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Implementing CICS TS for VSE/ESA New Functions:
Shared Data Tables and EXCI

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Implementing CICS TS for VSE/ESA New Functions

Shared Data Tables and EXCI

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Topics



- Shared Data Tables
 - Overview
 - Types of data tables
 - Selective loading of data tables
- EXCI
 - Overview
 - Programming interfaces

CICS TS New Functions



Shared Data Tables

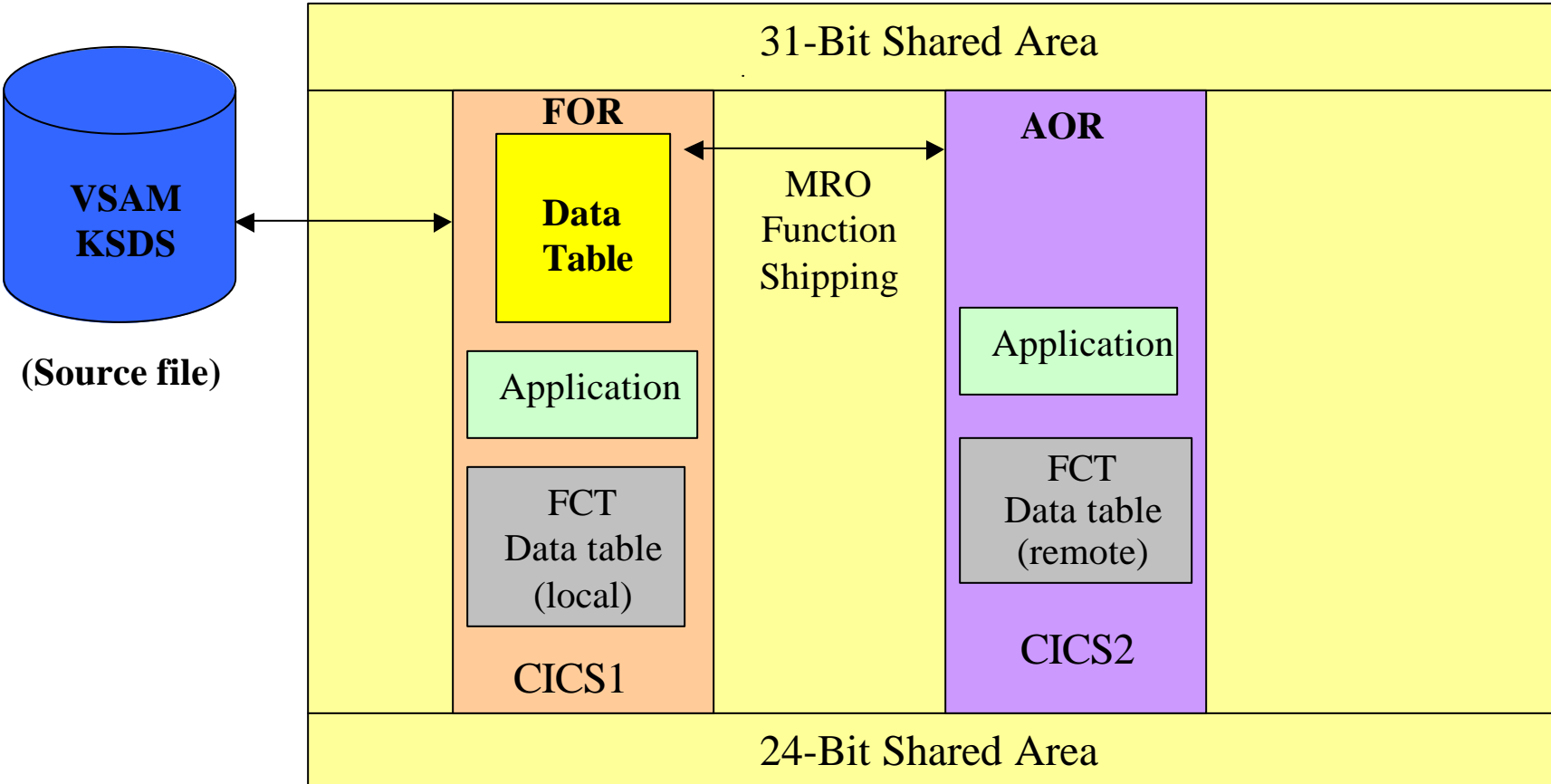
Shared Data Tables



- Data Tables Support in CICS/VSE
 - Data in memory option within CICS partition
 - | Stored in CICS partition 31-bit GETVIS area
 - High performance file access for read operations to KSDS files
 - | Full key, non-update reads only
 - | Other access tolerated but no performance benefit
 - Sharing between CICS partitions requires MRO function shipping

Shared Data Tables ...

CICS/VSE Support



Shared Data Tables ...



- Shared Data Tables in CICS TS
 - Extends previous support
 - | Still KSDS files only
 - Sharing between CICS TS partitions in same VSE system
 - | Cross memory services for read/browse data access
 - Directly from sharing partition
 - | MRO required between CICS partitions for Function Shipping
 - Control functions
 - File updates

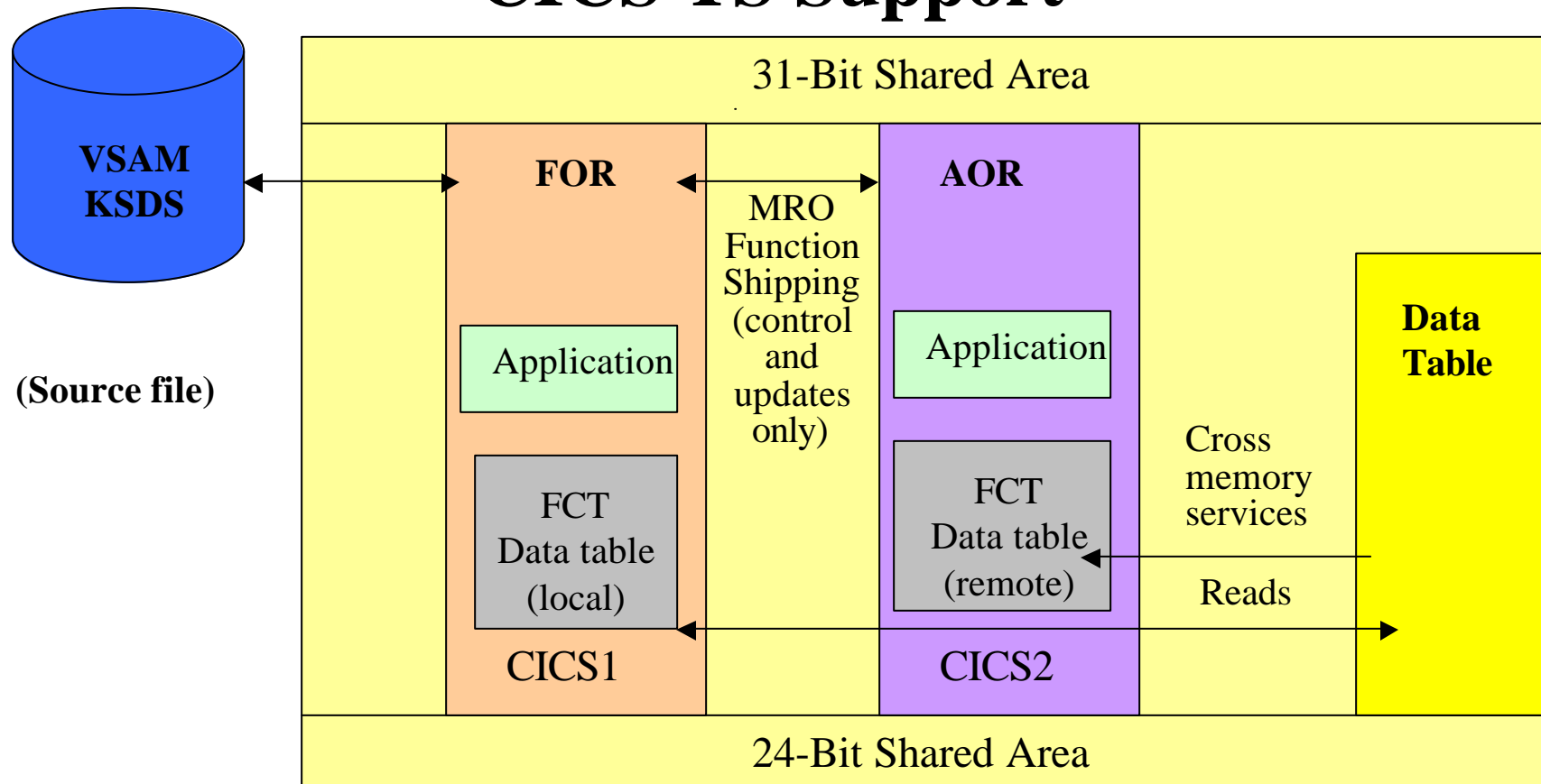
Shared Data Tables ...



- Shared Data Tables in CICS TS..
 - Data Table now in VSE Data Space
 - | Data Space owned by one CICS TS partition
 - One data space for all data tables owned by that partition
 - Space acquired in 2MB increments
 - | Be sure SYSDEF DSPACE and VSIZE definitions are adequate
 - Full key, imprecise key, and browse requests
 - | Updates still handled using Function Shipping

Shared Data Tables ...

CICS TS Support



Shared Data Tables ...



- Data Tables in CICS/VSE and CICS TS
 - CICS-Maintained Table (CMT)
 - | FCT TYPE=CICSTABLE
 - | RDO DEFINE FILE TABLE(CICS)
 - User-Maintained Table (UMT)
 - | FCT TYPE=USERTABLE
 - | RDO DEFINE FILE TABLE(USER)
 - Table loaded when file is opened
 - | Initial, first reference, CEMT, EXEC CICS
 - User exits control what data is loaded in table

Shared Data Tables ...



- CICS-Maintained data table
 - Full integrity
 - | Source file remains open and is updated by CICS
 - Full File Control API available
 - | Insert, delete, rewrite, read, browse, etc.
 - Transparent to existing applications
 - All or part of source file loaded into table
 - | Limits
 - Total number of records
 - Selection by user exit

Shared Data Tables ...



- User-Maintained data table
 - Application responsible for data integrity and recoverability
 - | Source file is closed after table is loaded
 - Subset of file control API available
 - | Full key read, rewrite, selected write and delete
 - Record format in table can be different from source file record
 - | User exit required to create
 - | Application changes required
 - All or part of source file (or any data) in table
 - | Determined by user exit

Shared Data Tables ...



- Selective loading of records
 - Use file definition maximum number of records field to limit entries
 - RDO DEFINE FILE TABLE() MAXNUMRECS()
 - FCT TYPE=CICSTABLE|USERTABLE,SIZE=#recs
 - 16 to 16 million records
 - Required entry even if using exit program
 - Loads first record in file up through limit
 - Generates error message on VSE console when limit reached

Shared Data Tables ...



■ Selective loading of records ...

■ Use a Global User Exit (GLUE)

┆ Exit points

- XDTRD each record read from source data set
- XDTLC when loading of table is complete
- XDTAD each record added to source data set

┆ Programming requirements for exit program

- Assembler
- AMODE 31 on entry and exit
- RMODE ANY or 24

Shared Data Tables ...



- Good candidates for data tables
 - Small files
 - | Can use record limit or user exit to select subset of records from large file
 - Read only files (or very high read/write ratio)
 - | Updates actually cause extra overhead
 - High activity
 - | Why improve performance on low-use files?
- Recommendation - use CMT only (at least first)

CICS TS New Functions



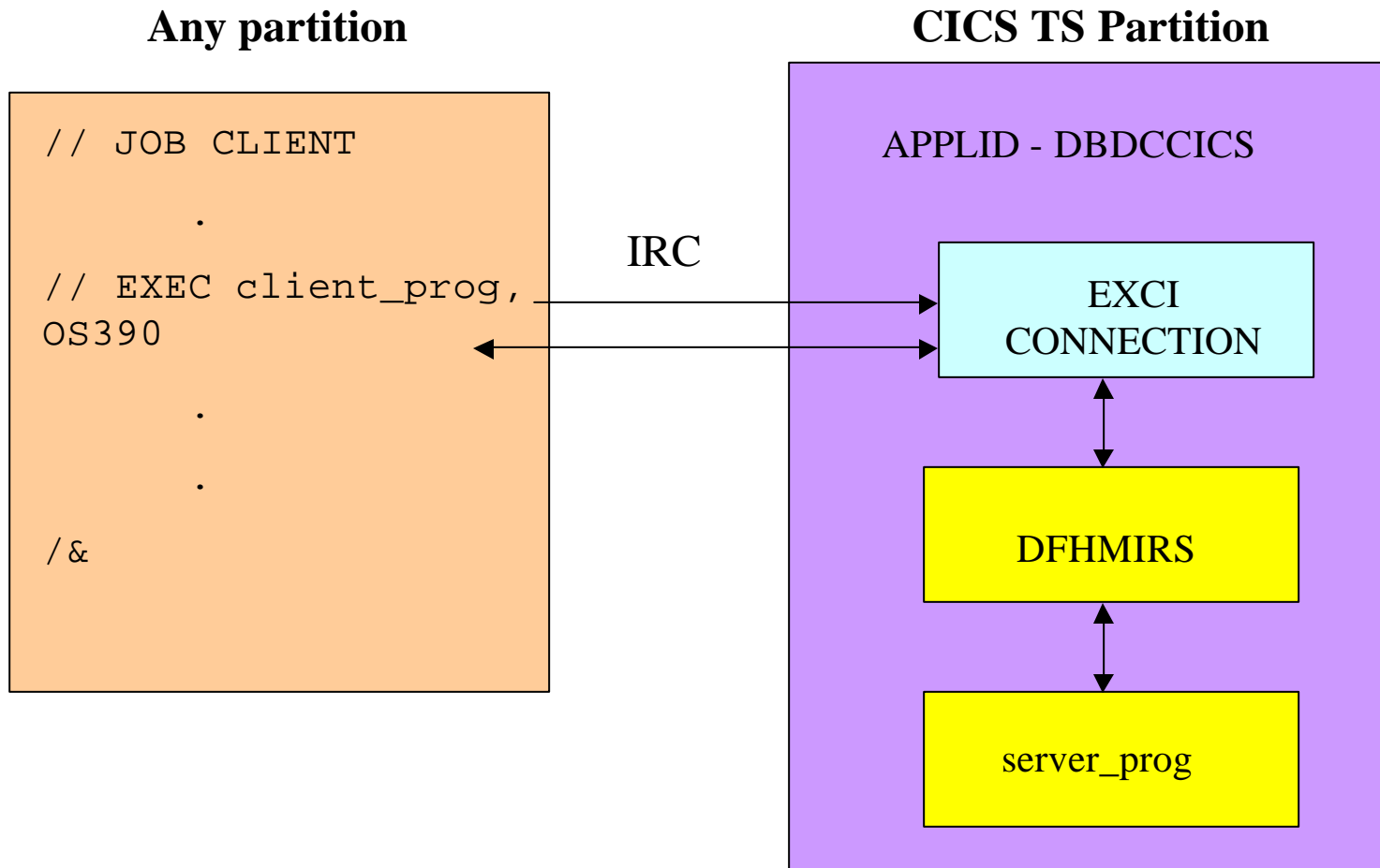
External CICS Interface (EXCI)

External CICS Interface



- Allows VSE batch program to link to program running in CICS TS
 - Similar to Distributed Program Link
 - Same VSE system
- User-written Client and Server programs
 - Samples supplied
- Two interfaces in Client
 - CALL interface
 - EXEC CICS LINK

External CICS Interface ...



External CICS Interface ...



- What can you do with EXCI?
 - Anything you want, of course!
 - | Send data to CICS
 - | Get data from CICS
 - | Issue commands to CICS
 - SHUTDOWN won't work!
 - | Start/Stop transactions in CICS
 - | ??????

External CICS Interface ...



■ Requirements

- Interregion Communications (IRC) must be defined and active in the target CICS
- CONNECTION and SESSION definition
 - | ACCESSMETHOD must be IRC
 - | PROTOCOL must be EXCI
 - | CONNTYPE
 - Must be GENERIC for EXEC CICS LINK interface
 - Can be GENERIC or SPECIFIC for CALL interface
- VTAM APPLID used to identify target CICS

External CICS Interface ...



■ Requirements...

- The Server program must be defined to CICS
 - | RDO or Program Autoinstall
- A Transaction Code must be defined
 - | Transaction definition must point to DFHMIRS
 - | RDO or use default transaction code of CSMI

External CICS Interface ...



- Client and Server programs
 - Batch program is client
 - Server program is CICS application in CICS
 - Communicate via COMMAREA
 - Languages
 - COBOL for VSE
 - PL/I for VSE
 - C for VSE
 - Assembler

External CICS Interface ...



- Copy books map return code fields for both interfaces
 - In PRD1.BASE for all programming languages
 - | Assembler DFHXCPLD.A
 - | COBOL DFHXCPLD.C
 - | PL/I DFHXCPLD.P
 - | C DFHXCPLD.H

External CICS Interface ...



- Client CALL interface
 - 6 different calls
 - Fairly complex
 - Best for multi-request applications
 - | Issue multiple DPL_requests
 - | Get/Put multiple file records, etc.
 - Linkedit requirements
 - | INCLUDE DFHXCSTB (CICS interface stub)
 - | AMODE(31)

External CICS Interface ...



- Client CALL interface...
 - Initialize_user call
 - | Initialize the user environment
 - | Once per task
 - Allocate_pipe call
 - | Allocate a single session for this connection
 - | Can allocate up to 25 pipes
 - | Generally once per task

External CICS Interface ...



- Client CALL interface...
 - Open_pipe call
 - | Connect an allocated pipe to a receive session in CICS TS
 - | Whenever ready to actually issue DPL calls
 - DPL_request call
 - | Issue actual requests to CICS TS
 - | However many times the application requires
 - | Appears to server program as normal EXEC CICS LINK from remote CICS TS partition

External CICS Interface ...



■ Client CALL interface...

■ Close_pipe call

- | Disconnect open pipe from CICS TS
- | Pipe remains allocated
 - Issue Open_pipe to reuse
- | Whenever finished issuing DPL calls

■ Deallocate_pipe call

- | Deallocate pipe from CICS TS
- | Generally once per task

External CICS Interface ...

Initialize_user

```
CALL 'DFHXCIS' USING VERSION-1  
    EXCI-RETURN-CODE USER-TOKEN  
    INIT-USER APPLICATION.  
IF EXCI-RESPONSE = 0 THEN  
    . . . .
```

Allocate_pipe

```
CALL 'DFHXCIS' USING VERSION-1  
    EXCI-RETURN-CODE USER-TOKEN  
    ALLOCATE-PIPE PIPE-TOKEN  
    TARGET-SYSTEM GENERIC-PIPE.
```

External CICS Interface ...

Open_pipe

```
CALL 'DFHXCIS' USING VERSION-1  
EXCI-RETURN-CODE USER-TOKEN  
OPEN-PIPE PIPE-TOKEN.
```

DPL_request

```
CALL 'DFHXCIS' USING VERSION-1  
EXCI-RETURN-CODE USER-TOKEN  
DPL-REQUEST PIPE-TOKEN  
TARGET-PROGRAM COMMAREA  
COMM-LENGTH DATA-LENGTH NULL-PTR  
NULL-PTR NULL-PTR EXCI-DPL-RETAREA  
SYNCONRETURN.
```

External CICS Interface ...



Close_pipe

```
CALL 'DFHXCIS' USING VERSION-1  
EXCI-RETURN-CODE USER-TOKEN  
CLOSE-PIPE PIPE-TOKEN.
```

Deallocate_pipe

```
CALL 'DFHXCIS' USING VERSION-1  
EXCI-RETURN-CODE USER-TOKEN  
DEALLOCATE-PIPE PIPE-TOKEN.
```

External CICS Interface ...



- Client EXEC CICS LINK interface
 - One simple command
 - | All 6 calls in 1 command
 - Best for one-time requests
 - | Single command to CICS
 - | Single record transfer
 - Requires translator option XOPTS(EXCI)
 - Linkedit requirements
 - | INCLUDE DFHXCSTB (CICS interface stub)
 - | AMODE(31)

External CICS Interface ...

Sample Client EXEC CICS LINK

```
EXEC CICS LINK PROGRAM(TARGET-PROGRAM)
      TRANSID(TARGET-TRANSID)
      APPLID(TARGET-SYSTEM)
      COMMAREA(COMMAREA)
      LENGTH(COMM-LENGTH)
      DATALENGTH(DATA-LENGTH)
      RETCODE(EXCI-EXEC-RETURN-CODE)
      SYNCONRETURN
END-EXEC.
```


Summary – Shared Data Tables



- Shared Data Tables
 - Now stored in a data space
 - Cross memory access for read/browse
 - Fast, low overhead for multiple CICS partition access
- CICS Maintained versus User Maintained
 - Use CMT if at all possible
 - Transparent to applications
 - CICS responsible for data integrity
- Simple file definition changes

Summary - EXCI



- Easy access from batch to CICS TS
 - Within same VSE image
- Two interfaces for batch client
 - EXEC CICS LINK
 - CALL
- Uses CICS Interregion Communication support