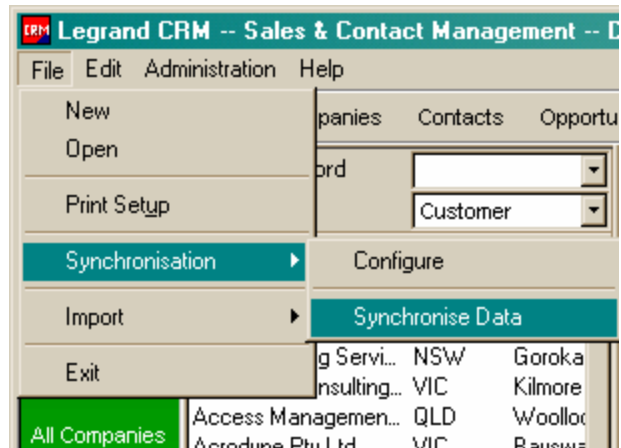


## Data Synchronization

### Introduction

As a company with many laptop users who travel frequently, synchronization has always been an extremely important matter at Legrand Software. It should come as no surprise therefore that Legrand CRM comes with a strong data synchronization function.

The synchronization function in Legrand CRM enables you to synchronize a Master database with any number of laptop or remote users. The synchronization feature in Legrand CRM is ideal for telecommute workers with a VPN connection to the main office or for travelling sales people who wish to synchronize their local data upon return to the office.



A typical example might be where an organization or business unit has a number of staff members who travel regularly and are equipped with laptops. While in the office the laptop users set their Legrand CRM software to work connected to the Master database. Prior to leaving the office, the laptop User performs data synchronization between his/her Local database and the Master database. This ensures that the Local database is an up-to-date copy of the Master database, except in the case of Restricted Synchronization in which case only a subset of the Master data resides on the Local database (*see further below*).

While away from the office the laptop User uses his Local database to view and add/modify records. Note that, for security reasons, the laptop User can only perform limited deletions.

Upon return to the office the laptop User performs data synchronization between his/her Local database and the Master database. This will send up to the Master database all the changes that the Laptop User has made while away from the office, while all the changes/additions/deletions that have been made at the Master database are sent to the Local database.

Legrand offers two types of synchronization, full and restricted. Legrand CRM Standard Edition offers only full synchronization; the Pro Edition offers both full and restricted synchronization.

- **Synchronization** is a single-step process and is initiated by the User of the remote database.
- During synchronization any changes made since the last synchronization time to either the Master database or the Remote database are exchanged.
- **Synchronization occurs at the record level.** If a record has been modified multiple times or has been modified in both the Master and Remote database, the most recent change will prevail.
- Synchronization covers all records of the CRM database, and also includes Letter Templates and document attachments.
- If remote users routinely attach document files (eg Excel, Word, Powerpoint, PDFs) to Activity records in their CRM database then the volume of data being exchanged increases correspondingly.
- Synchronization is best done via a **broadband VPN connection or a LAN connection** (i.e. when the remote user is back in the head office and is connected to the office network). **We strongly recommend against using a dial-up modem connection for synchronization.**
- The Standard (STD) edition of Legrand CRM provides **unrestricted synchronization**: i.e. the remote user receives a complete copy of all records in the master database.

- The Professional (PRO) edition of Legrand CRM enables you also to create Remote User Accounts who only have **Restricted Synchronization** rights.  
With restricted synchronization a remote user only receives updates to his/her own records, not the full master database. This is particularly useful in situations where an organization has multiple sales people (each maintaining a CRM datafile on their laptop) and it is a security requirement that a salesperson not be able to access/view information about the customers of the other sales people.

## How Synchronization works in STD and PRO Editions

The synchronization logic that is described in this section applies to the **STD** and **PRO** editions of Legrand, the CORP edition uses a very different synchronization mechanism.

Legrand CRM records the Creation Date, Creator ID, Last Modified Date and Modifier ID for every record in the database. In addition, the Local Database has a record of the network path to the Master Database (e.g. [\\servername\data\directory\crm\\_data](#)) and records the DateTime stamp of the last synchronization operation.

Fundamentally, data synchronization consists of comparing records in a Local database with records in the Master database and deciding which record will prevail.

More specifically, synchronization In Legrand CRM is performed according to the following process:-

- Synchronization is initiated by the laptop User.
- The system first attempts to make a network connection to the Master database.
- Once the connection to the Master database has been successfully established, the synchronization function will perform the following operation for every file in the database:-
  - Find all the new records that have been created in the Local database since the last sync operation and upload these records to the Master.
  - Find all the records that have been changed in the Local database since the last sync operation and check if that same record has also been modified at the Master database;
    - If the record has also been modified at the Master database compare the Last Modified date-time stamp; the record with the most recent changes wins (i.e. overwrites the other record).
    - Otherwise, If the record at the Master database has not been modified overwrite the record at the Master database with data from the record in the Local Database.
  - Find all the records in the Master database that have been created since the last sync operation and create these records into the local database.
  - Find all the records in the Master database that have been changed since the last sync operation and that have not yet been compared with the matching record in the local database; then download the change into the local database.
- The comparison logic outlined above is repeated for every major file in the database; i.e. companies, contacts, notes, calendar events, tasks, opportunities, marketing events, etc...

Please note that the record comparison between Master and Local data is performed on the local computer; data travels from the Master database on the fileserver to the local computer, where the records are compared with the Local database. This is because Legrand **STD** and **PRO** editions are file-sharing applications: while the data is stored on the fileserver there is not actually any application running on the server.

Many synchronization routines use record-level synchronization similar to the process we just outlined. For instance, synchronization between Outlook and a Palm or a PocketPC device uses a similar process.

Some systems even use simpler rules to perform the synchronization. Some do not even track as much information about the creation/modification of a record as Legrand CRM does. (Find out for yourself if the other CRM system records and displays the Creator, Modifier, creation date and modification date for every company/contact record?)

## Synchronization in the CORP Edition

The CORP edition of Legrand CRM uses Microsoft SQL Server for its database. Unlike the STD and PRO editions which use a file-sharing database (Microsoft Visual FoxPro), the CORP edition is a true client/server application.

Synchronization in the CORP edition is totally different than the process that has been described so far for the STD and PRO editions. The CORP edition uses SQL Server's native Replication functionality to perform sync operations.

On the plus side this delivers a lot of control to the SQL Database Administrator (DBA), enabling him/her to use the full power of SQL Server to set up very detailed rules that govern Publication and Subscription to the entire SQL database or selected segments of the database.

Synchronization in the CORP Edition is also much faster than with Legrand STD or PRO editions. This is because SQL Server only sends the actual changes down the network connection. Legrand STD and PRO editions are desktop applications that use a file-sharing database (Foxpro), therefore they need to download the database from the fileserver to perform the record comparisons at the local desktop.

The down side is that you do need a very experienced SQL Database Administrator to manage this. A second down side is that because Legrand CRM stores document attachments in a shared folder (i.e. not in the database itself) the replication of SQL Server does not take care of documents.

It is outside the scope of this document to give a detailed overview of the replication capabilities in Microsoft SQL Server. Please talk to a certified SQL DBA about this.

The next sections provide more details about synchronization in the STD and PRO editions of Legrand CRM, including a description of what specific steps have to be taken to set up the synchronization.

## A problem with record-level synchronization

Data synchronization works very well when all Users synchronise regularly, but it can create a problem when one User hasn't synchronised for a while.

Imagine the situation where User A last performed a sync operation 3 months ago. The Master database has continued to evolve over the last 3 months, with many records added and several changes made. For instance, the current record in the master database for ABC Corporation is the result of several small changes made during the last 3 months.

When User A performs a sync operation, all records that have been modified in the Master and Local database since the last sync operation will be compared. In case the same record in both the Master and Local database has changed, the one with the most recent change wins.

So, if User A did not modify the record for ABC Corporation he/she will simply get the latest data for ABC from the server; this data is the result of the cumulative changes of the last 3 months. This is good.

If, however, User A recently made a small change to his record for ABC Corporation this has the potential to wipe out the changes of the last 3 months at the server.

Because User A last performed a sync operation 3 months ago his/her information about ABC is clearly 3 months old. If he/she then makes a small change today (e.g. simply makes a change to one of the user fields) and then synchronises... what then happens is that, **if User's A minor change is the most recent change then User A's record of ABC corporation will prevail and will overwrite the record at the server.** The result: all the changes of the last 3 months to ABC Corporation are lost because User's A record for ABC Corporation consists of 3 months old data, plus the minor change he/she just made.

This is a common situation in record-level synchronization, but one that most people are not aware of. In fact, most CRM systems do not explain this very well at all.

For instance, synchronization between Microsoft Outlook and a Palm or PocketPC works like that too: the record with the latest change overwrites the other, unless you have specified that one side always wins.

When someone says that synchronization has caused their data to be 'lost', you can be almost certain that it is due to one user overwriting the server with old data as per the scenario above.

## A solution to the problem

Legrand Software delivers a solution to this problem in the form of a synchronization configuration setting in the Master database which enables the Administrator to exert some control over the sync process.

This configuration setting enables the Administrator to define the “Time Period allowed for updates to the master database”. This will determine what happens in the situation where both the Master and Local record have changed since the last sync operation.

**Synchronisation Settings**

**This is a MASTER database**

Other users will synchronise their 'local' database with this 'master' database. The synchronisation operation will be initiated by the 'local' database, therefore the synchronisation command is disabled in this database.

**Time Period allowed for updates to Master database**  
Whenever there is a change to the same record in the Master and the Local database, the Master database will always win if the last time that the Local User performed a synchronisation falls outside the time period allowed for updates. This avoids the situation where a user who, for instance, hasn't synchronised in six months makes a minor change to a record and then, through synchronisation, could overwrite the master with what is mostly 6-month old data because he/she made a minor change just before synchronising.

No Time Period Defined  
 Days from the last Synch DateTime

**This is a LOCAL database**

The network location of the MASTER database is :

*E.g.* \\SERVERNAME \DIRECTORPNAME \CRMDATAFOLDER

When executing the synchronisation command any changes made in either the Master or the Local database since the last time will be synchronised. Note that if the same record has been modified in both the Local and the Master database, **it is the most recent change that will win**, subject to the local change having been made within the allowable time period for updates (see above).

This is how it works:-

- Say that the “Period allowed for updates to the master data” is 15 days.
- If the last sync operation was less than 15 days ago there is no impact; all changes are compared and the usual rules apply, as outlined previously.
- However, if the last sync operation was more than 15 days ago then the following rules apply:
  - All new additions (new records) in the Local data are uploaded to the Master. *(as before)*
  - All new additions in the Master data are downloaded to the Local. *(as before)*
  - All changes in the Master database to records that have not changed in the Local database are downloaded to the local database. *(as before)*
  - Any changes in the Local database to existing records will only be uploaded to the Master database if the Master record itself has not changed since the last sync operation.
  - If both records at Master and Local have changed since the last sync operation and even if the Local database is the one with the most recent change, it will still be the Master record that prevails! This will avoid the problem outlined before.

*Reminder: the above only applies to STD and PRO editions, not to CORP*

## A few important notes about data synchronization

- While synchronization is performed at the record level, please remember that any Activity Note, Calendar Event, Task, Sales Opportunity and Service Issues that are linked to a Contact do not form part of the Contact record but are simply linked to it. Therefore a change to a Contact's phone number and a change to an Appointment with that Contact are changes to different records in different files in the database and both will successfully synchronize.
- For security reasons some, but not all deletions performed by a Remote User are propagated up to the Master database. You wouldn't want to have a situation where a Remote User – either accidentally or deliberately – deletes a large number of records in his local database, then propagates this deletion up to the Master database through synchronization. The following deletions by a Remote User will propagate through to the master database:-
  - Only Tasks, Customer Service Issues and Calendar Events that are assigned to the Remote User can be deleted.
  - Only Company, Contact, Activity Note and Opportunity records that were created by the Remote User can be deleted by the Remote User.
  - There is no restriction on the deletion of marketing campaigns/events, or the Targets and Respondents to a marketing event.
- File attachments (e.g. Word, Excel, PDF, text or any other Windows file) and mail-merge templates will also be synchronized, however the trigger for this synchronization is not a change to the file attachment itself. The synchronization of a file attachment is triggered by a change in the record that records the information about the attachment. When attaching a file to a Company or a Contact the system will take a copy of that file and store it in a Documents sub-directory within the database folder. You are prompted to provide a description for this file attachment and the system then creates a document record that contains the description you have just given, together with the path name to the file that was copied into the Documents sub-directory. You can make a change to the file attachment by opening it and editing it. This in itself will not cause the document to be synchronized. You need to make a change to the document description record. This will cause a change to the DateTime stamp of the document description record, which in turn will trigger synchronization. Please note that synchronization of file attachments can cause a significant increase in the time taken by the synchronization operation.
- Data structure changes can not be synchronized back to remote users. The system administrator must make the data structure changes on every laptop user individually.

## Restricted Synchronization in PRO Edition

So far the discussion has been about complete data synchronization – all the data in the Master database is synchronized with the Local database.

The PRO edition of Legrand CRM enables you to define Restricted Users. A Restricted User is a user that has an account in the Master database but who cannot directly log into the Master database. The Restricted User can only log into and work from his/her Local database.

When a Restricted User performs a sync operation with the Master database it will be a Restricted synchronization: the system **only** synchronizes those Companies and Contacts (plus the underlying Activity Notes, Calendar events, Opportunities and Customer Service Issues) for which the Restricted User is the designated Account Manager.

Marketing campaigns/events, however, are not restricted to specific Account Managers. A Restricted User will therefore receive the main data of all marketing campaigns/events, but will only be able to see the details of those Targets or Respondents where the Restricted User is the appointed Account Manager.

The PRO edition allows you to define any number of normal Users (with full, unrestricted synchronization rights) and restricted users (with restricted synchronization rights)

The User Rights in the PRO edition also allow you to control who can or can not change the Account Manager field in companies, contacts and opportunities. Restricted synchronization is a powerful feature for those organizations that have a need to restrict the access to customer data.

## Limitations of Synchronization

As with any feature it is almost as important to know what it cannot do as to what it can, with that in mind we have tried to list all the issues on which there may be some confusion.

- Synchronization of Documents
  - Company Documents tab.
    - New Documents added, will synchronize.
    - If you make a change to an existing document it will only synchronize if you make (and save) a modification to the description.
  - Documents attached to Activity notes.
    - A document will only be synced when it is part of a new activity note.
    - If a change is made to a document attached to an existing activity note it will not synchronize.
    - If a change is made to an existing activity note the document will not synchronize.
- Restricted Synchronization
  - The purpose of restricted synchronization is to limit the users access to only their records, this will mean the user will not have access to allocate other records i.e. tasks, customer service issues, to other users.
  - Changing account manager, if on the Master database a companies account manager is changed the existing record will **not** be deleted from the old account manager's local database, thou no further changes to this record will be synchronized. The solution is simply, to delete and recreate the restricted users local database.

## How to set up synchronization in the STD edition

1. You must have a login account at the Master database
2. While connected to the Master database, create a new CRM database. This will create a new, blank database with the same login name & password as what you are currently logged in.
3. Copy this new database to a directory location on your local computer or laptop and possibly rename the database folder to something meaningful like "XYZ\_local", where XYZ is the name that was given to the Master database.
4. Before you can log into this new local database you will first have to add this database to your list of CRM databases. At the Legrand login screen click on the "Select" button and then, when presented with your list of databases, click on the "Add" button to create an entry for the database you have just created. Specify a name for the database and point to its location on your computer's hard disk.
5. Log into the new database.
6. Go to the menu and select "File > Synchronization > Configure"
7. Click on "This is a LOCAL database" and specify the network location of the Master database.
8. To perform the initial synchronization simply execute "File > Synchronization > Synchronize Data"
9. The initial synchronization will take some time as every record from the Master database will be downloaded and recreated in the Local database. Subsequent synchronizations will be much faster as only those records that have been modified will be transported up or down.

## How to set up full synchronization in the PRO edition

1. You must have a login account at the Master database
2. While connected to the Master database, create a new CRM database. This will create a new, blank database with the same login name & password as what you are currently logged in.
3. Copy this new database to a directory location on your local computer or laptop and possibly rename the database folder to something meaningful like "XYZ\_local", where XYZ is the name that was given to the Master database.
4. Before you can log into this new local database you will first have to add this database to your list of CRM databases. At the Legrand login screen click on the "Select" button and then, when presented with your list of databases, click on the "Add" button to create an entry for the database you have just created. Specify a name for the database and point to its location on your computer's hard disk.
5. Log into the new database.
6. Go to the menu and select "File > Synchronization > Configure"
7. Click on "This is a LOCAL database" and specify the network location of the Master database.
8. To perform the initial synchronization simply execute "File > Synchronization > Synchronize Data"
9. The initial synchronization will take some time as every record from the Master database will be downloaded and recreated in the Local database. Subsequent synchronizations will be much faster as only those records that have been modified will be transported up or down.

## How to set up restricted synchronization in the PRO edition

1. You must login to the Master database with an administrator account
2. While logged in as an administrator, create a new user with the type of Remote. With a remote user you will have to specify a 5 character user ID as well as a user login.
3. While connected to the Master database, create a new CRM database You need to select the option for 'This new database is for a Remote user with RESTRICTED access to the master database' and enter in the user login and user Id
4. Copy this new database to a directory location on your local computer or laptop and possibly rename the database folder to something meaningful like "XYZ\_local", where XYZ is the name that was given to the Master database.
5. Before you can log into this new local database you will first have to add this database to your list of CRM databases. At the Legrand login screen click on the "Select" button and then, when presented with your list of databases, click on the "Add" button to create an entry for the database you have just created. Specify a name for the database and point to its location on your computer's hard disk.
6. Log into the new database.
7. Go to the menu and select "File > Synchronization > Configure"
8. Click on "This is a LOCAL database" and specify the network location of the Master database.
9. To perform the initial synchronization simply execute "File > Synchronization > Synchronize Data"
10. The initial synchronization will take some time as every record from the Master database will be downloaded and recreated in the Local database. Subsequent synchronizations will be much faster as only those records that have been modified will be transported up or down.