CICS VSAM Transparency V1.1

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AGENDA

- What is CICS VT?

- Product highlights

- Components

- Migration process summary

- Setting expectations

WHAT EXACTLY IS CICS VT?

- Tool to migrate VSAM files to DB2 without changing application programs

  - Single copy of the data
  - Single version of the truth

- Legacy programs access DB2 data using driver modules CICS VT generates for each migrated data set

- Migrated data can be accessed by SQL in new programs

- Existing programs can be enhanced using SQL

- Lowest risk migration strategy

WHAT EXACTLY IS CICS VT *(continued)*?

WRITE, REWRITE

Application Program

VSAM File #1

VSAM File #2

READ

WHAT EXACTLY IS CICS VT *(continued)*?

INSERT, UPDATE

DB2
Table #1

SELECT

Application
Program

C
I
C
S

V
T

VSAM
File #1

GET, READ

WRITE, REWRITE

VSAM
File #2
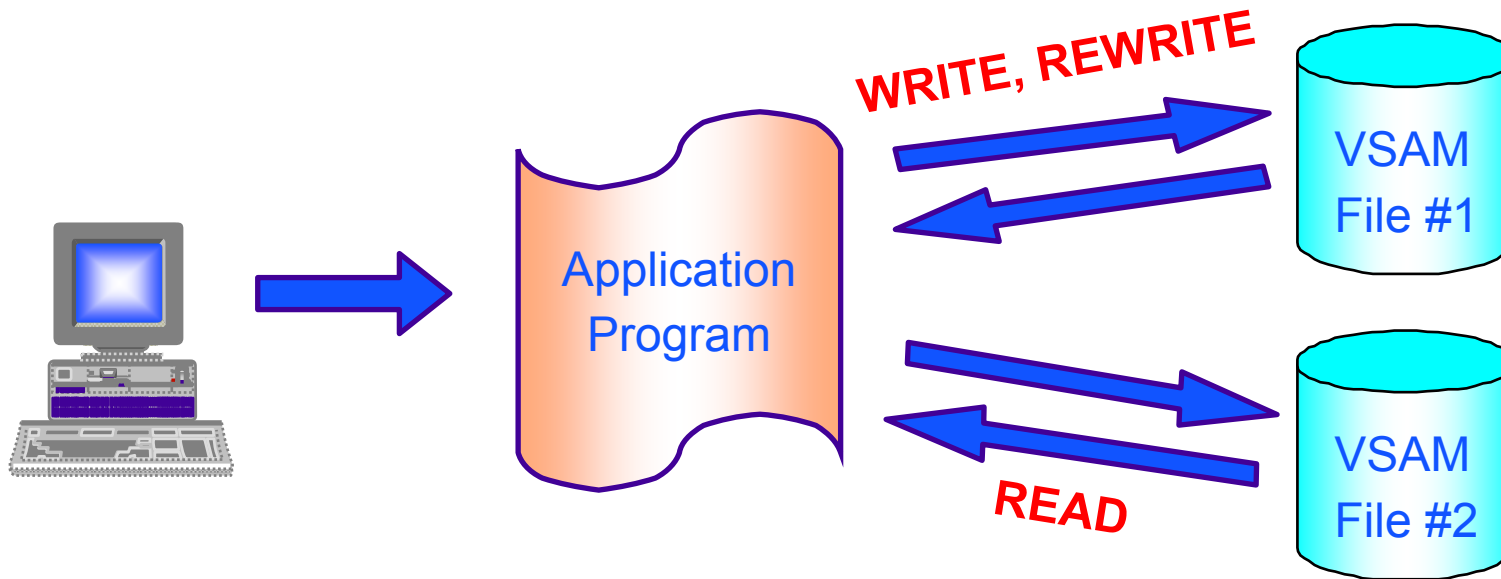
Application programs underlined unchanged
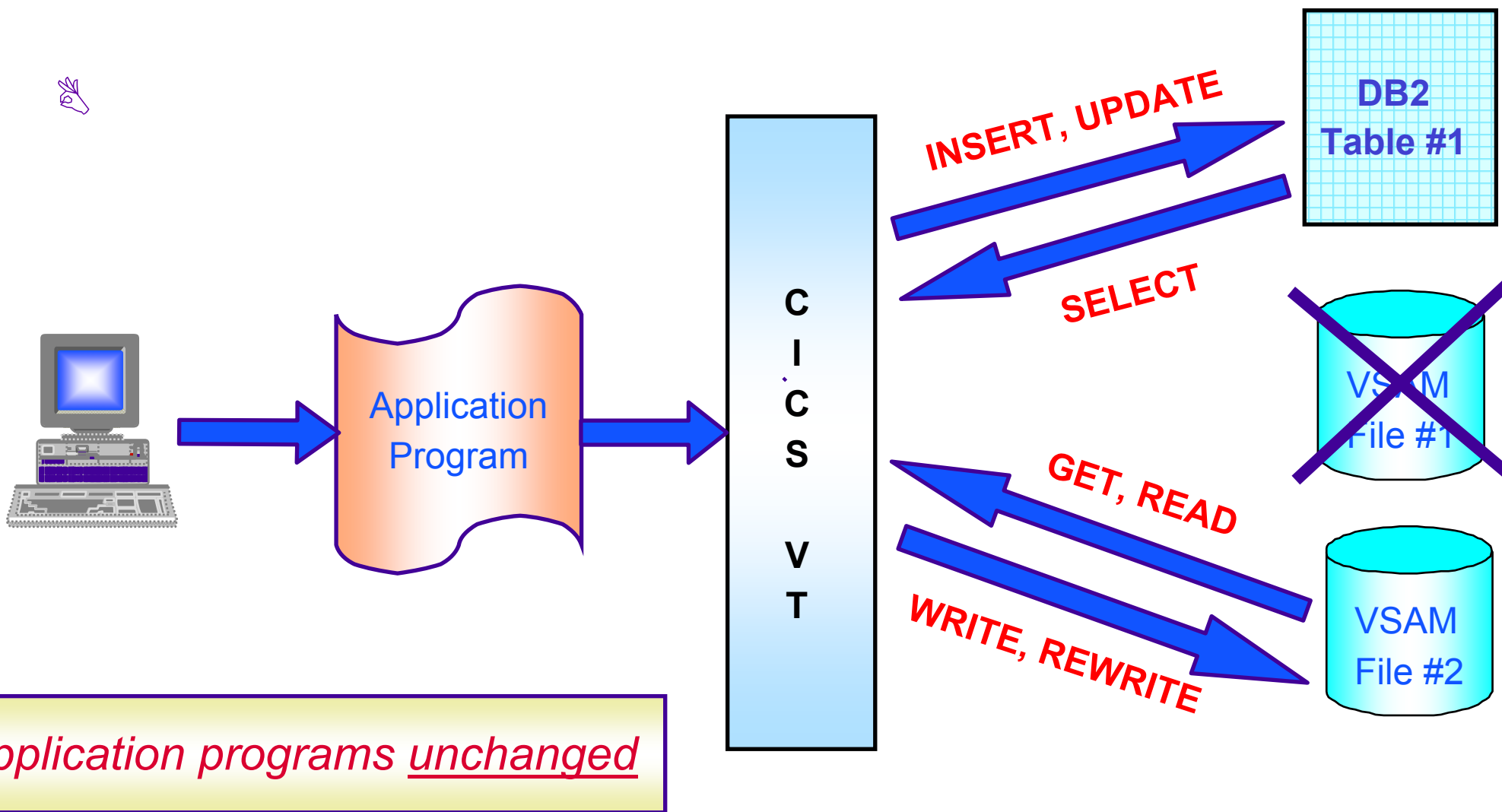
CICS VT HIGHLIGHTS

✍ Completely separate from application program

✍ Transparent access to data in DB2

✍ 100% static SQL

✍ Migrate on a file by file basis

✍ Single copy of data

✍ Data can be re-engineered

❑ Same data returned to VSAM programs
❑ Enhanced data available using SQL

CICS VT COMPONENTS

✍ **Mapping component**

 📁 Establishes relationship between VSAM record layout and DB2 row

✍ **Data migration component**

 📁 Utilities to migrate data to DB2 and re-engineer if required

✍ **Run time component**

 📁 Intercepts application calls to VSAM data sets migrated to DB2

MAPPING COMPONENT

" The relationship between the record in VSAM and the row in DB2"

- One time activity for each data set and alternate index

- Manual and automated mapping methods

- Automated method should handle at least 70% of all data sets

- Run-time driver module generation

- Performed by DB2 DBA and application programmer

- Includes design of DB2 objects

MAPPING COMPONENT

MAPPING DATA in DB2

ISPF

VSAM

RUN-TIME DRIVERS

COPYBOOK

```
01 VSAM-file.
 02 file-key       pic 9999
 02 group-field.
   03 order-number pic x(3)
   03 order-type   pic s9(8) comp
 02 next-field     pic s999 comp-3
.........
.........
```

```
CREATE TABLE VSAM_TAB (
 TAB_KEY        DEC(5, 0)
,ORDER_NO       CHAR(3)
,ORDER_TYPE     INTEGER
,NEXT_FIELD     DEC(3,0)
 PRIMARY KEY(TAB_KEY))
```
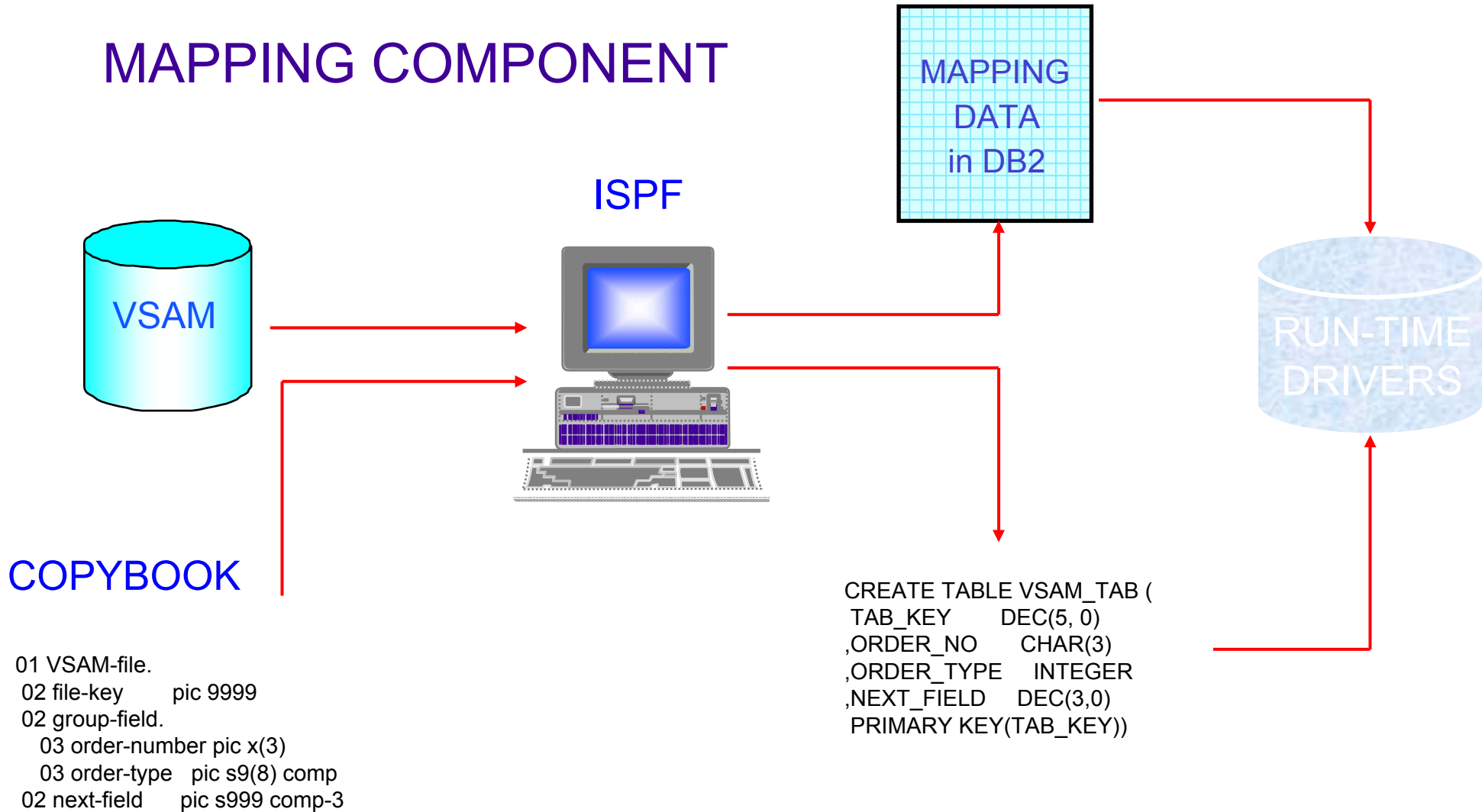
Usually one to one, can be one to many

DATA MIGRATION COMPONENT

✆ Three steps in data migration process

   Unload existing data from VSAM data set

   Convert data to DB2 format

   Load DB2 data (using DB2 LOAD utility)

✆ CICS VT utilities provided for 1 and 2

✆ Optionally identifies invalid numeric fields that are mapped to numeric column types (which would cause data conversion errors)

RUN-TIME COMPONENT

✍ Application programs continue to issue calls to VSAM files

    ✍ CICS VT intercepts call

      ❑ Using a global user exit (GLUE) in CICS
      ❑ Using an MVS sub-system for batch programs

    ✍ Translates call to equivalent SQL call and processes in DB2

    ✍ After call has been processed by CICS VT

      ❑ Data and RESP codes return to CICS program
      ❑ Data and return and reason codes passed back to batch program

MIGRATION PROCESS SUMMARY

ANALYSIS

MAP

MIGRATE

TEST

CUTOVER
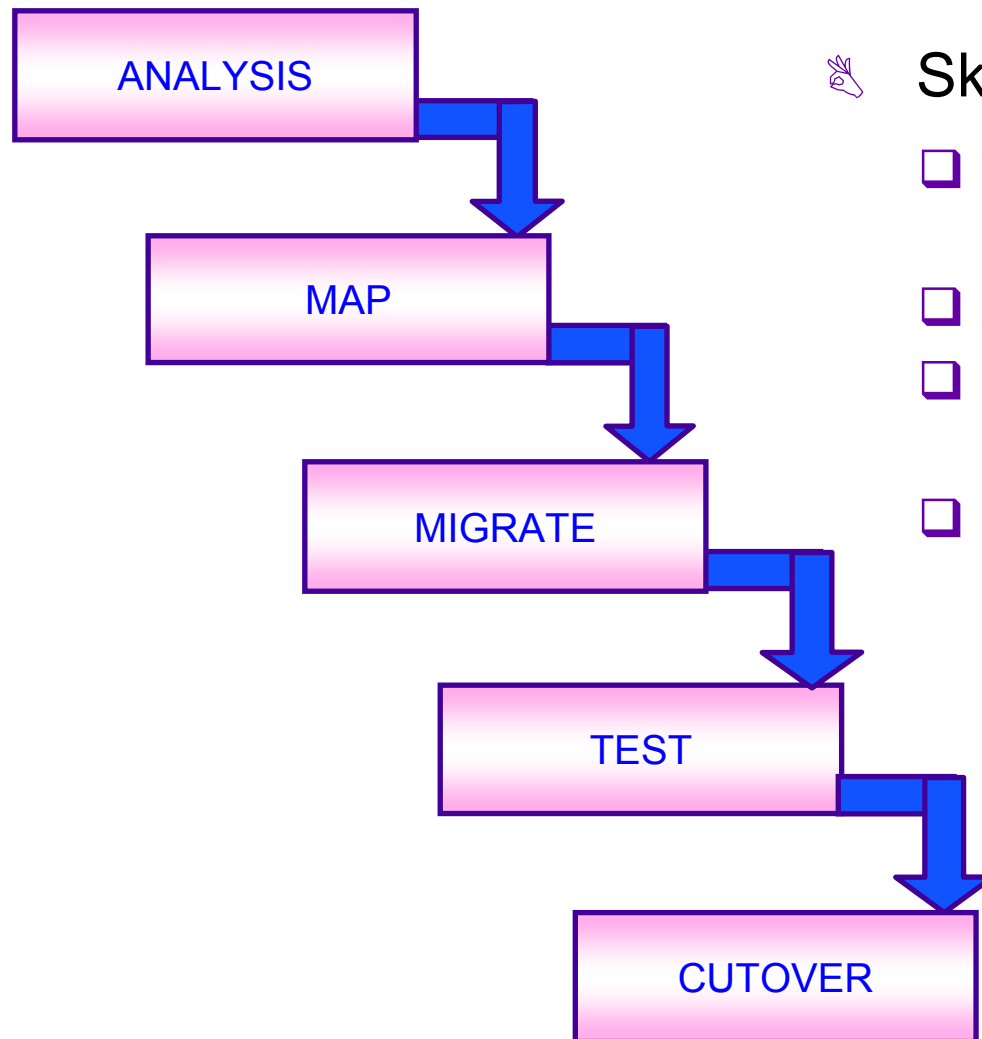
✥ Skills required

- ❑ Application programmer and DBA for migration and testing
- ❑ Users for testing
- ❑ CICS support for defining driver modules
- ❑ Assembler skills needed if exits are required

SETTING EXPECTATIONS

☞ Scepticism

- ❑ Transparency tools get bad press
- ❑ Performance usually deteriorates
- ❑ Application maintenance becomes more complex
- ❑ "Black box" solutions unpopular with systems staff

☞ Performance

- ❑ VSAM is a file system, DB2 is a DBMS
- ❑ DBMS functionality comes at a price

☞ What are the <u>REAL</u> benefits?

REAL BENEFITS

✌ Data is in DB2

- ❏ Improved access - Java, www etc
- ❏ Wealth of query tools
- ❏ Potentially 24 x 7
- ❏ Availability of skills
- ❏ Integration with other other DB2 data
- ❏ Data integrity
- ❏ Single copy of the truth

✌ So why use CICS VT ?

WHY USE CICS VT ?

☞ Lowest risk migration methodology

- ❑ One file at a time
- ❑ No application program changes
- ❑ Extensive re-engineering capabilities
- ❑ Complete set of migration tools
- ❑ Automated mapping facility

☞ Usable DB2 design is **essential**

- ❑ Justifies effort to convert
- ❑ Justifies increased CPU

HOW DOES IT PERFORM ?

- Main difference is due to DB2 overhead

  - VSAM is an access method
  - DB2 is a database management system

- Data access CPU costs could increase 3-4 times

- This DOES NOT translate to response time increase - response times should be comparable

- Batch program elapsed time may increase, although DB2 sequential processing is very efficient

- Lab tests measured CICS VT overhead as less than one tenth of total increase

HOW TO MITIGATE PERFORMANCE IMPACT

- CICS VT uses 100% static SQL and every DB2 call uses an index

- Concurrent batch and online programs

- Online backups

- DB2 data can be reorganised non-disruptively to ensure consistent access times

- Re-engineered data provides extra business value

ESTIMATING CONVERSION EFFORT

☞ It depends on the complexity of the file

  📂 Files containing single record type can be mapped automatically, and migrated usually within 1 day

  📂 CICS VT user exits are required to migrate one data set to multiple DB2 tables - 2 to 5 days for this kind of VSAM file

  📂 Typical split seems 70-30

☞ Allow time for data cleansing - more likely in applications processing numeric and date fields

☞ Testing is the most significant element - 0.5 to 1 day per program - user decides which programs

Ebauche de plan de migration - 1

✤ Initial analysis of files and copybooks to scope project

✤ Designing DB2 tables

   📁 Identifying where user exits are required

✤ Data migration requires combination of skills

   📁 Using VSAM utilities
   📁 DB2 DBADM
   📁 CICS
   📁 General programming
   📁 Testing

Ebauche de plan de migration - 2

✌ CICS VT exits must be assembler

✌ Support for production cutover

✌

📂 DB2 system - bufferpool / EDM pool usage

📂 DB2 objects

📂 DB2 - CICS interface

✌

CONCLUSIONS

VSAM based applications

- VSAM is not designed for open data access (i.e. management reporting, analytics)
- VSAM data does not easily integrate with data from DB2 and other systems
- VSAM is not easily accessible from other platforms
- VSAM is not designed to support 24*7 mixed online and batch workloads
- Maintenance and re-organization tools are lacking the richness of DBMS tools

Why migrate data to DB2?

- 24x7 availability – batch and online sharing
- Integration with new applications based on DB2 technology, such as online and e-business systems
- Running ad hoc queries
- Ability to perform data analysis
- Creating visual information, such as executive dashboards
- Exploitation of database maintenance tools

IBM's solution – CICS VSAM Transparency

A tool which allows migration of data from VSAM to DB2 without the need to rewrite CICS/VSAM applications

CICS VT capabilities

- **Tool to migrate legacy VSAM files to DB2 without changing application programs**
  - Single instance of the data is maintained
- **Both CICS and batch programs can access data in DB2 under the control of CICS VT**
- **Migrated data can be accessed by SQL by new programs**
- **Existing programs are enhanced using SQL**
- **Lower risk migration strategy**

What is CICS VT?

Application Program

VSAM call

CICS VT

NO **VSAM file migrated to DB2?** YES

SQL Driver

VSAM

DB2
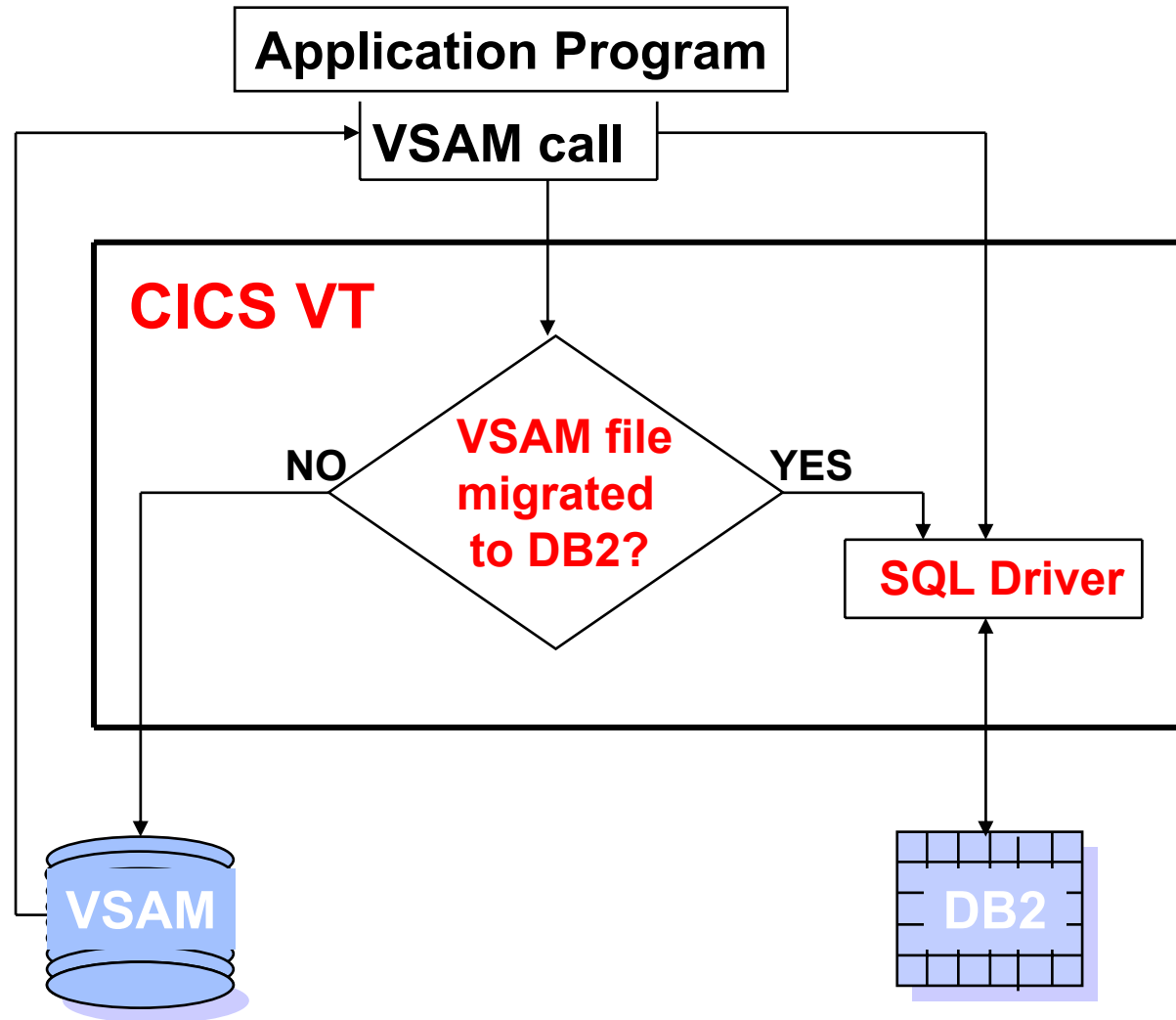
CICS VT value

For	IT / AD manager
Who needs	To rewrite CICS applications to support his IT organisation's migration strategy of VSAM to DB2
The offering	CICS VSAM Transparency V1.1
Is a	Data migration tool
That	▪Allows data to be migrated from VSAM without application rewrite ▪Is completely separate from the CICS app ▪Offers totally transparent access to the data in DB2 ▪Allows you to migrate VSAM files as required
Unlike	Replication, duplication or propagation solutions
Our offering	Maintains a single instance version of the data

Decision makers

- CICS VT directly benefits the application programmer
- Data management staff will also influence
- Operations staff will appreciate Improved continuity of operations
- Having that data more accessible in DB2 will appeal to knowledge workers

CICS VT Availability and Pricing

CICS VT V1.1 licence: 5697-I76

CICS VT V1.1 S&S: 5697-I77

Announced: February 17, 2004

GA: March 26, 2004

Further Info on CICS VT

- CICS VT web page
  - *www.ibm.com/cics/vt*

Publications

www.ibm.com/cics/library

CICS VT data sheet – G244-7285

CICS VT user guide – SC34-6343