Funambol™ Connector Overview

Overview

The Funambol Data Synchronization (DS) server is a flexible SyncML platform for synchronizing handheld devices with any data storage such as JDBC databases, groupware servers, CRM applications and SOAP services. The software that integrates the Funambol DS server and data storage is called a connector. This document describes two types of connectors supported by Funambol: zero footprint and outbound connection.

Introduction

The Funambol DS server is designed to connect to any data. It provides this ability via connector software with which it, as a SyncML server, "offers" data to be synchronized. The connector is bound on the server side by a SyncSource interface and on the data storage side by the data storage interface. The connector associates operations of the SyncSource with operations on the data storage. The interface of the data storage can be of any kind, in any language or according to any protocol. The figure below depicts the connector as it sits between the Funambol DS server and a groupware server.

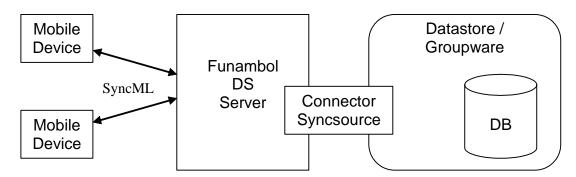| Mobile Device			Datastore / Groupware
SyncML	Funambol DS Server	Connector Syncsource	DB
Mobile Device			

Figure 1: Connector Overview

The figure shows that mobile devices communicate with the Funambol DS server. The communication between the mobile devices and the Funambol DS Server is performed with the SyncML standard that is defined by the Open Mobile Alliance (OMA).

The connector provides the seamless integration of application functionality from the groupware server to mobile devices using the Funambol DS server and SyncML. At the side of the Funambol DS server, a SyncSource interface is implemented to perform SyncML operations and translate them into application requests to the groupware server. Inside the connector, there might exist a protocol to enable separation of the Funambol DS server and the groupware server over different machines, but there may also exist code level integration.

The connector hooks into the application functionality layer of the groupware server to allow reuse of groupware functionality and guarantee data consistency. For example, if the synchronization system is based on a calendar application that implements invitations, the application functionality layer provides the mechanism to handle invitations in a neutral way and keep that logic distinct from the connector.

A connector can also implement an "Officer" for the Funambol DS server that allows the direct verification of user credentials with the groupware server. This eliminates the storage of user accounts in the Funambol DS server, which is useful for hosted systems.

Zero-footprint Connector

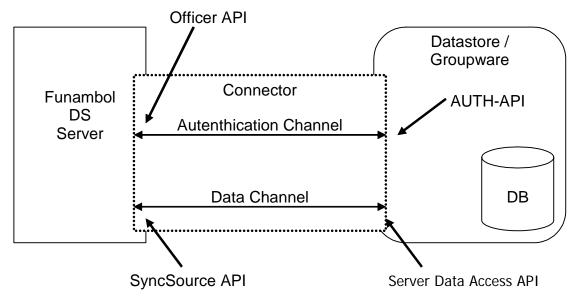The system architecture for a zero footprint connector is depicted in Figure 2.

Figure 2: Zero-footprint Connector Architecture

In this architecture, the connector uses two channels, one for authentication of Funambol DS server users and the other for data to be synchronized. Both channels might use the same protocol or even the same connection, although this is not required. For example, the Funambol Exchange connector uses WEBDAV for both channels, but it could also use LDAP for authentication and JDBC for data. This depends on the implementation of the connector and the interface to the data storage.

The authentication channel follows the APIs as provided by both the Funambol DS server and the groupware server. In practice, that means the Funambol DS server side must implement the authentication channel according to the Officer interface and the groupware server side is determined by its AUTH-API. Due to the authentication channel enabling the Funambol DS server to use the groupware authentication and user account data remotely, the Funambol DS server does not require local storage of user account data.

The data channel also follows the APIs as provided by the Funambol DS server and the groupware server. That means a SyncSource interface must be supported for the Funambol DS server side. The interface of the groupware server side is determined by its server data access API. To allow different kinds of data to be synchronized, a connector can implement multiple data channels and potentially use different protocols for each type. This is more determined by the methods for accessing data in the groupware server.

The solution is "zero footprint" as the connector communicates directly with the external protocol of the groupware server. That results in the connector being a client of the groupware server and therefore only additional software needs to be installed on the Funambol DS server. This is ideal for a hosted environment.

Example: Funambol Exchange Connector

The Funambol Exchange Connector is an out-of-the-box solution for accessing data managed by Microsoft Exchange. When the Funambol DS server starts a new SyncML session, it uses the authentication channel to authenticate access and the data channel to provide access to Exchange data. The protocol used for both channels is implemented with WEBDAV. This is the recommended protocol by Microsoft in a distributed environment. As WebDAV is an HTTP protocol, security and authentication use the same mechanisms as the core HTTP protocol. Authentication is also the mechanism used by the Exchange server to support multiple users. When a WebDAV request is served, it allows operation only with data belonging to the requesting user.

Outbound Connector

Funambol also supports an outbound connector. Unlike the zero-footprint connector, this requires installing software at the data source side. The benefit of this approach is that enterprises do not have to open a firewall for incoming connections. The installed software only establishes an outbound connection to the Funambol DS server that is accessable via the Internet. This is depicted in Figure 3.
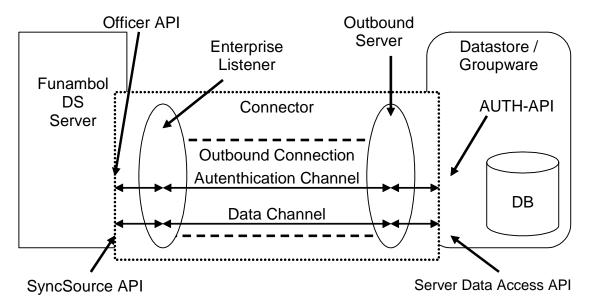

Figure 3: Outbound Connector Architecture

The connector sits between the Funambol DS server and the data storage. It enables access to the data via the Internet for the Funambol DS server to which mobile devices request synchronization. The connector still implements two channels for authentication and data, but both channels pass an outbound server and enterprise listener. These two

components provide a one-way connection setup from the groupware server to the Funambol DS server. The outbound server sets up an authenticated channel to the enterprise listener and thereafter acts as a protocol relay for the authentication and data channels. This allows use of existing connectors, because the Funambol DS server connects to the enterprise listener as it would to the real data storage. From that point, all traffic is relayed via the outbound server to the data storage.

The outbound connector requies additional software on both the Funambol DS server and the data storage side. It offers full access control to the data storage admin by the ability to stop the outbound server. The communication between the data storage and the Funambol DS server is provided by the outbound connection that provides multiple channels for SyncML sessions.

Conclusion

Funambol offers two types of connectors. The first is more commonly used and has a zero footprint approach. It requires only installation and administration at the Funambol DS server side and access to the data store as with other clients. The second connector is less common but is required by some enterprises for security reasons. Those enterprises prefer not to have incoming connections in their network. Both connectors have different security impacts but in general enable the highest levels of security. They or the outbound connection might not only use 'plain text' protocols but can provide privacy with the same protocols in combination with SSL usage. In both solutions, the authentication can be completely provided by the data store avoiding user account storage in the Funambol DS server. The same can apply to the data channel, where all data resides only in the data store and only during a SyncML session will data pass to the Funambol DS server.

About Funambol

Funambol is the mobile open source company. Funambol's Mobile Application Server offers "push" email, multimaster PIM synchronization, and management facilities for mobile devices. Funambol, formerly known as Sync4j, is an open source development platform for mobile applications that has been downloaded more than any other wireless middleware product – 750,000+ times. The commercial version has been deployed at wireless carriers, Fortune 100 enterprises, hardware OEMs/ODMs and ISVs including customers such as Computer Associates. Funambol is headquartered in Redwood City, California with a development center in Italy. For more information, please visit http://www.funambol.com.

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