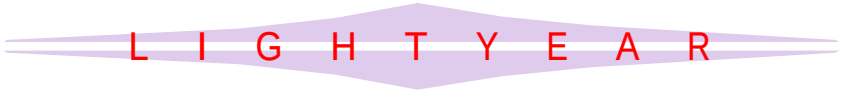
DL/2

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



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IBM Business Partner

Agenda

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

The DL/2 Solution

- 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 ccould 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

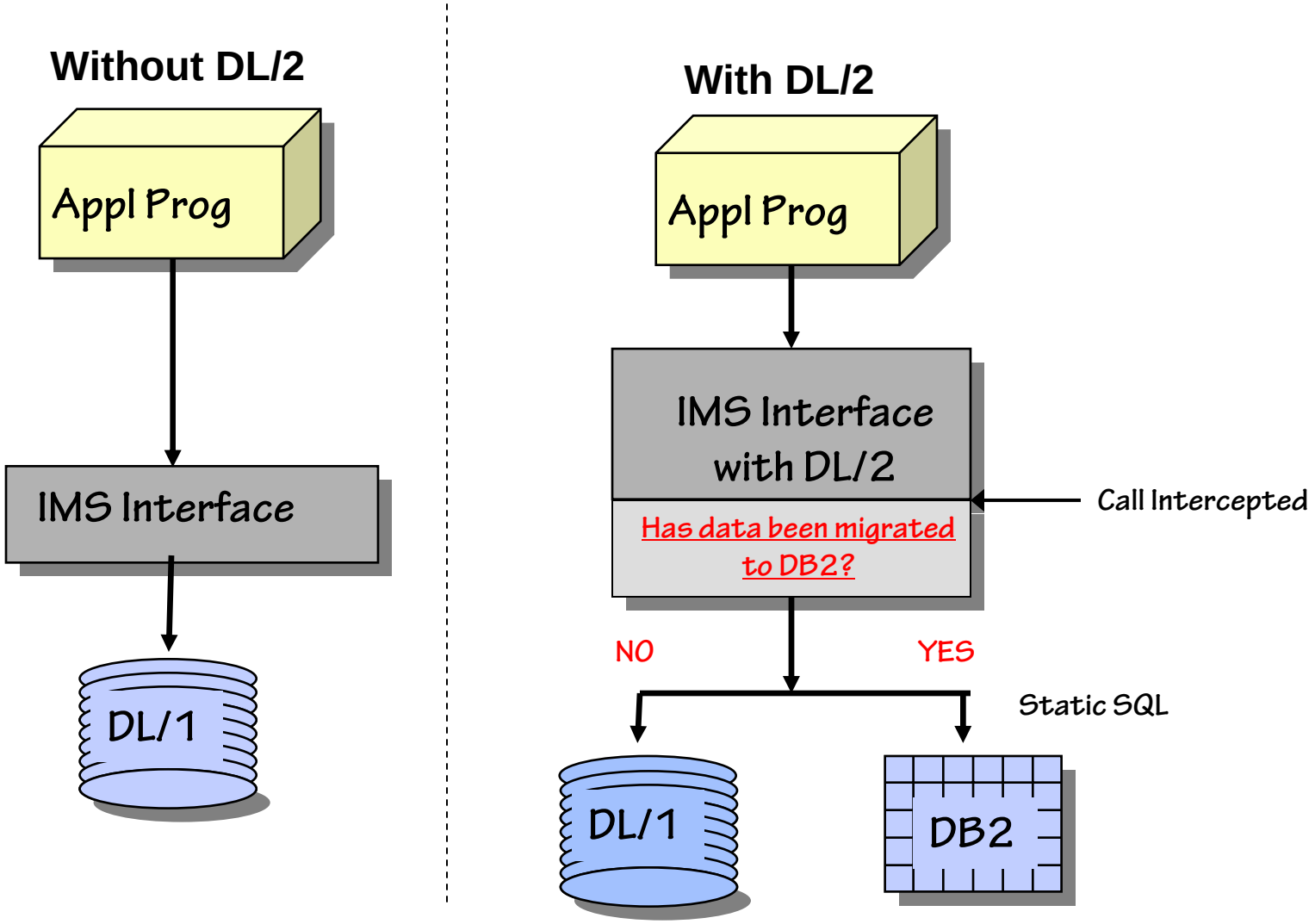
- CICS, DB2, IMS, WebSphere MQ & z/OS education, software, tools
- Websphere MQ application integration
- Application development services
- Database Migration to DB2
- eServer Hardware

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

The DL/2 Approach

- **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

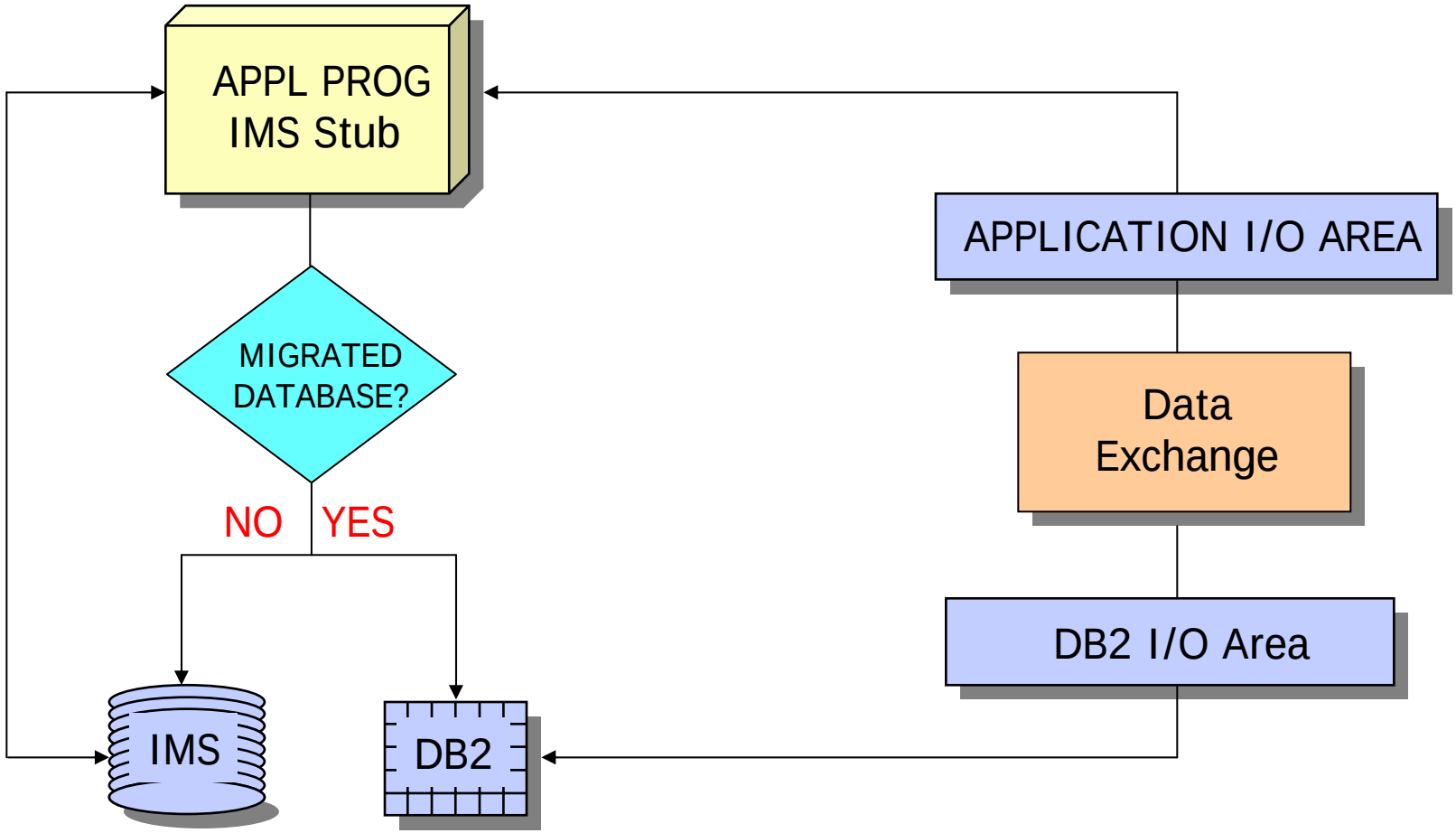
- Objective of DL/2
- DL/2 Architecture Overview
- Typical DL/2 Database Migration Process
- Database Design and Data Re-engineering
- Maintaining Applications Post-Migration

Objective of DL/2

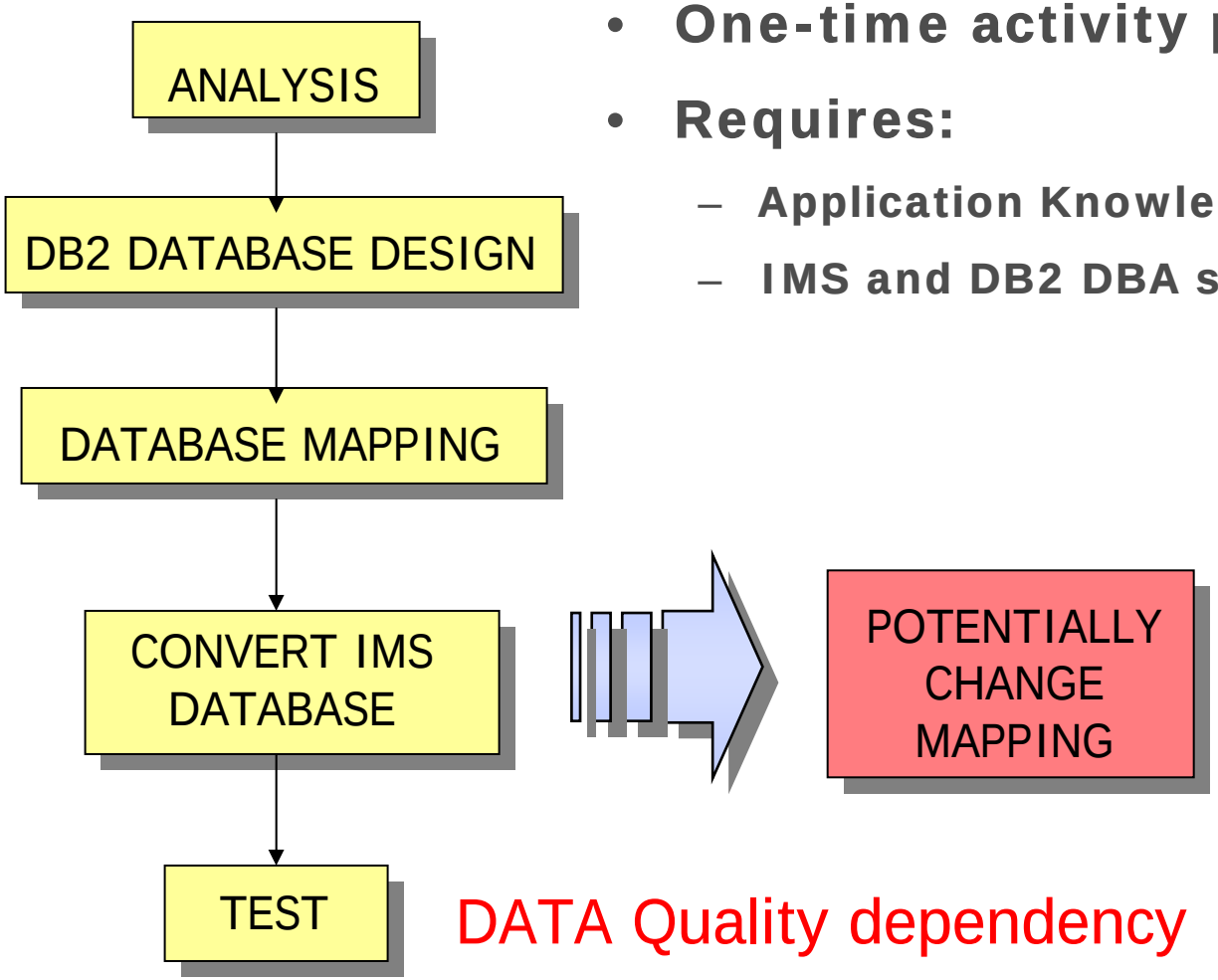
"To allow you to migrate your IMS data to DB2 without having to change Application Programs"

- 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

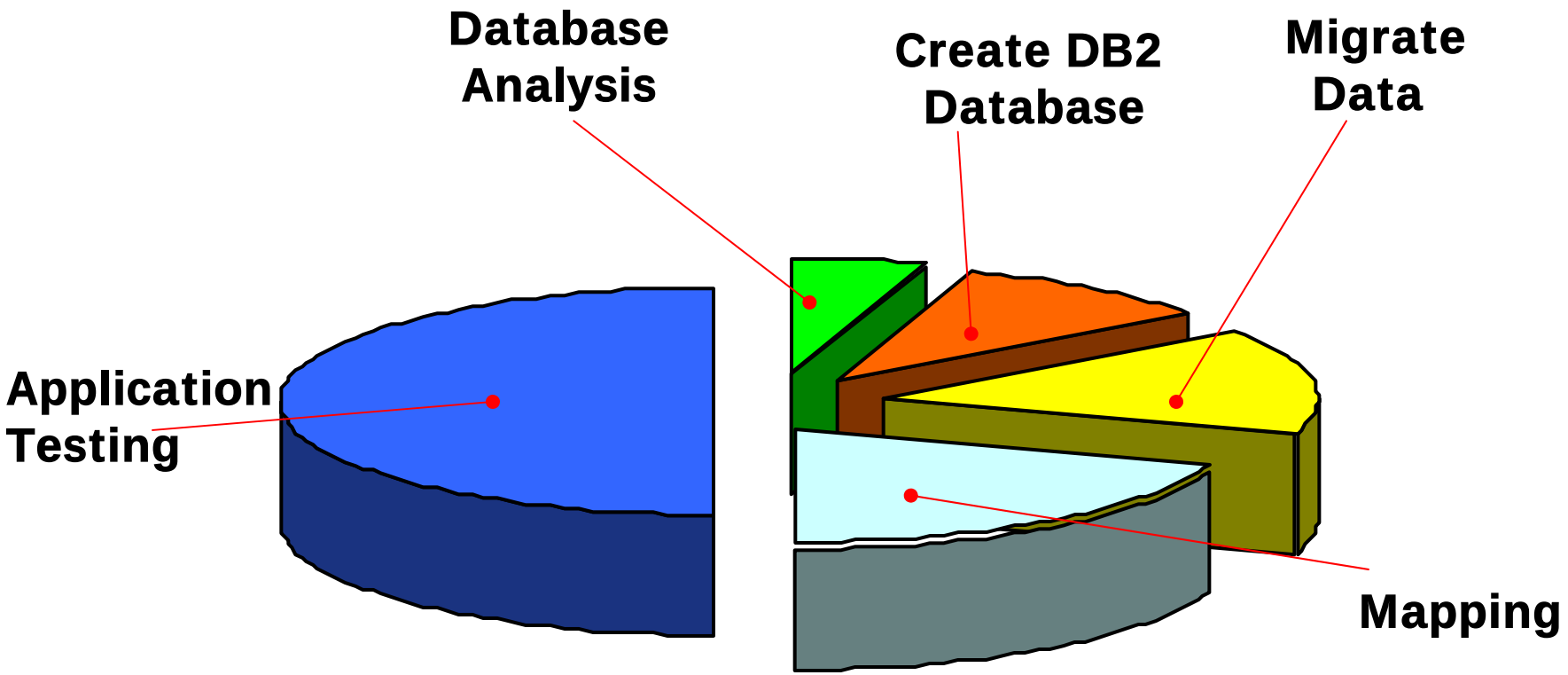


Typical DL/2 Database Migration



- **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

DB2 Database Design Options

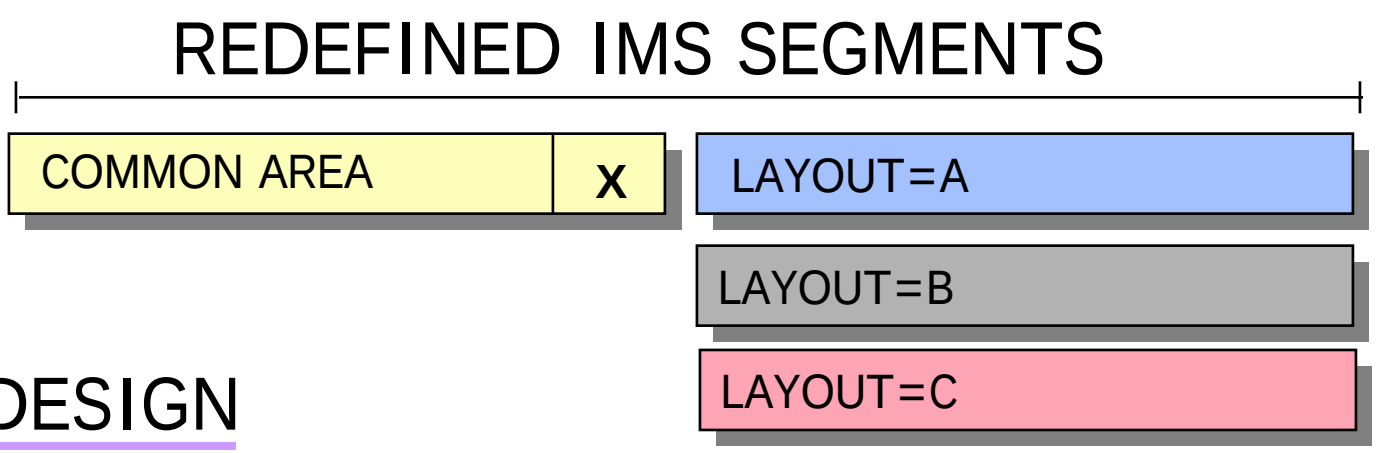
- Each IMS Segment Type becomes a DB2 table
- IMS Concatenated Key become DB2 Primary Key
- Hierarchy maintained using Referential Integrity
- TIMESTAMP column for non-keyed segments
- DB2 Partitioning using Primary Key (if required)

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

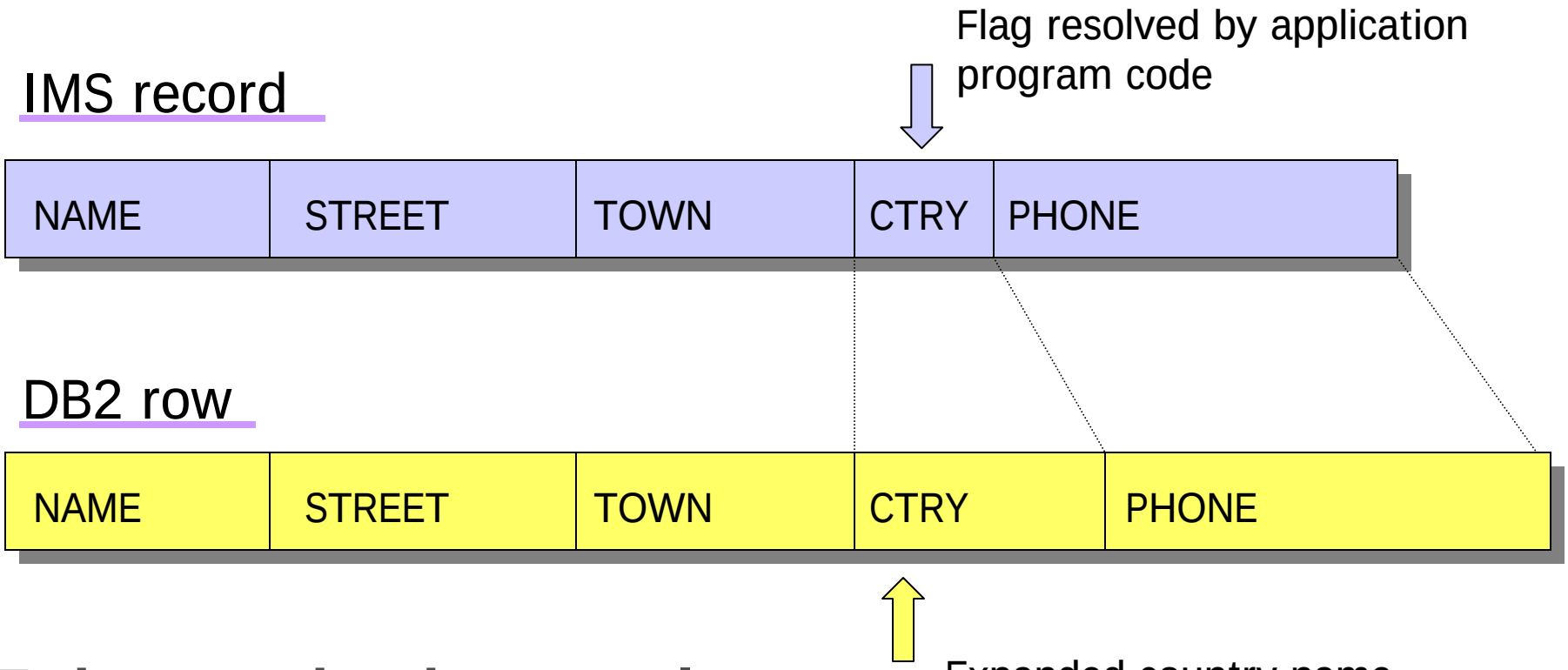
- **User APIs for more complex Re-engineering**
  - Field Level data verification
  - Repeating groups
  - REDEFINEd structures



DB2 DESIGN

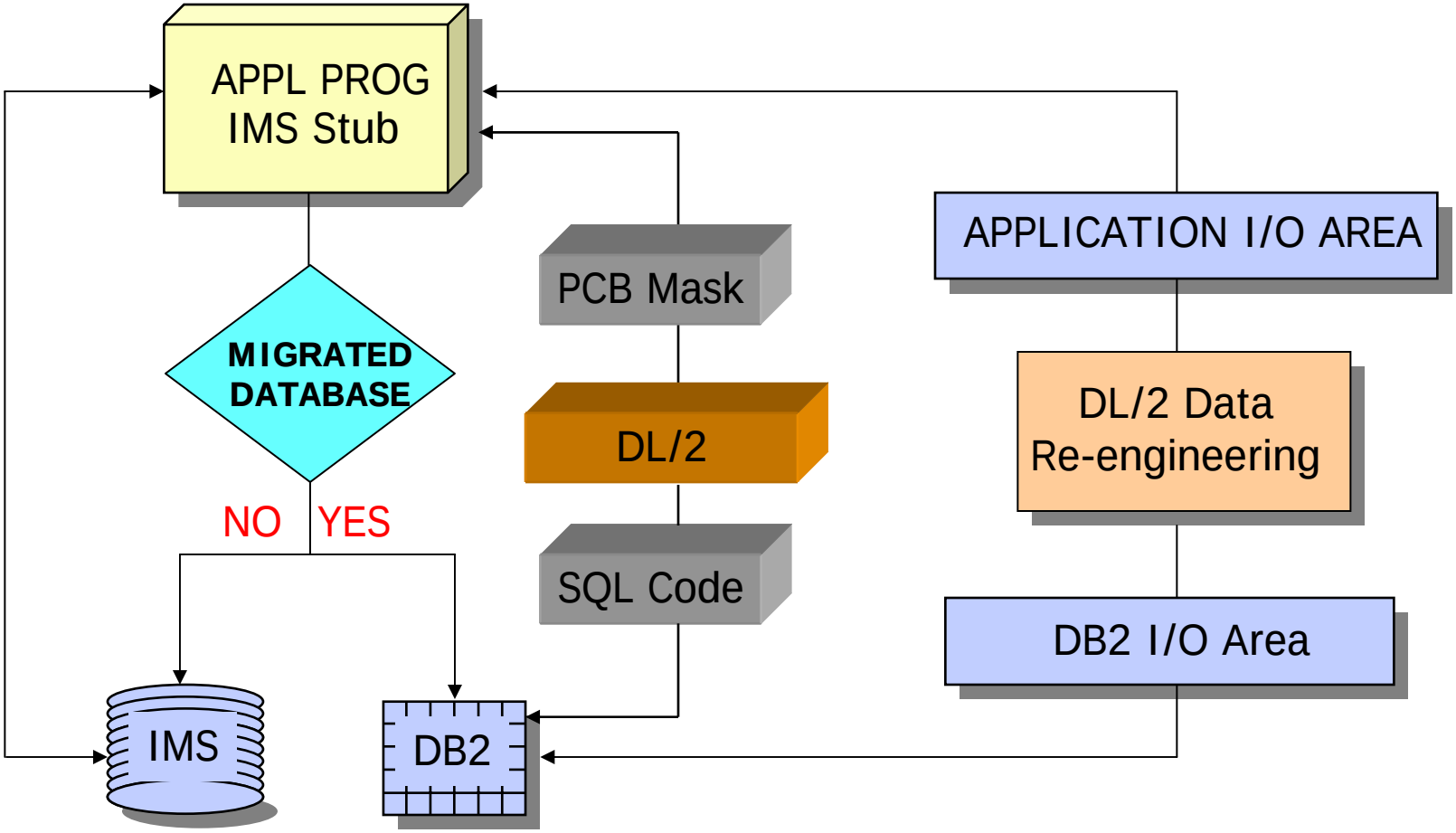
DB2TAB_COMMON	KCOL_A, KCOL_B + Common area columns
DB2TAB_LAYOUT_A	KCOL_A, KCOL_B + Layout=A columns
DB2TAB_LAYOUT_B	KCOL_A, KCOL_B + Layout=B columns
DB2TAB_LAYOUT_C	KCOL_A, KCOL_B + Layout=C columns

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



Enhances business value of data in DB2

Run-time decision to process in IMS or DB2



DL/2 Architecture

- **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

Typical DL/2 Database Cut Over

- **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

Questions ...