IBM Software Group

IBM WebSphere Information Integration

“ IBM Information Integration offering on z/OS”

WebSphere. Information Integration Software

ON DEMAND BUSINESS

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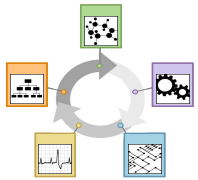
Defining Business Integration

The efficient and flexible combination of resources to optimize operations across and beyond the enterprise

People

- Portal – personalized information
- Collaboration technology
- Adaptable workplace
- Consistent rule-based experience across devices



Processes

- Workflow management
- B2B connectivity
- Messaging infrastructure (EAI)
- e-Business transactions
- Service-oriented architecture

Information

- Federation & data placement (replication, ETL, caching)
- XML (store, query, webservices)
- Meta-data management
- Text Search and analytics

40% of people's time is spent searching for relevant information	*40% of IT budgets may be spent on integration*	*30-50% of design time is copy management*	*85% of information is unstructured*

☹ *for each $1 spent for a packaged application, customers spend $5 to $9 on the labor for integration !*
(IBM Customer Surveys, 2001, 2002)

Can I create business value from my existing IT systems? → ***People, Process, Information***

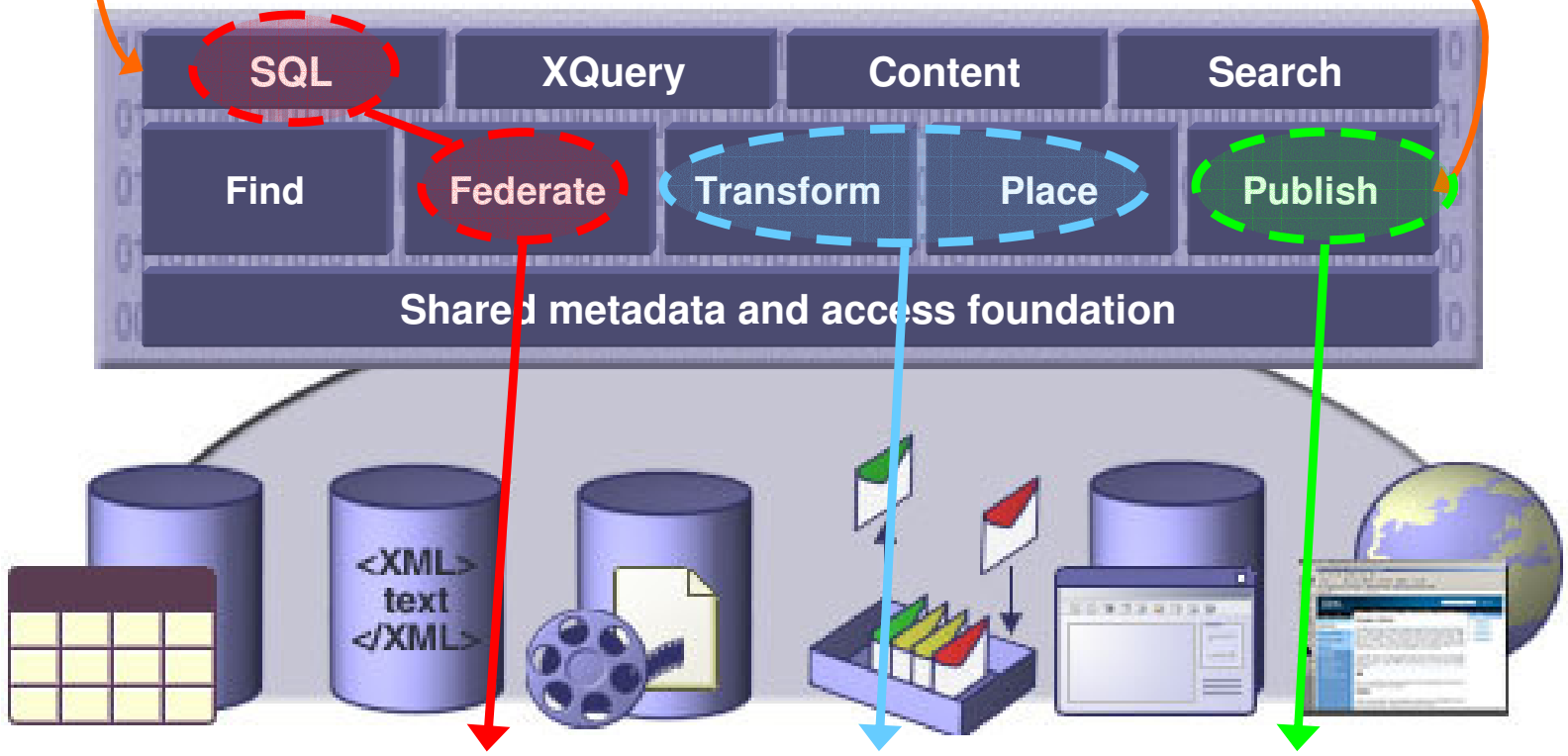
Can users react in real-time to the most recent information? → ***People, Information***

Are business operations fully integrated for optimal efficiency? → ***Process, Information***

IBM Information Integration Vision

Any Data

- ***Multiple access paradigms***
- ***Multiple integration disciplines***



zSeries II Offering :

Federated Data

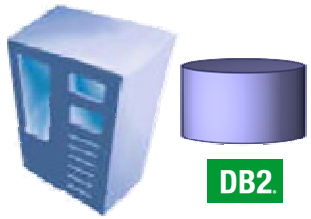
Replicated Data

Event Publishing

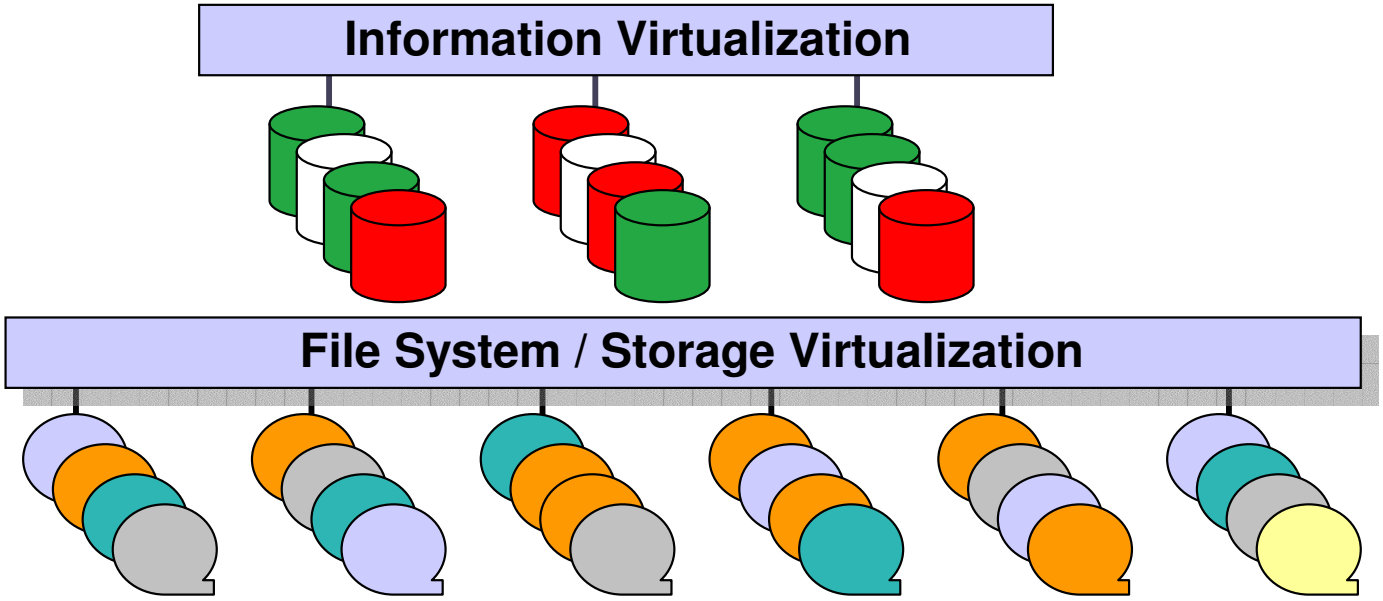
Using Websphere Information Integrator as GRID Enabler

- Leverage IT Infrastructure
- Accessing Information regardless of Database Management System and Structure

Federation instead of Centralization



WebSphere Information Integrator



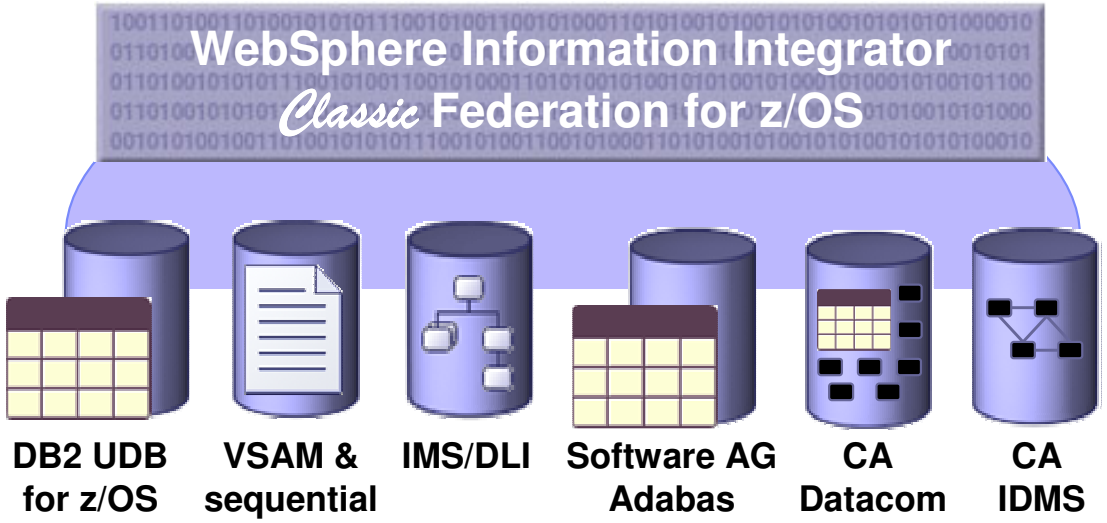
Federated Data Server

- *WebSphere Information Integrator Classic Federation – z/OS Platforms*
- *WebSphere Information Integrator - LUW Platforms*

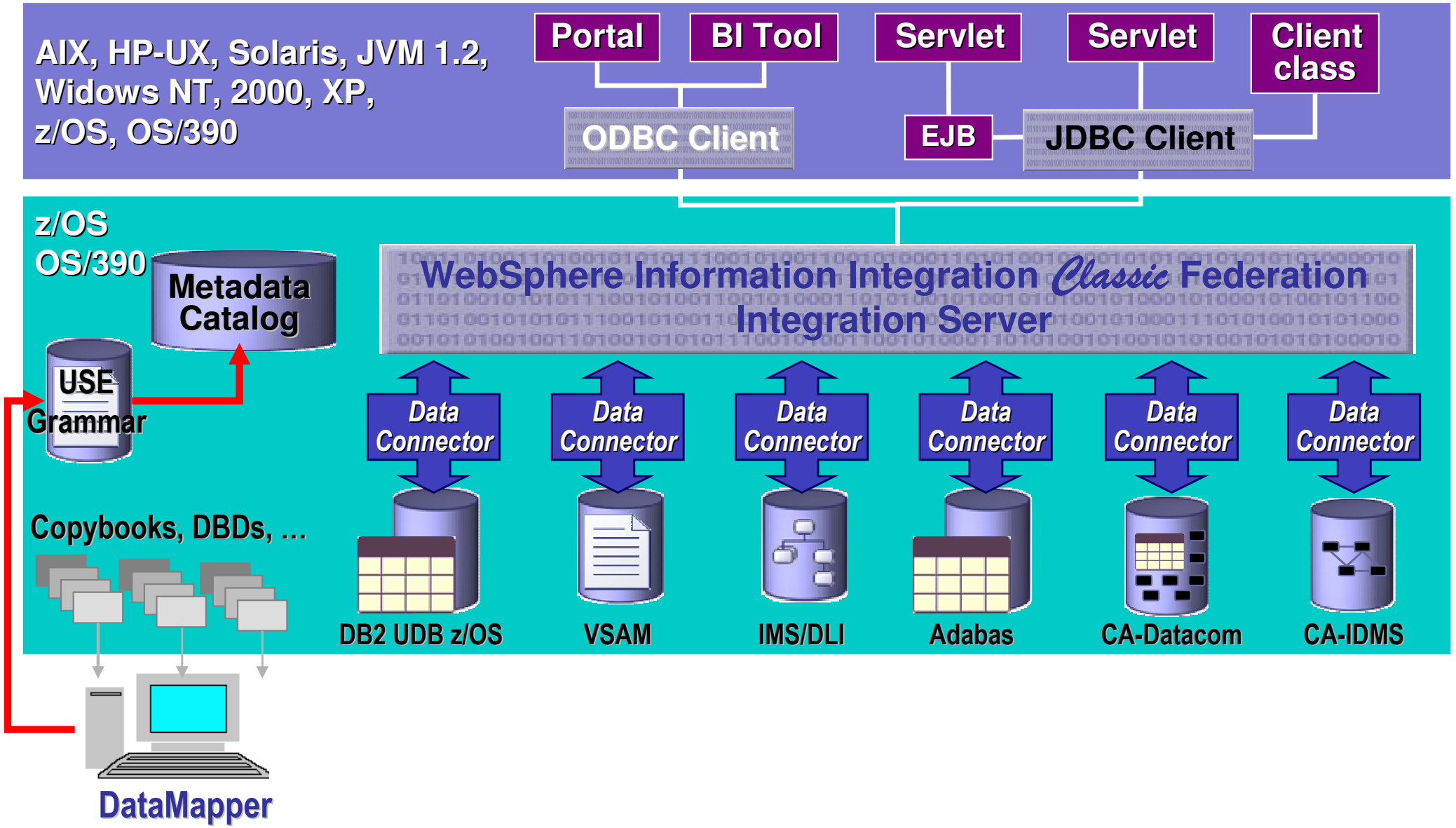
WebSphere Information Integrator Classic Federation for z/OS

- Typical Large IT Enterprise Environment
  - Decades of heterogeneous technology investment :
    60% of data resides on mainframe and is growing 20% per year
  - Real-time access to mainframe–based data to remain competitive
  - High performance and scalability are mandatory

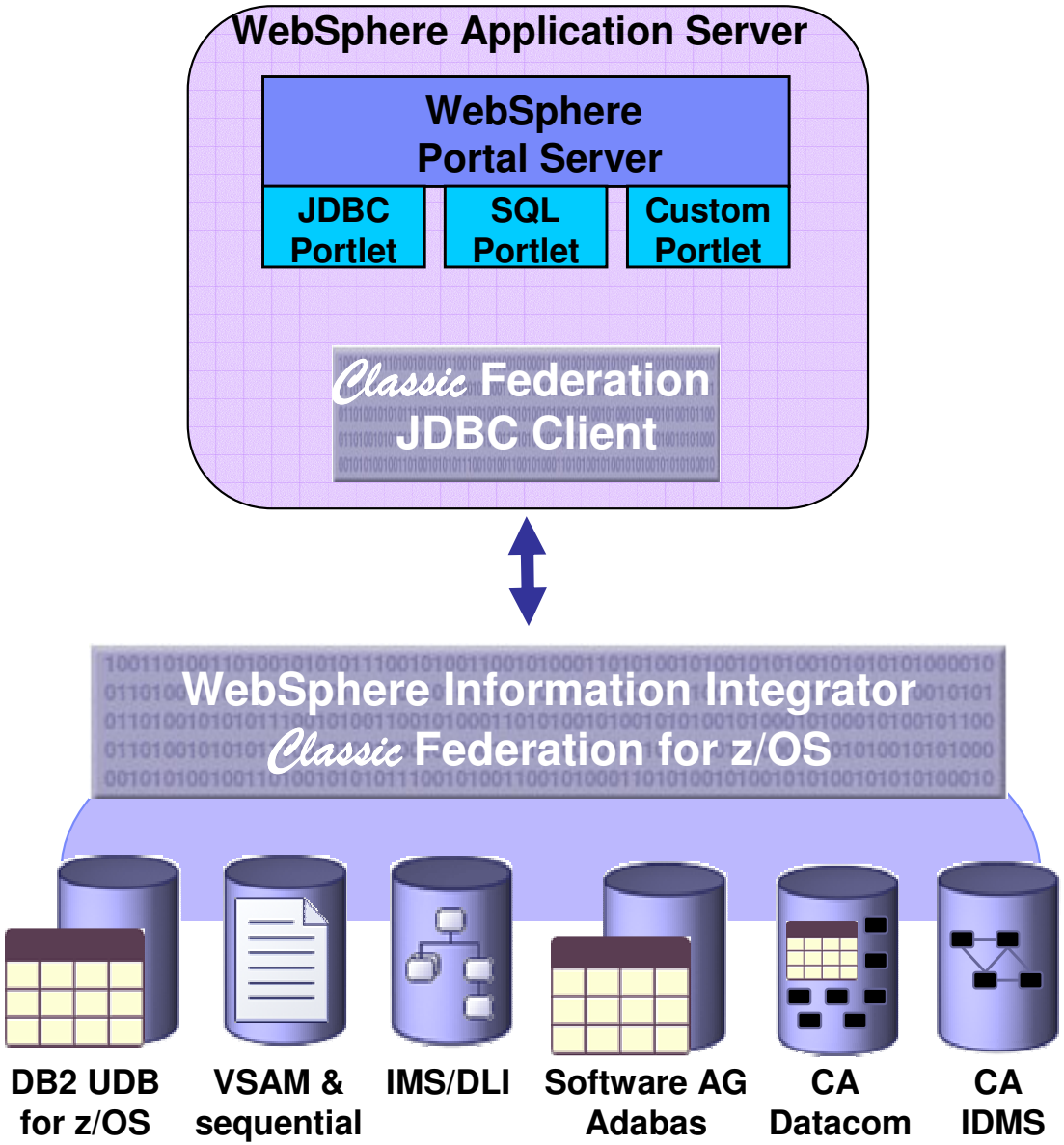
- DB2 Information Integrator Classic Federation for z/OS
  - Read/Write mainframe data sources using SQL through
    standard ODBC, JDBC, CLI
  - Native database connectors leverage power of each database/file accessed
  - Metadata-driven means:
    - No mainframe programming required
    - Fast installation, configuration & ease of maintenance



WdebSphere Information Integratror *Classic* Federation



WebSphere and II Classic Federation

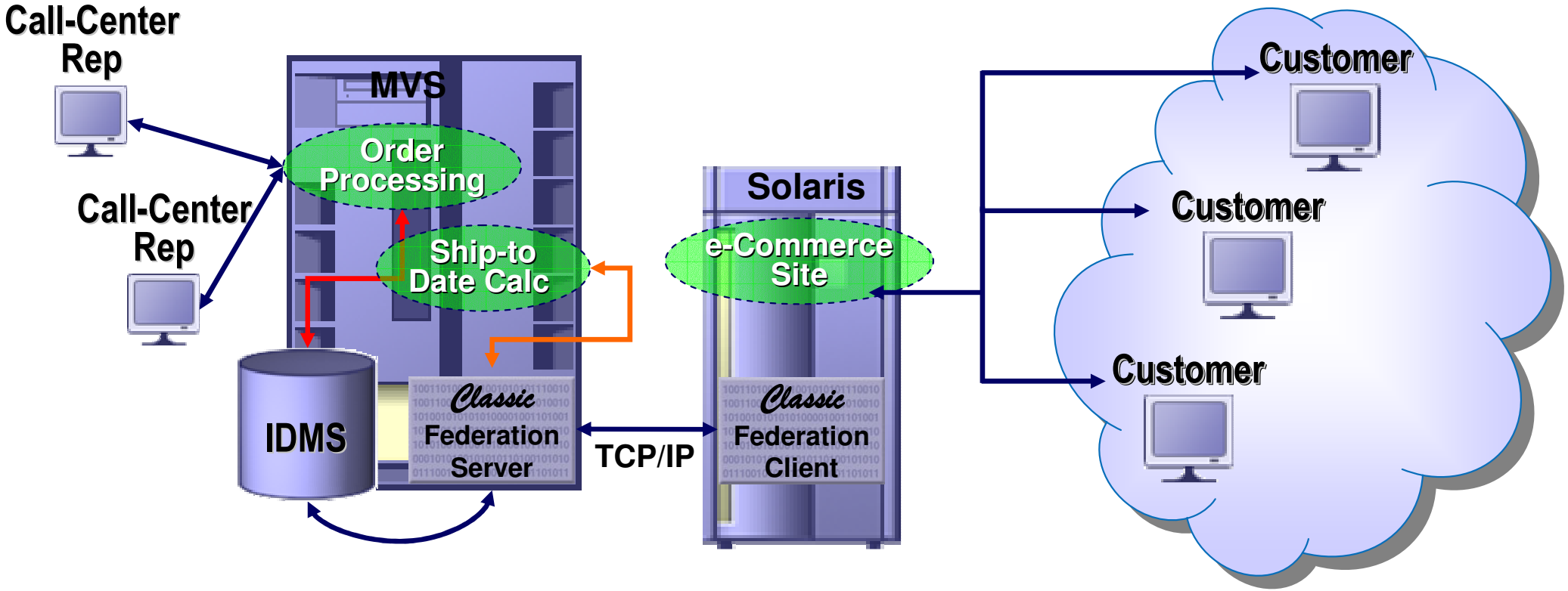


- Integrate mainframe data directly with Web applications, Portals, EAI platforms
- Supports JDBC 2.1 Core APIs Plus
  - Scrollable/Updatable ResultSets
  - Commit – Rollback – AutoCommit - XA
  - Stored Procedure to mainframe programs
  - Parameter Markers
  - Metadata commands for tables, columns, keys, procedures, …
  - Connection Pooling Support via Relational Resource Adapter (RRA)
  - SQLBatch Operations
  - Statement commands e.g. re-execution of prepared statements

Integration in Action – European Catalog House

Seamlessly share order processing data and algorithms between:

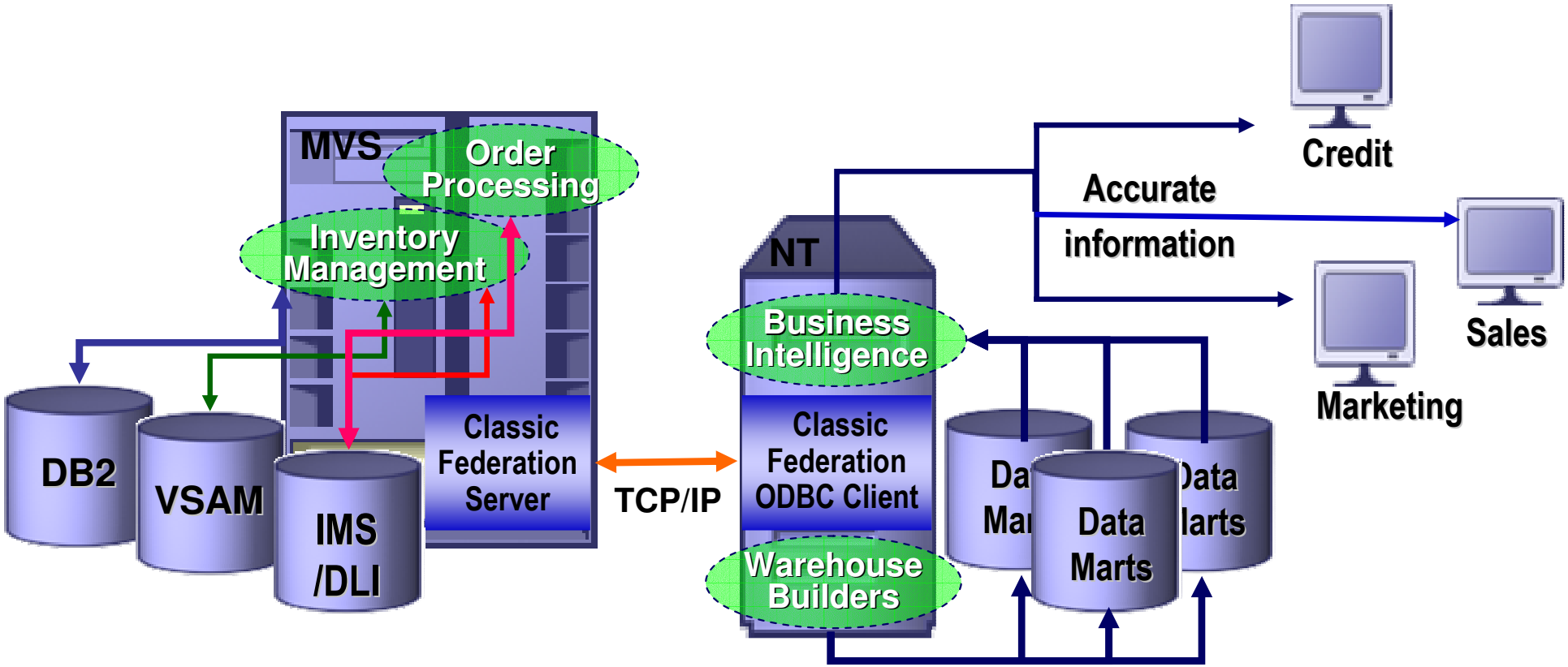
- Legacy call-center systems
- New e-commerce applications
- No mainframe skills required for e-commerce site development



Integration in Action – Recreation Vehicle Manufacturer

Provide accurate inventory and sales data to data warehouse

- Dynamically connect data warehouse tool with mainframe data
- Cut development time in half
- Accelerate product delivery with warehouse “pull” of new shipment data



Integrating Enterprise Data

Integrated SQL View

DB2 Information Integrator

SQL, SQL/XML

Federation Engine

Wrappers and functions

ODBC

DB2 II Classic Federation

z/OS

DB2 UDB

VSAM

IMS/DLI

SAG Adabas

CA Datacom

CA IDMS

Packaged apps

New

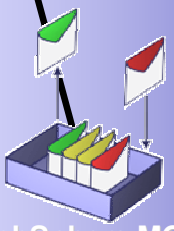
Biological Data And Algorithms

Text

<XML> text </XML>

XML

Excel



WebSphere MQ

IBM Extended Search

WWW, email,...

DB2 Family

Sybase

Informix

SQL Server

Oracle

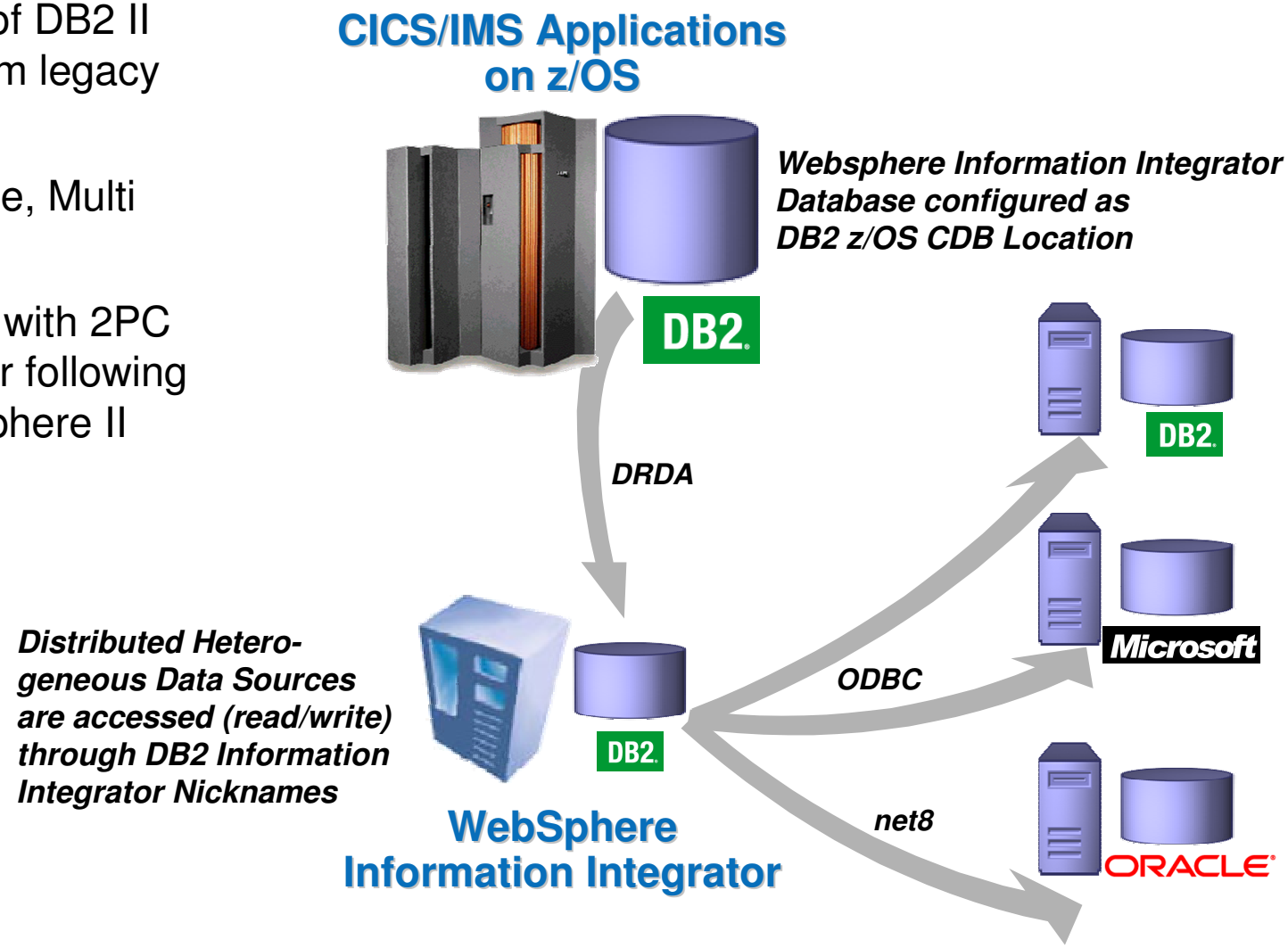
Teradata

ODBC

Access Distributed Heterogeneous Data from CICS Applications

Business Scenario

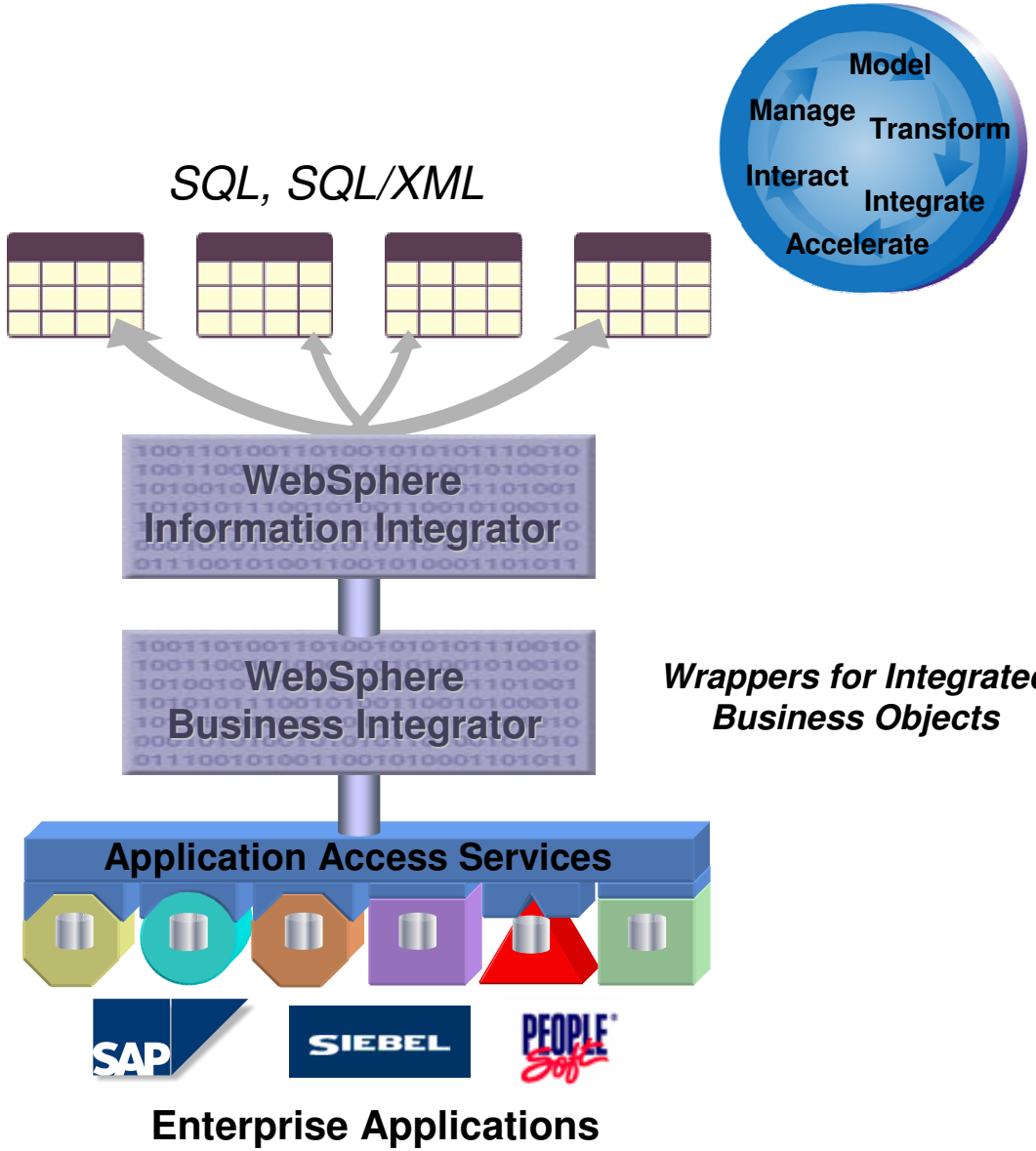
- Access all kinds of DB2 II Data Sources from legacy Applications
- Single Site Update, Multi Site Read
- Distributed UOW with 2PC support in plan for following version of WebSphere II



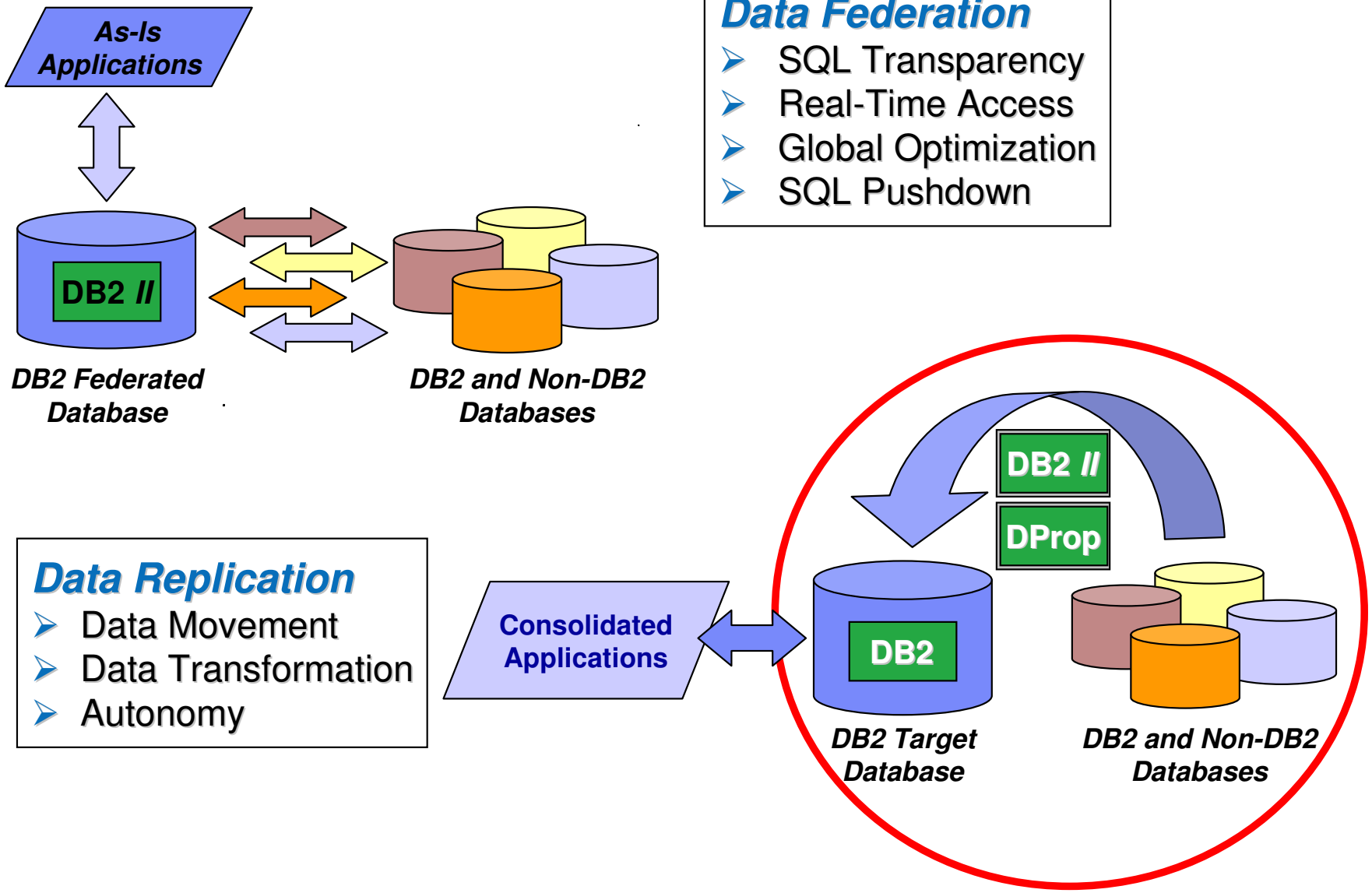
Information and Process Integration with WebShpere

Business Scenario

- Enterprise Applications provide APIs for Business Object/Component Retrieval
- Enterprise Business Components can be mapped into relational Format using WebSphere components :
  - ✓ Information Integration
  - ✓ Business Adapters
- Business Objects can be joined with other relational / non-relational Information



Federate or Replicate – That is the Question !!

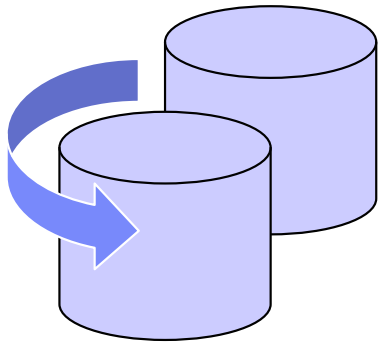


Replicated Data

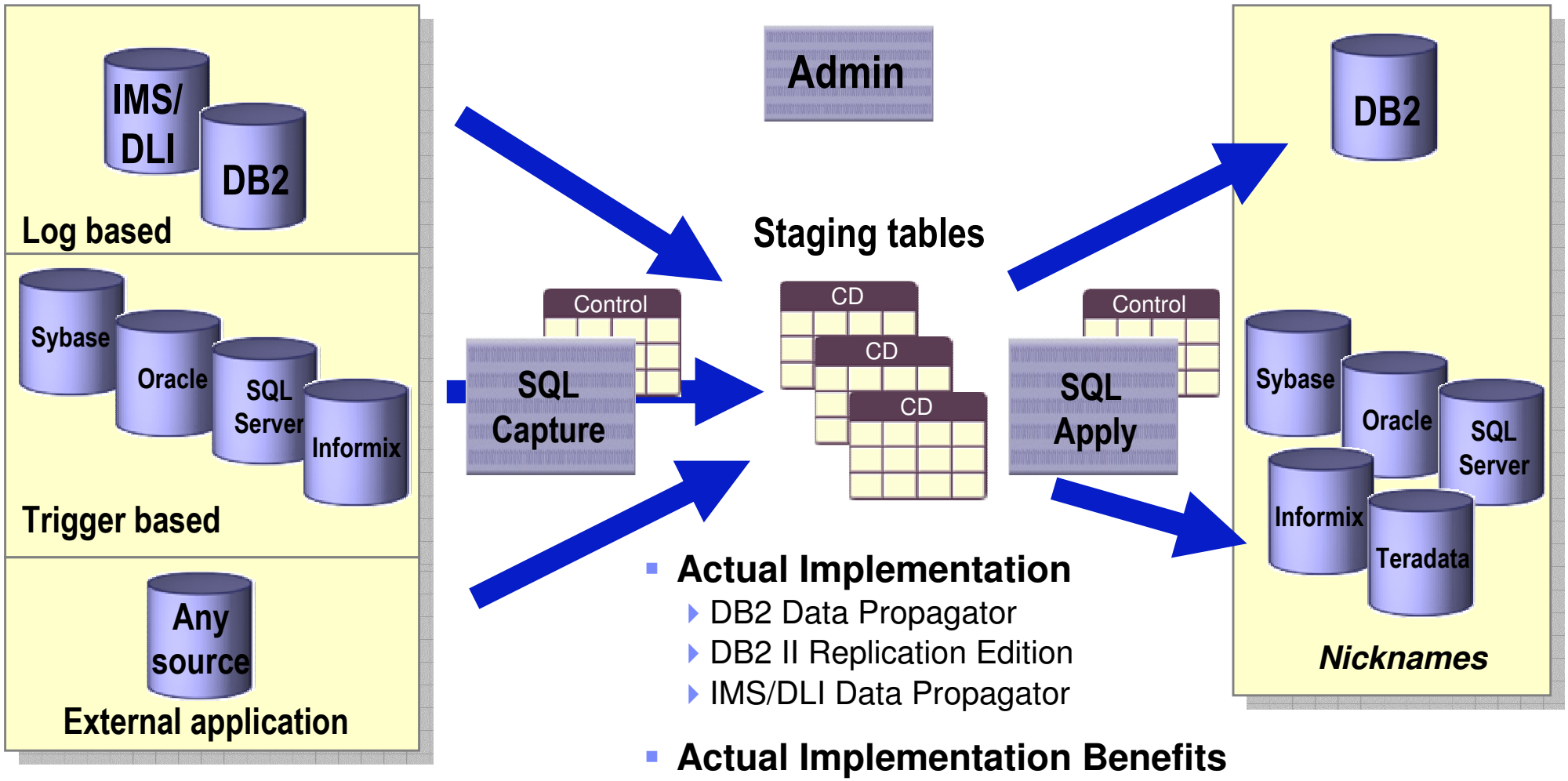
- ***SQL Replication***
- ***Q Replication***

Why Replicate?

- **Distribution / Consolidation**
  - Move data between central to branches, branches to central, or both
  - Federate or Replicate ?
    - where does the application need the data ?
    - does the data need to be real time ?
    - what is the change volume ?
- **Warehouse & Business Intelligence**
  - Move data to new platform/database, transform data
  - ETL or Replicate?
    - latency needs
    - change volume versus total volume
    - complexity of transformation and/or cleansing
- **Mobile Workforce**
  - Occasionally connected distribution/consolidation
- **Availability**
  - Scheduled outage, failover, disaster recovery
    - can use Hardware and/or Software
    - replication offers lower expense, faster restart, multi-purpose
    - Hardware offers simplicity of setup
  - Move query or reporting work to a separate system
    - other methods such as flash copy also possible
  - Peer to peer - split workload
    - only possible through replication
    - requires serious planning and consideration

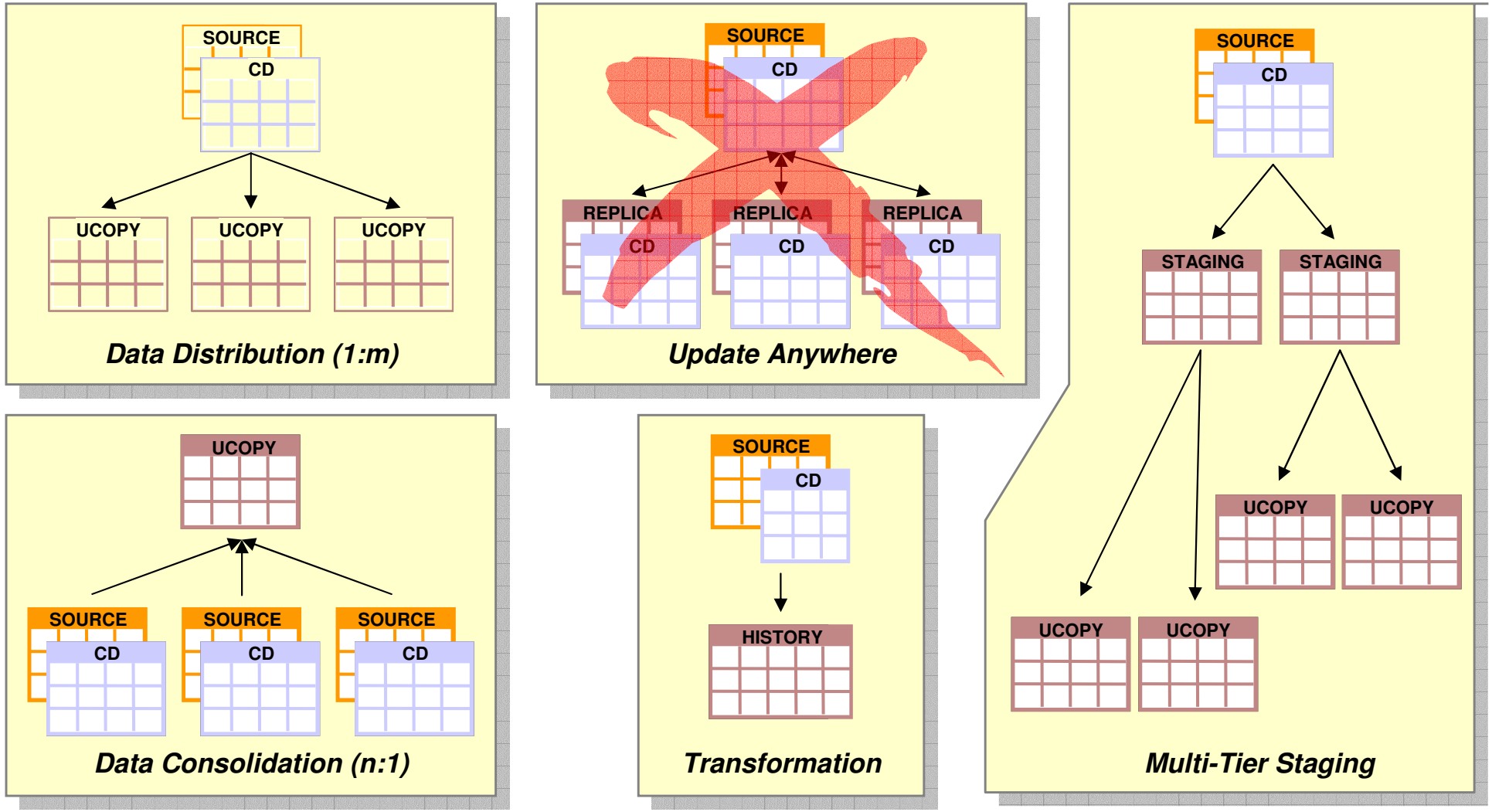


SQL Replication Architecture



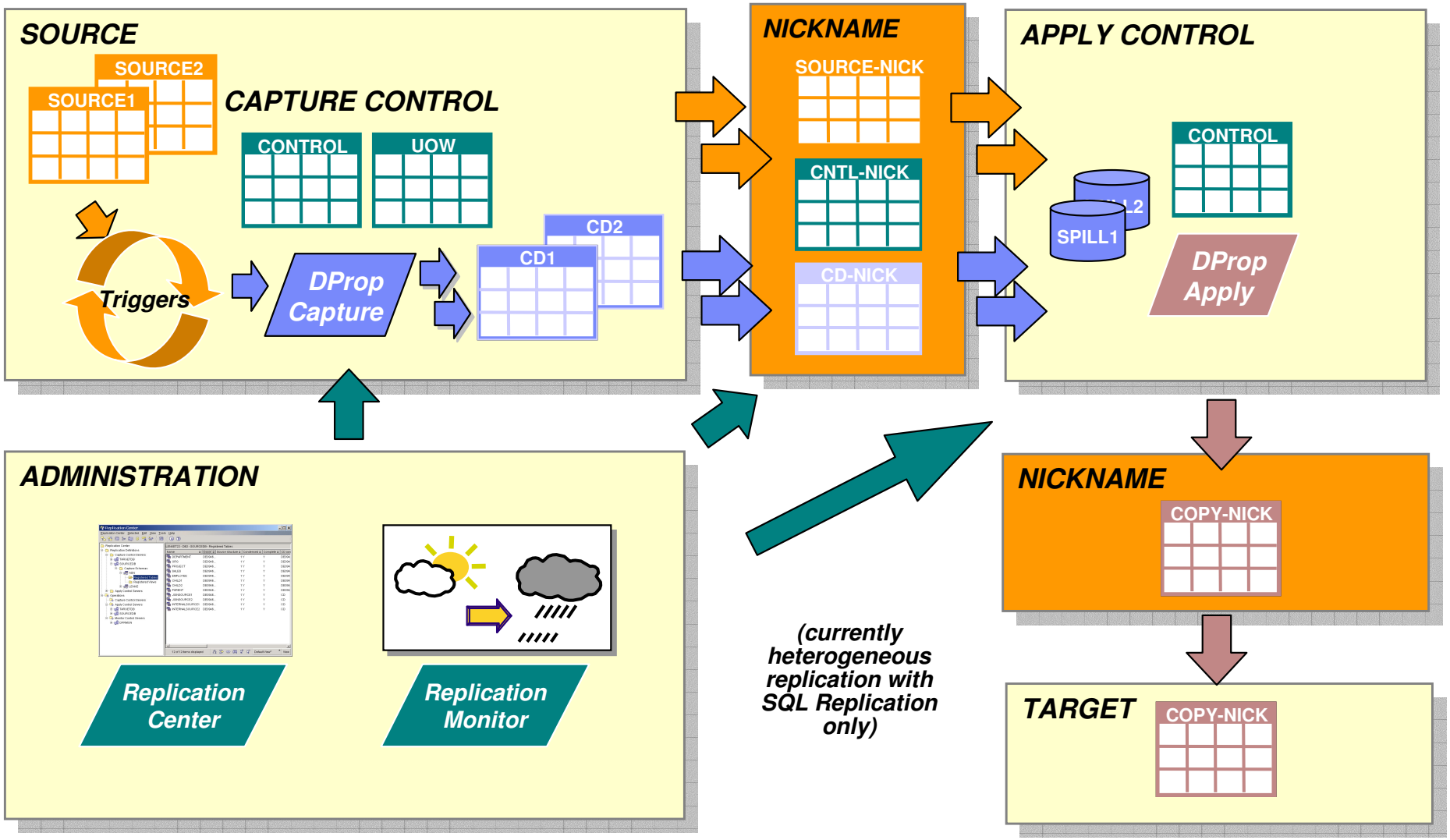
- **Actual Implementation**
  - DB2 Data Propagator
  - DB2 II Replication Edition
  - IMS/DLI Data Propagator
- **Actual Implementation Benefits**
  - Extremely flexible and resilient
  - Very easy to set up transformations
  - Scales well to reach multiple targets
  - Homogeneous & Heterogeneous Sources

Sample SQL Replication Scenarios



- Subsets
- SQL Transformations
- Updateable Predicates
- Updateable Primary Keys

DB2 Data Replication TO / FROM Federated SOURCES



Federated Sources & Targets

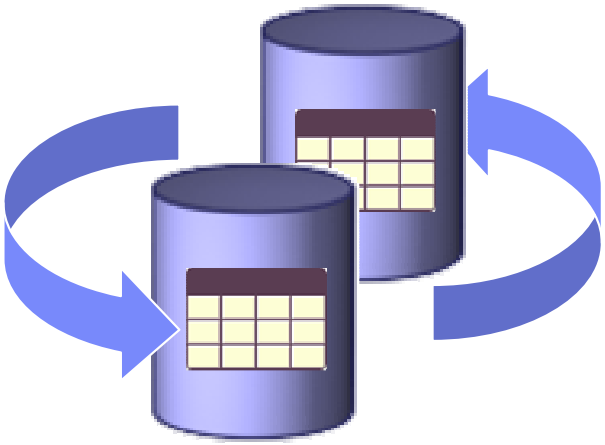
- DB2
- Oracle
- SQL/Server
- Informix
- Sybase
- Teradata (Target only)

Why Create Another Replication Architecture?

- **Performance**
  - Combine high Throughput with low Latency

- **New Function**
  - Event Publishing from DB2 and Classic Sources

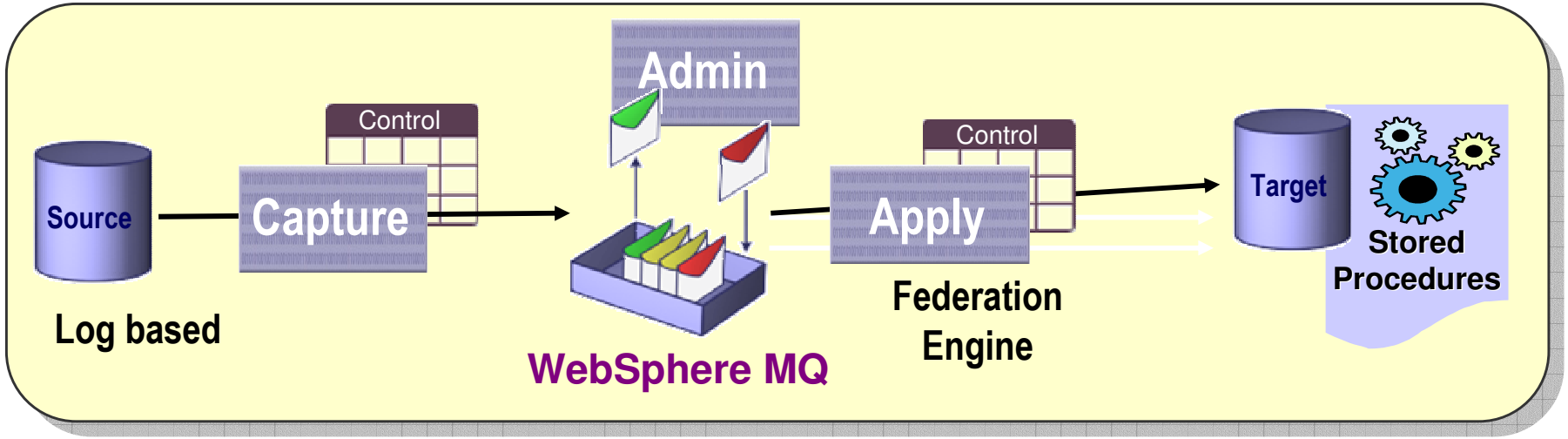
- **Capability**
  - Significantly improve multi-directional Replication Support



- **Manageability**
  - Reduce the number of Replication Objects to be defined and managed
  - Ease the Definition Process with new Replication Center Wizards

Q Replication Architecture

Websphere Information Integrator introduces new replication architecture for delivering extremely low latency replication



- Each message represents a transaction
- Highly parallel apply process
  - Non dependent transactions re-parallelized at the target
- Differentiated conflict detection and resolution
- Integrated infrastructure for replication and publishing
- DB2 to DB2 today

- Data Integrity
  - Persistent messaging with WebsphereMQ
  - Detects missing messages
- Data transformation
  - Triggers on the target table
  - Stored Procedures called by Apply at the row level
  - Publish Event to user application

Q Replication – Defining Subsets or Filters

- Subset data
  - Subset of rows through Q Capture predicate on subscription/publication
  - Subset of columns through subscription/publication definition
  - Signal (IGNORETRANS) defined to allow user selected transactions to be ignored
  - Subscription/publication send options
    - ***Change Only***: Publish only columns that have changed vs all columns in the row
    - ***All Changed Rows***: Publish a row if any column changes (subscribed or not)
    - ***Suppress Delete***: Do not publish row deletes
    - ***Before/After values***: Publish before values as well as after values

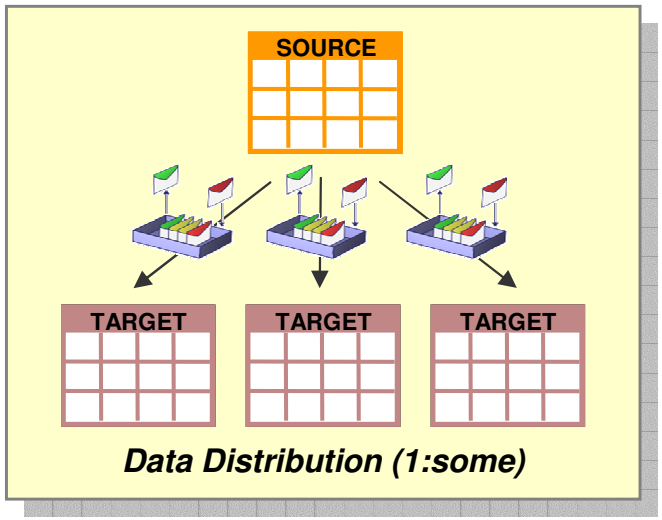
- Predicate examples
  - Based on values in the row data itself

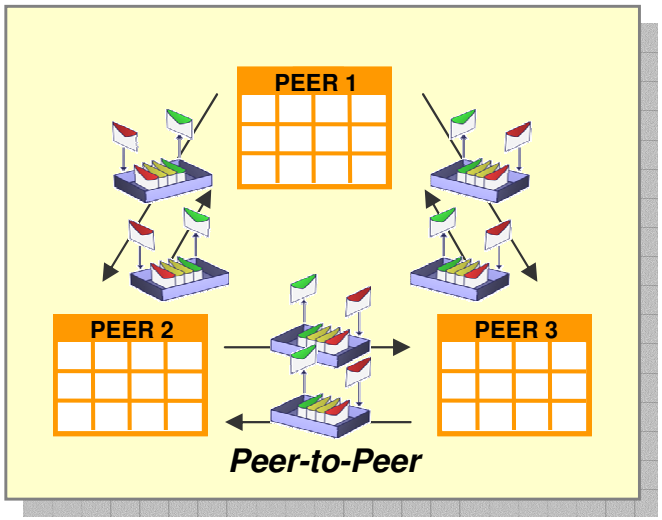
```
WHERE :LOCATION ='EAST' AND :SALES  > 100000
```

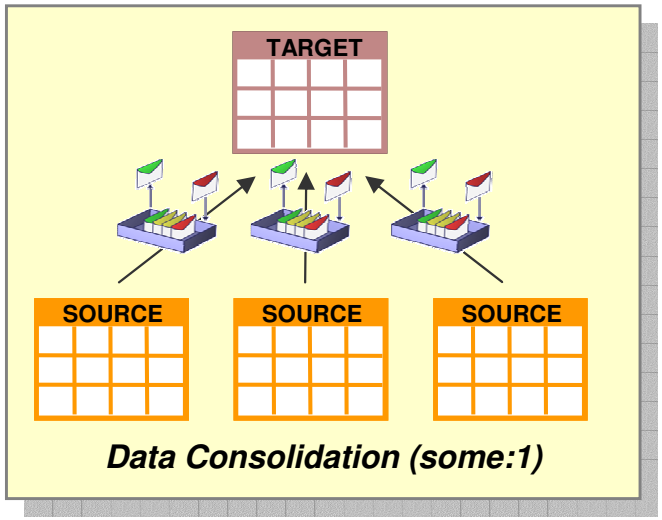
  - Based on values in data in other tables

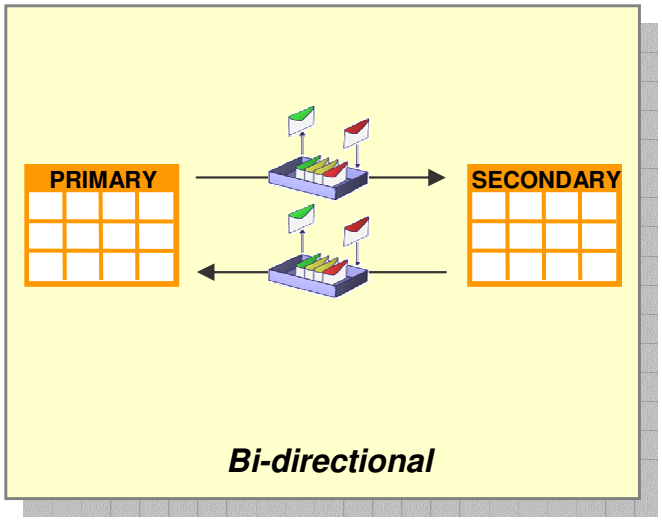
```
WHERE :LOCATION ='EAST' AND :SALES > (SELECT SUM(expense)
FROM STORES WHERE stores.deptno = :DEPTNO)
```

Sample Q-Replication Scenarios





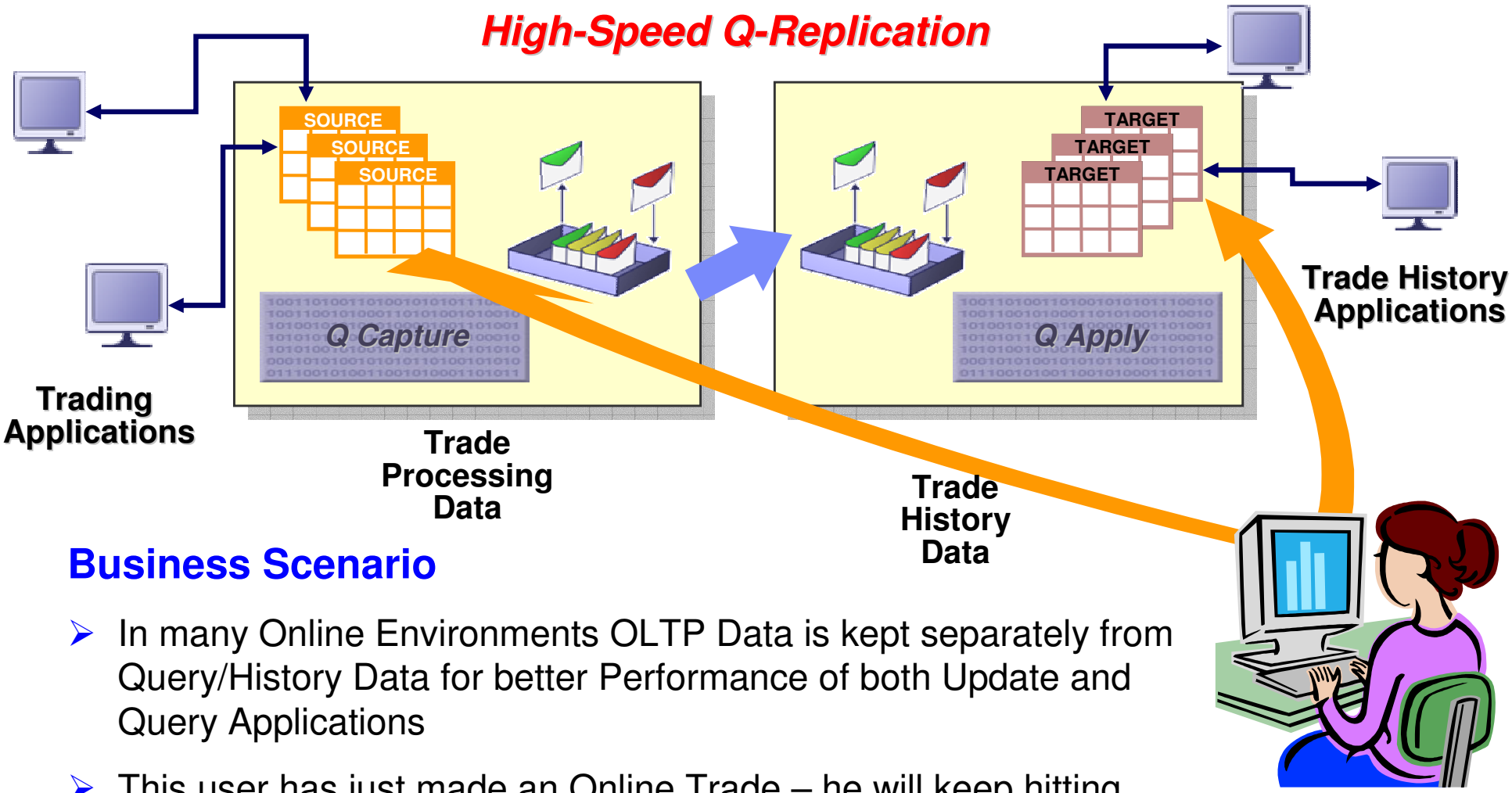




Key Scenarios:

- Low-Latency Replication
- Geographically dispersed Applications with distributed Databases
- Bi-directional Replication with Conflict Checking, Handling, and Notification
- Software-based Hot-Standby
- Cross DB2-Family

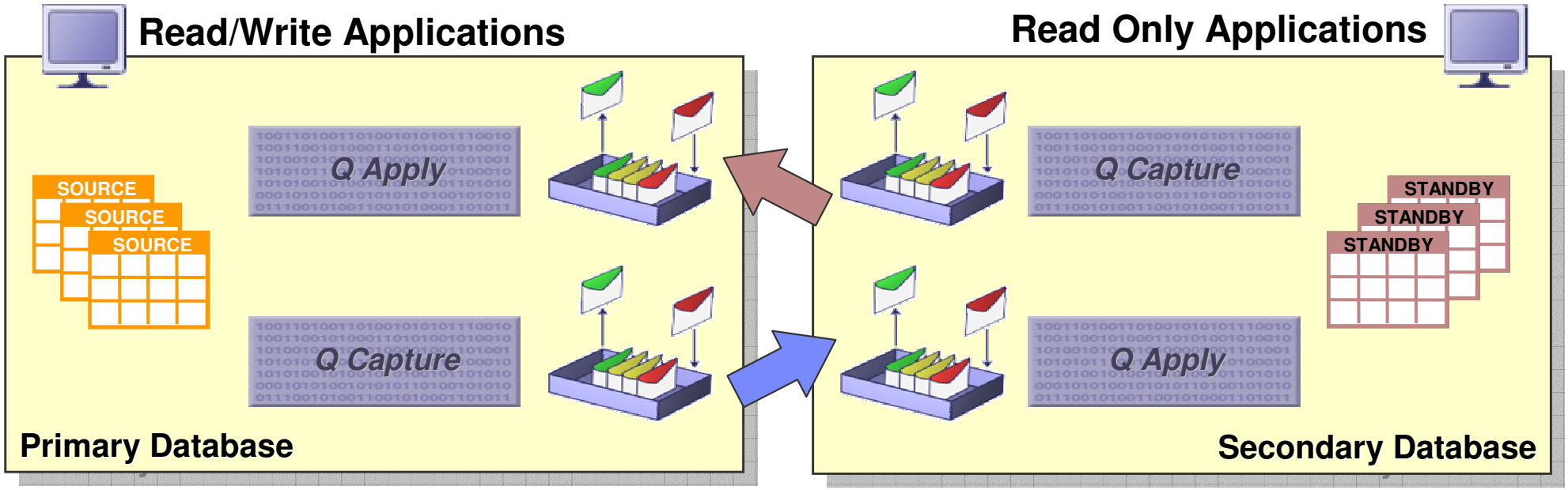
Feeding Trade-History Database with Q-Replication



Business Scenario

- In many Online Environments OLTP Data is kept separately from Query/History Data for better Performance of both Update and Query Applications
- This user has just made an Online Trade – he will keep hitting Enter until he sees that the Trade is complete, in this Case meaning it has been replicated to the Trade History Database

High-Availability Solution built upon Q-Replication



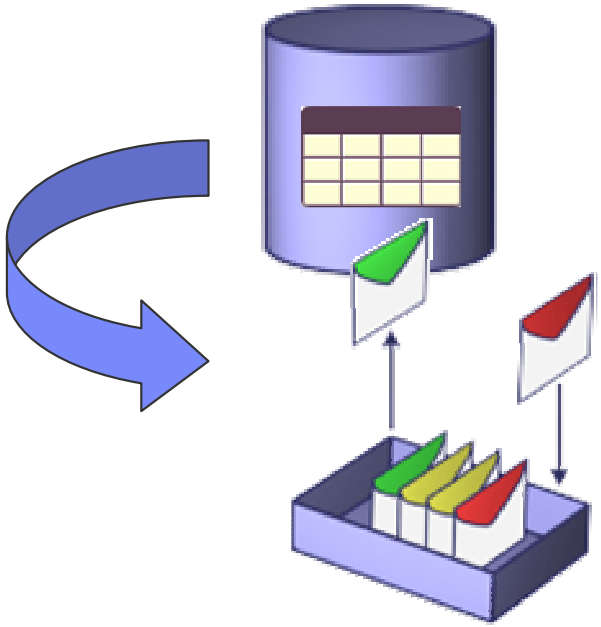
Business Scenario

- Replication Processes and Subscriptions are defined in both Directions, but Data mainly flows in one Direction at a Time
- Recursion is stopped by Capture, which reads special logged Events created by Apply
- Data at the Secondary System is transactionally consistent and is available for “read only” Applications permanently
- Procedures for Failover and Switchback will depend on which Options have been selected for Conflict Detection

Event Publishing

Why Publish Data?

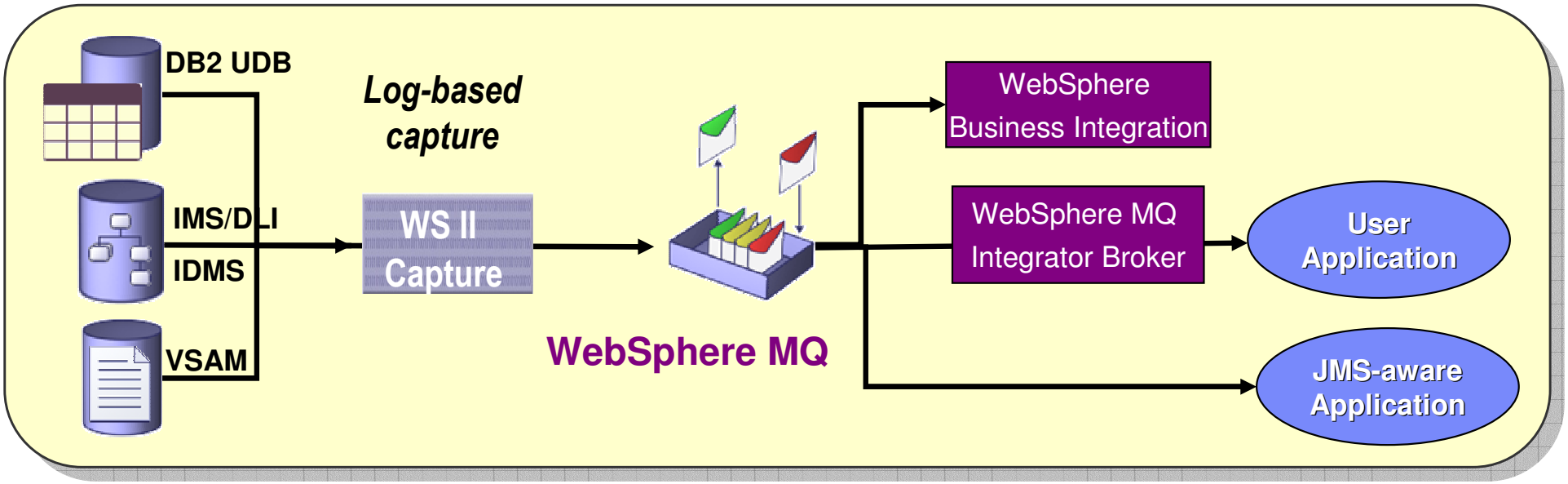
- **Database to Application Messaging**
  - Drive downstream Applications or APIs based on the Transactional Data of the changed Database Events
- **Event Notification**
  - Stream changed Data Information to Web Interfaces
  - Stream only particular Events of Interest (filter Data)
- **Data Warehouse / Business Intelligence**
  - Integrate captured Changed Data with an ETL Tool
  - Perform complex Transformations with custom Logic
  - Use a specific Transaction Format to update Target
- **MQ provides guaranteed delivery**
  - Avoids the need for 2-Phase-Commit (2PC)
  - Works even when the Target is not available



Publishing data events to facilitate business integration

Capture database changes as XML messages and publish them to WebSphere MQ

- **Function**
  - Publish events to a message queue
  - XML self-describing format
  - Wizard-driven configuration
- **Usage**
  - Application to application messaging
  - Event streaming
  - Source for ETL tool



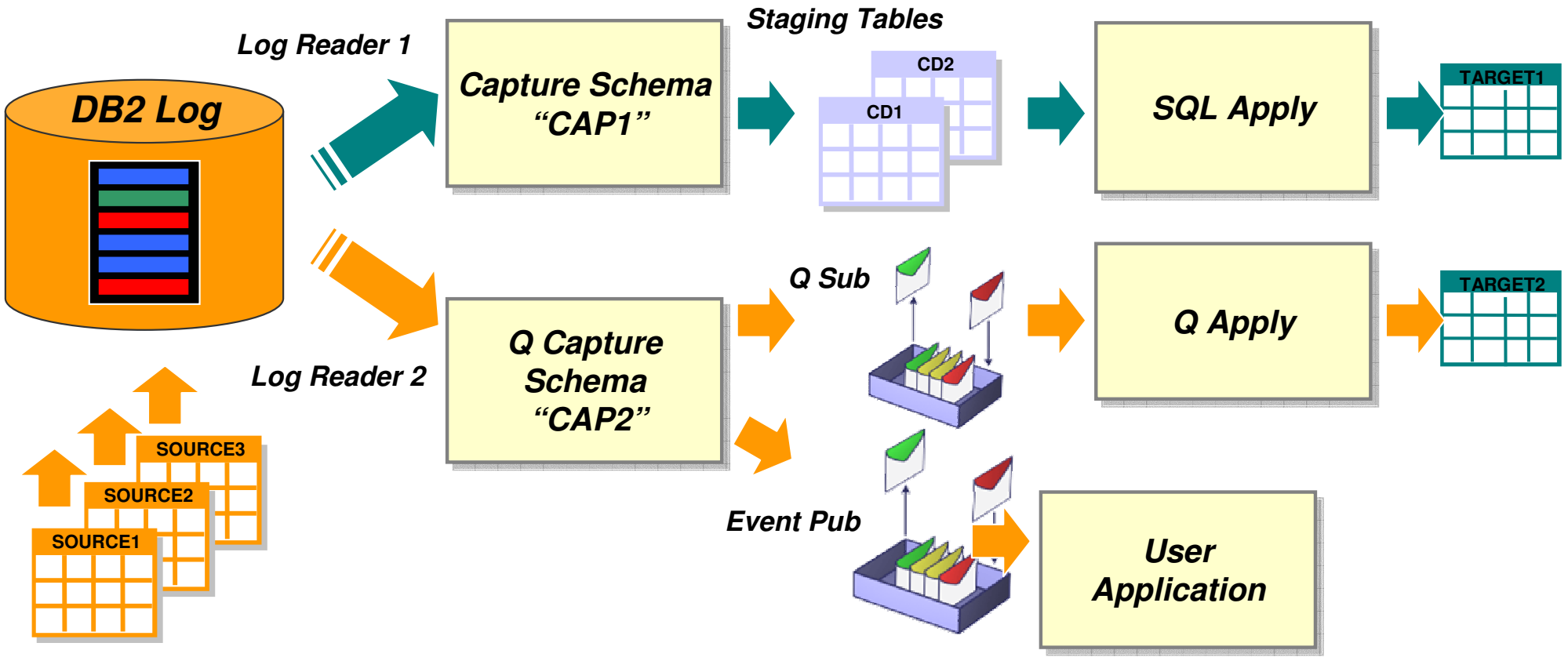
Classic Data is REACTIVATED !

Event Publishing - Publication Options

- **Format**
  - Only data from committed transactions is published
  - Data is self describing with XML tags
  - Row based = one row per message
  - Transaction based = one transaction per message

- **Row Content**
  - Subset by column
  - Subset by predicate
  - Changed column values only or all column values
  - New data values only or include old values

Combining SQL and Q Replication with Event Publishing



SQL Replication and Q Replication can co-exist

- Managed at source by using multiple capture schemas
- One Q Capture can handle both Publications and Subscriptions

DB2 II Event Publisher & Business Intelligence

Feeding Changed Data to :

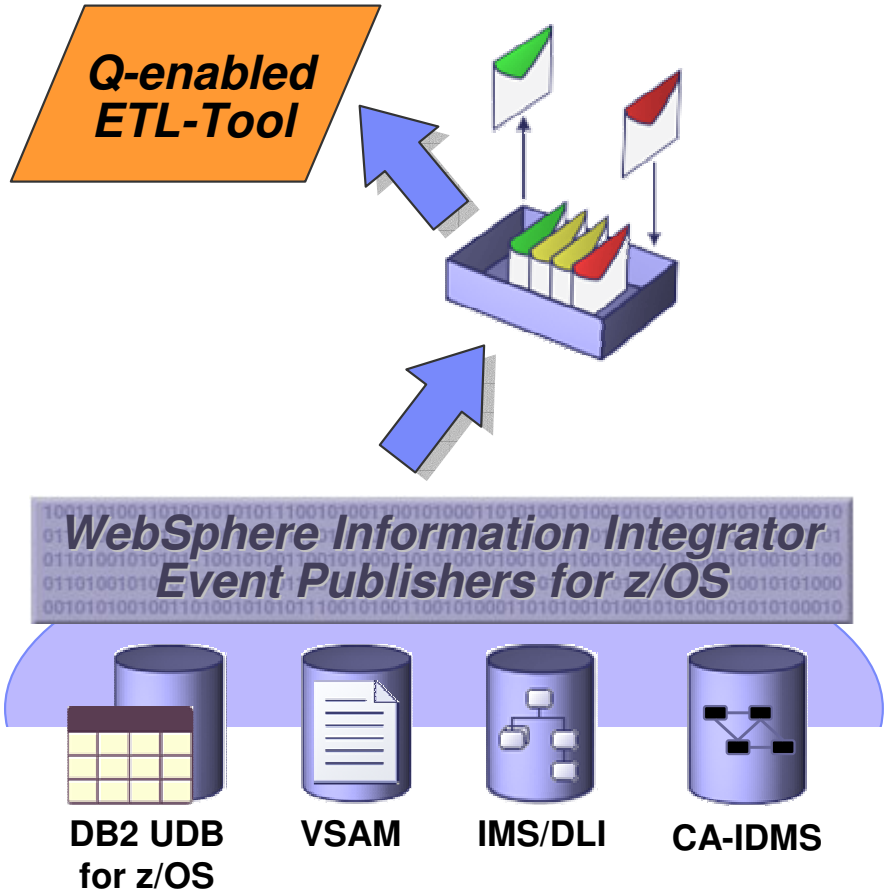
- Data Warehouse
- Datamart
- Operational Data Store (ODS)

Optimize Resource Utilization

- Minimize Bandwidth Requirements
- Maximize Data Currency

Complements with WebSphere II Federation

- Data feed using Event ***Publishers***
- Real-time extensions using ***Federation***



DB2 II Event Publisher & Business Integration

Data "Events" drive business integration

- Seamless integration with EAI via WebSphere MQ

Data used to drive EAI workflow

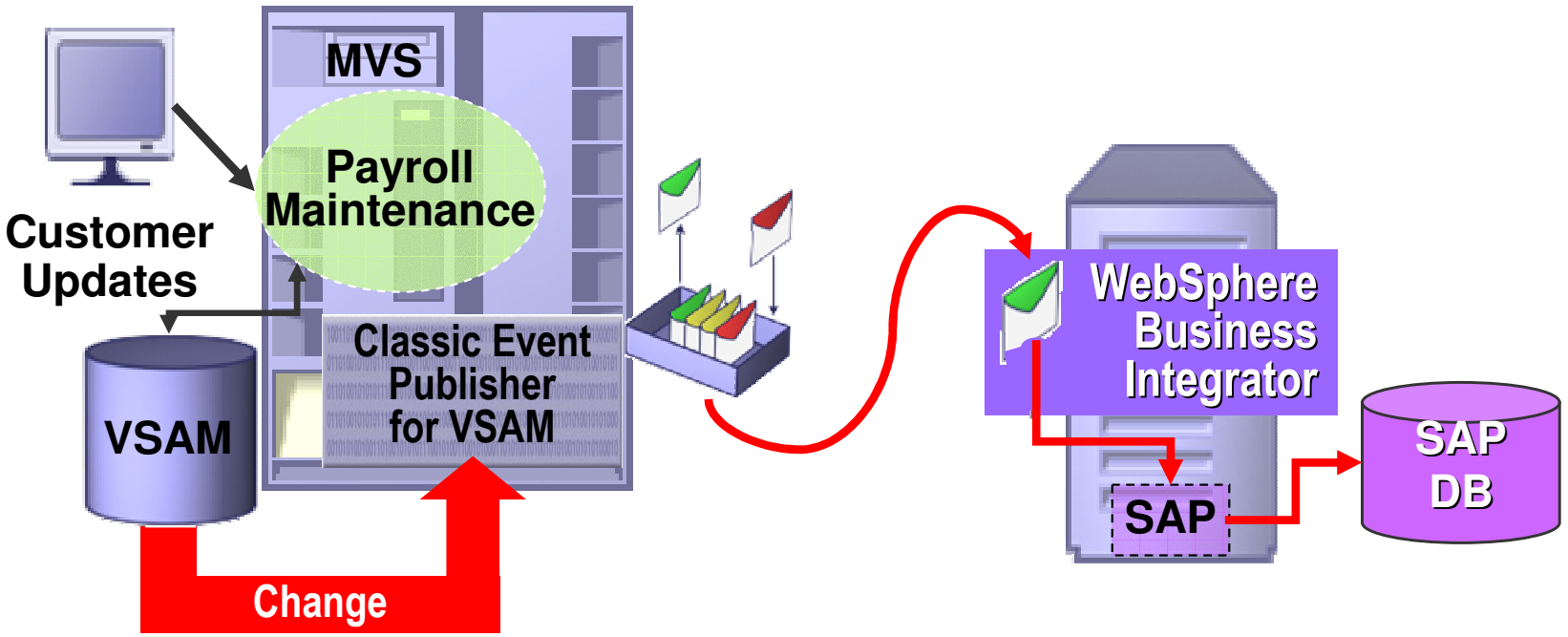
- Inventory update hits threshold… triggering restocking process
- Addition of new customer:
  - ✓ Initiates welcome email
  - ✓ Credit verification
  - ✓ Accounting updates
  - ✓ …

Cross-silo data synchronization

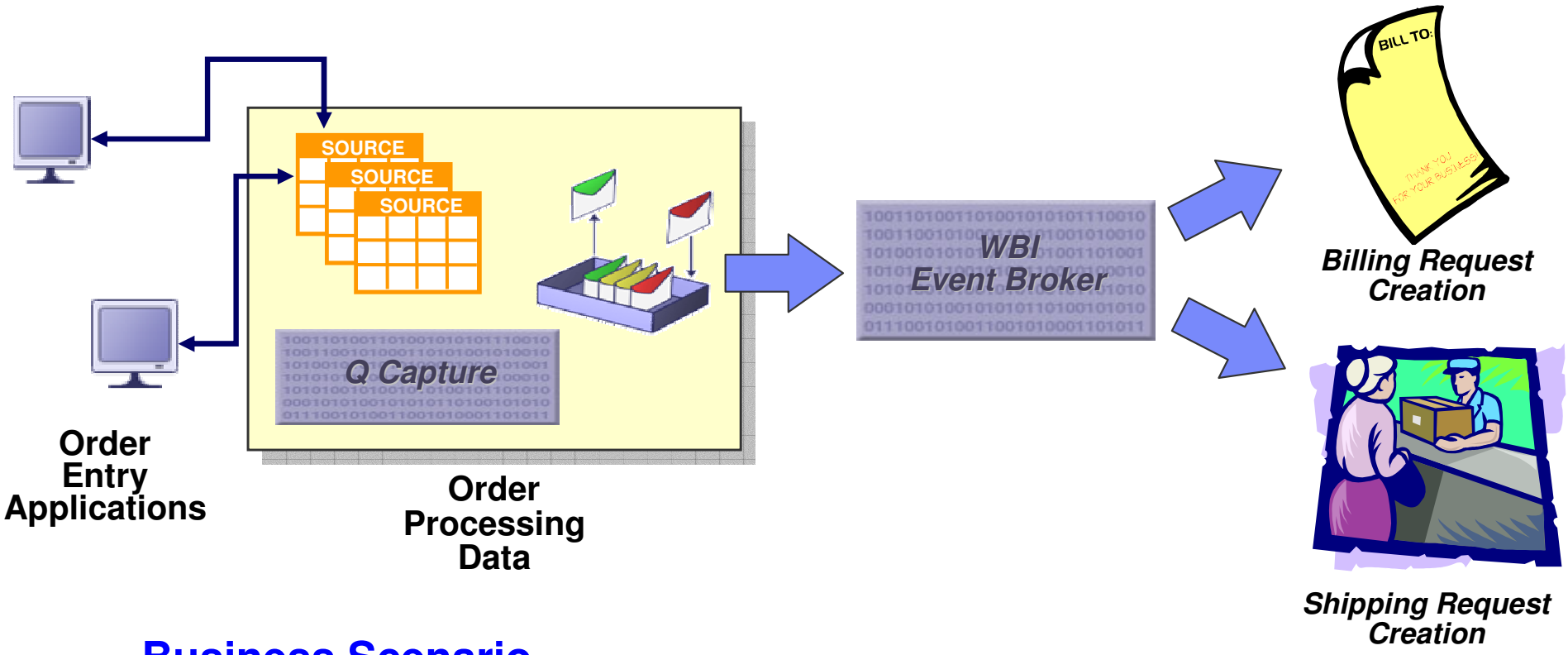
- Synchronize mainframe updates with:
  - ✓ CRM
  - ✓ ERP
  - ✓ HR, etc.

Sample Application

- Near real-time cross-silo data synchronization
  - Loosely coupled integration
  - Minimizes development effort
  - Simplifies maintenance
- ***e.g. New order data is automatically pushed to a CRM application***
  e.g. VSAM employee data updates are pushed to SAP payroll



Order Processing – Exploiting II Event Publishing

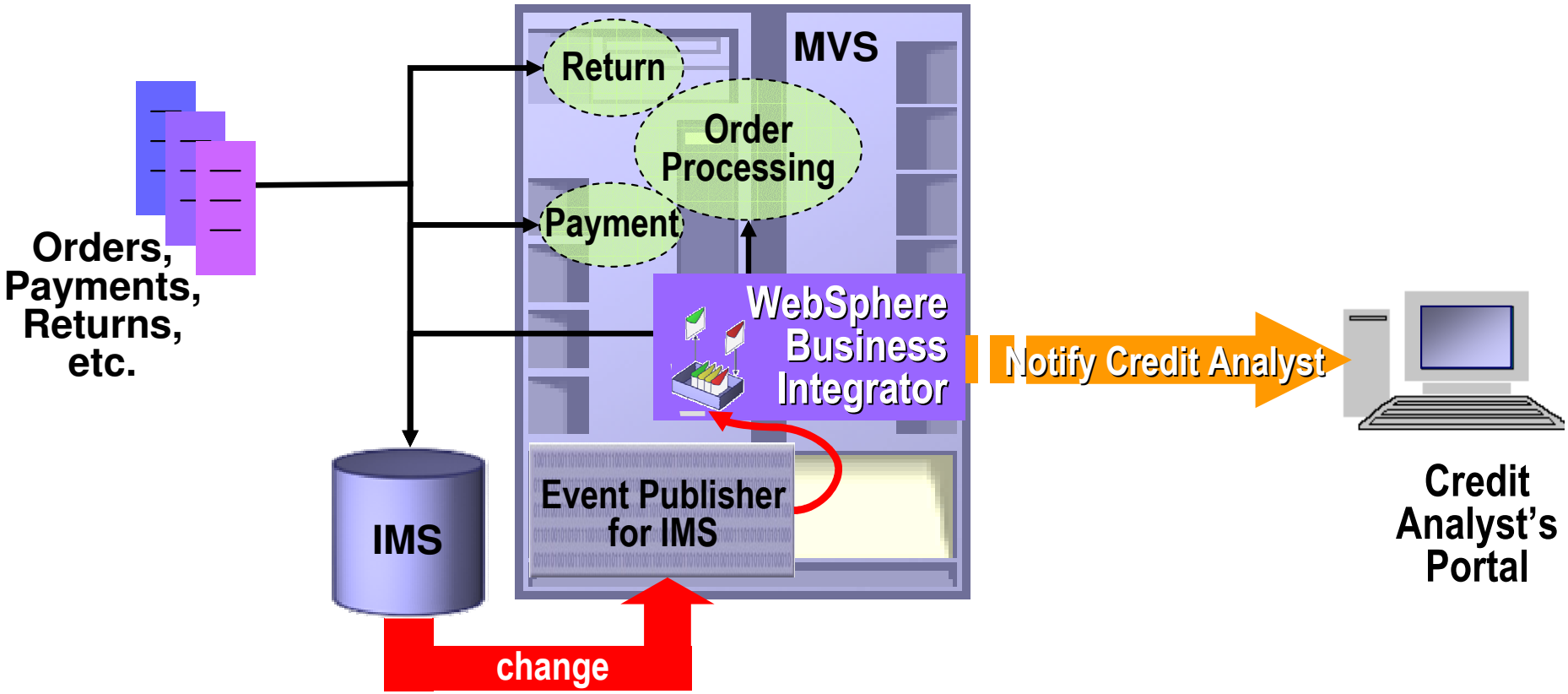


Business Scenario

- As new Orders are entered into the Order Entry System, the pertinent Data is captured and published into a Queue
- The Websphere MQ Integrator Broker processes the queued Data
- A billing Transaction is created and queued in one System and a Shipping Transaction is created and queued in another System

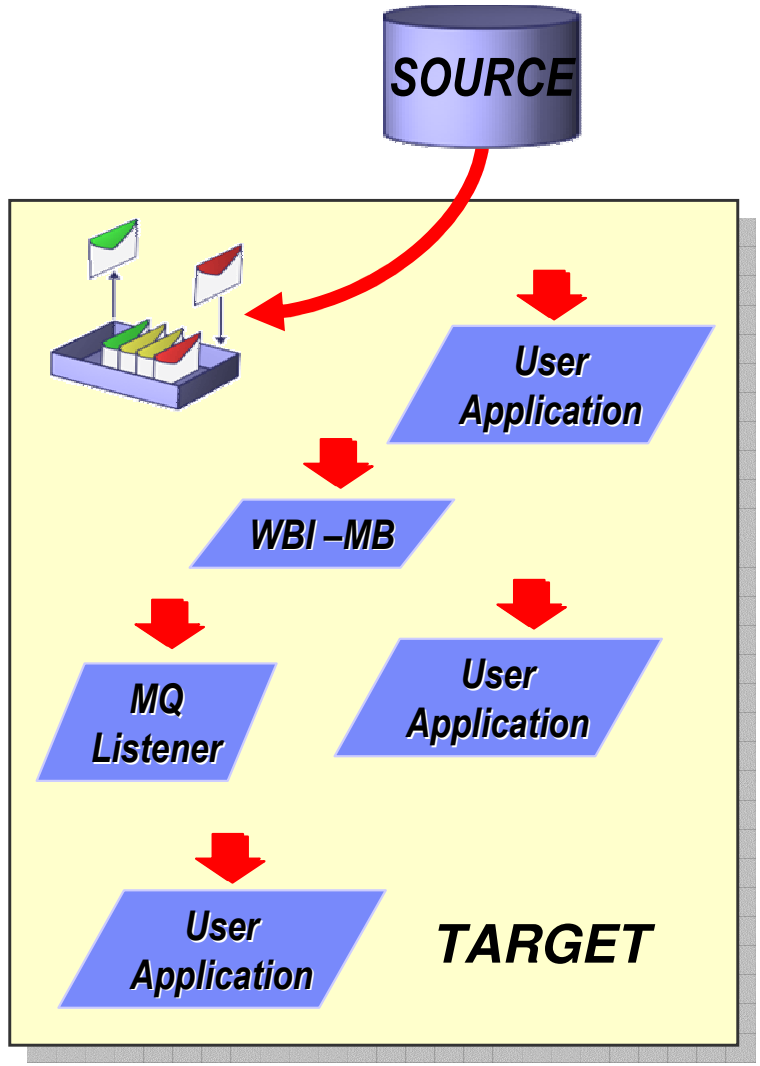
Sample Application

- Event Notification
  - Receivable balances approaching credit limit pushed to a credit analyst
    - Threshold is independent of order processing and accounting applications
    - No “hard-hooks” in OLTP applications necessary



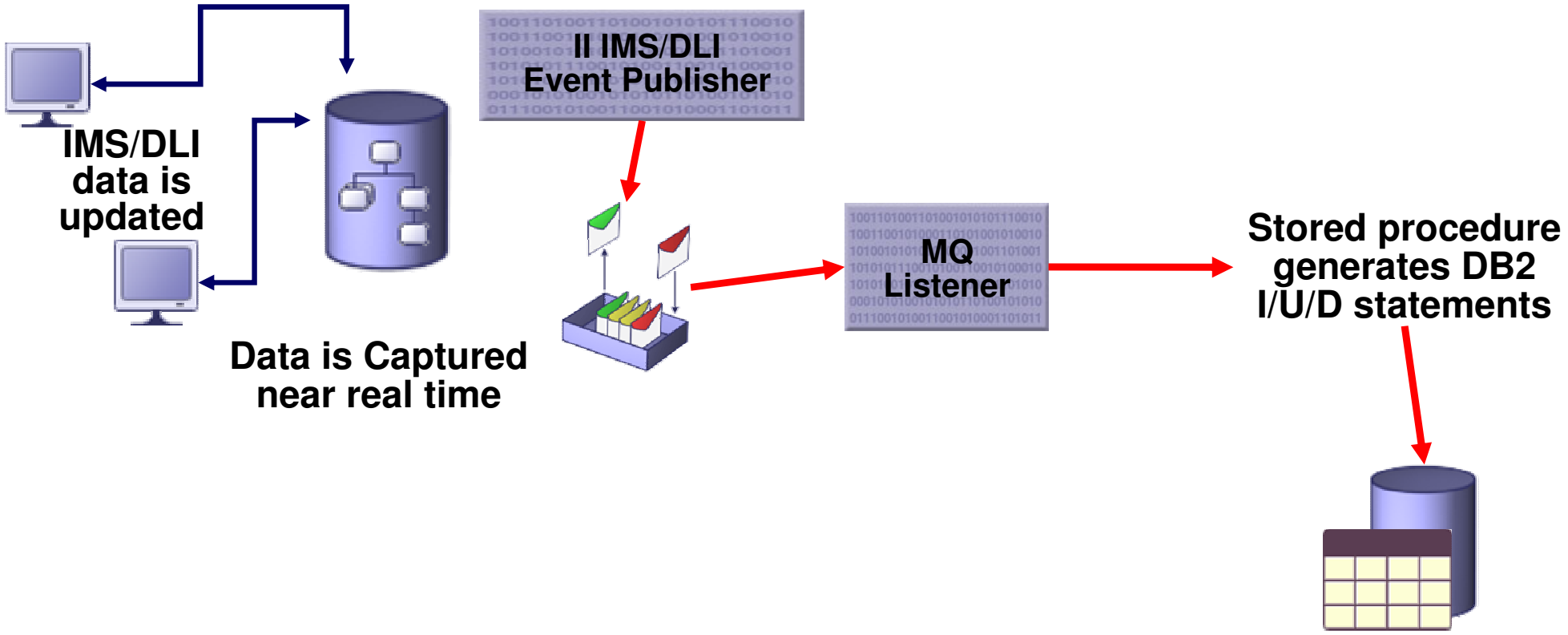
Why data events versus application events?

- **Integration is independent of the source applications**
  - Applications grow and evolve with
    " minimal impact on the integration "
  - Relatively straight forward to find data items
    " rather than every business rule "
  - e.g.many applications change inventory
    but the data values trigger re-stocking
  - e.g. many transactions impact Claim status
    changes to status value drives workflow
  - e.g. order data is needed by a CRM
    CRM has no dependence on ordering process



Summary

Using Classic II Event Publishing for Replication



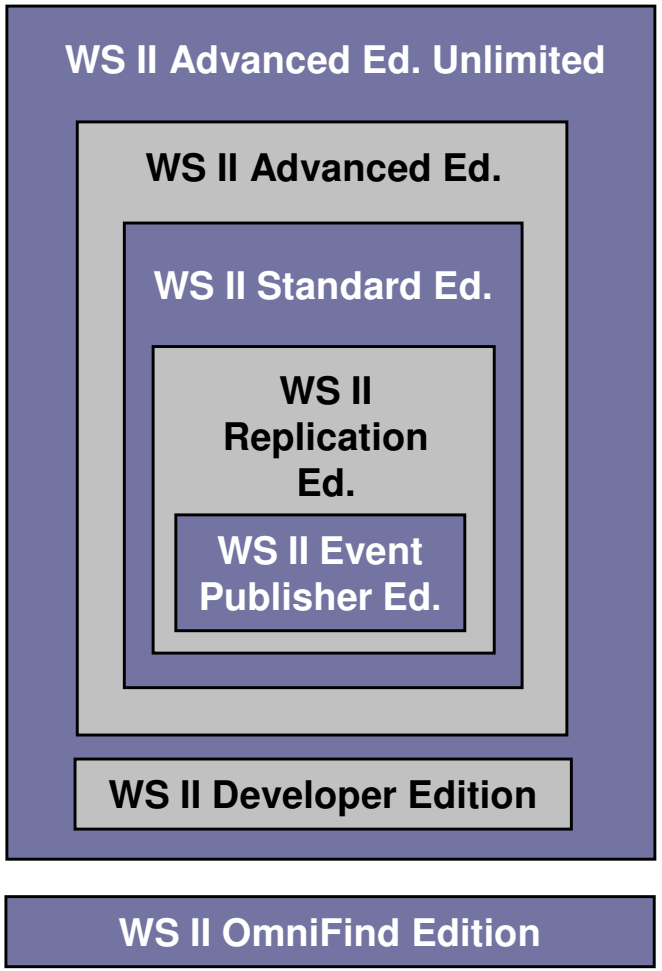
- It is our direction to support replication of Classic data sources using the highly parallel Q Apply of DB2 II Replication.
- As an interim suggestion, SQL stored procedures can be used to apply the data captured through the II Classic Event Publisher

Summary

- Information integration is a foundation for companies to build an On Demand Operating Environment enabling them to align their IT infrastructure to business priorities
- WebSphere Information Integrator provides access to diverse, distributed, and real-time data as if it were a single source, no matter where it resides.
- WebSphere Information Integrator will help businesses
  - Optimize IT investments given more choice in data access
  - Improve productivity and application efficiency
  - Enable greater return on existing assets
- Rely on IBM's proven technology and support for open standards

WebSphere Information Integrator Packaging and PIDs

Distributed (Linux, UNIX, Windows)

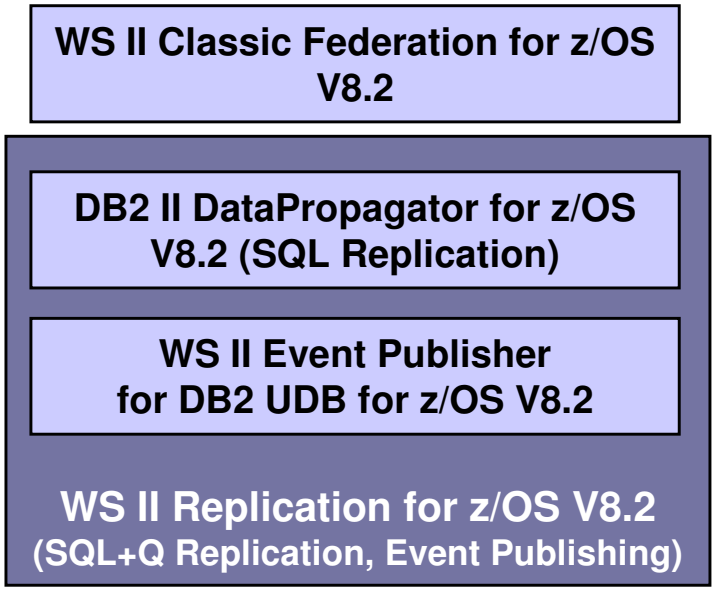


PID 5724-C74

PID 5724-C74 (same as for DB2 II)

- Processor-based pricing except for Developer Edition which is priced by user
- Priced Connectors to access non-IBM sources

Mainframe (IBM eServer zSeries)



PID 5697-I82

PID 5655-I60

PID 5655-M36

PID 5655-L88

PID 5655-M38

PID 5655-M35

PID 5655-N56

- Value Unit pricing Model