



CICS Interdependency Analyzer for z/OS v1.3

What's new ?

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Preface

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 - ▶ DB2, QMF
 - ▶ DFSMS/MVS, TotalStorage
 - ▶ IBM
 - ▶ MQSeries
 - ▶ OS/390, S/390, z/OS
 - ▶ RMF, Resource Measurement Facility
 - ▶ WebSphere
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What is CICS IA ?

- CICS Interdependency Analyzer for z/OS

- ▶ run-time tool for use with CICS TS for z/OS
- ▶ identifies the sets of resources used by CICS transactions, and their relationships to other resources
- ▶ consists of,
 - run-time collector
 - query interface
 - batch reporter
 - load module scanner

- Program Product - 5655-G76

- ▶ Not part of CICS Transaction Server for z/OS



CICS IA Benefits

- enables you to understand the make-up of your application set

- you can see
 - ▶ what resources a CICS region uses
 - ▶ what resources a transaction needs in order to run
 - ▶ which programs use which resources
 - ▶ which resources are no longer used
 - ▶ etc.

- thus the ability to maintain, enhance, modify or redistribute your applications is much improved



CICS IA Highlights

- Support for all current CICS resources, including those introduced in CICS TS for z/OS Version 2.2.
 - ▶ TCPIP, WEB, JAVA, FEPI , COUNTER are collected
- Collection of resource relationships for most CICS SPI commands.
- Collection of resource relationships for the following non-CICS API commands:
 - ▶ EXEC SQL calls to DB2 Universal Database
 - ▶ MQM calls to WebSphere MQ
 - ▶ EXEC DLI calls to IMS Database resources
 - ▶ Dynamic COBOL calls to other programs



CICS IA Highlights *(continued)*

- Collection of SYSID information on commands, even when the SYSID option is not specified on the command but is set by other means.
 - ▶ on an User Exit , e.g. workload balancing
 - ▶ on the CICS resource definition
- Ability to gather dependency information for several regions into one VSAM file.
- Ability to control CICS IA collectors on multiple regions from a single CICS terminal.

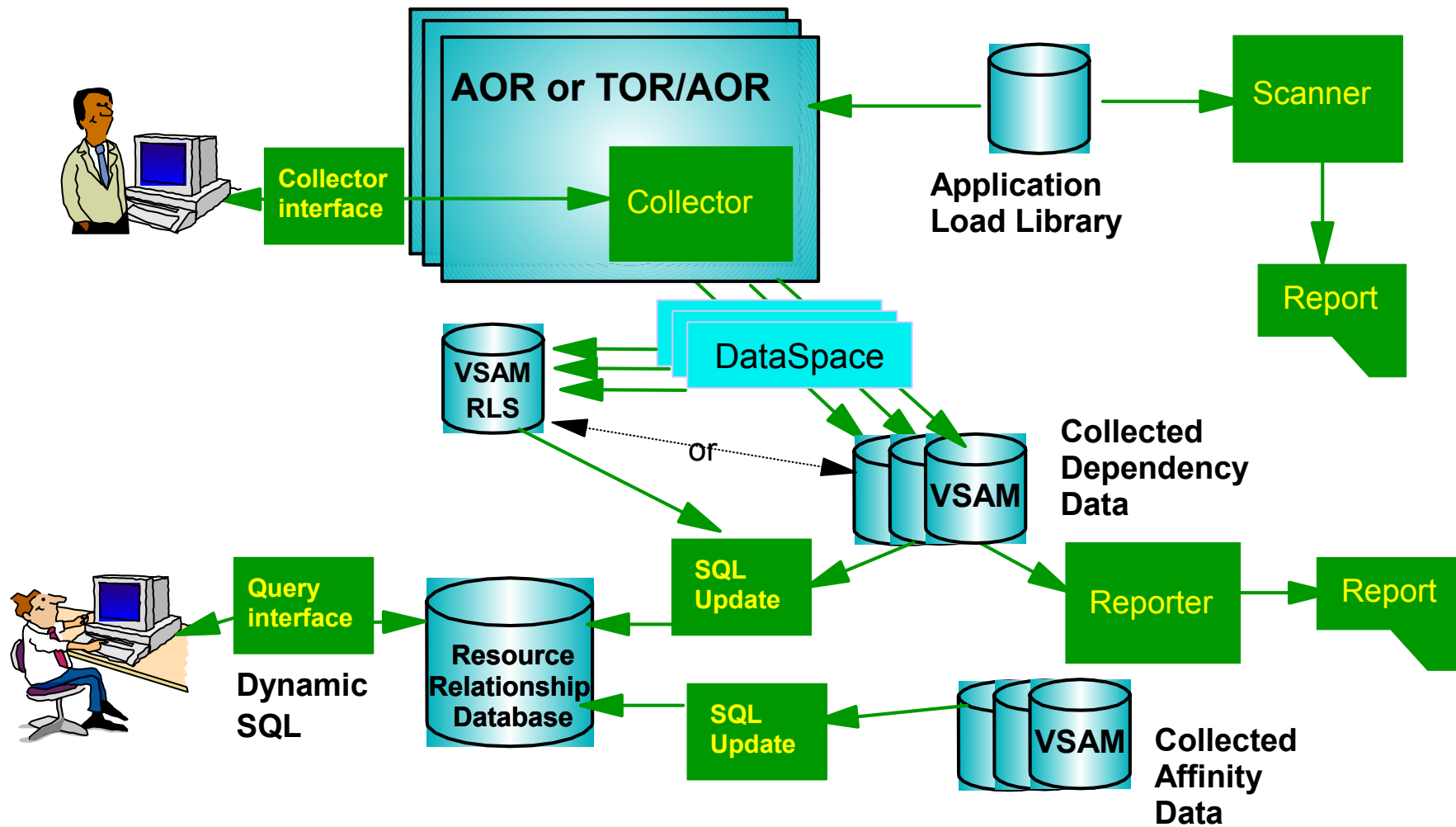


CICS IA Requirements

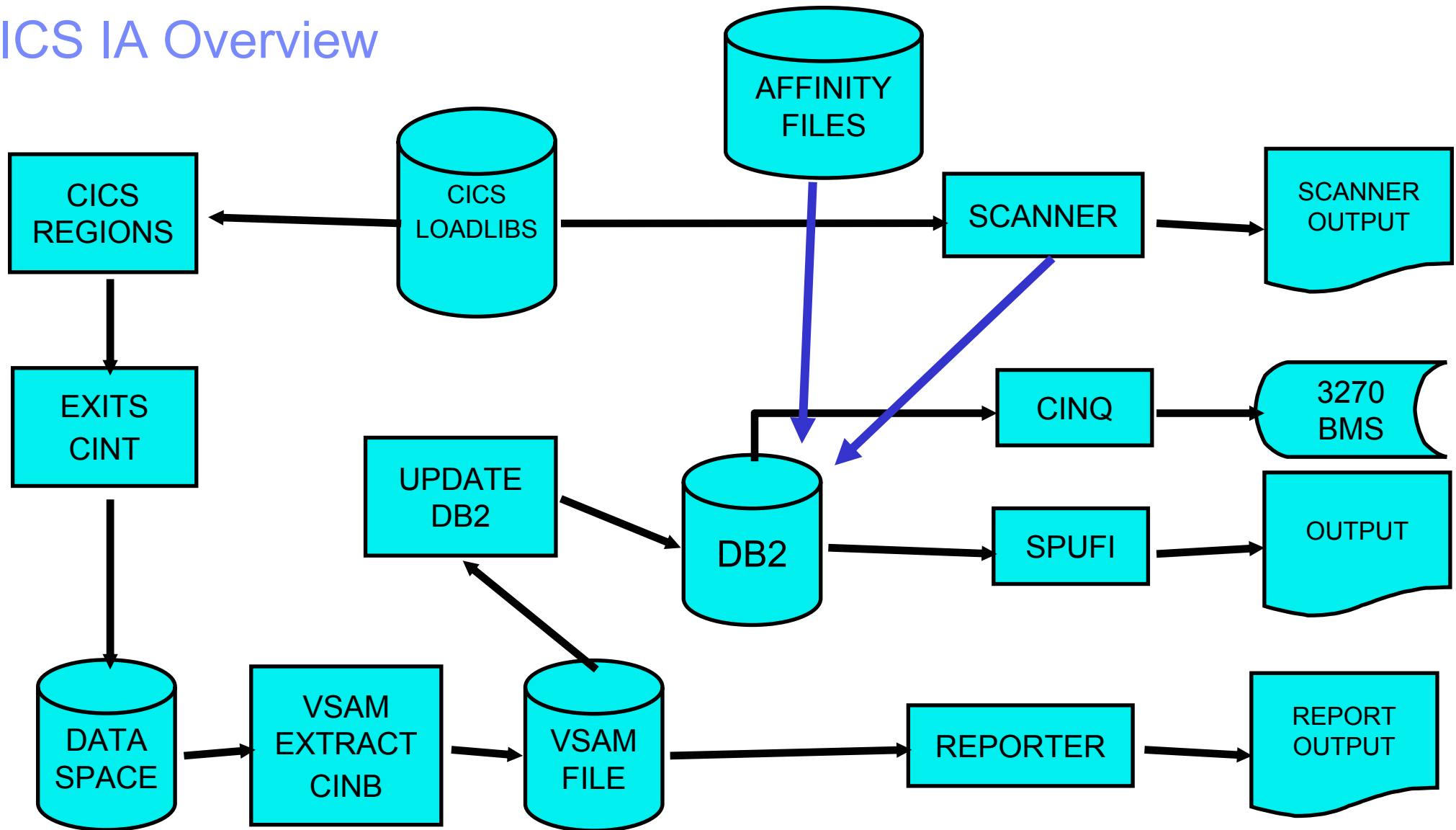
- OS/390 Version 2.10 or later
- CICS Transaction Server for OS/390 or CICS Transaction Server for z/OS
 - TS 2.2 - UQ90107 (Sysid Support)
 - TS 2.3 - UQ90108
- LE/390 or COBOL/MVS run-time library
- DB2
- VSAM RLS



CICS IA - Overview



CICS IA Overview





CICS Interdependency Analyzer for z/OS

The Collector

Commands Monitored by CICS IA

CICS API Commands

**SEND MAP, RECEIVE MAP
ALLOCATE, CONNECT PROCESS, SEND CONVID/ SESSION, CONVERSE CONVID/ SESSION, FREE
HANDLE ABEND PROGRAM
READ FILE, WRITE FILE, REWRITE FILE, DELETE FILE, STARTBR FILE, READNEXT FILE,
READPREV FILE, ENDBR FILE, RESETBR FILE, UNLOCK FILE
START
WAIT JOURNALNUM/NAME, WRITE JOURNALNUM/NAME
DEFINE COUNTER/ DCOUNTER, DELETE COUNTER/ DCOUNTER, GET COUNTER/DCOUNTER
QUERY COUNTER/ DCOUNTER, REWIND COUNTER/ DCOUNTER, UPDATE COUNTER/ DCOUNTER
LINK, LOAD, RETURN TRANSID, XCTL
ENQ, DEQ
READQ TS, WRITEQ TS, DELETEQ TS
READQ TD, WRITEQ TD, DELETEQ TD
WEB ENDBROWSE FORMFIELD/ HTTPHEADER, WEB EXTRACT, WEB READ FORMFIELD/ HTTPHEADER,
WEB READNEXT FORMFIELD/ HTTPHEADER, WEB RECEIVE, WEB RETRIEVE, WEB SEND,
WEB STARTBROWSE FORMFIELD/ HTTPHEADER, WEB WRITE HTTPHEADER
ADDRESS CWA, ASSIGN APPLID**

Commands Monitored by CICS IA ...

CICS SPI Commands

INQUIRE BRFACILITY, SET BRFACILITY

**CREATE CORBASERVER, INQUIRE CORBASERVER, SET CORBASERVER,
PERFORM CORBASERVER, DISCARD CORBASERVER**

CREATE DB2ENTRY, INQUIRE DB2ENTRY, SET DB2ENTRY, DISCARD DB2ENTRY

CREATE DJAR, INQUIRE DJAR, PERFORM DJAR, DISCARD DJAR

CREATE FILE, INQUIRE FILE, SET FILE, DISCARD FILE

INQUIRE JOURNALNUM/ NAME, SET JOURNALNUM/ NAME, DISCARD JOURNALNUM/ NAME

INQUIRE JVMPROFILE

CREATE PROGRAM, INQUIRE PROGRAM, SET PROGRAM, DISCARD PROGRAM

CREATE PCPIPSERVICE, INQUIRE TCPIPSERVICE, SET TCPIPSERVICE, DISCARD TCPIPSERVICE

CREATE TSMODEL, INQUIRE TSMODEL, DISCARD TSMODEL

INQUIRE TSPOOL

INQUIRE TSQUEUE, SET TSQUEUE, INQUIRE TSQNAME, SET TSQNAME

CREATE TRANSACTION, INQUIRE TRANSACTION, SET TRANSACTION, DISCARD TRANSACTION

CREATE TDQUEUE, INQUIRE TDQUEUE, SET TDQUEUE

Commands Monitored by CICS IA

CICS FEPI API Commands

FEPI ALLOCATE PASSCONVID, FEPI ALLOCATE POOL

FEPI CONVERSE DATASTREAM CONVID, FEPI CONVERSE DATASTREAM POOL, FEPI CONVERSE FORMATTED CONVID,

FEPI CONVERSE FORMATTED POOL

FEPI EXTRACT CONV, FEPI EXTRACT FIELD, FEPI EXTRACT STSN

FEPI FREE

FEPI ISSUE

FEPI RECEIVE/ SEND DATASTREAM, FEPI RECEIVE/ SEND FORMATTED

FEPI REQUEST PASSTICKET

FEPI START

FEPI INQUIRE CONNECTION, FEPI SET CONNECTION

FEPI INQUIRE NODE, FEPI SET NODE

FEPI ADD POOL, FEPI INSTALL POOL, FEPI DELETE POOL, FEPI INQUIRE POOL, FEPI SET POOL, FEPI DISCARD POOL

FEPI INSTALL PROPERTYSET, FEPI INQUIRE PROPERTYSET, FEPI DISCARD PROPERTYSET

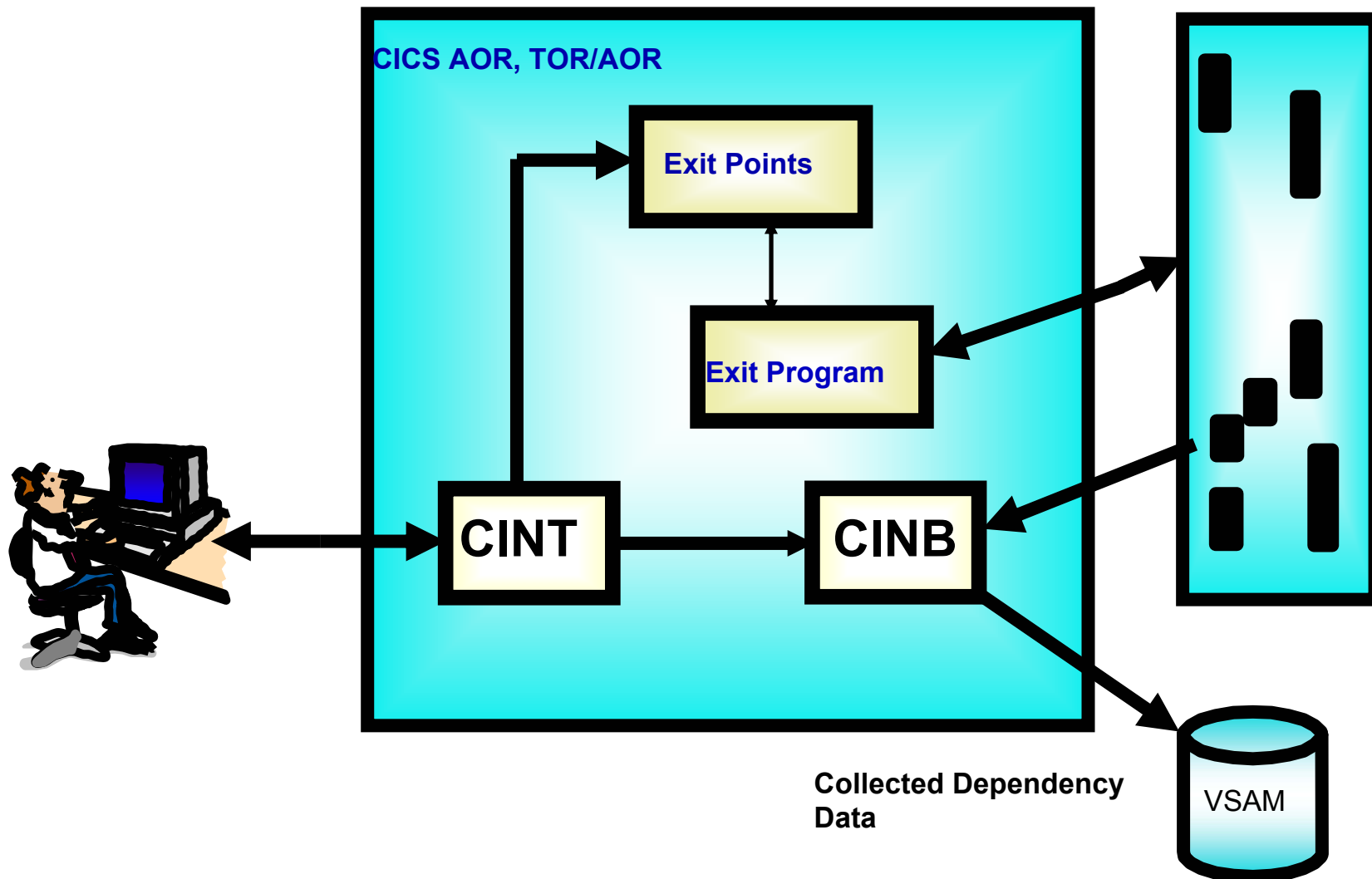
FEPI INQUIRE TARGET, FEPI SET TARGET

Commands Monitored by CICS IA ...

Non-CICS API Commands

**EXEC SQL ALTER, EXEC SQL CLOSE, EXXEC SQL CREATE,
EXEC SQL DELETE, EXEC SQL DESCRIBE, EXEC SQL DROP,
EXEC SQL EXECUTE, EXEC SQL EXECUTE IMMEDIATE,
EXEC SQL EXPLAIN, EXEC SQL FETCH, EXEC SQL INSERT,
EXEC SQL OPEN, EXEC SQL PREPARE, EXEC SQL SELECT,
EXEC SQL UPDATE
MQCLOSE, MQGET, MQOPEN, MQPUT, MQPUT1
EXEC DLI
CALL**

The Collector Architecture



CICS IA Components - The Collector

- Consists of :-

- ▶ 2 transactions :-

- CINT - drives operations and administration panels
 - CINB - background transaction that saves data to VSAM file

- ▶ several CICS 'Global User Exits' :-

- XEIIN, XEIOU
 - XFCREQC
 - XICREQC
 - XTSREQC
 - XTDEREQC
 - XPCREQC
 - XRMIIN, XRMIIOUT



CICS IA Components - The Collector

- Consists of :-
 - ▶ 7 MVS data space tables :-
 - CICS, DB2, MQ, IMS ,DTP , MQX and **CICL**
 - ▶ 6 VSAM files :-
 - CIUCNTL - control file
 - CIUINT1 – CICS collector file**
 - CIUINT2 – DB2 collector file**
 - CIUINSTC – MQ collector file**
 - CIUINT4 – IMS collector file**
 - CIUINT5 – CICS (>32byte) collector file**



CICS IA Collector – what's new ?

- Support for long ENQ/DEQ resource names.
 - ▶ Resource names can be up to 255 bytes.
 - ▶ Resources > 32 bytes are stored in the CIUINT5 VSAM file.
 - ▶ Loaded into the CIU3_CICS_DATA table.
 - ▶ Resources <= 32 bytes are stored in the CIUINT1 VSAM file
 - ▶ Loaded into the same CIU3_CICS_DATA table.
- ▶ New Affinity field set for CICS resources.
 - ▶ A one byte field has been added to the CICS data collected.
 - ▶ This will indicate if the resource is a **possible** affinity.
 - ▶ Can be used with the new Affinity Tables.



CICS IA Collector – what's new ?

- Collection of TCB mode information.
 - ▶ 2 byte TCB mode field added to all VSAM records.
 - ▶ this is populated into the respective DB2 tables.
 - ▶ tells us what TCB mode the program is in when executing the command. e.g. QR or L8.
 - ▶ Will assist customers in identifying which DB2 programs can be defined as threadsafe and which ones need to be reworked.
 - ▶ Will also assist in TCB 'swapping' performance problems.



CICS IA Collector – what's new ?

- Differentiate between main, auxiliary and shared temporary storage queues.
 - ▶ New resource types added.
 - ▶ TS – TSQUEUE MAIN
 - ▶ TSAUX – TSQUEUE AUXILLIARY
 - ▶ TSSHR – SHARED TSQUEUE (remote or CF)





CICS Interdependency Analyzer for z/OS

DB2 Tables and Views

CICS IA Components - DB2 Tables and Views

- 12 main tables
 - CIU3_CICS_DATA
 - CIU3_DB2_DATA
 - CIU3_MQ_DATA
 - CIU3_IMS_DATA
 - CIU3_SQL_DATA
 - CIU3_APPLS_DESC
 - CIU3_CICS_CHAIN
 - CIU3_CICS_CHAINP
 - **CIU3_AFF_GRP_DATA**
 - **CIU3_AFF_CMD_DATA**
 - **CIU3_SCAN_SUMMARY**
 - **CIU3_SCAN_DETAIL**
- 5 main views
 - V_CIU3_CICS_INDS
 - V_CIU3_CICS_INDS2
 - V_CIU_DB2_RES
 - V_CIU_DB2_RES2
 - **V_CIU3_AFFINITY**

CIU3_CICS_DATA

Column	Type	Description
APPLID	CHAR(8)	CICS region applid
HOMESYSID	CHAR(4)	SYSID of local region
TRANSID	CHAR(4)	CICS transaction ID
PROGRAM	CHAR(8)	Currently active CICS program
FUNCTION	CHAR(8)	EXEC CICS command name, such as READ, WRITEQ ¹
TYPE	CHAR(8)	Resource type, such as TS, program ¹
OBJECT	CHAR(255)	Resource name ²
RMTSYSID	CHAR(4)	Remote SYSID where relevant ³
RMTNAME	CHAR(8)	Name by which the resource is known in the remote region
TERMTRAN	CHAR(1)	Whether there is a terminal associated with the transaction: Y Terminal transaction N Non-terminal transaction
TCBMODE	CHAR(2)	CICS TCB in which the application is running; for example, QR or L8
AFFINITY	CHAR(1)	Whether the EXEC CICS command could cause an affinity: Y Yes N No

CIU3_CICS_DATA cont

Column	Type	Description
OFFSET	CHAR(8)	The offset of the command from the start of the program
USECOUNT	INTEGER	Number of occurrences
FIRST_RUN	time	Time of first occurrence
LAST_RUN	time	Time of latest observation

CIU3_DB2_DATA

Column	Type	Description
APPLID	CHAR(8)	CICS region applid
HOMESYSID	CHAR(4)	SYSID of local region
DB2ID	CHAR(4)	DB2 subsystem ID
TRANSID	CHAR(4)	CICS transaction ID
PROGRAM	CHAR(8)	CICS program name
PLAN	CHAR(8)	DB2 plan ID
FUNCTION	CHAR(24)	EXEC SQL command name, such as CREATE, UPDATE ¹
SECTION	SMALL INT	The section number, in the source code of the CICS program, at which the DB2 command is issued
STATEMENT	SMALL INT	The pre-compiler statement number, in the source code of the CICS program, at which the DB2 command is issued
RESTYPE	CHAR(10)	DB2 resource type
RESNAME	CHAR(40)	DB2 resource name
TERMTRAN	CHAR(1)	Whether there is a terminal associated with the transaction: Y Terminal transaction N Non-terminal transaction
TCBMODE	CHAR(2)	CICS TCB in which the application is running; for example, QR or L8

CIU3_DB2_DATA cont

Column	Type	Description
OFFSET	CHAR(8)	The offset of the command from the start of the program
USECOUNT	INTEGER	Number of occurrences
FIRST_RUN	time	Time of first occurrence
LAST_RUN	time	Time of latest observation

CIU3_MQ_DATA

Column	Type	Description
APPLID	CHAR(8)	CICS region applid
HOMESYSID	CHAR(4)	SYSID of local region
TRANSID	CHAR(4)	CICS transaction ID
PROGRAM	CHAR(8)	CICS program name
FUNCTION	CHAR(8)	MQM command name, such as MQGET, MQPUT ¹
TYPE	CHAR(8)	Resource type ¹
OBJECT	CHAR(48)	Resource name ²
TERMTRAN	CHAR(1)	Whether there is a terminal associated with the transaction: Y Terminal transaction N Non-terminal transaction
TCBMODE	CHAR(2)	CICS TCB in which the application is running; for example, QR or L8
OFFSET	CHAR(8)	The offset of the command from the start of the program
USECOUNT	INTEGER	Number of occurrences
FIRST_RUN	time	Time of first occurrence
LAST_RUN	time	Time of latest observation

CIU3_IMS_DATA

Column	Type	Description
APPLID	CHAR(8)	CICS region applid
HOMESYSID	CHAR(4)	SYSID of local region
TRANID	CHAR(4)	CICS transaction ID
PROGRAM	CHAR(8)	Currently-active CICS program
CALLTYPE	CHAR(4)	Reserved
FUNCTION	CHAR(12)	DLI command
TYPE	CHAR(4)	PSB or PCB
OBJECT	CHAR(8)	PSB name or PCB name
TERMTRAN	CHAR(1)	Whether there is a terminal associated with the transaction: Y Terminal transaction N Non-terminal transaction
TCBMODE	CHAR(2)	CICS TCB in which the application is running; for example, QR or L8
OFFSET	CHAR(8)	The offset of the command from the start of the program
USECOUNT	INTEGER	Number of occurrences
FIRST_RUN	TIMESTAMP	Time of first occurrence
LAST_RUN	TIMESTAMP	Time of last occurrence

CIU3_SQL_DATA

Column	Type	Description
KEY1	SMALLINT	Option selected from first menu screen. Value 1-10
KEY2	SMALLINT	Option selected from second menu. Value 1-11
KEY3	SMALLINT	Indicator of precise or 'LIKE' selection
KEY4	SMALLINT	Indicator of extra details required: (1) =YES (0)=NO
KEY5	SMALLINT	unused
APP	CHAR(3)	Application code if selected, or ??? if not selected
SEQ	SMALLINT	Sequence in which SQL text read
USECOUNT	INTEGER	Number of occurrences
SQLTEXT	CHAR(80)	SQL text used to satisfy query



CICS Interdependency Analyzer for z/OS

New DB2 Query Interface

```

E - mvs21
File Edit View Communication Actions Window Help
[Icons]

CIU400          CICS Interdependency Analyzer for z/OS - V1R3M0          09/12/04
                  Query Menu                                          15:58:50

Select one of the following.  Then press Enter.

-  1  Inquire on CICS Resources.
    2  Inquire on DB2 Resources.
    3  Inquire on MQ Resources.
    4  Inquire on IMS Resources.
    5  Additional inquire on DB2 Resources.
    6  Inquire on CICS Affinities.

CICS Sysid:  TLS4   CICS Applid:  IYCLZC04   TermID:  TC11
CIU7000I 5655-G76 (C) Copyright IBM Corp. 2001,2004
F1=Help      F2=          F3=Exit      F4=          F5=          F6=
F7=          F8=          F9=          F10=         F11=         F12=Exit

MA e                                                    06/002
[Icon] Connected to remote server/host WINMVS21 using port 23
[Icon] gbhurl89 3240/02/A on PSM:
    
```

E - mvs21

File Edit View Communication Actions Window Help

CIUA00 CICS Interdependency Analyzer for z/OS - V1R3M0 09/12/04
 CICS Affinities Query Menu 15:37:56

Select the Affinty type to query: _

1. Transactions	9. Load Hold/Release
2. Programs	A. Retrieve/Wait/Start
3. ENQ/DEQ	B. Cancel
4. TSQueues	C. CWA
5. Getmain/Freemain	D. Transaction System
6. Getmain/Freemain(Unmatched)	E. Applications
7. Load Hold/Freemain	F. Regions
8. Load Hold/Freemain(Unamtched)	G. Groups

OR display all affinities in application ____
 Enter the application's 3 character code or
 ? for a list of applications available.
 WARNING : Option C may take a long time.

CICS Sysid: TLS4 CICS Applid: IYCLZC04 TermID: TC11

F1=Help	F2=	F3=End	F4=Exit	F5=	F6=
F7=	F8=	F9=	F10=	F11=	F12=End

MA e 04/045

Connected to remote server/host WINMVS21 using port 23 gbhur189 3240/02/A on PSM:


```

E - mvs21
File Edit View Communication Actions Window Help
[Icons]

CIUA20          CICS Interdependency Analyzer for z/OS - V1R3M0          09/12/04
                Affinity Query  ENQ/DEQ                             15:38:55

Select the option that best suits your query by entering the resource
details in the field provided for each option. Use % as a wildcard
character to specify a generic name. Note: Only one option can be chosen.

1.  By transaction..... _____
2.  By program.....      %_____
3.  In region.....       _____
4.  In application.....   _____ (enter ? for a list of application codes)

CICS Sysid:  TLS4   CICS Applid:  IYCLZC04   TermID:  TC11

F1=Help      F2=          F3=End      F4=Exit     F5=          F6=
F7=          F8=          F9=          F10=        F11=         F12=End

MA e                                               09/030
Connected to remote server/host WINMVS21 using port 23 | gbhurl89 3240/02/A on PSM:
    
```

```

E - mvs21
File Edit View Communication Actions Window Help
[Icons]
CIUA60          CICS Interdependency Analyzer for z/OS - V1R3M0          09/12/04
For your Affinities Query          15:41:41
WHICH ENQ/DEQ AFFINITIES ARE IN PROGRAM %          Page 1 of 1

HOME          HAS
APPLID        PROGRAM    AFFINITY      LIFETIME      RESOURCE
IYCLZC04      CAMT200C  Background   SYSTEM        NQ200205
              EMSTESTS  GLOBAL       SYSTEM
              EQZ2REQH  GLOBAL       SYSTEM        A (144B9930)
              EQZ3SWCF  GLOBAL       SYSTEM        ABCDEFGHIJKLMNOPQRSTUVWXYZABCD..
              EQZ4SIME  Background  SYSTEM        EQZREQAUP
              EQZREQAUP
              EQZREQAUP
              EQZEVTaup

CICS Sysid:  TLS4    CICS Applid:  IYCLZC04    TermID:  TC11
CIU7011I No more details to display
F1=          F2=          F3=End      F4=Exit     F5=          F6=
F7= Page Up  F8= Page Down F9=         F10=        F11=        F12=End

MA  e                                          01/001
[Icon] Connected to remote server/host WINMVS21 using port 23          |gbhurl89 3240/02/A on PSM:
    
```