

IBM System z Technology Summit



Tooling Showcase: IBM Problem Determination Tools Overview of Version 11



Why are Customers Migrating?

Issues with Productivity, Functionality, Cost

Business (Vendor Issues)

- Business Practices
- Pricing Issues
 - Upgrade fees
 - Rising maintenance fees
 - Unplanned budget overages
 - Long term contracts

Technical (Product Issues)

- Ongoing enhancements
 - Integration with other products and hardware
 - Product support
 - Administrative complexity

Application Development Environment

- Unable to deploy new applications on the platform that best meets business needs (z/OS)
- Forced to consider other platforms for application hosting or affordable tools and utilities
- Reuse traditional assets in the Internet world



**Productivity,
Flexibility**

Costs

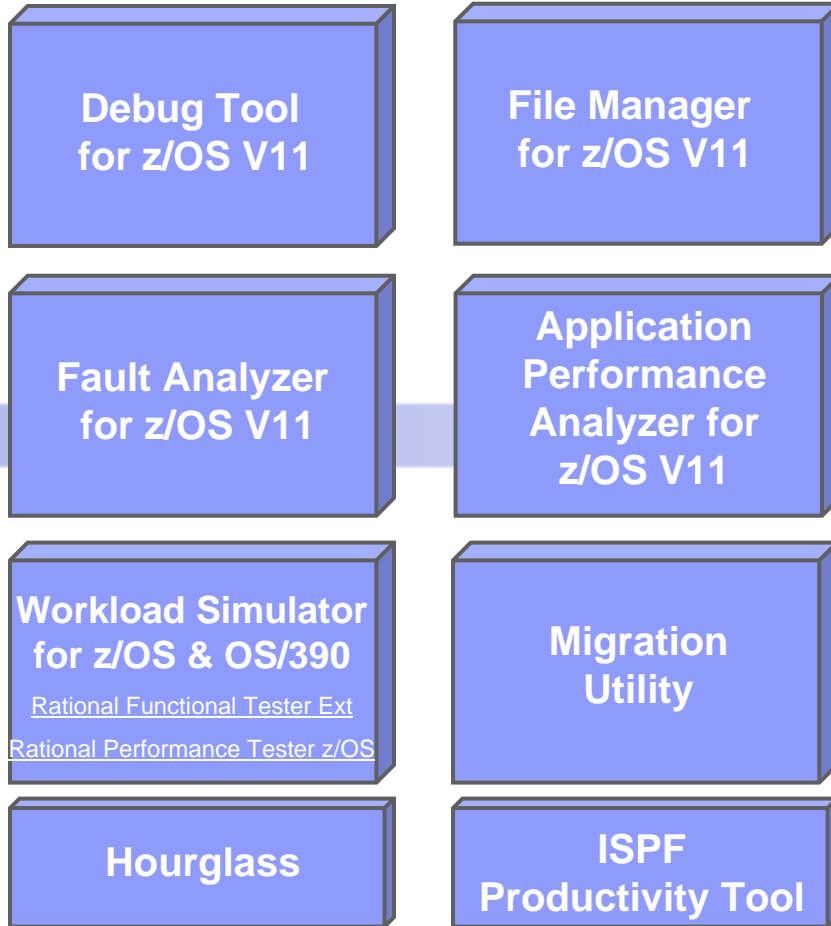
Offer a tool set that:

- Exploits IBM's latest software and processor technology
- Offers wide array of key features and functions
- Enhances the Application Development Lifecycle
- Provides opportunity for increased user productivity
- Is affordably priced
- Has flexible terms and conditions
- Has no license keys

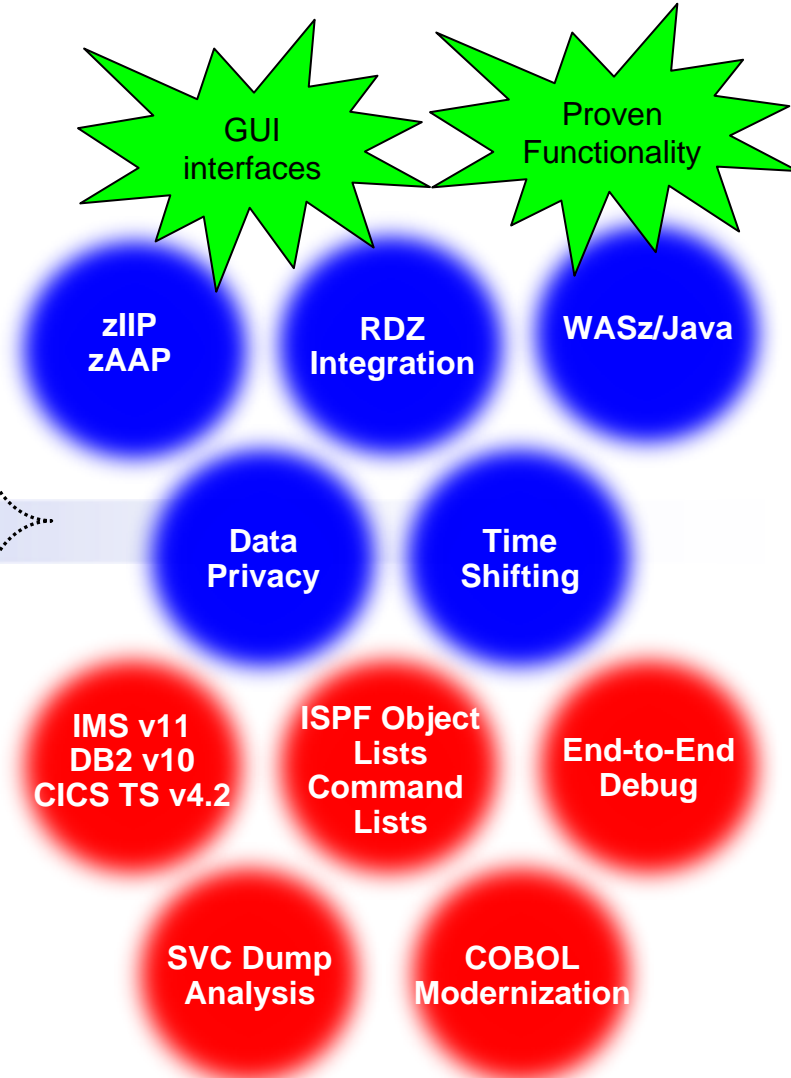
IBM Problem Determination Tools Suite for z/OS

Best of breed application development tooling

IBM 2011 Offerings



www.ibm.com/software/awdtools/deployment



IBM Problem Determination Tools

z/OS Problem Determination Tools

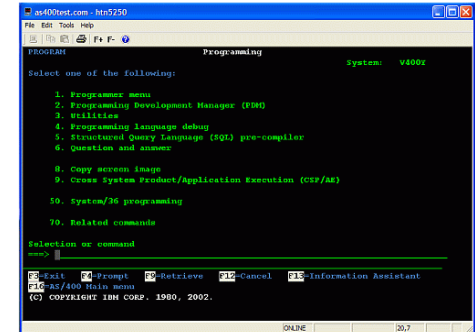
Product Descriptions

- **Debug Tool z/OS**
 - Interactive source level debugging for multiple languages
- **Fault Analyzer for z/OS**
 - Captures and analyzes abend information about application and environment
- **File Manager for z/OS**
 - Manages production, test, and development data across multiple file formats and storage media
- **Application Performance Analyzer for z/OS**
 - Helps maximize application performance and resource consumption
- **Workload Simulator for z/OS and OS/390**
 - Regression, performance, stress, function, and capacity testing
- **ISPF Productivity Tool**
 - Integrates with ISPF providing improved access to key functionality, reducing time-consuming navigation steps
- **HourGlass**
 - Provides date and time manipulation for time sensitive applications

Improve developer productivity with modern interfaces

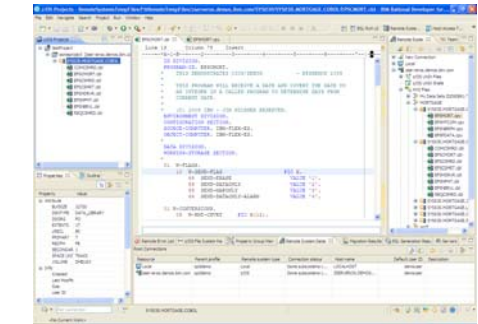
New Stand-alone GUI interfaces

- A user interface's design affects the amount of **effort** needed to **provide** input and **interpret** output from a system, and the **effort** required to **learn** how.
- Use common Eclipse-based tooling across multiple platforms and languages
 - Achieve ~15% improvement in mainframe developer productivity¹
 - Reduce host CPU usage 50%-80%¹ with workstation syntax checking
 - Reduce training costs, more attractive IDE for younger developers



✓ Produce code faster, save MIPS

- Speed development with specialized editors



1. Aggregation of results from a productivity study conducted by IBM mainframe customers



IBM Debug Tool for z/OS Version 11



IBM Debug Tool for z/OS

Examine, monitor, and control program execution

Program A,
calls B...



Problem

- Need a program testing and analysis aid that helps examine, monitor, and control the execution of application programs on a z/OS system



IBM Debug
tool!

Solution

- **Source level debugging**
 - Conditional and unconditional breakpoints
 - Step mode debugging
 - Variable and storage monitoring and update
- **Single debugging engine for many environments**
 - Batch
 - TSO
 - CICS
 - IMS
 - WLM
 - WASz
 - UNIX System Services
 - DB2 Stored Procedures
 - JZOS
- **Ability to run automated command scripts**
- **Frequency sampler**
- **Interactive playback support**

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

IBM 2011 Offerings

Debug Tool
for z/OS

File Manager
for z/OS

Fault Analyzer
for z/OS

Application
Performance
Analyzer for
z/OS

Workload Simulator
for z/OS & OS/390

Migration
Utility

Hourglass

ISPF
Productivity Tool

www.ibm.com/software/awdtools/deployment

Debug Tool for zOS

- Interactive program debugging
- Easy setup – debug your program quickly
- Multiple languages:
 - COBOL
 - PL/I
 - C/C++
 - Assembler
- Multiple z/OS environments
 - Batch
 - TSO
 - CICS
 - IMS/TM
 - DB2 stored procedures
 - Websphere application server
 - Unix system services
- Code coverage reporting
- COBOL modernization
- GUI Eclipse plug-in for CICS Explorer **at no additional cost!**

What is IBM Debug Tool for z/OS ?

- An interactive program debugger to control and monitor application programs while they run

The diagram illustrates the workflow of the IBM Debug Tool for z/OS. On the left, a box labeled 'z/OS' contains two interconnected components: 'Application' and 'Debug Tool'. An arrow points from the 'Application' to the 'Debug Tool', and another arrow points from the 'Debug Tool' to a user sitting at a computer terminal. The terminal displays a COBOL program being debugged, with the following code visible:

```

COBOL LOCATION: ADSTAT :> 63.1
Command ==>
MONITOR -----1-----2-----3-----4-----5-----6- LINE: 1 OF 8

0001 1 ACCUM-A +0508
0002 2 RESULT-SUM +0000000508
0003 3 ***** AUTOMONITOR *****
0004 02 NUM ( 1 )
0005 SUB (1) +0000000103
0006 02 WORK-MAX +0000000000

SOURCE: ADSTAT --1-----2-----3-----4-----5-----6- LINE: 61 OF 95
61 MOVE 'CALCULATING MIN MOV AND DANCE' TO PROGRAM STATUS 1
62 MOVE NUM(1) TO WORK-
63 MOVE NUM(1) TO WORK-
64 PERFORM VARYING SUB-
65 UNTIL SUB-A
66 IF NUM(SUB-A) >

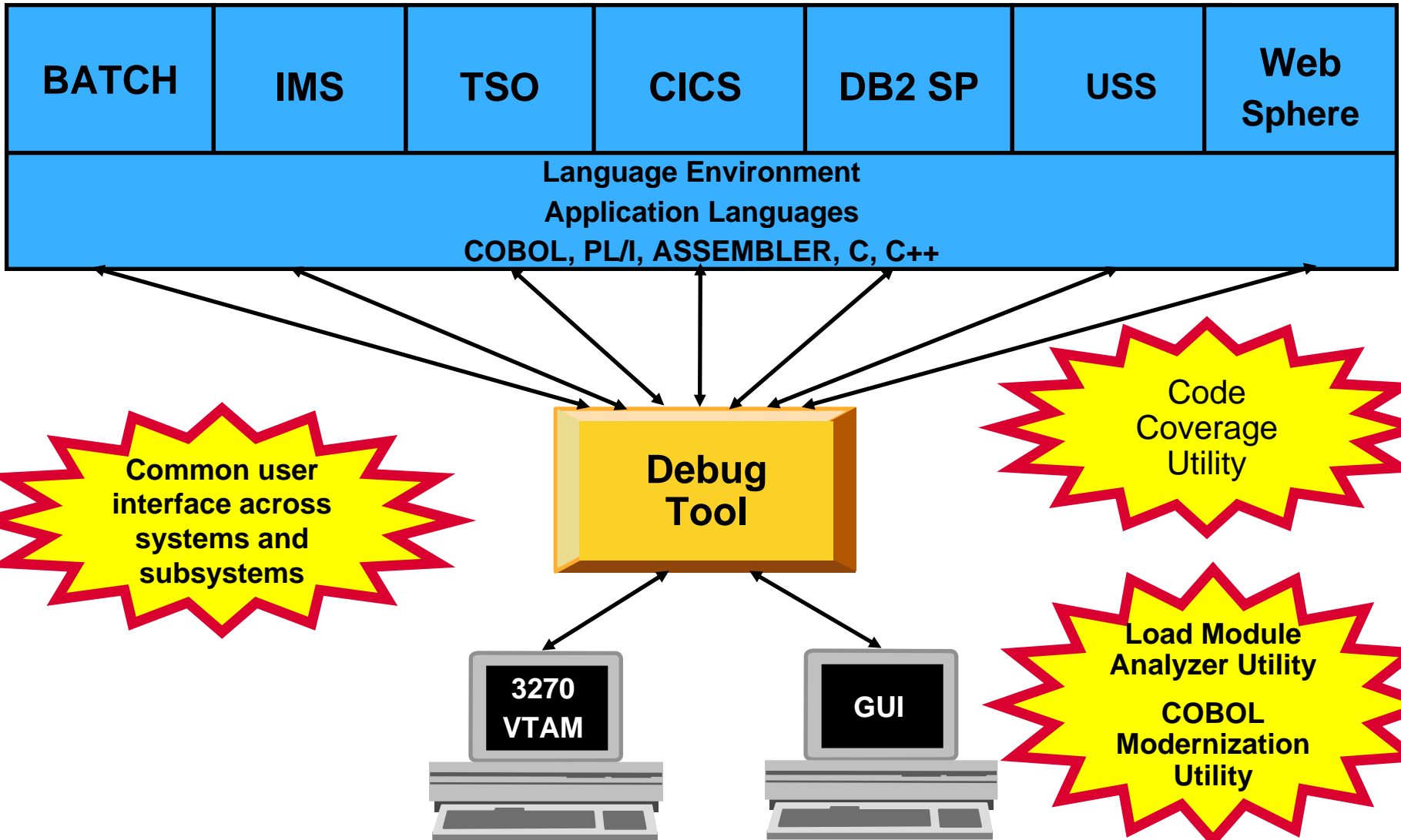
LOG 0-----1-----2-----3-----
0039 GO ;
0034 SET AUTOMONITOR ON ;
0035 MONITOR
0036 LIST RESULT-SUM ;
PF 1: ? 2: STEP 3: QUIT
PF 7: UP 8: DOWN 9: GO
    
```

To the right of the terminal, a screenshot of the IBM WorkSpace Developer Debugger for Systems z interface is shown. The interface includes a 'Debug Console' with a list of program statements and their addresses, a 'Registers' panel showing the values of various registers, and a 'Memory' panel. The 'Registers' panel shows the following values:

Name	Value
RPT-HEADER	
FILER	CUSTOMER FILE #
RPT-REV	1
FILER	7
RPT-CD	1
FILER	1
RPT-PT	1
FILER	(ShareView) TIME
RPT-PR	1
FILER	7
RPT-REN	1
FILER	1

- And a set of related online panels and batch utilities

Debug enterprise applications to isolate coding issues



Debug Tool Features

- Source-level debugging
- Multiple breakpoints
 - Conditional
 - Unconditional
- Step mode debugging
- Dynamic patching
 - Modify variables
 - Insert statements
- Command logging of debugging session
- Frequency sampler
- Programmable command entry
- Utilizes LE services
 - Breakpoints at LE conditions
 - Recovery of program abends
- Interactive playback support
- Automonitor support for COBOL, PL/I, and Assembler programs
- Save and restore sessions settings
- An interface to the Fault Analyzer
- Commands to query, allocate, and free files
- Object level disassembly debugging
- CICS
 - Detect storage violations
 - Memory editor and browser
 - Display channel and containers
 - Pattern-matching breakpoints
- 64-bit register support Assembler

Visit our web site: www.ibm.com/software/awdtools/debugtool

The screenshot shows the IBM website interface for the Debug Tool for z/OS. The page is in English, with the location set to "United States". The navigation bar includes links for Home, Solutions, Services, Products, Support & downloads, and My IBM. A search bar is present in the top right. The main content area is titled "Debug Tool for z/OS" and includes a breadcrumb trail: Software > Software Development > z/OS Problem Determination Tools >. A sidebar on the left contains a navigation menu with links for Debug Tool for z/OS, Features and benefits, System requirements, Library, News, Training and certification, Services, How to buy, and Support. Below the sidebar is a section for "IBM Software products" with a "Find products" button and a search box. The main content area features an "Overview" section with a description of the tool and a list of features. To the right of the overview is a "Learn more" section with links to Features & benefits, System requirements, Product library, Announcement letter, Data sheet (PDF, 451KB), and Technical architecture. Below that is a "Downloads" section with a link to GUI plug-ins, and a "Use and maintain" section with links to Product support, Information center, and Training and certification. On the far right, there is a "We're here to help" section with a photo of a woman and links to "Request a quote" and "E-mail IBM". Below this is contact information: "Or call us at: 877-426-3774, Priority code: 109HE03W". At the bottom right, there is a "Highlights" section with links to "Executive Brief: IBM PD Tools Win Top Spot (318KB)", "Monthly Podcast Series", "System z Events", "IBM System z Twitter", and "Get Adobe® Reader®".

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Debug Tool for z/OS

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Overview

IBM Debug Tool for z/OS enables you to examine, monitor, and control the execution of C, C++, COBOL, and PL/I programs.

Debug Tool is an interactive source-level debugging tool for compiled applications in a variety of environments

- Supports batch, TSO, CICS, DB2, DB2 stored procedures, IMS, and UNIX System Services
- Supports seamless debugging of mixed-language applications in the same session
- Offers a set of interpreted commands that you can use to specify actions to be taken
- Provides the option of setting breakpoints in an application program, monitoring variables for changes and watching for specified exceptions and conditions during program execution
- Counts how many times a statement or verb has been processed in an application program
- Integration with IBM Rational Developer for System z enables developers to debug applications within an integrated application development environment
- IBM Debug Tool for z/OS V11.1 replaces all prior versions of both IBM Debug Tool for z/OS and IBM Debug Tool for z/OS and IBM Debug Tool Utilities and Advanced Functions for z/OS.
- [New features in V11.1 can be found here](#)
- [New!! GUI plug-in download now available !!](#)

Learn more

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- [Data sheet \(PDF, 451KB\)](#)
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We're here to help

Easy ways to get the answers you need.

- ➔ [Request a quote](#)
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Or call us at:
877-426-3774
Priority code:
109HE03W

Highlights

- 📄 [Executive Brief: IBM PD Tools Win Top Spot \(318KB\)](#)
- ➔ [Monthly Podcast Series](#)
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IBM Fault Analyzer for z/OS Version 11



IBM Fault Analyzer for z/OS

Assists in analyzing and fixing application and system failures



SOC7, S522,
SOC1, SCQ4

Problem

- Your new developers don't have the experience to diagnose faults and dumps
- Your experienced developers don't have the time



IBM Fault
Analyzer

Solution

- Analysis at application level
- Information gathered at time of abend
- Translates low-level dump information into application-level information
- Expands abend code and message descriptions
- No recompile of applications or JCL changes
- No performance overhead
- Integrated 64-bit DB2 support
- Interface to File Manager for z/OS

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

IBM 2010 Offerings

Debug Tool
for z/OS

File Manager
for z/OS

Fault Analyzer
for z/OS

Application
Performance
Analyzer for
z/OS

Workload Simulator
for z/OS & OS/390

Rational Functional Tester Ext
Rational Performance Tester z/OS

Migration
Utility

Hourglass

ISPF
Productivity Tool

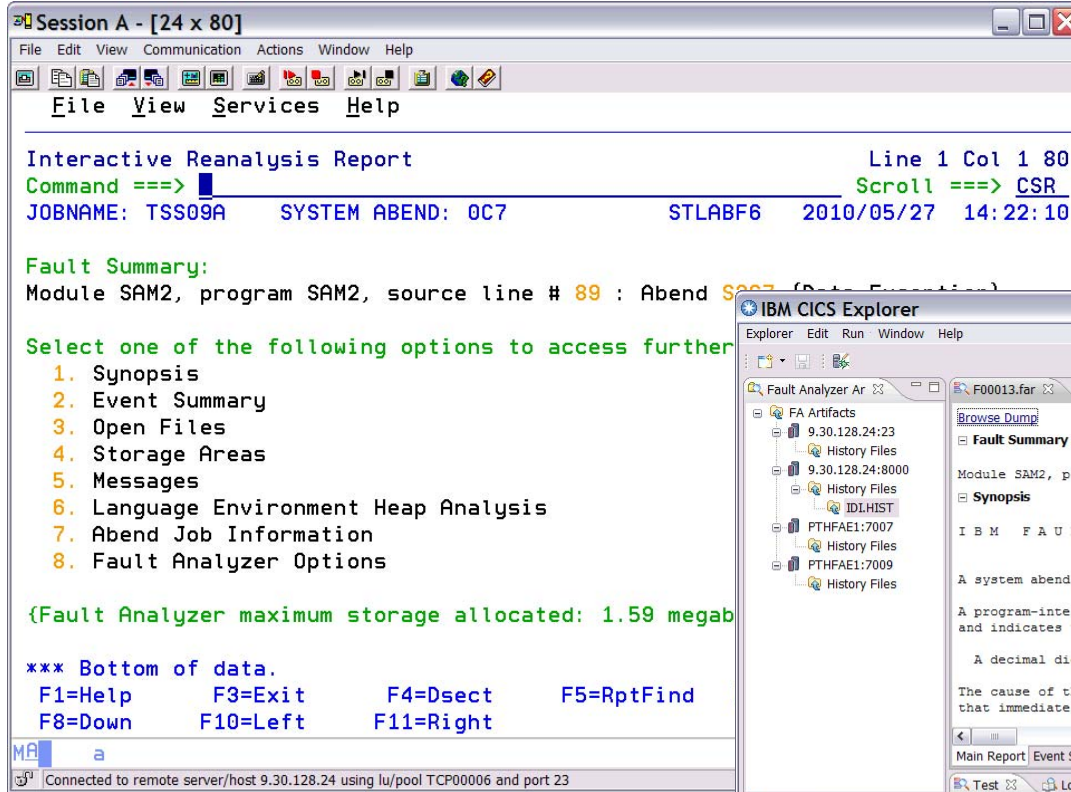
www.ibm.com/software/awdtools/deployment

Fault Analyzer for z/OS Highlights

- Automatic program abend capture and reporting
- Program source-level reporting
- Multiple languages and z/OS environments including CICS, DB2, IMS, Enterprise PL/I, Enterprise COBOL and WebSphere Application Server for z/OS systems
- Provides a detailed report about program failures to help resolve them quickly
- Enables you to track and manage application failures and fault reports
- Offers a view of storage contents, trace tables and terminal screen images at the time of failure to help speed corrective action
- Provides the ability to customize message descriptions to be used in application-failure reports
- Eclipsed-based GUI plug-in available for download

IBM Fault Analyzer for z/OS

Multiple interfaces and modes of operation

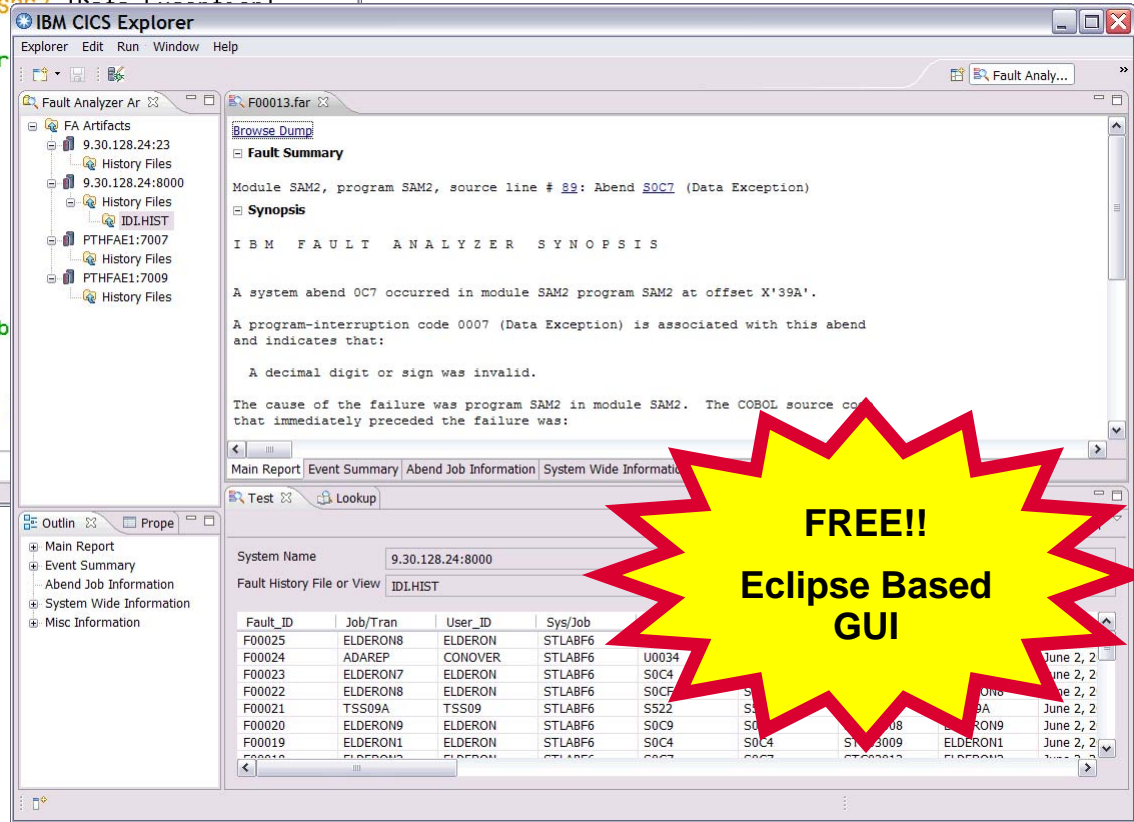


Interfaces

- ISPF
- RDz
- GUI
- CICS
- Web

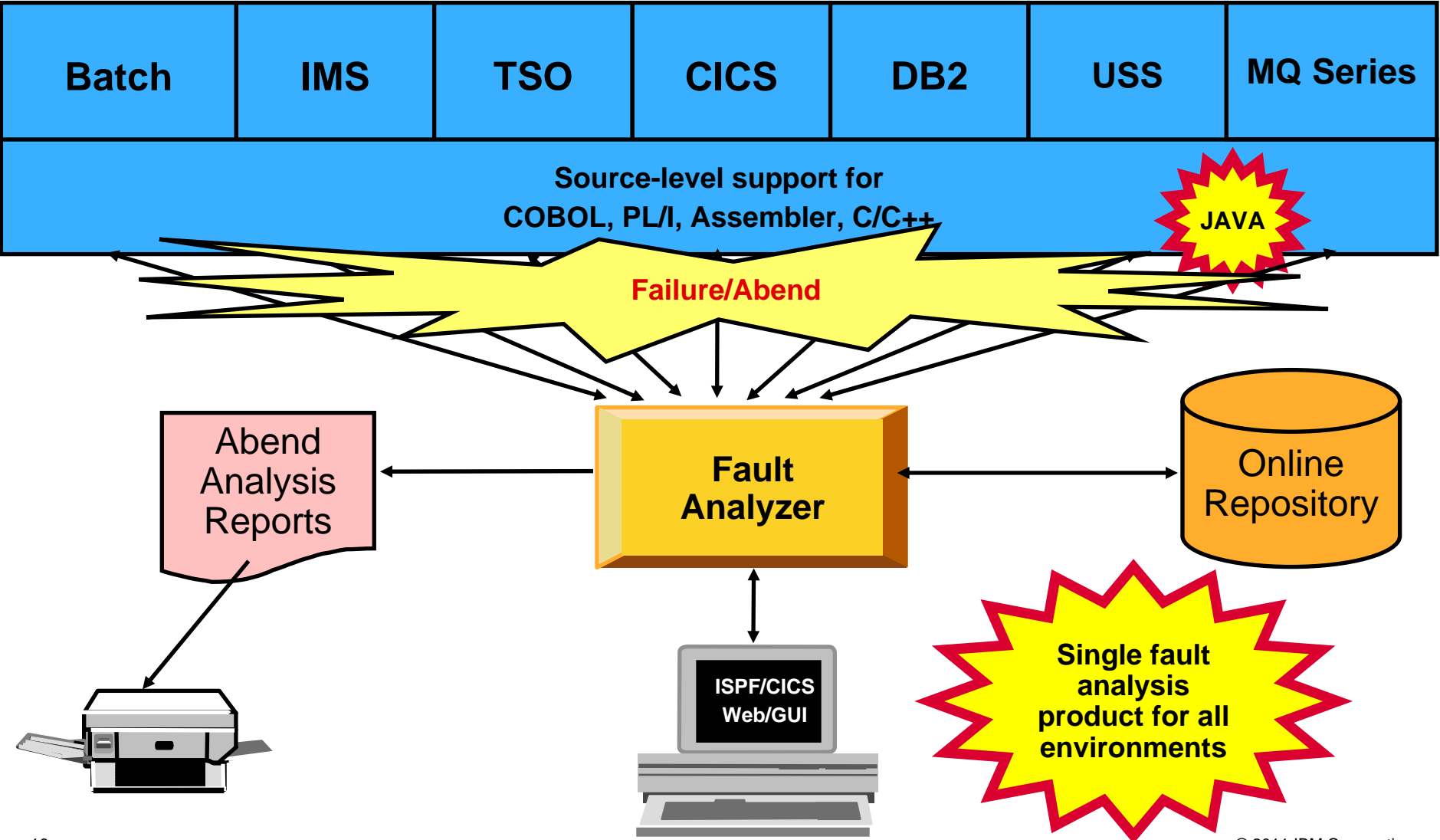
Modes Of Operation

- Real-time analysis
- Batch dump re-analysis
- Interactive dump re-analysis



FREE!!
Eclipse Based GUI

Fault Analyzer - Helps you rapidly pinpoint why and where an application failed



Fault Analyzer provides information to determine the cause and resolution of application and system failures

- Analysis at the application level
- Information gathered at time of abend
- Translates low-level dump information into application-level information
- Expands abend code and message descriptions
- No recompile of applications
- No JCL changes
- No performance overhead
- Integrated 64-bit support
- Interface to File Manager for z/OS
- Three Modes Of Operation
 - Real-time analysis
 - Batch dump re-analysis
 - Interactive dump re-analysis
- Interfaces
 - RDz
 - Eclipsed-based GUI
 - ISPF
 - CICS
 - Web
- Support for IBM software
 - CICS TS 4.2
 - **Channels and containers** in 64-bit storage
 - DB2 V10
 - IMS V11

IBM Fault Analyzer for zOS

One tool for all your application abend reporting

- **Identifies the cause of a program abend**
 - Helps you quickly resolve the problem
- **Reports detailed information for:**
 - CICS
 - WAS
 - Batch
- **Source-level support for programs**
 - COBOL, PL/I, C/C++ and assembler
 - Provides detailed program source and variable value information
- **Advanced CICS Transaction Server support**
 - Reports channels and containers in 64-bit storage
 - CICS containers with XML data are formatted to simplify reviewing the XML information
- **Java enhancements**
 - Use of Java-supplied Diagnostic Tooling Framework for Java (DTFJ)
 - Java information is captured and displayed



- Fault Analyzer for z/OS**
- Features and benefits
- System requirements
- Library**
- News
- Training and certification
- Services
- How to buy
- Support

Software > Software Development >

Fault Analyzer for z/OS

Library

Fault Analyzer - English:

- ↓ [Version 11 Release 1](#)
- ↓ [Version 10 Release 1](#)
- ↓ [Version 9 Release 1](#)
- ↓ [Version 8 Release 1](#)
- ↓ [Version 7 Release 1](#)
- ↓ [Version 6 Release 1](#)
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[Search for text](#) in the book in the Fault Analyzer V11 BookShelf.

Fault Analyzer, Version 11 Release 1 Publications - English (new table)				
Title View/download PDF	Order number	View Book	Download Book	Last update
Program Directory (PDF, 130KB)	GI10-8857-00	-	-	11/2010
User's Guide and Reference (PDF, 3.0MB)	SC19-3131-00	View	Download (BOO, 1.6MB)	11/2010
Bookshelf	GC19-3129-00	View	Download (BKS, 1KB)	11/2010
Bookshelf Index	GC19-3128-00	-	Download (BKI, 390KB)	11/2010

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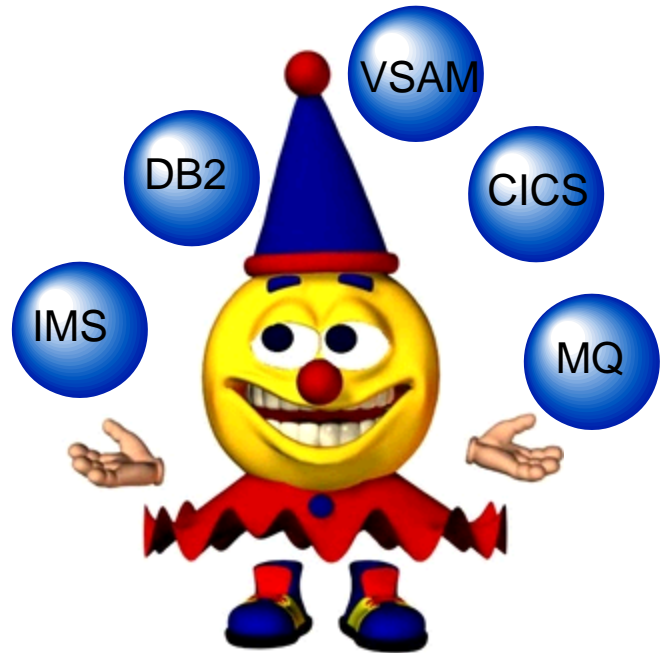


IBM File Manager for z/OS Version 11



IBM File Manager for z/OS

Manage, Edit, View, Browse data stored in various formats



Problem

- Developers need to see data in a formatted mode so they don't see non-display data
- Your developers need to browse, edit and view data in DB2, IMS, VSAM, Sequential datasets, etc

IBM File Manager



- Edit entire files regardless of size
- Format data with COBOL, PL/I or Assembler record layouts
- Scrambling sensitive data to insure data privacy across all environments
- Identify fields that contain invalid values
- Find and change data within specific fields
- Websphere MQ support
- Test data generation based on record layouts
- Compare data/load modules between datasets using field level mapping

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

IBM 2011 Offerings

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File Manager
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Fault Analyzer
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Application
Performance
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Workload Simulator
for z/OS & OS/390

Migration
Utility

Hourglass

ISPF
Productivity Tool

www.ibm.com/software/awdtools/deployment

File Manager for z/OS Highlights

- Select, create, browse, copy, edit, print, and format or reformat data files
- Manipulate data using COBOL, Assembler and PL/I record layouts interactively or in batch
- Scrambling of data for data privacy
- SQL Prototyping and Execution
- Comprehensive, user-friendly, batch and interactive utilities extends standard ISPF
- Multiple z/OS environments
 - Batch
 - TSO/ISPF
 - CICS
 - IMS/TM
 - DB2
 - Websphere MQ

IBM File Manager for z/OS

Inclusive of all environments

The image displays four overlapping screenshots of the IBM File Manager interface, illustrating the navigation path from the main menu to a specific DB2 object.

Top Screenshot: File Manager
 Menu: Process Options Help
 Primary Option Menu
 Command ==> 2
 0 Settings Set processing options User ID . : TSS05
 1 View
 2 Edit
 3 Utilities
 4 Tapes
 5 Disk/VSAM
 6 OAM
 7 Templates
 8 HFS
 9 WebSphere MQ
 X Exit
 F1=Help F9=Swap

Second Screenshot: FM/CICS
 Menu: Process Options Help
 Primary Option Menu
 Command ==> 2
 0 Settings
 1 View
 2 Edit
 3 Utilities
 4 Templates
 FM FM
 FI FM/IMS
 FD FM/DB2
 X Exit
 Processing Options
 CICS Resource
 1 1. File
 2. Temporary
 3. Transient
 F1=Help F3=E
 F12=Cancel

Third Screenshot: FM/IMS
 Menu: Process Options Help
 Primary Option Menu
 Command ==> 2
 0 Settings Set processing options User ID . : DBA022
 1 Browse Browse data System ID : DEMOMVS
 2 Edit
 3 Utilities
 4 Templates
 X Exit

Bottom Screenshot: FM/DB2 (DB1F)
 Menu: Process Options Utilities Help
 Primary Option Menu
 Command ==> 2
 0 Settings Set processing options User ID . : TSS05
 1 View View DB2 object System ID : STLABF6
 2 Edit Edit DB2 object Appl ID . : FMN2
 3 Utilities Perform utility functions Version . : 10.1.0
 4 SQL Prototype, execute and analyze SQL Terminal : 3278A
 5 DB2I Start DB2 Interactive Screen . : 1
 6 Command Enter and execute a DB2 Command Date . . : 2009/12/10
 X Exit Terminate FM/DB2 Time . . : 09:00
 DB2 SSID . DB1F
 SQL ID . . TSS05 +

Announcing the File Manger z/OS Eclipse Based GUI

IBM CICS Explorer

Edit Data Set Query

Enter a data set query. For example, "USER.DS1.**" will find all data sets that start with "USER.DS1."

System: DEMOMVS.DEMOPKG.IBM.COM-1960

Query: **DDS0200.ADLAB.****

Type Filtering Options

<input checked="" type="checkbox"/> All Data Set Types	<input checked="" type="checkbox"/> AIX	<input checked="" type="checkbox"/> ALIAS	<input checked="" type="checkbox"/> ARCHIVED	<input checked="" type="checkbox"/> DA
<input checked="" type="checkbox"/> DATA	<input checked="" type="checkbox"/> GDS	<input checked="" type="checkbox"/> ESDS	<input checked="" type="checkbox"/> ESDSIAM	<input checked="" type="checkbox"/> GDG
<input checked="" type="checkbox"/> KSDSIAM	<input checked="" type="checkbox"/> PATH	<input checked="" type="checkbox"/> HFS	<input checked="" type="checkbox"/> INDEX	<input checked="" type="checkbox"/> KSDS
<input checked="" type="checkbox"/> UCAT	<input checked="" type="checkbox"/> PDS	<input checked="" type="checkbox"/> LDS	<input checked="" type="checkbox"/> LIBRARY	<input checked="" type="checkbox"/> MIGRATED
		<input checked="" type="checkbox"/> PS	<input checked="" type="checkbox"/> RRDS	

Enter the high level qualifier, and additional qualifiers if needed

Narrow the list farther by un-checking the undesired data types

Viewing Data with Formatting

Total number of records in the dataset

Field names

Layout

Apply Formatting

View Multiple Record Layouts

Navigation TOP Go Start 1 End 100 Total 100 Edit type FULL

	CUST-ID	NAME	ACCT-BALANCE	ORDERS-YTD	ADDR	CITY	STATE	COUNTRY	MONI
1	01001	Lynn, Amanda	67.68	9	119 North Lake Road	Spirit Lake	ID	USA	
2	02200	Graham, Anna	610.05	10	89 Clay Springs Rd	Atwon	NV	USA	
3	02202	Major, Art	1234.56	5	1512 Pine Bluff	Harmon	MN	USA	
4	03003	Prentice, Anna	0.00	7	33 Renshaw	Laramie	WY	USA	
5	03390	Deeds, Darren	74.00	3	649 Brown Street	Sandstone	IN	USA	
6	05570	Parker, Ford	233.27	12	3039 Manning St.	Dearborn	MI	USA	1
7	06101	Early, Brighton	311.08	10	9662 Summit Road	Buxford	NE	USA	
8	06106	Lander, Annette	489.84	7	6127 Cedar Street	Taledega	AL	USA	
9	06711		192.98	11	9229 Delegate's Row	Indianapolis	IN	USA	
10	06900		1001.01	0	1134 Rosetta	Lisle	IL	USA	
11	07008		296.97	10	4411 Northside Pkway	Banner Elk	NC	USA	
12	07044		88.83	7	7331 Gulf Shore Dr.	Naples	FL	USA	
13	07077	Mann, Mr. E.	621.05	1	24 Valentine Rd	Danville	TN	USA	
14	07707	Clime, Hilda	232.20	9	5545 Crystal Springs	Dowagiac	MI	USA	1
15	07870	Furst, April	122.15	1	955 Dundas	London	ON	Canada	
16	07880	Marx, Audrey	450.51	2	90 South Cascade	Boulder	CO	USA	
17	08085	Moore, Adeline	498.95	3	4700 S. Syracuse	Denver	CO	USA	
18	10207	Auerbach, Hans	11.11	0	Hahnstrasse 46	Frankfurt		Germany	1

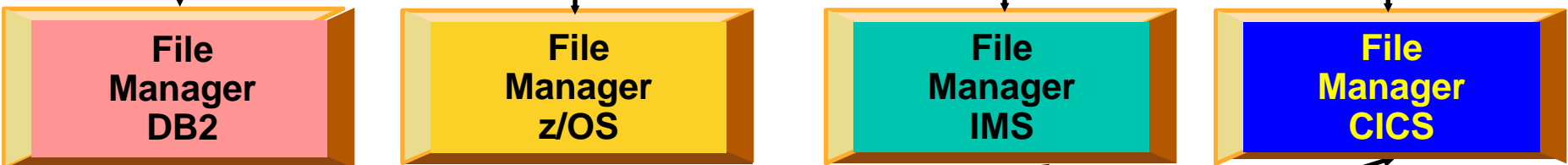
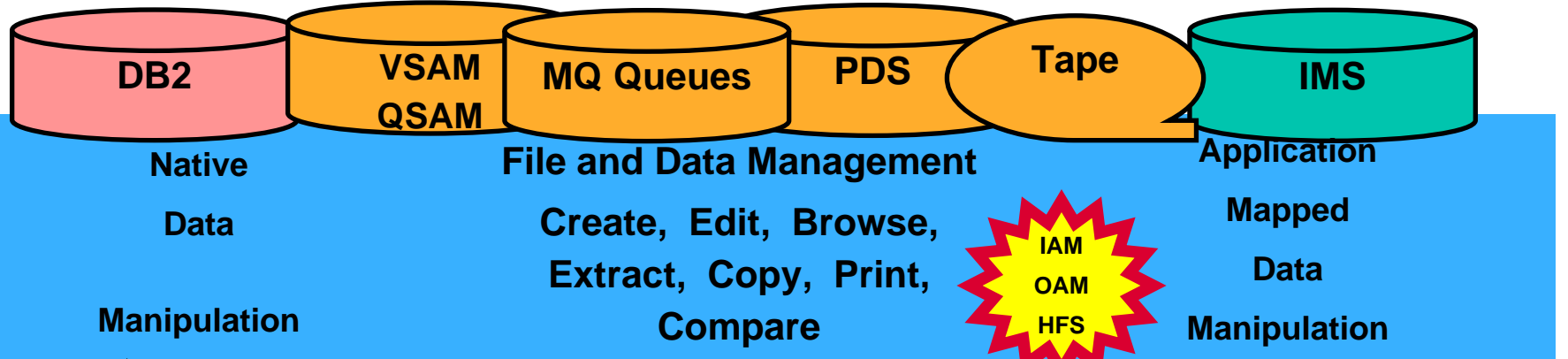
Layout CUST-REC Template DDS0200.ADLAB.COPYLIB(C) .lookup Apply Edit

Formatted Mode

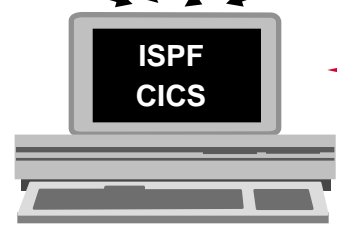
Properties Console No consoles to display at this time.

IBM File Manager for z/OS

Manage a variety of enterprise data file structures



Common User Interface In All Environments



Do what you want, how you want, with your data

File Manager z/OS Features

- Full function edit and view
 - Table
 - Single
- Flexible selection criteria
 - Work with copybooks or templates
- Edit any file regardless of size
- Create data
- Print data
- Copy data
 - File reformatting
 - Scramble fields
- Catalog services
- Work with VTOC
- Compare
 - Data
 - Load Modules
- Search for and change data
 - Insert continuation JCL statement
- View or print
 - Copybooks
 - Templates
- Modes Of Operation
 - Interactive
 - Batch
- Interfaces
 - ISPF
 - CICS
 - RDz
 - **New File Manager z/OS GUI**

File Manager CICS Features

- ISPF-like panels
- Full function edit and view
 - Table
 - Single
- Flexible selection criteria
 - Work with copybooks or templates
- CICS Resource
 - File
 - Temporary Storage
 - Transient Data
- Print data
- List Resources
- Support for extended addressability ESDSs
- Interface to File Manager z/OS
- Interface to File Manager DB2
- Interface to File Manager IMS
- Modes Of Operation
 - Interactive
- Interfaces
 - CICS
- Support for IBM Software
 - CICS TS V3.2

File Manager DB2 Features

- Edit and View data
 - Edit a DB2 Table or View
 - select rows and columns displayed
- Print
 - Table or Single format
 - select rows and columns
- Create and Drop DB2 objects
- Copy data
 - Select rows
 - Map columns from an input table to an output table
 - Reformat and generate data while copying
 - Scramble columns
- Work with a list of DB2 objects
 - Use line commands to initiate functions
- Generate JCL for DB2 utilities:
 - COPY, LOAD, REBUILD, RECOVER, REORG, and RUNSTATS
- Relational Edit
- Grant and Revoke DB2 privileges
- Import and Export data
 - Select Rows
 - Export to a file in default FM/DB2 format, a format defined by a copybook, or a comma-delimited file
 - Import from a file generated by the Export function, or a file described by a copybook
 - Scramble columns
- Execute SQL Statements
- Create and test new SQL statements
 - Two methods: Basic and Advanced
- Modes of Operation
 - Interactive
 - Batch
- Interfaces
 - ISPF
 - CICS
- Support for IBM software
 - DB2 V10

File Manager IMS Features

- Online utilities for IMS databases
 - Edit and Browse data
 - Extract segments from a database
 - Load segments into a database
- Support for processing databases using either:
 - physical DBD
 - logical DBD
- Access databases using either:
 - Static (existing) PSBs
 - Dynamic PSBs
- Process databases in alternate sequences using secondary indexes
- Support for HDAM, HIDAM, HISAM, HSAM, DEDB, MSDB
- Optional audit trail to record database updates
- Work with segments that have multiple layouts
- Optionally use COBOL or PL/I segment layouts to format data into fields
 - Edit and Browse segments in tabular or character format
 - Access source in PDS, PDSE, or Panvalet libraries
- Use flexible criteria to select segments for browse, edit, and extract processing
- Change segment selection criteria and formatting “on the fly”, while browsing or editing
- Modes of Operation
 - Interactive
 - Batch
- Interfaces
 - ISPF
 - CICS
- Support for IBM Software
 - IMS V11

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File Manager for z/OS

Library

File Manager - English:

- ↓ Version 11 Release 1
- ↓ Version 10 Release 1
- ↓ Version 9 Release 1
- ↓ Version 8 Release 1
- ↓ Version 7 Release 1
- ↓ Version 6 Release 1
- ↓ Redbooks

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File Manager, Version 11 Release 1 Publications - English				
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IBM Application Performance Analyzer for z/OS Version 11



IBM Application Performance Analyzer for z/OS

Fine tune application performance

Performance
issues



Problem

- Application performance problems often mean unhappy users, missed deadlines, and unmet service levels.

IBM Application Performance Analyzer



Solution

- APA helps programmers identify constraints and the root cause of performance bottlenecks. Drill down to modules, programs, files, databases, SQL statements, CICS transactions, and even individual program source statements.

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

IBM 2011 Offerings

Debug Tool
for z/OS

File Manager
for z/OS

Fault Analyzer
for z/OS

Application
Performance
Analyzer for
z/OS

Workload Simulator
for z/OS & OS/390

Migration
Utility

Hourglass

ISPF
Productivity Tool

www.ibm.com/software/awdtools/deployment

Application Performance Analyzer for z/OS

- Identify performance and response time problems in production
- Reduce batch application turnaround time
- Multiple languages:
 - COBOL
 - PL/I
 - C/C++
 - Assembler
 - Java
 - Natural
- Multiple z/OS environments
 - Batch
 - CICS
 - IMS
 - DB2 (SP, DDF/DRDA)
 - Websphere MQ
 - Websphere Application Server
 - Adabas
- Can be integrated with Fault Analyzer and Application Performance Analyzer with source mapping side files
- Workstation GUI plug-in

IBM Application Performance Analyzer for z/OS 3270 or GUI interfaces

Session A - [24 x 80]
File Edit View Communication Actions Window Help
File View Navigate Help

R01: IBM APA for z/OS Performance Reports (6852/MACHIND) Row 00001 of 00007
Command ==> Scroll ==> PAGE

Select a category from the list to the right to view the available reports in the selection list below.

- A Admin/Miscellaneous
- S **Statistics/Storage**
- C CPU Usage Analysis
- D DASD I/O Analysis
- W CPU WAIT Analysis
- H HFS Analysis
- V Variance Report
- I IMS Measurement
- E CICS Measurement
- F DB2 Measurement

Enter S to make a selection or enter the report

- S01 Measurement Profile
- S02 Load Module Attributes
- S03 Load Module Summary
- S04 TCB Summary
- S05 Memory Usage Timeline
- S06 Data Space Usage Timeline
- S07 T
- S08 P
- S09 M

F1=Help F2=Split F3=End F4=Jump F5
F9=Swap F10=Left F11=Right F12=Cancel

Connected to remote server/host 9.30.128.24 using lu/pool TCP00006 and port 23

Source-level support for:

- C/C++
- Assembler
- COBOL
- PL1
- JAVA

Types of Observation Sessions

- Real-Time
- Scheduled
- Via batch submission

IBM CICS Explorer
Explorer Edit Window Help

APA Observations List (CAZA) - Local

ReqNo.	Owned By	Description	Job Name	Date/Time	Samples	Status
6263	MACHIN2	v10ref	PLITEST	May-04 09:40	5,282	Ended
6259	MACHIN2	v10ref-uc29-F7	JAVATST1	May-04 09:38	9,999	USS
6257	MACHIN2	v9	MQPUT	May-04 09:37	774	Ended
6246	TSS09	Jeremys performance capture of SA...	TSS09APA	May-03 17:39	10,000	Steps
6247		0001 IKJEFT01 CUSTKSDDS CH...		May-03 17:46	5	Ended
6248		0002 IEFBR14 CUSTKSDDS ALL...		May-03 17:46	1	Failed
6249		0003 IDCAMS CUSTKSDDS CO...		May-03 17:46	1	Failed
6250		0004 IKJEFT01 CUSTKSDDS CH...		May-03 17:46	3	Ended
6251		0005 IEFBR14 CUSTKSDDS ALL...		May-03 17:46	1	Failed
6252		0006 IDCAMS CUSTKSDDS CO...		May-03 17:46	1	Failed
6253		0007 IDCAMS VERIFY		May-03 17:46	18	Ended
6254		0008 SAM1V RUNSAM		May-03 17:48	10,000	Ended
6277	TSS16	Downs performance capture of SAM	TSS16APA	May-03 13:36	1	Steps

STC Properties

Property Value

DSNHLQ ADTOOLS.APAA10
Job CAZA
Started 2010-05-25 11:53:3
Sysplex CAZAPLEX
Version 10.10F

S - Statistics/Storage

- S01 - Measurement Profile
- S02 - Load Module Attributes
- S03 - Load Module Summary
- S04 - TCB Summary
- S05 - Memory Usage Timeline
- S06 - Data Space Usage Timeline
- S07 - TCB Execution Summary
- S08 - Processor Utilization Summary
- S09 - Measurement Analysis

C - CPU Usage Analysis

- C01 - CPU Usage by Category
- C02 - CPU Usage by Module
- C03 - CPU Usage by Code Slice

S01: Mea

CPU Usage D

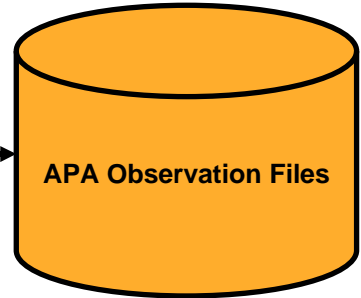
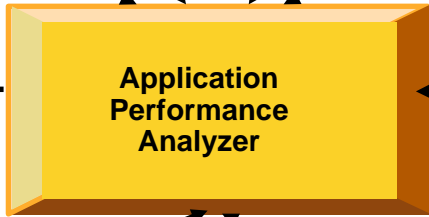
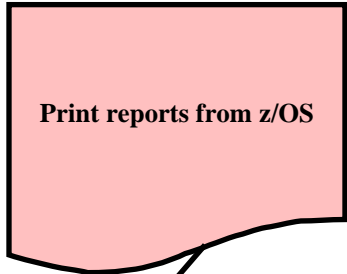
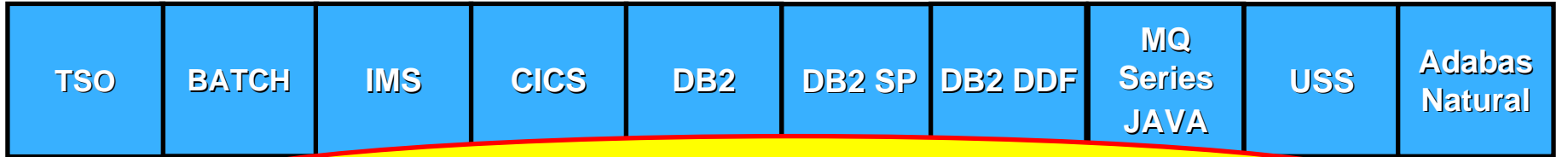
Category	Value	Percentage
CPU Active	4,507	45.07%
Application	4,181	41.81%
System	0	0.00%
DB2 SQL	0	0.00%
Data Mgmt	12	0.12%
Unresolved	714	7.14%
IMS DLI Call	0	0.00%

FREE!!

Eclipse Based GUI

IBM Application Performance Analyzer for z/OS

Provides rapid pinpointing of enterprise application bottlenecks



View reports
online with ISPF



View reports
in PDF format on PC



What is Application Performance Analyzer (APA) for z/OS ?

- Application Performance Analyzer for z/OS is an application performance-measurement tool that helps you perform application performance tuning for applications running on IBM z/OS systems
- APA will measure and report on how system resources are used by applications running in virtually any z/OS address space
- APA can minimize the time needed to resolve production performance problems by identifying the issue
- APA can also analyze transactions running under an online subsystem such as IBM CICS, IBM IMS, and WebSphere Application Server, as well as DB2 stored procedures
- Using APA helps you maximize the performance of your existing hardware resources and helps you improve the performance of your applications and subsystems
- APA aids application design, development and maintenance cycles. It helps evaluate application prototypes in the design phase, review the impact of increased data volume or changes in business requirements on performance

Application Performance Analyzer Features

- **Online analysis:** Displays overall system activity, enabling you to check job execution online and select which active job to monitor.
- **Monitoring:** Automatically starts to monitor job performance when the job or program becomes active
- **Reports:** Provides multiple summary reports to assist in identifying key areas of performance bottlenecks. Analysis data is available in printed reports, which can be created as an Adobe PDF file or as an XML file
- **Performance analysis:** Provides CPU usage, as well as multiple DASD statistics including EXCP, VSAM statistics, and I/O wait time
- **DB2 monitoring:** Delivers relevant information for DB2 performance analysis and tuning, including SQL statements
- **CICS monitoring:** Includes monitoring by specific transaction or transaction prefix with wildcards. CICS+ provides tracing support for critical situations
- **IMS support:** Delivers IMS application performance data on call time and service-call time for DL/I. IMS+ can be used to trace all IMS calls.
- **WebSphere MQ support:** Provides CPU usage by queue, by request, and by transaction, as well as service time and wait time for the same

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Software > WebSphere > z/OS Problem Determination Tools >

Application Performance Analyzer for z/OS

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Overview

Application Performance Analyzer for z/OS measures and reports how your applications use resources

This problem determination tool helps you identify system constraints and improve application performance.

- Helps your business maximize the performance of your existing applications and improve the response time of your online transactions and batch turnaround times
- Gives you the information you need to isolate performance problems in applications and test the effect of increased workloads on your systems
- Monitors, analyzes and reports the performance of CICS®, Assembler, COBOL, PL/I, C/C++, DB2®, IMS™ and WebSphere® MQ applications
- Collects samples from the monitored address space and analyzes the system or resource application usage of CPU, DASD, I/O or the total address space
- Features online analysis and reports that can be created as PDF or XML files, so that you can view them on workstations or transfer easily to other applications
- Integrates with Fault Analyzer for z/OS and Debug Tool for z/OS
- [New features in V11.1 can be found here](#)
- [New!! GUI plug-in download now available !!](#)

→ [View features and benefits](#)

Learn more

- Features & benefits
- System requirements
- Product library
- Data sheet (PDF, 438KB)
- Announcement letter

Downloads

- GUI plug-ins

Use and maintain

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Highlights

- [Executive Brief: IBM PD Tools Win Top Spot \(318KB\)](#)
- [Monthly Podcast Series](#)
- [System z Events](#)
- [IBM System z Twitter](#)
- [Get Adobe® Reader®](#)

Application Performance Analyzer for z/OS

- Features and benefits
- System requirements
- Library
- News
- Training and certification
- Services
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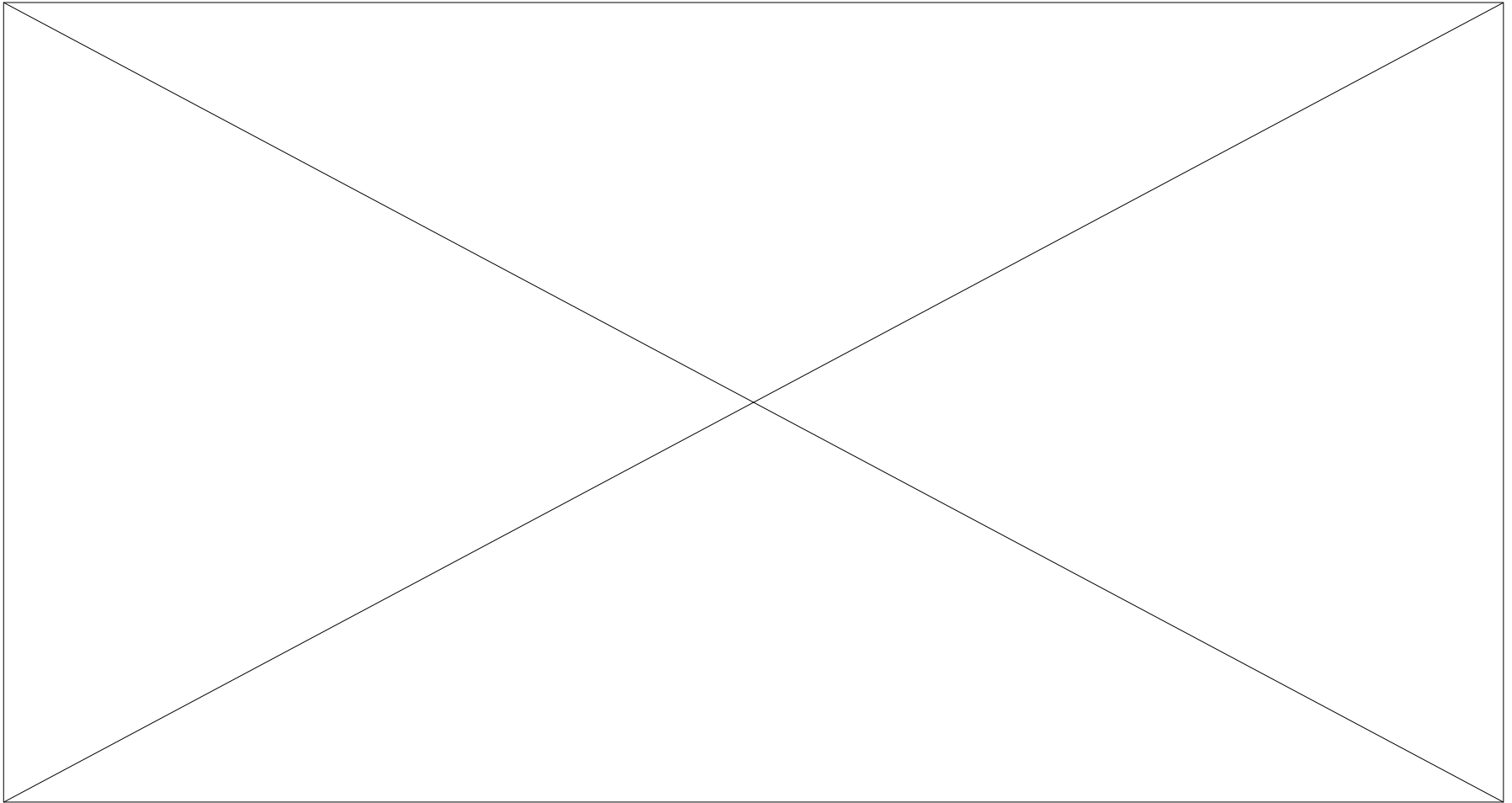
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Our shop is currently using the free CICS Explorer?

Yes

No

Our shop is currently using the free CICS Explorer?

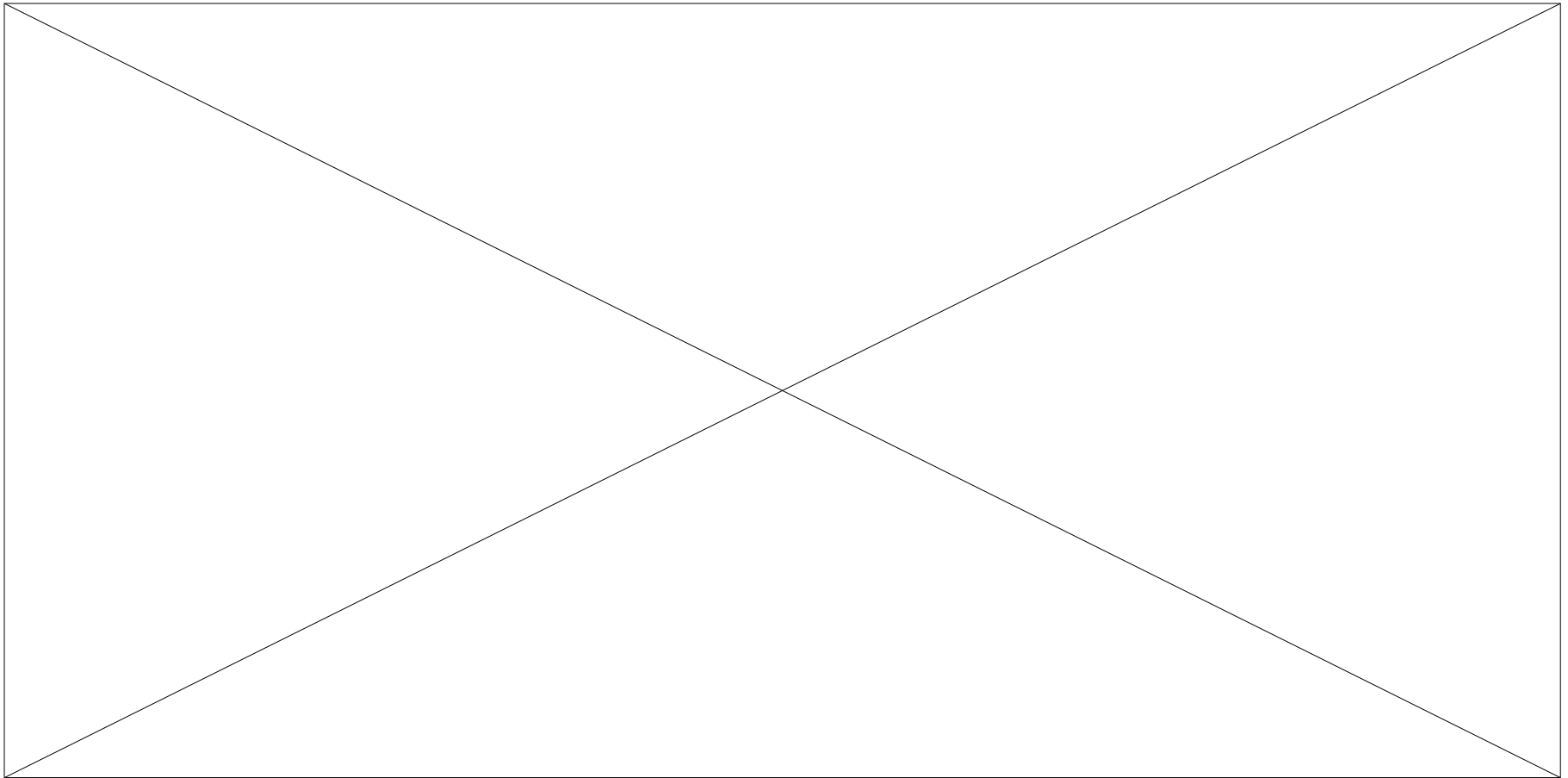


We would consider making the free Problem Determination Tool GUI's available to our developers?

Yes

No

We would consider making the free Problem Determination Tool GUI's available to our developers?





IBM Workload Simulator for OS/390 and z/OS Version 2.1



IBM Workload Simulator for OS/390 and z/OS

Automated testing to simulate Load, Stress, Performance, and Regression tests

10,000 Users... what
will the response time
be like



Problem

- How do we get 100 users to hit the Enter Key at the same time?
- Can I find 300 people to do some work on this system to create some Load to see what the response time will be?
- Can this configuration support 2000 users? Or do I need more DASD or CPU?

IBM Workload
Simulator



Solution

- Simulate 1 or 50,000 users
- Assign work to the simulated users
- Feed data from files or user tables
- Set criteria for pass / fail of an execution
- Capture and report on response time

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

IBM 2011 Offerings

Debug Tool
for z/OS

File Manager
for z/OS

Fault Analyzer
for z/OS

Application
Performance
Analyzer for
z/OS

Workload Simulator
for z/OS & OS/390

Migration
Utility

Hourglass

ISPF
Productivity Tool

www.ibm.com/software/awdtools/deployment

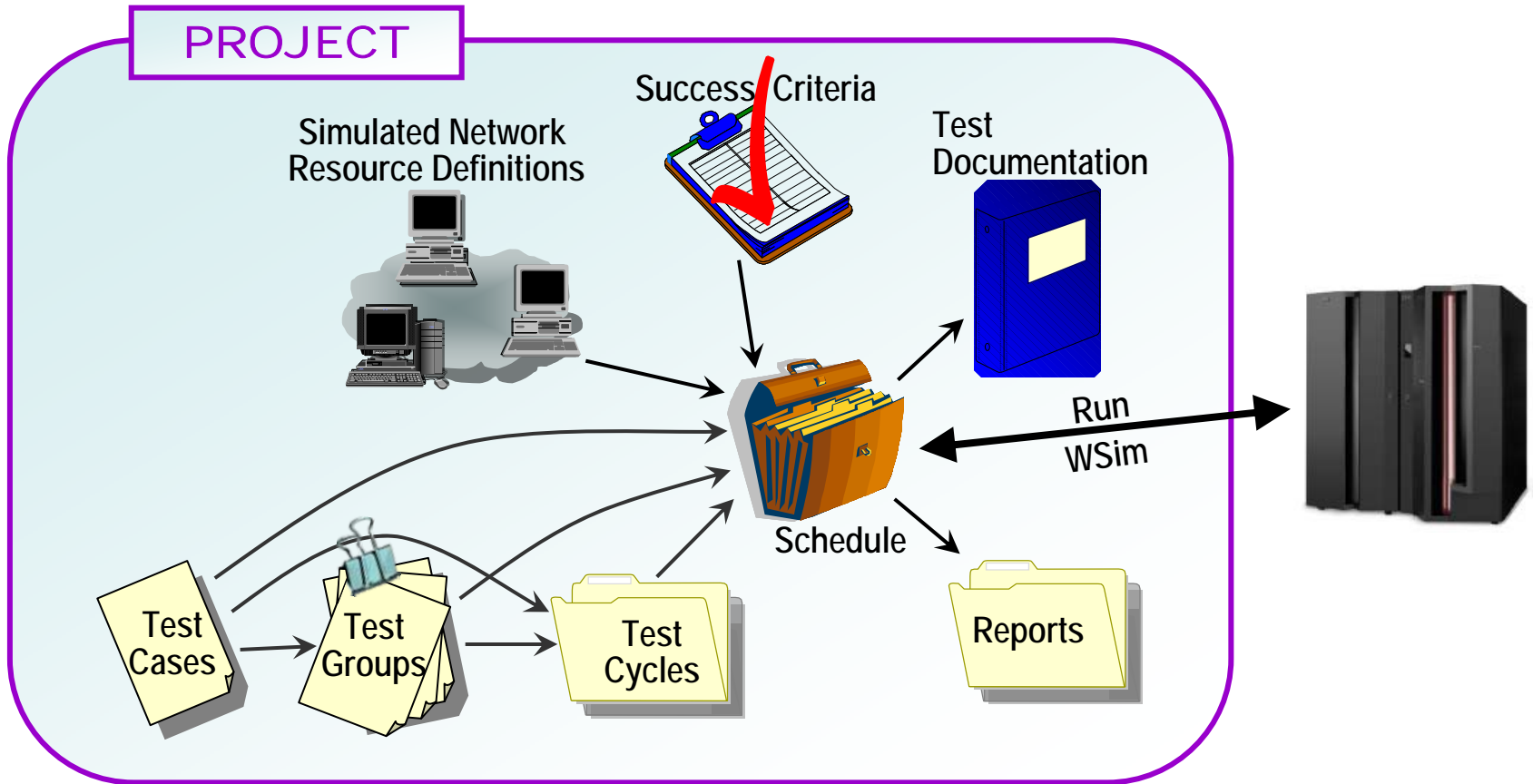
Workload Simulator

- Simulates network resources, such as VTAM terminals
 - WSim’s “logical” network resources appear to be real to the live system
- Run test scripts to simulate network traffic against live systems and applications
 - Simulate a single terminal or resource to test application functionality
 - Define multiple resources to simulate a large number of users and high transaction volumes
- Report the status and results of tests

What can be Simulated?

- VTAM terminals
 - Simulate secondary VTAM Logical Units (LUs) to test VTAM applications such as CICS, IMS, and TSO
- VTAM Applications
 - Simulate primary VTAM LUs to simulate an existing application or to prototype a new application
- TCP/IP clients
 - Simulate Telnet 3270, 3270E, 5250, NVT, or FTP clients communicating with servers such as TCP/IP for MVS
 - Simulate simple TCP or UDP clients
- CPI-C (CPI-C: Common Programming Interface Communications)
 - Simulate client or server CPI-C (LU6.2) transaction programs

The WSim Test Manager (WTM)



- Manage and organize your tests with WTM
- WTM provides a “front-end” to the original WSim panels

Workload Simulator Features

- Auto Generation Of Scripts
- Auto Generation Of Networks
- Controls Resource During Runs
- Simulates Different Terminals, Terminal Features And Terminal Operator Actions
- Executes Independently Of The System Under Test
- Provides utilities for post-test analysis
- REXX-like scripting language
- Conducts Reliable Stress, Performance, Regression, Function And Capacity Planning Tests
- Consistent Across Protocols
 - SNA, CPI-C, TCP/IP
- Consistent Across Operating Systems
 - z/OS & OS/390, MVS/ESA, VM/ESA

IBM Workload Simulator on the web

<http://www.ibm.com/software/awdtools/deployment>

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Software > Software Development >

Workload Simulator for z/OS and OS/390

WebSphere software

Library

Workload Simulator Publications

Title View/download PDF	Order number	View Book	Download Book	Last update
Brochure (PDF, 86KB)	GC18-7063-00	-	-	12/2008
Program Directory (PDF, 84KB)	GI10-3234-00	-	-	08/2002
User's Guide (PDF, 454KB)	SC31-8948-00	View	Download (384KB)	08/2002
Utilities Guide (PDF, 719KB)	SC31-8947-00	View	Download (500KB)	08/2002
User Exits (PDF, 201KB)	SC31-8950-00	View	Download (176KB)	08/2002
Messages and Codes (PDF, 367KB)	SC31-8951-00	View	Download (288KB)	08/2002
Creating WSim Scripts (PDF, 1.2MB)	SC31-8945-00	View	Download (1.3MB)	08/2002
Script Guide and Reference (PDF, 1.2MB)	SC31-8946-00	View	Download (386KB)	08/2002
Test Manager User's Guide and Reference (PDF, 608KB)	SC31-8949-00	View	Download (176KB)	08/2002

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IBM ISPF Productivity Tool for z/OS Version 6.1



IBM ISPF Productivity Tool

Productivity and Performance enhancement for TSO/ISPF

Split Screen, Start
ISPF, Swap.....



Problem

- Files Qualified Differently
- Multiple ISPF Sessions
- Cut and Paste Files from panel to panel

IBM IPT



Solution

- Reduce Navigation of ISPF Panels
- Create, Save, Maintain multiple ISPF Clipboards
- Point and Shoot Capabilities in ISPF
- Multiple list of files with different qualifiers on the same panel
- Search for text-strings in multiple members – in Multiple Datasets
- Filter datasets lists

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

IBM 2011 Offerings

Debug Tool
for z/OS

File Manager
for z/OS

Fault Analyzer
for z/OS

Application
Performance
Analyzer for
z/OS

Workload Simulator
for z/OS & OS/390

Migration
Utility

Hourglass

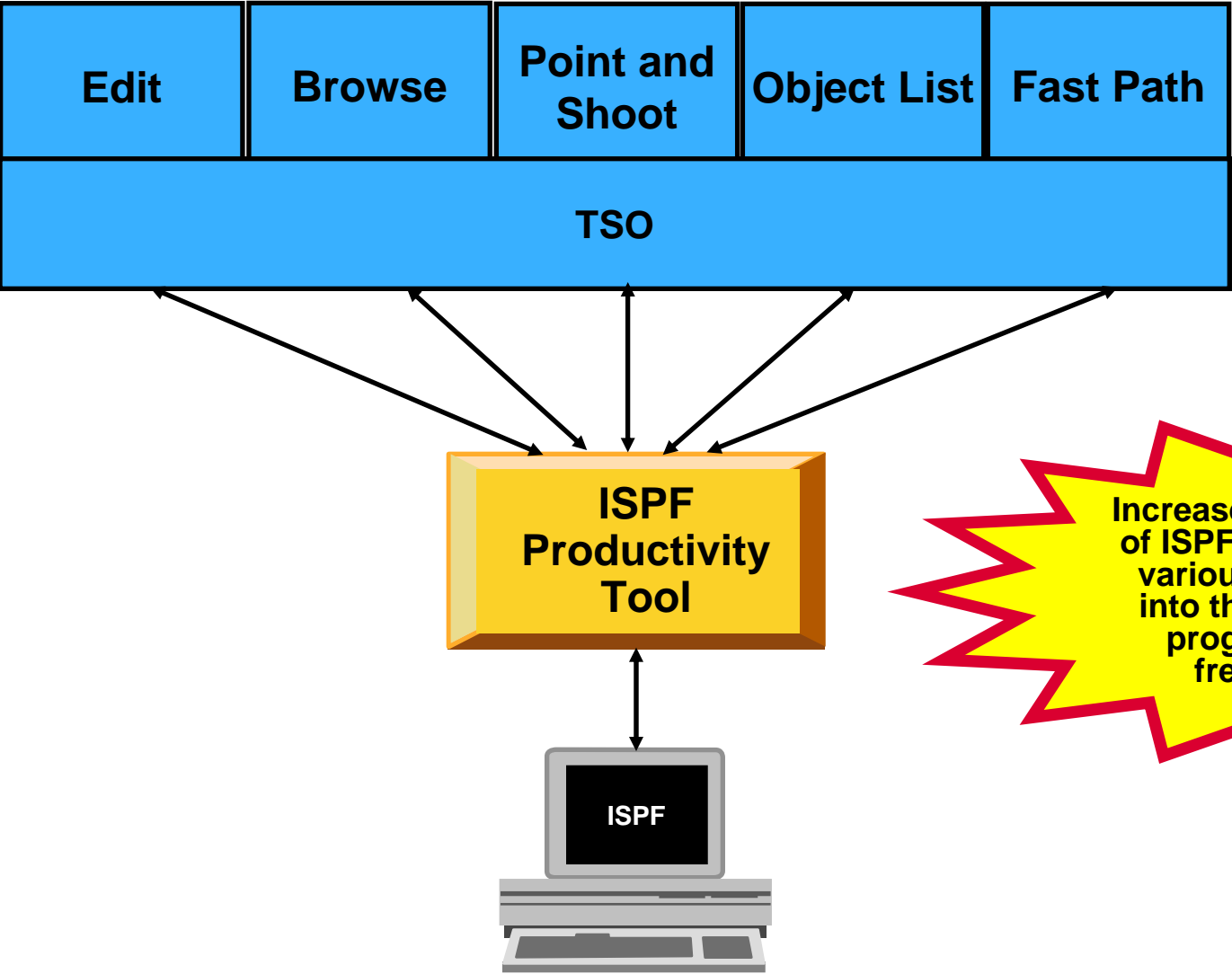
ISPF
Productivity Tool

www.ibm.com/software/awdtools/deployment

IPT Highlights

- Integrates enhanced functionality into the standard ISPF browse, edit, view, member list and data set list functions
- Extends the standard member lists with powerful search functionality that provides instantaneous results so that you can search through multiple members or libraries
- Helps you locate volumes, data sets, members and text
- Includes an interactive or automated interface to the change functionality and offers you the option to save changes into copies of modified members, leaving the originals intact
- Consolidates native ISPF and additional tools to provide automatic and integrated access to VSAM files, Panvalet® libraries, Librarian files, IBM DB2® tables, HFS files, PC files, catalog levels and other objects
- Uses proprietary technology for fast results

ISPF Productivity Tool – Enhances TSO ISPF productivity



Increases the productivity of ISPF users by packing various ISPF functions into the areas in which programmers most frequently work

ISPF Productivity Tool Features

- Consolidates commands within a single panel
- Presents a comprehensive, object-oriented, project-related list of data sets
- Provides extensive point & shoot capabilities
- Extended TSO command execution
- Automatic PDS compression
- Reduces keystrokes and EXCP counts
- Enhanced print and clipboard capabilities
- Improves ISPF navigation
- SCLM, Librarian, Panvalet Library support
- IPT increases the productivity of ISPF users by packing various ISPF functions into the areas in which programmers most frequently work, such as browse, edit ,member lists, and dataset lists.
- New commands and functions reduce the need to navigate to additional panels to perform utility functions. This results in reduced keystrokes and increase productivity.

ISPF Productivity Tool extends the productivity of ISPF

- Seamless integration with ISPF
- Organize files using Object Lists
- Use Member Selection Lists to work with PDS members
- Minimize panel navigation and improve productivity
 - Shortcuts
 - ISPF Productivity Tool commands
 - Extensive “Find” capabilities across multiple files
 - **Reduce keystrokes**



IBM HourGlass for z/OS Version 6.1



IBM HourGlass for z/OS

Alter Date and Time to accommodate Application Testing

Date and Time Testing



Problem

- Test changes to date and time sensitive applications without creating new regions or resetting current System Date and Time

IBM HourGlass



Solution

- Provide specific Date and Times to be used by applications in Batch, CICS, and IMS without creating new regions or altering the actual System Date and Time
- Test Regulatory Changes to applications

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

IBM 2011 Offerings

Debug Tool
for z/OS

File Manager
for z/OS

Fault Analyzer
for z/OS

Application
Performance
Analyzer for
z/OS

Workload Simulator
for z/OS & OS/390

Migration
Utility

Hourglass

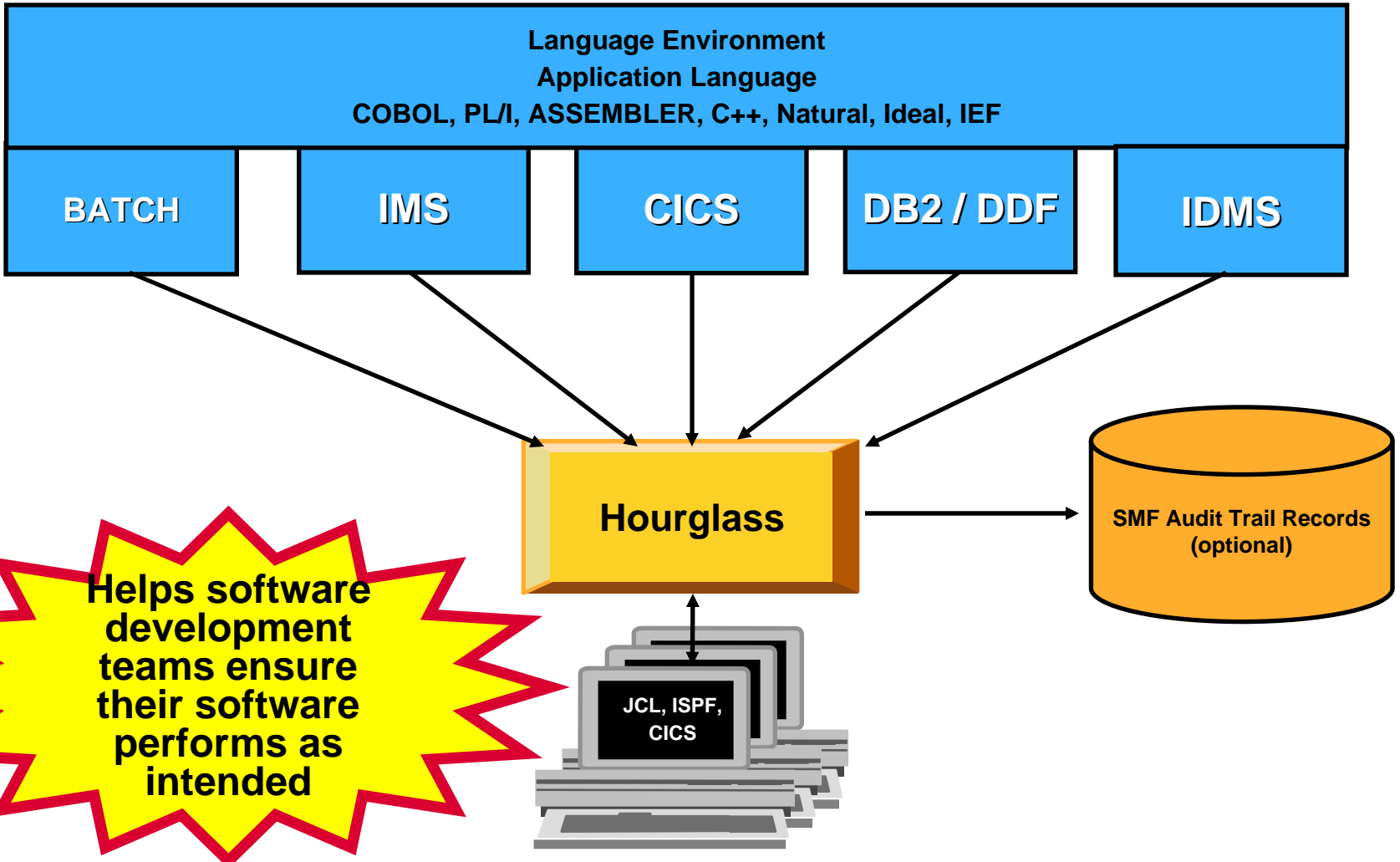
ISPF Productivity
Tool

www.ibm.com/software/awdtools/deployment

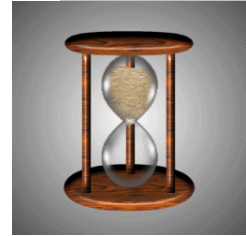
HourGlass

- Eligibility Checking
 - Security to identify applications that may use Hourglass
- Activate HourGlass via standard JCL
 - Override DD Statement for Date and/or Time
 - REXX Wizard to Accurately Generate Override DD Statement
 - Overrides for an entire JOB or a specific STEP
- Activate HourGlass using the provided ISPF Interface
 - Set Date and/or Time processing for JOBS
 - Restore Prior Settings
 - Review All JOB Settings
 - Review Hourglass Settings
- HourGlass Scheduling Facility
 - Continuously Roll Dates for JOBS or STEPS
 - Create/Drop Schedules
 - Up To 100 Active Schedules with Specifications for Up To 100 STEPS in each Schedule

HOURLASS – alter dates and times for application processing or testing



Hourglass Features



- Eligibility Checking
 - Security to identify applications that may use Hourglass
- Activate Hourglass via standard JCL Statements
 - Override DD Statement for Date and/or Time
 - REXX Wizard to Accurately Generate Override DD Statement
 - Overrides for an entire JOB or a specific STEP
- Activate Hourglass using the provided ISPF Interface
 - Set Date and/or Time processing for JOBS
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 - Review All JOB Settings
 - Review Hourglass Settings
- Hourglass Scheduling Facility
 - Continuously Roll Dates for JOBS or STEPS
 - Create/Drop Schedules
 - Up To 100 Active Schedules with Specifications for Up To 100 STEPS in each Schedule

Hourglass Features



- Hourglass for CICS
 - CICS Region Activation
 - Specific User, Terminal, Transaction Activation
 - Easily Managed with the HGCC Transaction
 - Audit Trail Facility
- Hourglass for IMS
 - Region Activation
 - Specific User Activation
- Hourglass for Software AG COM-LETE
 - Activated for Software AG Natural Application via Hourglass ISPF
- Hourglass for CA-IDMS
 - CA-IDMS Single User Batch Applications

Get more information about these tools at:
<http://www.ibm.com/software/awdtools/hourglass/library>

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IBM Software > WebSphere >

HourGlass library

PDF files require [Adobe® Reader®](#)

Product documentation

IBM HourGlass V6.1: Usage and Installation Guide
 User guide and installation instructions for the IBM HourGlass V6.1 product
Last updated: 15 Feb 2010
[View PDF \(384KB\)](#)

HourGlass v6.1 Usage and Installation Guide
 Many data processing installations have applications that contain time-sensitive logic—special processing that executes at certain intervals such as at the end of a week, month, or quarter.
Last updated: 05 Feb 2009
[View PDF \(388KB\)](#)

HourGlass v6.1 License Information
 The Programs listed below are licensed under the following terms and conditions in addition to those of the International Program License Agreement.
Last updated: 29 Jan 2009
[View PDF \(492KB\)](#)

HourGlass v6.1 Program Directory
 This Program Directory is intended for the system programmer responsible for program installation and maintenance.
Last updated: 05 Jan 2009
[View PDF \(76KB\)](#)

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 - System z Servers



IBM Migration Utility for z/OS Version 3.2



IBM Migration Utility for z/OS

Improve your total cost of ownership

Software
Cost



Problem

- Must save money but must leverage existing skills

IBM Migration Utility



Solution

- After conversion, continue writing & maintaining your EZT programs as long as you want to; capture COBOL business logic for SOA applications.

The IBM Problem Determination Tools Suite for z/OS

IBM Problem Determination Tools

IBM 2011 Offerings

Debug Tool
for z/OS

File Manager
for z/OS

Fault
Analyzer for
z/OS

Application
Performance
Analyzer for
z/OS

Workload Simulator
for z/OS & OS/390

Rational Functional Tester Ext
Rational Performance Tester z/OS

Migration Utility
for z/OS

Hourglass

ISPF
Productivity Tool

www.ibm.com/software/awdtools/migrationt

Migration Utility for z/OS Highlights

- Run and maintain converted programs as either COBOL programs or in the Easytrieve languages—without installing Easytrieve products.
- Delivers efficient COBOL I/O handling and memory management
- Increases COBOL sorting and searching efficiency
- Increases portability of programs
- Modernizes existing reports with the addition of a few simple new language statements
- Modifies or enhances converted programs using either Easytrieve language or COBOL
- Provides analysis of program abends, identifying the original failing Easytrieve program statement
- Creates HTML and HTML Drill Down reports and character-separated value output easily
- Batch-convert programs for more efficient processing and automatically convert and parallel test programs
- Improved Dynamic SQL options to improve performance-- a new feature in V3.2
- Report Modernization Utility converts mainframe printer files to HTML and .CSV files without modifying the originating program-- a new feature in V3.2

Definitions:

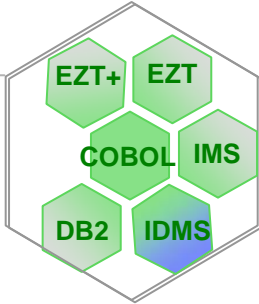
Differentiate between CA Easytrieve Product and Easytrieve Language

- The CA Easytrieve Plus Product is licensed from CA, and may be costing you annual maintenance or capacity upgrade fees
- The CA Easytrieve and Easytrieve Plus Languages are the programming language your programs are written in – those programs are your intellectual property, just like COBOL or C programs
- With IBM Migration Utility you can continue using the Easytrieve or Easytrieve Plus languages, without having the CA Easytrieve Plus product installed, or you can simply convert and capture COBOL, maintaining in that language in the future

Why Migrate from CA Easytrieve?



Save Money
 Improve Your Total Cost of Ownership



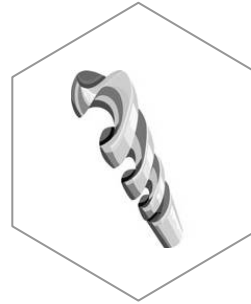
Capitalize on Investments
 After conversion, continue writing & maintaining your EZT programs as long as you want to; capture COBOL business logic for SOA applications



Language Skills
 Continue using EZT Languages as long as you like; switch to COBOL if/when desired



Modernize Output
 Automatically convert output to HTML or .CSV formats with no program changes

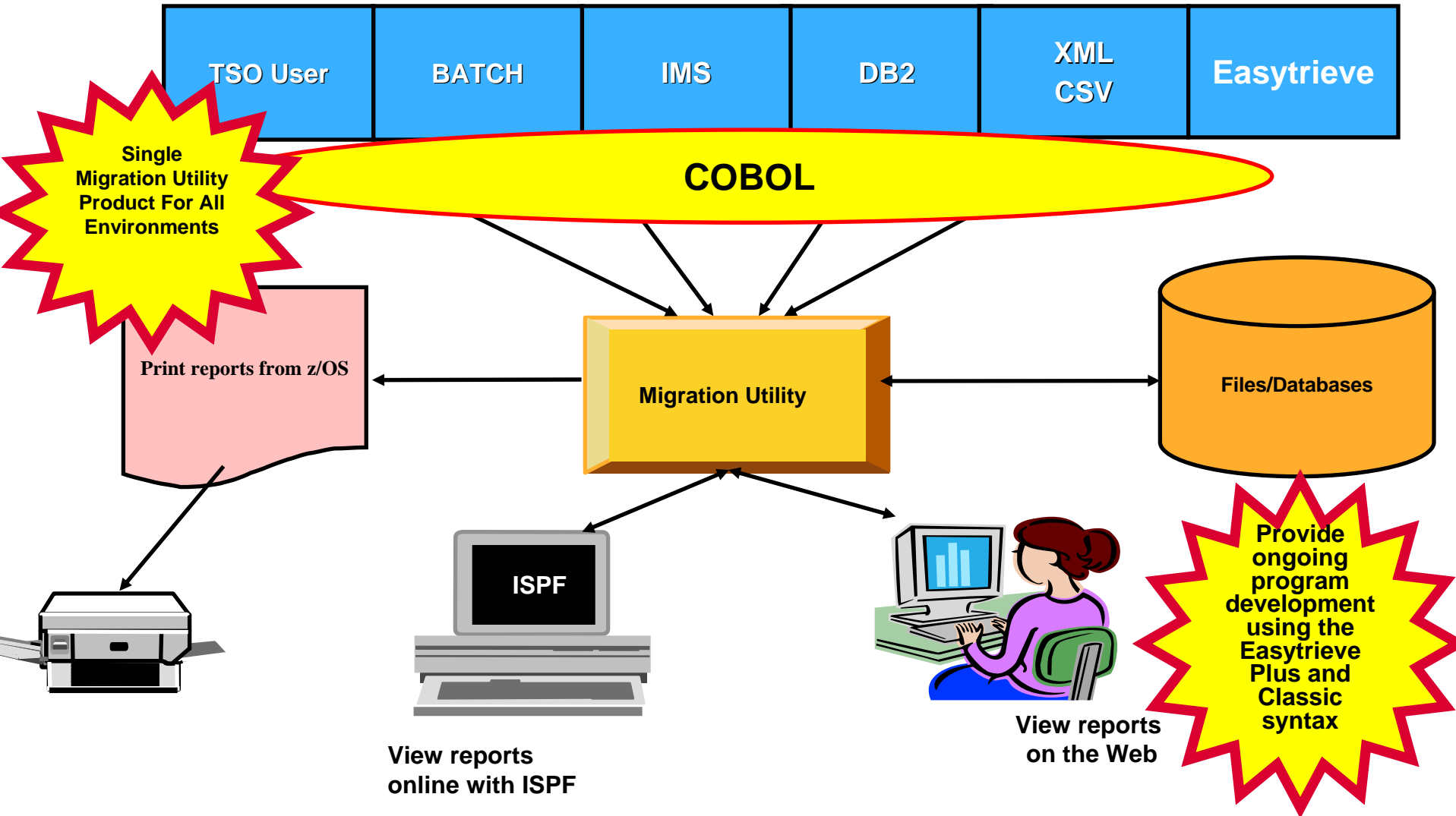


Advanced Features
 Drill-Down Reports
 Improved Debugging
 Add COBOL Statements



Ease Pain of Re-testing
 With new EZT Plus version, you must to re-test programs without assistive tools

Migration Utility - Provides rapid development for adhoc requests



Migration Utility Functional Overview

- Single Tool for All Supported Environments
 - JES/Batch, IMS, DB2, partial IDMS
- Benefits Provided by IBM Migration Utility:
 - Automated conversion of Easytrieve Plus programs to COBOL
 - Ongoing program development using the Easytrieve or Easytrieve Plus syntax
 - Automated testing / validation for converted programs
 - Affordable high level development tool for COBOL Environment
 - Users retain Easytrieve ease of use at a much lower cost
 - Lower annual cost
 - Possible machine cycle savings at run time
- Migration Utility Features
 - **Existing and new** Easytrieve Plus language programs can be processed by the IBM Migration Utility (IMU)
 - Programs written using Easytrieve Plus language can be converted to standard IBM COBOL
 - Creates IBM standard COBOL syntax from Easytrieve Plus language statements without Easytrieve Plus installed
 - Discovery Utility
 - Batch Conversion Utility
 - Parallel Testing and Electronic Output Comparison Utility
 - One-step driver enables re-use of existing compiler JCL with only minor changes
 - Report Modernization Utility – Generate HTML or Spreadsheet output without program changes

The value of IBM PD Tools for z/OS

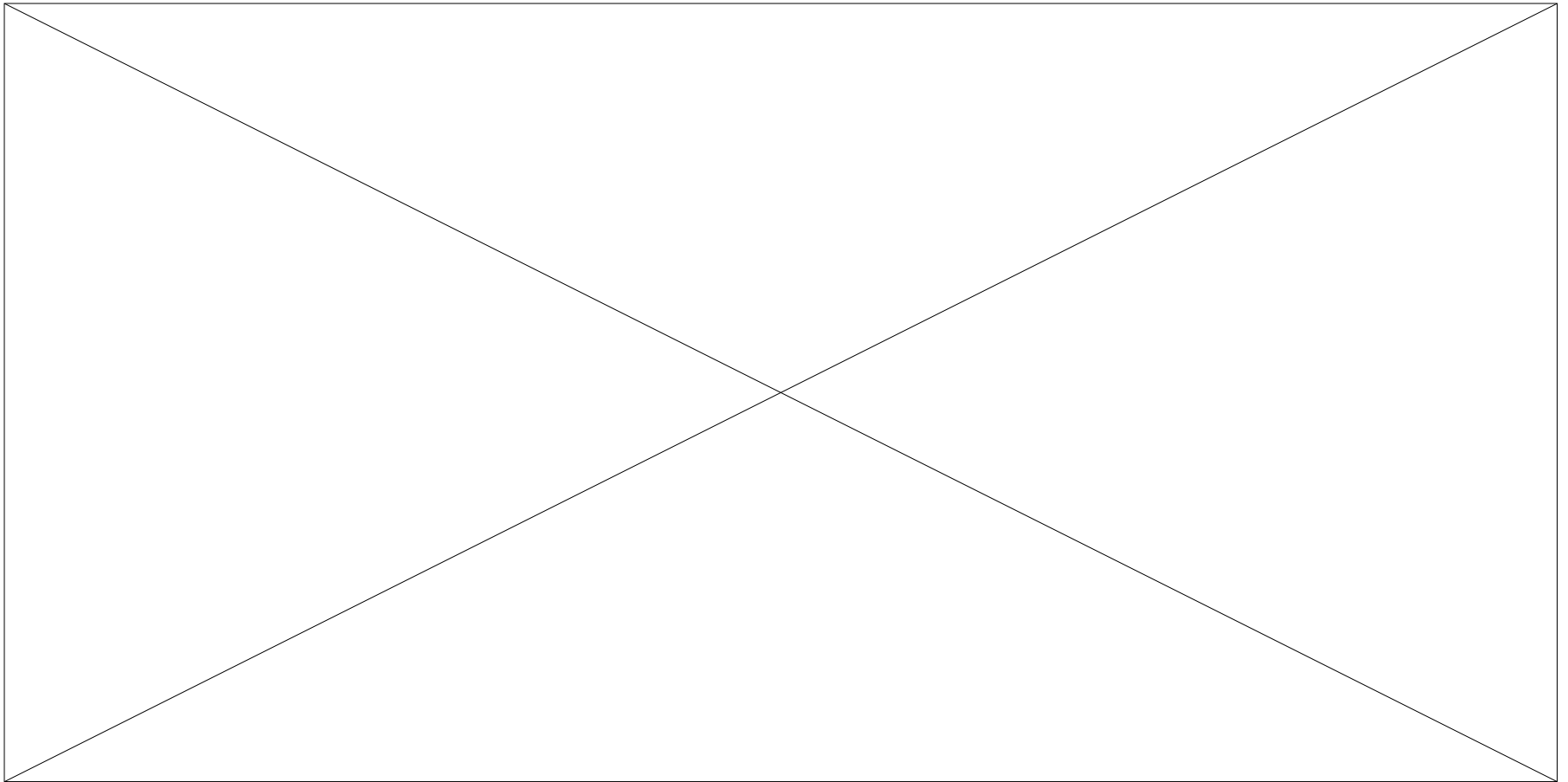
- **Reduces the time programmers need to perform common development tasks such as debugging, test data creation/management, testing, and performance analysis**
- **Shortens application development cycles**
- **Provides diagnostic tools that provide detailed information about production problems, and tools for rapidly correcting data problems**
- **Results in reduced production down time, shortened problem resolution time, and fewer problem re-works**
- **Provides an extensive collection of features and utilities to automate file and data management, copying and reformatting, data scrambling, comparison, etc.**
- **Reduces loss of time and productivity spent writing in-house utilities**
- **Simplifies programming tasks during the entire development process**
- **Lets you spend more development time creating value, instead of struggling through mundane tasks without the right tools**
- **Increases productivity**

We would like to engage the Problem Determination Tools group for an on site "Live Demo"?

Yes

No

We would like to engage the Problem Determination Tools group for an on site "Live Demo"?



We currently have problem determination Tools from

Compuware

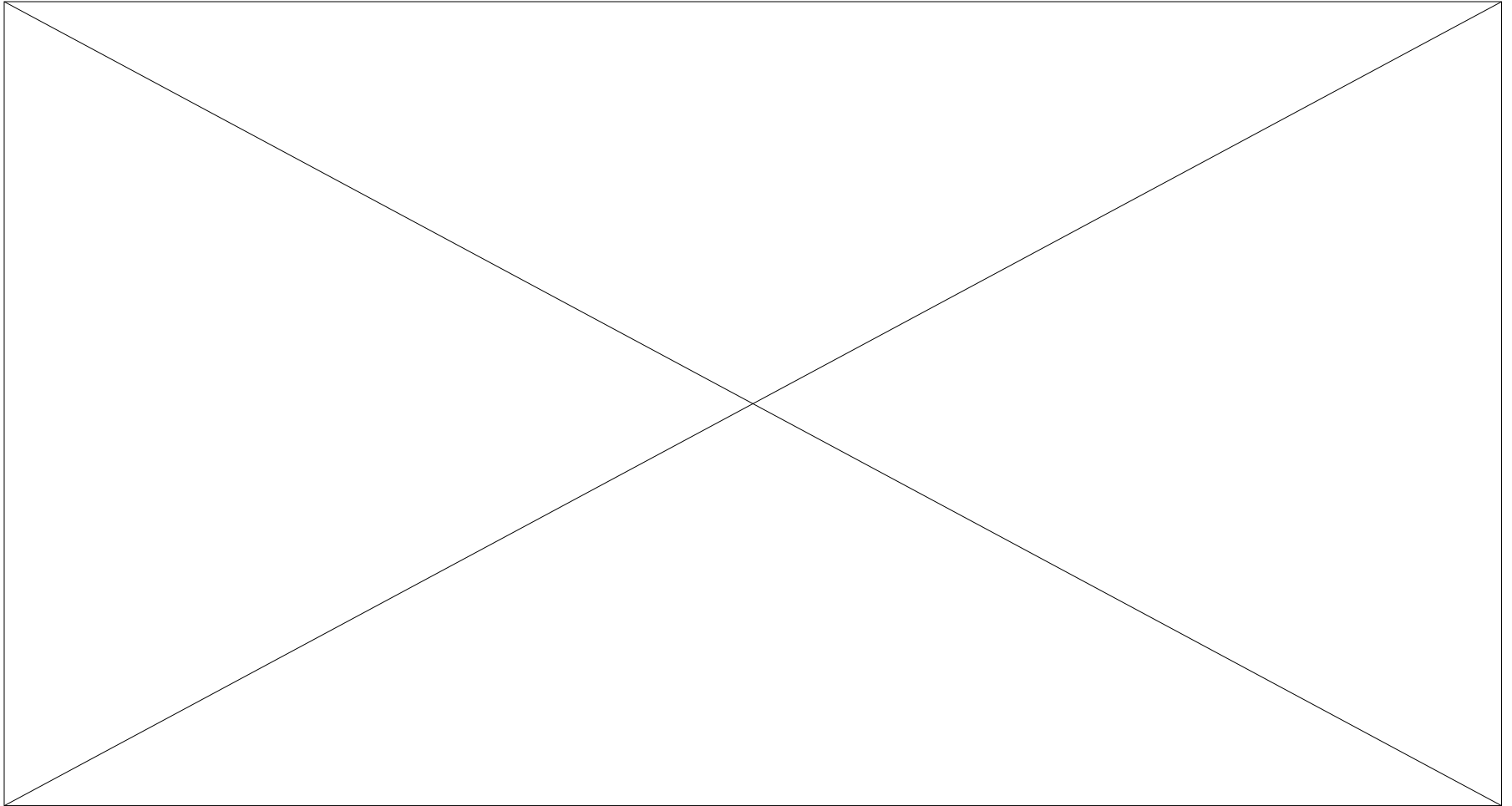
CA

Macro4 (Unicom)

ASG

Other

We currently have problem determination Tools from



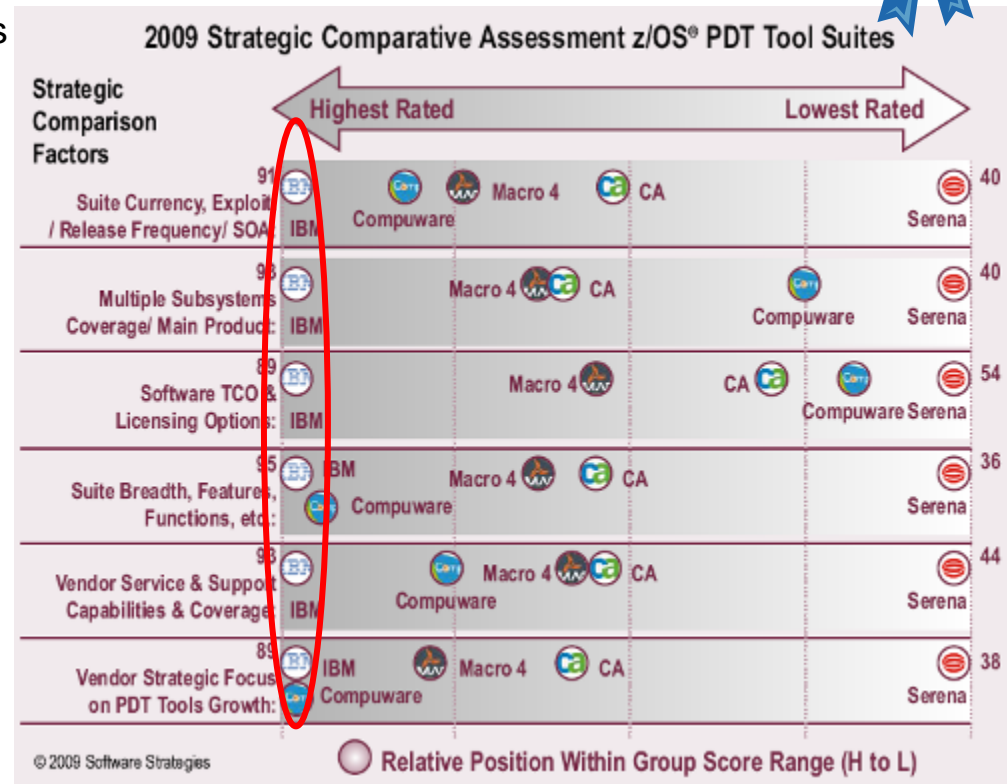
IBM Problem Determination Tools Wins Top Spot

Software Strategies Analyst Report, Released April 2011



IBM's PD Tools Suite Extends Technology Lead:

- IBM successfully challenged existing vendors in this segment since 2000
- Modern, well-featured, fully integrated, inclusive, and good-value
- The latest suite (V11) has now extended clear technology, feature and functional leadership



IBM PD Tools for z/OS are a cost-effective alternative to competitive products

- **IBM is committed to customer success**

- Affordable pricing
- Flexible terms and conditions
- A wide array of key features and functions
- The opportunity to increase user productivity
- Exploitation of IBM's latest technology
- Dedicated Product Support Team
- Customer Requirements Drive Product Enhancements
- Classroom Training Services

Problem Determination Tools “Live” Road Show

- **¾ Day Event**
 - **8:30 AM until 2:00 PM local time**
 - **Continental Breakfast and Lunch Served**
 - **Presentation and Live Demos of PD Tool Products**
 - **Please Register**
 - <https://www.ibm.com/events/>
 - **Developer Tools Live**

- **IBM Locations for 2nd Quarter 2011**
 - **Raleigh, NC May 3, 2011**
 - IBM 3100 Smoketree Court Raleigh
 - **New York, NY May 6, 2011**
 - IBM 33 Maiden Lane, New York
 - **Richmond, VA May 10, 2011**
 - IBM, 9201 Arboretum Parkway, Richmond, VA
 - **Detroit, MI June 14, 2011**
 - IBM 18000 West Nine Mile Rd Southfield, MI
 - **Kansas City, KS/MO June 16, 2011**
 - IBM 11550 Ash Street Suite 350 Leawood, KS



Thank
YOU