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Tealeaf Databases Guide

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IBM Tealeaf CX Database Guide

The Tealeaf Databases Guides provides an overview of each database that is part of the IBM Tealeaf CX platform.

Overview of Tealeaf databases

The Tealeaf product suite requires several databases for configuration and data storage.

These databases are maintained in one or more Microsoft SQL Server instances that are hosted by the customer. Tealeaf requires two SQL Server logins to provide different applications the proper level of access to the databases.

This section provides an overview of database topics that are covered in the Tealeaf Databases Guide.

Tealeaf Databases

The databases available to you depend on the Tealeaf component you licensed. This section lists all of the Tealeaf databases, which are covered in the *IBM® Tealeaf Databases Guide*.

• CX Databases

- **System Database** - Required for the IBM Tealeaf® cxImpact Portal and Reporting capabilities. Contains all Tealeaf system information that is created through the configuration and use of Tealeaf.
- **Reporting Database** - Contains statistical information about traffic that is captured from monitored customer applications. This information is collected from the Tealeaf canister(s), aggregated, and stored for use in reporting.
- **Statistics Database** - Contains performance information about the IBM Tealeaf CX system itself. Used for monitoring the systems health and to aid in database troubleshooting.

• cxResults Databases

- **Visitor Staging Database** - Contains the raw data that is extracted from sessions in the Tealeaf canisters. Data that is extracted into this database provides flexibility in other ETL operations and separates those operations from the reporting capabilities of IBM Tealeaf cxResults.
- **Session Segment Database** - Contains analytical data that is parsed from sessions that are identified by Tealeaf users through Portal search and session segment analysis. Used to provide in-depth analysis of groups of sessions.
- **Visitor Reporting Database** - Contains the aggregated reporting data for IBM Tealeaf cxResults. This database is updated on an hourly basis.

- **cxReveal Database** - The IBM Tealeaf cxReveal database is used to store session attributes and other session-related information as soon as the data is detected in the Windows pipeline.

Related reference

[CX databases](#)

This section provides some overview information on each of the IBM Tealeaf CX databases.

[cxResults databases](#)

The filegroup reference information in this section applies to new installations of the databases for Tealeaf Release 8.0 or later. Filegroups for upgraded versions of the databases reflect the earlier version's layout with new filegroups added, based on the new scheme.

[cxReveal database](#)

The IBM Tealeaf cxReveal (TL_SEARCH) database stores session attribute data and other session-related data in the database as soon as it is captured. This immediate capture allows rapid access to sessions for IBM Tealeaf cxReveal users and fast response times when querying through the Portal for sessions.

Requirements

Ensure that the following requirements for are met for databases used with the IBM Tealeaf CX platform.

Database server

All Tealeaf databases can be hosted in Microsoft SQL Server.

For more detailed information about the database server requirements see "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*.

Required system user accounts

Each Tealeaf database requires two database user accounts:

- TLADMIN - administrator account that must be able to modify database schema. The applications using this account are not exposed to user access.
- TLUSER - user account used by the Tealeaf Portal and other applications. Access is limited to reading and writing data from the databases.

Installation

For IBM Tealeaf cxImpact and IBM Tealeaf cxResults, you can use the external Tealeaf Database Manager program (TDM) to manage installations, updates, and upgrades to your Tealeaf databases.

This tool manages all of the backend SQL scripting and queries necessary to manage basic operations on the databases. The TDM can also generate scripts for later use.

Related reference

[Installing Tealeaf databases](#)

This section contains server requirements and sequences of steps for installing Tealeaf databases for this release.

Administration

Customers are responsible for the maintenance and backup of Tealeaf databases. Tealeaf provides some tools and recommendations for how to back up the databases, including the creation of backup scripts according to recommended practices as part of the install process.

Related concepts

[Database Administration](#)

The IBM Tealeaf CX datastore runs on top of a set of four Microsoft SQL Server databases.

SQL Server administration

This section describes the requirements for installing and configuring the SQL Server instance used by Tealeaf databases.

SQL Server installation

This section describes the requirements for installing the SQL Server instance used by Tealeaf databases.

Related reference

[Troubleshooting Tealeaf databases](#)

If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

Required components

The following database components are required.

- The database service and shared tools
- Workstation client connectivity management tools

Replication and full text search are not required.

Supported SQL Server Versions

Tealeaf supports the following versions of MS SQL Server.

Table 1. Supported SQL Server Versions			
SQL Server Version	Express®	Standard	Enterprise
SQL Server 2008 (64-bit)		Yes	Yes
SQL Server 2012 (64-bit)		Yes	Yes
SQL Server 2014 (64-bit)		Yes	Yes
SQL Server 2016 (64-bit)		Yes	Yes

- The SQL Server Express Edition is not supported. You must install the Standard or Enterprise versions.
- Tealeaf supports SQL Server 2008 (SP2) and SQL Server 2008 (R2). The R2 version is recommended.
- For very high volume sites installing IBM Tealeaf cxResults, you may need to install the IBM Tealeaf cxResults (VISITORS) database on a separate SQL Server instance from the IBM Tealeaf cxImpact (REPORTS) database.
- Depending on the volume of traffic at your site, Enterprise Edition of SQL Server may be required.
- For more information, consult Tealeaf support.

Note: On 64-bit versions of Windows, SQL Server performance may be affected because of a known Microsoft Windows issue.

Recovery model

To help reduce log file growth, Tealeaf recommends using the SIMPLE recovery model for all Tealeaf databases.

Note: SQL Server does not support automatic backup of log files in SIMPLE recovery model.

Related concepts

Database backup strategy

Your Tealeaf databases should be backed up regularly for recovery and performance reasons. Without valid backups, Tealeaf may be unable to recover customer data in the event of a system failure or data corruption.

File paths

If you are installing the Tealeaf databases on a remote instance of SQL Server, you must create the file paths in advance of installing the databases.

- See "Using Tealeaf Database Manager" in the *IBM Tealeaf Databases Guide*.

Related reference

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

UNC paths

Use of UNC paths is supported in the Tealeaf Database Manager.

Related reference

[Installing Tealeaf databases](#)

This section contains server requirements and sequences of steps for installing Tealeaf databases for this release.

Collation

These are the requirements and best practices for configuring the collation setting in Tealeaf databases.

The collation setting affects the storage and conversion of all text data in SQL Server.

The collation setting must be the same for all Tealeaf databases. For the Tealeaf databases, it is a best practice to configure the collation setting to be consistent between SQL Server, each database, and each table of the database. If there are mismatches between these settings, you may need to reinstall the Tealeaf databases, SQL Server, or both.

Given the size of Tealeaf databases in most deployments, changing the collation setting after installation is a difficult and time-consuming process. It is recommended that you set the collation setting for all Tealeaf databases during installation to the value listed below.

Tealeaf supports the following collation settings for SQL Server.

```
Latin1_General_CI_AS :- Latin1-General, case-insensitive, accent-sensitive,  
kanatype-insensitive, width-insensitive
```

```
SQL_Latin1_General_CP1_CI_AS:- Latin1-General, case-insensitive,  
accent-sensitive, kanatype-insensitive, width-insensitive for Unicode Data,  
SQL Server Sort Order 52 on Code Page 1252 for non-Unicode Data
```

By default, Tealeaf uses the SQL_Latin1_General_CP1_CI_AS collation setting.

- For more information, consult your Microsoft SQL Server documentation.

Max degree of parallelism

Tealeaf recommends setting the SQL Server max degree of parallelism option to the number of available cores. If the number of cores exceeds 8, set this value to 8.

This current value of this setting can be found by running the following query:

```
select * from sys.configurations where [name] = 'max degree of parallelism';
```

The value can be changed by running the following commands:

```
EXEC sp_configure 'show advanced option', '1'  
RECONFIGURE  
GO  
sp_configure 'max degree of parallelism', n  
RECONFIGURE  
GO
```

Where:

n is the value to be set.

Separation of data, indexes, and logs across storage volumes

Particularly in high-volume environments, storage of Tealeaf data on the same disk volume as the log files governing that data can introduce latency issues. If the database server hosts several databases that generate more than 200 transactions per second, then each database log should be written to a dedicated disk.

- Including the Tealeaf database indexes on the same volume as the data or logs can add even more latency to the write operations.
- The critical factor is determined by the random write I/O performance of the storage disks in use.

Note: The Tealeaf operating environment requires low-latency access to Tealeaf databases for real-time reads and writes of Tealeaf data. Tealeaf recommends storing Tealeaf database logs and indexes on different storage volumes from the drive hosting the SQL Server data files.

SQL Server data files can be shared to use the full capabilities of the entire storage system.

Block size

Tealeaf recommends using a block size of 64 KB in SQL Server implementations in which SQL Server is on a dedicated machine or is on the Report Server.

Note: If the SQL Server machine also hosts a Tealeaf Processing Server, then you must use a block size of 8 KB.

Disable database audit triggers

In some customer environments, database audit triggers were associated with Tealeaf databases. This prevents the TL_ADMIN database account from running a procedure to create tables, which are needed for creating events.

- After installation, if you are having trouble saving events, verify that DB audit triggers are disabled on the Tealeaf databases.

Note: Do not enable database audit triggers on the Tealeaf databases.

Network configuration

Tealeaf supports TCP and Named Pipes connections to SQL Server. By default, TCP is used.

About this task

The connection type can be changed through the Tealeaf Management System.

Note: This configuration change must also be applied through SQL Server Management Studio. For more information, refer to the documentation that came with your SQL Server product.

Procedure

1. Log in to the Tealeaf Portal as an administrator.
2. From the **Portal** menu, select **Tealeaf > TMS**. The Tealeaf Management System is displayed.
3. Click the **WorldView** tab.
4. Open the **Tealeaf** node.
5. Click **Shared configuration information**.
6. Click **View/Edit (Raw)**.
7. Edit the value for SQL Server communication protocol.
8. Set the value to Named Pipes.
9. Click **Save**.
10. Push the change to all Tealeaf servers.

See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

Memory configuration

If SQL Server is installed in a shared environment or if memory problems persist, you may change the amount of memory that SQL Server acquires for use.

About this task

By default, SQL Server is configured to behave as though it has exclusive access to the system on which it is installed, except for the operating system. SQL Server leaves sufficient memory available for the operating system to function without paging. SQL Server assumes it is running on a dedicated server and is not sharing the system with other resource-intensive applications. In this case the default memory allocation assumption should not cause problems.

However, a typical Tealeaf installation calls for SQL Server to reside on the Tealeaf Report server that contains several other memory intensive services.

Note: SQL Server should never be configured to use less than 1 GB of RAM and Tealeaf recommends having a minimum of 4GBs allocated to SQL Server. For more information about SQL Server sizing and memory configuration contact Tealeaf Professional Services.

If you need to change the memory that is allocated for SQL Server, complete the following steps.

Procedure

1. Log in to the server.
2. Open **SQL Server Management Studio**.
3. Login.
4. In the Object Explorer pane, select **<ServerProperties > Memory**.
5. In the Maximum Server Memory textbox, enter the amount of memory that you want to reserve for SQL Server, leaving enough memory to safely run other applications.
6. Restart the SQL Server service.

tempdb

Tealeaf uses tempdb to create temporary tables for generating reports for the Tealeaf Report Builder.

- It is not used explicitly for ETL processing.

Note: Tealeaf recommends allocating 25% of the TL_REPORTS database size for the tempdb size.

SQL Server authentication

This page contains information about the authentication methods and login permissions that are required by Tealeaf for accessing the SQL Server databases.

Authentication

During the installation process for SQL Server, you are prompted for the type of authentication in use for the install account.

The account in use should have both Windows and SQL Server authentication.

Note: If your account is restricted to Windows-only authentication, and you are upgrading Tealeaf databases on an SQL Server, see *Upgrading Tealeaf databases on SQL Server when your account is restricted to Windows-only authentication* in the topic titled "Other common database scenarios".

Note: If your account is restricted to Windows-only authentication, and you are installing Tealeaf databases on an SQL Server, see *Installing Tealeaf databases on SQL Server when your account is restricted to Windows-only authentication* in the topic titled "Scenario 2: Partial permissions; must grant permissions to Tealeaf database users".

Note: The accounts that you use for the Tealeaf databases should not be shared with any other application in your SQL Server environment.

Note: If these logins are created with names other than the default ones, that information must also be updated in the Report Server configuration. See "Configuring the Report Server" in the *IBM Tealeaf CX Configuration Manual*.

Required SQL Server login permissions

The Tealeaf application requires three SQL Server logins to operate correctly:

About this task

Procedure

1. During installation, a SQL Server login is required with sufficient permissions to create and modify the Tealeaf databases. This login is used only during installation. See ["Installation login" on page 7](#).
2. An Administrative login enables background processes to modify the database schema during normal operation. See ["Administrative login" on page 7](#).
3. A User login is used by all customer-facing portions of the application and only permits read and write access to the databases. See ["User login" on page 8](#).

Installation login

The SQL Server login that is used during installation needs the following permissions to install and modify the schemas of each Tealeaf database.

This login can either be the NT account of the user running the Tealeaf installation or a separate SQL Server login that is provided to the Tealeaf Database Manager as a secondary step after the main installation completes.

Note: The Installation login is required during initial installation of the databases only. After the installation completed successfully, this login can be deleted or disabled.

The simplest option is to use an NT Account that has SQL Server admin privileges or provide a SQL login with that level of access. If that is not possible a login with the following roles and permissions is required to successfully complete the Tealeaf database installation:

- Required Database Roles:
 - db_ddladmin
 - db_datareader
 - db_datawriter
- Required Database Permissions:
 - ALTER ANY LOGIN
 - ALTER ANY USER
 - CREATE DATABASE
 - CREATE SCHEMA

Administrative login

This login is used by Tealeaf applications that must be able to modify the schemas of one or more of the Tealeaf databases. The applications that use this account that is run in the background and do not allow user interaction.

- Default Account Name - TLADMIN
- Required Database Roles:
 - db_ddladmin
 - db_datareader
 - db_datawriter
- Optional Database Permissions:
 - VIEW SERVER STATE is useful for performance monitoring.

Extra admin login permissions

Through the Portal, database administrators can access useful reports on the state of the Tealeaf databases.

See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

To acquire all of the information to populate the Database Filegroup Size report, the TLADMIN account requires extra permissions. Below are the permissions to enable:

```
USE MASTER
GO

EXEC sp_grantdbaccess 'TLADMIN';

GRANT EXECUTE ON sys.sp_OACreate TO TLADMIN;
GRANT EXECUTE ON sys.sp_OADestroy TO TLADMIN;
GRANT EXECUTE ON sys.sp_OAGetErrorInfo TO TLADMIN;
GRANT EXECUTE ON sys.sp_OAGetProperty TO TLADMIN;
```

If these permissions are not enabled or are not possible, the Database Filegroup Size contains a significant number of zeros in the data.

User login

This login is used by the Tealeaf Portal and any other Tealeaf applications that require database access and allow user interaction. The login is limited to reading and writing data from the Tealeaf databases.

- Default Account Name - TLUSER
- Required Database Roles:
 - db_datareader
 - db_datawriter

ssclr_login login

This login is used by a stored procedure for IBM Tealeaf cxResults to perform enhanced searches against the Visitors database.

- Default Account Name - ssclr_login
- Required Database Roles:
 - db_datareader
 - db_datawriter
 - EXTERNALACCESS
 - ASSEMBLY

Tealeaf database security

Follow these guidelines when setting up database security for Tealeaf.

- You can set the default database for the Tealeaf logins TLADMIN and TLUSER to any valid value.
- No stored procedures in any Tealeaf databases should have access that is granted to public. All access should all be limited explicitly to TLADMIN and TLUSER. Revoking permissions from public does not cause an issue.
- Many system stored procedures in TL_SYSTEM database have run privileges that are granted to public. Revoking these permissions should not cause problems. However, since revoking these permissions requires changes to the MS SQL Server system procedures, Tealeaf cannot guarantee that the changes does not result in system issues. The Tealeaf SQL Server logins are explicitly granted the permissions that they need to access any system-stored procedures.

Upgrading SQL Server for Tealeaf

The IBM Tealeaf CX platform requires Microsoft SQL Server 2008 or later. This section contains instructions for how to manage upgrades and migrations to SQL Server 2008. Except where noted, these instructions also apply to SQL Server 2012 and later versions of the product.

Note: Microsoft is no longer supporting SQL Server 2000, so if you are currently using Tealeaf products on SQL Server 2000, you must upgrade to at least SQL Server 2008 as part of your upgrade to Tealeaf version 8.8 or later.

Possible upgrade paths

use the Microsoft process for migration in the scenarios described here.

- **Upgrading to 64-bit SQL Server 2008:** To convert from SQL Server 2000 to 64-bit SQL Server 2008 or to change the edition (for example, from Standard to Enterprise).
- **Upgrading to 64-bit SQL Server 2012:** To convert from SQL Server 2000 to 64-bit SQL Server 2012 or to change the edition (for example, from Standard to Enterprise).

The upgrade and migration processes are defined elsewhere in this section.

Before you begin

Before you begin any upgrade or migration operations, complete the following steps.

Procedure

1. Review the database server requirements for the Tealeaf version that use the upgraded SQL Server installation. See "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*.
 - For the most recent SQL Server access requirements, see "Database Manager SQL Server Access and Permission Requirements" in the *IBM Tealeaf Databases Guide*.
2. Perform a full backup of all Tealeaf databases through SQL Server. If prompted, you should choose to overwrite any existing backups.

Related concepts

[Database manager SQL Server access and permission requirements](#)

Some Tealeaf Database Manager functions require specific permissions on the SQL Server instance. This section describes these permissions and the procedures for working around situations where these permissions cannot be granted.

Upgrading to SQL Server 2008 or later

If you are migrating from a 32-bit version of SQL Server to a 64-bit version of SQL Server 2008 or later, you must move your Tealeaf databases to a temporary server first. A direct upgrade does not work.

About this task

Note: As of Release 8.1, Tealeaf requires 64-bit machines for all Windows-based servers that host Tealeaf software. If your Release 8.1 or later installation of Tealeaf databases is hosted on a machine that also hosts other Tealeaf software, such as the Reporting Server, you may use a supported 32-bit version of SQL Server. However, Tealeaf recommends 64-bit versions of SQL Server.

Procedure

1. Verify that you completed a full backup of all existing Tealeaf databases.
2. Run the SQL Server setup .exe program for the new version of SQL Server.
3. When prompted to upgrade an existing instance, select the SQL Server instance to upgrade.
4. When the setup program is finished, SQL Server was upgraded to the wanted version.

Related tasks

[Migrating to SQL Server 2008 or later](#)

These steps cover moving the Tealeaf databases to a new server where a SQL Server 2008 or later was installed and removing SQL Server 2000 and installing the new version of SQL Server on the existing server.

Migrating to SQL Server 2008 or later

These steps cover moving the Tealeaf databases to a new server where a SQL Server 2008 or later was installed and removing SQL Server 2000 and installing the new version of SQL Server on the existing server.

About this task

Note: As of Release 8.1, Tealeaf requires 64-bit machines for all Windows-based servers hosting Tealeaf software. If your Release 8.1 or later installation of Tealeaf databases is hosted on a machine that also hosts other Tealeaf software, such as the Reporting Server, you may use a supported 32-bit version of SQL Server. However, Tealeaf recommends 64-bit versions of SQL Server.

Procedure

1. Verify that you completed a full backup of all existing Tealeaf databases.
2. If SQL Server 2000 is installed on the server, uninstall it.
3. Reboot the machine.
4. Run the SQL Server setup . exe program for the new version of SQL Server.
5. In SQL Server Management Studio, create the Tealeaf logins TLADMIN and TLUSER.
6. If the new instance of SQL Server was installed on a new server, copy the database backup files for the Tealeaf databases to the new server.
7. Restore each of the Tealeaf databases.
8. After all Tealeaf databases are restored, run the following two commands on each database:

```
EXEC sp_change_users_login 'update_one', TLADMIN, TLADMIN;  
EXEC sp_change_users_login 'update_one', TLUSER, TLUSER;
```

9. Verify that the compatibility mode was properly configured.

Results

More detailed steps and instructions are available on the Microsoft website at: <http://microsoft.com/technet/>

Related concepts

Database compatibility mode

When a Tealeaf database is upgraded from an earlier version of SQL Server, it retains its existing compatibility level. Depending on your enterprise installation of Microsoft SQL Server, you must apply the following Compatibility Mode levels to the Tealeaf databases.

Database compatibility mode

When a Tealeaf database is upgraded from an earlier version of SQL Server, it retains its existing compatibility level. Depending on your enterprise installation of Microsoft SQL Server, you must apply the following Compatibility Mode levels to the Tealeaf databases.

In the table below, you can review the SQL Server version on which the databases were initially installed and the corresponding compatibility mode in which they must run after you completed the SQL Server upgrade.

Note: Running in Compatibility Mode may affect database performance.

Note: Compatibility Mode changes should only be applied while there are not any users connected to the database.

SQL Server Version Compatibility Mode

SQL Server 2000 80

Note: For Release 7.0 or later, this Compatibility Mode level is not supported.

SQL Server 2005 90 (Release 7.0 through 8.7)

Note: For Release 8.8 or later, this Compatibility Mode level is not supported.

SQL Server 2008 100 (Release 7.2 or later)

SQL Server 2012 110 (Release 8.8 or later)

Configuring compatibility mode for SQL Server 2012

In SQL 2012, you can configure the Compatibility Mode using the above method or by running an ALTER DATABASE SQL command to set the Compatibility Mode for a named database. For more information, see the documentation that came with your product.

Configuring compatibility mode for SQL Server 2008

In SQL 2008, you can configure the Compatibility Mode using the above method or by running an ALTER DATABASE SQL command to set the Compatibility Mode for a named database. For more information, see the documentation that came with your product.

Installing Tealeaf databases

This section contains server requirements and sequences of steps for installing Tealeaf databases for this release.

Additionally, you can find references to other sections containing more details on requirements and variations of installations.

Note: This section applies only to new installations of Tealeaf and its databases.

Related reference

[Upgrading the databases to the current release](#)

This section describes how to upgrade the Tealeaf databases to the latest version of Tealeaf.

Database server requirements

>For more information about the requirements for the machine hosting SQL Server and the Tealeaf databases, see the *IBM Tealeaf CX Installation Manual*

SQL server instances

Tealeaf requires that all IBM Tealeaf CX databases be stored on a single SQL Server instance.

- **Note:** Tealeaf does not officially support multiple instances of Tealeaf using a single SQL Server instance. Installing Dev and Prod databases installations of Tealeaf, for example, into the same SQL Server instance can cause unanticipated conflicts in the Tealeaf components referencing the databases.
- Tealeaf recommends that IBM Tealeaf cxResults customers store the IBM Tealeaf cxResults databases on a separate SQL Server instance.

Note: If your SQL Server installation uses dynamic ports, extra configuration is required before installing or upgrading the Tealeaf databases.

Related reference

[Troubleshooting Tealeaf databases](#)

If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

UNC paths support

The Tealeaf Database Manager supports the use of UNC paths to install or modify Tealeaf databases on network locations.

There is a known issue with SQL Server supporting UNC paths. For more information about the required configuration changes, see <http://social.msdn.microsoft.com/Forums/en-US/Vsexpressvcs/thread/97479a6d-9630-4510-9994-a6cd96c5840d/>.

Overview of Tealeaf database installation

By default, the Tealeaf Database Manager automatically manages the installation of all Tealeaf databases that are required for your Tealeaf solution. However, if your deployment has additional security or configuration requirements, you may choose to install the Tealeaf databases with the separate Tealeaf Database Manager after the main installer completed.

Note: IBM Tealeaf CX requires SQL Server 2008 or later. Before you install or upgrade your database, review the instructions for managing the SQL Server upgrade first.

The Tealeaf Database Manager requires specific permissions to install the Tealeaf databases. Before you begin, you should review the set of permissions and make arrangements as necessary.

Note: The Tealeaf Database Manager is used to install the SQL Reporting and IBM Tealeaf cxResults databases. It cannot be used to install or update the Canister databases, which are installed as part of the Processing Server through Setup.exe in the initial installation. For more information about those databases, see "CX Installation and Setup" in the *IBM Tealeaf CX Installation Manual*.

- For more information about configuring the Canister databases, see "Configuring the CX Canister" in the *IBM Tealeaf CX Configuration Manual*.

In this chapter, you can learn how to launch the Tealeaf Database Manager after installation and how to complete different installation scenarios depending on available permissions.

Note: Before you begin installation, you should review the administrator's topics.

Note: If needed, you can change the names of Tealeaf databases before you installed them.

After completing your installation or upgrade, if you are experiencing database issues, see "Troubleshooting - Tealeaf Databases" in the *IBM Tealeaf Troubleshooting Guide*.

Related concepts

[SQL Server administration](#)

This section describes the requirements for installing and configuring the SQL Server instance used by Tealeaf databases.

[Database Administration](#)

The IBM Tealeaf CX datastore runs on top of a set of four Microsoft SQL Server databases.

Related reference

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

[Troubleshooting Tealeaf databases](#)

If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

Database installation scenarios

The following sections describe common scenarios for installing Tealeaf databases.

Depending on the available database permissions and the location of the SQL Server installation, you may be able to use one of the following sequences to complete the database installation process.

Note: Before you begin, review the prerequisites.

Note: After you began installation or upgrading in All Database Mode, canceling interrupts the process after the requested action was completed on the current database. The actions on the current database and all previous databases are retained, and any remaining databases are left untouched. You may want to revert to the backup or make adjustments before completing the action.

The steps below contain links to other pages, where further detail is provided.

These scenarios apply to fresh installations of the Tealeaf databases.

Related reference

[Overview of Tealeaf database installation](#)

By default, the Tealeaf Database Manager automatically manages the installation of all Tealeaf databases that are required for your Tealeaf solution. However, if your deployment has additional security or configuration requirements, you may choose to install the Tealeaf databases with the separate Tealeaf Database Manager after the main installer completed.

[Upgrading Tealeaf databases](#)

Before you upgrade your Tealeaf databases to Release 8.1 or later, you must upgrade them to the latest build of Release 7.2. Direct upgrades from earlier builds and Releases are not supported.

Order of creation for individual databases

The System and Reports databases must be created in a specific order.

If you are using creating or upgrading all databases through the Tealeaf installer, upgrader, or Tealeaf Database Manager, these steps are performed in the proper order for you.

If you are installing or upgrading databases individually, you must manage these steps.

Related reference

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Creating databases with new names

If needed, you can change the names of the Tealeaf databases as part of the installation process, before data populates them.

About this task

Note: You cannot rename the databases after data is migrated into them or after the Tealeaf system begins to populate them.

If you have not yet installed Tealeaf software, you can complete the following steps to rename the databases in advance.

Note: If you are upgrading your Tealeaf databases, custom database names are automatically retained for you.

Procedure

1. Complete the installation, but do not choose to create the databases as part of the process.

2. When installation is complete, start the Tealeaf Database Manager.
3. In the **TDM** menu, select **Mode > Info/Config > Report Server Configuration**.
4. Switch to the **Database** page.
5. Modify the database names as necessary.
6. Click **OK**.
7. Now, use the Tealeaf Database Manager to create the databases.
8. When installed, the databases have the names that you specified.

Related concepts

[Database installation scenarios](#)

The following sections describe common scenarios for installing Tealeaf databases.

Related reference

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Scenario 1: Installing with full SQL Server admin permissions

Follow this procedure to install your Tealeaf database with all required permissions and with default values.

Procedure

1. Start Tealeaf Database Manager:

```
<Tealeaf_install_directory>\Reporting\TealeafDatabaseManager.exe
```

2. In the menu, select **Mode > Database Setup > All Databases**.
3. From the Action drop-down, select **Install**.
4. From the page list, select **Filegroups > General**.
5. Verify that the specified file paths are correct and exist on the remote server hosting the databases or storage.
 - If the database server or storage is on a remote server, the specified paths must exist on that server.
6. Click **OK**.
7. All databases are installed.
8. After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.

Results

- Close the output window.

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Scenario 2: Partial permissions; must grant permissions to Tealeaf database users

The Tealeaf databases can be installed using the TLADMIN Tealeaf login or a custom login with the same permissions.

About this task

- Full installation permissions are not available to the current user.
- Permissions must be granted to Tealeaf database users.
- The file paths in the file for each database must be edited.
- You may need to review the size that is allocated for each file.
- For a scenario where SQL Server installation allows only Windows authentication and does not allow SQL Server authentication, see *Installing Tealeaf databases on SQL Server when your account is restricted to Windows-only authentication*.

Related concepts

[SQL Server administration](#)

This section describes the requirements for installing and configuring the SQL Server instance used by Tealeaf databases.

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Install steps

Procedure

1. Before running the Database Manager, a DBA or someone with SA access must run for any new databases the database creation scripts. These scripts create the empty databases and users on SQL Server and are provided in the following directory:

```
<Tealeaf_install_directory>\SQL\DBCcreateScripts
```

2. Start Tealeaf Database Manager:

```
<Tealeaf_install_directory>\Reporting\TealeafDatabaseManager.exe
```

3. In the **Connection** window, verify that the correct host and port values are entered.

Note: You must connect using Tealeaf Authentication.

4. Click **Connect**.

5. Complete one of the following sequences, depending on how you are installing the databases.

Note: When installing or upgrading in Tealeaf Authentication mode, some commands may fail. If the Tealeaf Database Manager reports a successful install or upgrade operation, these failures can be ignored.

a) All Databases Mode Install/Upgrade:

- 1) In the menu, select **Mode > Database Setup > All Databases**.
- 2) In the Action drop-down, select **Install** for an installation.

- 3) In the **DB Creation** menu, clear **Create Databases**, which prevents Tealeaf Database Manager from attempting to create the databases or users and from attempting to grant permissions to these users on SQL Server.
- 4) Click **OK**.
- 5) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully ran.
- 6) Close the output window.

b) Single Database Mode Install/Upgrade:

- 1) In the menu, select **Mode > Database Setup > Single Database**.
- 2) Select the **Action and Database Type**, and set any necessary options.
- 3) In the **DB Creation** menu, deselect **Create Databases**, which prevents Database Manager from attempting to create the databases or users and from attempting to grant permissions to these users on SQL Server.
- 4) Click **OK**.
- 5) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully ran.
- 6) Close the output window.

6. Post-Install/Upgrade Steps:

- a) In the menu, select **Mode > Database Users > Permissions Scripts**.
- b) In the **Output Location** field, enter the location and file name where you want to store the output scripts.
- c) Click **OK**. An SQL script containing all of the necessary permission grant statements is generated in the output location.
- d) Access the scripts in the directory you selected.
- e) Have the DBA or person with SA access run the scripts.

7. Tealeaf Authentication: If you are running these steps using Tealeaf Authentication, you must perform the following steps now to configure the System database:

- a) In the menu, select **Mode > Database Setup > Single Database**.
- b) From the Database drop-down, select **System**.
- c) From the Action drop-down, select **Upgrade**.
- d) For the Command File, navigate to the following directory:

```
<Tealeaf_Install_Directory>\Reporting\DatabaseSchema\
```

- 1) Depending on the products you licensed, the following files appear in the directory.

Note: You must run each of the following schema upgrades for the databases of the products you installed.

- a) IBM Tealeaf CX: `SystemDBConfig.xml`
- b) IBM Tealeaf cxResults: `ResultsDBConfig.xml`
- c) IBM Tealeaf cxReveal: `RevealDBConfig.xml`
- e) Click **OK**.
- f) After the operation completes, review the output window.

- g) Be sure to review the Failed Statements pane to verify that all statements were successfully run.

Installing Tealeaf databases on SQL Server when your account is restricted to Windows-only authentication

Procedure

1. On the Reporting Server, modify the settings for **AdminUserName** and **UserName** in the registry key at: HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\TeaLeaf Technology\DataStore\ReportServer to "TLADMIN" and "TLUSER".

2. Upgrade the database.

Run the Tealeaf Database Manager as an Active Directory (AD) user with sysadmin privileges.

3. Generate the SQL permissions script as a text file:

In Tealeaf Database Manager, select **Mode > User Management > Permissions Scripts** from the menu bar and generate the SQL permissions.

Edit the resulting text file by changing "TLADMIN" and "TLUSER" to the corresponding AD user name, delimited with square brackets. For example:

```
[domain\user]
```

or

```
[user@domain.subdomain.tld]
```

4. Run the modified SQL permissions script as a user with sysadmin privileges.
5. Reset the AdminUserName and UserName values from step 1 to the AD user names.

Scenario 3: Installing Tealeaf databases one at a time

If needed, you can use the Tealeaf Database Manager to install Tealeaf databases one at a time.

Note: If you are installing all databases now, Tealeaf recommends that you install them in a specific order.

Related reference

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Scenario 4: Pre-Allocating the databases during Installation

If needed, you can configure the Tealeaf Database Manager to pre-allocate one or all databases during the installation process. After the pre-allocation is completed, you can complete installation, upgrade, or other operations as needed.

Procedure

1. If the databases did not exist, you can use the following steps to install the databases by a script.
 - a) Locate the scripts that are provided by Tealeaf in the following directory:

```
<Tealeaf_install_directory>\SQL\DBCcreateScripts
```

- b) Make the following edits to the scripts:
 - 1) Edit them to use the correct file paths.
 - 2) Edit them if you are using custom databases names.

- c) Through SQL Server Management Studio, the DBA must use the scripts to create the empty databases.

2. Start Tealeaf Database Manager:

```
<Tealeaf_install_directory>\Reporting\TealeafDatabaseManager.exe
```

3. In the **Connection** window, verify that the correct host and port values are entered.

Note: You must connect using Tealeaf Authentication.

4. Click **Connect**.
5. Under the **DB Creation** menu, clear the **Create Databases** option.
6. When the installation is run, the Tealeaf Database Manager skips the database creation step and assumes that they exist.
7. Install the databases individually or all together.

Related concepts

[Database installation scenarios](#)

The following sections describe common scenarios for installing Tealeaf databases.

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Post-installation tasks

After you completed your installation, specify a backup strategy, recovery model, and log file compression settings.

Install event definitions

If you installed the System database through Tealeaf Database Manager, the event definitions must be loaded into the database. If you already started the Portal and discovered that there are no events that are displayed in the Portal, this installation step is the likely solution.

About this task

Procedure

1. Log in to the Report Server as an administrator.
2. Navigate to the following directory:

```
<Tealeaf_install_directory>\Reporting
```

3. Launch `TealeafDatabaseManager.exe`.
4. Enter login information.
5. From the menu, select **Mode > Database Management > Initialize Configuration**.
 - If you are upgrading the databases, select **Mode > Database Management > Migrate Configuration**. This step performs the initialization and migrates configuration information from the previous version.
6. Click **OK**.
7. If the events are successfully loaded, the following message is displayed:

```
Operation completed successfully.
```

Logging

About this task

Note: If you receive a non-zero return code when loading event definitions from the command line after a fresh installation, retrieve the log file for the utility from the Logs directory and contact Tealeaf <http://support.tealeaf.com>.

A log file is maintained in the following location:

```
<Tealeaf_install_directory>\Logs\TLEventManager_YYYYMMDD.log
```

Below you can review the possible return codes reported in the log file.

Return Code

	Description
0	No Errors
1	Invalid command arguments
2	Could not connect to data service
3	Data service started with error
4	License file not valid
5	Unable to load TLResource
6	Unable to load current event container
7	Error saving events
8	Error saving reports

Install cxResults stored procedure

Included with IBM Tealeaf cxResults is a stored procedure that can be deployed on the SQL Server to significantly improve search performance for sequence searches and deliver more accurate results. This section describes how to install and deploy the stored procedure, which is packaged as a .DLL provided by Tealeaf.

About this task

Note: cxResults is a separately licensable component of the Tealeaf CX platform. for more information, please contact your IBM Tealeaf representative.

Note: To install the .DLL, you must use an account that has Windows administration privileges on the local machine.

Note: To deploy the .DLL, you must use an account in the Tealeaf Database Manager that has system administrator privileges to the SQL Server instance.

Procedure

1. Before you begin, you must install the IBM Tealeaf cxResults databases.
2. Acquire the .DLL from the Tealeaf distribution that is provided to you. The .DLL is in the following location:

```
<Tealeaf_install>directory\Reporting\SequenceSearchCLR.dll
```

3. Log in to the machine hosting the SQL Server instance.
 - In most environments, this machine is the Report Server.
4. Copy this .DLL in a location on the machine hosting the SQL Server instance that stores the IBM Tealeaf cxResults database.
5. Retain the absolute path to the installation location. Copy it to the clipboard.
6. Start the Tealeaf Database Manager, which is stored in the following location:

```
<Tealeaf_install_directory>\Reporting\TealeafDatabaseManager.exe
```

7. From the Tealeaf Database Manager menu, select **Mode > Database Setup > CLR Sequence Search**.
8. Enter the absolute path to the .DLL on the SQL Server machine.

Note: This path must include the file name.

- UNC paths are supported.

9. Click **OK**.

10. When the stored procedure was deployed, sequence searches through IBM Tealeaf cxResults are executed using it.

See "Searching for Visitors" in the *IBM Tealeaf cxResults User Manual*.

Uninstalling Tealeaf databases

Uninstalling Tealeaf databases is a permanent operation and results in the loss of all data that was not backed up.

Note: Lost data includes, but is not limited to, event object definitions, report definitions, and then data they reference.

Note: For most operations, Tealeaf Database Manager stops all Tealeaf services necessary. However, it does not stop the Tealeaf Transport Service. If StatsLogger was enabled in the pipeline, the Tealeaf Transport Service must be stopped manually before continuing to uninstall the Tealeaf databases.

Scenario 1: all required privileges

Follow this procedure to uninstall a database using an account with all required administrative privileges.

Procedure

1. Start Tealeaf Database Manager:

```
<Tealeaf_install_directory>\Reporting\TealeafDatabaseManager.exe
```

2. **All Databases Mode Uninstall:**

- a) In the menu, select **Mode > Database Setup > All Databases**.
- b) In the Action drop-down, select **Uninstall**.
- c) Click **OK**.
- d) After the operation completes, review the output window.

- Be sure to review the Failed Statements pane to verify that all statements were successfully run. .
- e) Close the output window.

3. Single Database Mode Uninstall:

- In the menu, select **Mode > Database Setup > Single Database**.
- In the Database drop-down, select the wanted database.
- In the Action drop-down, select Drop.
- Click **OK**.
- After the operation completes, review the output window.

Be sure to review the Failed Statements pane to verify that all statements were successfully run.

- Close the output window.
- Repeat for all existing databases.

Related reference

Using Tealeaf Database Manager

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Scenario 2: missing required privileges

Dropping databases from SQL Server requires SA privileges. If Tealeaf Database Manager cannot be run with such privileges, a DBA or other user with the necessary privileges must drop the databases manually from SQL Server.

Upgrading Tealeaf databases

Before you upgrade your Tealeaf databases to Release 8.1 or later, you must upgrade them to the latest build of Release 7.2. Direct upgrades from earlier builds and Releases are not supported.

For more information about upgrading the Tealeaf databases, see the *IBM Tealeaf CX Upgrade Manual*.

Database manager SQL Server access and permission requirements

Some Tealeaf Database Manager functions require specific permissions on the SQL Server instance. This section describes these permissions and the procedures for working around situations where these permissions cannot be granted.

When installing or upgrading Tealeaf Databases, the Tealeaf Database Manager must have permission to create new databases and users on SQL Server and to grant permissions to the new users.

- For more information about SQL Server authentication and required logins, see "SQL Server Authentication" in the *IBM Tealeaf Databases Guide*.

Related concepts

SQL Server authentication

This page contains information about the authentication methods and login permissions that are required by Tealeaf for accessing the SQL Server databases.

Guidelines for configuring NT directory permissions for SQL Server

Microsoft IIS is sensitive to changes in directory permissions. It is important that changes are made with care.

If you have questions about configuring the correct permissions for an Application Pool identity, visit <http://www.msdn.com>.

Note: It is recommended that the NT Account used for SQL connectivity be configured so that its password does not expire and cannot be changed. Disruptions to connectivity settings can disable Tealeaf processing and reporting functionality.

Running Tealeaf services through an NT domain account without administrator privileges

If needed, you can run Tealeaf services using an NT domain account, even if the account lacks administrator privileges. The following additional configuration is required.

Note: More customer-specific configuration may need to be done to complete this change.

Related reference

Using Tealeaf Database Manager

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Generating the database permissions scripts

Follow this procedure to generate a database permissions script to be run against your Tealeaf database.

About this task

The Tealeaf Reporting Services below require the listed privileges to run operations.

Service

Required Privileges

Data Collector

An NT account with privileges equivalent to TLADMIN

Data Service

An NT account with privileges equivalent to TLUSER

RSE Service

An NT account with privileges equivalent to TLADMIN

Search Server

An NT account with privileges equivalent to TLUSER

Transport Service

An NT account with privileges equivalent to TLUSER

Steps:

After the above account privileges are enabled, complete the following steps.

Procedure

1. Start the Tealeaf Database Manager.
2. Generate the DB Permissions script.
3. Edit the permissions script in a text editor.
 - a) Search for TLADMIN and replace with the NT administrator account name for Tealeaf to use.
 - b) Search for TLUSER and replace with the NT user account name for Tealeaf to use.
 - c) Save the file.
4. Give the permissions script to the DBA for execution in SQL Server Management Studio.

Configuring database NT authentication

Follow this procedure to configure database NT authentication.

About this task

In the Tealeaf registry hive, locate the following area:

On 64-bit Windows:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\
```

Procedure

1. In the appropriate area, set the DBTrustedAuthentication value to True.
2. Each Tealeaf database service must be configured to run as account with the required permissions.
3. After the services are restarted, they attempt to connect to SQL Server using the appropriate account configured to run the service.

Configuring the Tealeaf Portal

Similar to other Tealeaf services that require database connectivity, the Portal shares the ReportServer registry hive and requires the correct DBTrustedAuthentication value.

About this task

To run the Portal as an NT Account, the IIS Application Pool to which the Portal's Application/Virtual Directory is assigned must be configured to use the wanted NT Account as its identity.

Note: It is recommended that you create an Application Pool specifically for the NT Account identity to isolate the IIS Applications/Virtual Directories that require its functionality.

Complete the following steps:

Procedure

1. Open **Internet Information Services (IIS) Manager**.
2. From the **Start** menu, select **Settings > Control Panel**.
3. Open **Administrative Tools**.
4. Double-click **Internet Information Services (IIS) Manager**.
5. Configure IIS 6:
 - a) Create an Application Pool:
 - 1) Beneath HOSTNAME (local computer), expand the Application Pools node.
 - 2) Right-click the Application Pools node and select **New > Application Pool**.
 - 3) Enter a meaningful name for the Application Pool. For example, you might enter NTAppPool1.
 - 4) All other defaults are acceptable.
 - 5) To save the new Application Pool, click **OK**.
 - b) To configure the new Application Pool to use the wanted NT Account, right-click the newly created Application Pool (NTAppPool1) and select **Properties**.
 - c) Click the **Identity** tab. Select the Configurable button.
 - d) If you know the DOMAIN\username you want to use, enter it in the **user name** field. Otherwise, click **Browse...** and select the appropriate user name.
 - e) After supplying the user name and Password for the new Application Pool, click **OK** to save your changes.
6. Configure IIS 7:
 - a) Create an Application Pool:
 - 1) Beneath HOSTNAME (local computer), expand the Application Pools node.
 - 2) Right-click the Application Pools node and select **Add Application Pool...**
 - 3) Enter a meaningful name for the Application Pool. For example, you might enter NTAppPool1.
 - 4) All other defaults are acceptable.
 - 5) To save the new Application Pool, click **OK**.

- b) To configure the new Application Pool to use the wanted NT Account, right-click the newly created Application Pool (NTAppPool1) and select **Advanced Settings...**
 - c) In the Process Model section, click the textbox and select the newly revealed button on the right of the textbox.
 - d) On the Application Pool Identity dialog, select **Custom account**. Then click **Set...** to enter the NT Account information for the wanted NT Account.
 - e) To save your changes, click **OK** twice.
7. Assign Application Pool: After you configured the new Application Pool, you must assign the Portal to the new Application Pool and associate the correct directory/user group permissions for the specified NT Account.
- a) To open the IBM Tealeaf CX Web Application Installation Utility, click the **Windows Start** menu. Select **Programs > TeaLeaf Technology > TeaLeaf IBM Tealeaf CX Portal > IBM Tealeaf CX Web Application Installation Utility**.
 - For more information about this utility, see "Tealeaf Web Application Installation Utility" in the *IBM Tealeaf CX Installation Manual*.
 - b) In the Virtual Directory section, click the **Application Pool** textbox. Click the newly revealed button to the right of the textbox.
 - c) From the list, select the newly created Application Pool (NTAppPool1).
 - d) To reinstall the Portal IIS Application/Virtual Directory, click **Execute**.
 - e) The Portal is reconfigured to use the newly created Application Pool (NTAppPool1) and assigns the necessary user group and directory permissions.

Related concepts

Tealeaf Web Application Installation Utility

Configuration for Portal API

If you are using the Portal search API, which enables session searches through URL from external clients, the Portal API might be using a different application domain from the Portal application itself. If so, verify that the Portal API domain has the same identities and permissions as the Portal application.

For more information about the Portal API, see "Authentication" in the *IBM Tealeaf cxImpact Administration Manual*.

Upgrading the databases to the current release

This section describes how to upgrade the Tealeaf databases to the latest version of Tealeaf.

Depending on how databases are deployed in your Tealeaf environment, you may choose to upgrade the databases inline with upgrading its host server or after you complete your upgrade of the Report Server.

Note: If you have any questions about the process or the steps that are required to upgrade your Tealeaf solution, contact <http://support.tealeaf.com>.

Note: It is possible to upgrade your Tealeaf software and migrate only your event and alert definitions into a new database. See "Upgrading with Event and Alert Migration Only" in the *IBM Tealeaf CX Upgrade Manual*.

Required upgrade to Release 7.2

Note: Before you upgrade your Tealeaf solution to Release 8.1 or later, you must upgrade to Release 7.2.12.7296 or later. The minimum components that must be upgraded to a supported build are the Report Server and all Tealeaf databases. Tealeaf recommends updating all Tealeaf components and databases to a build supported for Release 8 upgrade at the same time. Direct upgrades from earlier builds and Releases are not supported. See "Preparing to Upgrade to Release 8.x" in the *IBM Tealeaf CX Upgrade Manual*.

Do not upgrade databases inline during upgrade from Release 7.2

This warning applies only if you are upgrading your Tealeaf solution from Release 7.2. If your pre-upgrade system is already running a Release 8.x or later build, this warning does not apply.

If you are upgrading from Release 7.2 to Release 8.x or later, Tealeaf strongly recommends that you perform the database upgrade after you complete the software upgrade. Do not upgrade the database and migrate the report data inline with the software upgrade. You can perform this upgrade and optional report data migration afterward through the Database Manager.

See "Overview of Upgrade Process" in the *IBM Tealeaf CX Upgrade Manual*.

Database compatibility mode

When the databases are upgraded to Release 8.x, you may be required to update the SQL Server Compatibility Mode.

Related concepts

[Upgrading SQL Server for Tealeaf](#)

The IBM Tealeaf CX platform requires Microsoft SQL Server 2008 or later. This section contains instructions for how to manage upgrades and migrations to SQL Server 2008. Except where noted, these instructions also apply to SQL Server 20012 and later versions of the product.

SA permissions required

Upgrading the databases to Release 8.1 or later requires System Administrator permissions, as the process creates new filegroups. You cannot upgrade by using the TLADMIN account. Verify that the account you are using has the appropriate permissions.

Use of dynamic ports

If your SQL Server installation uses dynamic ports, extra configuration is required before you install or upgrade the Tealeaf databases.

Related reference

[Troubleshooting Tealeaf databases](#)

If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

Required temporary space

During the upgrade process, you may choose to migrate event definitions and reporting data. Depending on the options you choose, the Tealeaf Database Manager requires sufficient space to perform the upgrade operations.

- The values in the Required Temp Space column indicate the volume of space that is required on the SQL Server machine as a multiple of the size of the database.
- If you are performing multiple operations, they are additive, meaning that the required temp space factors must be added to see the total required temporary space.

Note: The following are estimates and may not be exact for each Tealeaf solution.

Table 2. Required Temporary Space		
Product	Operations	Required Temp Space
No data migration	Install the event definitions	0x
IBM Tealeaf CX	<ul style="list-style-type: none">• Install the event definitions• Migrate report data - Delete during migration• Migrate report data - Delete after migration	<ul style="list-style-type: none">• 0x• 1.25x• 2x
IBM Tealeaf cxReveal	Migrate search data	1.25x
IBM Tealeaf cxResults	Migrate visitor data	0x

New Databases

This section describes databases and a database management tool introduced in recent releases.

Tealeaf Database Manager

In Release 7.1, the Tealeaf Database Manager was introduced. TDM presents an easy-to-use tool for installing, upgrading, and maintaining databases for IBM Tealeaf CX and IBM Tealeaf cxResults.

IBM Tealeaf cxConnect for Data Analysis may include supporting databases. These databases are installed and maintained separately.

Visitor Database

Release 7 of IBM Tealeaf CX introduced the Visitor database, which captures and maintains a rich repository of information about individual visitors to your website.

Note: The Visitor database is a component of cxResults, a separately licensable component of the Tealeaf CX platform.

cxReveal Search Database

Release 7.2.12.7296 of IBM Tealeaf CX introduced the IBM Tealeaf cxReveal database, which captures session attribute information and enables immediate and rapid access to sessions through database-based search.

Note: The Search database is a component of cxReveal, a separately licensable component of the Tealeaf CX platform.

Related concepts

[cxResults User Manual](#)

Database manager SQL Server access and permission requirements

Some Tealeaf Database Manager functions require specific permissions on the SQL Server instance. This section describes these permissions and the procedures for working around situations where these permissions cannot be granted.

Related reference

[CX databases](#)

This section provides some overview information on each of the IBM Tealeaf CX databases.

[Migrating Tealeaf databases](#)

If you are moving Tealeaf databases to a new instance of SQL Server, complete the following steps to ensure a smooth migration.

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

[Troubleshooting Tealeaf databases](#)

If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

Preparing the Report Server

Before you begin your upgrade, copy the event definitions to the Report Server and verify user permissions.

Preparing the database server

Follow these instructions to prepare the database server.

Before you begin, run or verify that you have a valid and up-to-date backup of the current Tealeaf databases.

Before you upgrade the databases, verify the following:

- If you are upgrading on a remote server, you must create the filegroup paths on the remote SQL Server before you upgrade.
- If you are not logged in as a user with admin privileges on the database, make the following entries or selections in the Authentication box:
 - Manual Authentication
 - User name: <SQL Server login>
 - Password: <password>
- The user that installs the databases must have access to a user account that has permissions to create databases on the remote SQL Server. You must be logged in as a trusted user that has admin privileges, or you must have the user name and password for an authorized SQL Server login.

Note: To upgrade the databases, the database user account must have SA privileges.

Related reference

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Database upgrade steps

Follow the procedures in this section to upgrade your databases.

Disabling the StatsLogger session agent

The database upgrade may hang during the System upgrade step if an active Stats Logger session agent is enabled in the Windows pipeline on the Report Server and is actively writing to the SQL Server database.

Before you begin, consider disabling the Stats Logger session agent on the Report Server.

Related reference

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Creating the cxReveal databases

If you have newly licensed IBM Tealeaf cxReveal or are upgrading from a version of IBM Tealeaf cxReveal that did not include the IBM Tealeaf cxReveal database, you must create the IBM Tealeaf cxReveal database through the Tealeaf Database Manager.

- The IBM Tealeaf cxReveal database was introduced in Release 7.2.12.7296. It requires separate installation and configuration of a dedicated Windows pipeline.
- The IBM Tealeaf cxReveal database requires a separate installation process. See "cxReveal Installation" in the *IBM Tealeaf cxReveal Administration Manual*.

Upgrading the databases

Through the Tealeaf Database Manager, the Tealeaf databases can be upgraded all at one time or individually. For Release 8.x, the databases must be upgraded in a specific order. This order is managed for you in All Databases mode. When you upgrade databases individually, you must complete the upgrade in the order described in this section.

Related tasks

[In Single Database mode](#)

Follow these steps in the order shown to manually upgrade your Tealeaf databases.

Raising the Command Timeout setting

If you are migrating a sizeable set of IBM Tealeaf CX or IBM Tealeaf cxResults data from Release 7.2.12.7296 format to the current schema, raise the Command Timeout setting in the Tealeaf Database Manager.

When you start the Database Manager, the Command Timeout is set to a default value of 600 seconds (10 minutes).

For purposes of data migration, Tealeaf recommends raising this value to at least 1800 seconds (30 minutes).

After you complete the data migration and exit the Tealeaf Database Manager, this value is reset to the default.

Related reference

Using Tealeaf Database Manager

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

In All Databases mode

Use this procedure to upgrade your databases in All Databases mode.

About this task

Note: You should be on the Tealeaf Portal Server.

Procedure

1. Run the following executable:
`<Tealeaf_Install_Directory>\Reporting\TeaLeafDatabaseManager.exe`
2. Enter your connection information. See "Tealeaf Database Manager Reference" in the *IBM Tealeaf Databases Guide*.
3. In the menu, select **Mode > Database Setup > All Databases**.
4. From the Action drop-down, select Upgrade.
5. Click **OK**.

Note: After you begin installation or upgrading in All Database Mode, canceling interrupts the process after the requested action is completed on the current database. The actions on the current database and all previous databases are retained, and any remaining databases are left untouched. You may want to revert to the backup or make adjustments before you complete the action.

6. After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.

Note: After completion of an upgrade, the Tealeaf Database Manager attempts to start the SQL Server services on the host machine, in case they stop at some point. If the Database Manager fails to start them on a remote machine, an error message may be generated. If the services are operational, then this message is harmless; a restart of SQL Server is not required during upgrade.

Related reference

Tealeaf Database Manager reference

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

In Single Database mode

Follow these steps in the order shown to manually upgrade your Tealeaf databases.

About this task

The databases must be upgraded in the following order.

1. The System database must be upgraded first.
2. The Reports database must be upgraded second.

Note: If you install or update the System database, you must install or reinstall the event definitions through the Tealeaf Database Manager at some later point in the installation process. See "Installing Tealeaf Databases" in the *IBM Tealeaf Databases Guide*.

3. The other databases can then be created and updated in any order.

Perform the following steps on the Tealeaf Portal Server.

Procedure

1. Run the following executable: <Tealeaf_Install_Directory>\Reporting\TeaLeafDatabaseManager.exe
2. Enter your connection information. See "Tealeaf Database Manager Reference" in the *IBM Tealeaf Databases Guide*.
3. Upgrade the System database:

Note: The System database must always be created first.

- a) In the menu, select **Mode > Database Setup > Single Database**.
- b) From the Database drop-down, select System.
- c) From the Action drop-down, select Upgrade.
- d) Click **OK**.
- e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.

Note: If you install or update the System database, you must install or reinstall the event definitions through the Tealeaf Database Manager at some later point in the installation process.

- f) Close the output window.
4. Upgrade the Reports database:
 - a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select Reports.
 - c) From the Action drop-down, select Upgrade.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.
 - f) Close the output window.
 5. Upgrade the RS Extractor database:
 - a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select RS Extractor.
 - c) From the Action drop-down, select Upgrade.

- d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.
 - f) Close the output window.
6. Upgrade the Statistics database:
- a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select Statistics.
 - c) From the Action drop-down, select Upgrade.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.
 - f) Close the output window.
7. Upgrade the IBM Tealeaf cxReveal database:
- Note:** The IBM Tealeaf cxReveal database requires special setup.
- a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select Search.
 - c) From the Action drop-down, select Upgrade.
 - d) Click **OK**.
 - e) Close the output window.
8. In single database mode, after you complete the upgrade, you must install the event definitions.

Related concepts

Install the event definitions

After you complete the upgrade of the databases, you must install the event definitions for the current release.

Related reference

Tealeaf Database Manager reference

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Installing Tealeaf databases

This section contains server requirements and sequences of steps for installing Tealeaf databases for this release.

Install the event definitions

After you complete the upgrade of the databases, you must install the event definitions for the current release.

Related reference

Installing Tealeaf databases

This section contains server requirements and sequences of steps for installing Tealeaf databases for this release.

Migrate data

As part of the upgrade, you may optionally choose to migrate your IBM Tealeaf CX, IBM Tealeaf cxReveal Search, and cxVisitor database data to the current schema.

Complete the migration steps in the order shown in this section.

Note: Before you begin, verify that you have sufficient temporary space on the SQL Server machine to complete the operations.

Related concepts

Required temporary space

During the upgrade process, you may choose to migrate event definitions and reporting data. Depending on the options you choose, the Tealeaf Database Manager requires sufficient space to perform the upgrade operations.

Migrating Report data

This step migrates your IBM Tealeaf CX report database (TL_REPORTS) to the schema for the current release.

About this task

Note: Depending on the size of your database, this step may take multiple hours. Tealeaf recommends scheduling this step during off-peak hours.

Procedure

1. Log in to the Report Server as an administrator.
2. Navigate to the following directory:

```
<Tealeaf_install_directory>\Reporting
```

3. Launch `TealeafDatabaseManager.exe`.
4. Enter login information.
5. From the menu, select **Mode > Database Management > Migrate Report Data**.
6. Click the Migrate Report Data check box.
7. If you are constrained for disk space, you may choose to remove the data during the migration process by selecting the Delete during migration check box.

Note: Before you select this option, verify that you completed a valid backup of your Release 7.2 IBM Tealeaf CX databases. Otherwise, any errors that occur during data migration are not recoverable.

8. Optionally, you may choose to migrate dimension data for enumerated events. When this option is selected, value lists from Release 7.2 enumerated events are converted to dimensions for use in the current release.
9. Click **OK**.
10. The database data is migrated to the new schema.

Related reference

Tealeaf Database Manager reference

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Migrate Search data

This step migrates your IBM Tealeaf cxReveal Search database (TL_SEARCH) to the schema for the current release.

About this task

- This step migrates only the current day's table formats to the new format. Migration of historical data from previous days is performed by the Attribute Indexing session agent upon initial startup of the IBM Tealeaf cxReveal capture pipeline.

Note: This option is necessary only if you licensed IBM Tealeaf cxReveal and licensed and installed the IBM Tealeaf cxReveal Search database. This database is available in Release 7.2.12.7296 or later.

Procedure

1. Log in to the Report Server as an administrator.
2. Navigate to the following directory:

```
<Tealeaf_install_directory>\Reporting
```

3. Launch `TealeafDatabaseManager.exe`.
4. Enter login information.
5. From the menu, select **Mode > Database Management > Migrate Search Data**.
6. To migrate Search data, click **OK**.
7. The database data is migrated to the new schema.

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Migrating Visitor data

This step migrates your IBM Tealeaf cxResults Visitor databases (TL_VISREPORT and TL_VISSTAGE) to the schema for the current release.

About this task

Note: Reference dimensional data is not migrated. The use of reference dimensions in IBM Tealeaf cxResults is not supported in the current release.

Note: This option is only necessary if you licensed IBM Tealeaf cxResults. This database is available in Release 7.0 or later.

Note: Depending on the size of your database, this step may take multiple hours. Tealeaf recommends scheduling this step during off-peak hours.

Procedure

1. Log in to the Report Server as an administrator.
2. Navigate to the following directory:

```
<Tealeaf_install_directory>\Reporting
```

3. Launch `TealeafDatabaseManager.exe`.
4. Enter login information.
5. From the menu, select **Mode > Database Management > Migrate Visitor Data**.
6. To migrate Visitor data, click **OK**.
7. The database data is migrated to the new schema.

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Other common database scenarios

Depending on the location of the SQL Server installation and available account permissions, your upgrade path may vary from the scenarios.

Upgrading Tealeaf databases on SQL Server when your account is restricted to Windows-only authentication

Note: The following procedure is only required if the SQL Server installation allows Windows authentication and does not allow SQL Server authentication.

To upgrade the Tealeaf databases in an AD-environment, perform the following procedure:

1. On the Reporting Server, modify the settings for **AdminUserName** and **UserName** in the registry key at HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\TeaLeaf Technology\DataStore\ReportServer to "TLADMIN" and "TLUSER".

2. Upgrade the database:

Run the Tealeaf Database Manager as an Active Directory (AD) user with sysadmin privileges.

3. Generate the SQL permissions script as a text file:

In Tealeaf Database Manager, select **Mode > User Management > Permissions Scripts** from the menu bar and generate the SQL permissions.

Edit the resulting text file by changing "TLADMIN" and "TLUSER" to the corresponding AD user name, delimited with square brackets. For example:

```
[domain\user]
```

or

```
[user@domain.subdomain.tld]
```

4. Run the modified SQL permissions script as a user with sysadmin privileges.
5. Reset the AdminUserName and UserName values from step 1 to the AD user names.

Related reference

[Installing Tealeaf databases](#)

This section contains server requirements and sequences of steps for installing Tealeaf databases for this release.

Troubleshooting

Topics in this section describe steps you can take to resolve common problems you might encounter when upgrading your database.

Upgrading when a database originating from a release before 7.2 fails with a collation conflict

Use this procedure when you encounter a collation conflict during an upgrade of a Tealeaf database that was originally installed in a release before 7.2.

About this task

You see an error similar to the following:

```
Cannot resolve the collation conflict between "SQL_Latin1_General_CP1_CI_AS"
and "Latin1_General_CI_AS" in the equal to operation.
At statement: CREATE VIEW [dbo].[V_PERFORMANCE_COUNTERS] AS
SELECT
dmv_cntr.[object_name] AS [OBJECT_NAME],
dmv_cntr.counter_name AS COUNTER_NAME,
dmv_cntr.instance_name AS INSTANCE_NAME,
```

```
dmv_cnttr.cnttr_type AS CNTR_TYPE,
CASE dmv_cnttr.cnttr_type
...
```

The issue is caused by a hard coded collation setting in an earlier release. This setting may be in conflict with the default collation for the SQL Server you are upgrading.

Note: This issue may persist even after you upgrade from Release 7.2.

The fix is to remove a single statement from the XML file that is used to create the V_PERFORMANCE_COUNTERS view before you upgrade the database individually.

Procedure

1. Identify the Statement ID that failed in the Database Manager log.
2. On the Reporting Server, open the following directory. The Reporting Server is typically co-hosted with the Portal server:

```
<Tealeaf_install_directory>\Reporting\DatabaseSchema\
```

3. Depending on the database you are trying to upgrade, open the corresponding XML file:

Database Name

File name

TL_SYSTEM

SystemDb.xml

TL_REPORTS

ReportsDb.xml

TL_STATISTICS

StatisticsDb.xml

TL_SEARCH

SearchDb.xml

TL_VISREPORT

VisitorReportDb.xml

TL_VISSTAGE

VisitorStageDb.xml

4. Find the XML <statement> block with the ID that failed. It should contain a statement similar to the following:

```
CREATE VIEW [dbo].[V_PERFORMANCE_COUNTERS]
```

5. Remove all content between the two <statement> tags that contain the string and the statement tags themselves.

For example:

```
<statement id="252">CREATE VIEW [dbo].[V_PERFORMANCE_COUNTERS]
...
</statement>
```

6. Save the file.
7. Repeat the steps for any other databases that you are trying to upgrade.
8. Run the Tealeaf Database Manager to upgrade the database or databases individually.

Related reference

Using Tealeaf Database Manager

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database

installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Upgrading when the database server times out during upgrade of rs_activity_log table

Use this procedure when you encounter a timeout error during a database upgrade.

About this task

During the upgrade of the rs_activity_log table in the TL_SYSTEM database, you may receive a timeout error similar to the following:

```
4/8/2010 9:04:40 AM    TL_SYSTEM    ERROR    There was an error executing
the command list.
Timeout expired. The timeout period elapsed prior to completion of
the operation or the server is not responding.
At statement: --Move all the 'DocumentsFound' attribute values into the
new REPORT_VALUE column to make them reportable/chartable in the Portal
```

This database table contains the user activity logs from the Portal. In pre-Release 7.2 versions, there was a known issue in which this database table was not properly trimmed. As a result, the table can grow large. Depending on the size of the SQL Server timeout setting, the timeout may occur during the upgrading of this table.

You may want to review the rs_activity_log table to identify if the data should be preserved or not.

To fix this issue:

Procedure

1. Back up the contents of the rs_activity_log, if you want to preserve it for auditing purposes.
2. You can do either of the following:
 - a) Increase the SQL Server timeout setting for the Tealeaf databases.
 - b) Clear the rs_activity_log database.

Related tasks

Increasing the SQL Server timeout

Complete the following steps to increase the SQL Server timeout setting that is used by Tealeaf and complete the upgrade.

Clearing the rs_activity_log table

To clear the contents of the rs_activity_log table and complete the upgrade, complete the following steps.

Increasing the SQL Server timeout

Complete the following steps to increase the SQL Server timeout setting that is used by Tealeaf and complete the upgrade.

Procedure

1. Log in to the Tealeaf Portal as an administrator.
2. From the **Portal** menu, select **Tealeaf > TMS**.
3. The Tealeaf Management System is displayed. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.
4. In Server view, click the **Tealeaf** node.
5. Select **Shared configuration information**.
6. In the Config Actions pane, click **View/Edit**.
7. The Tealeaf Report Configuration dialog is displayed. Click the **Database** tab.
8. Click Connection Timeout.

- By default, this value is set to 600 (seconds), which is 10 minutes.
9. Enter a higher value and click **Apply**.
 10. Click **Save**.
 11. In the Update Servers dialog, select **Add Tasks and Submit**.
 12. After the job runs, all Tealeaf servers in your environment are updated with the new database connection timeout setting.
 - See "TMS Jobs Tab" in the *IBM Tealeaf cxImpact Administration Manual*.
 - For more information about the database connection timeout, see "Shared configuration information" in the *IBM Tealeaf cxImpact Administration Manual*.
 13. Upgrade the TL_SYSTEM database in Individual Database mode through the Tealeaf Database Manager.

Related reference

Using Tealeaf Database Manager

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Clearing the rs_activity_log table

To clear the contents of the rs_activity_log table and complete the upgrade, complete the following steps.

Procedure

1. Log in to SQL Management Studio.
2. To clear the table, run the following SQL:

Note: This statement removes the contents of the rs_activity_log table. Verify that you have a backup.

```
use tl_system;
TRUNCATE TABLE RS_ACTIVITY_LOG;
```

3. Upgrade the TL_SYSTEM database in Individual Database mode through the Tealeaf Database Manager.

Related reference

Using Tealeaf Database Manager

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Migrating Tealeaf databases

If you are moving Tealeaf databases to a new instance of SQL Server, complete the following steps to ensure a smooth migration.

Migration steps

This is an overview of the steps required to move Tealeaf databases to a new instance of SQL Server.

Procedure

1. [“Prerequisites” on page 37](#)
2. [“Backing up the existing databases” on page 37](#)
3. [“Creating TL user accounts” on page 38](#)

4. [“Restoring backups to the new server” on page 39](#)
5. [“Repairing users” on page 40](#)
6. [“Upgrading databases” on page 40](#)

Prerequisites

Ensure that these prerequisites are met before migrating your databases.

About this task

Note: Run or verify a current backup of the IBM Tealeaf databases before completing this operation.

Procedure

1. If you are migrating your Tealeaf databases from version 7.2 to versions 8.7 through 8.8, run the following SQL commands from SQL Management Studio to prepare the `tl_reports` table for migration.

```
use tl_reports
go
declare @status int
declare @message nvarchar(4000)
declare @date datetime
set @date = getdate()
exec pr_LoadCalendar @date, @status output, @message output
exec pr_LoadCalendarHour @date
```

2. Stop all services that make use of the Tealeaf databases, except for the Portal services.
3. Before beginning the migration, Tealeaf services must be made aware of the change in SQL Server instances through the Tealeaf Management System.
 - Only the settings that apply to your specific Tealeaf solution must be updated. For example, if you were not licensed IBM Tealeaf cxResults, you do not need to update the Visitor Server or Visitor Database Port settings.
 - For more information about TMS, see "Configuring the Report Server" in the *IBM Tealeaf CX Configuration Manual*.
4. Using TMS, navigate to the Shared configuration information node and update the following settings to reflect the new SQL Server environment:
 - Database Host Name
 - Report Database Port
 - Visitor Server
 - Visitor Database Port
5. Stop the Portal services.

Related tasks

[Backing up the existing databases](#)

For each Tealeaf database, follow these steps in SQL Server Management Studio, which must be connected to the original SQL Server instance.

Backing up the existing databases

For each Tealeaf database, follow these steps in SQL Server Management Studio, which must be connected to the original SQL Server instance.

About this task

Note: For this task, do not use the backup features in Tealeaf Database Manager, which enable scheduled backups that include database trimming. To run a full on-demand backup of Tealeaf databases, use SQL Server Management Studio.

Procedure

1. Right-click the database name in Object Explorer.
2. Select **Tasks > Back Up....**
3. Under Source:
 - **Database:** <Database to be backed up>
 - **Backup type:** Full
 - **Backup component:** Database
4. Under Backup set:
 - **Name:** <Preferred backup name>
 - **Description:** (Optional)
 - **Backup set will expire:** After 0 days
5. Under Destination, remove any existing listed sets.

Note: This step does not delete the set. It just removes it from the list.
6. Add a new set in a known location and with a known name. Add the .bak file type extension. For example:

```
C:\tl_reports.bak
```

7. Under Select a page, select **Options**.
8. Select **Back up to the existing media set**.
9. Select **Overwrite all existing backup sets**.
10. Click **OK**.

Results

The backup may take a while, depending on the size of the database.

Creating TL user accounts

Before you migrate the data to the databases, you must verify that the TLUSER and TLADMIN accounts were created for use with the new database. Complete the following steps to verify and, if necessary, create the accounts in the new instances of SQL Server.

About this task

Note: To perform these steps, the database account that you use must have admin privileges.

Procedure

1. Log in to the Report Server.
2. Navigate to the following directory:

```
<Tealeaf_install_directory>\Reporting
```

3. Start Tealeaf Database Manager:

```
TealeafDatabaseManager.exe
```

4. Enter the connection information for the new database.
 - a) **Authentication:** You must use Windows Authentication or SQL Server Authentication to verify the database account.
 - b) **User name and Password:** Enter the credentials for the administrator account that is used to connect to the new SQL Server instance.

- c) **Reports Host:** Enter the host server of the SQL Server instance hosting the new TL_REPORTS database.
 - d) **Port:** Enter the port to use to connect. By default, this value is 1433.
 - e) **Visitor Host:** Enter the host server of the SQL Server instance hosting the new Visitors databases.
Note: This step is only necessary if you have licensed and installed IBM Tealeaf cxResults.
 - f) **Port:** Enter the port to use to connect. By default, this value is 1433.
5. The Tealeaf Database Manager is opened.
- a) Create an user:
 - 1) From the **TDM** menu, select **User Management > Create User**.
 - 2) Enter the credentials for the TLUSER account.
 - 3) Click **OK**.

The user account is created.

Note: If you receive an error message indicating that the account exists, then the account is properly configured, and you may continue with these steps.
6. Repeat the above steps to verify and, if necessary, create the TLADMIN account.

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Restoring backups to the new server

For each Tealeaf database, follow these steps in SQL Server Management Studio, which must be connected to the new SQL Server instance.

Procedure

1. Right-click the Databases folder in Object Explorer.
2. Select **Restore Database....**
3. Under Source for restore:
 - Select **From device**.
 - Select the ... button to the right of the From device box.
 - Select **Add**.
 - Select the backup file for the current database. In the above example, it is C:\tl_reports.bak. Click **OK**.
 - Click **OK** to return to the **Restore Database** window.
4. Under Select the backup sets to restore, select the **Restore** check box to the left of the newly added backup.
5. Under Destination for restore:
 - From the To database drop-down, select the name of the current database.
6. Under Select a page, select **Options**.
7. Select the check box next to Overwrite the existing database.
8. Under Restore the database files as, update the filegroups to reflect your filegroup paths.
9. Select **Leave the database ready to use by rolling back uncommitted transactions**.
10. Click **OK**.

Repairing users

After restoring the database, SQL Server logins must be updated for the Tealeaf databases.

About this task

The local definitions for user accounts must be updated to point to the new server hosting the Tealeaf databases. You can repair these user accounts through the Tealeaf Database Manager.

- This command can be run multiple times without issues.

Complete the following steps.

Procedure

1. On the Report Server, navigate to the following directory.

```
<Tealeaf_install_directory>\Reporting
```

2. Launch `TealeafDatabaseManager.exe`.
3. Connect to the databases.
4. The Tealeaf Database Manager is displayed.
5. From the Tealeaf Database Manager menu, select **Mode > User Management > Repair Users**.
6. To repair the TLADMIN and TLUSER accounts used to access each of your Tealeaf databases, click **OK**.

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Upgrading databases

Typically, database migrations are done during an upgrade. If you are not upgrading Tealeaf, you may omit this step.

Using Tealeaf Database Manager

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

- Tealeaf Database Manager uses a statement ID-based method for managing updates and revisions to the Tealeaf databases. The most recent statement that runs for each database is displayed in the General Info window.

Note: Tealeaf Database Manager is used to install the SQL Reporting and IBM Tealeaf cxResults databases. It cannot be used to install or update the Canister databases, which are installed as part of the Processing Server through `Setup.exe` in the initial installation.

Related concepts

[CX Installation and Setup](#)

Related tasks

[Configuring the CX Canister](#)

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Troubleshooting Tealeaf databases

If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

Generating the SQL permissions script

Before you begin, you may want to review the set of permissions that the Tealeaf Database Manager grants during the installation process.

About this task

Note: Installing using the SQL permissions scripts may require more configuration. Before you begin, review the requirements.

Procedure

1. Run the following program from the **Windows Start** menu:

```
Start > All Programs > TeaLeaf Technology >
Tealeaf CX Report Server > CX Report Database Manager
```

2. From the **Tealeaf Database Manager** menu, select **Mode > Database Users > Permissions Scripts**.
3. You may enter a path to which the script is to be written or leave the default path:
<Tealeaf_Install_Directory>\Reporting\Permissions
4. Click **OK**.
5. Wait for the operation to complete. When it is done, the following output message is displayed:

```
The operation was successful.
```

SQL Server Database Installation

This section describes how to install the SQL database.

Create the SQL databases

Before You Begin

- A data directory must be created on the remote SQL Server for the database files. See [“Adding database files”](#) on page 51.
- You must have access to a user account that has permissions to create databases on the remote SQL Server. You must either login as a trusted user that has admin privileges or have the Username and Password for an authorized SQL Server login with admin privileges.

Creating the databases using All Database mode

Use this procedure to install your databases in All Databases mode.

About this task

Note: You should be on the Tealeaf Portal Server.

Procedure

1. Run the following program from the Windows Start menu:

```
Start > All Programs > TeaLeaf Technology >  
Tealeaf CX Report Server > CX Report Database Manager
```

2. Enter your connection information.
3. In the menu, select **Mode > Database Setup > All Databases**.
4. From the Action drop-down, select Install.
5. Select other options as needed.
6. Click **OK**.

Note: After you have begun installation or upgrading in All Database Mode, canceling interrupts the process after the requested action has been completed on the current database. The actions on the current database and all previous databases are retained, and any remaining databases are left untouched. You may wish to revert to the backup or make adjustments before completing the action.

7. After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.
8. After you have created the databases, you must initialize them.

Related reference

[Installing Tealeaf databases](#)

This section contains server requirements and sequences of steps for installing Tealeaf databases for this release.

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Creating the Databases using Single Database mode

Use this procedure to install your databases in Single Database mode.

About this task

This section outlines the steps to install the Tealeaf databases. Tealeaf databases must be installed in the following order:

- The System database must be created first.
- The Reports database must be created second.
- The System database must be updated.

Note: If you install or update the System database, you must install or re-install the event definitions through the Tealeaf Database Manager at some later point in the install process.

- The other databases can then be created and updated in any order.

Note: You should be on the Tealeaf Portal Server.

Procedure

1. Run the following program from the Windows Start menu:

```
Start > All Programs > TeaLeaf Technology >  
Tealeaf CX Report Server > CX Report Database Manager
```

2. Enter your connection information.
3. Install the System database:

Note: The System database must always be created first.

- a) In the menu, select **Mode > Database Setup > Single Database**.

- b) From the Database drop-down, select System.
 - c) From the Action drop-down, select Create.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.
 - Note:** If you install or update the System database, you must install or re-install the event definitions through the Tealeaf Database Manager at some later point in the install process.
 - f) Close the output window.
4. Install the Reports database:
- a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select Reports.
 - c) From the Action drop-down, select Create.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.
 - f) Close the output window.
5. Configure the System database:
- a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select System.
 - c) From the Action drop-down, select Upgrade.
 - d) For the Command File, navigate to <Tealeaf_Install_Directory>\Reporting\DatabaseSchema\SystemDBConfig.xml.
 - e) Click **OK**.
 - f) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.
 - g) Close the output window.
6. Initialize the database:
- a) In the menu, select **Mode > Data Management > Initialize Configuration**.
 - b) Click **OK**.
 - c) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.
 - d) Close the output window.
7. Install the RS Extractor database:
- a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select RS Extractor.
 - c) From the Action drop-down, select Create.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.

- f) Close the output window.
- 8. Install the Statistics database:
 - a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select Statistics.
 - c) From the Action drop-down, select Create.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.
 - f) Close the output window.
- 9. Install the IBM Tealeaf cxReveal database:
 - a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select Search.
 - c) From the Action drop-down, select Create.
 - d) Click **OK**.
 - e) Close the output window.
- 10. After you have created the System database or installed all databases one at a time, you must initialize them.

Backup requirement for upgrading the SQL Server database

Run or verify a current backup of the Tealeaf databases before completing this operation.

Upgrade the SQL databases

Before you upgrade your Tealeaf databases to Release 8.1 or later, you must upgrade them to the latest build of Release 7.2. Direct upgrades from earlier builds and Releases are not supported.

Note: See "Preparing to Upgrade to Release 8.x" in the *IBM Tealeaf CX Upgrade Manual*.

Prerequisites

You must have access to a user account that has permissions to create databases on the remote SQL Server. You must either log in as a trusted user that has admin privileges or have the user name and password for an authorized SQL Server login with admin privileges.

Note: To upgrade the databases, the database user must have SA privileges.

Upgrading the databases using All Database mode

Before you upgrade your Tealeaf databases to Release 8.1 or later, you must upgrade them to the latest build of Release 7.2. Direct upgrades from earlier builds and Releases are not supported.

About this task

Note: You should be on the Tealeaf Portal Server.

Note: After you have begun installation or upgrading in All Database Mode, canceling interrupts the process after the requested action was completed on the current database. The actions on the current database and all previous databases are retained, and any remaining databases are left untouched. You may want to revert to the backup or make adjustments before completing the action.

Procedure

1. Run the following program from the **Windows Start** menu:


```
Start > All Programs > TeaLeaf Technology >  
Tealeaf CX Report Server > CX Report Database Manager
```

2. Enter your connection information.
 3. In the menu, select **Mode > Database Setup > All Databases**.
 4. From the Action drop-down, select Upgrade.
 - Select the appropriate options.
- Note:** The Data Management options apply only to Release 7.2 to Release 8.1 or later upgrades. If the current version of your databases is Release 8100 or later, these settings have no effect and can be ignored.
5. Click **OK**.
 - a) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.
 - b) Close the output window.

Related concepts

[Preparing to Upgrade to the Current Release](#)

Upgrading the databases using Single Database mode

Before you upgrade your Tealeaf databases to Release 8.1 or later, you must upgrade them to the latest build of Release 7.2. Direct upgrades from earlier builds and Releases are not supported.

Prerequisites

Note: You should be on the Tealeaf Portal Server.

Related concepts

[Preparing to Upgrade to the Current Release](#)

Upgrade steps

Use the following procedure to upgrade your database using Single Database mode.

Procedure

1. Run the following program from the **Windows Start** menu:

```
Start > All Programs > TeaLeaf Technology >  
Tealeaf CX Report Server > CX Report Database Manager
```

2. Enter your connection information.
 3. Install the System database:
 - a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select System.
 - c) From the Action drop-down, select Upgrade.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.
- Note:** If you install or update the System database, you must install or reinstall the event definitions through the Tealeaf Database Manager at some later point in the installation process.
- f) Close the output window.
4. Install the Reports database:
 - a) In the menu, select **Mode > Database Setup > Single Database**.

- b) From the Database drop-down, select Reports.
 - c) From the Action drop-down, select Upgrade.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully run.
 - f) Close the output window.
5. Install the RS Extractor database:
- a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select RS Extractor.
 - c) From the Action drop-down, select Upgrade.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.
 - f) Close the output window.
6. Install the Statistics database:
- a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select Statistics.
 - c) From the Action drop-down, select Upgrade.
 - d) Click **OK**.
 - e) After the operation completes, review the output window.
 - Be sure to review the Failed Statements pane to verify that all statements were successfully executed.
 - f) Close the output window.
7. Install the IBM Tealeaf cxReveal database:
- a) In the menu, select **Mode > Database Setup > Single Database**.
 - b) From the Database drop-down, select Search.
 - c) From the Action drop-down, select Upgrade.
 - d) Click **OK**.
 - e) Close the output window.

Post-upgrade steps

After you upgrade all databases, you may need to perform additional steps to initialize the databases and migrate any existing data from your pre-upgrade system.

Related reference

Upgrading the databases to the current release

This section describes how to upgrade the Tealeaf databases to the latest version of Tealeaf.

Generate SQL scripts to upgrade the databases

Using this method to upgrade Tealeaf databases is not supported in this release.

For more information, contact Tealeaf <http://support.tealeaf.com>.

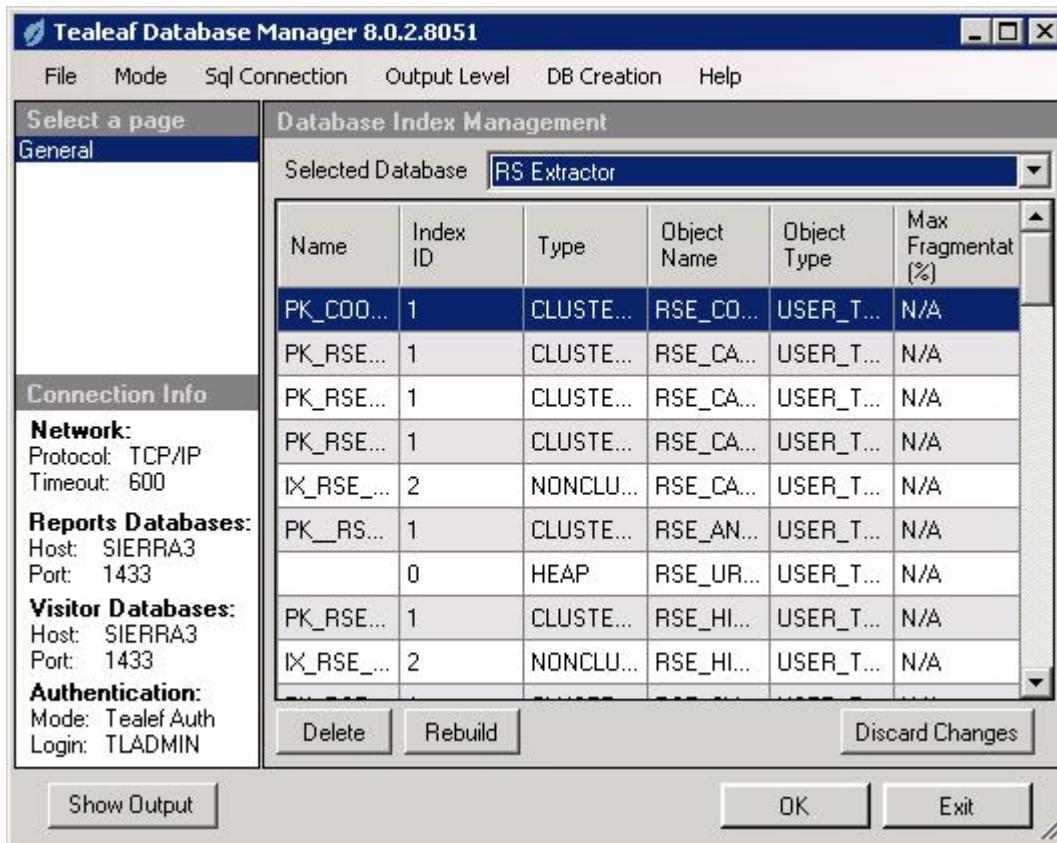
Managing database indexes

Through Tealeaf Database Manager, you can delete and rebuild the indexes on any Tealeaf database.

About this task

- To manage your Tealeaf database indexes, select **Mode > Index Management** from the menu.

The Index Management view enables you to queue up indexing tasks and then run them as needed.

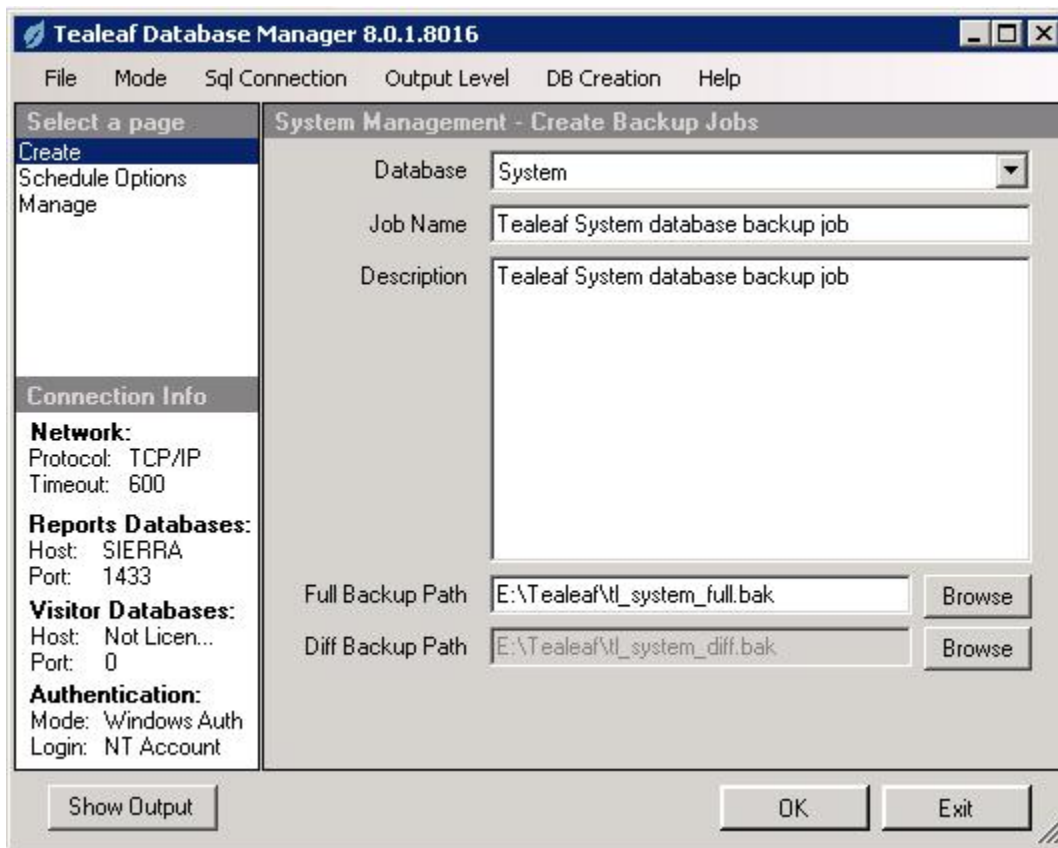


Procedure

- From the Selected Database drop-down, select the database containing the index you want to delete.
- Select the index in the window.
- Tasks:
 - To delete the index, click **Delete**.
 - To rebuild the index, click **Rebuild**.
- The task is highlighted in the window.
 - To run the queued tasks, click **OK**.
 - To clear the queue, click **Discard Changes**.

Backing up Tealeaf databases

You can use Tealeaf Database Manager to perform incremental and full backups of individual databases, which are useful for creating backups before you perform other TDM database operations.



Backup Prerequisites

Tealeaf Database Manager can be used to schedule incremental backups of Tealeaf databases. To run a full, on demand of all Tealeaf databases, you should use SQL Server Management Studio.

-
- Backups from the Tealeaf Database Manager require the SQL Server Agent service to be enabled. Verify that this service was enabled through the Services Control Panel.
- Backups that are created from Tealeaf Database Manager run at midnight according to the local system clock. They use the user account that was used to create the backup job. If a .bak does not yet exist for the backup job, it is created on first execution.

Creating a backup job

Use this procedure to create a backup job in Database Manager.

Procedure

1. To back up a database, select **Mode > Job Management > Backup Jobs**.
2. The **Create Backup Job** window is displayed.
3. From the Database drop-down, select the database to back up.
4. Provide a Job Name and meaningful Description.
5. Navigate to locations where Full and Diff (incremental) backups can be stored.

Note: These directories must be absolute directories local to SQL Server. You cannot use network paths for these locations.

6. To run the specified backup, click **OK**.

7. Review the output window for any errors. Depending on the size of the database, the backup may take several minutes.

Results

You can also review the history of backup jobs, including the individual steps within the backup. To review database backup history, select **Mode > Job Management > Backup Job History**.

Backing up Tealeaf

Tealeaf provides multiple mechanisms for backing up your Tealeaf system and your captured data.

Backup Type	Description
-------------	-------------

Event Model data	Through the Portal Management page, you can run scheduled and on-demand backups of event model data.
-------------------------	---

Database data	Using the Tealeaf Database Manager or SQL Server Management Studio, you can perform full backups of all Tealeaf databases.
----------------------	--

Canister data	Tealeaf provides a pair of utilities for backing up session and index data that is stored on Tealeaf Canisters.
----------------------	---

scorecards/dashboards/reports	Through the Portal, you can import and export templates for scorecards, dashboards, and reports.
--------------------------------------	--

Database user management

You can edit user accounts and change passwords for the Tealeaf databases through the Tealeaf Database Manager.

Related tasks

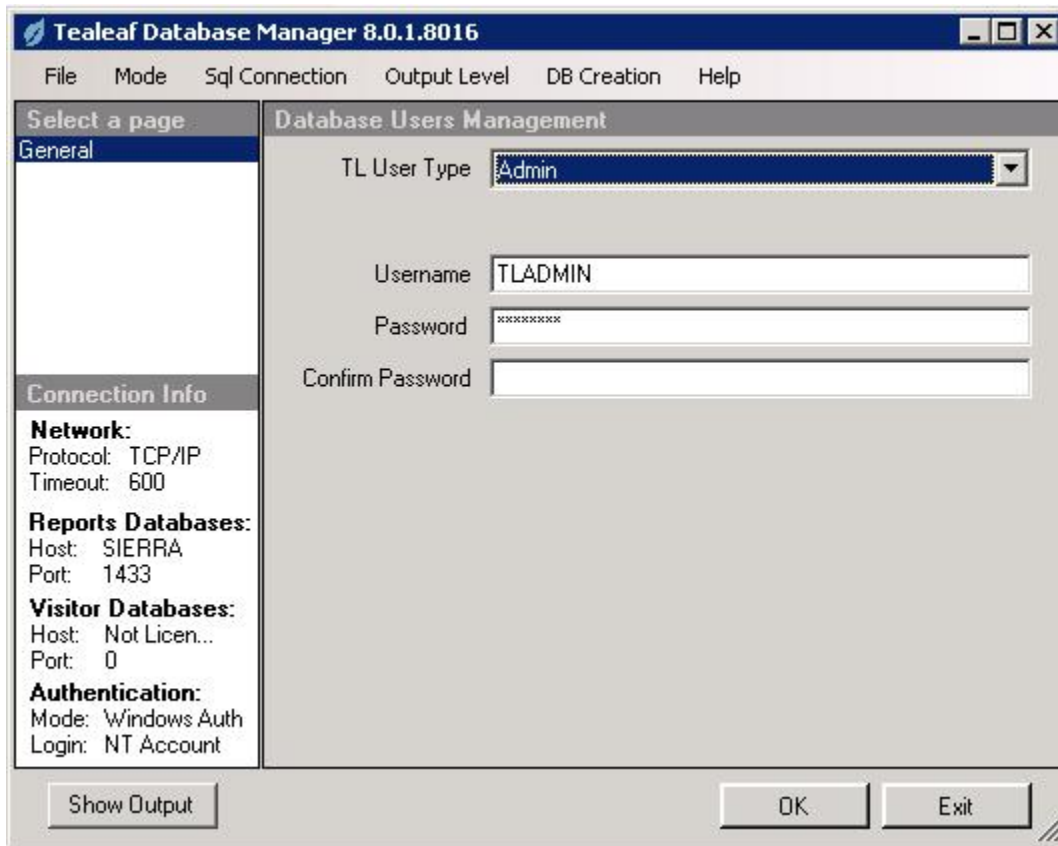
[Generating the SQL permissions script](#)

Before you begin, you may want to review the set of permissions that the Tealeaf Database Manager grants during the installation process.

Managing database users

Tealeaf requires one user account from each of two database user classes: Admin and User. Through TDM, you can change the user ID and password of these accounts.

About this task



Procedure

1. To manage users, select **Mode > Database Users**.
2. To change a user account or password, select the type of user from the TL User Type drop-down.
3. If a user account for that type was already created, the fields are populated for you.
4. To change the user name, enter a new value in the user name textbox.
5. To change the password on the selected account, enter the new password twice.
6. To save changes, click **OK**.
7. No reboot of SQL Server is required.
8. To apply these changes, any Tealeaf service that connects to the database, such as Reporting Service, Data Collector, and RSE Service must be restarted. These restarts can be managed through TMS. See "Tealeaf Management System" in the *IBM Tealeaf cxImpact Administration Manual*.

Changing user permissions

You can change some permissions for each type of user through Tealeaf Database Manager.

About this task

To change permissions:

Procedure

1. In the menu, select **Mode > Database Users > User Permissions**.
2. From the TL User Type drop-down, select the type of user account to edit.
3. The current permissions are updated in the check boxes.
4. Make changes as needed.
5. To save changes, click **OK**.

Related reference

[Tealeaf Database Manager reference](#)

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Adding database files

If necessary, you can use the Tealeaf Database Manager to create an empty database file and a new filegroup to contain it.

About this task

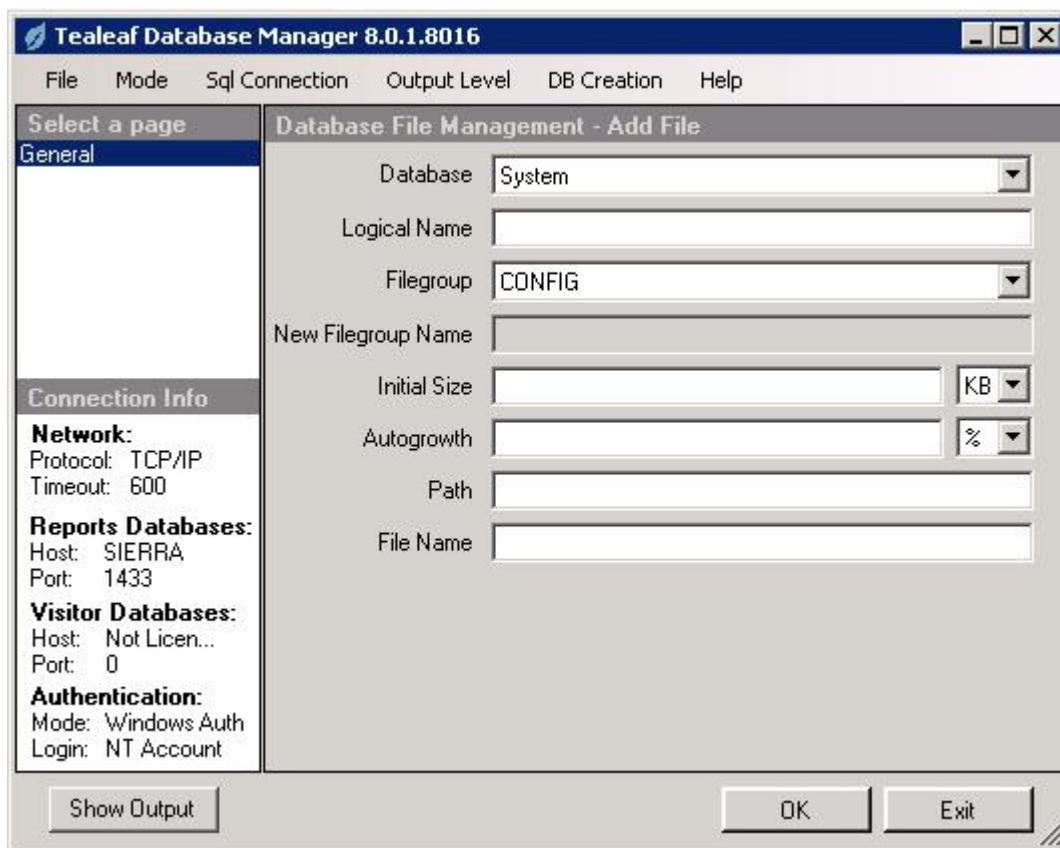
Note: After creating the database file, you must integrate it with the database through SQL Server Management Studio. For more information, consult your SQL Server Management Studio product documentation.

You can add new files to any database filegroup.

To add a file

Procedure

1. In the Tealeaf Database Manager, select **Mode > Filegroup Management > Add File**.



2. From the Database drop-down, select the database to which you want to add a file.
3. Enter a Logical Name that is unique among the logical names in the filegroup.
4. Select the Filegroup to which to add the file.
 - To add a filegroup, select <New Filegroup> from the Filegroup drop-down. In the New Filegroup Name, enter the name for the new filegroup. The created file is added to this filegroup.
5. Enter a beginning size for the file and choose the size units.

6. You can configure the file to automatically grow over time to accommodate more data. In the Autogrowth textbox, enter a value by which to auto-grow the database. Select the units: KB, MB, GB, or % (percentage of original size).
7. Provide a full Path and file name from the file to create.
 - To locate where the other files for the database are located, select **Mode > Info/Config > Database Information**.
8. To add the file, click **OK**.

Tealeaf Database Manager reference

In most cases, the Tealeaf databases are installed and configured automatically by the IBM Tealeaf CX installer. However, it may be useful to rebuild or set up the databases manually. The Tealeaf Database Manager provides a comprehensive interface for these actions.

Note: Tealeaf Database Manager is used to install the SQL Reporting and IBM Tealeaf cxResults databases. It cannot be used to install or update the Canister databases, which are installed as part of the Processing Server through Setup . exe in the initial installation. For more information about those databases, see "CX Installation and Setup" in the *IBM Tealeaf CX Installation Manual*.

- For more information about configuring the Canister databases, see "Configuring the CX Canister" in the *IBM Tealeaf CX Configuration Manual*.

Note: Use of UNC paths in the Tealeaf Database Manager is not supported.

Connecting

If your SQL Server installation uses dynamic ports, extra configuration is required before installing or upgrading the Tealeaf databases.

Procedure

1. Run the CX Report Database Manager by clicking **Start > All Programs > TeaLeaf Technology > Tealeaf CX Report Server > CX Report Database Manager**.

When Tealeaf Database Manager is started, the **Connect to Tealeaf Databases** window is displayed.

2. If you want to connect to the IBM Tealeaf database, verify the connection information and the authentication mode; then, click **Connect**.

Tealeaf Database Manager attempts to connect to the databases and gather general information about the databases.

- a) In the Authentication dropdown you can select the type of user authentication to connect to the database.

Option

Description

Windows Authentication

Select this option if the Windows account running the Tealeaf Database Manager has administrator (sa) access to Microsoft SQL Server.

Tealeaf Authentication

Select this option to run using the built-in Tealeaf SQL account.

Note: After running the Database Manager to upgrade or install databases under Tealeaf Authentication, you must generate and run a permissions script that enables the appropriate permissions for the TLADMIN account. This script must be run as a SQL Server admin user.

Note: The Tealeaf SQL account only has access to the Tealeaf objects within SQL server and cannot create new objects.

SQL Server Authentication

Select this option to enter an SQL Server user name and password with administrator (sa) access to SQL Server.

Local Access

Select this option to gain access to actions that do not require access to SQL Server.

- b) In the Network Protocol dropdown, you can select the connection type.

Note: The Network Protocol setting you specify here must match the setting that is configured in SQL Server Management Studio. For more information, see the documentation that came with that product.

Connecting options:

- TCP/IP
- Named Pipes

Note: Shared Memory protocol is not supported by Tealeaf Database Manager.

- c) If needed, you can change the default command timeout. Values are in seconds.

- d) In the Reports Host field, enter the host name of the server hosting the reports databases (Reports, System, RS Extractor, Statistics). Tealeaf Database Manager attempts to auto-populate this field.

Note: Depending on your license and the local database environment, a Product Registry Entry(s) Missing message may appear in the Host and Port fields for the corresponding database(s).

- e) In the Port field, enter the port SQL Server is configured to use. Tealeaf Database Manager attempts to auto-populate this field.

Note: If you are not using the standard Tealeaf databases port (1433), this value must be also populated in the Report configuration.

- f) In the Visitor Host field, enter the host name of the server hosting the visitor databases (Visitor Report and Visitor Staging), if IBM Tealeaf cxResults is licensed. Tealeaf Database Manager attempts to auto-populate this field.

- If IBM Tealeaf cxResults is not licensed, leave this field blank.

- g) In the Port field, enter the port SQL Server is configured to use for the IBM Tealeaf cxResults database. Tealeaf Database Manager attempts to auto-populate this field.

Note: If you are not using the standard Tealeaf databases port (1433), this value must be also populated in the Report configuration.

- If IBM Tealeaf cxResults is not licensed, leave this field blank.

- h) In the Search Host field, enter the host name of the server hosting the IBM Tealeaf cxReveal database, if IBM Tealeaf cxReveal is licensed.

- The IBM Tealeaf cxReveal database is used to store session attribute information for IBM Tealeaf cxReveal users. Additional installation and configuration is required.

- i) In the Port field, enter the port SQL Server is configured to use for the IBM Tealeaf cxReveal database. Tealeaf Database Manager attempts to auto-populate this field.

Note: If you are not using the standard Tealeaf databases port (1433), this value must be also populated in the Report configuration.

3. If you do not want to connect to the database or the database is not accessible, you can still make configuration changes by clicking **Configure**.

4. After verifying that the information is correct, click **Connect**. Tealeaf Database Manager attempts to connect to the databases and gather general information about them.

Related concepts

[Authentication](#)

[Configuring the Report Server](#)

[Configuring Session Attribute Search](#)

Related reference

[Troubleshooting Tealeaf databases](#)

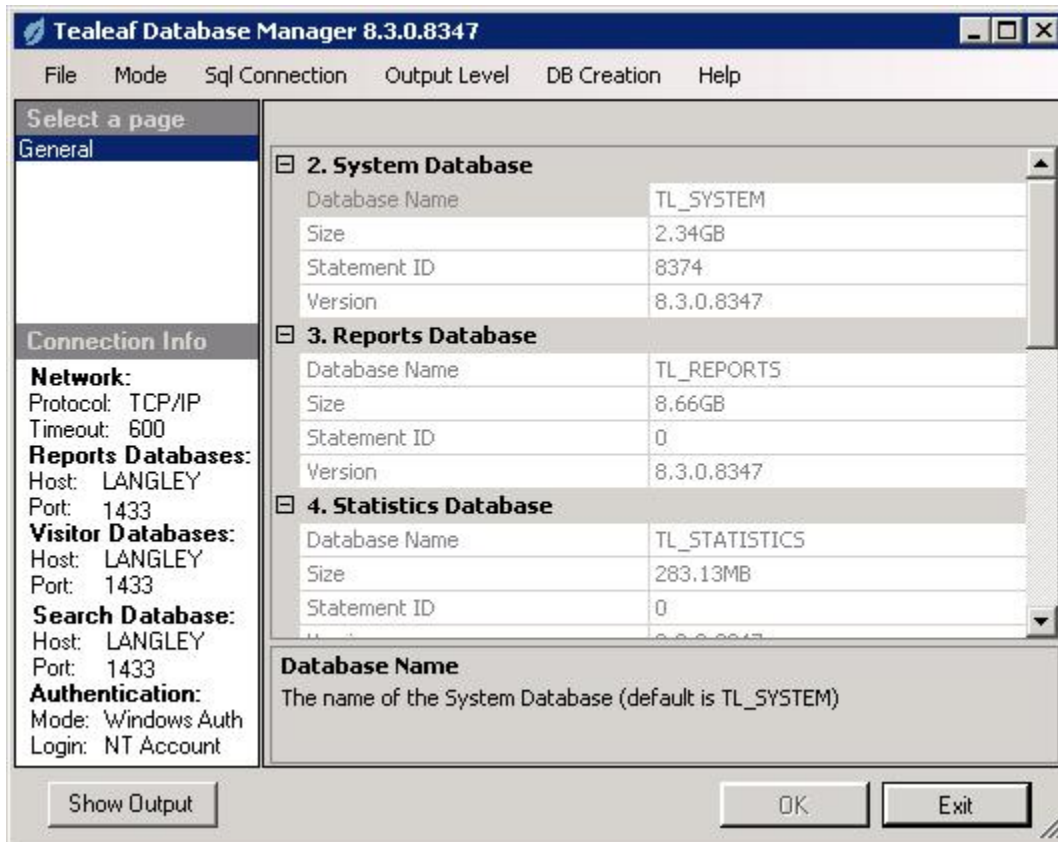
If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

Using Tealeaf Database Manager

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

Layout

The Tealeaf Database Manager is composed of five main components.



Component Description

Menu bar

Provides common operations and functionality

Navigation

The navigation list is displayed at the upper left of the window. It provides a list of option and configuration pages for the current mode.

Connection Info

The connection info window is displayed at the lower left of the window. It displays all connection-related information for the current connection.

Main Window

The main window is displayed to the right of the navigation and connection info panes. It displays the options and information that is related to the currently selected mode and page.

Footer

The footer contains the following controls:

- **Show Output** - Toggles display of output
- **OK** - Run specified operation

- **Exit** - Exit the application.

Menu bar

The following commands are available through the Tealeaf Database Manager menu bar.

Table 3. Menu Bar		
Menu	Command	Description
File	Exit	Quit the application
Mode		See “Modes” on page 55.
Sql Connection	Change Connection	Displays the Connection window. Allows the user to change connection properties. See “Connecting” on page 52.
Output Level	Normal	Minimal output
	Verbose	Verbose output
DB Creation	Create Databases	When selected, databases are created and SQL grant statements are run during install. <ul style="list-style-type: none"> • When cleared, the Database Manager sets up the databases using existing databases and does not run SQL grant statements.

Modes

The Tealeaf Database Manager functions in several modes, which can be changed through the Mode menu.

Table 4. Modes		
Sub-Menu	Option	Description
Info/ Config		Provides information about the databases and server, as well as server configuration options.
	General Overview	Displays general database information (Database names, versions, and so on). See “General overview view” on page 57.
	Database Information	Displays database-specific information such as status and size. See “Database information view” on page 57.
	Sql Server Information	Displays server configuration such as parallelism and memory settings. Requires SA Access. See “SQL Server information view” on page 58.
	Report Server Configuration	Allows configuration of local Report Server settings. Requires TMS to be running. See “Report Server Configuration view” on page 58.
Data Management		Manage the initialization of databases and migration of data from the format of an earlier version.

Table 4. Modes (continued)

Sub-Menu	Option	Description
	Initialize Configuration	Perform initial configuration of all databases. See “Initialize configuration” on page 68.
	Migrate Configuration	Perform initial configuration and data migration of event definitions from Release 7.2 format. See “Migrate configuration” on page 68.
	Migrate Report Data	Migrate data in TL_REPORTS database from Release 7.2 format. See “Migrate report data” on page 68.
	Migrate Search Data	Migrate data in TL_SEARCH database from Release 7.2 format. See “Migrate search data” on page 69.
Database Setup		Provides controls for installing, upgrading, and uninstalling the Tealeaf databases.
	All Databases	Mode features simple operations and is recommended for most users. See “All Databases Mode” on page 60.
	Single Database	Mode features fine-tuned controls for more complex environments and tasks, such as setting up a remote database. See “Single Database mode” on page 64.
User Management		Provides controls for managing the database users and permissions.
	Create User	Allows the creation of the required Tealeaf SQL Server logins. See “Create User view” on page 70.
	User Permissions	Provides ability to repair server and stored procedure permissions. See “User Permissions View” on page 71.
	Permissions Scripts	Provides controls for producing SQL permissions scripts. See “Permissions Scripts view” on page 71.
	Repair Users	Repair database user accounts after migration of Tealeaf databases to a new SQL Server instance. See “Repair Users view” on page 72.
Job Management		Provides controls for setting up and managing backup operators, notifications, and jobs.
	Backup Jobs	Provides controls for creating and managing Tealeaf database backup jobs. See “Backup Jobs view” on page 72.
	Backup Job History	Displays Tealeaf database backup job history. See “Backup Job History view” on page 72.

Table 4. Modes (continued)

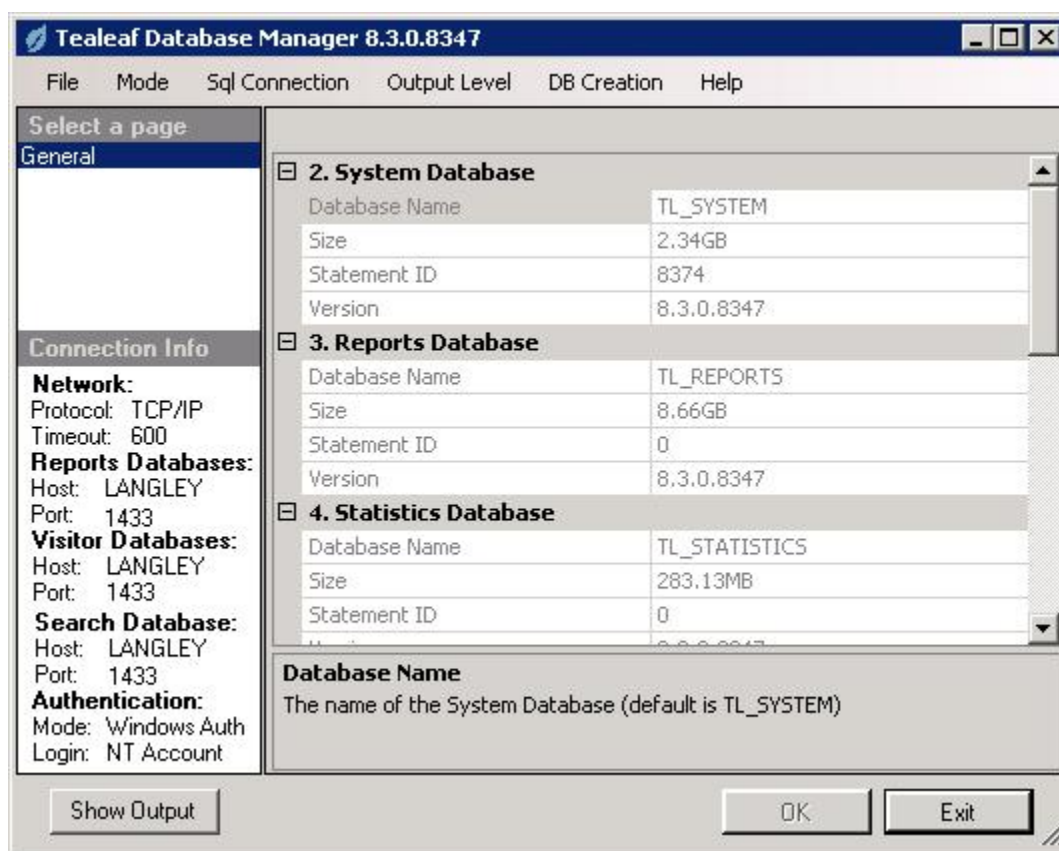
Sub-Menu	Option	Description
	Operators	Provides controls for adding job operators. See “Operators view” on page 72.
	Notifications	Provides controls for adding notifications to Tealeaf database backup jobs. See “Notifications view” on page 73.
Index Management		Provides controls for viewing and managing indexes. See “Index Management view” on page 73.
Filegroup Management		Provides controls for adding files and filegroups to a database.
	Add File	Provides controls for adding files and filegroups to Tealeaf databases. See “Add File view” on page 73.

Info/config

Topics in this section describe the information and configuration views in Database Manager.

General overview view

The general overview displays read-only information about the current installation, if any.



Database information view

The database information view displays read-only information about the currently selected database.

The database can be selected from the **Database** drop-down. Different information about the currently selected database can be viewed by selecting the wanted category from the **Category** drop-down.

- This information is primarily for debugging purposes.

Category Notes®

Database Files

File information for the currently selected database.

OS System Info

Operating system information relevant to the database.

- Requires SA Access

Performance Counters

Performance metrics on the currently selected database.

- Requires SA Access

Exec Session Requests

Database session information.

- Requires SA Access

Server Configuration

Configuration information for SQL Server. Properties:

- max degree of parallelism
- the maximum degree of parallelism that is configured for the database. See "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*.
- min server memory (MB)
- max server memory (MB)
- AWE enabled

SQL Server information view

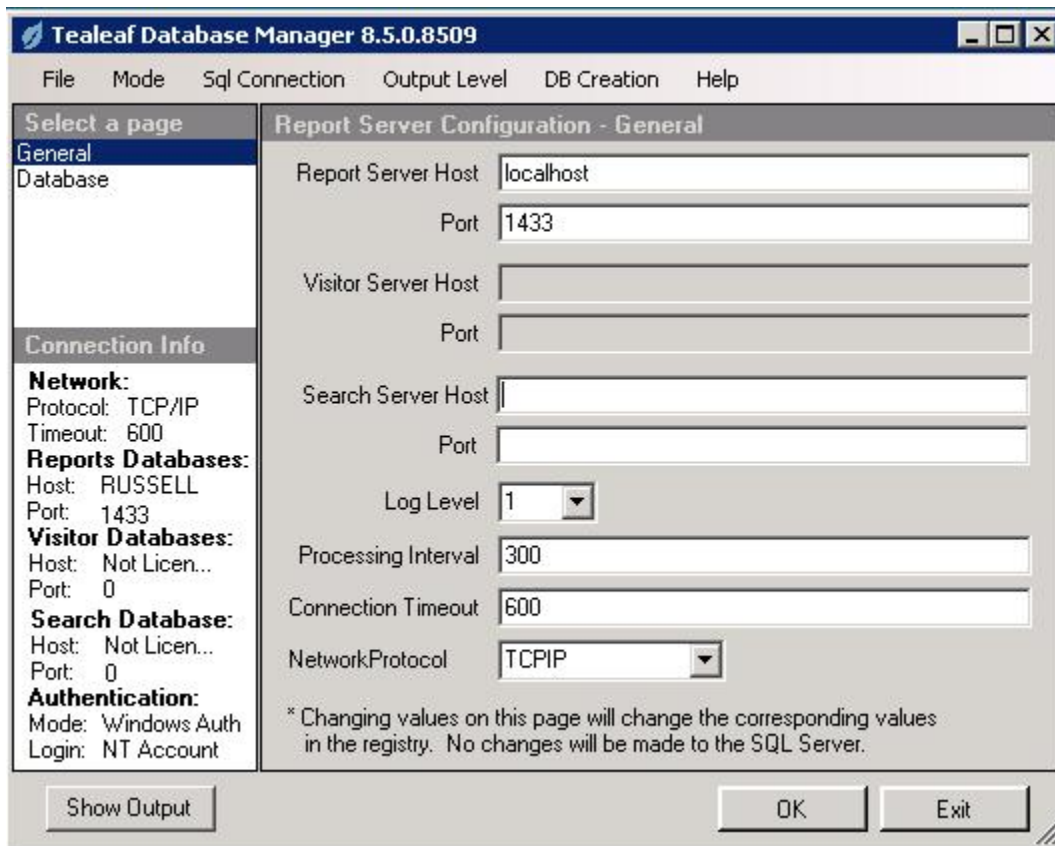
The SQL Server information view displays read-only information about the currently selected server. The server can be selected from the **SQL Server** drop-down.

Report Server Configuration view

The Report Server Configuration view exposes the report server settings in an editable format.

Tealeaf Database Manager uses Tealeaf Management System to commit these changes, so TMS must be running to edit any settings in this view.

Note: Any changes to these settings must be applied through SQL Server Management Studio.



The following settings are exposed only through the Tealeaf Database Manager.

Setting

Description

NetworkProtocol

Configure the network protocol in use by SQL Server:

- TCPIP
- NAMED PIPES

Note: Changes to this setting are not automatically applied to SQL Server Management Studio. You must verify that your setting change is reflected in the corresponding configuration in SQL Server Management Studio.

For more information about the other settings, see "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

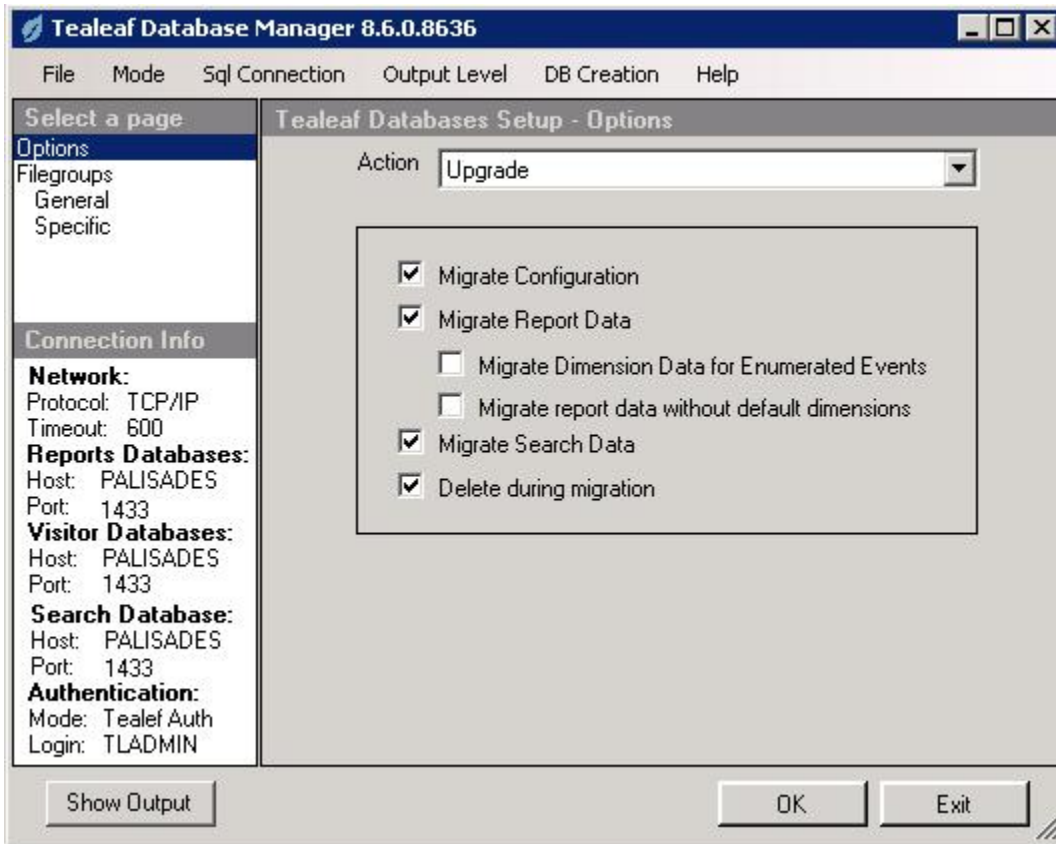
After making the wanted changes, click **OK** to commit them via TMS.

Database setup

Topics in this section describe database setup options in Database Manager.

All Databases Mode

All Databases Mode provides simple actions for managing the entire set of Tealeaf databases.



Note: When installing the IBM Tealeaf cxReveal database on a SQL Server instance by itself, All Databases mode is not available in the Tealeaf Database Manager.

- Install - Set up the Tealeaf databases using default settings
 - Initialize Configuration - Perform the initial configuration of the installed databases. See [“Initialize configuration”](#) on page 68.
- Upgrade - Upgrade an existing Tealeaf database
 - Migrate Configuration - Migrate data from the previous version's format to the new version's schema. See [“Migrate configuration”](#) on page 68.
 - Migrate Report Data - Migrate data from the IBM Tealeaf cxImpact reporting database from the previous version's format to the new version's schema. See [“Migrate report data”](#) on page 68.
 - You may optionally choose to migrate the value lists for enumerated value events to dimensions in the current Release.
 - You may optionally choose to include the reference dimension data from Release 7.2 in the migration. To include these dimensions, clear the Migrate report data without default dimensions. See "Release 8.x Upgrade for Reporting Server" in the *IBM Tealeaf CX Upgrade Manual*.
 - Migrate Search Data - Migrate data from IBM Tealeaf cxReveal Search database from the previous version's format to the new version's schema. See [“Migrate search data”](#) on page 69.
 - Delete during migration - When selected, data is deleted during the migration operation.

Note: By default, data is deleted during migration to limit the overhead required to complete the operation. Before you begin when using this option, verify that you have a valid backup of the databases you are migrating.

Note: If you do not delete during migration, the data from the previous version is retained, and all migration operations are performed within the database to copies of the data. If migration fails, your Release 7.2 database remains intact. However, the size of your SQL Server database may become very large.

- Migrate Visitor Data - If IBM Tealeaf cxResults was licensed and the Tealeaf Database Manager is connected to the Visitor database, you may optionally choose to migrate your visitor data. See [“Migrate visitor data” on page 69](#).
- Uninstall - Uninstall all databases
 - Close Connections - When selected, all database connections are closed after completion of the selected action.

Before the installation of new databases, you can configure the general filegroup locations to be applied by default to each newly installed database and specific filegroup locations for individual databases.

Note: Changes to filegroup paths are not applied during upgrades. For more information about changing filegroup paths for existing databases, see your SQL Server product documentation.

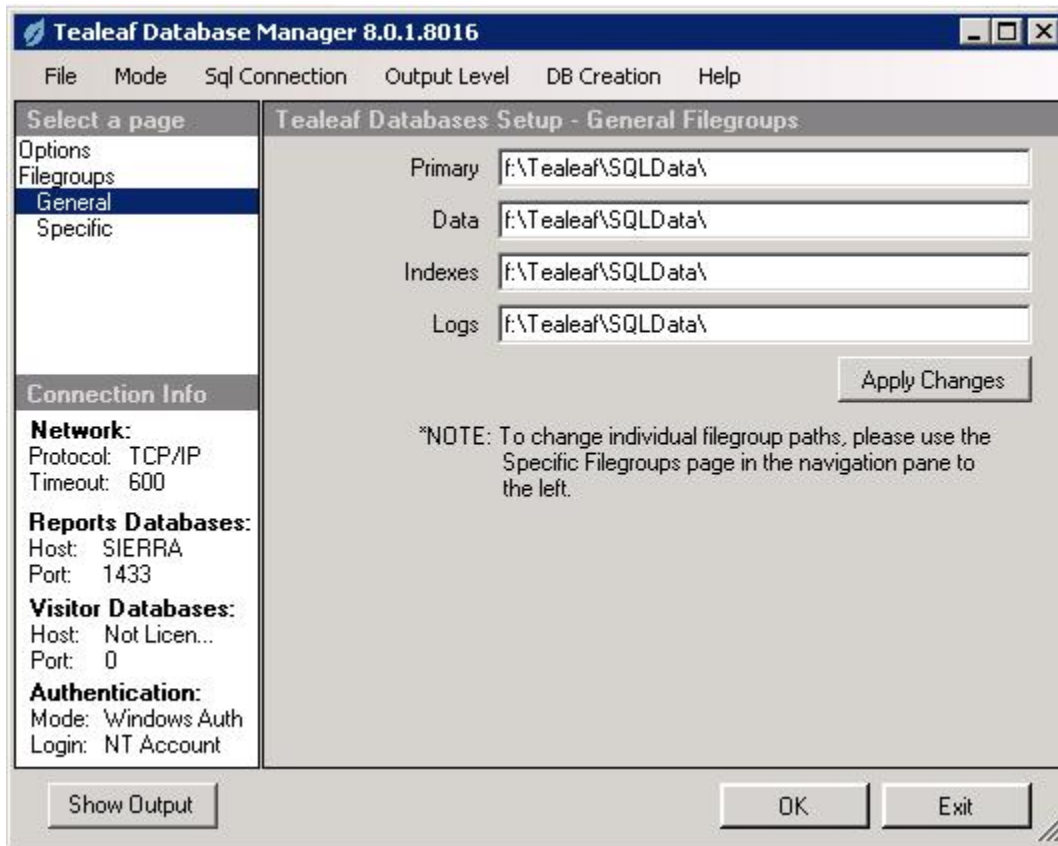
Note: If your upgrade process is creating new databases, then these filegroup settings can be applied to the specific, newly installed databases. For example, if you are upgrading from pre-Release 6.2 and installing IBM Tealeaf cxResults, the TL_SYSTEM and TL_VISREPORT databases are created as part of the upgrade process. Those databases can have specific filegroup settings that are defined for them on the **Specific Filegroups** page.

- To configure general filegroup settings, select the General page. See [“General Filegroups page” on page 61](#).
- To configure filegroup settings for a specific database, select the Specific page. See [“Specific Filegroups page” on page 63](#).

General Filegroups page

On the **General Filegroups** page, all Tealeaf database filegroups are categorized into one of four general groups: Primary, Data, Indexes, and Logs.

- All Tealeaf databases data is stored in these locations, unless you create overriding values for individual databases on the **Specific Filegroups** page. See [“Specific Filegroups page” on page 63](#).



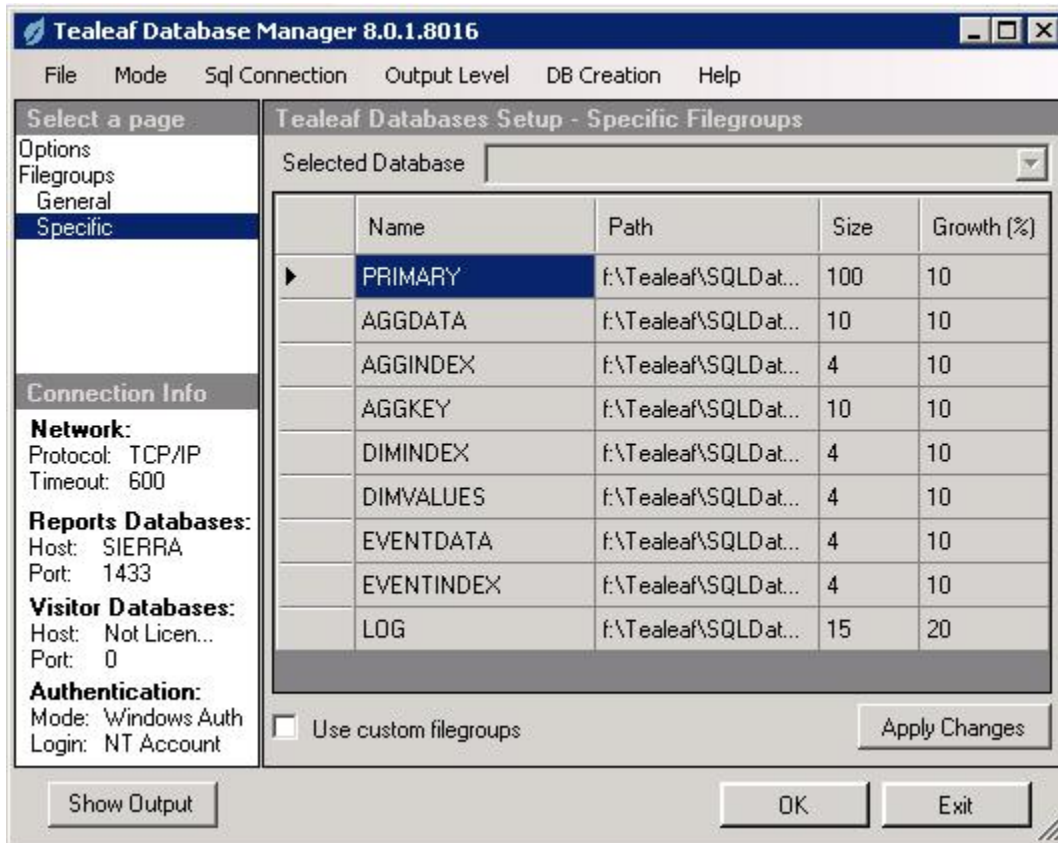
The **General Filegroups** page can be used to quickly structure the filegroups. After editing the filegroup paths in the provided textboxes, click **Apply Changes**. During the installation, the new filegroup paths are used to store the newly created databases.

- These values are saved to disk and reloaded by default the next time Tealeaf Database Manager is opened. If you must close TDM and reinstall databases, these filegroups do not need to be respecified.

Specific Filegroups page

On the **Specific Filegroups** page, individual filegroups for each Tealeaf database can be independently configured.

About this task



For example, you may decide that filegroups for TL_REPORTS belong on a separate volume on the current system.

Note: SQL Server requires full paths to filegroups local to the SQL Server path. Network paths and relative paths are not supported.

The default paths on this page are derived from any applied changes on the **General Filegroups** page.

Note: To enable the use of custom filegroups, click the use custom filegroups check box. When custom filegroups are enabled, any changes that are applied in the General filegroups page overwrite any values that are specified in the Specific filegroups page. You should specify the general filegroups first.

To define custom file groups:

Procedure

1. If you did not do so already, click the use custom filegroups check box.
2. Select the database to which you are applying the custom filegroups.
3. Specify the filegroups for the database in the provided area.
4. Click **Apply Changes**.

Results

Option	Description
--------	-------------

Selected Database

The database whose filegroups should be edited.

Name

Name of the filegroup.

Path

Path to the filegroup file.

Size

Size of file in megabytes.

Growth

Automatic growth in percent.

- To use custom filegroups, select the check box. You can change the fields as needed.
- To apply changes to the currently selected database's filegroup settings, click **Apply Changes**.

Note: These changes are also automatically applied when leaving the **Filegroups** page or running an All Databases operation.

Single Database mode

Single Database Mode provides operations for managing specific Tealeaf databases.

The screenshot shows the 'Tealeaf Database Manager 8.0.1.8016' window. The 'Filegroups' tab is selected in the left sidebar. The main area is titled 'Tealeaf Databases Setup - Specific Filegroups'. It features a 'Selected Database' dropdown menu. Below it is a table with columns: Name, Path, Size, and Growth (%). The table lists several filegroups, with 'PRIMARY' selected. At the bottom, there is a checkbox for 'Use custom filegroups' and an 'Apply Changes' button. The bottom of the window has 'Show Output', 'OK', and 'Exit' buttons.

Name	Path	Size	Growth (%)
PRIMARY	f:\Tealeaf\SQLDat...	100	10
AGGDATA	f:\Tealeaf\SQLDat...	10	10
AGGINDEX	f:\Tealeaf\SQLDat...	4	10
AGGKEY	f:\Tealeaf\SQLDat...	10	10
DIMINDEX	f:\Tealeaf\SQLDat...	4	10
DIMVALUES	f:\Tealeaf\SQLDat...	4	10
EVENTDATA	f:\Tealeaf\SQLDat...	4	10
EVENTINDEX	f:\Tealeaf\SQLDat...	4	10
LOG	f:\Tealeaf\SQLDat...	15	20

Option

Description

Database

Select the database to manage from the currently licensed and accessible to Tealeaf Database Manager.

Action

Select the action to perform on the currently selected database.

Command File

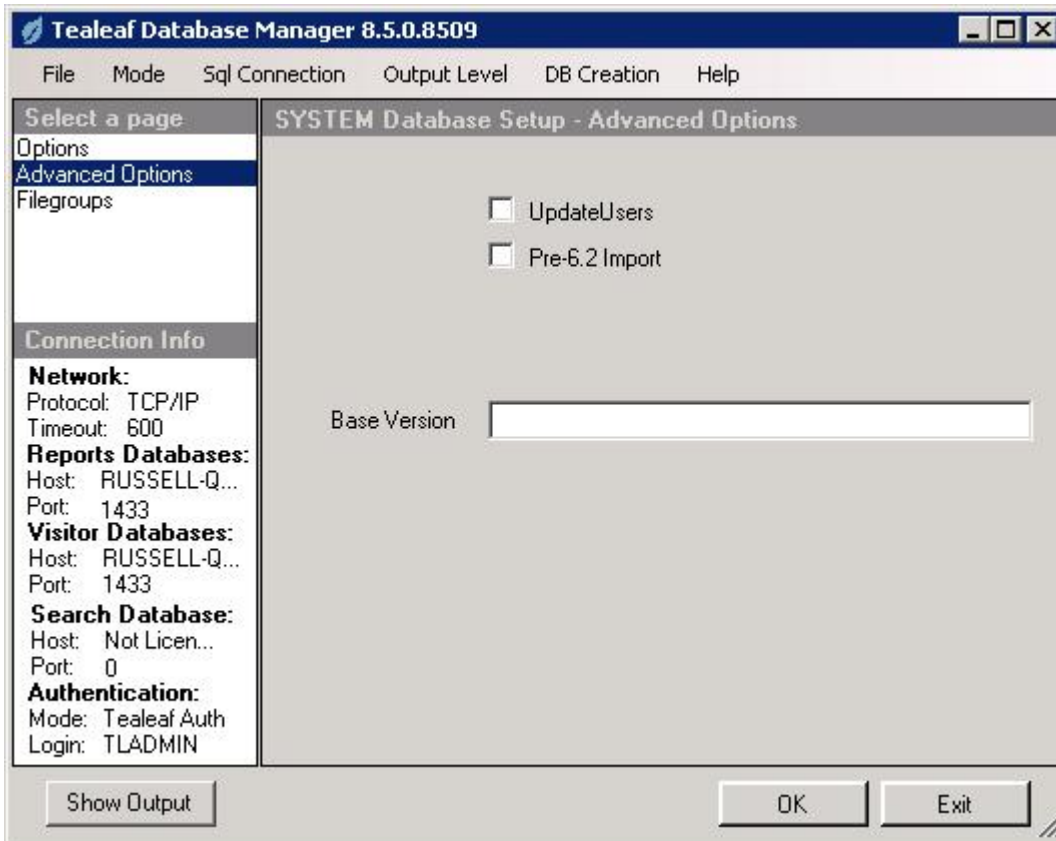
The absolute path to the command file to be used for the current action and database. The command file can be selected by entering the path or by browsing for the file using the **Browse** button.

Close Connections

When selected, all database connections are closed after completion of the selected action.

Advanced Options page

This section describes the Advanced Options page in Single Database mode.



Option

Description

Update Users

When selected, TeaLeaf users are updated when a database is being Altered.

Pre-6.2 Import

When enabled, TeaLeaf system data is persisted in the database. This data can be customized using the Persist Opts. tab.

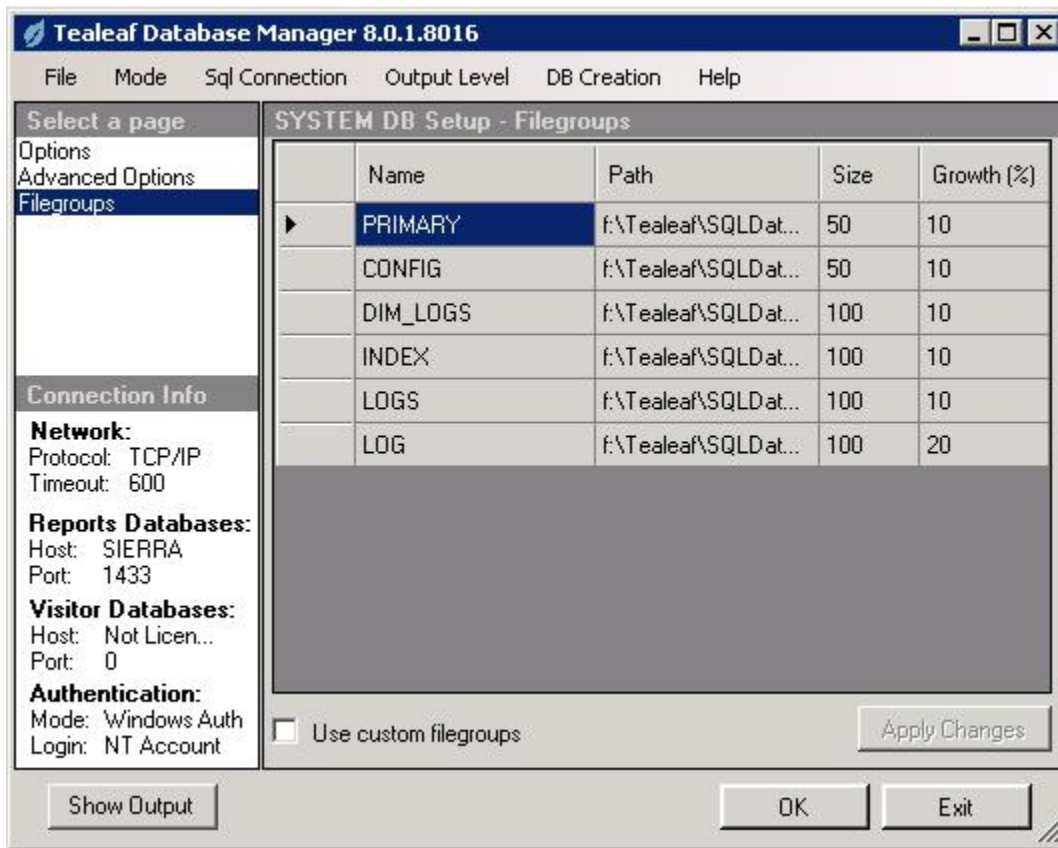
Note: Do not select this option unless you were instructed to do so by Tealeaf personnel.

Base Version

The base database version to use when generating an upgrade script.

Filegroups page

In Single Database mode on the Filegroups page, you can configure filegroup settings for the currently selected database before it is created.



Note: SQL Server requires full paths to filegroups local to the SQL Server path. Network paths and relative paths are not supported.

- To customize these settings, select the Use custom filegroups check box. Make your edits as needed. To apply changes, click **Apply Changes**.

Note: These changes are also automatically applied when leaving the **Filegroups** page or running the create operation.

CLR sequence search

For IBM Tealeaf cxResults, you can deploy a stored procedure onto the SQL Server instance hosting the IBM Tealeaf cxResults databases to improve performance of sequence searches.

About this task

Note: Tealeaf strongly recommends using the IBM Tealeaf cxResults stored procedure for sequence searches.

Through Tealeaf Database Manager, you can enable the use of the stored procedure.

Note: The stored procedure must be installed on the SQL Server local system before enabling its use. See "Installing Tealeaf Databases" in the *IBM Tealeaf Databases Guide*.

Procedure

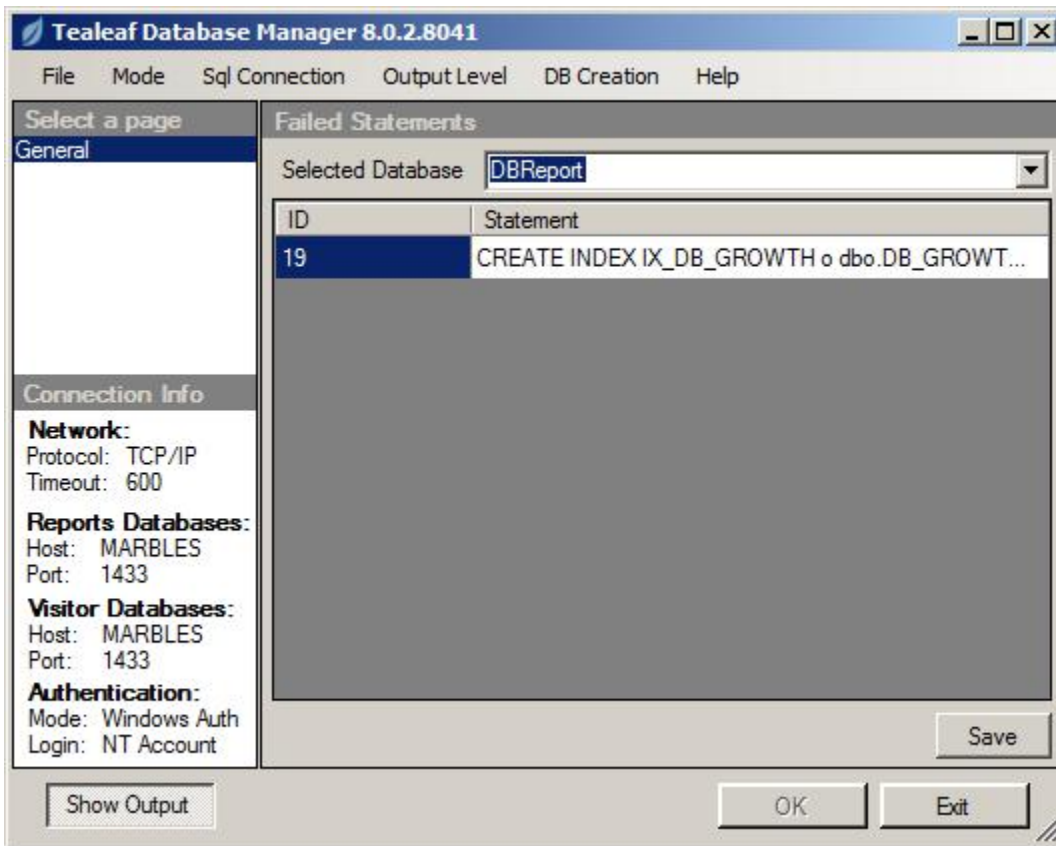
1. Copy the DLL file from the Tealeaf Report Server in your environment to the server hosting SQL Server if it is remote.
2. To use the stored procedure for sequence search, enter the absolute path to the sequence search DLL on the SQL Server machine.

3. To enable it, click **OK**.
4. The stored procedure is enabled.
5. After you installed this stored procedure, you should rebuild the index for the database, which enables sequence searching on existing data.
6. You may also choose to populate the session end column in the event occurrence table, which improves search and reporting performance. See [“Visitor sequence search” on page 70](#).

Failed statements

When a database is modified using the Tealeaf Database Manager, you may review this pane to identify if any non-critical statements in the operation failed.

- The Tealeaf Database Manager uses a statements-based method of creating and modifying individual databases. Any defined operation that is applied to a Tealeaf database is defined as a sequence of statements that are applied to the database.



Depending on the type of statement, the failure may be deemed to be non-critical or to be critical.

Note: Only non-critical statements are displayed in this pane. When a non-critical error is encountered during a database operation, a message is logged and an entry is added to this pane before continuing with the database operation.

- Successful statements do not appear in this pane.
- A critical failure immediately terminates execution of the operation. These errors are not reported in this pane.
- See [“List of failed statement types” on page 73](#).

When a database operation results in a non-critical failure, the statements that failed to properly run appear in the Failed Statements pane and may be exported into a SQL file. If the error that caused the statements to fail was corrected, you may re-execute the statements in the exported file to complete the operation.

Note: This pane is reset with each database operation. You should develop the habit of checking this pane after each database operation that you perform.

- To review the failed statements for a specific database, select the database from the drop-down list.
- To export the failed statements to a SQL file, click **Save**.

Data management

Topics in this section describe data management options in Database Manager.

The Data Management options apply only to Release 7.2 to Release 8.1 or later upgrades. If the current version of your databases is Release 8100 or later, these settings have no effect and can be ignored.

Initialize configuration

After your Tealeaf databases were installed a new version of IBM Tealeaf CX, you can use this option to perform the initial configuration. This step initializes the database with default events, dimensions, reports, and dashboards.

Migrate configuration

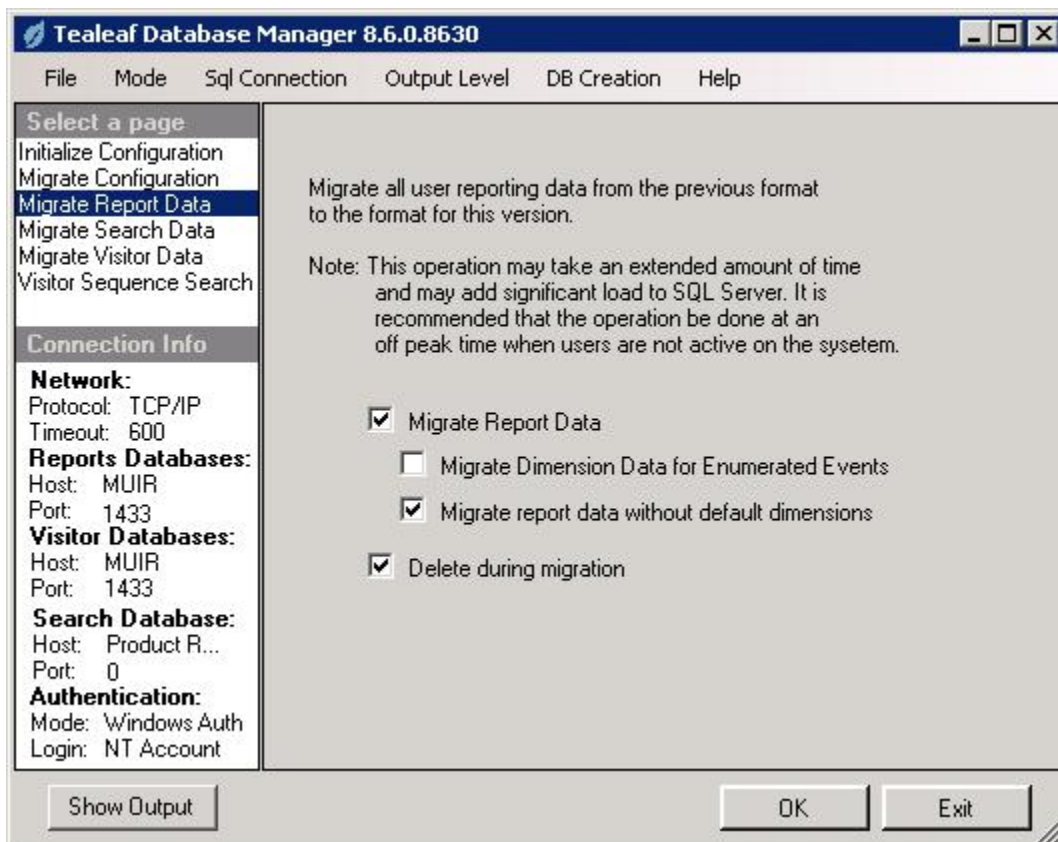
After you upgrade to a new version of the database, you may migrate configuration information from the old version to the new schema. System configuration, user profiles, report definitions, and dashboards from the earlier version are converted and loaded into the database.

Note: You cannot perform migration operations before you upgrade your databases.

- This step performs the Initialize Configuration step first. See [“Initialize configuration” on page 68](#).

Migrate report data

This command converts IBM Tealeaf cxImpact Report TL_REPORTS data from the old version's schema into the new schema.



Note: You cannot perform migration operations before you upgrade your databases.

Note: Before migrating report data, make a backup of the TL_REPORTS database.

- To enable report data migration, click the Migrate Report Data check box.

Note: Depending on the size of your database, this operation may take significant time and impede performance on your instance of SQL Server. It is recommended that you run this operation during off-peak hours.

- You may optionally choose to migrate the value lists from your previous installation into the new reporting schema as newly created dimensions. When the migration is completed, the newly created dimensions are named after the enumerated event to which they are linked, and all enumerated values are whitelisted values in the dimension. To perform this step during migration, select the Migrate Dimension Data for Enumerated Events check box.

Note: Before you perform this event migration, verify that the Release 7.2 event definitions are installed and available in the Report Server from which you are running the upgrade. See "Release 8.x Upgrade for Reporting Server" in the *IBM Tealeaf CX Upgrade Manual*.

Note: This option is only applied if you are migrating report data from Release 7.2.12.7296. Otherwise, it is ignored.

- You may optionally choose to include the reference data dimensions in the migrated report data. To include these dimensions, clear the Migrate report data without default dimensions. See "Release 8.x Upgrade for Reporting Server" in the *IBM Tealeaf CX Upgrade Manual*.
- To delete data after it was successfully migrated during the migration operation, click the Delete during migration check box.

Note: By default, data is deleted during migration to limit the overhead that is required to complete the operation. Before you begin when using this option, verify that you have a valid backup of the databases you are migrating.

Note: If you do not delete during migration, the data from the previous version is retained, and all migration operations are performed within the database to copies of the data. If migration fails, your Release 7.2 database remains intact. However, the size of your SQL Server database may become very large.

Migrate search data

This command converts IBM Tealeaf cxReveal Search TL_SEARCH data for the current day from the old version's schema into the new schema.

Note: You cannot perform migration operations before you upgrade your databases.

Data from previous days that are stored in the IBM TealeafcxReveal Search database is migrated after initial startup of the Attribute Indexing session agent. See "Attribute Indexing Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

Note: The Search database that is provided with IBM Tealeaf cxReveal requires separate installation and configuration. See "cxReveal Installation" in the *IBM Tealeaf cxReveal Administration Manual*.

To migrate the Search data, click **OK**.

Note: By default, data is deleted during migration to limit the overhead that is required to complete the operation. Before you begin when using this option, verify that you have a valid backup of the databases you are migrating.

Migrate visitor data

This process migrates visitor data.

About this task

Migration of Visitor Data affects the following:

Procedure

1. Updates all timestamps from GMT to Tealeaf time
2. Drops unused tables

Note: This process does not migrate reference dimension data from Release 7.2 format. The use of dimensions is not supported in IBM Tealeaf cxResults.

Results

Note: Do not start the Tealeaf Scheduling Service before Visitor data migration occurred.

Note: You cannot perform migration operations before you upgraded your databases.

This command converts IBM Tealeaf cxResults Visitor (TL_VISREPORT and TL_VISSTAGE) data from the old version's schema into the new schema.

Note: The Visitor databases that are provided with IBM Tealeaf cxResults requires separate installation and configuration.

- To migrate the Visitors data, click **OK**.

Note: Depending on the size of your database, this operation may take significant time and impede performance on your instance of SQL Server. It is recommended that you execute this operation during off-peak hours.

Note: By default, data is deleted during migration to limit the overhead that is required to complete the operation. Before you begin when using this option, verify that you have a valid backup of the databases you are migrating.

Visitor sequence search

For the Visitor database, you can choose to rebuild an index on the event table in the Visitor Reporting database. Rebuilding this index adds a column to it and improves performance of visitor sequence searches.

Note: For a pre-existing Visitor database, this operation may take a significant amount of time and SQL Server processing to complete. Tealeaf recommends executing this operation during off-peak hours.

Optionally, you can choose to populate the session end column for historical data in the Visitor database. When this option is enabled, the database column in the event occurrence table is populated with the session end timestamp for all previously recorded events in the database. All subsequent event occurrences added to the database are populated with the session end time for the events when they are inserted into the Visitor database.

- Including this option in your Visitor database improves performance of search and reporting in IBM Tealeaf cxResults, if you installed the Sequence Search stored procedure.

Note: If you installed the Sequence Search stored procedure and do not choose to populate the session end column, then sequence searches on these historical sessions do not work.

- If you did not install the Sequence Search stored procedure, this optional step is not necessary.
- See [“CLR sequence search”](#) on page 66.

- To populate the session end column, click **OK**.

User management

Topics in this section describe user management options in Database Manager.

Create User view

The Create User view exposes controls for changing the user name and password for the Tealeaf database admin and user accounts. These changes are updated in the database as well as the Report Server settings.

Option

Description

TL User Type

Select the type of Tealeaf user account to change: User or Admin.

Username

For the selected type, enter the user name.

Password

For the user name, enter the password.

Confirm Password

To change the password, enter it again.

User Permissions View

The User Permissions view exposes controls for updating a Tealeaf database users server and stored procedure permissions. SA permissions are required to make these changes.

Option

Description

TL User Type

Select the type of Tealeaf user account to change: User or Admin.

Server Permissions

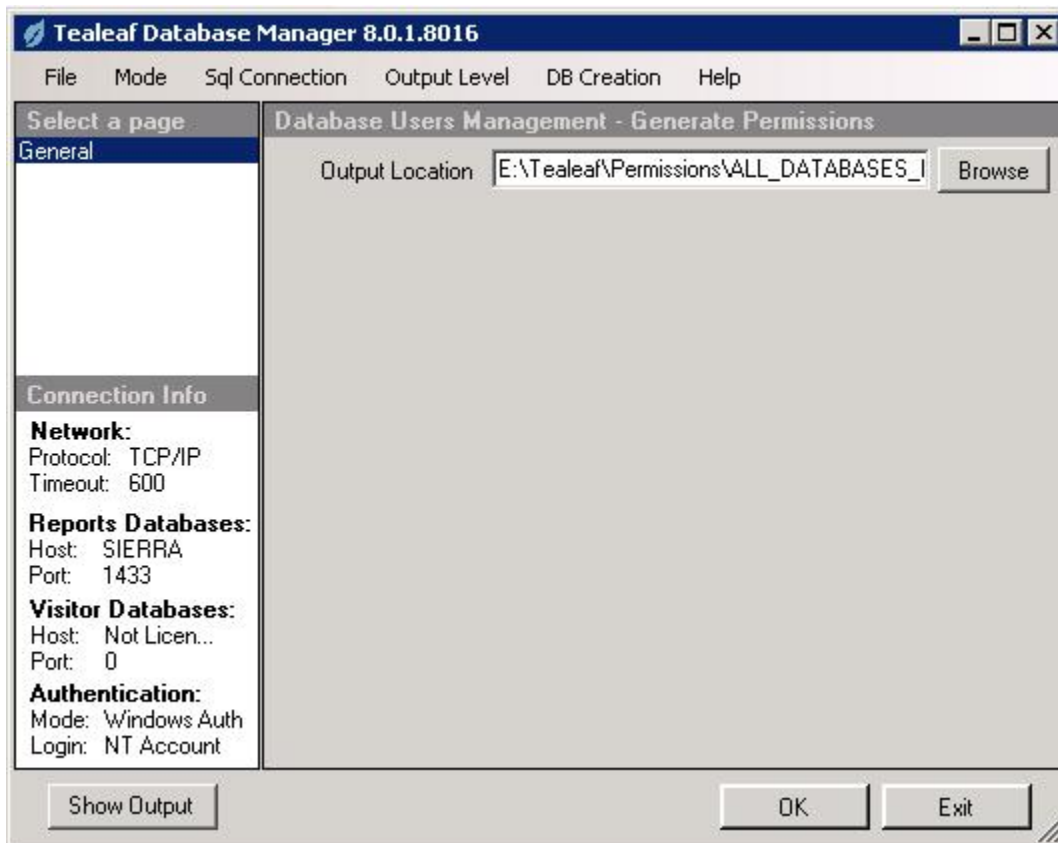
When enabled, Tealeaf Database Manager attempts to repair any missing permissions to the Tealeaf databases.

Stored Procedure Permissions

When enabled, Tealeaf Database Manager grants permissions to the selected user to run Tealeaf database stored procedures.

Permissions Scripts view

Permissions Scripts Mode provides the ability to generate a set of SQL statements granting the permissions necessary for the various Tealeaf services to make use of the databases.



- To specify the location where the permissions scripts are to be generated, enter the absolute path where the SQL script should be written. The path can be entered directly into the field or can be selected using the **Browse** button.

Repair Users view

This command repairs the TLADMIN and TLUSER accounts used by the Tealeaf Database Manager to point to a new server hosting the SQL Server instance after you migrate and restore your Tealeaf databases.

Note: If you migrated one or more of your Tealeaf databases to a new instance of SQL Server, you must run this command to correct the local information about the accounts that are used to access each database.

This command can run multiple times without issues.

Note: Before you run this command, verify that you migrated all necessary databases to the new SQL Server instance and restored the databases through the Tealeaf Database Manager. See "Migrating Tealeaf Databases" in the *IBM Tealeaf Databases Guide*.

- To repair the TLADMIN and TLUSER accounts for each of your Tealeaf databases, click **OK**.

Job management

Topics in this section describe job management options in Database Manager.

Backup Jobs view

The Backup jobs view exposes controls for creating and managing Tealeaf database backup jobs.

Note: The backup features in Tealeaf Database Manager are used for scheduling backup tasks, which include trimming of the databases. To run a full on-demand backup of Tealeaf databases, use SQL Server Management Studio.

All fields on the **Create and Schedule Options** page must be populated before a job can be created. Existing jobs can be enabled/disabled or deleted on the **Manage** page.

Option

Description

Database

From the drop-down, select the database to back up.

Job Name

Enter a user-friendly name for the backup job.

Description

Provide a clear description of the job.

Full Backup Path

Enter or select the absolute path where full backups for this database can be stored. This value must be an absolute path on the SQL Server machine.

Note: If SQL Server is remote, enter the path manually. Do not select the path using the Browse option.

Diff Backup Path

Enter or select the absolute path where incremental backups for this database can be stored. This value must be an absolute path on the SQL Server machine.

Note: If SQL Server is remote, enter the path manually. Do not select the path using the Browse option.

Backup Job History view

The Backup Job History view displays history for Tealeaf database backup jobs that are configured and run from the Tealeaf Database Manager. Select the backup job from the drop-down. Status information is displayed.

Operators view

The Operators view exposes controls for adding operators to SQL Server. An operator consists of a user name and an email address. Operators can be automatically notified of Tealeaf database backup job events.

Notifications view

The Notifications view exposes controls for adding notifications to a Tealeaf database backup job. An operator can be notified when a specific job succeeds, fails, or completes.

Index Management view

The Index Management view displays a list of all indexes and keys in a Tealeaf database. These can be selected for deletion or rebuilding.

- To queue an index for deletion, select it and click **Delete**.
- To queue an index for rebuilding, select it and click **Rebuild**.
- To run all queued operations, click **OK**.
- To clear the queue of operations, click **Discard Changes**.

Filegroup management

Topics in this section describe filegroup management options in Database Manager.

Add File view

In the Add File view, you can create individual files to database filegroups.

Option

Description

Database

From the drop-down, select the database to which to add the file.

Logical Name

The logical name for the database.

Filegroup

For the selected database, select the filegroup to which you want to add the file.

New Filegroup Name

To add the file to a new filegroup, enter the name of the new filegroup here.

Initial Size

Enter the initial size of the filegroup. Select the size units using the provided drop-down.

Autogrowth

Specify the percentage of automatic growth of the file that is expected during normal operations. Select the growth units using the provided drop-down.

- To disable auto-growth, set this value to 0.

Path

Enter the absolute path to the file.

File Name

The filename of the file to add.

List of failed statement types

This section describes non-fatal errors in Database Manager.

When a non-critical statement failed during a database operation, an error message similar to the following is displayed in the output pane:

```
One or more errors occurred during the operation.
TL_REPORTS : There was an error executing the command list. |
Incorrect syntax near 'o'. | At statement:
CREATE INDEX IX_DB_GROWTH o dbo.DB_GROWTH (DTS, NAME) ON [PRIMARY]

One or more warnings occurred during the operation.
TL_REPORTS : A non fatal error has occurred while executing a CREATE_INDEX
statement 19 TL_REPORTS : There was an error executing the command list
```

Each of the following statement types is considered to be non-fatal by the Tealeaf Database Manager. When any of these errors occur, a log entry is inserted, similar to the above, and the DBM continues processing the script.

```
TLDbmStatementType.GRANT
TLDbmStatementType.GRANT_DATABASE
TLDbmStatementType.CREATE_INDEX
TLDbmStatementType.ALTER_INDEX
TLDbmStatementType.DROP_INDEX
TLDbmStatementType.CREATE_PROCEDURE
TLDbmStatementType.DROP_PROCEDURE
TLDbmStatementType.ALTER_PROCEDURE
TLDbmStatementType.CREATE_FUNCTION
TLDbmStatementType.DROP_FUNCTION
TLDbmStatementType.ALTER_FUNCTION
```

Missing product registry keys

This section describes possible causes for the "Product Registry Entry(s) Missing" error.

Depending on your license and installed products, you may see the following message in the Host and Port field for one or more Tealeaf database(s):

```
Product Registry Entry(s) Missing
```

The above message indicates that the product registry keys for the listed database do not exist on the machine where the Tealeaf Database Manager is being run. This situation may be caused by one of the following:

- The product was not installed locally yet, so the database does not yet exist. You cannot perform operations on the local database until you complete the product installation.
- The database is installed on a remote server. For databases installed on a different server, no such registry key exists. In this case, the message can be ignored for purposes of local installation.
 - This message may be displayed for the Visitor Report, Visitor Staging, and IBM Tealeaf cxReveal Search databases in particular.

Database Administration

The IBM Tealeaf CX datastore runs on top of a set of four Microsoft SQL Server databases.

Tealeaf components access these databases using one of two SQL logins created automatically during installation. These accounts are granted membership to a select set of database roles on each of the Tealeaf databases. They do not have access to any other databases or to the SQL Server instance itself.

Tealeaf databases can be installed independent of the main Tealeaf installer.

Database backup strategy

Your Tealeaf databases should be backed up regularly for recovery and performance reasons. Without valid backups, Tealeaf may be unable to recover customer data in the event of a system failure or data corruption.

Without a proper backup strategy, the log files for the Tealeaf databases may grow unbounded, causing both disk space loss and performance issues.

The strategies that are outlined below are recommended for providing the most reliable recovery capability while minimizing storage overhead and potential interference with the operation of the Tealeaf system.

Note: Tealeaf strongly recommends performing regular backups of the Tealeaf databases using the recommended backup strategies in this section. Failure to back up your databases may result in unrecoverable loss of data.

Backup mechanisms

You can back up your Tealeaf databases using either of the following ways:

- The Tealeaf installation process includes pre-scripted SQL files to create and schedule back up jobs consistent with the backup strategy recommended by Tealeaf. See [“Database backup scripts”](#) on page 75.
- You can use the Tealeaf Database Manager to configure and run regularly scheduled backups. See [“Using Tealeaf Database Manager”](#) in the *IBM Tealeaf Databases Guide*.

Recommended backup strategy

Tealeaf recommends running a nightly Full Backup on all Tealeaf databases.

The recommended backup strategy should be deployed for all Tealeaf databases, whenever possible. These databases contain information essential to the system operation or information that is not easily recovered from another part of the Tealeaf system.

By default, the Tealeaf databases are installed and maintained in Simple Recovery Mode. As a result, incremental backups are not necessary.

Note: Tealeaf recommends the SIMPLE recovery model for SQL Server. If your instance of SQL Server is configured for SIMPLE recovery model, it is not possible to back up the database logs.

Alternate backup strategies

If the Tealeaf databases cannot be backed up on a nightly basis or another recovery model or backup strategy is required for business reasons, you should ensure that the Tealeaf databases are backed up and maintained properly. Failure to do so may result in wasted space and decreased system performance.

Database backup scripts

As part of the installation process, a set of database backup scripts is generated according to the strategies listed above.

The scripts are stored in the following directory:

```
<Tealeaf_install_directory>\Reporting\DatabaseSchema
```

Generated backup script files are of the following pattern: *DBBackup.sql

Backup notifications

By default, the backup jobs that are created by the scripts insert a message in the Event Log if the backup job fails to run.

- The reason for the error can be seen by viewing the history of the backup job in SQL Server Management Studio.
- The backup jobs can be configured to send emails on success and failure if the SQL Server Notification Service is installed and enabled. See [“SQL Server notifications”](#) on page 76.

Setting up database backups using the scripts

Follow this procedure to set up database backup scripts.

Procedure

1. Each backup script contains a section of variables at the top of the file. The values of these variables are the only things that should be edited in the file, as follows:

```
/*****  
* Script Variables
```

```

* @jobName           - The name of the backup job
* @jobOwner          - The SQL Server Login that will own the backup job
* @operator          - The name of the email operator who will be notified
*                    - if the job fails (added through sp_add_operator).
* @scheduleName      - The name of the backup job schedule
* @database           - The name of the CX database
* @fullBackupFile    - The filename of the full backup of the database.
*                    - By default this will be
*                    - overwritten with a new backup twice a week (Sunday,
*                    - Wednesday).
* @logBackupFile     - The filename of the log backup for the database.
*                    - This will be appended to
*                    - daily and started fresh on Monday and Thursday by
*                    - default.
*****/
DECLARE @database nvarchar(256),
        @fullBackupFile nvarchar(256),
        @jobOwner nvarchar(128),
        @jobName nvarchar(128),
        @scheduleName nvarchar(128),
        @serverName nvarchar(30),
        @operator nvarchar(128),
        @backupCmd nvarchar(4000);

SELECT @jobName = N'cxImpact Reporting Database Backup',
       @scheduleName = N'cxImpact Reporting Backup Job',
       @jobOwner = N'sa',
       @database = N'TL_REPORTS',
       @fullBackupFile = N'c:\Tealeaf\db_backups\tl_reports_full.bak',
       @serverName = N'(local)',
       @operator = NULL;

/***** DO NOT CHANGE ANYTHING BELOW THIS LINE *****/

```

2. The only required change is to assign valid file paths to the @fullBackupFile and @logBackupFile variables.
3. To create and schedule a backup for a particular database:
 - a) Open the file in SQL Server Management Studio. The scripts must be run as SA or an equivalent login.
 - b) Set the files paths correctly.
 - c) If the SQL Server Notification service is being used, set the @operator variable to a valid SSNS Operator. When run, the backup job sends email to the specified address.
 - For more information about configuring the operator, see [“SQL Server notifications” on page 76](#).
 - d) Run the script.

SQL Server notifications

If the SQL Server Notification Service is installed and enabled, the backup jobs can be configured to send email notifications upon success, failure, or both.

About this task

Using SQL Notification Service requires the creation of an Operator. To assist, an extra script, AddNotificationOperator.sql, is created during the installation process in the same directory as the backup scripts.

To create the operator:

Procedure

1. Open the AddNotificationOperator.sql script in SQL Management Studio.
2. Set valid display name and email address values.
3. Run the script.

Database sizing

Sizing guidelines for Tealeaf databases are based on multiple interdependent factors.

For detailed guidelines, contact Tealeaf Professional Services.

- For general sizing guidelines for IBM Tealeaf CX databases, see "CX Databases" in the *IBM Tealeaf Databases Guide*.
- For general sizing guidelines for IBM Tealeaf cxResults databases, see "cxResults Databases" in the *IBM Tealeaf Databases Guide*.

Setting the recovery model and logging levels for Tealeaf databases

To properly maintain the Tealeaf databases, control their size, and improve performance, Tealeaf recommends using the Simple Recovery Model for SQL Server and compressing the log files.

About this task

If you are experiencing database size and performance issues, review the following steps to set the Recovery model to the Simple setting:

Procedure

1. For each installed Tealeaf database:
 - a) In SQL Server Management Studio, right-click each Tealeaf database and select **Properties**.
 - b) In the dialog, select the **Options** page. Review the setting in the **Recovery Model** drop-down. To reduce the size of the database, set this setting to Simple. Click **OK** at the bottom of the dialog.
 - c) Repeat the above steps for the other Tealeaf databases.
2. Then, stop the Tealeaf Data Collector and Tealeaf Data Service through the Windows Services Control Panel.
3. In SQL Server Management Studio, for each database:
 - a) Right-click the database name. Select **Tasks > Shrink > Files**.
 - b) In the dialog, select Log from the **File Type** drop-down. Click **OK**.
 - c) Repeat the above steps for the other Tealeaf databases.
4. After the above was completed for each database, restart the Tealeaf services.

Results

These steps should reduce the size of your databases and reduce the disk I/O by lowering the amount of logging that is being done.

Managing Tealeaf data

This section contains links to documentation on how to manage critical areas of your Tealeaf data set and the tasks to configure their size and management.

Overview

Section

Description

"Tealeaf Data Flow" in the *IBM Tealeaf cxImpact User Manual*

Overview of how data flows through the Tealeaf system and enters the database

Data aggregation and retention

Section

Description

"Data Aggregation and Retention" in the *IBM Tealeaf cxImpact Administration Manual*

Description of how the Data Collector gathers and aggregates data. Includes references to settings to control Data Collector aggregation and trim operations.

- For more information, see the "Data Aggregation and Retention" in the *IBM Tealeaf cxImpact Administration Manual*.

"CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*

The Data Collector gathers data from individual Tealeaf Canisters for event counts, dimensional data, and other data sources for aggregation and storage in the reporting database.

- For more information, see the "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Data management

Section

Description

"Data Management for Dimensions" in the *IBM Tealeaf Event Manager Manual*

By default, dimensions are configured to enable the capture of all detected values and storage in the database. Often, this data is repeated. If dimension data is allowed to grow without limit, your storage space can be filled.

- For more information, see the "Data Management for Dimensions" in the *IBM Tealeaf Event Manager Manual* section in the "Tealeaf Event Manager Manual" in the *IBM Tealeaf Event Manager Manual*.

"Data Management for Top Movers" in the *IBM Tealeaf Event Manager Manual*

You may configure the automatic creation of Top Movers for newly created events and dimensions. For events and dimensions whose values rarely vary, a Top Mover is not necessary.

- For more information, see the "Data Management for Top Movers" in the *IBM Tealeaf Event Manager Manual* section in the "Tealeaf Event Manager Manual" in the *IBM Tealeaf Event Manager Manual*.

"Managing URL and Other High-Volume Dimensions" in the *IBM Tealeaf Event Manager Manual*

A page of information on how to manage dimensions that capture a high volume of data, using the URL dimension as an example

Task scheduling

Section

Description

"TLBackup and TLRestore" in the *IBM Tealeaf cxImpact Administration Manual*

You can use these utilities to back up and restore your Tealeaf Canister data.

"Preserving and Rebuilding Data" in the *IBM Tealeaf Troubleshooting Guide*

Tealeaf provides several utilities for rebuilding Canister data.

"Scheduling Overnight Tealeaf Tasks" in the *IBM Tealeaf cxImpact Administration Manual*

Some recommendations for when to run various overnight tasks for managing Tealeaf data to reduce overlaps and introduction of inconsistencies in the data

Troubleshooting Tealeaf databases

If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

Note: For some functions of the Tealeaf Database Manager, you must have System Administrator privileges for the SQL Server hosting the Tealeaf databases.

The Tealeaf SQL databases are installed using the Tealeaf Database Manager, which can be used to upgrade or reinstall the databases. Some of these steps may require reinstallation or upgrading. See "Using Tealeaf Database Manager" in the *IBM Tealeaf Databases Guide*.

Note: The Tealeaf Database Manager is used to install the SQL Reporting databases and IBM Tealeaf cxResults databases. It cannot be used to install or update the Canister databases, which are installed as part of the Processing Server through Setup .exe in the initial installation. For more information about those databases, see "CX Installation and Setup" in the *IBM Tealeaf CX Installation Manual*.

- For more information about configuring the Canister databases, see "Configuring the CX Canister" in the *IBM Tealeaf CX Configuration Manual*.

SQL Server configuration

Topics in this section describe ways to correct issues with SQL Server configuration.

Unable to connect to SQL Server

If Tealeaf is unable to connect to the SQL Server database, try the following steps:

About this task

Procedure

1. SQL Server custom ports

- By default, SQL Server listens on port 1433, which is also the default communication port for Tealeaf, unless selected differently during installation. You can verify this value through the SQL Server Configuration Manager.

2. Unable to connect through dynamic ports

- If your SQL Server implementation uses dynamic ports, you must sync your Tealeaf solution with them. See [“Configuring use of SQL Server dynamic ports” on page 79](#).

3. SQL network protocols

- By default, SQL Server does not enable TCP and Named Pipes, which are used by Tealeaf. Verify that these protocols are enabled through the SQL Configuration Manager.

Failure to install due to model database size mismatch

During installation of the Tealeaf databases, the Tealeaf Database Manager may report a failure because of a mismatch between the configured database sizes in Tealeaf and the model database sizes that are configured in SQL Server Management Studio.

About this task

In rare cases, a customer may change the size of the model database size in their SQL Server installation from the default value of 50MB. SQL Server Management Studio does not allow databases to be installed below the model database size. For example, if the model database size is set to 250MB, when the Tealeaf Database Manager attempts to install the Tealeaf databases, some installations fail because they are smaller than this minimum limit.

The solution is to do one of the following:

Procedure

1. Reconfigure the model database size in SQL Server Management Studio to 50MB. For more information, consult the documentation that was provided with your SQL Server product.
2. Reconfigure the database sizes in Tealeaf Database Manager to be slightly larger than the model database size in SQL Server Management Studio. For the above example, you could set the database size to 260MB.
 - Database sizes must be configured through individual filegroups for each database. See "Tealeaf Database Manager Reference" in the *IBM Tealeaf Databases Guide*.

Configuring use of SQL Server dynamic ports

Tealeaf does not natively support use of dynamic ports when accessing SQL Server. If possible, Tealeaf recommends disabling use of dynamic ports.

About this task

When SQL Server starts, a dynamic port is selected. This port is used during operations. During restart, the configured port remains, unless a conflict emerges.

If the ports must remain dynamic, complete the following steps.

Procedure

1. Start all Tealeaf services.
2. Start the database.
3. Through SQL Server Management Studio, locate the port that SQL Server is using.
4. This port must be populated for each database in the Connection dialog of the Tealeaf Database Manager. See "Tealeaf Database Manager Reference" in the *IBM Tealeaf Databases Guide*.
5. In the Tealeaf Database Manager, you can set the ports for the databases.
 - a) From the TDM menu, select **Mode > Info/Config > Report Server Configuration**.
 - b) Populate the ports accordingly. When changes are applied, the registry keys below are updated for you.
 - See "Tealeaf Database Manager Reference" in the *IBM Tealeaf Databases Guide*.
6. Through Tealeaf Database Manager, install or upgrade the databases as necessary.
 - See "Using Tealeaf Database Manager" in the *IBM Tealeaf Databases Guide*.

Results

On the Report Server, database port numbers are in the following registry keys. You can update these through the Tealeaf Database Manager Connecting screen.

Product (Database)

Registry Key

IBM Tealeaf cxImpact (Reports)

Tealeaf Technology > DataStore > Report Server > Port

IBM Tealeaf cxResults (Visitors)

Tealeaf Technology > DataStore > Report Server > Visitor Port

IBM Tealeaf cxReveal (Search)

Tealeaf Technology > DataStore > Database > Search > Database Port

Note: If SQL Server is forced to choose a new dynamic port, then the new port must be used whenever you access the databases through the Connecting screen in the Tealeaf Database Manager and repopulated in the appropriate registry key through the Tealeaf Database Manager using the above steps.

Migrating to a new SQL Server

If you are migrating to a new instance of SQL Server, there are more steps that are required.

See "Migrating Tealeaf Databases" in the *IBM Tealeaf Databases Guide*.

Restore failed when MDF file name is claimed

When restoring databases to a new instance of SQL Server, you may encounter an error similar to the following:

```
Restore failed for Server <MyServer>

Additional information: System.Data.SqlClient.SqlError: File:
'C:\Program Files\Microsoft SQL Server\
MSSQL10_50.MSSQLSERVER\MSSQL\DATA\RL_REPORTS.mdf' is claimed by 'DATA'(3) and
'PRIMARY'(1). The WITH MOVE clause can be used to relocate one or more files.
(Microsoft.SqlServer.Smo)
```

The above issue is caused by the SQL Server restore procedure that converts all of the Tealeaf database names to RL_REPORT.mdf. This situation is typically caused when the new location has a different directory structure or when the databases are moved to a new version of SQL Server.

The solution is to manually append the file name of each data file to include the Filegroup identifier for the file to the end of the file name.

For more information about the appropriate steps to restore the databases, see "Migrating Tealeaf Databases" in the *IBM Tealeaf Databases Guide*.

Poor SQL Server performance on 64-Bit operating systems

Follow this procedure to correct poor SQL Server performance on 64-Bit operating systems.

About this task

Note: If you are using Tealeaf version 8.8 or later, SQL Server 2005 is no longer supported. For more information, see "Supported SQL Server Versions" in the *IBM Tealeaf CX Databases Guide*.

Tealeaf databases are designed to take advantage of 64-bit operating system capabilities. However, because of a Microsoft issue, performance issues may arrive when running SQL Server 2005 on a 64-bit version of Windows. These issues can include the following:

- The performance of SQL Server 2005 decreases suddenly.
- SQL Server 2005 stops responding for a short time.
- A timeout occurs for applications that connect to SQL Server 2005.
- Problems occur when you run even simple commands or use applications on the system.

The issue may be that 64-bit Windows operating system is paging out the working set of the SQL Server process. When the SQL Server process reaches 50 percent of the memory that is allocated for the process on SQL Server 2005 SP2 or later, error messages may begin appearing in the SQL Server error log.

To fix the issue:

Procedure

1. Review the troubleshooting steps on the Microsoft Support site for information about "How to reduce paging of buffer pool memory in the 64-bit version of SQL Server".
2. If the problem persists, you can prevent Windows from paging out the buffer pool memory of the SQL Server process. You can lock the memory by assigning the Lock pages in memory user right to the user account that is the startup account for the SQL Server service.

This step prevents the operating system from paging out memory and instead allows SQL Server to do the paging. See the Microsoft Support site for information about the "Enable the Lock Pages in Memory Option (Windows)".

3. Restart the SQL Server.

SuperSocket information: (SpnRegister): error 1355 in Windows application event log

If the SQL Server is unable to register a Service Principal Name (SPN), a SuperSocket information: (SpnRegister): error 1355 message is thrown.

See the Microsoft Support site for information about the Warning SuperSocket Info warning message.

This message is not an error message. This text is only a warning that SQL Server was not able to register a Service Principal Name (SPN), which indicates that the security mechanism used is Microsoft Windows NT Challenge\Response (NTLM) authentication instead of Kerberos.

CAUSE

The message usually appears because the SQL Server service account is running as a domain user who does not have requisite permissions to register SPNs.

SQL Server blocks access to procedure sys.sp_OAGetProperty

In some environments, the following error may be displayed in the SQL Server error log:

About this task

SQL Server blocked access to procedure 'sys.sp_OAGetProperty' of component 'Ole Automation Procedures' because this component is turned off as part of the security configuration for this server. A system administrator can enable the use of 'Ole Automation Procedures' by using sp_configure. For more information about enabling 'Ole Automation Procedures', see "Surface Area Configuration" in SQL Server Books Online.

sys.sp_OAGetProperty is an automation procedure that allows access to system details. Tealeaf uses this stored procedure to acquire details on disk space.

Note: If access to the sys.sp_OAGetProperty procedure is not enabled:

1. The Database Filegroup Size and Database Table Size reports in the Portal do not contain free space and unused space information.
2. Available disk space on SQL Server is not recorded and does not appear in the Tealeaf Event Log.

The error message is harmless. However, to avoid confusion, you may want to deny access to pr_ServerDiskSpace, which uses this stored procedure. When access is denied, error messages are reported from pr_ServerDiskSpace, instead of sys.sp_OAGetProperty. Error messages from the latter procedure may suggest possible hacks or malicious software, so unnecessary messages should be suppressed.

To deny access, run the following through SQL Server Management Studio:

```
use TL_STATISTICS
go
Deny execute on pr_ServerDiskSpace to TLAdmin;
Deny execute on pr_ServerDiskSpace to TLUser;

use TL_visreport
go
Deny execute on pr_ServerDiskSpace to TLAdmin;
Deny execute on pr_ServerDiskSpace to TLUser
```

Tealeaf database configuration

Topics in this section describe ways to correct issues with Tealeaf database configuration.

Unable to connect

If you are unable to access the Tealeaf database, you should verify that you are using the appropriate full-qualified host name.

If you are running against a named database instance, then the host name must follow a specific format:

<host_name>\<instance_name>

where

<host_name> is the IP address, the machine name, or localhost

<instance_name> is the name of the DB instance.

See "Using Tealeaf Database Manager" in the *IBM Tealeaf Databases Guide*.

During upgrade, Tealeaf Database Manager fails to upgrade the Result Set Extractor

In some situations, the Database Manager fails to upgrade the Results Set Extractor.

The required views do not exist. The RSE Database must be re-created. See ["Result set extractor database for cxResults" on page 85](#).

Related tasks

[Result set extractor database for cxResults](#)

During an upgrade or reinstall of the RSE database, you may encounter the following error message, which is followed by a table create statement:

Failing to create database in clustered server environment

During installation into a clustered server environment, if you are seeing error messages during creation, you may have improperly specified your SQL path to a disk that is not part of the cluster group or dependency list.

To resolve the cluster dependency issue, see information in the Microsoft Support site about "How to create databases or change disk file locations on a shared cluster drive on which SQL Server was not originally installed" .

In the Tealeaf Database Manager, you should also verify the path where the database files are stored. If you do not know the path to a remote server, contact the appropriate person.

Note: The path must be the absolute path relative to the SQL Server. Network paths are not permitted.

See "Using Tealeaf Database Manager" in the *IBM Tealeaf Databases Guide*.

Tealeaf database performance

Tealeaf database performance can be effected by the amount of memory allocated and by database fragmentation.

Use the information in this section to address database performance issues related to memory usage and fragmentation.

Memory allocation

You may need to adjust memory allocation for Tealeaf databases to resolve some problems.

About this task

If any of the following conditions are occurring:

Procedure

1. Tealeaf is performing slowly
2. Reports are delayed in arriving
3. The box running SQL Server is having paging or disk I/O problems

Results

The memory that is allocated for SQL Server may be set too low. You can verify and change the amount of memory that is allocated to the Tealeaf databases in the SQL Server Management Studio.

Fragmentation

Normal database operations may cause the hard disk drive media and the stored Tealeaf databases to become fragmented. Over time, disk fragmentation can significantly affect performance.

- As part of regular server maintenance, your DBA should perform disk fragmentation checks and defragment disks periodically.

The Tealeaf database indexes can also become fragmented. Periodically, these should be defragmented to ensure optimal performance.

Note: Generally, database index fragmentation should be kept below 20%.

- **Release 7.1 or earlier:** You can run fragmentation checks and defragmentation tasks through Microsoft SQL Server Administration Console. For more information, consult the documentation that came with the product.
- **Release 7.2:** Through the Tealeaf Database Manager, you can check the fragmentation status of your database indexes and run defragmentation tasks as needed. See "Using Tealeaf Database Manager" in the *IBM Tealeaf Databases Guide*.

Tealeaf Database Manager hangs when upgrading the System database

The Tealeaf Database Manager may hang when the System database is being upgrade if other components of the system are running.

About this task

While this situation may be caused by multiple factors, in many cases the cause is the presence of an active Stats Logger session agent in the Windows pipeline of the Report Server. This session agent is used to collect statistical information in the pipeline and submit it to the Statistics database for use in Portal-based reports.

- See "Statistics Logger Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

The active session agent may be keeping the Statistics database open and therefore unavailable to the Tealeaf Database Manager, which causes it to hang.

Possible solutions

About this task

To resolve this issue, you may pursue any of the following solutions:

Procedure

1. Stop the Transport Service before you start the Database Manager.

Note: As soon as you stop the Transport Service, hits are dropped and data is lost.

- a) After you use the Database Manager, you must remember to restart the Transport Service through TMS.

- See "Configuring the Transport Service" in the *IBM Tealeaf CX Configuration Manual*.
- See "TMS WorldView Tab" in the *IBM Tealeaf cxImpact Administration Manual*.

2. Remove or disable the Stats Logger session agent from your processing pipeline.

Note: Tealeaf recommends disabling the Stats Logger session agent during Database Manager operations in an All-in-One system.

- a) When the session agent is removed from the pipeline, you may start the Database Manager.
- b) Remember to add it back through TMS after you exited the Database Manager.

- See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

3. If the Stats Logger session agent is part of a dedicated child pipeline in the Canister, you can disable the whole pipeline through TMS.

- See "TMS Pipeline Editor" in the *IBM Tealeaf cxImpact Administration Manual*.

Addressing issues with various Tealeaf databases

Use information in this section to learn how to address issues that might occur with various Tealeaf databases.

Visitor database for cxResults

The Visitor database applies to IBM Tealeaf cxResults. IBM Tealeaf cxResults is no longer available as a newly licensed product as of Release 8.7. Customers that licensed IBM Tealeaf cxResults in Release 8.6 and earlier may continue to use and receive support for the product in Release 8.7 and later. For more information, contact [Tealeaf Customer Support](#).

Although there is a data connection timeout setting for the Visitor database, the default value is set high. It should not need to be changed.

Data connection timeout in Visitor database

Although there is a data connection timeout setting for the Visitor database, the default value is set high. It should not need to be changed.

Result Set Extractor Database for cxResults

Result set extractor database for cxResults

During an upgrade or reinstall of the RSE database, you may encounter the following error message, which is followed by a table create statement:

About this task

```
Failed to create the database views:  
Invalid object name 'RSE_HITSTATISTICS'.
```

In this case, the RSE database may be missing some views. In this case, the RSE database empty. To resolve this issue, the database must be re-created:

Procedure

1. Run the Tealeaf Database Manager. See "Using Tealeaf Database Manager" in the *IBM Tealeaf Databases Guide*.
2. Select **Advanced mode**.
3. In the Database Install tab, click **Create**.
4. In the Database Type pane, click **RSE**.
5. Click **Run**. The RSE database is re-created.
 - Review and observe any generated error messages.
6. After the reinstallation is complete, you may upgrade the database. See "Using Tealeaf Database Manager" in the *IBM Tealeaf Databases Guide*.

Search database for cxReveal

cxReveal database install forces collation setting

If you attempted to install the IBM Tealeaf cxReveal search database, the database collation setting may be forced to the following:

About this task

```
SQL_Latin1_General_CP1_CI_AS
```

This setting is configured regardless of the collation setting in SQL Server, which presents a problem for international customers, specifically those in Europe.

The solution to drop and reinstall the TL_SEARCH database through the Tealeaf Database Manager.

Note: Before you begin, verify that the System database (TL_SYSTEM) and the Reports database (TL_REPORTS) were installed or upgraded to the version for which you are installing the TL_SEARCH database.

Procedure

1. On the Portal Server, start the Tealeaf Database Manager.
2. From the TDM menu, select **Mode > Database Setup > Single Database Mode**.
3. Drop the Search (TL_SEARCH) database:

- a) From the Single Database Options screen, select Search from the Database drop-down.
- b) From the Action drop-down, select Uninstall.
- c) Click **OK**.
- d) The database is uninstalled.

4. Create the Search database:

- a) Use the Search database creation script, which is provided in the following location:

```
<Tealeaf_install_directory>\SQL\DBCreateScripts\CREATE_TL_SEARCH.sql
```

- b) Start the Tealeaf Database Manager.
 - c) From the TDM menu, select **Mode > Database Setup > Single Database Mode**.
 - d) From the TDM menu, select **DB Creation > Create Databases** so that the option is not selected.
 - e) From the Single Database Options screen, select Search from the Database drop-down.
 - f) From the Action drop-down, select Install.
 - g) Click **OK**.
5. The Search database is installed with the proper collation setting.
6. If you are performing further installation operations, you might want to re-enable the Create Databases option. From the TDM menu, select **DB Creation > Create Databases** so that the option is selected.

Configuration issues

Use the information in this section to troubleshoot database configuration and data collection issues.

Data collection

Poor data collection performance

If the data collection process is consuming large volumes of memory or failing to finish, you may need to adjust the Data Collector Batch Size setting, which defines the maximum number of records to extract or load for the Data Collector in a single batch. The default value is set to 2000.

Note: Do not set this value over 5000.

See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Slow data collection times

Typically, data collection should run in under 5 minutes. If the data collection process is more than 10 minutes, then you should increase the size of the Data Trim Interval setting.

The default value is 1 - Hourly. Setting it to a larger value causes this process to run less frequently. However, you should see temporary spikes in the size of your database.

See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Database connection timeouts

If your Tealeaf databases are experiencing repeated timeouts, you may need to adjust the Database Connection Timeout setting. The default connection timeout is set to 30 seconds. After the system was running for a while and traffic was increased, your hardware may not be able to manage the traffic level at the current setting.

Try setting this value to double its current value. If it happens again, double it again.

Note: If you must set the connection timeout above 300 seconds (5 minutes), you may have more issues in your environment.

See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

Data collection performance from multiple canisters

By default, Tealeaf can collect from two canisters at one time. If your environment has more canisters, you can increase the size of the Data Collection - Max Concurrent setting. The appropriate setting depends on your hardware environment.

About this task

- See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

If you notice any of the following:

Procedure

1. Some slow-down in data collection
2. Errors in the data collection process
3. The canisters are busy

Results

Then you should try decreasing this setting.

Database is getting too large

If the size of your database is pushing the limits of your storage, you may consider adjusting some settings.

About this task

Procedure

1. If you do not use the Page Performance reports, you do not need to collect the Path Statistics. You can disable the Path Statistics collection to save significant database space.
 - See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.
2. In SQL Server Management Studio, check the Recovery Model setting for each database. If the Recovery Model is set to Full, the databases and their log files can grow larger. See "Database Sizing" in the *IBM Tealeaf Databases Guide*.

Error - an existing connection was forcibly closed by the remote host

When this error occurs frequently, you should check log information as described here.

From time to time, the Data Collector may register the following log message:

```
An existing connection was forcibly closed by the remote host
```

This error indicates that SQL Server or the server hosting it closed the connection unexpectedly. Typically, SQL Server was restarted, or an operation that required closing all existing connections was run, such as a backup or restore operation.

When these errors occur sporadically, they do not affect data collection or the validity of the data.

Note: If these errors are occurring frequently, verify that data collection is actually completing. You can review the log information for the most recent Data Collector that is run through the Portal. See "Portal Logs" in the *IBM Tealeaf cxImpact Administration Manual*.

Visitor Database Extractor

The Visitor Database Extractor is used to extract session data from the database and to insert it into the staging tables for the Visitor database. This section provides some suggestions for how to troubleshoot issues with the VDB Extractor.

- See "Configuring the Scheduling Service" in the *IBM Tealeaf CX Configuration Manual*.

Unable to search for visitors

If you are unable to complete searches of the Visitor database or are no longer getting updated results, the Visitor database extractor job may be disabled.

For more information about enabling this job, see "Configuring the Scheduling Service" in the *IBM Tealeaf CX Configuration Manual*.

Addressing intermittent Search Server connection errors report error code 12029

Periodically, Search Server may return errors with a message indicating that a connection to the server could not be established.

About this task

Here is an example of the message:

```
An error occurred while executing the search.  
<ServerName> - Error: (12029) A connection with the server could  
be established
```

Use the procedure in the following topic troubleshoot server connection errors.

Troubleshooting database upgrades

During the upgrade of one or more Tealeaf databases, you might receive an error similar to the following:

```
Invalid filegroup <name> specified.
```

Where <name> is the database file name.

The error indicates that the database file <name> is missing. To fix this issue, you must determine if the database that contains the file is supposed to contain a single filegroup or not.

Note: The only Tealeaf database that contains a single filegroup is the TL_REPORTS database if it was upgraded from a Release 4.x version of Tealeaf. All other Tealeaf databases contain multiple filegroups.

If the database contains a single filegroup, use the Tealeaf Database Manager to reinstall the database.

If the database contains multiple filegroups, a missing filegroup indicates database corruption and might require rebuilding the database or restoring from backup.

Invalid filegroup specified error during database upgrade

During the upgrade of one or more Tealeaf databases, you may receive an error similar to the following:

```
Invalid filegroup <name> specified.
```

This error indicates that the database file (<name>) is missing.

To fix this issue, you must determine if the database containing the file is supposed to contain a single filegroup or not.

If the database contains a single filegroup

Note: The only Tealeaf database containing a single filegroup is the TL_REPORTS database if it was upgraded from a Release 4.x version of Tealeaf. All other Tealeaf databases contain multiple filegroups.

Try reinstalling the database through the Tealeaf Database Manager. See "Installing Tealeaf Databases" in the *IBM Tealeaf Databases Guide*.

If the database contains multiple filegroups, including the missing one:

If the database is not a single filegroup database, a missing filegroup indicates database corruption. This serious issue may require rebuilding the database or restoring from backup.

- For more information, contact Tealeaf <http://support.tealeaf.com>.

Checklist

If you are still experiencing difficulties with your Tealeaf databases, acquire the following information from your system:

About this task

Procedure

1. Acquire the full specs of the box running the Reporting/SQL Server, including CPU, RAM, and information about each hard disk drive. Drive information should include number of drives, contents of each drive, and available disk space.
2. Acquire the version of Tealeaf that is in use. Improvements may be made in subsequent Tealeaf releases.
3. What is the traffic load? How many pages per day? How many events per page? How many pages per session?
4. Is the entire Portal sluggish or certain items in the Portal?
 - If the latter, the problem is likely caused by issues with the code or configuration of the individual item(s).
5. Set Log Level = 9. Acquire a day or two of TealeafReportingSvc.log messages.
 - This information is useful for troubleshooting.
6. On the SQL Server, open **Performance Monitor**. Watch the Avg. Disk Queue and Page/Sec counters for 5 to 10 minutes. Are either of them consistently pegged through the roof?
 - Does **Performance Monitor** show much paging on the box? This may indicate that the Data Service is starved for memory.
7. How large is the TL_REPORTS database?

Results

When you acquired the above information, open a support ticket with <http://support.tealeaf.com>.

CX databases

This section provides some overview information on each of the IBM Tealeaf CX databases.

Note: The following filegroup reference information applies to new installations of the databases for Tealeaf Release 8.0 or later. Filegroups for upgraded versions of the databases reflect the earlier version's layout with new filegroups added, based on the new scheme.

System database

The system database is required for the configuration and operation of all Portal and Reporting capabilities. It contains all Tealeaf system information that is created through the configuration and use of Tealeaf.

It contains the following data specific to the customer environment:

- Tealeaf user information
- Dashboards definitions
- Scorecards definitions
- Report definitions
- System log information
- Event definitions
 - Step-based event definitions

Filegroups

Filegroup Description

PRIMARY

Contains SQL Server database-specific information, including temp space and data management inside the database. Does not contain any Tealeaf data.

CONFIG

System configuration information contains all Tealeaf system configuration information, user profiles, and report definitions.

INDEX

Contains indexes on all tables in the database.

APP_LOGS

Contains log tables for various components of the Tealeaf application.

Sizing

This database is small, typically between 500 MB and 1 GB. It might experience some growth during normal operation because system logging data is written in to the database.

Filegroups

Filegroup Description

PRIMARY

Contains SQL Server database-specific information, including temp space and data management inside the database. Does not contain any Tealeaf data.

CONFIG

System configuration information contains all Tealeaf system configuration information, user profiles, and report definitions.

INDEX

Contains indexes on all tables in the database.

APP_LOGS

Contains log tables for various components of the Tealeaf application.

Sizing

This database is small, typically between 500 MB and 1 GB. It might experience some growth during normal operation because system logging data is written in to the database.

Reporting database

This database contains statistical information about traffic that is captured from monitored customer applications.

This information is collected from the Tealeaf canister(s), aggregated, and stored for use in reporting.

Note: All tables containing indexes are stored in the Reporting database, which enables accurate "point in time" snapshots to be made by performing a backup of this single database.

Filegroups

Filegroup Description

PRIMARY

Contains SQL Server database-specific information, including temp space and data management inside the database. Does not contain any Tealeaf data.

DATA

Contains miscellaneous short-term lookup data

CANDATA

Contains the unaggregated data that is collected from the Processing servers

AGGDATA

Contains hourly aggregated event reporting data

AGGINDEX

Contains indexes for the tables in the AGGDATA filegroup

AGGDATAALT

Contains daily aggregated event reporting data

AGGINDEXLT

Contains indexes for the tables in the AGGDATAALT filegroup

AGGKEY

Contains the dimension report group key information that is used to aggregate dimension data

AGGKEYINDEX

Contains the indexes on the tables in AGGKEY

DIMVALUES

Contains tables that hold all dimension values used in reporting

DIMINDEX

Contains the indexes for the tables in DIMVALUES

EVENTDATA

Contains scorecard and top movers data

EVENTINDEX

Contains the indexes for tables in EVENTDATA

PERFDATA

Contains all hourly Performance reporting data

PERFINDEX

The indexes for the data in PERFDATA

PERFDATAALT

Contains all daily Performance reporting data

PERFINDEXLT

The indexes for the data in PERFDATAALT

Sizing

The reporting database can be large. Its size is determined by the amount of traffic that flows through the website and the length of time for which you want to retain the reporting data.

Note: For more information about sizing any Tealeaf database, contact Tealeaf Professional Services.

Filegroups**Filegroup****Description****PRIMARY**

Contains SQL Server database-specific information, including temp space and data management inside the database. Does not contain any Tealeaf data.

DATA

Contains miscellaneous short-term lookup data

CANDATA

Contains the unaggregated data that is collected from the Processing servers

AGGDATA

Contains hourly aggregated event reporting data

AGGINDEX

Contains indexes for the tables in the AGGDATA filegroup

AGGDATAALT

Contains daily aggregated event reporting data

AGGINDEXLT

Contains indexes for the tables in the AGGDATAALT filegroup

AGGKEY

Contains the dimension report group key information that is used to aggregate dimension data

AGGKEYINDEX

Contains the indexes on the tables in AGGKEY

DIMVALUES

Contains tables that hold all dimension values used in reporting

DIMINDEX

Contains the indexes for the tables in DIMVALUES

EVENTDATA

Contains scorecard and top movers data

EVENTINDEX

Contains the indexes for tables in EVENTDATA

PERFDATA

Contains all hourly Performance reporting data

PERFINDEX

The indexes for the data in PERFDATA

PERFDATAALT

Contains all daily Performance reporting data

PERFINDEXLT

The indexes for the data in PERFDATAALT

Sizing

The reporting database can be large. Its size is determined by the amount of traffic that flows through the website and the length of time for which you want to retain the reporting data.

Note: For more information about sizing any Tealeaf database, contact Tealeaf Professional Services.

Statistics database

The statistics database contains performance information about the IBM Tealeaf CX system itself. It is used to monitor the systems health and to aid in troubleshooting if an issue arises.

Filegroups**Filegroup****Description****PRIMARY**

No Tealeaf data. Used by MSSQL Server for temp space and data management inside the database

DATA

Tealeaf system statistics data

INDEX

Indexes for the database

LOG

The database log

Sizing

This database should remain fairly small. Statistics gathering may be turned off by the user, in which case this database should never grow. If statistics are being gathered, then the size of the database is determined by the length of time the data is kept before being trimmed.

Filegroups

Filegroup Description

PRIMARY

No Tealeaf data. Used by MSSQL Server for temp space and data management inside the database

DATA

Tealeaf system statistics data

INDEX

Indexes for the database

LOG

The database log

Sizing

This database should remain fairly small. Statistics gathering may be turned off by the user, in which case this database should never grow. If statistics are being gathered, then the size of the database is determined by the length of time the data is kept before being trimmed.

Reports

Tealeaf captures statistical information from these databases, which is available through the Portal.

- See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.
- See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

cxResults databases

The filegroup reference information in this section applies to new installations of the databases for Tealeaf Release 8.0 or later. Filegroups for upgraded versions of the databases reflect the earlier version's layout with new filegroups added, based on the new scheme.

Session Segment database

This database contains analytical data that is parsed from sessions that are identified by Tealeaf users through the search functionality.

Note: The session segment database is only found on IBM Tealeaf systems that were upgraded from release 9.0.1 or earlier. Session segment analysis is no longer available beginning with IBM Tealeaf version 9.0.2.

The data is used to provide in-depth analysis of groups of sessions pertaining to a particular issue or event.

Filegroups

Filegroup Description

PRIMARY

Used for short-term storage and for the storage of small lookup tables.

DATA

Stores the analytic data that is used for session segment analysis.

INDEX

Non-clustered index storage.

Sizing

This database can be fairly large. Its size is dependent on the number and size of session segments being analyzed. If session segment analysis is not being used, this database should experience no growth.

Visitor Staging database

The Visitor Staging database contains the raw data that is extracted from sessions in the Tealeaf canisters.

The data is extracted into this database to provide flexibility in other ETL operations and to separate those operations from the reporting capabilities of IBM Tealeaf cxResults.

Filegroups

Filegroup	Description
-----------	-------------

PRIMARY	Contains basic database configuration and SQL Server information.
----------------	---

VISITOR	Contains the unique visitor information that is extracted from the canister sessions.
----------------	---

VISITORINDEX	Contains index information for the tables in the Visitor filegroup.
---------------------	---

SESSION	Contains the raw session information that is extracted from the Tealeaf canisters.
----------------	--

SESSIONINDEX	Contains index information about the tables in the Session filegroup.
---------------------	---

EVENT	Contains the raw event data that is extracted from the Tealeaf canister sessions.
--------------	---

EVENTINDEX	Contains index information about the tables in the Event filegroup.
-------------------	---

DATA	Look up and Index data for the VDB extract process
-------------	--

Sizing

Under normal operation the Staging database contains only one week of information. Assuming that traffic levels on the website remain relatively constant, this database should reach a stable size and remain relatively unchanged. The actual size of the database can be fairly large and varies depending several factors. Refer to the database sizing section for further details.

Visitor Reporting database

The Visitor Reporting database contains a snapshot of the visitor data that is contained in the Tealeaf canisters.

This data supports the search and reporting capabilities IBM Tealeaf cxResults application. The data is loaded through an ETL process from the Staging database.

Filegroups

Filegroup	Description
-----------	-------------

PRIMARY	Contains basic database configuration and SQL Server information.
----------------	---

DATA	Contains the segment information that is generated through searches in the IBM Tealeaf cxResults application.
-------------	---

LOOKUP	Contains largely static lookup information for use in reporting (for example, event definitions, reference information, and so on).
---------------	---

VISITOR

Contains all unique visitor information.

SESSION

Contains all the extracted session information.

EVENT

Contains all the information about events the fired in the customers system.

INDEX

Contains all the indexes for the database.

Sizing

The reporting database contains a snapshot of the visitor information that passes through the customers website. The time interval of the snapshot is configurable and is typically 2 - 3 months. As a result, this database can be quite large, but its size should stabilize after the first time interval. At that point, the snapshot functions like a rolling window, removing older data and replacing it with current data. For exact sizing information, refer to "Database Sizing" in the *IBM Tealeaf Databases Guide*.

Reports

Tealeaf captures statistical information from these databases, which is available through the Portal.

- See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.
- See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.

cxResults Visitor database

This section provides some overview information about the IBM Tealeaf cxResults databases.

Overview

The Visitor database included with IBM Tealeaf cxResults captures and retains detailed information about individual visitors and their activities on your website and enables you to make direct queries of that data.

Hosted in Microsoft SQL Server, this relational database allows Portal- and script-driven access to visitor data, which greatly enhances the reporting reach of the Tealeaf system.

Note: As of Release 8.8, IBM Tealeaf CX requires SQL Server 2008 or later. Before you install or upgrade your database, review the instructions for managing the SQL Server upgrade first. See "Upgrading SQL Server for Tealeaf" in the *IBM Tealeaf Databases Guide*.

Prerequisites

The Visitor database can be installed in the same SQL Server instance as IBM Tealeaf CX databases, or you can install it in a separate instance.

- If you are installing IBM Tealeaf cxResults in a separate instance, you should review the pre-installation requirements. See "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*.

Note: Whether you are installing in the same system as the IBM Tealeaf CX databases or in a separate system, you should review the database server requirements, which recently changed and may be different from when you initially installed. See "CX Pre-Installation Checklist" in the *IBM Tealeaf CX Installation Manual*.

Administration reference

Before you begin installation, you should review the advanced administration topics in the IBM Tealeaf cxImpact Administration Manual to learn the required logins, storage requirements, backup strategies, and other useful information.

See "Database Administration" in the *IBM Tealeaf Databases Guide*.

- For more information about the specific databases, filegroups, and their sizing requirements that are provided with IBM Tealeaf cxResults, see "cxResults Databases" in the *IBM Tealeaf Databases Guide*.

The IBM Tealeaf cxResults database schema is published online. See "Visitor Database Schema" in the *IBM Tealeaf Databases Guide*.

Installation

The Visitor database can be installed through the Tealeaf Database Manager, an external utility that can be used to install one or more Tealeaf databases, including the generation of required permissions scripts for the database users.

Permissions

The Tealeaf Database Manager requires specific permissions to install Tealeaf databases.

Upgrading

If you are installing the Visitor database as part of an upgrade of your Tealeaf system, the Tealeaf Database Manager handles most upgrades seamlessly. Depending on your configuration, you may be required to install in Advanced mode, which requires extra manual steps.

Dimensional data

Note: The use of dimensional data in IBM Tealeaf cxResults is not supported in this release.

Beginning Installation

When you are ready to begin your installation, launch the Tealeaf Database Manager.

Related concepts

[Database manager SQL Server access and permission requirements](#)

Some Tealeaf Database Manager functions require specific permissions on the SQL Server instance. This section describes these permissions and the procedures for working around situations where these permissions cannot be granted.

Related reference

[Using Tealeaf Database Manager](#)

The Tealeaf Database Manager provides a simple graphical interface through which you can install or update the SQL Server Reporting database. Through the interface, you can configure your database installation options, which can include completing the installation or generating the SQL scripts that can create the databases later.

[Migrating Tealeaf databases](#)

If you are moving Tealeaf databases to a new instance of SQL Server, complete the following steps to ensure a smooth migration.

[Installing Tealeaf databases](#)

This section contains server requirements and sequences of steps for installing Tealeaf databases for this release.

Troubleshooting

You can troubleshoot if you encounter difficulties during the installation or upgrade of the Visitor database.

Related reference

[Troubleshooting Tealeaf databases](#)

If you are experiencing an access or performance-related issue with your installed Tealeaf SQL database, review the troubleshooting tips in this section, which may help to resolve your issue.

Visitor Database Schema

Tealeaf publishes a set of views in the Visitor Reporting database to facilitate custom reports and queries against the data. These views will be maintained in future releases regardless of underlying schema changes.

Note: It is strongly recommended that any custom reports or queries reference the views and avoid directly referencing the underlying tables.

Table 5. Visitor Database Schema		
View Name	Description	Columns
VW_DATASET	Lists the current segments in the database along with their sessions and a count of how many times each session matched the search terms.	ID, VISITOR_ID, SESSION_ID, MATCH_1, MATCH_2, MATCH_3, MATCH_4
VW_EVENT	Returns the list of all regular event occurrences for sessions currently in the database.	ID, TIMESTAMP, VISITOR_ID, SESSION_ID, UNIQUE_ID, URL, PREV_URL, SERVER, HOST, APP, HIT_NUMBER, VALUE Note: Beginning in Release 8.0, the structure of Tealeaf events changed. To maintain consistency with previous versions of IBM Tealeaf cxResults, the columns in VW_EVENT remain unchanged. In Release 8.0 and later, however, the following columns contain null values: UNIQUE_ID, PREV_URL, SERVER, HOST, and APP.
VW_NUMERIC_EVENT	Returns the list of all numeric event occurrences for sessions currently in the database.	ID, TIMESTAMP, VISITOR_ID, SESSION_ID, UNIQUE_ID, URL, PREV_URL, SERVER, HOST, APP, HIT_NUMBER, VALUE
VW_REPORTS	Returns the list of defined visitor report types. Any report added using the steps for creating a custom report should appear in this view.	ID, IDENTIFIER, DISPLAY_NAME, CUSTOM, FORMAT, STORED_PROCEDURE
VW_SESSION	Returns the list of sessions currently contained in the Visitor database.	CANISTER_SESSION_ID, TLTSID, START, END, LENGTH, REPEAT_VISIT, PAGE_COUNT, REQUEST_SIZE, RESPONSE_SIZE, IP, LOGIN, USERDEF1, USERDEF2, USERDEF3, USERDEF4, FIRST_PAGE, LAST_PAGE, REFERRER, BROWSER, HOSTNAME, FILE

Table 5. Visitor Database Schema (continued)

View Name	Description	Columns
VW_SESSION_ATTRIBUTE	Returns session attribute data.	<ul style="list-style-type: none"> SESSION_ID - Database session ID for joining to session and event data CANISTER_SESSION_ID - The session ID from the Canister TLTSID - the session's TLTSID ATTRIBUTE_ID - The database ID for the session attribute ATTRIBUTE_TYPE - T for text attributes; N for numeric attributes ATTRIBUTE_VALUE - The value represented as a sql_variant. Based on the ATTRIBUTE_TYPE column, it can be cast to either NVARCHAR or FLOAT. HOSTNAME - The server name of the Canister FILENAME - The Canister file containing the session
VW_SESSION_EVENT	Returns the same list of sessions as VW_SESSION with the addition of a comma separated list of event UNIQUE_ID values. This view is less efficient than VW_SESSION and should only be used when the event list is required.	CANISTER_SESSION_ID, TLTSID, START, END, LENGTH, REPEAT_VISIT, PAGE_COUNT, REQUEST_SIZE, RESPONSE_SIZE, IP, LOGIN, USERDEF1, USERDEF2, USERDEF3, USERDEF4, FIRST_PAGE, LAST_PAGE, REFERRER, BROWSER, HOSTNAME, FILE, EVENT_UNIQUEIDS
VW_VISITOR	Returns data on the list of visitors in the database.	ID, VISITOR_ID, FIRST_VISIT, LAST_VISIT, LOOKUP
VW_VISITOR_STATISTICS	Returns database wide statistics grouped in hour intervals.	UNIQUE_VISITORS, TOTAL_VISITS, ONE_HIT_VISITS, NEW_VISITS, REPEAT_VISITS

Examples

This section provides some examples of views that were created by using the visitor database schema.

Retrieve a list of the top IP addresses for a segment

The variables @top and @dataset must be defined or substituted for numeric values.

```
SELECT TOP(@top) s.IP IP, count(s.ID) [COUNT]
FROM VW_DATASET ds
JOIN VW_SESSION s on s.ID = ds.SESSION_ID
WHERE ds.ID = @dataset
GROUP BY s.IP
ORDER BY [COUNT] DESC;
```

cxReveal database

The IBM Tealeaf cxReveal (TL_SEARCH) database stores session attribute data and other session-related data in the database as soon as it is captured. This immediate capture allows rapid access to sessions for IBM Tealeaf cxReveal users and fast response times when querying through the Portal for sessions.

In the database, data is stored in individual tables for each day.

The IBM Tealeaf cxReveal database requires the following:

- IBM Tealeaf cxReveal license
- IBM Tealeaf cxConnect for Data Analysis license (for Event Bus)

Filegroups

- **PRIMARY** - The default filegroup for the database. Used by SQL Server for record keeping and management in the database.
- **LOOKUP** - Contains all non-search Tealeaf data.
- **INDEX** - Contains the non-clustered indexes for the data in the LOOKUP filegroup.
- **SESSION** - Contains the searchable session data.
- **SESSION_INDEX** - The non-clustered indexes on the searchable data.

Sizing

The size of the database correlates directly to the number of sessions per day that are processed by Tealeaf. For each session, one row is created and stored while the session is retained in the source Canister.

- For most customers, this database should range from 50 GB to 300 GB.

Reports

Tealeaf captures statistical information from this database, which is available through the Portal.

Filegroups

- **PRIMARY** - The default filegroup for the database. Used by SQL Server for record keeping and management in the database.
- **LOOKUP** - Contains all non-search Tealeaf data.
- **INDEX** - Contains the non-clustered indexes for the data in the LOOKUP filegroup.
- **SESSION** - Contains the searchable session data.
- **SESSION_INDEX** - The non-clustered indexes on the searchable data.

Sizing

The size of the database correlates directly to the number of sessions per day that are processed by Tealeaf. For each session, one row is created and stored while the session is retained in the source Canister.

- For most customers, this database should range from 50 GB to 300 GB.

Reports

Tealeaf captures statistical information from this database, which is available through the Portal.

IBM Tealeaf documentation and help

IBM Tealeaf provides documentation and help for users, developers, and administrators.

Viewing product documentation

All IBM Tealeaf product documentation is available at the following website:

[Tealeaf Customer Experience Support](#)

Use the information in the following table to view the product documentation for IBM Tealeaf:

Table 6. Getting help	
To view...	Do this...
Product documentation	On the IBM Tealeaf portal, go to ? > Product Documentation .
IBM Tealeaf Knowledge Center	On the IBM Tealeaf portal, go to ? > Product Documentation and select <i>IBM Tealeaf Customer Experience in the ExperienceOne Knowledge Center</i> .
Help for a page on the IBM Tealeaf Portal	On the IBM Tealeaf portal, go to ? > Help for This Page .
Help for IBM Tealeaf CX PCA	On the IBM Tealeaf CX PCA web interface, select Guide to access the <i>IBM Tealeaf CX PCA Manual</i> .

Available documents for IBM Tealeaf products

The following table is a list of available documents for all IBM Tealeaf products:

Table 7. Available documentation for IBM Tealeaf products	
IBM Tealeaf products	Available documents
IBM Tealeaf CX	<ul style="list-style-type: none">• <i>IBM Tealeaf Customer Experience Overview Guide</i>• <i>IBM Tealeaf CX Client Framework Data Integration Guide</i>• <i>IBM Tealeaf CX Configuration Manual</i>• <i>IBM Tealeaf CX Cookie Injector Manual</i>• <i>IBM Tealeaf CX Databases Guide</i>• <i>IBM Tealeaf CX Event Manager Manual</i>• <i>IBM Tealeaf CX Glossary</i>• <i>IBM Tealeaf CX Installation Manual</i>• <i>IBM Tealeaf CX PCA Manual</i>• <i>IBM Tealeaf CX PCA Release Notes</i>

Table 7. Available documentation for IBM Tealeaf products (continued)

IBM Tealeaf products	Available documents
IBM Tealeaf CX	<ul style="list-style-type: none"> • <i>IBM Tealeaf CX RealTime Viewer Client Side Capture Manual</i> • <i>IBM Tealeaf CX RealTime Viewer User Manual</i> • <i>IBM Tealeaf CX Release Notes</i> • <i>IBM Tealeaf CX Release Upgrade Manual</i> • <i>IBM Tealeaf CX Support Troubleshooting FAQ</i> • <i>IBM Tealeaf CX Troubleshooting Guide</i> • <i>IBM Tealeaf CX UI Capture j2 Guide</i> • <i>IBM Tealeaf CX UI Capture j2 Release Notes</i>
IBM Tealeaf cxImpact	<ul style="list-style-type: none"> • <i>IBM Tealeaf cxImpact Administration Manual</i> • <i>IBM Tealeaf cxImpact User Manual</i> • <i>IBM Tealeaf cxImpact Reporting Guide</i>
IBM Tealeaf cxConnect	<ul style="list-style-type: none"> • <i>IBM Tealeaf cxConnect for Data Analysis Administration Manual</i> • <i>IBM Tealeaf cxConnect for Voice of Customer Administration Manual</i> • <i>IBM Tealeaf cxConnect for Web Analytics Administration Manual</i>
IBM Tealeaf cxOverstat	<i>IBM Tealeaf cxOverstat User Manual</i>
IBM Tealeaf cxReveal	<ul style="list-style-type: none"> • <i>IBM Tealeaf cxReveal Administration Manual</i> • <i>IBM Tealeaf cxReveal API Guide</i> • <i>IBM Tealeaf cxReveal User Manual</i>
IBM Tealeaf cxVerify	<ul style="list-style-type: none"> • <i>IBM Tealeaf cxVerify Installation Guide</i> • <i>IBM Tealeaf cxVerify User's Guide</i>
IBM Tealeaf cxView	<i>IBM Tealeaf cxView User's Guide</i>
IBM Tealeaf CX Mobile	<ul style="list-style-type: none"> • <i>IBM Tealeaf CX Mobile Android Logging Framework Guide</i> • <i>IBM Tealeaf Android Logging Framework Release Notes</i> • <i>IBM Tealeaf CX Mobile Administration Manual</i> • <i>IBM Tealeaf CX Mobile User Manual</i> • <i>IBM Tealeaf CX Mobile iOS Logging Framework Guide</i> • <i>IBM Tealeaf iOS Logging Framework Release Notes</i>

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