Using Synchronization

Information in this section explains how to set up and work with PCS Axis synchronization. The information is intended for your company's *Database System Administrator* and PCS Axis users with *SysAdmin*, *User*, and *Read Only* permissions.

Topics in this section include those in the following list:

- *About Synchronization* (page 776)

- *PCS Axis Features Unavailable in a Subscription* (page 777)

- *Creating the Publication* (page 778)

- *Adding Subscribers* (page 781)

- *Configuring a Subscription* (page 783)

- *Synchronizing a Subscription* (page 785)

- *Reinitializing a Subscription* (page 786)

- *Switching Database Connections* (page 789)

NOTE: For information about how PCS Axis activates a Bridge license for a subscription (remote client), see *Activating Bridge Import for Operation* (page 15).

About Synchronization

Synchronization uses a Microsoft SQL Server publisher/subscriber database model. The publisher database is the primary database on a network server or host computer (central database server). Each subscription database is a copy of the publication database. Remote users who do not have access to the publication database can update data in a subscription database on their local computer. Frequent synchronization between the publication and subscription databases ensures all PCS Axis users are working with the same data (Figure 17-1).

Synchronization supports one publisher with multiple subscribers running in a client-server network. Synchronizing data between the publisher and subscribers is achieved using merge/pull replication. Merge replication is used with the publisher database. Pull replication is used with subscriber databases. After the initial snapshot of the publisher database is replicated, subsequent synchronizations only replicate data that has changed since the last synchronization.

IMPORTANT: To avoid data conflicts, it is important to synchronize data between the publisher and each subscriber at *frequent intervals*. The subscriber must establish a reliable high-speed connection to the publisher to successfully synchronize data.
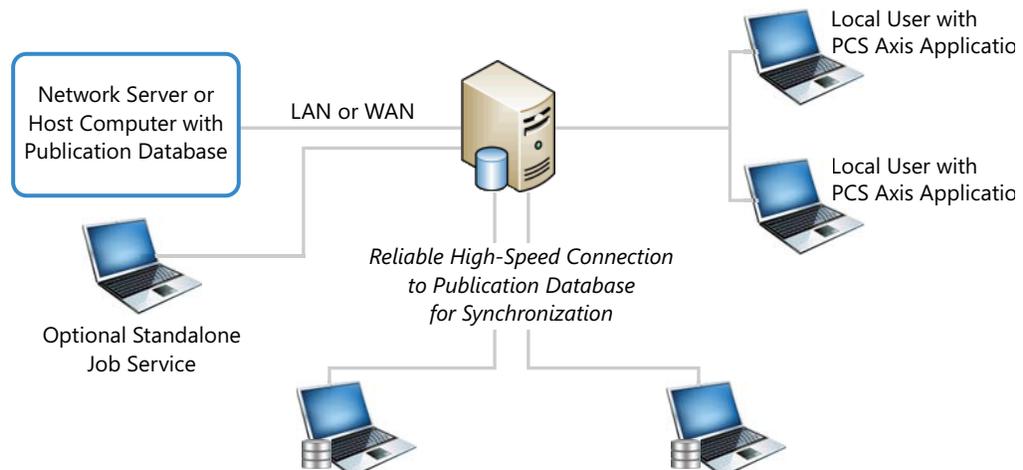
Figure 17-1. Typical Publisher/Subscriber Configuration

NOTE: *Hierarchy Rights* set up for a user in *User Management* determines which pipeline segments the user has access. This also applies to remote users with a subscription database on their local computer. See *Setting Up User Management* (page 187) for more information.

PCS Axis Features Unavailable in a Subscription

Items in the following table identify PCS Axis features unavailable to a remote user with a subscription database (Table 17-1):

Table 17-1. PCS Axis Features Unavailable in a Subscription

Select ROWs window:

- Add hierarchy levels

- Add, delete, and rename ROWs

Modules menu:

Custom Module Management

NOTE: Creating a custom module is disabled at the subscription level. A custom module created on the publisher is available to synchronized subscriptions however.

Data Entry menu:

- Define Routes

- Define Schedules

- Edit Schedule Settings

- Edit ROW Detail

- Survey Folder Maintenance

Tools menu:

- Bullhorn Bridge

- Fields and UDF Customizations

- Email Notification

- Themes Management

- Facility Type Themes

- User Management

- Options

Creating the Publication

PCS Axis supports one publication with multiple subscriptions for data replication and synchronization. Creating a publication is a function performed by your company's *Database System Administrator*. Adding subscription users is a function performed by the *PCS Axis System Administrator* or a user with PCS Axis *SysAdmin* permissions.

Information in this section explains how to complete the following tasks:

- *Confirming Share Folder Access*

- *Creating the Publication* (page 779)

Confirming Share Folder Access

Before creating the publication, verify the items in the following list are available to ensure successful creation of the publication and subscription databases:

- *Share Folder*: Confirm with your company's database administrator (DBA) or IT group that a share folder has been added on the server for the publication snapshot files. These files are a "snapshot" of the PCS Axis database and are created at the time you create the publication. They are also updated when changes in the database structure are detected by the Snapshot Agent.

- *Share Folder Access and Permissions*: Confirm with your company's DBA or IT group that the share folder is accessible to any Windows domain user who will be configuring a subscription. These users require read/write permissions set up for the share folder on the server.

NOTE: The path and name of the server and share folder are needed later when creating the publication. The format for this information appears as: *\\ServerName\SnapshotShareFolder*

- *Snapshot Agent Security*: Confirm with your company's DBA or IT group that the Snapshot Agent is set up on the publication to run as a process under a Windows domain account. This requirement is set in the *Agent Security* page when using SQL Server Management Studio (SSMS). It allows PCS Axis to re-initialize a subscription that has expired.

IMPORTANT: An expired subscription occurs when a subscriber does not synchronize within the publication retention period, also referred to as subscription expiration period. The publication retention period is set in the field *Subscription expiration* in the *General* page when using SQL Server Management Studio. When choosing the *Subscription expiration interval*, valid options for selection are *Days*, *Weeks*, or *Months*.

Creating the Publication

Information in this section explains how to create the publication on the server (central database server). The information is intended for your company's *Database System Administrator*.

IMPORTANT: Microsoft SQL Server must be installed on the computer you plan to create and configure the publication. For more information, refer to the AI document entitled *PCS Axis Client/Server New Installation with Replication*. This document is available for download in the section entitled *Installation & Best Practice Guides* (page 3) of PCS Axis Help.

To create the publication, follow these steps:

1 Click **Tools** > **Synchronization** > **Create Publication** to open the *Create Publisher* dialog box (Figure 17-2).

2 Type the server path to the share folder in the field **Enter Snapshot Path** using the format *ServerName\SnapshotShareFolder*.

3 Click ![save icon] **OK** to create the publication and add snapshot files in the share folder.

NOTE: During the process of creating the publication and adding snapshot files, status messages and a percentage completed display in the dialog box.
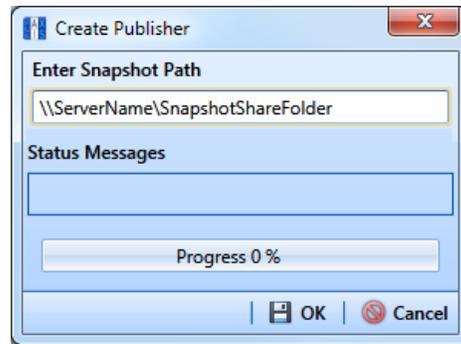
Figure 17-2. Create Publisher

4   Click ✔ **OK** when the message *Publisher Creation Complete* displays (Figure 17-3, page 780).
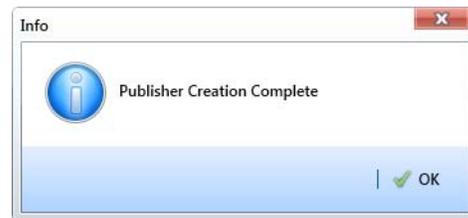
Figure 17-3. Publisher Creation Complete

To view information for the current server and database connection, as well as the PCS Axis software version, click *Help > About PCS Axis*. For more information, see *Viewing Information About PCS Axis* (page 24).

Adding Subscribers

The following information explains how to add one or more subscribers (remote users) who will set up and use a subscription database on their local computer. Information in this section is intended for the *PCS Axis System Administrator* or a PCS Axis user with *SysAdmin* permissions.

To add one or more subscribers, follow these steps:

1 Click **Tools** > **Synchronization** > **Synchronization Configuration** to open the *Sync Configuration* window (Figure 17-4).

> **NOTE:** A list of users previously added as a subscriber display in the *Subscribers* panel of the *Sync Configuration* window. Information in the *Subscription Name* field identifies whether or not a subscription has been set up on a subscriber's local computer. When a subscription has been set up, the name of the subscriber's computer and subscription display in the field. Otherwise, *Unconfigured* displays as shown in the next figure Figure 17-4.
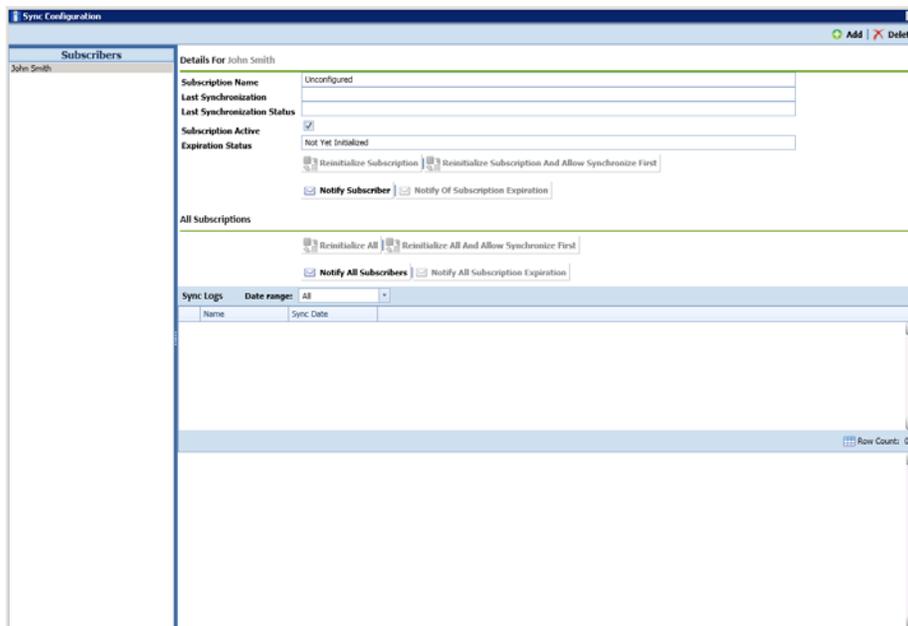
Figure 17-4. Synchronization Configuration

2 Click ⊕ **Add** to open the *Add Subscription* dialog box (Figure 17-5, page 782).

The dialog box includes a list of PCS Axis users available for set up as a *Subscriber*. Users are also set up as an *Active* user in *User Management* (*Tools > User Management*).

3 Select the user you want to add as a subscriber. Then click **OK** [OK] to close the dialog box.
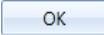
4 Repeat **step 2** and **step 3** to add additional subscribers as needed. When you finish, click the ✖ close button to close the *Sync Configuration* window.

Subscribers can now configure a subscription on their local computer. See *Configuring a Subscription* (page 783) for more information.
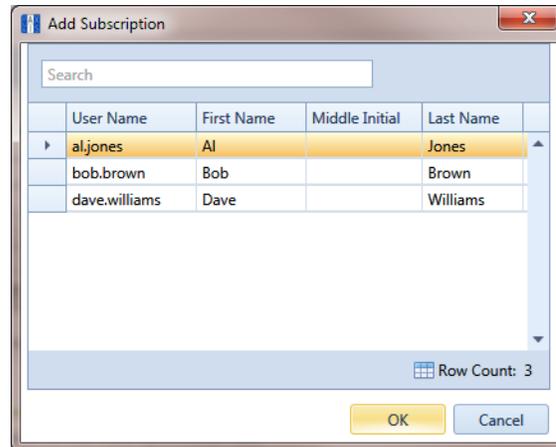
Figure 17-5. Add Subscription

Configuring a Subscription

Information in this section explains how to set up a subscription on the local computer of a PCS Axis user who has previously been added as a subscriber in *Sync Configuration*. The information is intended for PCS Axis users with *User* or *SysAdmin* permissions.

IMPORTANT: Because the configuration process transfers a full copy of the publication snapshot to the subscriber's computer, it's recommended that a high-speed reliable connection to the server be available when configuring the subscription. Subsequent synchronizations only update data that has changed between the publication and subscription databases.

To configure a subscription on a subscriber's computer, follow these steps:

1   Log on to the computer using the subscriber's login credentials. Then start the PCS Axis software (*Start > American Innovations > PCS Axis*).

IMPORTANT: Microsoft SQL Server must be installed on the computer you plan to create and configure a subscription. For more information, refer to the AI document entitled *PCS Axis Client/Server New Installation with Replication*. This document is available for download in the section entitled *Installation & Best Practice Guides* (page 3)of PCS Axis Help.

2   Click **Tools** > **Configure Subscription** to open the *Configure Subscriber* dialog box (Figure 17-6, page 784).

3   PCS Axis provides the name of the subscriber's computer in the field **Enter Instance Name**. Include the name of the local SQL server instance in this field using the following format:

ComputerName\LocalSQLServerInstanceName

NOTE: To view the name of the local SQL server instance using Microsoft SQL Server Management Studio (SSMS):
(1) Start SSMS and connect to the server.
(2) Right-click the server instance in *Object Explorer* and select *Properties*.
(3) On the *General* page, view the SQL server instance name in the *Name* field.

4 If you want to use a different subscription database name than the default name set up previously in system Options (*Tools > Options > General*), type a name in the field **Enter Subscription Database Path**.

5 Click 💾 **OK** to create the subscription database.
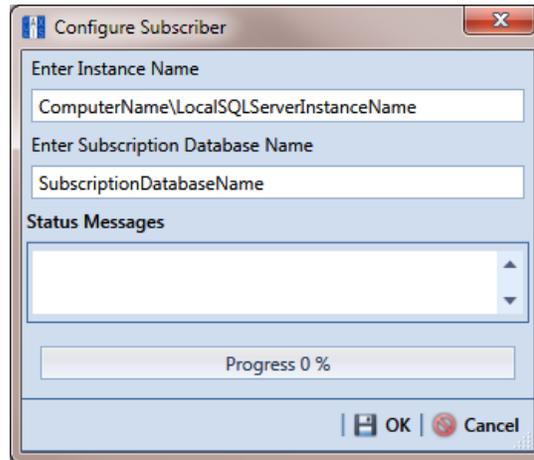
Figure 17-6. Configure Subscriber

6 Click ✔ **OK** when the message *Subscription Complete Restart* displays (Figure 17-7).

When the process completes, the PCS Axis software automatically restarts and then connects the user to the subscription database on the local computer. In SQL Server Management Studio, the name of the subscription database is added in the *Replication/Local Subscriptions* folder in *Object Explorer*.
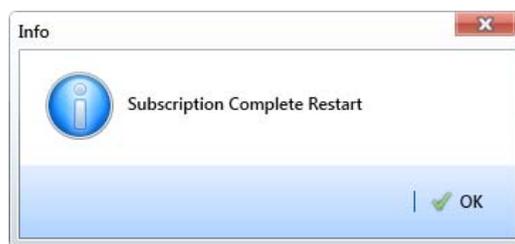
Figure 17-7. Subscription Complete Restart

NOTE: To view information for the current server and database connection, as well as the software version of PCS Axis, click **Help** > **About PCS Axis**. The *About* dialog box displays the current server and database connection in the *Connection* field. The *Version* field identifies the current database and software version. See *Viewing Information About PCS Axis* (page 24).

Synchronizing a Subscription

Information in this section explains how a subscriber (remote user) can synchronize the subscription database on their local computer with the publication database on the network server. When a subscription database is about to expire, PCS Axis displays a message to notify the subscriber (Figure 17-8).
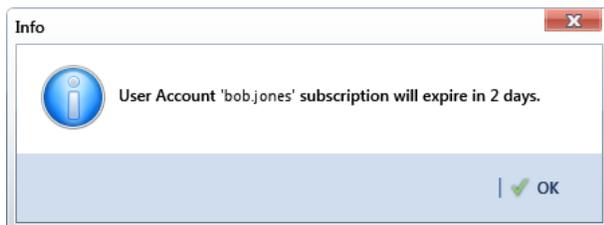
Figure 17-8. Pending Subscription Expiration

IMPORTANT: To avoid data conflicts, it is important to synchronize data between the publisher and each subscriber at *frequent intervals*. The subscriber must establish a reliable high-speed connection to the publisher to successfully synchronize data.

To synchronize a subscription, follow these steps:

1   Click **Tools** > **Synchronize Now** to open the *Synchronize Now* dialog box. Then click **Start** (Figure 17-9).
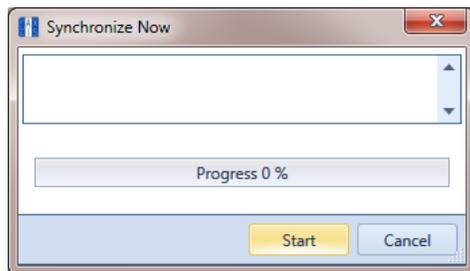
Figure 17-9. Synchronize Now

2   Click ✔ **OK** when the message *Synchronization Complete* displays to complete the process (Figure 17-10).
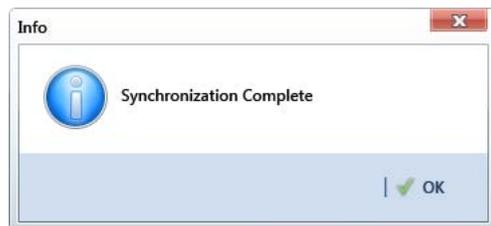
Figure 17-10. Synchronization Complete

Reinitializing a Subscription

When a subscription database has expired, PCS Axis displays a message on the local computer of the subscriber informing the user their subscription has expired (Figure 17-11).

Figure 17-11. Expired Subscription (Subscriber)

When the PCS Axis SysAdmin is connected to the publication database on the central database server, the message *Subscription Has Expired* displays in the *Expiration Status* field for the subscriber selected in the *Sync Configuration* window (*Tools > Synchronization > Subscription Configuration*). In the following example, the subscription for the selected subscriber John Smith has expired (Figure 17-12).
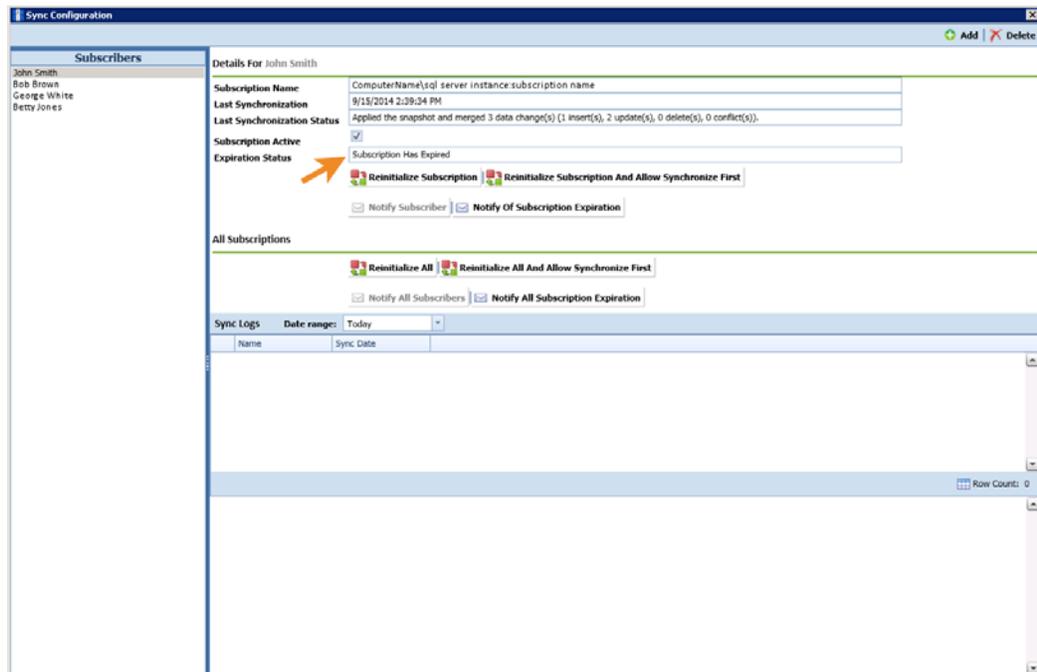
Figure 17-12. Expired Subscription (Publisher)

The procedure in this section explains how to re-initialize an expired subscription. The information is intended for the PCS Axis SysAdmin and requires a connection to the publication database on the central database server.

IMPORTANT: Because the re-initialization process transfers a full copy of the publication snapshot to the subscriber's computer, it's recommended that the subscriber have a high-speed reliable connection to the publication server when re-initializing the subscription.

Unsynchronized data is lost when re-initializing a subscription. To avoid losing unsynchronized data, first use Bridge to export data on the subscription. Then use Bridge again to import data after re-initialization is complete. See *Using Bridge* (page 491) for more information.

Complete the following steps to re-initialize an expired subscription:

1   Click **Tools** > **Synchronization** > **Synchronization Configuration** to open the *Sync Configuration* window (Figure 17-13).

2   Select the name of the subscriber with the expired subscription in the *Subscribers* panel.
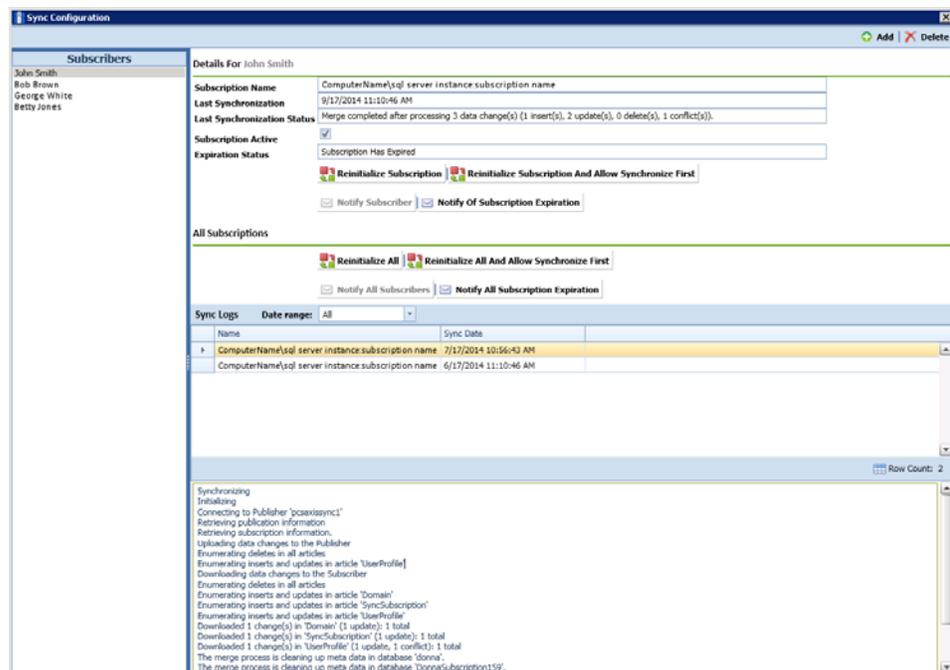
Figure 17-13. Sync Configuration

3 Complete one of the following steps:

    a If the subscription database has updated records that have not been synchronized with the publication database, click ▣ **Reinitialize Subscription And Allow Synchronize First**.

        –or–

    b If the subscription database does not need to be synchronized with the publication database, click ▣ **Reinitialize Subscription**.

4 Click ✔ **Yes** when the message *Reinitialize Subscription* displays (Figure 17-14).

The message includes the following information for the subscription: name of the server, primary database, and publication. This is shown in the following figure as *ServerName:DatabaseName:PublicationName*.

Figure 17-14. Reinitialize Subscription

5 Click ✔ **OK** when the message *Subscription Reinitialized* displays to close the dialog box.
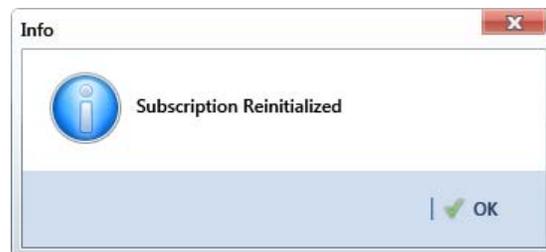
Figure 17-15. Subscription Reinitialized

Switching Database Connections

Subscribers have the option of switching database connections when logging into the PCS Axis software. This feature allows a subscriber to connect either to the subscription database on their local computer or the publication database on the company network server. It is intended for subscribers working from the company main office instead of a remote field office.

IMPORTANT: Before switching database connections, the subscriber must first synchronize data between the publication and subscription databases.

To switch database connections, follow these steps:

1 Synchronize data between the subscription and publication databases. Click **Tools** > **Synchronize Now** (Figure 17-16).
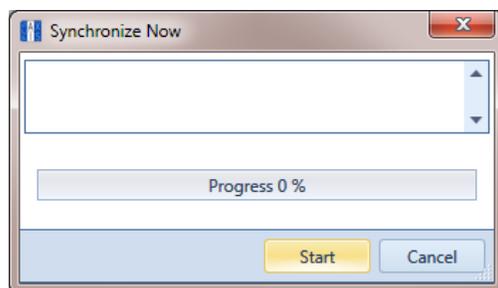
Figure 17-16. Synchronize Now

2 Click ✔ **OK** when the message *Synchronization Complete* displays to complete the process (Figure 17-17).
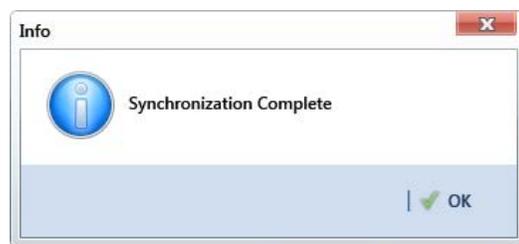
Figure 17-17. Synchronization Complete

3 Click ✖ **Log Out** in the main menu. Then click ✔ **Yes** when the *Logout* message displays.

4 When the *Login* window displays, type your Windows password in the **Password** field and then complete one of the following steps to switch database connections (Figure 17-18):

    a To switch to the publication, click the check box **Use Subscription** to clear the check mark.

    –or–

    b To switch to your subscription, click the check box **Use Subscription** to place a check mark inside the check box.

5 Click the login button ➡ to start PCS Axis.

Figure 17-18. PCS Axis Login