

New environment needed for IMS testing?

Name: John Butterweck
Email: john.butterweck@compuware.com
Company: Compuware

November 2018
Session MG



Agenda

- The Compuware DevOps story
- What is IMS Virtualization?
- How do we define the Virtual Environment?
- How does COPE transform Programs and Databases?
- How does a Transaction run in a COPE environment?
- What technologies work in a COPE system?
- Demo
- Wrap up



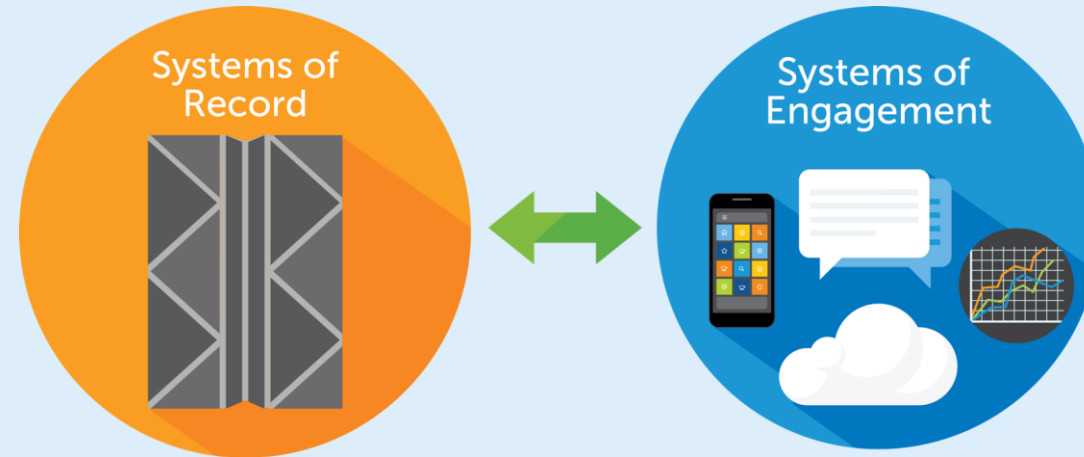
Agenda

- **The Compuware DevOps story**
- What is IMS Virtualization?
- How do we define the Virtual Environment?
- How does COPE transform Programs and Databases?
- How does a Transaction run in a COPE environment?
- What technologies work in a COPE system?
- Demo
- Wrap up

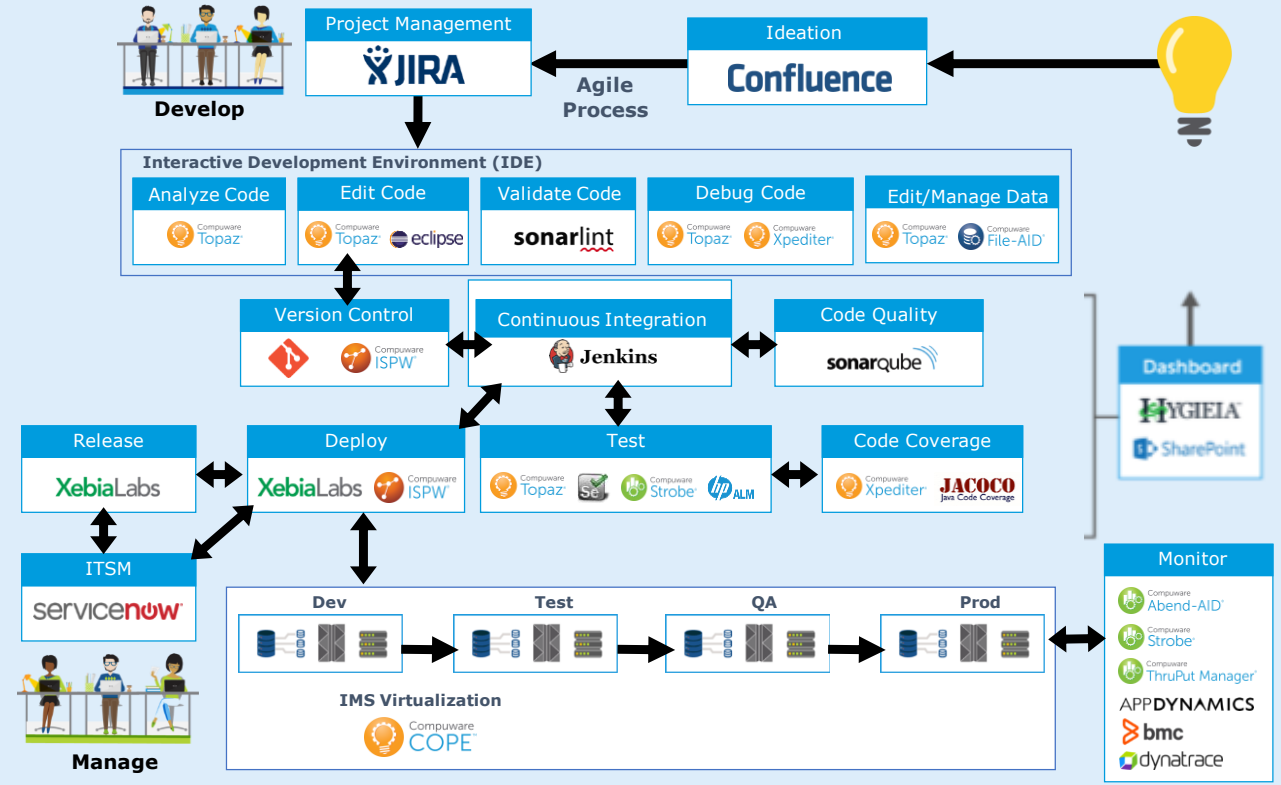


Today You Need to Master These with intelligent tools

Mobility | Analytics | Social | Cloud



DevOps Toolchain



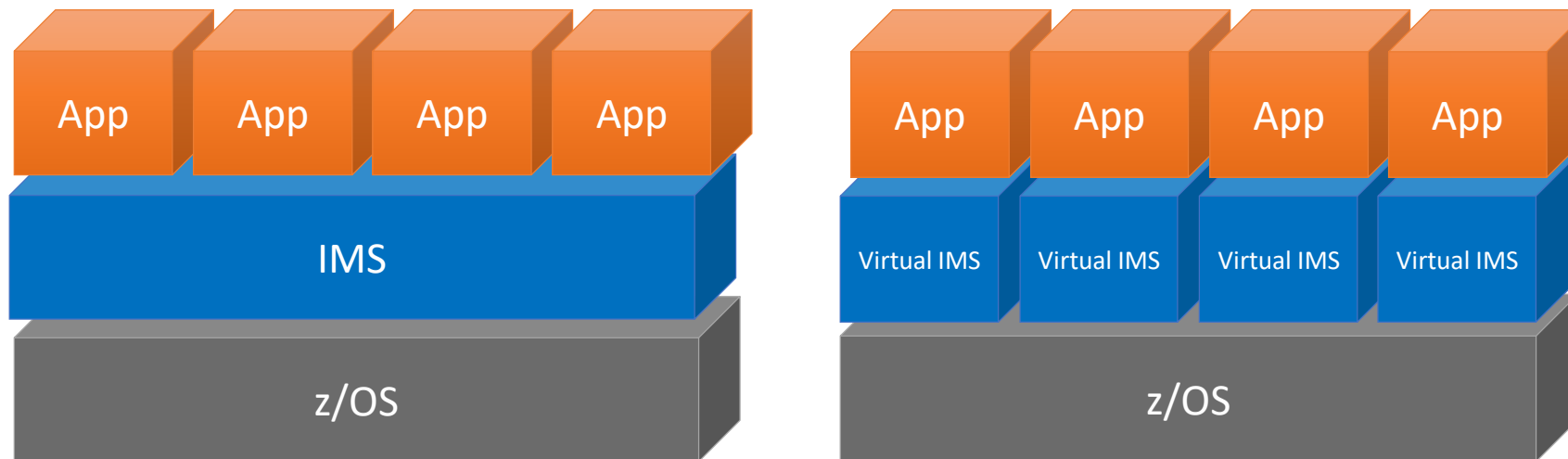
Agenda

- The Compuware DevOps story
- **What is IMS Virtualization?**
- How do we define the Virtual Environment?
- How does COPE transform Programs and Databases?
- How does a Transaction run in a COPE environment?
- What technologies work in a COPE system?
- Demo
- Wrap up

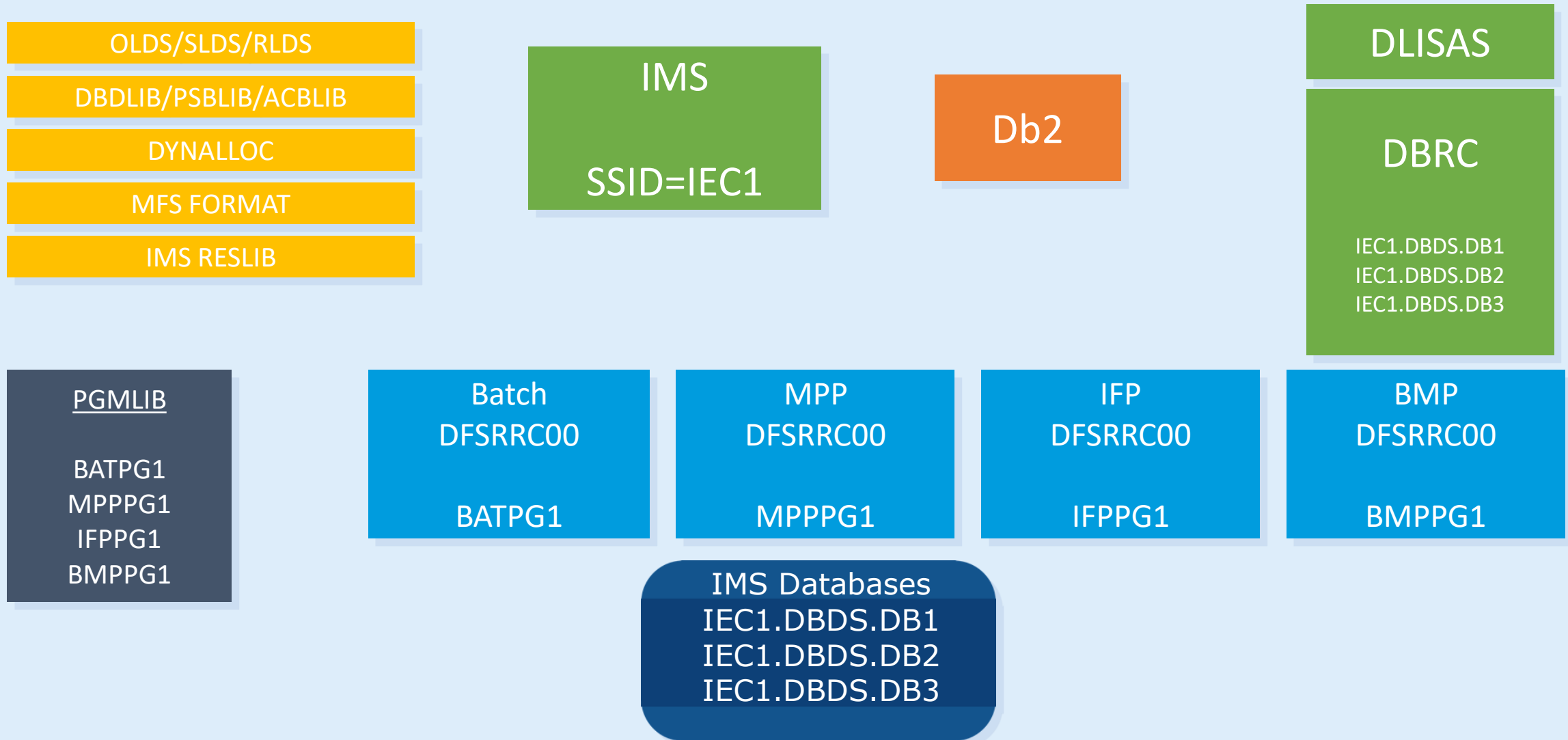


What is IMS Virtualization?

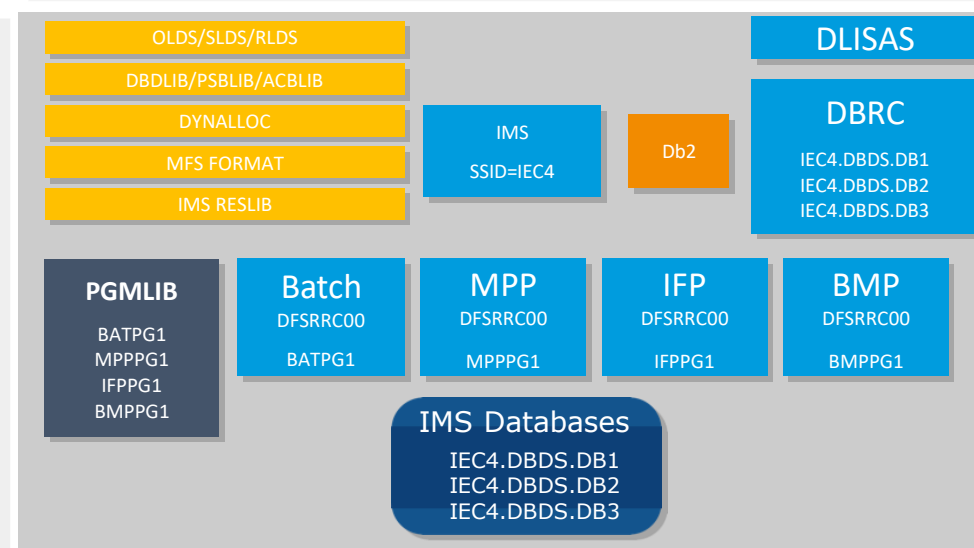
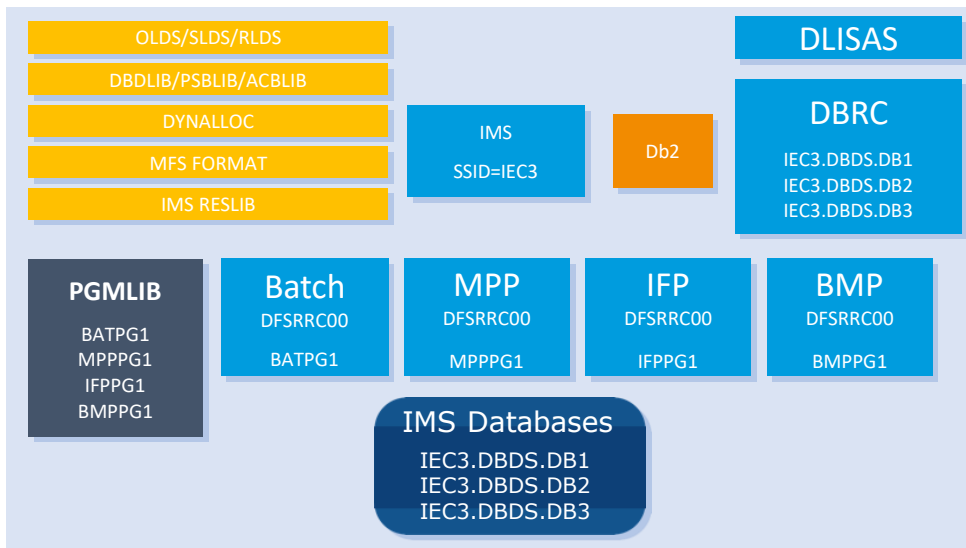
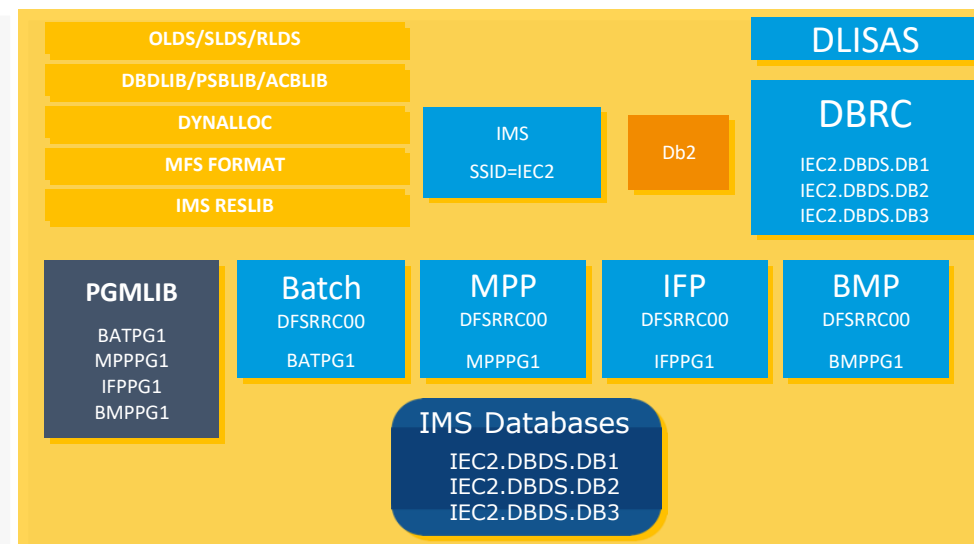
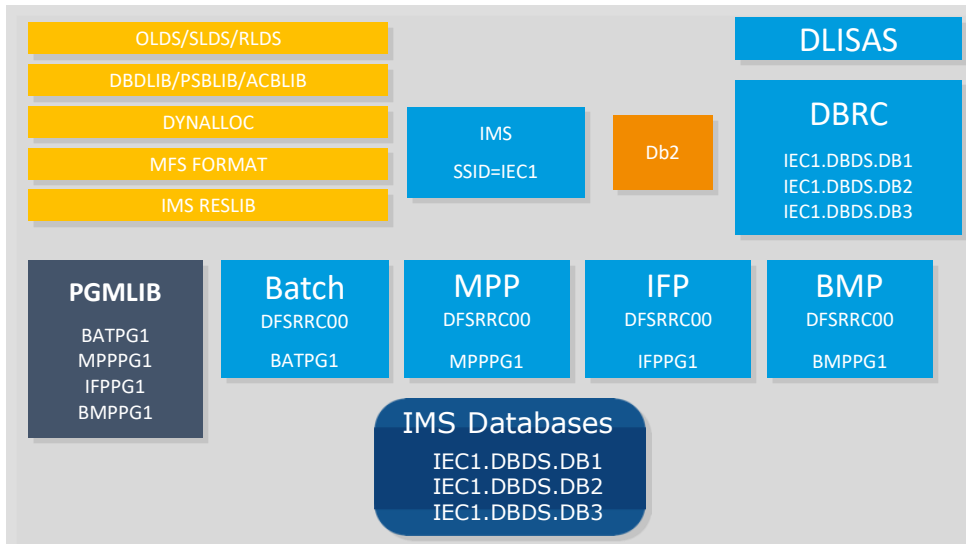
“The ability to execute multiple versions of IMS and DB2 programs within a single physical IMS subsystem.”



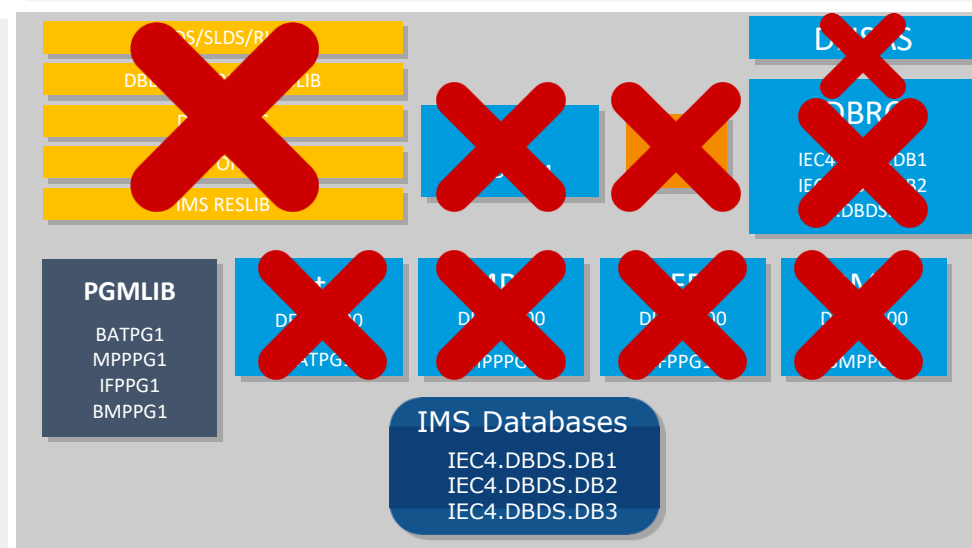
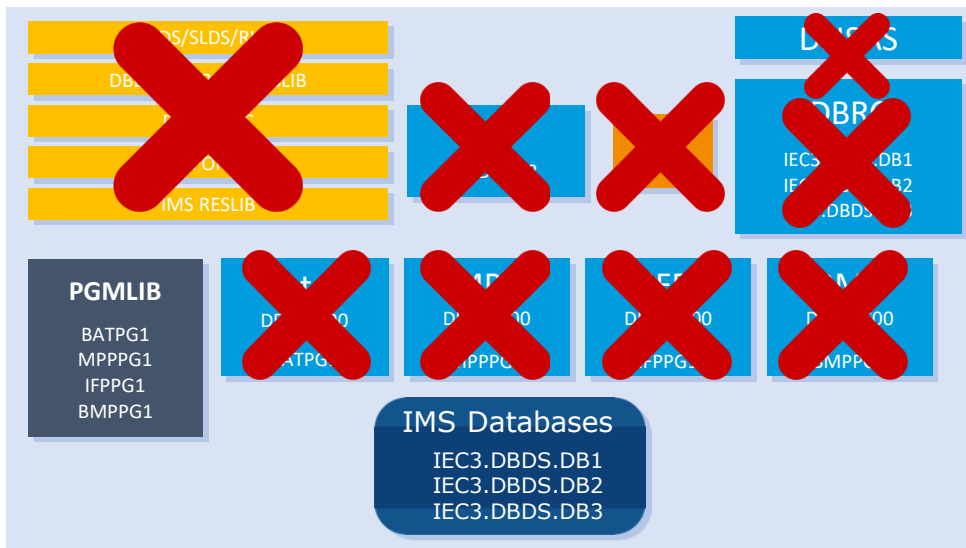
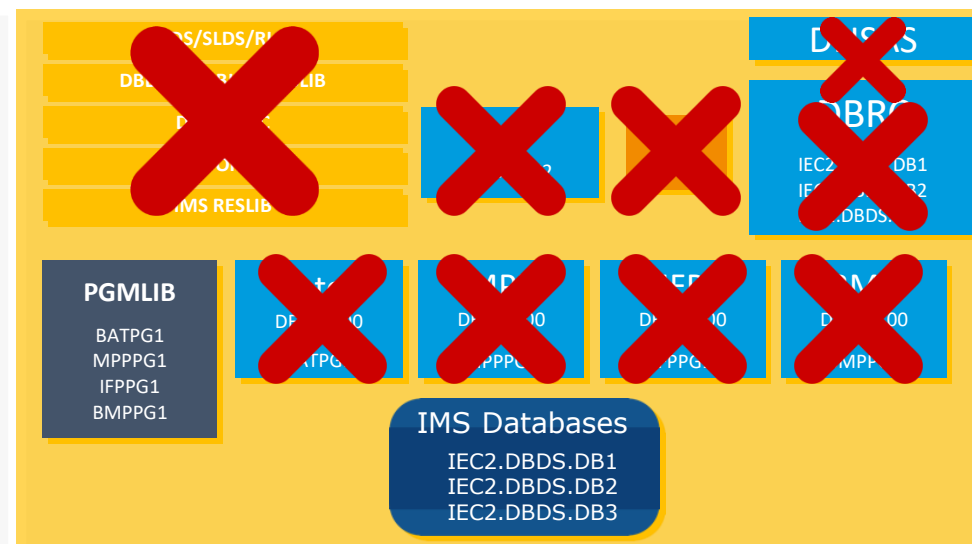
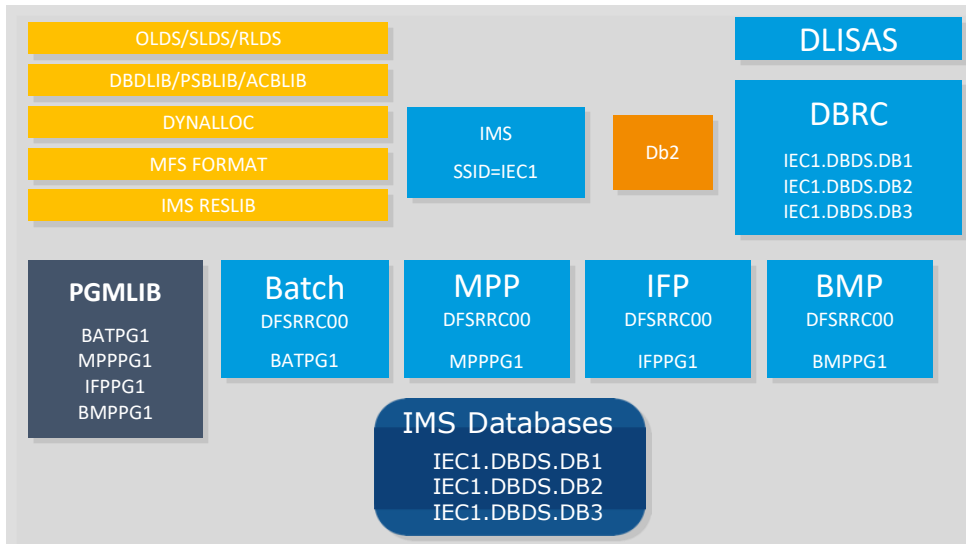
IMS Environment (Without COPE for IMS)



Four IMS Environments (Without COPE for IMS)



Four IMS Environments (With COPE for IMS)



Four IMS Environments (Resource Savings with COPE)

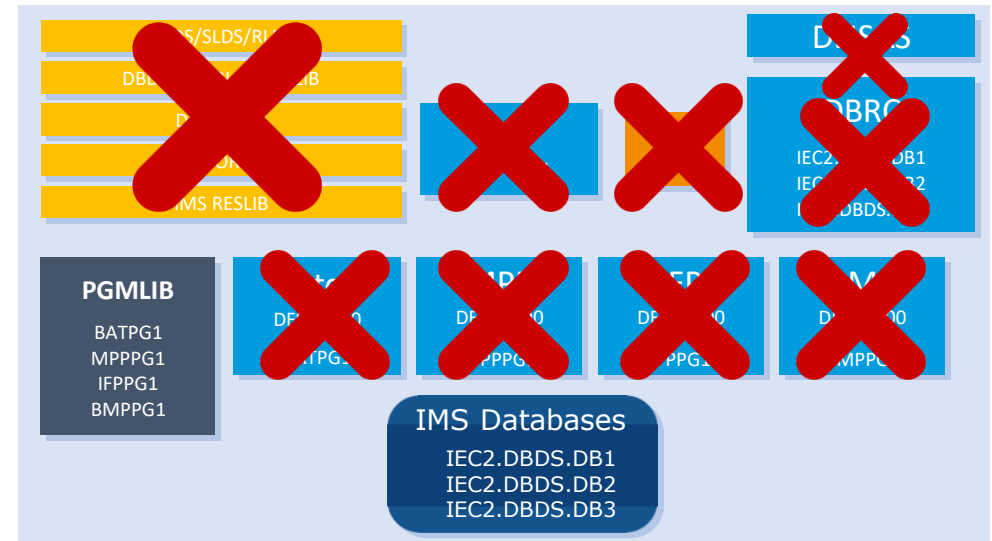
Eliminated Resources

Reason and "Rule of Thumb"

DBDLIB/PSBLIB/ACBLIB, FORMAT, OLDS/SLDS/RLDS	Eliminate duplicate resources
TP Buffer Pools	Replace with definition of largest buffer
DB Buffer Pools	Replace all pools with 1.3 * size of largest pool
IMS Control Regions, DBRC, DLISAS, Message Regions	Replace with 1.3 * largest # of message regions
ACBLIB increase in one IMS LSYS	$(\#TP PCB + \#BMP + \#Batch) * \#LSYS$

More Eliminated Resources

Db2 System Buffers and Db2 Working Sets
Db2 Address Space
MQM System Resources



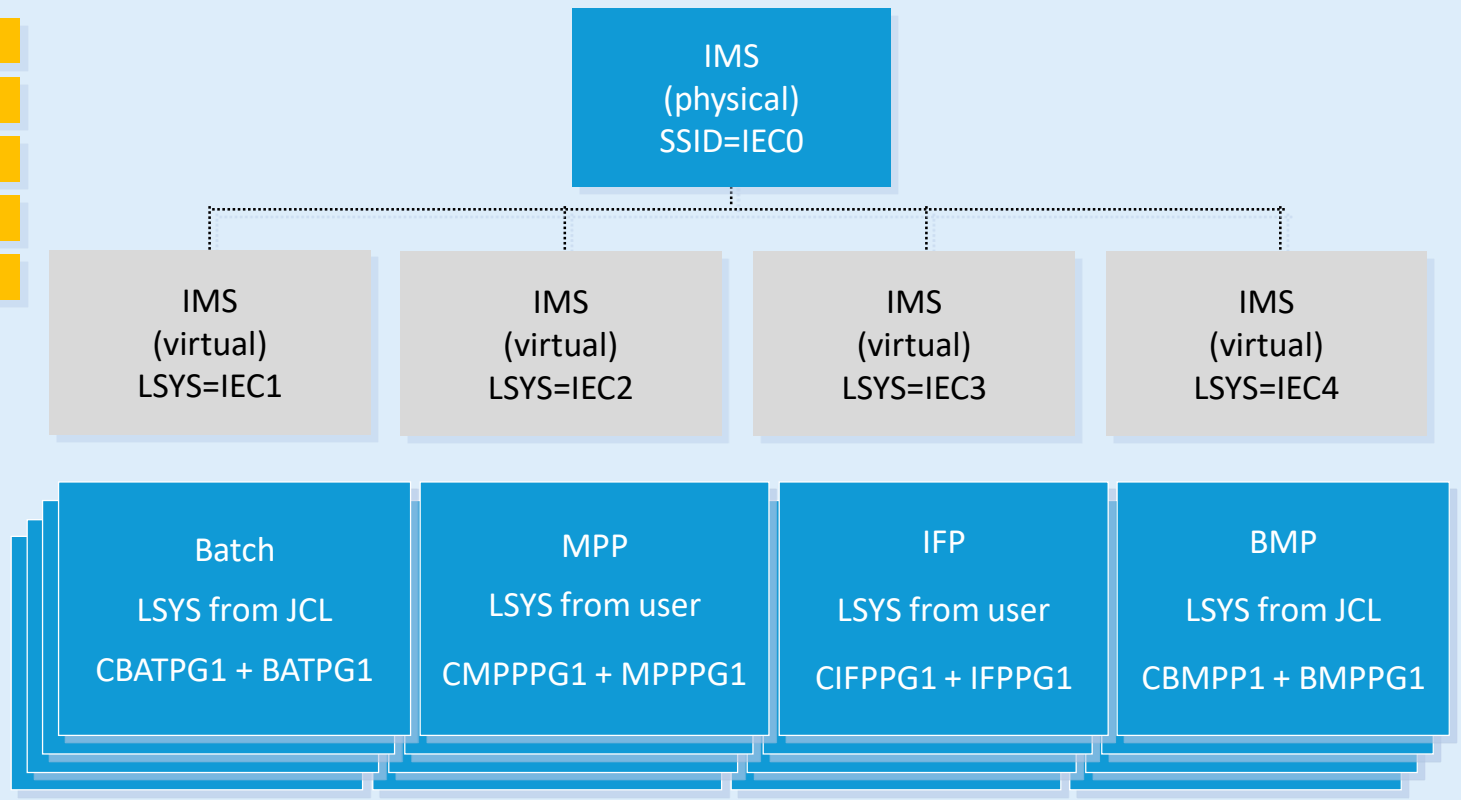
IMS Virtualized Environments (With COPE for IMS)

- OLDS/SLDS/RLDS
- DBDLIB/PSBLIB/ACBLIB
- DYNALLOC
- MFS FORMAT
- IMS RESLIB

PGMLIB

Stubx + Program

CBATPG1 + BATPG1
 CMPPPG1 + MPPPG1
 CIFPPG1 + IFPPG1
 CBMPPG1 + BMPPG1



DLISAS

- DBRC**
- RECON**
- IEC1.DBDS.DB1
 - IEC1.DBDS.DB2
 - IEC1.DBDS.DB3

 - IEC2.DBDS.DB1
 - IEC2.DBDS.DB2
 - IEC2.DBDS.DB3

 - IEC3.DBDS.DB1
 - IEC3.DBDS.DB2
 - IEC3.DBDS.DB3

 - IEC4.DBDS.DB1
 - IEC4.DBDS.DB2
 - IEC4.DBDS.DB3

IMS Databases
 IEC1.DBDS.DB1
 IEC1.DBDS.DB2
 IEC1.DBDS.DB3

IMS Databases
 IEC2.DBDS.DB1
 IEC2.DBDS.DB2
 IEC2.DBDS.DB3

IMS Databases
 IEC3.DBDS.DB1
 IEC3.DBDS.DB2
 IEC3.DBDS.DB3

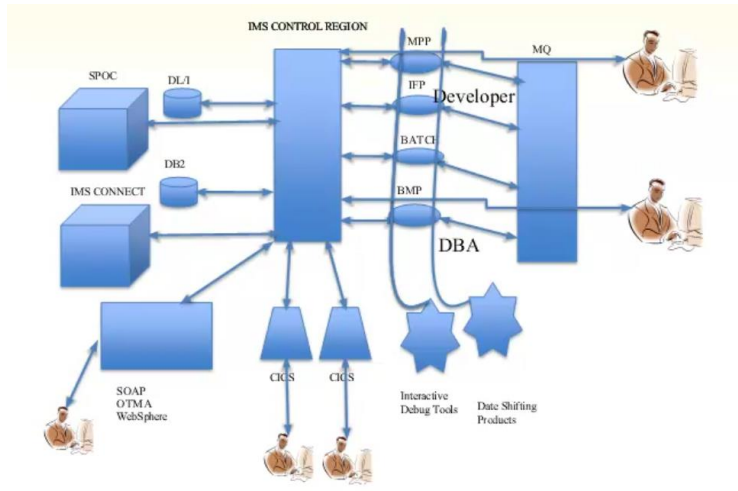
IMS Databases
 IEC4.DBDS.DB1
 IEC4.DBDS.DB2
 IEC4.DBDS.DB3

Agenda

- The Compuware DevOps story
- What is IMS Virtualization?
- **How do we define the Virtual Environment?**
- How does COPE transform Programs and Databases?
- How does a Transaction run in a COPE environment?
- What technologies work in a COPE system?
- Demo
- Wrap up



Virtualization Process



Original IMS Environment

```
----- COPE Development System -----
option ==> -
1 - Setup                               Version 4.4.14
2 - Import and Generate                  Date 16/09/28
3 - Update/Copy/Move/Generate           Time 19:02
4 - Data Transform (IMS and COPE)       Julian 16.272
5 - Utilities                           Screen 1
6 - View Trace and (XPEDITOR TSO)       z/os 2.01.00
T-7 - Translate Function                 IMS 14.1.0
B - Base Selection Menu
9 - IMS Type 2 Commands (SPOC)
X - Exit

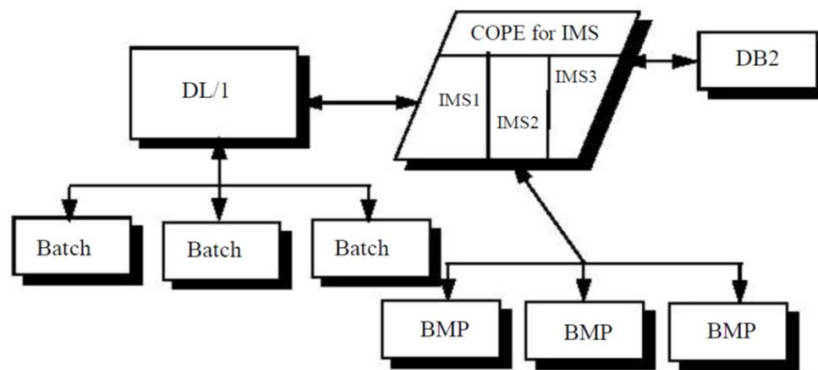
Physical IMS      IMSW
Procs Dataset     IMSTEST, COPE, UMOD, PROCS
Master Lsys       MASTER

Enter "JOB"       Enter "EDIT"       Enter "BROW"       Enter "UTIL"
to review job    to access      to access      to access
status           ISPF Edit     ISPF view       ISPF Utility

Lsys Licenced    09                      Expiry Date= 17/06/22
copyright (c) 1989-2016 Standardware Inc.
```

Process:

- Setup – defining environment
- Import – DBD's, PSB's, DYNALOC
- Change – modify definitions such as PSB's (as required)
- Data Def regeneration including renaming of objects for
 - virtual environment,
 - DBD Generation,
 - PSB Generation etc.
- Load IMS data / DB2 data



Virtual IMS Environment

COPE ISPF Interface: Main Menu

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help
----- COPE Development System -----
1 - Setup                               Version 4.4.14
2 - Import and Generate                 Date 17/08/31
3 - Update/Copy/Move/Generate          Time 12:35
4 - Data Transform (IMS and COPE)      Julian 17.243
5 - Utilities                          Screen 1
6 - View Trace                         z/OS 2.03.00
T-7 - Translate Function                IMS 14.1.0
B - Base Selection Menu
9 - IMS Type 2 Commands (SPOC)
X - Exit

Physical IMS   RELE
Procs Dataset IM.COPEU.PROCS
Master Lsys   IEC1

] Enter "JOB" ]
] to review job ]
] status ]

] Enter "EDIT" ]
] to access ]
] ISPF Edit ]

] Enter "BROW" ]
] to access ]
] ISPF View ]

] Enter "UTIL" ]
] to access ]
] ISPF Utility ]

Option ==> _
F1=HELP   F2=SPLIT   F3=END   F4=RETURN   F5=RFIND   F6=RCHANGE
F7=UP     F8=DOWN    F9=SWAP  F10=LEFT   F11=RIGHT  F12=RETRIEVE

MA A 22/014

```

Create the IMS Virtualization Environment

COPE ISPF Interface: Setup IMS Virtualization

```
Session A - [24 x 80] Setup IMS Virtualization
File Edit View Communication Actions Window Help
----- COPE Development System Setup -----
----- Initial COPE Installation Tasks -----
1 - Define Logical Systems
2 - Generate Batch JCL Procedure
3 - Define Batch JOB Card
4 - Edit External Interface (Batch Input) Sample JCL
5 - Specify Message Region Datasets
6 - Define Lsys Identifying Tokens (Re-Linkedit IMS Modules)
7 - Define Excluded (Not Modified by COPE) Databases and Transactions
8 - Define Common Stage 1 and Dynallocation (DFSMDA) Specifications
9 - Bind COPE DB2 Plans
----- COPE System Maintenance Tasks -----
10 - Generate Environment Member after Changes to ZDEFAULT
11 - Create a DBDLIB and PSBLIB from an IMS catalog
12 - Limit Lsys Access to Specific Users
```

Define IMS Logical Systems (Lsys)

```
Session B - [24 x 80]
File Edit View Communication Actions Window Help
EdIt Projects and Systems - Table Data Panel ---
Commands: FIND/POPUP/REPORT View.: none
Rcd(s): S/R/I/D/C/M/DD/RR View.: L/LIBS
```

Rcd	PROJECT NAME	SYSTEM NAME	PREV SYSTEM	ACTIVE SYS?
.....	CPWR	IEC1		Y
.....	CPWR	IEC2	IEC1	Y
.....	CPWR	IEC3	IEC1	Y
.....	CPWR	IEC4	IEC1	Y

Define IMS Message Regions Datasets

```
Session B - [24 x 80]
File Edit View Communication Actions Window Help
EdIt Message Region Datasets - Table Data Panel -----
ROW 1 OF 4
MORE -->
```

Rcd	DD NAME	LSYS NAME	DATASET NAME	CONC ORD
.....	TASKLIB	IEC1	IM.COPE.LOAD	1
.....	TASKLIB	IEC2	IM.COPE.LOAD	1
.....	TASKLIB	IEC3	IM.COPE.LOAD	1
.....	TASKLIB	IEC4	IM.COPE.LOAD	1

"Exclude" Resources

Setup "Exclude" List

```
----- COPE Development System -----
1 - Setup                               Version 4.4.14
2 - Import and Generate                 Date 17/11/28
3 - Update/Copy/Move/Generate           Time 09:36
4 - Data Transform (IMS and COPE)       Julian 17.332
5 - Utilities                           Screen 1
6 - View Trace and (Xpediter TSO)       z/OS 2.02.00
T-7 - Translate Function                 IMS 14.1.0
B - Base Selection Menu
9 - IMS Type 2 Commands (SPOC)
X - Exit

Physical IMS  IMSECTL5
Procs Dataset IM.COPEU.PROCS
Master Lsys   TEC01

] Enter "JOB" ] ] Enter "EDIT" ] ] Enter "BROW" ] ] Enter "UTIL" ]
] to review job ] ] to access ] ] to access ] ] to access ]
] status ] ] ISPF Edit ] ] ISPF View ] ] ISPF Utility ]

Option ==>
```

Exclude Transactions, Programs, Databases

```
----- COPE Development System Setup -----
----- Initial COPE Installation Tasks -----
1 - Define Logical Systems
2 - Generate Batch JCL Procedure
3 - Define Batch JOB Card
4 - Edit External Interface (Batch Input) Sample JCL
5 - Specify Message Region Datasets
6 - Define Lsys Identifying Tokens (Re-Linkedit IMS Modules)
7 - Define Excluded (Not Modified by COPE) Databases and Transactions
8 - Define Common Stage 1 and Dynallocation (DFSMDA) Specifications
9 - Bind COPE DB2 Plans
----- COPE System Maintenance Tasks -----
10 - Generate Environment Member after Changes to ZDEFAULT
11 - Create a DBDLIB and PSBLIB from an IMS catalog
12 - Limit Lsys Access to Specific Users

==> //AMIGGGT JOB (YHFHYF0001),ECOMBE.COPEXXXX,CLASS=5,
==> // MSGCLASS=V,REGION=33M,NOTIFY=AMIGGGO
==> /*JOBPARM S=CW01
```

Edit "Exclude" List

```
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT      AMIGGG0.EXCLUDE(UNCLUDE) - 01.00          Columns 00001 00072
***** ***** Top of Data *****
==MSG> *****
==MSG> * USE THIS MEMBER TO SPECIFY PSB'S, DBD'S AND TRANSACTIONS THAT SHOULD *
==MSG> * NOT BE TRANSLATED BY COPE. *
==MSG> *
==MSG> * WARNING: DO NOT DELETE THE 'DATABASE' MACRO FOR THE USTDLMGR DBD. *
==MSG> * DO NOT DELETE MACROS REFERENCING OBJECTS BEGINNING 'COPE'. *
==MSG> *****
000001      APPLCTN PSB=COPEAPI,PGMTYPE=(TP,5)
000002      TRANSACT CODE=COPEAPI,PROCLIM=(5,5),PRTY=(7,7,65535), *
000003      MSGTYPE=(SNGLSEG,RESPONSE),MODE=SNGL
000004      APPLCTN PSB=HGIMS,PGMTYPE=(TP,5)
000005      TRANSACT CODE=HGIMS,PROCLIM=(5,5),PRTY=(7,7,65535), *
000006      MSGTYPE=(SNGLSEG,RESPONSE),MODE=SNGL
000007      DATABASE ACCESS=EX,DBD=XPIMSDBT
000008      DATABASE ACCESS=EX,DBD=XPGSAMD
000009      DATABASE ACCESS=EX,DBD=IMSVX000
000010      DATABASE ACCESS=EX,DBD=IMSV0000
Command ==> Scroll ==> CSR
```

Agenda

- The Compuware DevOps story
- What is IMS Virtualization?
- How do we define the Virtual Environment?
- **How does COPE transform Programs and Databases?**
- How does a Transaction run in a COPE environment?
- What technologies work in a COPE system?
- Demo
- Wrap up



COPE ISPF Interface: Transform IMS Resources

COPE Main ISPF Screen

```

Session A - [24 x 80]
----- COPE Development System -----
1 - Setup                               Version 4.4.14
2 - Import and Generate                  Date 17/08/31
3 - Update/Copy/Move/Generate           Time 12:35
4 - Data Transform (IMS and COPE)       Julian 17.243
5 - Utilities                           Screen 1
6 - View Trace                          z/OS 2.03.00
T-7 - Translate Function                 IMS 14.1.0
B - Base Selection Menu
9 - IMS Type 2 Commands (SPOC)
X - Exit
  
```

Step 1: Import IMS Resources

```

Session A - [24 x 80]
----- COPE Development System Import -----

Logical System ==> IEC1
Input Dataset ==> 'IMS141A.COPE.DEV.INSTALIB' (Or Catalog
                                                extract name if DBD or PSB)
----- Input IMS Definitions into COPE -----
Stage 1
S1-1 - Import Entire Stage 1 Source to COPE Dictionary
      Dynalloc
      DYN-2 - Import Dynalloc (Source or Load) to COPE Dictionary
            DBD-3 DBD DBDCOPY-3C
            Import and Generate DBD (Source/Load/Dictionary) or Import DBDCOPY Members
            PSB-4 PSB PSBCOPY-4C
            Import and Generate PSB (Source/Load/Dictionary) or Import PSBCOPY Members
            MFS-5 MFS MFSCOPY-5C
            Import and Generate MFS Source or Import MFSCOPY Members
            Recon
            REC-6 - Create and Generate Recon Database Definitions
  
```

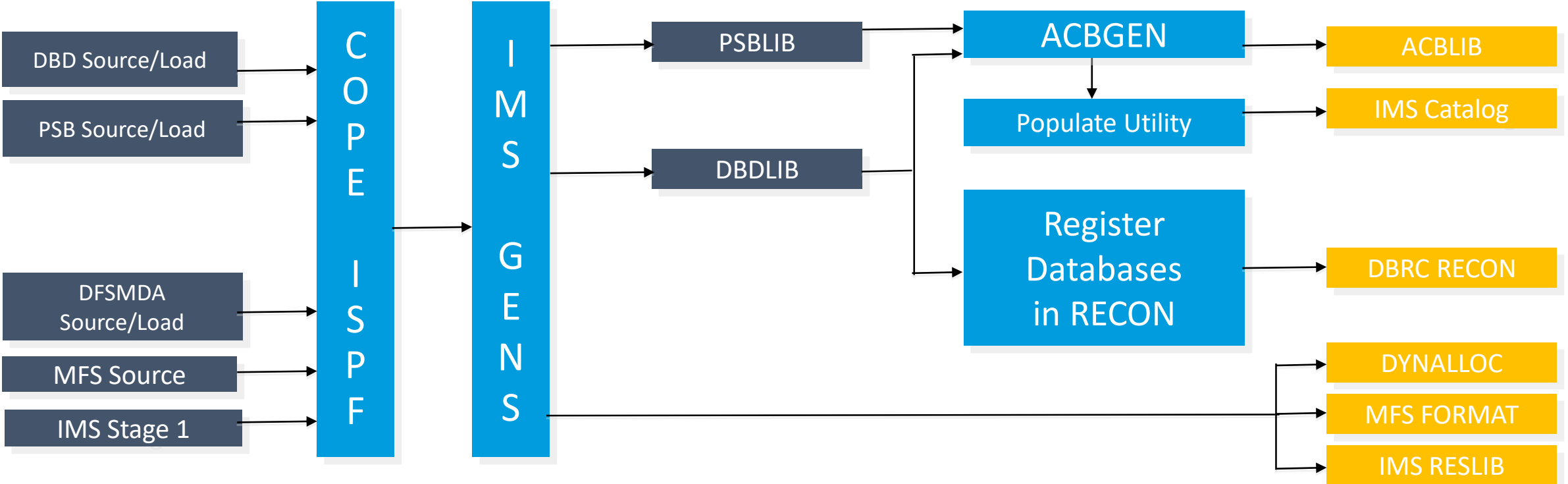
Step 2: Execute IMS Transformations

```

Session A - [24 x 80]
----- COPE Development System Transform -----

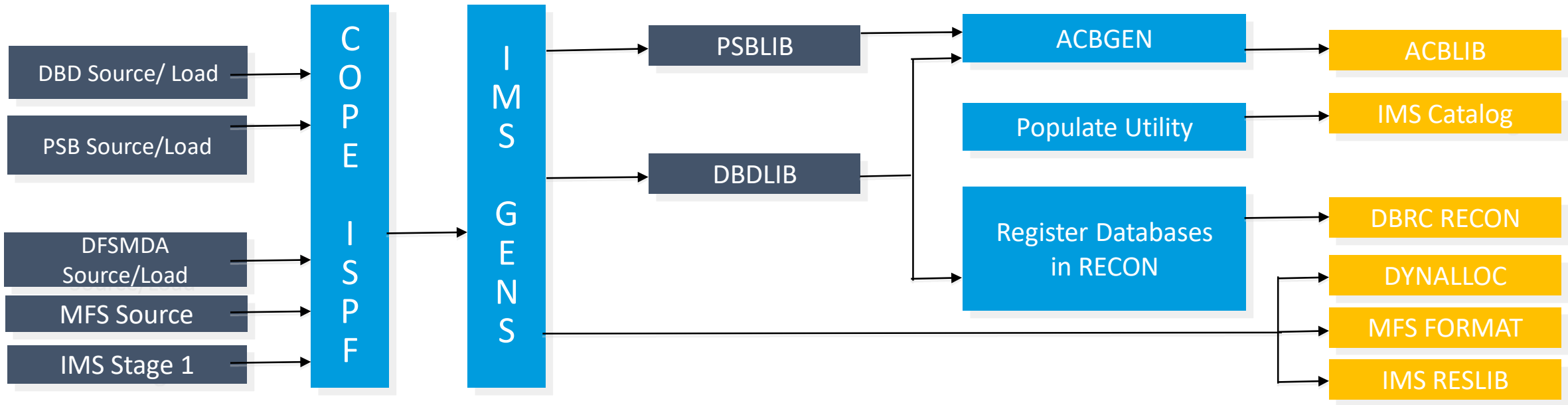
IMS Data Transformations
-----
S1-1 - Perform a Stage1 Generation and Update Executing System
For COPE - Edit (and submit) a Stage 1 member
S1E-1E
S2-2 - Edit (and submit) a Stage 2 member
      DYN-3 - Perform a Dynalloc Generation for all Databases
      PSB-4 - Perform a PSBGEN
      ACB-5 - Perform an ACBGEN
      DBRC - Create/Generate DBRC definitions
----- COPE to IMS Execution Environment Transformations -----
REF-6 - Refresh COPE Name Translation Members (COPEXRF1/2/3)
MFS-7 - Generate MFS Name Translation Table (COPEMFSX)
----- COPE Internal Transformations -----
RPSB-8 - Recreate Dictionary of PSB Definitions
RSS-9 - Recreate COPE Transaction and Database Start/Stop Definitions
----- COPE Dictionary -----
D-10 - Internal COPE Dictionary Tables
Option ==>
  
```

Transforming IMS into a COPE Virtualized Environment



COPE Cross-reference Tables

Transforming IMS into a COPE Virtualized Environment



DBD

```

DBD NAME=DBD1
SEGM NAME=DBD1SEG1,...
FIELD NAME=DBD1FLD1,...
...
DBDGEN
FINISH
END
    
```

DBD

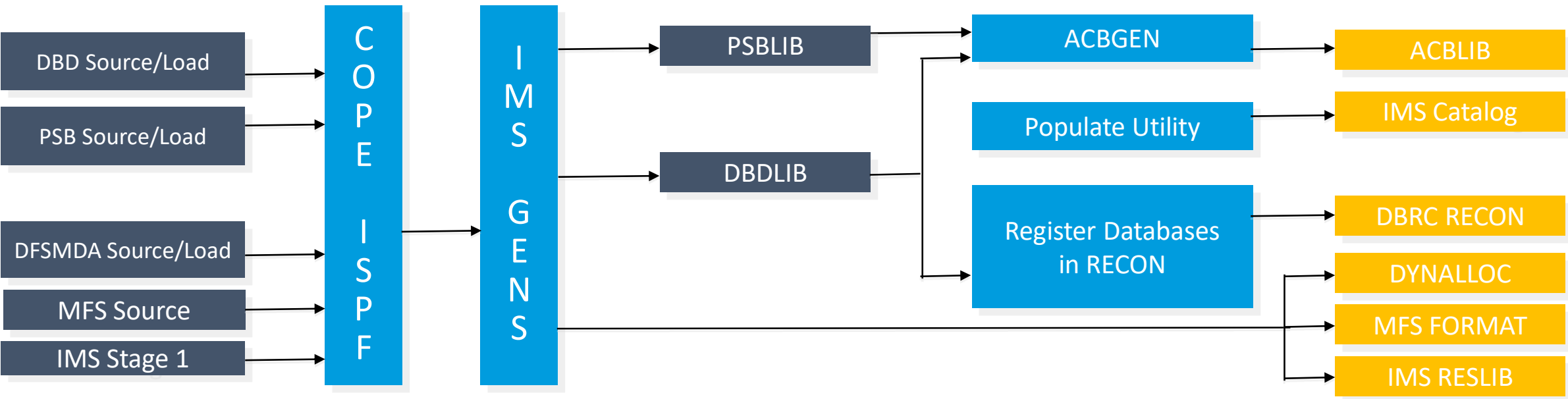
```

DBD NAME=DBD2
SEGM NAME=DBD2SEG1,...
FIELD NAME=DBD2FLD1,...
...
DBDGEN
FINISH
END
    
```

TRANSFORM

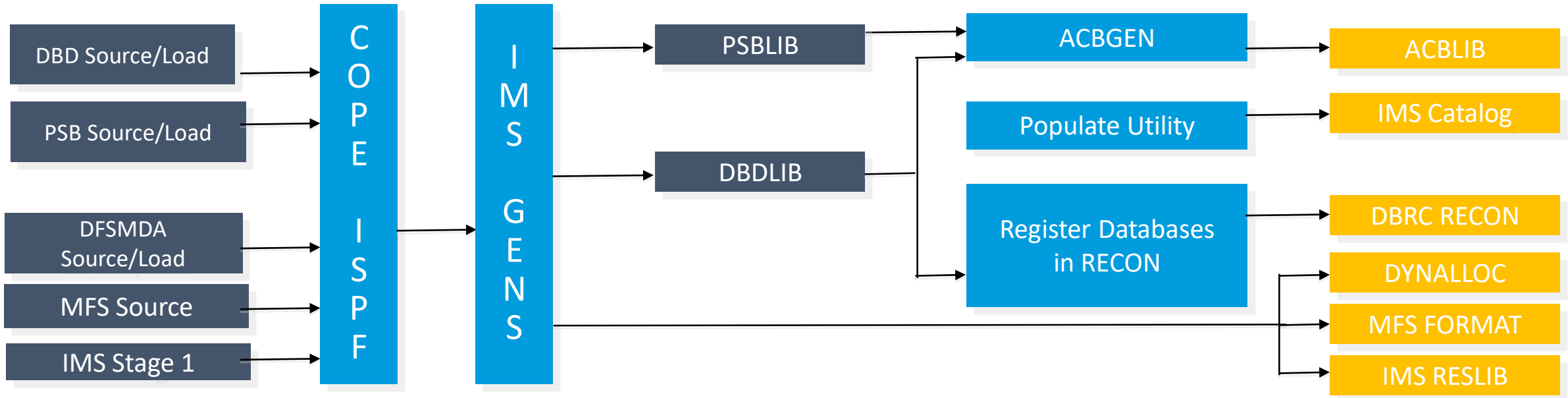
LSYS	DBD	COPE DBD	COPE DBDS
IEC1	DBD1	C1DBD1	IEC1.DBDS.DBD1
IEC2	DBD1	C2DBD1	IEC2.DBDS.DBD1
IEC3	DBD1	C3DBD1	IEC3.DBDS.DBD1
IEC1	DBD2	C1DBD2	IEC1.DBDS.DBD2
IEC2	DBD2	C2DBD2	IEC2.DBDS.DBD2
IEC3	DBD2	C3DBD2	IEC3.DBDS.DBD2

Transforming IMS into a COPE Virtualized Environment



		LSYS	Trancode	Program	COPE Stubx/PSB	DBD	COPE DBD
PSB	PCB TYPE=DB,DBDNAME=DBD1 SENSEG NAME=DBD1SEG1,...	IEC1	TRAN1	MPPPG1	CMPPPG1	DBD1	C1DBD1
	... PSBGEN PSBNAME=MPPPG1 END	IEC2	TRAN1	MPPPG1	CMPPPG1	DBD1	C2DBD1
		IEC3	TRAN1	MPPPG1	CMPPPG1	DBD1	C3DBD1
Stage 1	DATABASE DBD=DBD1 APPLCTN PSB=MPPPG1 TRANSACTION CODE=TRAN1	IEC1	TRAN2	MPPPG2	CMPPPG2	DBD2	C1DBD2
		IEC2	TRAN2	MPPPG2	CMPPPG2	DBD2	C2DBD2
	DATABASE DBD=DBD2 APPLCTN PSB=MPPPG2 TRANSACTION CODE=TRAN2	IEC3	TRAN2	MPPPG2	CMPPPG2	DBD2	C3DBD2

Transforming IMS into a COPE Virtualized Environment



DFSMDA

```
DFSMDA TYPE=INITIAL
DFSMDA TYPE=DATABASE,DBNAME=DBD1
DFSMDA TYPE=DATASET,
    DSNNAME=IMS.DBDS.DBD1,
    DDNAME=DBD1DD
DFSMDA TYPE=DATABASE,DBNAME=DBD2
DFSMDA TYPE=DATASET,
    DSNNAME=IMS.DBDS.DBD2,
    DDNAME=DBD2DD
...
DFSMDA TYPE=FINAL
END
```

TRANSFORM

LSYS	DBD	COPE DBD	COPE DBDS	COPE DDNAME
IEC1	DBD1	C1DBD1	IEC1.DBDS.DBD1	C1DBD1DD
IEC2	DBD1	C2DBD1	IEC2.DBDS.DBD1	C2DBD1DD
IEC3	DBD1	C3DBD1	IEC3.DBDS.DBD1	C3DBD1DD
IEC1	DBD2	C1DBD2	IEC1.DBDS.DBD2	C1DBD2DD
IEC2	DBD2	C2DBD2	IEC2.DBDS.DBD2	C2DBD2DD
IEC3	DBD2	C3DBD2	IEC3.DBDS.DBD2	C2DBD2DD

Agenda

- The Compuware DevOps story
- What is IMS Virtualization?
- How do we define the Virtual Environment?
- How does COPE transform Programs and Databases?
- **How does a Transaction run in a COPE environment?**
- What technologies work in a COPE system?
- Demo
- Wrap up



Select the COPE for IMS Logical System (LSYS)

Step 1: Sign on to IMS

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help
DFS3649A /SIGN COMMAND REQUIRED FOR IMS IEC0

DATE: 09/01/17    TIME: 09:37:40

NODE NAME: TCP06009

USERID: amiggg0

PASSWORD:

USER DESCRIPTOR: _
GROUP NAME:
NEW PASSWORD:

OUTPUT SECURITY AVAILABLE
  
```

Step 2: Enter COPE Tran

```

Session A - [24 x 80]
File Edit View Communication
COPE
  
```

Step 3: Enter COPE User Screen and Select LSYS

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help
COPE IEC1 AMIGGG0 11:28 IMSEMR1A
====> IEC2_

Enter a command above, or PF1 to access the tutorial.

Lsys          - Logon to, or change to, logical system Lsys
/FOR Format    - Display MFS format
ABS           - Display last ABend Summary screen
SS            - Start/Stop databases or transactions
TRACE ON     - Turn DLI and SQL call trace on

AVAIL> IEC1 IEC2 IEC3 IEC4
  
```

Step 4: LSYS = IEC2 Selected

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help
COPE IEC2 AMIGGG0 11:32 IMSEMR1A
====>
User AMIGGG0 changed logon from IEC1 to IEC2
Programs are loaded using real names (not C-numbers), from the following
concatenation of libraries (for Lsys IEC2 in region IMSEMR1A):

=LIB=> IM.COPE.LOAD

The DDname search order is: C0000002 COPESTEP STEPLIB
Use the LIB COPESTEP command to see the libs on COPESTEP.
ESTAEs curr active: COPEXP7 DFSPCRP0

IMS Rel 14.1 (14.1 in ISPF/14.1 Sim), MVS 2.03 Cope 4.4.14

AVAIL> IEC1 IEC2 IEC3 IEC4
  
```

COPE Cross-reference Table

LSYS	IMS User
IEC1	AMIGGG0
IEC2	AMIGGG0

Executing a Transaction in COPE for IMS

Step 1: Enter Transaction in LSYS IEC2

Step 2: Enter Data into MFS Screen

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help
COPE IEC2 AMIGGGO 12:39 IMSEMR1A
=====> /FOR IVTNO_

Enter a command above, or PF1 to access the tutorial.

Lsys          - Logon to, or change to, logical system Lsys
/FORMAT      Format - Display MFS format
ABS          - Display last ABend Summary screen
SS           - Start/Stop databases or transactions
TRACE ON     - Turn DLI and SQL call trace on

AVAIL> IEC1  IEC2  IEC3  IEC4
    
```

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help
*****
* IMS INSTALLATION VERIFICATION PROCEDURE *
*****

TRANSACTION TYPE : NON-CONV (OSAM DB)
DATE             : 09/01/2017

PROCESS CODE (*1) : _ (*1) PROCESS CODE
LAST NAME        : ADD
FIRST NAME       : DELETE
EXTENSION NUMBER : UPDATE
INTERNAL ZIP CODE : DISPLAY
                : TADD
                :
                : SEGMENT# :
    
```

Step 3: Run Program in COPE

MPP
COPERC00

1. Run COPE Stubx = CDFSIVP1
2. Find USERID in IOPCB
3. Associate with USERID with LSYS
4. Find program = DFSIVP1 in correct PGMLIB
5. Run program = DFSIVP1
6. Dynamically allocate databases

COPE Program and Transaction Cross-reference Table

LSYS	Trancode	Program	COPE Stubx	DBD	COPE DBD
IEC2	IVTNO	DFSIVP1	CDFSIVP1	DFSIVD1	CDFSIVD1

COPE User to LSYS Cross-reference Table

LSYS	IMS User
IEC2	AMIGGGO

COPE for IMS Start/Stop Application

Step 1: COPE User Screen

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
COPE IEC1 AMIGGG0 10:27 IMSEMR1A
=====>
Enter a command above, or PF1 to access the tutorial.
Lsys - Logon to, or change to, logical system Lsys
/FOR Format - Display MFS format
ABS - Display last ABend Summary screen
SS - Start/Stop databases or transactions
TRACE ON - Turn DLI and SQL call trace on
AVAIL> IEC1 IEC2 IEC3 IEC4
```

Step 2: COPE Start/Stop Application

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
COPE DATABASE/TRANSACTION START/STOP
SELECT FUNCTION ==>
ACTION ==> (S-START P-STOP OR BLANK-DISPLAY)
DB/TR ==> DB
NAME ==>
SYSTEM ==> IEC1_ (BLANK FOR LIST)
USER NAME ==> AMIGGG0
DISPLAY ==> (G-GROUPS P-STOPPED BLANK-ALL)
LOG SWITCH ==> NOFE0V (NORMALLY NOFE0V)
```

LSYS = IEC1

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
COPE START/STOP DATABASE
SELECT FUNCTION ==>
SYSTEM: IEC1 DB:
USER: AMIGGG0 10:51 AMIGGG0 17.244 DISPLAY:
(S-START P-STOP X-DISPLAY)
S/P/X DATABASE G STOPPED DESCRIPTION
AUTODB++ B 0/4 AUTODB
- CUSDB A
CUSDB++ B 1/7 CUSDB
DBFSAMD3 A STOPPED
```

LSYS = IEC2

```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
COPE START/STOP DATABASE
SELECT FUNCTION ==>
SYSTEM: IEC2 DB:
USER: AMIGGG0 10:53 AMIGGG0 17.244 DISPLAY:
(S-START P-STOP X-DISPLAY)
S/P/X DATABASE G STOPPED DESCRIPTION
AUTODB++ B 0/4 AUTODB
- CUSDB A STOPPED
CUSDB++ B 2/7 CUSDB
DBFSAMD3 A STOPPED
```

COPE LSYS Databases Can Have Different Statuses

Executing a BMP, DBB or Batch Job in COPE

Method 1: Specify LSYS Name in IMSID PARM (ex. IEC2)

BMP and DBB (13th positional PARM)
 Batch job (11th positional PARM)

```
//STEP EXEC PGM=DFSRR00,  
//   PARM=(BMP,PROG,PSB,,,,,,,,,IEC2)
```

Method 2: Specify LSYS Name in Temporary DS (ex. IEC3)

BMP, DBB or Batch Job

```
//STEP1 EXEC PGM=DFSRR00  
//COPEBSYS DD DSN=&&IEC3,  
//   UNIT=SYSDA,SPACE=(TRK,1)
```

Method 3: Specify LSYS Name in JOB Card (ex. IEC4)

BMP (2nd positional parm – Programmer's name field)

```
//FRED JOB (ACCT),IEC4,  
//   MSGLEVEL=(1,1),CLASS=F
```

Agenda

- The Compuware DevOps story
- What is IMS Virtualization?
- How do we define the Virtual Environment?
- How does COPE transform Programs and Databases?
- How does a Transaction run in a COPE environment?
- **What technologies work in a COPE system?**
- Demo
- Wrap up



COPE with IBM, BMC, CA and Other Utilities

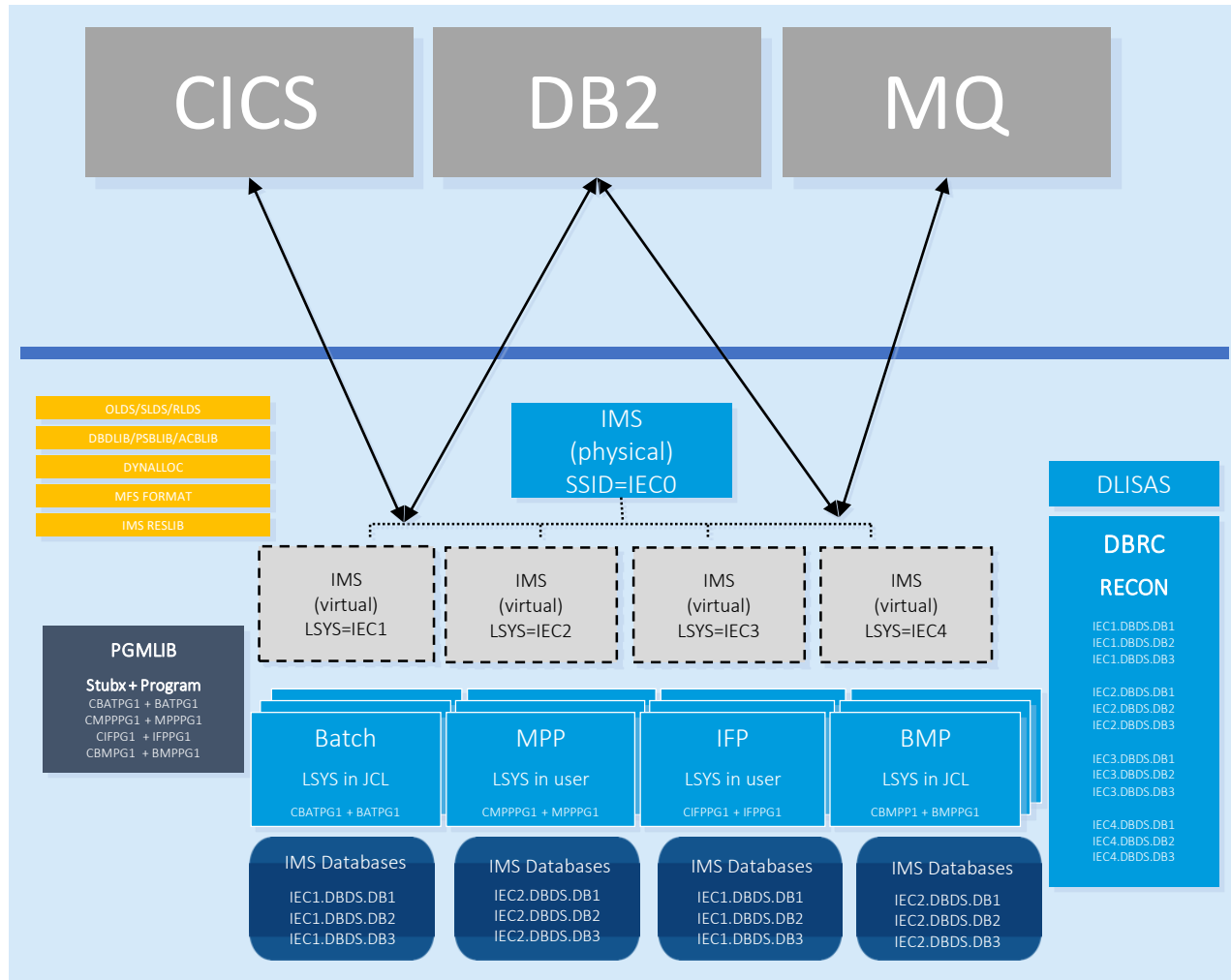
COPE has special code to translate database and program utility inputs to their IMS LSYS names

Specify LSYS name in temporary dataset for utility

IBM, BMC, CA and other Utilities

```
//STEP1 EXEC PGM=DFSRR00  
//COPEBSYS DD DSN=&&IEC3,  
// UNIT=SYSDA,SPACE=(TRK,1)
```

COPE for IMS Supports Many Applications and Tools



- **Dynamic Resource Support**
 - BMC Delta
 - IBM ETO support
 - IBM DRD
- **Application Debugging**
 - Compuware
 - Xpediter (TSO and Eclipse)
 - Abend-AID
 - File-AID (in plan)
 - IBM Debug Tool
- **Date/Time Altering Software**
 - IBM Hourglass
 - Compuware Xchange

Agenda

- The Compuware DevOps story
- What is IMS Virtualization?
- How do we define the Virtual Environment?
- How does COPE transform Programs and Databases?
- How does a Transaction run in a COPE environment?
- What technologies work in a COPE system?
- **Demo**
- Wrap up



Agenda

- The Compuware DevOps story
- What is IMS Virtualization?
- How do we define the Virtual Environment?
- How does COPE transform Programs and Databases?
- How does a Transaction run in a COPE environment?
- What technologies work in a COPE system?
- Demo
- **Wrap up**



The Benefits of IMS Virtualization with COPE

- **Less usage of CSA**
 - Reduction in number of IMS control regions and their associated address spaces
- **Potential elimination of duplicate MQM and Db2 system resources**
- **Buffer pools:**
 - Duplicate DB buffer pools are removed. There is a 'rule of thumb' that you can calculate that you can replace any number of buffer pools with 1.3 times the size of the largest one.
 - All duplicate TP buffer pools can be replaced with a single definition equivalent to the largest one.
 - Elimination of duplicate DB2 systems buffers (not data). The reduction of working sets can be massive.
- **Message region**
 - All message regions can be replaced with $1.3 * \text{Largest number of message regions}$ for any existing system.
- **DASD**
 - The only DASD savings is the elimination of duplicate IMS system datasets (DBDLIB, PSBLIB, FORMAT, OLDS, ACBLIBS together with their source datasets).
 - Each Logical System (Lsys) has duplicate data datasets.

Overhead of COPE

Measuring IMS resource usage is difficult/impossible. Comparing multiple IMS non- COPE systems with a COPE system with different users and transaction volumes and transactions is not possible in any meaningful way if the results are to be extended to a different system with different DB2 and DL1 data and different applications.

In the early days of COPE usage, we had a customer use **STROBE** to find the overhead of COPE usage. The differences were so small that no significant difference was detectable.

The overhead of execution under COPE is restricted to an additional GU to a HDAM database to find the users logical system (Lsys) and an additional program load caused by the STUBX (dataset of COPE) being loaded before the application. With a correct setup of LE this is very small.

Occasionally there is an additional message switch caused by overflow PSBs being required. This impact is very small since only a single GU database call is required followed by an insert of the input message.

The ACBLIB increase can be calculated by the following:

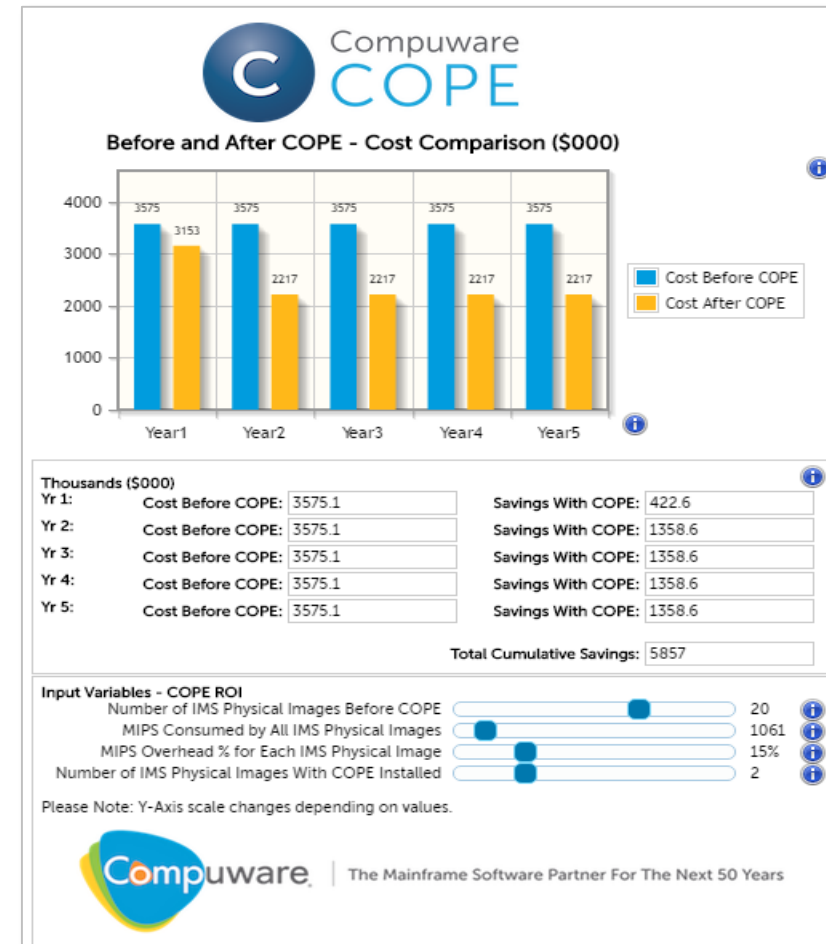
(Number of TP PCBs plus (the number of BMP plus Batch PSBS) multiplied with the number of logical systems).

The ACBs can be put above the 64M line so there is insignificant impact.





The Benefits of IMS Virtualization with COPE

Cost Justification

- No CPU resources for desired number of virtual environments
- Licensing cost of IMS because of less IMS systems needed



In Summary...

-  Compuware **COPE™** supports rapid deployment with Virtual IMS systems
-  Compuware **COPE™** reduces CPU by eliminating IMS address spaces
-  Compuware **COPE™** supports Program and Database versioning
-  Compuware **COPE™** does not require any application changes



We want your feedback!

- Please submit your feedback online at
 - <http://conferences.gse.org.uk/2018/feedback/MG>
- Paper feedback forms are also available from the Chair person
- This session is MG
- Thank You

