

# Introduction CICS InterTest

## Introduction

### Chapter 1:

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## Objectives

You will learn:

- The features of InterTest.
- How to invoke and terminate InterTest.
- Error detection methodology in InterTest
- Commands versus menus.

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# Introduction

## CICS InterTest

### Features

- AllFusion CA-InterTest for CICS is a tool for both application and system programmers:
  - It makes CICS testing faster, easier, and more effective.
  - It prevents CICS crashes by automatically detecting and preventing application errors before they damage CICS.
  - It provides the capability for examining and modifying main and auxiliary storage.

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### Testing

- CA-InterTest for CICS can simplify testing in a number of ways:
  - Through interactive testing using the AllFusion CA-InterTest for CICS monitor.
  - Error detection and prevention.
  - Diagnostic information display screens.
  - Program interruption through setting breakpoints.
  - Isolated test sessions through monitoring by CICS User ID.

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# Introduction CICS InterTest

## Testing Programs

- AllFusion CA-InterTest for CICS allows interactive testing.
- When AllFusion CA-InterTest for CICS detects an error, it can be corrected either dynamically or by bypassing the error and then resuming testing.
  - This allows several errors to be corrected in a single test session.
- AllFusion CA-InterTest for CICS obviates the requirement for utilizing dumps.
  - The information required for diagnosing and correcting errors is available online.
- It is possible to continue testing without recompiling a program or waiting for new printouts.

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## Using CA-InterTest

AllFusion CA-InterTest for CICS operates as follows:

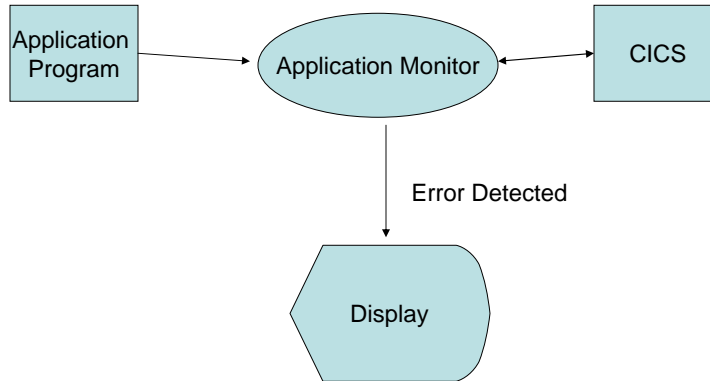
- AllFusion CA-InterTest for CICS is instructed to monitor a program and then run the program.
- AllFusion CA-InterTest for CICS inspects each instruction and CICS command before it executes to ensure that the program or CICS itself will not fail.
- If an error is detected, AllFusion CA-InterTest for CICS automatically interrupts the program.
  - This temporary interruption in program execution is called a *breakpoint*.
  - AllFusion CA-InterTest for CICS then displays a diagnostic screen explaining the nature of the problem and provides detailed information for correcting it.

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## Using CA-InterTest



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## Error Detection

- CA-InterTest for CICS can detect and prevent the following errors:
  - Storage violations, which are attempts to modify storage not owned by a program.
  - CICS abends which occur in a command level program.
  - Improper or invalid CICS requests at the command or Macro level.
  - Statements that would cause a program check or other abend.
  - Illegal or invalid instructions such as stop STOP RUN.
  - wild branches.

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## CICS InterTest

### Diagnostic Information

- AllFusion CA-InterTest for CICS provides the information needed to diagnose and correct errors.
- When AllFusion CA-InterTest for CICS detects an error, it halts the program before the error occurs.
  - This temporary halt in program execution is known as an automatic breakpoint.
  - AllFusion CA-InterTest for CICS then displays a screen of diagnostic information indicating the statement or instruction triggering the breakpoint.

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### Diagnostic Information

```
CA-InterTest - PROTDEM FILE SOURCE LISTING BREAKPOINT
COMMAND ==>
Program= COBDEMO   Option #           Stmt #           Margin= 01
                  Search=
OPTS 1 Proc div  2 Work-stor 3 Link sect 4 D-map    5 Clst/Pmap More: +
      6 Data xref 7 Proc xref 8 Err msgs  9 Srch fwd 10 Srch bwd
PFKS 1 Help      2           3 Det Bkpt  4 Profile  5 Resume   6 Menu
      7 Backward 8 Forward  9           10 001 Verb 11 Backtrace 12 Status
-----
_ 00880 CONTINUE-TASK.
00881**** TASKNUM *NOTE* FIELD MUST BE INITIALIZED
A ==> ADD +1 TO TASKNUM.
==>
==> ASRA abend (0C7) detected and prevented. Caused by invalid decimal
==> arithmetic data format.
==>
==> Press PF1 for a detailed description.
==>
_ 00883 IF TASKNUM = 1
_ 00884 MOVE 'DMPASR' TO MAPNAME.
```

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## CICS InterTest

### Setting Breakpoints

Four types of breakpoints can be set:

- Unconditional
  - The program stops when it reaches a specified location.
- Conditional
  - The program stops when it reaches a specified location and a prescribed condition is met.
- Variable-change
  - The program stops at any location if the value of a specified variable has changed.
- Request
  - The program stops when it reaches:
    - Specified CICS macros and commands.
    - Calls to DL/I or DB2.
    - Calls to subroutines, such as database software.

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### Count Breakpoint

- AllFusion CA-InterTest for CICS can also be instructed to halt a program each time it executes a specified number of COBOL verbs, PL/1 statements, or Assembler instructions.
- Controlling the pace at which a program executes makes it easier to pinpoint and correct logic errors.
  - When a program is halted, it is possible to inspect the values of program variables and test data in order to determine whether processing is proceeding as planned.
  - It is also possible to dynamically change the value of a data item or generate additional test records before resuming execution.

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## CICS InterTest

### Breakpoint Halt

- When a program is halted at a breakpoint, the following tasks can be performed:
  - View the program listing and compiler output online and search for a data string.
  - Display data items in a keep window to observe changes in their values.
  - Display and modify main storage.
  - Display and modify auxiliary storage.
  - Set and remove breakpoints.
  - Halt the program after it executes a specified number of COBOL verbs.
  - Write and execute indirect commands; which are statements that are inserted during a test session without recompiling the source code.
  - Display the path, backtrace, that brought the program to its current point.
  - Display the execution counts of the lines that brought the program to its current point.
  - Resume program execution or abend the task.

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### Protect CICS

- AllFusion CA-InterTest for CICS protects CICS test and production systems because it will not permit errors that could damage CICS.
- In a test CICS system, CA-InterTest can be instructed to inspect every program for errors.
- CA-InterTest for CICS detects and prevents all CICS storage violations.
- The utilization of AllFusion CA-InterTest for CICS in CICS test systems means programs are less likely to have bugs when they go into production.

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## CICS InterTest

### Examine and Modify Storage

- AllFusion CA-InterTest for CICS has facilities for examining and modifying main and auxiliary storage.
- Program execution can be executed at various points in order to examine how the values of program variables and test data have changed.
- Storage can be modified as the testing progresses.

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### Starting InterTest

- It is not necessary to learn command syntax.
- Standard ISPF-like menus and selection screens make it easy to access any component in AllFusion CA-InterTest for CICS at any time.
- The ITST transaction displays the Primary Option Menu from which any AllFusion CA-InterTest for CICS function can be accessed.
- Specially formatted displays and screens provide the capability to bypass menu processing by using special commands or single keystrokes for the most frequently used testing functions.

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# Introduction CICS InterTest

## ITST Panel

```
----- CA-InterTest r8 PRIMARY OPTION MENU -----  
OPTION ==>  
  
1 Source           - Display/select program source files/listings  
2 Monitoring       - Display/modify CA-InterTest monitoring/activity  
3 Main Storage     - Display/modify CICS storage areas  
4 Auxiliary storage - Display/access database/files/queues  
5 Dump Analysis    - Invoke CA-SymDump CICS dump/trace capture facility  
6 Product Help     - Invoke CA-InterTest product help facility  
7 Status/Maintenance - Product status and maintenance functions  
8 What's new?      - Display information about CA-InterTest for CICS r8  
X Exit            - Terminate menu processing
```

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## CICS Transactions

AllFusion CA-InterTest for CICS consists of these CICS transactions:

- ITST
  - Displays the ISPF-like Primary Option Menu.
- LIST
  - Displays online COBOL, PL/1, and Assembler source listings and compiler output.
- CNTL
  - Controls program monitoring.
- CORE
  - Inspects and modifies main storage.
- FILE
  - Displays and updates CICS files, DL/I, DB2, and SQL/DS databases, temporary storage, or transient data.
- HELP
  - Provides online assistance for using CA-InterTest.

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# Introduction CICS InterTest

## Menus and Displays

Menus:

- Are always available.
- Use a standard set of PF keys.
- Support a subset of ISPF commands, including the fast-path Jump (=x.y.z) command for quick navigation.
- Simplify navigation among the Source Listing, Monitoring (CNTL), Main Storage (CORE), Auxiliary Storage (FILE), and AllFusion CA-SymDump for CICS (SYMD) displays.

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## ITST

- In order to access the Primary Option Menu, enter ITST from:
  - CICS.
  - any Source Listing display or breakpoint.
  - any AllFusion CA-InterTest for CICS menu.
- Before a test session, sign on to CICS, and then enter the ITST Transaction.
- From any Source Listing or breakpoint display, type ITST on the Command line.
- From the Breakpoint Primary Option Menu, type ITST or select option 1 Main Menu

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## CICS InterTest

### Breakpoint Menu

- When at a breakpoint, AllFusion CA-InterTest for CICS includes a Breakpoint Primary Option Menu.
- In order to access the Breakpoint Primary Option Menu from any Source Listing Breakpoint, enter MENU on the Command line or press PF6 Menu.

```
----- CA-InterTest r8 BREAKPOINT PRIMARY OPTION MENU -----  
OPTION ==>  
  
1 Main menu           - Display the CA-InterTest primary option menu  
2 Status              - Display/remove current monitoring options  
3 Abend               - Abend the breakpointed task  
4 Resume              - Resume breakpointed task menu options  
5 Override             - Override automatic breakpoint default processing  
6 Dump                - Cause dump, resume from next sequential instruction  
7 Disconnect          - Disconnect the breakpoint from this terminal  
8 Hogan SMART         - Invoke Hogan System's debugging facility  
X Exit                - Terminate breakpoint menu processing
```

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### Breakpoint Primary Option Menu

```
----- CA-InterTest r8 BREAKPOINT PRIMARY OPTION MENU -----  
OPTION ==>  
  
1 Main menu           - Display the CA-InterTest primary option menu  
2 Status              - Display/remove current monitoring options  
3 Abend               - Abend the breakpointed task  
4 Resume              - Resume breakpointed task menu options  
5 Override             - Override automatic breakpoint default processing  
6 Dump                - Cause dump, resume from next sequential instruction  
7 Disconnect          - Disconnect the breakpoint from this terminal  
8 Hogan SMART         - Invoke Hogan System's debugging facility  
X Exit                - Terminate breakpoint menu processing
```

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## CICS InterTest

### Standard PF Keys

- PF1 Help
  - Displays a Help menu relating to the current menu or display.
  - At an automatic breakpoint, it provides help for the specific problem.
  - Use Clear to exit help.
- PF3 End
  - Ends the current display and returns to the previous menu or display.
- PF4 Return
  - Returns to the highest level menu, either the Primary Option Menu or the Breakpoint Primary Option Menu.
- PF7 Backward
  - Scrolls a list back one page, or scrolls back to the list item indicated by the user's cursor.
- PF8 Forward
  - Scrolls a list forward one page, or scrolls down to the list item indicated by the user's cursor.

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### Commands

- BACKWARD,BWD
  - Same as PF7, scrolls backwards or towards the top of the selection list.
- BOTTOM, BOT
  - Scrolls to the bottom of a selection list.
- COLLAPSE
  - Collapses a branch in a tree structure to show only the base entry.
- DOWN
  - Same as FORWARD.
- END Same as PF3.
  - Ends the current function and returns to the previous menu or display.
- EXPAND
  - Expands a branch in a tree structure to show all related entries.

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## CICS InterTest

### Commands

- FORWARD, FWD
  - Same as PF8, scrolls the display list forward towards the bottom of the selection list.
- HELP Same as PF1
  - Displays help for the current screen.
- LOCATE, LOC, L
  - Locates a selection in a list based on the character that has been entered.
- MAIN Same as PF4 Return.
  - Returns to the highest level menu, such as the Primary Option Menu.
- REFRESH Same as PF2 Refresh.
  - Refreshes or redraws the current display to reflect recent modifications.

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### Commands

- RETURN Same as PF4 Return.
  - Returns you to the highest level menu.
- SELECT, SEL, S
  - Selects an option on a menu.
- TERMINAL, TERM
  - Displays the current Terminal ID.
- TIME
  - Displays the current time.
- TOP
  - Scrolls to the first entry in a selection list.
- UP Same as PF7
  - Backward.
- USER
  - Displays the current CICS user ID.

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## CICS InterTest

### Monitoring Status Display

- The Monitoring Status display shows the current monitoring, breakpoints, and monitoring options in effect for one or for all monitoring entries.
- In order to get a Monitoring Status for a single monitoring entry, such as a single program:
  - From the Source Listing Display or Source Listing Breakpoint screen, enter STATUS in the COMMAND line when the current program is displayed.
  - From the Breakpoint Primary Option Menu, select option 2 Status.
  - From the Primary Option Menu, complete the Monitoring Menu for the Program (2.1), Transaction (2.2), or Terminal (2.3), and select the Status option from the option list.

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### Monitoring Status Display

- In order to get a Monitoring Status for all monitoring entries:
  - from the Source Listing Display or Source Listing Breakpoint screen, enter STATUS ALL.
  - from the Breakpoint Primary Option Menu, select option 2 Status.

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## MONITORING STATUS

```
----- CA-InterTest for CICS r8 MONITORING STATUS -----  
COMMAND ===>  
  
Type + to expand or - collapse option levels displayed below,  
or R to remove option(s).                               More: +  
  
  Option      Description      Attributes  
- - COB2DEMO  Program monitor entry  COBOL II  
  |          Waiting at breakpoint  Task 00043, UBP since 08:48 a.m.  
- - |-.ANY    User monitoring options  Active  
- - |-.ANY    User monitoring options  Deactivated  
  |          Symbolic listing file  PROTDEM  
  |          Symbolic listing file  PROTDEM  
- - |-RBP    Request breakpoint(s)    DSNHLI calls  
  |          Option ID          CB1E38D7  
  |          From, to terminals    X508, X508  
  |          On count, times thru, left  39, 0, 39  
- + |-UBP    Unconditional breakpoint  #386  
- + |-UBP    Unconditional breakpoint  #389  
-   |-SLB    Source listing breakpoints  .ANY  
-   |-SLB    Source listing breakpoints  X508
```

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## Remove Monitoring, Breakpoints, or Other Options

- Enter the letter r in the selection field next to any option to remove it.
  - This removes the option and any options in that branch breakpoints also.
- Removing breakpoints, especially request breakpoints, is simple using the status display.
- After removing an option, the display can be refreshed to reflect changes.
  - Use the REFRESH Command or press PF2 Refresh.

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