



Funambol

Installation and Administration Guide

Last modified: January 5, 2011

Table of Contents

1. Introduction.....	6
2. Getting started.....	7
2.1. Preparing a host computer.....	7
2.1.1. Minimum system requirements.....	7
2.1.2. Preparing the Funambol Server package installation.....	7
2.2. Obtaining the Funambol Server package.....	8
3. Installing the Funambol Server package.....	9
3.1. Installation on a Windows host server.....	9
3.1.1. Verifying the server startup.....	9
3.1.2. What to do if the server does not automatically start.....	10
3.1.3. Run Funambol As Microsoft Windows Service (from XP to above).....	10
3.2. Installation on a Linux host server.....	10
3.2.1. Verifying the server startup.....	11
3.3. Setting up automatic Data Synchronization Service startup.....	11
4. The Funambol Administration Tool.....	12
4.1. Opening the Administration Tool window.....	12
4.2. Logging into the Data Synchronization Service.....	13
4.2.1. Logging in through a proxy.....	13
4.3. Changing the admin user password.....	14
4.4. Creating additional administrator user accounts.....	15
4.5. A tour of the Administration Tool window.....	16
4.5.1. Maximizing / minimizing the Data Entry pane.....	17
4.5.2. Hiding / restoring the Navigation pane.....	17
4.5.3. Hiding / restoring the Output - Messages pane.....	18
5. Reviewing the Data Synchronization Service's settings.....	20
5.1. Getting started.....	20
5.2. Specifying a public IP address.....	20
5.3. Reviewing the capabilities options.....	21

5.4. Reviewing the engine options.....	21
5.5. Configuring the Data Transformation Manager.....	23
5.6. Configuring the synchronization strategy.....	24
6. Adding and managing user accounts.....	26
6.1. Adding a new user account.....	26
6.2. Editing existing user accounts.....	27
6.3. Deleting existing user accounts.....	28
7. Managing device records.....	29
7.1. Adding a new device record.....	29
7.2. Editing existing device records.....	30
7.3. Reviewing device capabilities.....	31
7.4. Deleting device records.....	32
8. Managing principals.....	33
8.1. Creating a new principal.....	33
8.2. Editing existing principals.....	35
8.3. Deleting existing principal records.....	35
8.4. Reviewing last synchronization timestamps.....	35
8.4.1. Deleting a synchronization record.....	36
9. Using the Email Connector and Inbox Listener Service.....	37
9.1. Environment description.....	37
9.2. Email Connector configuration steps.....	39
9.3. Assigning the officer for the Email Connector.....	39
9.4. Configuring the Email Connector.....	39
9.4.1. Creating public mail server records.....	40
9.4.2. Linking user accounts to mail servers.....	42
9.4.3. Activating mailbox listening and email push for user accounts.....	43
9.5. Forcing the verification of SSL certificates.....	43
9.6. Manually enabling encryption / encoding.....	44
9.7. The Inbox Listener Service.....	45
9.8. Configuring the Inbox Listener Service.....	45
9.8.1. Inbox Listener Service configuration strategy.....	46
9.9. Starting and stopping the Inbox Listener Service.....	46
9.10. Database maintenance.....	46

10. Using the PIM Listener Service.....	47
10.1. Configuring the PIM Listener Service.....	47
10.1.1. Configuring PIM Listener Service logging.....	47
10.1.2. About the detailed appenders.....	48
10.2. Activating and using the PIM Listener Service.....	48
10.2.1. Starting the PIM Listener Service.....	48
10.2.2. Monitoring the PIM Listener Service status.....	48
10.2.3. Managing the user account database.....	49
10.2.4. Stopping the PIM Listener Service.....	49
11. Using the Push Connection Service.....	50
11.1. Configuring the Push Connection Service.....	50
11.1.1. Configuring Push Connection Service logging.....	50
11.2. Activating and using the Push Connection Service.....	50
11.2.1. Starting the Push Connection Service.....	51
11.2.2. Monitoring the Push Connection Service status.....	51
11.2.3. Stopping the Push Connection Service status.....	51
12. Customizing the DS Service's log settings.....	52
12.1. Getting started.....	52
12.2. Reviewing the logging appenders.....	54
12.3. Customizing log files on a per-user basis.....	56
13. Test-driving Funambol.....	57
13.1. "Proof of concept" test drive.....	57
13.2. "Real world" test drive.....	57
13.3. Synchronizing your Microsoft Outlook data.....	57
13.4. How do test drives compare?.....	58
14. Taking the "proof of concept" test drive.....	59
14.1. Managing user data on the Funambol Data Synchronization Service.....	59
14.1.1. Getting started.....	59
14.1.2. Adding a new Address Book contact to the database.....	60
14.1.3. Adding a new Calendar entry to the database.....	61
14.1.4. Test preparation summary.....	62
14.2. Synchronizing a mobile device with the Funambol Data Synchronization Service Database.....	63
14.3. Synchronizing Microsoft Outlook with the Funambol Data Synchronization Service.....	64

15. Taking the “real world” test drive.....	65
15.1. Configuring the Data Synchronization Service.....	65
15.1.1. Setting up user accounts on the Funambol DS Service.....	65
15.2. Synchronizing Microsoft Outlook with the Funambol Server.....	65
15.2.1. Verifying synchronized data with the Web Demo Client.....	66
15.3. Synchronizing a mobile device with Funambol.....	67
15.3.1. Setting up a mobile device for Funambol connections.....	67
15.3.2. Starting the synchronization.....	68
16. Funambol reference guide.....	69
16.1. How to install a new module.....	69
16.2. Default SyncSource properties.....	70
16.2.1. Contacts.....	70
16.2.2. Calendar.....	70
16.2.3. Notes.....	71
16.2.4. Briefcase.....	71
16.3. The install.properties configuration file.....	71
16.4. Using Funambol with MySQL.....	71

1. Introduction

This document will guide you through the Funambol Server installation and both initial and ongoing administration tasks, using the Funambol Administration Tool, a standalone application with versions for both Linux and Microsoft Windows.

Chapter 3 will take you through a small-scale server installation. (Note: if you are using Funambol Carrier Edition, you should skip this chapter and refer to the Funambol Carrier Edition Installation and Operation Guide.)

Chapter 4 describes in detail the Funambol Administration Tool.

The Data Synchronization Service and related configuration topics are described in chapters 5, 6, 7 and 8.

The remaining components that make up Funambol are described in chapters 9 (Email Connector and Inbox Listener Service), 10 (PIM Listener Service) and 11 (Push Connection Service).

Chapter 12 describes the Data Synchronization Service's log settings.

In chapters 13, 14 and 15 you will see how you can test-drive Funambol in two different synchronization scenarios:

- Using a “mobile device” emulator or your current copy of Microsoft Outlook
- Using a real SyncML device, through a live Internet connection, along with your current copy of Microsoft Outlook

Chapter 16 includes additional reference topics.

2. Getting started

Before you start the process, you may want to start with a review of your installation options.

Funambol is distributed as an all-components-included package, that includes all the required software resources and a set of accessories that let you try out the Funambol Server before committing to a full-scale installation/configuration.

The Funambol Server package installation provides you with a fully functional Funambol Server - which includes Data Synchronization Service, Inbox Listener Service, PIM Listener Service and Push Connection Service - and if your host computer is open to out-of-network connections, you will quickly have a Funambol system ready for real-world use.

To help you get started, all steps of the setup procedures for each package are provided for use with both Microsoft Windows and Linux systems.

2.1. Preparing a host computer

The Funambol Server package is available for both Windows and Linux. This section details the software and hardware requirements for a successful installation of each package (which have overlapping system requirements).

2.1.1. Minimum system requirements

Windows-based host

- Pentium 4 CPU, running at 1.8GHz
- Windows 2000 Professional, Windows XP Professional or Windows Vista
- 200 MB of free disk space
- 768 MB memory

Linux-based host

- Pentium 4 CPU, running at 1.8GHz
- No Linux version or publisher restrictions, at present
- 200 MB of free disk space
- 512 MB memory

Per-user capacity

Allocate 1.5 Mb of drive space per potential user (allowing for an average of 1,000 contacts and 1,000 events).

2.1.2. Preparing the Funambol Server package installation

If your plan is to evaluate the Data Synchronization Service before engaging in a real-world deployment, you should install this ready-to-run Funambol server package on a little-used local host computer. Or, if you have a network with a few users, and would like to offer data synchronization that encompasses contacts and calendar information with a minimum of additional setup, this package will serve your needs. You also have the option of establishing links from the Data Synchronization Service to any external data sources such as email servers.

This package includes these key components:

- Funambol Data Synchronization Service
- Java Runtime Environment
- Hypersonic (JDBC-compliant) database
- Funambol Administration Tool
- Software accessories for use in the Data Synchronization Service test drives

Note: if you prefer to use a JDBC-compliant database other than Hypersonic, you need to install both the database and the required driver.

Fix for PostgreSQL version 8.3 or later (error syncing configuration)

When using the server with PostgreSQL version 8.3 or later, there is an error while performing a fast sync of client configuration (for the clients that support this feature as for example the Windows Mobile Sync Client). The problem arises from a change in the database from version 8.2.

The database no longer automatically casts all data types into text strings for functions that take a string input. An explicit cast is now needed.

This can be accomplished by launching the following commands from the database prompt:

```
CREATE FUNCTION pg_catalog.text(bigint) RETURNS text STRICT IMMUTABLE LANGUAGE
SQL AS 'SELECT textin(int8out($1));';

CREATE CAST (bigint AS text) WITH FUNCTION pg_catalog.text(bigint) AS IMPLICIT;

CREATE FUNCTION pg_catalog.text(integer) RETURNS text STRICT IMMUTABLE LANGUAGE
SQL AS 'SELECT textin(int4out($1));';

CREATE CAST (integer AS text) WITH FUNCTION pg_catalog.text(integer) AS
IMPLICIT;
```

2.2. Obtaining the Funambol Server package

You can obtain the Funambol Server installation package for your host system (Windows or Linux) by downloading it from the Funambol website: www.funambol.com.

Once the download is complete, you can start the installation process, as detailed in sections 3.1 Installation on a Windows host server or 3.2 Installation on a Linux host server.

3. Installing the Funambol Server package

After downloading a copy of the Funambol Server package (as detailed in the previous chapter), you can run the installer on either a Windows or Linux host. Each installation is described in step-by-step detail in the following sections.

In the rest of this document, the Funambol installation directory will be referred to as `$FUNAMBOL_HOME`.

3.1. Installation on a Windows host server

After downloading the package, double-click the installer icon and follow these steps:

1. When the Funambol Setup wizard window appears, review the introductory text and click *Next* to proceed.
2. When the *License Agreement* window appears, review the GNU Affero General Public License (AGPL) text. If you agree to the terms in the license, click the checkbox by *"I accept..."* and click *Next* to proceed.
3. When the *Choose Install Location* window appears, if you prefer, you can change the default destination folder: `C:\Program Files\Funambol..` Click *Next* to proceed.
4. When the *Choose Start Menu Folder* window appears, if you prefer, you can change the default folder selection: *Funambol*.
5. Click *Install* to proceed with installation. The *Installing Status* window records each phase of installation.
6. When the final *Completing Funambol Setup* window appears, if you want to immediately run Funambol, make sure the *Start Funambol Server* checkbox is checked, then click *Finish*.

A terminal window briefly appears, recording the status of the server startup.

If a Windows Security Alert dialog box appears to inform you that a particular Java program will (by default) be blocked, click *Unblock*, which enables the server startup to continue.

Server startup should normally be complete in under a minute's time.

Note: when installing the Funambol Server Package on Windows 7 64-bit, the default installation path, e.g. `C:\Program Files (x86)`, does not work. To solve the issue, remove the parenthesis from the file path, for example: `C:\Program Files x86`.

3.1.1. Verifying the server startup

To verify that the Funambol Data Synchronization Service is running, open the system tray and look for the DS Service status icon, as shown in Figure 1.



Figure 1: Server status icon

The server status icon should be green if the server was successfully started. If the icon is red, or if no status icon appears, follow the steps detailed in the next section to manually start the Data Synchronization Service.

If you want to assign a public IP to your Funambol DS Service, please refer to section 5.2.

3.1.2. What to do if the server does not automatically start

If no server status icon appears in the system tray after a couple of minutes, you must manually start the Funambol server. To do so, follow these steps:

1. From the *Start* menu, choose *Programs -> Funambol -> Data Synchronization Server -> Start Server*. After a brief pause, the system tray icon should appear at this point. The color of the icon represents one of these states:
 - Green – the server is running.
 - Yellow – the server is loading.
 - Red – the server is stopped.
2. If the Funambol icon is green, you can start a web browser and connect to the URL <http://localhost:8080/funambol>. A summary web page with Funambol DS Service information appears.

3.1.3. Run Funambol As Microsoft Windows Service (from XP to above)

1. Download *instsrv.exe* and *srvany.exe* included in Windows Server 2003 Resource Kit Tools: <http://www.microsoft.com/downloads/details.aspx?familyid=9d467a69-57ff-4ae7-96ee-b18c4790cfd&displaylang=en>
2. Create the service: "instsrv [ServiceName] [srvanyPATH]\srvany.exe"
i.e.: `C:\Program Files\Windows Resource Kits\Tools> instsrv.exe "FunambolDS" "C:\Program Files\Windows Resource Kits\Tools\srvany.exe"`
3. Run *regedit.exe* and navigate to
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\[ServiceName]
4. set DWORD *Start* to value 2 (auto start)
5. create key *Parameters* and inside this key, create the following String values
AppDirectory with value `$FUNAMBOL_HOME\bin`
Application with value `$FUNAMBOL_HOME\bin\restartall.cmd`
AppParameters with empty values
6. Open Control Panel (Classic View) -> System -> Advanced -> Environment Variables
7. Look for the system variable (at the bottom of the list) *JAVA_OPTS* and if it exists add `;-Xrs`. If it does not exist, create the new variable *JAVA_OPTS* with `"-Xrs"`
8. Restart Windows

3.2. Installation on a Linux host server

This installation requires the use of a terminal window and a shell command line. Have the package version number handy (as noted in the downloaded package filename), for use in this procedure.

Note: you do not have to log in as root to complete this installation; any administrative account has permission for this task.

After downloading the package, follow these steps to install the Funambol Server package:

1. Open a terminal window and type the following command:

```
sh funambol-<version number>.bin
```

2. When the license agreement appears, read the text. To accept the terms of the agreement, type *y* (yes) at the prompt and press *Enter*.
3. Specify a top-level directory in which to install the packaged software, which will be referred to as `$FUNAMBOL_HOME` in this document. Otherwise, the installation defaults to the directory `/opt/Funambol`.

At the conclusion of installation, you are prompted to start the server; type *y* (yes) and press *Enter*.

If you prefer to delay the server startup, you can always change to `$FUNAMBOL_HOME/bin` and run this command at a later time:

```
sh funambol start
```

This concludes the installation.

If you want to assign a public IP to your Funambol DS Service, please refer to section 5.2.

3.2.1. Verifying the server startup

After you've installed and started the Data Synchronization Service, you can verify its operation by following these steps:

1. Open a terminal and run the `ps` command.
2. When the results appear, `grep` for "funambol".
3. If a listing is found, the server is in operation.

Or you can do the following:

1. Start a web browser and connect to the URL: <http://localhost:8080/funambol>
2. If the server is running, a web page with Funambol Data Synchronization Service information appear.

3.3. Setting up automatic Data Synchronization Service startup

As of this edition of the user guide, the Funambol Data Synchronization Service won't automatically start when you start or restart the host server.

Follow these steps to automate server startup on a Linux host:

1. Using a terminal window, copy the startup script into the `/etc/init.d` directory using the following command:

```
cp $FUNAMBOL_HOME/bin/funambol /etc/init.d/funambol
```

2. Open the newly copied script in a text editor and change the following line:

```
FUNAMBOL_HOME=`(cd .. ; pwd)`
```

to:

```
FUNAMBOL_HOME=`(cd $FUNAMBOL_HOME ; pwd)`
```

This points the script to the absolute location of your installation.

3. Create a symbolic link to your `rc3.d` directory using this command:

```
ln -s /etc/init.d/funambol /etc/rc3.d/S30funambol
```

To verify that the Funambol Data Synchronization Service is running, start a web browser and open the URL <http://<servername>:8080/funambol>. A Data Synchronization Service test page should appear.

4. The Funambol Administration Tool

The Funambol Administration Tool is a user interface that allows remote configuration of server parameters.

Note: before using the Administration Tool, verify that both Data Synchronization Service and database have been started and are in operation. For details on how to use Funambol with a MySQL database, see section 16.4 Using Funambol with MySQL.

Note: The user running the Funambol Administration Tool and other Funambol tools (such as the Java Demo Client) must have writing/execution permissions on the installation directory.

4.1. Opening the Administration Tool window

To start the Funambol Administration Tool, use one of the following commands:

- On Windows: from the *Start* menu, choose *Programs -> Funambol -> Administration Tool*. (Please note that the Funambol Administration Tool does not work without administrator privileges in Windows Vista.)
- On Linux: at the prompt, change to `$FUNAMBOL_HOME` and type:

```
admin/bin/funamboladmin
```

The Funambol Administration Tool window appears on-screen (see Figure 2).

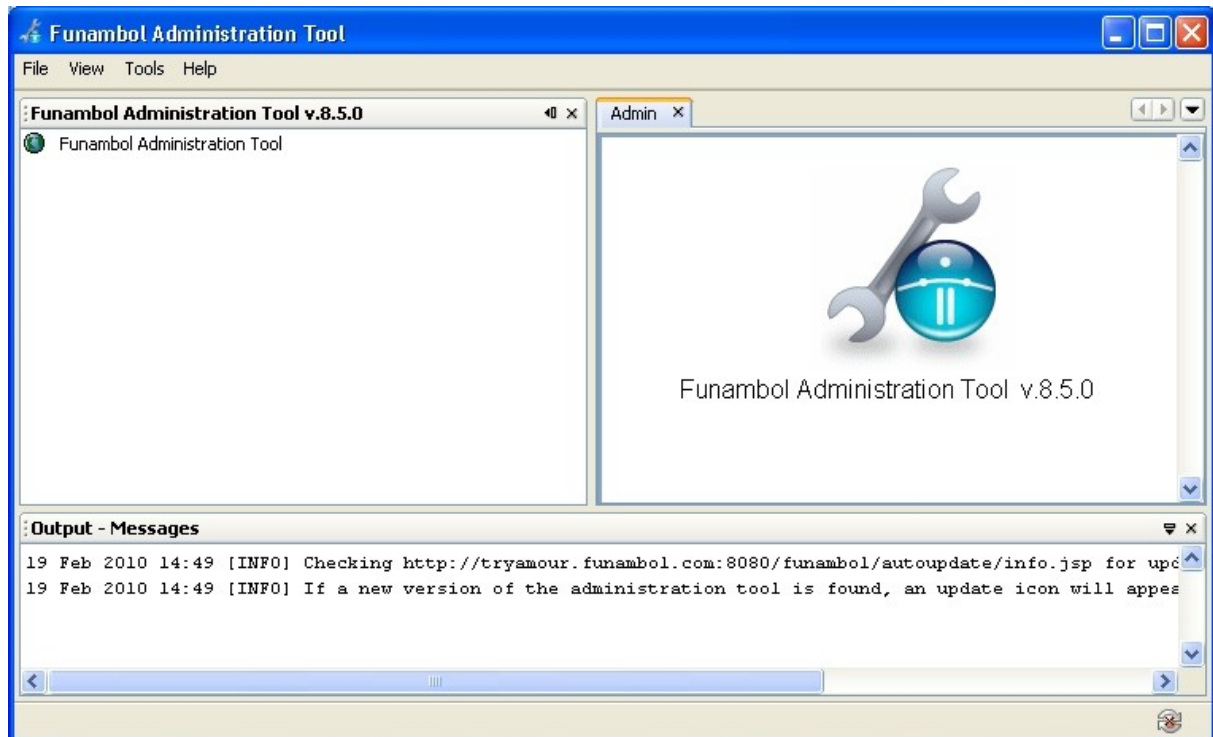


Figure 2: The Funambol Administration Tool

No information will be displayed until you log in with an administrative user ID and password, as detailed in the next section.

4.2. Logging into the Data Synchronization Service

In the Administration Tool window, choose *File -> Login* or double-click the Funambol Administration Tool icon in the Navigation pane.

The *Login* dialog box appears (see Figure 3).

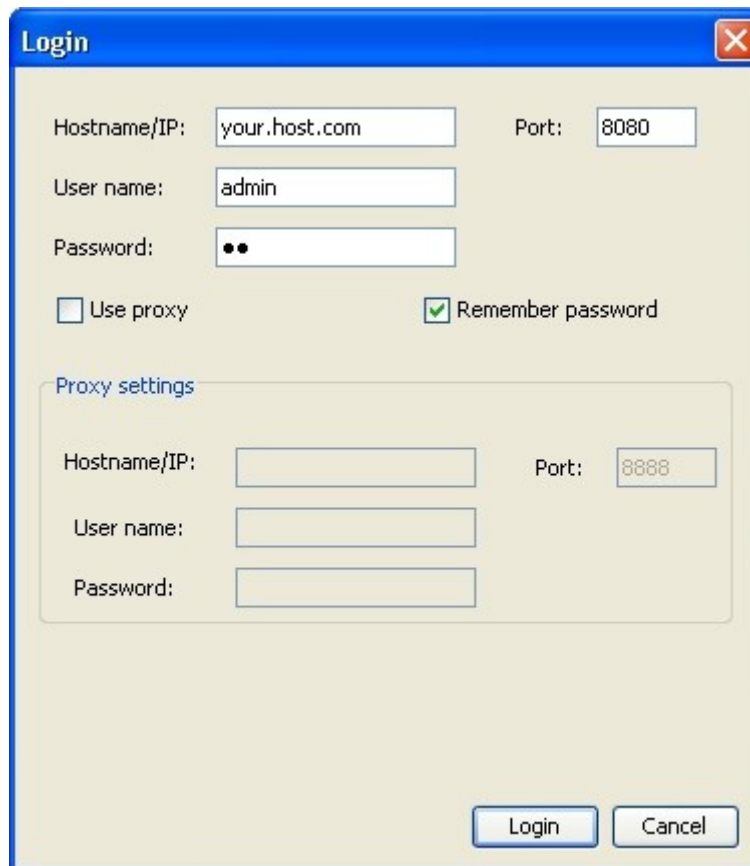


Figure 3: Funambol Administration Tool login box

If this is your first time logging in, you have two options:

- If the server is on a local host, make no changes to the default settings and click *Login*.
- If the server is on a remote host, enter the correct information in the *Hostname/IP* field, then click *Login*.

The default access credentials are:

- Username: **admin**
- Password: **sa**

Note: the Administration Tool remembers the most recent entries and will suggest them for use in future logins.

After login, the Administration Tool window *Navigation* pane will list your server as the root node of an expandable tree structure that sorts your management options into Server Settings, Users, Devices, Principals, Modules and more.

Your first task is to change the default *admin* login information, as detailed in section 4.3.

4.2.1. Logging in through a proxy

After configuring and activating your Data Synchronization Service, you or other admin-role users may need to log in for administrative purposes through a proxy server, depending on your location and network connection. This requires a slight adjustment of the login procedure:

1. In the Administration Tool window, choose *File -> Login* or double-click the Funambol Administration Tool icon in the Navigation pane; the *Login* dialog box appears.
2. Verify your user entries in the active fields.
3. Check the *Use Proxy* checkbox. Additional features appear in the *Login* dialog box.
4. Enter the relevant proxy server information. Once you have logged in with proxy settings, the *Login* dialog box retains your entries for future use.
5. Click *Login*.

4.3. Changing the *admin* user password

You should regularly change the *admin* password to increase security to your system, when you first log in and at regular intervals thereafter. Note that when you apply the change, you'll need to immediately exit the Funambol Administration Tool, then restart it and log back in to the server, using the new password.

In order to change the *admin* user password, follow these steps:

1. In the Administration Tool window, expand the server tree in the *Navigation* pane, and double-click *Users*.
2. When the *Search Users* features appears, type "admin" in the *Username* field and then click *Search* (see Figure 4).



Figure 4: Search users

The *admin* account should appear in the results table.

3. Select the *admin* account and click *Edit*. The *User Details* options panel appears, with key information displayed in editable fields (see Figure 5).
4. Type a new password in both *Password* and *Confirm Password* fields.

The screenshot shows a 'User Details' dialog box with the following fields and values:

- Username : admin
- Password : ..
- Confirm password : ..
- First Name : admin
- Last Name : admin
- E-mail : admin@funambol.com
- Roles : User, Administrator (selected)

Buttons: Save, Cancel

Figure 5: Edit admin user details

5. Click *Save* to apply the new password.
6. After changing the password, exit the Administration Tool.
7. Restart the tool and log in again as *admin* using your new password. This confirms your new password.

4.4. Creating additional administrator user accounts

If your Funambol server workload justifies the use of more than one system administrator, you can add the needed accounts by following these steps (also see section 6 Adding and managing user accounts):

1. Expand the server tree in the *Navigation* pane, right-click *Users* and choose *Add User*. The *Add User* options appear in the *Data Entry* pane.
2. Enter the required information in the following fields:

<i>Field</i>	<i>Description</i>
Username	A name up to 255 characters in length, using any combination of characters (case-sensitive).
Password	A unique password (case-sensitive).
Confirm password	The same password.
First Name	The user's first name.
Last Name	The user's last name.
Email	The email address the user wants to link to the Funambol DS Service
Roles	Choose <i>Administrator</i> . Anyone using this account will be able to perform administrative tasks but not synchronizations.

3. Click *Add* to save the settings. A confirmation message appears in the *Output - Messages* pane.

Repeat this procedure to create other needed administrator accounts.

4.5. A tour of the Administration Tool window

The Funambol Administration Tool window is divided into three panes, displayed in Figure 6 in a typical working mode (example of log file configuration):

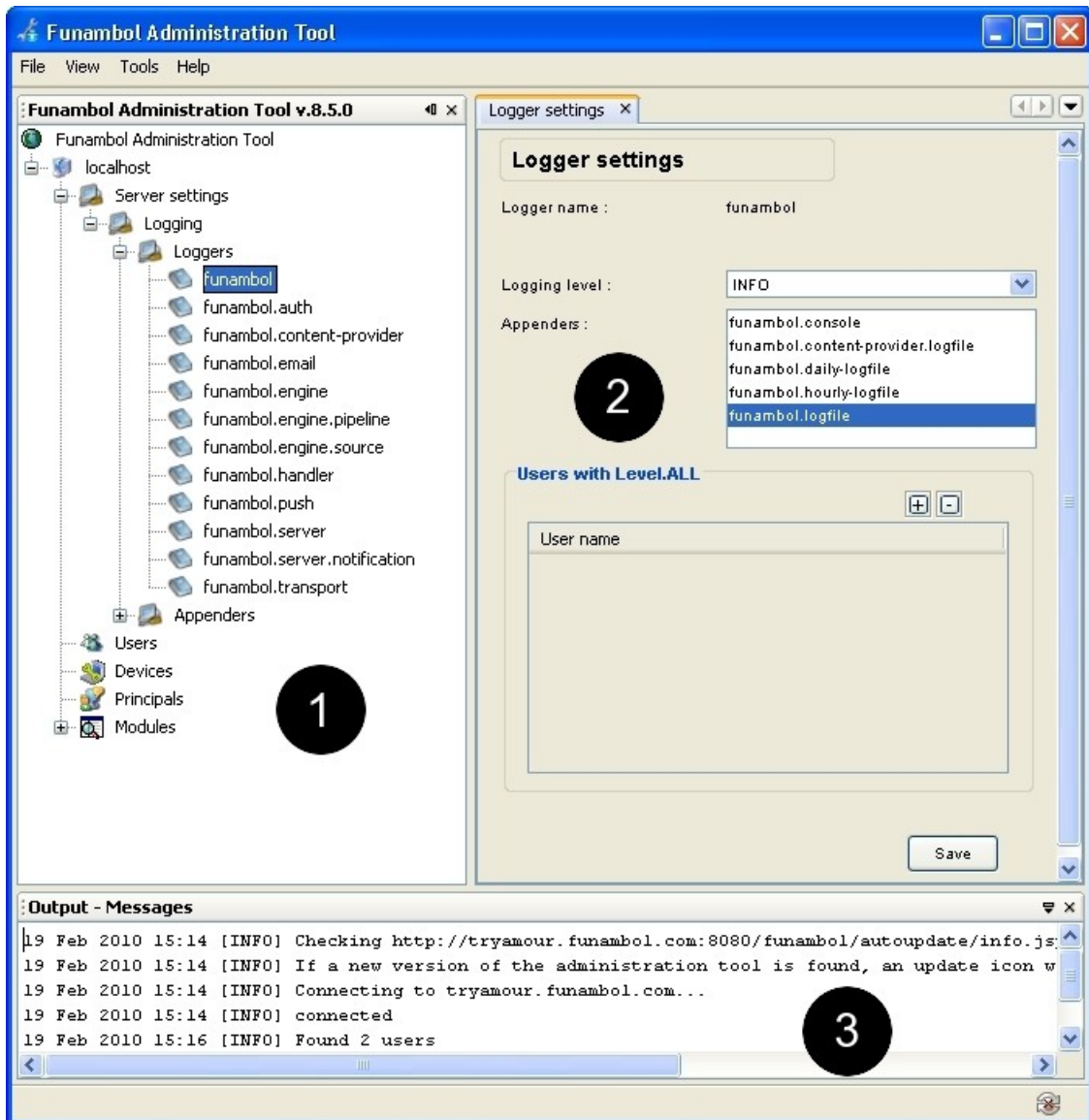


Figure 6: Funambol Administration Tool panes

1. **Navigation:** lists all the primary components that you can add to or edit to monitor and maintain the server, users, devices, principals, modules, etc.

Double-click an item in the expanded navigation tree to see the current entries and editable options in the *Data Entry* pane.

2. **Data Entry:** use the features in this pane to add, edit, delete or search for information related to the item selected in the *Navigation* pane.
3. **Output - Messages:** this pane displays in-progress status messages (results, success or failure) relevant to your current task.

It is possible to temporarily hide one or two of the three principal panes, as needed.

4.5.1. Maximizing / minimizing the Data Entry pane

You can quickly maximize the *Data Entry* pane to hide both *Output - Messages* and *Navigation* panes by doing the following (see Figure 7):

1. Double-click the *Data Entry* label tab to expand this pane. The expanded pane now fills the window.
2. To see the *Navigation* pane, double-click the *Data Entry* pane label tab again. The *Data Entry* pane is minimized to its original size.

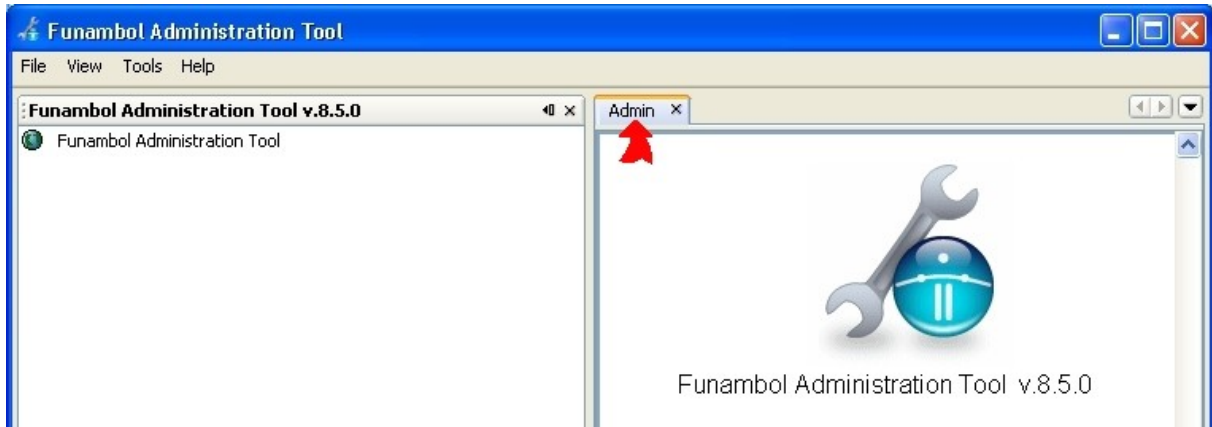


Figure 7: Maximizing/minimizing the Data Entry pane

4.5.2. Hiding / restoring the Navigation pane

To hide just the *Navigation* pane, click the *Hide* button once (see Figure 8).



Figure 8: Hiding/restoring the Navigation pane

The *Navigation* pane collapses into the left window frame, visible as a sideways label (see Figure 9).

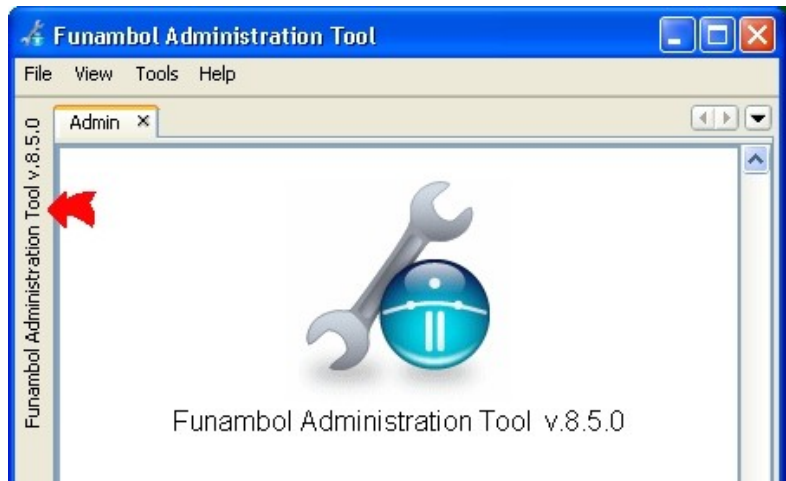


Figure 9: Navigation pane - collapsed

To reopen the *Navigation* pane (see Figure 10):

1. Float the cursor over the label.
2. When the pane temporarily reappears, click the *Show* button.

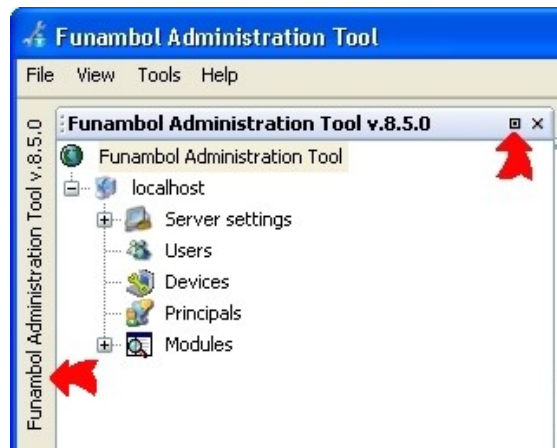


Figure 10: Reopening the Navigation pane

4.5.3. Hiding / restoring the Output - Messages pane

To hide just the *Output - Messages* pane, click the *Hide* button once (see Figure 11).

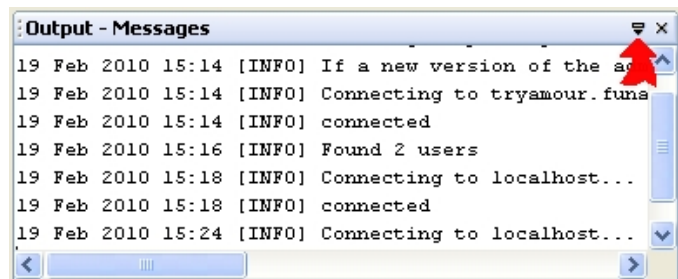


Figure 11: Hiding the Output - Messages pane

The *Navigation* pane collapses into the window frame, visible as a tab label (see Figure 12).

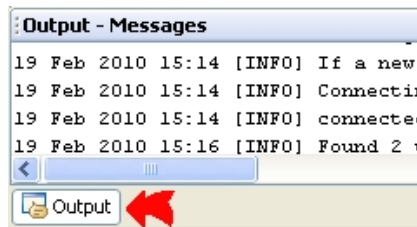


Figure 12: Output pane - collapsed

To reopen the *Output - Messages* pane (see Figure 13):

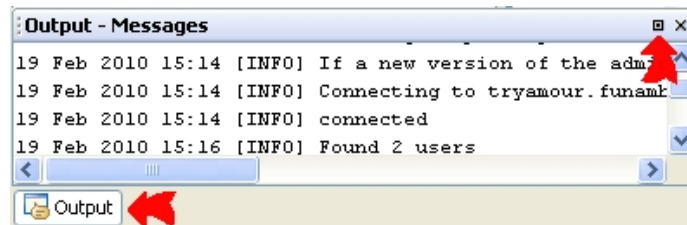


Figure 13: Reopening the Output pane

1. Float the cursor over the tab label.
2. When the pane temporarily reappears, click the *Show* button.

Note: the *Data Entry* pane cannot be hidden, only the *Navigation* and *Output - Messages* panes (singly or both at once) can be hidden.

5. Reviewing the Data Synchronization Service's settings

The Data Synchronization Service is at the core of the Funambol Server sync architecture. You can review and modify the server settings using the Administration Tool, as detailed in this chapter.

5.1. Getting started

To open the Data Synchronization Service file containing the principal settings in the Administration Tool, follow these steps:

1. In the Administration Tool window, expand the server tree in the *Navigation* pane.
2. Double-click *Server Settings*. The *Server Setting* options appear in the *Data Entry* pane.
3. You can review and change server setting as organized into the following key categories:
 - Capabilities (detailed in section 5.3)
 - Engine (detailed in section 5.4)
4. Under *Engine* you will find additional options for the following:
 - Data Transformer Manager (detailed in section 5.5)
 - Strategy configuration (detailed in section 5.6)

This chapter will guide you through the options for each category, as incorporated into the Administration Tool.

5.2. Specifying a public IP address

After installation, your access to the Funambol Server is via a localhost address; this allows extremely limited access to the Funambol Data Synchronization Service, permitting only direct administrative connections.

This section details replacing the localhost address with a publicly accessible IP address, to allow system users (internal and external) to connect to the Data Synchronization Service for data synchronization.

In order to change the IP address, follow these steps:

1. Log in to the Data Synchronization Service with the Administration Tool (see section 4.2).
2. Expand the server tree and double-click *Server Settings* and locate the *Server URI* property.
3. Enter the IP address or hostname assigned to the Data Synchronization Service, in the following format:

```
http://<server name or IP address>:<server port>/funambol/ds
```

The default port number for Funambol is 8080.

4. Click *Save*. The *Output Message* pane will display a confirmation message.

Note: After changing the URI, you can test the availability of your Funambol Server from outside your network by starting a browser and entering the server's public address in either of the following formats:

- `http://<your_IP_address>:<port_number>/funambol/`
- `http://<your_server_name>:<port_number>/funambol/`

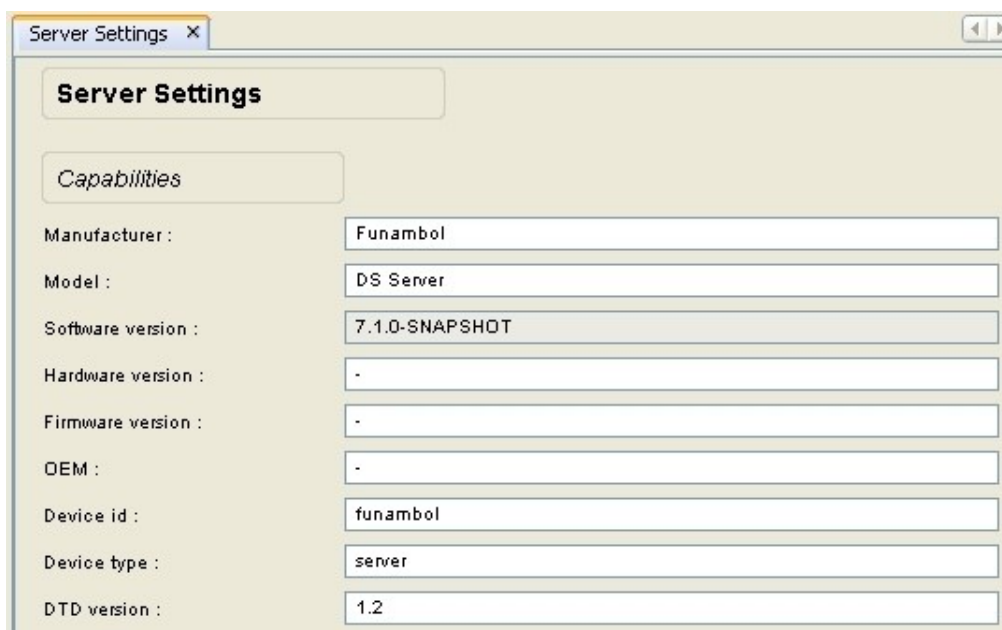
5.3. Reviewing the capabilities options

These options include all the settings that determine what is initially sent to the SyncML device or Funambol client, to describe important server characteristics.

Note: in most Data Synchronization Service installations, the default Capabilities and Engine settings should not require any changes.

1. In the Administration Tool window, open the *Server Settings* in the *Data Entry* pane. The *Server Settings* options appear in the *Data Entry* pane, including the *Capabilities* options, as shown in Figure 14.

This collection of options represents information about the Data Synchronization Service that is sent to the client, to help in identifying the server.



The screenshot shows a window titled "Server Settings" with a sub-section titled "Capabilities". Below this section, there are several labeled text input fields:

Manufacturer :	Funambol
Model :	DS Server
Software version :	7.1.0-SNAPSHOT
Hardware version :	-
Firmware version :	-
OEM :	-
Device id :	funambol
Device type :	server
DTD version :	1.2

Figure 14: Server Settings options panel - Capabilities

2. Review the options under *Capabilities*, and make any needed changes.
3. When done, click *Save* to apply the changes. Look for a confirmation message in the *Output - Messages* pane.

You can now review the Data Synchronization Service engine options, detailed in the next section.

5.4. Reviewing the engine options

These options include all the settings that control the behavior of the Data Synchronization Service. In most server installations, you will need to attend to the engine settings for Handler, Data transformer and Strategy.

Note: in most Data Synchronization Service installations, the default Capabilities and Engine settings should prove adequate.

1. In the Administration Tool window, open the *Server Settings* in the *Data Entry* pane. The *Server Settings* options appear in the *Data Entry* pane, including the *Engine* options as shown in Figure 15.

Engine

Server URI :

Officer :

Handler :

Device inventory :

Data transformer manager :

Strategy :

User manager :

SMS service :

Min. value for max. msg size :

Check for server updates :

Figure 15: Server Settings options panel - Engine

2. Review the following options:

Option	Description
Server URI	Specifies the URI to be used by the client in responding to the server messages. Note that this value doesn't affect the URL or port used by the application server that runs the Funambol application. For example: http://my.funambol.com/sync .
Officer	Controls how users are authenticated and granted access to the system. (See section 9.3 Assigning the officer for the Email Connector for more details).
Handler	This option (utilizing the contents of an XML-format file) manages the synchronization sessions.
Device Inventory	This option manages all the device records.
Data Transformation Manager	This option involves a separate dialog box that allows you to customize the encryption applied to incoming and outgoing messages. (See section 5.5 Configuring the Data Transformation Manager for more details).
Strategy	This option involves a separate dialog box in which you can fine-tune the prioritization of data, when duplications are detected. (See section 5.6 Configuring the synchronization strategy for more details).
SMS service	This option manages the SMS service, responsible for sending SMS messages.
User Manager	This option manages all the user records. If you plan to store user records on a LDAP server, you will need to create a new user manager and select the resulting XML file in this field.
Min. Value for Max. Msg Size	This option specifies the minimum value to be used by the client for <i>MaxMsgSize</i> . This value is the maximum size that all messages sent by the server must have (specified by the SyncML protocol). If a client specifies a value for <i>MaxMsgSize</i> that is smaller than "Min. Value for Max. Msg Size", the server refuses the synchronization and will log an error.
Check for updates	Enables the Data Synchronization Service to check the Funambol website daily for updates, that will be automatically downloaded and installed. This option is active by default.

3. When done, click **Save** to apply the changes. Look for a confirmation message in the **Output - Messages** pane.

You can now review the encryption and duplicate-information strategy options, detailed in the following sections.

5.5. Configuring the Data Transformation Manager

These options, part of the *Engine* settings, control which encryption algorithms are applied to data traffic. Transformations are applied to data in both directions, usually encrypting outgoing data and decrypting incoming data.

You can specify the name and class of transformers for both incoming and outgoing items, with the source URI of items to be transformed along with the name of the transformer to be used.

1. In the *Engine* options of the *Server Settings*, review the information noted in the *Data Transformer Manager*.
2. To edit or replace this entry, click *Configure*. The *DataTransformer Manager* options appear in the *Data Entry* pane (see Figure 16).

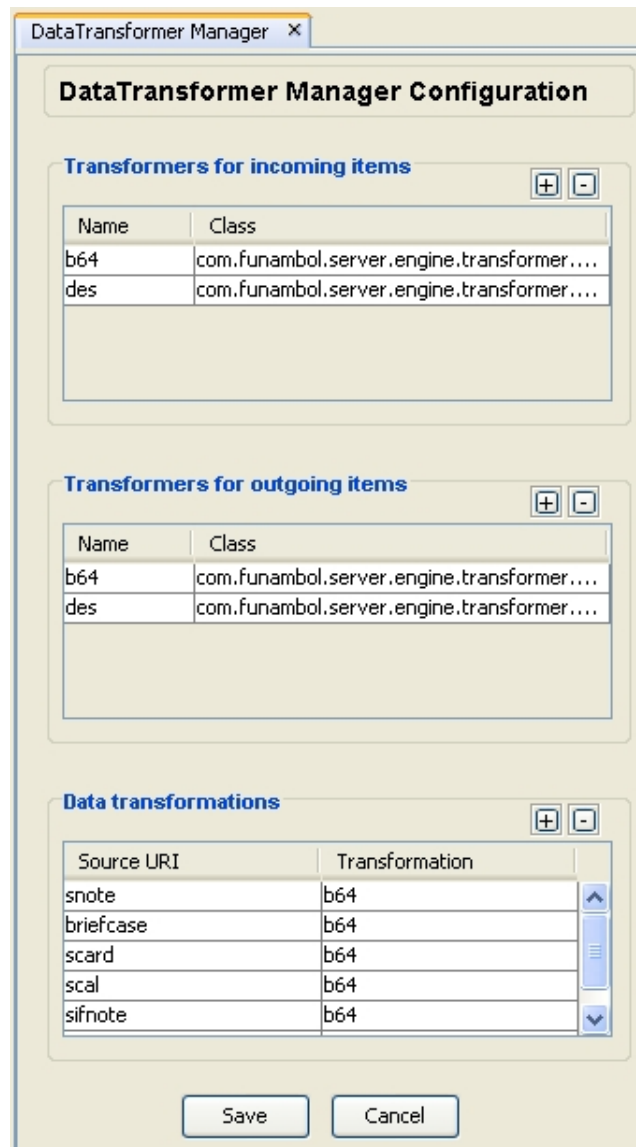


Figure 16: DataTransformer Manager configuration

This collection of features includes default transformation encryption components, and pre-set combinations that are applied to incoming and outgoing messages.

- Review the following options, and make the needed changes. This includes adding new rows/entries, editing the existing rows/entries, and deleting existing rows/entries.
- Under *Transformers for incoming items*, click the “+” icon in the upper right corner of this table. A new row appears at the bottom of the table, as shown in Figure 17.

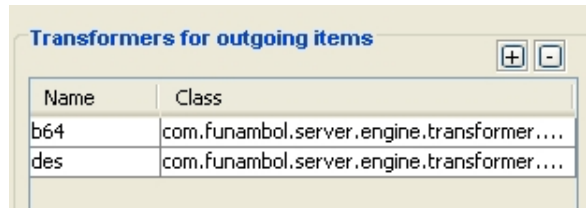


Figure 17: Trasformers for incoming items

- Click each cell in the row to make it active, and make the needed entries to guide the server in decrypting information from a specific item that may have a combination of encryption applied. This allows the server to decrypt the data received from a client and sync it.
- Under *Transformers for outgoing items* click the “+” icon in the upper right corner of this table.
- When a new row appears at the bottom of the table, make the needed entries to guide the server in encrypting information extracted from a specific item that may require a specific combination of encryption applied. This allows the server to encrypt the data and transmit it to the client.
- Under *Data Transformations* click the “+” icon in the upper right corner of this table.

When a new row appears at the bottom of the table, make the following entries in each column of the new row:

<i>Column</i>	<i>Description</i>
Source URI	Enter the value of the source (e.g., card, mail, ...).
Transformation	Enter the needed encoding parameters, separated by a semi-colon.

- When done, click *Save*.

A confirmation message appears in the *Output - Messages* pane. To return to *Server Settings*, click *Cancel*.

5.6. Configuring the synchronization strategy

These options, part of the *Engine* settings, are where you can set the preferred conflict resolution applied by the Funambol Data Synchronization Service to SyncSources. You can use this feature to specify how the server handles any potential conflicts that may occur when the Data Synchronization Service tries to synchronize two copies of similar records. This is done by designating either client or server as “winner”.

- In the *Engine* options of the *Server Settings*, note the XML file pathway in the *Strategy* field. This file stores all data-conflict strategy settings.
- To review the current settings and make changes, click *Configure*. The *Strategy Configuration* options appear in the *Data Entry* pane (see Figure 18).

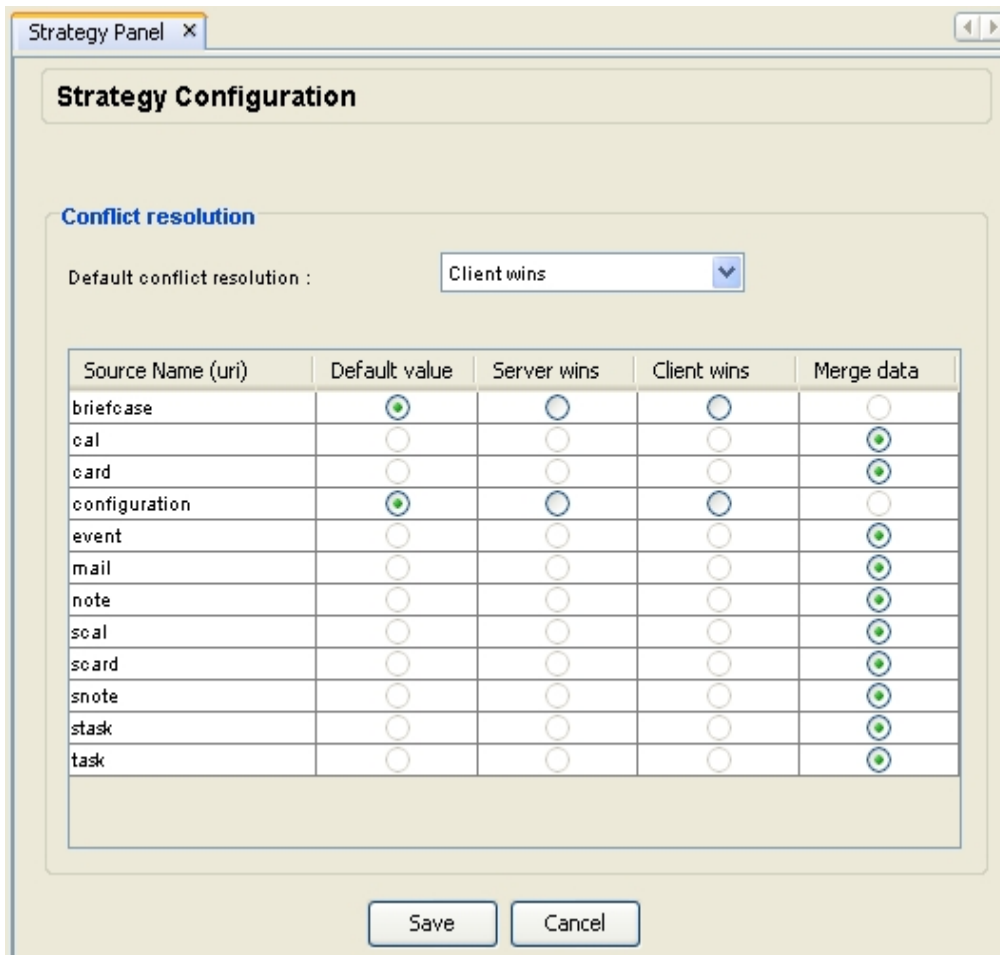


Figure 18: Strategy configuration options

The available options for resolving conflicts are listed in the following table:

Option	Description
Server wins	Changes made to an item on the server are copied to the client, overwriting previously stored data.
Client wins	Changes made to an item on the client are copied to the server, overwriting previously stored data.
Merge data	Item details are compared and changes are merged; if a field (for example, the contact's last name) has been modified both on the server and on the client, the "Client wins" rule is applied.

- Open the *Default Conflict Resolution* menu and choose the desired option.

Note: this setting is applied to those SyncSources that do not need to be configured individually, and can be used to globally switch the conflict resolution for all such SyncSources.

- Review the table and select the preferred conflict resolution for each URI source name (where the option is active).

Note: data sources with only one active resolution option reflect their base SyncSource, while other sources with two or more resolution options reflect different SyncSources.

- When done, click *Save*.

A confirmation message appears in the *Output - Messages* pane. To return to *Server Settings*, click *Cancel*.

6. Adding and managing user accounts

It is critically important to understand how *User* records fit in with *Device* and *Principal* records, since the two types of records are used together in the data synchronization process.

User records A separate user record must exist for every person who will be syncing data between a wireless device and the Data Synchronization Service. The system defines a single record per user, regardless of the number of devices that the user will be syncing.

Device records Each wireless device—laptop, smartphone, PDA, etc.—must have a record in the Data Synchronization Service database, whether used solely by one person, or shared among several users

Principal records This set of records allows you to combine individual users and devices, so that you can account for all usage patterns. This includes the following:

- Exclusive use of one device by one person.
- Shared use of one device by several people.

This enables the Data Synchronization Service to specifically sort out data synchronized from more than one user, who share the same work-use cell phone. Their specific data will be available only to them, once they've been identified in a "principal" record.

Important notice

One of the most efficient labor-saving aspects of the Funambol Server is that Administrators and IT staff do not need to manually add new user records (as described in this chapter), as new Funambol users can auto-load their accounts (including device record) when they initially connect to the Data Synchronization Service; this feature is referred to as "self-provisioning". If you are anticipating thousands of users, this is a tremendous benefit.

How does this work?

Each user initially prepares their mobile devices for a "sync" by entering a username and password of their choice, along with the Funambol server URL. During the resulting connection attempt, this information triggers the Data Synchronization Service to:

- Auto-generate a new user record (applying their user name and password).
- Add a new device record.
- Link user and device automatically in a new principal record.

A synchronization then starts. This auto-loading process is particularly useful if you have a large number of potential users.

So, why is there an *Add User* entry form?

When would you possibly manually create new user records? If you are setting up an email synchronization for a potential (unregistered) user, you may need to create the records for User, Device and Principal, then use the new user record to link to the relevant mail server (using the Email Connector, as detailed in a later chapter). The actual user (who hasn't registered yet) must then be sent a copy of the Funambol URL, plus the newly recorded username and password, to use in setting up all their synchronization connections with clients and devices.

6.1. Adding a new user account

To add a new user record to the Data Synchronization Service database, follow these steps:

1. After expanding the server tree in the *Navigation* pane, right-click *Users* and choose *Add User*.

The Add User options appear in the Data Entry pane (see Figure 19).

Figure 19: Add User panel

2. Enter the relevant information in the available fields.

<i>Field</i>	<i>Description</i>
Username	The user's system ID: a name up to 255 characters in length, using any combination of characters (case-sensitive). Note: keep in mind the space and typing limitations of mobile devices.
Password	A unique password (case-sensitive).
Confirm password	The same password.
First Name	The user's first name.
Last Name	The user's last name.
Email	The email address the user wants to link to the Funambol DS Service.
Roles	Select a role from the following: User: can perform synchronizations with the server. Administrator: can log into the Administration Tool (see chapter 4) and perform administrative tasks but not synchronizations.

Table 1: User details

3. Click *Add* to save the settings, or *Cancel* to quit without saving the settings.

A confirmation message appears in the *Output - Messages* pane.

Repeat this procedure to create any other user accounts.

6.2. Editing existing user accounts

To review and change the information for an existing user account, follow these steps:

1. After expanding the server tree in the *Navigation* pane, double-click *Users*. The *Search User* options appear in the *Data Entry* pane (see Figure 20).

The screenshot shows a web application window titled "Search Users". At the top, there is a search form with the title "Search Users". The form contains four rows of input fields: "Username", "First Name", "Last Name", and "E-mail". Each row has a "Start with" dropdown menu and a text input field. Below the form are two buttons: "Reset" and "Search". Below the form is a table with the following columns: "Username", "First Name", "Last Name", "E-mail", and "Roles". To the right of the table are three buttons: "Add", "Delete", and "Edit".

Figure 20: Search Users options

2. Click in one or more relevant search fields (e.g., just *Last Name*, or both *First Name* and *Last Name*) and type the search text.
3. Click *Search*. The resulting matches, if any, appear in the table.
4. Click the likely record and then click the now-active *Edit* button. The *Edit User* options appear in the *Data Entry* pane, displaying the current user's information.
5. Review the available fields and make the needed changes. Refer to Table 1 on page 27.
6. Click *Add* to save the changes, or *Cancel* to quit without saving the settings.

6.3. Deleting existing user accounts

To delete an existing user account, follow these steps:

1. Expand the server tree in the *Navigation* pane and double-click *Users*. The *Search User* options appear in the *Data Entry* pane.
2. Click in one or more relevant search fields (e.g., just *Last Name*, or both *First Name* and *Last Name*) and type the search text.
3. Click *Search*. The resulting matches, if any, appear in the table.
4. To verify the account is the one that is to be deleted, select the likely record and click the now-active *Edit* button.
5. Review the *User Details* options, then click *Cancel* to reopen the *Search Users* pane.
6. Select the record and click the now-active *Delete* button.

7. Managing device records

As with user records, this chapter guides you through the creation and management of the needed records. Each wireless device – laptop, Smartphone, PDA, etc. – must have a record in the Data Synchronization Service database, whether used solely by one person, or shared among several users. As noted previously, this permits you to set up synchronization for each user on any relevant device.

Important notice

You do not need to manually add new device records (as detailed in this chapter), as Funambol users can auto-load their account (including user, device and principal information) when they initially connect to the Data Synchronization Service or later, if they update their device.

For more details, see box on page 26.

7.1. Adding a new device record

To manually add a new device record to the Data Synchronization Service, follow these steps:

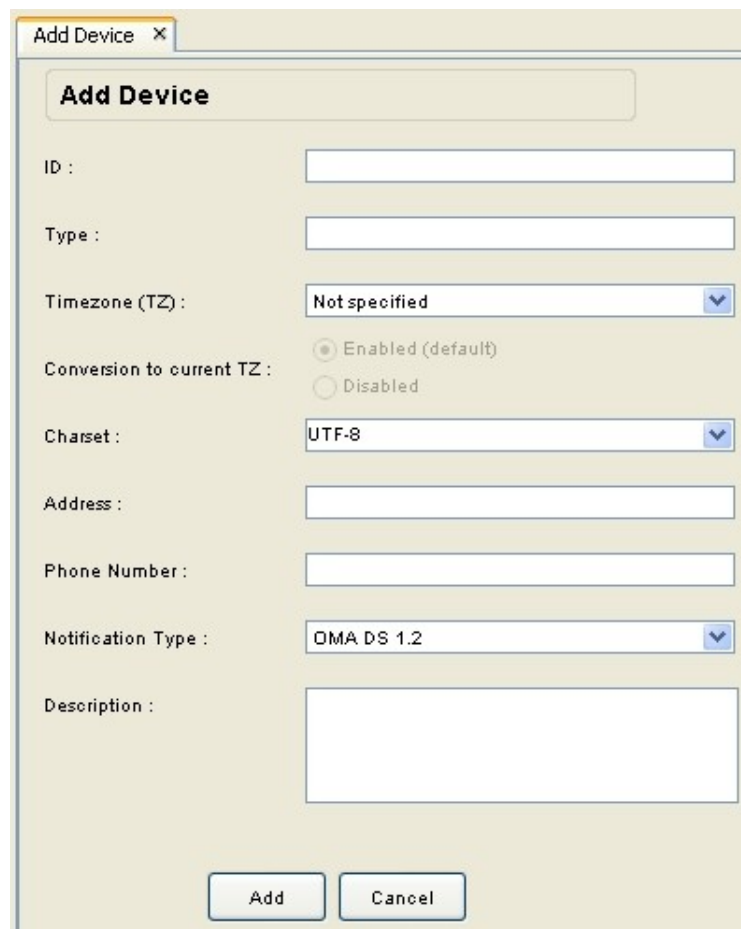


Figure 21: Add Device options

1. In the Navigation pane, right-click *Devices* and choose *Add Device*. The *Add Device* options appear in the *Data Entry* pane (see Figure 21).
2. Enter the relevant information in the available fields.

<i>Field</i>	<i>Description</i>
ID	The device ID, e.g., the phone IMEI for SyncML phones.
Type	The device type.
Timezone (TZ)	The timezone associated with the device.
Conversion to current TZ	Enable/disable conversion to the current timezone.
Charset	The character set used for communication with the device. Valid values: UTF-8, UTF-16, ISO-8859-1, US-ASCII.
Address	IP address of the device (if applicable).
Phone number	The full phone number of the device.
Notification type	Choose the correct type from the options in this menu: <ul style="list-style-type: none"> • OMA DS 1.2: works with Funambol clients and with SyncML 1.2 clients • Nokia OMA DS 1.1: works with Nokia phones that support SyncML 1.1
Description	Informational or descriptive text (optional).

Table 2: Device details

3. Click *Add* to save the settings. A confirmation message appears in the *Output - Messages* pane

7.2. Editing existing device records

To review and revise the settings for an existing device record, follow these steps:

1. In the *Navigation* pane, double-click *Devices*. The *Search Devices* options appear in the *Data Entry* pane (see Figure 22).

Figure 22: Search Devices options

2. Click in one or more relevant search fields and type the search text. (Or, to view a complete list of all existing device records, make no entries in the search fields).
3. Click *Search*. The resulting matches appear in the table.

Figure 23: Device Details options

4. Click the likely record and then click the now-active *Edit* button. The *Edit Device* options appear in the *Data Entry* pane (see Figure 23).
5. Review the information in the available fields and make any needed changes. Refer to Table 2 on page 30.
6. Click *Save* to commit any changes. A confirmation message appears in the *Output - Messages* pane.

7.3. Reviewing device capabilities

If you wish to examine in great detail the technical capabilities of a specific device, you can do so using the Funambol Administration Tool, in the *Devices* data entry options.

Note: all of the *Device Capability* categories and options are read-only displays and cannot be modified.

1. After expanding the server tree in the *Navigation* pane, double-click *Devices*.
2. The *Search User* options appear in the *Data Entry* pane.
3. Click in one or more relevant search fields and type the search text; then click *Search*.
The resulting matches, if any, appear in the table.
4. To verify the account is the one that is to be deleted, select the likely record and click the now-active *Capabilities* button.

The *Capabilities Details* pane appears (see Figure 24).

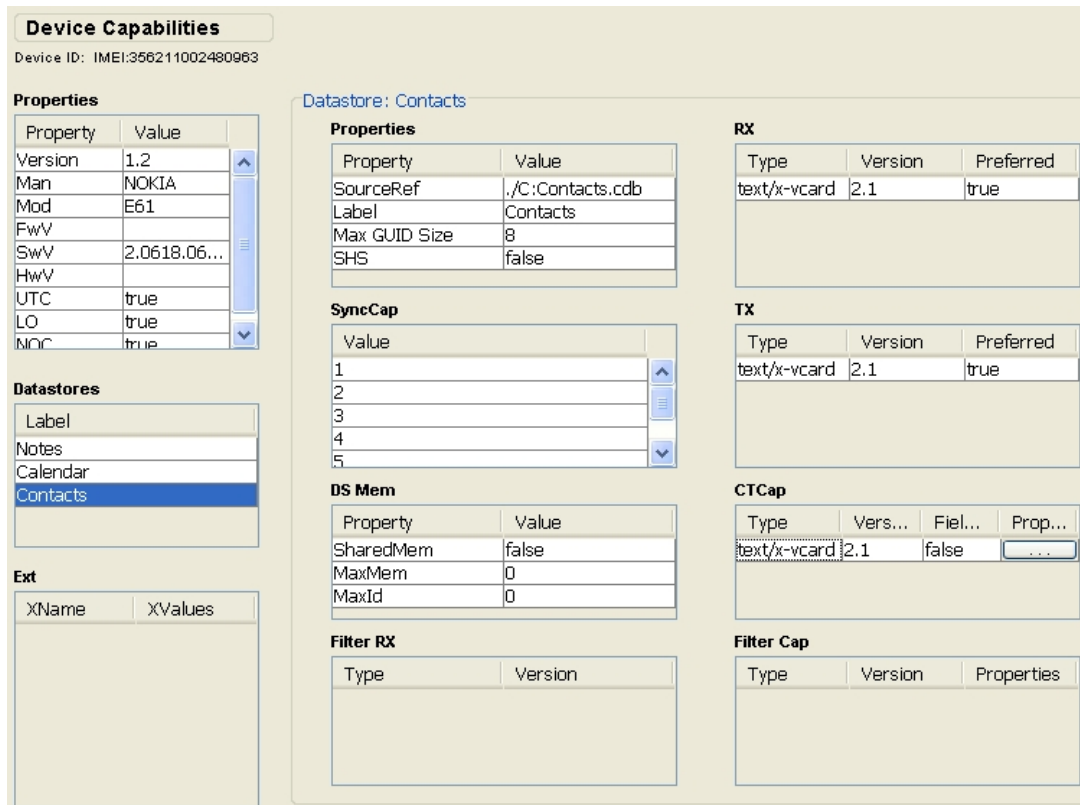


Figure 24: Device Capabilities

This pane is organized into collections of related capability options: *Properties*, *Datastores*, *Extensions* and a full range of *Datastore: Contacts*.

You can review all four sets of options through this *Data Entry* display.

7.4. Deleting device records

To delete an existing device record from the Data Synchronization Service database, follow these steps:

1. After expanding the server tree in the *Navigation* pane, double-click *Devices*. The *Search Devices* options appear in the *Data Entry* pane.
2. Type the search text in one or more relevant search fields and then click *Search*. The resulting matches, if any, appear in the table.
3. To verify the account is the one that is to be deleted, select the likely record and click the now-active *Edit* button.
4. Review the *Device Details* options, then click *Cancel* to reopen the *Search Devices* pane. Select the record and click the now-active *Delete* button. A confirmation message appears in the *Output - Messages* pane.

8. Managing principals

In the wireless mobile universe, there are two overlapping combinations of user and device that pose a potential quandary for centralized data synchronization services:

- A single Funambol user using more than one device or client for data synchronization. For example, one might have an at-work SyncML phone, a personal-use Smartphone, a copy of Microsoft Outlook on their laptop, and a Pocket PC PDA.
- Or, that same individual may be one of several users who would want to synchronize data from a single device that they take turns sharing.

With these two associations in mind, the Funambol Data Synchronization Service incorporates the concept of a principal, that associates a single user with a specific device. This allows one device to be shared by multiple users, or one user to utilize any number of devices, all synchronizing with Funambol, but without the wrong data going to the wrong client. Each of these associations is uniquely identifiable in the system as a principal.

Important notice

You do not need to manually add new principal records (as detailed in this chapter), as Funambol users can auto-load their account (including user, device and principal information) when they initially connect to the Data Synchronization Service or later, if they update their device.

For more details, see box on page 26.

8.1. Creating a new principal

To create a new principal in Funambol, use the Administration Tool to search for the desired user, then for a device match. After selecting a matching user and device from the search results tables, you link them as an individual principal following the steps detailed below.

Note: remember that you can pair more than one user with the same device, each as a unique principal. If a single phone has five users, you would create five principals to represent the associations.

1. In the *Navigation* pane, right-click *Principals* and choose *Add Principal*. The *Add Principal* options appear in the *Data Entry* pane (see Figure 25).

The screenshot shows a dialog box titled "Add Principal" with a close button (X) in the top right corner. Below the title bar is a section labeled "Add Principal". The main area is divided into two columns: "Search Users" on the left and "Search Devices" on the right. Each column contains four search fields: "Username", "First Name", "Last Name", and "E-mail" for users; and "ID", "Type", and "Description" for devices. Each field has a "Start with" dropdown menu and a text input box. Below the search fields are "Reset" and "Search" buttons. At the bottom of the dialog are "Add Principal" and "Cancel" buttons.

Figure 25: Add Principal options

2. Enter the relevant information in one or more of the *Users* search fields and then click *Search*. The results (if any) appear in the table below.
3. Enter the relevant information in one or more of the *Devices* search fields and click *Search*. The table below the search form lists the results of your query.

After you have matched a particular user and a device, the tables should look like the example in Figure 26.

The screenshot shows the "Add Principal" dialog box with search results. In the "Search Users" section, the "Last Name" field contains "Fun". In the "Search Devices" section, the "ID" field contains "Nokia". The "Search" button in the "Search Devices" section is highlighted with a dotted border. Below the search forms are two tables. The first table lists search results for users, and the second table lists search results for devices.

Username	Name	E-mail
prosewonk	Giovanni Funambolo	mudhen@funambol....

ID	Type	Description
Nokia 880	Phone	Bogus

Figure 26: Add Principal - search result

4. If your search turned up one match for each category, make sure each record is selected. If your search turned up multiple matches for user or device, select the correct record for each category.
5. Click the now-active *Add Principal* button to save the user/device pairing. Look in the *Output - Messages* area for confirmation of the new principal.

8.2. Editing existing principals

As there is no way to directly edit a principal record. In the Funambol Administration Tool you have the option to delete the existing record and create a new principal record.

8.3. Deleting existing principal records

In order to delete an existing principal record, follow these steps:

1. Right-click the *Principals* icon in the *Navigation* pane and choose *Search Principals*. The *Search Principals* options appear in the *Data Entry* pane.
2. Search for a specific principal, using any of the available data fields, or if you prefer to view the complete catalog of principals, leave the search fields empty and click *Search*.
3. Select the appropriate result in the table below the search form and click *Delete*.
4. When the deletion confirmation dialog box appears, click *OK*. The selected record is deleted and a confirmation message appears in the *Output - Messages* pane.

8.4. Reviewing last synchronization timestamps

To find and display the details about the most recent synchronization of a specific principal, follow these steps:

1. Right-click the *Principals* icon in the *Navigation* pane and choose *Search Principals*. The *Search Principals* options appear in the *Data Entry* pane.
5. Search for a specific principal, using any of the available data fields, or if you prefer to view the complete catalog of principals, leave the search fields empty and click *Search*.
2. Select the appropriate result in the table below the search form and click *Details*.
3. The *Last Synchronization Timestamps* options appear in the *Data Entry* pane (see Figure 27).

Database	Sync Type	Status	Client anchor	Server anchor	Start	End
sc.al	TWQ-WAY	200	1165020255406	1165020255	2006-12-01 16:44:15.39	2006-12-01 16:44:15....
sc.ard	TWQ-WAY	200	1165020254906	1165020254	2006-12-01 16:44:14....	2006-12-01 16:44:15....

Figure 27: Last Synchronization Timestamps

4. The table shown in Figure 27 provides the following information about the most recent synchronizations of the selected principal:

<i>Column</i>	<i>Description</i>
Database	Identifies the SyncSource used by the principal
Sync Type	Notes the type of synchronization
Status	Reports the sync status code
Client anchor	Displays the client anchor last used
Server anchor	Displays the server anchor last used
Start	Notes the start time of the most recent synchronization
End	Notes the end time of synchronization

5. If you wish to verify that this is indeed the most recent synchronization, click *Refresh*.

When done, double-click another icon in the server tree, or exit the Funambol Administration Tool.

8.4.1. Deleting a synchronization record

You can delete the records about the most recent synchronizations. This not only erases the records, but will also force the Data Synchronization Service to perform a deep comparison of client and server data, that is, a so-called slow synchronization. This will be automatically initiated the next time the client device or service attempts to sync with the Data Synchronization Service. You may want to perform this task only if there are problems arising from previous synchronizations.

To start the process, click the *Reset* button.

9. Using the Email Connector and Inbox Listener Service

The Email Connector, a key Funambol Data Synchronization Service module, allows a user to synchronize email clients on their computers and mobile devices to external mail servers through a Funambol Data Synchronization Service connection.

If you have previously installed the Funambol Server package, the Email Connector is present, ready for setup and use (as detailed in this chapter).

The Email Connector module incorporates a basic SyncSource (“mail”) that enables email synchronization and email push for both POP and IMAP email. When this module is set up and active, email can be synchronized with a designated mail server, but with important protocol-specific differences:

- POP users can sync their client Inbox folder (but no subfolders), and can send mail through their client Outbox
- IMAP users enjoy full synchronization of all folders and subfolders with the mail server

You set up the Email Connector as a “mail” service, then configure the protocols (POP or IMAP) on a per-user record basis, through the Users options.

Note that (as detailed in this chapter) user authentication with the email server can be configured to rely on the user’s own mail authentication settings—which means a simpler setup for you, the administrator.

The Email Connector serves your users who want to manually synchronize their various email clients. You can also install and configure Funambol Inbox Listener Service (as detailed in “About the Inbox Listener Service” on page 45) to enable email push, so that the Data Synchronization Service is automatically loaded with the latest incoming email, and copies are pushed to all active client devices.

9.1. Environment description

Before starting with the installation procedure, it may be helpful to review the main features of Funambol’s email module.

To implement the push email functionality and improve performance, the email module provides the Email Connector and the Inbox Listener Service tool, which offers the following features:

- **Polling Inbox Listener Service feature.** The service polls the Mail Server for new mail for a specific email account; when new mail has been received for that account, the tool sends a notification to the Data Synchronization Service.
- **Notifiable Inbox Listener Service feature.** The service keeps listening for notifications from the Mail Server, which are sent out when new mails are received by a specific email account.
- **Message processor feature.** The service stores some basic email information (such as Message-ID, Date, etc). from the inbox folder into a local caching system in order to improve the synchronization performance. The number of emails that should be cached on the system can be configured by the user.

Note: if the Inbox Listener Service is not running, both push email functionalities and message processor features are not available.

To use the email synchronization feature, the module (*s4j*) of the Email Connector must be added to the Data Synchronization Service; this component allows synchronization of a user’s email between a Mail Server and a Mobile Device.

In order to manage the Email Connector and the Inbox Listener Service, the administrator can use the panels provided in the Administration Tool after the Email Connector installation.

All data related to the Email Connector is stored in a database schema that must be added to the Funambol Data Synchronization Service Schema. This database schema is automatically created during the installation procedure.

The email synchronization process is summarized in Figure 28 and detailed in the following steps:

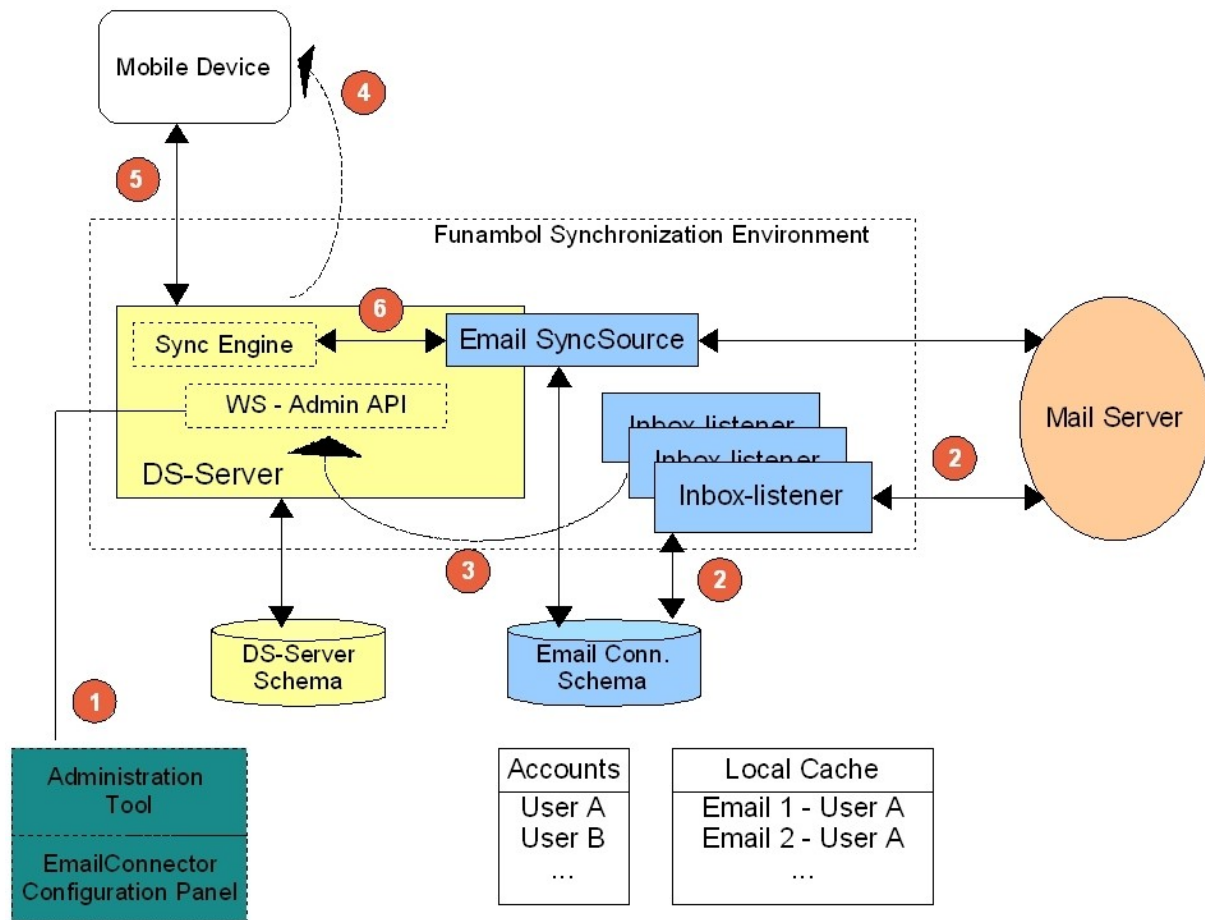


Figure 28: Email Connector: environment description diagram

1. The administrator user must create the *ds-user* user in the Data Synchronization Service and the relative account (i.e. *ds-user* + all the information about the mail server)
2. The Inbox Listener Service uses the Email Connector DB Schema and reads data from the *Accounts* table. It retrieves the last *N* (max email number) emails from the server's inbox folder and stores some basic info in the local cache. This behavior allows the Email Connector to improve the performance during the sync process. The Inbox Listener Service can be driven by a polling system or an asynchronous external notification.
3. When new email has been received in the server's inbox folder, the Inbox Listener Service sends a notification to the Data Synchronization Service.
4. The Data Synchronization Service sends the notification to the client.
5. The client (or mobile device) performs a sync session. A sync session can be driven by:
 - A Data Synchronization Service Notification. The Data Synchronization Service sends a notification if a new email is the inbox folder.
 - The user. The user starts the sync session pressing the sync button on the SyncML client.
6. The Data Synchronization Service uses the Email Connector in order to sync the email with the Mail Server. The Email Connector uses the local cache in order to improve the performance.

9.2. Email Connector configuration steps

To configure the Email Connector for external mail server communications and synchronizations, use the Funambol Administration Tool to perform the following actions:

- Assigning the Officer for the Email Connector to enable user authentication (see section 9.3).
- Configuring the Email Connector (see section 9.4).
- Setting up the Email SyncSources.

9.3. Assigning the officer for the Email Connector

After the initial installation, a key server setting, *Email Officer*, controls how users are authenticated so that they can access the server functions. Two xml files define the options for the two instances of the Officer that are present in the Funambol standard installation:

- *UserProvisioningOfficer.xml*. This is the default officer. Use this file if your Data Synchronization Service cannot use an external mail server or user database for user authentication. In this case, this Officer performs the authentication function locally. Note that, if this officer is active, you must manually enter user accounts, including ID and password, then communicate that information to users to aid them in preparing their clients and devices for synchronization.
- *EmailOfficer.xml*. This is the alternate officer. Use this file if your Data Synchronization Service has access to a mail server or other user-authentication source. This greatly simplifies your user-connection setup; your users can set up device sync profiles using their email login entries for authentication and access to Funambol. When they first connect, the system validates their identity, then auto-generates the needed user, device and principal records.

To change the default to *EmailOfficer.xml*, follow these steps:

1. After opening the Funambol Administration Tool, log into the server.
2. Expand the server tree in the *Navigation* pane and double-click *Server Settings*. The *Server Settings* options appear in the *Data Entry* pane.
3. In the *Officer* field (included in the *Engine* options; see), the default entry is *UserProvisioningOfficer.xml*. Edit the entry as follows (with edits shown in bold):

com/funambol/server/security/EmailOfficer.xml



The screenshot shows a configuration window with a tab labeled 'Engine'. Below the tab, there are two input fields. The first is labeled 'Server URI :'. The second is labeled 'Officer :'. The text in the 'Officer' field is 'com/funambol/server/security/UserProvisioningOfficer.xml'. The text 'EmailOfficer.xml' is highlighted in bold in the original image, indicating the intended replacement.

Figure 29: Changing the default officer

4. Click *Save* to apply the configuration settings. You can now proceed with Email Connector configuration.

9.4. Configuring the Email Connector

Expand the *Navigation* pane tree to *Modules | email | FunambolEmailConnector* and double-click *FunambolEmailConnector*. The Email Connector options appear in the working pane, divided into two collections of options: *Public Mail Servers* and *Accounts* (see Figure 30).

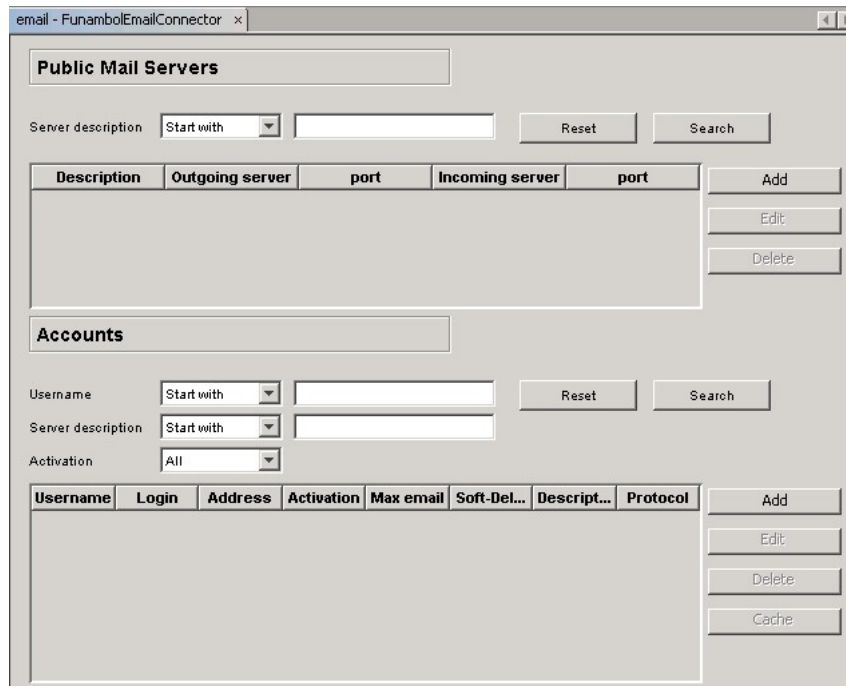


Figure 30: Email Connector configuration options

Use these features to complete a sequence of three setup tasks:

1. Create records for public mail servers that your Funambol users would synchronize with (see section 9.4.1).
2. Link existing user records to relevant servers (see section 9.4.2).
3. Activate mailbox monitoring and email push on a per-account basis (see section 9.4.3).

9.4.1. Creating public mail server records

The Data Synchronization Service is pre-loaded with the most common public mail servers, such as AOL, Yahoo, Gmail, Hotmail. After activating this group, you may need to manually add more mail servers. This section describes both tasks in step-by-step detail.

1. After opening the *FunambolMailConnector* options, locate the *Public Mail Server* options and click *Search*. The table lists a default set of public servers, ready for use (see Figure 31).

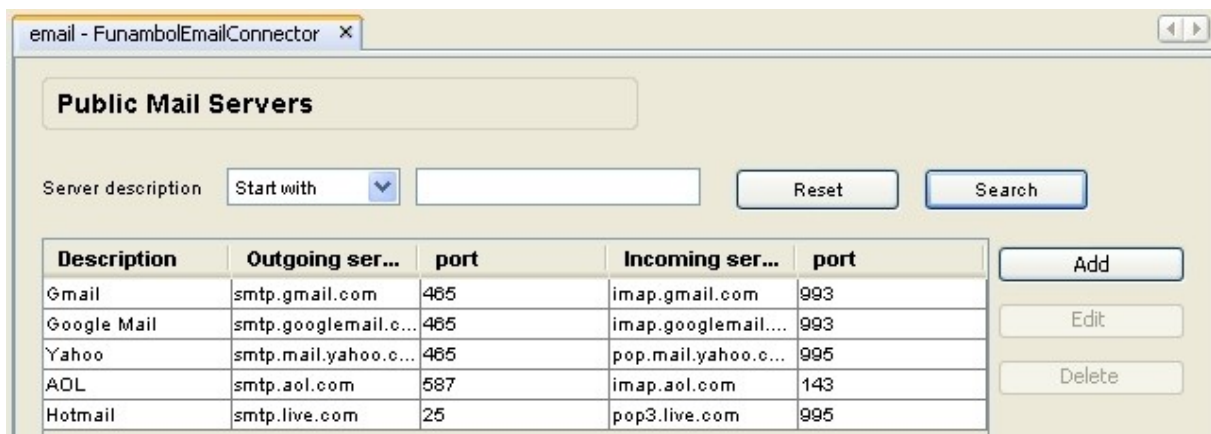


Figure 31: Public Mail Servers list

2. If this list is not inclusive of servers utilized by your users, click *Add*. The *Mail Server Details* dialog box appears (see Figure 32).

Figure 32: Public Mail Servers - Mail Server Details

- Review the following options (some of which are read-only) and make needed entries and selections:

Field	Description / action
Description	A plain-language descriptive name for this server, usually incorporating the server's brand name, e.g. Scalix.
Server product	Open this menu and choose the mail server application. If it matches one of the listed options. Default: "Other".
Protocol	Open this menu and choose "pop3" or "imap". Note that some options will be activated (or rendered inactive) depending on your choice of protocol.
Outgoing server	The URL of the outgoing email server.
Port	Outgoing email server port. Default is 25 (SMTP).
Auth	If checked, the user credentials (mail login and password) are sent to the email server to authenticate the outgoing mail.
Incoming server	The URL of the incoming email server.
Port	Incoming mail server port. Default entries are 110 (POP) and 143 (IMAP)
SSL Outgoing	If checked, this option activates SSL on all outgoing messages.
SSL Incoming	If checked, this option activates SSL on all incoming messages.
Soft-delete on server	If checked, when you delete a message on your client, the message will not be deleted on the server. Checked by default.
Inbox folder name	Displays the name server label assigned to the Inbox folder. Inactive by default.
Outbox folder name	Displays the name server label for the Outbox folder. (Inactive by default).
Sent folder name	Displays the name server label for the Sent folder.
Drafts folder name	Enter the name server label for the Drafts folder. Check this option to activate synchronization. (Optional).
Trash folder name	Enter the name server label for the Trash folder. Check this option to activate synchronization. (Optional).

- Click **Save**. When the confirmation dialog box appears, click **OK**.

Repeat the previous steps as needed until you have records for all relevant mail servers.

9.4.2. Linking user accounts to mail servers

Do not start this task until you have already compiled a Data Synchronization Service database of user records.

1. In the *FunambolEmailConnector Account* options, click *Add*. The *Search Users* dialog box appears.
2. Use the search features to find matching user records (from your Funambol database of active users and double-click the exact user match.

The *Search Users* dialog box is replaced by the *User Account Details* dialog box, which displays a set of options related to the current state of the user record, including mail server options that automatically fill in with relevant values (see Figure 33).

Figure 33: User Account Details

3. Review the left-hand column of user-specific options, and make any needed changes:

Field	Description
Login	Enter the mail server user name for this record.
Password	Enter the related password.
Confirm password	Re-enter the same password text.
E-mail address	Enter the full text of this user's email address.
Enable Push	Check this flag to enable push notifications.
Enable Polling	Check this flag to enable polling.
Refresh time (min)	Enter a number that determines how many minutes between mailbox pollings.
Max email number	(Applies to POP accounts) Choose a number from the menu to control the maximum number of email messages that are pushed to the user at one time.
Max IMAP emails	(Applies to IMAP accounts) Choose a number from the menu to set the maximum number of email messages that are cached from the Inbox, Drafts, Sent and Trash folders at one time.

4. Review the right-hand mail server-specific options, but don't make any changes at this time.
5. Open the *Mail Server* menu and choose the pre-existing mail server used by this user. The existing server settings automatically load into this dialog box. All the options are read-only, as shown in Figure 34.

Figure 34: User Account Details – read only details

6. Click **Save**. When the confirmation dialog box appears, click **OK**.

Repeat this procedure as needed to link all users to mail servers.

9.4.3. Activating mailbox listening and email push for user accounts

If a user wishes to make use of email push, you can use the Funambol Administration Tool to open that user's record and reset the relevant Inbox Listener Service activation options.

1. Expand the *Navigation* pane tree to *Modules | email | FunambolEmailConnector* and double-click *FunambolEmailConnector*. The Email Connector options appear in the working pane, divided into two collections of options.
2. Select a user record (after searching for and finding the records) and click *Edit*.
3. When the *User Account Details* dialog box appears, look for the option:
 - o *Enable Push* – Check to activate email push, by which the Inbox Listener Service notifies the Data Synchronization Service of new email to be pushed to the user's client.
4. Click **Save**. When the confirmation dialog box appears, click **OK**.

This will enable push to the user. The push mode depends on the user device's capabilities: the server will first try to use connection-less push with the device, than connection-oriented push, and finally SMS-based push, if permitted to do so by the parameter in the respective XML file located in the directory *\$FUNAMBOL_HOME/config/com/funambol/server/notification*.

Note: SMS-based push is not provided out-of-the-box.

9.5. Forcing the verification of SSL certificates

By default, Funambol doesn't verify the certificates provided by email servers in SSL connections. This doesn't mean that the communication between Funambol and the email servers are not encrypted, but that the authenticity of the certificates is not verified. This makes it possible for the portal to connect to email server that support SSL without any manual intervention.

If you are worried about this behavior, you can change it editing the following files:

- *Funambol/config/com/funambol/email/inboxlistener/task/InboxListenerTask.xml*
- *Funambol/config/email/email/FunambolEmailConnector.xml*

and setting the *checkCertificates* property to 'true'.

9.6. Manually enabling encryption / encoding

All communication between the Email Connector and any SyncML client is automatically encoded with base64. If you prefer, those communications can be encoded with both DES and base64. To do so, follow the procedure described below:

1. In the *Navigation* pane, expand the server tree and double-click *Server Settings*. The *Server Settings* options appear in the *Data Entry* pane.
2. Locate the *Data Transformer Manager* option (under *Engine*) and click the *Configure* button to the right of the field.
3. When the *Data Transformer Manager Configuration* options appears as shown in Figure 35, click the "+" icon in the upper right corner of the *Data Transformations* table.

DataTransformer Manager Configuration

Transformers for incoming items

Name	Class
b64	com.funambol.server.engine.transformer....
des	com.funambol.server.engine.transformer....
New Item	New Item

Transformers for outgoing items

Name	Class
b64	com.funambol.server.engine.transformer....
des	com.funambol.server.engine.transformer....

Data transformations

Source URI	Transformation
scard	b64
briefcase	b64
scal	b64
stask	b64
note	b64

Save Cancel

Figure 35: Data Transformer Manager Configuration

This creates a new row at the bottom of the table.

4. Make the following entries in each column of the new row:

<i>Field</i>	<i>Description</i>
Source URI	Enter the value of the Source URI (e.g., the string "mail") of the SyncSource instance you created in the previous section.
Transformation	Enter this text: "des;b64" to apply the DES cipher and Base64 encoding.

- Click **Save** to apply this encryption transformation.

9.7. The Inbox Listener Service

In conjunction with the Email Connector, the Inbox Listener Service is a key component that makes it possible for the Funambol Data Synchronization Service to monitor external mail servers, and when new in-bound messages are detected in a user's mailbox, to do the following:

- Send an alert to the user.
- Automatically sync ("push") the new messages to the user's Funambol archives.

When a new message is detected by the Inbox Listener Service, the Funambol engine notifies the user's device about the new mail. The device then initiates the email synchronization process with the email server via the Funambol engine and Funambol Email Connector.

Note: there is no access to the Inbox Listener Service by means of the Administration Tool. You must use the command line (as detailed in the following sections) to configure and manage the Inbox Listener Service.

9.8. Configuring the Inbox Listener Service

To customize the Inbox Listener Service to match your system, you will follow the procedure detailed in this section. You may need to repeat the procedure twice, to cover POP mail and IMAP mail. The following cannot be done with the Administration Tool; you must use a command line window.

- Change to the directory `$FUNAMBOL_HOME/config/com/funambol/email/inboxlistener` and open the `InboxListenerConfiguration.xml` file using a text editor.
- Review and edit any of the following properties:

<i>Property</i>	<i>Description</i>
maxThreadPoolSize	Specifies the max number of threads that can be used. This should be a function of the number of users to monitor.
healthThreadExecutionPeriod	Sets the interval (in seconds) between executions of the HealthThread, a thread that at regular intervals assesses the Inbox Listener Service status.
registryMonitorPollingTime	Sets the interval (in seconds) between executions of the RegistryMonitor, a thread that regularly checks the database for changes to the monitored accounts.
taskPeriodTolerance	Sets the tolerance accepted on the period between two data checks. If a user is scheduled to be checked every x seconds (period), the server will produce a warning log entry if the data check occurs after x + periodTolerance/x
registryTableName	Defines the table that contains the push registry entries. By default <code>fnbl_email_push_registry</code> .
registryEntriesIdSpace	ID space used to create unique identifiers for registry entries. By default <code>email.registryid</code> .
pluginDirectory	The directory from which the service loads plug-ins.
WSServerInformation	Records the information used to call any webservices exposed by the Data Synchronization Service, as noted below: <ul style="list-style-type: none"> <i>url</i>: the Funambol engine administration URL <i>username</i>: the Funambol engine administrator username <i>password</i>: the Funambol engine administrator password
clusterConfiguration	Contains the information used to create a cluster between two or more Inbox Listener Services.

3. Save your changes and close the file.

9.8.1. Inbox Listener Service configuration strategy

If you anticipate a large number of users who want email push for their mail data, the cluster configuration of the Inbox Listener Service is suggested; in this configuration, load balancing is implemented for better performances.

9.9. Starting and stopping the Inbox Listener Service

To start the Inbox Listener Service, follow these steps:

1. Open a command line window (Windows or Linux).
2. At the prompt, type the following:
 - on Windows:

```
cd $FUNAMBOL_HOME\bin
inbox-listener.cmd start [-debug]
```

- on Linux: (you must have superuser privileges)

```
cd $FUNAMBOL_HOME/bin
./inbox-listener start [-debug]
```

To stop the Inbox Listener Service, follow these steps:

1. Open a command line window.
2. Type the following at the prompt:
 - on Windows:

```
cd $FUNAMBOL_HOME\bin
inbox-listener.cmd stop
```

- on Linux:

```
cd $FUNAMBOL_HOME/bin
./inbox-listener stop
```

Note: if the Inbox Listener Service was started with the *-debug* option, use the *Ctrl-C* key combination to stop it.

9.10. Database maintenance

When using a PostgreSQL database, you need to periodically check the the size of the *fnbl_email_inbox* table. To do so, go to the PostgreSQL console and run this query:

```
select * from pg_relation_size('fnbl_email_inbox');
```

which will return the number of bytes occupied by the *fnbl_email_inbox* table.

If necessary, use the VACUUM facility provided for PostgreSQL to clean up the database.

To do a deeper cleaning and free the disk space, the VACUUM function should be run with the *'full'* option. Please refer to official PostgreSQL documentation for further details.

10. Using the PIM Listener Service

PIM, or Personal Information Management, is the standard term used to refer to the collection of personal information (contacts, calendar entries, notes, tasks, etc.) that the user can synchronize with the server using the Funambol software.

The Funambol PIM Listener Service monitors the Data Synchronization Service PIM database. If PIM Listener Service detects any out-of-sync data, a prompt is sent to the Funambol engine. If correctly configured, the server notifies any affected, out-of-sync devices using the appropriate push mode (connectionless, connection-oriented or SMS) ; the devices, in response, automatically initiate a new synchronization process to update all their data.

Note: SMS-based push is not provided out-of-the-box.

10.1. Configuring the PIM Listener Service

This section details the configuration of the software, including log settings (see section 10.1.1).

1. Change to the directory `$FUNAMBOL_HOME/config/com/funambol/pimlistener/`
2. Open the `PIMListenerConfiguration.xml` file.
3. Review and edit the following properties:

<i>Property</i>	<i>Description</i>
maxThreadPoolSize	Specifies the max number of threads that can be used. This should be a function of the number of users to monitor.
healthThreadExecutionPeriod	Sets the interval (in seconds) between executions of the HealthThread, a thread that at regular intervals assesses the PIM Listener Service status.
registryMonitorPollingTime	Sets the interval (in seconds) between executions of the RegistryMonitor, a thread that regularly checks the database for changes to the monitored accounts.
taskPeriodTolerance	Sets the tolerance accepted on the period between two data checks. If a user is scheduled to be checked every x seconds (period), a warning is triggered if the data check occurs after $x + periodTolerance/x$
registryTableName	Defines the table that contains the push registry entries. By default <code>fnbl_push_listener_registry</code> .
registryEntriesIdSpace	ID space used to create unique identifiers for registry entries. By default <code>pushlistener.id</code> .
pluginDirectory	The directory from which the service loads plug-ins.
WSServerInformation	Records the information used to call any web services exposed by the Data Synchronization Service, as noted below: <ul style="list-style-type: none">• <i>url</i>: the Funambol engine administration URL• <i>username</i>: the Funambol engine administrator username• <i>password</i>: the Funambol engine administrator password
clusterConfiguration	Contains the information used to create a cluster between two or more PIM Listener Services.

4. Save your changes and close the file.

10.1.1. Configuring PIM Listener Service logging

The Funambol PIM Listener Service uses Log4j as the basis for its logging system. In order to configure the PIM Listener Service log, follow these steps:

1. Change to the directory `$FUNAMBOL_HOME/config`
2. Open the `log4j-pimlistener.xml` file.

Note: there is no need to restart the Data Synchronization Service for changes to take effect since, by default, this file is checked for updates every 30 seconds.

Refer to official Log4j documentation for details about log configuration.

10.1.2. About the detailed appenders

By default, two detailed appenders are configured in the PIM Listener Service:

- detailed-console
- detailed-log-file

Both appenders use this layout:

```
[%d{yyyy-MM-dd HH:mm:ss,SSS}] [%c] [%p] [%t] [%X{entryId}] [%X{deviceId}]
[%X{userName}] [%X{sourceURI}] %m%n
```

These options, when utilized fully, create a very enriched log message with this [text]:

```
username/deviceId/sourceUri
```

10.2. Activating and using the PIM Listener Service

Activating and using the PIM Listener Service

This section covers the procedures for starting the PIM Listener Service, and managing the user account database. The following tasks are covered in separate sub-sections.

- Starting the PIM Listener Service (see 10.2.1)
- Monitoring the status of the PIM Listener Service (see 10.2.2)
- Adding user accounts to the PIM Listener Service (see 10.2.3)
- Stopping the PIM Listener Service (see 10.2.4)

10.2.1. Starting the PIM Listener Service

To start the PIM Listener Service after configuring the scripts, open a command line window and type the following at the prompt:

- on Windows:

```
cd $FUNAMBOL_HOME\bin
pim-listener.cmd start [-debug]
```

- on Linux: (you must have superuser privileges)

```
cd $FUNAMBOL_HOME/bin
./pim-listener start [-debug]
```

Note: if you run the PIM Listener Service using the *-debug* option, the output messages will be displayed on the console.

10.2.2. Monitoring the PIM Listener Service status

To review the current PIM Listener Service status, open a command line window and type the following at the prompt:

- on Windows:

```
cd $FUNAMBOL_HOME\bin
```

```
pim-listener.cmd status
```

- on Linux:

```
cd $FUNAMBOL_HOME/bin  
./pim-listener status
```

10.2.3. Managing the user account database

To configure the users that must be monitored, follow these steps:

1. Open a command line window and type the following at the prompt:
 - on Windows:

```
cd $FUNAMBOL_HOME\bin  
pim-listener.cmd console
```

- on Linux:

```
cd $FUNAMBOL_HOME  
./pim-listener console
```

2. When the PIM Listener Service console window appears, use the following commands to enter and/or manage your user accounts:

Command	Description
0 – quit	Exits the PIM Listener Service console.
11 – list entries	Displays a list of all monitored users (entries).
12 – list entries by userName	Displays a list of all entries associated with a specific user.
14 – get entry	Displays the entry with a specified ID.
15 – enable entry	Enables the entry with a specified ID.
16 – disable entry	Disables the entry with a specified ID.
17 – insert entry	Inserts a new entry through a guided procedure. Please note that by activating calendars, tasks will be activated as well.
18 – update entry	Update an already existing entry.
19 – mark an entry as deleted	Marks an entry deleted. The record in the database will be automatically deleted by the PIM Listener Service itself.

10.2.4. Stopping the PIM Listener Service

To stop the PIM Listener Service, open a command line window and type the following at the prompt:

- on Windows:

```
cd $FUNAMBOL_HOME\bin  
pim-listener.cmd stop
```

- on Linux:

```
cd $FUNAMBOL_HOME/bin  
./pim-listener stop
```

Note: if the PIM Listener Service was started with the *-debug* option, use the *Ctrl-C* key combination to stop it.

11. Using the Push Connection Service

The Funambol Push Connection Service is responsible for managing the connections between the mobile device and the Funambol Data Synchronization Service.

11.1. Configuring the Push Connection Service

This section details the configuration of the software, including log settings (see).

1. Change to the directory `$FUNAMBOL_HOME/config/com/funambol/ctp/server/`
2. Open the `CTPServerConfiguration.xml` file.
3. Review and edit the following properties:

<i>Property</i>	<i>Description</i>
portNumber	By default, the Push Connection Service opens a server socket on port 4745. Client devices connect to this port in order to receive notification messages. If you wish to change the port, change the value of this property accordingly.
loggingFilterEnabled	By default, the Push Connection Service does not log incoming and outgoing messages. If you want to log them you have to enable the logging filter by setting the value of this property to "true". Please note that the incoming and outgoing messages are logged at "trace" level, so you have to enable logging level to "All" in the file <code>log4j-ctpserver.xml</code> located in the directory: <code>\$FUNAMBOL_HOME/config/</code>
WSServerInformation	By default, the Push Connection Service connects to the Data Synchronization Service web service at the URL <code>http://localhost:8080/funambol/services/admin</code> using user = "admin" and password = "sa". If you wish to change these details, modify the value of the sub-properties url, username and password.
notificationGroupName	By default, Push Connection Services and Push Senders communicate using the group name <code>ctp-notification-group</code> . If you wish to install two distinct groups of processes, you must specify a different group name either for the Push Connection Services or for the Push Senders: <ul style="list-style-type: none">• To specify the group name for the Push Connection Service, modify the value of this property.• To specify the group name for the Push Sender, open the <code>\$FUNAMBOL_HOME/config/com/funambol/server/notification/PushSender.xml</code> file and modify the <code>groupName</code> property.

11.1.1. Configuring Push Connection Service logging

The Funambol Push Connection Service uses Log4j as the basis for its logging system. In order to configure the Push Connection Service log, follow these steps:

1. Change to the directory `$FUNAMBOL_HOME/config directory`
2. Open the `log4j-ctpserver.xml` file.

Note: there is no need to restart the Data Synchronization Service for changes to take effect since, by default, this file is checked for updates every 30 seconds.

Please refer to official Log4j documentation for details about log configuration.

11.2. Activating and using the Push Connection Service

This section covers the procedures for starting the Push Connection Service and managing the user account database. The following tasks are covered in separate sub-sections.

- Starting the Push Connection Service (see 11.2.1)

- Monitoring the status of the Push Connection Service (see 11.2.2)
- Stopping the Push Connection Service (see 11.2.3)

11.2.1. Starting the Push Connection Service

To start the Push Connection Service after configuring the scripts, open a command line window and type the following at the prompt:

- on Windows:

```
cd $FUNAMBOL_HOME\bin
ctp-server.cmd start [-debug]
```

- on Linux: (you must have superuser privileges)

```
cd $FUNAMBOL_HOME/bin
./ctp-server start [-debug]
```

Note: if you run the PIM Listener using the *-debug* option, the output messages will be displayed on the console.

11.2.2. Monitoring the Push Connection Service status

To review the current Push Connection Service status, open a command line window and type the following at the prompt:

- on Windows:

```
cd $FUNAMBOL_HOME\bin
ctp-server.cmd status
```

- on Linux:

```
cd $FUNAMBOL_HOME/bin
./ctp-server status
```

11.2.3. Stopping the Push Connection Service status

To stop the Push Connection Service, open a command line window and type the following at the prompt:

- on Windows:

```
cd $FUNAMBOL_HOME\bin
ctp-server.cmd stop
```

- on Linux:

```
cd $FUNAMBOL_HOME/bin
./ctp-server stop
```

Note: if the Push Connection Service was started with the *-debug* option, use the *Ctrl-C* key combination to stop it.

12. Customizing the DS Service's log settings

A basic Data Synchronization Service installation provides a single log file called *ds-server.log*, which you will find in the *\$FUNAMBOL_HOME/logs/ds-server* directory. This file has been structured to store a lot of information; if you prefer, you can use the Funambol Administration Tool to redirect logging for specific server components so that more refined output is sorted into distinct log files.

12.1. Getting started

To review the settings for the default system logger, follow these steps:

1. In the Funambol Administration Tool, expand the navigation pane server tree to *Server settings* -> *Logging* -> *Loggers*. A list of logging categories (called “loggers”) appears below *Logging*, as shown in Figure 36.

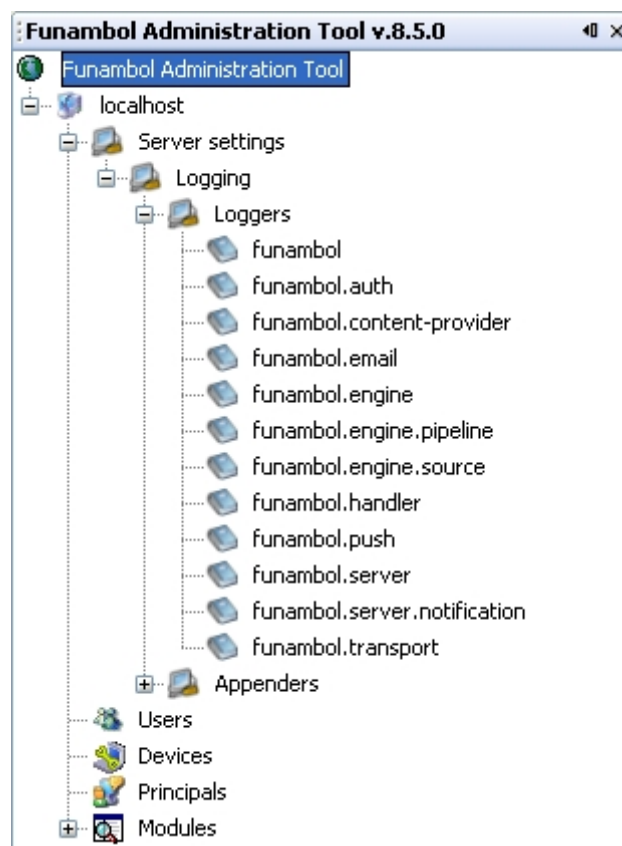


Figure 36: Loggers

A second list of logging configuration files (called “appenders”) are also listed here.

2. To review the default log file settings (automatically applied to all other loggers), double-click *funambol* (under “loggers”).

The pane displays the current logger settings, which are editable (see Figure 37).

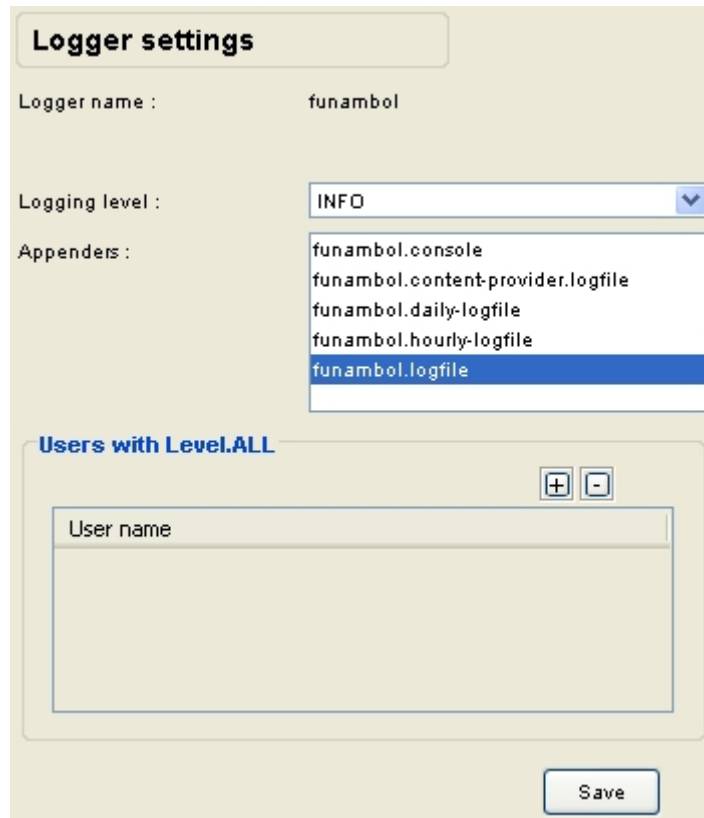


Figure 37: Logger settings

These settings are automatically applied to all of the other listed loggers.

3. To review and customize each logging category, double-click each logger name in the *Logger* tree. Note that all of the options of all other loggers are grayed out (inactive).
4. To customize the settings for a specific server logger, uncheck the Same as Funambol checkbox.
5. The following logging parameters become active, which you can now revise:
 - *Logging Level*. Open this menu and choose the level of information to be logged (see Figure 38). The default menu choice is *INFO*.

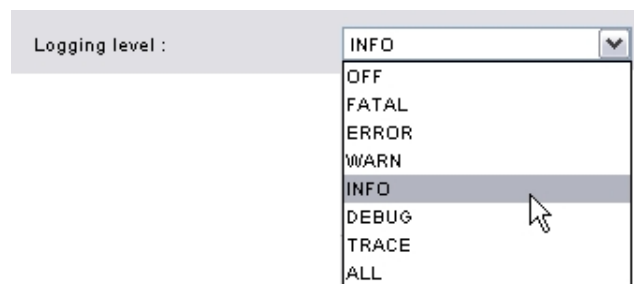


Figure 38: Logging level

The menu choice range from Off to All, reflecting the following:

- *OFF* = no information logged
- *ALL* = info, errors and debug information are logged.

To record all server problems when debugging the server or a SyncSource, choose *ALL*. This level provides the most information. You should also use *ALL* if you wish to submit a log file for consideration by participants in any Funambol mailing lists.

- *Appenders*. This list displays the relevant appenders that control aspects of this logger's operations. You can review each of the appenders and their settings in a separate procedure, detailed in the following section.
- *Users with Level.ALL*. This list is for additional logs that track specific individual users. To add a user to this list, click the plus [+] button, then double-click the "user name" row that appears to activate the text field.

Type the exact text of a user name in this field, then click anywhere in the pane. The *funambol_ds.log* file now tracks the activities of the selected user.

Note: the log to *ALL* for users is valid only for specific actions (for example, syncing) carried out by a particular user, but it does not affect SMS sending. In order to enable full logging on SMS sending as well, which is controlled by the logger *funambol.server.notification.subitosms*, you must enable full logging on the parent logger: *funambol.server.notification*, by following these steps:

1. Open the Funambol Administration Tool
2. Log in to the server you want to manage
3. Expand the server name
4. Expand *Server settings | Logging | Loggers*
5. Double click on *funambol.server.notification*; the logger configuration panel will appear on the right.
6. Uncheck "Same as *funambol.server*". By doing so, you are specifying different logging settings for the specific logger.
7. Set *Logging level* to *ALL*
8. Select *funambol.logfile* in the Appenders list.

When done, click *Save* to apply your changes. A confirmation message appears in the *Output - Messages* pane.

12.2. Reviewing the logging appenders

Appenders are files that store particular configurations that you can customize on a per-log basis.

1. In the Funambol Administration Tool, expand the navigation pane server tree to *Server settings -> Logging -> Appenders* (see Figure 39).

The appenders listed in the Navigation tree are:

- *funambol.console*
- *funambol.content-provider.logfile*
- *funambol.daily-logfile*
- *funambol.hourly-logfile*
- *funambol.logfile*

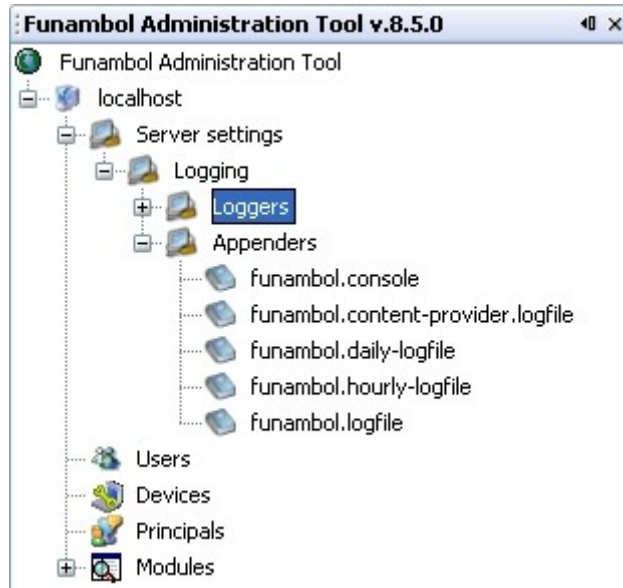


Figure 39: Appenders

2. Double-click an appender to review its current settings. The appender-specific options appear in the working pane.

For example, if you open the *funambol.console* appender, the dialog box shown in Figure 40 appears:



Figure 40: *funambol.console* appender settings

The following options are used to format appenders:

<i>Option</i>	<i>Description</i>
File Name	Stores the log file name and exact pathway.
Date Pattern	Notes the pattern of date entries.
File Size Limit	Sets a maximum size for a log file, before earliest entries are deleted to make room.
Rotation File Count	Determines how many separate log files can be maintained.
Pattern Layout	<p>Edit these text string elements to control how much data is stored per entry:</p> <ul style="list-style-type: none"> • / - the local pathname separator • %t - the system temporary directory • %h - the value of the <i>user.home</i> system property • %g - an automatically generated number to distinguish rotated logs • %u - a unique number to resolve conflicts • %% - translates to a single percent sign (%)

Copy the current *Pattern Layout* string to a text editor, make any needed changes, then copy it back to this text field.

3. Click *Save* to apply any changes. A confirmation message appears in the *Output - Messages* pane.

12.3. Customizing log files on a per-user basis

It is possible to add individual users to the log files maintained by the Data Synchronization Service. In addition to system status and activities, log files can now be directed to record all the activities of individual users.

This enables you to check the activities and any potential problems experienced by users, from the point of view of the server. All you need is the exact Funambol username and the appropriate log file.

To set up a log file for an individual user, follow these steps:

1. In the Funambol Administration Tool, expand the navigation pane server tree to *Server settings -> Logging -> Loggers*. A list of logging categories appears.
2. Double-click the appropriate log file (under “loggers”). Note that all of the options of this logger are grayed out (inactive).
3. To add a user to this logger, uncheck the “*Same as Funambol*” checkbox.
4. You can now add one or more user-specific log files, by means of the *Users with Level.ALL* list:
 1. Click the plus [+] button.
 2. Double-click the *user name* row that appears (see).



Figure 41: *Users with Level.ALL*

This activates the text field.

3. Type the exact text of the Funambol user name in this field.
4. Click anywhere in the pane to save your entry.
5. Repeat this procedure to add other users, as needed.

An additional log file will be kept (with “level ALL”) that tracks the activities of the newly entered user.

5. Click *Save* to apply your changes. A confirmation message appears in the *Output - Messages* pane.

13. Test-driving Funambol

This section presents several test drives that will help you evaluate the use of a Data Synchronization Service at what it does best: synchronizing important personal data on a wide range of client devices and applications.

13.1. “Proof of concept” test drive

The first test drive, which is called a “proof of concept”, installs all the software and accessories that let you try out the Data Synchronization Service in an efficient simulation mode. You use a pre-packaged Server demo, a Sync Client demo, and (optionally) a local copy of Microsoft Outlook, to try out the following:

- Storing and managing personal information on the Funambol Server
- Synchronizing server data with information stored on the mobile device
- Installing the Funambol Outlook Sync Client and running a Outlook-to-server-to-mobile device synchronization (optional)

This test drive shows how both Funambol administrators and users can use Funambol to set up user data stores and to synchronize that data with other devices:

- As a prospective Funambol administrator, you use a demo browser-based Administration Tool to add user-specific contact and calendar data to a Data Synchronization Service at your site.
- As a prospective Funambol user, you use a demo client to synchronize a fictitious device to the Funambol Server, to copy the newly entered contact and event data.

See chapter 14 for a detailed description of this test.

13.2. “Real world” test drive

If you have a host computer that is accessible by other devices outside your network with active Internet connections, the Funambol Server package installs all the software and accessories that let you try out the Data Synchronization Service in a “real world” test drive.

In fact, you can keep running this Funambol installation after a successful test drive if your potential user group is small enough and you don’t plan on trying to sync Funambol with an email server or any other external data source. This low-scale implementation allows you and a small number of users to synchronize your contact records and calendar items with a minimum of setup involved.

See chapter 15 for a detailed description of this test.

13.3. Synchronizing your Microsoft Outlook data

Not only can you, as a user, connect with any number of SyncML-enabled mobile devices and synchronize data between their Funambol data stores and their client devices, but you can use the Funambol Sync Client with Windows Mobile and Java ME phones, and also with iPods or copies of Microsoft Outlook to exchange data with the Funambol Server.

A key test drive component, available to both “proof of concept” and “real world” test drives, is the Funambol Outlook Sync Client. After installation of the client on your computer, you can synchronize your contacts, notes, tasks, and calendar entries. You can then run a full “real world” through-the-internet sync or a “proof of concept” sync on the local Funambol host.

This additional test is detailed in section 15.2. You can take advantage of this feature after completing the preliminary test drive evaluations.

13.4. How do test drives compare?

The following table shows how each test drive differs in setup, use, and scope.

<i>"Proof of concept" test drive</i>	<i>"Real world" test drive</i>
One user, on a single PC	One or more users
No user accounts	User accounts available
No out-of-network access	Both in-network and Internet access for all users
Software simulators	Actual devices and software clients
One user syncs data from Microsoft Outlook	One or more users sync data with multiple copies of Outlook
Setup: none	Setup: Minor network configuration

Once you determine which scenario you would like to take advantage of (if not both), this guide takes you through the preparation and use of Funambol in the following:

- Synchronizing a small set of data with a mobile device emulator or a local copy of Microsoft Outlook on the Funambol host computer.
- Synchronizing real data on any number of real client devices or client applications such as Microsoft Outlook through the network or Internet.

14. Taking the “proof of concept” test drive

This chapter will help you try out the “proof of concept” test drive briefly described in section 13.1 using convenient software emulators (installed as part of the Funambol Server package) to do the following:

- Storing and managing personal information on the Funambol Server
- Making a device-to-server connection, in which server data is synchronized with information stored on the mobile device

If you want, you can also install and use the Funambol Outlook Sync Client to run an Outlook-to-server-to-mobile device synchronization (optional) as detailed in section 15.2.

This simulation gives you an experience of how both administrators and users would use Funambol.

As a prospective Funambol administrator, you would install, configure and manage a Data Synchronization Service at your site, and would want to know how data is synchronized and what data is transferred during a sync. This simulation will prove how the concept actually works.

14.1. Managing user data on the Funambol Data Synchronization Service

After installing and starting the Funambol Server, you can do the following:

- Review already-loaded personal information on the server
- Add more data (such as personal information) to the server database

These two tasks let you experience the role of an administrator working on a Data Synchronization Service with the Administration Tool.

The scope of this test drive encompasses personal contacts and calendar entries.

14.1.1. Getting started

To start a web browser that auto-loads the Web Demo Client, follow these steps:

1. (on Windows) Open the *Start* menu and choose *Programs | Funambol | Web Demo Client* and then click on the *Web Demo Client* text link.

(on Linux) Open your browser at the following URL: <http://localhost:8080/webdemo>

A login page appears, as shown in Figure 42.

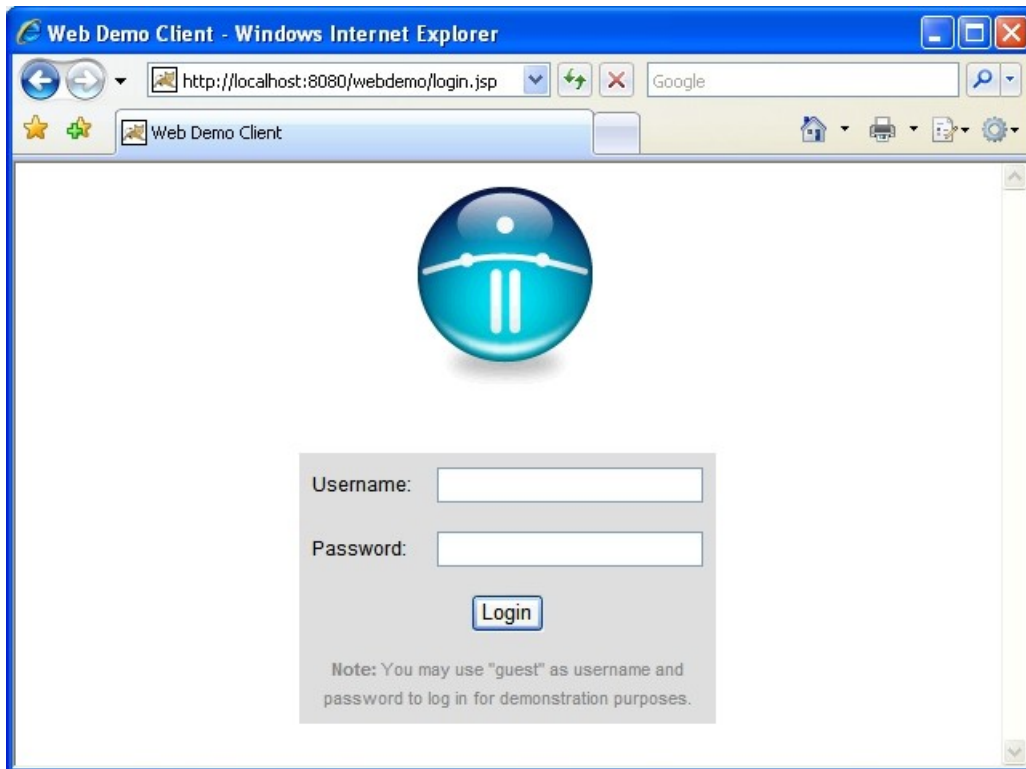


Figure 42: Funambol Web Demo Client login screen

2. As the printed instructions suggest, enter the word “guest” as both Username and Password and click *Login*.

The browser should now display the Funambol Web Demo Client page (see Figure 43).

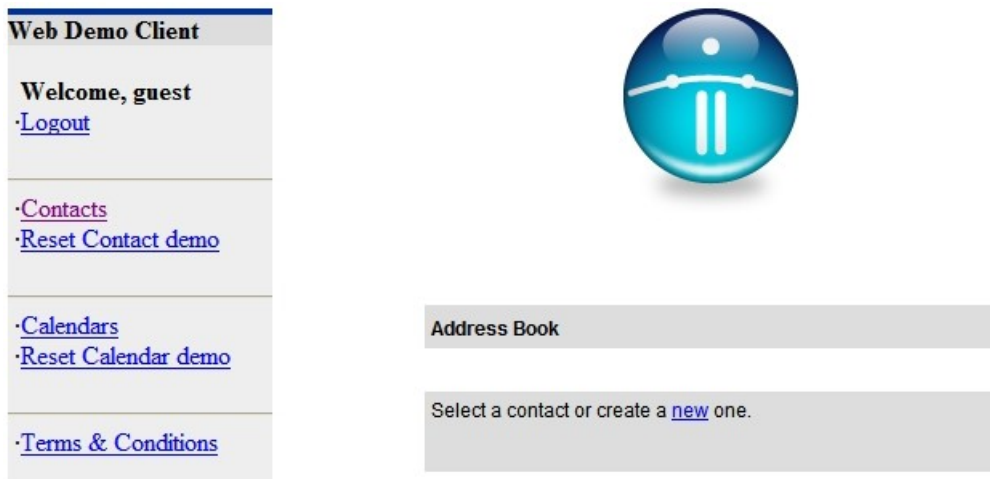


Figure 43: Funambol Web Demo Client initial page

You will use this web demo to create new personal contact and calendar entries on the server.

14.1.2. Adding a new Address Book contact to the database

At this time, you add a new contact to the Address Book that effectively stores the record on the Data Synchronization Service.

To create a new contact, follow these steps:

1. Click the “new” text link, as shown in Figure 44.

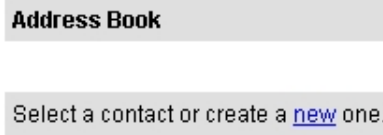


Figure 44: Create a new contact

The *Contact Details* page appears, displaying empty contact data fields (see Figure 45).

First Name	<input type="text"/>
Last Name	<input type="text"/>
Display Name	<input type="text"/>
E-mail Address	<input type="text"/>
Main Phone	<input type="text"/>
Company	<input type="text"/>
Job Title	<input type="text"/>
Home Phone	<input type="text"/>
Business Phone	<input type="text"/>
Mobile Phone	<input type="text"/>
Fax Number	<input type="text"/>

Figure 45: Contact Details page

2. Click in the data fields and type the information for a new contact.
Note: you just need to enter *First Name*, *Last Name* and *Main Phone*.
3. Do not fill in the *Display Name* field; it auto-fills with “Last Name, First Name” after you make those entries.)
4. When done, click *Add* to save your changes.
5. After the *Contact Details* page refreshes itself, click *Back* to reopen the *Contact List* page. Your new entry should be listed.

14.1.3. Adding a new Calendar entry to the database

To create a new calendar entry, follow these steps:

1. In the left column, click *Calendars*. A blank *Calendars List* appears (see Figure 46).

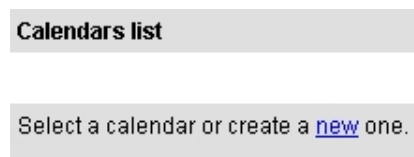


Figure 46: Calendars list

2. Click the “new” text link to add a new event to the list. The *Calendar Details* page appears (see Figure 47).

Calendar details

Summary *

Starting date (dd/mm/yyyy) * / /

Starting time (hh:mm) :

Ending date (dd/mm/yyyy) * / /

Ending time (hh:mm) :

All Day Calendar

Calendar type

Location

Description

* These fields are mandatory

Figure 47: *Calendar Details* page

3. Use the features to create an entry for an event (such as, for example, your birthday).
 - o You can enter a *Description*, a *Summary*, and *Start* and *End* times/dates.

Note: the text in the *Summary* text field is what will be listed in the *Calendars List* menu.
4. When you are done, click *Add* to save your changes.
5. Repeat this procedure to add other upcoming events, if you choose.
6. When done, click *Back* to reopen the *Calendars* list page. Your new event entries should be listed there.

You can now minimize the browser window and refer to it as the simulation proceeds.

14.1.4. Test preparation summary

You have just loaded a sample of personal and calendar information into the Funambol Data Synchronization Service, just as you might do using the Funambol Administration Tool.

Now you can use the Java Demo Client to simulate what happens when you, as a would-be user, synchronize a SyncML-enabled mobile device with your existing Data Synchronization Service records.

14.2. Synchronizing a mobile device with the Funambol Data Synchronization Service Database

With personal information stored in the Funambol Server, you can simulate the synchronization of the address book or calendar between a mobile device and your data on a Data Synchronization Service database. To do so, you use a Java Demo Client that was installed as part of the Funambol Server package.

Note: this simulation assumes that the SyncML device has already been configured to communicate with the Funambol Server.

To start the Java Demo Client, follow these steps:

1. (on Windows) Open the *Start* menu and choose *All Programs | Funambol | Java Demo Client* or or go to `$FUNAMBOL_HOME/plugin-ins/javademo/bin` and run the command:

```
demo.cmd
```

(on Linux) At the prompt, change to `$FUNAMBOL_HOME/plugin-ins/javademo/bin` and run the command:

```
./demo.sh
```

When the Funambol Java Demo Client client window appears, it displays an empty *Contact List* (see Figure 48).



Figure 48: The Funambol Java Demo Client

2. Click *Synchronize* at the bottom of the window. A series of log entries appears in the client window, as shown in Figure 49.
3. Click *OK* to return to the *Contact List*.

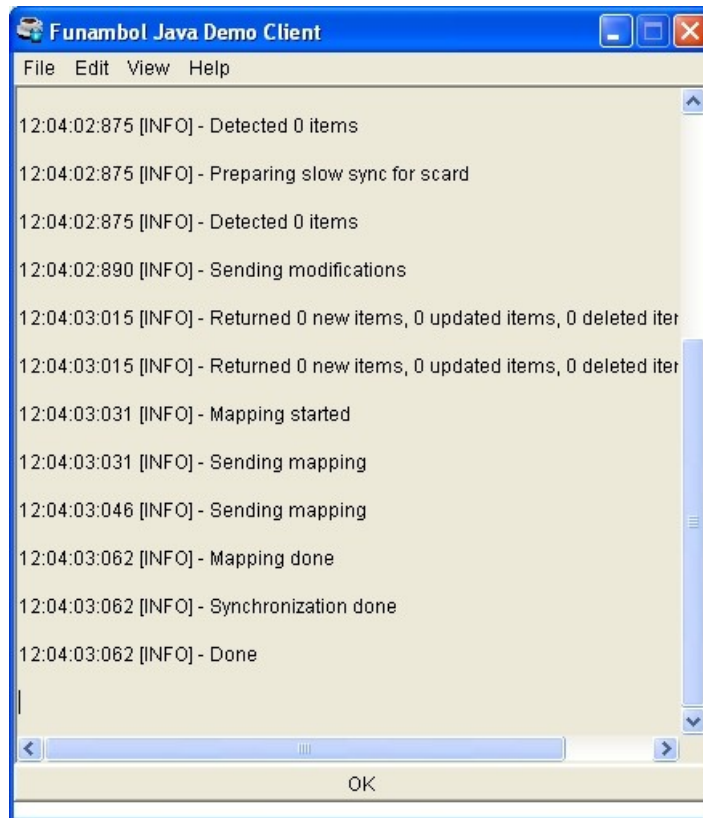


Figure 49: Log info in the Funambol Java Demo Client

If the synchronization is successful, you will see the records from the Funambol Server in the *Contact List*, that you previously entered with the Web Demo Client. These records are now available through the mobile device.

4. To view any synchronized calendar entries, choose *View/Calendar List*.

14.3. Synchronizing Microsoft Outlook with the Funambol Data Synchronization Service

At this point you have successfully stored personal data in the Funambol Server, then synchronized the data with your Java Demo Client. It may be helpful to take the simulation one step further, and attempt a synchronization of your Microsoft Outlook contacts with the Funambol Server on your computer, then synchronize the new entries to the Java Demo Client.

To take advantage of this, follow the procedure detailed in section 15.2.

15. Taking the “real world” test drive

Following installation, the Funambol Data Synchronization Service is ready to use out-of-the-box. If you prefer the “real world” test drive, you will need to complete a brief configuration of the Data Synchronization Service before starting. This preparation (i.e. entering a valid network address) will be detailed in this chapter. You can then start your “real world” test drive, either with an Outlook-to-Funambol synchronization or letting real users connect with real mobile devices to your Data Synchronization Service through the Internet.

The preliminary configuration procedures are completed with the Funambol Administration Tool, a GUI-based application that provides efficient access to most of the functions on the Funambol DS Server (see chapter 4 for further details).

After you change the IP address of the server, real-world synchronizations can begin - with a Microsoft Outlook sync (see section 15.2), then by configuring a wireless mobile device to connect to the Funambol Server, and synchronizing contacts and calendar items (see section 15.3).

15.1. Configuring the Data Synchronization Service

Changing your Data Synchronization Service IP address, as detailed below, will make your Funambol Data Synchronization Service fully ready for use, including (but not restricted to) a “real world” test drive.

1. Start the Administration Tool (see section 4.1).
2. Log in to the Data Synchronization Service (see section 4.2).
3. Specify a public IP address for your server, as detailed in section 5.2.
4. Test the availability of your Funambol Server from outside your network by starting a browser and entering the server’s public address in one of the following formats:
 - *http://<your_IP_address>:<port_number>/funambol/*
 - *http://<your_server_name>:<port_number>/funambol/*

(The default port number for Funambol is 8080.)

Note: again, the Funambol Server must have a publicly available IP address. Internal-use IP addresses will not permit successful connection to, or testing and use of the Data Synchronization Service.

15.1.1. Setting up user accounts on the Funambol DS Service

You do not need to manually add new user records, as Funambol users can auto-load their account (including user and device information) when they initially connect to the Data Synchronization Service or later, if they update their device. For more details, see box on page 26.

15.2. Synchronizing Microsoft Outlook with the Funambol Server

This section provides instructions for a helpful synchronization that can be accomplished with either test drive. You’ll learn how to install the Funambol Outlook Sync Client, configure it for Data Synchronization Service connections, and then run a synchronization.

You have two test drive-specific options:

1. You can run this synchronization as the first component of the “real world” test drive. It assumes the installation and configuration of a Data Synchronization Service with an externally available IP address (as detailed in section 5.2).

This component also assumes the setup of a mobile device for Funambol access, as detailed in section 15.3. You will need some synchronization connection data from your device to take advantage of this test drive.

2. If you are continuing the “proof of concept” test drive, at this point you have successfully entered contact and event data on a Funambol Data Synchronization Service, then synchronized data between a mobile device and the Data Synchronization Service. It may be helpful to take the experience one step further, and attempt a synchronization of your Microsoft Outlook contacts with the Funambol Server, then synchronize those new entries to the mobile device (i.e. the Java Demo Client) that you have already synchronized to Funambol.

The basic tasks that you need to carry out to set up Microsoft Outlook for Funambol synchronization are the following:

1. Download the Outlook Sync Client from the Funambol website: <http://www.funambol.com>.
2. Install and configure the Outlook Sync Client following the instructions provided in the Funambol Outlook Sync Client User Guide.
3. Start the synchronization:
 - If you are taking the “proof of concept” test drive, follow these steps:
 1. Make the browser window with the Web Demo Client active, and click *Refresh*.
 2. Look at the *Contacts List*. The full collection of Microsoft Outlook contacts should be listed.
 3. Make the Java Demo Client window active and click *Synchronize*. After a brief pause, your Outlook contacts should now be listed in this window.

This completes the synchronization simulation.

- If you are taking the “real world” test drive, you have the following options:
 - Use the Web Demo Client, as detailed in section 15.2.1, to verify the presence of synchronized data in your database.
 - Log into the Data Synchronization Service using the Funambol Administration Tool and verify that a new user record exists for test drive participants.
 - Use your newly registered mobile device to sync with the Data Synchronization Service, as detailed in section 15.3, at which time you should see your Microsoft Outlook contacts added to the device.

15.2.1. Verifying synchronized data with the Web Demo Client

In order to verify that data was successfully synchronized between Microsoft Outlook and the Funambol Data Synchronization Server database, follow these steps:

1. Open the *Start* menu in Microsoft Windows and choose *Programs | Funambol | Web Demo Client*.
2. When the Web Demo Client login page appears in a browser window, edit the default *Data Synchronization Service URL* to replace the “localhost:8080” text with the actual IP address or host name, as configured following instructions in section 5.2.

For example, the URL may be *https://localhost:8080/webdemo/login.jsp*; replace it with your Funambol Server IP address, for example: *https://192.168.0.0:8080/webdemo/login.jsp*

3. Enter your username and password and click *Login*.

When the Web Demo Client loads, the Address Book appears. You should see all of the contacts from your Microsoft Outlook and Java Demo Client listed here.

4. To fully verify your test drive results, look in the Web Demo Client navigation area and click the *Calendars* link. The *Calendars List* should display any items from your previous synchronizations.

You can now log out of the Web Demo Client, and exit the browser.

15.3. Synchronizing a mobile device with Funambol

This section will take you through the “real world” test drive scenario in which you can do what the typical user would do:

- Setup a mobile phone or wireless device for Funambol connections.
- Establish the initial connection.
- Synchronize any data stored on the Data Synchronization Service (including contacts and calendars).

In this section, we will assume the typical new-user setup of a basic SyncML phone, that requires only network/server configuration for successful use.

Note: the Funambol Server supports user self-provisioning, so you do not have to manually set up user access or enter records for each of the user’s mobile devices on the Data Synchronization Service and each potential user can auto-load the needed records by simply connecting to the Data Synchronization Service with a SyncML-ready device, using a username and password of their choosing. However, all users need the URL of the Data Synchronization Service to provision their mobile devices.

15.3.1. Setting up a mobile device for Funambol connections

Before starting the synchronization test, you need to make sure that the chosen device is compatible with SyncML services on the Funambol website: <http://www.funambol.com/solutions/devices.php>.

The following is a generalized example of mobile device setup instructions, and is included to give you some idea of the kind of setup process your own phone or device might require. The actual sequence for your phone may vary; for exact instructions, refer to your device user guide.

1. After turning your phone on, verify that it has a live Internet connection.
2. Locate and open the *Sync* options. (Check your phone’s user guide for details.)
3. Create a new (untitled) sync profile.
4. When the following fields (or their counterparts) appear, make the needed profile entries:
 - *Name*: the preferred name (for example, “Funambol”)
 - *URL*: the URL of the Data Synchronization Service. It should approximately match this example: `https://<your-server>:<your-port>/funambol/ds`
 - *User Name*: your username
 - *Password*: your password
 - *Transport Protocol*: if this option is present, enter “HTTP”
5. If a *Data Path* or *Database* option is available, select it.
6. When the following *Data Path* or *Database* fields/settings appear, verify the following:
 - *Contacts*: should display the notation “card”
 - *Calendar*: should display the notation “cal”
 - *Tasks*: should display the notation “task”
 - *Notes*: should display the notation “note”

Note: these entries are case-sensitive.

7. Save these new entries.
8. Save this new sync profile.

Your phone is now ready for synchronization.

15.3.2. Starting the synchronization

Now you can synchronize the contact and calendar data on your device with the Funambol Data Synchronization Service database. To do so, follow these steps:

1. From your phone's menu, choose *Settings* | *Connection* | *Sync*. The menu sequence may vary per phone; please refer to your phone's user guide.
2. Select *Funambol*. A sync/connection status screen appears.
3. When the synchronization process completes, a confirmation message appears.

If for some reason the data synchronization fails or the connection is broken, a notification will be displayed.

4. If your synchronization attempt is successful, you should see your Microsoft Outlook contacts listed in your phone's address book. If so, congratulations!

16. Funambol reference guide

16.1. How to install a new module

In order to install a new module (such as a connector) into the Funambol Server, copy the *s4j* file into the directory `$FUNAMBOL_HOME/ds-server/modules` (for example, *acmeconnector-1.0.s4j*) and follow these steps:

1. Make sure Funambol is up and running
2. Using a text editor, open the `$FUNAMBOL_HOME/ds-server/install.properties` file.
3. Find the line that begins with “*modules-to-install=*” in the Module definitions section. This line specifies, in a comma-separated list, the modules to install during installation.
4. Add the connector to the comma-separated list, omitting the *.s4j* filename extension (for example, *acmeconnector-1.0*).
5. Save and close the *install.properties* file.
6. Open a command window and run the server installation script by typing the following:

- on Windows:

```
cd $FUNAMBOL_HOME/ds-server
bin\install-modules
```

- on Unix/Linux:

```
cd $FUNAMBOL_HOME/ds-server
bin/install-modules
```

7. Answer all questions about re-creating the modules DB schema when prompted; type 'y' when asked to install the database for the new module and 'n' for all others.

```
[echo] Funambol Data Synchronization Server will be installed on the Tomcat 5.5.x
application server
[echo] Undeploying funambol...
[echo] Pre installation for modules foundation-8.0.1,acmeconnector-1.0
[echo] foundation-8.0.1 pre-installation...
[echo] foundation-8.0.1 pre-installation successfully completed
[echo] acmeconnector-1.0 pre-installation...
[echo] acmeconnector-1.0 pre-installation successfully completed
[echo] Copying configuration files
[echo] Post installation for modules foundation-8.0.1,acmeconnector-1.0
[echo] has.install: true
[echo] Starting custom installation...
[echo] Foundation Installation
[echo] Foundation installation successfully completed
[echo] foundation-8.0.1 installation...
[echo] Database installation for module foundation-8.0.1 on hypersonic
(/opt/Funambol/ds-server)

[iterate] The Funambol Data Synchronization Server installation program can now create
```

```

[iterate] the database required by the module foundation-8.0.1 (if any is needed).
[iterate] You can skip this step if you have already a valid database created
[iterate] or the module does not require a database.
[iterate] If you choose 'y' your existing data will be deleted.
[iterate] Do you want to recreate the database?
[iterate]      (y,n)
n

```

and

```

[echo] foundation-8.0.1 installation successfully completed
[echo] has.install: true
[echo] Starting custom installation...
[echo] acmeconnector installation
[echo] acmeconnector installation successfully completed
[echo] acmeconnector-1.0 installation...
[echo] Database installation for module acmeconnector-1.0 on hypersonic
(/opt/Funambol/ds-server)
[iterate] The Funambol Data Synchronization Server installation program can now create
[iterate] the database required by the module acmeconnector-1.0 (if any is needed).
[iterate] You can skip this step if you have already a valid database created
[iterate] or the module does not require a database.
[iterate] If you choose 'y' your existing data will be deleted.
[iterate] Do you want to recreate the database?
[iterate]      (y,n)
y
[echo] acmeconnector-1.0 installation successfully completed
[war] Warning: selected war files include a WEB-INF/web.xml which will be ignored
(please use webxml attribute to war task)
[echo] Remove output dir

BUILD SUCCESSFUL
Total time: 12 seconds

```

8. Restart the Data Synchronization Service.

The new module is now installed.

Note: installed modules are visible in the Funambol Administration Tool, in the *Modules* section.

16.2. Default SyncSource properties

The Funambol Data Synchronization Service provides the following default databases to which you can synchronize user data. Note that all noted URI entries are case-sensitive.

16.2.1. Contacts

Usage: synchronizing contact data.

<i>URL</i>	<i>MIME-type</i>	<i>Client</i>
card	text/x-vcard text/vcard	All Funambol clients and most of the common and known clients that are already built into a mobile device.

16.2.2. Calendar

Usage: synchronizing calendar data, including events and tasks.

<i>URL</i>	<i>MIME-type</i>	<i>Client</i>
cal	text/x-vcalendar text/calendar	Some Funambol clients and most of the common and known clients that are already built into a mobile device. This database manages both events and tasks.
event	text/x-vcalendar text/calendar	Some Funambol clients and most of the common and known clients that are already built into a mobile device. This database manages events only.
task	text/x-vcalendar text/calendar	Some Funambol clients and most of the common and known clients that are already built into a mobile device. This database manages tasks only.

16.2.3. Notes

Usage: synchronizing text-based notes.

<i>URL</i>	<i>MIME-type</i>	<i>Client</i>
note	text/plain	Most of the common and known clients that are already built into a mobile device.
snote	text/x-s4j-sifn	All Funambol clients

16.2.4. Briefcase

Usage: synchronizing briefcase data.

<i>URL</i>	<i>MIME-type</i>	<i>Client</i>
briefcase	Application/*	All Funambol clients

16.3. The install.properties configuration file

The `$FUNAMBOL_HOME/install.properties` file is the central repository of configuration information that is used by the installation procedure to set up the Funambol Data Synchronization Service. A standard Java properties file, it contains the following parameters:

<i>Parameter</i>	<i>Description</i>
context-path	The context path to be used to configure the web container for the Funambol Data Synchronization Service module. The Data Synchronization Service will respond to URLs starting with this context path.
dbms	Name of the database where Funambol Data Synchronization Service tables are created.
jdbc.classpath	Classpath including the JDBC driver for the database, if not included in the system classpath.
jdbc.driver	JDBC driver class.
jdbc.password	Database user password.
jdbc.url	JDBC connection URL.
modules-to-install	Comma-separated list of Funambol Data Synchronization Service modules to install. If a module has already been installed, the installation procedure reinstalls it again.
server-name	The server URI that will be specified in SyncML messages. The server will only respond to messages addressed to this URI.

16.4. Using Funambol with MySQL

If you wish to use Funambol with a MySQL database (instead of Hypersonic, which is provided by default when installing Funambol) follow these steps:

1. Create the user *funambol*.
2. Create the database *funambol* and grant the user *funambol* all privileges on the database *funambol*:

```
mysql> create database funambol;
mysql> GRANT ALL PRIVILEGES ON funambol.* TO 'funambol'@'localhost' IDENTIFIED BY 'funambol';
```

3. Copy *mysql-connector-java-5.0.4-bin.jar* to the directory:

\$FUNAMBOL_HOME/funambol/tools/jre-1.6.0/jre/lib/ext

4. Modify the file:

\$FUNAMBOL_HOME/funambol/ds-server/install.properties

changing the value of the *dbms* parameter to:

```
dbms=mysql
```

5. Comment the hypersonic configuration section:

```
#jdbc.classpath=../tools/hypersonic/lib/hsqldb.jar
#jdbc.driver=org.hsqldb.jdbcDriver
#jdbc.url=jdbc:hsqldb:hsqldb://localhost/funambol
#jdbc.user=sa
#jdbc.password=
```

6. Insert the MySQL configuration; for example:

```
jdbc.classpath=/opt/Funambol/tools/jre-1.6.0/lib/ext/mysql-connector-java-5.1.7-
bin.jar
jdbc.driver=com.mysql.jdbc.Driver
jdbc.url=jdbc:mysql://localhost/funambol?characterEncoding=UTF-8
jdbc.user=funambol
jdbc.password=funambol
```

7. Run the command:

\$FUNAMBOL_HOME/funambol/bin/install.cmd

answering 'y' to all questions.