



# **TIBCO® Data Virtualization**

## **Microsoft DynamicNAV Adapter Guide**

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# Contents

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<b>Contents</b>	<b>2</b>
<b>Microsoft Dynamics NAV Adapter</b>	<b>4</b>
Getting Started	4
Basic Tab	5
Logging	6
Changelog	7
Advanced Features	15
User Defined Views	16
SSL Configuration	18
Firewall and Proxy	18
Query Processing	19
Logging	20
SQL Compliance	23
SELECT Statements	24
SELECT INTO Statements	27
INSERT Statements	27
UPDATE Statements	28
DELETE Statements	29
EXECUTE Statements	29
PIVOT and UNPIVOT	30
Data Model	31
Tables	32
Stored Procedures	103
Connection String Options	109
Authentication	112
SSL	116
Firewall	118

Proxy .....	122
Logging .....	129
Schema .....	129
Miscellaneous .....	131
<b>TIBCO Product Documentation and Support Services .....</b>	<b>137</b>
How to Access TIBCO Documentation .....	137
How to Contact TIBCO Support .....	138
Release Version Support .....	138
How to Join TIBCO Community .....	139
<b>Legal and Third-Party Notices .....</b>	<b>140</b>

# Microsoft Dynamics NAV Adapter

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## Microsoft Dynamics NAV Version Support

The adapter supports read/write access to Microsoft Dynamics NAV 2013+ through OData Web services. To access data through the API, you will need to publish the pages you want to work with as Web services: In the Web or Windows Dynamics NAV client, search for 'Web services.' To add a page to the list of the pages exposed, select the Object Type and Object Id.

## SQL Compliance

The [SQL Compliance](#) section shows the SQL syntax supported by the adapter and points out any limitations.

# Getting Started

## Connecting to Microsoft Dynamics NAV

[Basic Tab](#) shows how to authenticate to Microsoft Dynamics NAV and configure any necessary connection properties. Additional adapter capabilities can be configured using the available [Connection](#) properties on the Advanced tab. The Advanced Settings section shows how to set up more advanced configurations and troubleshoot connection errors.

## Deploying the Microsoft Dynamics NAV Adapter

To deploy the adapter, you can execute the server\_util utility via the command line by

1. Unzip the tdv.dynamicsnav.zip file to the location of your choice.
2. Open a command prompt window.
3. Navigate to the <TDV\_install\_dir>/bin
4. Enter the server\_util command with the -deploy option:

```
server_util -server <hostname> [-port <port>] -user <user> -
password <password> -deploy -package <TDV_install_
dir>/adapters/tdv.dynamicsnav/tdv.dynamicsnav.jar
```

Note: When deploying a build of an existing adapter, you will need to undeploy the existing adapter using the `server_util` command with the `-undeploy` option.

```
server_util -server <hostname> [-port <port>] -user <user> -password
<password> -undeploy -version 1 -name DynamicsNAV
```

## Basic Tab

### Connecting to Microsoft Dynamics NAV

Before the adapter can connect with Microsoft Dynamics NAV, OData services need to be enabled on the server. Once OData Services are enabled, the adapter will be able to query any services that are published on the server.

In addition, specify a Url to a valid Microsoft Dynamics NAV server organization root (e.g. `http://MyServer:7048`) and a ServerInstance (e.g. `DynamicsNAV71`). If there is not a Service Default Company for the server, set the Company (e.g. `'CRONUS Canada, Inc.'`) as well.

In a multitenant installation, specify the tenant Id in Tenant (e.g. `'Cronus1'`).

### Authenticating to Microsoft Dynamics NAV

To authenticate, set the User and Password properties to valid Microsoft Dynamics NAV logon credentials or Windows user credentials. Select the appropriate authentication method in AuthScheme.

### Auth Schemes

The available authentication schemes are configured in IIS where Dynamics NAV is hosted. In IIS you can select to enable or disable Digest, Basic, Windows, or Anonymous authentication. Please consult with your Dynamics NAV admin to determine which authentication scheme is appropriate for you. Set AuthScheme to one of the following:

- NEGOTIATE (default) - It is part of the Windows authentication, also known as Kerberos.
- BASIC - Basic authentication.
- DIGEST - Digest authentication.
- NTLM - Part of the Windows authentication.
- NONE - Anonymous authentication.

## Logging

The adapter uses TDV Server's logging (log4j) to generate log files. The settings within the TDV Server's logging (log4j) configuration file are used by the adapter to determine the type of messages to log. The following categories can be specified:

- Error: Only error messages are logged.
- Info: Both Error and Info messages are logged.
- Debug: Error, Info, and Debug messages are logged.

The Other property of the adapter can be used to set Verbosity to specify the amount of detail to be included in the log file, that is:

```
Verbosity=4;
```

You can use Verbosity to specify the amount of detail to include in the log within a category. The following verbosity levels are mapped to the log4j categories:

- 0 = Error
- 1-2 = Info
- 3-5 = Debug

For example, if the log4j category is set to DEBUG, the Verbosity option can be set to 3 for the minimum amount of debug information or 5 for the maximum amount of debug information.

Note that the log4j settings override the Verbosity level specified. The adapter never logs at a Verbosity level greater than what is configured in the log4j properties. In addition, if Verbosity is set to a level less than the log4j category configured, Verbosity defaults to the minimum value for that particular category. For example, if Verbosity is set to a value less than 3 and the Debug category is specified, the Verbosity defaults to 3.

The following list is an explanation of the Verbosity levels and the information that they log.

- 1 - Will log the query, the number of rows returned by it, the start of execution and the time taken, and any errors.
- 2 - Will log everything included in Verbosity 1 and HTTP headers.
- 3 - Will additionally log the body of the HTTP requests.
- 4 - Will additionally log transport-level communication with the data source. This includes SSL negotiation.
- 5 - Will additionally log communication with the data source and additional details that may be helpful in troubleshooting problems. This includes interface commands.

## Configure Logging for the Microsoft Dynamics NAV Adapter

By default, logging is turned on without debugging. If debugging information is desired, uncomment the following line in the TDV Server's log4j.properties file (default location of this file is: C:\Program Files\TIBCO\TDV Server <version>\conf\server):

```
log4j.logger.com.cdata=DEBUG
```

The TDV Server must be restarted after changing the log4j.properties file, which can be accomplished by running the composite.bat script located at: C:\Program Files\TIBCO\TDV Server <version>\bin. Note that reauthenticating to the TDV Studio is required after restarting the server.

Here is an example of the calls:

```
.\composite.bat monitor restart
```

All logs for the adapter are written to the "cs\_server\_dsrc.log" file as specified in the log4j properties.

**Note:** The "log4j.logger.com.cdata=DEBUG" option is not required if the **Debug Output Enabled** option is set to true within the TDV Studio. To set this option, navigate to **Administrator > Configuration**. Select **Server > Configuration > Debugging** and set the Debug Output Enabled option to **True**.

## Changelog

## General Changes

Date	Build Number	Change Type	Description
	83832/14/2022	General	<b>Changed</b> <ul style="list-style-type: none"> <li>Added the Default column to the sys_procedureparameters table.</li> </ul>
	83089/30/2022	General	<b>Changed</b> <ul style="list-style-type: none"> <li>Added the IsPath column to the sys_procedureparameters table.</li> </ul>
	82648/17/2022	General	<b>Changed</b> <ul style="list-style-type: none"> <li>We now support handling the keyword "COLLATE" as standard function name as well.</li> </ul>
	81705/24/2022	Microsoft Dynamics NAV	<b>Changed</b> <ul style="list-style-type: none"> <li>Changed provider name to Microsoft Dynamics NAV.</li> </ul>



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81505/04/2022	Microsoft Dynamics NAV	<b>Changed</b> <ul style="list-style-type: none"><li>• Due to some of the tables containing keys that must be specified during insertion, primary keys are no longer marked as read-only. If for any reason this causes issues, the connection property ReadOnlyKeys may be set to true.</li></ul>
79159/02/2021	General	<b>Added</b> <ul style="list-style-type: none"><li>• Added support for the STRING_SPLIT table-valued function in the CROSS APPLY clause.</li></ul>
78898/07/2021	General	<b>Changed</b> <ul style="list-style-type: none"><li>• Added the KeySeq column to the sys_foreignkeys table.</li></ul>

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7888	06/20/2021	General	<b>Changed</b>	<ul style="list-style-type: none"><li>Added the new sys_primarykeys system table.</li></ul>
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7874	07/23/2021	General	<b>Changed</b>	<ul style="list-style-type: none"><li>Updated the Literal Function Names for relative date/datetime functions. Previously relative date/datetime functions resolved to a different value when used in the projection vs the predicate. ie: SELECT LAST_MONTH() AS lm, Col FROM Table WHERE Col &gt; LAST_MONTH(). Formerly the two LAST_MONTH() methods would resolve to different datetimes. Now they will match.</li></ul>
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- 
- As a replacement for the previous behavior, the relative date/datetime functions in the criteria may have an 'L' appended to them. I.e: WHERE col > L\_LAST\_MONTH(). This will continue to resolve to the same values that previously were calculated in the criteria. Note that the "L\_" prefix will only work in the predicate - it not available for the projection.

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78597/08/2021 General **Added**

- Added the TCP Logging Module for the logging information happening on
-

			the TCP wire protocol. The transport bytes that are incoming and ongoing will be logged at verbosity=5.
77854	23/2021	General	<b>Added</b> <ul style="list-style-type: none"><li>Added support for handling client side formulas during insert / update. For example: UPDATE Table SET Col1 = Concat(Col1, " - ", Col2) WHERE Col2 LIKE 'A%'</li></ul>
77804	23/2021	General	<b>Changed</b> <ul style="list-style-type: none"><li>Updated how display sizes are determined for varchar primary key and foreign key columns so they will match the reported length of the column.</li></ul>

77764/16/2021	General	<b>Added</b> <ul style="list-style-type: none"><li>• Non-conditional updates between two columns is now available to all drivers. For example: UPDATE Table SET Col1=Col2</li></ul>
		<b>Changed</b> <ul style="list-style-type: none"><li>• Reduced the length to 255 for varchar primary key and foreign key columns.</li><li>• Updated implicit and metadata caching to improve performance and support for multiple connections. Old metadata caches are not compatible - you would need to generate new metadata caches if you are currently using</li></ul>

					<div>CacheMetadat a.</div> <div><ul style="list-style-type: none"><li>• Updated index naming convention to avoid duplicates</li><li>• Updated and standardized Getting Started connection help.</li><li>• Added the Advanced Features section to the help of all drivers.</li><li>• Categorized connection property listings in the help for all editions.</li></ul></div>
/2021	77764/15	General	Changed		<div></div> <div><ul style="list-style-type: none"><li>• Kerberos authentication is updated to use TCP by default, but will fall back to UDP if a TCP connection cannot be established</li></ul></div>

# Advanced Features

This section details a selection of advanced features of the Microsoft Dynamics NAV adapter.

## User Defined Views

The adapter allows you to define virtual tables, called *user defined views*, whose contents are decided by a pre-configured query. These views are useful when you cannot directly control queries being issued to the drivers. See [User Defined Views](#) for an overview of creating and configuring custom views.

## SSL Configuration

Use [SSL Configuration](#) to adjust how adapter handles TLS/SSL certificate negotiations. You can choose from various certificate formats; see the [SSLServerCert](#) property under "Connection String Options" for more information.

## Firewall and Proxy

Configure the adapter for compliance with [Firewall and Proxy](#), including Windows proxies and HTTP proxies. You can also set up tunnel connections.

## Query Processing

The adapter offloads as much of the SELECT statement processing as possible to Microsoft Dynamics NAV and then processes the rest of the query in memory (client-side).

See [Query Processing](#) for more information.

## Logging

See [Logging](#) for an overview of configuration settings that can be used to refine CData logging. For basic logging, you only need to set two connection properties, but there are numerous features that support more refined logging, where you can select subsets of information to be logged using the [LogModules](#) connection property.

## User Defined Views

The Microsoft Dynamics NAV Adapter allows you to define a virtual table whose contents are decided by a pre-configured query. These are called *User Defined Views*, which are useful in situations where you cannot directly control the query being issued to the driver, e.g. when using the driver from a tool. The User Defined Views can be used to define predicates that are always applied. If you specify additional predicates in the query to the view, they are combined with the query already defined as part of the view.

There are two ways to create user defined views:

- Create a JSON-formatted configuration file defining the views you want.
- DDL statements.

### Defining Views Using a Configuration File

User Defined Views are defined in a JSON-formatted configuration file called *UserDefinedViews.json*. The adapter automatically detects the views specified in this file.

You can also have multiple view definitions and control them using the UserDefinedViews connection property. When you use this property, only the specified views are seen by the adapter.

This User Defined View configuration file is formatted as follows:

- Each root element defines the name of a view.
- Each root element contains a child element, called **query**, which contains the custom SQL query for the view.

For example:

```
{
  "MyView": {
    "query": "SELECT * FROM Customer WHERE MyColumn = 'value'"
  },
  "MyView2": {
    "query": "SELECT * FROM MyTable WHERE Id IN (1,2,3)"
  }
}
```

Use the UserDefinedViews connection property to specify the location of your JSON configuration file. For example:



```
"UserDefinedViews",
"C:\\Users\\yourusername\\Desktop\\tmp\\UserDefinedViews.json"
```

## Defining Views Using DDL Statements

The adapter is also capable of creating and altering the schema via DDL Statements such as CREATE LOCAL VIEW, ALTER LOCAL VIEW, and DROP LOCAL VIEW.

### Create a View

To create a new view using DDL statements, provide the view name and query as follows:

```
CREATE LOCAL VIEW [MyViewName] AS SELECT * FROM Customers LIMIT 20;
```

If no JSON file exists, the above code creates one. The view is then created in the JSON configuration file and is now discoverable. The JSON file location is specified by the UserDefinedViews connection property.

### Alter a View

To alter an existing view, provide the name of an existing view alongside the new query you would like to use instead:

```
ALTER LOCAL VIEW [MyViewName] AS SELECT * FROM Customers WHERE
TimeModified > '3/1/2020';
```

The view is then updated in the JSON configuration file.

### Drop a View

To drop an existing view, provide the name of an existing schema alongside the new query you would like to use instead.

```
DROP LOCAL VIEW [MyViewName]
```

This removes the view from the JSON configuration file. It can no longer be queried.

## Schema for User Defined Views

User Defined Views are exposed in the **UserViews** schema by default. This is done to avoid the view's name clashing with an actual entity in the data model. You can change the name of the schema used for UserViews by setting the UserViewsSchemaName property.

## Working with User Defined Views

For example, a SQL statement with a User Defined View called *UserViews.RCustomers* only lists customers in Raleigh:

```
SELECT * FROM Customers WHERE City = 'Raleigh';
```

An example of a query to the driver:

```
SELECT * FROM UserViews.RCustomers WHERE Status = 'Active';
```

Resulting in the effective query to the source:

```
SELECT * FROM Customers WHERE City = 'Raleigh' AND Status = 'Active';
```

That is a very simple example of a query to a User Defined View that is effectively a combination of the view query and the view definition. It is possible to compose these queries in much more complex patterns. All SQL operations are allowed in both queries and are combined when appropriate.

# SSL Configuration

## Customizing the SSL Configuration

By default, the adapter attempts to negotiate SSL/TLS by checking the server's certificate against the system's trusted certificate store.

To specify another certificate, see the SSLServerCert property for the available formats to do so.

# Firewall and Proxy

## Connecting Through a Firewall or Proxy

### HTTP Proxies

To connect through the Windows system proxy, you do not need to set any additional connection properties. To connect to other proxies, set ProxyAutoDetect to false.

In addition, to authenticate to an HTTP proxy, set ProxyAuthScheme, ProxyUser, and ProxyPassword, in addition to ProxyServer and ProxyPort.

### Other Proxies

Set the following properties:

- To use a proxy-based firewall, set FirewallType, FirewallServer, and FirewallPort.
- To tunnel the connection, set FirewallType to TUNNEL.
- To authenticate, specify FirewallUser and FirewallPassword.
- To authenticate to a SOCKS proxy, additionally set FirewallType to SOCKS5.

## Query Processing

### Query Processing

CData has a client-side SQL engine built into the adapter library. This enables support for the full capabilities that SQL-92 offers, including filters, aggregations, functions, etc.

For sources that do not support SQL-92, the adapter offloads as much of SQL statement processing as possible to Microsoft Dynamics NAV and then processes the rest of the query in memory (client-side). This results in optimal performance.

For data sources with limited query capabilities, the adapter handles transformations of the SQL query to make it simpler for the adapter. The goal is to make smart decisions based on the query capabilities of the data source to push down as much of the computation as possible. The Microsoft Dynamics NAV Query Evaluation component examines SQL queries and returns information indicating what parts of the query the adapter is not capable of executing natively.

The Microsoft Dynamics NAV Query Slicer component is used in more specific cases to separate a single query into multiple independent queries. The client-side Query Engine

makes decisions about simplifying queries, breaking queries into multiple queries, and pushing down or computing aggregations on the client-side while minimizing the size of the result set.

There's a significant trade-off in evaluating queries, even partially, client-side. There are always queries that are impossible to execute efficiently in this model, and some can be particularly expensive to compute in this manner. CData always pushes down as much of the query as is feasible for the data source to generate the most efficient query possible and provide the most flexible query capabilities.

## More Information

For a full discussion of how CData handles query processing, see [CData Architecture: Query Execution](#).

# Logging

Capturing adapter logging can be very helpful when diagnosing error messages or other unexpected behavior.

## Basic Logging

You will simply need to set two connection properties to begin capturing adapter logging.

- Logfile: A filepath which designates the name and location of the log file.
- Verbosity: This is a numerical value (1-5) that determines the amount of detail in the log. See the page in the Connection Properties section for an explanation of the five levels.
- MaxLogFileSize: When the limit is hit, a new log is created in the same folder with the date and time appended to the end. The default limit is 100 MB. Values lower than 100 kB will use 100 kB as the value instead.
- MaxLogFileCount: A string specifying the maximum file count of log files. When the limit is hit, a new log is created in the same folder with the date and time appended to the end and the oldest log file will be deleted. Minimum supported value is 2. A value of 0 or a negative value indicates no limit on the count.

Once this property is set, the adapter will populate the log file as it carries out various tasks, such as when authentication is performed or queries are executed. If the specified file doesn't already exist, it will be created.

## Log Verbosity

The verbosity level determines the amount of detail that the adapter reports to the Logfile. Verbosity levels from 1 to 5 are supported. These are described in the following list:

1	Setting <u>Verbosity</u> to 1 will log the query, the number of rows returned by it, the start of execution and the time taken, and any errors.
2	Setting <u>Verbosity</u> to 2 will log everything included in <u>Verbosity</u> 1 and additional information about the request.
3	Setting <u>Verbosity</u> to 3 will additionally log HTTP headers, as well as the body of the request and the response.
4	Setting <u>Verbosity</u> to 4 will additionally log transport-level communication with the data source. This includes SSL negotiation.
5	Setting <u>Verbosity</u> to 5 will additionally log communication with the data source and additional details that may be helpful in troubleshooting problems. This includes interface commands.

The Verbosity should not be set to greater than 1 for normal operation. Substantial amounts of data can be logged at higher verbosities, which can delay execution times.

To refine the logged content further by showing/hiding specific categories of information, see LogModules.

## Sensitive Data

Verbosity levels 3 and higher may capture information that you do not want shared outside of your organization. The following lists information of concern for each level:

- Verbosity 3: The full body of the request and the response, which includes all the data returned by the adapter
- Verbosity 4: SSL certificates
- Verbosity 5: Any extra transfer data not included at Verbosity 3, such as non human-readable binary transfer data

## Best Practices for Data Security

Although we mask sensitive values, such as passwords, in the connection string and any request in the log, it is always best practice to review the logs for any sensitive information before sharing outside your organization.

## Java Logging

When Java logging is enabled in Logfile, the Verbosity will instead map to the following logging levels.

- 0: Level.WARNING
- 1: Level.INFO
- 2: Level.CONFIG
- 3: Level.FINE
- 4: Level.FINER
- 5: Level.FINEST

## Advanced Logging

You may want to refine the exact information that is recorded to the log file. This can be accomplished using the LogModules property.

This property allows you to filter the logging using a semicolon-separated list of logging modules.

All modules are four characters long. **Please note that modules containing three letters have a required trailing blank space.** The available modules are:

- **EXEC:** Query Execution. Includes execution messages for original SQL queries, parsed SQL queries, and normalized SQL queries. Query and page success/failure messages appear here as well.
- **INFO:** General Information. Includes the connection string, driver version (build number), and initial connection messages.
- **HTTP:** HTTP Protocol messages. Includes HTTP requests/responses (including POST messages), as well as Kerberos related messages.
- **SSL :** SSL certificate messages.
- **OAUT:** OAuth related failure/success messages.
- **SQL :** Includes SQL transactions, SQL bulk transfer messages, and SQL result set messages.
- **META:** Metadata cache and schema messages.
- **TCP :** Incoming and Ongoing raw bytes on TCP transport layer messages.

An example value for this property would be.

```
LogModules=INFO;EXEC;SSL ;SQL ;META;
```

Note that these modules refine the information as it is pulled after taking the Verbosity into account.

## SQL Compliance

The Microsoft Dynamics NAV Adapter supports several operations on data, including querying, deleting, modifying, and inserting.

### SELECT Statements

See [SELECT Statements](#) for a syntax reference and examples.

See [Data Model](#) for information on the capabilities of the Microsoft Dynamics NAV API.

## INSERT Statements

See [INSERT Statements](#) for a syntax reference and examples, as well as retrieving the new records' Ids.

## UPDATE Statements

The primary key Id is required to update a record. See [UPDATE Statements](#) for a syntax reference and examples.

## DELETE Statements

The primary key Id is required to delete a record. See [DELETE Statements](#) for a syntax reference and examples.

## EXECUTE Statements

Use EXECUTE or EXEC statements to execute stored procedures. See [EXECUTE Statements](#) for a syntax reference and examples.

## Names and Quoting

- Table and column names are considered identifier names; as such, they are restricted to the following characters: [A-Z, a-z, 0-9, \_:@].
- To use a table or column name with characters not listed above, the name must be quoted using double quotes ("name") in any SQL statement.
- Strings must be quoted using single quotes (e.g., 'John Doe').

## SELECT Statements

A SELECT statement can consist of the following basic clauses.

- SELECT
- INTO
- FROM
- JOIN



- WHERE
- GROUP BY
- HAVING
- UNION
- ORDER BY
- LIMIT

## SELECT Syntax

The following syntax diagram outlines the syntax supported by the Microsoft Dynamics NAV adapter:

```

SELECT {
  [ TOP <numeric_literal> ]
  {
    *
    | {
      <expression> [ [ AS ] <column_reference> ]
      | { <table_name> | <correlation_name> } .*
    } [ , ... ]
  }
  [ INTO csv:// [ filename= ] <file_path> [ ;delimiter=tab ] ]
  {
    FROM <table_reference> [ [ AS ] <identifier> ]
  }
  [ WHERE <search_condition> ]
  [
    ORDER BY
    <column_reference> [ ASC | DESC ] [ NULLS FIRST | NULLS LAST ]
  ]
} | SCOPE_IDENTITY()
<expression> ::=
  | <column_reference>
  | @ <parameter>
  | ?
  | COUNT( * | { [ DISTINCT ] <expression> } )
  | { AVG | MAX | MIN | SUM | COUNT } ( <expression> )
  | NULLIF ( <expression> , <expression> )
  | COALESCE ( <expression> , ... )
  | CASE <expression>
    WHEN { <expression> | <search_condition> } THEN { <expression> |
NULL } [ ... ]

```

```

    [ ELSE { <expression> | NULL } ]
    END
    | <literal>
    | <sql_function>
<search_condition> ::=
{
    <expression> { = | != | <> | > | < | >= | <= | LIKE | IS NOT NULL
| IS NULL | AND | OR } [ <expression> ]
} [ { AND | OR } ... ]

```

## Examples

1. Return all columns:

```
SELECT * FROM Customer
```

2. Rename a column:

```
SELECT "Contact" AS MY_Contact FROM Customer
```

3. Cast a column's data as a different data type:

```
SELECT CAST(AnnualRevenue AS VARCHAR) AS Str_AnnualRevenue FROM
Customer
```

4. Search data:

```
SELECT * FROM Customer WHERE Name <> 'CData, Inc.'
```

5. The Microsoft Dynamics NAV APIs support the following operators in the WHERE clause: =, !=, <>, >, <, >=, <=, LIKE, IS NOT NULL, IS NULL, AND, OR.

```
SELECT * FROM Customer WHERE Name <> 'CData, Inc.';
```

6. Sort a result set in ascending order:

```
SELECT No, Contact FROM Customer ORDER BY Contact ASC
```

## SELECT INTO Statements

You can use the SELECT INTO statement to export formatted data to a file.

### Data Export with an SQL Query

The following query exports data into a file formatted in comma-separated values (CSV):

```
boolean ret = stat.execute("SELECT No, Contact INTO
'csv://c:/Customer.txt' FROM 'Customer' WHERE Name <> 'CData, Inc.'");
System.out.println(stat.getUpdateCount()+" rows affected");
```

You can specify other file formats in the URI. The following example exports tab-separated values:

```
Statement stat = conn.createStatement();
boolean ret = stat.execute("SELECT * INTO 'Customer' IN
'csv://filename=c:/Customer.csv;delimiter=tab' FROM 'Customer' WHERE
Name <> 'CData, Inc.'");
System.out.println(stat.getUpdateCount()+" rows affected");
```

## INSERT Statements

To create new records, use INSERT statements.

### INSERT Syntax

The INSERT statement specifies the columns to be inserted and the new column values. You can specify the column values in a comma-separated list in the VALUES clause, as shown in the following example:

```
INSERT INTO <table_name>
( <column_reference> [ , ... ] )
VALUES
( { <expression> | NULL } [ , ... ] )

<expression> ::=
| @ <parameter>
| ?
| <literal>
```

You can use the executeUpdate method of the Statement and PreparedStatement classes

to execute data manipulation commands and retrieve the rows affected. To retrieve the Id of the last inserted record use `getGeneratedKeys`. Additionally, set the **RETURN\_GENERATED\_KEYS** flag of the Statement class when you call `prepareStatement`.

```
String cmd = "INSERT INTO Customer (Contact) VALUES (?)";
PreparedStatement pstmt = connection.prepareStatement
(cmd, Statement.RETURN_GENERATED_KEYS);
pstmt.setString(1, "John");
int count = pstmt.executeUpdate();
System.out.println(count+" rows were affected");
ResultSet rs = pstmt.getGeneratedKeys();
while(rs.next()){
    System.out.println(rs.getString("Id"));
}
connection.close();
```

## UPDATE Statements

To modify existing records, use UPDATE statements.

### Update Syntax

The UPDATE statement takes as input a comma-separated list of columns and new column values as name-value pairs in the SET clause, as shown in the following example:

```
UPDATE <table_name> SET { <column_reference> = <expression> } [ , ... ]
WHERE { Id = <expression> } [ { AND | OR } ... ]
<expression> ::=
    | @ <parameter>
    | ?
    | <literal>
```

You can use the `executeUpdate` method of the Statement or PreparedStatement classes to execute data manipulation commands and retrieve the rows affected, as shown in the following example:

```
String cmd = "UPDATE Customer SET Contact='John' WHERE Id = ?";
PreparedStatement pstmt = connection.prepareStatement(cmd);
pstmt.setString(1, "http://myserver:7048/DynamicsNAV71/odata/Customer
('01234567')");
int count = pstmt.executeUpdate();
System.out.println(count + " rows were affected");
connection.close();
```

## DELETE Statements

To delete information from a table, use DELETE statements.

### DELETE Syntax

The DELETE statement requires the table name in the FROM clause and the row's primary key in the WHERE clause, as shown in the following example:

```
<delete_statement> ::= DELETE FROM <table_name> WHERE { Id =
<expression> } [ { AND | OR } ... ]
<expression> ::=
    | @ <parameter>
    | ?
    | <literal>
```

You can use the executeUpdate method of the Statement or PreparedStatement classes to execute data manipulation commands and retrieve the number of affected rows, as shown in the following example:

```
Connection connection = DriverManager.getConnection
("jdbc:dynamicsnav:URL=http://myserver:7048;User=myserver\Administrator;
Password=admin;ServerInstance=DYNAMICSNAV71;");
String cmd = "DELETE FROM Customer WHERE Id = ?";
PreparedStatement pstmt = connection.prepareStatement(cmd);
pstmt.setString(1, "http://myserver:7048/DynamicsNAV71/odata/Customer
('01234567')");
int count=pstmt.executeUpdate();
connection.close();
```

## EXECUTE Statements

To execute stored procedures, you can use EXECUTE or EXEC statements.

EXEC and EXECUTE assign stored procedure inputs, referenced by name, to values or parameter names.

### Stored Procedure Syntax

To execute a stored procedure as an SQL statement, use the following syntax:

```
{ EXECUTE | EXEC } <stored_proc_name>
{
  [ @ ] <input_name> = <expression>
} [ , ... ]
<expression> ::=
  | @ <parameter>
  | ?
  | <literal>
```

## Example Statements

Reference stored procedure inputs by name:

```
EXECUTE my_proc @second = 2, @first = 1, @third = 3;
```

Execute a parameterized stored procedure statement:

```
EXECUTE my_proc second = @p1, first = @p2, third = @p3;
```

## PIVOT and UNPIVOT

**PIVOT and UNPIVOT** can be used to change a table-valued expression into another table.

### PIVOT

PIVOT rotates a table-value expression by turning unique values from one column into multiple columns in the output. PIVOT can run aggregations where required on any column value.

### PIVOT Syntax

```
"SELECT 'AverageCost' AS Cost_Sorted_By_Production_Days, [0], [1], [2],
[3], [4]
FROM
(
  SELECT DaysToManufacture, StandardCost
  FROM Production.Product
) AS SourceTable
```

```
PIVOT
(
AVG(StandardCost)
FOR DaysToManufacture IN ([0], [1], [2], [3], [4])
) AS PivotTable;"
```

## UNPIVOT

UNPIVOT carries out nearly the opposite to PIVOT by rotating columns of a table-valued expressions into column values.

## UNPIVOT Syntax

```
"SELECT VendorID, Employee, Orders
FROM
(SELECT VendorID, Emp1, Emp2, Emp3, Emp4, Emp5
FROM pvt) p
UNPIVOT
(Orders FOR Employee IN
(Emp1, Emp2, Emp3, Emp4, Emp5)
)AS unpvt;"
```

For further information on PIVOT and UNPIVOT, see [FROM clause plus JOIN, APPLY, PIVOT \(Transact-SQL\)](#)

# Data Model

The Microsoft Dynamics NAV Adapter models Microsoft Dynamics NAV entities in relational tables and stored procedures. The table definitions are dynamically obtained from the OData service you connect to.

## Tables

Only Pages that are published as Web Services in Dynamics NAV will be available as tables. The [Data Model](#) shows the tables available in the demonstration database; the actual tables available will depend on your Microsoft Dynamics NAV instance.

## Stored Procedures

Stored Procedures are function-like interfaces to the data source. They can be used to

search, update, and modify information in the data source.

## Tables

The adapter models the data in Microsoft Dynamics NAV into a list of tables that can be queried using standard SQL statements.

Generally, querying Microsoft Dynamics NAV tables is the same as querying a table in a relational database. Sometimes there are special cases, for example, including a certain column in the WHERE clause might be required to get data for certain columns in the table. This is typically needed for situations where a separate request must be made for each row to get certain columns. These types of situations are clearly documented at the top of the table page linked below.

### Microsoft Dynamics NAV Adapter Tables

Name	Description
<a href="#">Company</a>	The DynamicsNAV table Company.
<a href="#">Country</a>	The DynamicsNAV table Country.
<a href="#">Currency</a>	The DynamicsNAV table Currency.
<a href="#">Customer</a>	The DynamicsNAV table Customer.
<a href="#">GeneralProductPosting</a>	The DynamicsNAV table GeneralProductPosting.
<a href="#">PurchaseLines</a>	The DynamicsNAV table PurchaseLines.
<a href="#">PurchaseOrder</a>	The DynamicsNAV table PurchaseOrder.
<a href="#">PurchaseOrderPurchLines</a>	The DynamicsNAV table PurchaseOrderPurchLines.
<a href="#">PurchaseOrders</a>	The DynamicsNAV table PurchaseOrders.
<a href="#">ResourceCard</a>	The DynamicsNAV table ResourceCard.
<a href="#">SalesOrder</a>	The DynamicsNAV table SalesOrder.



# Company

The DynamicsNAV table Company.

## Columns

Name	Type	Read Only	Description
[KEY]	String	False	The Name column for the table Company.
	LinkedCountry	False	The LinkedCountry column for the table Company.
	LinkedCurrency	False	The LinkedCurrency column for the table Company.
	LinkedCustomer	False	The LinkedCustomer column for the table Company.
	LinkedGeneralProduct	False	The Posting LinkedGeneralProductPosting column for the table Company.
	LinkedPurchaseLine	False	The LinkedPurchaseLines column for the table Company.
	LinkedPurchaseOrder	False	The LinkedPurchaseOrd

				er column for the table Company.
	LinkedPurchaseOrderPurchLines	LinkedPurchaseOrderPurchLines		column for the table Company.
	LinkedPurchaseOrders	LinkedPurchaseOrders		column for the table Company.
	LinkedResourceCard	LinkedResourceCard		column for the table Company.
	LinkedSalesOrder	LinkedSalesOrder		column for the table Company.

## Country

The DynamicsNAV table Country.

### Columns

Name	Type	ReadOnly	Description
[KEY]	Code String	False	The Code column for the table

				Country.
	Address_	Format	False	The Address_ Format column for the table Country.
	g			
	Contact_	Address_	Format	The Contact_ Address_ Format column for the table Country.
	g			
	ETag	String	False	The ETag column for the table Country.
	EU_Country_	Region_	Code	The EU_Country_ Region_ Code column for the table Country.
	g			
	Intrastat_	Code	False	The Intrastat_ Code column for the table
	g			

				Country.
	Name	String	False	The Name column for the table Country.

## Currency

The DynamicsNAV table Currency.

### Columns

Name		Type	ReadOnly	Description
[KEY]	Code	String	False	The Code column for the table Currency.
	Amount_Decimal_Places	Decimal	False	The Amount_Decimal_Places column for the table Currency.
	Amount_Rounding_Precision	Decimal	False	The Amount_Rounding_Precision column for the table Currency.

Appln_Rounding_Precision	Decimal	False	The Appln_Rounding_Precision column for the table Currency.
Conv_LCY_Rndg_Credit_Acc	String	False	The Conv_LCY_Rndg_Credit_Acc column for the table Currency.
Conv_LCY_Rndg_Debit_Acc	String	False	The Conv_LCY_Rndg_Debit_Acc column for the table Currency.
CurrencyFactor	Decimal	False	The CurrencyFactor column for the table Currency.
Description	String	False	The Description column for the table Currency.
EMU_Currency	Boolean	False	The EMU_Currency column for

				the table Currency.
	ETag	String	False	The ETag column for the table Currency.
	Invoice_Rounding_Precision	Decimal	False	The Invoice_ Rounding_ Precision column for the table Currency.
	Invoice_Rounding_Type	String	False	The Invoice_ Rounding_ Type column for the table Currency.
	Last_Date_Adjusted	DateTime	False	The Last_ Date_ Adjusted column for the table Currency.
	Last_Date_Modified	DateTime	False	The Last_ Date_ Modified column for the table Currency.
	Max_Payment_Tolerance	Decimal	False	The Max_ Payment_ Tolerance



	Realized_Gains_Acc	False	The Realized_Gains_Acc column for the table Currency.
	Realized_Losses_Acc	False	The Realized_Losses_Acc column for the table Currency.
	Residual_Gains_Account	False	The Residual_Gains_Account column for the table Currency.
	Residual_Losses_Account	False	The Residual_Losses_Account column for the table Currency.
	Symbol	String False	The Symbol column for the table Currency.
	Unit_Amount_Decimal_Places	String False	The Unit_Amount_Decimal_Places column for the table Currency.



		Places column for the table Currency.
Unit_Amount	Denom_Rounding_Precision	The Unit_Amount_Rounding_Precision column for the table Currency.
Unrealized_Gains_Acc	String	The Unrealized_Gains_Acc column for the table Currency.
Unrealized_Losses_Acc	String	The Unrealized_Losses_Acc column for the table Currency.
VAT_Rounding_Type	String	The VAT_Rounding_Type column for the table Currency.

## Customer

The DynamicsNAV table Customer.

## Columns

Name		Type	Read Only	Description
[KEY]	No	String	False	The No column for the table Customer.
	Address	String	False	The Address column for the table Customer.
	Address_2	String	False	The Address_2 column for the table Customer.
	Allow_Line_Disc	Boolean	False	The Allow_Line_Disc column for the table Customer.
	Application_Method	String	False	The Application_Method column for the table Customer.
	Balance_Local	Decimal	False	The Balance_LCY column for the

			table Customer.
	Bank_Communication	String False	The Bank_ Communica tion column for the table Customer.
	Base_Calendar_Code	String False	The Base_ Calendar_ Code column for the table Customer.
	Bill_to_Customer	String False	The Bill_to_ Customer_ No column for the table Customer.
	Block_Payment_Tolerance	String False	The Block_ Payment_ Tolerance column for the table Customer.
	Blocked	String False	The Blocked column for the table Customer.
	Cash_Flow_Payment_Terms	String False	The Cash_ Flow_ Payment_ Terms_ Code

				Terms_ Code column for the table Customer.
	Check_Date_	String	False	The Check_ Date_ Format column for the table Customer.
	Check_Date_	String	False	The Check_ Date_ Separator column for the table Customer.
	City	String	False	The City column for the table Customer.
	Combine_Shipments	Boolean	False	The Combine_ Shipments column for the table Customer.
	Contact	String	False	The Contact column for the table Customer.
	Copy_Sell_to_	String	False	The Copy_ Sell_to_

			Addr_to_Qte_From column for the table Customer.
	Country_Region_Code	String	The Country_Region_Code column for the table Customer.
	County	String	The County column for the table Customer.
	Credit_Limit_LCY	Decimal	The Credit_Limit_LCY column for the table Customer.
	CURP_No	String	The CURP_No column for the table Customer.
	Currency_Code	String	The Currency_Code column for the table Customer.
	Currency_Fldr	String	The Currency_

			Filter column for the table Customer.
	CustomString	Disc_Group	The Customer_Disc_Group column for the table Customer.
	CustomString	Posting_Group	The Customer_Posting_Group column for the table Customer.
	CustomString	Price_Group	The Customer_Price_Group column for the table Customer.
	CustomString	Calendar	The Customized_Calendar column for the table Customer.
	E-Mail	String	The E-Mail column for the table Customer.

ETag	String	False	The ETag column for the table Customer.
Fax_No	String	False	The Fax_No column for the table Customer.
Fin_Charge_Terms_Code	String	False	The Fin_Charge_Terms_Code column for the table Customer.
Gen_Bus_Posting_Group	String	False	The Gen_Bus_Posting_Group column for the table Customer.
Global_Dimension_1_Filter	String	False	The Global_Dimension_1_Filter column for the table Customer.
Global_Dimension_2_Filter	String	False	The Global_Dimension_2_Filter column for the table Customer.

Home_Page	String	False	The Home_Page column for the table Customer.
IC_Partner_Code	String	False	The IC_Partner_Code column for the table Customer.
Invoice_Copies	Integer	False	The Invoice_Copies column for the table Customer.
Invoice_Disc_Code	String	False	The Invoice_Disc_Code column for the table Customer.
Language_Code	String	False	The Language_Code column for the table Customer.
Last_Date_Modified	DateTime	False	The Last_Date_Modified column for the table Customer.



Last_Statement_No	Integer	False	The Last_Statement_No column for the table Customer.
Location_Code	String	False	The Location_Code column for the table Customer.
Name	String	False	The Name column for the table Customer.
Partner_Type	String	False	The Partner_Type column for the table Customer.
Payment_Method_Code	String	False	The Payment_Method_Code column for the table Customer.
Payment_Terms_Code	String	False	The Payment_Terms_Code column for the table

			Customer.
	Phone_No	String False	The Phone_No column for the table Customer.
	Post_Code	String False	The Post_Code column for the table Customer.
	Preferred_Bank_Account	String False	The Preferred_Bank_Account column for the table Customer.
	Prepayment_Percent	Decimal False	The Prepayment_Percent column for the table Customer.
	Prices_Including_VAT	Boolean False	The Prices_Including_VAT column for the table Customer.
	Primary_Contact_No	String False	The Primary_Contact_No column for

			the table Customer.
	Print_Statements	Boolean	The Print_Statements column for the table Customer.
	Reminder_Terms_Code	String	The Reminder_Terms_Code column for the table Customer.
	Reserve	Boolean	The Reserve column for the table Customer.
	Responsibility_Center	Boolean	The Responsibility_Center column for the table Customer.
	RFC_No	Boolean	The RFC_No column for the table Customer.
	Salesperson	Boolean	The Salesperson_Code column for

			the table Customer.
	Search_Name	String False	The Search_Name column for the table Customer.
	Service_Zone_Code	String False	The Service_Zone_Code column for the table Customer.
	Shipment_Method_Code	String False	The Shipment_Method_Code column for the table Customer.
	Shipping_Advice	String False	The Shipping_Advice column for the table Customer.
	Shipping_Agent_Code	String False	The Shipping_Agent_Code column for the table Customer.
	Shipping_Agent_Service_Code	String False	The Shipping_Agent_Service_Code column for the table Customer.

			Shipping_ Agent_ Service_ Code column for the table Customer.
	Shipping_ Time	String False	The Shipping_ Time column for the table Customer.
	State_ Inscription	String False	The State_ Inscription column for the table Customer.
	Tax_ Area_ Code	String False	The Tax_ Area_ Code column for the table Customer.
	Tax_ Exemption_ No	String False	The Tax_ Exemption_ No column for the table Customer.
	Tax_ Identification_ Type	String False	The Tax_ Identification_ Type column for the table Customer.

	Tax_Liable	Boolean	False	The Tax_Liable column for the table Customer.
	VAT_Bus_Posting_Group	String	False	The VAT_Bus_Posting_Group column for the table Customer.
	VAT_Registration_No	String	False	The VAT_Registration_No column for the table Customer.
	LinkedCountry_Region_Code_Link	String	False	The LinkedCountry_Region_Code_Link column for the table Customer.
	LinkedCurrency_Code_Link	String	False	The LinkedCurrency_Code_Link column for the table Customer.
	LinkedCurrency_Link	String	False	The LinkedCurrency_

Filter\_Link  
column for  
the table  
Customer.

## GeneralProductPosting

The DynamicsNAV table GeneralProductPosting.

### Columns

Name	Type	ReadOnly	Description
[KEY]	CodeString	False	The Code column for the table GeneralProduct Posting.
	AutoInsert_Default	False	The Auto_ Insert_Default column for the table GeneralProduct Posting.
	Def_VAT_Prod_Posting_Group	False	The Def_VAT_Prod_Posting_Group column for the table GeneralProduct Posting.
	Description	False	The Description column for the table

			GeneralProduct Posting.
	ETag	String False	The ETag column for the table GeneralProduct Posting.

## PurchaseLines

The DynamicsNAV table PurchaseLines.

### Columns

Name	Type	ReadOnly	Description
[KEY]	Document_No	String No False	The Document_No column for the table PurchaseLines.
[KEY]	Document_Type	String Type False	The Document_Type column for the table PurchaseLines.
[KEY]	Line_No	Int32 False	The Line_No column for the table PurchaseLines.



			es.
Amt_Rcd_Not_Invoiced_LCY	Decimal	False	The Amt_Rcd_Not_Invoiced_LCY column for the table PurchaseLines.
Buy_from_Vendor_No	String	False	The Buy_from_Vendor_No column for the table PurchaseLines.
Description	String	False	The Description column for the table PurchaseLines.
Direct_Unit_Cost	Decimal	False	The Direct_Unit_Cost column for the table PurchaseLines.
ETag	String	False	The ETag column for the table PurchaseLines.
Expected_Receipt_Date	Date	False	The Expected_

			Receipt_
			Date column
			for the table
			PurchaseLin
			es.
	Indirect_Cost_Percent	Decimal	The
			Indirect_
			Cost_
			Percent
			column for
			the table
			PurchaseLin
			es.
	Job_Line_Type	String	The Job_
			Line_Type
			column for
			the table
			PurchaseLin
			es.
	Job_No	String	The Job_No
			column for
			the table
			PurchaseLin
			es.
	Job_Task_No	String	The Job_
			Task_No
			column for
			the table
			PurchaseLin
			es.
	Line_Amount	Decimal	The Line_
			Amount
			column for
			the table

				PurchaseLines.
	LocationCode	String	False	The LocationCode column for the table PurchaseLines.
	No	String	False	The No column for the table PurchaseLines.
	OutstandingAmount_LCY	Decimal	False	The OutstandingAmount_LCY column for the table PurchaseLines.
	OutstandingQuantity	Decimal	False	The OutstandingQuantity column for the table PurchaseLines.
	Quantity	Decimal	False	The Quantity column for the table PurchaseLines.
	ReservedQty_Base	Decimal	False	The

	al	Reserved_ Qty_Base column for the table PurchaseLin es.
	Shortcut_Dimensi on_1_Code	The Shortcut_ Dimension_ 1_Code column for the table PurchaseLin es.
	Shortcut_Dimensi on_2_Code	The Shortcut_ Dimension_ 2_Code column for the table PurchaseLin es.
	ShortcutDim Code_x005B_3_ x005D_	The ShortcutDim Code_ x005B_3_ x005D_ column for the table PurchaseLin es.
	ShortcutDim Code_x005B_4_ x005D_	The ShortcutDim Code_ x005B_4_ x005D_ column for the table PurchaseLin es.

		column for the table PurchaseLin es.
ShortcutDimCode_5_	ShortcutDimCode_5_	column for the table PurchaseLin es.
ShortcutDimCode_6_	ShortcutDimCode_6_	column for the table PurchaseLin es.
ShortcutDimCode_7_	ShortcutDimCode_7_	column for the table PurchaseLin es.
ShortcutDimCode_8_	ShortcutDimCode_8_	

				column for the table PurchaseLines.
	Type	String	False	The Type column for the table PurchaseLines.
	Unit_Cost_LCY	Decimal	False	The Unit_Cost_LCY column for the table PurchaseLines.
	Unit_of_Measure_Code	String	False	The Unit_of_Measure_Code column for the table PurchaseLines.
	Unit_Price_LCY	Decimal	False	The Unit_Price_LCY column for the table PurchaseLines.
	Variant_Code	String	False	The Variant_Code column for the table PurchaseLines.

# PurchaseOrder

The DynamicsNAV table PurchaseOrder.

## Columns

Name	Type	Read Only	Description
[KEY]	Document_Type	False	The Document_Type column for the table PurchaseOrder.
[KEY]	No	False	The No column for the table PurchaseOrder.
	Area	False	The Area column for the table PurchaseOrder.
	Assigned_User_ID	False	The Assigned_User_ID column for the table PurchaseOrder.
	Buy_from_Address	False	The Buy_from_Address column for the table PurchaseOrder.
	Buy_from_Address_2	False	The Buy_from_Address_2 column for the table PurchaseOrder.
	Buy_from_City	False	The Buy_from_City

		column for the table PurchaseOrder.
Buy_from_Contact	String	The Buy_from_Contact column for the table PurchaseOrder.
Buy_from_Contact_No	String	The Buy_from_Contact_No column for the table PurchaseOrder.
Buy_from_County	String	The Buy_from_County column for the table PurchaseOrder.
Buy_from_Post_Code	String	The Buy_from_Post_Code column for the table PurchaseOrder.
Buy_from_Vendor_Name	String	The Buy_from_Vendor_Name column for the table PurchaseOrder.
Buy_from_Vendor_No	String	The Buy_from_Vendor_No column for the table PurchaseOrder.
Compress_Prepayment	Boolean	The Compress_Prepayment column for the table



		PurchaseOrder.
	Creditor_No String_False	The Creditor_No column for the table PurchaseOrder.
	Currency_Code String_False	The Currency_Code column for the table PurchaseOrder.
	Document_Date Date_False	The Document_ Date column for the table PurchaseOrder.
	Due_Date Date_False	The Due_Date column for the table PurchaseOrder.
	Entry_Point String_False	The Entry_Point column for the table PurchaseOrder.
	ETag String_False	The ETag column for the table PurchaseOrder.
	Expected_Receipt_Date Date_False	The Expected_ Receipt_Date column for the table PurchaseOrder.
	Invoicing_Whse_Handling_Time String_False	The Invoicing_ Whse_Handling_ Time column for

		the table PurchaseOrder.
	IRS1099_Code <del>String</del> False	The IRS_1099_Code column for the table PurchaseOrder.
	JobQueue_Status <del>String</del> False	The Job_Queue_ Status column for the table PurchaseOrder.
	LeadTime_Calculation <del>String</del> False	The Lead_Time_ Calculation column for the table PurchaseOrder.
	Location_Code <del>String</del> False	The Location_Code column for the table PurchaseOrder.
	No_of_Archived_Versions <del>Int32</del> False	The No_of_ Archived_Versions column for the table PurchaseOrder.
	On_Hold <del>String</del> False	The On_Hold column for the table PurchaseOrder.
	Order_Address_Code <del>String</del> False	The Order_ Address_Code column for the table PurchaseOrder.

<del>Order_Date</del> <i>ime</i>	<del>False</del>	The Order_Date column for the table PurchaseOrder.
<del>Pay_to_Address</del>	<del>False</del>	The Pay_to_Address column for the table PurchaseOrder.
<del>Pay_to_Address_2</del>	<del>False</del>	The Pay_to_Address_2 column for the table PurchaseOrder.
<del>Pay_to_City</del>	<del>False</del>	The Pay_to_City column for the table PurchaseOrder.
<del>Pay_to_Contact</del>	<del>False</del>	The Pay_to_Contact column for the table PurchaseOrder.
<del>Pay_to_Contact_No</del>	<del>False</del>	The Pay_to_Contact_No column for the table PurchaseOrder.
<del>Pay_to_County</del>	<del>False</del>	The Pay_to_County column for the table PurchaseOrder.
<del>Pay_to_Name</del>	<del>False</del>	The Pay_to_Name column for the table PurchaseOrder.

Pay_to_Post_Code	String	False	The Pay_to_Post_Code column for the table PurchaseOrder.
Pay_to_Vendor_No	String	False	The Pay_to_Vendor_No column for the table PurchaseOrder.
Payment_Discount_Percent	Decimal	False	The Payment_Discount_Percent column for the table PurchaseOrder.
Payment_Reference	String	False	The Payment_Reference column for the table PurchaseOrder.
Payment_Terms_Code	String	False	The Payment_Terms_Code column for the table PurchaseOrder.
Pmt_Discount_Date	Date	False	The Pmt_Discount_Date column for the table PurchaseOrder.
Posting_Date	Date	False	The Posting_Date column for the table PurchaseOrder.
Posting_Description	String	False	The Posting_Description column for the table

	PurchaseOrder.
Prepayment_Due_Date <i>ime</i>	The Prepayment_Due_Date column for the table PurchaseOrder.
Prepayment_Percent <i>mal</i>	The Prepayment_Percent column for the table PurchaseOrder.
Prepayment_Include_Tax <i>an</i>	The Prepmt_Include_Tax column for the table PurchaseOrder.
Prepayment_Discount_Percent <i>mal</i>	The Prepmt_Discount_Percent column for the table PurchaseOrder.
Prepayment_Terms_Code <i>ing</i>	The Prepmt_Payment_Terms_Code column for the table PurchaseOrder.
Prepayment_Discount_Date <i>ime</i>	The Prepmt_Discount_Date column for the table PurchaseOrder.
Promised_Receipt_Date <i>ime</i>	The Promised_Receipt_Date column for the

		table PurchaseOrder.
	Provincial_FalseAreaCode	The Provincial_Tax_Area_Code column for the table PurchaseOrder.
	Purchaser_Code	The Purchaser_Code column for the table PurchaseOrder.
	Quote_No	The Quote_No column for the table PurchaseOrder.
	Requested_Receipt_Date	The Requested_Receipt_Date column for the table PurchaseOrder.
	Responsibility_Center	The Responsibility_Center column for the table PurchaseOrder.
	Sell_to_Customer_No	The Sell_to_Customer_No column for the table PurchaseOrder.
	Ship_to_Address	The Ship_to_Address column for the table PurchaseOrder.

<del>Ship_To_Address_2</del>	<del>Ship_To_Address_2</del>	The Ship_to_Address_2 column for the table PurchaseOrder.
<del>Ship_To_City</del>	<del>Ship_To_City</del>	The Ship_to_City column for the table PurchaseOrder.
<del>Ship_To_Code</del>	<del>Ship_To_Code</del>	The Ship_to_Code column for the table PurchaseOrder.
<del>Ship_To_Contact</del>	<del>Ship_To_Contact</del>	The Ship_to_Contact column for the table PurchaseOrder.
<del>Ship_To_County</del>	<del>Ship_To_County</del>	The Ship_to_County column for the table PurchaseOrder.
<del>Ship_To_Name</del>	<del>Ship_To_Name</del>	The Ship_to_Name column for the table PurchaseOrder.
<del>Ship_To_Postal_Code</del>	<del>Ship_To_Postal_Code</del>	The Ship_to_Postal_Code column for the table PurchaseOrder.
<del>Ship_To_UPS_Zone</del>	<del>Ship_To_UPS_Zone</del>	The Ship_to_UPS_Zone column for the table PurchaseOrder.

Shipment_Method_Code	String	False	The Shipment_Method_Code column for the table PurchaseOrder.
Shipment_Dimension_1_Code	String	False	The Shipment_Dimension_1_Code column for the table PurchaseOrder.
Shipment_Dimension_2_Code	String	False	The Shipment_Dimension_2_Code column for the table PurchaseOrder.
Status	String	False	The Status column for the table PurchaseOrder.
Tax_Area_Code	String	False	The Tax_Area_Code column for the table PurchaseOrder.
Tax_Exemption_No	String	False	The Tax_Exemption_No column for the table PurchaseOrder.
Tax_Liable	Boolean	False	The Tax_Liable column for the table PurchaseOrder.
Transaction_Specification	String	False	The Transaction_Specification column for the table PurchaseOrder.



		column for the table PurchaseOrder.
TransactionType	String	The TransactionType column for the table PurchaseOrder.
TransportMethod	String	The TransportMethod column for the table PurchaseOrder.
VendorCrMemoNo	String	The Vendor_Cr_Memo_No column for the table PurchaseOrder.
VendorInvoiceNo	String	The Vendor_Invoice_No column for the table PurchaseOrder.
VendorOrderNo	String	The Vendor_Order_No column for the table PurchaseOrder.
VendorShipmentNo	String	The Vendor_Shipment_No column for the table PurchaseOrder.
LinkedPurchaseOrder	Boolean	The PurchLines LinkedPurchaseOrderPurchLines column for the table

	PurchaseOrder.
LinkedCurrencyCode_Link	The LinkedCurrencyCode_Link column for the table PurchaseOrder.

## PurchaseOrderPurchLines

The DynamicsNAV table PurchaseOrderPurchLines.

### Columns

Name	Type	Read Only	Description
[KEY]	Document_No	False	The Document_No column for the table PurchaseOrderPurchLines.
[KEY]	Document_Type	False	The Document_Type column for the table PurchaseOrderPurchLines.
[KEY]	Line_No	False	The Line_No column for the table PurchaseOrderPurchLines.
	Allow_WholesaleDisc	False	The Allow_WholesaleDisc

			Invoice_Disc column for the table PurchaseOrderP urchLines.
	AllowBottomCharge_ an	False	The Allow_Item_ Charge_ Assignment column for the table PurchaseOrderP urchLines.
	ApplToItemEntry	False	The Appl_to_ Item_Entry column for the table PurchaseOrderP urchLines.
	Bin_Code	False	The Bin_Code column for the table PurchaseOrderP urchLines.
	BlanketOrderLine_No	False	The Blanket_ Order_Line_No column for the table PurchaseOrderP urchLines.
	BlanketOrderNo	False	The Blanket_ Order_No column for the table PurchaseOrderP urchLines.

Cross_	String	False	No	The Cross_Reference_No column for the table PurchaseOrderPurchLines.
Description	String	False		The Description column for the table PurchaseOrderPurchLines.
Direct_Unit_Cost	Decimal	False		The Direct_Unit_Cost column for the table PurchaseOrderPurchLines.
Drop_Shipment	Boolean	False		The Drop_Shipment column for the table PurchaseOrderPurchLines.
ETag	String	False		The ETag column for the table PurchaseOrderPurchLines.
Expected_Receipt_Date	Date	False		The Expected_Receipt_Date column for the table PurchaseOrderPurchLines.
Finished	Boolean	False		The Finished

	<i>an</i>		column for the table PurchaseOrderPurchLines.
	GST_HST	False	The GST_HST column for the table PurchaseOrderPurchLines.
	IC_Partner_Code	False	The IC_Partner_Code column for the table PurchaseOrderPurchLines.
	IC_Partner_Ref_Type	False	The IC_Partner_Ref_Type column for the table PurchaseOrderPurchLines.
	IC_Partner_Reference	False	The IC_Partner_Reference column for the table PurchaseOrderPurchLines.
	Inbound_Whse_Handling_Time	False	The Inbound_Whse_Handling_Time column for the table PurchaseOrderPurchLines.
	Indirect_Cost_Percent	False	The Indirect_Cost_Percent

		column for the table PurchaseOrderPurchLines.
Inv_Discount_Amount	False	The Inv_Discount_Amount column for the table PurchaseOrderPurchLines.
IRS_1099_Liability	False	The IRS_1099_Liability column for the table PurchaseOrderPurchLines.
Job_Line_Amount	False	The Job_Line_Amount column for the table PurchaseOrderPurchLines.
Job_Line_Amount_LCY	False	The Job_Line_Amount_LCY column for the table PurchaseOrderPurchLines.
Job_Line_Disc_Amount_LCY	False	The Job_Line_Disc_Amount_LCY column for the table PurchaseOrderPurchLines.
Job_Line_Disc_Amount	False	The Job_Line_Disc_Amount column for the table PurchaseOrderPurchLines.

			Amount column for the table PurchaseOrderPurchLines.
	Job_Line_Discount_Percent	False	The Job_Line_Discount_Percent column for the table PurchaseOrderPurchLines.
	Job_Line_Type	False	The Job_Line_Type column for the table PurchaseOrderPurchLines.
	Job_No	False	The Job_No column for the table PurchaseOrderPurchLines.
	Job_Planning_Line_No	False	The Job_Planning_Line_No column for the table PurchaseOrderPurchLines.
	Job_Remaining_Qty	False	The Job_Remaining_Qty column for the table PurchaseOrderPurchLines.
	Job_Task_No	False	The Job_Task_No column for

		the table PurchaseOrderP urchLines.
	Job_Debit_Pri mal	The Job_Total_ Price column for the table PurchaseOrderP urchLines.
	Job_Debit_Pri mal	The Job_Total_ Price_LCY column for the table PurchaseOrderP urchLines.
	Job_Debit_Pri mal	The Job_Unit_ Price column for the table PurchaseOrderP urchLines.
	Job_Debit_Pri mal	The Job_Unit_ Price_LCY column for the table PurchaseOrderP urchLines.
	Lead_Time_Calc ulation	The Lead_Time_ Calculation column for the table PurchaseOrderP urchLines.
	Line_Amount mal	The Line_ Amount column for the table



			PurchaseOrderPurchLines.
	Line_Disc <sub>mal</sub>	Amount_Boolean	The Line_Disc <sub>mal</sub> Amount column for the table PurchaseOrderPurchLines.
	Line_Disc <sub>mal</sub>	Percent_Boolean	The Line_Disc <sub>mal</sub> Percent column for the table PurchaseOrderPurchLines.
	Location_ <sub>String</sub>	Code_Boolean	The Location_ <sub>String</sub> Code column for the table PurchaseOrderPurchLines.
	No_ <sub>String</sub>	Boolean	The No_ <sub>String</sub> column for the table PurchaseOrderPurchLines.
	Nonstock_ <sub>Boolean</sub>	Boolean	The Nonstock column for the table PurchaseOrderPurchLines.
	Operation_ <sub>String</sub>	No_Boolean	The Operation_ <sub>String</sub> No column for the table PurchaseOrderPurchLines.

Order_Date	Boolean	False	The Order_Date column for the table PurchaseOrderPurchLines.
Planned_Receipt_Date	Boolean	False	The Planned_Receipt_Date column for the table PurchaseOrderPurchLines.
Planning_Flexibility	String	False	The Planning_Flexibility column for the table PurchaseOrderPurchLines.
Prepayment_Percent	Boolean	False	The Prepayment_Percent column for the table PurchaseOrderPurchLines.
Prepmt_Amt_Deducted	Boolean	False	The Prepmt_Amt_Deducted column for the table PurchaseOrderPurchLines.
Prepmt_Amt_Inv	Boolean	False	The Prepmt_Amt_Inv column for the table PurchaseOrderPurchLines.

Prepmt_Amt_FalseDeduct	mal	The Prepmt_Amt_to_Deduct column for the table PurchaseOrderPurchLines.
Prepmt_Line_Amount	mal	The Prepmt_Line_Amount column for the table PurchaseOrderPurchLines.
Prod_Order_Line_No	FalseNo	The Prod_Order_Line_No column for the table PurchaseOrderPurchLines.
Prod_Order_No	False	The Prod_Order_No column for the table PurchaseOrderPurchLines.
Promised_Receipt_Date	False	The Promised_Receipt_Date column for the table PurchaseOrderPurchLines.
Provinc_Tax_Area_Code	False	The Provincial_Tax_Area_Code column for the table PurchaseOrderPurchLines.

				urchLines.
	Qty_Assigned	Decimal	False	The Qty_Assigned column for the table PurchaseOrderPurchLines.
	Qty_to_Assign	Decimal	False	The Qty_to_Assign column for the table PurchaseOrderPurchLines.
	Qty_to_Invoice	Decimal	False	The Qty_to_Invoice column for the table PurchaseOrderPurchLines.
	Qty_to_Receive	Decimal	False	The Qty_to_Receive column for the table PurchaseOrderPurchLines.
	Quantity	Decimal	False	The Quantity column for the table PurchaseOrderPurchLines.
	Quantity_Invoiced	Decimal	False	The Quantity_Invoiced column for the table PurchaseOrderPurchLines.
	Quantity_Received	Decimal	False	The Quantity_Received

			column for the table PurchaseOrderPurchLines.
Requested_Received_Receipt_Date	Requested_Received_Receipt_Date	False	The Requested_Received_Receipt_Date column for the table PurchaseOrderPurchLines.
Reserved_Qual	Reserved_Qual	False	The Reserved_Qual column for the table PurchaseOrderPurchLines.
Return_Reason_Code	Return_Reason_Code	False	The Return_Reason_Code column for the table PurchaseOrderPurchLines.
Shortcut_Dimension_1_Code	Shortcut_Dimension_1_Code	False	The Shortcut_Dimension_1_Code column for the table PurchaseOrderPurchLines.
Shortcut_Dimension_2_Code	Shortcut_Dimension_2_Code	False	The Shortcut_Dimension_2_Code column for the table PurchaseOrderPurchLines.
Shortcut_Dimension_3_Code	Shortcut_Dimension_3_Code	False	The Shortcut_Dimension_3_Code column for the table PurchaseOrderPurchLines.

	ShortcutDimCode_x005B_3_x005D_ column for the table PurchaseOrderPurchaseLines.
ShortcutDimCode_x005B_4_x005D_	ShortcutDimCode_x005B_4_x005D_ column for the table PurchaseOrderPurchaseLines.
ShortcutDimCode_x005B_5_x005D_	ShortcutDimCode_x005B_5_x005D_ column for the table PurchaseOrderPurchaseLines.
ShortcutDimCode_x005B_6_x005D_	ShortcutDimCode_x005B_6_x005D_ column for the table PurchaseOrderPurchaseLines.
ShortcutDimCode_x005B_7_x005D_	ShortcutDimCode_x005B_7_x005D_ column for the table PurchaseOrderPurchaseLines.
ShortcutDimCode_x005B_8_x005D_	

				ShortcutDimCode_x005B_8_x005D_ column for the table PurchaseOrderPurchaseLines.	
		Tax_Area_Code	String	False	The Tax_Area_Code column for the table PurchaseOrderPurchaseLines.
		Tax_Group_Code	String	False	The Tax_Group_Code column for the table PurchaseOrderPurchaseLines.
		Tax_Liable	Boolean	False	The Tax_Liable column for the table PurchaseOrderPurchaseLines.
		Type	String	False	The Type column for the table PurchaseOrderPurchaseLines.
		Unit_Cost_LCY	Decimal	False	The Unit_Cost_LCY column for the table PurchaseOrderPurchaseLines.
		Unit_of_Measure	String	False	The Unit_of_Measure column for the table

			PurchaseOrderPurchLines.
	Unit_of_Measure	False	The Unit_of_Measure_Code column for the table PurchaseOrderPurchLines.
	Unit_Price_LCY	False	The Unit_Price_LCY column for the table PurchaseOrderPurchLines.
	Use_Tax	False	The Use_Tax column for the table PurchaseOrderPurchLines.
	Variant_Code	False	The Variant_Code column for the table PurchaseOrderPurchLines.
	VAT_Prod_Posting_Group	False	The VAT_Prod_Posting_Group column for the table PurchaseOrderPurchLines.
	Whse_Outstanding_Qty_Base	False	The Whse_Outstanding_Qty_Base column for the table



		PurchaseOrderPurchLines.
	WorkCenterFlag	The WorkCenter_No column for the table PurchaseOrderPurchLines.
	LinkedBlanketOrder_Line_No_Link	The LinkedBlanketOrder_Line_No_Link column for the table PurchaseOrderPurchLines.

## PurchaseOrders

The DynamicsNAV table PurchaseOrders.

### Columns

Name	Type	ReadOnly	Description
[KEY]	DocumentNo	False	The Document_No column for the table PurchaseOrders.
[KEY]	DocumentType	False	The

				Document_ Type column for the table PurchaseOr ders.
[KEY]		Line_No 32	False	The Line_No column for the table PurchaseOr ders.
		Amount Decimal	False	The Amount column for the table PurchaseOr ders.
		Buy_from_ String/End 5	False	The Buy_ from_ Vendor_No column for the table PurchaseOr ders.
		Currency_ String Code	False	The Currency_ Code column for the table PurchaseOr ders.
		Description String	False	The Description column for the table PurchaseOr

			ders.
	Direct_Unit_Cost	Boolean	The Direct_Unit_Cost column for the table PurchaseOrders.
	ETag	String	The ETag column for the table PurchaseOrders.
	Expected_Receipt_Date	DateTime	The Expected_Receipt_Date column for the table PurchaseOrders.
	Line_Discount_Percent	Boolean	The Line_Discount_Percent column for the table PurchaseOrders.
	No	String	The No column for the table PurchaseOrders.
	Outstanding_Quantity	Boolean	The Outstanding_Quantity column for the table PurchaseOrders.

				g_Quantity column for the table PurchaseOr ders.
	Quantity	Decimal	False	The Quantity column for the table PurchaseOr ders.
	Type	String	False	The Type column for the table PurchaseOr ders.
	Unit_of_Measure	String	False	The Unit_ of_Measure_ Code column for the table PurchaseOr ders.
	LinkedCurrency	String	False	The LinkedCurre ncy_Code_ Link column for the table PurchaseOr ders.

## ResourceCard

The DynamicsNAV table ResourceCard.

## Columns

Name		Type	ReadOnly	Description
[KEY]	No	String	False	The No column for the table Resource Card.
	Address	String	False	The Address column for the table Resource Card.
	Address_2	String	False	The Address_2 column for the table Resource Card.
	Automatic_Ext_Text	Boolean	False	The Automatic_Ext_Texts column for the table Resource Card.
	Base_Unit	String	False	The Base_

				Unit_of_Measure column for the table Resource Card.
	Blocked	<i>Boolean</i>	False	The Blocked column for the table Resource Card.
	City	<i>String</i>	False	The City column for the table Resource Card.
	Contract_Class	<i>String</i>	False	The Contract_Class column for the table Resource Card.
	County	<i>String</i>	False	The County column for the table Resource Card.

Direct_Unit_Cost	Decimal	False	The Direct_Unit_Cost column for the table Resource Card.
Education	String	False	The Education column for the table Resource Card.
Employment_Date	Date	False	The Employment_Date column for the table Resource Card.
ETag	String	False	The ETag column for the table Resource Card.
Gen_Prod_Posting_Group	String	False	The Gen_Prod_Posting_Group column for the table

			Resource Card.
IC_Partner_	String	False	The IC_Partner_Purch_G_L_Acc_No column for the table Resource Card.
Indirect_Cost_Percent	Decimal	False	The Indirect_Cost_Percent column for the table Resource Card.
Job_Title	String	False	The Job_Title column for the table Resource Card.
Last_Date_Modified	DateTime	False	The Last_Date_Modified column for the table Resource Card.



Name	String	False	The Name column for the table Resource Card.
Post_Code	String	False	The Post_Code column for the table Resource Card.
Price_Profit_Calculation	String	False	The Price_Profit_Calculation column for the table Resource Card.
Profit_Percent	Decimal	False	The Profit_Percent column for the table Resource Card.
Resource_Group_No	String	False	The Resource_Group_No column for the table

			Resource Card.
	Search_Name	String False	The Search_Name column for the table Resource Card.
	Social_Security_No	String No False	The Social_Security_No column for the table Resource Card.
	Tax_Group_Code	String Code False	The Tax_Group_Code column for the table Resource Card.
	Time_Sheet_Approver_User_ID	String Approver_User_ID False	The Time_Sheet_Approver_User_ID column for the table Resource

				Card.
	Time_Sheet_ String	Owner_ False	User_ID	The Time_ Sheet_ Owner_ User_ID column for the table Resource Card.
	Type	String	False	The Type column for the table Resource Card.
	Unit_Cost	Decimal	False	The Unit_ Cost column for the table Resource Card.
	Unit_Price	Decimal	False	The Unit_ Price column for the table Resource Card.
	Use_Time_ Boolean	Sheet	False	The Use_ Time_ Sheet column

		for the table Resource Card.
	VAT_Prod_Posting_Group	The VAT_Prod_Posting_Group column for the table Resource Card.
	LinkedGenProd_Posting_Group_Link	The LinkedGenProd_Posting_Group_Link column for the table Resource Card.

## SalesOrder

The DynamicsNAV table SalesOrder.

### Columns

Name	Type	ReadOnly	Description

[KEY]	DocumentNo	String	No	False	The Document_No column for the table SalesOrder.
[KEY]	DocumentType	String	Type	False	The Document_Type column for the table SalesOrder.
[KEY]	Line_No	Int32		False	The Line_No column for the table SalesOrder.
	Amount	Decimal		False	The Amount column for the table SalesOrder.
	Currency	String	Code	False	The Currency_Code column for the table SalesOrder.
	Description	String		False	The Description column for the table SalesOrder.
	ETag	String		False	The ETag column for the table SalesOrder.

	Line_Discount_Percent	Decimal	False	The Line_Discount_Percent column for the table SalesOrder.
	No	String	False	The No column for the table SalesOrder.
	Outstanding_Quantity	Decimal	False	The Outstanding_Quantity column for the table SalesOrder.
	Quantity	Decimal	False	The Quantity column for the table SalesOrder.
	Sell_to_Customer_No	String	False	The Sell_to_Customer_No column for the table SalesOrder.
	Shipment_Date	Date	False	The Shipment_Date column for the table SalesOrder.
	Type	String	False	The Type column for

			the table SalesOrder.
	Unit_of_Measure_Code	False	The Unit_ of_Measure_ Code column for the table SalesOrder.
	Unit_Price_Decimal	False	The Unit_ Price column for the table SalesOrder.
	Work_Type_Code	False	The Work_ Type_Code column for the table SalesOrder.
	LinkedCurrency_Global_Link	False	The LinkedCurre ncy_Code_ Link column for the table SalesOrder.

## Stored Procedures

Stored procedures are function-like interfaces that extend the functionality of the adapter beyond simple SELECT/INSERT/UPDATE/DELETE operations with Microsoft Dynamics NAV.

Stored procedures accept a list of parameters, perform their intended function, and then return, if applicable, any relevant response data from Microsoft Dynamics NAV, along with an indication of whether the procedure succeeded or failed.

## Microsoft Dynamics NAV Adapter Stored Procedures

Name	Description
<a href="#">CreateAssociation</a>	Creates an association between two entities. This will only work for tables that have in-line columns.
<a href="#">ListAssociations</a>	Lists associations for a given entity Id. This will only work for tables that have in-line columns.
<a href="#">RemoveAssociation</a>	Removes an association between two entities. This will only work for tables that have in-line columns.

### CreateAssociation

Creates an association between two entities. This will only work for tables that have in-line columns.

### Input

Name	Type	Description
SourceId	<i>String</i>	The Id of the entity you are listing associations for.
DestinationId	<i>String</i>	The Id of the entity you are associating with the SourceId.
SourceTable	<i>String</i>	The table



		where the SourceId is listed. For example, if the SourceId was from a table called Customers, enter Customers.
	DestinationTable	The table where the DestinationId is listed. For example, if the DestinationId comes from a table called Orders, enter Orders.

## Result Set Columns

Name	Type	Description
*	String	Output will vary for each entity.

## ListAssociations

Lists associations for a given entity Id. This will only work for tables that have in-line columns.

## Input

Name	Type	Description
SourceId	String	The Id of the entity you are listing associations for.
SourceTable	String	The table where the entity comes from that you are listing entities for. For example, if the SourceId was from a table called Customers, set this parameter to Customers.
DestinationTable	String	The table you are looking for associations with. For example, if you are looking for associations with the Orders table, set this parameter to Orders.

## Result Set Columns

Name	Type	Description
	*	Output will vary for each entity.

## RemoveAssociation

Removes an association between two entities. This will only work for tables that have inline columns.

### Input

Name	Type	Description
SourceId	String	The Id of the entity you are removing an association from.
DestinationId	String	The Id of the entity you are removing as an association.

## Result Set Columns

Name	Type	Description
	*	<i>String</i>
		Output will vary for each entity.

## Data Type Mapping

### Data Type Mappings

The adapter maps types from the data source to the corresponding data type available in the schema. The table below documents these mappings.

Microsoft Dynamics NAV (OData V4)		CData Schema
	Edm.Binary	binary
	Edm.Boolean	bool
	Edm.Date	datetime
	Edm.DateTimeOffset	datetime
	Edm.Decimal	decimal
	Edm.Double	double
	Edm.Guid	guid

	Edm.Int32	int
	Edm.String	string
	Edm.TimeOfDay	time

## Connection String Options

The connection string properties are the various options that can be used to establish a connection. This section provides a complete list of the options you can configure in the connection string for this provider. Click the links for further details.

For more information on establishing a connection, see [Basic Tab](#).

### Authentication

Property	Description
<a href="#">URL</a>	URL to the Microsoft Dynamics NAV server organization root. For example, http://MyServer:7048.
<a href="#">ServerInstance</a>	The instance of the Dynamics NAV server. For example, DynamicsNAV71.
<a href="#">AuthScheme</a>	The scheme used for authentication. Accepted entries are NTLM, Basic, Digest, None, or Negotiate. Negotiate is the default option.
<a href="#">User</a>	The Microsoft Dynamics NAV user account used to authenticate.
<a href="#">Company</a>	The company to submit queries against. For example, 'CRONUS Canada, Inc.'.
<a href="#">Password</a>	The password used to authenticate the user.

## SSL

Property	Description
<a href="#">SSLServerCert</a>	The certificate to be accepted from the server when connecting using TLS/SSL.

## Firewall

Property	Description
<a href="#">FirewallType</a>	The protocol used by a proxy-based firewall.
<a href="#">FirewallServer</a>	The name or IP address of a proxy-based firewall.
<a href="#">FirewallPort</a>	The TCP port for a proxy-based firewall.
<a href="#">FirewallUser</a>	The user name to use to authenticate with a proxy-based firewall.
<a href="#">FirewallPassword</a>	A password used to authenticate to a proxy-based firewall.

## Proxy

Property	Description
<a href="#">ProxyAutoDetect</a>	This indicates whether to use the system proxy settings or not. This takes precedence over other proxy settings, so you'll need to set ProxyAutoDetect to FALSE in order use custom proxy settings.
<a href="#">ProxyServer</a>	The hostname or IP address of a proxy to route HTTP traffic through.
<a href="#">ProxyPort</a>	The TCP port the ProxyServer proxy is running on.

<a href="#">ProxyAuthScheme</a>	The authentication type to use to authenticate to the ProxyServer proxy.
<a href="#">ProxyUser</a>	A user name to be used to authenticate to the ProxyServer proxy.
<a href="#">ProxyPassword</a>	A password to be used to authenticate to the ProxyServer proxy.
<a href="#">ProxySSLType</a>	The SSL type to use when connecting to the ProxyServer proxy.
<a href="#">ProxyExceptions</a>	A semicolon separated list of destination hostnames or IPs that are exempt from connecting through the ProxyServer .

## Logging

Property	Description
<a href="#">LogModules</a>	Core modules to be included in the log file.

## Schema

Property	Description
<a href="#">Location</a>	A path to the directory that contains the schema files defining tables, views, and stored procedures.

## Miscellaneous

Property	Description
<a href="#">ContinueOnError</a>	Whether or not to continue after encountering an error on a batch request.

<a href="#">MaxRows</a>	Limits the number of rows returned rows when no aggregation or group by is used in the query. This helps avoid performance issues at design time.
<a href="#">Other</a>	These hidden properties are used only in specific use cases.
<a href="#">Readonly</a>	You can use this property to enforce read-only access to Microsoft Dynamics NAV from the provider.
<a href="#">Tenant</a>	Use this value to connect to a specific Tenant in a multitenant installation of DynamicsNAV.
<a href="#">Timeout</a>	The value in seconds until the timeout error is thrown, canceling the operation.
<a href="#">UserDefinedViews</a>	A filepath pointing to the JSON configuration file containing your custom views.

## Authentication

This section provides a complete list of the Authentication properties you can configure in the connection string for this provider.

Property	Description
<a href="#">URL</a>	URL to the Microsoft Dynamics NAV server organization root. For example, http://MyServer:7048.
<a href="#">ServerInstance</a>	The instance of the Dynamics NAV server. For example, DynamicsNAV71.
<a href="#">AuthScheme</a>	The scheme used for authentication. Accepted entries are NTLM, Basic, Digest, None, or Negotiate. Negotiate is the default option.
<a href="#">User</a>	The Microsoft Dynamics NAV user account used to authenticate.
<a href="#">Company</a>	The company to submit queries against. For example, 'CRONUS Canada, Inc.'.



---

**Password**

The password used to authenticate the user.

---

## URL

URL to the Microsoft Dynamics NAV server organization root. For example, `http://MyServer:7048`.

## Data Type

string

## Default Value

""

## Remarks

URL to the Microsoft Dynamics NAV server organization root. For example, `http://MyServer:7048`.

## ServerInstance

The instance of the Dynamics NAV server. For example, `DynamicsNAV71`.

## Data Type

string

## Default Value

""

## Remarks

The instance of the Dynamics NAV server. For example, `DynamicsNAV71`.

## AuthScheme

The scheme used for authentication. Accepted entries are NTLM, Basic, Digest, None, or Negotiate. Negotiate is the default option.

### Possible Values

None, NTLM, Basic, Digest, Negotiate

### Data Type

string

### Default Value

"Negotiate"

### Remarks

Together with [Password](#) and [User](#), this field is used to authenticate against the server. Negotiate is the default option. Use the following options to select your authentication scheme:

- NTLM: Set this to use your Windows credentials to authenticate.
- Basic: Set this to use HTTP Basic authentication.
- Negotiate: If [AuthScheme](#) is set to Negotiate, the adapter will negotiate an authentication mechanism with the server. Set [AuthScheme](#) to Negotiate to use Kerberos authentication.
- Digest: Set this to use HTTP Digest authentication.
- None: Indicates the service does not use authentication. It is not normally supported.

## User

The Microsoft Dynamics NAV user account used to authenticate.

### Data Type

string

## Default Value

""

## Remarks

Together with [Password](#), this field is used to authenticate against the Microsoft Dynamics NAV server.

## Company

The company to submit queries against. For example, 'CRONUS Canada, Inc.'.

## Data Type

string

## Default Value

""

## Remarks

The company to submit queries against. For example, 'CRONUS Canada, Inc.'. This property is required if the Service Default Company has not been specified for the [ServerInstance](#) in question. If blank, the adapter will submit queries to the server and attempt to use the Service Default Company.

## Password

The password used to authenticate the user.

## Data Type

string

## Default Value

""

## Remarks

The [User](#) and [Password](#) are together used to authenticate with the server.

# SSL

This section provides a complete list of the SSL properties you can configure in the connection string for this provider.

---

Property	Description
<a href="#">SSLServerCert</a>	The certificate to be accepted from the server when connecting using TLS/SSL.

---

## SSLServerCert

The certificate to be accepted from the server when connecting using TLS/SSL.

## Data Type

string

## Default Value

""

## Remarks

If using a TLS/SSL connection, this property can be used to specify the TLS/SSL certificate to be accepted from the server. Any other certificate that is not trusted by the machine is rejected.

This property can take the following forms:

Description	Example
PEM Certificate (example shortened for brevity)	A full BEGIN CERTIFICATE----- MIICHTCCAe4CAQAwDQYJKoZIhvd.....Q w== -----END CERTIFICATE-----
to a local file containing the certificate	C:\path\cert.cer
public key (example shortened for brevity)	The BEGIN RSA PUBLIC KEY----- MIGfMA0GCSq.....AQAB -----END RSA PUBLIC KEY-----
Thumbprint (hex values can also be either space or colon	The MD5 5a1529c58a1e9e09828d70e4

---

separated)

---

Thumbprint  
(hex  
values  
can also  
be  
either  
space or  
colon  
separated)

34a92b26ae0819f2ec14b4a3d904f801  
cbb150d

---

If not specified, any certificate trusted by the machine is accepted.

Certificates are validated as trusted by the machine based on the System's trust store. The trust store used is the 'javax.net.ssl.trustStore' value specified for the system. If no value is specified for this property, Java's default trust store is used (for example, JAVA\_HOME\lib\security\cacerts).

Use '\*' to signify to accept all certificates. Note that this is not recommended due to security concerns.

## Firewall

This section provides a complete list of the Firewall properties you can configure in the connection string for this provider.

---

Property	Description
<a href="#">FirewallType</a>	The protocol used by a proxy-based firewall.
<a href="#">FirewallServer</a>	The name or IP address of a proxy-based firewall.
<a href="#">FirewallPort</a>	The TCP port for a proxy-based firewall.

---

<a href="#">FirewallUser</a>	The user name to use to authenticate with a proxy-based firewall.
<a href="#">FirewallPassword</a>	A password used to authenticate to a proxy-based firewall.

## FirewallType

The protocol used by a proxy-based firewall.

### Possible Values

NONE, TUNNEL, SOCKS4, SOCKS5

### Data Type

string

### Default Value

"NONE"

### Remarks

This property specifies the protocol that the adapter will use to tunnel traffic through the [FirewallServer](#) proxy. Note that by default, the adapter connects to the system proxy; to disable this behavior and connect to one of the following proxy types, set [ProxyAutoDetect](#) to false.

Type	Default Port	Description
	TUNNEL 80	When this is set, the adapter opens a connection to Microsoft Dynamics NAV and traffic flows back and forth

		through the proxy.
	SOCKS4 1080	When this is set, the adapter sends data through the SOCKS 4 proxy specified by <a href="#">FirewallServer</a> and <a href="#">FirewallPort</a> and passes the <a href="#">FirewallUser</a> value to the proxy, which determines if the connection request should be granted.
	SOCKS5 1080	When this is set, the adapter sends data through the SOCKS 5 proxy specified by <a href="#">FirewallServer</a> and <a href="#">FirewallPort</a> . If your proxy requires authentication, set <a href="#">FirewallUser</a> and <a href="#">FirewallPassword</a> to credentials the proxy recognizes.

To connect to HTTP proxies, use [ProxyServer](#) and [ProxyPort](#). To authenticate to HTTP proxies, use [ProxyAuthScheme](#), [ProxyUser](#), and [ProxyPassword](#).

## FirewallServer

The name or IP address of a proxy-based firewall.



## Data Type

string

## Default Value

""

## Remarks

This property specifies the IP address, DNS name, or host name of a proxy allowing traversal of a firewall. The protocol is specified by [FirewallType](#): Use [FirewallServer](#) with this property to connect through SOCKS or do tunneling. Use [ProxyServer](#) to connect to an HTTP proxy.

Note that the adapter uses the system proxy by default. To use a different proxy, set [ProxyAutoDetect](#) to false.

## FirewallPort

The TCP port for a proxy-based firewall.

## Data Type

int

## Default Value

0

## Remarks

This specifies the TCP port for a proxy allowing traversal of a firewall. Use [FirewallServer](#) to specify the name or IP address. Specify the protocol with [FirewallType](#).

## FirewallUser

The user name to use to authenticate with a proxy-based firewall.

## Data Type

string

## Default Value

""

## Remarks

The FirewallUser and [FirewallPassword](#) properties are used to authenticate against the proxy specified in [FirewallServer](#) and [FirewallPort](#), following the authentication method specified in [FirewallType](#).

## FirewallPassword

A password used to authenticate to a proxy-based firewall.

## Data Type

string

## Default Value

""

## Remarks

This property is passed to the proxy specified by [FirewallServer](#) and [FirewallPort](#), following the authentication method specified by [FirewallType](#).

## Proxy

This section provides a complete list of the Proxy properties you can configure in the connection string for this provider.

---

Property	Description
<a href="#">ProxyAutoDetect</a>	This indicates whether to use the system proxy settings or not. This takes precedence over other proxy settings, so you'll need to set ProxyAutoDetect to FALSE in order use custom proxy settings.
<a href="#">ProxyServer</a>	The hostname or IP address of a proxy to route HTTP traffic through.
<a href="#">ProxyPort</a>	The TCP port the ProxyServer proxy is running on.
<a href="#">ProxyAuthScheme</a>	The authentication type to use to authenticate to the ProxyServer proxy.
<a href="#">ProxyUser</a>	A user name to be used to authenticate to the ProxyServer proxy.
<a href="#">ProxyPassword</a>	A password to be used to authenticate to the ProxyServer proxy.
<a href="#">ProxySSLType</a>	The SSL type to use when connecting to the ProxyServer proxy.
<a href="#">ProxyExceptions</a>	A semicolon separated list of destination hostnames or IPs that are exempt from connecting through the ProxyServer .

## ProxyAutoDetect

This indicates whether to use the system proxy settings or not. This takes precedence over other proxy settings, so you'll need to set ProxyAutoDetect to FALSE in order use custom proxy settings.

### Data Type

bool

### Default Value

true

## Remarks

This takes precedence over other proxy settings, so you'll need to set ProxyAutoDetect to FALSE in order use custom proxy settings.

NOTE: When this property is set to True, the proxy used is determined as follows:

- A search from the JVM properties (**http.proxy**, **https.proxy**, **socksProxy**, **etc.**) is performed.
- In the case that the JVM properties don't exist, a search from **java.home/lib/net.properties** is performed.
- In the case that java.net.useSystemProxies is set to True, a search from **the SystemProxy** is performed.
- In Windows only, an attempt is made to retrieve these properties from the **Internet Options** in the **registry**.

To connect to an HTTP proxy, see [ProxyServer](#). For other proxies, such as SOCKS or tunneling, see [FirewallType](#).

## ProxyServer

The hostname or IP address of a proxy to route HTTP traffic through.

### Data Type

string

### Default Value

""

## Remarks

The hostname or IP address of a proxy to route HTTP traffic through. The adapter can use the HTTP, Windows (NTLM), or Kerberos authentication types to authenticate to an HTTP proxy.

If you need to connect through a SOCKS proxy or tunnel the connection, see [FirewallType](#).

By default, the adapter uses the system proxy. If you need to use another proxy, set [ProxyAutoDetect](#) to false.

## ProxyPort

The TCP port the ProxyServer proxy is running on.

### Data Type

int

### Default Value

80

### Remarks

The port the HTTP proxy is running on that you want to redirect HTTP traffic through. Specify the HTTP proxy in [ProxyServer](#). For other proxy types, see [FirewallType](#).

## ProxyAuthScheme

The authentication type to use to authenticate to the ProxyServer proxy.

### Possible Values

BASIC, DIGEST, NONE, NEGOTIATE, NTLM, PROPRIETARY

### Data Type

string

### Default Value

"BASIC"

### Remarks

This value specifies the authentication type to use to authenticate to the HTTP proxy specified by [ProxyServer](#) and [ProxyPort](#).

Note that the adapter will use the system proxy settings by default, without further configuration needed; if you want to connect to another proxy, you will need to set

[ProxyAutoDetect](#) to false, in addition to [ProxyServer](#) and [ProxyPort](#). To authenticate, set [ProxyAuthScheme](#) and set [ProxyUser](#) and [ProxyPassword](#), if needed.

The authentication type can be one of the following:

- **BASIC:** The adapter performs HTTP BASIC authentication.
- **DIGEST:** The adapter performs HTTP DIGEST authentication.
- **NEGOTIATE:** The adapter retrieves an NTLM or Kerberos token based on the applicable protocol for authentication.
- **PROPRIETARY:** The adapter does not generate an NTLM or Kerberos token. You must supply this token in the Authorization header of the HTTP request.

If you need to use another authentication type, such as SOCKS 5 authentication, see [FirewallType](#).

## ProxyUser

A user name to be used to authenticate to the ProxyServer proxy.

### Data Type

string

### Default Value

""

### Remarks

The [ProxyUser](#) and [ProxyPassword](#) options are used to connect and authenticate against the HTTP proxy specified in [ProxyServer](#).

You can select one of the available authentication types in [ProxyAuthScheme](#). If you are using HTTP authentication, set this to the user name of a user recognized by the HTTP proxy. If you are using Windows or Kerberos authentication, set this property to a user name in one of the following formats:

```
user@domain  
domain\user
```

## ProxyPassword

A password to be used to authenticate to the ProxyServer proxy.

### Data Type

string

### Default Value

""

### Remarks

This property is used to authenticate to an HTTP proxy server that supports NTLM (Windows), Kerberos, or HTTP authentication. To specify the HTTP proxy, you can set [ProxyServer](#) and [ProxyPort](#). To specify the authentication type, set [ProxyAuthScheme](#).

If you are using HTTP authentication, additionally set [ProxyUser](#) and [ProxyPassword](#) to HTTP proxy.

If you are using NTLM authentication, set [ProxyUser](#) and [ProxyPassword](#) to your Windows password. You may also need these to complete Kerberos authentication.

For SOCKS 5 authentication or tunneling, see [FirewallType](#).

By default, the adapter uses the system proxy. If you want to connect to another proxy, set [ProxyAutoDetect](#) to false.

## ProxySSLType

The SSL type to use when connecting to the ProxyServer proxy.

### Possible Values

AUTO, ALWAYS, NEVER, TUNNEL

### Data Type

string

## Default Value

"AUTO"

## Remarks

This property determines when to use SSL for the connection to an HTTP proxy specified by [ProxyServer](#). This value can be AUTO, ALWAYS, NEVER, or TUNNEL. The applicable values are the following:

<b>AUTO</b>	Default setting. If the URL is an HTTPS URL, the adapter will use the TUNNEL option. If the URL is an HTTP URL, the component will use the NEVER option.
<b>ALWAYS</b>	The connection is always SSL enabled.
<b>NEVER</b>	The connection is not SSL enabled.
<b>TUNNEL</b>	The connection is through a tunneling proxy. The proxy server opens a connection to the remote host and traffic flows back and forth through the proxy.

## ProxyExceptions

A semicolon separated list of destination hostnames or IPs that are exempt from connecting through the ProxyServer .

## Data Type

string

## Default Value

""

## Remarks

The [ProxyServer](#) is used for all addresses, except for addresses defined in this property. Use semicolons to separate entries.



Note that the adapter uses the system proxy settings by default, without further configuration needed; if you want to explicitly configure proxy exceptions for this connection, you need to set [ProxyAutoDetect](#) = false, and configure [ProxyServer](#) and [ProxyPort](#). To authenticate, set [ProxyAuthScheme](#) and set [ProxyUser](#) and [ProxyPassword](#), if needed.

## Logging

This section provides a complete list of the Logging properties you can configure in the connection string for this provider.

---

Property	Description
<a href="#">LogModules</a>	Core modules to be included in the log file.

---

## LogModules

Core modules to be included in the log file.

### Data Type

string

### Default Value

""

### Remarks

Only the modules specified (separated by ';') will be included in the log file. By default all modules are included.

See the [Logging](#) page for an overview.

## Schema

This section provides a complete list of the Schema properties you can configure in the connection string for this provider.

Property	Description
<a href="#">Location</a>	A path to the directory that contains the schema files defining tables, views, and stored procedures.

## Location

A path to the directory that contains the schema files defining tables, views, and stored procedures.

## Data Type

string

## Default Value

"%APPDATA%\\CData\\DynamicsNAV Data Provider\\Schema"

## Remarks

The path to a directory which contains the schema files for the adapter (.rsd files for tables and views, .rsb files for stored procedures). The folder location can be a relative path from the location of the executable. The [Location](#) property is only needed if you want to customize definitions (for example, change a column name, ignore a column, and so on) or extend the data model with new tables, views, or stored procedures.

If left unspecified, the default location is "%APPDATA%\\CData\\DynamicsNAV Data Provider\\Schema" with **%APPDATA%** being set to the user's configuration directory:

Platform	%APPDATA%
Windows	The value of the APPDATA environment variable

	Mac	~/Library/Application Support
	Linux	~/.config

## Miscellaneous

This section provides a complete list of the Miscellaneous properties you can configure in the connection string for this provider.

Property	Description
<a href="#">ContinueOnError</a>	Whether or not to continue after encountering an error on a batch request.
<a href="#">MaxRows</a>	Limits the number of rows returned rows when no aggregation or group by is used in the query. This helps avoid performance issues at design time.
<a href="#">Other</a>	These hidden properties are used only in specific use cases.
<a href="#">Readonly</a>	You can use this property to enforce read-only access to Microsoft Dynamics NAV from the provider.
<a href="#">Tenant</a>	Use this value to connect to a specific Tenant in a multitenant installation of DynamicsNAV.
<a href="#">Timeout</a>	The value in seconds until the timeout error is thrown, canceling the operation.
<a href="#">UserDefinedViews</a>	A filepath pointing to the JSON configuration file containing your custom views.

## ContinueOnError

Whether or not to continue after encountering an error on a batch request.

## Data Type

bool

## Default Value

false

## Remarks

This connection property is only supported on servers with OData version 4.0 and higher. However, individual servers may choose to ignore this setting. Setting ContinueOnError to true will cause exceptions to be returned in the temporary table instead of being thrown when a batch request is attempted.

## MaxRows

Limits the number of rows returned rows when no aggregation or group by is used in the query. This helps avoid performance issues at design time.

## Data Type

int

## Default Value

-1

## Remarks

Limits the number of rows returned rows when no aggregation or group by is used in the query. This helps avoid performance issues at design time.

## Other

These hidden properties are used only in specific use cases.

## Data Type

string

## Default Value

""

## Remarks

The properties listed below are available for specific use cases. Normal driver use cases and functionality should not require these properties.

Specify multiple properties in a semicolon-separated list.

## Integration and Formatting

DefaultColumnSize	Sets the default length of string fields when the data source does not provide column length in the metadata. The default value is 2000.
ConvertDateTimeToGMT	Determines whether to convert date-time values to GMT, instead of the local

	time of the machine.
RecordToFile=filename	Records the underlying socket data transfer to the specified file.

## Readonly

You can use this property to enforce read-only access to Microsoft Dynamics NAV from the provider.

### Data Type

bool

### Default Value

false

### Remarks

If this property is set to true, the adapter will allow only SELECT queries. INSERT, UPDATE, DELETE, and stored procedure queries will cause an error to be thrown.

## Tenant

Use this value to connect to a specific Tenant in a multitenant installation of DynamicsNAV.

### Data Type

string

## Default Value

""

## Remarks

Specify the tenant Id to connect to a specific tenant in a multitenant installation of DynamicsNAV. For example, "Cronus1".

## Timeout

The value in seconds until the timeout error is thrown, canceling the operation.

## Data Type

int

## Default Value

60

## Remarks

If Timeout = 0, operations do not time out. The operations run until they complete successfully or until they encounter an error condition.

If Timeout expires and the operation is not yet complete, the adapter throws an exception.

## UserDefinedViews

A filepath pointing to the JSON configuration file containing your custom views.

## Data Type

string

## Default Value

""

## Remarks

User Defined Views are defined in a JSON-formatted configuration file called *UserDefinedViews.json*. The adapter automatically detects the views specified in this file.

You can also have multiple view definitions and control them using the UserDefinedViews connection property. When you use this property, only the specified views are seen by the adapter.

This User Defined View configuration file is formatted as follows:

- Each root element defines the name of a view.
- Each root element contains a child element, called **query**, which contains the custom SQL query for the view.

For example:

```
{
  "MyView": {
    "query": "SELECT * FROM Customer WHERE MyColumn = 'value'"
  },
  "MyView2": {
    "query": "SELECT * FROM MyTable WHERE Id IN (1,2,3)"
  }
}
```

Use the UserDefinedViews connection property to specify the location of your JSON configuration file. For example:

```
"UserDefinedViews",
"C:\\Users\\yourusername\\Desktop\\tmp\\UserDefinedViews.json"
```



# TIBCO Product Documentation and Support Services

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For information about this product, you can read the documentation, contact TIBCO Support, and join the TIBCO Community.

## How to Access TIBCO Documentation

Documentation for TIBCO products is available on the [TIBCO Product Documentation](#) website, mainly in HTML and PDF formats.

The [TIBCO Product Documentation](#) website is updated frequently and is more current than any other documentation included with the product.

## Product-Specific Documentation

The following documentation for this product is available on the [TIBCO® Data Virtualization](#) page.

- **Users**
  - TDV Getting Started Guide
  - TDV User Guide
  - TDV Web UI User Guide
  - TDV Client Interfaces Guide
  - TDV Tutorial Guide
  - TDV Northbay Example
- **Administration**
  - TDV Installation and Upgrade Guide
  - TDV Administration Guide
  - TDV Active Cluster Guide
  - TDV Security Features Guide
- **Data Sources**

TDV Adapter Guides

TDV Data Source Toolkit Guide (Formerly Extensibility Guide)

- **References**

TDV Reference Guide

TDV Application Programming Interface Guide

- **Other**

TDV Business Directory Guide

TDV Discovery Guide

- *TIBCO TDV and Business Directory Release Notes* Read the release notes for a list of new and changed features. This document also contains lists of known issues and closed issues for this release.

## How to Contact TIBCO Support

Get an overview of [TIBCO Support](#). You can contact TIBCO Support in the following ways:

- For accessing the Support Knowledge Base and getting personalized content about products you are interested in, visit the [TIBCO Support](#) website.
- For creating a Support case, you must have a valid maintenance or support contract with TIBCO. You also need a user name and password to log in to [TIBCO Support](#) website. If you do not have a user name, you can request one by clicking **Register** on the website.

## Release Version Support

TDV 8.5 is designated as a Long Term Support (LTS) version. Some release versions of TIBCO® Data Virtualization products are selected to be long-term support (LTS) versions. Defect corrections will typically be delivered in a new release version and as hotfixes or service packs to one or more LTS versions. See also

[https://docs.tibco.com/pub/tdv/general/LTS/tdv\\_LTS\\_releases.htm](https://docs.tibco.com/pub/tdv/general/LTS/tdv_LTS_releases.htm).

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