



Lotus Expeditor 6.1 Education

IBM® Lotus® Expeditor 6.1 Server DB2® Everyplace® Overview

Lotus software

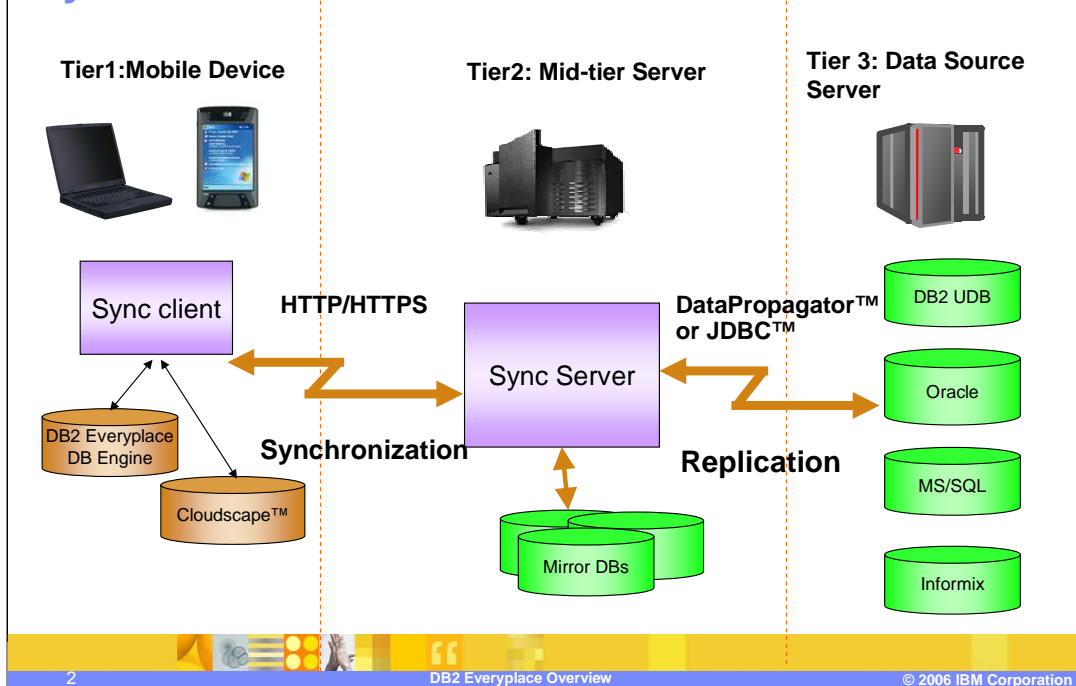


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Hello, and welcome to this overview of DB2 Everyplace for Lotus Expeditor 6.1 Server.

Synchronization solution architecture



DB2 Everyplace provides synchronization of relational database information to and from the client and a back-end enterprise database. There are three tiers to the DB2 Everyplace architecture. Tier 1 is the DB2 Everyplace client. The client allows you to access database records in a local DB2 Everyplace database or a local Cloudscape database. The client then communicates to a tier 2 DB2 Everyplace Sync Server which handles synchronizing data between the client database and a mirror database connected to the tier 2 system. The tier 2 sync server will then replicate the information to the tier 3 back-end enterprise database server.

Sync server overview

- Efficient two-way synchronization with data sources (table subscriptions)
 - ▶ IBM DB2 UDB
 - ▶ IBM Cloudscape
 - ▶ Oracle
 - ▶ Sybase Adaptive Server Enterprise
 - ▶ Microsoft® SQL Server 2000
 - ▶ Informix® Server
- File download
- Remote stored procedure support for DB2 data source

The DB2 Everyplace synchronization server manages two-way data synchronization between a data source and a target database. The synchronization server acts as an intermediary between the synchronization client software in the Lotus Expeditor client and the DB2 database or the JDBC database on the source server.

You define data from the source server to be accessed by each group of users. Mobile workers use the Lotus Expeditor application that incorporates the DB2 Everyplace Sync Client's API to connect to the server and copy source data to their mobile devices. They modify this data using these applications and then synchronize their changes with the source database.

JDBC subscriptions provide users with access to data in source tables on a data source with a JDBC interface, including Oracle, DB2, Microsoft SQL Server, Informix, and Sybase.

File subscriptions allow replication of any type of file stored at the source server and are not bi-directional. They are from the Sync Server to the mobile device. File subscriptions can be created as a convenient way to distribute and update mobile applications and other data to the devices.

The remote stored procedure support allows the Lotus Expeditor client to run stored procedures on a remote database for real-time query or transaction. The result set is stored locally in a temporary DB2 Everyplace table.

Sync server overview (cont.)

- Centralized administration
 - ▶ Mobile Devices Administration Center GUI
 - ▶ XML Scripting tool
 - ▶ Zero administration on devices
 - Manage table definitions, constraints, and indexes
 - Vertical and horizontal partitioning of data
 - ▶ Control distribution of data, files, and applications
 - ▶ Grouping of subscriptions
 - ▶ Access control for device users based on privileges

The DB2 Everyplace Sync Server provides an administration tool that helps you manage and deliver synchronization services to groups of users with similar data synchronization needs. The Mobile Devices Administration Center, a graphical administration tool for the Sync Server, allows you to define subsets of data and files to be accessed by groups of users. The Sync Server accesses this administration information each time a user requests data synchronization.

In the Mobile Devices Administration Center, you administer synchronization processes through a set of synchronization objects, including users, groups, subscriptions, and subscription sets. When you create, edit, or delete synchronization objects, the Mobile Devices Administration Center records this administration information in the DB2 Everyplace control database.

The XML Scripting tool automates tasks otherwise performed using the Mobile Devices Administration Center. You can also use the XML Scripting tool to copy or move metadata information such as subscriptions, subscription sets, users, and groups from one server to several other servers. The XML Scripting tool allows you to export information from the control database into an XML script file and edit it for bulk processing or automation.

DB2 Everyplace requires zero administration on the Lotus Expeditor client; all administration is done through either the XML Scripting tool or the Mobile Devices Administration Center. Access control for client users is handled through table definitions, constraints, and indexes defined in the subscription.

Sync server overview (cont.)

- Message protocol utilizes WAP binary XML for compression
- Common User Registry
 - ▶ DB2 Everyplace users must exist in the Lotus Expeditor common user registry.
 - ▶ All DB2 Everyplace users must be members of the synchronization group (that is, xpdsyncusers) and one group prefixed with the characters “DB2e”.
- Security
 - ▶ Authentication and security
 - WebSphere® HTTP basic authentication
 - Secure Sockets Layer (SSL)
 - ▶ Local data encryption on devices setup through central administration

Data synchronization can be bi-directional or uni-directional. Data can be updated at the DB2 Everyplace mobile device or the enterprise database. For example, users could download a subset of data from a DB2 for an Oracle database to a DB2 Everyplace database on the mobile device, view the data, make changes to the data, and then synchronize the changed data back to the Oracle database server. The DB2 Everyplace Sync Server also provides a mechanism for conflict resolution.

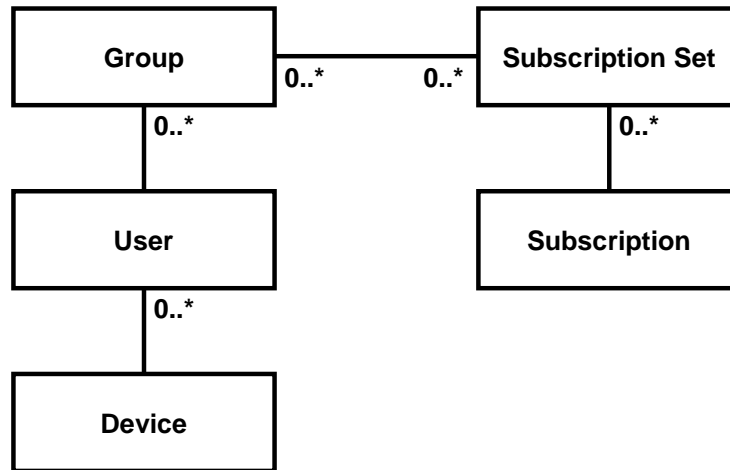
The DB2 Everyplace message protocol utilizes WAP binary XML for compression of the synchronization message.

DB2 Everyplace users must be members of the Lotus Expeditor common user registry. They must belong to the xpdsyncusers group and also be a member of one, and only one, group that is prefixed with the characters “DB2e”.

The Lotus Expeditor client authenticates to the DB2 Everyplace server using WebSphere HTTP basic authentication.

Secure Sockets Layer security can be configured between the Lotus Expeditor client and server. In addition, local data encryption can be setup through central administration.

Synchronization object hierarchy



In the Mobile Devices Administrator you can administer synchronization processes through a set of *synchronization objects*. A synchronization object contains information about aspects of the synchronization process in your organization. You can create and edit groups, subscriptions, subscription sets, and users to handle your organization's synchronization requirements.

Group is a group of users with similar mobile data synchronization needs. You define synchronization characteristics for each group, such as which applications the users in the group need to access to perform their jobs and what subsets of enterprise data they need to access.

User is a user and application that uses the DB2 Everyplace Sync Server to synchronize data between a source (the enterprise system) and a target (the mobile device). You assign a user to a group to provide access to the subscriptions defined in the group's subscription sets. A user must belong to the Lotus Expeditor synchronization group and one, and only one, data synchronization group (prefixed with DB2e).

Device is the Lotus Expeditor client associated with the user.

Subscription is a specification for what information in a source database or server is to be replicated to a target database (the DB2 Everyplace mobile database on the client). Like a magazine subscription where you choose the types of information you want to see on a periodic basis, a subscription allows you to define which subsets of your enterprise's data and files the group members are allowed to access. Members can then access and synchronize just this subset of data and files, improving both security and performance. You can create two types of subscriptions: file subscriptions for files stored at the source server, and table subscriptions in the source database using either IBM DataPropagator™ or JDBC subscriptions.

Subscription set is a collection of subscriptions. To provide group members with access to the data and files defined in subscriptions, you collect the subscriptions together in a container called a *subscription set*, then assign this container object to the group. This two-step process of enabling members of a group to access the information that they need makes administration easier because you can bundle a set of subscriptions and assign that bundle to multiple groups if necessary.

Synchronization messaging

- Each subscription (including configuration) is handled in its own message set, or “session”
- Http messages with WBXML content
- Typical session consists of
 - ▶ Phase 1 messages: Sync request, including client-initiated change data
 - ▶ Phase 2 messages: Sync response, including change data for client and reject records
 - ▶ Phase 3 message: Completion handshake

Each DB2 Everyplace subscription is synchronized in its own message set or session. A typical session consists of 3 messages: (1) the synchronization request, (2) the synchronization response including changed data, and (3) the synchronization completion handshake.

Phase 1 messages consist of the synchronization request which includes the client-initiated change data. The Phase 2 message consists of the synchronization response with changes from the server that must be applied to the client and rejection records for changes that could not be made on the server. The Phase 3 message is the completion handshake.

DB2 Everyplace subscriptions

- **JDBC subscriptions** provide users with access to data in source tables on a data source with a JDBC interface, including Oracle, DB2, Microsoft SQL Server, Informix.
 - Filters vertically (which columns?) and horizontally (which rows?)
- **Upload subscriptions** only allows the user to directly insert rows into a table on a source database. Data flows from device to source database only. Related tables on the mobile devices are not refreshed during synchronization.
- **File subscriptions** allow replication of any type of file stored at the source server and are not bi-directional.
- **DataPropagator subscriptions** provide users with access to data in source tables on a DB2 server
 - Filters vertically (which columns?) and horizontally (which rows?)
- **Custom Subscriptions** provide capability for client devices to call store procedure on server side.

There are five different subscription types:

JDBC subscriptions provide bi-directional access to a data source that supports a JDBC interface, such as DB2, Oracle, Microsoft SQL, or Informix. JDBC subscriptions support column and row filtering.

Upload subscriptions allow clients to insert rows directly into tables on the source database.

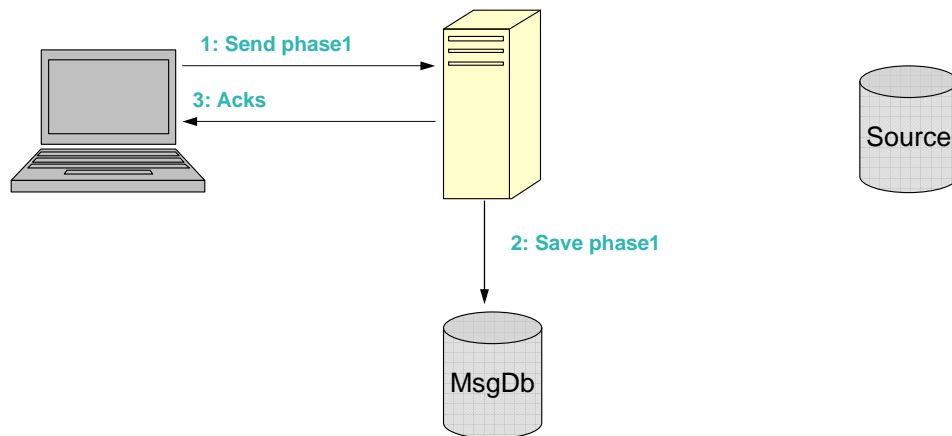
File subscriptions allow files stored on the source server to be sent to the client.

Data Propagator subscriptions provide bi-directional access to a data in DB2 servers using the Data Propagator capture process. Data Propagator subscriptions support column and row filtering.

Custom subscriptions call remote store procedure on the server side.

Upload table subscription

Phase 1

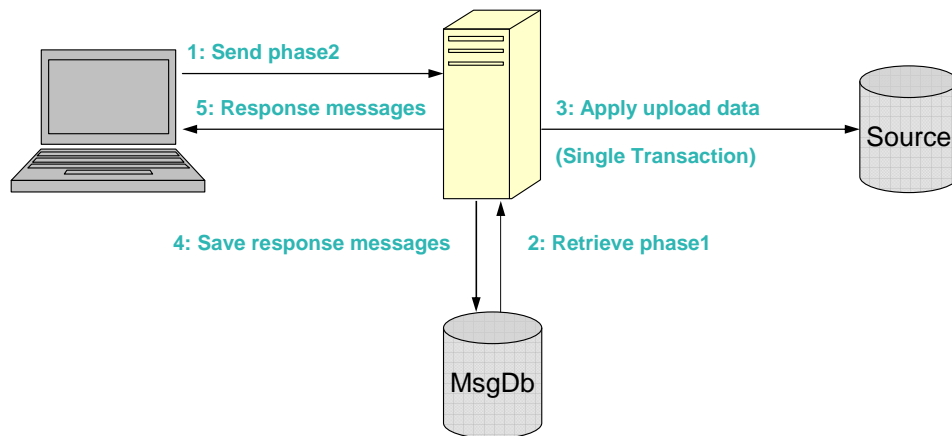


This diagram illustrates the synchronization process for the uni-directional upload table subscription.

1. In Phase 1, the client sends the upload message, with the changed data, to the DB2 Everyplace synchronization server.
2. The sync server saves the request and updated data in the message database on the server.
3. The sync server then sends the completion handshake to the client.

Upload table subscription (cont.)

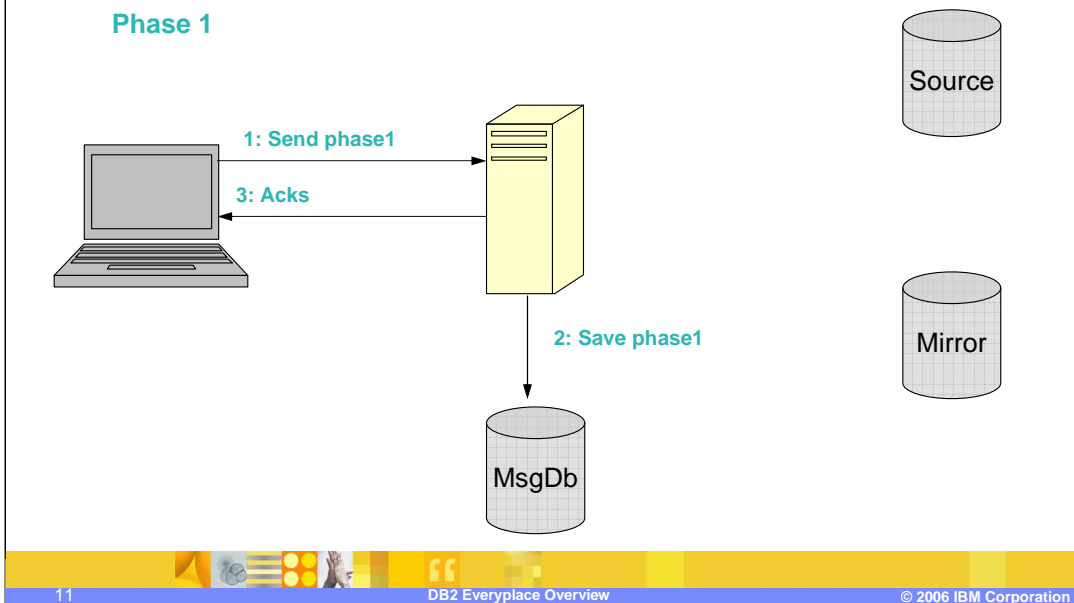
Phase 2



This diagram illustrates the phase 2 processing of the upload table subscription.

1. The client sends the phase 2 synchronization response message.
2. The synchronization server retrieves the phase 1 client updates from the message database on the server.
3. The synchronization server sends the uploaded data from the client to the source database.
4. The response messages are stored in the message database.
5. The response messages are sent to the DB2 Everyplace client.

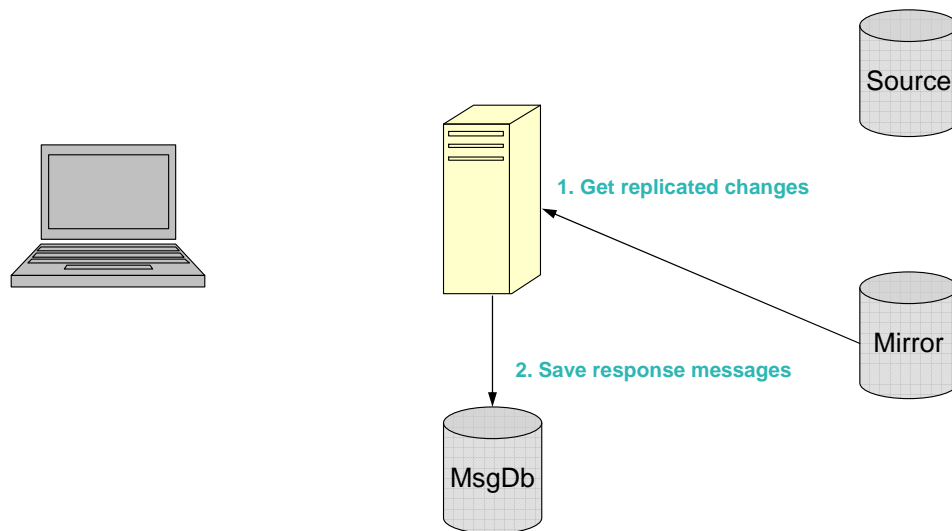
Replicated table subscription



The bi-directional synchronization of relational data is shown in the replicated table subscription diagram above.

1. The DB2 Everyplace application on the Lotus Expeditor client sends the synchronization request, including data changes from the client, to the DB2 Everyplace sync server.
2. The sync server buffers the phase 1 message and associated data in the message database on the Lotus Expeditor server.
3. The sync server sends an acknowledgement to the phase 1 message to the client.

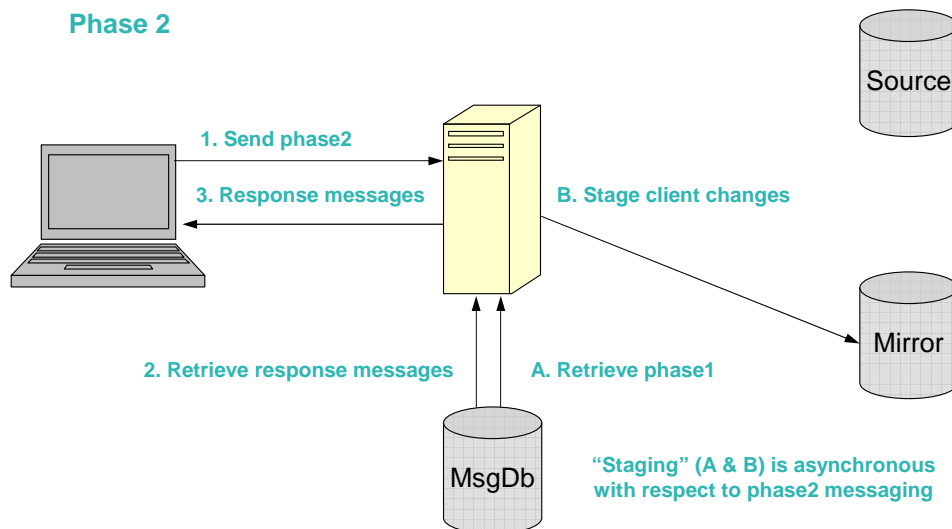
Replicated table subscription (cont.)



The sync server retrieves replication changes from the mirror database on the Lotus Expeditor server. The mirror database is a staging database used by the synchronization server to merge two-way synchronization updates and perform conflict resolution.

The sync server buffers the synchronization request and data updates from the server in the message database.

Replicated table subscription (cont.)



This diagram illustrates the sync server reconciling the updates from the client with the updates from the server, and then sending those changes to both client and server.

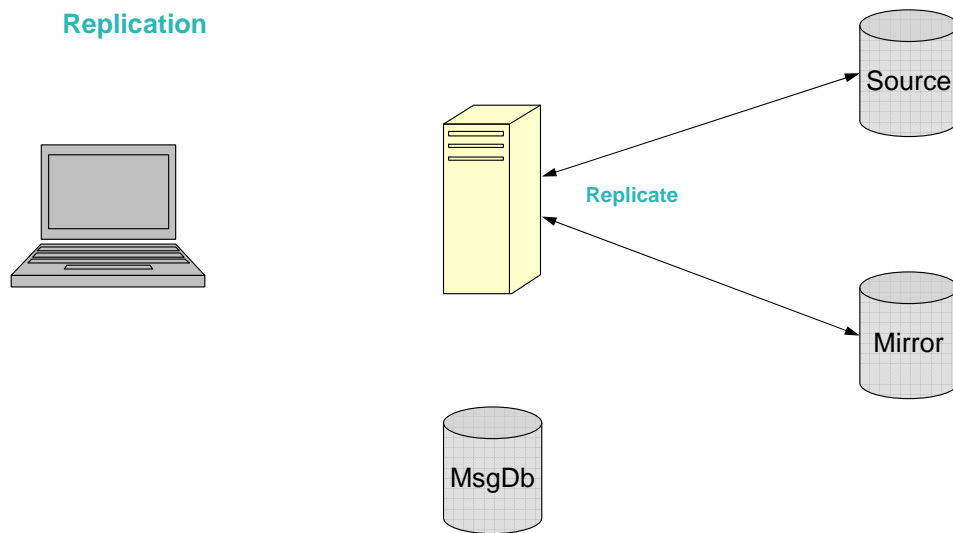
The client has finished sending updated data in phase 1 and sends the phase 2 message.

The sync server retrieves the response messages and the phase 1 data updates from the message database. The data updates from both the client and server (mirror database) are in the message database. The sync server reconciles the synchronization updates.

The sync server sends the response messages to the client with any data updates from the server side.

The sync server sends the changes from the client to the mirror database on the server.

Replicated table subscription (cont.)



In this final stage of replicated table synchronization, the replication process updates the source database with the latest changes in the mirror database.

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