

DL/2

The IMS to DB2 Transparency Migration Solution
for Your Business Sustaining Applications

L I G H T Y E A R

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April 13, 2005



- **Introductions**
 - Circle Computer Group
 - Lightyear Consulting
- **Overview of DL/2**
- **New Features and Functionality**
- **Q&A**

- Migrate your business sustaining data from IMS to DB2 without changing any of your business sustaining application programs' source code
- Retain the investment in your business sustaining applications
- Improve the availability and accessibility of your business sustaining data

Why Make the Move?

- IMS Skills are at a premium
- Support of multiple DB environments is drain on resources and man time
- The cost of IMS Licensing and 3rd Party tools are expensive but could be mitigated
- Access to IMS for data mining and reporting is limited and could be impacting your business
- The move from IMS to DB2 could provide significant business, and financial gains to your organization

Circle Computer Group www.circle-group.com

- IBM mainframe software and services provider
- Global software products and solutions
- Specialists in Transparency Migration of Business Sustaining Applications
- DL/2 IMS to DB2 and VS/2 VSAM to DB2
- CICS VSAM Transparency for z/OS
 - IBM Program Product
 - Announced on Feb 19, 2004
 - www.ibm.com/cics/vt

Lightyear Consulting

www.lightyr.com

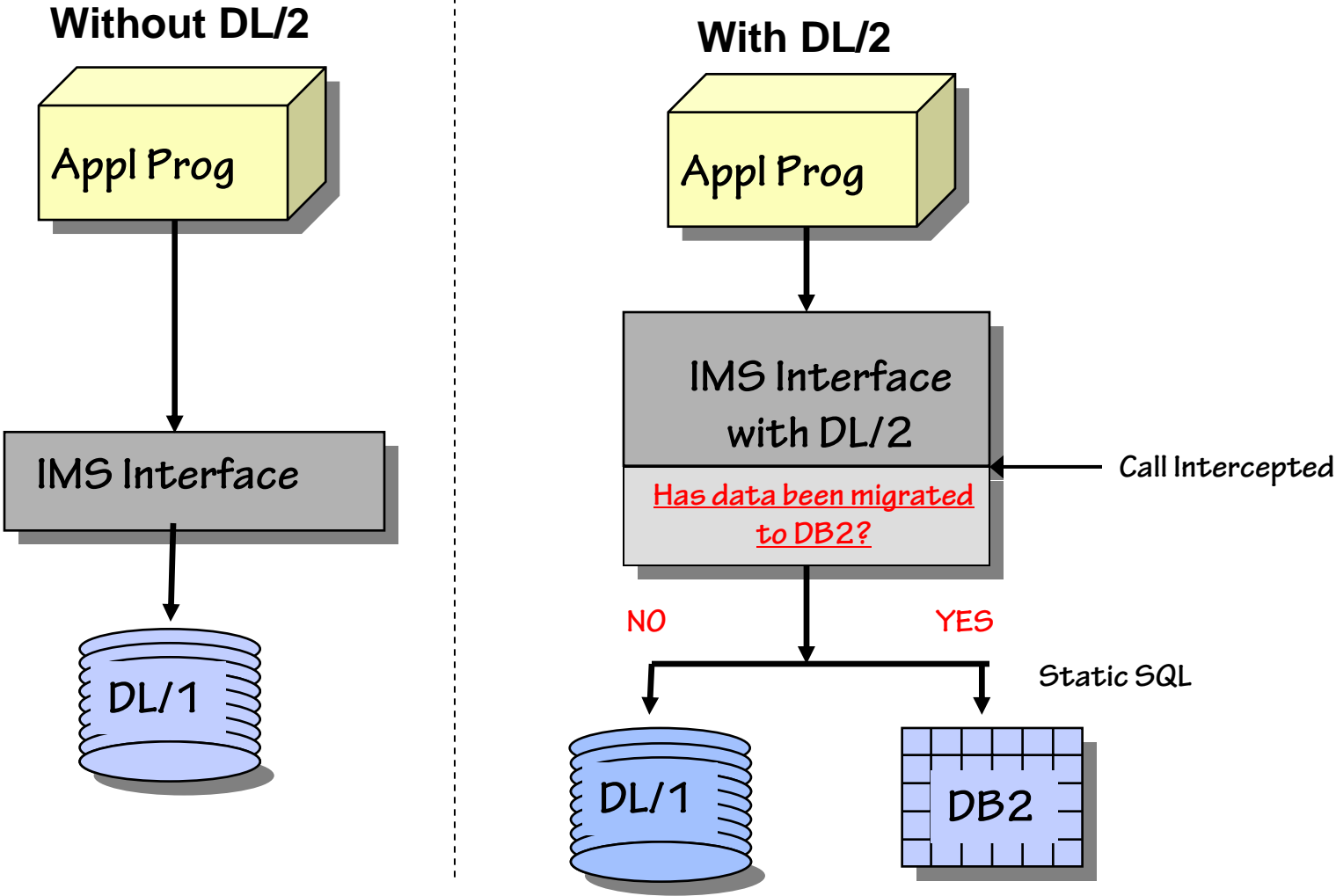
- Circle's North American Distributor
- IBM Business Partner
 - CICS, DB2, IMS, WebSphere MQ & z/OS education, software, tools
 - Websphere MQ application integration
 - Application development services
 - Database Migration to DB2
 - eServer Hardware

Palo Alto – Dallas – Boston - St Louis – Chicago – Scottsdale - Calgary



- **Low Risk/Accelerated Delivery**
 - **Applications remain unchanged during the data migration**
 - Legacy IMS calls are converted to highly optimized DB2 calls
 - **Migrate one database at a time**
 - Mapping and transformation tools help automate the process
 - **Testing is simplified**
 - Only checking for data transformation errors, not application logic errors
 - **Value is delivered quickly**
 - Fastest route to DB2
 - **Application modification can then:**
 - Proceed if required
 - Occur one application at a time

The DL/2 Approach



Take full advantage of DB2 Capabilities

- 24*7 mixed workload support
- Easy integration with other applications
- Supports web enablement
- Data opened up for ad hoc access
- SQL is easier to maintain
- Single DBA skill set
- One operational database environment to support

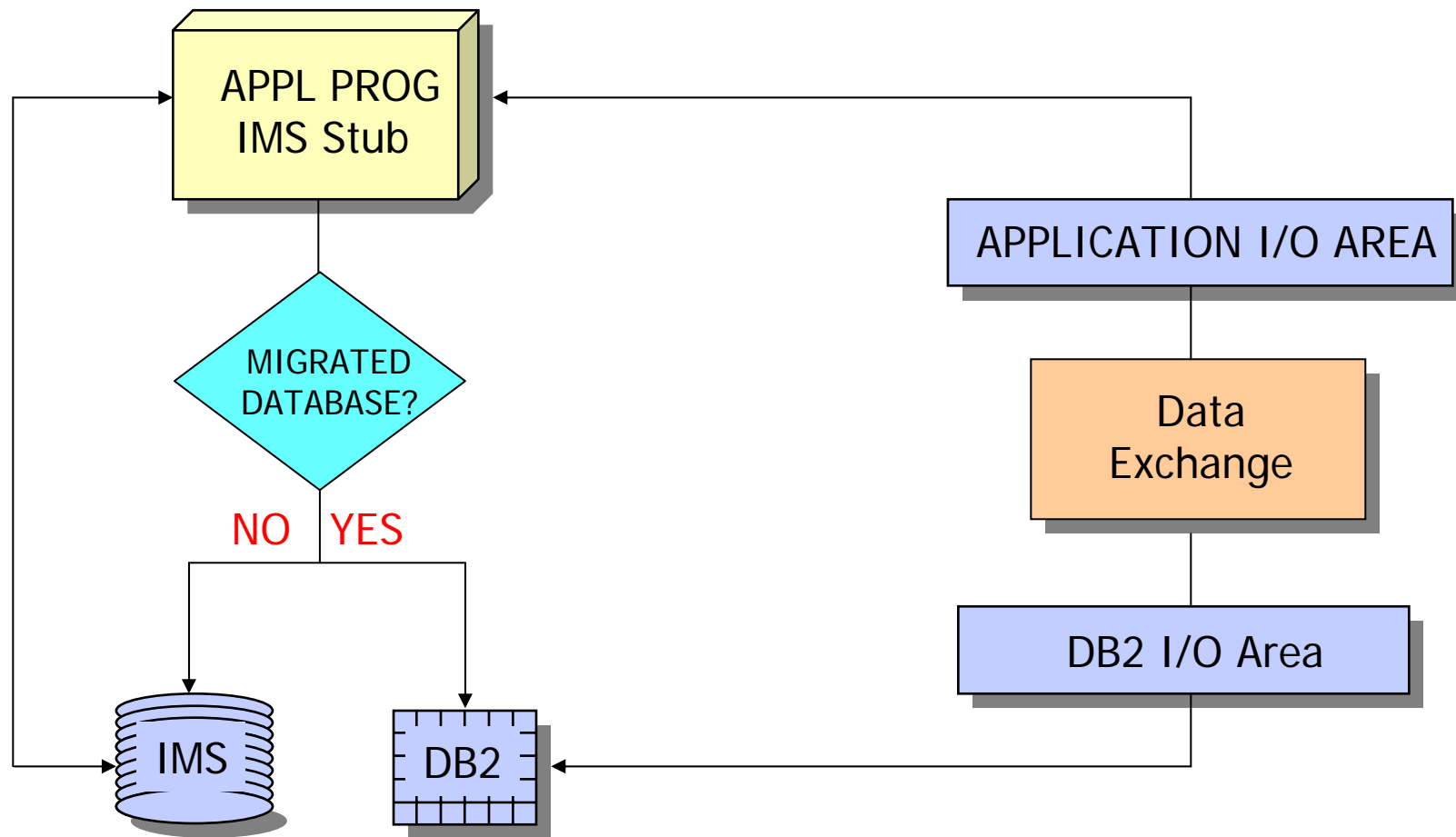
***While protecting your investment in
your business sustaining applications***

- **Objective of DL/2**
- **DL/2 Architecture Overview**
- **Typical DL/2 Database Migration Process**
- **Database Design and Data Re-engineering**
- **Maintaining Applications Post-Migration**

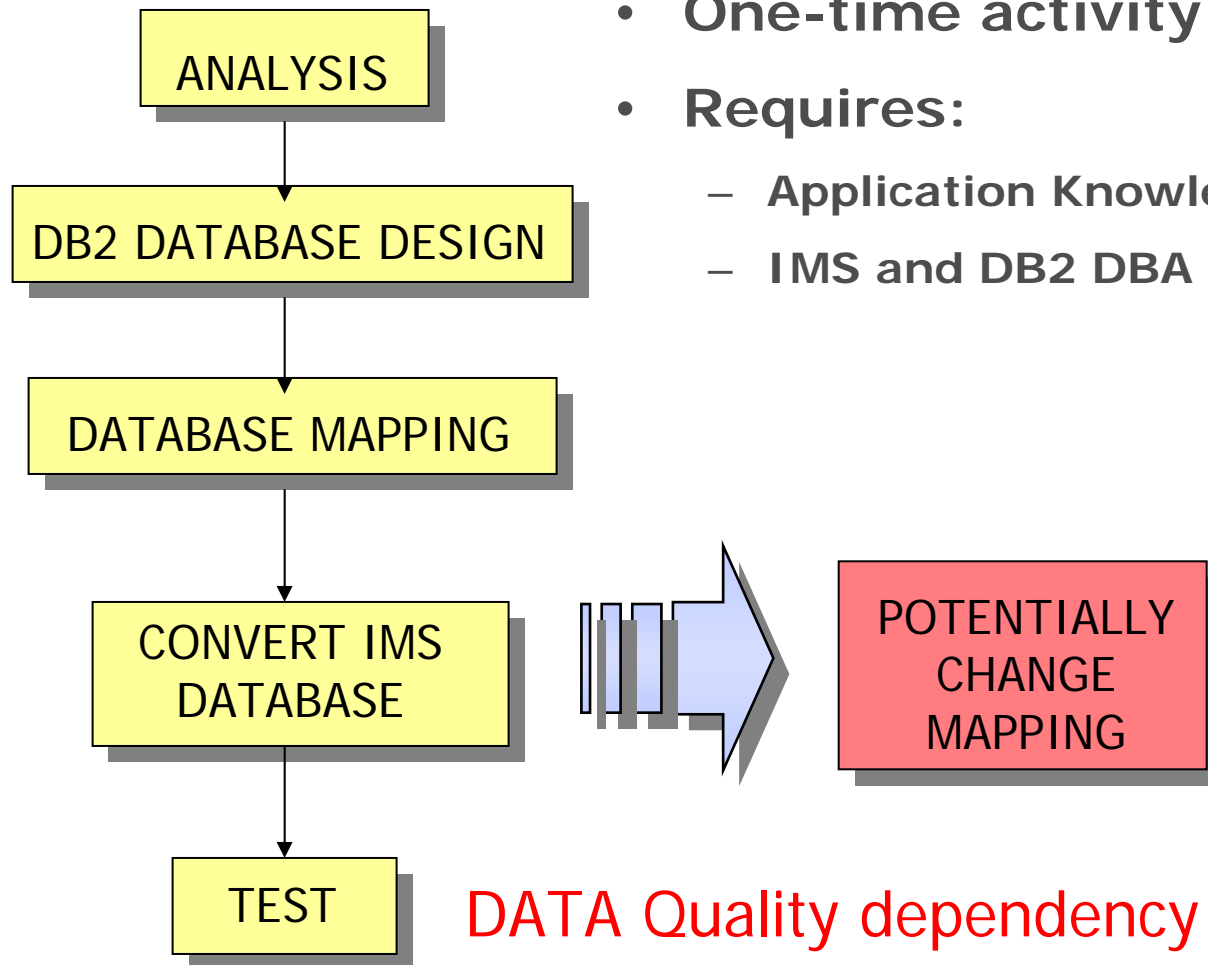
“To allow you to migrate your IMS data to DB2 without having to change Application Programs”

- Program calls continue to be EXEC DLI / CALL xxxTDLI
- Program logic still driven by IMS Status Codes
- DB2 isolated into new programs
- SQL code checking handled externally

Run-time decision to process in IMS or DB2

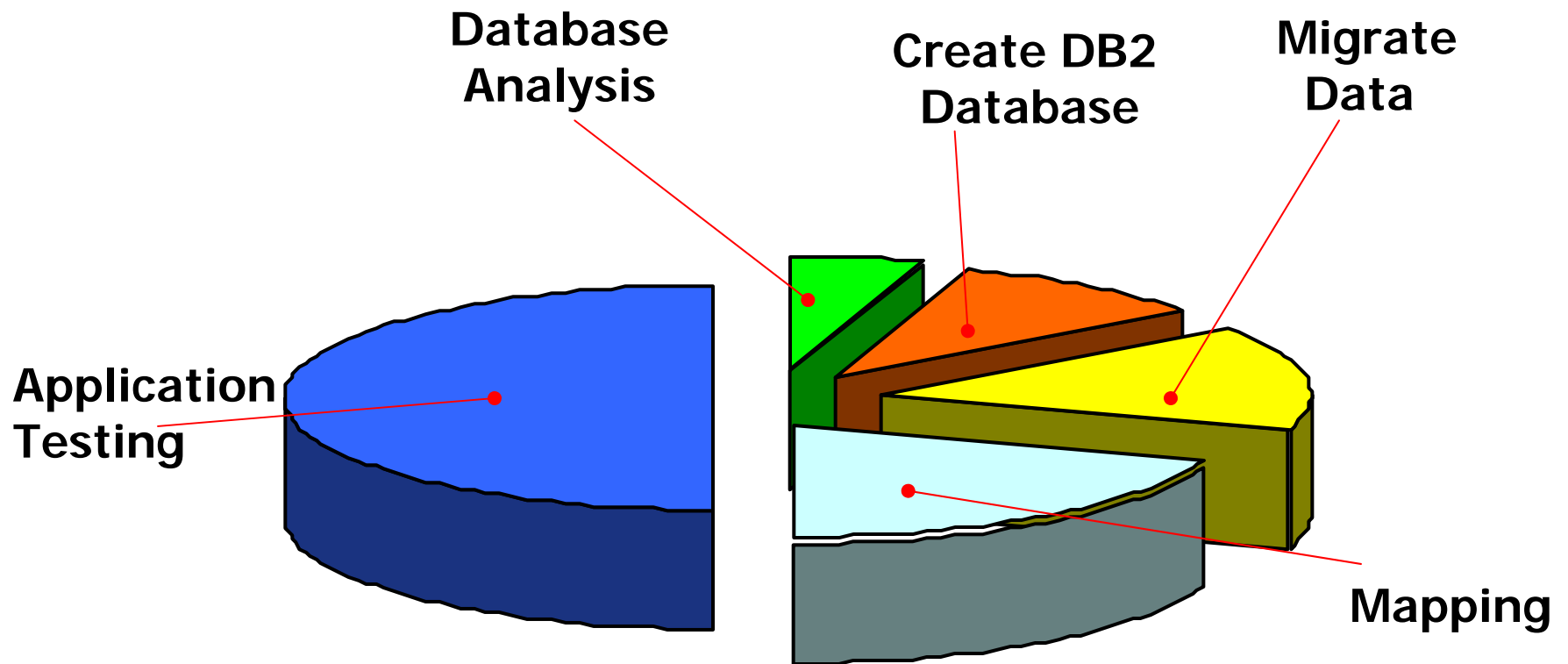


Typical DL/2 Database Migration



- One-time activity per database DBD
- Requires:
 - Application Knowledge
 - IMS and DB2 DBA skills

Typical DL/2 Database Migration



Automation to generate DDL, database mapping,
and some application testing

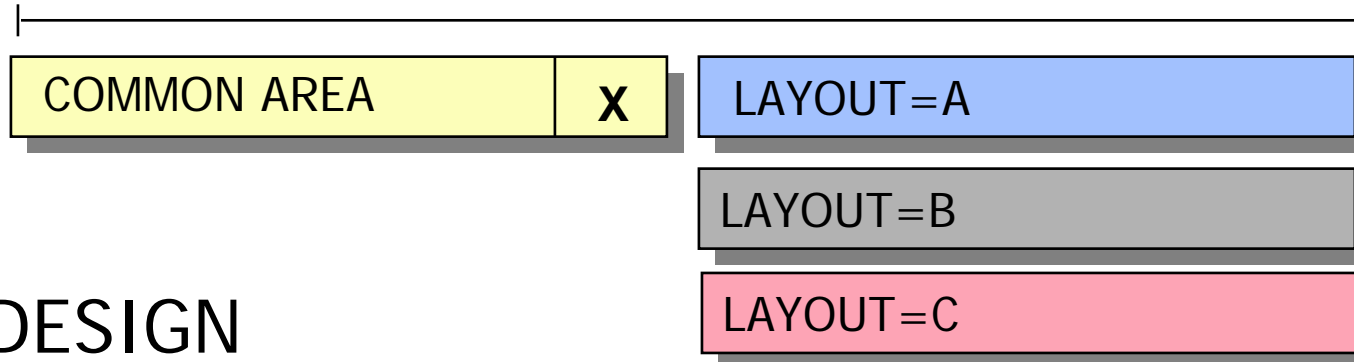
- **Each IMS Segment Type becomes a DB2 table**
- **IMS Concatenated Key become DB2 Primary Key**
- **Hierarchy maintained using Referential Integrity**
- **TIMESTAMP column for non-keyed segments**
- **DB2 Partitioning using Primary Key (if required)**

How will the data be used after migration to DB2?

- **If no SQL access is required, DB2 design should be based on DBD fields**
- **If query or program access is required, DB2 design should be based on Copybook fields**
- **Numeric and date data inconsistencies are almost inevitable with Copybook method**

- **DL/2 Provides automated Re-engineering**
 - Any numeric date field can become DB2 DATE column
 - Zoned Decimal can become DEC, INT, SMALLINT
 - Filler fields do not need to be migrated
- **User APIs for more complex Re-engineering**
 - Field Level data verification
 - Repeating groups
 - REDEFINED structures

REDEFINED IMS SEGMENTS



DB2 DESIGN

DB2TAB_COMMON	KCOL_A, KCOL_B + Common area columns
DB2TAB_LAYOUT_A	KCOL_A, KCOL_B + Layout=A columns
DB2TAB_LAYOUT_B	KCOL_A, KCOL_B + Layout=B columns
DB2TAB_LAYOUT_C	KCOL_A, KCOL_B + Layout=C columns

- **Field Build Exit (FBE)** for data retrieval
- **Insert Replace Delete Exit (IRD)** for update

IMS record

NAME	STREET	TOWN	CTRY	PHONE
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Flag resolved by application program code



DB2 row

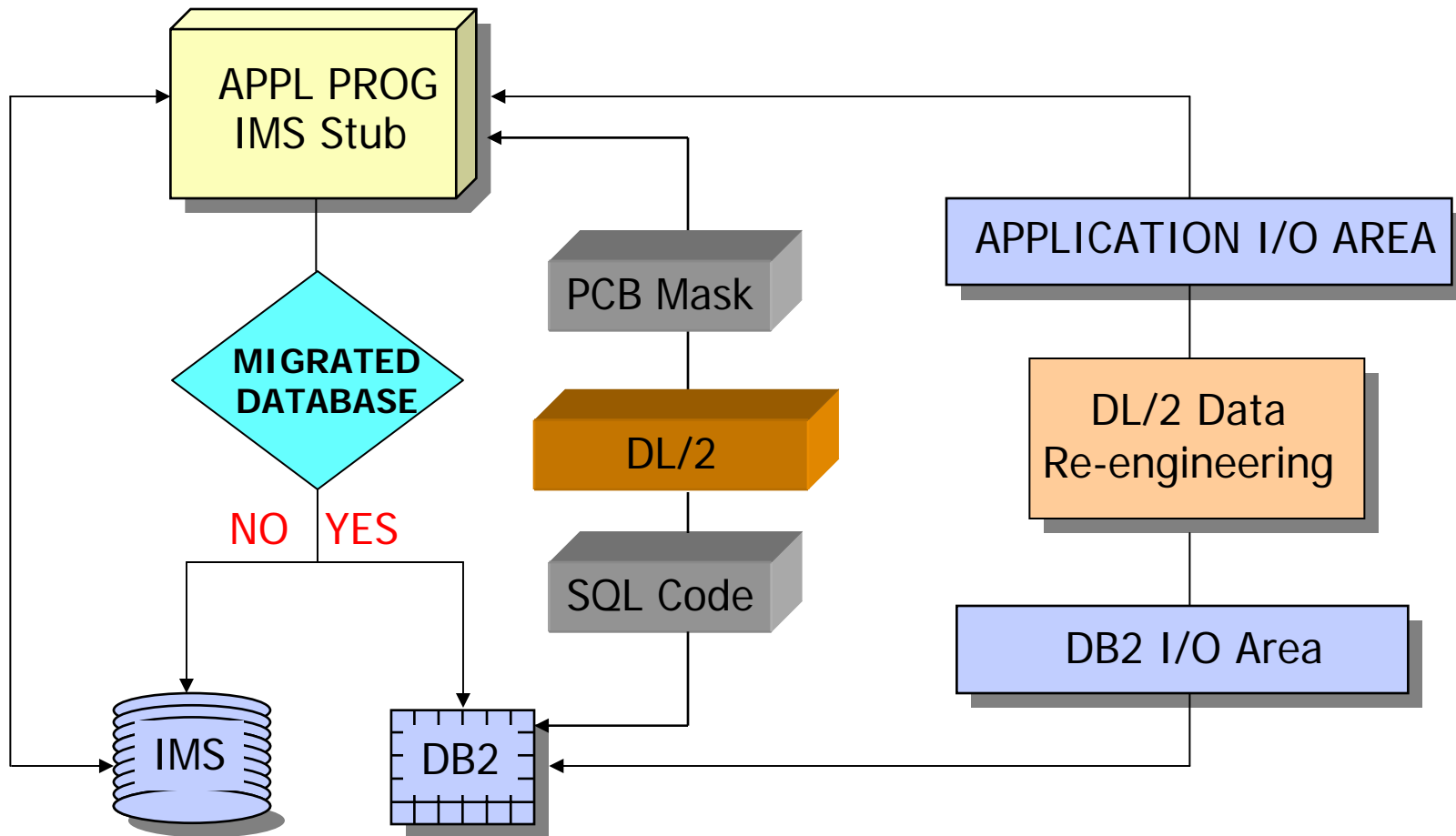
NAME	STREET	TOWN	CTRY	PHONE
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Expanded country name maintained by DL/2 exits

Enhances business value of data in DB2

Run-time decision to process in IMS or DB2



- **Call Interception at Application Program Runtime**
- **Gets IMS call parms and PCBLIST**
- **Executes DL/2 Driver Programs**
 - Data Structures from DL/2 DBD Driver module
 - SQL Access by DL/2 SQL Driver module
- **Data and IMS PCB Feedback area returned to Application Program**

- **DBD Driver Module**
 - Shows the Mapping of IMS record to DB2 Record
 - Includes any DL/2 data re-engineering
 - One per IMS database DBD
- **SQL Driver Module**
 - Contains SQL to access DB2
 - 100% Static SQL
 - Indexed Access Paths always used
 - One per IMS PSB

- **After Testing Completed**
 - Create DB2 Objects in Production DB2
 - Promote DL/2 DBD and SQL Drivers to Production
 - Define DL/2 objects to CICS
 - JCL changes to IMS MPRs, CICS, and Batch jobs
 - Migrate Production Database(s)
 - Register Migrated Databases
 - New DB2 Utility jobs required

Maintaining Applications Post DL/2 Migration

- **Application Programs can be maintained as either IMS or DB2 programs**
- **New database calls can be coded in SQL**
- **New columns can be added to DB2 tables**
 - Existing Copybook not necessarily affected
 - Existing Programs not necessarily affected
- **Existing IMS calls can be converted to DB2 calls**

Maintaining Applications Post DL/2 Migration

- **If no changes to database calls are required, DL/2 is completely transparent to programmer**
- **No restriction on types of database calls**
 - Existing IMS and DB2 programs supported
- **DL/2 Library must be part of regular Program Management process**
 - DL/2 Stub will resolve static IMS calls

Features Not Supported in DL/2 V2.3

- **FASTPATH DBs using Calls not supported by 'full function' IMS**
- **Non-DL/1 calls to DL/1 DBs**
- **Independent 'AND' in SSAs**
- **Q'n' COMMAND CODE**
- **IRD calls to Secondary IXs as Standalone DBs**
- **Applications not using IMS Services to access DBs**

- **Projected Availability 3Q05**
- **Many enhancements:**
 - Functionality
 - Operability
 - Performance
 - Serviceability

Functionality Enhancements:

- Support CKPT, XRST, ROLS, & SETS
- Register GSAM database
- Compare Tool in CICS

Operability Enhancements:

- Drivers are re-entrant
- In CICS, Drivers can be RELOAD=NO
- Removed IMS segment size limit
- Mapper generates more objects

Performance Enhancements:

- Drivers are re-entrant
- Drivers are smaller in size
- DBOS support of variable length records

Serviceability Enhancements:

- Compare tool enabled at step level
- DL/2 trace facility enhanced
- Improved diagnostics

