IBM DB2 Middleware

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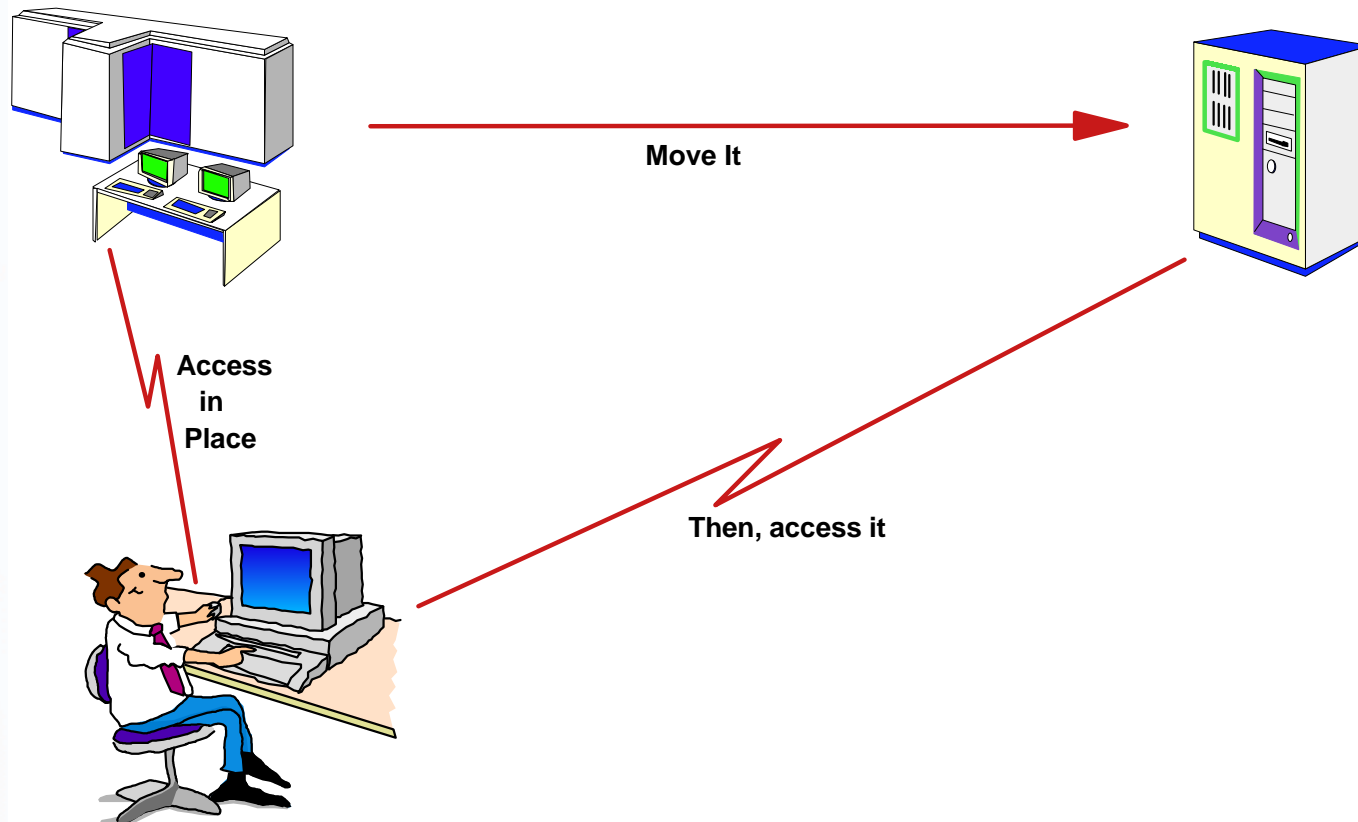# Alternative Ways To Provide Data Access

- **Access the data in place**
- **Move the data**
  - ► Move it to another location
  - ► Then, access it there

Move It

Access in Place

Then, access it

DM Middleware: DB2 Connect

What Does DB2 Connect Do?

- Between a workstation-based (distributed) application and DB2 on a host system, provides:
  - ► a **required** translation mechanism (ASCII/EBCDIC)
  - ► a coordination mechanism (blocking, pooling, etc.)
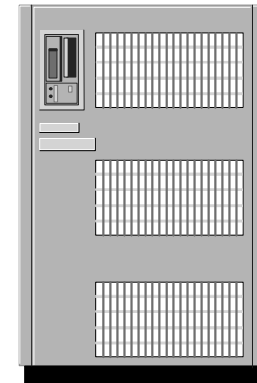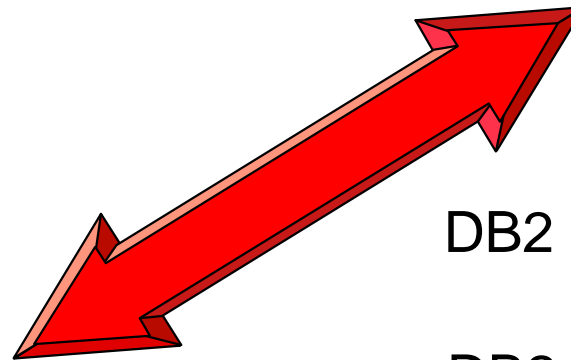 - ► application/end-user transparency

What Does DB2 Connect Do?

- Provides extremely fast and robust connectivity to DB2 UDB for OS/390, to DB2 UDB for VM/VSE, or to DB2 UDB for AS/400, from applications running on AIX, Linux, HP-UX, Microsoft Windows (all variants), OS/2, and Sun Solaris.

Client Application

DB2 UDB for OS/390
or
DB2 UDB for AS/400
or
DB2 UDB for VM/VSE

AIX, Linux, HP-UX, Windows, OS/2, Solaris

DRDA

- October 26, 1998: THE OPEN GROUP ADOPTS DRDA AS AN INDUSTRY STANDARD FOR OPEN DATABASE INTEROPERABILITY
  - ► "The approval of the DRDA protocol as a standard responds to a specific demand by the customer members of The Open Group", said Allen Brown, COO and Acting President of The Open Group. "It represents another step in creating trust in multi-source interoperability and enabling customer choice with confidence."

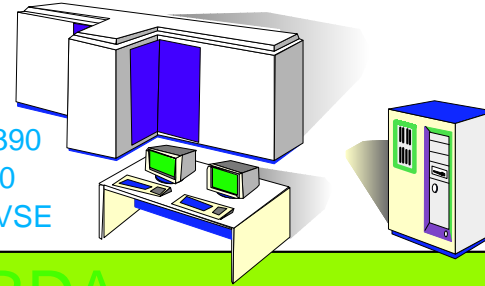   **Allen Brown**, COO and Acting President of The Open Group
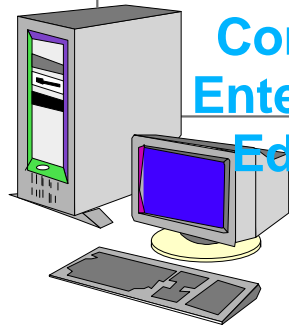
DB2 Connect

On-Ramp to Your Data Highway

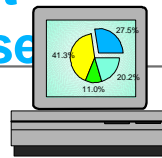DB2 OS/390
DB2/400
DB2/VM&VSE

DRDA Application Servers

DRDA

DB2 Connect Enterprise Edition

Any DB2 Clients

DB2 Connect Personal Edition
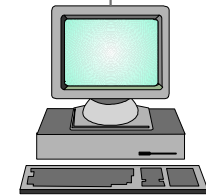
OS/2
Windows
(3.1, 95, NT)
Linux

AIX HP-UX NT
OS/2 SCO
SINIX Solaris

- ■ **Efficient and cost effective**
- ■ **No host code required**
- ■ **Data integrity maintained**
- ■ **Data security maintained**
- ■ **Transparent to programmer or end user**

Adopted by Peoplesoft as standard as of V8!

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DB2 Connect Personal Edition vs. Enterprise Edition

DB2 for OS/390

DB2 Connect Enterprise Edition

DB2 Connect Personal Edition

DB2 Run-Time Client

DB2 Run-Time Client

DB2 Run-Time Client
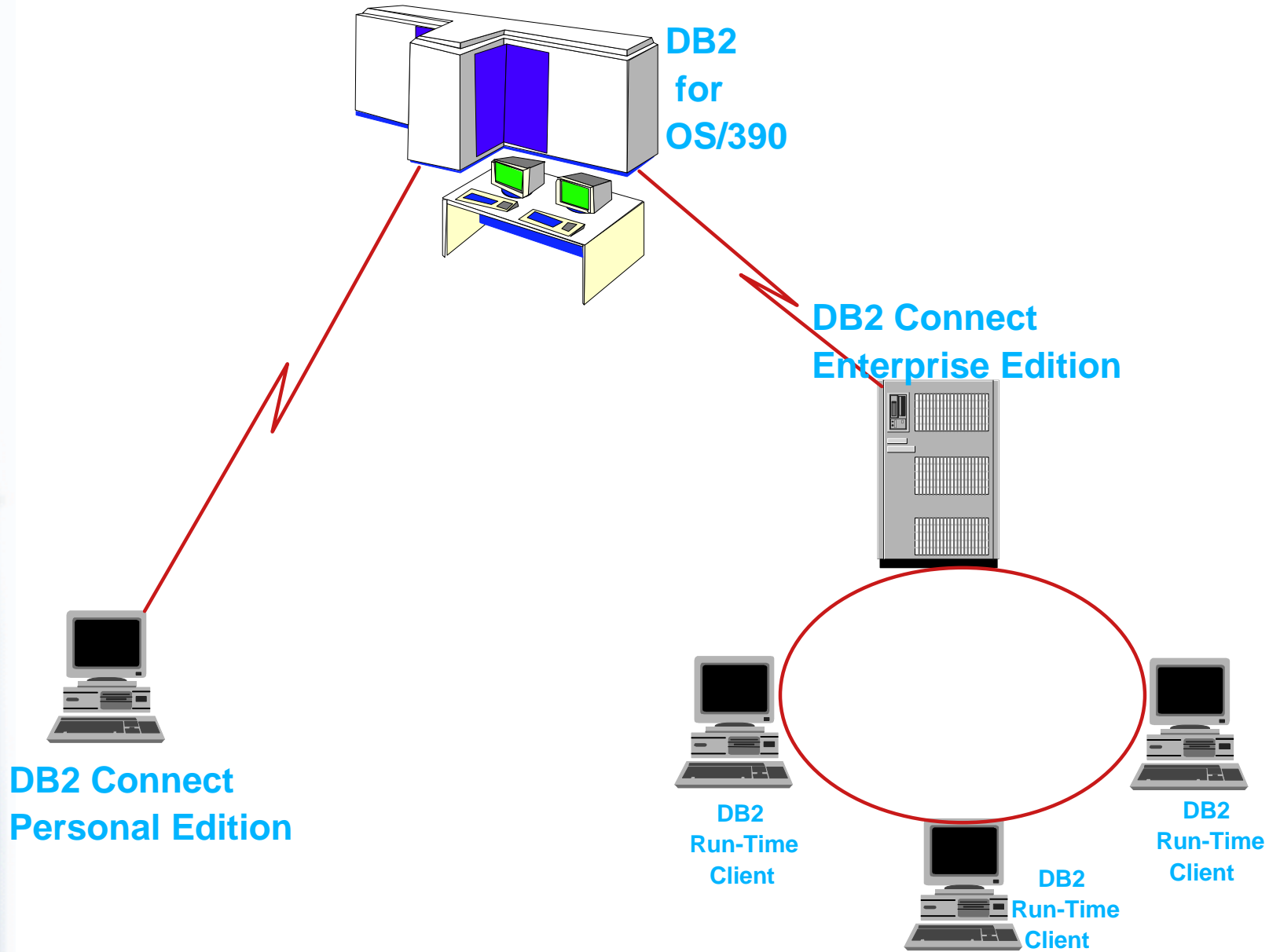
Another Common Enterprise Edition Scenario

DB2 UDB for OS/390

1. DB2 Connect EE
2. DB2 Run-Time Client
3. Web Server

Web Browser

Web Browser

Web Browser
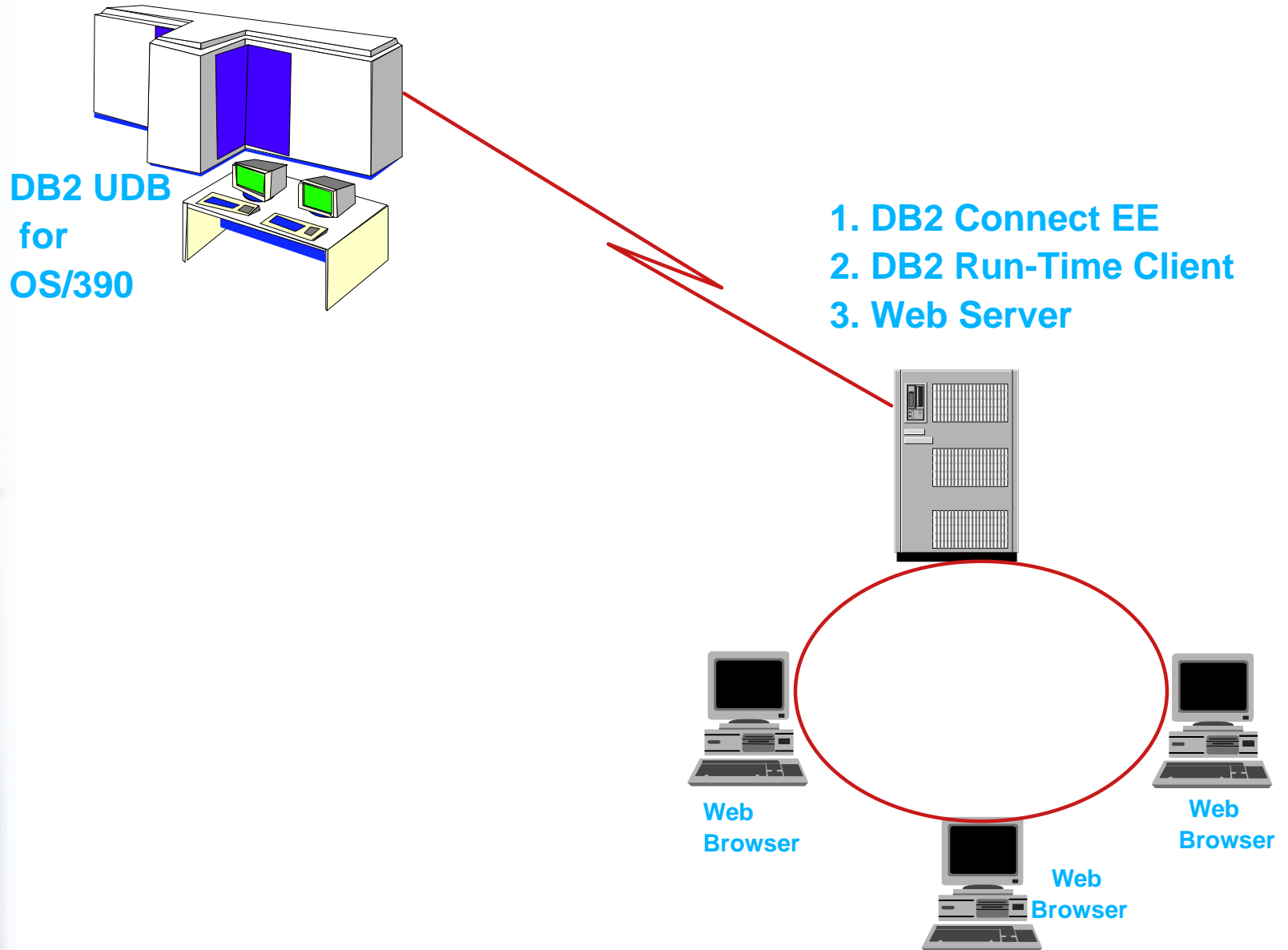
DB2 Connect
What data can it access?

- **MVS and OS/390**
  - ► DB2 for MVS/ESA V3.1, V4.1 (SNA only)
  - ► DB2 for OS/390 V5.1, V6.1 (both TCP/IP and SNA)
  - ► CICS, VSAM (via DB2 Stored Procedures)
    - ● VSAM can be direct access but CICS normally used
  - ► IMS (via DB2 Stored Procedures)
- **VM and VSE**
  - ► SQL/DS Version 3.5
  - ► DB2 Server for VSE & VM V5.1
- **AS/400**
  - ► DB2/400 V2.1.1 or higher (SNA only)
  - ► DB2/400 V4.2 supports both TCP/IP and SNA

DB2 Connect
Supported applications

- **End-user productivity applications**
  - ► Microsoft Excel and Word, Lotus 1-2-3 and WordPro
- **Query and analysis tools**
  - ► Access, Approach, Business Objects, Impromptu, Forest & Trees, InfoMaker etc.
- **Report writers**
  - ► Crystal Reports, Report Smith, Access etc.
- **Rapid Application Development (RAD)**
  - ► VisualBasic, PowerBuilder, Delphi, Optima, VisualAge
- **Java RAD**
  - ► IBM VisualAge for Java, Symantec Cafe, Borland JBuilder
- **Industry applications (e.g. PeopleSoft, Catia, Siebel)**

DB2 Connect
What APIs are supported?

- Embedded SQL
  - ► static SQL
  - ► dynamic SQL
  - ► Java (SQLJ), COBOL, C, C++, FORTRAN, REXX
- ODBC (including ADO, RDO)
  - ► Version 3.5
- DB2 Call Level Interface (DB2 CLI)
- JDBC (Java)
  - ► JDBC 2.0 compliant
  - ► both application and applet drivers are provided

New packaging & pricing option

- DB2 Connect Unlimited Edition (DB2 for OS/390)
  - ► licensed only for access to DB2 for OS/390 servers
  - ► consists of both DB2 Connect Personal and Enterprise Editions
  - ► deployed on unlimited number of desktops and servers
  - ► no need to count users
  - ► price is based on the size of the DB2 for OS/390 being accessed
  - ► licensed as OTC (one time charge) i.e. not MLC (monthly license charge)
  - ► target audience: web, ERP, and large scale applications
- DB2 Connect for DB2 for VSE & VM
  - ► same packaging as the DB2 Connect Unlimited
  - ► licensed only for access to DB2 for VSE & VM servers

Customer Success

Over 4,000 corporate customers worldwide benefit from the power of DB2 Connect, including:

- Wal-Mart (www.wal-mart.com)
- Bear Stearns
  - ► DB2 Connect allows Bear Stearns to leave the data in place on the mainframe, yet provides easy to use, high performance access for employees and selected customers.
- Morgan Stanley/Dean Witter
  - ► wanted to do development on the desktop, while accessing DB2 for OS/390 data for test cases; also wanted to link to mainframe applications like trading systems.
- New England Financial Services
  - ► implemented DB2 Connect to relay information from the host data warehouse to the end user. End users can now use Visual Basic applications to perform queries directly from the DB2 host and have direct access to key customer information.
- Swiss Bank
  - ► "DB2 Connect has provided real-time connectivity to a reliable database product. In addition to improving our in-house business processes, we can now better serve our clients."
- American Airlines, Smith-Barney, Ford, Pru Securities, John Deere, Chubb, Guardian, Allstate, Boeing, Spiegel, and others ...

DM Middleware: DB2 Datajoiner

What Does Datajoiner Do?

- DB2 DataJoiner presents end-users and applications with a DB2 interface -- but where some (or all) of the data may in fact reside in other DB2 or non-DB2 databases.
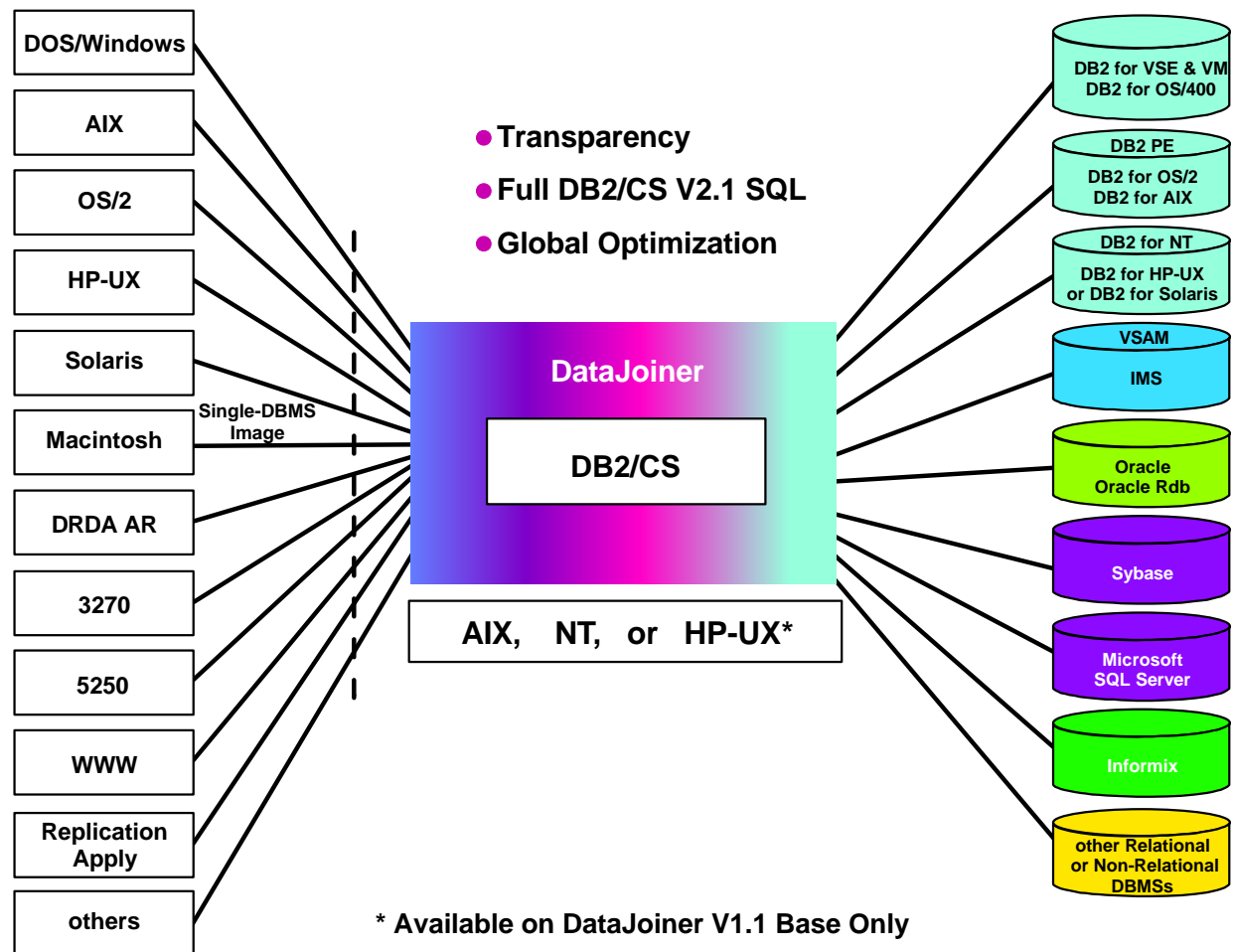
DataJoiner Version 2.1

e-business

Client Platforms		Data Sources
DOS/Windows		DB2 for VSE & VM / DB2 for OS/400
AIX	• **Transparency**	DB2 PE / DB2 for OS/2 / DB2 for AIX
OS/2	• **Full DB2/CS V2.1 SQL**	DB2 for NT / DB2 for HP-UX or DB2 for Solaris
HP-UX	• **Global Optimization**	VSAM / IMS
Solaris		Oracle / Oracle Rdb
Macintosh	**Single-DBMS Image**	Sybase
DRDA AR	**DataJoiner**	Microsoft SQL Server
3270	**DB2/CS**	Informix
5250		other Relational or Non-Relational DBMSs
WWW	**AIX, NT, or HP-UX***	
Replication Apply		
others	*** Available on DataJoiner V1.1 Base Only**	

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More on Datajoiner Features/Functions

- Heterogeneous (DB2 and non-DB2) Access
- Heterogeneous Join
- Transparency
  - ► All tables appear to be "local" to the DB2 DataJoiner database
- Global Optimization
- Heterogeneous Replication

What Differentiates Datajoiner from DB2 Connect?

- DB2 Connect provides access in place to DB2 UDB on OS/390, DB2 UDB for VM/VSE, or DB2 UDB for OS/400
- DB2 Datajoiner provides access to DB2 on any platform (includes DB2 Connect), but can also provide access to non-DB2 data
- DB2 Datajoiner provides heterogeneous join capability
- DB2 Datajoiner has a DB2 optimizer built in
- DB2 Datajoiner includes replication components and is the solution that addresses a heterogeneous replication requirement (e.g. the need to move data from DB2 to Oracle or Sybase to DB2)

Examples of Potential Datajoiner Opportunities

- A customer that needs to access savings/checking acct. data on Oracle and mortgage data on DB2 from a VB application
- A customer that has an application that queries their sales transaction history on DB2 and wants to move some or all of it to a non-DB2 db without changing the app.
- A customer who needs to employ data replication to move data from DB2 to Oracle, SQL Server, Informix, Teradata, Sybase, or any supported Datajoiner target.
- Any customer that is running a web server on Intel/UNIX and needs to access both DB2 and non-DB2 data from that web server
- A customer that wants to "federate" their data warehouse without moving the data
- A customer who wishes to access data from more than one DB2 database within one connect scope, i.e. any customer who is looking for function comparable to the Oracle Database Link function or SQL Server 3-part name function
- Any customer who is frustrated with the cost, performance, etc. of the competition, or who is seriously looking at the competition

Move the Data Somewhere Else

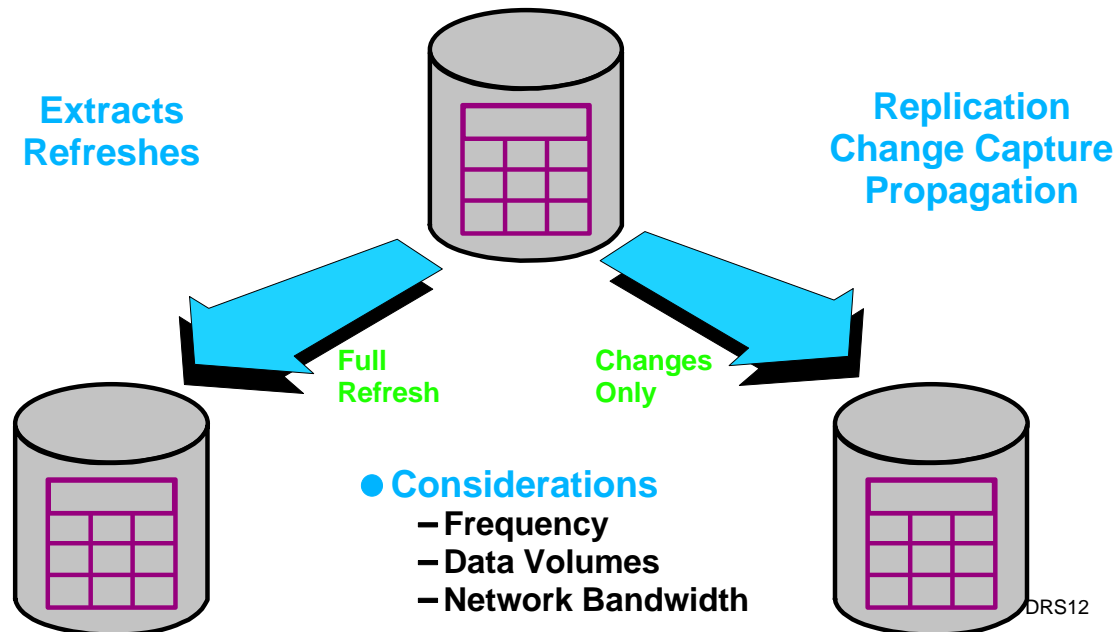# *DM Middleware: Replication*

Move the Data Someplace Else - DB2 Data Propagator

- What does DB2 DataPropagator Do?
  - ► DB2 Data Propagator allows customers to move data from DB2 source databases on any supported platform to DB2 target databases on any supported platform

Extracts
Refreshes

Replication
Change Capture
Propagation

Full
Refresh

Changes
Only

● **Considerations**
 – **Frequency**
 – **Data Volumes**
 – **Network Bandwidth**

DRS12

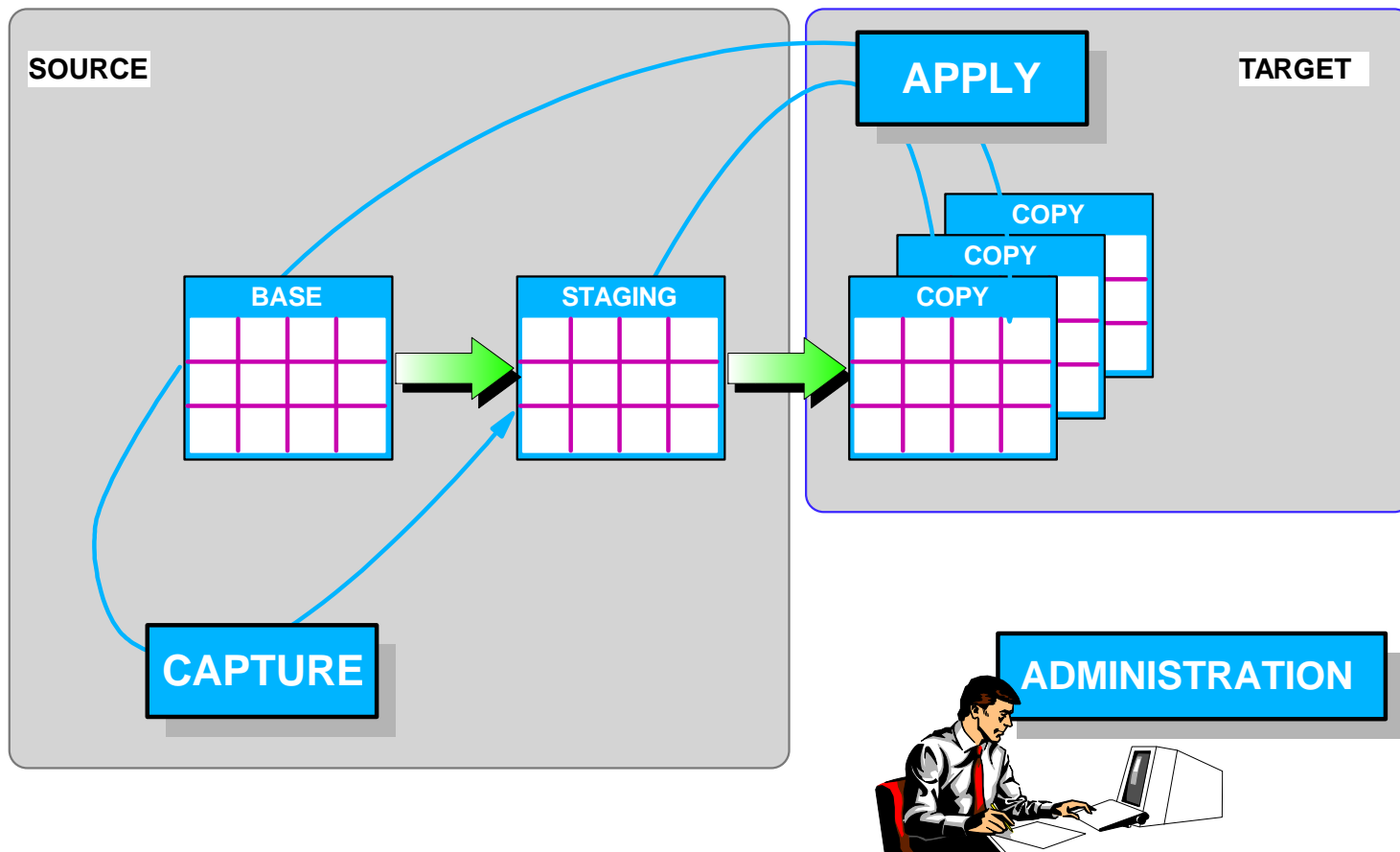# What Does DataPropagator Relational Do?

- DataPropagator Relational allows customers to move data from DB2 source databases on any supported platform to DB2 target databases on any supported platform

Relational Replication - Components

- **Independent operation**
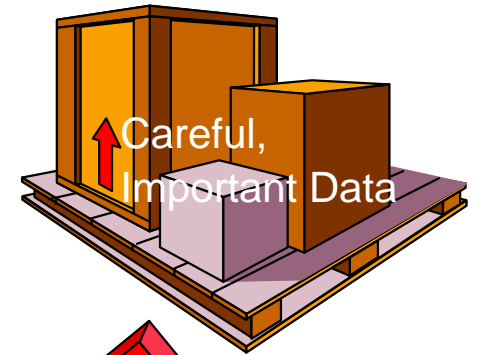- **Refresh, update, and enhancement**
- **Database connectivity and security**

Value Proposition

DataPropagator helps meet growing demands for data by delivering the

- ➡ *Right data in the*
- ➡ *Right format into the*
- ➡ *Right hands at the*
- ➡ *Right time*

Careful, Important Data

More on DPropR Features/Functions

- a relational application
- supports complete refresh or incremental updates
- some transformation capabilities
  - ▶ enhancements, summarizations, calculations
  - ▶ denormalization
- can be scheduled
- not trigger-based ... obtains incremental updates from the log
- can be extended to non-DB2 targets using Datajoiner
- can be extended to non-DB2 sources using Datajoiner, but employs triggers to do so

DPropR Packaging

- comes with DB2 UDB on Intel/UNIX free-of-charge
- comes with Datajoiner (NT, AIX, Solaris) free-of-charge
- additional purchase on OS/390, AS/400
  - ► Capture
  - ► Apply

Examples of Potential DPropR Opportunities

- a customer who needs to move data from DB2 UDB for OS/390 to DB2 UDB for Solaris
- a customer wishes to move a day/month at a time of their sales transaction history from DB2 UDB for OS/390 down to DB2 UDB for NT for access by Cognos Impromptu
- a customer who wishes to move data their DB2 UDB for HP-UX transaction-based order database to a decision-support database on DB2 UDB for OS/390
- a customer who wants to move data incrementally from DB2 UDB for OS/390 to a DB2 UDB Data Warehouse on Windows/2000
- a customer who wants to move data from DB2 UDB for OS/390 to a DB2 UDB Data Warehouse on OS/390
- any customer who is frustrated with the cost, performance, etc. of the competition, or who is seriously looking at the competition

How to identify IBM Middleware opportunities

- DB2 Connect
  - ▶ Customer needs to access data stored in DB2 on S/390:
    - ✓ to create an OLAP cube
    - ✓ for data warehousing
    - ✓ for a web application... for any reason
- DB2 DataJoiner:
  - ▶ Customer needs to access data across several systems and databases
    - ✓ to read and write data from DB2 to Oracle, SQL Server, Informix, Teradata, Sybase, or any supported Datajoiner target to access both DB2 and non-DB2 data from a web server on Intel/UNIX.
    - ✓ to join savings/checking acct. data on Oracle and mortgage data on DB2 from a VB application.
- DB2 Data Propagator:
  - ▶ Customer needs to replicate data
    - ✓ **From DB2 on OS/390 to DB2 on Solaris.**
    - ✓ From DB2 on an HP-UX transaction-based order database to a decision-support database on DB2 for OS/390.
    - ✓ Incrementally from DB2 for OS/390 to a DB2 DataWarehouse on Windows/2000.
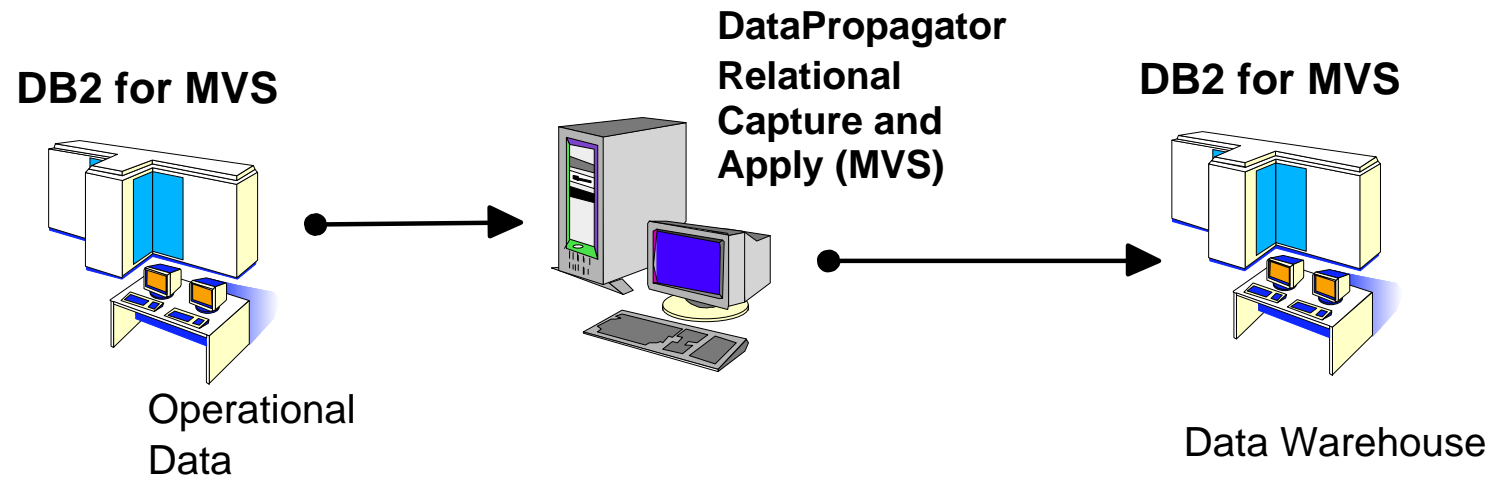
DM Middleware: Supplemental Information

Miller Brewing

Business problem:

User access to production systems for decision support impacted operational online transactions

IBM Solution

DB2 for MVS

DataPropagator Relational Capture and Apply (MVS)

DB2 for MVS

Operational Data
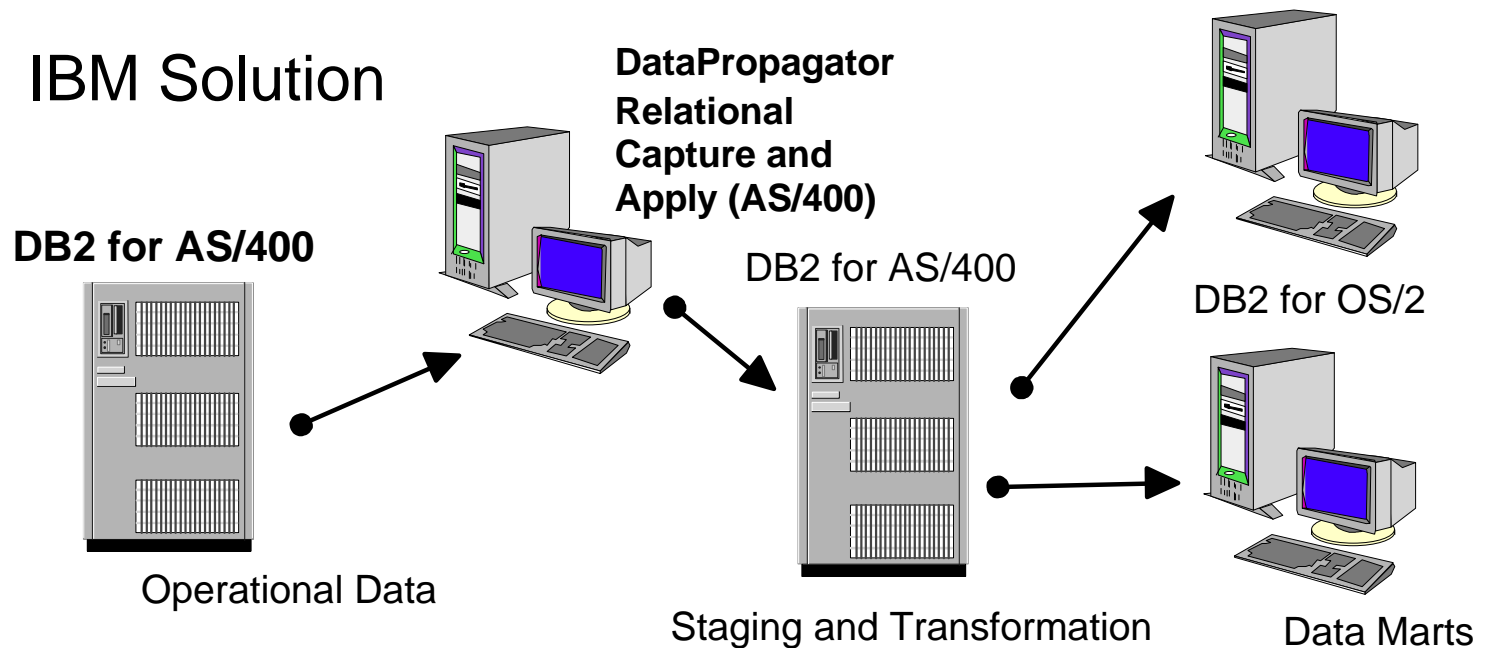
Data Warehouse

IBM revenue -- $100K a year!

e-business

US Mining Company

Business Problem:

User access to production systems for decision support impacted production availability. Operational data not configured for end-user queries/tools.

IBM Solution

DataPropagator Relational Capture and Apply (AS/400)

DB2 for AS/400

DB2 for AS/400

DB2 for OS/2

Operational Data

Staging and Transformation

Data Marts

IBM revenue -- $500K (including a new AS/400)!

Business Problem:

Need legacy IMS data in DB2 for MVS for new applications

IBM Solution

IMS DataPropagator

DB2 for MVS

IMS

DB2 for MVS

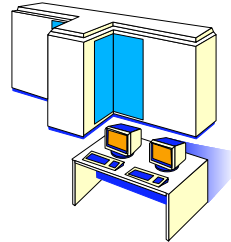DataPropagator Relational Apply for MVS
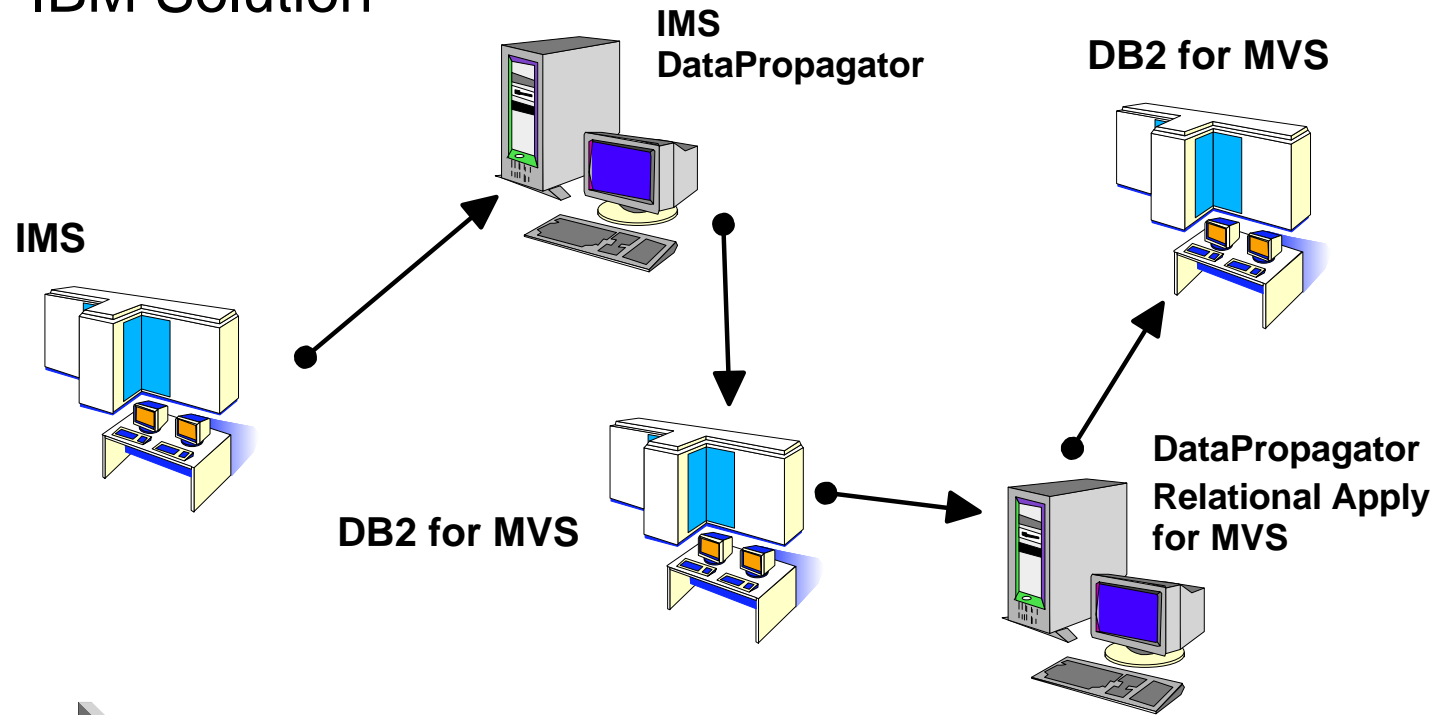
IBM revenue -- $150K!

US Insurance Company

Business Problem:
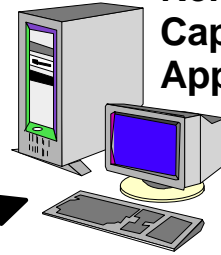
17,000 insurance agents need to exchange data with headquarters

IBM Solution

DataPropagator Relational Capture and Apply (MVS)

DB2 for MVS

DB2 UDB Personal Edition

IBM revenue -- $1 Million plus!