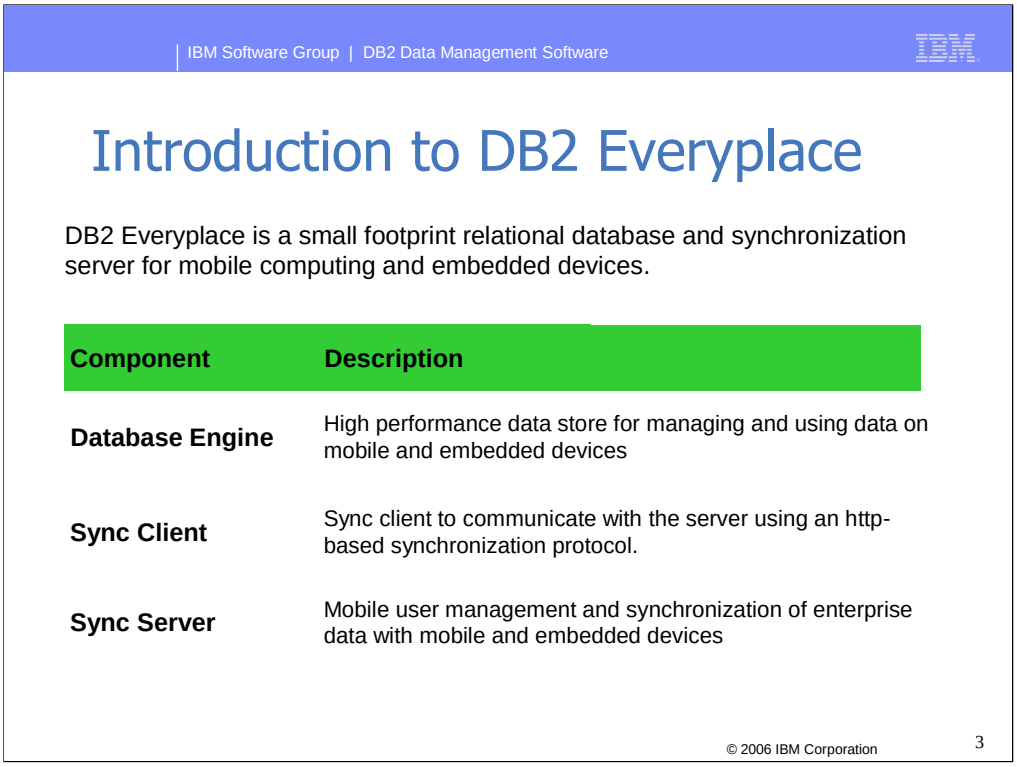
This presentation provides an overview of DB2 Everyplace version 9.1.

Product Overview

- DB2 Everyplace Components
- Three-tier Architecture
- Synchronization and Replication
- Component List

In this presentation, you will learn about the components of DB2 Everyplace and the 3-tier architecture that is implemented for DB2 Everyplace. You will also learn how DB2 Everyplace utilizes data synchronization and replication and how a wide variety of mobile devices are supported.



DB2 Everyplace is a high performance database server that has a small footprint of approximately 350K, enabling it to be embedded in small mobile devices.

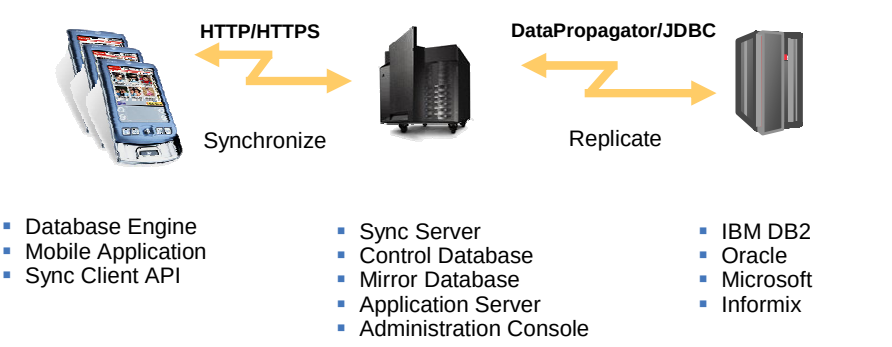
Synchronization is bi-directional, meaning that data can be synchronized going from the enterprise database to the small mobile device, or from the small mobile device to the enterprise database over an http or https protocol.

DB2 Everyplace Overview

- Mobile workers can access corporate data and participate in business processes wherever they are, using whichever devices suit their needs.
- DB2 Everyplace can be embedded into devices and appliances to increase functionality and market appeal.

DB2 Everyplace supports Windows® CE, Windows Mobile, Symbian, Palm OS, Nutrino, and Embedded Linux™.

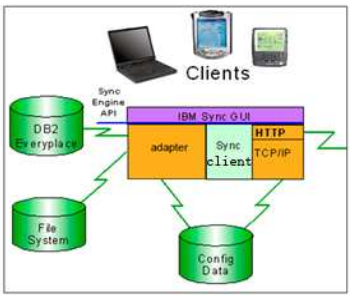
DB2 Everyplace Solution



As depicted in this graphic, DB2 Everyplace is a 3-tier solution. The server, the mobile application, and a synchronization API are installed on the small mobile device of your choice. The middle tier, which is accessed over an http or https protocol, consists of the Synchronization Server and provides a control database and a mirror database to optimize performance while also providing an administrative console that enables you to configure and administer your application to meet your needs. The third tier, which is accessed through either JDBC or DataPropogator, is the back-end data server. DB2 Everyplace supports IBM DB2, Informix®, Microsoft®, and Oracle®.

At any given point in time, the data reflected on the mobile device, the synchronization server, and the back-end data source server could all be different because of the synchronization and replication cycles that must occur across the 3 tiers. While the propagation of the data is quick, it does take time for these activities to occur and it is important that you know this difference will exist.

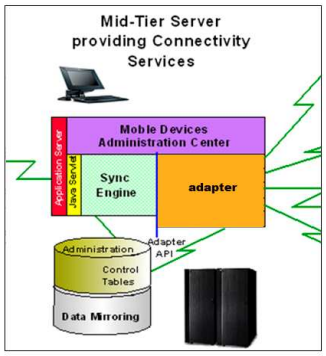
Tier 1: Device (Mobile) Systems



- The Sync Client provides different adapters to retrieve and store data from data sources or file system
- Sync/Application GUI determines the data that needs to be synchronized
- Sync Engine API retrieves information through the adapters and calls the transport API to send messages to the sync server

Shown here is a graphical depiction of the tier 1 device systems, including adapters, the sync client GUI, and the sync engine API.

Tier 2: Mid-tier (Sync) Server



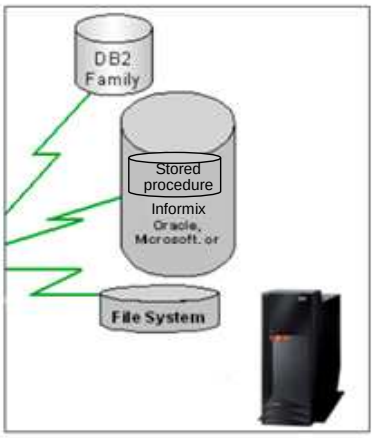
- Java Servlet receives the request and authenticates the device
- Sync Engine stores the changed data in the local database (Data Mirroring)
- Different adapters retrieve or store data from different data sources or file system

The mid-tier Synchronization Server processes data from the Sync Client and stores the data in the source database. There are two databases in the Synchronization Server, the control database and the mirror database.

The control database is used to store meta data such as user information, group information, subscription information, and subscription set information. When the Sync Client synchronizes the data with the Sync Server, this meta data is required to validate the user.

The mirror database acts as a staging table to store the data that is received from the mobile devices.

Tier 3: Data Source (Back-End) Server

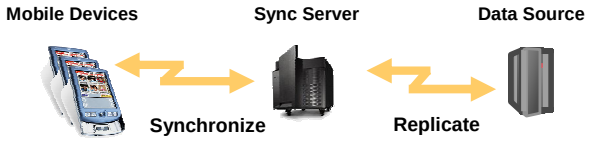


- Data Source Server

The back-end servers that are supported by DB2 Everyplace include DB2, Informix, Oracle, and SQL Server.

Synchronization and Replication

- Mobile Devices **synchronize** with the mid-tier Sync Server
  - Efficient two-way synchronization over HTTP / HTTPS
- DB2 Everyplace provides powerful, flexible replication facilities for the Data Source (back-end) server to **replicate** with the mid-tier Sync Server.
  - JDBC replication engine
  - Data Propagator replication engine
    - Only supported by DB2 v9



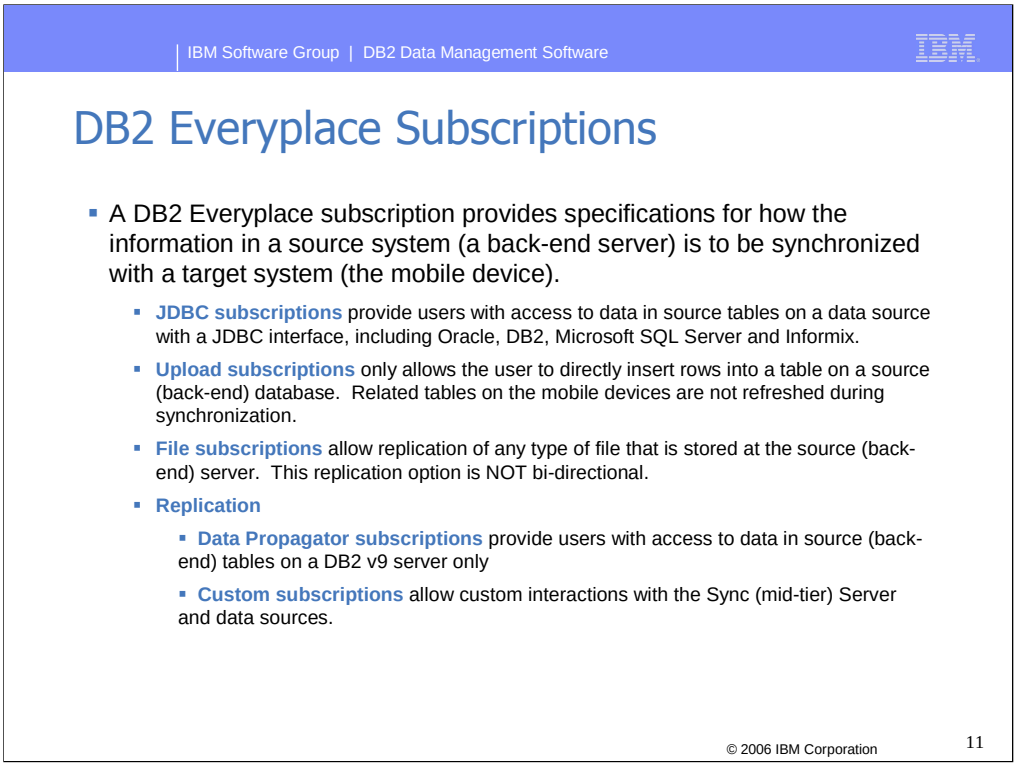
Bi-directional synchronization is enabled over the http and https protocols to synchronize the data between the mobile devices and the mid-tier Synchronization Server.

In addition, DB2 Everyplace provides replication of this data to a powerful back-end server, such as DB2 or Informix, for storage of the data. This replication is made possible through a JDBC replication engine. For clients with DB2 v9, a Data Propagator replication engine is also available.

Administration Objects

- **Subscriptions**
  - Specifications for how the information in a source (back-end) data server is replicated to a target (mobile device) data server.
- **Adapters**
  - There are adapters for the different subscription tasks available.
- **Subscription Sets**
  - Assign one or more subscriptions to a subscription set.
- **Server**
  - An instance of DB2 Everyplace Sync Server that runs on a host and listens to a port.
- **Users**
  - Associates mobile devices with mobile users. Assigned to groups which are associated with applications.
- **Groups**
  - Data filters can be at the group level. Collection of users with similar synchronization needs can be specified. This enables you to make different data available to different users . . . facilitates the “need to know.”

There are a variety of objects that you can administer to meet your application needs.



JDBC subscriptions have limited functionality because the JDBC parameter defined in MDAC is a simple SQL statement to retrieve data from the source database.

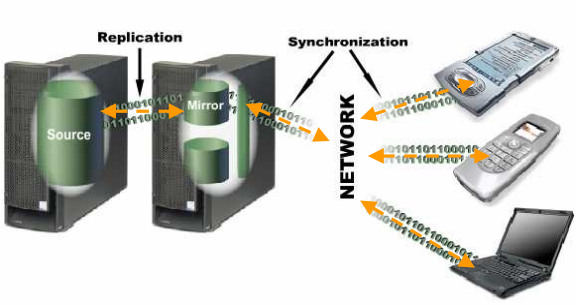
Upload subscriptions are to be used for fast replication tasks. The mid-tier Synchronization Server is skipped. This option requires more hardware resources than the other subscription options.

Custom subscriptions provide the most flexibility, because they can use stored procedure programming functions to apply more complex scenarios. This subscription option can be customized to meet your specific business or personal requirements. DB2 Everyplace provides an easy interface for you to use this option. It includes stored procedure programming, defining custom subscriptions in MDAC, the utilization of an xml script, or the ability to write your own client procedure. By using an API you can pass parameters and get results from stored procedure or source db.

Each of these subscription options is discussed in more detail in the following slides.

JDBC Subscriptions

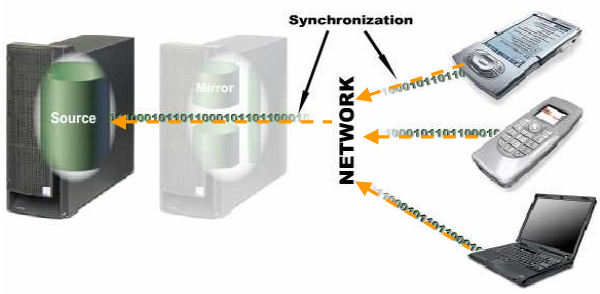
- Database deltas are synchronized between the clients and mirror database.
- Deltas between the mirror and source are only transferred after replication.



With the JDBC subscription option, changes to the database are synchronized between the clients (the mobile devices) and the mirror database within the mid-tier Sync Server. Once the replication is complete between the mobile devices and the mirror database, the changes are replicated from the mid-tier Sync server mirror database to the back-end source server.

Upload Subscriptions

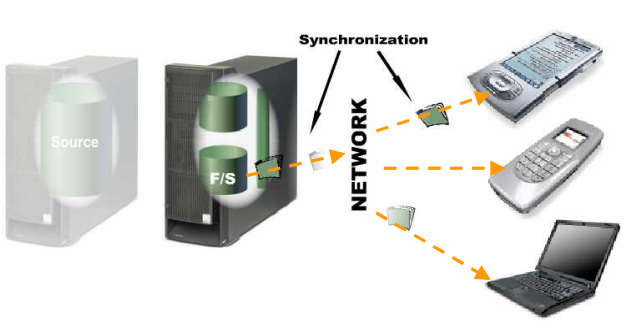
- Database deltas are uploaded directly from the clients to the source database.



With the Upload Subscription option, changes made on mobile devices are uploaded directly to the back-end source server. The mid-tier (Sync) Server is by-passed. The Upload option is most frequently used when a back-end response is needed immediately. However, because the mid-tier is by-passed, more robust hardware is usually needed.

File Subscriptions

- Files are downloaded to the clients directly from the file system.

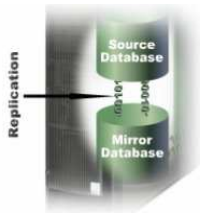


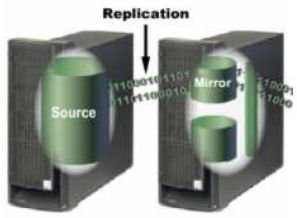
With the File Subscription option, files are downloaded to the mobile devices directly from the mid-tier Sync system.

Replication

DB2 Everyplace supports two replication mechanisms

- **JDBC Replication Solution**
  - Trigger-based mechanism
- **Data Propagator Replication Solution**
  - IBM DB2 Data Propagator Update Anywhere solution (IBM SQL Replication)
  - Log-based mechanism

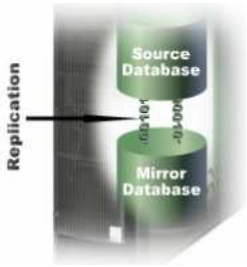




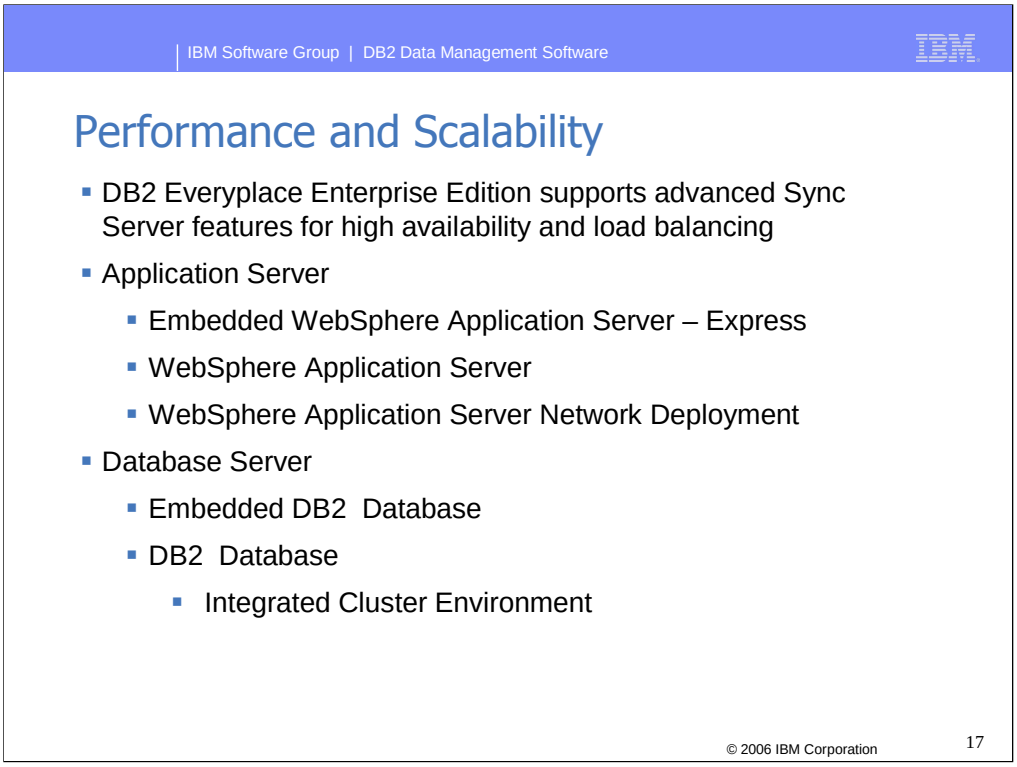
Data Propagator provides the Update Anywhere solution, which is only available on DB2 v9 and is also referred to as “SQL Replication.” The Data Propagator parses the log.

DB2 Everyplace Benefits

- Performance and Scalability
- Advanced Administrative Tools
- Platform Independence and Portability
- Device Synchronization Statistics
- Multiple Devices per User
- Encryption



There are many benefits and advantages to using DB2 Everyplace. Each of these benefits is discussed in more detail in the following slides.



DB2 Everyplace Enterprise Edition supports advanced synchronization features at the mid-tier for high availability and load balancing through the use of WebSphere Application Server.

The Embedded WebSphere Application Server Express version is shipped with DB2 Everyplace. The WebSphere Application Server stand-alone can also be used. If you need clustering, load balancing, and high availability, the WebSphere Application Server Network Deployment is required.

When you install DB2 Everyplace, an Embedded DB2 server is also installed, unless another instance of DB2 is already installed on the system.

Advanced Administrative Tools

- Mobile Device Administration Center (MDAC)
  - A graphical interface that allows you to create, edit, and view synchronization objects and their relationships to each other. The Mobile Devices Administration Center also allows you to view synchronization and replication status and error messages.
- XML Scripting Tool
  - Fully automate or perform bulk processes for administration tasks such as defining subscriptions, adding and removing tables, adding and removing indices, as well as creating, updating, and deleting users and groups.

MDAC allows you to control data access to groups of users, in addition to the other benefits mentioned here. MDAC manages objects one at a time.

Platform Independence and Portability

- DB2 Everyplace consistently supports all features across all device platforms.
- The data server is platform independent, meaning that a database populated on a Pocket PC device can be easily moved to another platform, such as Symbian for a smartphone
  - Enables developers to quickly create, deploy, and support applications on all platforms

DB2 Everyplace consistently supports all features across all device platforms.

Encryption

- Data Transfer Encryption
  - DB2 Everyplace enables you to encrypt data as synchronization is happening and the data is being transferred from a mobile device to the mid-tier Sync Server
  - The encryption level of a subscription is specified on the identification page of the Mobile Device Administration Center (MDAC). The available options are:
    - None: No encryption will be used during data transfer
    - Limited: 56-bit data encryption standard
    - Strong: 128-bit data encryption standard

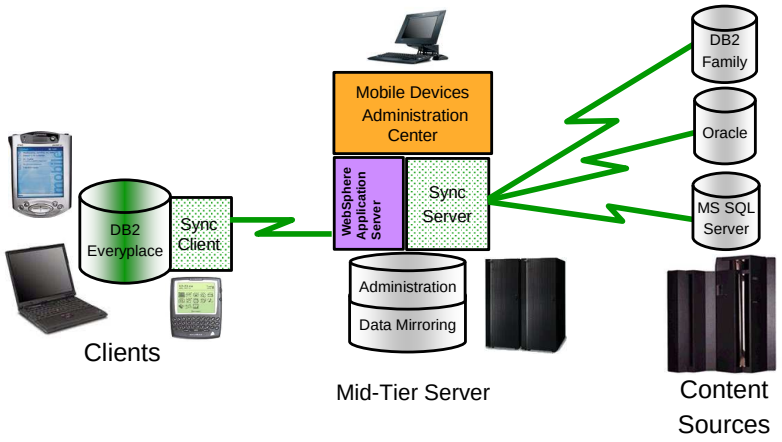
For additional information, see the IBM DB2 Sync Server Administration Guide topic on Specifying the Encryption Level of a JDBC subscription, Specifying the Encryption Level of an Upload subscription, and Specifying the Encryption Level of a File subscription.

Encryption (continued)

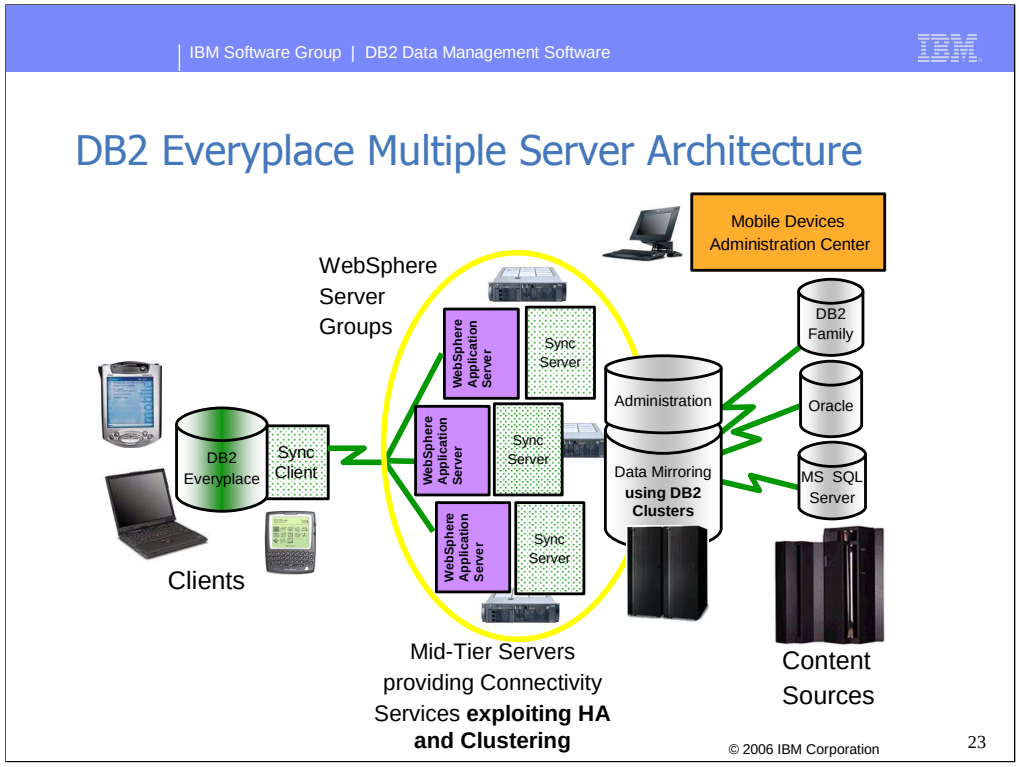
- Local Data Encryption
  - Local data encryption is used to encrypt data on a mobile or embedded device
    - The first goal is to encrypt secret or sensitive information stored in DB2 Everyplace tables. Data is encrypted using standard methods like DES, which implements encryption keys.
    - The second goal is to provide a secure framework to manage the keys used to encrypt the data. A user ID and password are required to connect to the database.

Refer to the 'IBM DB2 Application and Development Guide' topic on 'Security' for more detailed information on encryption.

DB2 Everyplace Single Server Architecture



DB2 Everyplace can be configured with a single-server architecture, as shown here.



DB2 Everyplace can also be configured to utilize a multiple-server architecture, as depicted here. When multiple servers are employed, horizontal clustering with high availability (HA) can be acheived.

Understanding the Business

- ***Part of designing a DB2 Everyplace solution is to fully understand the underlying business requirements and environment.***

- Important Concepts:
  - *Acceptable* synchronization times
  - Replication cycles
  - Number of users in production
  - Maximum number of users synchronizing at a point in time
  - How much data is synchronized (initial and subsequent syncs)
  - How much data is replicated
  - Multiple users per device

To determine which architecture is best for your application, it is important that you fully understand the business problem that you need to solve before you design your application.

DB2 Everyplace Sync Connection Options

DB2 Everyplace mid-tier Sync Servers can connect to a wide variety of options, including integrated cellular; cable, infrared, or bluetooth to a cell phone; using a cradle, cable, infrared or bluetooth to a PC; over a modem to a telephone line; and to a wireless LAN. The possibilities are limited only by your innovation!

References

- DB2 Everyplace external website: http://www.ibm.com/software/data/db2/everyplace
- DB2 Everyplace library: http://www-306.ibm.com/software/data/db2/everyplace/library.html
- DB2 Everyplace forum: http://www-128.ibm.com/develooperworks/forums/dw_forum.jsp?forum=492&cat=19
- DB2 Everyplace Evaluation: http://www14.software.ibm.com/webapp/download/Product.jsp?s=p&id=JPEN-4HNW2H
- DB2 Everyplace documentation
  - IBM DB2 Everyplace Sync Server Administration Guide
  - IBM DB2 Everyplace Sync Server Administration Guide
  - IBM DB2 Everyplace Installation and User's Guide

Access the links shown here for additional information. For a 90-day free trial evaluation of DB2 Everyplace, see the DB2 Everyplace Evaluation link above.

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