IBM PDTools for z/OS

Update

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PD Tools + Rational on System z
Technical Sales and Solutions
IBM Systems

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Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user’s job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.
Agenda

Updates on

- IBM Application Performance Analyzer for z/OS V14.0
- IBM Fault Analyzer for z/OS V13.1
- IBM File Manager for z/OS V13.1
ADFz v3.0

- Application Delivery Foundation for z Systems is a bundle of individual products. Individual products can be purchased separately as well.
- The same z/OS debug technology is included in Developer for z Systems, Developer for z Systems Enterprise Edition and Debug for z Systems.
- Debug for z Systems includes a 3270 interface for debugging which is NOT available with Developer for z Systems.
- Developer for z Systems Enterprise Edition includes Debug for z Systems and 1 authorized user license of Developer for z Systems per Value Unit.
- Everything except IBM Developer for z Systems V14.0 are available in Shop z.
- IBM Developer for z Systems V14.0 is continue to be available in Passport Advantage and allows no cost upgrade from RDz V9.5.
IBM Application Performance Analyzer

Update
IBM Application Performance Analyzer for z/OS 14.0

Monitors application performance

- Observes application performance and resource usage by sampling technology
- Provides performance information on several levels down to source code
- Non intrusive - runs outside of application address space
- Supports many environments and languages up to current Version (CICS/DB2/IMS/MQ/WAS/COBOL/PLI/ASM/ C/C++/JAVA)
- Provides hints about tuning options
- Pinpoints performance bottlenecks
- Identifies constraints
- Easy-to-use 3270 Interface
- Eclipse based GUI available
- Reports are also available in XML or PDF format

Update to V14.0

- new version number and product number (V14.0 & 5655-Q49)
- structure of checkpoint file has changed
- request numbers are increased from 4 to 5 digits
- new option for observation file maintenance
- GUI improvements
- Support for Automatic Binary Optimizer modules
Request numbers

- Number of requests has been increased 5 digits

<table>
<thead>
<tr>
<th>ReqNum</th>
<th>Owned By</th>
<th>Description</th>
<th>Job Name</th>
<th>Date/Time</th>
<th>Samples</th>
<th>Status</th>
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<tbody>
<tr>
<td>09029</td>
<td>EMILIO</td>
<td>UNIPOL - 21 Ser WPSR21S</td>
<td>Oct-7 17:18</td>
<td>9,801</td>
<td>Ended</td>
<td></td>
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<td>09028</td>
<td>EMILIO</td>
<td>UNIPOL - 21 Con WPSR21</td>
<td>Oct-7 17:18</td>
<td>300</td>
<td>Ended</td>
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<tr>
<td>09016</td>
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<td>CICS java</td>
<td>CICSMI42</td>
<td>Sep-8 11:53</td>
<td>9,999</td>
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<td>09014</td>
<td>EMILIO</td>
<td>WAS Activity [S ZTSR01A</td>
<td>Sep-8 11:38</td>
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<tr>
<td>09013</td>
<td>EMILIO</td>
<td>was java short</td>
<td>ZTSR01AS</td>
<td>Sep-5 13:40</td>
<td>2,000</td>
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<tr>
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<td>EMILIO</td>
<td>batch VSAM MQ</td>
<td>EMILIO5</td>
<td>Sep-4 15:15</td>
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<td>09011</td>
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<td>batch java-&gt;COB</td>
<td>EMILIO1</td>
<td>Sep-4 15:12</td>
<td>2,698</td>
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<tr>
<td>09007</td>
<td>DANTE</td>
<td>sdfzefze</td>
<td>COHELLO</td>
<td>Aug-1 13:21</td>
<td>5,000</td>
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<td>08842</td>
<td>EMRICH</td>
<td>Hans Test 2</td>
<td>EMRICHQ</td>
<td>Jun-16 15:51</td>
<td>10,000</td>
<td>STEPS</td>
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<tr>
<td>08850</td>
<td>0008 SAM1V</td>
<td>RUNSAM</td>
<td></td>
<td>Jun-16 15:54</td>
<td>9,879</td>
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<tr>
<td>08632</td>
<td>EMRICH</td>
<td>HANS: Trader2 C CICSC23G</td>
<td>Nov-11 17:05</td>
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<tr>
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<td>Nov-11 17:01</td>
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<tr>
<td>08251</td>
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<td>EMRICHB</td>
<td>May-16 20:59</td>
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<td>08224</td>
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<tr>
<td>08213</td>
<td>NTIEL</td>
<td>NSWPF ADA/NAT 0 CICSPE01</td>
<td>May-7 1:22</td>
<td>50,000</td>
<td>Ended</td>
<td></td>
</tr>
</tbody>
</table>

Command ==>
The checkpoint file

APA executes the observation as requested

- Observation specifications read from the checkpoint file
- Observed data are stored in measurement datasets
- Observation can also be monitored realtime

The checkpoint file holds data like request number, measured job name, number of samples, measurement status, sample file dataset name, etc.
Checkpoint file - change

- Old Checkpoint File Version was 2.2, now the Version number is 3.0
  - Message in started task:

```
2017/060 11:22:32.23526 CAZ9998D CAZ1-MAIN Checkpoint file: ADTCFG.CAZ.CHPK is at version: 3.0
```

- Supports now up to 30,000 observation requests
  - can be limited through new MAXREQ parameter

- APA V14 standalone works ONLY with checkpoint file version 3.

- Checkpoint conversion utility available
  - **NOTE**: MAXREQ should be specified before. Value can not be decreased afterwards

- COMPAT mode available for different APA Versions in a sysplex
Checkpoint file maintenance

New parameter for a better maintenance control

ObsMaintenance=(AutoDel=,DelDSNotFnd=,TOD=,INTVAL=)
– AutoDel=Y Delete expired observations
– DelDSNotFnd=Y Delete completed observations with no associated sample file
– TOD=hh:mm Performs daily observation maintenance at hh:mm
– INTVAL=hh Performs observation maintenance every hh hours after APA starts.
GUI Improvements

In STC View:
  Show all LPAR connections

In Observation List:
  Five digit request numbers
  Multiple observation selection

Reports List:
  Multiple report selection
IBM Fault Analyzer

Enhancements
IBM Fault Analyzer for z/OS

Abend analyses up to source code level

- Collects information about environment and application at time of abend
- Subsequent analyses of system dumps possible
- Provides a well formatted readable analyses report about the abend situation
- Provides an intuitive ISPF interface for interactive analyses
- Supports most environments and languages up to current version (CICS/DB2/IMS/COBOL/PLI/ASM/C/C++/JAVA)
- Supports LE- and non-LE applications
- COBOL Explorer for extended program logic analyses
- Eclipse based graphical user interface available
- Liberty profile based Web interface available
- Direct access to messages and codes descriptions
- File Manager z/OS interface for direct access to data
- Supports for LE- and non-LE applications

Updates via PTF

- New 3270 feature: CICS LINK hierarchy
- New GUI feature: Fault Analytics with Chart Wizard
- Support for the new PDTCC Event Processing feature
CICS LINK hierarchy

- Provides an E.C. LINK hierarchy from CICS internal trace or CICS auxtrace
- available at interactive analyses only

<table>
<thead>
<tr>
<th>File</th>
<th>View</th>
<th>Services</th>
<th>Help</th>
</tr>
</thead>
</table>

### CICS Internal Trace

<table>
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<tr>
<th>Abbrev</th>
<th>Short</th>
<th>Full</th>
<th>-</th>
<th>TRANID: 4038</th>
<th>CICS</th>
<th>ABEND: SHIT</th>
<th>ZT01</th>
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<td>QR</td>
<td>MN</td>
<td>0A01</td>
<td>MNXM</td>
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<td>SO</td>
<td>0401</td>
<td>S0IS</td>
<td>ENTRY</td>
<td>INET_NTOP</td>
<td>1B01C94 , 00000000 , 00000028 ,</td>
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<td>SO</td>
<td>0402</td>
<td>S0IS</td>
<td>EXIT</td>
<td>INET_NTOP/OK</td>
<td>1B01C94 , 00000000 , 00000028 , IPV4</td>
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</tr>
<tr>
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<td>QR</td>
<td>MN</td>
<td>0A02</td>
<td>MNXM</td>
<td>EXIT</td>
<td>TRANSACTION_BIND/OK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00082</td>
<td>QR</td>
<td>MP</td>
<td>0200</td>
<td>MPXM</td>
<td>ENTRY</td>
<td>BIND_XM_CLIENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00082</td>
<td>QR</td>
<td>MP</td>
<td>0201</td>
<td>MPXM</td>
<td>EXIT</td>
<td>BIND_XM_CLIENT/OK</td>
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<td>QR</td>
<td>AP</td>
<td>1790</td>
<td>TFXM</td>
<td>ENTRY</td>
<td>BIND_XM_CLIENT</td>
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<td>QR</td>
<td>AP</td>
<td>1791</td>
<td>TFXM</td>
<td>EXIT</td>
<td>BIND_XM_CLIENT/OK</td>
<td>YES,CICS4038,YES,NO,</td>
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<tr>
<td>00082</td>
<td>QR</td>
<td>AP</td>
<td>0500</td>
<td>APXM</td>
<td>ENTRY</td>
<td>RMI_START_OF_TASK</td>
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<td></td>
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<tr>
<td>00082</td>
<td>QR</td>
<td>AP</td>
<td>2520</td>
<td>ERM</td>
<td>ENTRY</td>
<td>CALL-TRUES-FOR-TASK-START</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Called-from-address IADFCATC : Module DFHAPXM + X'CTC'**

| 00082  | QR    | US   | 0401 | USXM        | ENTRY | INQUIRE_TRANSACTION_USER |
| 00082  | QR    | US   | 0402 | USXM        | EXIT  | INQUIRE_TRANSACTION_USER/OK 1A6ED0B8 |
| 00082  | QR    | RM   | 0301 | RMLN        | ENTRY | ADD_LINK | RMI,1BC3621C , 00000000 , 00000008 , |
| 00082  | QR    | RM   | 0302 | RMLN        | EXIT  | ADD_LINK/OK | 0103001B,1BC3621C , 00000000 , 00000008 , |
| 00082  | QR    | SM   | 0C01 | SMMG        | ENTRY | GETMAIN | ICE,YES,00,TASK |
| 00082  | QR    | SM   | 0C02 | SMMG        | EXIT  | GETMAIN/OK | 00000000_1B003AF8 |
| 00082  | QR    | AP   | 00E1 | EIP         | ENTRY | GETMAIN | 0004,10 |

**Called-from-address IADF0088A : Module EQA0CTRU + X'18A'**

| 00082  | QR    | PG   | 0500 | PGIS        | ENTRY | INQUIRE_CURRENT_PROGRAM |

**Command ===> F1=Help F3=Exit F4=CICSLINK F5=RptFind F6=Actions F7=Up F8=Down**

---

place cursor and press **PF4**
or use command **CICSLINK**

**tsotso**
(can also be used from the fault entries entry panel)

a task number prompt appears if not unique
CICS LINK hierarchy

- place cursor on module and press enter to get trace analyses statistic information
Fault Analyzer Analytics

- Provides fault statistics based on a history file
Fault Analyzer Analytics

Faults By ABEND

Chart data from zt01.pssc.mop.fr.ibm.com/2800/ADTCFGLH1HIST. Results Limit 10

Manage configurations

<table>
<thead>
<tr>
<th>FAULT_ID</th>
<th>JOBS/TRAN</th>
<th>SYS/JOBS</th>
<th>ABEND</th>
<th>LAB1</th>
</tr>
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<tbody>
<tr>
<td>F17615</td>
<td>DMCBENM</td>
<td>ZT01</td>
<td>U0100</td>
<td>U003</td>
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<tr>
<td>F17614</td>
<td>DMCBEMA</td>
<td>ZT01</td>
<td>S013</td>
<td>S013</td>
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<tr>
<td>F17613</td>
<td>CZOSCON</td>
<td>ZT01</td>
<td>S013</td>
<td>S013</td>
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<tr>
<td>F17612</td>
<td>LEO1</td>
<td>ASRA</td>
<td>ASRA</td>
<td>ASRA</td>
</tr>
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<td>F17610</td>
<td>LEO1</td>
<td>ASRA</td>
<td>ASRA</td>
<td>ASRA</td>
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<td>F17608</td>
<td>IMSCMB</td>
<td>ZT01</td>
<td>SEC6</td>
<td>SEC6</td>
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<tr>
<td>F17607</td>
<td>JOBEXCB</td>
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<td>U0100</td>
<td>U003</td>
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<tr>
<td>F17606</td>
<td>JOBEXCB</td>
<td>ZT02</td>
<td>S013</td>
<td>S013</td>
</tr>
</tbody>
</table>

Chart Functions

- Display Chart
- New Chart...
- Edit Chart...
- Duplicate Chart
- Delete Chart...

Data set loaded. Contains 529 records with 39 fields. From zt01.pssc.mop.fr.ibm.com/2800/ADTCFGLH1HIST. Results Limit 10
Fault Analyzer Analytics – Chart Wizard
Fault Analyzer Analytics – Chart Wizard

Faults by User 1

User Name

MOPZSTC  MICHAL3  DELAHAY  OLSSON  FARKAS  STC  EMRICH  GUSTAVO  NIEL

Fault Frequency

Chart data from zt01.pssc.mop.fr.ibm.com/2800/ADTCFG.ID1HIST. Results Limit 15
Fault Analyzer Analytics – Event support

- Event Processing is new feature of the PD Tools Common Component Server (APAR PI65687)
- PDTCC event processing allows any products or systems data to send data to an asynchronous back-end for processing
  
  *IPVEPSND* sender module, called by the event triggering product. spawns an BPX batch address space for module *IPVEPRCV*

  *IPVEPRCV* runs asynchronously in the BPX address space provides an interface to a user exit that was specified in the parms
Fault Analyzer Analytics – Event support

Running Address Space

ABEND occurs in running address space. FA detects this and tells PDTCC to delegate information about the ABEND to the Event Processing exit to handle.

Running Program → Fault Analyzer → PDTCC → Event Processing Exit

PDTCC passes event data to the Event Processing exit where it is handled independently from the running address space.

Once PDTCC has passed the data to be processed to the exit, it immediately gives control back to the running program so it can continue working without waiting for the exit to complete.
Fault Analyzer Analytics – Event support

- Fault Analyzer provides samples for RTC ticketing
Fault Analytics
Outlook: FA GUI - Deferred Breakpoint

It's now real
IBM File Manager

Enhancements
IBM File Manager for z/OS

Manage a variety of enterprise data file structures

- Manages production, test, and development data across multiple file formats and storage media
- Create, edit, copy, browse, extract, print, and compare enterprise data in a structured way
- Works with a broad area of data formats
  - DB2, IMS, CICS, MQ Series, VSAM, sequential dataset, PDS, PDS/E,
- Support many different media
  - DASD, Tape, optical Discs
- Work with data using COBOL, Assembler and PL/I record layouts interactively or in batch
- Data scrambling for data privacy
- Generate test data
- SQL Prototyping and Execution
- Eclipse based GUI interface
- Proven 3270-based interface

Updates via PTF

- Enhancements to the Load Module Viewer providing new viewer options and reporting capabilities
- Load module compare now compares compiler options
- Search panel enhancement to supports, Search history, batch execution
New Load Module Viewer features

### Input:
- Data set name: 'FMN.V13R1M0.SFMNMOD1.AD66168'
- Member: FMNMAIN (Blank or pattern for member list)
- Volume serial: _____ (If not cataloged)

### Processing Options:
- Order CSECTs by:
  1. Address
  2. Name
- Output to:
  1. Display
  2. Printer
  3. XML
- Enter "/" to select option:
  1. Batch execution
  2. Date format 'Www Mmm DD, YYYY'
  3. Exclude Labels
  4. Clear print data set
  5. Advanced member selection
  6. Skip member name list
- Report options:
  - Summary
  - Compiler options
  - Identify
  - Text
  - Zap

### XML
- Improved date formatting
- Exclude labels
- Clear the print data set

### Mask
- YY/MM/DD: 16/04/20
- MM/DD/YYYY: 04/20/2016
- DD/MM/YYYY: 20/04/2016
- 'Www Mmm DD, YYYY': Wed Apr 20, 2016
### File Manager

- Extended Load module information window with new options

<table>
<thead>
<tr>
<th>Process</th>
<th>Options</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>File Manager</strong></td>
<td><strong>Load Module Information</strong></td>
<td><strong>Row 00001 of 00082</strong></td>
</tr>
<tr>
<td>Command ==&gt;</td>
<td></td>
<td>Scroll CSECT</td>
</tr>
</tbody>
</table>

**Load Library**: FMN.V13R1M0.SFMNMOD1.AD66168

**Load Module**: FMNMAIN

**Linked on**: Thu Aug 25, 2016 at 10:36:34 by PROGRAM BINDER 5695-PMB V2R1

**EPA**: 000090 **Size**: 058F1B0 **TTR**: 018812 **SSI**: AC 01 AM 31 **RM**: ANY

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<th>Address</th>
<th>CSECT name</th>
<th>Type</th>
<th>Size</th>
<th>Class</th>
<th>AMODE</th>
<th>RMODE</th>
<th>Date</th>
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<tr>
<td>0000000</td>
<td>FMN$SISR</td>
<td>SD</td>
<td>00001E8</td>
<td>B_TEXT</td>
<td>31</td>
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<td>Tue Aug 27, 2013</td>
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<td>FMNIVL</td>
<td>SD</td>
<td>00007A8</td>
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<td>ANY</td>
<td>Wed Aug 24, 2016</td>
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<td>ANY</td>
<td>Wed Aug 24, 2016</td>
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<td>00009B2</td>
<td>FMNMAIN..FNMIB</td>
<td>LD</td>
<td>0000006</td>
<td>B_TEXT</td>
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<tr>
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<td>FMNMAIN..FNBDB</td>
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<td>0000006</td>
<td>B_TEXT</td>
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<td></td>
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<tr>
<td>00009BE</td>
<td>FMNMAIN..FILEMIB8</td>
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<td>B_TEXT</td>
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</tbody>
</table>

- **New line commands**
  - D: Disassemble
  - T: User Data
  - O: Compile options
  - V: View text
  - Z: ZAP data

- **Column expands to support long names**
  - use TA command to customize

- **Label lengths derived**
  - Removal of duplicate label names

- **Only one CSECT date which supports new formats**

- **New class column**
File Manager

- Compiler option display

```
File Manager
Section Name: COB0CB
Class: C_CODE
Compiler Options:
<--------10-------->
ADV
APF(VOLATILE)
QUOTE
ARCH(11)
ARITH(EXTEND)
NOAUD
NOBLOCK0
NOCICS
CODEPAGE(1140)
NOCURRENCY
DATA(31)
DBCS
NODECK
DISPSIGN(COMPAT)
MODLL
NODUMP

File Manager
Section Name: COB0CB
Class: C_CODE
Compiler Options:
<--------10-------->
DYNAM
NOEXPORTTAL
NOSTART
HGR(PRESERVE)
INTOATE(ANSI)
LIST
MAP
NDII
NOMODE
NONAME
NUMBER
NUMPROC(NOPFD)
OBJECT
NOOFFSET
NOWNOT
OPTIMIZE(8)
OUTDD(SYSOUT)

File Manager
Section Name: COB0CB
Class: C_CODE
Compiler Options:
<--------10-------->
RMODE(ANY)
SEQUENCE
NOSERVICE
SOURCE
NOSQL
SQLCSDI
NOSQLIMS
NOSRANGE
NOSTROPT
NOTERM
TEST(EJPD,SOURCE)
NOTHREAD
TRUNC(STD)
LEINFO=(COBOL,V5R2M0 2017.031 18:20:31)

**** End of data ****
```
File Manager

- Enhanced Search Facility

Menu  List  Mode  Functions  Utilities  Help

Command ==> Enhanced Search Command

E
String:

String options  Columns
3  Prefix  From
2  Suffix  To
1  Word

P
Scope:
Index .  DEM*  Edit
DDnames  DSNs .

Options:
Enter "/" to select option
Directory  Drill  Result  Parmlib  Batch

blank field for history

generic or blank to see member list.

specify data set names (generic supported) on this panel.

batch execution
**File Manager**

- index member list where descriptions are now supported

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Date Changed</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEM01</td>
<td>Tech talk 1 - EXEC/ Panels/ skels</td>
<td>2016/08/10 11:08</td>
<td>5</td>
</tr>
<tr>
<td>DEM02</td>
<td>Tech talk 2 - HFS and PDS</td>
<td>2015/12/01 13:32</td>
<td>2</td>
</tr>
<tr>
<td>DEM03</td>
<td>Tech talk 3 - JCL</td>
<td>2015/12/01 13:34</td>
<td>2</td>
</tr>
<tr>
<td>DEM04</td>
<td>Tech Talk 4 - CICS</td>
<td>2015/12/01 13:37</td>
<td>2</td>
</tr>
<tr>
<td>DEM05</td>
<td>Tech Talk 5 - Proclib - substitutions</td>
<td>2015/12/01 14:00</td>
<td>12</td>
</tr>
<tr>
<td>DEM06</td>
<td>Tech Talk 6 - MQ resources</td>
<td>2015/12/02 06:53</td>
<td>1</td>
</tr>
<tr>
<td>DEM07</td>
<td>tech talk 7 - random</td>
<td>2015/12/02 07:01</td>
<td>3</td>
</tr>
<tr>
<td>DEM08</td>
<td></td>
<td>2015/12/02 10:45</td>
<td>2</td>
</tr>
<tr>
<td>DEM09</td>
<td></td>
<td>2015/12/02 11:16</td>
<td>1</td>
</tr>
</tbody>
</table>

L: locate displayed values
F: search content of members
S: select
E: edit
V: view
I: insert
R: rename
D: delete

Simply overtype descriptions to update

---

IBM System z – PDTools 2016

IBM Systems – PDTools 2017

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1. Compiler options for load module browse and compare.
2. Text viewing and printing has been made available for load module browse.
3. Load module full screen support now includes a command to disassemble text data.
4. Labels can be excluded for load module browse and print reports.
5. XML reporting is now supported by load module browse.
6. Load module dates can now be reported in any supported Language Environment date format.
7. Long section names can now be viewed and printed without truncation.
8. Compare functionality has been modified to support key synchronization of different field types, and ordering of key fields can now be specified.

Panel functions:
9. Panel fields for various functions can now be saved and retrieved for selected base functions.

Enhanced Search Facility:
10. The Enhanced Search Facility has been modified to support a panel driven command with usability improvements such as command history, description for index members and batch
ABO V1.2 Update
What’s new in ABO v1.2

GA: Nov 11

• Optimization coverage
  • Includes program modules compiled with
    • VS COBOL II V1.3 & 1.4 (LE enabled)
    • COBOL/370 1.1
    • COBOL for MVS & VM V1.2
    • COBOL for OS/390 & VM V2.1 & v2.2
    • Enterprise COBOL V3 and V4
  • Includes program modules containing CICS HANDLE ABEND & CICS HANDLE AID

• Link Libraries - Partially bound program modules

• Scalability - Reduced ABO CPU usage by up to 9X and memory up to 35%

• Usability - Allows selection of objects to optimize

• IBM tooling support
  Compiler listings, SYSDEBUG or LANGX side files of original programs can be used along with ABO Listings to create new side files to work with IBM DevOps tools (ADFz, Debug for z, FA, APA)
Questions ?