



ORACLE  
NETSUITE

# SuiteAnalytics Connect

---

2023.1

May 24, 2023



Copyright © 2005, 2023, Oracle and/or its affiliates.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software, software documentation, data (as defined in the Federal Acquisition Regulation), or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

**U.S. GOVERNMENT END USERS:** Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software," "commercial computer software documentation," or "limited rights data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle®, Java, and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

If this document is in public or private pre-General Availability status:

This documentation is in pre-General Availability status and is intended for demonstration and preliminary use only. It may not be specific to the hardware on which you are using the software. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to this documentation and will not be responsible for any loss, costs, or damages incurred due to the use of this documentation.

If this document is in private pre-General Availability status:

The information contained in this document is for informational sharing purposes only and should be considered in your capacity as a customer advisory board member or pursuant to your pre-General Availability trial agreement only. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, timing, and pricing of any features or functionality described in this document may change and remains at the sole discretion of Oracle.

This document in any form, software or printed matter, contains proprietary information that is the exclusive property of Oracle. Your access to and use of this confidential material is subject to the terms and conditions of your Oracle Master Agreement, Oracle License and Services Agreement, Oracle PartnerNetwork Agreement, Oracle distribution agreement, or other license agreement which has been executed by you and Oracle and with which you agree to comply. This document and information contained herein may not be disclosed, copied, reproduced, or distributed to anyone outside Oracle without prior written consent of Oracle. This document is not part of your license agreement nor can it be incorporated into any contractual agreement with Oracle or its subsidiaries or affiliates.

### **Documentation Accessibility**

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <https://www.oracle.com/corporate/accessibility>.

### **Access to Oracle Support**

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

### **Sample Code**

Oracle may provide sample code in SuiteAnswers, the Help Center, User Guides, or elsewhere through help links. All such sample code is provided "as is" and "as available", for use only with an authorized NetSuite Service account, and is made available as a SuiteCloud Technology subject to the SuiteCloud Terms of Service at [www.netsuite.com/tos](http://www.netsuite.com/tos).

Oracle may modify or remove sample code at any time without notice.

### **No Excessive Use of the Service**

As the Service is a multi-tenant service offering on shared databases, Customer may not use the Service in excess of limits or thresholds that Oracle considers commercially reasonable for the Service. If Oracle reasonably concludes that a Customer's use is excessive and/or will cause immediate or ongoing performance issues for one or more of Oracle's other customers, Oracle may slow down or throttle Customer's excess use until such time that Customer's use stays within reasonable limits. If Customer's particular usage pattern requires a higher limit or threshold, then the Customer should procure a subscription to the Service that accommodates a higher limit and/or threshold that more effectively aligns with the Customer's actual usage pattern.

### **Beta Features**

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software" or "commercial computer software documentation" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

This documentation is in pre-General Availability status and is intended for demonstration and preliminary use only. It may not be specific to the hardware on which you are using the software. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to this documentation and will not be responsible for any loss, costs, or damages incurred due to the use of this documentation.

The information contained in this document is for informational sharing purposes only and should be considered in your capacity as a customer advisory board member or pursuant to your pre-General Availability trial agreement only. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described in this document remains at the sole discretion of Oracle.

This document in any form, software or printed matter, contains proprietary information that is the exclusive property of Oracle. Your access to and use of this confidential material is subject to the terms and conditions of your Oracle Master Agreement, Oracle License and Services Agreement, Oracle PartnerNetwork Agreement, Oracle distribution agreement, or other license agreement which has been executed by you and Oracle and with which you agree to comply. This document and information contained herein may not be disclosed, copied, reproduced, or distributed to anyone outside Oracle without prior written consent of Oracle. This document is not part of your license agreement nor can it be incorporated into any contractual agreement with Oracle or its subsidiaries or affiliates.

# Send Us Your Feedback

We'd like to hear your feedback on this document.

Answering the following questions will help us improve our help content:

- Did you find the information you needed? If not, what was missing?
- Did you find any errors?
- Is the information clear?
- Are the examples correct?
- Do you need more examples?
- What did you like most about this document?

Click [here](#) to send us your comments. If possible, please provide a page number or section title to identify the content you're describing.

To report software issues, contact NetSuite Customer Support.

# Table of Contents

SuiteAnalytics Connect .....	1
Getting Started with SuiteAnalytics Connect .....	2
Prerequisites for Using the Connect Service .....	2
Enabling the Connect Service Feature .....	2
Connect Permissions .....	3
Supported Windows Versions .....	8
Supported Linux Distributions .....	8
Authentication for SuiteAnalytics Connect .....	8
OAuth 2.0 for Connect .....	9
Token-based Authentication for Connect .....	12
Connect Drivers .....	17
ODBC Drivers .....	17
JDBC Drivers .....	21
ADO.NET Drivers .....	22
Connect Driver Download Page .....	22
Downloading and Installing Connect Drivers .....	25
Verifying the Downloaded File .....	27
Configuring Your Data Source .....	28
Determining Your Connect Driver Version .....	28
Accessing the Connect Service Using an ODBC Driver .....	31
Prerequisites .....	31
Downloading and Installing the ODBC Driver for Windows .....	31
ODBC Installation on Windows for a Bundled Installation .....	32
ODBC Installation on Windows for Installer Only .....	33
Verifying the ODBC Driver Installation on Windows .....	34
Configuring the ODBC Data Source on Windows .....	36
Downloading and Installing the ODBC Driver for Linux .....	39
Installing the Latest Driver on Linux .....	39
Installing a Driver for Linux into an Alternate Directory .....	39
Accessing ODBC Data Source on Linux .....	40
Verifying the ODBC Driver Installation on Linux .....	40
Configuring the ODBC Data Source on Linux .....	41
Configuring the ODBC Driver .....	43
Connecting Using a Connection String .....	43
Connection Attributes .....	45
Authentication Using Server Certificates for ODBC .....	50
Upgrading an ODBC Driver .....	52
Accessing the Connect Service Using Microsoft Excel .....	52
Accessing the Connect Service Using a JDBC Driver .....	56
Prerequisites .....	56
Installing the JDBC Driver for Windows .....	56
Installing the JDBC Driver for Linux .....	57
Installing the JDBC Driver for OS X .....	58
Configuring the JDBC Driver .....	58
Specifying Connection Properties .....	58
JDBC Connection Properties .....	60
JDBC Code Examples .....	64
Connection URL Used with JDBC Driver Manager Example .....	64
JDBC Data Source Example .....	65
Authentication Using Server Certificates for JDBC .....	65
Accessing the Connect Service Using an ADO.NET Data Provider .....	68
Prerequisites .....	68
Review the ADO.NET Data Server Configuration .....	68

Downloading and Installing the ADO.NET Driver .....	69
Connecting with the ADO.NET Data Provider .....	70
ADO.NET Connection Options .....	72
Authentication Using Server Certificates for ADO.NET .....	75
Removing the ADO.NET Driver .....	76
Connect Service Considerations .....	77
Query Language Compliance .....	78
Connections .....	91
Exceptions .....	93
Column Joins in the Connect Service .....	94
Custom Columns, Lists, and Records in the Connect Service .....	95
Driver Access for a Sandbox or Release Preview Account .....	99
Operating System Settings .....	99
Third-Party Application Access .....	100
Server Restarts .....	100
Connect Data Source .....	101
Changing from NetSuite.com to NetSuite2.com .....	101
Connect Schema .....	103
Working with the Connect Browser .....	111
Custom Record Types and Lists .....	116
Examples of Queries .....	117
NetSuite2.com Data Source .....	119
Working with the Static Data Model .....	119
Record Types and Fields .....	121
Record Names, Permissions, and Features Required .....	124
SuiteAnalytics Connect System Tables .....	125
oa_tables .....	126
oa_columns .....	126
oa_fkeys .....	128
Querying Data with Connect .....	130
Using Qualified Queries .....	131
Using the Uppercase Attribute .....	131
Replication of Tables .....	133
Incremental Backups .....	134
Connect Service Notifications .....	136
New Uppercase Connection Attribute .....	137
OAuth 2.0 for SuiteAnalytics Connect .....	137
Latest JDBC Driver Version Available .....	137
Required Update of SuiteAnalytics Connect Drivers .....	138
New Accounts and Access to the Connect Data Source .....	140
Connect NetSuite.com Data Source No Longer Being Updated .....	140
Removal of the Analytics Browser .....	142
Change to Display Size and Precision in Some Connect Columns .....	142
Changes to Return Values in Some Connect Columns .....	143
Removal of Some Connect Tables and Columns .....	143
Changes to Return Values in SuiteAnalytics Connect Columns .....	144
Audit Trail and Execution Log Record Types Contain Outdated Data .....	144
Idle Session Timeout for SuiteAnalytics Connect .....	145
Deprecation of Data Center-Specific Domains for SuiteAnalytics Connect .....	145
Change in Time Zone of Charges Table Date Columns .....	146
New Version for SuiteAnalytics Connect ODBC and JDBC Drivers .....	147
Changes to SuiteAnalytics Connect Return Values and String Types .....	148
The Analytics Data Source and SuiteAnalytics Connect .....	149
NetSuite Password Policies Now Apply to SuiteAnalytics Connect .....	150
Cipher Suite Deprecations for SuiteAnalytics Connect JDBC Drivers .....	151

Mandatory Update for SuiteAnalytics Connect ODBC Drivers .....	151
SuiteAnalytics Connect FAQ .....	154

# SuiteAnalytics Connect

The SuiteAnalytics Connect Service lets you archive, analyze, and report on NetSuite data. You can use a third-party tool or a custom-built application on any device that uses Windows, Linux, or OS X operating system. If your company enables the Connect Service, NetSuite offers ODBC, JDBC, and ADO.NET drivers that you can download, install, and use for the Connect Service.

**i Note:** The SuiteAnalytics Connect Service provides a read-only method for obtaining NetSuite data. You cannot use the Connect Service to update NetSuite data.

Before using the Connect Service, be aware of the following:

## ■ Third-Party Applications

You can use a variety of compatible applications, including Microsoft® Excel, BIRST, Adaptive, or any other compatible application, to work with the Connect Service.

**i Note:** The Connect Service is intended for use with static data or data that does not change often. Using real-time data access applications with the Connect Service can slow the retrieval of results and cause connection interruptions. For more information, see [Third-Party Application Access](#).

## ■ NetSuite2.com Data Source

With SuiteAnalytics Connect you can access NetSuite data through the NetSuite2.com data source, also known as the analytics data source. The NetSuite2.com data source is designed to display consistent data across SuiteAnalytics Workbook, which solves some previous inconsistencies in data exposure between saved searches, reports, and the NetSuite user interface. It also applies role-based access control, which contributes to improved security. To work with the NetSuite2.com data source, you must be aware of some considerations. For more information, see [NetSuite2.com Data Source](#).

**⚠ Important:** As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

## ■ Authentication

There are several ways to access SuiteAnalytics Connect. You can use your NetSuite account email address with a valid password, or you can use two industry standard-based mechanisms that increase overall system security: OAuth 2.0 and token-based authentication (TBA). For more information, see [Authentication for SuiteAnalytics Connect](#).

**i Note:** Ensure that you have the latest driver version installed and the required connection attributes. You must also update your NetSuite connections to use certificate-based server authentication and provide the NetSuite Account ID and Role ID on every connection. For information on the latest driver versions available, see [Required Update of SuiteAnalytics Connect Drivers](#).

To start working with Connect, see [Getting Started with SuiteAnalytics Connect](#).

# Getting Started with SuiteAnalytics Connect

## Prerequisites for Using the Connect Service

### Installation Prerequisites

Before you install or upgrade the Connect driver, ensure that you meet the following:

- Install or upgrade the driver as administrator.

 **Note:** If you use Windows, ensure that you install the Connect driver as local administrator. If you install the driver on Windows as domain administrator, the installation process may fail.

- Close any applications that you use for accessing or configuring the Connect Service. For example, if you use Connect with an ODBC driver, you should close third-party tools for accessing Connect such as MS SQL Server or other BI tools, and applications for configuring Connect such as the Windows registry and the ODBC administrator tool.

 **Note:** Ensure that these applications are not running in the background.

### Setup Prerequisites

Before you set up the Connect Service, ensure that your firewall configurations meet the following conditions:

- **Port 1708** - Ensure that port 1708 is not blocked in the firewall for outgoing connections.
- **IP Addresses** - Do not use NetSuite IP addresses to manage access to any NetSuite services because it is not supported. If you use IP addresses in your configurations and the IP addresses change, you cannot access the Connect Service. To manage access to the Connect Service, you use the domain name in your configurations instead. The domain does not change, even if the account is moved to a different data center. For more information, see the help topic [NetSuite IP Addresses](#).

After you verify that you meet the prerequisites, ensure that the Connect feature is enabled. See [Enabling the Connect Service Feature](#).

For more information about the configuration details in the Connect Service, see [Configuring Your Data Source](#).

## Enabling the Connect Service Feature

Whether you wish to use an ODBC, JDBC, or ADO.NET driver to access the Connect Service, you must first enable the SuiteAnalytics Connect feature.

 **Important:** Ensure that you have the latest driver version installed and the required connection attributes. You must also update your NetSuite connections to use certificate-based server authentication and provide the NetSuite Account ID and Role ID on every connection. For information on the latest driver versions available, see [Required Update of SuiteAnalytics Connect Drivers](#).

For more information about upgrading the SuiteAnalytics Connect driver, see [Upgrading an ODBC Driver](#).

For information about setting up certificate-based server authentication, see the following topics:

- ODBC driver, see [Authentication Using Server Certificates for ODBC](#).
- JDBC driver, see [Authentication Using Server Certificates for JDBC](#).
- ADO.NET driver, see [Authentication Using Server Certificates for ADO.NET](#).

For information about setting up connections to provide NetSuite Account ID and Role ID, see the following topics:

- ODBC driver, see [Connection Attributes](#).
- JDBC driver, see [JDBC Connection Properties](#).
- ADO.NET driver, see [ADO.NET Connection Options](#).

### To enable the Connect Service feature:

1. Ensure that your Account Administrator has enabled your Account and Role with the Connect Service feature.
2. Navigate to Setup > Company > Enable Features.
3. Click the **Analytics** tab.
4. Check the **SuiteAnalytics Connect** box.



**Note:** If you do not see this feature, it has not been provisioned for your account. Contact NetSuite Customer Support or your Account Manager for assistance.

## Connect Permissions

You need the SuiteAnalytics Connect permission to download a Connect driver and access NetSuite data. To access the data source through Connect, you should consider the following:

- General Role and Permission Considerations for Connect
- Role and Permission Considerations for NetSuite.com
- Role and Permission Considerations for NetSuite2.com

## General Role and Permission Considerations for Connect

Account administrators can assign the SuiteAnalytics Connect permission as a Setup permission for a role or as a global permission for an employee. The employee permission gives per-user control of Connect access.

To learn how to assign the SuiteAnalytics Connect permission to roles and employees, see [Providing Users with SuiteAnalytics Connect Permissions](#).

You can verify that you have the SuiteAnalytics Connect permission if the Set Up SuiteAnalytics Connect option appears in the Settings portlet on your home page. See [Verifying the SuiteAnalytics Connect Permission](#).

Depending on the data source that you use when you access the Connect Service, consider the following:

- Role and Permission Considerations for NetSuite.com
- Role and Permission Considerations for NetSuite2.com

## Role and Permission Considerations for NetSuite.com



**Important:** As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

Account administrators should exercise caution when assigning the SuiteAnalytics Connect permission, as some NetSuite permissions and restrictions are not enforced for Connect Service. The same permissions apply for accessing the Connect Service no matter the type of driver used.

When you use the Connect Service to access the NetSuite.com data source, consider the following:

- [Enforced Permissions](#)
- [Non-enforced Permissions and Restrictions](#)
- [SuiteAnalytics Connect – Read All Permission](#)

### Enforced Permissions

The following permissions are enforced for Connect access, unless a user has been granted the SuiteAnalytics Connect – Read All permission:

- All Transactions permissions and Lists permissions for employees
- Customers
- Partners
- Vendors
- Accounting registers

Enforcement of these permissions means that when users access NetSuite data through the Connect Service, they can see only the records they have access to.



**Note:** Users with the SuiteAnalytics Connect – Read All permission have read-only access to all NetSuite data through the Connect Service, regardless of what they can access in the NetSuite user interface. This applies to **NetSuite.com** data source only, which uses the only schema available up to 2018.2. For more information, see [SuiteAnalytics Connect – Read All Permission](#)

### Non-enforced Permissions and Restrictions

Other permissions and restrictions are not enforced for Connect access, including:

- Classes
- Departments
- Locations
- Custom records

- Subsidiary Restrictions (OneWorld only)

This lack of enforcement means that users with the Connect permission enabled can access records of these types through the Connect Service that they cannot access in the NetSuite user interface.

## SuiteAnalytics Connect – Read All Permission

As of 2018.2, the SuiteAnalytics Connect – Read All permission enables users to have read-only access to NetSuite data using the Connect Service, regardless of what they can access in the NetSuite user interface. This permission applies to the NetSuite.com data source only. It is not applicable to the analytics data source, also known as NetSuite2.com. The analytics data source applies role-based access restrictions. Users can query only data that they can access in the NetSuite user interface.



**Important:** Enabling the SuiteAnalytics Connect - Read All permission can improve performance when running queries, however sensitive information such as employee and customer records are also exposed to the user. Account administrators should therefore only enable this permission for some users in their account.

The roles and permissions assigned to Connect users determine the data that they can access through NetSuite.com.

- Custom roles**

Certain records in the Connect schema are only accessible using an Administrator role, even if you set the appropriate permissions in NetSuite. Consequently, users assigned to custom roles who have only been granted the SuiteAnalytics Connect permission may have access to different data in the NetSuite user interface than through the Connect Service. Queries that are run using the Connect Service may also be slower for these users, because of permission checks that are not performed for Administrators.

- Custom roles and the SuiteAnalytics Connect - Read All permission**

Users assigned to custom roles who have been granted both permissions, the SuiteAnalytics Connect and the SuiteAnalytics Connect - Read All permission, have read-only access to NetSuite data through the Connect Service that they cannot access through the NetSuite user interface.



**Note:** To protect sensitive data such as contacts, certain records are only accessible using an administrator role, even if the SuiteAnalytics Connect - Read All permission has been granted. For example, when a contact is marked as private, only the owner and the administrator role have access to its data through the Contacts table.

## Role and Permission Considerations for NetSuite2.com

The roles and permissions assigned to Connect users determine the data that they can access through NetSuite2.com. However, if they use the Static Data Model, they can see the structure and the name of all available record types and fields, even if they can only get the data for the records that they have access to. For more information, see [Setting the Static Data Model for Connect Drivers](#).

- Data Warehouse Integrator (DWI) role**

The Data Warehouse Integrator role allows users to access all NetSuite data through the NetSuite2.com data source. Note that credit card information is not accessible even if users are assigned to the Data Warehouse Integrator role. Also, Global Permissions take precedence over the Data Warehouse Integrator role. If the access level for some permissions is set to **None**, users with the Data Warehouse Integrator role will not have access to this data. For more information, see the help topic [Using the Global Permissions Feature](#).

The Data Warehouse Integrator role requires access with token-based authentication (TBA).

**Note:** The Data Warehouse Integrator role and custom roles are the preferred option when transferring data to a data warehouse.

For more information, see [Token-based Authentication for Connect](#).

#### ■ General role limitations

The Connect Service enforces role-based access restrictions to the analytics data source, also known as NetSuite2.com, which contributes to improved security. The analytics data source is not accessible for the following roles and permissions:

- Administrator

**Note:** When you use SuiteAnalytics Connect with OAuth 2.0, the NetSuite2.com data source is accessible for the Administrator role. However, the Data Warehouse Integrator role and custom roles are the preferred option when transferring data to a data warehouse.

- Full Access (Deprecated)
- Roles requiring two-factor authentication (2FA)
- Roles accessing the Connect Service with IP restrictions

## Providing Users with SuiteAnalytics Connect Permissions

As an administrator, you can assign other users with the SuiteAnalytics Connect permission to give them access to the Connect Service. For users assigned to custom roles, you can also assign the SuiteAnalytics Connect – Read All permission which gives users read-only access to all NetSuite data through the Connect Service. Enabling the SuiteAnalytics Connect – Read All permission can improve performance when running queries, however sensitive data such as employee and customer records are also exposed to the user. Therefore, you should only enable this permission for some users in your account.

You can enable both of these permissions for users through the Manage Roles option or through the Employee record.

**Note:** The SuiteAnalytics Connect - Read All permission is not applicable to the analytics data source. The analytics data source applies role-based access restrictions. Users can query only data that they can access in the NetSuite user interface.

**Important:** Certain records in the Connect schema are only obtainable using an Administrator role, despite setting the appropriate permissions in NetSuite. Consequently, users assigned to custom roles who have only been granted the SuiteAnalytics Connect permission may see a discrepancy between the information displayed in NetSuite and the information pulled when running a query using SuiteAnalytics Connect.

Note that users who have been granted both permissions, the SuiteAnalytics Connect and the SuiteAnalytics Connect – Read All permissions, have read-only access to all NetSuite data only through the Connect Service, but not through the NetSuite user interface.

### To set up SuiteAnalytics Connect permissions using Manage Roles:

1. Navigate to Setup > Users/Roles > User Management > Manage Roles.
2. Click **Customize** next to the name of the role for which you would like to add the SuiteAnalytics Connect permission.
3. Click the **Setup** tab under the Permissions tab.
4. Add the SuiteAnalytics Connect permission.

PERMISSION*	LEVEL
Accounting Lists	Full
Accounting Management	Full
Custom Record Types	View
Deleted Records	Full
Import XML Document	Full
Mobile Device Access	Full
Other Lists	Full
Outlook Integration 1.0	Full
Outlook Integration 2.0	Full
Web Services	Full
SuiteAnalytics Connect	Full



**Important:** You cannot add the SuiteAnalytics Connect permission to a role that has SAML Single Sign-on permission.

5. Optionally, add the SuiteAnalytics Connect – Read All permission.



**Note:** This permission is not applicable to the analytics data source. The analytics data source applies role-based access restrictions. Users can query only data that they can access in the NetSuite user interface.

6. Click **Add**.
7. Click **Save**.

### To set up SuiteAnalytics Connect permissions using the Employee record:

1. Navigate to Lists > Employees > Employees.
2. Click **Edit** next to the name of employee.
3. Click the **Access** tab.
4. Select the role you would like to grant SuiteAnalytics Connect permission, and click the Open icon next to it.
5. Click the **Setup** tab under the Permissions tab.
6. Add the SuiteAnalytics Connect permission.
7. Optionally, add the SuiteAnalytics Connect – Read All permission.

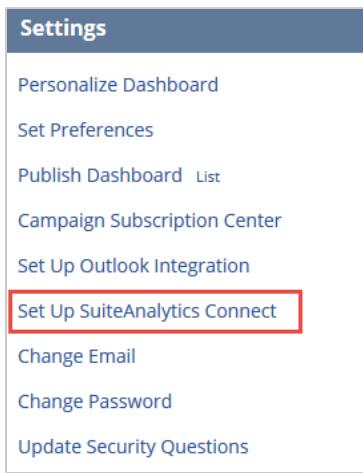


**Note:** This permission is not applicable to the analytics data source. The analytics data source applies role-based access restrictions. Users can query only data that they can access in the NetSuite user interface.

8. Click **Add**.
9. Click **Save**.

## Verifying the SuiteAnalytics Connect Permission

You can verify that you have the SuiteAnalytics Connect permission if the Set Up SuiteAnalytics Connect option appears in the Settings portlet on your home page.



## Supported Windows Versions

The following Windows operating systems are compatible with the SuiteAnalytics Connect service:

- Windows 10
- Windows Server 2012 R2
- Windows Server 2016
- Windows Server 2019

## Supported Linux Distributions

The following Linux distributions are compatible with the SuiteAnalytics Connect service:

- Ubuntu 19.04 (x64)
- CentOS 7 (x64)
- OpenSUSE Tumbleweed (x64)
- Debian 9.9 (x64)
- Mint 19.1 (x64)



**Note:** Consider the following:

- The Connect drivers may be compatible with other distributions and later versions, but only the distributions and versions on the list have been tested.
- A process has started to end support for Linux x86 architecture. For now, the Linux 32-bit driver is still available.

## Authentication for SuiteAnalytics Connect

There are several ways to access SuiteAnalytics Connect:

- Using your NetSuite account email address with a valid password – The Connect Service follows the same password policy used in the NetSuite UI. If the password has expired, you cannot access the service. For more information, see the help topic [Password Expiration Notifications](#).

- Using two industry standard-based mechanisms: OAuth 2.0 and token-based authentication (TBA) – These two mechanisms increase overall security and enable SuiteAnalytics Connect to use a token to access the NetSuite2.com data source. Both mechanisms can be used together, but OAuth 2.0 is the preferred authentication method. You should consider using OAuth 2.0 instead of TBA whenever possible. For information about the two authentication methods, see the following:
  - [OAuth 2.0 for Connect](#)
  - [Token-based Authentication for Connect](#)

 **Note:** The OAuth 2.0 and token-based authentication (TBA) methods are available for NetSuite2.com only. The NetSuite2.com data source is not accessible for all roles. For more information, see [Role and Permission Considerations for NetSuite.com](#).

SuiteAnalytics Connect has the following authentication considerations for security purposes.

- After five failed attempts, the account is locked. You cannot access your account for thirty minutes, at which point you will have one additional attempt. If another failed attempt occurs, the account is locked again for thirty minutes.
- You cannot access SuiteAnalytics Connect in the following situations:
  - When the Require Password Change on Next Login option is selected on your Employee record's Access tab.
  - If your Employee record is inactive.
  - When your role with the SuiteAnalytics Connect permission is inactive. Also, you must ensure that you meet all Connect permission considerations. See [Connect Permissions](#).
  - If your password has expired.

For more information about setting up certificate-based server authentication, see the following topics:

- ODBC driver, see [Authentication Using Server Certificates for ODBC](#).
- JDBC driver, see [Authentication Using Server Certificates for JDBC](#).
- ADO.NET driver, see [Authentication Using Server Certificates for ADO.NET](#).

## OAuth 2.0 for Connect

You can use OAuth 2.0 for SuiteAnalytics Connect using the client credentials flow or the authorization code grant flow. For details about using OAuth 2.0 with SuiteAnalytics Connect, see the following topics:

- [Requirements for Using OAuth 2.0 for Connect](#)
- [Getting the Authentication String](#)
- [Setting the OAuth2Token Attribute](#)
- [Using Connect with OAuth 2.0](#)

For general information about OAuth 2.0, see the help topic [OAuth 2.0](#).

## Requirements for Using OAuth 2.0 for Connect

Before you can use OAuth 2.0 for Connect, you must complete several setup tasks. These tasks include the following:

- **Enabled Features** – The OAuth 2.0 feature must be enabled. For more information, see the help topic [Enable the OAuth 2.0 Feature](#).
- **Roles and Permissions** – You must have assigned a user to a role that meets the following conditions:

- Access requirements for accessing the NetSuite2.com data source. OAuth 2.0 is supported for the NetSuite2.com data source only.



**Note:** When you use SuiteAnalytics Connect with OAuth 2.0, the NetSuite2.com data source is accessible for the Administrator role. However, the Data Warehouse Integrator (DWI) role and custom roles are the preferred option when transferring data to a data warehouse. For more information about the access to NetSuite2.com, see [Role and Permission Considerations for NetSuite2.com](#).

- Permission to login by using OAuth 2.0. For more information, see the help topic [Set Up OAuth 2.0 Roles](#).
- Permission to access SuiteAnalytics Connect. For more information, see [Providing Users with SuiteAnalytics Connect Permissions](#).
- **User** – You must have assigned a role that has the Log in Using OAuth 2.0 Access Tokens permission. For more information, see the help topic [Assign Users to OAuth 2.0 Roles](#).
- **Integration Record** – An integration record for the application must exist at Setup > Integration > Manage Integrations. On the **OAuth 2.0** subtab of your integration record, check the **SuiteAnalytics Connect** box. Then, do the following depending on the flow that you want to use:
  - **Authorization Code Grant** – Application developers and integrators can use a redirection-based authorization code grant flow with OAuth 2.0. Check this box if you want to implement the OAuth 2.0 authorization code grant flow for this integration.
  - **Client Credentials (Machine to Machine) Grant** – The client credentials flow is machine-to-machine and does not require any user interaction. Check this box if you want to implement the OAuth 2.0 client credentials flow for this integration.



**Note:** You can check both the **Authorization Code Grant** box and the **Client Credentials (Machine to Machine) Grant** box.

After you have created the integration record, ensure that you take note of the Consumer Key (client ID), Consumer Secret (client secret), and application ID that appear on the confirmation page.

For more information about how to create or edit an integration record, and about the authorization code grant and the client credentials flows, see the help topic [Create Integration Records for Applications to Use OAuth 2.0](#).

- **Certificate** – Upload the public key of the certificate that you want to use with NetSuite. For more information, see the help topic [OAuth 2.0 Client Credentials Setup](#).



**Note:** This step is required for the OAuth 2.0 client credentials flow only.

To get the authentication string and include the required OAuth2Token attribute for both flows, see the following:

- [Getting the Authentication String](#)
- [Setting the OAuth2Token Attribute](#)

## Getting the Authentication String

Depending on the flow that you are using, do one of the following:

- **Authorization Code Grant flow**– The OAuth 2.0 authorization code grant flow consists of two steps, an additional refresh token request, and a request to the revoke token endpoint. For more information about how you can get the access token, see the help topic [OAuth 2.0 Authorization Code Grant Flow](#).

- **Client Credentials flow** – You need to generate an authentication string by sending a request to the token endpoint. If the request is valid, the token endpoint returns the authentication string. For more information, see the help topic [OAuth 2.0 Client Credentials Flow](#).

You can get an authentication token using a Python request. See the following example:

```

1  #! /usr/bin/env python3
2
3  import requests
4  import logging
5
6  from pathlib import Path
7  import datetime
8  import jwt # PyJWT
9
10 GRANT_TYPE = "client_credentials"
11 CLIENT_ASSERTION_TYPE = 'urn:ietf:params:oauth:client-assertion-type:jwt-bearer'
12 CLIENT_ID = "<CLIENT_ID>"
13 TOKEN_ENDPOINT_URL = "https://<COMPID>.suitetalk.api.netsuite.com/services/rest/auth/oauth2/v1/token"
14 CONNECT_ENDPOINT_URL = "https://<COMPID>.connect.api.netsuite.com/services/rest/auth/oauth2/v1/token"
15
16 CERTIFICATE_ID = "<CERTIFICATE_ID_GENERATED_WHEN_UPLOADED_TO_NS>"
17 CERTIFICATE_KEY_FILE = Path("certificates/key.pem")
18
19 SCOPES = ['SuiteAnalytics']
20
21
22 def main():
23     now = datetime.datetime.now()
24     payload = {
25         'iss': CLIENT_ID,
26         'scope': SCOPES,
27         'aud': CONNECT_ENDPOINT_URL,
28         'iat': now.timestamp(),
29         'exp': now + datetime.timedelta(hours=1),
30     }
31
32     private_key = CERTIFICATE_KEY_FILE.read_bytes()
33
34     jwt_assertion = jwt.encode(payload, private_key, algorithm="PS256", headers={'kid': CERTIFICATE_ID})
35
36     data = {
37         'grant_type': GRANT_TYPE,
38         'client_assertion_type': CLIENT_ASSERTION_TYPE,
39         'client_assertion': jwt_assertion,
40     }
41     resp = requests.post(TOKEN_ENDPOINT_URL, data=data)
42     data = resp.json()
43     logging.debug("Received '%s'[%d]: %s", TOKEN_ENDPOINT_URL, resp.status_code, resp.raw)
44     assert data["access_token"]
45
46
47 if __name__ == '__main__':
48     main()
```

After the command has returned the authentication string, take note of it.

After you generated the authentication string, add the OAuth2Token attribute in your driver configuration, and include the authentication string as the value of the new attribute. For more information, see [Setting the OAuth2Token Attribute](#).

## Setting the OAuth2Token Attribute

When you install or update your Connect driver, the OAuth2Token attribute is not included in the default driver or data source name (DSN) attributes. To access the NetSuite2.com data source with OAuth 2.0 you must update the connection attributes to add the OAuth2Token attribute. Depending on the driver that you use, there are different ways to edit the connection attributes.

- ODBC drivers
- JDBC drivers
- ADO.NET drivers

## ODBC drivers

If you use a connection string, you must update your connection string to add the OAuth2Token attribute and place it at the end of the list of CustomProperties attributes. For more information about how to include the attribute, see [Connecting Using a Connection String](#) and [Connection Attributes](#).

**i Note:** Using a DSN-less connection string for ODBC drivers on Windows is the recommended option. If you choose to use a DSN connection instead, you must add the OAuth2Token attribute using the Windows Registry Editor application. The access token expires after one hour, and you need to update the access token each time it has expired. Therefore, the recommended option is using a DSN-less connection string.

## JDBC drivers

You must update your connection string to add the OAuth2Token attribute and place it at the end of the list of CustomProperties attributes. For more information, see [JDBC Connection Properties](#).

## ADO.NET drivers

You must update your connection string to add the OAuth2Token attribute and place it at the end of the list of CustomProperties attributes. For more information about using connection strings with the ADO.NET driver, see [ADO.NET Connection Options](#).

## Using Connect with OAuth 2.0

When you log in to the Connect Service with OAuth 2.0, consider the following:

- **Data Source** – You must use the NetSuite2.com data source. For more information about the NetSuite2.com data source, see the help topic [Connect Data Source](#).
- **Access Token** – The access token that you obtain is valid during one hour and can be used in several sessions during the time period in which the access token is valid. You can see the time during which the access token is valid in the following parameters:
  - **"exp" parameter** – For more information, see the help topic [The Request Token Structure](#).
  - **"expires\_in" parameter** – For more information, see the help topic [Refresh Token POST Request to the Token Endpoint](#).

## Token-based Authentication for Connect

**i Note:** You can use two authentication methods with SuiteAnalytics Connect: OAuth 2.0 and token-based authentication (TBA). However, OAuth 2.0 is the preferred authentication method. You should consider using OAuth 2.0 instead of TBA whenever possible. For more information about OAuth 2.0, see [OAuth 2.0 for Connect](#).

For details about using token-based authentication (TBA) with SuiteAnalytics Connect, see the following topics:

- [Requirements for Using Token-based Authentication in Connect](#)
- [Using Connect with Token-Based Authentication \(TBA\)](#)

- [Token Password for Connect](#)

For more information about token-based authentication (TBA) in NetSuite, see the help topic [Token-based Authentication \(TBA\)](#).

## Requirements for Using Token-based Authentication in Connect

Before you can use token-based authentication with Connect, you must complete several setup tasks. These tasks include the following:

- **Enabled Features** – The Token-based Authentication feature must be enabled. For more information, see the help topic [Enable the Token-based Authentication Feature](#).
- **Roles and Permissions** – You must have assigned a user to a role that meets the following conditions:
  - Access requirements for accessing the NetSuite2.com data source. For more information, see [Role and Permission Considerations for NetSuite2.com](#).
  - Permission to login by using token-based authentication. For more information, see the help topic [Set Up Token-based Authentication Roles](#).
  - Permission to access SuiteAnalytics Connect. For more information, see [Providing Users with SuiteAnalytics Connect Permissions](#).
- **Integration Record** – An integration record for the application must exist at Setup > Integration > Manage Integrations. On the integration record, the Token-based Authentication option must be checked. Ensure that the rest of options are not checked. For information about how to create an integration record, see the help topic [Create Integration Records for Applications to Use TBA](#).

**Note:** Ensure that you take note of the Consumer Key (client ID) and Consumer Secret (client secret) that appear on the confirmation page.

- **Access Token** – You must create a token and token secret for the user who will use TBA for accessing the Connect Service. For more information, see the help topics [Access Token Management – Create and Assign a TBA Token](#) and [Manage TBA Tokens in the NetSuite UI](#).

**Note:** Ensure that you take note of the Token ID and Token Secret that appear on the confirmation page.

## Using Connect with Token-Based Authentication (TBA)

When you log in to the Connect Service with TBA, ensure that the following attributes meet these requirements:

- **Data Source** – You must use the NetSuite2.com data source. For more information about the NetSuite2.com data source, see [Connect Data Source](#).
- **User** – You must access the Connect Service with a user that meets the required conditions for TBA with Connect. You must use **TBA** as the username value, instead of using the NetSuite email address which is the required value when you log in to an account that does not require token-based authentication.

**Note:** When you log in with the TBA username, SuiteAnalytics Connect identifies that you are accessing the Connect Service with TBA and that the token password is required.

- **Token Password** – You must use a token password instead of the NetSuite account password. The token password that you obtain is valid within the next 5 minutes and for a single session only. If you

open a new session, you need to create a new token password. For more information about the token password, see [Token Password for Connect](#).

To learn how to run queries with Connect and TBA, see [Running Connect Queries with TBA](#).

## Running Connect Queries with TBA

After you have accessed the Connect Service with TBA, the session is valid within the next 60 minutes. See the following examples:

- If you run a query and obtain the query result before 60 minutes have elapsed, your session is still valid. You can run new queries until the session expires after 60 minutes.
- If you run a query and you have not received a response after 60 minutes have elapsed, the session is still active until you receive the response. However, you cannot run new queries using this session. If you want to run new queries, you need to start a new Connect session.

## Token Password for Connect

With token-based authentication (TBA), you need a token password to access the Connect Service which is an authentication string. To learn how to create the token password for Connect, see the following topics:

- [Required Parameters for Creating the Token Password](#)
- [Creating the Token Password](#)

## Required Parameters for Creating the Token Password

The token password is an authentication string that has a limitation of approximately 500 characters. The string includes a concatenation of parameters with the ampersand character (&) as the delimiter. The values of the required parameters are arranged as follows:

<account-id>&<consumer-key>&<token-key>&<nonce>&<timestamp>&<signature>&<signature-algorithm>

Parameter	Description
Base string	<p>The base string is the variable created from concatenating a series of values, with an ampersand as a delimiter between values. The values are arranged in the following sequence:</p> <ul style="list-style-type: none"> <li>■ <b>Account ID</b> – Your NetSuite account ID. You can find this value on the SuiteAnalytics Connect Driver Download Page under Your Configuration. For more information, see <a href="#">Connection Attributes</a>.</li> <li>■ <b>Consumer key</b> – The consumer key for the integration record. This string was created when you created the integration record. For more information, see <a href="#">Requirements for Using Token-based Authentication in Connect</a>.</li> <li>■ <b>Token key</b> – This is a string identifier or an ID of a token that represents a unique combination of a user, a role, and an integration record. For more information about how to obtain a token key, see the help topic <a href="#">Manage TBA Tokens in the NetSuite UI</a>.</li> <li>■ <b>Nonce</b> – This field should hold a unique, randomly generated alphanumeric string of 6-64 characters.</li> <li>■ <b>Timestamp</b> – This field should hold a current timestamp in Unix format.</li> </ul> <p>All parameters for creating the base string use the percent encoding. For more information about percent encoding, see <a href="https://tools.ietf.org/html/rfc5849#section-3.6">https://tools.ietf.org/html/rfc5849#section-3.6</a>.</p>
Signature	The first step in generating the signature is creating the signature key. The signature key is the variable created from concatenating the consumer secret and the token secret. For more information about the consumer secret and the token secret, see <a href="#">Requirements for Using Token-based Authentication in Connect</a> .

Parameter	Description
	After you created the signature key, use the base string and signature key to create the signature parameter. The signature must be encoded by Base64 and only the HMAC-SHA256 algorithm is supported. For more information, see <a href="#">Creating the Token Password</a> .
Signature algorithm	The Connect Service supports only the HMAC-SHA256 algorithm.

## Creating the Token Password

You need to combine several values to get the token password which is the authentication string that allows you to access the Connect Service with TBA.

### To create the token password:

1. Create a base string. The base string is the variable created from concatenating a series of values. Use an ampersand as a delimiter between values. The values should be arranged in the following sequence:
  1. NetSuite account ID
  2. Consumer key
  3. Token
  4. Nonce
  5. Timestamp

The following example shows the base string that you obtain if you have the following values:

- **NetSuite account ID** - 1234567
- **Consumer key** - 71cc02b731f05895561ef0862d71553a3ac99498a947c3b7beaf4a1e4a29f7c4
- **Token** - 89e08d9767c5ac85b374415725567d05b54ecf0960ad2470894a52f741020d82
- **Nonce** - 6obMKq0tmY8yIVOdEkA1
- **Timestamp** - 1439829974

In this case, the base string is as follows:

```
1 1234567&71cc02b731f05895561e
   f0862d71553a3ac99498a947c3b7beaf4a1e4a29f7c4&89e08d9767c5ac85b374415725567d05b54ecf0960ad2470894a52f741020d82&6obMKq0t
   mY8yIVOdEkA1&1439829974
```

2. Create the signature key. The key is a string variable created by concatenating the appropriate consumer secret and token secret. These two strings should be concatenated by using an ampersand.

The following example shows the signature key that you obtain if you have the following values:

- **Consumer secret** - 7278da58caf07f5c336301a601203d10a58e948efa280f0618e25fce1ef2abd
- **Token secret** - 060cd9ab3ffbbe1e3d3918e90165ffd37ab12acc76b4691046e2d29c7d7674c2

In this case, the key is as follows:

```
1 7278da58caf07f5c336301a601203d10a58e948efa280f0618e25fce1ef2abd&060cd9ab3ffbbe1e3d3918e90165ffd37ab12ac
   c76b4691046e2d29c7d7674c2
```

3. Create the signature by using the base string, the signature key, and concatenating the algorithm with an ampersand. The signature must be encoded by Base64 and only the HMAC-SHA256 algorithm is supported.

In this case, the signature is as follows:

```
1 | FCghIZqXNetuZY8ILWOFH0ucdfzQ0mAuL+q+kF21zPs=&HMAC-SHA256
```

4. Use the base string and the signature to get the token password.

In this case, the token password is as follows:

```
1 | 1234567&71cc02b731f05895561e  
f0862d71553a3ac99498a947c3b7beaf4a1e4a29f7c4&89e08d9767c5ac85b374415725567d05b54ecf0960ad2470894a52f741020d82&6obMKq0t  
mY8ylV0dEkA1&1439829974&FCghIZqXNetuZY8ILWOFH0ucdfzQ0mAuL+q+kF21zPs=&HMAC-SHA256
```



**Note:** The token password always includes the equal character (=) as part of the SHA256 algorithm, but the ADO.NET driver does not identify correctly this special character. If you are using the ADO.NET driver, you must enclose the token password in single quotation marks ('example').

# Connect Drivers

To analyze your data with SuiteAnalytics Connect, you must download and install a Connect driver. SuiteAnalytics Connect supports three driver types: ODBC, JDBC, and ADO.NET.

The following table includes links to the information that you need for each driver type.

Links	Description
<a href="#">ODBC Drivers</a>	This topic includes the details of the latest ODBC driver version and the history of all ODBC driver versions that have been available for download.
<a href="#">JDBC Drivers</a>	This topic includes the details of the latest JDBC driver version and the history of all JDBC driver versions that have been available for download.
<a href="#">ADO.NET Drivers</a>	This topic includes the details of the latest ADO.NET driver version and the history of all ADO.NET driver versions that have been available for download.
<a href="#">Connect Driver Download Page</a>	This topic includes an overview to understand the SuiteAnalytics Connect Driver Download page.
<a href="#">Downloading and Installing Connect Drivers</a>	This topic describes how to download and install your Connect driver.
<a href="#">Verifying the Downloaded File</a>	This topic describes how to verify the downloaded file.
<a href="#">Configuring Your Data Source</a>	This topic describes how you should set up your data source to work with SuiteAnalytics Connect.
<a href="#">Determining Your Connect Driver Version</a>	This topic describes how to verify the Connect driver version that you are using.

## ODBC Drivers

This topic includes all the ODBC driver versions that have been made available for download. Each driver version includes details of the changes that were introduced and additional information of each version. You should always install the latest version available.

For Windows, you can download the ODBC driver as a ZIP file by clicking **Download** next to the installation bundle, or as an EXE file by clicking **Download** next to the driver version. For more information about these two options, see [Downloading and Installing Connect Drivers](#).

- [ODBC Driver 64-bit for Windows](#)
- [ODBC Driver 32-bit for Windows](#)
- [ODBC Driver 64-bit for Linux](#)
- [ODBC Driver 32-bit for Linux](#)

### ODBC Driver 64-bit for Windows

Driver versions are listed chronologically with the latest version at the top of the list.

- [ODBC Driver 64-bit for Windows \(8.10.143.0\)](#)
- [ODBC Driver 64-bit for Windows \(8.10.92.0\)](#)
- [ODBC Driver 64-bit for Windows \(7.20.55.0\)](#)

## ODBC Driver 64-bit for Windows (8.10.143.0)

- **Driver version:** 8.10.143.0
- **Release date:** February 25, 2022
- **Driver details:** Upgrade to this version is required. If you do not install or upgrade to this version, you may experience a delay of up to 30 seconds when you log out of your Connect session.
- **SHA256 of the downloadable EXE file:**  
19c11fbe7ab1f03f5e5fa46868bccf2ed5e7517ef2e9f2b004dca161dab05424

For more information about how to install or upgrade to this driver version, see [Required Update of SuiteAnalytics Connect Drivers](#).

## ODBC Driver 64-bit for Windows (8.10.92.0)

- **Driver version:** 8.10.92.0
- **Release date:** September 23, 2019
- **Driver details:** The installer automatically updates your data sources to use the generic system trust store and account-specific domains. The operating system trust store is used instead of using attached certificates. This is not the latest ODBC driver version released. For information about the latest ODBC driver released, see [ODBC Driver 64-bit for Windows \(8.10.143.0\)](#).
- **SHA256 of the downloadable EXE file:**  
ef637918ef0b636f9ce060b392510ef5c7f81dec7f2faff73218bc56520f4bf2

## ODBC Driver 64-bit for Windows (7.20.55.0)

- **Driver version:** 7.20.55.0
- **Release date:** March 22, 2018
- **Driver details:** This version supports the SSL certificates that were installed on the SuiteAnalytics Connect servers on May 11, 2018. This is not the latest ODBC driver version released. For information about the latest ODBC driver released, see [ODBC Driver 64-bit for Windows \(8.10.143.0\)](#).

## ODBC Driver 32-bit for Windows

Driver versions are listed chronologically with the latest version at the top of the list.

- [ODBC Driver 32-bit for Windows \(8.10.143.0\)](#)
- [ODBC Driver 32-bit for Windows \(8.10.92.0\)](#)
- [ODBC Driver 32-bit for Windows \(7.20.55.0\)](#)

## ODBC Driver 32-bit for Windows (8.10.143.0)

- **Driver version:** 8.10.143.0
- **Release date:** February 25, 2022
- **Driver details:** Upgrade to this version is required. If you do not install or upgrade to this version, you may experience a delay of up to 30 seconds when you log out of your Connect session.
- **SHA256 of the downloadable EXE file:**  
bbf31cf3ecac1635b72c8f8a6accf10f4b384daa72db7fdca57a18bb502dc15b

For more information about how to install or upgrade to this driver version, see [Required Update of SuiteAnalytics Connect Drivers](#).

## ODBC Driver 32-bit for Windows (8.10.92.0)

- **Driver version:** 8.10.92.0
- **Release date:** September 23, 2019
- **Driver details:** The installer automatically updates your data sources to use the generic system trust store and account-specific domains. The operating system trust store is used instead of using attached certificates.
- **SHA256 of the downloadable EXE file:**  
36d4a2cefda32c56d3daa374de9aaecbd32c3e89b31717cee8a98928d4388d72

This is not the latest ODBC driver version released. For information about the latest ODBC driver released, see [ODBC Driver 64-bit for Windows \(8.10.143.0\)](#).

## ODBC Driver 32-bit for Windows (7.20.55.0)

- **Driver version:** 7.20.55.0
- **Release date:** March 22, 2018
- **Driver details:** This version supports the SSL certificates that were installed on the SuiteAnalytics Connect servers on May 11, 2018.

This is not the latest ODBC driver version released. For information about the latest ODBC driver released, see [ODBC Driver 32-bit for Windows \(8.10.143.0\)](#).

## ODBC Driver 64-bit for Linux

Driver versions are listed chronologically with the latest version at the top of the list.

- [ODBC Driver 64-bit for Linux \(8.10.143.0\)](#)
- [ODBC Driver 64-bit for Linux \(8.10.89.0\)](#)
- [ODBC Driver 64-bit for Linux \(7.20.51.0\)](#)

## ODBC Driver 64-bit for Linux (8.10.143.0)

- **Driver version:** 8.10.143.0
- **Release date:** February 25, 2022
- **Driver details:** Upgrade to this version is required. If you do not install or upgrade to this version, you may experience a delay of up to 30 seconds when you log out of your Connect session.

For more information about how to install or upgrade to this driver version, see [Required Update of SuiteAnalytics Connect Drivers](#).

## ODBC Driver 64-bit for Linux (8.10.89.0)

- **Driver version:** 8.10.89.0
- **Release date:** September 23, 2019
- **Driver details:** This version includes some security updates.

This is not the latest ODBC driver version released. For information about the latest ODBC driver released, see [ODBC Driver 64-bit for Linux \(8.10.143.0\)](#).

## ODBC Driver 64-bit for Linux (7.20.51.0)

- **Driver version:** 7.20.51.0
- **Release date:** March 22, 2018
- **Driver details:** This version supports the SSL certificates that were installed on the SuiteAnalytics Connect servers on May 11, 2018.

This is not the latest ODBC driver version released. For information about the latest ODBC driver released, see [ODBC Driver 64-bit for Linux \(8.10.143.0\)](#).

## ODBC Driver 32-bit for Linux

Driver versions are listed chronologically with the latest version at the top of the list.

- [ODBC Driver 32-bit for Linux \(8.10.143.0\)](#)
- [ODBC Driver 32-bit for Linux \(8.10.89.0\)](#)
- [ODBC Driver 32-bit for Linux \(7.20.51.0\)](#)

## ODBC Driver 32-bit for Linux (8.10.143.0)

- **Driver version:** 8.10.143.0
- **Release date:** April 23, 2022
- **Driver details:** Upgrade to this version is required. If you do not install or upgrade to this version, you may experience a delay of up to 30 seconds when you log out of your Connect session.

 **Note:** This is the last 32-bit driver version released for Linux. The upcoming ODBC drivers will be available for 64-bit Linux distributions only.

For more information about how to install or upgrade to this driver version, see [Required Update of SuiteAnalytics Connect Drivers](#).

## ODBC Driver 32-bit for Linux (8.10.89.0)

- **Driver version:** 8.10.89.0
- **Release date:** September 23, 2019
- **Driver details:** This version includes some security updates.

This is not the latest ODBC driver version released. For information about the latest ODBC driver released, see [ODBC Driver 32-bit for Linux \(8.10.143.0\)](#).

## ODBC Driver 32-bit for Linux (7.20.51.0)

- **Driver version:** 7.20.51.0
- **Release date:** March 22, 2018
- **Driver details:** This version supports the SSL certificates that were installed on the SuiteAnalytics Connect servers on May 11, 2018.

This is not the latest ODBC driver version released. For information about the latest ODBC driver released, see [ODBC Driver 32-bit for Linux \(8.10.143.0\)](#).

# JDBC Drivers

This topic includes all the JDBC driver versions that have been made available for download. Each driver version includes details of the changes that were introduced and additional information of each version. JDBC drivers are available for Windows, Linux, and OS X. You should always install the latest version available.

- [JDBC Driver 8.10.136.0](#)
- [JDBC Driver 8.10.85.0](#)
- [JDBC Driver 7.20.50.0](#)

## JDBC Driver 8.10.136.0

- **Driver version:** 8.10.136.0
- **Release date:** July 13, 2022
- **Driver details:** This driver version is optional, but it is preferred. Prior to this version, the JDBC driver did not consider the KeepAliveTime parameter of your operating system. With this JDBC driver version, you can set the KeepAliveTime parameter to prevent your system from closing the connection if the Connect session is not considered active. For this version, you must set the NegotiateSSLClose parameter to **false**.
- **SHA256 checksum of the JAR file:**  
535d5e6f8817b3ef55ba6841c235fc2d277814422ee6bcfe72ff3bdc36d28061

For more information about how to install or upgrade to this driver version, see [Latest JDBC Driver Version Available](#).

## JDBC Driver 8.10.85.0

- **Driver version:** 8.10.85.0
- **Release date:** September 23, 2019
- **Driver details:** It is required to have at least the 8.10.85.0 version installed to ensure a smooth transition. If you do not install or upgrade at least to this version, you may experience a delay of up to 30 seconds when you log out of your Connect session. For this version, you must set the NegotiateSSLClose parameter to **false**.
- **SHA256 checksum of the JAR file:**  
bd52e937cc861fdefa353ae45ba65b40aa5abf6028b9a988ddae92dd476553ea

This is not the latest JDBC driver version released. For information about the latest JDBC driver released, see [JDBC Driver 8.10.136.0](#).

## JDBC Driver 7.20.50.0

- **Driver version:** 7.20.50.0
- **Release date:** January 8, 2016
- **Driver details:** This version includes the following changes for use with SuiteAnalytics Connect:
  - Certificates are required.
  - TLS version 1.2 cipher suites are supported.
  - The scmpid and roleid parameters are required.
- **SHA256 checksum of the JAR file:**  
19d01341439721ffd87eb896c4fd43a0a75ffed504df3bbddfb194c0ac91bea2

This is not the latest JDBC driver version released. For information about the latest JDBC driver released, see [JDBC Driver 8.10.136.0](#).

## ADO.NET Drivers

This topic includes all the ADO.NET driver versions that have been made available for download. Each driver version includes details of the changes that were introduced and additional information of each version. You should always install the latest version available.

Driver versions are listed chronologically with the latest version at the top of the list.

- [ADO.NET Driver for Windows \(8.10.89.0\)](#)
- [ADO.NET Driver for Windows \(7.20.50.0\)](#)

### ADO.NET Driver for Windows (8.10.89.0)

- **Driver version:** 8.10.89.0
- **Release date:** November 17, 2022
- **Driver details:** Upgrade to this version is optional, but it is preferred. This version includes the following changes for use with SuiteAnalytics Connect:
  - Security upgrades
  - General bug fixes
- **SHA256 checksum of the downloadable EXE file:**  
7d56bc332d6fb558185413450ff2d44f85e938c1c41911970e9d718df7731276

### ADO.NET Driver for Windows (7.20.50.0)

- **Driver version:** 7.20.50.0
- **Release date:** January 8, 2016
- **Driver details:** This version includes the following changes for use with SuiteAnalytics Connect:
  - Certificates are required.
  - TLS version 1.2 cipher suites are supported.
  - The scompid and roleid parameters are required.
- **SHA256 checksum of the downloadable EXE file:**  
a0e4887c6e54aa78010957fe52c5d4d6373bf2fc8c60f22fab956f0d7155c839

This is not the latest ADO.NET driver version available. For information about the latest ADO.NET driver released, see [ADO.NET Driver for Windows \(8.10.89.0\)](#).

## Connect Driver Download Page

The Connect Driver Download page is available for all roles with the SuiteAnalytics Connect permission. For more information about Connect permissions, see [Connect Permissions](#).

You can access the SuiteAnalytics Connect Driver Download page using the **Set Up Analytics Connect** link in the Settings portlet when you are logged on to [NetSuite](#). For more information, see the help topic [Finding Your Settings Portlet](#).

The following screenshot shows what you can find in the SuiteAnalytics Connect Driver Download page.

**Note:** Drivers that have been recently made available for download are shown with the New badge **NEW** next to the driver version. The badge is removed 60 days after the driver version is made available for download.

The screenshot shows the Oracle NetSuite SuiteAnalytics Connect Driver Download page. At the top, there's a navigation bar with links for Activities, Transactions, Lists, Reports, Analytics, Customization, Documents, Setup, Commerce, SuiteApps, and Support. Below the navigation is a search bar. The main content area has a header 'SuiteAnalytics Connect Driver Download'. It lists several driver bundles:

- Installation Bundles:**
  - ODBC INSTALLATION BUNDLE 64-BIT**: Release Date 25/2/2022, Version 8.10.143.0, SHA256 Checksum: 52cd80a904d114d586ea2f397be8d4db5109b493a4dde6a65f6499480219fd6e. Includes a 'View Driver Details' link, a 'Previous Versions' dropdown, and a 'Download' button.
  - ODBC INSTALLATION BUNDLE 32-BIT**: Release Date 25/2/2022, Version 8.10.143.0, SHA256 Checksum: c1358c2789150e26372945aef847e04761486b744cf610bae8dec9cc40802. Includes a 'View Driver Details' link, a 'Previous Versions' dropdown, and a 'Download' button.
- Drivers:**
  - ODBC DRIVER 64-BIT**: Release Date 25/2/2022, Version 8.10.143.0, SHA256 Checksum: 19c11fb7ab1f03f5e5fa46868bcc2ed5e7517ef2e9f2b004dca161dab05424. Includes a 'View Driver Details' link, a 'Previous Versions' dropdown, and a 'Download' button.
  - ODBC DRIVER 32-BIT**: Release Date 25/2/2022, Version 8.10.143.0, SHA256 Checksum: bbf31cf3ecac1635b72c88a6accf104b384daa72db7fda57a18bb502dc15b. Includes a 'View Driver Details' link, a 'Previous Versions' dropdown, and a 'Download' button.
  - JDBC DRIVER**: Release Date 13/7/2022, Version 7.20.50, SHA256 Checksum: 72ecc1465a197b6e4746da529017e42cbd0e2a7f32a22254e8ac802273205a84. Includes a 'View Driver Details' link, a 'Previous Versions' dropdown, and a 'Download' button.
  - ADONET DRIVER**: Release Date 17/11/2022, Version 7.20.50, SHA256 Checksum: a0e4887c6e54aa78010957fe52c5d4d6373b2fc860f22fab956fd7155c839. Includes a 'View Driver Details' link, a 'Previous Versions' dropdown, and a 'Download' button.
- Resources:**
  - CERTIFICATION AUTHORITY CERTIFICATES**: Certificates.zip, SHA256 Checksum: 8555a507dbde65a430a707abebc3c69574a8b1fd9b41ef4b8ce239f407cf520. Includes a 'View Driver Details' link, a 'Previous Versions' dropdown, and a 'Download' button.

1	<b>Operating System</b> – Select your operating system from the list of options. The following options are available:
	<ul style="list-style-type: none"> <li>▪ Windows 64-bit</li> <li>▪ Windows 32-bit</li> <li>▪ Linux 64-bit</li> <li>▪ Linux 32-bit</li> <li>▪ OS X</li> </ul>
2	<b>Data Source Configuration Values</b> – Ensure that you take note of these configuration values. These values are required to set up your data source after you install your driver. When you set up your data source to work with the Connect Service, you must ensure that the values that you enter match the values shown on the SuiteAnalytics Connect Driver Download page. The following configuration values are displayed:
	<ul style="list-style-type: none"> <li>▪ <b>Service Host</b> – Displays your account-specific domain. Account-specific domains contain the account ID as part of the domain name and identify the account type (production, sandbox, or Release Preview). For more information, see the help topic <a href="#">URLs for Account-Specific Domains</a>.</li> <li>▪ <b>Service Port</b> – Displays <b>1708</b>. This value does not change.</li> <li>▪ <b>Service Data Source</b>– Displays the name of the Connect data source: <b>NetSuite2.com</b>. For more information, see the help topic <a href="#">Connect Data Source</a>.</li> <li>▪ <b>Account ID</b> – Displays your account ID.</li> </ul>

	<ul style="list-style-type: none"> <li>■ <b>Role ID</b> – Displays your role ID.</li> </ul> <p><b>Note:</b> When you download an ODBC installation bundle for Windows or the ODBC driver for Linux, you also get a configuration file with these configuration values.</p>
3	<p><b>Installation Bundles</b> – Displays the latest driver version at the top of the list. Installation bundles are only available for ODBC drivers. The following details of the latest driver version are available:</p> <ul style="list-style-type: none"> <li>■ <b>Release Date</b> – Displays the date when the driver was made available for download.</li> <li>■ <b>Version</b> – Displays the version number of the driver.</li> <li>■ <b>SHA256 Checksum</b> – Displays the SHA256 checksum value of a downloadable file. You can verify your driver version with this value.</li> <li>■ <b>View Driver Details</b> – Click <b>View Driver Details</b> to view a detailed description of this driver version in the Help Center.</li> </ul> <p>In the latest installation bundle version, click <b>Download</b> at the right of the section to download the installation bundle.</p>
4	<p><b>Previous Versions</b> – You can expand this section to view previous versions of installation bundles. The following details are displayed for each driver version:</p> <ul style="list-style-type: none"> <li>■ <b>Release Date</b> – Displays the date when the driver was made available for download.</li> <li>■ <b>Version</b> – Displays the version number of the driver.</li> <li>■ <b>View Driver Details</b> – Click <b>View Driver Details</b> to view a detailed description of this driver version in the Help Center.</li> </ul> <p>Only the latest driver version is available for download.</p>
5	<p><b>Drivers</b> – The latest version of each driver type is displayed at the top of the list. Driver types are displayed in the following order: ODBC, JDBC, and ADO.NET.</p> <p><b>Note:</b> Depending on your operating system, some driver types and driver details are not available.</p> <p>The following details are displayed for each driver type:</p> <ul style="list-style-type: none"> <li>■ <b>Release Date</b> – Displays the date when the driver was made available for download.</li> <li>■ <b>Version</b> – Displays the version number of the driver.</li> <li>■ <b>SHA256 Checksum</b> – Displays the SHA256 checksum value of a downloadable file. You can verify your driver version with this value.</li> <li>■ <b>View Driver Details</b> – Click <b>View Driver Details</b> to view a detailed description of this driver version in the Help Center.</li> </ul> <p>In the latest driver version, click <b>Download</b> at the right of the section to download the installation file.</p>
6	<p><b>Previous Versions</b> – You can expand this section to view previous versions of each driver type: ODBC, JDBC, and ADO.NET.</p> <p><b>Note:</b> Depending on your operating system, some driver types are not available.</p> <p>The following details are displayed for each driver version:</p> <ul style="list-style-type: none"> <li>■ <b>Release Date</b> – Displays the date when the driver was made available for download.</li> <li>■ <b>Version</b> – Displays the version number of the driver.</li> <li>■ <b>View Driver Details</b> – Click <b>View Driver Details</b> to view a detailed description of this driver version in the Help Center.</li> </ul> <p>Only the latest driver version is available for download.</p>

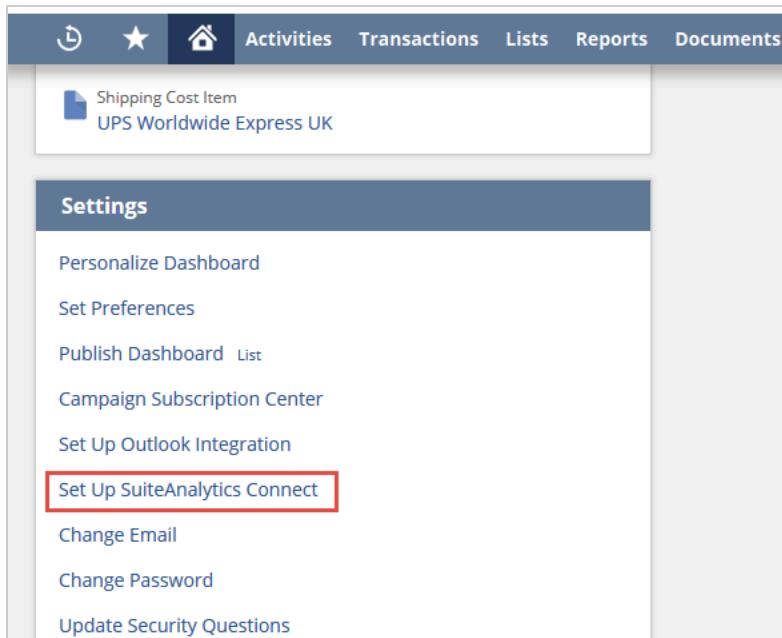
- 7 **Resources** – Click **Download** to download additional Certification Authority certificates. The SHA256 checksum of the downloadable file is displayed.
- For more information about how to use the Certification Authority certificates, see the following topics:
- [Authentication Using Server Certificates for ODBC](#)
  - [Authentication Using Server Certificates for JDBC](#)
  - [Authentication Using Server Certificates for ADO.NET](#)

## Downloading and Installing Connect Drivers

To work with SuiteAnalytics Connect, you must download and install an ODBC, JDBC, or ADO.NET driver. You can download your Connect driver from the Connect Driver Download page.

### To download a Connect driver:

1. On your NetSuite home page, find the Settings portlet and click **Set Up SuiteAnalytics Connect**. If the link is not displayed, you need to enable the Connect Service first. For more information, see [Enabling the Connect Service Feature](#).

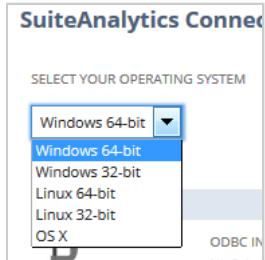


The SuiteAnalytics Connect Driver Download page appears.

2. From the **Select Your Operating System** dropdown list, select your operating system.



**Note:** If your platform is 64-bit, but you are planning to use a 32-bit application to get data from NetSuite, choose the 32-bit version of your platform, so you can install a 32-bit SuiteAnalytics Connect driver.



3. Take note of the configuration values that appear on the upper-right part of the page, under Your Configuration. These configuration values are required to set up your data source after you install the driver. For more information about the configuration values, see [Connect Driver Download Page](#).
4. On the Installation Bundles and Drivers section, click **Download** next to the driver type that you want to install. The latest driver version appears on top of the list of each driver type. The following driver types are available:
  - ODBC driver or installation bundle  
For Windows, you can download the ODBC driver as a ZIP file by clicking **Download** next to the installation bundle, or as an EXE file by clicking Download next to the driver version. For more information about these two options, see [Downloading and Installing the ODBC Driver for Windows](#).
  - JDBC driver
  - ADO.NET driver
 Each driver version includes details such as the release date and a description of the version details.
5. (Option) You can also do the following:
  - Click **View Driver Details** to view a detailed description of each driver version on the Help Center.
  - Click the arrow next to **Previous Versions** to see the list of previous driver versions.



**Note:** Only the latest driver version of each driver type is available for download.

- On the **Resources** section, click **Download** to download additional security certificates.

After you download the driver, you can check the SHA256 checksum value to verify that the downloaded file is safe and that no malicious content has been injected. For more information, see [Verifying the Downloaded File](#).

To install your driver and configure the connection attributes to set up your data source, see the following topics:

- [Downloading and Installing the ODBC Driver for Windows](#)
- [Downloading and Installing the ODBC Driver for Linux](#)
- [Installing the JDBC Driver for Windows](#)
- [Installing the JDBC Driver for Linux](#)
- [Installing the JDBC Driver for OS X](#)

- Downloading and Installing the ADO.NET Driver

## Verifying the Downloaded File

To ensure that the file that you downloaded is safe and that no malicious content has been injected, you can check the SHA256 checksum value. This value is shown under Driver Details on the Connect driver download page. For more information, see [Connect Driver Download Page](#).

- [Verifying the SHA256 checksum on Windows](#)
- [Verifying the SHA256 checksum on Linux or OS X](#)

### Verifying the SHA256 checksum on Windows

You can check the SHA256 checksum of a file on Windows using certutil.

#### **To verify the SHA256 checksum using certutil:**

1. Open a command window.
  2. Type the following command where <file path> is the path to the folder:  
cd <file path>
  3. In the command window, type the following command where <file name> is the name of the file that you want to check:  
certutil -hashfile <file name> SHA256
- The following example shows how to get the SHA256 checksum of the EXE file for the ODBC driver on Windows:
- ```
certutil -hashfile NetSuiteODBCDrivers_Windows64bit.exe SHA256
```
4. View the output to verify that the SHA256 checksum matches the value under your driver type on the **SuiteAnalytics Connect Driver Download** page.

### Verifying the SHA256 checksum on Linux or OS X

There are several ways to verify the checksum of a file on Linux and OS X. The following example shows how to verify the SHA256 checksum using sha256sum.

#### **To verify the SHA256 checksum using sha256sum:**

1. Open the terminal.
2. Type the following command where <file path> is the path to the folder:  
cd <file path>
3. In the terminal, type the following command where <file name> is the name of the file that you want to check:  
sha256sum NetSuiteJDBCDrivers.zip
4. View the output to verify that the SHA256 checksum matches the value under your driver type on the **SuiteAnalytics Connect Driver Download** page.

## Configuring Your Data Source



**Important:** As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

After you have downloaded and installed your driver, you must configure your data source or connection string. Follow the required steps:

- Take note of your configuration values – The configuration values are available under [Your Configuration](#) on the SuiteAnalytics Connect Driver Download page. For more information, see [Connect Driver Download Page](#).
- Add the configuration values to set up your data source – There are several ways to add the configuration values to the connection attributes of your driver. Depending on your driver and operating system, see the following topics:
  - [Configuring the ODBC Data Source on Windows](#)
  - [Configuring the ODBC Data Source on Linux](#)
  - [JDBC Connection Properties](#)
  - [Connecting with the ADO.NET Data Provider](#)

After you configured your driver, you can start querying your data through Connect. For more information, see [Connect Data Source](#).

## Determining Your Connect Driver Version

There are several ways to determine the Connect driver version depending on the driver type that you installed and your operating system:

- [ODBC and ADO.NET Drivers on Windows](#)
- [ODBC Drivers on Linux](#)
- [JDBC Drivers](#)
- [OS X](#)

### ODBC and ADO.NET Drivers on Windows

Open the Windows Control Panel and browse to the location on your machine where you can find all programs. Find your SuiteAnalytics Connect driver and check the version.

For information about the latest driver version, see [Connect Drivers](#).

## ODBC Drivers on Linux

The installation directory of the ODBC driver contains the **version.txt** file. You can check the version in this file. If the installation directory does not contain this file, the installed driver version is earlier than 8.10.89.0. You must upgrade to the latest driver version. See an example of the content in the **version.txt** file:

SuiteAnalytics Connect Linux ODBC Driver version 8.10.143.0

For information about the latest driver version, see [Connect Drivers](#).

## JDBC Drivers

You can check the version in the **versions.txt** file. This file is located in the folder where you installed the EXE file or unzipped the ZIP file. The **versions.txt** file includes the SHA256 checksum values for all the JDBC versions that have been released. The first line in the file corresponds to the latest driver version.

Determine the driver version by checking the SHA256 checksum in the TXT file that matches the SHA256 checksum of the JAR file that you are using. For example, if the SHA256 checksum of the JAR file that you are using matches the SHA256 checksum in the first line of the file, you are using the latest driver version. See an example of the **versions.txt** file:

535d5e6f8817b3ef55ba6841c235fc2d277814422ee6bcfe72ff3bdc36d28061 NQjc.jar 8.10.136.0

bd52e937cc861fdefa353ae45ba65b40aa5abf6028b9a988ddae92dd476553ea NQjc.jar 8.10.85.0

19d01341439721ffd87eb896c4fd43a0a75ffed504df3bbddfb194c0ac91bea2 NQjc.jar 7.20.50

**Note:** The SHA256 checksum available on the SuiteAnalytics Connect Driver Download page corresponds to the SHA256 checksum of the file on the same page. For example, if the file available for download is a ZIP file, ensure that you are verifying the checksum of the ZIP file, and not the checksum of the JAR file. For more information about the download page, see [Connect Driver Download Page](#)

## OS X

There are two ways to determine your driver version:

- **Verify the driver version** – You can check the version in the **versions.txt** file. This file is located in the .zip archive. The first line in the file includes the SHA256 checksum of the JAR file and the version number. The version number must match the version under your driver type on the [SuiteAnalytics Connect Driver Download](#) page. For more information about the download page, see [Connect Driver Download Page](#).

See an example of the content in the versions.txt file:

535d5e6f8817b3ef55ba6841c235fc2d277814422ee6bcfe72ff3bdc36d28061 NQjc.jar 8.10.136.0

- **Verify the SHA256 checksum** – You can also check the SHA256 checksum of the file available for download, and verify that the checksum of the downloaded file matches the SHA256 checksum under your driver type on the [SuiteAnalytics Connect Driver Download](#) page.

**Note:** The SHA256 checksum available on the [SuiteAnalytics Connect Driver Download](#) page corresponds to the SHA256 checksum of the file on the same page. For example, if the file available for download is a ZIP file, ensure that you are verifying the checksum of the ZIP file, and not the checksum of the JAR file.

For information about the latest driver version, see [Connect Drivers](#).

For information about how to verify the SHA256 checksum of a file, see [Verifying the SHA256 checksum on Linux or OS X](#).

# Accessing the Connect Service Using an ODBC Driver

The following table lists tasks for an ODBC driver to connect to Connect Service; however, some of these tasks are optional to complete.

| Task                                                         | Description                                                                                                                                                                        |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Set up an environment and verify installation prerequisites. | For both Windows and Linux, verify the installation prerequisites. For more information, see <a href="#">Installation Prerequisites</a> .                                          |
| Download and install the driver.                             | For Windows, see <a href="#">Downloading and Installing the ODBC Driver for Windows</a> .<br>For Linux, see <a href="#">Downloading and Installing the ODBC Driver for Linux</a> . |
| Set up the ODBC connection.                                  | For both Windows and Linux, see <a href="#">Configuring the ODBC Driver</a> .                                                                                                      |
| Optionally, upgrade from a previous version.                 | For both Windows and Linux, see <a href="#">Upgrading an ODBC Driver</a> to upgrade a previous installation.                                                                       |
| Optionally, enable authentication with server certificates.  | For both Windows and Linux, see <a href="#">Authentication Using Server Certificates for ODBC</a> to add increased encryption to secure the data connection.                       |

## Prerequisites

Before you begin the download and installation process, complete all prerequisites. For more information, see the [Prerequisites for Using the Connect Service](#).

## Downloading and Installing the ODBC Driver for Windows

For Windows, two types of installation methods exist. To download the required drivers for either method, click **Set Up SuiteAnalytics Connect** in the **Settings** portlet on your NetSuite home page. For more information about the **Settings** portlet, see the help topic [Finding Your Settings Portlet](#).

 **Note:** If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).

After you downloaded the Connect driver, ensure that you install it as local administrator. If you install the driver on Windows as domain administrator, the installation process may fail.

- **Driver Installation Bundle.** The installation bundle is a .zip file that contains the installer together with a dsn.ini file. The dsn.ini file is automatically generated and contains parameters which are used by the installer to create the DSN. The dsn.ini file contains parameters which are reflecting the user context, for example, the role and the account that you used at the time you downloaded the .zip file. The user context data includes the Service Host, Account ID, and Role ID. Use this method if you want to use the driver to connect to your current account. See [ODBC Installation on Windows for a Bundled Installation](#).
- **Installer only.** The installer does not include any user context data. You should use this method if you want to install the driver for other users. Installers are available only for the Windows operating system. The .exe file installs the driver and unpacks other distributable content (for example, the

license and certificates) to the folder selected during the installation. For an ODBC driver, the installer also creates the DSN in the operating system unless you choose to skip this step. For more information, see [ODBC Installation on Windows for Installer Only](#).

For information about the supported Windows versions, see [Supported Windows Versions](#).

## ODBC Installation on Windows for a Bundled Installation

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

Download an installation bundle to automatically incorporate your current user context data (such as Service Host, Account ID and Role ID) in to the installer. This is the preferred approach if you want to use the driver to connect to your current account. This installer uses the provided dsn.ini file to configure the System DSNS using the account information for the user who downloaded the installation bundle. Use this option if you want to install the driver on a single machine and connect to a production account.

After you downloaded the Connect driver, ensure that you install it as local administrator. If you install the driver on Windows as domain administrator, the installation process may fail.

When you install the bundle you get DSN content from dsn.ini and thus the DSN is created automatically.

After you complete the installation, you can add additional System DSNS to connect to the Connect Service for a sandbox or Release Preview account. For more information, see [Configuring the ODBC Data Source on Windows](#) and [Driver Access for a Sandbox or Release Preview Account](#).

### To install or update the ODBC driver using a bundled installation:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. For more information about the **Settings** portlet, see the help topic [Finding Your Settings Portlet](#).
 

 **Note:** If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).
2. In the upper left corner, select your platform.
 

 **Note:** If your platform is 64-bit, but you are planning to use a 32-bit application to get data from NetSuite, choose the 32-bit version of your platform, so you can install a 32-bit SuiteAnalytics Connect driver.
3. Click the **Download** button next to the ODBC Installation Bundle.
4. When the driver installation bundle is downloaded, extract the .zip file. The dsn.ini file and the driver .exe file are extracted to the same folder. If you decide to move the files elsewhere, make sure you move both the dsn.ini file and the .exe file, as they should always be in the same location.
5. Run **NetSuiteODBCDrivers\_Windows32bit.exe** or **NetSuiteODBCDrivers\_Windows64bit.exe**, depending on the driver version you downloaded.
6. Follow the wizard's instructions to install or update the driver.
7. When the installation is complete, check that the correct data source is configured for your ODBC driver. For more information, see [Verifying the ODBC Driver Installation on Windows](#) and [Configuring the ODBC Data Source on Windows](#).
 

 **Note:** For information about the data source, see the help topic [Connect Data Source](#).

When you installed the driver and verified the data source settings, you can configure your applications to access the SuiteAnalytics Connect service. One of the options is to connect your application using a connection string. To learn more about connection strings, see [Connecting Using a Connection String](#).

## ODBC Installation on Windows for Installer Only

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

Download an installer if you do not want your current user context data to be used. Use this approach if you want to install the driver or automated services. This installer can create generic System DSNs. If you use only the installer file and there is no dsn.ini file, then fallback content is provided during installation. The fallback content configures the default service host without any role IDs or account IDs.

After you downloaded the Connect driver, ensure that you install it as local administrator. If you install the driver on Windows as domain administrator, the installation process may fail.

When you run the installer, you must review the content and add the Account ID and Role ID to get a DSN. Note that you may need to create additional DSNs manually, if you want to connect to another server or you want to select between different account types, for example, both production and sandbox. For more information, see [Configuring the ODBC Data Source on Windows](#).

- [Downloading the Connect Driver](#)
- [Installing the Connect Driver](#)
- [Upgrading the Connect Driver](#)

## Downloading the Connect Driver

You can download all Connect drivers from the SuiteAnalytics Connect Driver Download page. For more information, see [Downloading and Installing Connect Drivers](#).

## Installing the Connect Driver

After downloading the driver, run the downloaded file to install it.

### To install the Connect driver:

1. Run the file you downloaded and follow the wizard's instructions.
2. When the installation is complete, configure the connection attributes. For more information, see [Configuring the ODBC Data Source on Windows](#).

## Upgrading the Connect Driver

There are several ways to upgrade the ODBC driver:

- **Upgrading the existing driver** - This upgrade option is preferred. The values of the Data Source Name (DSN) are updated automatically with the required attributes. See [Upgrading the Existing Driver](#).
- **Uninstalling the old driver before installing the latest one** - Choosing this upgrade option is not preferred. You need to create a new DSN or to edit to Windows registry to include a connection attribute. See [Uninstalling the Old Driver and Installing the Latest Driver](#).

### Upgrading the Existing Driver

The preferred upgrade option is to install the latest driver without uninstalling the old one. If you choose this option, you do not need to perform any further steps, unless you use a DSN-less connection.

### To upgrade the existing driver:

1. Run the file you downloaded and follow the wizard's instructions.

2. When the installation is complete, you can verify the connection attributes. For more information, see [Verifying the ODBC Driver Installation on Windows](#).

## Uninstalling the Old Driver and Installing the Latest Driver

Choosing this upgrade option is not preferred. If you choose to uninstall the old driver and install the latest one, you need to update the existing Data Source Name (DSN) values in the Windows registry.

### To uninstall the old driver and install the latest driver:

1. Locate the existing driver file on your machine.
2. Right-click the driver file and click **Uninstall**.
3. You are asked if you want to delete the existing ODBC DSNs. You can choose one of the following options:
  - **Yes** - If you choose to delete the existing Data Source Names (DSN) you need to create a new DSN after installing the new driver. This DSN includes the required attributes of the latest driver. For more information, see [Using the ODBC Administrator Tool](#).
  - **No** - If you choose not to delete the existing DSNs, the values of the DSNs are kept. However, these values do not include the required attribute for the latest driver. You need to edit the Windows registry to add the the required connection attribute. For more information, see [Using the Windows Registry](#).
4. After uninstalling the old driver, run the file you downloaded and follow the wizard's instructions. Do one of the following:
  - If you chose **Yes** when you uninstalled the old driver, you need to create a new DSN using the ODBC administrator tool. For more information, see [Using the ODBC Administrator Tool](#).
  - If you chose **No** when you uninstalled the old driver, the old values of the DSNs were kept and you need to update them using the Windows registry. For more information, see [Using the Windows Registry](#).

## Verifying the ODBC Driver Installation on Windows

You can verify the ODBC driver version by running the ODBC Administrator tool or identifying the driver in the list of programs of the Windows Control Panel.

- [Using the ODBC Administrator Tool](#)
- [Using the Control Panel in Windows](#)

## Using the ODBC Administrator Tool

The location of the ODBC Administrator tool depends on your version of Windows.

- 32-bit Windows versions:

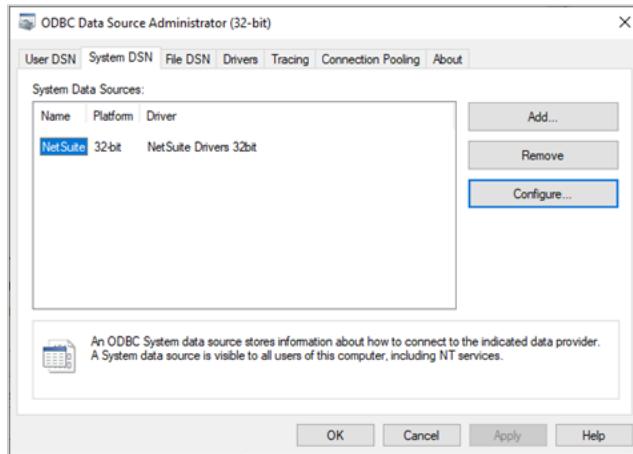
| Connect Driver Version | ODBC Administrator Location      |
|------------------------|----------------------------------|
| 32-bit driver          | C:\Windows\System32\odbcad32.exe |

- 64-bit Windows versions:

| Connect Driver Version | ODBC Administrator Location      |
|------------------------|----------------------------------|
| 32-bit driver          | C:\Windows\SysWOW64\odbcad32.exe |
| 64-bit driver          | C:\Windows\System32\odbcad32.exe |

## To use the ODBC Administrator Tool:

1. Open the ODBC Administrator tool.
2. Click the **System DSN** tab.



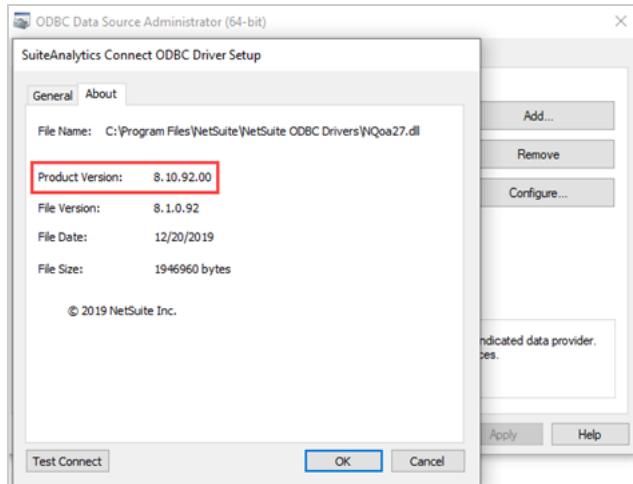
3. In the list of drivers, try to find a driver whose name contains **NetSuite**.

This indicates that you have an official NetSuite ODBC driver installed. If no such driver is present, then you either have a non-official ODBC driver or the installation was not successful.

4. After you have located the driver, click **Configure...** or double-click the driver name.

**Note:** If you click **Add**, the file version is displayed under the **Version** column. This value does not correspond to the driver version. To see the driver version, you need to click the **Configure** button.

5. Click the **About** tab and check the driver version.



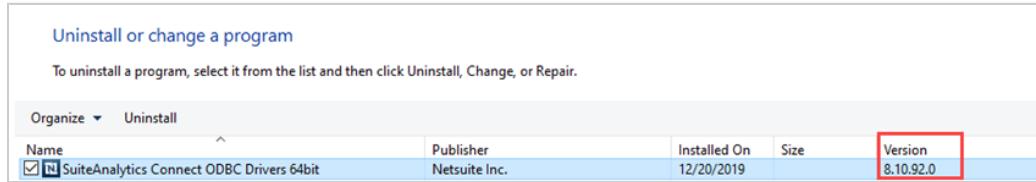
The driver version, which corresponds to the value next to **Product Version**, must match the version available on the SuiteAnalytics Connect Driver Download page.

## Using the Control Panel in Windows

You can check the driver version in the Windows control panel.

## To use the Control Panel in Windows:

1. For most Windows versions, go to **Start > Control Panel > Programs and Features**.
2. In the list of programs, identify the installed **SuiteAnalytics Connect Driver**.
3. After you have located the driver, check the version number under the **Version** column.



The driver version must match the version available on the SuiteAnalytics Connect Driver Download page.

## Configuring the ODBC Data Source on Windows

To set up the Connect Service, you must enter the required values to connect to your data center. You must create a Data Source Name (DSN) to add or edit the required values. The standard way to configure the required values is to use the ODBC data source on Windows. However, if you did not follow the standard option to upgrade your driver, you may need to edit an additional attribute using the Windows registry.

- [Using the ODBC Administrator Tool](#)
- [Using a Connection String](#)
- [Using the Windows Registry](#)

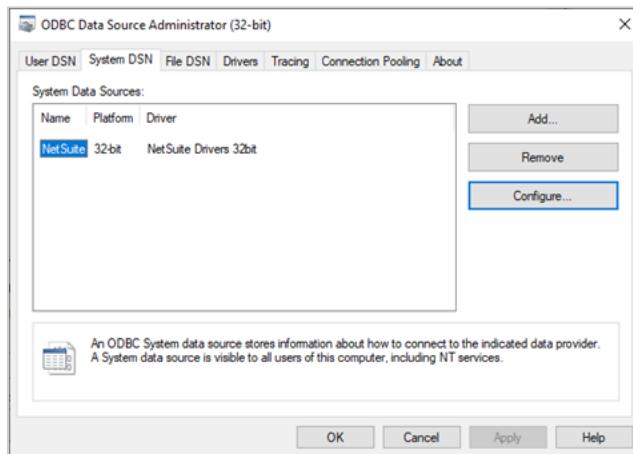
To verify your connection attributes, see [Verifying the ODBC Driver Installation on Windows](#).

## Using the ODBC Administrator Tool

Use the ODBC administrator tool to set up the values for your Data Source Names.

### To use the ODBC administrator tool:

1. Open the ODBC administrator tool.
2. Click the **System DSN** tab.



3. From the list of **System Data Sources**, select the NetSuite data source name and click **Configure**.

If the **System Data Sources** list doesn't contain the NetSuite data source, click the **Add** button, select the NetSuite driver in the drivers list, and click **Finish**.

4. On the **General** tab, set the configuration fields. You can find these values under **Your Configuration** on the SuiteAnalytics Connect Driver Download page. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

The following table describes the configuration fields:

| Data Source Setup Fields       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name</b>                    | Enter a data source name (DSN) to help you identify the connection, for example, <b>NetSuite</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b>             | Enter a description.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Account ID</b>              | The NetSuite account ID that will access the SuiteAnalytics Connect schema.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Role ID</b>                 | Role ID corresponding to the Account ID.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Service Host</b>            | <p>The Connect Service host name. The host name you should use for your connection is displayed in the <b>Service Host</b> field on the SuiteAnalytics Connect Driver Download page, under <b>Your Configuration</b>.</p> <p>By default, this field is automatically populated. To edit the field, check the <b>Customize</b> box.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Service Port</b>            | <p>1708</p> <p>By default, this field is automatically populated. To edit the field, check the <b>Customize</b> box.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Hostname in Certificate</b> | You should leave the <b>Hostname in Certificate</b> field blank.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Service Data Source</b>     | <p><b>NetSuite2.com</b></p> <p>To select the data source, use the <b>Browse</b> button. Note that the <b>Default</b> and <b>NetSuiteDW</b> options are not used. You must select <b>NetSuite2.com</b>.</p> <div style="border: 1px solid #f0e68c; padding: 10px; background-color: #fffacd;"> <p><b>Important:</b> As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.</p> <p>Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see <a href="#">New Accounts and Access to the Connect Data Source</a>.</p> </div> |

For information about the connection attributes, see [Connection Attributes](#).

5. Click **Test Connect** to verify the connection. Use your account username and password to connect.
6. Click **OK**.

When you try to connect your external tools to NetSuite using the SuiteAnalytics Connect ODBC driver, in addition to the settings you configured in the ODBC Administrator tool, you may need to provide a user ID (or user name) and a password for your connection. You can use your NetSuite account email address and password as the user ID and password for your connection.



**Important:** Tracing is an optional feature available in the ODBC Administrator tool that creates a log of all the calls to ODBC drivers. If you enable tracing, you might experience significantly slower performance when accessing the Connect Service using the ODBC driver.

## Using a Connection String

When you installed the driver and verified the data source settings, you can configure your applications to access the SuiteAnalytics Connect service. One of the options is to connect your application using a connection string. To learn more about connection strings, see [Connecting Using a Connection String](#).

## Using the Windows Registry

This action is only required if you uninstalled the old driver and kept the existing DSNs. The old DSNs do not include the required attribute for the latest driver and you need to use the Windows registry to add the AllowSinglePacketLogout attribute. If you upgraded your driver using the preferred option this action is not required. For more information, see [Upgrading the Connect Driver](#).

### To use the Windows registry:

1. Open the Registry Editor application.
2. Locate the ODBC.ini folder.



**Note:** When you configure your driver, some systems allow you to create a User DSN or a System DSN, and some systems allow you to choose between both. This depends on the permissions on your machine. There are no relevant differences between User DSNs and System DSNs. However, the location of the INI file that you must edit changes.

For most Windows versions, do the following:

- For System DSNs, go to the following folders:
    - For 64-bit drivers, go to Computer\HKEY\_LOCAL\_MACHINE\SOFTWARE\ODBC\ODBC.INI
    - For 32-bit drivers, go to Computer\HKEY\_LOCAL\_MACHINE\SOFTWARE\WOW6432Node\ODBC\ODBC.INI
  - For User DSNs in 64-bit and 32-bit drivers go to Computer\HKEY\_CURRENT\_USER\Software\ODBC\ODBC.INI
3. To create the AllowSinglePacketLogout attribute, right-click the ODBC.ini folder, and select **New > String Value**.



**Note:** If the folder includes the AllowSinglePacketLogout attribute, right-click the attribute to modify the value.

4. In the **Name** column, enter **AllowSinglePacketLogout**.
5. Right-click **AllowSinglePacketLogout** and select **Modify**. In the **Value data** field, enter **1**.

If you are using the NetSuite2.com data source, you can also work with the Static Data Model which enables you to see the structure and the name of all available record types and fields. For more information, see [Setting the Static Data Model for Connect Drivers](#).

# Downloading and Installing the ODBC Driver for Linux

You can install an ODBC driver in a Linux operating system.

- Before you install the driver, make sure your Linux distribution is compatible with the ODBC driver for Linux. For details, see [Supported Linux Distributions](#).
- To learn how to download and install the ODBC driver for Linux, see [Installing the Latest Driver on Linux](#).
- To learn how to install the driver in a custom location, see [Installing a Driver for Linux into an Alternate Directory](#).

## Installing the Latest Driver on Linux

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

To install the latest driver on Linux, follow these steps.

### To install the latest driver on Linux:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).
2. In the upper left corner, select your platform.
3. Click the **Download** button next to the ODBC Driver.
4. Agree to the terms of service to be able to start the download. You cannot download the driver archive unless you agree to the terms of service.
5. Save the installation .zip file to your computer.
6. In the location where you downloaded the .zip file, extract the .zip file.

**Note:** Ensure that the TrustStore parameter in your connection string includes a path to the ca3.cer certificate. For more information, see [Configuring the ODBC Data Source on Linux](#) and [Connecting Using a Connection String](#).

7. Create a new installation directory with the following path:

```
1 | /opt/netsuite/odbcclient
```

**Note:** If you wish to install the driver to another location, see [Installing a Driver for Linux into an Alternate Directory](#) for more information.

8. Copy the extracted installation files to the installation directory.
9. Set up the DSN entries. For information, see [Configuring the ODBC Data Source on Linux](#).
10. Verify the ODBC driver installation. See [Verifying the ODBC Driver Installation on Linux](#).

## Installing a Driver for Linux into an Alternate Directory

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

To install a driver for Linux into an alternate directory, update the oaodbc[64].sh and oaodbc[64].csh files with the installation directory of your choice.

### To install a driver for Linux in to an alternate directory:

1. Extract the .zip archive content in to a directory of your choice.
2. Update the oaodbc[64].sh and oaodbc[64].csh files with the installation directory of your choice.

For example if we want to install in to /drivers/netsuite-odbc we replace default path /opt/netsuite/odbccclient in oaodbc64.sh so the result looks like:

```

1 LD_LIBRARY_PATH=/drivers/netsuite-odbc/lib64${LD_LIBRARY_PATH:+:"} ${LD_LIBRARY_PATH:-""}
2 export LD_LIBRARY_PATH
3 OASDK_ODBC_HOME=/drivers/netsuite-odbc/lib64; export OASDK_ODBC_HOME
4 ODBCINI=/drivers/netsuite-odbc/odbc64.ini; export ODBCINI

```

The same has to be done for all oaodbc[64].sh and oaodbc[64].csh files.

## Accessing ODBC Data Source on Linux

In Linux, the ODBC Driver Manager accesses defined Data Sources. For the Driver Manager to access the defined drivers, you must set the environment correctly. The following system properties need to be set so the Driver Manager is able to locate and utilize the driver:

```

1 LD_LIBRARY_PATH - path to ODBC driver libraries
2
3 OASDK_ODBC_HOME - path to ODBC driver libraries
4
5 ODBCINI - path to ini file holding Data Source definitions

```

You must set correct values for these system variables. You can do so by running:

```
1 | source oaodbc[64].sh
```

on your command line. This command will export the variables with correct values and it will make them available in your current process. Exporting the variables makes them accessible for processes that are started from current shell. Executing this command (exporting the variables) must precede starting an ODBC client that uses the SuiteAnalytics Connect Linux ODBC driver and must be executed within the same environment.

The default values are:

```

1 LD_LIBRARY_PATH=/opt/netsuite/odbccclient/lib64${LD_LIBRARY_PATH:+:"} ${LD_LIBRARY_PATH:-""}
2
3 OASDK_ODBC_HOME=/opt/netsuite/odbccclient/lib64;
4
5 ODBCINI=/opt/netsuite/odbccclient/odbc64.ini;

```



**Note:** These values change if you do not install it in the default directory. You are prompted to replace these values in oaodbc[64].sh if you are installing it into an alternate directory.

## Verifying the ODBC Driver Installation on Linux

You can verify your ODBC driver installation with the isql command on Linux.



**Note:** isql may not be installed on your system by default. You may need to install the unixODBC package which contains this application.

### To verify the ODBC driver installation on Linux:

1. Go to the installation directory.
2. Execute the source oaodbc[64].sh or source oaodbc[64].csh shell command.
3. Run the following command from a command prompt:

```
isql NetSuite <user name>@netsuite.com <NetSuite user account password>
```

NetSuite refers to the data source defined in odbc.ini.



**Note:** You can also use the -v switch to run the command in verbose mode to get more information in the event of a connection failure.

## Configuring the ODBC Data Source on Linux

### Editing odbc.ini or odbc64.ini and Configuring the ODBC Data Source

To update the ODBC Data Source on Linux, you must edit the odbc.ini or odbc64.ini file, depending on whether you installed the 32-bit or the 64-bit version of the driver. Use the odbc64.ini if you installed a 64-bit ODBC Connect driver.

### To edit odbc.ini or odbc64.ini and configure the ODBC data source on Linux:

1. Locate the odbc.ini or odbc64.ini file. Typically, this file is located in your driver's installation folder.
2. Edit the following values in odbc.ini or odbc64.ini. You can find many of these values under **Your Configuration** on the SuiteAnalytics Connect Driver Download page. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

| Variable Name    | Description                                                                                                                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host             | Connect Service host name. The host name you should use for your connection is displayed in the <b>Service Host</b> field on the SuiteAnalytics Connect Driver Download page, under <b>Your Configuration</b> . |
| Port             | Should always be set to 1708.                                                                                                                                                                                   |
| ServerDataSource | Data source for the Connect Service.<br>Available values: NetSuite2.com<br>For more information about the data source, see <a href="#">Connect Data Source</a> .                                                |
| Encrypted        | Should always be set to 1.                                                                                                                                                                                      |
| TrustStore       | The security certificates used for the connection.                                                                                                                                                              |
| AccountID        | The NetSuite account ID that will access the SuiteAnalytics Connect schema. Enter this value under CustomProperties.                                                                                            |

| Variable Name           | Description                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | The value is displayed in the <b>Account ID</b> field on the SuiteAnalytics Connect Driver Download page, under <b>Your Configuration</b> .                                                                                                                                                                                                                                 |
| RoleID                  | Role ID corresponding to the Account ID. Enter this value under CustomProperties.<br>The value is displayed in the <b>Role ID</b> field on the SuiteAnalytics Connect Driver Download page, under <b>Your Configuration</b> .                                                                                                                                               |
| AllowSinglePacketLogout | You must set this attribute to <b>1</b> . You must use AllowSinglePacketLogout=1.<br>For more information, see <a href="#">Connection Attributes</a> .                                                                                                                                                                                                                      |
| StaticSchema            | Optional. The Static Data Model option provides you with the structure and the name of all available record types and fields in the NetSuite2.com data source. To use the Static Data Model in your account, you must add the StaticSchema attribute and set it to <b>1</b> . For more information, see <a href="#">Setting the Static Data Model for Connect Drivers</a> . |

You can have more than one Data Source defined in a Linux ODBC driver configuration.

**Note:** The below examples are working with a 64-bit version, for a 32-bit version use odbc.ini.

## Adding an ODBC Data Source

To add a new ODBC Data Source on Linux, you must edit the odbc64.ini file.

### To add an ODBC Data Source on Linux

1. Locate odbc[64].ini.
2. Modify the [ODBC Data Sources] section. Add new line:

```
1 | MyNewDatasource=NetSuite ODBC Drivers 8.1
```

3. Add a new [MyNewDatasource] section:

```
1 | [MyNewDatasource]
2 | Driver=/opt/netsuite/odbcclient/lib64/ivoa27.so
3 | Description=My new Sandbox ODBC datasource
4 | Host=<ServiceHost>
5 | Port=1708
6 | ServerDataSource=NetSuite.com
7 | Encrypted=1
8 | AllowSinglePacketLogout=1
9 | TrustStore=/opt/netsuite/odbcclient/cert/ca3.cer
10 | CustomProperties=AccountID=<accountID>;RoleID=<roleID>
```

The resulting odbc64.ini file looks like the following:

```
1 | [ODBC Data Sources]
2 | NetSuite_DC001=NetSuite ODBC Drivers 8.1
3 | MyNewDatasource=NetSuite ODBC Drivers 8.1
4 |
```

```

5 [NetSuite]
6 Driver=/opt/netsuite/odbcclient/lib64/ivoa27.so
7 Description=Connect to your NetSuite account
8 Host=<ServiceHost>
9 Port=1708
10 ServerDataSource=NetSuite.com
11 Encrypted=1
12 AllowSinglePacketLogout=1
13 TrustStore=/opt/netsuite/odbcclient/cert/ca3.cer
14 CustomProperties=AccountID=<accountID>;RoleID=<roleID>
15
16 [MyNewDatasource]
17 Driver=/opt/netsuite/odbcclient/lib64/ivoa27.so
18 Description=My new Sandbox ODBC datasource
19 Host=<ServiceHost>
20 Port=1708
21 ServerDataSource=NetSuite.com
22 Encrypted=1
23 AllowSinglePacketLogout=1
24 TrustStore=/opt/netsuite/odbcclient/cert/ca3.cer
25 CustomProperties=AccountID=<accountID>;RoleID=<roleID>
26
27 [ODBC]
28 Trace=0
29 IANAAppCodePage=4
30 TraceFile=odbctrace.out
31 TraceDll=/opt/netsuite/odbcclient/lib64/ddtrc27.so
32 InstallDir=/opt/netsuite/odbcclient

```



**Note:** To include the required attribute values, see the following:

The <ServiceHost>, <accountID> and <roleID> variables represent your host name, account ID, and role ID. The values are available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

## Configuring the ODBC Driver

After you installed the driver, you must specify the required connection attributes and you can also configure some additional operating system settings.

- **Connection Attributes** - To learn about the required and optional connection attributes, see the following topics:
  - [Configuring the ODBC Data Source on Windows](#)
  - [Configuring the ODBC Data Source on Linux](#)
- **Operating System Settings** - When you work with the Connect Service, you can choose to change some operating system settings. For more information, see [Operating System Settings](#).

## Connecting Using a Connection String

If you want to use a connection string to connect to NetSuite, or if your application requires it, you must specify either a DSN (data source name) or a DSN-less connection in the string.

- For a DSN connection, use the **DSN=** attribute, along with other required attributes.

- For a DSN-less connection, use the **DRIVER=** attribute, along with other required attributes.

A DSN connection string tells the driver where to find the default connection information. Optionally, you may specify **attribute=value** pairs in the connection string to override the default values stored in the data source.

## DSN connection

The DSN connection string has the form:

```
1 | DSN=data_source_name[;attribute=value[;attribute=value]...]
```

**Note:** The data source name (DSN) depends on the driver configuration. When you install the SuiteAnalytics Connect driver, the data source name is set to **NetSuite**.

For example, a connection string may look like the following. Only the data source name (DSN), user name (UID), and password (PWD) are required:

```
1 | DSN=NetSuite;UID=test@netsuite.com;PWD=<password>
```

To learn your data source name, check the values available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

For details on how to configure the ODBC Data Source on Windows, see [Configuring the ODBC Data Source on Windows](#).

## DSN-less connection

The DSN-less connection string specifies a driver instead of a data source name. All connection information must be entered in the connection string because there is no data source storing the information.

The DSN-less connection string has the form:

```
1 | DRIVER=driver_name[;attribute=value[;attribute=value]...]
```

**Note:** Empty string is the default value for attributes that use a string value unless otherwise noted.

A DSN-less connection string must provide all necessary connection information. Depending on your operating system, you must set a different value of the trust store parameter to enable the authentication with server certificates. The following examples show the connection string for the Windows and Linux operating systems:

- Connection string for Windows ODBC:

```
1 | DRIVER=NetSuite Drivers 32bit;Host=<ServiceHost>;Port=1708;Encrypted=1;AllowSinglePacketLogout=1;Truststore=sys
tem;SDSN=NetSuite.com;
2 | UID=test@netsuite.com;PWD=<password>;CustomProperties=AccountID=<accountID>;RoleID=<roleID>
```

- Connection string for Linux ODBC:

```

1 DRIVER=NetSuite Drivers 32bit;Host=<ServiceHost>;Port=1708;Encrypted=1;AllowSinglePacketLogout=1;Truststore=/opt/
netsuite/odbcclient/cert/ca3.cer;SDSN=NetSuite.com;UID=test@netsuite.com;PWD=<password>;CustomProperties=AccountID=<accoun
tID>;RoleID=<roleID>

```



**Note:** To include the required attribute values, see the following:

The <ServiceHost>, <accountID>, and <roleID> variables represent your host name, account ID, and role ID. The values are available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

For more information, see [Configuring the ODBC Data Source on Windows](#) and [Configuring the ODBC Data Source on Linux](#).



**Note:** Driver names may vary, depending on whether you use a 32-bit or the 64-bit version of the driver.

## Connection Attributes

You can modify a connection by specifying connection string options.

The basic format of a connection string includes a series of keyword/value pairs separated by semicolons. The following example shows the keywords and values for a simple connection string to connect to the SuiteAnalytics Connect server using the Windows operating system:

```

1 DRIVER=NetSuite Drivers 32bit;Host=<ServiceHost>;Port=1708;Encrypted=1;ServerDataSource=NetSuite.com;
2 Truststore=system;LogonId=test@netsuite.com;Password=<password>;AllowSinglePacketLogout=1;CustomProperties=AccountID=<accoun
tID>;RoleID=<roleID>

```



**Note:** The required value of the trust store parameter varies depending on the operating system. For more information, see [Authentication Using Server Certificates for ODBC](#).

These attributes correspond to the following fields in the driver setup dialog:

### SuiteAnalytics Connect ODBC Driver Setup Window Fields on the General Connection Attribute Tab

|                     |                   |
|---------------------|-------------------|
| Name                | DSN               |
| Account ID          | AccountID         |
| Role ID             | RoleID            |
| Service Host        | Host              |
| Service Port        | Port              |
| Service Data Source | ServiceDataSource |

| Logon to SuiteAnalytics Connect ODBC Data Source Window | Connection Attribute |
|---------------------------------------------------------|----------------------|
| User Name                                               | LogonID              |

| Logon to SuiteAnalytics Connect ODBC Data Source Window | Connection Attribute |
|---------------------------------------------------------|----------------------|
| Password                                                | Password             |

This section describes the ODBC connection attributes supported by the ODBC driver on Linux and Windows, on 32-bit and 64-bit platforms.

Connection attributes are listed alphabetically by their names that appear on the driver setup dialog. The connection string attribute name, along with its short name, is listed immediately underneath the user interface name. The list includes long and short names and provides a description of each attribute. Short names are enclosed in parentheses ( ).

In many cases, the user interface name and the attribute name are the same. However, some connection string attributes may not appear in the user interface at all.

## Custom Properties

SuiteAnalytics Connect requires two custom properties attributes: Account ID and Role ID.

### AccountID

|             |                                    |
|-------------|------------------------------------|
| Attribute   | AccountID                          |
| Description | Required. The NetSuite account ID. |
| Default     | None                               |

### Role ID

|             |                                                          |
|-------------|----------------------------------------------------------|
| Attribute   | RoleID                                                   |
| Description | Required. The NetSuite role ID for the specified account |
| Default     | None                                                     |

**i Note:** The <accountID> and <roleID> variables correspond to your account ID and role ID. The values are available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

## Uppercase

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute   | Uppercase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Description | Optional. When the record or field definitions are redefined or updated, the NetSuite2.com data source may change the case of the record type and field names. If you use the Uppercase attribute and set it to <b>1</b> , query results return record type and field names in uppercase.<br><br>If you use SuiteAnalytics Connect with applications that are case sensitive and do not support changes to lowercase or uppercase, you can use this attribute to avoid these changes and potential issues with queries. |

|              |                                                                                                                                                                                                                                                                                                                          |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <p> <b>Note:</b> The Connect Service is not case sensitive and this change does not affect your queries. The case used in your queries is not considered.</p>                                                                           |
|              | <p>For more information about the Uppercase attribute and examples of queries, see <a href="#">Using the Uppercase Attribute</a>.</p>                                                                                                                                                                                    |
| Valid Values | <p><b>0 or 1</b></p> <p>If you use this attribute, you should set it to <b>1</b>. Then, query results return record type and field names in uppercase.</p> <p>If you set it to <b>0</b>, names are not changed to uppercase and you may encounter issues if you use applications that are sensitive to case changes.</p> |
| Default      | None                                                                                                                                                                                                                                                                                                                     |

## StaticSchema

|              |                                                                                                                                                                                                                                                                                                                                                              |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | StaticSchema                                                                                                                                                                                                                                                                                                                                                 |
| Description  | Optional. The Static Data Model option provides you with the structure and the name of all available record types and fields in the NetSuite2.com data source. To use the Static Data Model in your account, you must add the StaticSchema attribute and set it to <b>1</b> . For more information, see <a href="#">Working with the Static Data Model</a> . |
| Valid Values | <p><b>0 or 1</b></p> <p>If you use this attribute, you must set it to <b>1</b>.</p>                                                                                                                                                                                                                                                                          |
| Default      | Off                                                                                                                                                                                                                                                                                                                                                          |

## OAuth2Token

|              |                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | OAuth2Token                                                                                                                                                                                                                                                                                                                                                                   |
| Description  | <p>Optional. The OAuth 2.0 feature is an authentication mechanism that enables you to use a token to access the NetSuite2.com data source.</p> <p>For more information about OAuth 2.0 and Connect, see <a href="#">OAuth 2.0 for Connect</a>.</p> <p>For more information about adding the OAuth2Token attribute, see <a href="#">Setting the OAuth2Token Attribute</a>.</p> |
| Valid Values | Authentication string                                                                                                                                                                                                                                                                                                                                                         |
| Default      | None                                                                                                                                                                                                                                                                                                                                                                          |

The list of custom properties attributes should be added in the following order:

CustomProperties=AccountID=<accountID>;RoleID=<RoleID>;Uppercase=1;StaticSchema=1;OAuth2Token=<connection string value>

## Driver

|              |                                                                                                                                |
|--------------|--------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | Driver                                                                                                                         |
| Description  | Required when DSN-less connection is used. For more details, see <a href="#">DSN-less connection</a> .                         |
| Valid Values | <ul style="list-style-type: none"> <li>■ on Windows: <b>NetSuite Drivers 32bit</b> or <b>NetSuite Drivers 64bit</b></li> </ul> |

|         |                                              |
|---------|----------------------------------------------|
|         | ■ on Linux: <b>NetSuite ODBC Drivers 7.2</b> |
| Default | None                                         |

## DSN

|              |                                                                                                             |
|--------------|-------------------------------------------------------------------------------------------------------------|
| Attribute    | DSN (DSN)                                                                                                   |
| Description  | Optional. Specifies the SuiteAnalytics Connect data source configuration name for established connections.  |
| Valid Values | A string containing the name of the DSN that is used to connect to NetSuite. For example, <b>NetSuite</b> . |
| Default      | Empty string                                                                                                |

## Encrypted (SSL)

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | Encrypted (ENC)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Description  | Required. Enables the use of SSL encryption for data exchanged with the SuiteAnalytics Connect service server. Must be included in the connection string.                                                                                                                                                                                                                                                                                                                  |
| Valid Values | <p><b>1</b></p> <p>The Connect Service works only with encrypted connections. The default value is <b>0</b>. Therefore, to establish an encrypted connection, you must set the value to <b>1</b>.</p> <p>When set to <b>1</b>, the SuiteAnalytics Connect server can establish an encrypted connection and enables users to connect.</p> <p>When set to <b>0</b>, the SuiteAnalytics Connect server cannot establish an encrypted connection and users cannot connect.</p> |
| Default      | <b>0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Password

|              |                                                                                                                                                                                                                                                                                                                                    |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | Password (PWD)                                                                                                                                                                                                                                                                                                                     |
| Description  | Required. The password used to log in to NetSuite.                                                                                                                                                                                                                                                                                 |
|              | <p> <b>Note:</b> If you log in to the Connect Service with token-based authentication (TBA), you must use a token password instead of your NetSuite account password. For more information, see <a href="#">Token Password for Connect</a>.</p> |
| Valid Values | A string containing a password used to log in to NetSuite.                                                                                                                                                                                                                                                                         |
| Default      | None                                                                                                                                                                                                                                                                                                                               |

## Service Data Source

|           |                         |
|-----------|-------------------------|
| Attribute | ServerDataSource (SDSN) |
|-----------|-------------------------|

|              |                                                                                                                         |
|--------------|-------------------------------------------------------------------------------------------------------------------------|
| Description  | Required. The name of the SuiteAnalytics Connect server data source to be used for the connection.                      |
| Valid Values | <b>NetSuite2.com</b><br>For information about the data source, see the help topic <a href="#">Connect Data Source</a> . |
| Default      | None                                                                                                                    |

## Service Host

|              |                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | Host (HST)                                                                                                                                                                                                                                                                                                                                                                      |
| Description  | Required. The TCP/IP address of the SuiteAnalytics Connect server, specified as a host name.                                                                                                                                                                                                                                                                                    |
| Valid Values | The Connect Service host name. The host name you should use for your connection is displayed in the <b>Service Host</b> field on the SuiteAnalytics Connect Driver Download page, under <b>Your Configuration</b> .<br><br>If the Hostname in Certificate attribute is used, see <a href="#">Authentication Using Server Certificates for ODBC</a> to check which value to use. |
| Default      | None                                                                                                                                                                                                                                                                                                                                                                            |

## Service Port

|              |                                                                                    |
|--------------|------------------------------------------------------------------------------------|
| Attribute    | Port (PRT)                                                                         |
| Description  | Required. The TCP/IP port on which the SuiteAnalytics Connect server is listening. |
| Valid Values | <b>1708</b>                                                                        |
| Default      | None                                                                               |

## Truststore

|              |                                                                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | Truststore (TS)                                                                                                                                                                                                                                                               |
| Description  | Required. Certificate Authorities (CAs) to be used for server authentication.                                                                                                                                                                                                 |
| Valid Values | Depending on your operating system and the driver type, you may need to update the value manually to ensure that the authentication with server certificates is enabled.<br><br>For more information, see <a href="#">Authentication Using Server Certificates for ODBC</a> . |
| Default      | None                                                                                                                                                                                                                                                                          |

## User Name

|              |                                                          |
|--------------|----------------------------------------------------------|
| Attribute    | LogonID (UID)                                            |
| Description  | Required. The string required to log in to your account. |
| Valid Values | The email used to log in to NetSuite.                    |

|         |                                                                                                                                                                                                                                  |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <p><b>Note:</b> If you log in to the Connect Service with token-based authentication (TBA), you must use <b>TBA</b> as the username value. For more information, see <a href="#">Token-based Authentication for Connect</a>.</p> |
| Default | None                                                                                                                                                                                                                             |

## Validate Server Certificate

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | ValidateServerCertificate (VSC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description  | <p>Optional. If you choose to use this connection attribute, make sure it is set to <b>1</b>.<br/>Determines whether the driver validates the certificate sent by the SuiteAnalytics Connect server. During SSL server authentication, the SuiteAnalytics Connect server sends a certificate issued by a trusted Certificate Authority (CA). This certificate is validated against the certificate files specified in the <b>Truststore</b> attribute.</p>                                                                     |
| Valid Values | <p><b>0 or 1</b><br/>If you use this attribute, it must be set to <b>1</b>.<br/>When set to <b>1</b>, the driver validates the certificate sent by the SuiteAnalytics Connect server against the certificate files specified in the <b>Truststore</b> attribute.<br/>Any certificate from the server must be issued by a trusted CA.<br/>When set to <b>0</b>, the driver does not validate the certificate sent by the database server. The driver ignores any certificates specified in the <b>TrustStore</b> attribute.</p> |
| Default      | <b>1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## AllowSinglePacketLogout

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | AllowSinglePacketLogout                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Description  | <p>Required. You must add the attribute value pair AllowSinglePacketLogout=1 to your configuration.</p> <p><b>Note:</b> NetSuite accounts are moved to NetSuite data centers built on the Oracle Cloud Infrastructure (OCI). If you do not add this attribute value pair, you may experience a delay of up to 30 seconds when you log out of your Connect session after the move. For more information, see <a href="#">Required Update of SuiteAnalytics Connect Drivers</a>.</p> |
| Valid Values | <p>You must set this attribute to <b>1</b>. You must use AllowSinglePacketLogout=1.<br/>For more information, see <a href="#">Connecting Using a Connection String</a>.</p>                                                                                                                                                                                                                                                                                                        |
| Default      | <b>0</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Authentication Using Server Certificates for ODBC

ODBC uses TLS-secured connections. Currently, only TLS 1.2 is supported. Further, we actively look for new vulnerabilities and respond as needed to new threats.

You should use authentication using server certificates. To ensure that the authentication with server certificates is enabled, check the following topics:

- Determining the Required Actions for your Driver and Operating System
- Adding the Required Security Certificates to the Certificates Store

## Determining the Required Actions for your Driver and Operating System

The following tables outlines the actions required depending on your operating system and the version of the driver you install:

| Driver                                         | Action Required                                                                                                                                                                                                                                                                          |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Windows ODBC 8.10.143.0                        | <p>No update required.</p> <p>The installer automatically updates your data sources to use the generic system trust store and account-specific domains.</p> <p>For more information on the installation, see <a href="#">Downloading and Installing the ODBC Driver for Windows</a>.</p> |
| Windows ODBC 8.10.143.0 (DSN-less connections) | Ensure that the connection attribute TrustStore=system is included in your connection string. See <a href="#">Connecting Using a Connection String</a> .                                                                                                                                 |
| Linux ODBC 8.10.143.0                          | <p>Ensure that the TrustStore parameter in your connection string includes a path to the ca3.cer certificate.</p> <p>For more information, see <a href="#">Configuring the ODBC Data Source on Linux</a> and <a href="#">Connecting Using a Connection String</a>.</p>                   |

## Adding the Required Security Certificates to the Certificates Store

To access the Connect Service, the required server certificates must be included in your Windows Trusted Root Certification Authorities store. The server certificates are usually already included. In case they are not and you are unable to connect, you can download the security certificates from the SuiteAnalytics Connect driver download page and add them manually.

### To add the required security certificates to the certificates store:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).
2. Click the **Download** button next to CA CERTIFICATES.
3. When the certificates .zip file is downloaded, extract it to any location on your computer.
4. Next, go to your Windows **Start** menu, type **mmc** in the search field and press Enter. This opens the Microsoft Management Console.
5. On the **File** menu, select **Add/Remove Snap-in**.
6. Select the **Certificates** snap-in and click **Add**.

You can set the snap-in to manage security certificates for your user account, service account, or computer account.

7. When you have finished setting up the snap-in, click **OK**.
8. In the console tree, double-click **Certificates**.
9. Right-click the **Trusted Root Certification Authorities** store and select All Tasks > Import.
10. Follow the wizard's instructions to specify the downloaded security certificate files and import them to your Trusted Root Certification Authorities store.

When the security certificates are imported, the SuiteAnalytics Connect ODBC integrations will automatically start using them when connecting to NetSuite.

## Upgrading an ODBC Driver

To upgrade from a previous version of a Connect for ODBC driver:

- If you use a Windows version of the driver, you can update the driver using the ODBC for Windows driver installer. For more information, see [ODBC Installation on Windows for Installer Only](#).
- If you use a Linux version of the driver, you must update the trust store parameter or connection string. You must remove the ca.cer and ca2.cer files and ensure that the ca3.cer file exists. For more information, see [Installing the Latest Driver on Linux](#).



**Note:** Ensure that you have the latest driver version installed and the required connection attributes. For more information, see [Required Update of SuiteAnalytics Connect Drivers](#).

## Accessing the Connect Service Using Microsoft Excel

You can use the SuiteAnalytics Connect ODBC driver to load your NetSuite data to Microsoft Excel workbooks.

There are several ways to do this:

- Run a query over a set of tables in the Connect schema and load the results to an Excel worksheet.
- Use Data Connection Wizard to load the table data to an Excel worksheet.
- Use Microsoft Query over a table or a set of tables and load the results to an Excel worksheet.

Before you can configure Microsoft Excel to pull data from the SuiteAnalytics Connect data source, you need to download and install the latest SuiteAnalytics Connect ODBC driver and make sure it is connected to your NetSuite data source. To learn how to download and install the driver, see [Downloading and Installing the ODBC Driver for Windows](#). To learn how to test your connection, see [Configuring the ODBC Data Source on Windows](#).

## Using a query

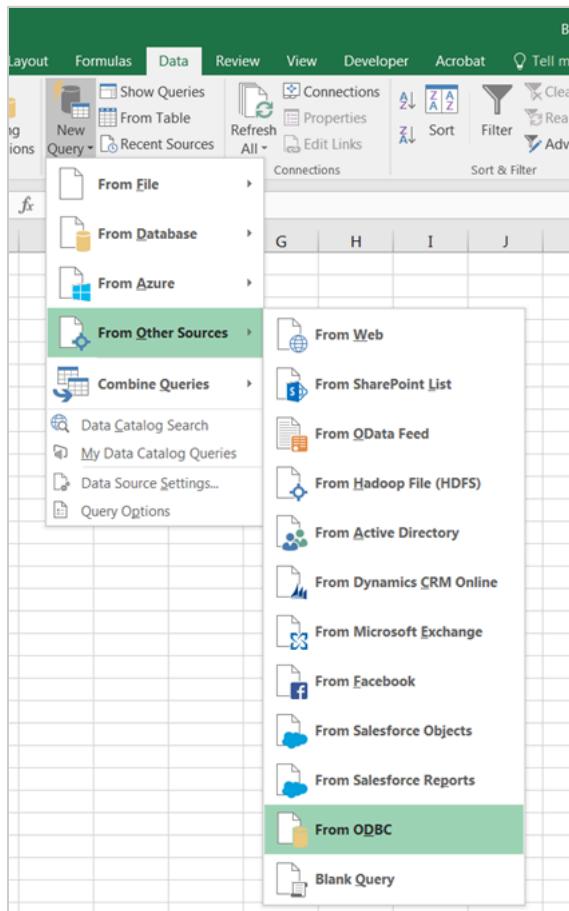
One of the most convenient ways to run a database query in Microsoft Excel is to use the New Query option. This option is available starting with Microsoft Excel version 2016. However, if you use Microsoft Excel 2010 or 2013, you can install the Power Query add-in to be able to use this option. For details, see <https://www.microsoft.com/en-us/download/details.aspx?id=39379>.



**Important:** The following instruction is based on a 32-bit SuiteAnalytics Connect ODBC driver used in conjunction with 32-bit Microsoft Excel 2016. Please note that the examples in this instruction are provided for illustrative purposes only. The tables available in your NetSuite account may vary.

## To load data using a query:

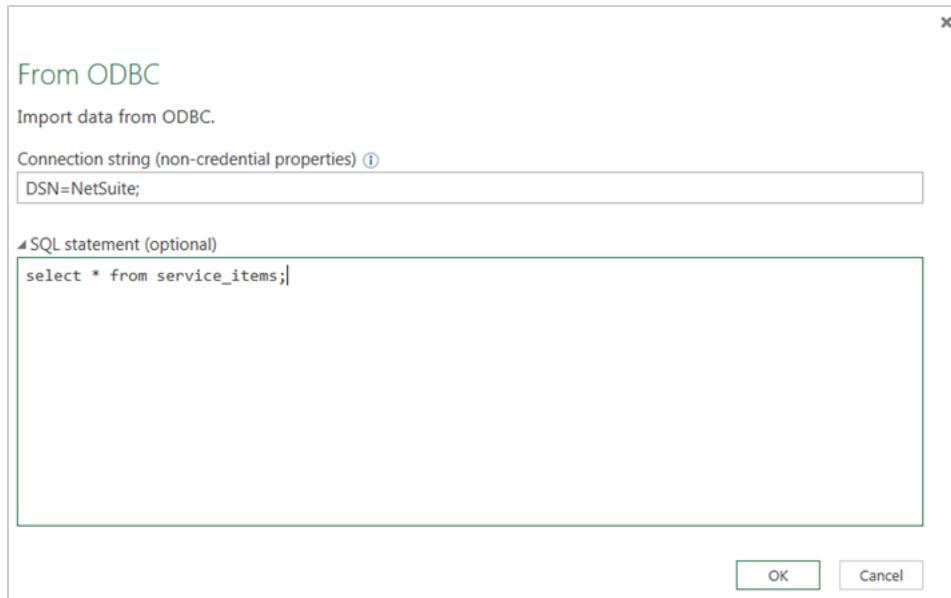
1. In Microsoft Excel, go to the **Data** tab and select **New Query > From Other Sources > From ODBC**.



2. In the connection string field, type **DSN=NetSuite**; to use the Connect driver DSN for connection. To learn how to check your NetSuite DSN, see [Configuring the ODBC Data Source on Windows](#). For DSN-less connection string options, see [Connecting Using a Connection String](#).
3. Expand the **SQL Statement** area and enter your SQL query. For example, to run a query over all columns in the Service Items table, enter **select \* from service\_items;**

To explore the tables available in the Connect schema, you can use the [Connect Browser](#). To learn more about the Connect Browser, see [Working with the Connect Browser](#).

If you don't add any query in the **SQL Statement** field, you can click **OK** and select a table or a set of tables you want to open in the Query Editor. However, there can be Excel limitations to using this option. In this case, try running the query again, adding an explicit query statement in the **SQL Statement** field.

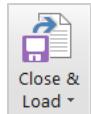


4. Click **OK**.
5. Provide your NetSuite login and password, if prompted, and click **Connect**.
6. The Query Editor opens. You can rearrange the columns in your query, removing those you do not need.

To learn more about the Query Editor, see <https://support.office.com/en-us/article/Introduction-to-the-Query-Editor-Power-Query>.

|    | NAME                                | DESCRIPTION                                                                  | CREATED               | MODIFIED             | RATE |
|----|-------------------------------------|------------------------------------------------------------------------------|-----------------------|----------------------|------|
| 1  | Cleaning                            | Cleaning                                                                     | 10/7/2003 9:10:49 PM  | 8/8/2011 7:40:58 PM  | 24   |
| 2  | Furniture Assembly                  | Assembly of furniture that does not arrive pre-assembled from the manuf      | 8/5/2008 6:41:03 PM   | 9/19/2011 3:36:22 PM | 20   |
| 3  | Interior Design                     | Design and layout services to prepare plans for the installation of furnitur | 8/5/2008 2:10:10 PM   | 7/23/2013 5:29:45 PM | 100  |
| 4  | Furniture Delivery and Installation | On-site delivery and installation of office furniture                        | 8/5/2008 4:12:35 PM   | 8/8/2011 7:40:58 PM  |      |
| 5  | Training                            | Comprehensive equipment training for up to 100 employees.                    | 12/29/2004 2:54:10 PM | 8/8/2011 7:40:58 PM  | 100  |
| 6  | Software Service 401                |                                                                              | null                  | 8/8/2011 7:40:58 PM  | 1500 |
| 7  | Software Service 202                |                                                                              | null                  | 8/8/2011 7:40:58 PM  | 1500 |
| 8  | Serving                             |                                                                              | null                  | 8/8/2011 7:40:58 PM  | 18   |
| 9  | Replacing of Dental Drill Head      |                                                                              | null                  | 8/8/2011 7:40:58 PM  | 125  |
| 10 | Drilling a hole on a wall           |                                                                              | null                  | 8/8/2011 7:40:58 PM  |      |
| 11 | Maintenance and Repair              |                                                                              | null                  | 8/8/2011 7:40:58 PM  | 50   |
| 12 | Installation                        |                                                                              | null                  | 8/8/2011 7:40:58 PM  | 50   |
| 13 | Customer Service Agreements         |                                                                              | null                  | 8/8/2011 7:40:58 PM  | 5000 |
| 14 | Basic Service Agreement             | Basic service agreements are available for fundamental needs such as plan    | 11/13/2003 5:41:38 AM | 8/8/2011 7:40:58 PM  | 5000 |
| 15 | Consultation                        |                                                                              | null                  | 8/8/2011 7:40:58 PM  | 50   |
| 16 | X-Ray Processing                    | Standard X-Ray Processing                                                    | 11/13/2003 5:21:16 AM | 3/5/2015 2:05:37 PM  | 68.8 |
| 17 | Medical Directory Listing           | Fees for listing professionals in the Medical Directory                      | 11/13/2003 5:18:23 AM | 7/23/2012 6:43:14 PM | 200  |
| 18 | Comprehensive Service Agreement     | Comprehensive service agreements deliver value-focused programs for yo       | 11/13/2003 5:41:39 AM | 8/8/2011 7:40:58 PM  | 6000 |
| 19 | null price item                     |                                                                              | null                  | 10/7/2011 1:34:42 AM | null |
| 20 | Furniture Consultation              | Consultation to determine services and items needed for a project. May ir    | 8/5/2008 4:09:43 PM   | 8/8/2011 7:40:58 PM  |      |
| 21 | Service Item 1                      |                                                                              | null                  | 7/26/2013 4:58:03 PM | 100  |

7. When ready, click **Close & Load** to load your query data to your Excel workbook. By default, your data will be loaded to a new worksheet. For more options, expand this menu and click **Close & Load To**.



**Note:** Due to an Oracle limitation, queries over SuiteAnalytics Connect schema tables including more than 999 fields will not run. This may happen when querying over tables that have many custom fields or when joining multiple tables in a single query and trying to retrieve all their fields. For example, if you add too many custom fields to the Transaction record type, exceeding the 999 fields per table limit, you may get the following error: "Error: Could not find any column information for table:transactions".

## Using Data Connection Wizard or Microsoft Query

You can also connect to the NetSuite data source using the Data Connection Wizard or Microsoft Query and select the tables you would like to import into your Excel workbook. In this case, you can choose whether to display the imported data as a table, a PivotTable report, or a PivotChart. To learn more about Data Connection Wizard and Microsoft Query, please refer to <https://support.office.com/en-us/article/Overview-of-connecting-to-importing-data>.

# Accessing the Connect Service Using a JDBC Driver

Installing a Connect JDBC driver enables you to connect a Java application to the Connect Service. The Connect JDBC driver is a database driver implementation that enables you to use JDBC API to communicate with the SuiteAnalytics Connect service. The advantages of this type of driver include:

- Provides Java platform independence.
- Offers a direct connection from the client application to the Connect Service.

The following table lists the tasks you must complete to set up your environment, download, and install the JDBC driver.

| Task                                                                                                | Description                                                                                                                                |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Verify the installation prerequisites.                                                              | For more information, see <a href="#">Installation Prerequisites</a> .                                                                     |
| Download and install the driver.                                                                    | For more information, see <a href="#">Installing the JDBC Driver for Windows</a> or <a href="#">Installing the JDBC Driver for Linux</a> . |
| Register the JDBC driver in your environment by adding the JAR file location to your class path.    | For more information, see the help topic <a href="#">Configuring the JDBC Driver</a> .                                                     |
| Optionally, you can enable authentication with server certificates for the Connect for JDBC driver. | For more information, see <a href="#">Authentication Using Server Certificates for JDBC</a> .                                              |

## Prerequisites

Before you begin the download and installation process, complete the following tasks:

- Ensure that the Java Virtual Machine (JVM) is installed on your computer. The latest version of the SuiteAnalytics Connect JDBC driver requires at least Java SE 8.
- Check the general installation prerequisites. See [Installation Prerequisites](#).
- To connect to the NetSuite account, environment, and role that you used to log in, your JDBC data source configuration must match the values available under **Your Configuration** on the SuiteAnalytics Connect Driver Download page. For more information, see [Connect Driver Download Page](#).

For more information, see [Prerequisites for Using the Connect Service](#).

## Installing the JDBC Driver for Windows

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

The binary and the download package are the same for both 32-bit and 64-bit JDBC drivers. No installation bundle exists for JDBC drivers, only an installer package. If you are using a Windows operating system, you can use either an .exe install package or a .zip file.

### To install the JDBC Driver for Windows:

1. In the Settings portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. For more information about the **Settings** portlet, see the help topic [Finding Your Settings Portlet](#).



**Note:** If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).

2. In the upper left corner, select your platform.
3. Click the **Download** button next to the JDBC Driver.

After you downloaded the Connect driver, ensure that you install it as local administrator. If you install the driver on Windows as domain administrator, the installation process may fail.

4. Run the installer and follow the instructions.
5. After the installation process has finished, locate the NQjc.jar file. This file contains the driver that you can register in your Java environment.
6. To complete the process, add the location of the NQjc.jar file to your class path.

For more information, see [JDBC Code Examples](#).

After you installed the driver, you must specify the connection attributes. For more information, see [Configuring the JDBC Driver](#).

For information about the supported Windows versions, see [Supported Windows Versions](#).

## Installing the JDBC Driver for Linux

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

The binary and the download package are the same for both 32-bit and 64-bit JDBC drivers. No installation bundle exists for JDBC drivers, only an installer package. For a Linux operating system, you must use a .zip file to install the JDBC driver. In the install procedure, you use the install package to extract the .jar file from the package.

### To install the JDBC driver for Linux:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. For more information about the **Settings** portlet, see the help topic [Finding Your Settings Portlet](#).



**Note:** If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).

2. In the upper left corner, select your platform.
3. Click the **Download** button next to the JDBC Driver.
4. Agree to the terms of service to be able to start the download. You cannot download the driver archive unless you agree to the terms of service.
5. Save the installation .zip file to your computer.
6. When the download is complete, extract the content of the .zip file to your desired location.
7. In the location where you extracted the content of the .zip file, locate the NQjc.jar file. This file contains the driver that you can register in your Java environment by adding the NQjc.jar file to your class path. For more information, see [JDBC Code Examples](#).

After you installed the driver, you must specify the connection attributes. For more information, see [Configuring the JDBC Driver](#).

## Installing the JDBC Driver for OS X

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

For a OS X operating system, you must use a .zip file to install the JDBC driver.

### To install the JDBC driver for OS X:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. For more information about the **Settings** portlet, see the help topic [Finding Your Settings Portlet](#).



**Note:** If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).

2. In the upper left corner, select **OS X**.
3. Click the **Download** button next to the JDBC Driver.
4. Agree to the terms of service to be able to start the download. You cannot download the driver archive unless you agree to the terms of service.
5. Save the installation .zip file to your computer.
6. When the download is complete, extract the content of the .zip file to your desired location.

After you installed the driver, you must specify the connection attributes. For more information, see [Configuring the JDBC Driver](#).

## Configuring the JDBC Driver

After you installed the driver, you must specify the required connection properties and you can also configure some additional operating system settings.

- **Connection Properties** - To learn about the required and optional connection properties, see [Specifying Connection Properties](#).
- **Operating System Settings** - When you work with the Connect Service, you can choose to change some operating system settings. For more information, see [Operating System Settings](#).

## Specifying Connection Properties

You can specify connection properties using a connection URL, the JDBC Driver Manager, or JDBC data sources. For a list of the connection properties, see [JDBC Connection Properties](#).

### Using the Connection URL

The following example shows a typical SuiteAnalytics Connect JDBC driver connection URL:

```
jdbc:ns://<ServiceHost>:1708;ServerDataSource=NetSuite2.com;Encrypted=1;NegotiateSSLClose=false;CustomProperties=(AccountID=<accountID>;<roleID>=<roleID>);
```



**Note:** The <ServiceHost>, <accountID>, and <roleID> variables correspond to your host name, account ID, and role ID. The values are available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

The user and password connection properties are not shown. These properties are usually specified in the connection properties stored in the java.util.Properties object. Alternatively, they can be supplied as parameters to the getConnection() method.

The connection properties used in this connection URL correspond to the following fields on the SuiteAnalytics Connect Driver Download page under **Your Configuration**.

| Field               | Connection Property          |
|---------------------|------------------------------|
| Service Host        | ServerName                   |
| Service Port        | PortNumber                   |
| Service Data Source | ServerDataSource             |
| Account ID          | CustomProperties (AccountID) |
| Role ID             | CustomProperties (RoleID)    |

For examples of connection URLs, see [Connection URL Used with JDBC Driver Manager Example](#).

## Using the JDBC Driver Manager

In order of precedence, you can specify connection properties using:

- **getConnection(url, user, password)**, where **user** and **password** are specified using the **getConnection** method defined in **java.sql.DriverManager**.

```
1 | DriverManager.getConnection(connectionURL, user, password);
```

- **java.util.properties** object.

```
1 | DriverManager.getConnection(connectionURL, (java.util.Properties) properties);
```

- Connection URL specified using the URL parameter of the **getConnection** method defined in **java.sql.DriverManager**.

```
1 | DriverManager.getConnection(connectionURL)
```

For details, see [JDBC Code Examples](#).

## Using JDBC Data Sources

In order of precedence, you can specify connection properties using:

- **getConnection(user, password)**, where **user** and **password** are specified using the **getConnection** method defined in **javax.sql.DataSource**.

```
1 | getConnection("test@netsuite.com", "<password>")
```

- JDBC DataSource object.

For details, see [JDBC Data Source Example](#).

## JDBC Connection Properties

This section lists the JDBC connection properties supported by the SuiteAnalytics Connect service and describes each property. The properties have the form:

```
1 | property = value
```

Connection property names are not case sensitive: they may contain both lowercase and uppercase letters.



**Note:** You must ensure that you have removed the "ciphersuites" parameter from your connection URL. The JDBC server automatically selects the appropriate cipher suite for authentication. If your connection URL contains a cipher suite, you are unable to access the Connect Service.

For information about supported cipher suites in NetSuite, see the help topic [Supported TLS Protocol and Cipher Suites](#).

## CustomProperties

SuiteAnalytics Connect requires two custom properties: AccountID and RoleID.

### AccountID

|             |                                    |
|-------------|------------------------------------|
| Description | Required. The NetSuite account ID. |
| Default     | None                               |

### RoleID

|             |                                                           |
|-------------|-----------------------------------------------------------|
| Description | Required. The NetSuite role ID for the specified account. |
| Default     | None                                                      |

### Uppercase

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute   | Uppercase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Description | <p>Optional. When the record or field definitions are redefined or updated, the NetSuite2.com data source may change the case of the record type and field names. If you use the Uppercase attribute and set it to <b>1</b>, query results return record type and field names in uppercase.</p> <p>If you use SuiteAnalytics Connect with applications that are case sensitive and do not support changes to lowercase or uppercase, you can use this attribute to avoid these changes and potential issues with queries.</p> |

|              |                                                                                                                                                                                                                                                                                                                          |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <p> <b>Note:</b> The Connect Service is not case sensitive and this change does not affect your queries. The case used in your queries is not considered.</p>                                                                           |
|              | <p>For more information about the Uppercase attribute and examples of queries, see <a href="#">Using the Uppercase Attribute</a>.</p>                                                                                                                                                                                    |
| Valid Values | <p><b>0 or 1</b></p> <p>If you use this attribute, you should set it to <b>1</b>. Then, query results return record type and field names in uppercase.</p> <p>If you set it to <b>0</b>, names are not changed to uppercase and you may encounter issues if you use applications that are sensitive to case changes.</p> |
| Default      | None                                                                                                                                                                                                                                                                                                                     |

## StaticSchema

|              |                                                                                                                                                                                                                                                                                                                                                            |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | StaticSchema                                                                                                                                                                                                                                                                                                                                               |
| Description  | <p>Optional. The Static Data Model option provides you with the structure and the name of all available record types and fields in the NetSuite2.com data source. To use the Static Data Model in your account, you must add the StaticSchema attribute and set it to 1. For more information, see <a href="#">Working with the Static Data Model</a>.</p> |
| Valid Values | <p><b>0 or 1</b></p> <p>If you use this attribute, you must set it to <b>1</b>.</p>                                                                                                                                                                                                                                                                        |
| Default      | Off                                                                                                                                                                                                                                                                                                                                                        |

## OAuth2Token

|              |                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | OAuth2Token                                                                                                                                                                                                                                                                                                                                                                   |
| Description  | <p>Optional. The OAuth 2.0 feature is an authentication mechanism that enables you to use a token to access the NetSuite2.com data source.</p> <p>For more information about OAuth 2.0 and Connect, see <a href="#">OAuth 2.0 for Connect</a>.</p> <p>For more information about adding the OAuth2Token attribute, see <a href="#">Setting the OAuth2Token Attribute</a>.</p> |
| Valid Values | Authentication string                                                                                                                                                                                                                                                                                                                                                         |
| Default      | None                                                                                                                                                                                                                                                                                                                                                                          |

The list of custom properties attributes should be added in the following order:

```
CustomProperties=(AccountID=<accountID>;RoleID=<RoleID>;Uppercase=1;StaticSchema=1;OAuth2Token=<connection string value>)
```

## Encrypted

|              |                                                                                                                                                            |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Required. Enables the use of SSL encryption for the data exchanged with the SuiteAnalytics Connect service server. Must be included in the connection URL. |
| Valid Values | <b>1</b>                                                                                                                                                   |
| Example      | <code>jdbc:ns://&lt;ServiceHost&gt;:1708;encrypted=1</code>                                                                                                |

|           |          |
|-----------|----------|
| Default   | <b>0</b> |
| Data type | boolean  |

**i Note:** The <ServiceHost> variable corresponds to your host name. This value is available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

## Password

|             |                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------|
| Description | Required. The password used to log in to NetSuite.                                                                        |
| Example     | For examples of using this connection property with the getConnection attribute, see <a href="#">JDBC Code Examples</a> . |
| Default     | None                                                                                                                      |
| Data type   | String.<br>You should use the getConnection() method instead of typing the password directly into the connection string.  |

## PortNumber

|              |                                                                                    |
|--------------|------------------------------------------------------------------------------------|
| Description  | Required. The TCP/IP port on which the SuiteAnalytics Connect server is listening. |
| Valid Values | <b>1708</b>                                                                        |
| Default      | None                                                                               |
| Data type    | String                                                                             |

## ServerDataSource

|              |                                                                                                      |
|--------------|------------------------------------------------------------------------------------------------------|
| Description  | Required. The name of the SuiteAnalytics Connect server data source to be used for the connection.   |
| Valid Values | <b>NetSuite2.com</b>                                                                                 |
|              | For more information about the data source, see the help topic <a href="#">Connect Data Source</a> . |
| Default      | None                                                                                                 |
| Data type    | String                                                                                               |

## ServerName

|              |                                                                                                                                                                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Required. The TCP/IP address of the SuiteAnalytics Connect server, specified as a host name.                                                                                                                        |
| Valid Values | The Connect Service host name. The host name you should use for your connection is displayed in the <b>Service Host</b> field on the SuiteAnalytics Connect Driver Download page, under <b>Your Configuration</b> . |
| Default      | None                                                                                                                                                                                                                |

|           |        |
|-----------|--------|
| Data type | String |
|-----------|--------|

## TrustStore

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | <p>Optional. If specified, the property should contain the path to a valid truststore containing the security certificates to be used for server authentication.</p> <p><b>Note:</b> The certificates provided on the SuiteAnalytics Connect driver download page are usually already included in the internal Java truststore. In this case, it is not required to add the TrustStore attribute to the connection string.</p> <p>Specifies the directory of the truststore file to be used when SSL is enabled using the <b>Encrypted</b> property and when service authentication is used. The truststore file contains a list of the Certificate Authorities (CAs) that the client trusts. This value overrides the directory of the Java truststore file specified by the javax.net.ssl.trustStore Java system property. If this property is not specified, the truststore directory is specified by the javax.net.ssl.trustStore Java system property.</p> <p>The truststore file is a Java keystore file, generated by the keytool utility, which is a part of the JDK. For more information on configuring a truststore using the keytool utility, see <a href="#">Authentication Using Server Certificates for JDBC</a> and <a href="http://docs.oracle.com/cd/E19509-01/820-3503/6nf1l6er/index.html">http://docs.oracle.com/cd/E19509-01/820-3503/6nf1l6er/index.html</a>.</p> <p>The TrustStore property is ignored if the <b>ValidateServerCertificate</b> property is set to <b>false</b>.</p> |
| Valid Values | A string containing the path to a truststore file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Default      | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Data type    | String                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## User

|              |                                                          |
|--------------|----------------------------------------------------------|
| Description  | Required. The email used to log in to NetSuite.          |
| Valid Values | A string containing an email used to log in to NetSuite. |
| Default      | None                                                     |
| Data type    | String                                                   |

## ValidateServerCertificate

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | <p>Optional. If you choose to use this connection property, make sure it is set to <b>true</b>.</p> <p>Determines whether the driver validates the certificate sent by the SuiteAnalytics Connect server. During SSL server authentication, the SuiteAnalytics Connect server sends a certificate issued by a trusted Certificate Authority (CA). The required CAs are usually included in the Java truststore, but you can also specify them using the <b>TrustStore</b> property.</p>                                       |
| Valid Values | <p><b>true</b> or <b>false</b></p> <p>If you use this property, it must be set to <b>true</b>.</p> <p>When set to <b>true</b>, the driver validates the certificate sent by the SuiteAnalytics Connect server. Any certificate from the server must be issued by a trusted CA in the truststore file.</p> <p>When set to <b>false</b>, the driver does not validate the certificate sent by the SuiteAnalytics Connect server. The driver ignores any truststore information specified by the <b>TrustStore</b> property.</p> |
| Default      | <b>true</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|           |         |
|-----------|---------|
| Data type | Boolean |
|-----------|---------|

## NegotiateSSLClose

|              |                                                                                                                                                                                                                                                                                                                                                                            |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Required. You must use the attribute value pair NegotiateSSLClose=false.                                                                                                                                                                                                                                                                                                   |
|              | <p><b>Note:</b> NetSuite accounts are moved to NetSuite data centers built on the Oracle Cloud Infrastructure (OCI). If you do not add this attribute value pair, you may experience a delay of up to 30 seconds when you log out of your Connect session after the move. For more information, see <a href="#">Required Update of SuiteAnalytics Connect Drivers</a>.</p> |
| Valid Values | You must set this attribute to <b>false</b> . You must use NegotiateSSLClose=false.                                                                                                                                                                                                                                                                                        |
| Default      | <b>true</b>                                                                                                                                                                                                                                                                                                                                                                |
| Data type    | String                                                                                                                                                                                                                                                                                                                                                                     |

## JDBC Code Examples

To use the Connect for JDBC driver when writing your own application, the NQjc.jar file needs to be on the Classpath. The Connect for JDBC driver provides two primary options for connecting to the Connect Service: using a connection URL in conjunction with the JDBC Driver Manager and using the JDBC DataSource class. The two approaches produce the same results.

For more information and examples, see the following topics:

- [Connection URL Used with JDBC Driver Manager Example](#)
- [JDBC Data Source Example](#)

**Note:** The installation package contains additional code examples.

### Connection URL Used with JDBC Driver Manager Example

You can use code like the following example to connect through a connection URL used with JDBC Driver Manager. Replace sample values with the values available under **Your Configuration** on the SuiteAnalytics Connect Driver Download page. For more information, see [Connect Driver Download Page](#) section.

```

1 import java.sql.Connection;
2 import java.sql.DriverManager;
3
4 public class ConnectionTest
5 {
6     public static void main(String[] args) throws Exception
7     {
8         Connection connection = null;
9         try
10     {
11         Class.forName("com.netsuite.jdbc.openaccess.OpenAccessDriver");
12         String connectionURL =
13             "jdbc:ns://<ServiceHost>:1708;" +
14             "ServerDataSource=NetSuite.com;" +
15             "Encrypted=1;" +
16             "NegotiateSSLClose=false;" +
17             "CustomProperties=(AccountID=<accountID>;RoleID=<roleID>)" ;
18         connection = DriverManager.getConnection(connectionURL, "User", "Password");

```

```

19     System.out.println("Connection success");
20 }
21 finally
22 {
23     if (connection != null)
24         connection.close();
25 }
26 }
27 }
```

**Note:** The <ServiceHost>, <accountID>, and <roleID> variables correspond to your host name, account ID, and role ID. The values are available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

## JDBC Data Source Example

You can use code like the following example to connect through JDBC Data Source. Replace bold text with the values available under **Your Configuration** on the SuiteAnalytics Connect Driver Download page. For more information, see [Connect Driver Download Page](#) section.

```

1 import com.netsuite.jdbcx.openaccess.OpenAccessDataSource;
2 import java.sql.Connection;
3
4 public class ConnectionTest
5 {
6     public static void main(String[] args) throws Exception
7     {
8         Connection connection = null;
9         try
10        {
11             OpenAccessDataSource sds = new OpenAccessDataSource();
12             sds.setServerDataSource("NetSuite2.com");
13             sds.setServerName("<ServiceHost>");
14             sds.setPortNumber(1708);
15             sds.setCustomProperties("(AccountID=<accountID>;RoleID=<roleID>)"); 
16             sds.setEncrypted(true);
17             sds.setNegotiateSSLClose("false");
18             connection = sds.getConnection("User", "Password");
19         }
20     finally
21     {
22         if (connection != null)
23             connection.close();
24     }
25 }
26 }
```

**Note:** The <ServiceHost>, <accountID>, and <roleID> variables correspond to your host name, account ID, and role ID. The values are available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

## Authentication Using Server Certificates for JDBC

JDBC uses TLS-secured connections. Currently, only TLS 1.2 is supported. Further, we actively look for new vulnerabilities and respond as needed to new threats.

You should use authentication with server certificates. Java truststore files usually include the required security certificate, so it is not required to set up a new truststore for them.

However, if your Java truststore does not include the required certificate, you can download it from the SuiteAnalytics Connect drivers download page. Then you can use the Java keytool utility to create a new truststore for the certificate or import it into your Java truststore. To learn more about the keytool utility and setting up truststores, see [docs.oracle.com/cd/E19509-01/820-3503/6nf1il6er/index.html](https://docs.oracle.com/cd/E19509-01/820-3503/6nf1il6er/index.html). You can also use the following instructions for reference.

### To create a new truststore:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).
  2. Click the **Download** button next to CA CERTIFICATES.
  3. When the certificates .zip file is downloaded, extract the ca3.cer file to any location on your computer.
  4. Find the keytool utility. It is usually located in the \bin folder inside your Java installation folder, for example, C:\Program Files\Java\jdk1.7.0\_71\bin\.
- If you have multiple Java versions installed, choose the keytool utility for the Java version you use with the SuiteAnalytics Connect JDBC driver.
5. Run the keytool utility, using the following command to create a new truststore. Replace CertificatesFolder with the path to the folder where you extracted the downloaded certificate and TrustStoreLocation with the path where you want to create the new truststore.

```
1 | keytool -import -file "CertificatesFolder\ca3.cer" -alias nsca3 -keystore "TrustStoreLocation\NSCA"
```

This will create an NSCA truststore in the location you specified.

6. When you have created the new truststore and imported the certificate, modify your JDBC driver connection strings, adding the TrustStore property. The TrustStore property should contain the path to the truststore that you have just created.

For example, if you created the NSCA truststore in C:\Program Files\NetSuite\, your connection URL should look like the following:

```
1 | jdbc:ns://<ServiceHost>:1708;ServerDataSource=NetSuite2.com;Encrypted=1;TrustStore=C:\\\\Program Files\\\\NetSuite\\\\NSCA;customProperties=(AccountID=<accountID>;RoleID=<roleID>);
```



**Note:** The <ServiceHost>, <accountID>, and <roleID> variables correspond to your host name, account ID, and role ID. The values are available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

Alternatively, you can add the certificate to your Java truststore. In this case, you do not have to add the TrustStore property to your connection URL.

### To add the certificate to your Java truststore:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).

2. Click the **Download** button next to CA CERTIFICATES.
3. When the certificates .zip file is downloaded, extract the ca3.cer file to any location on your computer.
4. Find the keytool utility. It is usually located in the \bin folder inside your Java installation folder, for example, C:\Program Files\Java\jdk1.7.0\_71\bin\.  
If you have multiple Java versions installed, choose the keytool utility for the Java version you use with the SuiteAnalytics Connect JDBC driver.
5. Run the keytool utility, using the following command to add the first certificate, ca.cer, to your Java truststore. Replace CertificatesFolder with the path to the folder where you extracted the downloaded certificates and JavaTrustStore with the path to the \lib\security\cacerts file in your Java installation folder, for example, C:\Program Files\Java\jdk1.7.0\_71\lib\security\cacerts. You may also need to specify the truststore password to access your Java truststore.

```
1 | keytool -import -file "CertificatesFolder\ca3.cer" -alias nsca3 -keystore "JavaTrustStore"
```

If you added the ca3.cer certificate to your Java truststore, you do not have to add the TrustStore property to your connection URLs.

For more information about the supported and unsupported cipher suites in NetSuite, see the help topic [Supported TLS Protocol and Cipher Suites](#).

# Accessing the Connect Service Using an ADO.NET Data Provider

The SuiteAnalytics Connect for ADO.NET data provider enables you to access the Connect Service from the Microsoft .NET platform. This type of data provider is appropriate for multi-tier architectures where you want to perform more complex data processing and analysis. Using a Connect ADO.NET data provider provides increased scalability for applications. The two main components of ADO.NET for accessing and manipulating data are the .NET Framework data providers and the DataSet. You can incorporate the Connect Service as one data source (of possibly multiple data sources) in to your ADO.NET schema.

The following table lists the tasks you must complete to set up your environment, download, and install the ADO.NET driver.

| Task                                                           | Description                                                                                      |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Verify the installation prerequisites.                         | For more information, see <a href="#">Prerequisites for Using the Connect Service</a> .          |
| Review the configuration values for the connection.            | For more information, see <a href="#">Review the ADO.NET Data Server Configuration</a> .         |
| Download and install the driver.                               | For more information, see <a href="#">Downloading and Installing the ADO.NET Driver</a> .        |
| Set up your environment to connect with ADO.NET.               | For more information, see <a href="#">Connecting with the ADO.NET Data Provider</a> .            |
| Set up the connection properties for ADO.NET.                  | For more information, see <a href="#">ADO.NET Connection Options</a> .                           |
| (Optional) Enable the authentication with server certificates. | For more information, see <a href="#">Authentication Using Server Certificates for ADO.NET</a> . |



**Note:** The ADO.NET data provider automatically uses server certificates authentication.

## Prerequisites

Before you download and install the driver, make sure that:

- You have both the .NET Framework 2.0 and .NET Framework 4.5 or newer.
- You use either of the following Visual Studio versions: Visual Studio 2012, 2013, or 2015.
- Port 1708 is not blocked by firewall.



**Note:** The installation does not add the data provider to the Global Assembly Cache.

## Review the ADO.NET Data Server Configuration

To connect to the NetSuite account, environment, and role you used to log in, your connection parameters must match the values listed under **Your Configuration** on the SuiteAnalytics Connect Driver Download page. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

| Parameters          | Value                                                                                                                                                                                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Service Host        | The host name you should use for your connection is displayed in the <b>Service Host</b> field on the SuiteAnalytics Connect Driver Download page, under <b>Your Configuration</b> . |
| Service Port        | 1708                                                                                                                                                                                 |
| Service Data Source | NetSuite2.com                                                                                                                                                                        |
| Account ID          | See your SuiteAnalytics Connect Driver Download page.                                                                                                                                |
| Role ID             | See your SuiteAnalytics Connect Driver Download page.                                                                                                                                |

The value of the Service Host configuration parameter determines the environment of your NetSuite account. The environment can be Production, Release Preview, or Sandbox. The host name you should use for your connection is displayed in the **Service Host** field on the SuiteAnalytics Connect Driver Download page, under **Your Configuration**.

For information about the data source, see [Connect Data Source](#).

## Downloading and Installing the ADO.NET Driver

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

The following steps provide instructions to install a SuiteAnalytics Connect ADO.NET driver. For more information on downloading the ADO.NET driver, see [Getting Started with SuiteAnalytics Connect](#).

### To install the ADO.NET driver:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. For more information about the **Settings** portlet, see the help topic [Finding Your Settings Portlet](#).

 **Note:** If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).

2. In the upper left corner, select your Windows platform.
3. Click the **Download** button next to the ADO.NET Driver.  
After you downloaded the Connect driver, ensure that you install it as local administrator. If you install the driver on Windows as domain administrator, the installation process may fail.
4. Run the **NetSuiteADO.NETDrivers\_Windows.exe** installer.
5. Follow the wizard's instructions to complete the installation.

When the installation is complete, you should register the `NetSuite.SuiteAnalyticsConnect.dll` data provider library in the Global Assembly Cache. You can register the library using Windows command prompt or the `VsUtil` tool found in the driver installation folder. Alternatively, you can include the `NetSuite.SuiteAnalyticsConnect.dll` library directly in your project, by using it in your .NET environment or embedding it in your custom application.

### To register the data provider using the VsUtil tool:

1. Locate the `VsUtil.exe` file. It is usually installed in the ADO.NET driver installation folder. The default location on a 64-bit Windows is `C:\Program Files (x86)\NetSuite\NetSuite ADO.NET Drivers`.
2. At the command prompt, run the following as administrator, in the folder where `VsUtil.exe` is installed:

```
vsutil.exe -i
```

To learn about other installation options, run VsUtil.exe without any parameters.

3. The VsUtil tool does the following:

- Registers the NetSuite.SuiteAnalyticsConnect.dll data provider library in the Global Assembly Cache.
- Installs the Visual Studio extension that enables you to connect your Visual Studio environment to the SuiteAnalytics Connect service.
- Adds C# and Visual Basic templates to your Visual Studio library.

When the VsUtil tool finishes running, you can connect your Visual Studio environment to the SuiteAnalytics Connect service. To learn more, see [Connecting with the ADO.NET Data Provider](#).

## Connecting with the ADO.NET Data Provider

You can use the ADO.NET data provider to access the Connect Service from your Visual Studio environment or your ADO.NET application.

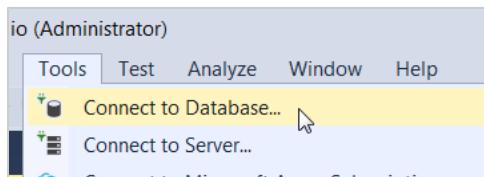
### Connecting from Visual Studio

Before you can start using the ADO.NET data provider in your Visual Studio projects, you should set up a connection from your Visual Studio environment to the SuiteAnalytics Connect service.

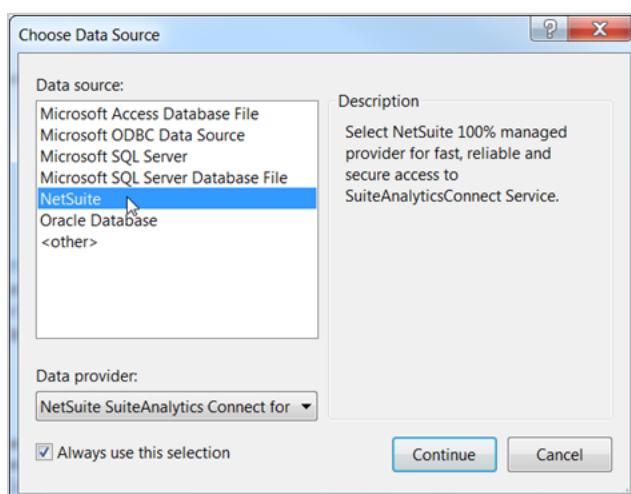
Please note that the following steps are not supported in the Express editions of Visual Studio.

#### To set up a connection:

1. Open your Visual Studio environment.
2. On the **Tools** menu, click **Connect to Database**.



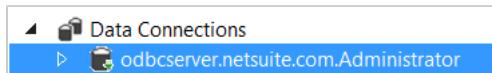
3. In the **Choose Data Source** window, select **NetSuite** and click **Continue**.



4. Fill in the **Host, Port**, and **Data Source** fields, using the values found in **Your Configuration** area on the SuiteAnalytics Connect Driver Download page. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

In the **User ID** and **Password** fields, type the email and password you use to log in to NetSuite.

5. Click **Advanced**.
6. In the **Advanced Properties** window, edit the following fields:
  - **Custom Properties** – Type **AccountID=your Account ID;RoleID=your Role ID**, using your NetSuite Account ID and Role ID values available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).
  - **EncryptionMethod** – Type **SSL**.
- When ready, click **OK**.
7. Test your connection settings by clicking **Test Connection**.
8. When you have connected successfully, click **OK** to save this connection in your environment.
9. The connection appears in your Visual Studio Server Explorer as an active connection.



You may need to refresh this connection after you close and reopen your Visual Studio environment.

## Connecting from an ADO.NET application

As a starting point, you can use the following example as a template for connecting to the Connect Service.

### To connect using the Common Programming Model:

1. Register the driver `NetSuite.SuiteAnalyticsConnect.dll` file in the Global Assembly Cache or, alternatively, include this file directly in your project. To learn how to register your driver file using the `VsUtil.exe` tool, see [Downloading and Installing the ADO.NET Driver](#).
2. You can use code like the following example to utilize ADO.NET connectivity in your application. Replace the bold values with the values in [Review the ADO.NET Data Server Configuration](#).

```

1  using System;
2  using System.Data;
3  using NetSuite.SuiteAnalyticsConnect;
4
5  namespace AdoExample
6  {
7      class AdoExample
8      {
9          public static void Main(string[] args)
10         {
11             string connectionString =
12                 "Host=<ServiceHost>" +
13                 "Port=1708;" +
14                 "ServerDataSource=NetSuite.com;" +
15                 "User Id=test@netsuite.com;" +
16                 "Password=<password>" +
17                 "CustomProperties='AccountID=<accountID>;RoleID=<roleID>;EncryptionMethod=SSL';"
18         }
19     }
20 }
```

```

19     using (OpenAccessConnection connection = new OpenAccessConnection(connectionString))
20     {
21         Connection.Open();
22         Console.WriteLine("Connection successful");
23     }
24 }
25 }
26 }
```

**Note:** The <ServiceHost>, <accountID>, and <roleID> variables correspond to your host name, account ID and role ID. The values are available on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

In addition, you can check out sample code examples in the SuiteAnalytics Connect ADO.NET data provider installation folder. The default location on a 64-bit Windows is C:\Program Files (x86)\NetSuite \NetSuite ADO.NET Drivers. If you used the VsUtil tool to register the data provider, the C# and Visual Basic templates should be available in your Visual Studio templates library.

## ADO.NET Connection Options

You can modify a connection by specifying connection string options.

The basic format of a connection string includes a series of option/value pairs separated by semicolons. The following example shows the connection options and values for a simple connection string to connect to the SuiteAnalytics Connect service:

```
Host=<ServiceHost>;Port=1708;EncryptionMethod=SSL;ServerDataSource=NetSuite.com;
UserID=test@netsuite.com;Password=<password>;CustomProperties='AccountID=<accountID>;RoleID=<roleID>';
```

**Note:** The <ServiceHost>, <accountID>, and <roleID> variables correspond to your host name, account ID, and role ID.

The connection options used in this connection string correspond to the following fields on the SuiteAnalytics Connect Driver Download page under **Your Configuration**. You can access the SuiteAnalytics Connect Driver Download page using the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. For more information, see the help topic [Finding Your Settings Portlet](#).

| SuiteAnalytics Connect Driver Download Page | Connection Attribute         |
|---------------------------------------------|------------------------------|
| Service Host                                | ServerName                   |
| Service Port                                | PortNumber                   |
| Service Data Source                         | ServiceDataSource            |
| Account ID                                  | CustomProperties (AccountID) |
| Role ID                                     | CustomProperties (RoleID)    |

Use the following guidelines when specifying a connection string:

- Connection string option names are not case-sensitive. For example, you can use **Password** or **password** as the connection option name. However, the values for the **User ID** and **Password** connection options may be case-sensitive.

- Special characters can be used in the value of the connection string option. If a value contains special characters, enclose it in single quotation marks ('example').

## CustomProperties

SuiteAnalytics Connect requires two custom properties connection options:

- Account ID** – your NetSuite account ID.
- Role ID** – the NetSuite role ID for the specified account.

## Uppercase

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | Uppercase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Description  | <p>Optional. When the record or field definitions are redefined or updated, the NetSuite2.com data source may change the case of the record type and field names. If you use the Uppercase attribute and set it to <b>1</b>, query results return record type and field names in uppercase.</p> <p>If you use SuiteAnalytics Connect with applications that are case sensitive and do not support changes to lowercase or uppercase, you can use this attribute to avoid these changes and potential issues with queries.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <span style="color: #0070C0; font-size: 1.5em; margin-right: 5px;">i</span> <b>Note:</b> The Connect Service is not case sensitive and this change does not affect your queries. The case used in your queries is not considered.         </div> <p>For more information about the Uppercase attribute and examples of queries, see <a href="#">Using the Uppercase Attribute</a>.</p> |
| Valid Values | <p><b>0 or 1</b></p> <p>If you use this attribute, you should set it to <b>1</b>. Then, query results return record type and field names in uppercase.</p> <p>If you set it to <b>0</b>, names are not changed to uppercase and you may encounter issues if you use applications that are sensitive to case changes.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Default      | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## StaticSchema

|              |                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Attribute    | StaticSchema                                                                                                                                                                                                                                                                                                                                                      |
| Description  | <p>Optional. The Static Data Model option provides you with the structure and the name of all available record types and fields in the NetSuite2.com data source. To use the Static Data Model in your account, you must add the StaticSchema attribute and set it to <b>1</b>. For more information, see <a href="#">Working with the Static Data Model</a>.</p> |
| Valid Values | <p><b>0 or 1</b></p> <p>If you use this attribute, you must set it to <b>1</b>.</p>                                                                                                                                                                                                                                                                               |
| Default      | Off                                                                                                                                                                                                                                                                                                                                                               |

## OAuth2Token

|           |             |
|-----------|-------------|
| Attribute | OAuth2Token |
|-----------|-------------|

|              |                                                                                                                                                                                                                                                                                                                                                                          |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description  | Optional. The OAuth 2.0 feature is an authentication mechanism that enables you to use a token to access the NetSuite2.com data source.<br><br>For more information about OAuth 2.0 and Connect, see <a href="#">OAuth 2.0 for Connect</a> .<br><br>For more information about adding the OAuth2Token attribute, see <a href="#">Setting the OAuth2Token Attribute</a> . |
| Valid Values | Authentication string                                                                                                                                                                                                                                                                                                                                                    |
| Default      | None                                                                                                                                                                                                                                                                                                                                                                     |

The list of custom properties attributes should be added in the following order:

```
CustomProperties='AccountID=<accountID>;RoleID=<RoleID>;Uppercase=1;StaticSchema=1;OAuth2Token=<connection
string value>'
```

## EncryptionMethod

|              |                                                                                                                                                           |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Property     | EncryptionMethod                                                                                                                                          |
| Description  | Required. Enables the use of SSL encryption for data exchanged with the SuiteAnalytics Connect service server. Must be included in the connection string. |
| Valid Values | <b>SSL</b>                                                                                                                                                |
| Default      | None                                                                                                                                                      |

## Host

|              |                                                                                                                                                                                               |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Property     | Host                                                                                                                                                                                          |
| Description  | Required. The TCP/IP address of the SuiteAnalytics Connect server, specified as a host name.                                                                                                  |
| Valid Values | The host name you should use for your connection is displayed in the <b>Service Host</b> field on the SuiteAnalytics Connect Driver Download page, under <a href="#">Your Configuration</a> . |
| Default      | None                                                                                                                                                                                          |

## Password

|              |                                                            |
|--------------|------------------------------------------------------------|
| Property     | Password                                                   |
| Description  | Required. The password used to log in to NetSuite.         |
| Valid Values | A string containing a password used to log in to NetSuite. |
| Default      | None                                                       |

## Port

|              |                                                                                    |
|--------------|------------------------------------------------------------------------------------|
| Property     | Port                                                                               |
| Description  | Required. The TCP/IP port on which the SuiteAnalytics Connect server is listening. |
| Valid Values | <b>1708</b>                                                                        |

|         |      |
|---------|------|
| Default | None |
|---------|------|

## Server Data Source

|              |                                                                                                                                        |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Property     | ServerDataSource                                                                                                                       |
| Description  | Required. The name of the SuiteAnalytics Connect server data source to be used for the connection.                                     |
| Valid Values | <p><b>NetSuite2.com</b></p> <p>For more information about the data source, see the help topic <a href="#">Connect Data Source</a>.</p> |
| Default      | None                                                                                                                                   |

## User ID

|              |                                                          |
|--------------|----------------------------------------------------------|
| Property     | UserID                                                   |
| Description  | Required. The email used to log in to NetSuite.          |
| Valid Values | A string containing an email used to log in to NetSuite. |
| Default      | None                                                     |

## Validate Server Certificate

|              |                                                                                                                                                                                                                                                                                                                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Property     | ValidateServerCertificate                                                                                                                                                                                                                                                                                                                                           |
| Description  | <p>Optional. If you choose to use this connection option, make sure it is set to <b>1</b>.</p> <p>Determines whether the driver validates the certificate sent by the SuiteAnalytics Connect server. During SSL server authentication, the SuiteAnalytics Connect server sends a certificate issued by a trusted Certificate Authority (CA).</p>                    |
| Valid Values | <p><b>0 or 1</b></p> <p>If you use this option, it must be set to <b>1</b>.</p> <p>When set to <b>1</b>, the driver validates the certificate sent by the SuiteAnalytics Connect server. Any certificate from the server must be issued by a trusted CA.</p> <p>When set to <b>0</b>, the driver does not validate the certificate sent by the database server.</p> |
| Default      | <b>1</b>                                                                                                                                                                                                                                                                                                                                                            |

## Authentication Using Server Certificates for ADO.NET

ADO.NET uses TLS-secured connections. Currently, only TLS 1.2 is supported. Further, we actively look for new vulnerabilities and respond as needed to new threats.

You should use authentication using server certificates. The required server certificates are usually already included in your Windows Trusted Root Certification Authorities store. In case they are not, you

can download the security certificates from the SuiteAnalytics Connect Driver Download page, and add them manually.

### To add the required security certificates to the certificates store:

1. In the **Settings** portlet on your NetSuite home page, click **Set Up SuiteAnalytics Connect**. If the download link is not displayed, you need to enable the Connect Service. For more information, see [Enabling the Connect Service Feature](#).
2. Click the **Download** button next to CA CERTIFICATES.
3. When the certificates .zip file is downloaded, extract it to any location on your computer.
4. Next, go to your Windows **Start** menu, type **mmc** in the search field and press Enter. This opens the Microsoft Management Console.
5. On the **File** menu, select **Add/Remove Snap-in**.
6. Select the **Certificates** snap-in and click **Add**.

You can set the snap-in to manage security certificates for your user account, service account, or computer account.

7. When you have finished setting up the snap-in, click **OK**.
8. In the console tree, double-click **Certificates**.
9. Right-click the **Trusted Root Certification Authorities** store and select **All Tasks > Import**.
10. Follow the wizard's instructions to specify the downloaded security certificate files and import them to your Trusted Root Certification Authorities store.

When the security certificates are imported, the SuiteAnalytics Connect ADO.NET integrations will automatically start using them when connecting to NetSuite.

## Removing the ADO.NET Driver

To remove the SuiteAnalytics Connect ADO.NET driver, you first need to use the VsUtil tool to remove the data provider library from your system and then uninstall the driver.

### To remove the driver:

1. Locate the VsUtil.exe file. It is usually installed in the ADO.NET driver installation folder. The default location on a 64-bit Windows computer is C:\Program Files (x86)\NetSuite\NetSuite ADO.NET Drivers.
2. At the command prompt, run the following as administrator, in the folder where VsUtil.exe is installed:  

```
vsutil.exe -u
```

To learn about other options, run VsUtil.exe without any parameters.
3. After the VsUtil tool has finished running, in Windows Control Panel, click **Uninstall a program**. Select **SuiteAnalytics Connect ADO.NET Drivers**, and click **Uninstall**.

# Connect Service Considerations

This section provides best practices and examples for working with the Connect Service.

- [Querying the Connect Service](#)
- [Troubleshooting Connection Issues](#)
- [Working with NetSuite Sandbox or Release Preview Accounts](#)

## Querying the Connect Service

For information about how to query the Connect Service and understand the records available through Connect, see the following topics:

- [Query Language Compliance](#)
- [Column Joins in the Connect Service](#)
- [Custom Columns, Lists, and Records in the Connect Service](#)

## Troubleshooting Connection Issues

For information about how to solve potential connection issues, see the following topics:

- [Connections](#)
- [Exceptions](#)
- [Operating System Settings](#)
- [Third-Party Application Access](#)
- [Server Restarts](#)

## Working with NetSuite Sandbox or Release Preview Accounts

For information about how to work with Sandbox or Release Preview accounts, see [Driver Access for a Sandbox or Release Preview Account](#).

# Query Language Compliance



**Important:** As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

When you run queries using the NetSuite2.com you must use SuiteQL. If you still use NetSuite.com, you should run standard SQL queries. See the following topics:

- [SuiteQL Compliance](#)
- [SQL Compliance](#)

For more information on general syntax requirements, see [Querying Data with Connect](#).

## SuiteQL Compliance



**Note:** This applies to the NetSuite2.com data source only.

SuiteQL lets you query your NetSuite data using advanced query capabilities. SuiteQL includes a list of supported SQL functions and does not allow you to use unsupported SQL functions in your query, which prevents SQL injection and other unauthorized access to data. Also, SuiteQL supports the syntax for both ANSI and non-ANSI joins. However, you cannot use both syntax types in the same query. To learn about SuiteQL and how to build SuiteQL queries, see the following help topics:

- [SuiteQL](#)
- [Using SuiteQL with the Connect Service](#)

## SQL Compliance



**Note:** This applies to the NetSuite.com data source only. The use of NetSuite.com is no longer a best practice. You should move to the NetSuite2.com data source. For more information, see [Changing from NetSuite.com to NetSuite2.com](#).

You should use generic SQL-92 syntax for the Connect Service, including standard SQL comments. The Connect Service may not be fully compliant with SQL-92 syntax and is limited to both OA SDK and Oracle. Take note of the following cases that may affect your queries.

We do not guarantee full SQL-92 compliance and are limited both by OA SDK and Oracle.

- [Non-deterministic Column Order Using the Column Selector](#)

- UNION Processing and UNION ALL
- Nested SELECT Statements
- Interval Types Not Supported
- CAST and CONVERT Function
- CLOB Values
- Reserved Words

## Non-deterministic Column Order Using the Column Selector

Using the \* column selector returns a non-deterministic column order.

## UNION Processing and UNION ALL

UNION query processing is LTR (Left-to-Right Subquery), as per the SQL standard. Consequently, queries that contain inner queries combined with the UNION operator may fail if the names of the selected inner queries' columns do not match. For example, the following query will fail because the company\_id and customer\_id columns do not match:

```

1 select *
2 from
3 (
4   select COMPANY_ID from NOTES_SYSTEM
5   union
6   select CUSTOMER_ID from CUSTOMERS
7 )

```

To prevent this failure, you can rewrite this query to use aliased column names:

```

1 select *
2 from
3   (select COMPANY_ID as 'ALIASED_COLUMN_1' from NOTES_SYSTEM
4   union
5   select CUSTOMER_ID as 'ALIASED_COLUMN_1' from CUSTOMERS
6   )

```

The following examples of UNION ALL are supported:

```

1 select N'' as COL1
2 from accounts
3 where account_id < 10
4 union all
5 select is_balancesheet as COL1
6 from accounts
7 where
8 account_id < 10
9
10 select to_number(sum(openbalance))
11 from accounts
12 where account_id < 100
13 union all
14 select to_number('')
15 from accounts
16 where account_id < 100
17
18 select sum(openbalance)
19 from accounts
20 where account_id < 100

```

```

21 | union all
22 | select to_number('')
23 | from accounts
24 | where account_id < 100

```

## Select All Rows Statements

Using 'select \* from certain tables' may lead to a timeout on large data volumes. For more information, see [Custom Field Limitations](#).

## Smaller Queries

For improved performance, try using multiple smaller queries instead one long query. Also, if too many concurrent queries are run, the concurrent queries may be killed.

## Nested SELECT Statements

The following Nested SELECT statements examples are supported:

```

1 | select d1.department_id, (select full_name from departments d2 where d2.department_id = d1.department_id) id from departments d1
2 |
3 | select * from (select * from departments) d1
4 |
5 | select * from (select department_id from departments) d1
6 |
7 | select * from departments d1 where department_id in ( select department_id from departments d2 where d1.department_id = d2.department_id)
8 |
9 | select d1.department_id, (select full_name from departments d2 where d2.department_id = d1.department_id) id from departments d1
   | where department_id in ( select department_id from departments d2 where d1.department_id = d2.department_id)

```

The following nested SELECT statements examples are not supported:

```

1 | select d1.department_id, (select full_name from departments d2 where d2.department_id = d1.department_id) id from (select department_id from departments) d1
2 |
3 | select (select full_name from departments d1 where d1.department_id = d2.department_id) d from departments d2
4 |
5 | select d1.department_id, (select full_name from departments d2 where d2.department_id = d1.department_id) id from (select department_id from departments) d1 where department_id in ( select department_id from departments d2 where d1.department_id = d2.department_id)

```

## Interval Types Not Supported

Connect drivers do not support interval types. You can use the following alternatives for interval types.

- **Interval Day** that is applied directly to TIMESTAMP or DATE types can be replaced with a positive or negative integer.

For example, replace **[current\_date - interval '7' Day]** with **[current\_date - 7]**.

- Intervals for values smaller than one day can be replaced in a similar manner by converting them to fractions of a day. However, current\_date does not support HH:MM:SS, so SYSDATE with the TIMESTAMP type is preferable.

For example, replace [**current\_date - interval '13' Hour**] with [**sysdate - 13/24**] or [**sysdate - 1/1.84615**].

- For values larger than one day, the function Add\_Months( ) can be used. Also, the numeric parameter can be multiplied by 12 for years.

For example, [**current\_date + interval '2' Year**] can be replaced with [**Add\_Months(current\_date, 12\*2)**].

## CAST and CONVERT Function

The CAST and CONVERT functions convert a value from one data type to another. The Connect driver supports the CAST and CONVERT functionality by providing alternatives to employing character, number, and date conversions using the following methods.

### Character Conversion

For example, to convert a VARCHAR type, you could use this as an alternative to the CAST and CONVERT function.

```
1 | select to_char(account_id) from REVRECSCHEDULELINES
```

### Numeric Conversion

For a NUMBER type, you could use to\_number for conversion in to a number example as an alternative to the CAST and CONVERT function.

```
1 | select to_number('10'+amount) from REVRECSCHEDULELINES
```

### Date Conversion

For a DATE conversion, you could use to\_date for conversion in to date.

```
1 | select to_date('01-01-2013', 'dd-mm-yyyy') from REVRECSCHEDULELINES
```

### CLOB Values

CLOB values are not supported in SQL Order by clauses. To determine if a column returns CLOB values, you can use the OA\_PRECISION column. The following example shows how you can use the OA\_PRECISION column in a query:

```
1 | Select TABLE_NAME, COLUMN_NAME, OA_PRECISION from OA_COLUMNS where OA_PRECISION > 4000
```

If you need to use a column that returns CLOB values in a SQL Order by clause, you can use the substring function in your query. The following examples show how you can change your queries.

The following example is not supported. The query does not include the substring function.

```
1 | SELECT to_char(MESSAGE) FROM MESSAGE ORDER BY 1
```

The following example is supported. The query includes the substring function.

```
1 | SELECT to_char(substr(MESSAGE, 1, 4000)) FROM MESSAGE ORDER BY 1
```

## Reserved Words

If you use any of the following reserved words, you must place them in quotes when using them in queries to avoid parsing errors:

- RANK
- ROW\_NUMBER
- STDDEV
- STDDEV\_POP
- STDDEV\_SAMP
- VAR\_POP
- VAR\_SAMP

For example:

```
1 | select "RANK" from TABLE
```

**i Note:** There are no standard NetSuite records or columns that conflict with the new reserved words. You will encounter this issue only if you have a custom record or custom column exposed through the Connect Service with a name that matches a new reserved word. Case does not matter and the conflict also occurs when the underscore is replaced with a space. For example, custom columns named both var samp (with a space) and var\_samp (with and underscore) would both conflict with a new reserved word and would need to be quoted in queries.

For the following reserved words, special rules apply:

- If you use one for the following reserved words for a SuiteAnalytics field, the field name will appear as "reserveword\_0".
- If you use one for the following reserved words for a SuiteAnalytics table, the table name will appear as "reserveword\_0".

If you use one of the following reserve words for a SuiteAnalytics custom table or field, will causes appended suffixes to appear. For example, If you attempt to name a SuiteAnalytics custom field using a reserved word, the field will appear as "reserveword\_0".

- |                 |             |                  |
|-----------------|-------------|------------------|
| ■ ABORT         | ■ ALLOW     | ■ ASSOCIATE      |
| ■ ACCESS        | ■ ALTER     | ■ AT             |
| ■ ACCESSED      | ■ ALWAYS    | ■ ATTRIBUTE      |
| ■ ACCOUNT       | ■ ANALYZE   | ■ ATTRIBUTES     |
| ■ ACTIVATE      | ■ ANCILLARY | ■ AUDIT          |
| ■ ADD           | ■ AND       | ■ AUTHENTICATED  |
| ■ ADMIN         | ■ AND_EQUAL | ■ AUTHENTICATION |
| ■ ADMINISTER    | ■ ANTIJOIN  | ■ AUTHID         |
| ■ ADMINISTRATOR | ■ ANY       | ■ AUTHORIZATION  |

|                          |                         |                          |
|--------------------------|-------------------------|--------------------------|
| ■ ADVISE                 | ■ APPEND                | ■ AUTO                   |
| ■ ADVISOR                | ■ APPLY                 | ■ AUTOALLOCATE           |
| ■ AFTER                  | ■ ARCHIVE               | ■ AUTOEXTEND             |
| ■ ALIAS                  | ■ ARCHIVELOG            | ■ AUTOMATIC              |
| ■ ALL                    | ■ ARRAY                 | ■ AVAILABILITY           |
| ■ ALL_ROWS               | ■ AS                    | ■ AVG                    |
| ■ ALLOCATE               | ■ ASC                   |                          |
| ■ BACKUP                 | ■ BINARY_FLOAT          | ■ BODY                   |
| ■ BATCH                  | ■ BINARY_FLOAT_INFINITY | ■ BOTH                   |
| ■ BECOME                 | ■ BINARY_FLOAT_NAN      | ■ BOUND                  |
| ■ BEFORE                 | ■ BINDING               | ■ BROADCAST              |
| ■ BEGIN                  | ■ BITMAP                | ■ BUFFER                 |
| ■ BEGIN_OUTLINE_DATA     | ■ BITMAP_TREE           | ■ BUFFER_CACHE           |
| ■ BEHALF                 | ■ BITMAPS               | ■ BUFFER_POOL            |
| ■ BETWEEN                | ■ BITS                  | ■ BUILD                  |
| ■ BFILE                  | ■ BLOB                  | ■ BULK                   |
| ■ BIGFILE                | ■ BLOCK                 | ■ BY                     |
| ■ BINARY_DOUBLE          | ■ BLOCK_RANGE           | ■ BYPASS_RECURSIVE_CHECK |
| ■ BINARY_DOUBLE_INFINITY | ■ BLOCKS                | ■ BYPASS_UJVC            |
| ■ BINARY_DOUBLE_NAN      | ■ BLOCKSIZE             | ■ BYTE                   |
| ■ CACHE                  | ■ CLUSTER               | ■ CONTINUE               |
| ■ CACHE_CB               | ■ CLUSTERING_FACTOR     | ■ CONSISTENT             |
| ■ CACHE_INSTANCES        | ■ COALESCE              | ■ CONSTRAINT             |
| ■ CACHE_TEMP_TABLE       | ■ COARSE                | ■ CONSTRAINTS            |
| ■ CALL                   | ■ COLLECT               | ■ CONTENT                |
| ■ CANCEL                 | ■ COLUMN                | ■ CONTENTS               |
| ■ CARDINALITY            | ■ COLUMN_STATS          | ■ CONTEXT                |
| ■ CASCADE                | ■ COLUMN_VALUE          | ■ CONTROLFILE            |
| ■ CASE                   | ■ COLUMNS               | ■ CONVERT                |
| ■ CATEGORY               | ■ COMMENT               | ■ CORRUPTION             |
| ■ CAST                   | ■ COMMIT                | ■ COST                   |
| ■ CERTIFICATE            | ■ COMMITTED             | ■ COUNT                  |
| ■ CFILE                  | ■ COMPACT               | ■ CPU_COSTING            |
| ■ CHAINED                | ■ COMPATIBILITY         | ■ CPU_PER_CALL           |
| ■ CHANGE                 | ■ COMPILE               | ■ CPU_PER_SESSION        |
| ■ CHAR                   | ■ COMPLETE              | ■ CREATE                 |
| ■ CHAR_CS                | ■ COMPOSITE_LIMIT       | ■ CREATE_STORED_OUTLINES |
| ■ CHARACTER              | ■ COMPRESS              | ■ CROSS                  |
| ■ CHECK                  | ■ COMPUTE               | ■ CUBE                   |
| ■ CHECKPOINT             | ■ CONFORMING            | ■ CUBE_GB OWN            |
| ■ CHILD                  | ■ CONNECT               | ■ CURRENT_DATE           |
| ■ CHOOSE                 | ■ CONNECT_BY_COMBINE_SW | ■ CURRENT_SCHEMA         |
| ■ CHUNK                  | ■ CONNECT_BY_COST_BASED | ■ CURRENT_TIME           |
| ■ CIV_GB                 | ■ CONNECT_BY_FILTERING  | ■ CURRENT_TIMESTAMP      |

- |                             |                         |                            |
|-----------------------------|-------------------------|----------------------------|
| ▪ CLASS                     | ▪ CONNECT_BY_ISCYCLE    | ▪ CURRENT_USER             |
| ▪ CLEAR                     | ▪ CONNECT_BY_ISLEAF     | ▪ CURSOR                   |
| ▪ CLOB                      | ▪ CONNECT_BY_ROOT       | ▪ CURSOR_SHARING_EXACT     |
| ▪ CLONE                     | ▪ CONNECT_TIME          | ▪ CURSOR_SPECIFIC_SEGMENT  |
| ▪ CLOSE                     | ▪ CONSIDER              | ▪ CYCLE                    |
| ▪ CLOSE_CACHED_OPEN_CURSORS | ▪ CONTAINER             |                            |
| <br>                        |                         |                            |
| ▪ DANGLING                  | ▪ DEFAULT               | ▪ DISCONNECT               |
| ▪ DATA                      | ▪ DEFERRABLE            | ▪ DISK                     |
| ▪ DATABASE                  | ▪ DEFERRED              | ▪ DISKGROUP                |
| ▪ DATAFILE                  | ▪ DEFINED               | ▪ DISKS                    |
| ▪ DATAFILES                 | ▪ DEFINER               | ▪ DISMOUNT                 |
| ▪ DATAOBJNO                 | ▪ DEGREE                | ▪ DISTINCT                 |
| ▪ DATE                      | ▪ DELAY                 | ▪ DISTINGUISHED            |
| ▪ DATE_MODE                 | ▪ DELETE                | ▪ DISTRIBUTED              |
| ▪ DAY                       | ▪ DEMAND                | ▪ DML                      |
| ▪ DB_ROLE_CHANGE            | ▪ DENSE_RANK            | ▪ DML_UPDATE               |
| ▪ DBA                       | ▪ DEQUEUE               | ▪ DOCUMENT                 |
| ▪ DBA_RECYCLEBIN            | ▪ DEREF                 | ▪ DOMAIN_INDEX_NO_SORT     |
| ▪ DBMS_STATS                | ▪ DEREF_NO_REWRITE      | ▪ DOMAIN_INDEX_SORT        |
| ▪ DBTIMEZONE                | ▪ DESC                  | ▪ DOUBLE                   |
| ▪ DDL                       | ▪ DETACHED              | ▪ DOWNGRADE                |
| ▪ DEALLOCATE                | ▪ DETERMINES            | ▪ DRIVING_SITE             |
| ▪ DEBUG                     | ▪ DICTIONARY            | ▪ DROP                     |
| ▪ DEC                       | ▪ DIMENSION             | ▪ DUMP                     |
| ▪ DECIMAL                   | ▪ DIRECTORY             | ▪ DYNAMIC                  |
| ▪ DECLARE                   | ▪ DISABLE               | ▪ DYNAMIC_SAMPLING         |
| ▪ DECREMENT                 | ▪ DISABLE_RPKE_EXTRACT  | ▪ DYNAMIC_SAMPLING_EST_CDN |
| ▪ DECRYPT                   | ▪ DISASSOCIATE          |                            |
| <br>                        |                         |                            |
| ▪ EACH                      | ▪ ENTERPRISE            | ▪ EXECUTE                  |
| ▪ ELEMENT                   | ▪ ENTRY                 | ▪ EXEMPT                   |
| ▪ ELIMINATE_JOIN            | ▪ ERROR                 | ▪ EXISTS                   |
| ▪ ELIMINATE_OBY             | ▪ ERROR_ON_OVERLAP_TIME | ▪ EXPAND_GSET_TO_UNION     |
| ▪ ELIMINATE_OUTER_JOIN      | ▪ ERRORS                | ▪ EXPIRE                   |
| ▪ ELSE                      | ▪ ESCAPE                | ▪ EXPLAIN                  |
| ▪ EMPTY                     | ▪ ESTIMATE              | ▪ EXPLOSION                |
| ▪ ENABLE                    | ▪ EVALNAME              | ▪ EXPORT                   |
| ▪ ENCRYPT                   | ▪ EVALUATION            | ▪ EXPR_CORR_CHECK          |
| ▪ ENCRYPTION                | ▪ EVENTS                | ▪ EXTENDS                  |
| ▪ END                       | ▪ EXCEPT                | ▪ EXTENT                   |
| ▪ END_OUTLINE_DATA          | ▪ EXCEPTIONS            | ▪ EXTENTS                  |
| ▪ ENFORCE                   | ▪ EXCHANGE              | ▪ EXTERNAL                 |
| ▪ ENFORCED                  | ▪ EXCLUDING             | ▪ EXTERNALLY               |
| ▪ ENQUEUE                   | ▪ EXCLUSIVE             |                            |

|                               |                        |                           |
|-------------------------------|------------------------|---------------------------|
| ■ FACT                        | ■ FINAL                | ■ FORCE                   |
| ■ FAILED                      | ■ FINE                 | ■ FORCE_XML_QUERY_REWRITE |
| ■ FAILED_LOGIN_ATTEMPTS       | ■ FINISH               | ■ FOREIGN                 |
| ■ FAILGROUP                   | ■ FIRST                | ■ FREELIST                |
| ■ FALSE                       | ■ FIRST_ROWS           | ■ FREELISTS               |
| ■ FAST                        | ■ FLAGGER              | ■ FREEPOOLS               |
| ■ FBTSCAN                     | ■ FLASHBACK            | ■ FRESH                   |
| ■ FFS                         | ■ FLOAT                | ■ FROM                    |
| ■ FIC_CIV                     | ■ FLOB                 | ■ FULL                    |
| ■ FIC_PIV                     | ■ FLUSH                | ■ FUNCTION                |
| ■ FILE                        | ■ FOLLOWING            | ■ FUNCTIONS               |
| ■ FILTER                      | ■ FOR                  |                           |
| ■ G                           | ■ GLOBAL_TOPIC_ENABLED | ■ GROUP                   |
| ■ GATHER_PLAN_STATISTICS      | ■ GLOBALLY             | ■ GROUPS                  |
| ■ GBY_CONC_ROLLUP             | ■ GRANT                | ■ GUARANTEE               |
| ■ GENERATED                   | ■ GROUP_BY             | ■ GUARANTEED              |
| ■ GLOBAL                      | ■ GROUPING             | ■ GUARD                   |
| ■ GLOBAL_NAME                 |                        |                           |
| ■ HASH                        | ■ HEADER               | ■ HINTSET_BEGIN           |
| ■ HASH_AJ                     | ■ HEAP                 | ■ HINTSET_END             |
| ■ HASH_SJ                     | ■ HIERARCHY            | ■ HOUR_CURRENT            |
| ■ HASHKEYS                    | ■ HIGH                 | ■ HWM_BROKERED            |
| ■ HAVING                      |                        |                           |
| ■ ID                          | ■ INDEX_JOIN           | ■ INSTANTLY               |
| ■ IDENTIFIED                  | ■ INDEX_ROWS           | ■ INTERMEDIATE            |
| ■ IDENTIFIER                  | ■ INDEX_RRS            | ■ INTERNAL_CONVERT        |
| ■ IDENTITY                    | ■ INDEX_RS             | ■ INTERNAL_USE            |
| ■ IDGENERATORS                | ■ INDEX_RS_ASC         | ■ INITIALIZED             |
| ■ IDLE_TIME                   | ■ INDEX_RS_DESC        | ■ INITIALLY               |
| ■ IF                          | ■ INDEX_SCAN           | ■ INLINE_XMLTYPE_NT       |
| ■ IGNORE                      | ■ INDEX_SKIP_SCAN      | ■ INSERT                  |
| ■ IGNORE_OPTIM_EMBEDDED_HINTS | ■ INDEX_SS             | ■ INSTANCES               |
| ■ IGNORE_WHERE_CLAUSE         | ■ INDEX_SS_ASC         | ■ INSTANTIABLE            |
| ■ IMMEDIATE                   | ■ INDEX_SS_DESC        | ■ INSTEAD                 |
| ■ IMPORT                      | ■ INDEX_STATS          | ■ INT                     |
| ■ IN                          | ■ INDEXED              | ■ INTEGER                 |
| ■ IN_MEMORY_METADATA          | ■ INDEXES              | ■ INTERPRETED             |
| ■ INCLUDE_VERSION             | ■ INDEXTYPE            | ■ INTERSECT               |
| ■ INCLUDING                   | ■ INDEXTYPES           | ■ INTERVAL                |
| ■ INCREMENT                   | ■ INDICATOR            | ■ INTO                    |
| ■ INCREMENTAL                 | ■ INFINITE             | ■ INVALIDATE              |

- INDEX
- INDEX\_ASC
- INDEX\_COMBINE
- INDEX\_DESC
- INDEX\_FFS
- INDEX\_FILTER
- INFORMATIONAL
- INITIAL
- INITTRANS
- INLINE
- INNER
- INSTANCE
- IS
- ISOLATION
- ISOLATION\_LEVEL
- ITERATE
- ITERATION\_NUMBER
  
- JAVA      ■ JOB      ■ JOIN
  
- K              ■ KEY              ■ KEYSIZE
- KEEP              ■ KEY\_LENGTH      ■ KILL
- KERBEROS      ■ KEYS
  
- LAST
- LATERAL
- LAYER
- LDAP\_REG\_SYNC\_INTERVAL
- LDAP\_REGISTRATION
- LDAP\_REGISTRATION\_ENABLED
- LEADING
- LEFT
- LENGTH
- LESS
- LEVEL
- LEVELS
- LIBRARY
- LIKE
- LIKE2
- LIKE4
- LIKEC
- LIKE\_EXPAND
- LIMIT
- LINK
- LIST
- LOB
- LOCAL
- LOCAL\_INDEXES
- LOCALTIME
- LOCALTIMESTAMP
- LOCATION
- LOCATOR
- LOCK
- LOCKED
- LOG
- LOGFILE
- LOGGING
- LOGICAL
- LOGICAL\_READS\_PER\_CALL
- LOGICAL\_READS\_PER\_SESSION
- LOGOFF
- LOGON
- LONG
  
- MAIN
- MANAGE
- MANAGED
- MANAGEMENT
- MANUAL
- MAPPING
- MASTER
- MATCHED
- MATERIALIZE
- MATERIALIZED
- MAX
- MAXARCHLOGS
- MAXDATAFILES
- MAXEXTENTS
- MAXINSTANCES
- MAXIMIZE
- MAXLOGFILES
- MAXLOGHISTORY
- MAXTRANS
- MAXVALUE
- MEASURES
- MEMBER
- MEMORY
- MERGE
- MERGE\_AJ
- MERGE\_CONST\_ON
- MERGE\_SJ
- METHOD
- MIGRATE
- MIN
- MINEXTENTS
- MINIMIZE
- MINIMUM
- MINUS
- MINUS\_NULL
- MINUTE
- MIRROR
- MLSLABEL
- MODE
- MODEL
- MODEL\_COMPILE\_SUBQUERY
- MODEL\_DONTVERIFY\_UNIQUENESS
- MODEL\_DYNAMIC\_SUBQUERY
- MODEL\_MIN\_ANALYSIS
- MODEL\_NO\_ANALYSIS
- MODEL\_PBY
- MODEL\_PUSH\_REF
- MODIFY
- MONITORING
- MONTH
- MOUNT
- MOVE
- MOVEMENT
- MULTISET

- MAXLOGMEMBERS      ■ MINVALUE      ■ MV\_MERGE
- MAXSIZE
  
- NAMED      ■ NO\_CPU\_COSTING      ■ NO\_ACCESS
- NAN      ■ NO\_ELIMINATE\_JOIN      ■ NOAPPEND
- NATIONAL      ■ NO\_ELIMINATE\_OBY      ■ NOARCHIVELOG
- NATIVE      ■ NO\_ELIMINATE\_OUTER\_JOIN      ■ NOAUDIT
- NATIVE\_FULL\_OUTER\_JOIN      ■ NO\_EXPAND      ■ NOCACHE
- NATURAL      ■ NO\_EXPAND\_GSET\_TO\_UNION      ■ NOCOMPRESS
- NAV      ■ NO\_FACT      ■ NOCPU\_COSTING
- NESTED\_TABLE\_FAST\_INSERT      ■ NO\_FILTERING      ■ NOCYCLE
- NESTED\_TABLE\_SET\_REFS      ■ NO\_INDEX      ■ NODELAY
- NCHAR      ■ NO\_INDEX\_      ■ NOFORCE
- NCHAR\_CS      ■ NO\_INDEX\_RS      ■ NOGUARANTEE
- NCLOB      ■ NO\_INDEX\_SS      ■ NOMAPPING
- NEEDED      ■ NO.Merge      ■ NOMAXVALUE
- NESTED      ■ NO\_MODEL\_PUSH\_REF      ■ NOMINVALUE
- NESTED\_TABLE\_GET\_REFS      ■ NO\_MONITORING      ■ NONE
- NESTED\_TABLE\_ID      ■ NO\_MULTIMV\_REWRITE      ■ NOPARALLEL\_INDEX
- NESTED\_TABLE\_SET\_SETID      ■ NO\_NATIVE\_FULL\_OUTER\_JOIN      ■ NORELY
- NETWORK      ■ NO\_ORDER\_ROLLUPS      ■ NOREPAIR
- NEVER      ■ NO\_PARALLEL      ■ NORESETLOGS
- NEW      ■ NO\_PARALLEL\_INDEX      ■ NOREVERSE
- NEXT      ■ NO\_PARTIAL\_COMMIT      ■ NOREWIRE
- NL\_AJ      ■ NO\_PULL\_PRED      ■ NOROWDEPENDENCIES
- NL\_SJ      ■ NO\_PUSH\_PRED      ■ NOSEGMENT
- NLS\_CALENDAR      ■ NO\_PUSH\_SUBQ      ■ NOSWITCH
- NLS\_CHARACTERSET      ■ NO\_PRUNE\_GSETS      ■ NOT
- NLS\_COMP      ■ NO\_PX\_JOIN\_FILTER      ■ NOTIFICATION
- NO\_CONNECT\_BY\_FILTERING      ■ NO\_QKN\_BUFF      ■ NOVALIDATE
- NLS\_CURRENCY      ■ NO\_QUERY\_TRANSFORMATION      ■ NOLOGGING
- NLS\_DATE\_FORMAT      ■ NO\_REF.Cascade      ■ NOMINIMIZE
- NLS\_DATE\_LANGUAGE      ■ NO\_REWRITE      ■ NOMONITORING
- NLS\_ISO\_CURRENCY      ■ NO\_SEMIJOIN      ■ NOORDER
- NLS\_LANG      ■ NO\_SET\_TO\_JOIN      ■ NO OVERRIDE
- NLS\_LANGUAGE      ■ NO\_SQL\_TUNE      ■ NOPARALLEL
- NLS\_LENGTH\_SEMANTICS      ■ NO\_STAR\_TRANSFORMATION      ■ NORMAL
- NLS\_NCHAR\_CONV\_EXCP      ■ NO\_STATS\_GSETS      ■ NOSORT
- NLS\_NUMERIC\_CHARACTERS      ■ NO\_SWAP\_JOIN\_INPUTS      ■ NOSTRICT
- NLS\_SORT      ■ NO\_TEMP\_TABLE      ■ NOTHING
- NLS\_SPECIAL\_CHARS      ■ NO\_UNNEST      ■ NOWAIT
- NLS\_TERRITORY      ■ NO\_USE\_HASH      ■ NULL
- NO      ■ NO\_USE\_HASH\_AGGREGATION      ■ NULLS
- NO\_BASETABLE\_MULTIMV\_REWRITE      ■ NO\_USE\_MERGE      ■ NUM\_INDEX\_KEYS
- NO\_BUFFER      ■ NO\_USE\_NL      ■ NUMBER
- NO\_CARTESIAN      ■ NO\_XML\_DML\_REWRITE      ■ NUMERIC
- NO\_CONNECT\_BY\_COMBINE\_SW      ■ NO\_XML\_QUERY\_REWRITE      ■ NVARCHAR2

- NO\_CONNECT\_BY\_COST\_BASED
  
- OBJECT                    ■ OPAQUE\_TRANSFORM                    ■ ORDER
- OBJNO                    ■ OPCODE                            ■ ORDERED
- OBJNO\_REUSE            ■ OPEN                            ■ ORDERED\_PREDICATES
- OF                        ■ OPERATOR                    ■ ORDINALITY
- OFF                      ■ OPT\_ESTIMATE            ■ ORGANIZATION
- OFFLINE                ■ OPT\_PARAM                ■ OUT\_OF\_LINE
- OID                      ■ OPTIMAL                    ■ OUTER
- OIDINDEX               ■ OPTIMIZER\_FEATURES\_ENABLE            ■ OUTLINE
- OLD                      ■ OPTIMIZER\_GOAL          ■ OUTLINE\_LEAF
- OLD\_PUSH\_PRED          ■ OPTION                    ■ OVER
- ON                        ■ OR                            ■ OVERFLOW
- ONLINE                   ■ OR\_EXPAND                ■ OVERFLOW\_NOMOVE
- ONLY                     ■ ORA\_ROWSCN                ■ OVERLAPS
  
- P                        ■ PCTFREE                    ■ PRECISION
- PACKAGE                ■ PCTTHRESHOLD            ■ PRECOMPUTE\_SUBQUERY
- PACKAGES               ■ PCTUSED                    ■ PREPARE
- PARALLEL               ■ PCTVERSION                ■ PRESENT
- PARALLEL\_INDEX        ■ PERCENT                    ■ PRESERVE
- PARAM                   ■ PERFORMANCE            ■ PRESERVE\_OID
- PARAMETERS            ■ PERMANENT                ■ PRIMARY
- PARENT                   ■ PFILE                    ■ PRIOR
- PARITY                   ■ PHYSICAL                ■ PRIVATE
- PARTIALLY              ■ PIV\_GB                    ■ PRIVATE\_SGA
- PARTITION              ■ PIV\_SSF                    ■ PRIVILEGE
- PARTITIONS            ■ PLAN                        ■ PRIVILEGES
- PARTITION\_HASH        ■ PLSQL\_CCFLAGS            ■ PROCEDURE
- PARTITION\_LIST        ■ PLSQL\_CODE\_TYPE        ■ PROFILE
- PARTITION\_RANGE       ■ PLSQL\_DEBUG              ■ PROGRAM
- PASSING                ■ PLSQL\_OPTIMIZE\_LEVEL    ■ PROJECT
- PASSWORD               ■ PLSQL\_WARNINGS        ■ PROTECTED
- PASSWORD\_GRACE\_TIME   ■ POINT                    ■ PROTECTION
- PASSWORD\_LIFE\_TIME    ■ POLICY                    ■ PUBLIC
- PASSWORD\_LOCK\_TIME    ■ POST\_TRANSACTION      ■ PULL\_PRED
- PASSWORD\_VERIFY\_FUNCTION    ■ POWER                ■ PURGE
- PASSWORD\_REUSE\_MAX    ■ PQ\_DISTRIBUTE        ■ PUSH\_PRED
- PASSWORD\_REUSE\_TIME    ■ PQ\_MAP                    ■ PUSH\_SUBQ
- PATH                    ■ PQ\_NOMAP                ■ PX\_GRANULE
- PATHS                   ■ PREBUILT                ■ PX\_JOIN\_FILTER
- PCTINCREASE            ■ PRECEDING                ■ QUIESCE
  
- QB\_NAME                ■ QUEUE                    ■ QUIESCE

|                      |                         |                    |
|----------------------|-------------------------|--------------------|
| ■ QUERY              | ■ QUEUE_CURR            | ■ QUOTA            |
| ■ QUERY_BLOCK        | ■ QUEUE_ROW_P           |                    |
| ■ RANDOM             | ■ REFERENCING           | ■ RESUMABLE        |
| ■ RANGE              | ■ REFRESH               | ■ RESUME           |
| ■ RAPIDLY            | ■ REGEXP_LIKE           | ■ RETENTION        |
| ■ RAW                | ■ REGISTER              | ■ RETURN           |
| ■ RBA                | ■ REJECT                | ■ RETURNING        |
| ■ RBO_OUTLINE        | ■ REKEY                 | ■ REUSE            |
| ■ READ               | ■ RELATIONAL            | ■ REVERSE          |
| ■ READS              | ■ RELY                  | ■ REVOKE           |
| ■ REAL               | ■ REMOTE_MAPPED         | ■ REWRITE          |
| ■ REBALANCE          | ■ RENAME                | ■ REWRITE_OR_ERROR |
| ■ REBUILD            | ■ REPAIR                | ■ RIGHT            |
| ■ RECORDS_PER_BLOCK  | ■ REPLACE               | ■ ROLE             |
| ■ RECOVER            | ■ REQUIRED              | ■ ROLES            |
| ■ RECOVERABLE        | ■ RESET                 | ■ ROLLBACK         |
| ■ RECOVERY           | ■ RESETLOGS             | ■ ROLLING          |
| ■ RECYCLE            | ■ RESIZE                | ■ ROLLUP           |
| ■ RECYCLEBIN         | ■ RESOLVE               | ■ ROW              |
| ■ REDUCED            | ■ RESOLVER              | ■ ROW_LENGTH       |
| ■ REDUNDANCY         | ■ RESOURCE              | ■ ROWDEPENDENCIES  |
| ■ REF                | ■ RESTORE               | ■ ROWID            |
| ■ REF.Cascade_CURSOR | ■ RESTORE_AS_INTERVALS  | ■ ROWNUM           |
| ■ REFERENCE          | ■ RESTRICT              | ■ ROWS             |
| ■ REFERENCED         | ■ RESTRICT_ALL_REF_CONS | ■ RULE             |
| ■ REFERENCES         | ■ RESTRICTED            | ■ RULES            |
| ■ SALT               | ■ SETTINGS              | ■ STATIC           |
| ■ SAMPLE             | ■ SEVERE                | ■ STATISTICS       |
| ■ SAVE_AS_INTERVALS  | ■ SIBLINGS              | ■ STORAGE          |
| ■ SAVEPOINT          | ■ SIZE                  | ■ STORE            |
| ■ SB4                | ■ SHARE                 | ■ STREAMS          |
| ■ SCALE              | ■ SHARED                | ■ STRICT           |
| ■ SCALE_ROWS         | ■ SHARED_POOL           | ■ STRING           |
| ■ SCAN               | ■ SHRINK                | ■ STRIP            |
| ■ SCAN_INSTANCES     | ■ SHUTDOWN              | ■ SUBMULTISET      |
| ■ SCHEDULER          | ■ SID                   | ■ SUBPARTITIONS    |
| ■ SCHEMA             | ■ SIMPLE                | ■ SUM              |
| ■ SCN                | ■ SINGLE                | ■ START            |
| ■ SCN_ASCENDING      | ■ SINGLETASK            | ■ STOP             |
| ■ SCOPE              | ■ SKIP                  | ■ STRUCTURE        |
| ■ SD_ALL             | ■ SKIP_EXT_OPTIMIZER    | ■ SUBPARTITION     |
| ■ SD_INHIBIT         | ■ SKIP_UNQ_UNUSABLE_IDX | ■ SUBPARTITION_REL |
| ■ SD_SHOW            | ■ SKIP_UNUSABLE_INDEXES | ■ SUBQUERIES       |

- SECOND
- SECURITY
- SEED
- SEG\_BLOCK
- SEG\_FILE
- SEGMENT
- SELECT
- SELECTIVITY
- SEMIJOIN
- SEMIJOIN\_DRIVER
- SET
- SEQUENCE
- SEQUENCED
- SEQUENTIAL
- SERIALIZABLE
- SERVERERROR
- SESSION
- SESSIONTZNAME
- SESSION\_CACHED\_CURSORS
- SESSIONS\_PER\_USER
- SESSIONTIMEZONE
- SET\_TO\_JOIN
- SETS
- SMALLFILE
- SMALLINT
- SNAPSHOT
- SOME
- SORT
- SOURCE
- SPACE
- SPECIFICATION
- SPFILE
- SPLIT
- SPREADSHEET
- SQL
- SQL\_TRACE
- STANDALONE
- STANDBY
- STAR
- STAR\_TRANSFORMATION
- STARTUP
- SYSOPER
- SYSTEM
- SYSTIMESTAMP
- STATEMENT\_ID
- SUBSTITUTABLE
- SUCCESSFUL
- SUMMARY
- SUPPLEMENTAL
- SUSPEND
- SWAP\_JOIN\_INPUTS
- SWITCH
- SWITCHOVER
- SYNONYM
- SYSAUX
- SYSDATE
- SYSDBA
- SYS\_DL\_CURSOR
- SYS\_FBT\_INSDEL
- SYS\_OP\_BITVEC
- SYS\_OP\_CAST
- SYS\_OP\_EXTRACT
- SYS\_OP\_ENFORCE\_NOT\_NULL\$
- SYS\_OP\_NOEXPAND
- SYS\_OP\_NTCTIMG\$
- SYS\_PARALLEL\_TXN
- SYS\_RID\_ORDER
- T
- TABLE
- TABLE\_STATS
- TABLES
- TABLESPACE
- TABLESPACE\_NO
- TABNO
- TEMP\_TABLE
- TEMPFILE
- TEMPLATE
- TEMPORARY
- TEST
- THAN
- THE
- THEN
- THREAD
- THROUGH
- TIME
- TIME\_ZONE
- TIMEOUT
- TIMESTAMP
- TIMEZONE\_ABBR
- TIMEZONE\_HOUR
- TIMEZONE\_MINUTE
- TIMEZONE\_OFFSET
- TIMEZONE\_REGION
- TIV\_GB
- TIV\_SSF
- TO
- TO\_CHAR
- TOLEVEL
- TRACE
- TRACING
- TRACKING
- TRAILING
- TRANSACTION
- TRANSITIONAL
- TREAT
- TRIGGER
- TRIGGERS
- TRUE
- TRUNCATE
- TRUSTED
- TX
- TUNING
- TYPE
- TYPES
- TZ\_OFFSET
- U
- UB2
- UBA
- UID
- UNPACKED
- UNPROTECTED
- UNRECOVERABLE
- UNTIL
- USE\_CONCAT
- USE\_HASH
- USE\_HASH\_AGGREGATION
- USE\_MERGE

- UNARCHIVED
- UNBOUND
- UNBOUNDED
- UNDER
- UNDO
- UNDROP
- UNIFORM
- UNION
- UNIQUE
- UNLIMITED
- UNLOCK
- UNNEST
- UNQUIESCE
- VALIDATE
- VALIDATION
- VALUE
- VALUES
- VARCHAR
- WAIT
- WALLET
- WELLFORMED
- WHEN
- WHENEVER
- X\_DYN\_PRUNE
- XCANONICAL
- XID
- XML\_DML\_RWT\_STMT
- XMLATTRIBUTES
- XMLCOLATTVAL
- YEAR
- ZONE
- UNUSABLE
- UNUSED
- UPD\_INDEXES
- UPD\_JOININDEX
- UPDATABLE
- UPDATE
- UPDATED
- UPGRADE
- UPSERT
- UROWID
- USAGE
- USE
- USE\_ANTI
- VARCHAR2
- VARRAY
- VARYING
- VECTOR\_READ
- WHERE
- WHITESPACE
- WITH
- WITHIN
- XMLEMENT
- XMLFOREST
- XMLNAMESPACES
- XMLPARSE
- XMLPI
- XMLQUERY
- YES
- USE\_MERGE\_CARTESIAN
- USE\_NL
- USE\_NL\_WITH\_INDEX
- USE\_PRIVATE\_OUTLINES
- USE\_SEMI
- USE\_STORED\_OUTLINES
- USE\_TTT\_FOR\_GSETS
- USE\_WEAK\_NAME\_RESL
- USER
- USER\_DEFINED
- USER\_RECYCLEBIN
- USERS
- USING
- VECTOR\_READ\_TRACE
- VERSION
- VERSIONS
- VIEW
- WITHOUT
- WORK
- WRAPPED
- WRITE
- XMLROOT
- XMLSCHEMA
- XMLSERIALIZE
- XMLTABLE
- XMLTYPE

## Reserved Words

## Connections

To enhance the security of your connections and to optimize system resources, SuiteAnalytics Connect applies some restrictions to multiple sessions and the connection may time out after some time of inactivity. When you are working with SuiteAnalytics Connect, consider the following:

- Multiple Concurrent Sessions

- [Multiple Concurrent Queries](#)
- [Idle Session Timeout](#)
- [Idle Connection Timeout](#)

## Multiple Concurrent Sessions

You should close unused connections and maintain a minimum number of open connections. Using many connections at the same time can slow performance and the retrieval of results.

If a connection fails with a Connect Timeout Error or the Connection Reset By Peer Error, you should retry to obtain a new connection.



**Important:** SuiteAnalytics Connect allows multiple concurrent sessions. However, if you try to access the Connect Service using many connections at the same time, you may be unable to connect. Depending on factors such as hardware and system resources, the maximum number of open connections allowed varies. If you are working with more than 50 open connections, you may get an error and be unable to access the Connect Service. If this happens, you should close all unused connections and try again.

## Multiple Concurrent Queries

Running multiple queries in a single session is not allowed. If you need to run multiple queries, do one of the following:

- If you use a single session, run one query at a time. After you receive the results of the first query, then you can run the second one.
- Use multiple sessions to run your queries in parallel. Note that using many connections at the same time can slow performance and the retrieval of results. For more information, see [Multiple Concurrent Sessions](#).

## Idle Session Timeout

Sessions automatically time out after 90 minutes of inactivity. If you exceed the time limit of inactivity, you are logged out of your session. To access the Connect Service, you must log in again.



**Note:** The time during which a query is running is not considered time of inactivity. For more information about the connection and response time when you run a query, see [Idle Connection Timeout](#).

The idle session timeout applies to ODBC, JDBC, and ADO.NET drivers, and occurs when you query the NetSuite data sources: NetSuite.com and NetSuite2.com.

## Idle Connection Timeout

By default, if a query exceeds the response time limit, you will not receive any results and the query will keep running. If you have not received a response after two hours, you may get the following error message: TCP/IP error, connection reset by peer. This message indicates that the connection was closed. There are several reasons that can trigger this message such as a network issue, a NetSuite server restart, the client/server host was unreachable, or a firewall on your system.

A firewall on your system may close the connection if it is considered idle. If you determine that the firewall or your operating system may be the problem, you can set the KeepAliveTime parameter to prevent your system from closing the connection.



**Note:** The KeepAliveTime parameter is supported for ODBC and JDBC drivers only.

This parameter verifies periodically that the idle TCP connections are still active. By default, this parameter is set to 7,200,000 ms (2 hours) and affects all system applications. You can change the settings and enter a lower value. For example, if you set the value to three minutes, the idle TCP connections are verified every three minutes. After this change, if you run a query and you do not receive any results within the next three minutes, the connection is not interrupted. Every three minutes the driver sends a keep-alive packet to keep the connection active.

## Setting the KeepAliveTime Parameter on Windows

For Windows, you must set the time value in the **KeepAliveTime** file.

### To set the KeepAliveTime Parameter on Windows:

1. Open the Registry Editor application.
2. For most Window versions, go to **HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services > Tcpip > Parameters**.
3. To create the **KeepAliveTime** file, right-click the Parameters folder, and select **New > DWORD 32-bit Value**.



**Note:** If the folder includes the **KeepAliveTime** file, right-click the file to modify the value.

4. In the **Name** column, enter **KeepAliveTime**.
5. Right-click the **KeepAliveTime** file and select **Modify**. In the **Value data** field, enter the time value in milliseconds.

In the following example, the value has been changed to **180000 ms (3 minutes)**. Use your best judgement to decide the time value that you want to use in your settings.

|               |           |                     |
|---------------|-----------|---------------------|
| KeepAliveTime | REG_DWORD | 0x0002bf20 (180000) |
|---------------|-----------|---------------------|

## Setting the KeepAliveTime Parameter on Linux

For Linux, you must enter a value for the following variables:

- **net.ipv4.tcp\_keepalive\_time** – Time of connection inactivity after which the first keep-alive request is sent.
- **net.ipv4.tcp\_keepalive\_probes** – Number of keep-alive requests sent before the connection is considered not active.
- **net.ipv4.tcp\_keepalive\_intvl** – Time interval between keep-alive probes within a request.

The following example shows how you can configure the KeepAliveTime parameter to send 3 probes every 60 seconds with an interval of 10 seconds.

```
sudo sysctl -w net.ipv4.tcp_keepalive_time=60 net.ipv4.tcp_keepalive_probes=3
net.ipv4.tcp_keepalive_intvl=10
```

## Exceptions

New connection and query execution requests may occasionally fail during moments of peak usage. Use an exception handling mechanism to automatically re-run such operations.

# Column Joins in the Connect Service



**Important:** This applies to the NetSuite.com data source only.

As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

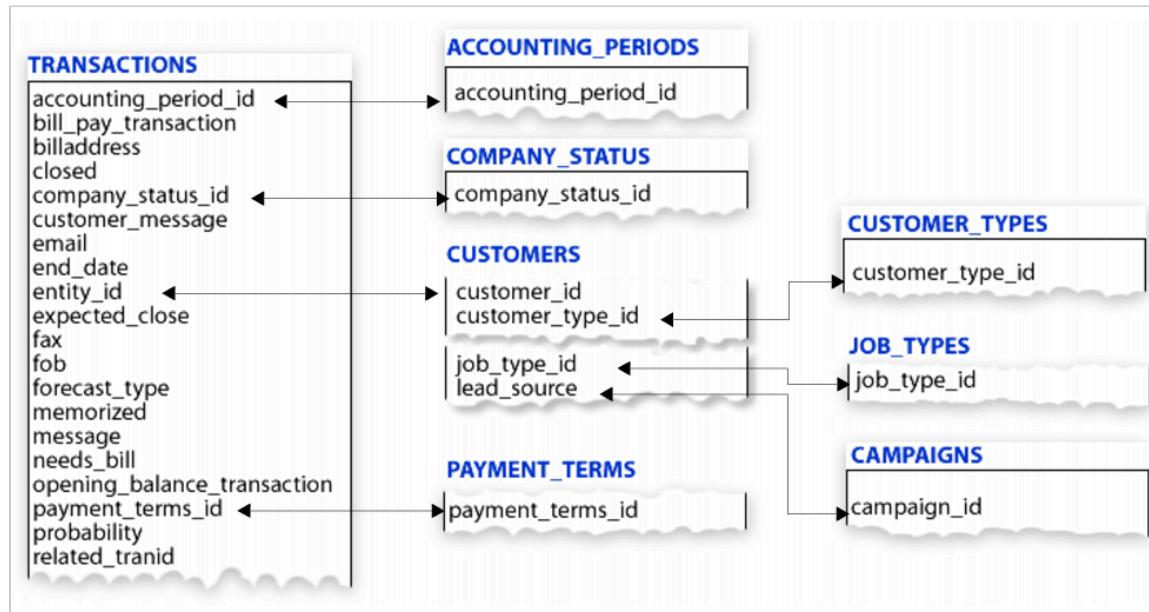
Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

The following example shows the relationship between tables in the Connect schema. This applies to the NetSuite.com data source only.

The Transactions table contains the **accounting\_period\_id** column. The arrows show the foreign key between the **accounting\_period\_id** column in the Transactions table and the corresponding column in the Accounting Periods table.

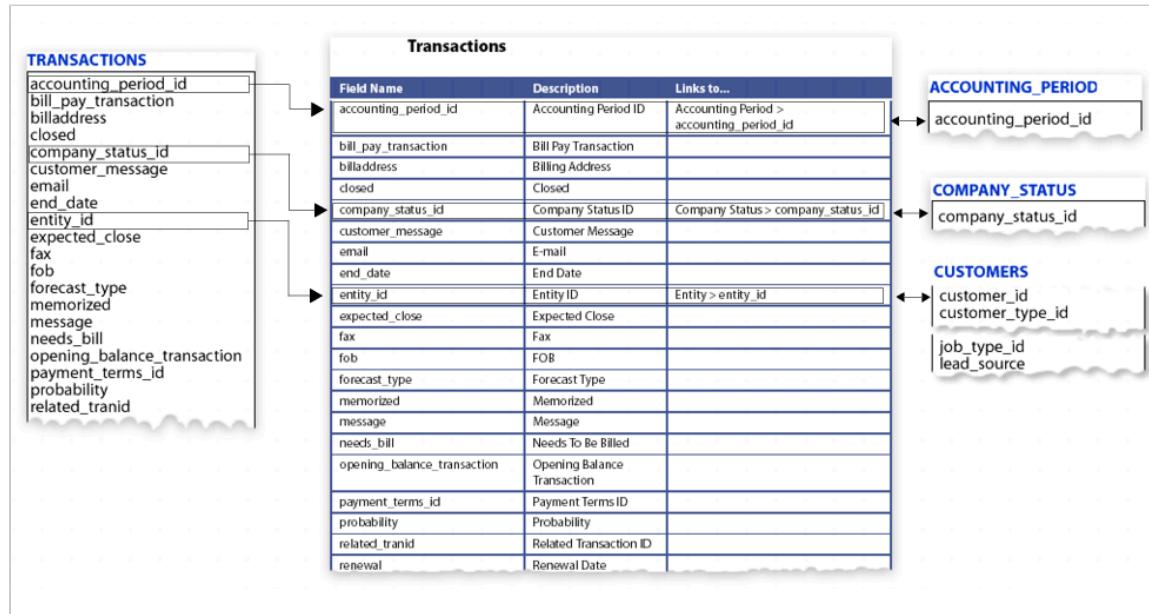
The Transactions table also contains an **entity\_id** column. In NetSuite, entities are defined as companies, contacts, customers, employees, leads, partners, prospects, and vendors, and have records stored in NetSuite. When browsing the schema, the **entity\_id** column may be listed for multiple tables. In the case of the Transactions table, this column is linked to the **customer\_id** column in the Customers table, but this column can also be linked to other tables, depending on the table in which the column is listed.

The following graphic contains portions of eight different tables and columns within the table. The schema can be listed similarly in a reporting tool.



The following graphic shows the Transactions table with a table of its corresponding columns. The table contains three columns: **Column Name**, **Descriptions**, and **Links to...**. In the Links to... column, if there is

a link to a column in another table, the name of the other table and the column linked to within that table appears.



## Custom Columns, Lists, and Records in the Connect Service



**Important:** As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

To work with the Connect Service and custom records, see the following examples and considerations:

- General Considerations for Connect
- Considerations for NetSuite.com
- Considerations for NetSuite2.com

### General Considerations for Connect

The following considerations apply to both data sources:

- Custom Field Limitations
- Newly Created Custom Records

## Custom Field Limitations

Due to an internal limitation, queries over SuiteAnalytics Connect schema tables that have more than 1000 columns only work if you retrieve 1000 columns or less in the query. For example, if the Transactions table has more than 1000 columns due to the number of custom fields that have been added to the Transaction record type, attempting to query the table using the "Select \* From" construct results in the following error: "Error: Could not find any column information for table:transactions".

This run failure may also occur when joining multiple tables in a single query and trying to retrieve all of their fields.

To query over a table with more than 1000 columns, you must enumerate the specific columns that you want to retrieve or, if you have to use the "Select \* From" construct, you must deactivate some of the custom fields that have been added to the table so that there are 1000 columns or less.

## Newly Created Custom Records

If you are using Connect and at the same time you create a new custom table or column using the same account, the newly custom record is not considered yet in your queries. After you created the custom table or column, you need to log out and open a new Connect session.

## Considerations for NetSuite.com

The following examples show how NetSuite represents customizations in the Connect Service.

- [Custom List, Record, or Column Name Conflicts](#)
- [Custom Transaction Body Column](#)
- [Custom List and Free Form Custom Column](#)
- [Custom List and Multiple Select Custom Column](#)
- [Custom Record and Custom Free Form Custom Column](#)
- [Custom Record and Multiple Select Custom Column](#)

For more information on custom record types and custom lists in the SuiteAnalytics Connect schema, see [Custom Lists](#) and [Custom Record Types](#).

## Custom List, Record, or Column Name Conflicts

The names of Connect tables and columns are unique and cannot be duplicated. When you create a custom list, record or field, you must ensure that the name is not used in any existing Connect tables or columns.

If you create a custom list, record, or field, and use a name that already exists, they will be exposed to Connect with the suffix \_0, or with a higher number in case of multiple duplicated record names. Therefore, your queries will not work as expected.

For example, if you create a custom field in the Transactions table and you name it "transaction\_id", the custom field will be renamed to "transaction\_id\_0".



**Important:** Changes to names are retroactive. If a newly exposed table or column has the same name as an existing custom list, record, or field that you created previously, the name that you defined is automatically changed to the same name and the suffix \_0.

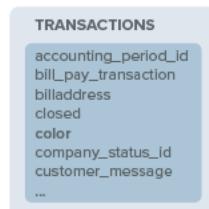
You must review your custom field names and your queries, and make adjustments as needed.

You can find the links to all Connect tables in the [Connect Schema](#) topic.

## Custom Transaction Body Column

In this example, an administrator has created a transaction body column called **Color**. The custom column is a free-form text column. This column is applied to Purchase and Sales transaction forms.

In the Connect Service, the custom column is added to the Transactions table.



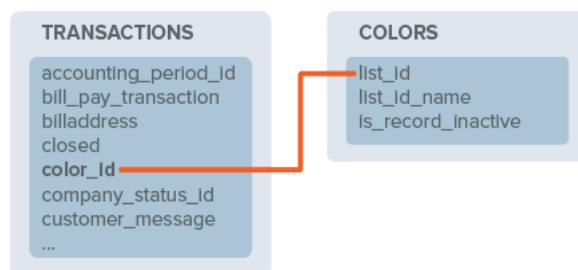
## Custom List and Free Form Custom Column

In this example, the administrator has created a custom list called **Colors**. The values included in this list are Blue, Red, Yellow, and Green.

Let's assume when you created the custom **Color** column in example 1, you selected the **Colors** list as the **List/Record** for that column.

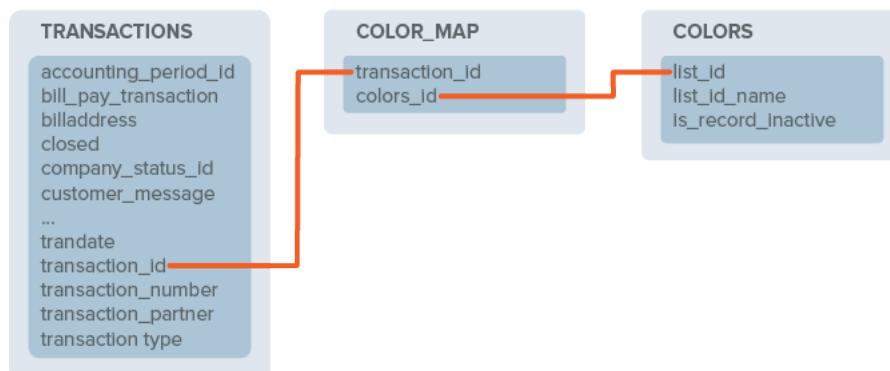
The **color** column shown in the Transactions table in example 1 has been replaced by a **color\_id** column and a new table has been created for the **Colors** list.

The **color\_id** column in the Transactions table links to the **list\_id** column on the Colors table.



## Custom List and Multiple Select Custom Column

This example illustrates the changes made to the Connect Service if the custom column, **Color**, is changed from a free-form text column to a multiple select column.



A new table, Color Map, is created and is linked to from the Transactions and Colors tables.

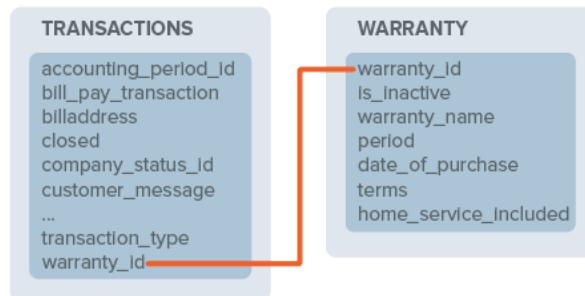
## Custom Record and Custom Free Form Custom Column

In this example, an administrator creates a custom record called **Warranty** and adds the following four columns to the custom record:

| Column Name           | Column Type    |
|-----------------------|----------------|
| Period                | Numeric        |
| Date of Purchase      | Date           |
| Terms                 | Free-form Text |
| Home Service Included | Check box      |

The administrator also creates a free-form transaction body column called **Warranty** and selects the new custom **Warranty** record as the **List/Record** for this column. This column is applied to Purchase and Sales transaction forms.

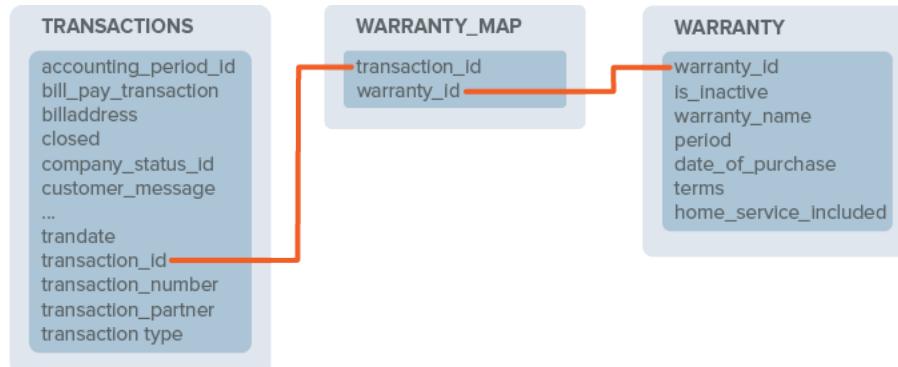
In the following graphic, a **warranty\_id** column is included in the Transactions table. A new table, named **Warranty**, represents the custom record. The **Warranty** table contains a column for each of the custom record columns. It also includes a **warranty\_name** column. This column indicates that the **Include Name Column** preference was checked during the initial setup of the custom record.



## Custom Record and Multiple Select Custom Column

This example is similar to [Custom Record and Custom Free Form Custom Column](#) except the custom **Warranty** column changes from a free-form text column to a multiple select column. The settings for the custom record are not changed.

A new table, **Warranty Map**, is created and is linked to from the **Transactions** table and the **Warranty** table.





**Note:** Custom column names that contain non-ASCII characters appear without those characters in the SuiteAnalytics Connect schema. If the custom column name contains only non-ASCII characters, the column's field ID is used instead.

## Considerations for NetSuite2.com

For details about general considerations for NetSuite2.com, see the following:

- [Querying Data with Connect](#)
- [SuiteQL Compliance](#)
- [Record Types and Fields](#)

## Driver Access for a Sandbox or Release Preview Account

After you have installed the NetSuite driver, you can use Windows administrative tools to set up NetSuite driver access to work with your NetSuite Sandbox or Release Preview account instead of your production account.

To configure the NetSuite driver for a Sandbox or Release Preview account, change your Service Host entry from the **Production** account setting to either the **Sandbox** or **Release Preview** account setting. For information about how to configure your date source or connection string, see [Configuring Your Data Source](#).

## Operating System Settings

You can set the following operating system parameter to prevent your system from closing the connection if the Connect session is not considered active.



**Note:** This parameter is supported for the ODBC driver and the latest version of the JDBC driver. For more information, see the following topics:

- [Required Update of SuiteAnalytics Connect Drivers](#)
- [Latest JDBC Driver Version Available](#)

## KeepAliveTime

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Optional. This parameter verifies periodically that the idle TCP connections are still active. By default, this parameter is set to 7,200,000 ms (2 hours) and affects all system applications. You can change the settings and enter a lower value. For example, if you set the value to three minutes, the idle TCP connections are verified every three minutes. After this change, if you run a query and you do not receive any results within the next three minutes, the connection is not interrupted. Every three minutes the driver sends a keep-alive packet to keep the connection active. For more information, see <a href="#">Idle Connection Timeout</a> . |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|              |                                                                                                                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Valid Values | Time period in milliseconds. Use your best judgement to decide the time value that you want to use. For example, if you want to use 3 minutes, type <b>180000</b> . |
| Default      | 7,200,000 ms (2 hours)                                                                                                                                              |
| Data type    | String                                                                                                                                                              |

## Third-Party Application Access

If you are unable to access SuiteAnalytics Connect, you can check the following considerations and make adjustments as needed to solve the connection problems.

- During the development stages of working with the SuiteAnalytics Connect for ODBC driver, you can use Windows administrative tools to set up ODBC access to work with your NetSuite Sandbox or Release Preview account instead of your production account. For more information, see [Driver Access for a Sandbox or Release Preview Account](#).
- You should not use IP addresses to access the Connect Service in your firewall configurations. For more information, see [Prerequisites for Using the Connect Service](#).
- Logins to SuiteAnalytics Connect are tracked in the Login Audit Trail. For more information, see the help topic [Using the Login Audit Trail](#).
- The order in which column values are returned is arbitrary. NetSuite does not guarantee the return order. In addition, Microsoft Access supports only 255 columns per result set. If you use Access to get results from the Connect Service that include more than 255 columns, it is not possible to see all of the table's column values in a single result set.
- Queries over SuiteAnalytics Connect schema tables that have more than 1000 columns only work if you retrieve 1000 columns or less in the query. A run failure may occur when using the "Select \* From" construct to query tables that have many custom fields or when joining multiple tables in a single query and trying to retrieve all their fields. For more information, see [Custom Field Limitations](#).
- SuiteAnalytics Connect requires TLS-secured connections. If you use a JDBC driver to access SuiteAnalytics Connect and you have specified a cipher suite in your connection URL, you should remove the cipher suite from the URL. If the connection URL does not include a cipher suite, the JDBC server automatically selects the appropriate cipher suite for authentication. If you use an ODBC or ADO.NET driver to access the Connect Service, no action is required. For more information, see [Authentication Using Server Certificates for JDBC](#) and [Supported TLS Protocol and Cipher Suites](#).

## Server Restarts

Server restarts may cause your queries to fail, or they may interrupt your Connect session. Server restarts can occur during a NetSuite update or maintenance. To avoid issues with query or session interruptions, consider the following:

- Retry the query manually or set up a retry mechanism to make sure that the failed queries are run again.
- Avoid using long-running queries. To prevent your queries from failing due to a server restart, you should run queries that do not require a long response time.

# Connect Data Source

With SuiteAnalytics Connect you can access NetSuite data through the NetSuite2.com data source, also known as the analytics data source. The NetSuite2.com data source uses the schema that has been used in SuiteAnalytics Workbook since 2019.2. The details about the record types and fields, joined record types and join properties are available through the Records Catalog, which shows only data relevant to your account and role. The Records Catalog is supported for the SuiteScript Analytic API and the REST Query API only. Note that the Records Catalog is available for all users that have the Records Catalog permission assigned to their role. For more information, see the help topic [Records Catalog Overview](#).



**Important:** As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

To help you understand how to use the Connect Service with NetSuite2.com, see the following topics:

- [NetSuite2.com Data Source](#)
- [Querying Data with Connect](#)

## Changing from NetSuite.com to NetSuite2.com



**Note:** This content is intended to help you change from NetSuite.com to NetSuite2.com. If you are not moving from NetSuite.com, see [Getting Started with SuiteAnalytics Connect](#).

If you have been working with NetSuite.com, you should make some adjustments before you work with NetSuite2.com.

The following table describes what changes when you move from NetSuite.com to NetSuite2.com and the required actions to complete the transition.

| What Changed            | Change Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Action Required                                              |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Accessing NetSuite2.com | <p>The NetSuite2.com applies role-based access control and is not accessible for some roles and permissions. Also, the NetSuite2.com supports the Data Warehouse Integrator (DWI) role which is not available for NetSuite.com.</p> <p>Prior to 2021.2, there was no role that allowed Connect users to access all NetSuite data through the NetSuite2.com data source. The Administrator role and the SuiteAnalytics - Read All permission were available for NetSuite.com only. As of 2021.2, the Data Warehouse Integrator role allows users to access all NetSuite data through the NetSuite2.com data source, except for sensitive data.</p> | Verify that you meet the conditions to access NetSuite2.com. |

| What Changed                    | Change Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Action Required                                           |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
|                                 | <p> <b>Note:</b> When you use SuiteAnalytics Connect with OAuth 2.0, the NetSuite2.com data source is accessible for the Administrator role. However, the Data Warehouse Integrator role and custom roles are the preferred option when transferring data to a data warehouse.</p> <p>For more information, see <a href="#">Role and Permission Considerations for NetSuite2.com</a>.</p>                                                                                                                                                                                                                                                                                                                                              |                                                           |
| Authentication                  | <p>You can access Connect with the email and password used to log in to NetSuite. However, the NetSuite2.com data source also supports two mechanisms that increase the overall system security: OAuth 2.0 and token-based authentication (TBA).</p> <p>OAuth 2.0 is the preferred authentication method. The token for OAuth 2.0 is valid for multiple sessions, while you can use the token for TBA for a single session only. You should consider using OAuth 2.0 instead of TBA whenever possible.</p> <p>For information about the two authentication methods and additional authentication considerations, see <a href="#">Authentication for SuiteAnalytics Connect</a>.</p>                                                                                                                                     | OAuth 2.0 is the preferred authentication option.         |
| Data source configuration       | <p>When you use the Connect Service with NetSuite.com, the Service Data Source connection attribute is set to NetSuite.com. To access NetSuite2.com, you must change the Service Data Source connection attribute to <b>NetSuite2.com</b>.</p> <p>To change the connection attribute for your driver and operating system, see <a href="#">Configuring Your Data Source</a>.</p> <p>For information about the data source, see the help topic <a href="#">Connect Data Source</a>.</p>                                                                                                                                                                                                                                                                                                                                  | Change the connection attribute to <b>NetSuite2.com</b> . |
| Running queries                 | <p>When you run queries with NetSuite2.com, you must use SuiteQL. SuiteQL is a query language based on the SQL-92 revision of the SQL database query language which provides advanced query capabilities. You must also consider the use of supported and unsupported functions when using SuiteQL.</p> <p>To learn about SuiteQL and see a list of supported and unsupported functions, see the help topics <a href="#">SuiteQL</a> and <a href="#">Using SuiteQL with the Connect Service</a>.</p>                                                                                                                                                                                                                                                                                                                    | Change your SQL queries to SuiteQL.                       |
| Verifying your existing queries | <p>The NetSuite2.com data source uses a different schema than NetSuite.com. Some record types and fields that were available in NetSuite.com may not be available in NetSuite2.com.</p> <p>For information about some record type differences between the two data sources, see <a href="#">Differences Between NetSuite.com and NetSuite2.com</a>.</p> <p>You must also consider that the NetSuite2.com data source applies role-based access restrictions. You may need to modify existing queries for NetSuite.com that you created when there were no role-based restrictions. You can use the Records Catalog to see the feature and permission requirements for each record type.</p> <p>For information about the Records Catalog and SuiteAnalytics Connect, see <a href="#">Using the Records Catalog</a>.</p> | Verify your queries and modify them as needed.            |
| Record types and fields         | There are multiple ways to find the names of the record types and fields available in the NetSuite2.com data source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | See <a href="#">Record Types and Fields</a> .             |

| What Changed | Change Description                                                                                                                                                        | Action Required |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|              | For information about the record types and the differences between the records available in NetSuite.com and NetSuite2.com, see <a href="#">Record Types and Fields</a> . |                 |

## Connect Schema



**Important:** This applies to the NetSuite.com data source only.

As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

The following tables describe the Connect schema available to external reporting tools when you work with the Connect Service and the NetSuite.com data source. For each Connect table, exists a list of the names of columns included in the table, column descriptions, and a list of keys, if applicable.

The best way to explore the Connect Schema is to view the standard tables and columns in the [Connect Browser](#). To learn more about the Connect Browser, see [Working with the Connect Browser](#).

SuiteAnalytics Connect introduces terms that differ from the terminology used for the ODBC Connections for the Advanced Reporting feature.

- Views are referred to as tables.
- Fields are referred to as columns.
- The entire group of the tables available through the NetSuite.com data source are known as the Connect schema.

The following is a list of tables that make up the Connect schema.

- [Account Activity](#)
- [Account Period Activity](#)
- [Account Period Activity - Period End Journal](#)
- [Account Subsidiary Map](#)
- [Accounting Books](#)
- [Accounting Periods](#)
- [Accounts](#)
- [Activities](#)
- [Address Book](#)
- [Addresses](#)

- Amortization Schedule Lines
- Amortization Schedules
- Assembly Bill of Materials
- Bill of Distributions
- Bill of Materials
- Bill of Materials Revision
- Bill of Materials Revision Components
- Billing Accounts
- Billing Class Rates
- Billing Classes
- Billing Rate Cards
- Billing Rate Card Prices
- Billing Rate Card Versions
- Billing Schedule
- Billing Schedule Descriptions
- Billing Subscription Lines
- Billing Subscriptions
- Bin Number
- Bin Number Counts
- Bins
- Budget
- Budget Category
- Calls
- Campaign Audiences
- Campaign Categories
- Campaign Channel
- Campaign Event
- Campaign Families
- Campaign Item
- Campaign Offer
- Campaign Response
- Campaign Response History
- Campaign Search Engine
- Campaign Subscription Statuses
- Campaign Subscriptions
- Campaign Verticals
- Campaigns
- Case Escalation History
- Case Issue
- Case Origin

- Case Origins
- Case Stage Changes
- Case Type
- Case Types
- Charges
- Classes
- Commission Authorization Link
- Commission Plan
- Commission Rate
- Commission Schedule
- Companies
- Company Contact Map
- Company Status
- Competitor
- Competitor Opportunity Map
- Components Per Routing Steps
- Components Per Routing Steps - Advanced Bill of Materials
- Consolidated Exchange Rates
- Contact Role
- Contact Types
- Contacts
- Countries
- Coupon Codes
- CRM Group
- CRM Group Map
- CRM Template
- Currencies
- Currency Exchange Rates
- Currency Exchange Rate Types
- Custom Lists
- Custom Record Types
- Customer Currencies
- Customer Group Pricing
- Customer Item Pricing
- Customer Partner Sales Teams
- Customer Sales Teams
- Customer Subsidiary Map
- Customer Types
- Customers
- Deleted Records

- Departments
- Distribution Categories
- Distribution Networks
- Employee Corporate Cards
- Employee Currencies
- Employee Expenses Sources
- Employee Time
- Employee Types
- Employees
- Entity
- Entity Category
- Entity Event Map
- Entity Role Map
- Entity Status
- Entity Status History
- Entity Territory Map
- Event Attendees
- Events
- Expense Accounts
- Expense Amortization Rules
- Expense Based Charge Rules
- Expense Categories
- Expense Categories Rates
- Expense Categories Subsidiary Map
- Expense Detail
- Expense Plan Lines
- Expense Plans
- Expense Reports
- Fair Value Prices
- Fixed Fee Charge Rules
- Generic Resources
- Gift Certificates
- Global Account Map
- Global Inventory Relationships
- Group Test Cell
- Imported Employee Expenses
- Inbound Shipments
- Inbound Shipment Items
- Income Accounts
- Inventory Cost Template

- Inventory Cost Template Items
- Inventory Items
- Inventory Number
- Inventory Statuses
- Item Account Map
- Item Billing Rates
- Item Collection Map
- Item Collections
- Item Demand Plan Lines
- Item Demand Plans
- Item Fulfillments
- Item Group
- Item Location Map
- Item Price History
- Item Prices
- Item Quantity
- Item Revisions
- Item Ship Methods
- Item Site Categories
- Item Subsidiary Map
- Item Supply Plan Attributes
- Item Supply Plan Lines
- Item Supply Plan Source
- Item Supply Plan Source Types
- Item Supply Plans
- Item Vendor Map
- Item Vendor Pricing
- Items
- Job Resource Role
- Job Resources
- Job Types
- Location Costing Groups
- Location Costing Groups -Locations
- Locations
- Memorized Transactions
- Message
- Message Recipient
- MFG Cost Template
- MFG Cost Template Items
- MFG Routing

- MFG Routing Steps
- Nexus
- NLCompany
- Note Type
- Notes User
- Opportunities
- Opportunity Contact Map
- Opportunity Lines
- Order Allocation Strategies
- Originating Leads
- Other Names
- Partner Sales Roles
- Partner Types
- Partners
- Payment Methods
- Payment Terms
- Payroll Item Types
- Payroll Items
- Percent Complete Overrides
- Plan Assignment Map
- Plan Schedule Map
- Planned Standard Costs
- Posting Account Activity
- Posting Account Activity - Period End Journal
- Price Book Line Intervals
- Price Books
- Price Plans
- Price Tiers
- Price Types
- Pricing Groups
- Project Billing Budgets
- Project Cost Budgets
- Project Cost Categories
- Project Expense Types
- Project Revenue Rule Types
- Project Charge Rules - Project Revenue Rules
- Project Revenue Rules
- Project Task Assignments
- Project Task Billing Budgets
- Project Task Cost Budgets

- Project Task Dependencies
- Project Tasks
- Project Templates
- Project Time Approval Types
- Promotion Codes
- Purchase Charge Rules
- Quota
- Resource Allocations
- Resource Group Entities
- Resource Groups
- Revaluation
- Revenue Elements
- Revenue Plan Lines
- Revenue Plan Version Lines
- Revenue Plan Versions
- Revenue Plans
- Revenue Recognition Rules
- Revenue Recognition Schedule Lines
- Revenue Recognition Schedules
- Role Subsidiary Map
- Roles
- Sales Channel
- Sales Forecast
- Sales Reps
- Sales Roles
- Sales Territories
- Service Items
- Shipment Packages
- Shipping Items
- Solution
- Solution Case Map
- Solution Topic Map
- Standard Cost Components
- States
- Subscription Line Price Intervals
- Subscription Line Revisions
- Subscription Change Orders
- Subscription Change Order Lines
- Subscription Plan Lines
- Subscription Plans

- Subscription Terms
- Subsidiaries
- Subsidiary Book Map
- Subsidiary Class Map
- Subsidiary Department Map
- Subsidiary Location Map
- Subsidiary Nexus Map
- Supplier Categories
- Support Case History
- Support Incidents (Cases)
- Support Reps
- Support Territories
- System Notes
- System Notes Custom
- Task Contacts
- Tasks
- Tax Items
- Territory
- Time Based Charge Rules
- Timesheet
- Topic
- Transaction Address
- Transaction Bin Numbers
- Transaction Book Map
- Transaction Cost Components
- Transaction History
- Transaction Inventory Numbers
- Transaction Line Book Map
- Transaction Lines
- Transaction Links
- Transaction Partner Sales Teams
- Transaction Sales Teams
- Transaction Shipping Groups
- Transaction Tax Detail
- Transaction Tracking Numbers
- Transactions
- Units Type
- Unlocked Time Periods
- UOM
- Usages

- [Vendor Currencies](#)
- [Vendor Subsidiary Map](#)
- [Vendor Types](#)
- [Vendors](#)
- [Win Loss Reason](#)
- [Work Calendar Holidays](#)
- [Work Calendars](#)

In addition to standard tables, SuiteAnalytics Connect includes system tables. For more information, see [SuiteAnalytics Connect System Tables](#).



**Note:** Additional schema tables are available only if you have the Advanced Revenue Management feature enabled in your account. For more information about those tables, please refer to the Advanced Revenue Management documentation.

## Working with the Connect Browser



**Important:** The Connect Browser is no longer being updated and shows tables and columns that were made available up to 2021.2 only.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change and the NetSuite2.com data source, see [New Accounts and Access to the Connect Data Source](#).

[Go to the SuiteAnalytics Connect Browser](#).

The [Connect Browser](#) includes a summary of NetSuite data available through the NetSuite.com data source. The browser provides a page for each of the standard tables in the Connect schema and is updated bi-annually to include any newly exposed tables and columns. Each page in the browser lists the table's columns, a subset of its primary and foreign keys, the related tables, and length, precision, and scale attributes for each table column.



**Important:** The data types listed in the Connect Browser follow Oracle naming conventions. Consequently, depending on the SuiteAnalytics Connect driver you use, the data types of certain columns may vary.

For some tables, the Connect Browser also provides domain diagrams that illustrate the relationships among tables in a specific business domain. Currently, only the most widely used domains are included.

The Connect Browser is integrated with the SuiteScript Records Browser and the SOAP Schema Browser, which enables you to compare record type support across SuiteScript, SOAP web services, and SuiteAnalytics Connect.

To learn how to use the Connect Browser, see the following:

- [Connect Schema](#)
- [SuiteAnalytics Connect System Tables](#)

- Custom Record Types and Lists
- Examples of Queries



**Note:** The system table OA\_COLUMNS contains identical column information as the pages for each table in the Connect Browser, however OA\_COLUMNS is updated immediately when there are new exposures in the Connect Schema. Consequently, the OA\_COLUMNS table may contain more column information than the Browser.

Additionally, the scale attribute in both the OA\_COLUMNS table and the Browser may display 0 when the value is unknown or undefined. For more information about the OA\_COLUMNS table, see [oa\\_columns](#).

## Working Offline

If you want to use the SuiteAnalytics Connect Browser when you are working offline, you can download the [.zip file](#) that contains the SOAP Schema Browser, SuiteScript Records Browser, and SuiteAnalytics Connect Browser.

After downloading the .zip file, extract it and go to the \odbc directory. To view the content, open the index.htm file in the browser of your choice.

Alternatively, you can download the SuiteAnalytics Connect Browser .chm file that contains only the SuiteAnalytics Connect Browser. To download the file, on your NetSuite home page, find the **Settings** portlet and click **Set Up SuiteAnalytics Connect**, then click the **Connect Browser** link.

After you have downloaded the Connect Browser .chm file, you may need to unblock the file to be able to use it.

To unblock the file:

1. Right-click the .chm file and choose **Properties**.
2. In the file properties window, click the **Unblock** button, and then click **Apply**.

When the file is unblocked, you can open it to work with the Connect Browser.

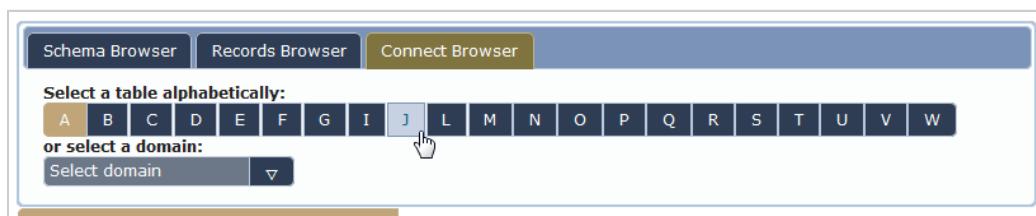
## Finding a Table

To find a table in the Connect Browser, use the A-Z index at the top of the browser window.

### To find a table:

1. Click the appropriate letter at the top of the browser window.

The pane at the left updates to include a list of all tables with names that begin with the selected letter. The center pane updates to show details of the first table in the list.



2. Click the name of the table you are interested in.
- The center pane updates to show details of the table.

## Table Summary

For each table, the browser displays a series of tables summarizing the following:

- **Columns** – the table's columns.
- **Primary key** – the table's primary key.
- **Foreign keys in this table** – foreign keys in this table that reference columns in other tables.
- **Foreign keys referencing this table** – foreign keys in other tables that reference columns in this table.
- **This table is included in the following domains** – lists the business domains this table is a part of. Domains are currently available only for some tables.
- **Domain diagrams** – if the table is included in a domain, you can use the domain diagram to explore the relationships between all tables included in that domain.

Primary keys use yellow highlighting, whereas foreign keys are highlighted in green. Pink highlighting is applied only to the **date\_last\_modified** columns, which are used for incremental backups.

Some of the labels used in the Connect Browser are described below.

 **Important:** The data types listed in the Connect Browser follow Oracle naming conventions. Consequently, depending on the SuiteAnalytics Connect driver you use, the data types of certain columns may vary.

| Label          | Description                                                                 |
|----------------|-----------------------------------------------------------------------------|
| Name           | Column name                                                                 |
| Type           | Column data type                                                            |
| Length         | Maximum field length, in bytes                                              |
| Precision      | Maximum digits in a number or maximum characters in a string                |
| Scale          | Maximum decimal places in a number                                          |
| References     | A primary key column in a different table that is referenced by this column |
| In             | The primary key table that is referenced by this column                     |
| Description    | Column description                                                          |
| PK Column Name | Primary key column name                                                     |
| PK Table Name  | Primary key table name                                                      |
| FK Name        | Foreign key name                                                            |
| FK Column Name | Foreign key column name                                                     |
| FK Table Name  | Foreign key table name                                                      |
| Key Seq        | For composite keys, the order of columns in a key                           |
| Domains        | The domains this table is included in                                       |



**Note:** If you are using the column attributes in your configuration, review them and make any adjustments as needed. To avoid errors or discrepancies, your configuration must match the column values listed in the Connect Browser.

## Comparing Connect, SuiteScript, and SOAP Web Services Exposure

You can check whether the table you are viewing in the Connect Browser is supported as a record in SuiteScript or SOAP web services.

- To check the SuiteScript support, click the Records Browser tab at the top of the page.
- To check the SOAP web services support, click the Schema Browser tab at the top of the page.



If the record is supported in SOAP web services or SuiteScript, you are directed to the corresponding page in the SOAP Schema Browser or the SuiteScript Records Browser. Otherwise, you are directed to the first page of the browser.

To compare record type support in SuiteScript, SOAP web services, and SuiteAnalytics Connect, see the help topic [SuiteCloud Supported Records](#).

## Domains and Domain Diagrams

Some tables in the Connect Browser are combined to form domains. Domains are groups of tables that are related to each other. The relationships between these tables are illustrated by domain diagrams provided for each of the domains.

Currently, the Connect Browser includes only the most widely used domains and their diagrams.

### To find a domain:

1. Select the domain from the list at the top of the browser window.



2. A list of all tables included in this domain appears. Click a table to view its summary.

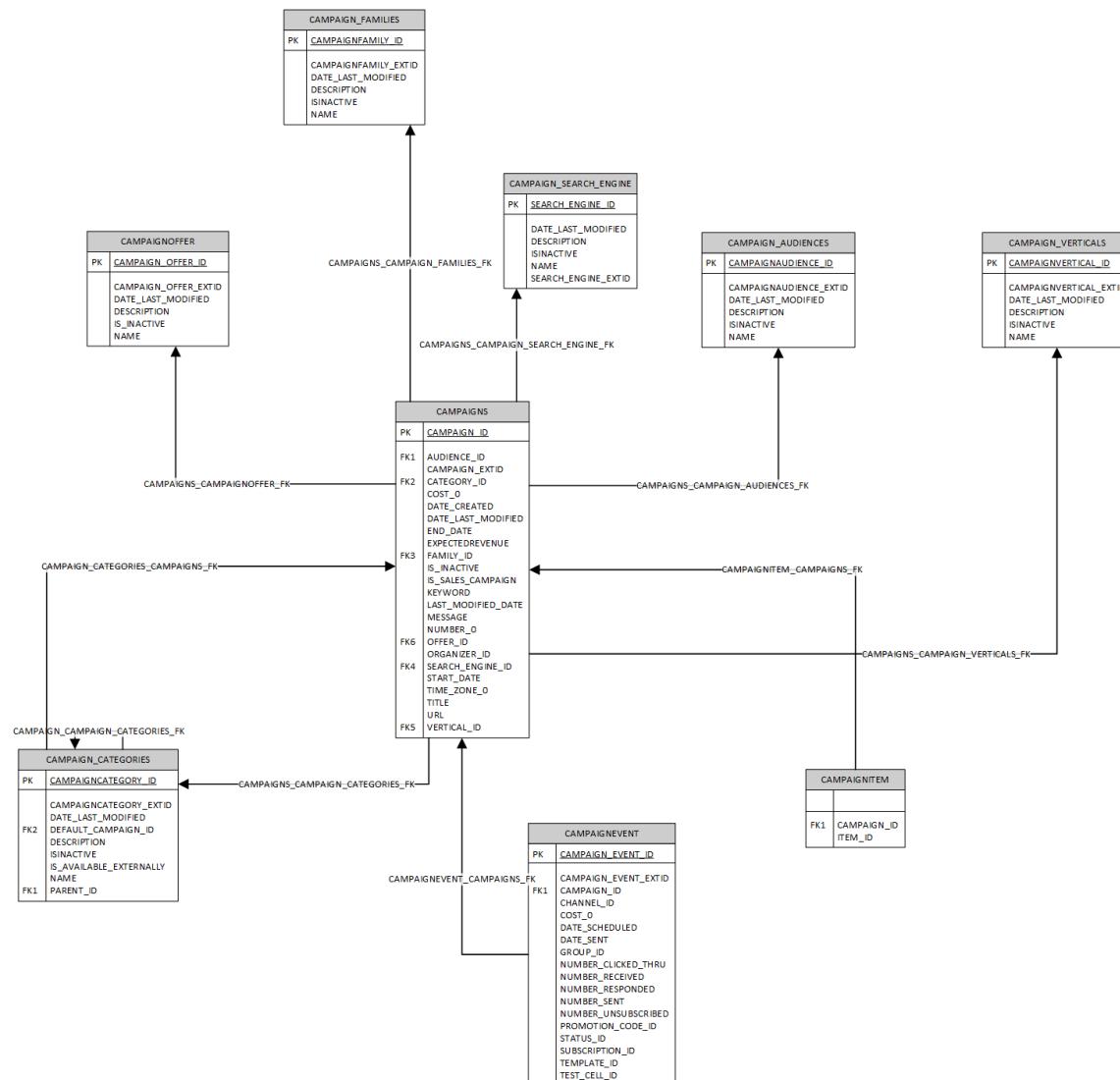
The diagrams for the domains in which this table is included are displayed at the bottom of the page.

## Understanding Domain Diagrams

Domain diagrams outline the relationships between tables in the same domain.

- Primary keys in each table appear at the top of the table and are labeled **PK**.
- Foreign keys are labeled **FK**. If a table contains multiple foreign keys, a number is added to the **FK** label.
- An arrow from one table to another indicates that this table contains a foreign key that is a primary key in the other table. This association can also occur within the same table. For example, in the Accounts table, an account can be a subaccount of another account.

In the following diagram, the **campaigns** table has one primary key, **campaign\_id**, and multiple foreign keys. Through its foreign keys, the **campaigns** table is related to the **campaignoffer**, **campaign\_families**, **campaign\_search\_engine**, **campaign\_audiences**, **campaign\_verticals**, and **campaign\_categories** tables. The tables that reference the **campaigns** table through its primary key are **campaignitem**, **campaign\_categories**, and **campaignevent**.



# Custom Record Types and Lists

To help you understand the custom record types and lists of the Connect Schema, see the following help topics:

- [Custom Lists](#)
- [Custom Record Types](#)

## Custom Lists

Data for each custom list in your account is exposed as a table. The name of each table corresponds to the name of the custom list. Each table includes all custom columns and the following additional columns.

| <b>Table name: any</b> |                                                                                                                                                                                          |                   |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Column Name</b>     | <b>Description</b>                                                                                                                                                                       | <b>Relates to</b> |
| date_created           | Date Created (GMT)                                                                                                                                                                       | —                 |
| last_modified_date     | Last Modified Date (GMT)                                                                                                                                                                 | —                 |
| is_record_inactive     | Value of the Inactive box.<br>F = the list is active.<br>T = the list is inactive.                                                                                                       | —                 |
| list_id                | Unique ID (auto-incremented number)                                                                                                                                                      | —                 |
| list_item_name         | This column contains the Name of the list.<br><br>If translations have been provided for this value, then the column will contain the value translated in to the user's selected locale. | —                 |
| <ListName>_extid       | External ID<br><br>If a custom list's name starts with a number or an underscore (_), the column name is N_<ListName>_extid.                                                             | —                 |



**Note:** Column names are case insensitive and do not contain spaces. Any spaces in your custom column names will be replaced by underscores in the underlying column names.

Custom column names that contain non-ASCII characters appear without those characters in the SuiteAnalytics Connect schema. If the custom column name contains only non-ASCII characters, the column's field ID is used instead.

## Identifying primary and foreign keys in custom lists

To find primary and foreign keys in a custom list, you can use the following query, replacing CUSTOM\_LIST\_NAME with your custom list name:

```
1 | select pktable_name, pkcolumn_name, pk_name, fktable_name, fkcolumn_name, fk_name from oa_fkeys where pktable_name =
'CUSTOM_LIST_NAME';
```

In the query output, the **pk\_name** column contains the primary key name, and the **fk\_name** column shows the foreign key name. For more examples of queries over primary and foreign keys, see [oa\\_fkeys](#).

## Custom Record Types

Data for each custom record type in your account is exposed as a table. The name of each table corresponds to the name of the custom record type. Each table includes all custom columns and the following additional columns.

| Table name:             |                                                                                                                                                                                                                                                              |            |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Column Name             | Description                                                                                                                                                                                                                                                  | Relates to |
| date_created            | Date Created (GMT)                                                                                                                                                                                                                                           | —          |
| last_modified_date      | Last Modified Date (GMT)                                                                                                                                                                                                                                     | —          |
| is_inactive             | Value of the Inactive box.<br>F = the record type is active.<br>T = the record type is inactive.                                                                                                                                                             | —          |
| <RecordTypeName>_id     | Unique ID (auto-incremented number)                                                                                                                                                                                                                          | —          |
| <RecordTypeName>_extid  | External ID<br><br>If a custom record type's name starts with a number or an underscore (_), the column name is N_<RecordTypeName>_extid.                                                                                                                    | —          |
| <RecordTypeName>_name   | This column will only be available if you marked the Include Name Column box. It contains the Name Column value. Note that this column, if selected, is required for all records (see the help topic <a href="#">Record Types</a> )                          | —          |
| <RecordTypeName>_number | This column will only be available if you have specified a numbering format for your custom record type. It contains an automatically generated number, formatted to your specification. (See the help topic <a href="#">Numbering Custom Record Types</a> ) | —          |



**Note:** Column names are case insensitive and do not contain spaces. Any spaces in your custom column names will be replaced by underscores in the underlying column names. <RecordTypeName> is the name of the custom record type.

Custom column names that contain non-ASCII characters appear without those characters in the SuiteAnalytics Connect schema. If the custom column name contains only non-ASCII characters, the column's field ID is used instead.

## Identifying primary and foreign keys in custom record types

To find primary and foreign keys in a custom record type, you can use the following query, replacing CUSTOM\_RECORD\_NAME with your custom record type name:

```
1 | select pktable_name, pkcolumn_name, pk_name, fktable_name, fkcolumn_name, fk_name from oa_fkeys where pktable_name =
  'CUSTOM_RECORD_NAME';
```

In the query output, the **pk\_name** column contains the primary key name, and the **fk\_name** column shows the foreign key name. For more examples of queries over primary and foreign keys, see [oa\\_fkeys](#).

## Examples of Queries

For examples of queries, see the following topics:

- Joining Tables in Connect
- Connect Access to Transaction Credit and Debit Amounts
- Connect Access to Transaction Quantities

## Joining Tables in Connect

In SuiteAnalytics Connect, you can join two tables in your query to obtain a customized result set. The following example shows how you can joint two Connect tables:

### Linking Gift Certificates to Transaction Line Items

You can return [Transaction Lines](#) table data together with [Gift Certificates](#) table data by querying for records where the Transaction Lines memo column value matches the Gift Certificates gift\_certificate\_id value. In addition, you can return [Items](#) table data by querying for records where the Transaction Lines item\_id column value matches the Items item\_id column value, and the value for the Items type\_name column is 'Gift Certificate'.

Use queries like the following for these data joins:

```

1 select * from TRANSACTION_LINES tl, GIFT_CERTIFICATES gc
2 where tl.MEMO = gc.GIFT_CERTIFICATE_ID
3
4 select * from TRANSACTION_LINES tl, GIFT_CERTIFICATES gc, ITEMS i
5 where tl.MEMO = gc.GIFT_CERTIFICATE_ID
6   and tl.ITEM_ID = i.ITEM_ID
7   and i.TYPE_NAME = 'Gift Certificate'
```

## Connect Access to Transaction Credit and Debit Amounts

Credit and debit amounts are not exposed as columns in the [Transactions](#) or [Transaction Lines](#) tables. However, you can obtain transaction credit and debit amounts from the Transaction Lines table with queries like the following:

To obtain the credit amount for a transaction:

```

1 SELECT TRANSACTION_ID, NULLIF(GREATEST(-1*TRANSACTION_LINES.AMOUNT,0),0) "CREDITAMOUNT" FROM TRANSACTION_LINES WHERE COMPANY_ID =
YOUR_ID
```

To obtain the debit amount for a transaction:

```

1 SELECT TRANSACTION_ID, NULLIF(GREATEST(TRANSACTION_LINES.AMOUNT,0),0) "DEBITAMOUNT" FROM TRANSACTION_LINES WHERE COMPANY_ID =
YOUR_ID
```

These results can be useful for financial reporting purposes.

## Connect Access to Transaction Quantities

Item count and quantity values are not exposed as columns in the [Transactions](#) table. However, you can obtain these values through the Connect Service by running a query against the [Transaction Lines](#) table such as the following:

```

1 select TRANSACTIONS.TRANSACTION_ID, TRANSACTION_LINES.ITEM_COUNT
2 from TRANSACTIONS, TRANSACTION_LINES
3 where TRANSACTION_LINES.TRANSACTION_ID = TRANSACTIONS.TRANSACTION_ID
4   and TRANSACTION_LINES.TRANSACTION_LINE_ID > 0;
```

These results can be useful for inventory reporting purposes.

Note that the **transaction\_id** field corresponds to the unique identifier of a transaction. To get the transaction ID through a Transaction saved search, select the **Internal ID (Number)** in the Filter field.

## NetSuite2.com Data Source

The analytics data source enhances the capabilities of querying your NetSuite data through the Connect Service. Some benefits of using the NetSuite2.com data source include the following:

- The exposed data is consistent with SuiteAnalytics Workbook. This data source solves some previous inconsistencies in data exposure that have resulted between the saved searches and reporting tools. For more information about the analytics data source and SuiteAnalytics Workbook, see the help topic [Analytics Data Source Overview](#).
- To learn about the record types and fields available in the NetSuite2.com data source, see [Record Types and Fields](#).
- The data source applies role-based access control. Users can query only data that they can access in the SuiteAnalytics Workbook user interface. Note that the analytics data source is not accessible for some roles and permissions. For more information, see [Role and Permission Considerations for NetSuite2.com](#).
- The Connect Service supports token-based authentication (TBA) for the NetSuite2.com data source. For more information, see [Token-based Authentication for Connect](#).
- The Connect Service supports SuiteQL which is a query language that provides advanced query capabilities and helps to increase security. SuiteQL includes a list of supported SQL functions and does not allow you to use unsupported SQL functions in your query, which prevents SQL injection. See the help topic [Using SuiteQL with the Connect Service](#).

To use the NetSuite2.com data source, see the following:

- To start working with Connect and the NetSuite2.com data source, see [Getting Started with SuiteAnalytics Connect](#).
- If you are already familiar with NetSuite.com and you need to learn how to change to NetSuite2.com, see [Changing from NetSuite.com to NetSuite2.com](#).

## Working with the Static Data Model

The NetSuite2.com data source applies role-based access control. This access control means that the features, roles, and permissions assigned to your account determine the data that you can access through SuiteAnalytics Connect. Using the Static Data Model, Connect still applies role-based access control. Therefore, you can only get the data for the records that you can access, but you can see the structure and the names of all available record types and fields.

To use the Static Data Model in your account, you must add the `StaticSchema` attribute to your driver configuration.

## Setting the Static Data Model for Connect Drivers

When you install or update your Connect driver, the Static Data Model attribute is not included in the default driver configuration. You must update the connection attributes to add the `StaticSchema` attribute. Depending on the driver that you use, there are different ways to edit the connection attributes.

- [ODBC Drivers for Windows Using a DSN Connection](#)
- [ODBC Drivers for Windows Using a Connection String](#)
- [ODBC Drivers for Linux](#)
- [JDBC Drivers](#)

- ADO.NET Drivers

**i Note:** When you update the connection string typing the new attribute, note the syntax changes between drivers.

## ODBC Drivers for Windows Using a DSN Connection

**x Warning:** When modifying registry entries using the Registry Editor. Modifying registry entries incorrectly can cause serious issues.

If you use a data source name (DSN) connection, you must add the **StaticSchema** entry using the Windows Registry Editor application.

### To set the **StaticSchema** attribute on Windows:

1. Open the Registry Editor application.
2. For most Windows versions, go to the following subkeys:
  - For 64-bit drivers, go to **Computer\HKEY\_LOCAL\_MACHINE\SOFTWARE\ODBC\ODBC.INI**.
  - For 32-bit drivers, go to **Computer\HKEY\_LOCAL\_MACHINE\SOFTWARE\WOW6432Node\ODBC\ODBC.INI**.
3. Locate the **CustomProperties** entry.
4. Right-click the **CustomProperties** entry and select **Modify**.
5. In the **Value data** field, type **StaticSchema=1** after the role ID attribute. See the following example:

| Name              | Type   | Data                                       |
|-------------------|--------|--------------------------------------------|
| (Default)         | REG_SZ | (value not set)                            |
| AlternateServers  | REG_SZ |                                            |
| ConnectionRetr... | REG_SZ | 0                                          |
| ConnectionRetr... | REG_SZ | 3                                          |
| Customized        | REG_SZ | 0                                          |
| CustomProperties  | REG_SZ | AccountID=12345;RoleID=1000;StaticSchema=1 |
| Description       | REG_SZ |                                            |

**i Note:** After you add the **StaticSchema** attribute, if you make changes to the driver configuration using the ODBC Administrator tool, the **StaticSchema** attribute is removed. For example, if you use the ODBC Administrator tool to edit the role ID, you need to add the **StaticSchema** attribute again.

## ODBC Drivers for Windows Using a Connection String

If you use a connection string, you must update your connection string to add the **StaticSchema** attribute to the list of **CustomProperties** attributes. Place the **StaticSchema** attribute after the required attributes, and set it to **1**. See the following example:

```
CustomProperties=AccountId=<AccountId>;RoleID=<RoleID>;Uppercase=1;StaticSchema=1;OAuth2Token=<connection string value>
```

For more information, see [Connecting Using a Connection String](#).

## ODBC Drivers for Linux

You must edit the odbc[64].ini or odbc.ini files to add the **StaticSchema** attribute to the list of **CustomProperties** attributes. See the following example:

```
CustomProperties=AccountId=<AccountId>;RoleID=<RoleID>;Uppercase=1;StaticSchema=1;OAuth2Token=<connection string value>
```

For more information about how to edit the INI files, see [Configuring the ODBC Data Source on Linux](#).

## JDBC Drivers

You must update your connection string to add the StaticSchema attribute to the list of CustomProperties attributes. Place the StaticSchema attribute after the required attributes, and set it to **1**. See the following example:

```
CustomProperties=(AccountID=<AccountID>;RoleID=<RoleID>;Uppercase=1;StaticSchema=1;OAuth2Token=<connection string value>)
```

For more information, see [JDBC Connection Properties](#).

## ADO.NET Drivers

You must update your connection string to add the StaticSchema attribute to the list of CustomProperties attributes. Place the StaticSchema attribute after the required attributes, and set it to **1**. See the following example:

```
CustomProperties='AccountID=<AccountID>;RoleID=<RoleID>;StaticSchema=1;OAuth2Token=<connection string value>'
```

For more information, see [ADO.NET Connection Options](#).

For more information about other connection attributes, see [Connection Attributes](#).

## Record Types and Fields

To query your NetSuite data with SuiteAnalytics Connect, you must know the names of the record types and fields that you want to use in your queries.

- [How to View the Record Types and Fields Available in Your Account](#)
- [How to Find Record Type Names and Field Names](#)
- [Differences Between NetSuite.com and NetSuite2.com](#)



**Note:** The NetSuite2.com data source applies role-based access control. This means that the features, roles and permissions assigned to your account determine the data that you can access through Connect. Using the Static Data Model, SuiteAnalytics Connect still applies role-based permissions. Therefore, you can only get the data for the records that you can access, but you can see the structure and the name of all available record types and fields. For more information, see [Setting the Static Data Model for Connect Drivers](#).

## How to View the Record Types and Fields Available in Your Account

To get a list of all record types and fields that are available in your account, see [SuiteAnalytics Connect System Tables](#).

## How to Find Record Type Names and Field Names

You can find the names of standard and custom record types and fields in the following ways:

- [Using SuiteAnalytics Connect](#)
- [Using the NetSuite UI](#)
- [Using SuiteAnalytics Workbook](#)

- Using the Records Catalog

## Using SuiteAnalytics Connect

If you know the field name in the NetSuite UI, you can use the oa\_tables and oa\_columns tables. For example, you can run the following query:

```
1 | SELECT * FROM OA_TABLES WHERE REMARKS=UI name
```

For more information about these tables, see [SuiteAnalytics Connect System Tables](#).

## Using the NetSuite UI

On the Customization tab, you can see the IDs of the available record types and fields. For example, to see the IDs for custom CRM fields, go to Customization > Lists, Records, & Fields > CRM Fields (Administrator). The ID column appears in the list of custom fields.

| Custom CRM Fields |                     |             |                       |                |      |     |
|-------------------|---------------------|-------------|-----------------------|----------------|------|-----|
|                   |                     | New         | FILTERS               |                |      |     |
|                   |                     | FILTERS     | FROM BUNDLE           |                |      |     |
|                   |                     | FROM BUNDLE |                       |                |      |     |
| #                 | DESCRIPTION         | FROM BUNDLE | ID                    | TYPE           | LIST | TAB |
| 1                 | Days Open           |             | custevent2            | Decimal Number | Main |     |
| 4                 | Inbound Memo        |             | custevent_inboundmemo | Free-Form Text | Main |     |
| 5                 | Current Assigned To |             | custevent4            | Free-Form Text | Main |     |

## Using SuiteAnalytics Workbook

You can use the SuiteAnalytics Workbook UI to find standard and custom record types and field names. For more information, see the help topic [Using the SuiteAnalytics Workbook UI](#).

## Using the Records Catalog

You can use the Records Catalog to see the fields and joins available for each record type. The Records Catalog also displays information such as the cardinality, field level help, and the feature and permission requirements for each record type. The Records Catalog relies on NetSuite role-based permissions, so you can see only the record types for the data that you can access in the NetSuite user interface. The Records Catalog is supported for the SuiteScript Analytic API and the REST Query API only. Therefore, the record types available in the Records Catalog and the record types accessible through the Connect Service may differ slightly.

**Note:** The Records Catalog is available for all users that have the Records Catalog permission assigned to their role. For more information, see the help topic [Records Catalog Overview](#).

## Differences Between NetSuite.com and NetSuite2.com

**Important:** This section is a work in progress. Additional updates are forthcoming.

The NetSuite2.com data source uses a different schema than the NetSuite.com data source. Some record types and fields that were available in NetSuite.com may not be available in NetSuite2.com. However, you

can get similar results if you change your queries and use the exposed record types and fields available in NetSuite2.com.

The following sections explain some important differences between record types in NetSuite.com and NetSuite2.com:

- [Legacy Tax Records and SuiteTax](#)
- [Subsidiary Field on Customer Records](#)
- [Subsidiary Records](#)
- [Transaction Records](#)

## Legacy Tax Records and SuiteTax

When the SuiteTax feature is enabled, the tax information about legacy records is migrated to SuiteTax. Note that the Connect data sources include different tax-related records:

- **NetSuite.com** - This data source includes legacy tax records and fields.
- **NetSuite2.com** - This data source includes SuiteTax records and fields.

For information about the benefits of switching to SuiteTax and the changes on NetSuite records when the SuiteTax feature is enabled, see the help topic [SuiteTax](#).

## Subsidiary Field on Customer Records

The field ID is **subsidiary**.

In NetSuite2.com, to query data about the subsidiary on a Customer record, you must do the following:

1. Join the Customer-Subsidiary Relationship record to the Customer record.
2. Filter them by the **Is Primary Subsidiary** field equals **Yes**. The field ID is **isprimarysub**.



**Important:** Do not omit this filter on accounts where the **Multi-Subsidiary Customer** feature (ID **multisubsidiarycustomer**) is disabled.



**Tip:** If the **Multi-Subsidiary Customer** feature is enabled, you can query data about all of the subsidiaries associated with the customer record.

## Subsidiary Records

When you query your data about subsidiaries, you must consider the following differences between the two data sources:

- **NetSuite.com** - The Subsidiary tables do not include data about child subsidiaries.
- **NetSuite2.com** - The Subsidiary record types include data about child subsidiaries.

When you use the NetSuite2.com data source, be aware that results will also include data for the child subsidiaries. You should consider this when you review your queries and make any adjustments as needed.

The following table includes the names of the tables in NetSuite.com and the alternative record types in NetSuite2.com:

| NetSuite.com        | NetSuite2.com        |
|---------------------|----------------------|
| Accound_subsidy_map | AccountSubsidiaryMap |

| NetSuite.com              | NetSuite2.com               |
|---------------------------|-----------------------------|
| Subsidiaries              | Subsidiaries                |
| Subsidiary_book_map       | Subsidiarybookmap           |
| Subsidiary_class_map      | ClassificationSubsidiaryMap |
| Subsidiary_department_map | DepartmentSubsidiaryMap     |
| Subsidiary_location_map   | LocationSubsidiaryMap       |
| Subsidiary_nexus_map      | Subsidiarynexusmap          |

For information about the tables that include subsidiary data in NetSuite.com, see [Connect Schema](#).

For information about the subsidiary data available through NetSuite2.com, see [Record Types and Fields](#).

## Transaction Records

Because the line-level query in NetSuite.com has no equivalent in NetSuite2.com, you need to run the following query:

```
1 | SELECT AltSalesTotal FROM transaction
2 | WHERE transaction = <Sales Order Internal ID>
```

Use the following table to map transaction fields from NetSuite.com to NetSuite2.com:

| NetSuite.com                       | NetSuite2.com                                                                                                      |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| transaction_lines.alt_sales_amount | no equivalent on line level                                                                                        |
| transaction_lines.net_amount       | In transaction currency: transactionline.netamount<br>In base (home) currency: transactionaccountingline.netamount |

## Record Names, Permissions, and Features Required

The following table lists record names, permissions, and features required for working with SuiteAnalytics Connect.

| Record Name              | Role Permission             | Feature Required |
|--------------------------|-----------------------------|------------------|
| assemblyItemPrice        | No role permission required | none             |
| CostEstimateType         | No role permission required | Gross Profit     |
| downloadItemPrice        | No role permission required | none             |
| giftCertificateItemPrice | No role permission required | none             |
| inventoryItemPrice       | No role permission required | none             |
| itemPrice                | No role permission required | none             |
| kitItemPrice             | No role permission required | none             |
| nonInventoryItemPrice    | No role permission required | none             |

| Record Name                 | Role Permission                                                             | Feature Required    |
|-----------------------------|-----------------------------------------------------------------------------|---------------------|
| nonInventoryResaleItemPrice | No role permission required                                                 | none                |
| nonInventorySaleItemPrice   | No role permission required                                                 | none                |
| otherChargeResaleItemPrice  | No role permission required                                                 | none                |
| otherChargeItemPrice        | No role permission required                                                 | none                |
| overallQuantityPricingType  | No role permission required                                                 | Sales Order Reports |
| otherChargeSaleItemPrice    | No role permission required                                                 | none                |
| salesInvoiced               | Transactions: Invoice – view<br>Reports tab: Sales (view)                   | Accounting          |
| salesOrdered                | Transactions: Sales Order – view<br>Reports tab: Sales Order Reports (view) | Sales Order         |
| serviceItemPrice            | No role permission required                                                 | none                |
| serviceResaleItemPrice      | No role permission required                                                 | none                |
| serviceSaleItemPrice        | No role permission required                                                 | none                |

## SuiteAnalytics Connect System Tables

In addition to standard and custom NetSuite tables, SuiteAnalytics Connect includes the following system tables:

- [oa\\_tables](#) – This table lists all available tables, including custom lists and custom records.
- [oa\\_columns](#) – This table lists all available columns in all available tables, including custom columns, custom lists, and custom records.
- [oa\\_fkeys](#) – This table shows the relations between columns in all available tables.

**i Note:** Due to the complexity of the NetSuite2.com schema, the oa\_fkeys table may provide inaccurate information about foreign keys for the NetSuite2.com data source. Some foreign keys may be missing or incorrectly identified as such. Consider the information about foreign keys for NetSuite2.com as a reference only.

The following tables are available in the schema but are not supported:

- [oa\\_proc](#)
- [oa\\_info](#)
- [oa\\_proccolumns](#)
- [oa\\_statistics](#)
- [oa\\_types](#)

These system tables can be used to show all columns and tables available in your account and the relations between them.

## Viewing the Record Types Available in Your Account

To find all records that are available in your account, you can do the following:

- To see all available record types, run the following query:

```
1 | select * from oa_tables;
```

- To see all available fields, run the following query:

```
1 | select * from oa_columns;
```

**Note:** Due to an internal limitation, queries over SuiteAnalytics Connect schema tables that have more than 1000 columns only work if you retrieve 1000 columns or less in the query. This run failure can occur when using the "Select \* From" construct to query tables that have many custom fields or when joining multiple tables in a single query and trying to retrieve all their fields. For more information, see [Custom Field Limitations](#).

There are several ways to find the name of the record types and fields available in the NetSuite2.com data source. For more information, see [Record Types and Fields](#).

## oa\_tables

This is a system table that contains the table name, table owner, table type and descriptions of all tables available in the SuiteAnalytics Connect schema.

| <b>Table name: oa_tables</b> |                                           |
|------------------------------|-------------------------------------------|
| <b>Column Name</b>           | <b>Description</b>                        |
| table_qualifier              | Name of the table qualifier               |
| table_owner                  | Name of the table owner                   |
| table_name                   | Name of the table                         |
| table_type                   | Table type (NetSuite table, system table) |
| table_path                   | not supported                             |
| oa_userdata                  | not supported                             |
| oa_support                   | not supported                             |
| remarks                      | Table description                         |

## oa\_columns

This is a system table that defines the column name, type, length, and description for all columns in all tables available in the SuiteAnalytics Connect schema.

| <b>Table name: oa_columns</b> |                             |
|-------------------------------|-----------------------------|
| <b>Column Name</b>            | <b>Description</b>          |
| table_qualifier               | Name of the table qualifier |
| table_owner                   | Name of the table owner     |
| table_name                    | Name of the table           |

| <b>Table name: oa_columns</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Column Name</b>            | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| column_name                   | Name of the column                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| data_type                     | The column's SQL data type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| type_name                     | Data source dependent data type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| oa_length                     | The length in bytes of data transferred for Fetch, GetData, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| oa_precision                  | The precision of the column on the data source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| oa_radix                      | Radix of data type, NULL for data types where radix does not apply                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| oa_scale                      | <p>Number of digits to the right of the decimal point that are significant.<br/>           If you use the NetSuite2.com data source, consider the following:</p> <ul style="list-style-type: none"> <li>■ The value <b>0</b> indicates that there are no significant digits.</li> <li>■ The value <b>-127</b> indicates that the number of significant digits is unknown.</li> </ul> <p>If you use the NetSuite.com data source, consider the following:</p> <ul style="list-style-type: none"> <li>■ The value <b>0</b> indicates that there are no significant digits or that the number of significant digits is unknown.</li> </ul> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <b>i Note:</b> The NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see <a href="#">New Accounts and Access to the Connect Data Source</a>.         </div> |
| oa_nullable                   | not supported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| oa_scope                      | not supported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| oa_userdata                   | not supported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| oa_support                    | not supported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| pseudo_column                 | not supported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| oa_columntype                 | not supported                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| remarks                       | Column description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## Example Queries

- To find all columns in a specific table, use the following query:

```
1 | select * from oa_columns where table_name = 'TABLE_NAME';
```

For example, if you search for all columns in the **departments** table, the output may include the following rows:

| table_name  | column_name        | type_name | oa_length | oa_precision | oa_scale |
|-------------|--------------------|-----------|-----------|--------------|----------|
| DEPARTMENTS | DATE_LAST_MODIFIED | TIMESTAMP | 0         | 0            | 0        |

| table_name  | column_name      | type_name | oa_length | oa_precision | oa_scale |
|-------------|------------------|-----------|-----------|--------------|----------|
| DEPARTMENTS | DEPARTMENT_EXTID | VARCHAR2  | 255       | 255          | —        |
| DEPARTMENTS | DEPARTMENT_ID    | NUMBER    | 8         | 22           | 0        |
| DEPARTMENTS | FULL_NAME        | VARCHAR2  | 1791      | 1791         | —        |
| DEPARTMENTS | ISINACTIVE       | VARCHAR2  | 3         | 3            | —        |
| DEPARTMENTS | NAME             | VARCHAR2  | 31        | 31           | —        |
| DEPARTMENTS | PARENT_ID        | NUMBER    | 8         | 22           | 0        |

- To find all tables that include a specific column, use the following query:

```
1 | select * from oa_columns where column_name = 'COLUMN_NAME';
```

For example, if you search for all tables that include the **subsidiary\_id** column, the output result may include the following rows:

| table_name              | column_name   | type_name | oa_length | oa_precision | oa_scale |
|-------------------------|---------------|-----------|-----------|--------------|----------|
| CUSTOMERS               | SUBSIDIARY_ID | NUMBER    | 8         | 22           | 0        |
| SUBSIDIARIES            | SUBSIDIARY_ID | NUMBER    | 8         | 22           | 0        |
| EMPLOYEES               | SUBSIDIARY_ID | NUMBER    | 8         | 22           | 0        |
| SUBSIDIARY_CLASS_MAP    | SUBSIDIARY_ID | NUMBER    | 8         | 22           | 0        |
| SUBSIDIARY_LOCATION_MAP | SUBSIDIARY_ID | NUMBER    | 8         | 22           | 0        |

- To see the available column descriptions for columns in a specific table, use the following query:

```
1 | select table_name, column_name, remarks from oa_columns where table_name = 'TABLE_NAME' AND remarks != '';
```

For example, if you try to find the descriptions for columns in the **vendors** table, the output result may include the following rows:

| table_name | column_name     | remarks                                                                                                                                             |
|------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| VENDORS    | INDUSTRY_2_ID   | Select the industry that best describes the business of the individual or company. You can enter new industry options by selecting new on the list. |
| VENDORS    | NO_OF_EMPLOYEES | The number of employees working for the company.                                                                                                    |

## oa\_fkeys

This is a system table that contains information about foreign keys referenced by each table and the primary keys in each table.

**i Note:** Due to the complexity of the NetSuite2.com schema, the **oa\_fkeys** table may provide inaccurate information about foreign keys for the NetSuite2.com data source. Some foreign keys may be missing or incorrectly identified as such. Consider the information about foreign keys for NetSuite2.com as a reference only.

A row in the **oa\_fkeys** table is considered a primary key if its **pktable\_name** and **pkcolumn\_name** values are not **NULL**.

| <b>Table name: oa_fkeys</b> |                                                        |
|-----------------------------|--------------------------------------------------------|
| <b>Column Name</b>          | <b>Description</b>                                     |
| pktable_qualifier           | Primary key table qualifier                            |
| pktable_owner               | Primary key table owner                                |
| pktable_name                | Primary key table name                                 |
| pkcolumn_name               | Primary key column name                                |
| fktable_qualifier           | Foreign key table qualifier                            |
| fktable_owner               | Foreign key table owner                                |
| fktable_name                | Foreign table name                                     |
| fkcolumn_name               | Foreign key column name                                |
| key_seq                     | The column sequence number in the key, starting with 1 |
| update_rule                 | not supported                                          |
| delete_rule                 | not supported                                          |
| fk_name                     | Name of the foreign key                                |
| pk_name                     | Name of the primary key                                |

## Example Queries

- To find all tables that reference a specific table, use the following query:

```
1 | select pktable_name, pkcolumn_name, fktable_name, fkcolumn_name, fk_name from oa_fkeys where pktable_name = 'TABLE_NAME';
```

For example, if you try to find all tables that reference the **accounts** table, the output result may include the following rows:

| <b>pktable_name</b> | <b>pkcolumn_name</b> | <b>fktable_name</b> | <b>fkcolumn_name</b> | <b>fk_name</b>                |
|---------------------|----------------------|---------------------|----------------------|-------------------------------|
| ACCOUNTS            | ACCOUNT_ID           | EXPENSE_ACCOUNTS    | EXPENSE_ACCOUNT_ID   | EXPENSE_ACCOUNTS_ACCOUNTS_FK  |
| ACCOUNTS            | ACCOUNT_ID           | TRANSACTION_LINES   | ACCOUNT_ID           | TRANSACTION_LINES_ACCOUNTS_FK |

- To find all tables that are referenced by a specific table, use the following query:

```
1 | select pktable_name, pkcolumn_name, fktable_name, fkcolumn_name, fk_name from oa_fkeys where fktable_name = 'TABLE_NAME';
```

For example, if you try to find all tables that are referenced by the **accounts** table, the output result may include the following rows:

| <b>pktable_name</b> | <b>pkcolumn_name</b> | <b>fktable_name</b> | <b>fkcolumn_name</b> | <b>fk_name</b>         |
|---------------------|----------------------|---------------------|----------------------|------------------------|
| ACCOUNTS            | ACCOUNT_ID           | ACCOUNTS            | DEFERRAL_ACCOUNT_ID  | ACCOUNTS_ACCOUNTS_FK   |
| ACCOUNTS            | ACCOUNT_ID           | ACCOUNTS            | PARENT_ID            | ACCOUNTS_ACCOUNTS_FK_2 |

| pktable_name | pkcolumn_name | fkttable_name     | fkcolumn_name      | fk_name                       |
|--------------|---------------|-------------------|--------------------|-------------------------------|
| ACCOUNTS     | ACCOUNT_ID    | EXPENSE_ACCOUNTS  | EXPENSE_ACCOUNT_ID | EXPENSE_ACCOUNTS_ACCOUNTS_FK  |
| ACCOUNTS     | ACCOUNT_ID    | TRANSACTION_LINES | ACCOUNT_ID         | TRANSACTION_LINES_ACCOUNTS_FK |

Please note that the table may reference itself.

- To find all tables that contain a specific column as the primary key, use the following query:

```
1 | select pktable_name, pkcolumn_name, key_seq from oa_fkeys where pkcolumn_name = 'COLUMN_NAME';
```

For example, if you try to search for the tables that contain the **location\_id** column as the primary key, the output may include the following rows:

| pktable_name            | pkcolumn_name | key_seq |
|-------------------------|---------------|---------|
| LOCATIONS               | LOCATION_ID   | 1       |
| SUBSIDIARY_LOCATION_MAP | LOCATION_ID   | 2       |

In this example, the **location\_id** column is the primary key in both the **locations** and the **subsidiary\_location\_map** tables. However, the **subsidiary\_location\_map** table has a composite primary key, consisting of two primary key columns: **subsidiary\_id** and **location\_id**. The **subsidiary\_id** column is the first in the primary key sequence, and the **location\_id** column is the second.

- To find all tables that contain a specific column as a foreign key and see which tables include that column as the primary key, use the following query:

```
1 | select fkttable_name, fkcolumn_name, pktable_name, pkcolumn_name, key_seq from oa_fkeys where fkcolumn_name = 'COLUMN_NAME';
```

For example, if you try to find all tables that contain the **location\_id** column as a foreign key, the output may include the following rows:

| fkttable_name           | fkcolumn_name | pktable_name | pkcolumn_name | key_seq |
|-------------------------|---------------|--------------|---------------|---------|
| ACCOUNTS                | LOCATION_ID   | LOCATIONS    | LOCATION_ID   | 1       |
| SUBSIDIARY_LOCATION_MAP | LOCATION_ID   | LOCATIONS    | LOCATION_ID   | 1       |

In this example, **location\_id** is a foreign key column in the **accounts** and **subsidiary\_location\_map** tables, whereas in the **locations** table it is the primary key. This means that both the **accounts** and the **subsidiary\_location\_map** tables are related to the **locations** table through the **location\_id** column.

## Querying Data with Connect

As you query the NetSuite2.com data source using SuiteAnalytics Connect, consider the following:

- [Using SuiteQL with the Connect Service](#)
- [Record Types and Fields](#)
- [Using Qualified Queries](#)
- [Using the Uppercase Attribute](#)
- [Replication of Tables](#)
- [Incremental Backups](#)

## Using Qualified Queries

If you prefer to use fully qualified table names in your SuiteAnalytics Connect queries, make sure that you use exact qualifier values. Inexact qualifier values are those that contain additional spaces or use lowercase characters instead of uppercase characters, or uppercase characters instead of lowercase. Queries that use inexact qualifier values will fail.

### To learn exact qualifier values for your account:

1. Run the following query:

```
1 | select distinct table_qualifier, table_owner from oa_tables where table_owner !='SYSTEM';
```

2. Make a note of the **table\_qualifier** and **table\_owner** values that are returned. These are the values that should be used in your qualified queries.

The **table\_qualifier** and **table\_owner** values should correspond to the company name and role name for the Account ID and Role ID you use to connect to the SuiteAnalytics Connect service.

For example, if the returned value of **table\_qualifier** is **Wolfe Company** and the value of **table\_owner** is **Administrator**, your qualified queries should reference SuiteAnalytics Connect tables in the following way:

```
1 | select * from "Wolfe Company"."Administrator".<table_name>;
```

If this query used an inexact **table\_qualifier** value, such as **WolfeCompany** or **wolfecompany**, it would fail to run.

For information about SQL queries, see [Query Language Compliance](#).

For information about using SuiteQL with the NetSuite2.com data source, see the help topic [Using SuiteQL with the Connect Service](#).

## Using the Uppercase Attribute

When the record or field definitions are redefined or updated, the NetSuite2.com data source may change the case of the record type and field names. If you use SuiteAnalytics Connect with applications that are case sensitive and do not support changes in case, you may encounter issues when running your queries.

The Uppercase attribute changes all record type and field names to uppercase. You can now use the Uppercase attribute to avoid case change problems. After applying the Uppercase attribute:

- Applications that show record type and field names display them in uppercase.
- Query results return record type and field names in uppercase.

The Connect Service is not case sensitive and this change does not affect your queries. The case used in your query is not considered. For example, if you want to query the record type "Account", you can use uppercase and lowercase in your queries. The following examples show several queries that are valid when you use the NetSuite2.com data source:

```
1 | select * from account
```

To change all record type and field names to uppercase, you must add the Uppercase attribute to your driver configuration, and set it to **1**.

## Setting the Uppercase Attribute

When you install or update your Connect driver, the Uppercase attribute is not included in the default driver or data source name (DSN) attributes. Depending on the driver that you use, there are different ways to edit the connection attributes.

- [ODBC drivers for Windows using a DSN connection](#)
- [ODBC drivers for Windows and Linux using a connection string](#)
- [JDBC drivers](#)
- [ADO.NET drivers](#)

### ODBC drivers for Windows using a DSN connection

 **Warning:** When modifying registry entries using the Registry Editor. Modifying registry entries incorrectly can cause serious issues.

If you use a data source name (DSN) connection, you must add the Uppercase entry using the Windows Registry Editor application.

#### To set the Uppercase attribute on Windows

1. Open the Registry Editor application.
2. For most Windows versions, go to the following subkeys:
  - For 64-bit drivers, go to **Computer\HKEY\_LOCAL\_MACHINE\SOFTWARE\ODBC\ODBC.INI**.
  - For 32-bit drivers, go to **Computer\HKEY\_LOCAL\_MACHINE\SOFTWARE\WOW6432Node\ODBC\ODBC.INI**.
3. Locate the **CustomProperties** entry.
4. Right-click the **CustomProperties** entry and select **Modify**.
5. In the **Value data** field, type **Uppercase=1** after the role ID attribute. See the following example:

| Name                    | Type   | Data                                    |
|-------------------------|--------|-----------------------------------------|
| (Default)               | REG_SZ | (value not set)                         |
| AllowSinglePacketLogout | REG_SZ | 1                                       |
| AlternateServers        | REG_SZ |                                         |
| ConnectionRetryCount    | REG_SZ | 0                                       |
| ConnectionRetryDelay    | REG_SZ | 3                                       |
| Customized              | REG_SZ | 0                                       |
| CustomProperties        | REG_SZ | AccountID=12345;RoleID=1000;Uppercase=1 |
| Description             | REG_SZ |                                         |

 **Note:** After you add the Uppercase attribute, if you make changes to the driver configuration using the ODBC Administrator tool, the Uppercase attribute is removed. For example, if you use the ODBC Administrator tool to edit the role ID, you need to add the Uppercase attribute again.

### ODBC drivers for Windows and Linux using a connection string

If you use a connection string, you must update your connection string to add the Uppercase attribute and place it in the first position of the list of optional CustomProperties attributes. For more information about how to include the attribute, see [Connecting Using a Connection String](#) and [Connection Attributes](#).

## JDBC drivers

You must update your connection string to add the Uppercase attribute and place it in the first position of the list of optional CustomProperties attributes. For more information about how to include the attribute, see [JDBC Connection Properties](#).

## ADO.NET drivers

You must update your connection string to add the Uppercase attribute and place it in the first position of the list of optional CustomProperties attributes. For more information about how to include the attribute, see [ADO.NET Connection Options](#).

## Replication of Tables



**Important:** As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

The following are some techniques for replicating of large data for when using SELECT \* FROM TABLE statement leads to an error.

- Return columns subset. Use only the necessary subset of return columns. For example, instead of:

```
1 | SELECT * FROM TRANSACTIONS
```

use:

```
1 | SELECT trandate, trandoc, total_amount FROM TRANSACTIONS
```

Using \* column selector is demanding on resources.

- Slicing. Slice one page result set by a condition in where clause that helps to divide the replicated data into blocks with predicted size. This requires a cycle. For example, instead of:

```
1 | SELECT * FROM TRANSACTIONS
```

use:

```
1 | select * from TRANSACTIONS where transaction_id >0 and transaction_id <= 1000000
2 |
3 | select * from TRANSACTIONS where transaction_id >1000000 and transaction_id <= 2000000
4 |
5 | select * from TRANSACTIONS where transaction_id 2000000 and transaction_id <= 3000000
6 |
7 | ...
```

- List of IDs and replicate. Fetch a list of IDs and then replicate by batches then iterate over the returned list and retrieve one transaction at a time. For example, use

```
1 | SELECT TRANSACTION_ID FROM TRANSACTIONS
```

then iterate over all TRANSACTION\_ID list

```
1 | SELECT trandate, trandoc, total_amount FROM TRANSACTIONS where TRANSACTION_ID = <xxx>
```

- Combination of Return column subset and Slicing. For example,

```
1 | select trandate, trandoc, total_amount from TRANSACTIONS where transaction_id >0 and transaction_id <= 1000000
2 |
3 | select trandate, trandoc, total_amount from TRANSACTIONS where transaction_id >1000000 and transaction_id <= 2000000
4 |
5 | select trandate, trandoc, total_amount from TRANSACTIONS where transaction_id >2000000 and transaction_id <= 3000000
```

- Combination of Slicing and List of IDs and replicate.

```
1 | SELECT TRANSACTION_ID FROM TRANSACTIONS
2 |
3 | SELECT trandate, trandoc, total_amount FROM TRANSACTIONS where TRANSACTION_ID = <xxx>
```

- Combination of all techniques.

```
1 | select TRANSACTION_ID from TRANSACTIONS where transaction_id >0 and transaction_id <= 1000000
2 |
3 | select TRANSACTION_ID from TRANSACTIONS where transaction_id >1000000 and transaction_id <= 2000000
4 |
5 | select TRANSACTION_ID from TRANSACTIONS where transaction_id >2000000 and transaction_id <= 3000000
```

then iterate over all TRANSACTION\_ID list

```
1 | SELECT trandate, trandoc, total_amount FROM TRANSACTIONS where TRANSACTION_ID = <xxx>
```

## Incremental Backups



**Important:** As of November 8, 2021, new Connect users can access the Connect Service using the NetSuite2.com data source only. If you gained access to the Connect Service before this date, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com.

Note that the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice, and all Connect users are encouraged to use the NetSuite2.com data source. For more information about this change, see [New Accounts and Access to the Connect Data Source](#).

Use the following points as best practices for incremental backups.

- Use **last\_modified\_date** or **date\_last\_modified** columns where possible.
- Use **deleted\_records** table where possible.
- When you cannot identify the **last\_modified\_date**, **date\_last\_modified**, or **deleted\_records**, you should file an issue.

- Some tables do not support **last\_modified\_date**, **date\_last\_modified**, and **deleted\_records**, for example, mapping tables. You must download all data from these tables every time, it is not possible to perform incremental downloads one time only.

# Connect Service Notifications

The following sections provide information about changes to the Connect Service which may impact the behavior of the service.

Changes to the Connect Service are listed chronologically with the most recent changes at the top of the list. Complete any before the dates specified to avoid service interruptions:

## Changes in 2022

- New Uppercase Connection Attribute
- OAuth 2.0 for SuiteAnalytics Connect
- Latest JDBC Driver Version Available
- Required Update of SuiteAnalytics Connect Drivers

## Changes in 2021

- New Accounts and Access to the Connect Data Source
- Connect NetSuite.com Data Source No Longer Being Updated
- Removal of the Analytics Browser
- Change to Display Size and Precision in Some Connect Columns
- Changes to Return Values in Some Connect Columns
- Removal of Some Connect Tables and Columns

## Changes in 2020

- Changes to Return Values in SuiteAnalytics Connect Columns
- Audit Trail and Execution Log Record Types Contain Outdated Data
- Idle Session Timeout for SuiteAnalytics Connect
- Deprecation of Data Center-Specific Domains for SuiteAnalytics Connect

## Changes in 2019

- Change in Time Zone of Charges Table Date Columns
- New Version for SuiteAnalytics Connect ODBC and JDBC Drivers
- Changes to SuiteAnalytics Connect Return Values and String Types
- The Analytics Data Source and SuiteAnalytics Connect
- NetSuite Password Policies Now Apply to SuiteAnalytics Connect

## Changes in 2018

- Cipher Suite Deprecations for SuiteAnalytics Connect JDBC Drivers

- Mandatory Update for SuiteAnalytics Connect ODBC Drivers

## New Uppercase Connection Attribute

When the record or field definitions are redefined or updated, the NetSuite2.com data source may change the case of the record type and field names. If you use SuiteAnalytics Connect with applications that are case sensitive and do not support changes in case, you may encounter issues when running your queries.

The Uppercase attribute changes all record type and field names to uppercase. You can now use the Uppercase attribute to avoid case change problems. After applying the Uppercase attribute:

- Applications that show record type and field names display them in uppercase.
- Query results return record type and field names in uppercase.

The Connect Service is not case sensitive and this change does not affect your queries. The case used in your query is not considered. For example, if you want to query the record type "Account", you can use uppercase and lowercase in your queries. The following examples show several queries that are valid when you use the NetSuite2.com data source:

```
1 | select * from account
```

To change all record type and field names to uppercase, you must add the Uppercase attribute to your driver configuration, and set it to **1**.

For more information about how to add the Uppercase attribute, see [Setting the Uppercase Attribute](#)

## OAuth 2.0 for SuiteAnalytics Connect

SuiteAnalytics Connect supports OAuth 2.0 for the NetSuite2.com data source. OAuth 2.0 is an authentication mechanism that enables you to access the Connect Service with increased overall system security. Note that token-based authentication (TBA) is also available for Connect. Both mechanisms can be used together, but OAuth 2.0 is the preferred authentication method. You should consider using OAuth 2.0 instead of TBA whenever possible.

For information about using OAuth 2.0 with SuiteAnalytics Connect, see [OAuth 2.0 for Connect](#).

For general information about OAuth 2.0, see the help topic [OAuth 2.0](#).

## Latest JDBC Driver Version Available

As of **July 13, 2022**, the latest version of the SuiteAnalytics JDBC driver is available for download. If you are using a JDBC driver, you can upgrade to the JDBC driver version 8.10.136.0 and set the connection attributes.



**Note:** This driver version requires Java SE 8 or later.

Prior to this version, the JDBC driver did not consider the KeepAliveTime parameter of your operating system. With the latest JDBC driver version, you can set the KeepAliveTime parameter to prevent your system from closing the connection if the Connect session is not considered active.

To download the latest driver version, log in to [NetSuite](#). In the Settings portlet on the Home page, click **Set Up SuiteAnalytics Connect**. After you install the driver, you must set the required NegotiateSSLClose parameter to **false**.

For more information about the optional KeepAliveTime parameter and the benefits of using it, see [Idle Connection Timeout](#).

For more information about installing JDBC drivers, see the following topics:

- [Accessing the Connect Service Using a JDBC Driver](#)
- [Configuring the JDBC Driver](#)
- [Determining Your Connect Driver Version](#)

## Required Update of SuiteAnalytics Connect Drivers

All NetSuite accounts are being moved to new NetSuite data centers that are built on the Oracle Cloud Infrastructure (OCI). To ensure a smooth transition, all users who use SuiteAnalytics Connect must upgrade to the latest ODBC or JDBC driver and change the connection attributes on their computers by **May 12, 2022**. If you do not take these required actions by this date, you may experience a delay of up to 30 seconds when you log out of your Connect session.

The latest ODBC driver version has been available for download since February 25, 2022.



**Note:** If you use the ADO.NET driver, no action is required.

To download the latest driver version, log in to [NetSuite](#). In the Settings portlet on the Home page, click **Set Up SuiteAnalytics Connect**.

Before you install or upgrade the Connect driver, ensure that you meet the installation prerequisites. For more information, see [Installation Prerequisites](#).

See the following table for more information about upgrading your drivers:

| Driver Type  | Required Driver Version | Actions Required                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Windows ODBC | 8.10.143.0 or later     | Upgrade to this version is required.<br><br>The preferred upgrade option is to download the driver and then run the installer. If you choose this option, you do not need to perform any further steps, unless you use a DSN-less connection.                                                                                                                                                                                                                           |
|              |                         | <p><b>Note:</b> You shouldn't uninstall the old driver and then install the new one. If you choose this option, you will need to update the existing Data Source Name (DSN) values in the Windows registry. For more information, see <a href="#">ODBC Installation on Windows for Installer Only</a>.</p> <p>If you use a DSN-less connection, you must also update your connection string to add the following attribute: <code>AllowSinglePacketLogout=1</code>.</p> |

| Driver Type | Required Driver Version | Actions Required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Linux ODBC  | 8.10.143.0 or later     | <p>For more information, see <a href="#">Connecting Using a Connection String</a>.</p> <p>Upgrade to this version is required.</p> <p>You must add the attribute <code>AllowSinglePacketLogout=1</code> to your configuration.</p> <p>For DSN connections, you must ensure that the <code>odbc[64].ini</code> file includes this attribute for each data source. After installing the driver, do one of the following:</p> <ul style="list-style-type: none"> <li>▪ Edit the <code>odbc[64].ini</code> file to include the attribute.</li> <li>▪ Overwrite the existing INI file with the <code>odbc[64].ini</code> file from the downloadable ZIP file. This file contains the new attribute.</li> </ul> <p>For more information, see <a href="#">Configuring the ODBC Data Source on Linux</a>.</p> <p>For DSN-less connections, you must update the connection string to include this attribute. For more information, see <a href="#">Connecting Using a Connection String</a>.</p> |
| JDBC        | 8.10.85.0 or later      | <p>It is required to have at least the 8.10.85.0 version installed to ensure a smooth transition. Installing the latest 8.10.136.0 version is optional.</p> <p>For both versions, you must set the <code>NegotiateSSLClose</code> parameter to <b>false</b>.</p> <p><code>NegotiateSSLClose=false</code></p> <p>For more information, see <a href="#">Configuring the JDBC Driver</a>.</p> <p>For more information about verifying the driver version installed on your system, see <a href="#">Determining Your Connect Driver Version</a>.</p> <p><b>Note:</b> Both versions require at least Java SE 8.</p>                                                                                                                                                                                                                                                                                                                                                                          |

**Note:** If you use the ADO.NET driver to access the Connect Service, no action is required.

For more information about upgrading ODBC drivers, see the following topics:

- [Downloading and Installing the ODBC Driver for Windows](#)
- [Downloading and Installing the ODBC Driver for Linux](#)
- [Configuring the ODBC Data Source on Linux](#)
- [Authentication Using Server Certificates for ODBC](#)
- [Connecting Using a Connection String](#)

For more information about JDBC drivers, see the following topics:

- Accessing the Connect Service Using a JDBC Driver
- Configuring the JDBC Driver
- Determining Your Connect Driver Version

For more information about NetSuite accounts moving to data centers built on OCI, see the help topic [Account Move to OCI FAQ](#).

## New Accounts and Access to the Connect Data Source

As of November 8, 2021, new Connect customers can access the Connect Service using the NetSuite2.com data source only.

 **Note:** If you gained access to the Connect Service before November 8, 2021, all users with access to your NetSuite accounts can still use the NetSuite.com data source. This applies also for users that you added to your NetSuite accounts after this date.

Prior to this change, Connect users were able to access two different data sources:

- **NetSuite.com** – This data source uses the only schema available up to 2018.2 to retrieve data. As of October 2021, the NetSuite.com data source is no longer being updated with newly exposed tables and columns, and no enhancements will be made. The NetSuite.com data source includes records exposed up to 2021.2 only, and support for this data source will end in a future release. The use of the NetSuite.com data source is no longer considered a best practice.
- **NetSuite2.com** - This data source uses the schema that has been used in SuiteAnalytics Workbook since 2019.2. The NetSuite2.com data source, also known as the analytics data source, is designed to display consistent data across SuiteAnalytics Workbook, which solves some previous inconsistencies in data exposure between saved searches, reports, and the NetSuite UI. The analytics data source provides advanced query capabilities and applies role-based access control, which contributes to improved security. NetSuite2.com is now the preferred data source, and all Connect users are encouraged to use it.

After this change, the transition to NetSuite2.com is planned as follows:

- If you gained access to the Connect Service before November 8, 2021, you can still access the NetSuite.com data source to ensure a smooth transition to NetSuite2.com. This applies also for users that you added to your NetSuite accounts after this date. For more information, see [Changing from NetSuite.com to NetSuite2.com](#).
- If you gained access to the Connect Service after November 8, 2021, you can access the NetSuite2.com data source only. If you try to select the NetSuite.com data source, you receive an error message indicating that NetSuite.com is not an option. For more information, see [Getting Started with SuiteAnalytics Connect](#).

## Connect NetSuite.com Data Source No Longer Being Updated

From October 2021 onwards, the NetSuite.com data source is still supported, but it will no longer be updated with newly exposed tables or columns, and it may be removed in the future. New tables and columns will now only be exposed to the NetSuite2.com data source.

You are encouraged to start a transition process from NetSuite.com to NetSuite2.com. NetSuite2.com provides advanced query capabilities and has been available since 2019.2.

Currently, SuiteAnalytics Connect provides access to the following data sources:

- **NetSuite.com** - Uses the only schema available up to 2018.2 to retrieve data. The details about the tables and columns in this schema are available through the Connect Browser.
- **NetSuite2.com** - Uses the schema that has been used in SuiteAnalytics Workbook since 2019.1. The details about the record types in NetSuite2.com, also known as the analytics data source, are available through the Records Catalog.

From **October 2021** onwards, the NetSuite.com data source will no longer be updated with newly exposed tables and columns, and no enhancements will be made. Users will still be able to access the NetSuite.com data source. However, the NetSuite.com data source will only include records exposed up to 2021.2, and support for NetSuite.com will end in a future release. The use of the NetSuite.com is no longer considered a best practice.

## Benefits of Using the NetSuite2.com Data Source

The analytics data source is designed to display consistent data across SuiteAnalytics Workbook, which solves some previous inconsistencies in data exposure between saved searches, reports, and the NetSuite UI. It applies role-based access control, which contributes to improved security.

When you use SuiteAnalytics Connect with the NetSuite2.com data source, you must consider the following:

- **Data Warehouse Integrator (DWI) role** - Previous to 2021.2, there was no role that allowed Connect users to have access to all NetSuite data through the NetSuite2.com data source. The Administrator role and the SuiteAnalytics - Read All permission were available for NetSuite.com only. As of 2021.2, the new Data Warehouse Integrator role allows users to have access to all NetSuite data through the NetSuite2.com data source, except for sensitive data, such as credit card information. Note that the DWI role requires token-based authentication (TBA).



**Note:** When you use SuiteAnalytics Connect with OAuth 2.0, the NetSuite2.com data source is accessible for the Administrator role. However, the Data Warehouse Integrator role and custom roles are the preferred option when transferring data to a data warehouse.

- **SuiteQL** - Change your SQL queries to SuiteQL queries. You must run SuiteQL queries when you use the Connect Service with NetSuite2.com data source. If you do not change your queries, they will not work with the NetSuite2.com data source.
- **Records Catalog** - To see information about the record types and fields, joined record types and join properties, you can use the Records Catalog, which shows only data relevant to your account and role.

For a list of other changes to the Connect Service, see [Connect Service Notifications](#).

## Required Actions

You should use the NetSuite2.com data source when you work with SuiteAnalytics Connect. To access the NetSuite2.com data source, you must set the Service Data Source connection attribute to **NetSuite2.com**. When you access the NetSuite2.com with the Connect Service, ensure that you change your SQL queries to SuiteQL queries.

For more information about specific considerations, see the following topics:

- To learn about the required roles and permissions, see [Role and Permission Considerations for NetSuite2.com](#).
- To learn about SuiteAnalytics Connect and token-based authentication, see [Token-based Authentication for Connect](#).
- To change the connection attribute to access the analytics data source, see [Configuring Your Data Source](#).
- To learn about SuiteQL and best practices for querying the Connect Service, see the help topics [SuiteQL](#) and [Using SuiteQL with the Connect Service](#).
- To learn about the analytics data source and Connect, see [The Analytics Data Source and SuiteAnalytics Connect](#).

## Removal of the Analytics Browser

As of NetSuite 2021.2, the Analytics Browser is no longer available. To see information about the record types and fields, joined record types and join properties, you can use the Records Catalog. Note that the Records Catalog is supported for the SuiteScript Analytic API and the REST Query API only.



**Note:** The Records Catalog is available for all users that have the Records Catalog permission assigned to their role. For more information, see the help topic [Records Catalog Overview](#).

For information about how to find the record types and fields accessible through SuiteAnalytics Connect, see [Record Types and Fields](#).

## Change to Display Size and Precision in Some Connect Columns

As of 2021.2, SuiteAnalytics Connect changes the display size and precision for return values in some columns.



**Note:** This change applies to the NetSuite.com data source only.

The following table shows the list of columns with changes:

| Column Name                       | Previous Value                    | Updated Value                       |
|-----------------------------------|-----------------------------------|-------------------------------------|
| transaction_history.column_number | Display size: 90                  | Display size: 138                   |
| transaction_lines.gl_sequence     | Display size: 40<br>Precision: 40 | Display size: 256<br>Precision: 256 |

If you work with the NetSuite.com data source and you are using column attributes in your configuration, review this change and make adjustments as needed.

To see the display size and precision for all columns, you can run the following query:

```
1 | SELECT COLUMN_NAME, TYPE_NAME, OA_LENGTH, OA_PRECISION, OA_SCALE FROM OA_COLUMNS WHERE TABLE_NAME = 'TRANSACTION_HISTORY'
```

For information about the column attributes, see [Table Summary](#).

# Changes to Return Values in Some Connect Columns

As of 2021.2, the maximum length for return values in some Connect columns has changed.

 **Note:** This update applies to the NetSuite.com data source only

The following table shows the list of columns with length changes for return values:

| Column Name          | Previous Length | Updated Length |
|----------------------|-----------------|----------------|
| class.name           | 31              | 60             |
| departments.name     | 31              | 60             |
| locations.name       | 31              | 60             |
| opportunities.status | 480             | 4000           |

If you work with the NetSuite.com data source and you are using the column attributes in your configuration, review them and make adjustments as needed. To avoid error or discrepancies, your configuration must match the column values listed in the Connect Browser.

This change is effective as of 2021.2, but the Connect Browser is not upgraded at the same time. The browser will show the updated values when the 2021.2 Connect Browser is released at a later date.

For information about the column attributes, see [Table Summary](#).

## Removal of Some Connect Tables and Columns

The following table shows some tables and columns that have been removed from the Connect Schema, and the tables and columns that you can use instead.

| Release of Removal | Removed Table or Column                                                                                                                                                                                                                                          | Alternative Table or Column                                                                                                                                                                                                                                                                                          |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2021.1             | Table name: notes_system                                                                                                                                                                                                                                         | Table name: <a href="#">system_notes</a>                                                                                                                                                                                                                                                                             |
| 2021.1             | Table name: notes_system_custom                                                                                                                                                                                                                                  | Table name: <a href="#">system_notes_custom</a>                                                                                                                                                                                                                                                                      |
| 2021.1             | Password custom fields have been removed. Password custom fields are fields that are created using the Password field type.<br><br>For more information about custom field types, see the help topic <a href="#">Field Type Descriptions for Custom Fields</a> . | There are no alternative fields available.                                                                                                                                                                                                                                                                           |
| 2021.2             | Column name: date_last_modified<br><br>Available in transaction_lines table                                                                                                                                                                                      | Column name: date_last_modified_gmt<br><br>Available in <a href="#">transaction_lines</a> table<br><br>The date_last_modified_gmt column returns results in the Coordinated Universal Time (Greenwich Mean Time). You should consider the time zone when you review your queries and make any adjustments as needed. |

These fields and tables should have been removed from all Connect queries. If you have not removed them, queries may return inaccurate results or may not work.

For more information about the tables available in the Connect Schema, see [Connect Schema](#).

## Changes to Return Values in SuiteAnalytics Connect Columns

Since 2020.2, SuiteAnalytics Connect changes the length attribute for return values in some columns and custom fields.

 **Note:** This change applies to the NetSuite.com data source only.

If you work with the NetSuite.com data source and you are using the column attributes in your configuration, review them and make adjustments as needed. To avoid error or discrepancies, your configuration must match the column values listed in the Connect Browser.

The following table shows the list of columns with length changes for return values:

| Column name                   | Previous length | Updated length |
|-------------------------------|-----------------|----------------|
| rmtemplate.description        | 1000            | 4000           |
| crmtemplate.name              | 128             | 4000           |
| item_fulfillments.status      | 480             | 4000           |
| items.type_name               | 128             | 4000           |
| roles1.permission_name        | 200             | 4000           |
| system_notes.name             | 283             | 4000           |
| system_notes.operation        | 264             | 4000           |
| system_notes_custom.name      | 227             | 4000           |
| system_notes_custom.operation | 208             | 4000           |
| transactions.status           | 480             | 4000           |

The length attribute also changes for custom fields that correspond to phone numbers in the NetSuite UI. The length changes from 21 to 32 bytes. These changes are available in the 2020.2 Connect Browser.

For information about the column attributes, see [Table Summary](#).

## Audit Trail and Execution Log Record Types Contain Outdated Data

Since 2020.1, the record types that allow monitoring the use of workbooks do not contain any new data. The audit trail data can be retrieved using the usrauditlog and usrdsauditlog record type IDs, while the execution log data is retrieved using the usrexecutionlog record type ID.

You can still query these record types using SuiteAnalytics Connect, however only data from 2019.2 and earlier will be retrieved.



**Note:** This applies only to NetSuite2.com, also known as the analytics data source. For more information about how to see the data available through NetSuite2.com, see [Connect Data Source](#).

For more information about the audit trail and execution log record types, see the help topic [Auditing Workbooks and Datasets](#).

## Idle Session Timeout for SuiteAnalytics Connect

Since 2020.1, SuiteAnalytics Connect has enforced idle session timeout policies to enhance the security of your connections and to optimize system resources. After 90 minutes of inactivity, SuiteAnalytics Connect sessions automatically time out.

If you exceed the time limit of inactivity, you are logged out of your session. To access the Connect Service, you must log in again.



**Note:** The time during which a query is running is not considered time of inactivity.

You should always close all sessions that you are not using. Since 2020.1, sessions automatically time out after 90 minutes of inactivity. The time limit will be set to a lower value in an upcoming release.

The idle session timeout applies to ODBC, JDBC, and ADO.NET drivers.



**Note:** The idle session timeout occurs when you query the NetSuite data sources: NetSuite.com and NetSuite2.com.

For more information, see [Connections](#) and [Types of NetSuite Sessions](#).

## Deprecation of Data Center-Specific Domains for SuiteAnalytics Connect

On **January 14, 2020**, data center specific domains used for access to the Connect Service were deprecated. Data center-specific domains are those that begin with odbcserver.

Account-specific domains have been supported by SuiteAnalytics Connect since June 19, 2019. After this support became available, we encouraged you to change the Connect Service host name to your account-specific domain in the connection attributes of the driver. However, users were still able to access the Connect Service using data center-specific domains.

On January, 14, 2020, data center-specific domains were deprecated. If you have not changed the connection attributes, you will be unable to log in to the Connect Service.

The following domains are no longer supported:

| Data Center-Specific Domains |
|------------------------------|
| odbcserver.netsuite.com      |
| odbcserver.na0.netsuite.com  |
| odbcserver.na1.netsuite.com  |
| odbcserver.na2.netsuite.com  |
| odbcserver.na3.netsuite.com  |

**Data Center-Specific Domains**

odbcserver.eu1.netsuite.com  
odbcserver.eu2.netsuite.com



**Important:** You must change the connection attributes for ODBC, JDBC, and ADO.NET drivers.

## Required Actions

You must ensure that the Connect Service host name in the connection attributes of the driver matches the host name of your account. The host name you should use for your connection is displayed in the **Service Host** field on the SuiteAnalytics Driver Download page, under **Your Configuration**. The Connect Service host name displayed on the SuiteAnalytics Driver Download page contains the account ID as part of the domain name.

To access the SuiteAnalytics Connect Driver Download page, use the Set Up Analytics Connect link in the **Settings** portlet when you are logged in to NetSuite. If you cannot locate the portlet, see the help topic [Finding Your Settings Portlet](#).

The screenshot shows the 'Settings' portlet with the following menu items listed vertically:

- Personalize Dashboard
- Set Preferences
- Publish Dashboard List
- Campaign Subscription Center
- Set Up Outlook Integration
- Set Up SuiteAnalytics Connect** (This item is highlighted with a red rectangular box.)
- Change Email
- Change Password
- Update Security Questions

For more information about account-specific domains, see the help topic [URLs for Account-Specific Domains](#).

For more information about how to change the connection attributes, see the following topics:

- For ODBC drivers, see [Configuring the ODBC Data Source on Windows](#) or [Configuring the ODBC Data Source on Linux](#).
- For JDBC drivers, see [JDBC Connection Properties](#).
- For ADO.NET drivers, see [Review the ADO.NET Data Server Configuration](#).

## Change in Time Zone of Charges Table Date Columns

Since December 12, 2019, all Date columns on the Charges table return dates in GMT time zone. Prior to this change, SuiteAnalytics Connect displayed dates on the Charges table using the time zone set in user or company preferences. After this change, dates are displayed in GMT time zone only.



**Note:** To see the data of the Charges table, the Charge-Based Billing feature must be enabled.

For more information about charge-based billing, see the help topic [Setting Up Charge-Based Billing](#).

For more information about the tables and columns available in the Connect Browser, see [Connect Schema](#).

## New Version for SuiteAnalytics Connect ODBC and JDBC Drivers

On September 23, 2019, new versions of the SuiteAnalytics Connect ODBC and JDBC drivers were made available for download. If you are using an ODBC driver, you must upgrade to the latest version before November 15, 2019.

You should upgrade to the latest version of the drivers as soon as possible. Since November 15, 2019, ODBC driver versions prior to 8.10.89.0 are no longer be supported. See the following table for the latest driver versions:

| Driver Type  | Driver Version | Action Required                       |
|--------------|----------------|---------------------------------------|
| Windows ODBC | 8.10.92.0      | Upgrade to this version is mandatory. |
| Linux ODBC   | 8.10.89.0      | Upgrade to this version is mandatory. |
| JDBC         | 8.10.85.0      | Upgrade to this version is optional.  |



**Note:** You must ensure that you have removed the "ciphersuites" parameter from your connection URL. The JDBC server automatically selects the appropriate cipher suite for authentication. After November 20, 2019, if your connection URL contains a cipher suite, you are unable to access the Connect Service.



**Note:** If you use an ADO.NET driver to access the Connect Service, no action is required.

To download the latest driver version, go to your NetSuite home page and click **Set Up SuiteAnalytics Connect** in the Settings portlet.

Depending on your operating system and the version of the driver you install, you may also need to update your connection attributes. See the following table for more information:

| Driver                                           | Action Required                                                                                                                                                                                                                                                                    |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Windows ODBC 8.10.92.0                           | No update required.<br><br>The installer automatically updates your data sources to use the generic system trust store and account-specific domains.<br><br>For more information on the installation, see <a href="#">Downloading and Installing the ODBC Driver for Windows</a> . |
| Windows ODBC 8.10.92.0<br>(DSN-less connections) | Update required.                                                                                                                                                                                                                                                                   |

| Driver               | Action Required                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | Set the value of the trust store parameter to <b>system</b> .                                                                                                                                                                                                                                                                                                                         |
| Linux ODBC 8.10.89.0 | Linux ODBC driver version 8.10.89.0 does not include ca.cer and ca2.cer files. If you are upgrading from a previous version, you must update the trust store parameter or connection string. You must remove the ca.cer and ca2.cer files, and ensure that the ca3.cer file is included.<br><br>For more information, see <a href="#">Configuring the ODBC Data Source on Linux</a> . |

For more information about upgrading ODBC drivers, see the following topics:

- [Upgrading an ODBC Driver](#)
- [Downloading and Installing the ODBC Driver for Windows](#)
- [Downloading and Installing the ODBC Driver for Linux](#)
- [Authentication Using Server Certificates for ODBC](#)

For more information about upgrading JDBC drivers, see the following topics:

- [Accessing the Connect Service Using a JDBC Driver](#)
- [JDBC Connection Properties](#)

For more information about account-specific domains, see the help topic [URLs for Account-Specific Domains](#).

## Changes to SuiteAnalytics Connect Return Values and String Types

On **March 19, 2019**, the software version of the SuiteAnalytics Connect server was upgraded for testing purposes. The upgrade applied to sandbox and release preview accounts only, and no user intervention is required. Production accounts were upgraded in June 2019. The upgrade changed the data types, precision, and display sizes for the return values of some functions and string types used in SuiteAnalytics Connect.

Changes resulting from the upgrade are as follows:

| Previous behavior                                                                     | Current behavior                                                                     | Description                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Numeric functions return INTEGER values.<br><br>Display size: 11<br><br>Precision: 10 | Numeric functions return BIGINT values.<br><br>Display size: 20<br><br>Precision: 19 | Affected functions:<br><br>Numeric functions such as count(), abs(), pow(), ceil(), floor(), and so on.                                                                                                                                                                   |
| The return values display sizes and precision equal to the original column size.      | The return values display sizes and precision equal to the resulting string size.    | Affected functions:<br><br>All string functions such as substring() and left().<br><br>For example, substring(col, 1, 30) returns a value with a precision and display size of 30.<br><br>Exception: the right() function has a fixed precision and display size of 4000. |

| Previous behavior                                                                                                  | Current behavior                                                                                                    | Description                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The return values display maximum sizes and precision for data types such as NVARCHAR and VARCHAR2.                | The return values display sizes and precision equal to the actual size of the column.                               | Affected functions: nvl()                                                                                                                                                                                                                                                     |
| The return values did not display sizes and precision based on the number of repeats.                              | The return values display sizes and precision based on the number of repeats.                                       | Affected functions: repeat()<br><br>The return values display sizes and precision based on the number of repeats.<br><br>For example, repeat(full_name, 2) returns a value with a display size of 8000, and repeat(full_name, 1) returns a value with a display size of 4000. |
| When col is null, the data type is CHAR and the display size and precision is 0.                                   | When col is null, the data type is VARCHAR and the display size and precision is 1.                                 | Affected functions: nvl().<br><br>When col is null, this change increases the display size and precision of the return values from 0 to 1.                                                                                                                                    |
| When using negative values to represent the number of characters to extract, the functions return an empty string. | When using negative values to represent the number of characters to extract, the functions return an error message. | Affected functions: left() and substring().<br><br>For example, substring(full_name, 0, -1) returns an error. However, you can still use negative values to specify an index in the substring() function. For example, substring(col, -2, 1) does not return an error.        |
| Using NULL returns values with a display size and precision of 0.                                                  | Using NULL after the upgrade returns values with a display size and precision of 1.                                 | For example, select NULL as "col1" FROM table_name returns a value with a display size and precision of 1 for col1.                                                                                                                                                           |
| JOIN clauses should follow the ANSI SQL-92 standard.                                                               | JOIN clauses must be compliant with ANSI SQL-92. Queries that are not compliant may fail.                           | When running queries with JOIN clauses, you must follow the SQL-92 standard for the Connect Service.                                                                                                                                                                          |

## The Analytics Data Source and SuiteAnalytics Connect

Since 2019.2, the new data source for SuiteAnalytics Connect is no longer considered a beta feature and is generally available. The new data source supports NetSuite phased release cycle. Therefore, when your production account is upgraded to the new NetSuite release, the same version of the data source is immediately available. The access to the new data source requires account-specific domains.

The new data source is designed to display consistent data across SuiteAnalytics Workbook, which solves some previous inconsistencies in data exposure between saved searches and reports.

To access the new data source, you must modify the following connection attributes of the driver to enable the connection.

- **Service Host** – Change the Connect Service host name to your account-specific domain. The host name you should use for your connection is displayed in the **Service Host** field on the SuiteAnalytics Connect Driver Download page, under **Your Configuration**.
- **Data Source** – Change the attribute to **NetSuite2.com**.

When you access the new data source, you need to consider the following:

- **Role-based access restrictions** – Users can only query data that they can access in the SuiteAnalytics Workbook user interface, which contributes to improved security. The new data source is not accessible for the following roles and permissions:

- Administrator



**Note:** When you use SuiteAnalytics Connect with OAuth 2.0, the NetSuite2.com data source is accessible for the Administrator role. However, the Data Warehouse Integrator role and custom roles are the preferred option when transferring data to a data warehouse.

- Full Access (Deprecated)
- Roles requiring Two-Factor Authentication (2FA)
- Roles accessing the Connect Service with IP restrictions
- SuiteAnalytics Connect - Read All Permission

- **SuiteQL** – SuiteAnalytics Connect supports SuiteQL. When you run queries, syntax for both SQL-92 and Oracle are supported, but you cannot use them in the same query. You can retrieve information from the schema of the new data source using the OA\_COLUMNS, OA\_TABLES, and OA\_FKEYS tables. Additionally, you must consider some syntax requirements when creating a query such as supported operators, functions, expressions and number of arguments.



**Note:** To access the new data source, the role used must be granted the SuiteAnalytics Connect permission.

For more information about account-specific domains, see the help topic [URLs for Account-Specific Domains](#).

For more information about the new data source, see the following topics:

- [Analytics Data Source Overview](#)
- [Configuring Your Data Source](#)

For more information about SuiteQL and best practices for querying the Connect Service, see the following topics:

- [SuiteQL](#)
- [Using SuiteQL with the Connect Service](#)
- [Query Language Compliance](#)

## NetSuite Password Policies Now Apply to SuiteAnalytics Connect

In January 2019, the Connect Service started enforcing the same password policy used in the NetSuite UI. If you try to access the Connect Service with an expired password, you receive an error message and are asked to go in to the NetSuite UI.

To reset an expired password, log in to the NetSuite UI (at <https://system.netsuite.com>), using your email address and the expired password. The Password Change screen opens. Enter your old (expired) password, and then enter a new password. The Password Criteria panel validates that your new password meets the necessary criteria as you type it. For more information, see the help topic [Password Expiration Notifications](#).

**Your password has expired. Please change it now.**

| <b>Password Criteria</b>                                                                                                                                                                                                                                                                                                                      |                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Old Password                                                                                                                                                                                                                                                                                                                                  | Does not contain illegal characters <span style="float: right;">✖</span>              |
| New Password                                                                                                                                                                                                                                                                                                                                  | Is at least 10 characters long <span style="float: right;">✖</span>                   |
| Confirm Password                                                                                                                                                                                                                                                                                                                              | Is sufficiently different from previous password <span style="float: right;">✖</span> |
| Contains at least 3 of these 4 character types:<br><ul style="list-style-type: none"> <li>• Uppercase alpha characters (A, B, ... z)</li> <li>• Lowercase alpha characters (a, b, ... z)</li> <li>• Numbers (1, 2, 3, 4, 5, 6, 7, 8, 9, 0)</li> <li>• Non-alphanumeric ASCII characters ( !@#\$%^&amp;*.;~`-+?,-_=()[]{}&lt;&gt; )</li> </ul> |                                                                                       |
| New passwords match <span style="float: right;">✖</span>                                                                                                                                                                                                                                                                                      |                                                                                       |

Before your password expires, you receive several emails notifying you that your password will expire. For more information on how to change the password before the expiry date, see the help topic [Change Password Link](#).

To find out when your NetSuite password will expire, go to the My Audit portlet on your home dashboard. For more information on adding this portlet to your dashboard, see the help topic [My Login Audit Portlet](#).

# Cipher Suite Deprecations for SuiteAnalytics Connect JDBC Drivers

Since **May 17, 2018**, all SuiteAnalytics Connect hostnames such as odbcserver.netsuite.com point to new servers with new IP addresses. As a result, only modern cipher suites are supported for authentication with SuiteAnalytics Connect JDBC drivers. All other previously supported cipher suites were deprecated on **May 17, 2018**.

If you use a JDBC driver to access SuiteAnalytics Connect and you have specified a cipher suite in your connection URL, you should remove the cipher suite from the URL immediately. If your connection URL contains a deprecated cipher suite, you cannot access the Connect Service. If the connection URL does not include a cipher suite, the JDBC server automatically selects the appropriate cipher suite for authentication. Additionally, you should ensure that there are no IP restrictions set up that might prevent you from connecting to the service.

If you use an ODBC or ADO.NET driver to access the Connect Service, no action is required. However, you should also check for IP restrictions that might prevent you from connecting to the service.

For more information about authentication using JDBC drivers, see [Authentication Using Server Certificates for JDBC](#).

## Mandatory Update for SuiteAnalytics Connect ODBC Drivers

On **May 11, 2018**, new DigiCert SSL certificates were installed on the SuiteAnalytics Connect servers. This change caused older versions of the ODBC drivers for SuiteAnalytics Connect to stop working. New versions of the ODBC drivers were made available for download on **March 22, 2018**.

To avoid a service outage, you should upgrade to Windows ODBC driver version 7.20.55 or Linux ODBC driver version 7.20.51. These drivers support the new ca3.cer certificate.

If you use JDBC or ADO.NET drivers to access SuiteAnalytics Connect, no action is required. However, you should verify that all of the required certificates are in your truststores.

## Required and Preferred Actions

To find the version of your current driver, open the Windows Control Panel and browse to Programs > Programs and Features. Find your driver in the list and check its version in the Version column.

| ODBC Driver Version         | Required Actions                                                                                                                                                                                                 | Additional Information                                                                                                                                      |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Windows ODBC Driver 7.20.54 | Upgrade to Windows ODBC driver version 7.20.55. If you are using a DSN-less connection, you should add a path to the newly introduced ca3.cer certificate to the Truststore parameter in your connection string. | For more information, see <a href="#">Downloading and Installing the ODBC Driver for Windows</a> and <a href="#">Connecting Using a Connection String</a> . |
| Linux ODBC Driver 7.20.50   | Upgrade to Linux ODBC driver version 7.20.51. If you are using a DSN-less connection, you should add a path to the newly introduced ca3.cer certificate to the Truststore parameter in your connection string .  | For more information, see <a href="#">Downloading and Installing the ODBC Driver for Linux</a> and <a href="#">Connecting Using a Connection String</a> .   |

| JDBC or ADO.NET Driver Version | Preferred Actions               | Additional Information                                                                                                                                                                                                             |
|--------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JDBC Driver 7.20.50            | Verify truststore certificates. | If the required certificates are present, no action is required. If the certificates are not present, you must add them manually. For more information, see <a href="#">Authentication Using Server Certificates for JDBC</a> .    |
| ADO.NET Driver 7.20.50         | Verify truststore certificates. | If the required certificates are present, no action is required. If the certificates are not present, you must add them manually. For more information, see <a href="#">Authentication Using Server Certificates for ADO.NET</a> . |

## Verifying Certificates for JDBC and ADO.NET Drivers

Complete the following steps to check whether the required certificates are in your truststores. If the certificates are present, no further action is required. If they are not, you must install the certificates manually to avoid service interruptions.



**Note:** The following paths and commands will vary, depending on your version of Java.

### JDBC Drivers

1. Open a command window.
  - a. Click the **Start** icon on the Windows Taskbar.
  - b. Type **cmd**.
  - c. Press **Enter**.
2. At the command prompt, type the file path for your Java bin directory.  
For example, "**C:\Program Files\Java\jre1.8.0\_144\bin**".
3. Press **Enter**.
4. The command list for the Key and Certificate Management Tool is displayed.
5. In Windows Explorer, navigate to the folder where your Java truststore certificates are stored.  
For example **C:\Program Files\Java\jre1.8.0\_144\lib\security**.
6. Copy the file path for the Java truststore certificates folder.

7. In the command window, enter the following command where **path** is the file path for your Java truststore certificates folder:

```
keytool -list -v -keystore "path\cacerts"
```

For example,

```
keytool -list -v -keystore "C:\Program Files\Java\jre1.8.0_144\lib\security\cacerts"
```

8. Press **Enter**.
9. In the command window, a list of keystore entries is displayed. An entry named digicertglobalrootca should be listed. If it is not, you must manually add the required certificates to your Java truststore. For more information, see [Authentication Using Server Certificates for JDBC](#).



**Note:** You might be required to enter a keystore password before the keystore entries are displayed. If you do not know the keystore password, contact your administrator.

## ADO.NET Drivers

1. On your Windows Start menu, type **certmgr.msc** in the search field.
2. Press **Enter**.
3. The Certificate Manager tool appears in a new window.
4. Open the Trusted Root Certification Authorities> Certificates folder.
5. The DigiCert Global Root CA certificate should be listed. If it is not, you can download the required certificates from the SuiteAnalytics Connect Driver Download page and manually add them to your Windows Trusted Root Certification Authorities store. For more information, see [Authentication Using Server Certificates for ADO.NET](#).

# SuiteAnalytics Connect FAQ

See the questions and answers below for information about SuiteAnalytics Connect.

## How can I get access to my NetSuite data through an ODBC, JDBC, or ADO.NET connection?

The SuiteAnalytics Connect feature is an add-on module. For additional information, or to purchase this module, please contact your Account Manager.

 **Note:** The SuiteAnalytics Connect module is not available for NetSuite Small Business accounts.

### To enable the SuiteAnalytics feature:

1. Go to Setup > Company > Enable Features.
2. On the **Analytics** subtab, in the Data Management section, enable **SuiteAnalytics Connect**.
3. Click the **Save** button.

Next, you should download a driver. Go to the Home tab and in the Settings portlet, click Download Driver for instructions.

Note that you need the SuiteAnalytics Connect permission to access the schema available with this feature.

For additional information about using SuiteAnalytics Connect, see [SuiteAnalytics Connect](#).

For more information, see [SuiteAnalytics Connect](#).

## I am getting the following error: TCP/IP error, connection reset by peer. What could be causing this?

This message indicates that the connection was closed. There are several reasons that can trigger this message such as a network issue, a NetSuite server restart, the client/server host was unreachable, or a firewall on your system.

A firewall on your system may close the connection if it is considered idle. If you determine that the firewall or your operating system may be the problem, you can set the KeepAliveTime parameter to prevent your system from closing the connection. For more information, see [Idle Connection Timeout](#).

## Why is NetSuite2.com the Preferred Data Source for Connect?

The NetSuite2.com data source, also known as the analytics data source, provides advanced query capabilities and solves some previous inconsistencies in data exposure. Also, this data source applies role-based access control which helps to increase security.

To learn about the benefits of using the analytics data source, see [NetSuite2.com Data Source](#).

## How can I see all the record types and fields available for Connect?

The NetSuite2.com data source applies role-based access control. This means that the features, roles and permissions assigned to your account determine the data that you can access through Connect. However, you can use the Static Data Model to see all available record types and fields. Using the Static Data Model, SuiteAnalytics Connect still applies role-based permissions. Therefore, you can only get the data for the records that you can access, but you can see the structure and the name of all available record types and fields. For more information, see [Setting the Static Data Model for Connect Drivers](#).

I moved to NetSuite2.com, but I do not get the same results when I use the same query.  
[How can I get results through NetSuite2.com?](#)

The NetSuite2.com data source uses a different schema than NetSuite.com. Some record types and fields that were available in NetSuite.com may not be available in NetSuite2.com, or may return different results. To understand how data is structured in NetSuite2.com and the differences between NetSuite.com and NetSuite2.com, see [Record Types and Fields](#).