

PL/1 Programming Fault Analyzer: Introduction

Fault Analyzer: Introduction

z/OS Mainframe Utilities
& Development Tools

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Objectives

You will learn:

- The purpose and featureset of the Fault Analyzer.
- To recognize the various report sections.
- Invoke the utility.
- Performing a Reanalysis report.
- Executing Fault Analyzer commands.

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Fault Analyzer: Introduction

Purpose of Fault Analyzer

- After analyzing information about the application and its environment, Fault Analyzer generates an analysis report.
- The report describes the problem in terms of application code.
- This is used to avoid system and user dumps.

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Analysis Engine

- The analysis engine is an expert system that encapsulates the collective debugging experience .
- It will be invoked when an abend or dump is requested.

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Real-time Abend Analysis

- When a program abends, the abend processing (MVS or subsystem) is intercepted and Fault Analyzer is automatically invoked.
- The analysis logic records details about the abend in a fault history file and writes the fault analysis report to the job.
- It also saves the analysis report in the fault history file along with a minidump.
- If Fault Analyzer deems the analysis to be successful then Fault Analyzer suppress the dump.

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Real-time SNAP Analysis

- There is essentially little difference between the Fault Analyzer real-time abend analysis process and the real-time SNAP analysis process, except for the way in which Fault Analyzer is invoked.
- The program SNAP interface permits an application program to invoke Fault Analyzer by including the appropriate calls where desired.
- After the SNAP, the application program is able to continue execution.

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Reanalysis Process

- The reanalysis process is essentially identical to the real-time analysis process, except for the following:
 - Fault Analyzer obtains the required information from the saved minidump.
 - History file is not updated.
 - No SYSLOG is written.

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Fault History Files

- Fault history files are PDS(E) data sets that contain information about faults that have been analyzed by Fault Analyzer.
- The members contain:
 - Abend code and failing program name.
 - Execution environment details.
 - Real-time analysis report.
 - Saved minidump.
 - Name of associated SYSMDUMP.

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Dump Suppression

- The types of dumps that can be suppressed are:
 - SYSABEND
 - SYSUDUMP
 - SYSMDUMP
 - CICS transaction dumps

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Fault Analyzer ISPF Interface

- At any time after an abend, a TSO user, can start the Fault Analyzer ISPF interface to review the fault.
- This interface can be used to:
 - View the stored real-time analysis report.
 - Start a batch reanalysis.
 - Start an interactive reanalysis.
 - View information about the fault.
 - View details about any faults.
 - Delete the fault entry.

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Invoking the Interface

- The interface is typically invoked by adding an option to one of the ISPF selection panels.
- Multiple concurrent invocations of Fault Analyzer by a single TSO/ISPF user is supported; however there are some limitations.
- When performing concurrent interactive reanalysis of the same fault entry in multiple ISPF split screen sessions, changes to user notes in one session are not reflected in another.

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Fault Entry List Display

```
IBM Fault Analyzer - Fault Entry List                               Line 1 Col 1 80
Command ==> _____ Scroll ==> CSR
```

```
Fault History File or View : 'IBMUSER.DEMO.HIST'
```

```
{The following line commands are available: ? (Query), V or S (View real-time
report), I (Interactive reanalysis), B (Batch reanalysis), D (Delete), H
(Duplicate history).}
```

Fault ID	Job/Tran	User ID	Sys/Job	Abend Date	Time
— F00323	IDIVPCOB	IBMUSER	MVS2	SOC7	2001/12/21 13:02:25
— F00445	ALLANT01	JACKIED	MVS8	SOC7	2001/12/19 03:29:57
— F00444	ALLANT01	JACKIED	MVS8	SOC7	2001/11/28 20:25:30
— F00442	ALLANT01	ALLANT	MVS8	SOC7	2001/09/10 22:20:10
— F00349	CS05	CICSUSER	CSCB0050	ASRA	2001/08/23 07:47:23
— F00348	CS04	CICSUSER	CSCB0040	ASRA	2001/08/23 07:46:36
— F00345	CS01	CICSUSER	CSCB0010	AEIL	2001/08/23 07:43:35

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- B
 - Batch reanalysis.
 - Submit a batch job to perform reanalysis against the selected fault entry.
- D
 - Delete
 - Delete the fault entry from the fault history file.

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Action

- I
 - Interactive reanalysis.
 - Run interactive reanalysis against the selected fault.
 - The interactive report will also eventually be displayed.
- H
 - Duplicate history.
 - When available, shows details about faults which have occurred, and were deemed to be duplicates of the selected fault entry.

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Action

- V (or S)
 - View report.
 - View the saved fault analysis report.
- ?
 - View fault entry information View the fault entry information.
 - This will show the the associated MVS dump data set name, if there is one.

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COLS

- From the Fault Entry List, COLS display brings up the Fault Entry List Column Configuration display.
- This provides for the capability to tailor the information shown on the Fault Entry List display.

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COPY

- The COPY command copies the current display to the specified data set name.
- The copy operation is made to the data set to which the display is to be written.

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DISASM

- DISASM command, is only available from within the interactive report.
- It can be used to perform disassembly of object code at a given address in storage.

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FIND

- The FIND command is used to locate a text string in the current display.
- It can be used to search for non case sensitive strings, case sensitive strings and HEX values.

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INFO

- The INFO command can be used to view information about the current fault entry.

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LOOKUP

- The LOOKUP command displays the explanation of a specified message ID, abend code, or other information.

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NOTELIST

- The NOTELIST command, can be used for displaying all user notes that exist in the current fault entry.

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QUIT

- The QUIT command is used from within the interactive reanalysis report; the user is returned to the Fault Entry List display.
- From the Fault Entry List display, the ISPF interface is terminated.

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RUNCHAIN

- The RUNCHAIN command, can be used to display chained data areas.

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SHOW

- The SHOW command, can be used to display a storage location.
- Example:
 - In order to display the storage at address 007F2300, enter:
SHOW 7F2300
- Offsets can be specified with the SHOW command.

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VIEWS

- The VIEWS command, is only available from the Fault Entry List display. It can be used to show a listing of all views currently available.
- Issuing the VIEWS command performs the same function as when the List Views option is selected from the File action-bar pull-down menu.

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Viewing a Real-time Fault Analysis Report

```
Real-Time Report                               Line 1 Col 1 80
Command ==> _____ Scroll ==> CSR

- Expand all / + Collapse all
*****
* IBM Fault Analyzer for z/OS V7R1M0 (MVS 2007/01/16)
*
* (C) Copyright IBM Corp. 2000, 2007. All rights reserved.
*****

JOBNAME: IDIVPPL2  SYSTEM ABEND: 0C9           FAE1      2005/06/22  09:28:

+ <H1> I B M   F A U L T   A N A L Y Z E R   S Y N O P S I S
+ <H1> I B M   F A U L T   A N A L Y Z E R   E V E N T   S U M M A R Y
+ <H1> I B M   F A U L T   A N A L Y Z E R   E V E N T   D E T A I L S
+ <H2> EVENT 1 OF 5: CALL (DSA ADDRESS 00034018)
+ <H2> EVENT 2 OF 5: CALL (DSA ADDRESS 000340E0)
+ <H2> EVENT 3 OF 5: CALL (DSA ADDRESS 000341D0)
```

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Condense Listing

- Sometimes it will be beneficial to eliminate the insertion of blank lines in Fault Analyzer.
- The information will be "condensed" and the need for vertical scrolling reduced.
 - The View menu Add Blank Lines option controls the insertion of blank lines.
 - The View menu Remove Blank Lines option controls the insertion or elimination of blank lines.

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Adding or Removing Detail

- Where applicable, additional detailed information can be included in the display.
 - The View menu Add Detail Information option controls the inclusion of detailed information.
 - The Remove Detail Information option controls the exclusion of detailed information.

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Abend Codes and Errors

- User-selected message or abend code explanations can be displayed.
- The LOOKUP command, which may be issued from the interactive fault history file display or the interactive fault reanalysis report, can be used to display explanations for user-selected message IDs or abend codes.

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Deleting Fault History File Entries

- A delete can be performed by entering the line command D against the fault entry in the Fault Entry List display.
- A range of fault history entries can be deleted using two DD range markers.
 - When deleting a range of a matched set of entries, only the entries displayed on the screen are deleted.
 - Entries that are not displayed, will not be deleted, and are interleaved with the displayed entries on the original fault history file.

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Initiating Batch Reanalysis

- In order to initiate batch reanalysis, enter B against the fault history entry.
- When performing batch reanalysis through the ISPF interface, the generated JCL will include DD statements as required for any JOBLIB, STEPLIB, or Fault Analyzer compiler listing or side file data sets.

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Report Sections

- **Prolog Section**
 - Consists of everything from the top of the report until the start of the synopsis section.
- **Synopsis Section**
 - Provides a brief description of the fault and its analysis.
- **Summary Section**
 - Contains a list of all events in chronological order.
- **Event Details Section**
 - Provides detailed information about each event.

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Report Sections

- **System-wide Information Section**
 - Contains CICS system-related information, such as trace data and 3270 screen buffer contents.
- **Abend Job Information Section**
 - Provides information about the abending job associated with the real-time invocation of Fault Analyzer.

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PL/I IVP

- The sample report was produced by running the Fault Analyzer supplied PL/I installation verification program (IVP), provided as member IDIVPPLI in data set IDI.SIDISAM1.

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