IBM

CICS Transaction Server for VSE/ESA Migration

Session: Sunday, 0915

WAVV 99
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CICS/VSE	VTAM	Language Environment
VSE/ESA	POWER	C/370
MVS/ESA		

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Agenda

- Planning for Migration
- Coexistence with CICS/VSE 2.3
- Migration to CICS Transaction Server
  - Resource Definition
  - Application Programming
  - Customization
  - Security
- Further Information

Planning for Migration

- There is no single set of instructions for migration
- There are some fundamentals
  - Position your current system in preparation
    - CICS/VSE 2.3
    - Start using RDO if not already doing so
  - Understand the CICS TS product changes
    - Function
    - Prerequisites
    - Environmental differences
    - Consider starting without exploitation of new function
  - Decide whether to run in coexistent or isolated modes
  - Involve your third party product suppliers early
  - Test and cutover in stages
    - Minimize simultaneous changes
    - Implement some form of change management
    - Have a fallback plan

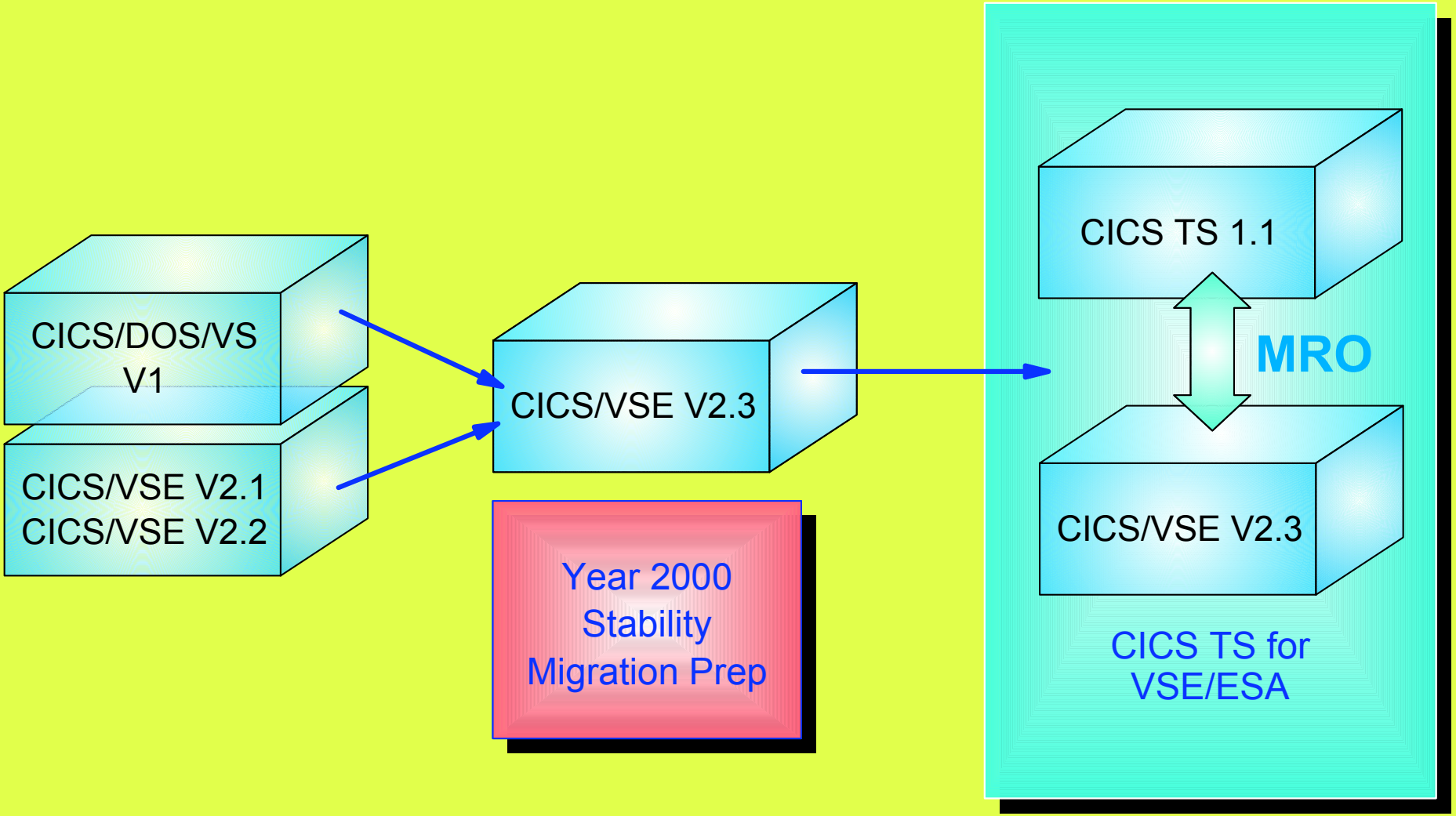
Installation and Tailoring: CICS versions

- CICS TS Release 1 :
  - is part of the VSE/ESA 2.4 base package
  - is restored as part of base installation process of all environments
  - runs with VSE/ESA 2.4 central functions only
  - exploits new VSE facilities and interfaces
  - is used by IUI and ICCF
- CICS/VSE 2.3 :
  - is supplied on the extended base tape
  - must be installed as an optional product
    - IUI dialog
    - Resides in PRD2 library
      - Existing CICS/VSE 2.3 startup jobs will need LIBDEF changes
    - Some skeletons provided

Prerequisite Hardware and Software

- Subsystem storage protection
  - ESA/390 processor that supports the subsystem storage protection facility
    - ES/9000 9021 Model 520, 640, 660, 711, 740, 820, 860, 831, 832, 860, 900, 941 or higher
    - ES/9000 9121 Model 180, 190, 210, 260, 311, 320, 411, 440, 480, 490, 511, 521, 522, 570, 610, 621, 622, 732, or 742
    - ES/9000 9221 Model 170 or 200
- VTAM persistent session support
  - "INTER-ENTERPRISE" version of VTAM
- CICS Statistics utility (DFHSTUP)
  - DFSORT/VSE or any sort package that supports E15 and E35 exits

Coexistence:
The Migration Platform



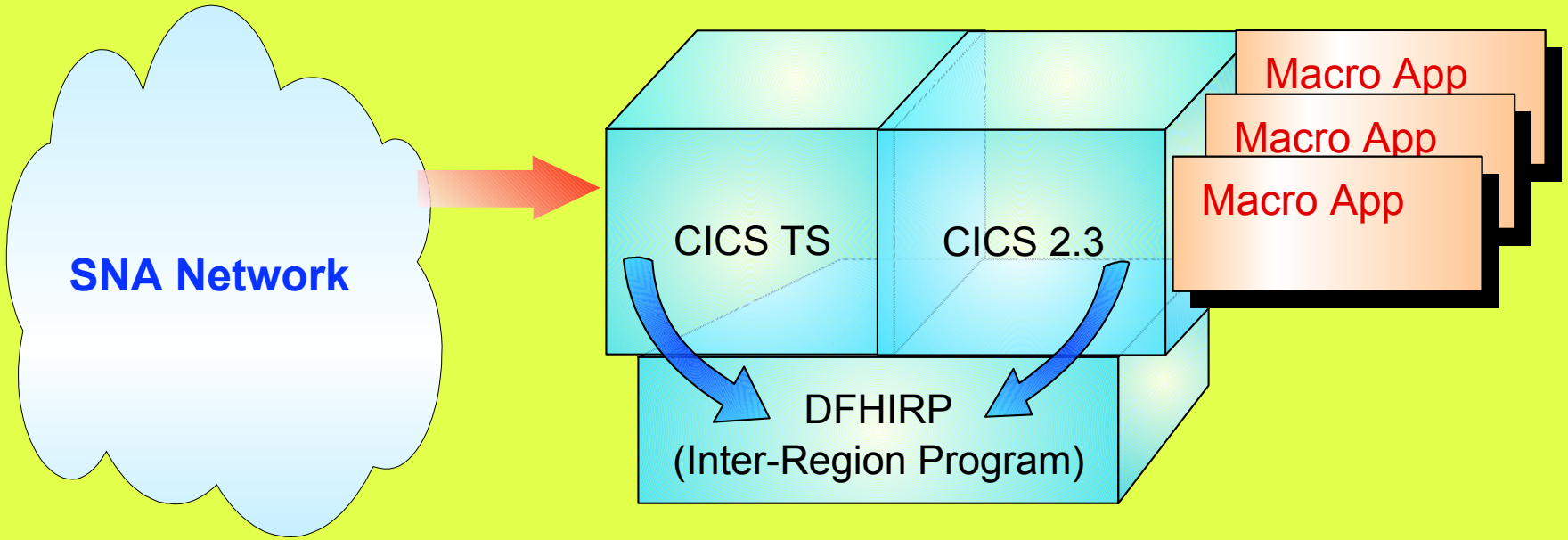
Coexistence

The coexistence environment is provided to assist with a staged transition

- MRO is extended to allow CICS TS and CICS for VSE 2.3 to communicate
  - Transaction Routing, Function Shipping, DPL, DTP
- Permits continued use of the withdrawn facilities during the migration period
- Care needed with SVA modules

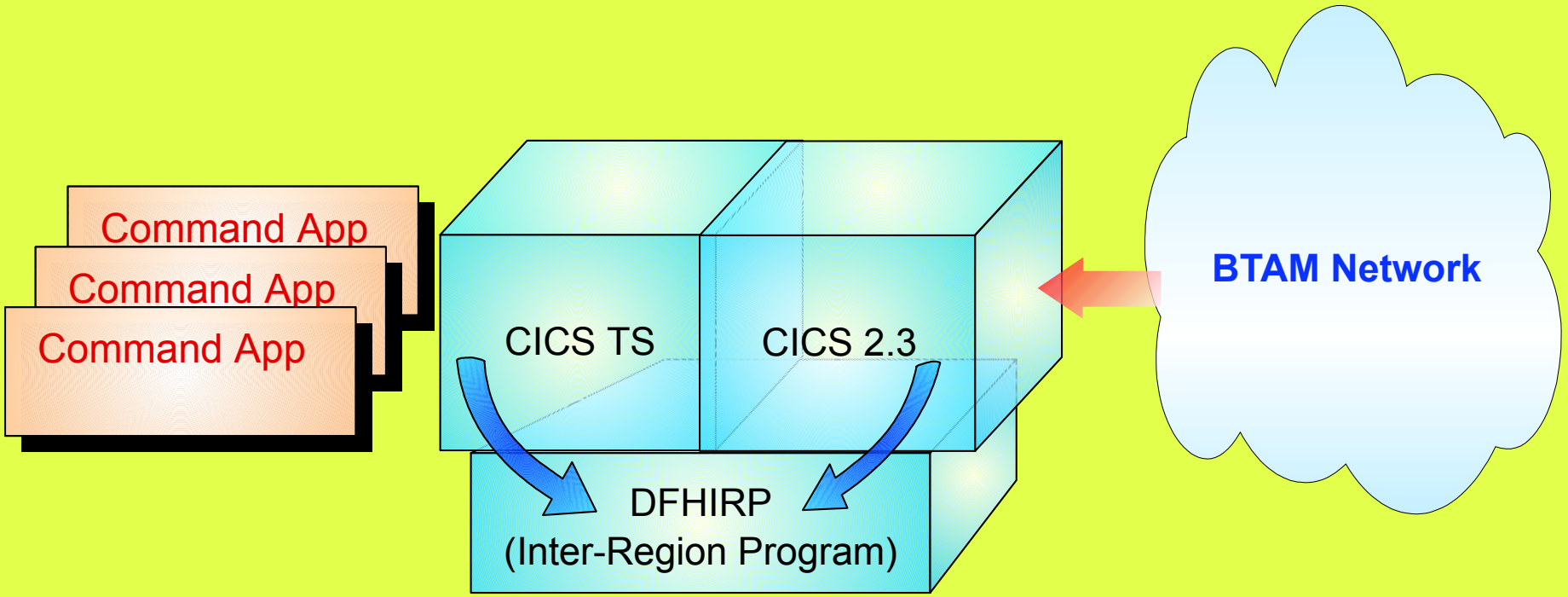
Coexistence
Macro Level Programs

- **Macro programs run in CICS 2.3 only**
- **Accessible from terminals attached to CICS TS via Transaction Routing**



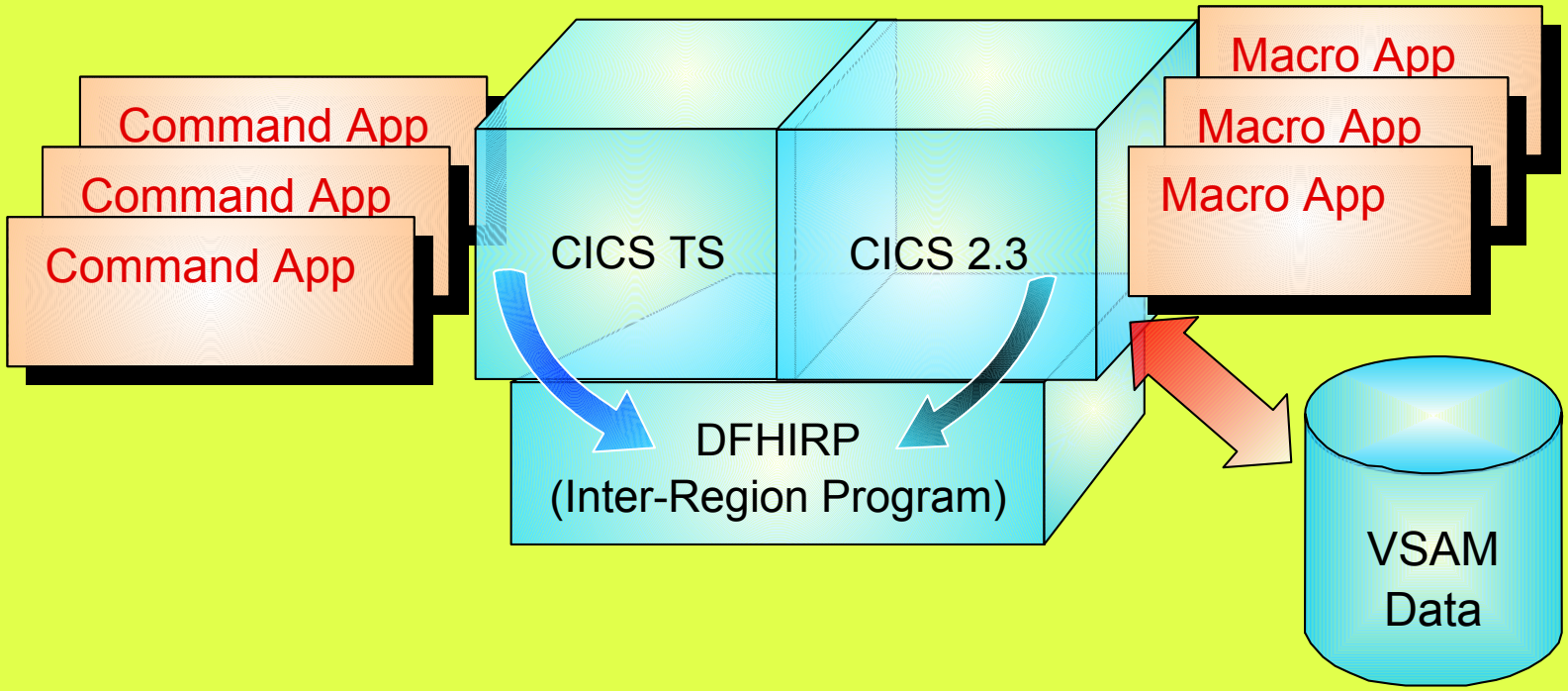
Coexistence:
BTAM network Access

- **BTAM runs on CICS 2.3 only**
- **Applications in CICS TS accessed via transaction routing**

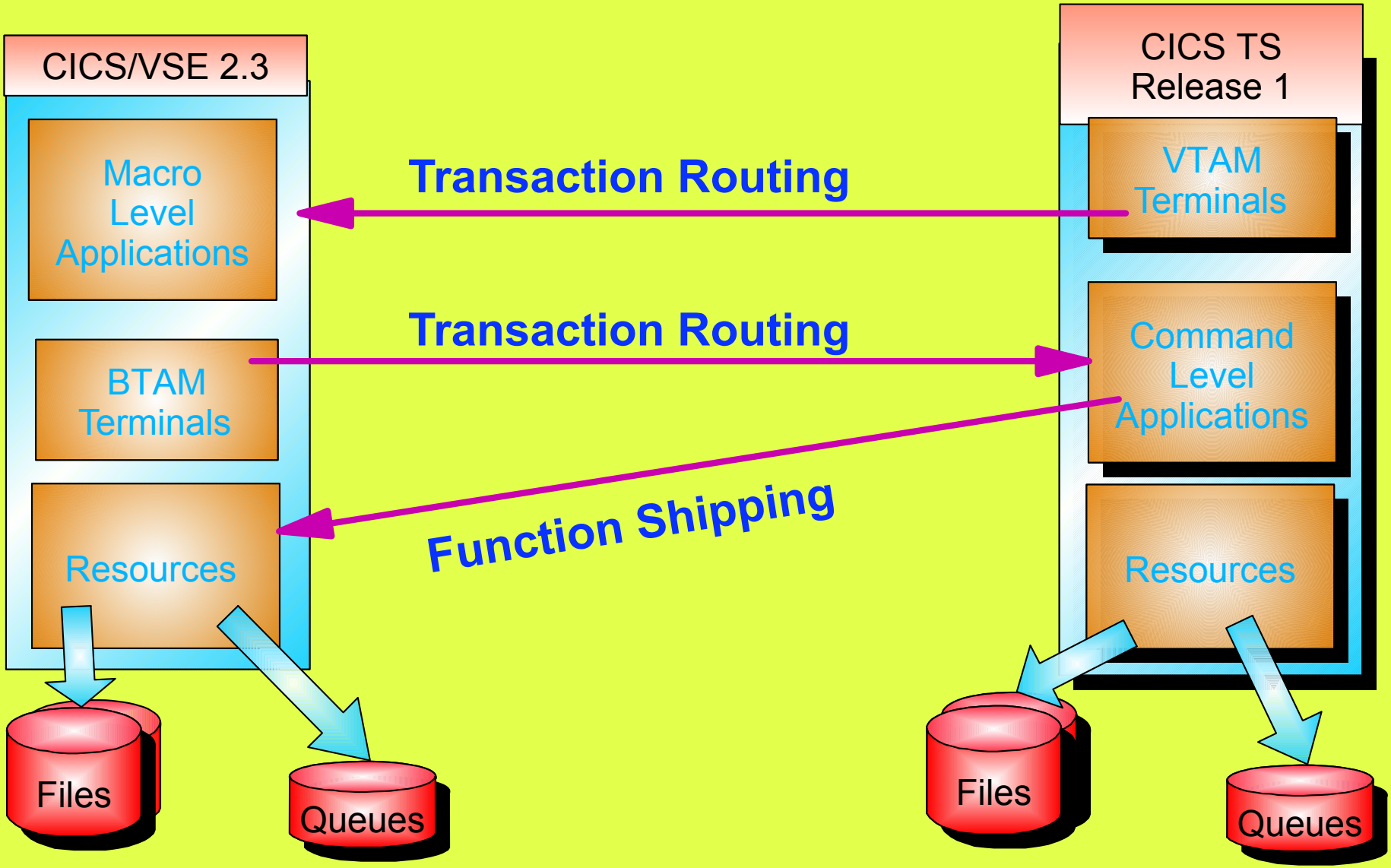


Coexistence:
Shared Data Access

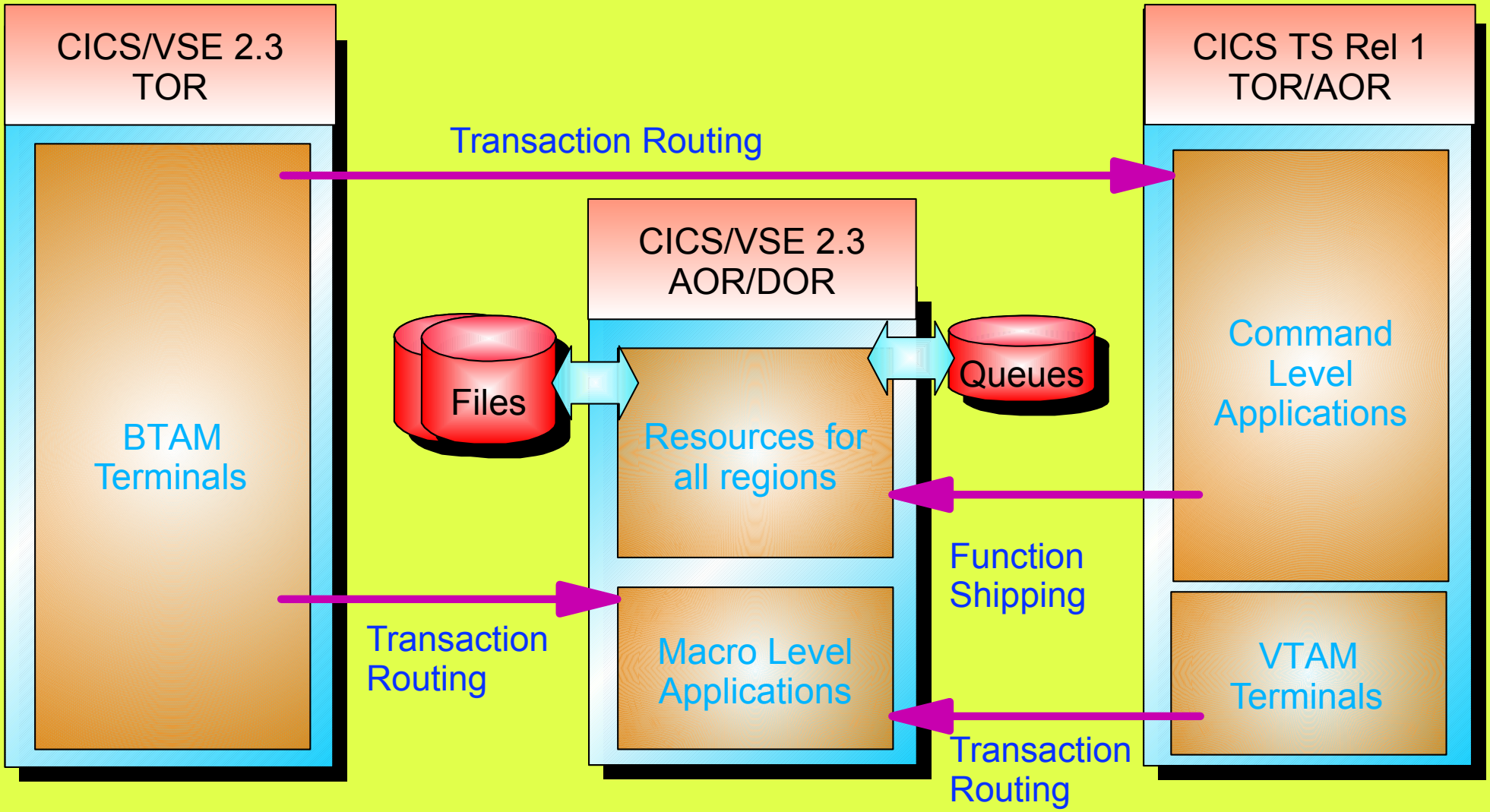
- **Data used by macro applications must reside on CICS/VSE 2.3**
- **Command level applications on CICS TS access shared data using Function Shipping**



Coexistence:
Single Region Configuration

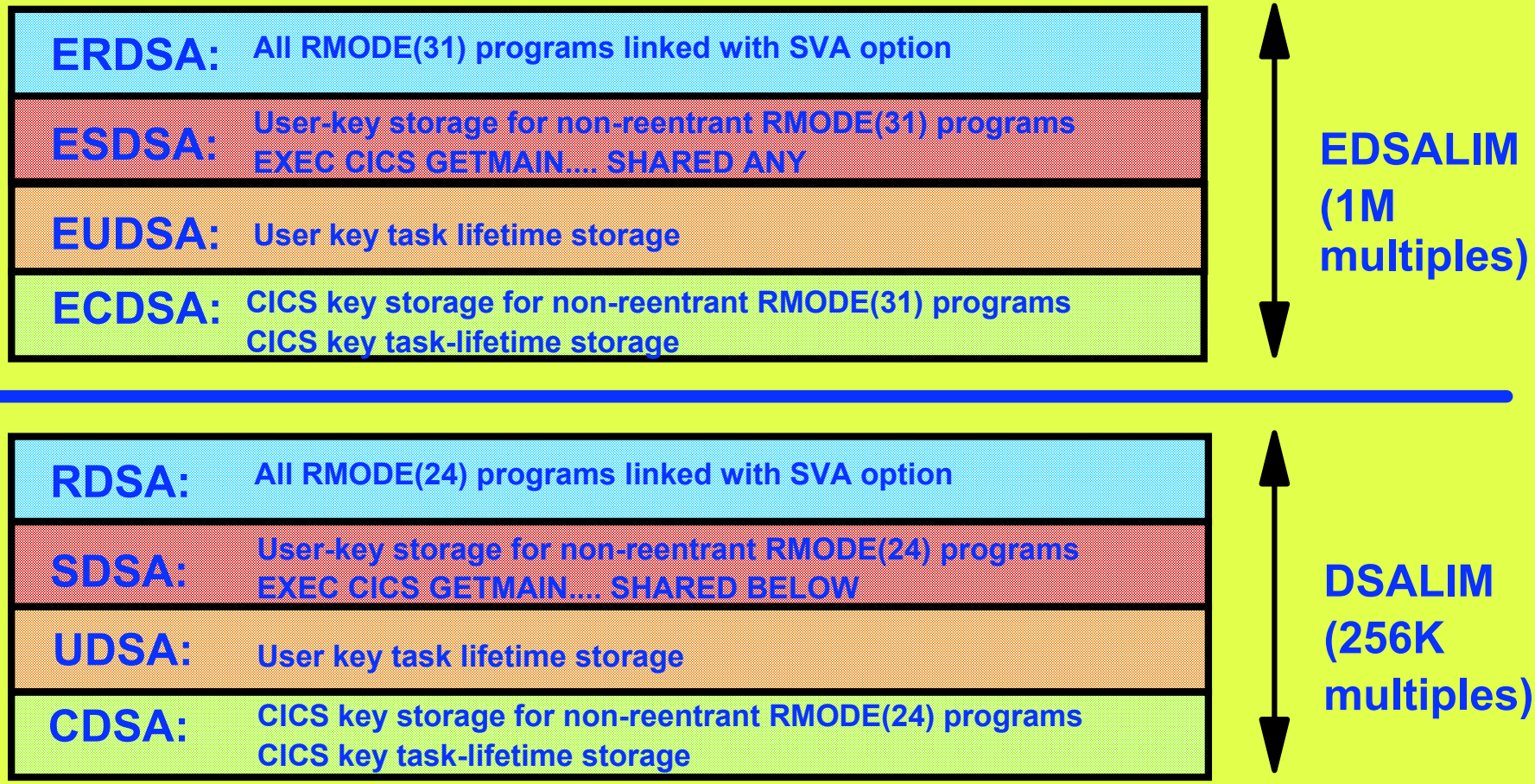


Coexistence:
Two Region configuration

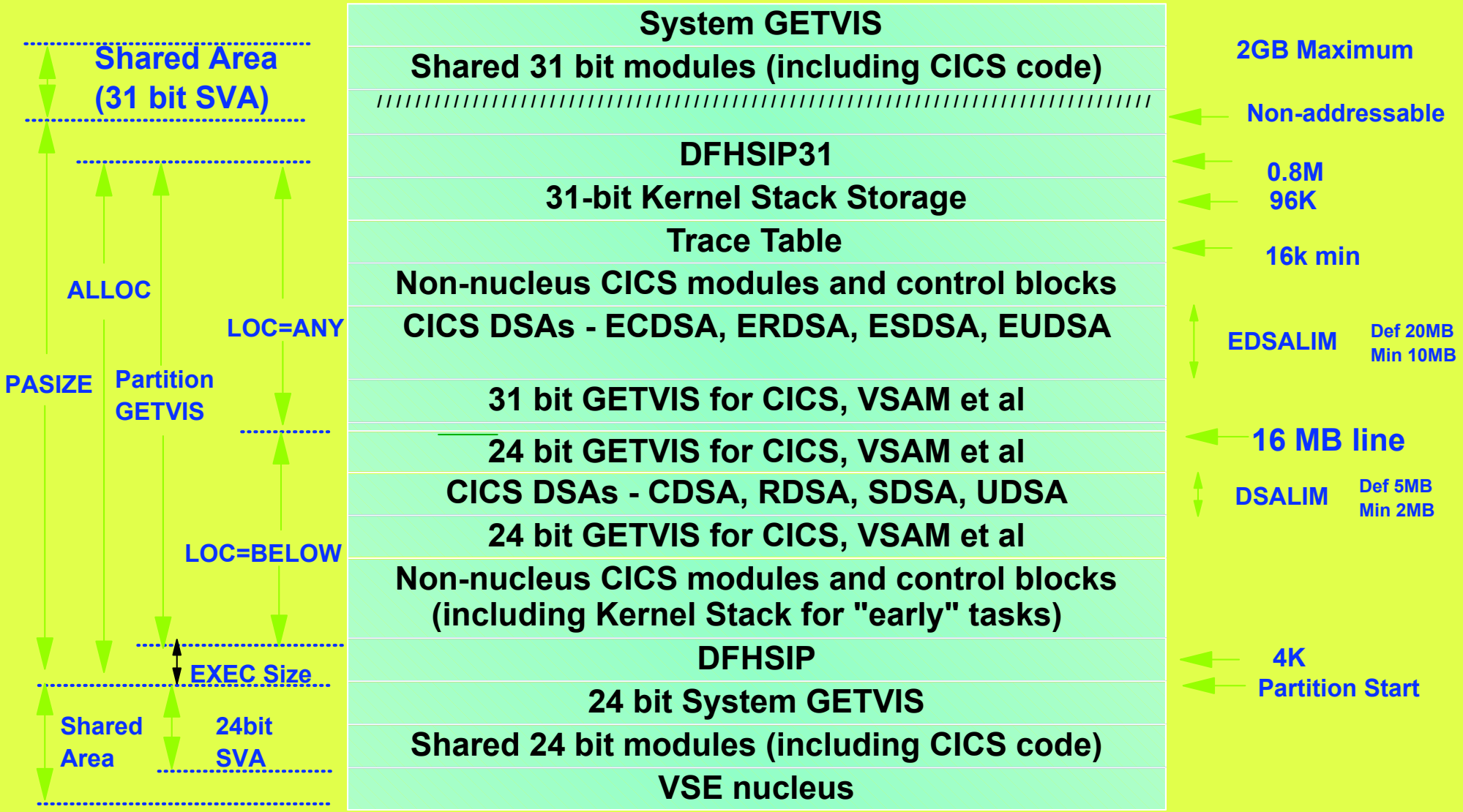


CICS DSA management

- **Overall size of CICS DSA's controlled by 2 new system initialization parameters**

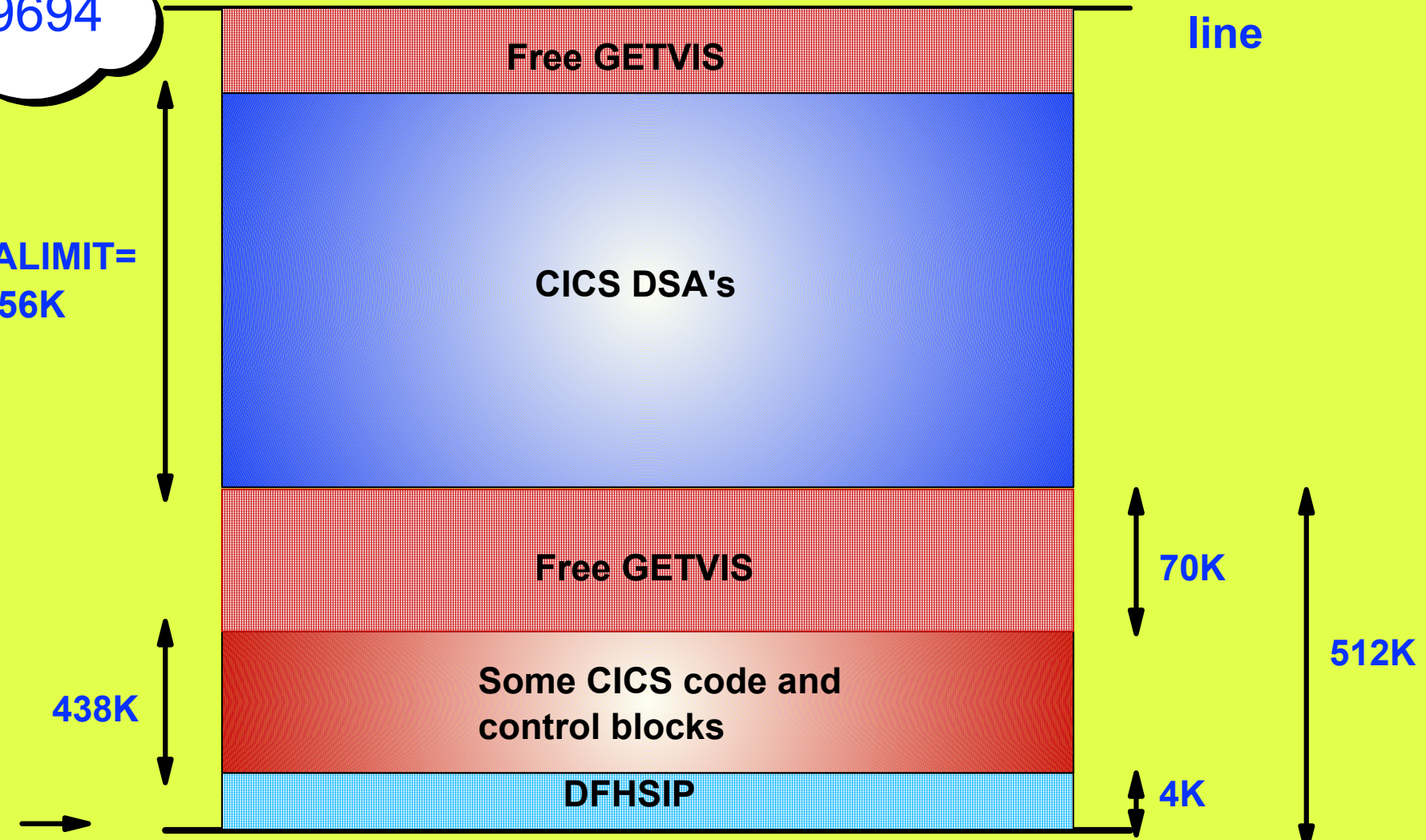


CICS Partition Layout



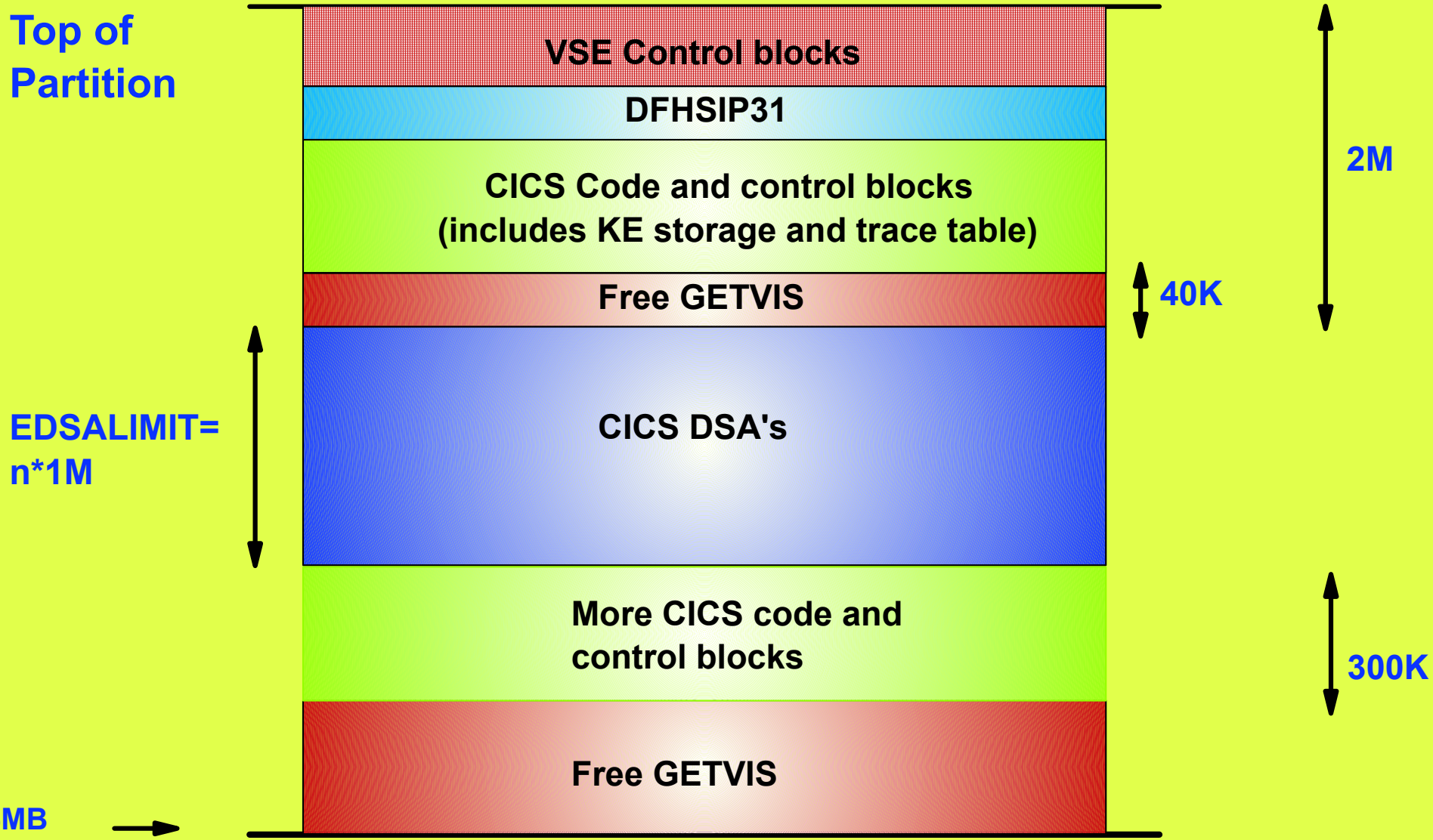
CICS partition layout - 24 bit GETVIS

Install PQ29694



(Storage layout after PQ29694 installed, no DL/I, no OEM products)

CICS partition layout - 31 bit GETVIS



(Storage layout assumes a trace table of default size, i.e. 16K)

Storage Requirements

- CICS Nucleus
  - Majority resides in RDSA/ERDSA storage
  - Size of nucleus depends on functions used
    - RDSA requirement 300 - 400K
    - ERDSA requirement 5 - 6M
  - DFHSIP31 resides in 31-bit GETVIS. Approx 0.8M in size
- CICS trace table
  - Trace table now allocated by size not number of entries
    - TRTABSZE= nK
  - Trace entries on average 100 bytes
    - CICS/VSE 2.3 trace entries all 32 bytes
  - Allocate a trace table 4-5 times size of that you use today
  - Increase space for auxiliary trace dataset by factor of 4

Storage requirements

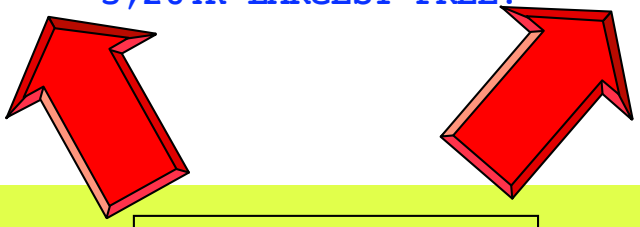
- Kernel stack (LIFO) storage
  - Now pre-allocated based on MXT system initialization parameter from CDSA/ECDSA storage
    - MXT does not include system tasks so you must allow for 10 system tasks in addition to MXT
    - For each task 2K of 24-bit DSA, 12K or 31-bit DSA
    - 10% extra allocated for "overflow" stack storage
    - DSA: (10 + MXT) * 2K)) + (MXT/10 * 2K)
    - EDSA: (10 + MXT) * 12K)) + (MXT/10 * 2K)
    - e.g. for a MXT of 100 you require 260K of DSA, 1360K of EDSA
  - Don't specify MXT=999
  - In addition storage for 8 (9 if using FEPI) "early" CICS tasks allocated from non-DSA storage

CICS TS Partition Size ?

- BOE recommends increasing partition size by about 5-6M
  - CICS requires at least this much EXTRA 31-bit storage compared to CICS/VSE 2.3 for relocation of CICS management code and control blocks above 16MB line
- But consider:
  - Data tables now stored in data space not in partition GETVIS
  - 31-bit application programs now "compressed"
    - In some cases you may be able to reduce partition size!
    - Larger trace table requirement
- Overall increasing partition size by 6M is a good rule of thumb

VSE MAP and GETVIS commands

```
map f2
AR 0015  PARTITION: F2         SPACE-GETVIS.....:    (N/A)
AR 0015  SPACE....: 2          ALLOC (VIRTUAL)...:   26624K  ADDR: 600000
AR 0015  STATUS...: VIRTUAL      SIZE............:   10192K
AR 0015  POWER-JOB: CICSTOR       EXEC-SIZE......:      4K
AR 0015  JOBNUMBER: 7            GETVIS..........:   16432K
AR 0015  JOBNAME..: CICSTOR       EXEC-GETVIS....:   26620K  ADDR: 601000
AR 0015  PHASE....: DFHSIP
AR 0015                        PFIX(BELOW)-LIMIT :     256K
AR 0015                                   -ACTUAL:       0K
AR 0015                        PFIX(ABOVE)-LIMIT :       0K
AR 0015                                   -ACTUAL:       0K
AR 0015 1I40I  READY
getvis f2
AR 0015 GETVIS USAGE    F2-24     F2-ANY                      F2-24     F2-ANY
AR 0015  AREA SIZE:   10,236K    26,620K
AR 0015  USED AREA:    6,644K    21,356K MAX. EVER USED:   10,236K    25,328K
AR 0015  FREE AREA:    3,592K     5,264K LARGEST FREE:      3,584K     5,228K
AR 0015 1I40I  READY
```



Max is always
= Area size

CICS TS SVA usage

- **Some CICS modules must reside in SVA**
  - **DFHCSVC and DFHDSPEX regardless of CICS facilities used**
  - **Add DFHCSEOT, DFHIRP, DFHIRW10 and DFHSCTE if using MRO**
  - **Add DFHDTSAN and DFHDTSVC is using shared data tables**
  - **Add DFHCDDAN is using XRF**
- **New SVA and PRVMOD system initialization parameters plus USESVACOPY option on RDO PROGRAM definition to control SVA usage for other modules (CICS and user)**

SVA= option	Module specified in PRVMOD list ?	USESVACOPY option	Which version of module used
NO	n/a	n/a	DSA
YES	YES	n/a	DSA
YES	NO	NO	DSA
YES	NO	YES	SVA

SVA usage and CICS coexistence

- If CICS TS and CICS/VSE 2.3 run in coexistence mode then the CICS TS version of any SVA mandatory module must loaded into the SVA
  - Applies to DFHCCDAN, DFHCSEOT, DFHIRP and DFHSCTE
- CICS/VSE 2.3 will use any module from SVA if its loaded there. So for any CICS module listed in DFH£SVEX in PRD1.BASE either:
  - Ensure module not loaded into SVA, or
  - Load CICS/VSE 2.3 version of module into the SVA and
    - Specify SVA=NO in system initialization parameters for CICS TS, or
    - Specify SVA=YES and list module on PRVMOD= system initialization override.
- If LE modules loaded in SVA then you must ensure CICS TS specifies SVA=YES and all PROGRAM definitions for LE modules specify USESVACOPY(YES)

Resource Definition
The CSD

- Mandatory for the first time
  - Critical resource
  - Plan for regular backup
- To convert an existing CICS/VSE 2.3 CSD for use with CICS TS
  - Copy the existing CICS 2.3 CSD to the new VSE/ESA 2.4 system
  - Run DFHCSDUP in CICS TS against this copy
    - UPGRADE
    - UPGRADE USING(DFHCURCF) if RCF required
    - UPGRADE USING(DFHCUICF) if ICCF required
  - Use DFHCSDUP to copy the VSE groups from the supplied VSE 2.4 CSD (CICS.CSD)
    - COPY GROUP(VSESPG) TO(VSESPG) FROMCSD(cics.csd) REPLACE
    - COPY GROUP(VSETYPE) TO(VSETYPE) FROMCSD(cics.csd) REPLACE
  - If you use modified versions of CICS supplied definitions
    - Replace your private versions with CICS TS supplied version
    - If required, modify the copies to meet your requirements

Resource Definition
Sharing the CSD

- The CSD can be shared between CICS TS and CICS/VSE 2.3
- Resources can be 'dual purpose'
  - Single resource used by both systems
  - Keywords obsolete in CICS TS are displayed as protected fields
  - Compatibility mode via PF key
    - Allows change of the obsolete keywords for CICS/VSE 2.3 use
    - **All** updates must be made from CICS TS system
      - Loss of attributes possible otherwise
      - APAR PQ23273 to CICS/VSE 2.3 to prevent this
- Any CICS/VSE 2.3 system sharing a CSD with CICS TS must add one or more 'compatibility groups' to the start up GRPLIST
  - At the end of the list

Resource Definition

- Some resources are now RDO only
  - Transactions, Programs, Profiles, Mapsets and VTAM Terminals
    - Macros provided for migration purposes only
    - Use DFHCSDUP MIGRATE command to migrate tables to CSD
    - Consider use of auto-install to reduce number of resource definitions required.
- All other tables must be reassembled against CICS TS 1.1 macros (DCT, FCT, JCT, TST)
  - Last release for File Control table definition of VSAM resources

Other CICS Datasets

- Catalog split across 2 VSAM KSDS files:
  - DFHGCD. It contains:
    - Restart control record
    - Journal status
    - Details of installed resource definitions
  - DFHLCD contains domain status information
  - DFHLCD needs formatting via DFHCCUTL utility before use
  - If you redefine the LCD/GCD you must redefine both
- DFHRSD now only used during emergency restart
- DFHCXRF dataset now used in non-XRF environment
  - Either define DLBL or // ASSGN SYS020,SYSLST
- DFHSTM and DFHSTN datasets no longer required

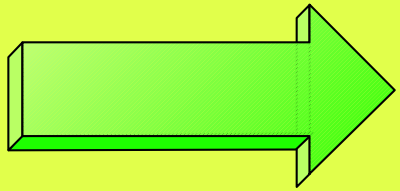
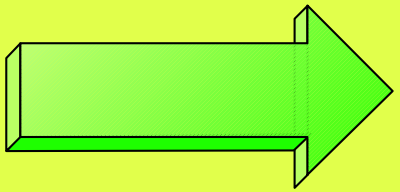
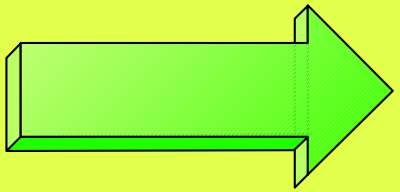
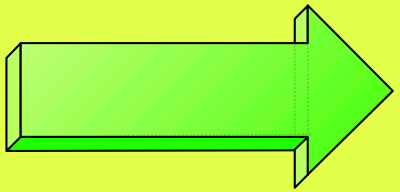
Application Programming

- CICS for VSE/ESA 2.3 command level programs are object compatible with CICS TS provided they:
  - Don't issue any CICS macros
    - Includes undocumented interfaces such as DFHTM, DFHWTO and DFHSEC
  - Don't issue any EXEC CICS ADDRESS CSA commands
  - Don't rely on R12 and R13 on entry
  - Are compiled with a supported compiler
- EIB is still addressable but modification is not supported
- Program working storage, EIB, TWA and EXEC CICS SET storage below 16MB line by default.
  - For AMODE(31) applications specify:
    - TASKDATALOC(ANY) on RDO TRANSACTION definition
    - DATALOCATION(ANY) on RDO PROGRAM definition

Application Programming

- EXEC CICS ASSIGN OPSECURITY and OPERKEYS return nulls
- EXEC CICS ASSIGN OPID, OPCLASS and USERPRIORITY return values defined to ESM
- EXEC CICS ASSIGN USERID always returns a value
  - In CICS/VSE 2.3 nulls returned if no user signed-on
- EXEC CICS INQUIRE and SET STALL obsolete
  - null returned on INQUIRE, no action taken on SET
- EXEC CICS ADDRESS CSA obsolete
  - returns address of a piece of fetch protected storage
  - program will abend when address "used"
  - usage logged on TD queue CMIG

Will my application run on CICS TS ?

Assembler COBOL/VSE PL/I VSE C/VSE		Application will run on CICS TS without need for recompile or relink
DOS/COBOL VS COBOL II		Application will run OK but relink with LE libraries for Y2K support
C/370 DOS PL/I		Application will not run on CICS TS. Recompile with LE enabled compiler
RPG		Not supported. Run on CICS/VSE 2.3 in coexistence mode.

CICS Task control

- Transaction classes
  - CMXT SIT parameter obsolete
  - Transaction classes now defined via RDO TRANCLASS
    - New PURGETHRESH parameter to limit queue size
  - TCLASS option on RDO TRANSACTION still supported
    - TCLASS(n) maps to TRANCLASS(DFHTCL0n)
    - Sample TRANCLASS's provided in RDO group DFHTCL
      - As a first step copy DFHTCL and adapt to match old CMXT values
- Runaway task detection
  - New RUNWAY option on RDO TRANSACTION
    - **RUNAWAY==> SYSTEM| 0 | 500-2700000**
      - SYSTEM means apply ICVR value
      - 0 means "no runway detection"
  - Maybe you can now reduce ICVR value
    - Set higher RUNWAY interval for "time consuming" transactions only

CICS Task control

- **Stall purge**
  - Stall purge facility replaced by improved design and a deadlock time-out facility that is applied to "waits" as well as "suspends"
    - SPURGE option on RDO TRANSACTION now means "system purgeable"
  - SPURGE(YES) required for EXEC CICS/CEMT SET TASK PURGE
  - Set DTIMEOUT to a non-zero value
    - This allows CICS to purge task if required, e.g. when SOS to reduce possibility of a stall

Customization

- Global user exits
  - Existing Global User Exit programs from CICS/VSE are neither source nor object compatible with CICS TS
  - A standardized calling interface and new Exit Programming Interface have been introduced
  - Parameters are always passed in the UEP parameter list
    - None passed in registers
  - The XPI provides extensive additional function
  - As a result, all existing exit programs will have to be altered to some extent to:
    - Conform to 31 bit addressing standards and reentrancy requirements
    - Conform to the new calling interface
    - Use the XPI and/or Command level API

Customization

- PLT programs
  - PLTPI now in two phases:
    - Phase one: Very restricted in what they can do
      - Use to enable recovery user exits
    - Phase two: Can use full API/SPI

```
DFHPLT TYPE=INITIAL,SUFFIX=xx
DFHPLT TYPE=ENTRY,PROGRAM=ENABEXIT
DFHPLT TYPE=ENTRY,PROGRAM=RECOV2
.....
DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
.....
DFHPLT TYPE=ENTRY,PROGRAM=DUMPTAB
DFHPLT TYPE=ENTRY,PROGRAM=STRTAPP1
DFHPLT TYPE=FINAL
```

  - No longer need a RDO PROGRAM definition for:
    - PLTPI or PLTSD phase
    - Any program defined *before* DFHDELIM in PLTPI
    - Any program defined *after* DFHDELIM in PLTSD
  - If storage protection enabled all PLT programs must be defined as CICS-key

Customization

- User Replaceable Modules
  - Must be written to Command Level standards
  - AMODE 31
  - COMMAREA passed
  - Any supported language (apart from XJCC and XJCO)
  - Obsolete: DFHACEE, DFHRTY, DFHUAKP, DFHXSE, DFHXSE
  - New: DFHPGADX, DFHZATDY
  - VSE provides some replacements as before
- Task Related User Exits
  - Essentially unchanged
  - Full recursion supported
  - new LINKEDITMODE attribute
- SYSGEN
  - No longer supported. Use global user exits
- SIMODS
  - No longer supported. Use 2nd stage PLTPI program

Security

- All security checking now performed by an External Security Manager (ESM)
  - Applications which "exploit" CICS internal security will need changing
- Decide which ESM meets your security requirements
  - Attend "Securing CICS Transaction Server, Monday, 1730"
- The BSM supplied as a VSE/ESA base product will support Signon and Transaction Attach security only
  - CA Top Secret available on VSE/ESA 2.4 Extended base tape
  - Other ESM products from BIM and MacKinney Systems
- BSM and Top Secret both include migration utilities to migrate SNT data to ESM database
  - both build on CICS Security Migration Aid shipped via PTF on CICS/VSE 2.3

Further information

- VM/VSE Technical conference sessions:
  - http:/www.s390.ibm.com/products/vse
    - Migrating to CICS TS for VSE/ESA (33B)
    - Overview of CICS Web Interface and 3270 Bridge (30F)
    - Overview of CICS TS Gateway and CICS Universal Clients (30G)
    - CICS TS for VSE/ESA: New Application Support (33D)
    - CICS TS for VSE/ESA Performance (32D)
    - Problem Solving under CICS TS (33E)
    - RDO Hints and Tips (33C)
    - VSE/ESA 2.4 Security (34D)
- CICS TS homepage
  - http: //www.software.ibm.com/ts/cics
    - down-loadable versions of all unlicensed manuals
- New Redbooks
  - http://www.redbooks.ibm.com
    - Migration to VSE/ESA 2.4 and CICS Transaction Server for VSE/ESA 1.1 (SG24-5595)
    - Implementation of VSE/ESA 2.4 and CICS Transaction Server for VSE/ESA 1.1 (SG24-5624)

Summary

- **Migration to CICS TS is more complex than previous CICS migrations**
- **Start planning NOW**
  - **Migrate to CICS/VSE 2.3 if not already done and use as a platform to:**
    - **Implement RDO (including terminal autoinstall)**
    - **Convert macro applications to EXEC CICS interface**
    - **Analyze security requirements**