



IBM Software Group

DB2 mobile



DB2. Data Management Software

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 e-business software

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Agenda

■ Introduction

- f* Reference scenarios
- f* Key components and Packaging

■ Technical part

- f* Database functions and features
- f* Sync architecture and Administration
- f* Application development
- f* Information sources



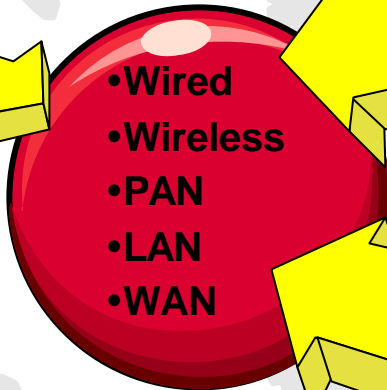
IBM Pervasive Computing Vision

**Any Content,
Application,
Services**



- Email, Addressbook, Calendar, ToDo, Notes (PIM)
- News, Weather, Sports
- Banking, Stock Trading, Travel, Retail, Healthcare, Public Sector
- CRM, SFA, ERP, SCM
- Navigation, Fleet Management
- Music, Video, Game

Any Network



**Any Device,
Any Where**



The natural extension of e-business

The Value of Mobilizing outcome



Find Ways to

- f* **Keep the mobile work force productive & engaged**
- f* **Lower cost of doing business**
- f* **Respond to customers requests and inquiries**
- f* **Maximize value of time, location, user tasks and actions**
- f* **Improve accuracy of information within the organization**
- f* **Minimize paperwork / manual tasks**

The Value of Mobilizing - key access points

■ Employees- extending the Enterprise

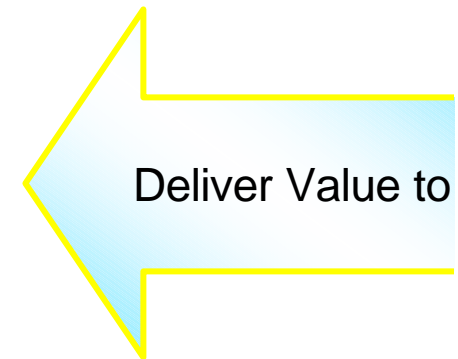
- f* stay current with office (e-mail, calendar, PIM)
- f* automate tasks (paperwork)
- f* access to peers and experts (help, info, sharing)
- f* access to business information (inventory, shipments, rates,...)
- f* receive alerts

■ Customer- extending the Web Presence

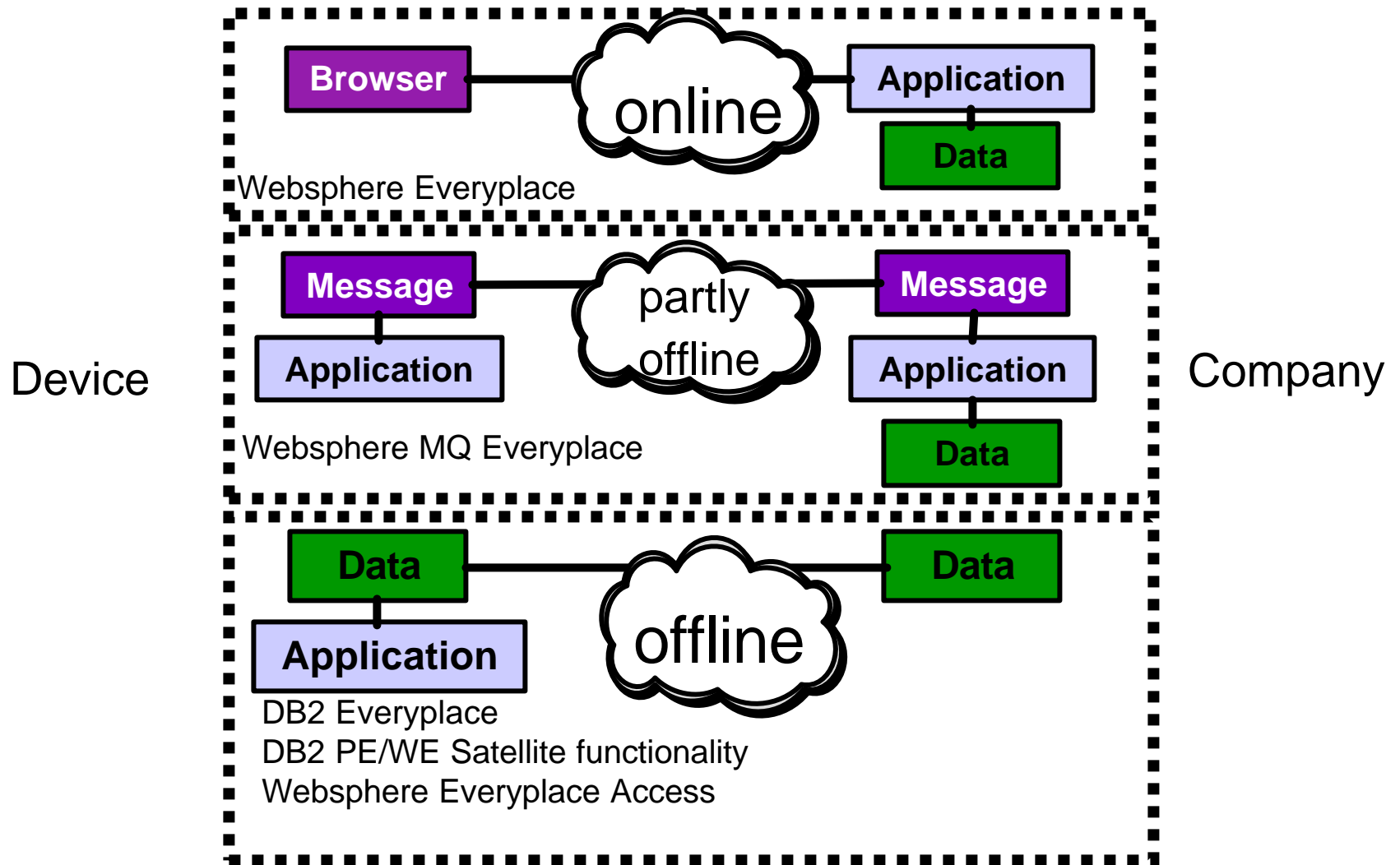
- f* provide requested information on products, prices, bids
- f* access to services, help, status
- f* provide assistance (self help, directions to closest "X")
- f* provide alternatives (flights, stocks, ...)

■ Partners / Suppliers - extending Communication

- f* access to contacts
- f* access to business information
- f* access to products, incentives, experts



IBM Mobile solutions-- technical overview



ISVs and partners

- DB2 Everyplace and Pervasive Computing efforts in DM follow the overall DM ISV strategy.

Partners inheriting DB2 Everyplace:

f **Siebel** 7 Sales Handheld for Palm OS

f **RiverRun** creates integrated PvC solutions

f **PeopleSoft**

"PeopleSoft will leverage DB2 Everyplace as the local data store for PeopleSoft's mobile applications. With a small footprint and its robust functionality, DB2 Everyplace provides a foundation for functionally rich mobile applications that can be quickly deployed to the end user."

"Leveraging DB2 Everyplace as the local data store device with PeopleSoft's pure internet data sync technology will enable mobile professionals to access and sync data at their convenience," said Janet Perna, general manager of IBM Data Management Solutions. "The combination of DB2 Everyplace and PeopleSoft's new mobile technology will empower PeopleSoft 8 customers with real-time information in mobile environments."

http://www.peoplesoft.com/conf/connect/1pla_4.html

Retail: LEAD

- Retail - Outlet explorer (Mobile shopbrowser)
- Shop infos like
 - f* owner information like telephone number , pictures
 - f* shop information like layout and picture of surrounding , performace info (tops &flops)
- Product catalog
- Predefined Reports
 - f* input of visiting issues
- Customer : Nokia
- web : www.lead-net.com



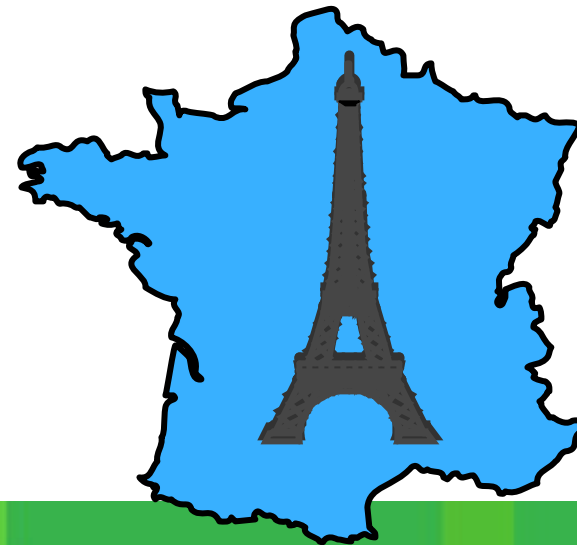
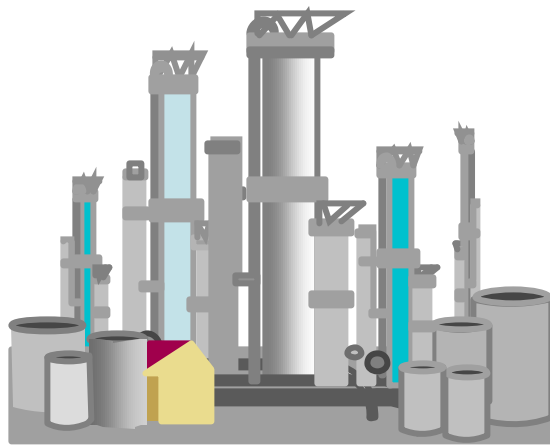
System Monitoring/Embedded: X-Serwis

- Solution based on DB2 Everyplace running on embedded x86 hardware and QNX Neutrino
- X-Serwis created a Weather reporting system based on European Union standards.
- Required robustness and reliability for continuous operation in remote locations.
- Benefit
 - f* 100% ROI in one year
 - f* annual savings of US\$1.5 million in road maintenance costs
 - f* more cost-effective road maintenance resulting from accurate evaluation of icy road conditions
 - f* improved driving safety



Field Force Automation: Gas de France

- IBM Global Services and Gas de France created a mobile gas meter reader application
- Deployed to 700 field engineers using Palm OS devices to monitor customer gas meters
- Uses the DB2 Everyplace Sync Server to synchronize with existing DB2 infrastructure
- Integrated with their Tivoli management environment



Government: CDL

- Travel - Access control solution
- Access to business critical areas and data. Authorisation with biometric data.
- Device with biometric fingerprint sensor
- OS: Linux
- Customer : Hongkong Air cargo terminal
- More Info
[f http://www.cdlnusa.com/](http://www.cdlnusa.com/)



*Paron MPC, based on DB2
Everyplace, brings the rich
functionality of desktop
computing to mobile users.*

Value of Mobile solutions with DB2 Everyplace

- improve business operations with up to date information
- increase employee productivity
- increase customer satisfaction



DB2 Everyplace components

**Mobile
application
builder**

API's
**DB2
Everyplace**

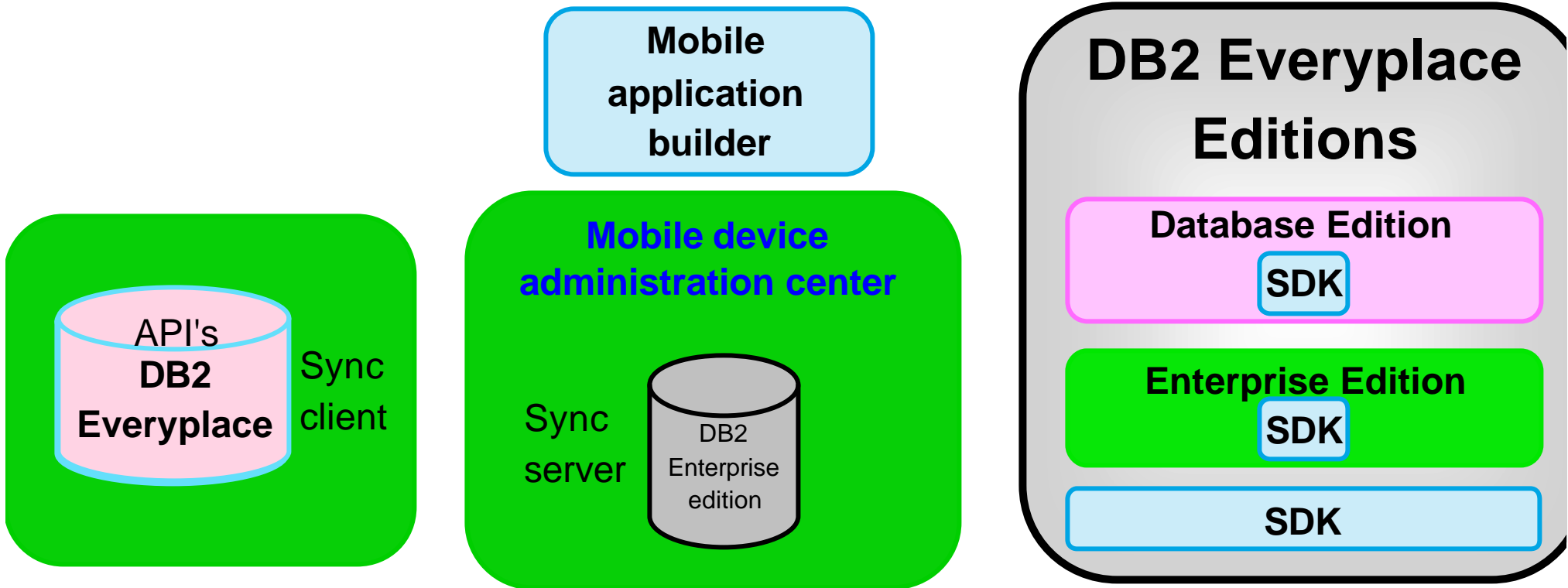
Sync
client

**Mobile device
administration center**

Sync
server

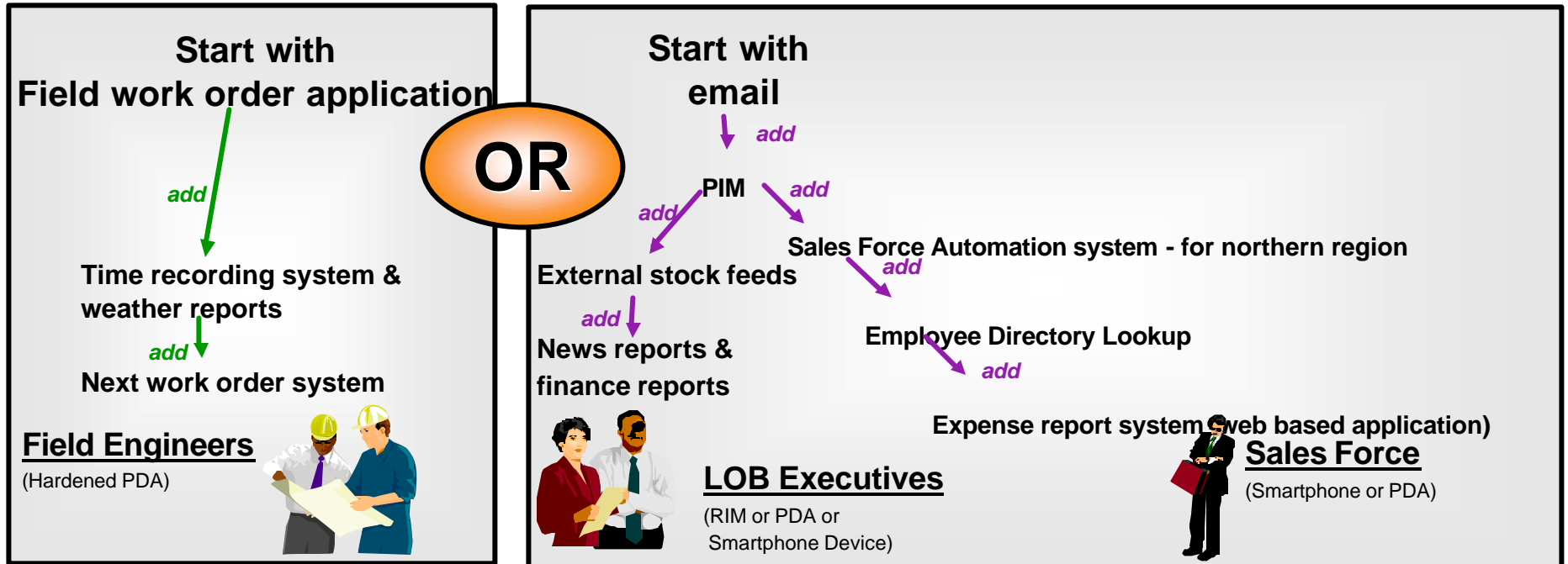
DB2
Enterprise
server

DB2 Everyplace editions and components



Reference : <http://www-3.ibm.com/software/data/db2/everyplace/>

Start Simple & Grow



DB2 Everyplace for mobilizing an enterprise application

upgrade pricing & technical assistance available

Websphere Everyplace Access allows upgrade to PIM synchronization, content adaptation & transcoding, device management, instant messaging, advanced security, etc.

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IBM DB2 Family

DB2

- Universal Access
- Universal Application
- Universal Extensibility
- Universal Scalability
- Universal Reliability
- Universal Management

Hosts

- DB2 UDB for OS/390
- DB2 for VSE & VM
- DB2 UDB for i series

Everyplace

- J2ME MIDP
- Palm OS
- Win CE/PocketPC
- Symbian OS 6
- QNX Neutrino
- embedded Linux
- Linux
- Win 32 (9x, NT, 2000,XP)

Cloudscape

Clients



- Win 95, 98, ME
- Win NT/2000/XP
- Linux

Personal



Workgroup

- Linux
- Win NT/2000
- AIX
- Solaris
- HP-UX

Cluster option

- AIX
- Linux
- Win NT/2000
- Solaris
- HP-UX



Enterprise server edition

- Win NT/2000
- AIX, HP-UX, Solaris
- Linux

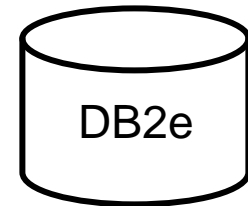
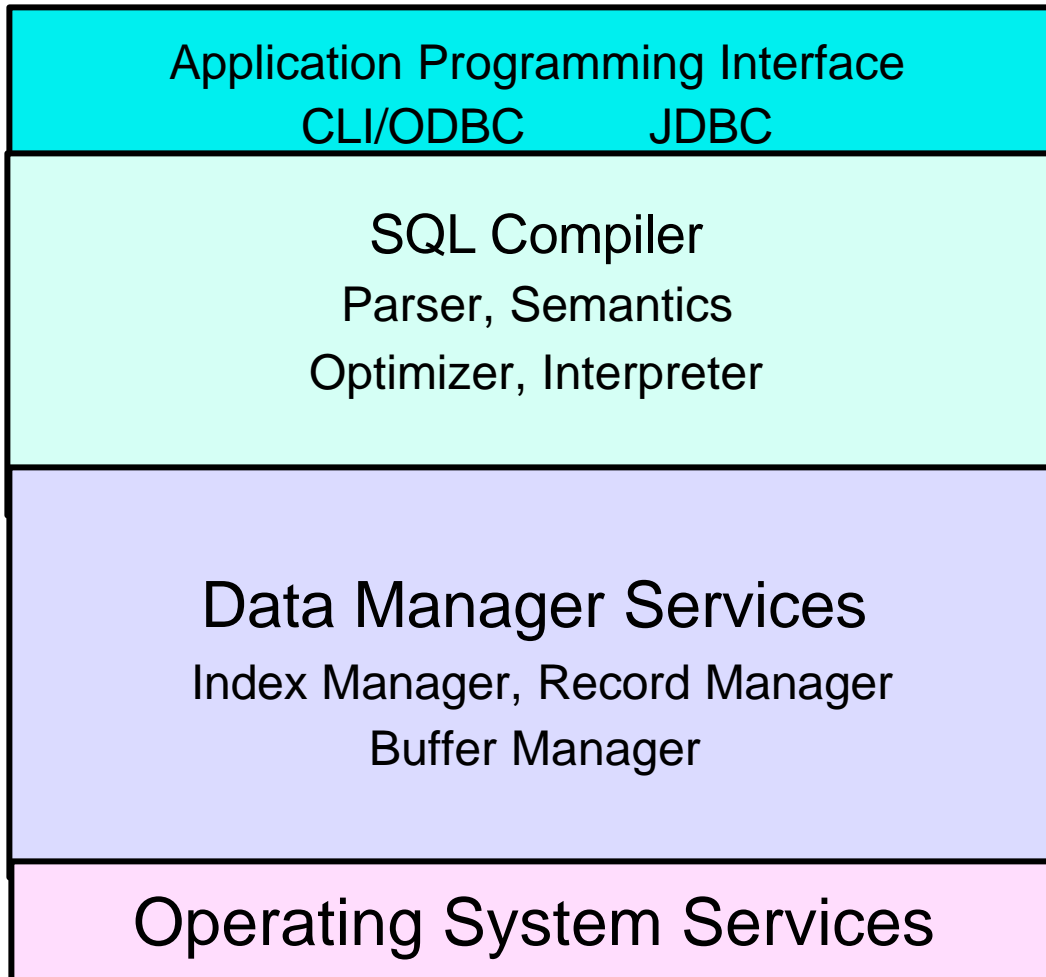
DB2 Connect



Satellite



DB2 Everyplace Database Architecture



System Tables:

DB2eSYSTABLES
DB2eSYSCOLUMNS
DB2eSYSRELS

DB2eSYSUSERS

User Tables

.....

Footprint: approx. 220

Well performing

DB2 Everyplace SQL

- Supports a subset of SQL

- f* CALL procedure
- f* CREATE INDEX (asc/desc) bidirectional
- f* CREATE TABLE with encryption option
- f* GRANT/REVOKE encrypt ...
- f* DROP TABLE / INDEX
- f* (Automatic) ONLINE Reorg
- f* EXPLAIN
- f* INSERT with subselects and default values
- f* DELETE
- f* UPDATE (records)
- f* SELECT (records) with
 - JOIN (up to 8 tables)
 - GROUP BY
 - ORDER BY (asc/desc)
 - LIMIT (integer) for result set
- f* IN list predicate
- f* scrollable cursors
- f* Basic transaction support
- f* Multiple connections serialized

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DB2 Everyplace Characteristics

■ CREATE TABLE

f with following datatypes

- INTEGER
- SMALLINT
- DECIMAL (Big)
- CHARACTER(32k)
- VARCHAR(32k)
- BLOB(32k)
- DATE
- TIME
- TIMESTAMP

f and options

- PRIMARY KEY with more than one column
- referential constraints
- CHECK constraints
- Identity Column (autoincrement INT,SMALLINT,DEC)



CREATE TABLE

- create table ORDERS
(CUSTNO CHAR(6) NOT NULL,
ENTRY TIMESTAMP NOT NULL DEFAULT Current Timestamp,

ITEM CHAR(15) ,
PRICE DECIMAL(9,2),

Check (Price < 100),

PRIMARY KEY (CUSTNO,ENTRY))

DB2 Everyplace Functions

- Functions supported

- f* **AVG**(expression)

- f* **SUM**(expression)

- f* **MIN**(expression)

- f* **MAX** (expression)

- f* **COUNT**(expression)

- f* **CONCAT**(expression,expression)

- f* **MOD**(expression,expression)

- f* **LENGTH**(expression)

- f* **RTRIM**(expression)

- f* **LCASE**(expression)

- f* **UCASE** (expression)

- expression can be

- f* a literal like *

- f* column name , function , special register like Current date/time/timestamp



Utilities

- Query By Example (QBE) only via download

GUI to view and update data without writing SQL

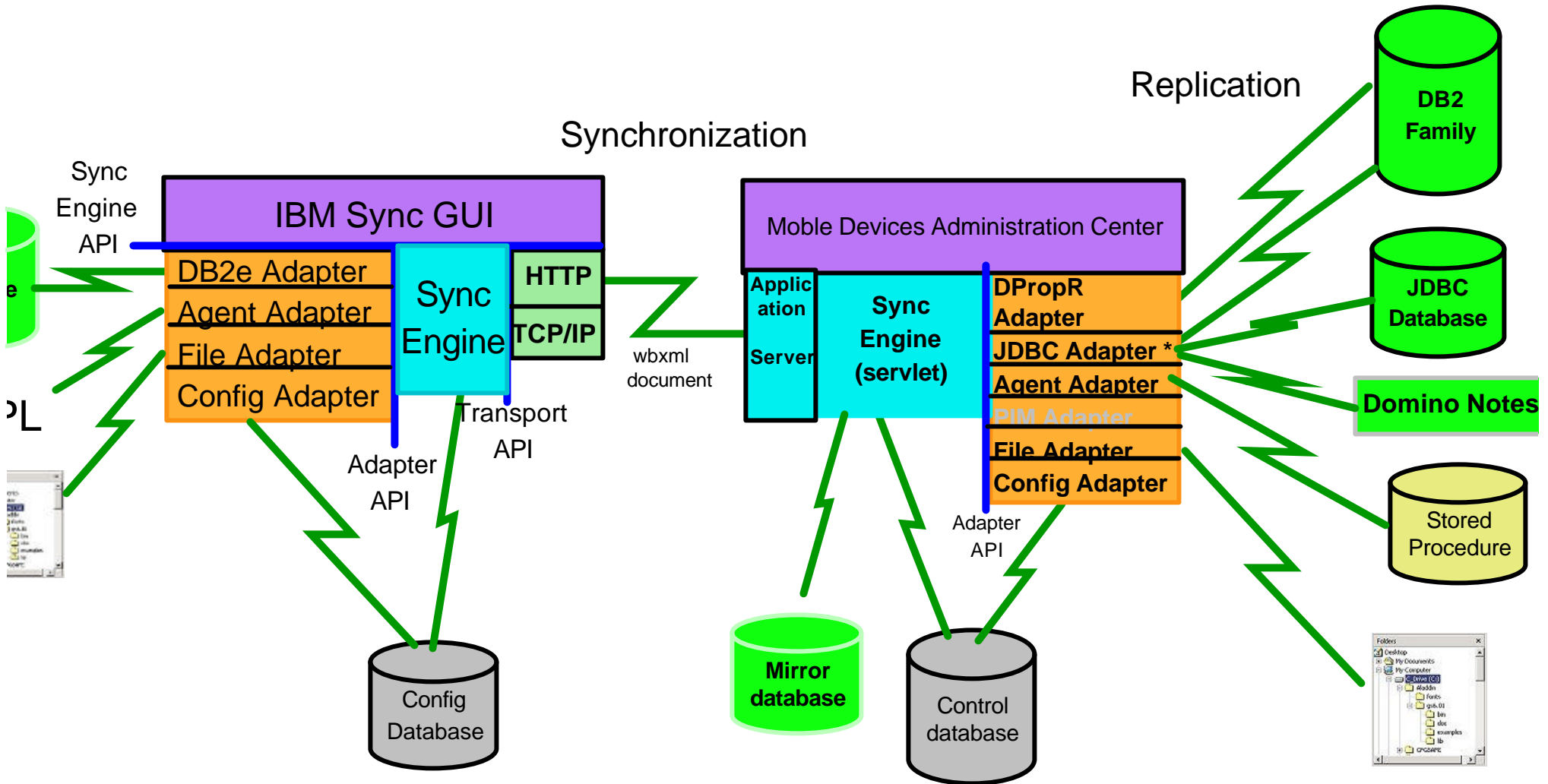
- Command Line Processor (CLP)

Good test tool, Import/Export data, source code provided as sample program

f commands like

- List Index
- List tables
- blastdb

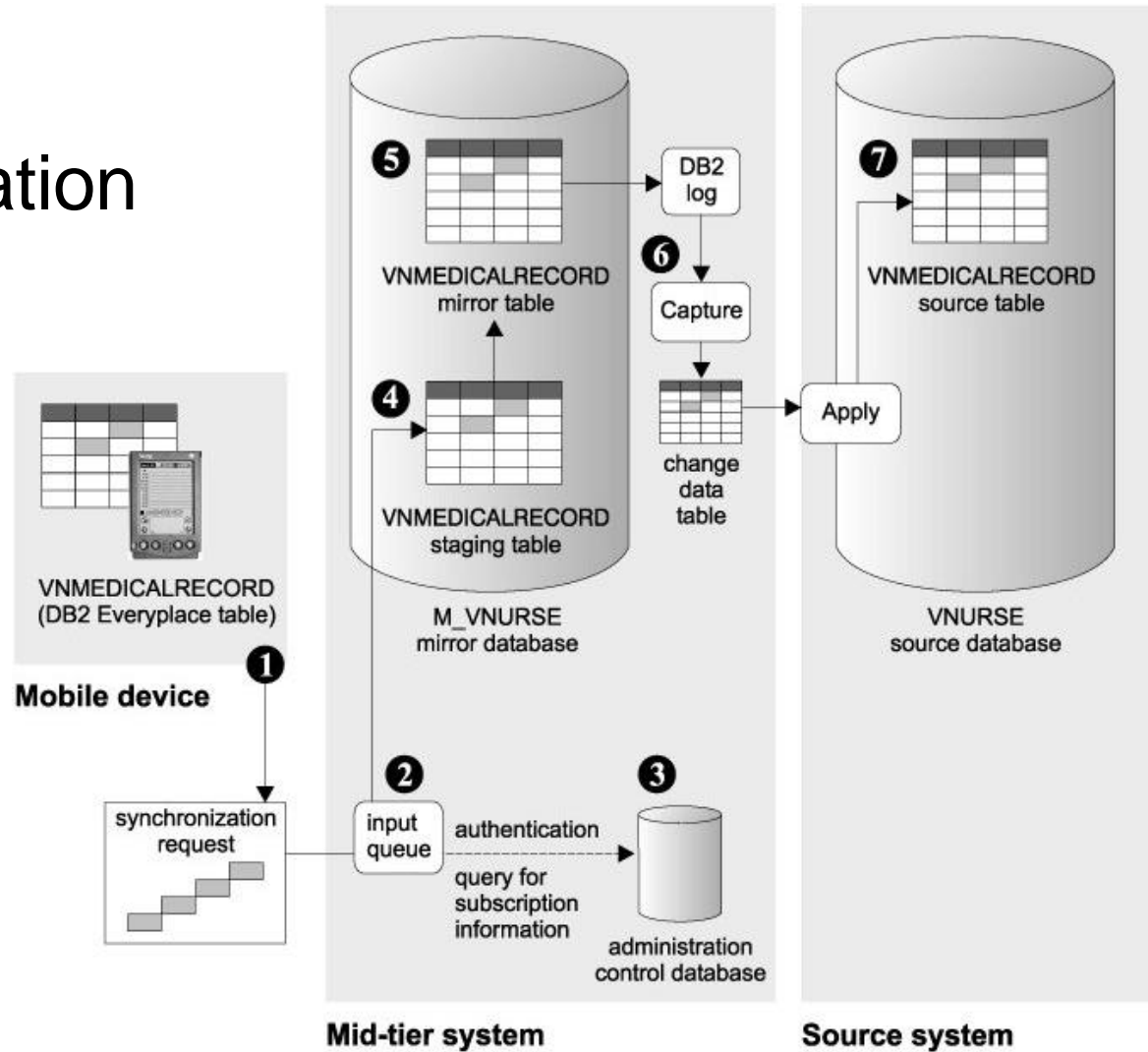
DB2 Everyplace Sync Architecture



Data Exchange from Client to Server

Synchronisation
Step 1-4

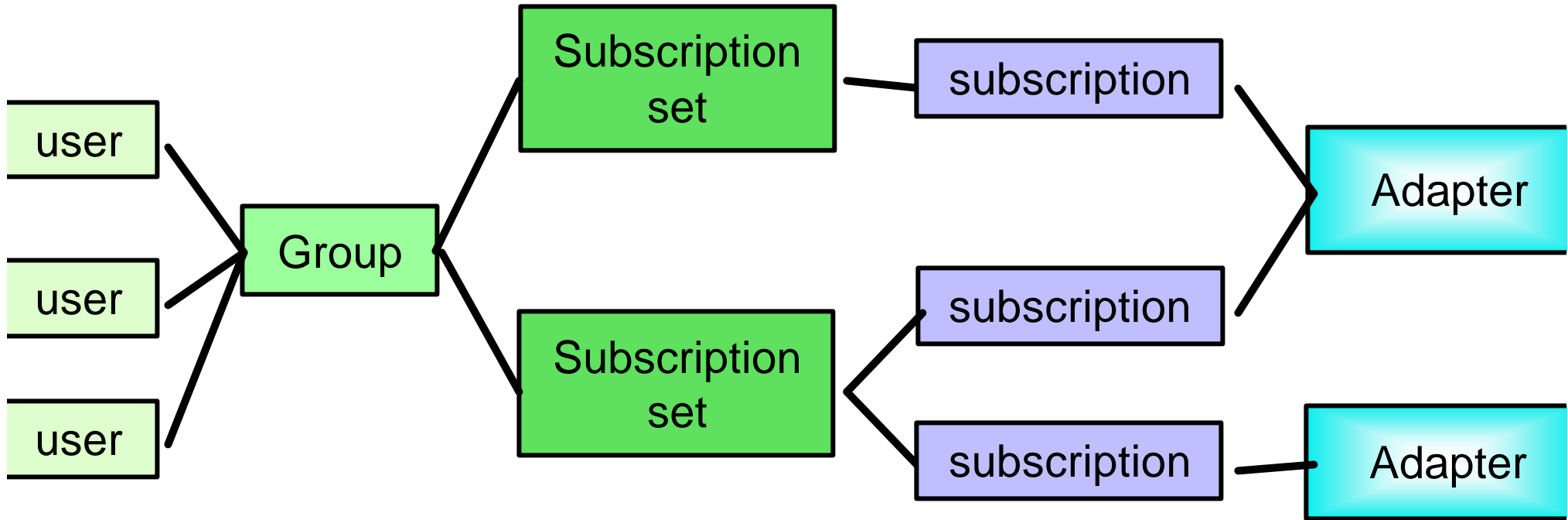
Replication
Step 5-7



DB2 Everyplace EE Characteristics

- Zero Admin for client
 - f* Centralized admin in server (GUI, XML script)
 - f* Auto deployment client tool
- Mode of Synchronization
 - f* synchronous, on demand, programmable API
- Optimization
 - f* Incremental changes, bi-directional synchronization
 - f* Recoverable (resume) for message transport
 - f* Fastpath for Upload
- Operational Enhancements
 - f* User Session Monitor
 - f* Online MDAC
 - f* Client Enhancements
 - user reset; target directory

Objects in MDAC





- Groups
- Users
- Subscription sets
- Subscriptions
- Adapters
- Servers
- Logs
 - All
 - Replication
 - Synchronization**

STUMPF-T23 - DB2 - DSYCTLDB - Synchronization

Timestamp	User	Subscription	Code	Description
2002-11-14 ...	m500		DSYS008I	Synchronization sta
2002-11-14 ...	m500	S_ADDRESS	DSYS006I	Receiving synchron
2002-11-14 ...	m500	S_ADDRESS	DSYS000I	Complete synchroni
2002-11-14 ...	m500	S_ADDRESS	DSYS001I	Synchronization enc
2002-11-14 ...	m500		DSYS009I	Synchronization cor
2002-12-22 ...	m500		DSYS008I	Synchronisation für
2002-12-22 ...	m500		DSYS006I	Empfangen wird Sy
2002-12-22 ...	pal...		DSYS008I	Synchronisation für
2002-12-22 ...	pal...		DSYS006I	Empfangen wird Sy
2002-12-22 ...	pal...		DSYS008I	Synchronisation für
2002-12-22 ...	pal...	S_ADDRESS	DSYS006I	Empfangen wird Sy
2002-12-22 ...	pal...	S_ADDRESS	DSYS000I	Vollständige Synchr
2002-12-22 ...	pal...	S_ADDRESS	DSYS001I	Synchronisation bei
2002-12-22 ...	pal...		DSYS009I	Synchronisation für
2002-12-28 ...	m500		DSYS008I	Synchronisation für
2002-12-28 ...	m500		DSYS006I	Empfangen wird Sy
2002-12-28 ...	pal...		DSYS008I	Synchronisation für
2002-12-28 ...	pal...		DSYS006I	Empfangen wird Sy
2002-12-28 ...	pal...		DSYS008I	Synchronisation für
2002-12-28 ...	pal...	S_ADDRESS	DSYS006I	Empfangen wird Sy
2002-12-28 ...	pal...	S_ADDRESS	DSYS000I	Vollständige Synchr
2002-12-28 ...	pal...	S_ADDRESS	DSYS001I	Synchronisation bei
2002-12-28 ...	pal...	Test	DSYS006I	Empfangen wird Sy
2002-12-28 ...	pal...	Test	DSYS000I	Vollständige Synchr
2002-12-28 ...	pal...	Test	DSYS001I	Synchronisation bei



Security layers

- Device
 - f* Using local data encryption on table level
- Transport
 - f* Communication Encryption (56bit and 128bit DES)
- Synchronization Server
 - f* Client Authentication
 - f* Controlled Access through filterin
 - f* **LDAP integration** (with WPS WES)

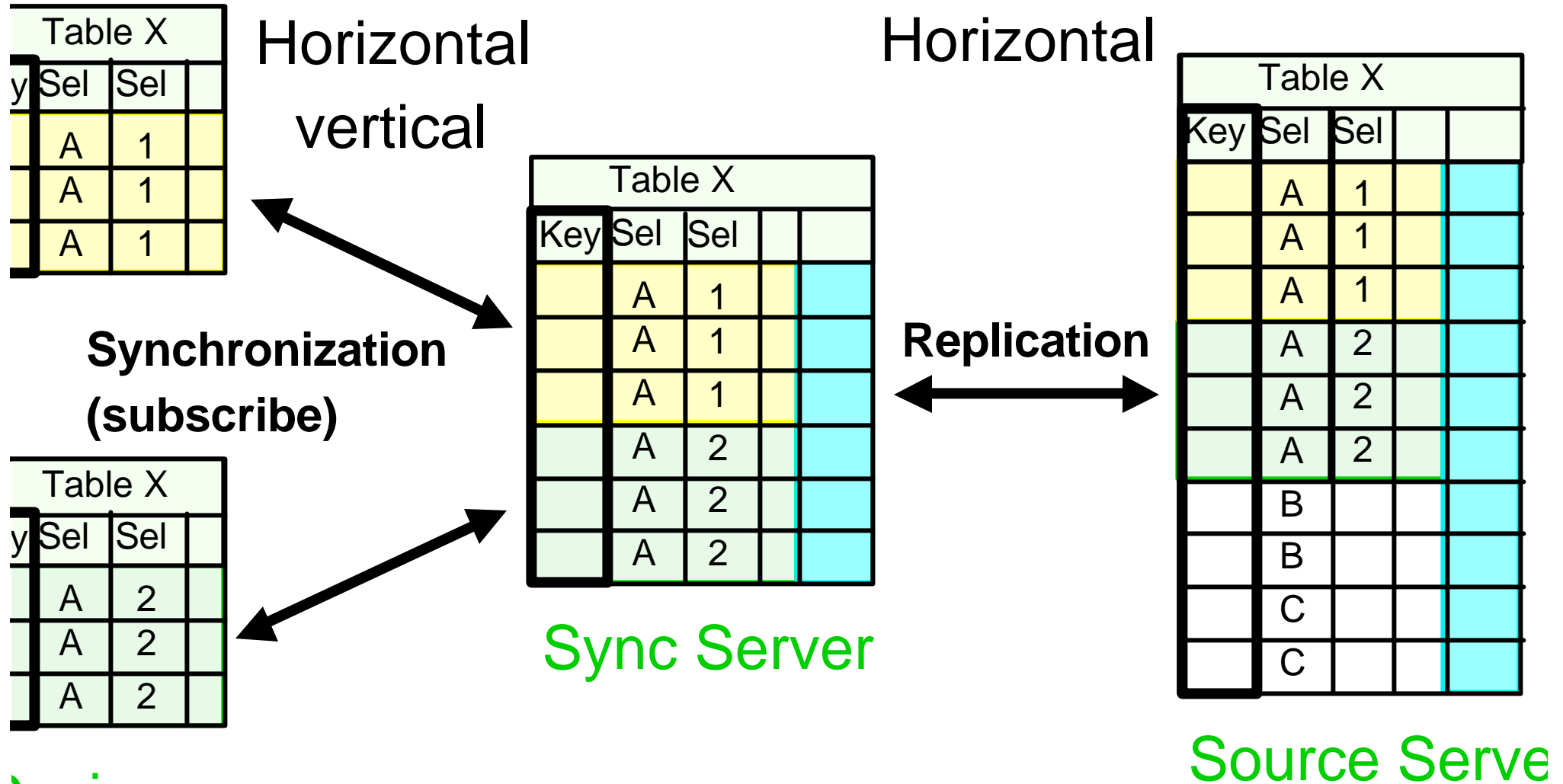


Filtering types

- Filtering basics
 - f* Needed for Security and Performance reasons
 - f* Done at Subscription, Group and user level
 - f* Default Values for column defined as Not Null provided at Syncserver
- Vertical Filtering
 - f* Reduce amount of columns
- Horizontal Filtering
 - f* Reduce amount of rows
- Join Filtering
 - f* Include a table with filter criteria for dynamic filter changes



Filtering



Device



Conflict handling (Konsistenz)

▪ Basic

f Conflicts between users changes and between users and source changes are resolved by the SyncServer during replication cycle

f Conflicts are at the row level

▪ Rules

f Source changes take priority over users changes

f Users changes are prioritized by the age of the base level of data available to each user, newer base data = higher priority

▪ Results

f Rejected Record is marked in the staging table with a reject code

f A message will be send to the client in the next sync cycle

–DSYD028I A synchronization element for database 'db', table 'schema'.table', primary key 'pkvalue', from device 'devtype_devid' was rejected due to 'reason'.

▪ Influence

f A user exit is called after the replication cycle . This can be used to add additional resolution rules



- VNApp
 - Tables
 - Palm OS
 - Forms
 - Schedule
 - Patient Information
 - Emergency Contact List
 - Contact Information
 - Medical Record List
 - Medical Record
 - New Medical Record
 - Form7Script1
 - Global Definitions
 - Alerts
 - Strings
 - Menus
 - MenuBars
 - Icon
 - Bitmaps

ies	Events
Source	Field2Form7
Id	VNMedicalRecord
Host Vari...	Date_C
Field Type	DATE
Font	FONT 2
Editable	USABLE
Line	EDITABLE
Alignment	SINGLELINE
Chars	LEFTALIGN
Unique Value	20
	No
	3
	32
	75
	44



300% New Medical Record

New Medical Record

Field1Form7

Field2Form7 : Field3Form7

Record ID : Field9Form7

Blood Pressure : Field4Form7

Pulse Rate : Field5Form7

Temperature : Field6Form7

Weight : Field7Form7

Comment

Field8Form7

(Save) ↑ (Back)

Pop-up Tr

Robust Development environment

- Programming interfaces supported
 - f* DB2 Call Level Interface (CLI) / ODBC subset
 - f* Java DataBase Connectivity (JDBC) driver for Java applications
 - f* Visual Basic Interface for Win32, WinCE/PocketPC application development
 - f* JSP processor & mini-http server (WinXX)
 - f* ADO.NET support and integration in Visual Studio.NET
- Included Developer tools
 - f* Database Import and Export utilities
 - f* Command Line Processor for all platforms
 - f* Sample applications with full source C/C++ code
 - f* Mobile Application Builder available free from website
 - Generate C code for Palm OS
 - Generate Java code for Java Virtual Machine supporting devices
- Commercial Development tools
 - f* Appforge plugin - <http://www.appforge.com/corp/press/2002Dec5-IBM.html>
 - f* Metrowerks CodeWarrior - <http://www.metrowerks.com/platforms/>
 - f* Microsoft eMbedded Visual Tools 3.0 - <http://msdn.microsoft.com/cetools/>
 - f* Websphere Studio device developer-<http://www.ibm.com/software/pervasive/products/wsdd/>

References/resources

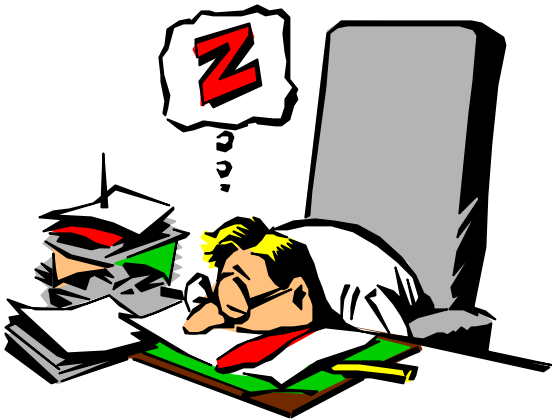
- DB2 Everyplace website
 - f* <http://www.ibm.com/software/data/db2/everyplace>
- developer forum
 - f* <http://www7b.software.ibm.com/dmdd/>
- redbooks (<http://www.redbooks.ibm.com>)
 - f* SG24-6217-00 IBM Replication Solutions for Pervasive Computing
- DB2 magazine
 - f* <http://www.db2mag.com>
- DB2 Everyplace db2everyplace@yahoogroups.com
 - f* To subscribe go to
 - <http://groups.yahoo.com/group/db2everyplace>
- Documentation
 - f* Installation and User Guide manual
 - f* Application Development Guide manual
 - f* Sync server administration guide
- Schulung
 - f* Kurs 'CG20EDE' <http://www.ibm.com/de/learning/>

Reference URLs

- Hardware Vendors
 - f* IBM Workpad: www.pc.ibm.com/us/workpad
 - f* IBM Microdrive: www.storage.ibm.com/hardsoft/diskdrdl/micro
 - f* TRG: www.trgnet.com
 - f* Symbol Technologies: www.symbol.com
 - f* Handspring: www.handspring.com
- IBM Pervasive Computing: www.ibm.com/pvc/



Questions??



Thank you for your interest

Retail/Sales Force Automation: NetSetGo

- Sales Force Automation Application tied in with retail store point of sale and Lawson accounting system

- DB2E database

DB2E sync server

DB2 UDB

on WinCE /
AS/400

on WinNT

or

Compaq IPAQ



1. Salesperson takes order and verifies item in stock;
76,000 SKUs to choose from.

2. Order forwarded from PDA;
immediate fulfillment

✓ **Benefits: Fewer errors, Faster delivery, Sales productivity**

Retail/Easy of Use: Penn State

- Penn State Center for Advanced Information Technology
- Used DB2 Everyplace in second year college class - students created a 'store' that can be accessed from a Palm device to order or check order status
- Use DB2 Everyplace on Palm OS; Sync Server on NT
- "We were amazed that DB2 Everyplace was a full function database, yet had a small footprint and ran on an handheld device...And the Mobile Application Builder was fantastic - led students through a point and click programming process and automatically created the C code for the Palm..."




Asset Tracking: Essential Systems

- Asset Tracking Application

- DB2E database

DB2 UDS 

DB2E sync server 
on Palm

on Linux

on Linux



1. Worker A takes tool.
2. Worker B scans bar code of tool & worker.
3. Information reconciled with corporate accounting, inventory and employee systems

Benefits:

- ✓ Tools and Tool status tracked
- ✓ Tool use can now be billed per job

DB2 Everyplace Multi-Servers Architecture

