

# CICS/TS Application Programming Workshop

Learn via: **Classroom / Virtual Classroom / Online**

Duration: **5 Day**

**Overview** This five-day, hands-on course explains the functions and facilities of CICS, and teaches how to write efficient application programs using command level CICS. The course combines both tutor tuition and several extensive practical hands-on sessions. On completing this course attendees will have written at least two CICS programs utilising a wide variety of CICS facilities and have run several CICS transactions. Attendees will gain an understanding of the need for an application architecture separating presentation from business/data logic, and will become familiar with BMS maps. The course also covers all the commonly used API options, with hands-on exercises. This course is also available for one-company, on-site presentations and for live presentation over the Internet, via the Virtual Classroom Environment service.

## Prerequisites

Experience of COBOL, PL/I or Assembler. An understanding of CICS at the conceptual level would be an advantage; this can be obtained by attending the course **CICS Transaction Server Concepts & Facilities**.

## What You Will Learn

- write CICS programs
- use the required CICS programming facilities
- separate presentation from business and data logic
- use the commonly used CICS API options.

## Outline

### **Introduction**

The CICS family; What is CICS?; What is a CICS transaction?; What is a CICS Task?; What is a CICS program?; Characteristics; CICS Transaction Server; Access to CICS; ISC / MRO; Accessing CICS from the Web; The IBM Client Family; The CICS universal clients Version 6.0; CICS/TS organisation; Principal Domains/Management modules; CICS resource definitions; RDO overview; RDO components.

### **Architecture**

Starting a transaction; Logging on; Message Input; Transaction validation; Program loading; Task execution; Program execution; Task Termination; Multi-tasking and multi-threading; The CICS Dispatcher; Multiple TCBS.

### **Command Level API**

Objectives; Command format and arguments; Translation; Program preparation; Integrated translator; Translator options; Explanation of command argument types; Explanation of CICS Value Data Areas; Explanation of syntax diagrams; EXEC Interface Block; The CICS Stub; Handling responses; RESP and NOHANDLE option; RESP examples; HANDLE CONDITION command and rules; IGNORE condition; Coding examples.

### **Application Design**

Conversational transactions; Pseudo-conversational transactions; COMMAREA; Three-Tier Application Design.

### **Basic Mapping Support (BMS)**

Native Terminal Control; Using Basic Mapping Support (BMS); Another view of BMS; Un-formatted data streams; Formatted data streams; Example 3270 data display; Control Indicator & Character; Read Modified Input; Basic Attributes; Extended attributes; Program Function keys; BMS (data mapping); BMS example; The macros used to create the screen; BMS output (COBOL); The suffixed fields; Attribute list; BMS output (PL/I); BMS output (C); BMS output (Assembler); Map generation; DFHMDI; DFHMDF; DFHMDF; Symbolic description; EXEC CICS SEND MAP; EXEC CICS RECEIVE MAP; COPYBOOKS.

### **Program Control**

Passing data to other tasks (COMMAREA); Passing data to the next task: COBOL; Passing data to the next task: PL/I; Passing data to the next task: PL/I; Program structure; EXEC CICS LINK; LINK options and arguments; EXEC CICS XCTL; Passing data to other programs: COBOL; Passing data to other programs: PL/I; Passing data to other programs: C; Passing data to other programs: Assembler; EXEC CICS RETURN; Channels and Containers; A Channel; A Container; API Changes; One Program/One Channel; One Program/Multiple Channels; CEDX Screens; Channel Scope.

## **CECI and CEDF**

The Command Interpreter CECI; Using CECI; Using Variables with CECI; Displaying Large Variables; Storing a command; Execute Diagnostic Facility (CEDF); CICS Messages and Code (CMAC).

## **File Access**

File Access; File Control Terminology; File Management; File Commands; EXEC CICS READ; Options; EXEC CICS REWRIT; EXEC CICS DELETE; EXEC CICS UNLOCK; EXEC CICS WRITE;; EXEC CICS STARTBR; EXEC CICS READNEXT; EXEC CICS READPREV; EXEC CICS ENDBR; EXEC CICS RESETBR.

## **Channel and Containers**

The 32K COMMAREA problem; The 32K solution; Channel Usage; The Current Channel; Channel scope; Channel deletion; Channel commands; Channel creation and deletion; EXEC CICS PUT CONTAINER CHANNEL; EXEC CICS ASSIGN CHANNEL; EXEC CICS GET CONTAINER; EXEC CICS MOVE CONTAINER; EXEC CICS DELETE CONTAINER CHANNEL; EXEC CICS STARTBROWSE CHANNEL; EXEC CICS GETNEXT CONTAINER; EXEC CICS ENDBROWSE CONTAINER; Migration of programs that use LINK; Migration of Programs That Use START.

## **Temporary Storage**

Temporary storage; EXEC CICS WRITEQ TS; EXEC CICS READQ TS; EXEC CICS DELETEQ TS.

## **Transient Data**

Transient data queues; Automatic Transaction Initiation (ATI); EXEC CICS WRITEQ TD; EXEC CICS READQ TD; EXEC CICS DELETEQ TD.

## **Interval Control**

Interval control; EXEC CICS ASKTIME; EXEC CICS FORMATTIME; EXEC CICS START; EXEC CICS RETRIEVE; EXEC CICS CANCEL.

## **Task Management**

EXEC CICS SUSPEND; EXEC CICS ENQ; EXEC CICS DEQ.

## **Storage Management**

EXEC CICS GETMAIN; EXEC CICS FREEMAIN; Storage violations; Transaction isolation.

## **Abnormal Termination**

EXEC CICS ABEND; EXEC CICS HANDLE ABEND; ABEND handling requirements.

## **Dumps & Traces**

Dumps; Traces; EXEC CICS ENTER TRACENUM; Working out the Offset; Working out the source statement; Finding the contents of data variables; WORKING-STORAGE SECTION; LINKAGE SECTION - COBOL; OTHER Abends; Unhandled exception conditions (most AEIX/AEXX/AEYX); Translating Addresses to Source Code; Most AEIX, AEXX & AEYX ABENDs.

## **Screen Definition Facility 2 (SDF2)**

Introduction to SDF II.

## **Case Study**

The main exercise is to write a 'back-end' business /data logic program which is developed incrementally in order to ensure that a steady progress is achieved.