNs facilitate a standardized method for applications to access databases without needing hard-coded connection details, enhancing flexibility and scalability in database management. • ***Drivers*** are the components that process ODBC requests and return data to the application. If necessary, drivers modify an application's request into a form that is understood by the data source. The **Drivers** tab in the **ODBC Data Source Administrator** dialog box lists all drivers installed on your computer, including the name, version, company, file name, and file creation date of each driver. • ***Data sources*** are the databases of files accessed by a driver and are identified by a data source name (DSN). You use the ODBC Data Source Administrator to add, configure, and delete data sources from your system.

Arbutus Connectors

All ODBC connections require that a DSN be configured to support the connection. When a client application wants to access an ODBC-compliant database, it references the database using the DSN.

The types of DSNs are:

- **User DSN** – User DSNs are local to a computer and can be used only by the current user. They are registered in the HKEY_Current_USER registry subtree.

- **System DSN** – System DSNs are local to a computer rather than dedicated to a user. The system or any user with privileges can use a data source set up with a system DSN. System DSNs are registered in the HKEY_LOCAL_MACHINE registry subtree.

- **File DSN** – File DSNs are file-based sources that can be shared among all users who have the same drivers installed and therefore have access to the database. These data sources need not be dedicated to a user nor be local to a computer. File data source names are identified by a file name with a .dsn extension.

User and system data sources are collectively known as *machine* data sources because they are local to a computer.

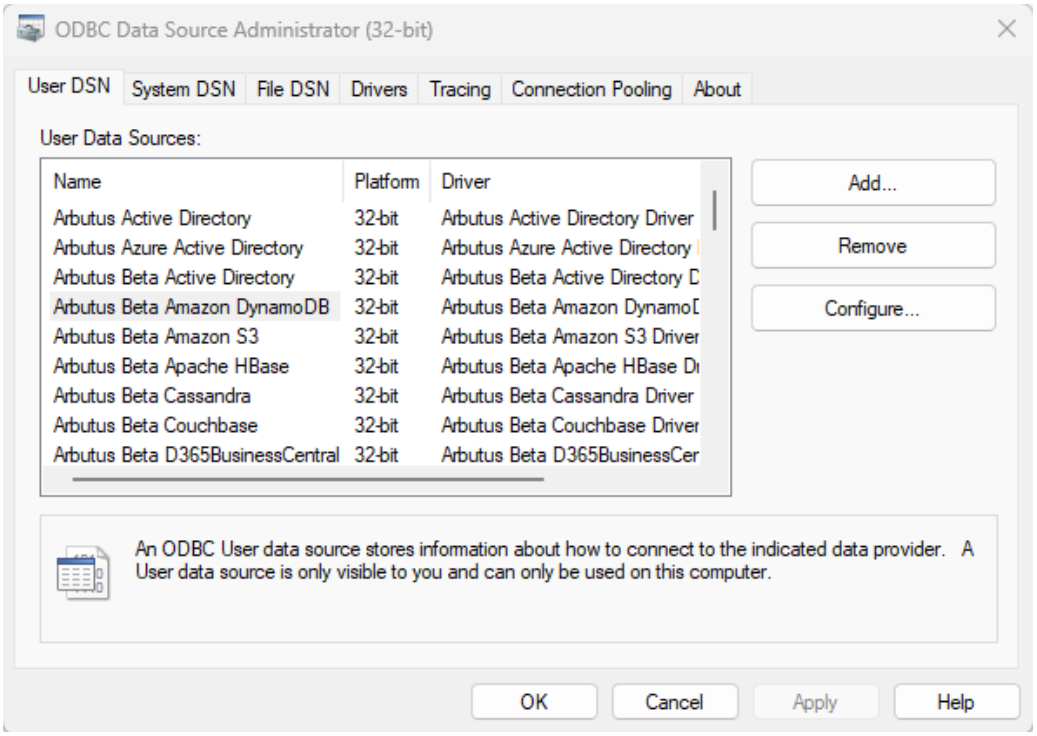
Each of these DSNs has a tab in the **ODBC Data Source Administrator** dialog.

The Arbutus ODBC Driver for Amazon DynamoDB enables real-time access to Amazon DynamoDB data, directly from any applications that support ODBC connectivity, the most widely supported interface for connecting applications with data.

Arbutus Connectors

Follow these steps to edit the DSN configuration and configure the Connector.

1. First open the **ODBC Data Source Administrator**.



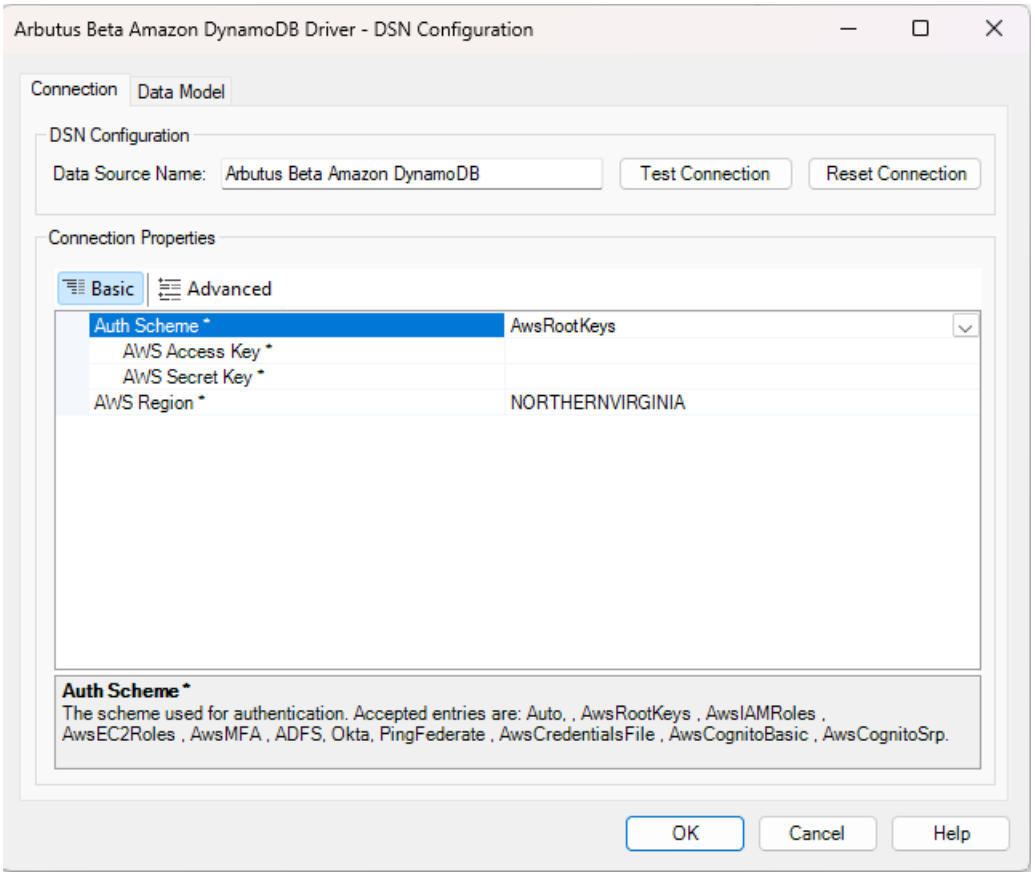
2. Click the **User DSN** tab.

   Selected data connectors are installed as **User DSN's** in Window's 32 Bit **ODBC Data Source Administrator**.

   Also, each of the data connector's names is prefaced with Arbutus, for example, **Arbutus Amazon DynamoDB.**

3. Select the Arbutus Connector, in this case it is **Arbutus Amazon DynamoDB**.
4. Click **Configure**.

This opens the **Arbutus Amazon DynamoDB Driver – DSN Configuration** dialog.



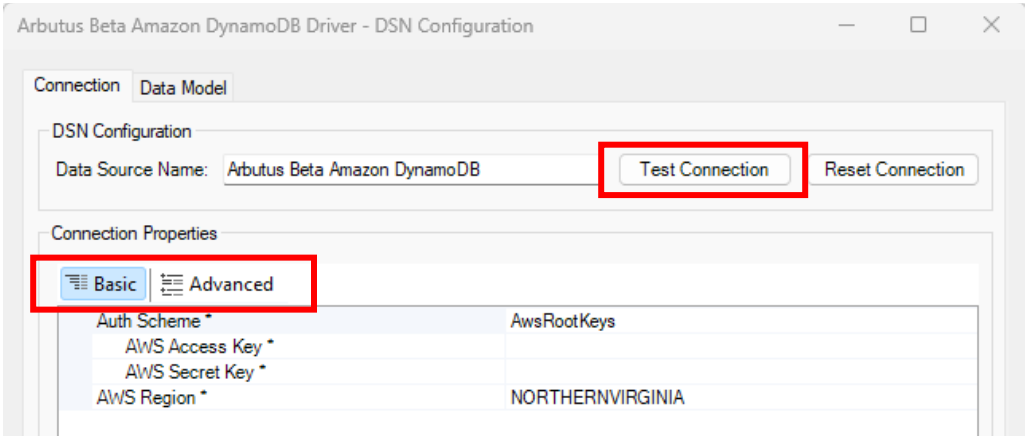
E. Editing the DSN properties – the Basic and Advanced tabs

With the DSN Configuration dialog open, the next step is to edit the DSN properties, where necessary, in the **Basic** and **Advanced** tabs. For example, editing the **AWS Region** property (per screenshot below) to match the region of your Amazon Web Services.

E1. Editing the DSN properties in the Basic tab

The properties listed in the **Basic** tab are typically the ones that are most commonly used, and as such are designed to be more user-friendly and straightforward, allowing you to quickly make changes without needing in-depth technical knowledge.

Once you have completed editing the properties in the **Basic** tab, you can go ahead and try testing the connection to the Amazon DynamoDB system by clicking the **Test Connection** button, as highlighted in the screenshot below.



In the **Basic** tab, there are **two** main properties to review:

1. **Auth Scheme** – click the dropdown to select from the list the appropriate scheme used for authentication. The options available for selection are as follows:
   - AwsRootKeys – select this if you need to authenticate using the root credentials of your AWS account. This method is typically used for administrative tasks that require full access to all AWS resources.

     However, it is generally recommended to use Identity Access Management (IAM) roles or IAM user credentials instead of root credentials for better security practices. IAM roles and users allow you to grant limited permissions, reducing the risk of accidental changes or security breaches.

Selecting **AwsRootKeys** requires you to specify the following:

- AWS Access Key – this is your AWS account access key. This value is accessible from your AWS security credentials page.

  To access this value, follow these steps:

  a. Sign into the AWS Management console with the credentials for your root account.
  b. Select your account name or number and select **My Security Credentials** in the menu that is displayed.
  c. Click **Continue to Security Credentials** and expand the **Access Keys** section to manage or create root account access keys.

- AWS Secret Key - Your AWS account secret key. This value is accessible from your AWS security credentials page.

  See the steps listed above on how to access this value.

The default value is **AwsRootKeys**.

- AwsIAMRoles – select this if you want to authenticate using IAM roles. Using IAM roles is a best practice for managing access to AWS resources securely and efficiently.

  Selecting **AwsIAMRoles** requires you to specify the following:

  - AWS Access Key – For more information, please see this same property listed and described above (under the **AwsRootKeys** section).

  - AWS Secret Key - For more information, please see this same property listed and described above (under the **AwsRootKeys** section).

- AWS Role ARN – this is the Amazon Resource Name (ARN) of the role to use when authenticating.

  When authenticating outside of AWS, it is common to use a Role for authentication instead of your direct AWS account credentials. Entering the **AWS Role ARN** will cause the ODBC Driver for Amazon DynamoDB to perform a role based authentication instead of using the **AWS Access Key** (see above) and **AWS Secret Key (see above)** directly. The **AWS Access Key** and **AWS Secret Key** must still be specified to perform this authentication. You cannot use the credentials of an AWS root user when setting **Role ARN**. The **AWS Access Key** and **AWS Secret Key** must be those of an IAM user.

- AWS External Id – this is a unique identifier that might be required when you assume a role in another account.

- AwsEC2Roles – select this if your application is running on an Amazon EC2 instance and you want to use the instance's IAM role for authentication. Using the instance's IAM role simplifies the authentication process and leverages AWS's built-in security features. Using EC2 roles is a best practice for securely managing access to AWS resources from applications running on EC2 instances.

- AwsMFA – select this if you are using **Multi-Factor Authentication (MFA)** to add an extra layer of security to your authentication process. This method requires an additional authentication factor, requiring users to provide a second form of verification, such as a code from a MFA device, in addition to their primary credentials.

Selecting **AwsMFA** requires you to specify the following:

- MFA Serial Number – this is the serial number of the MFA device if one is being used.

  You can find the device for an IAM user by going to the AWS Management Console and viewing the user's security credentials.

- MFA Token – this is the temporary token available from your MFA device.

  If MFA is required, this value will be used along with the **MFA Serial Number** to retrieve temporary credentials to login. The temporary credentials available from AWS will only last up to 1 hour by default (see **Temporary Token Duration** below). Once the time is up, the connection must be updated to specify a new MFA token so that new credentials may be obtained.

- Temporary Token Duration – this is the amount of time (in seconds) a temporary token will last.

  Temporary tokens are used with both MFA and Role based authentication. Temporary tokens will eventually time out, at which time a new temporary token must be obtained. For situations where MFA is not used, this is not a big deal. The ODBC Driver for Amazon DynamoDB will internally request a new temporary token once the temporary token has expired.

  However, for MFA required connection, a new **MFA Token** (see above) must be specified in the connection to retrieve a new temporary token. This is a more intrusive issue since it requires an update to the connection by the user. The maximum and minimum that can be specified will depend largely on the connection being used.

For Role based authentication, the minimum duration is 900 seconds (15 minutes) while the maximum if 3600 (1 hour). Even if MFA is used with role based authentication, 3600 is still the maximum.

For MFA authentication by itself (using an IAM User or root user), the minimum is 900 seconds (15 minutes), the maximum is 129600 (36 hours).

The default value is **3600** seconds.

- AwsCredentialsFile – select this if you want to use a credentials file to authenticate. The credentials file typically resides in the .aws directory in your home folder and contains your AWS access key ID and secret access key.

  Selecting **AwsCredentialsFile** requires you to specify the following:
  - AWS Credentials File – this is the path to the AWS Credentials File to be used for authentication.

    For more information, please see this link.

  - AWS Credentials File Profile – this is the name of the profile to be used from the supplied AWS Credentials File.

    For more information, please see this link.

- OKTA – select this if you want to use OKTA for authentication. This method allows you to leverage Okta's identity and access management capabilities, including single sign-on (SSO) and multi-factor authentication (MFA). Using Okta for authentication can streamline access management and improve the overall security of your AWS environment.

  Note:
  Okta is a widely used cloud-based identity and access management (IAM) service that provides secure identity management and Single Sign-On (SSO) solutions. It helps organizations manage user authentication and authorization across various applications and services, ensuring secure access and streamlined user experience.

  Selecting **OKTA** requires you to specify the following:

  - User – this is used to specify the OKTA username. This is necessary for authenticating the user through Okta's Single Sign-On (SSO) service. The Okta username identifies the user within the Okta system, allowing Okta to authenticate the user and provide the necessary access tokens. By specifying the Okta username, you enable the integration with Okta's SSO, which simplifies the login process and enhances security by centralizing authentication.

    Together with **Password** (see below), this field is used to authenticate in SSO connections against the Amazon DynamoDB server.

  - Password – this is the password used to authenticate the IDP user (see above for more information) via SSO. The **User** (see above) and **Password** are together used in SSO connections to authenticate with the server.

  - SSO Login URL – this is the identity provider's login URL.

- SSO Properties - additional properties required to connect to the identity provider in a semicolon-separated list. **SSO Properties** is used in conjunction with the **AWS Role ARN** and **AWS Principal ARN.**

  Shown below is an example of a semi-colon separated list:

  Okta; AWSRegion=Ireland;
  User=*user@abc_company.com*;
  Password=CH8WerW121235647iCa6;
  SSOLoginURL='https:// *the-identity-provider's-login-URL*';
  SSOProperties='ApiToken=01230GGG2ceAnm_tPAf4MhiM
  ELXZ0L0N1pAYrO1VR-hGQSf;';
  AWSRoleArn=arn:aws:iam::1234:role/Okta_SSO;
  AWSPrincipalARN=arn:aws:iam::1234:saml-
  provider/OktaProvider;

- Use Lake Formation - this is a True/False selection. Select the appropriate value, based on following determination:
  - When this property is set to true, **AWS Lake Formation** service will be used to retrieve temporary credentials, which enforce access policies against the user based on the configured Identity Access Management (IAM) role.

  The service can be used when authenticating through OKTA, ADFS, AzureAD, PingFederate, while providing a SAML (Single Assertion Markup Language) assertion – a SAML assertion is the message that tells a service provider that a user is signed in.

  The default value is **False**.

- TemporaryCredentials – select this if you want to use temporary security credentials for authentication. For example, when you need temporary (short-term) access to resources without using long-term credentials.

  Selecting **TemporaryCredentials** requires you to specify the following:
  - AWS Access Key - For more information, please see this same property listed and described above (under the **AwsRootKeys** section).
  - AWS Secret Key - For more information, please see this same property listed and described above (under the **AwsRootKeys** section).
  - AWS Session Token – this is your AWS session token. This value can be retrieved in different ways. See this link for more information.

- PingFederate – select this if you want to use PingFederate as your identity provider for Single Sign-On (SSO). As an example, PingFederate is typically useful when you want to enable single sign-on (SSO) capabilities, allowing users to authenticate once and gain access to multiple systems, including DynamoDB, without needing to re-enter credentials.

  Note:
  PingFederate is a highly regarded enterprise federation server that specializes in user authentication and providing standardized single sign-on (SSO) solutions.

  Selecting **PingFederate** requires you to specify the following:
  - **User** - For more information, please see this same property listed and described above (under the **OKTA** section).

- Password - For more information, please see this same property listed and described above (under the **OKTA** section).

- SSO Login URL - For more information, please see this same property listed and described above (under the **OKTA** section).

- SSO Properties - For more information, please see this same property listed and described above (under the **OKTA** section).

- SSO Exchange URL – this is the URL used for consuming the SAML response and exchanging it for service specific credentials.

  The ODBC Driver for Amazon DynamoDB will use the URL specified here to consume a SAML response and exchange it for service specific credentials. The retrieved credentials are the final piece during the SSO connection that are used to communicate with Amazon DynamoDB.

- Use Lake Formation - For more information, please see this same property listed and described above (under the **OKTA** section).

- AwsCognitoBasic – select this if you want to use Amazon Cognito for authentication. Amazon Cognito provides a fully managed service for user sign-up, sign-in, and access control, making it easier to manage user identities. Cognito generates temporary security credentials for authenticated and unauthenticated users, enhancing security by avoiding the use of long-term credentials.

Selecting **AwsCognitoBasic** requires you to specify the following:

- AWS Cognito Region - click the dropdown to select from the list the hosting region for AWS Cognito. The regions available for selection are as follows:

  OHIO, NORTHERNVIRGINIA, NORTHERNCALIFORNIA, OREGON, CAPETOWN, HONGKONG, HYDERABAD, JAKARTA, MALAYSIA, MELBOURNE, MUMBAI, OSAKA, SEOUL, SINGAPORE, SYDNEY, TOKYO, CENTRAL, CALGARY, BEIJING, NINGXIA, FRANKFURT, IRELAND, LONDON, MILAN, PARIS, SPAIN, STOCKHOLM, ZURICH, TELAVIV, BAHRAIN, UAE, SAOPAULO, GOVCLOUDEAST, GOVCLOUDWEST, ISOLATEDUSEAST, ISOLATEDUSEASTB, ISOLATEDUSWEST, ISOLATEDEUWEST

  The default value may show as **NORTHERNVIRGINIA**.

- AWS User Pool Id – this is the User Pool Id. You can find this in AWS Cognito -> Manage User Pools -> select your user pool -> General settings -> Pool Id.

- AWS User Pool Client App Id – this is the User Pool Client App Id. You can find this in AWS Cognito -> Manage Identity Pools -> select your user pool -> General settings -> App clients -> App client Id.

- AWS Identity Pool Id – this is the Identity Pool Id. You can find this in AWS Cognito -> Manage Identity Pools -> select your identity pool -> Edit identity pool -> Identity Pool Id.

- AWS User Pool Client App Secret (optional) – this is the User Pool Client App Secret. You can find this in AWS Cognito -> Manage Identity Pools -> select your user pool -> General settings -> App clients -> App client secret.

- AwsCognitoSrp – select this if you want to use the Secure Remote Password (SRP) protocol for authentication with Amazon Cognito. The SRP protocol provides strong authentication by ensuring that passwords are never sent over the network, reducing the risk of interception. SRP allows users to authenticate using their username and password, making it a familiar and straightforward method for end-users.

  Selecting AwsCognitoSrp requires you to specify the following:
  - AWS Cognito Region - For more information, please see this same property listed and described above (under the **AwsCognitoBasic** section).
  - AWS User Pool Id - For more information, please see this same property listed and described above (under the **AwsCognitoBasic** section).
  - AWS User Pool Client App Id - For more information, please see this same property listed and described above (under the **AwsCognitoBasic** section).
  - AWS Identity Pool Id - For more information, please see this same property listed and described above (under the **AwsCognitoBasic** section).
  - AWS User Pool Client App Secret - For more information, please see this same property listed and described above (under the **AwsCognitoBasic** section).

- ADFS – select this if you want to use Active Directory Federation Services (ADFS) for authentication. ADFS allows users to authenticate once and gain access to multiple applications, including DynamoDB, without needing to re-enter credentials. ADFS supports advanced security features, such as multi-factor authentication (MFA) and conditional access policies, to protect your AWS resources. As well, using ADFS helps centralize

identity management, simplifying the administration of user accounts and access permissions

Selecting ADFS requires you to specify the following:

- User – For more information, please see this same property listed and described above (under the **AwsCognitoBasic** section).

- Password – For more information, please see this same property listed and described above (under the **PingFederate** section).

- SSO Login URL – For more information, please see this same property listed and described above (under the **PingFederate** section).

- SSO Properties – For more information, please see this same property listed and described above (under the **PingFederate** section).

- Use Lake Formation – For more information, please see this same property listed and described above (under the **OKTA** section).

2. **AWS Region** – click the dropdown to select from the list the hosting region for your Amazon Web Services. The regions available for selection are as follows:

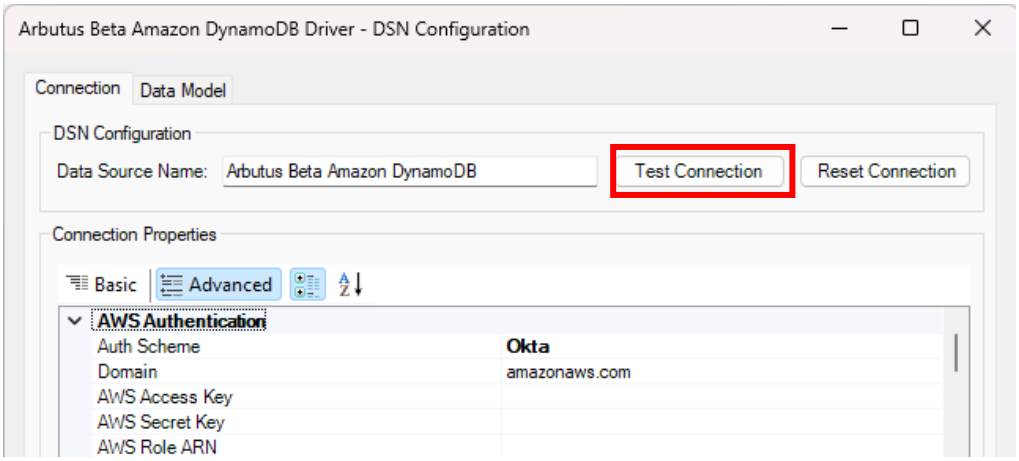
   OHIO, NORTHERNVIRGINIA, NORTHERNCALIFORNIA, OREGON, CAPETOWN, HONGKONG, HYDERABAD, JAKARTA, MALAYSIA, MELBOURNE, MUMBAI, OSAKA, SEOUL, SINGAPORE, SYDNEY, TOKYO, CENTRAL, CALGARY, BEIJING, NINGXIA, FRANKFURT, IRELAND, LONDON, MILAN, PARIS, SPAIN, STOCKHOLM, ZURICH, TELAVIV, BAHRAIN, UAE, SAOPAULO, GOVCLOUDEAST, GOVCLOUDWEST, ISOLATEDUSEAST, ISOLATEDUSEASTB, ISOLATEDUSWEST, ISOLATEDEUWEST

The default value may show as **NORTHERNVIRGINIA**.

E2. Editing the DSN properties in the Advanced tab

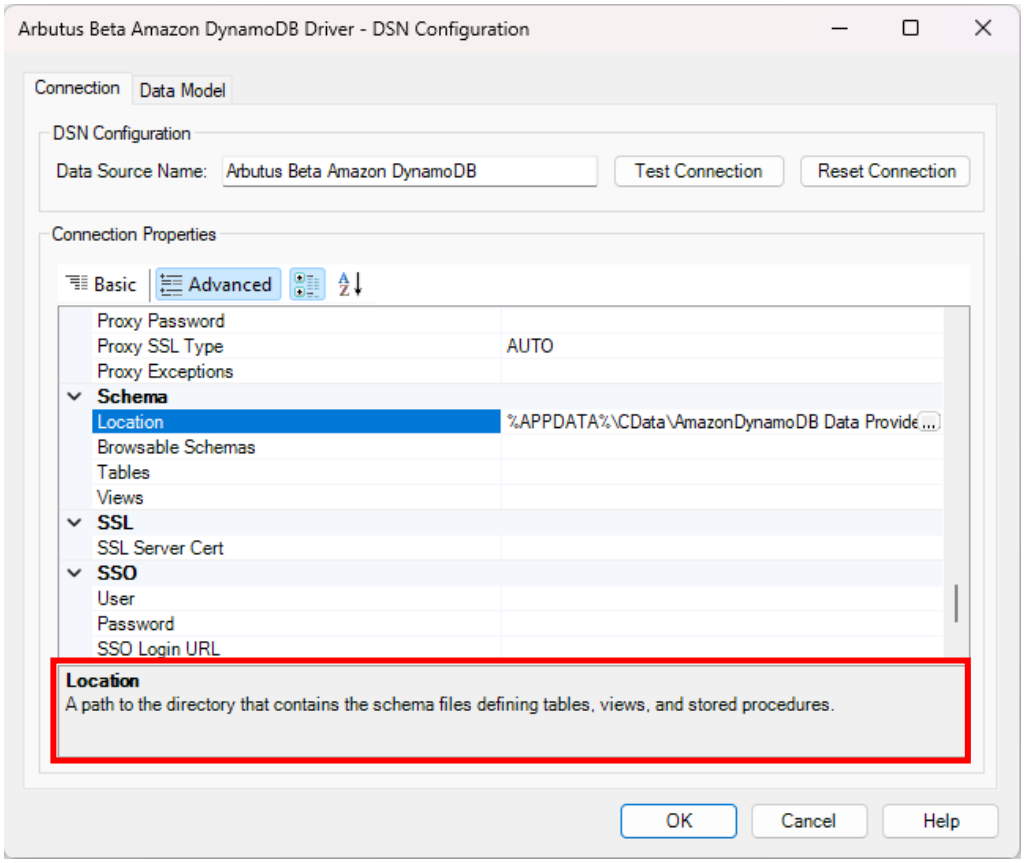
This tab includes more detailed and technical properties. It is intended for those users who need more control over the configuration and are comfortable with more complex options. The **Advanced** tab often includes properties that can fine-tune the behaviour of the system feature.

If you have already completed editing the properties in the **Basic** tab, as required, you do not necessarily need to also complete editing the properties in the **Advanced** tab. Instead, once you have completed editing the properties in the **Basic** tab, you may opt to proceed to testing the connection to the Amazon DynamoDB system by clicking the **Test Connection** button.



There are a lot more properties included for editing in the **Advanced** tab.

However, it is useful to know that each property does provide a short description of it and as such serves as a guide in terms of what to edit and/or enter. This short description can be seen at the bottom of the **DSN Configuration** dialog, as seen in the screenshot below.



If it is deemed necessary to complete some/all the properties in the **Advanced** tab, it is recommended that you refer to the description shown for any of the properties being edited and/or entered.

If required, more information on the properties listed in the **Advanced** tab can also be provided.

F. Other questions and/or request for assistance

There may be times when you need to consult with the technical support team at Arbutus Software. If so, please send an email request to support@ArbutusSoftware.com.

For more information, please refer to the CONTACT US page on our website.