Introduction

Chapter 1:

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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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.

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.
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.

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

Application Program → Application Monitor → CICS

Error Detected

Display

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.
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.
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.

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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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.

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.
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.

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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ITST Panel

----------------- CA-InterTest r8 PRIMARY OPTION MENU -----------------

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

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.
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.

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
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.

 Schro===> CA-InterTest r8 BREAKPOINT PRIMARY OPTION MENU Schro===>

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

Breakpoint Primary Option Menu

 Schro===> CA-InterTest r8 BREAKPOINT PRIMARY OPTION MENU Schro===>

OPTION ===>

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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.

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.
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.

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.
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 Menus for the Program (2.1), Transaction (2.2), or Terminal (2.3), and select the Status option from the option list.

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.
MONITORING STATUS

COMMAND ===> Type + to expand or - collapse option levels displayed below, or R to remove option(s).

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 CB1E3B00
| 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

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.