IBM
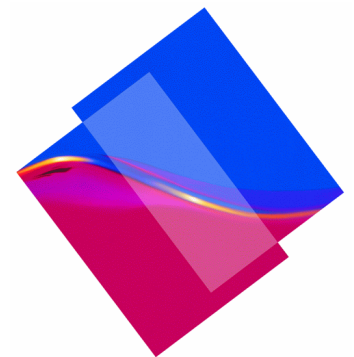
CICS Transaction Server
for OS/390 V1.3

Into the Twenty-First Century

IBM Software

CICS Transaction Server - Overview

- The leading transaction processing system for enterprise, mission critical applications

- Easy to use S/390 client/server single solution package
  - ► *CICS Server*
  - ► *CICS Client*
  - ► *CICS Transaction Gateway*
  - ► *CICSPlex System Manager*

CICS TS V1.3 - Release content

- **Application Enablement**
  - ► *Java Application Support*
  - ► *Object-Oriented Interface for CICS services for C++ and Java*
  - ► *CICS Business Transaction Services*
  - ► *Open Transaction Environment*
  - ► *Long Temporary Storage Queue names*
- **e-business Enablement**
  - ► *CORBA interoperability*
  - ► *CICS Web Interface*
  - ► *CICS Transaction Gateway*
  - ► *Transactional EXCI*
  - ► *3270 Bridge Enhancements*
- **Enterprise Scalability**
  - ► *Dynamic routing and load balancing*
  - ► *Coupling Facility Data Tables*
  - ► *Sysplex-wide Enqueue and Dequeue*
- **Enterprise Management**
  - ► *CICSPlex SM Enhancements*
  - ► *RDO for CICS Temporary Storage*
  - ► *Other System Management Enhancements*

Java Application Support

- **JVM**
  - ▶ *OE/MVS JVM runs under OTE TCB*
  - ▶ *Switch to CICS quasi-reentrant TCB as required*
- **High Performance Compiled Java**
  - ▶ *Compilation from bytecodes to machine instructions*
  - ▶ *Classes stored in PDSE*
  - ▶ *LE-enabled language (appears similar to C++)*
  - ▶ *Recommended when full Java function not required*
- **CICS Java classes**
  - ▶ *File Control*   *Interval Control*
  - ▶ *Program Control*   *Task Control*
  - ▶ *Temporary Storage*   *Transient Data*
  - ▶ *APPC*   *Limited 3270 Terminal Control*
  - ▶ *Abend Handling*   *Diagnostics*
  - ▶ *Environment*
- **SQLJ**
  - ▶ *Requires pre-compiler*
  - ▶ *Compatible with current CICS DB2 support*

OPEN Transaction Environment

- Objectives
  - ▶ *Long-term enhancement to CICS infrastructure*
  - ▶ *Enable CICS/ESA applications to use MVS and UNIX System Services*
  - ▶ *Seamless low-risk migration to new technologies*

- Function (to be provided in later releases)
  - ▶ *Access to POSIX functions, HLL functions*
  - ▶ *HFS, Sockets, COBOL READ/WRITE*
  - ▶ *Improved performance for DB2, MQSeries,... access*
  - ▶ *Earlier support for new technology*
  - ▶ *JVM, LDAP*

- Stage 1 (support in CICS TS V1.3)
  - ▶ *Pool of TCBs used for JVM transactions*
  - ▶ *Existing CICS applications run unchanged*

C++ Base Transaction Classes

- Provides access to CICS services using OO programming model
  - ► *File Control*   *Interval Control*
  - ► *Journal Control*   *Program Control*
  - ► *Syncpoint Management*   *Task Control*
  - ► *Temporary Storage*   *Transient Data*
  - ► *APPC*   *Limited 3270 Terminal Control*
  - ► *Authentication*   *Abend Handling*
  - ► *Console*   *Diagnostics*
  - ► *Environment*

- Eliminates need for CICS translator for C++

- Requires
  - ► *IBM C/C++ for MVS/ESA V3.1*
  - ► *Language Environment 1.5*

CICS Business Transaction Services

- New set of API and services to simplify the development and management of CICS Business Transactions

- Business transaction
    - ► *Implements a business function, multiple CICS transactions*
    - ► *Extension of pseudo-conversation program model*
    - ► *Initiated from any CICS supported work-origin*
    - ► *Long lived, possibly days*
    - ► *Possibly includes non-client initiated work*
    - ► *Possibly different users at different times*
    - ► *Requires intra-application control logic*

- Provides a framework that
    - ► *is built on existing CICS transaction model*
    - ► *encourages separation of control logic from business logic*
    - ► *promotes reuse*
    - ► *supports existing transactions and programs*
    - ► *allows concurrent execution of parts of business transaction*

Long Temporary Storage
Queue Names

- **API**
  - ► *QNAME() alternative to QUEUE()*
  - ► *Qname may be up to 16 characters long*
  - ► *Internally all queue names padded to 16 characters with blanks*

- **SPI**
  - ► *INQUIRE TSQUEUE QNAME*

- **Other enhancements**
  - ► *CEMT, CEBR*
  - ► *Monitoring, security*

CORBA Client Support

- **CICS ORB**
  - ► *IIOP inbound from any CORBA-compliant client*
  - ► *Object interfaces defined in IDL*
  - ► *Object implementations written in Java*
  - ► *User exit for client authentication*

- **Provides**
  - ► *Seamless access to CICS functions*
  - ► *OO and procedural applications coexist in same server*
  - ► *2-tier support for standard CORBA clients*
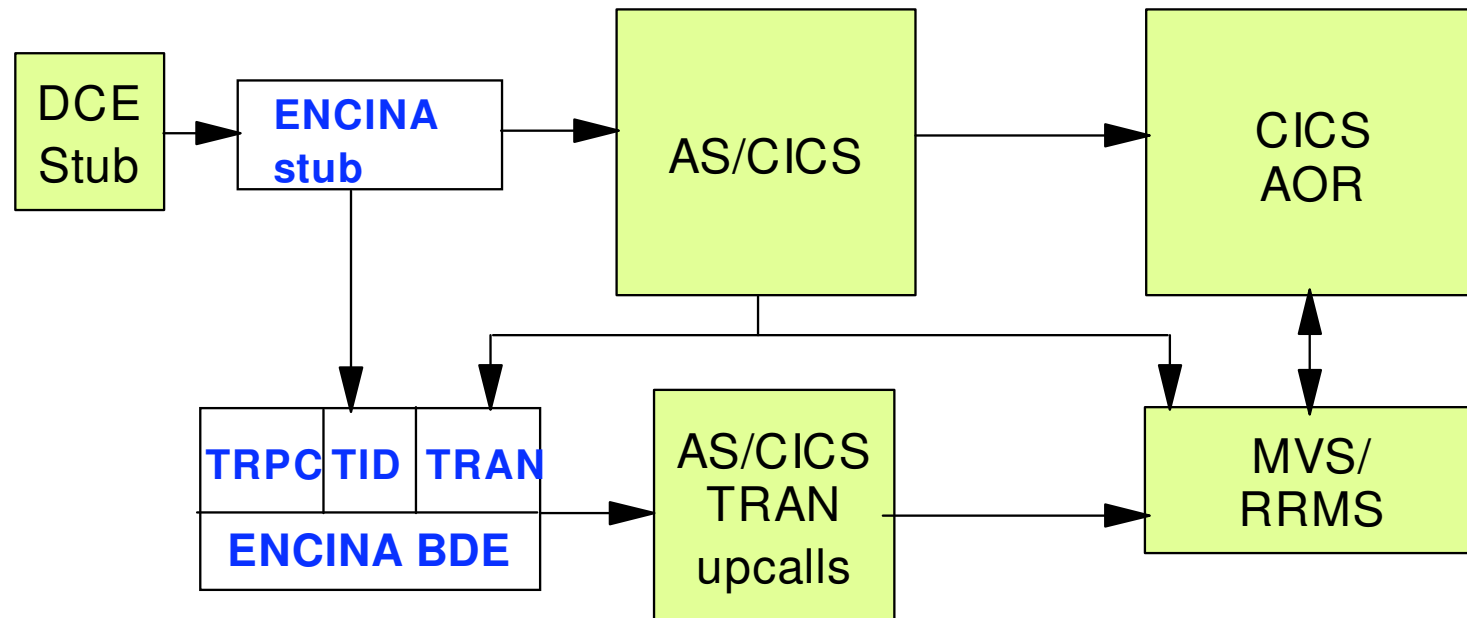
- **Restrictions**
  - ► *Stateless objects only*
  - ► *Each method invocation is a separate CICS transaction*
  - ► *Transaction and security contexts not supported*
  - ► *No support for outbound IIOP*

CICS Web Interface
Enhancements

- **Full integration into CICS**
  - ► *Listener domain*
  - ► *RDO and Catalog support*
  - ► *CEMT support*
  - ► *EXEC API for Template support*

- **CWI Network Security**
  - ► *SSL support*
  - ► *Mapping public key certificates to MVS USERID*

- **Support large HTML pages**
  - ► *Remove 32K restriction (enhance temporary fix for R2)*

- **Parallel Sysplex Enabled**

Transactional EXCI

```
┌──────┐     ┌──────────┐     ┌──────────┐          ┌──────────┐
│ DCE  │────▶│ ENCINA   │────▶│          │─────────▶│  CICS    │
│ Stub │     │ stub     │     │ AS/CICS  │          │  AOR     │
└──────┘     └──────────┘     │          │          │          │
                   │          └──────────┘          └──────────┘
                   │                │                     ▲│
                   ▼       ▼        │                     │▼
              ┌────────────────┐  ┌──────────┐       ┌──────────┐
              │TRPC│TID│ TRAN  │  │ AS/CICS  │       │  MVS/    │
              ├────────────────┤  │ TRAN     │──────▶│  RRMS    │
              │  ENCINA BDE    │─▶│ upcalls  │       │          │
              └────────────────┘  └──────────┘       └──────────┘
```

- Recoverable Resource Management System new in OS/390 V2.4
- CICS supports RRMS as a sub-coordinator
- EXCI extended
  - ► Additional parameter - context token
  - ► Management of mirror transaction
- Transactional EXCI
  - ► Supports DCE/TRPC
  - ► Used by S/390 CB Connector for CICS Procedural Application Adapter

3270 Bridge
Enhancements

- ### Remove restrictions
    - ►*Support for START from user program*
    - ►*Support for RETURN IMMEDIATE, INPUTMSG*
    - ►*Support any storage characteristics from single bridge environment*

- ### Usability improvements
    - ►*Simplified mechanism*
    - ►*EXEC CICS START TRANSID() BREXIT() BRDATA()*
    - ►*Split User-Replaceable Module*

Dynamic Routing of LINK Commands

- Enables dynamic routing of work requests initiated by:-
  - ► *DPL (CICS Servers)*
  - ► *ECI (CICS Client)*
  - ► *EXCI (DCE/RPC, OS/390 Component Broker)*
  - ► *CWI (Web browser, Web server plug-in, CICS Transaction Gateway)*
  - ► *IIOP (CORBA clients)*

- Dynamic routing program invoked if:-
  - ► *DYNAMIC=YES specified on Program definition*
  - ► *Program definition not found*

- Target system determined by:-
  - ► *the same dynamic routing program used for transaction routing*

- Associated TRANSID determined from:-
  - ► *LINK command (if specified)*
  - ► *Map of Program id -> TRANSID maintained by CPSM*
  - ► *PROGRAM definition*
  - ► *Default (CSMI)*

Dynamic Routing of
START Commands

■ Terminal-related START

- ► *Restricted subset of STARTs*
- ► *TERMID must be principal facility*
- ► *No time delay permitted*
- ► *START function shipped to TOR*
- ► *Transaction need not be defined in TOR*
- ► *Routing decision by Dynamic Routing Program in TOR*
- ► *Routing constrained to sysplex*
- ► *NOT constrained to STARTing AOR*

■ Non-Terminal related START

- ► *START routed if ROUTABLE option specified*
- ► *Routing Decision by Dynamic Routing Program in AOR*
- ► *Routing constrained to sysplex*
- ► *CANCEL is also supported*

Coupling Facility Data Tables

- Efficient access to shared data in the Coupling Facility
  - ► *Data is shared across sysplex with integrity*
  - ► *New facility for scratchpad data (to replace CWA,CSA)*
  - ► *Similar to user-maintained data tables*
  - ► *Suitable for small data items with high volatility*
  - ► *High availability*
- File Control API
  - ► *Contention model*
  - ► *Exploits CF compare-and -swap mechanism*
  - ► *New exception condition - CHANGED*
  - ► *Optimum performance for new programs*
  - ► *Non-recoverable*
  - ► *Locking model*
  - ► *UMT subset of API*
  - ► *Recoverable or non-recoverable*
- CFDT Server Region
  - ► *Separate servers for each pool of data tables*
  - ► *Server(s) replicated on each MVS image*

Sysplex-wide
ENQUEUE/DEQUEUE

- Provides serialized access to a named resource across multiple CICS regions in a sysplex
  - ► *Scope may be single region or named set within sysplex*
  - ► *Restricted to named resources (not addresses)*
  - ► *Eliminates a major cause of affinities*
  - ► *FIFO ordering not necessarily maintained across sysplex*
  - ► *Mechanism avoids "starvation"*
  - ► *Exploits MVS sysplex scope enqueues*
- No API changes
- ENQMODEL
  - ► *Maps enqueue prefix to 4-character scope name*
  - ► *May be over-ridden by user exit*
- SPI support
  - ► *INQUIRE UOWENQ*
  - ► *INQUIRE/SET/CREATE/DISCARD ENQMODEL*
- Enhancement to Affinities Utility

Named Counter Server

- Efficient assignment of unique sequence numbers
  - ► *New facility for managing sequence numbers*
  - ► *Named counters for different applications*
  - ► *Counters stored in Coupling Facility*
  - ► *Counters are shared across sysplex with integrity*

- Call Interface
  - ► *Same API for CICS and Batch*
  - ► *CREATE, ASSIGN, REWIND, DELETE*
- Exec Interface
  - ► *EXEC CICS format; equivalent to Call Interface*

- Named Counter Server Region
  - ► *Separate server for each pool of named counters*
  - ► *Server(s) replicated on each MVS image*

CICSPlex SM
Enhancements

- Support facilities for
  - ► *Java applications*
  - ► *CICS Business Transaction Services*
  - ► *CORBA client support*
  - ► *Dynamic Routing and Load Balancing*
  - ► *Sysplex-wide ENQUEUE/DEQUEUE*

- Tivoli Ready
  - ► *Resource discovery*
  - ► *Heartbeat*
  - ► *Event notification*

RDO for Temporary Storage

- Add, delete, change TST entries dynamically

- Queue prefixes up to 16 characters
  - ► *'+' and '%' as single character wildcards*
- TSMODEL
  - ► *Maps a queue prefix to a set of queue attributes:-*
  - ► *MAIN, RECOVERY, SECURITY, POOLNAME, SYSID, remote prefix*
  - ► *Model used is best match (cf. JOURNALMODEL)*
- Migration utility for macro TST
  - ► *TST required to map SYSID to POOLNAME if SYSID used on API*
- SPI support
  - ► *INQUIRE/CREATE/DISCARD TSMODEL*
  - ► *INQUIRE TSPOOL*
  - ► *POOLNAME as alternative to SYSID on INQUIRE TSQUEUE*
  - ► *SET TSQUEUE (for deletion of queues)*
- CEMT
  - ► *INQUIRE/SET/DISCARD*
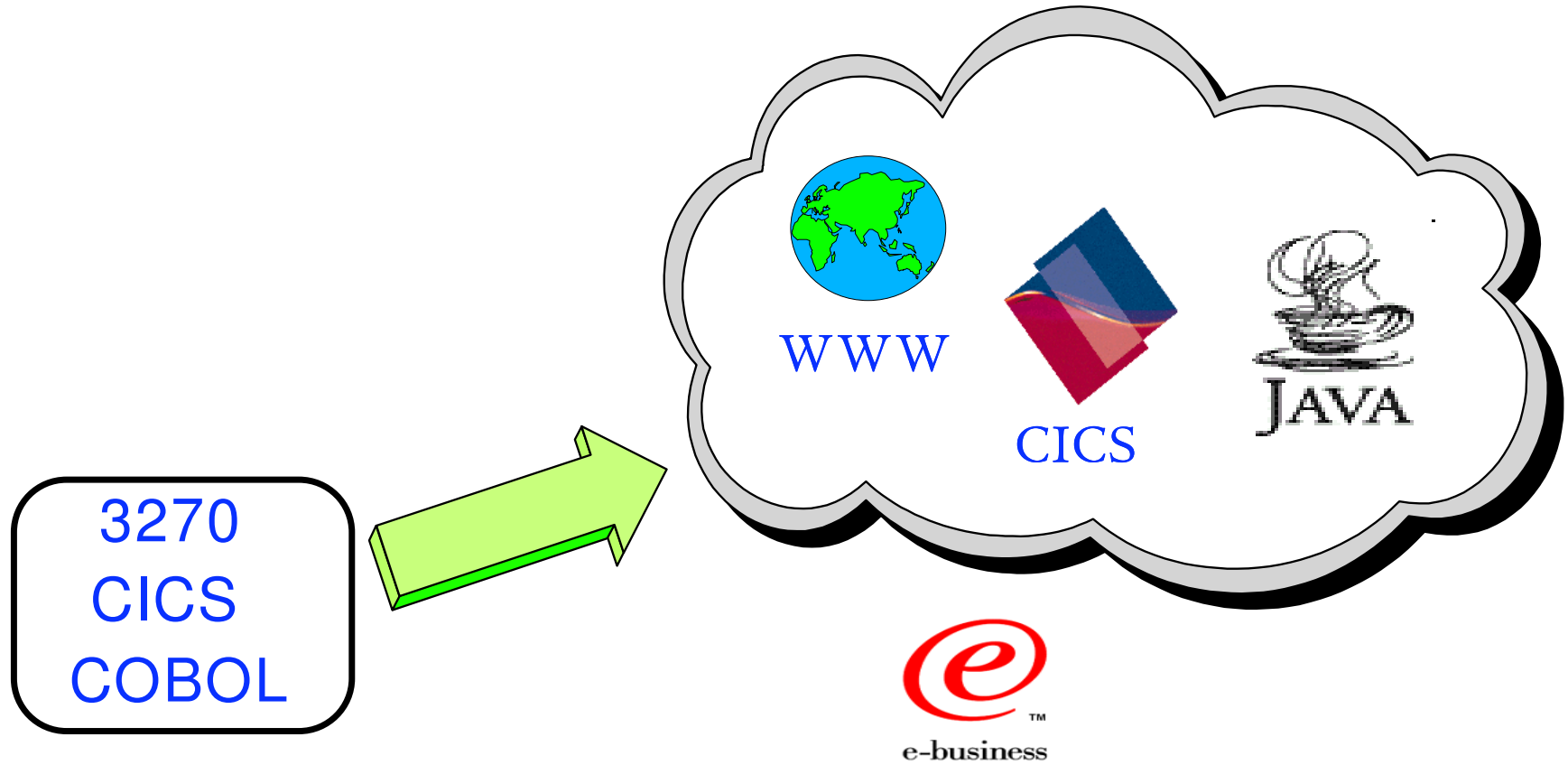
Additional Systems Management Enhancements

- Autoinstall for MVS Consoles

- Enhancements to CICS Monitoring and Statistics

- Quiesce for APPC

- Enhanced DBCTL connection

CICS TS Roll-out

Theme	CICS TS 1.1	CICS TS 1.2	CICS TS 1.3
Application Support		REXX	Java Support C++ and Java Classes CICS BTS OTE Long TSQ names
e-business Enablement	CICS Web Interface CICS Client ONC/RPC	ICAPI Support 3270 support MVS Java Gateway EXCI Java classes TCP62 3270 Bridge	CORBA client support CWI enhancements Transaction Gateway Transactional EXCI Bridge enhancements
Enterprise Scalability	VSAM RLS MVS Logger TS datasharing	MVS DASD Logger	Dynamic Routing for DPL and START CFDT Sysplex ENQ/DEQ NCS
Systems Management	CICSPlex SM 1.2 (API) RDO for DCT CREATE SPI Recovery Manager	CICSPlex SM 1.3 (BAS) RDO for RCT DB2 Connection	CICSPlex SM enhancements RDO for TST

Rapid Evolution, ... NOT Revolution

WWW

CICS

JAVA

e-business

3270
CICS
COBOL

M I S S I O N   C R I T I C A L

CICS TS Java Roadmap...

2000+

Enterprise Java Server

CICS EJB Support

**Server Java Applications
and JavaBean support**

Java/CORBA Client Access

**Transaction Gateway
(Integrated NCF Connectors)**

Web/Java Client Access

3270 Access

Component

Enablement

Today

Time