IBM z Systems

TPFUG – TPF Toolkit/Debugger update

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3/24/2015

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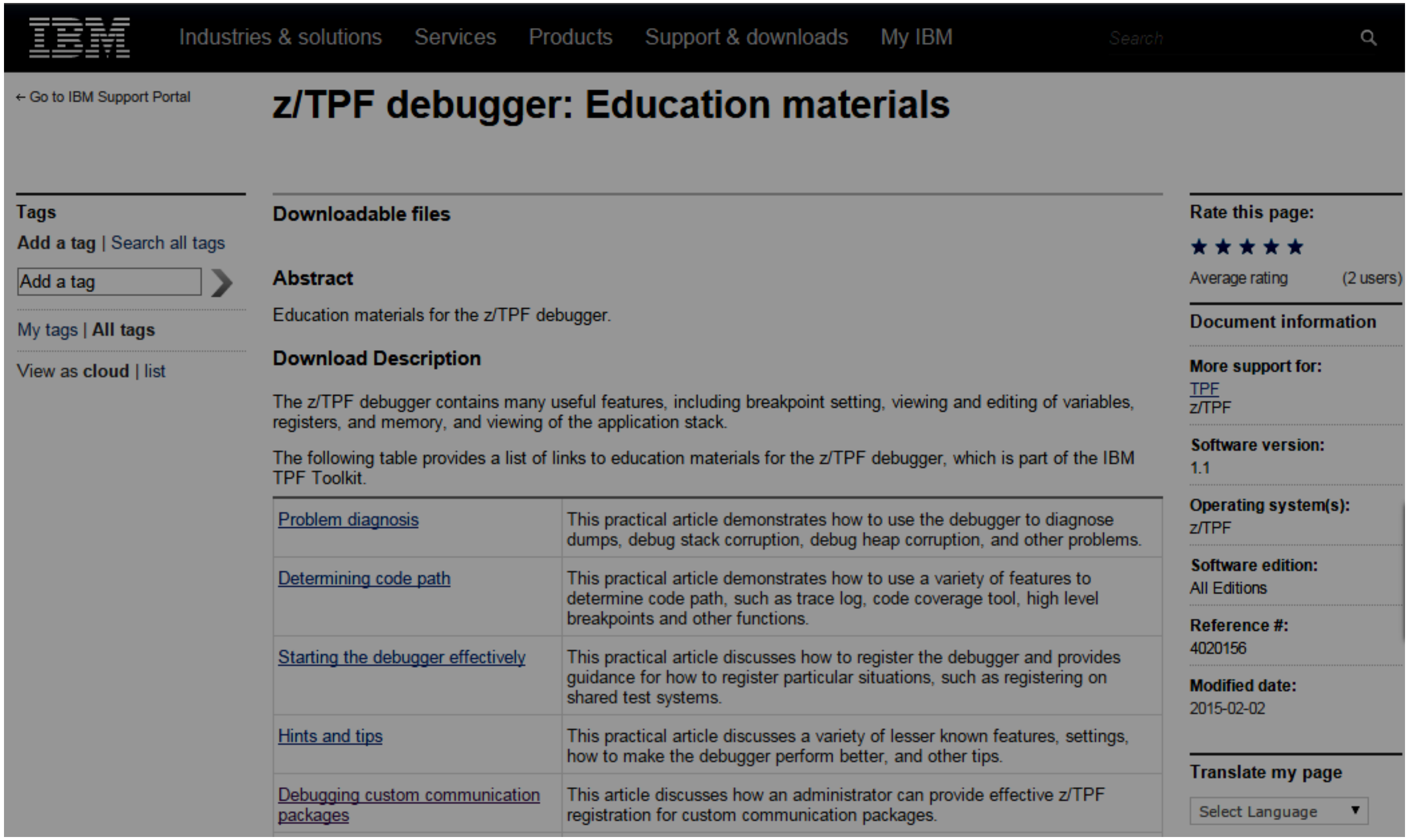
Agenda

- Helpful end user documentation
- Webinars in the works
- Updates themes
- IDE updates
- Debugger updates
- Other tools updates (code coverage, dump viewer)
- Deliverable details

Helpful end user documentation

- http://www.ibm.com/tpf/ Choose Downloads at the bottom. Choose Tools on the left. Then choose z/TPF Debugger. We are continuing to update these documents and will add more content in time.



z/TPF debugger: Education materials

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Downloadable files

Abstract

Education materials for the z/TPF debugger.

Download Description

The z/TPF debugger contains many useful features, including breakpoint setting, viewing and editing of variables, registers, and memory, and viewing of the application stack.

The following table provides a list of links to education materials for the z/TPF debugger, which is part of the IBM TPF Toolkit.

Problem diagnosis	This practical article demonstrates how to use the debugger to diagnose dumps, debug stack corruption, debug heap corruption, and other problems.
Determining code path	This practical article demonstrates how to use a variety of features to determine code path, such as trace log, code coverage tool, high level breakpoints and other functions.
Starting the debugger effectively	This practical article discusses how to register the debugger and provides guidance for how to register particular situations, such as registering on shared test systems.
Hints and tips	This practical article discusses a variety of lesser known features, settings, how to make the debugger perform better, and other tips.
Debugging custom communication packages	This article discusses how an administrator can provide effective z/TPF registration for custom communication packages.

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Document information

More support for:
TPF
z/TPF

Software version:
1.1

Operating system(s):
z/TPF

Software edition:
All Editions

Reference #:
4020156

Modified date:
2015-02-02

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Webinars in the works

- Debugger update webinar will be forth coming. We will give a live demonstration of the debugger updates that I present today. Anticipated in April 2015.
- IDE update webinar will be forth coming. We will give a live demonstration of the IDE/debugger updates that I present today. Anticipated in May 2015.
- TPF Toolkit Administrator installation webinar will be forth coming. We will give a live demonstration of the updated installation instructions. Anticipated in June 2015.
- We will notify our known contacts and post to the TPF Blog as more details become available.
- Please let me know if you would like to be added to the TPF Toolkit email distribution.

Update themes

- The updates released in 4.2.x are heavily focused on enhancing the **usability** of the toolset. A variety of features have been enhanced or added to more **readily expose crucial details** to help user's be more proficient with the tools. Other features have been enhanced to **remove obstacles** to better facilitate the use of the tools. Lastly, a variety of **new features** have been added to satisfy essential requirements.

IDE updates: Rational Team Concert (RTC)

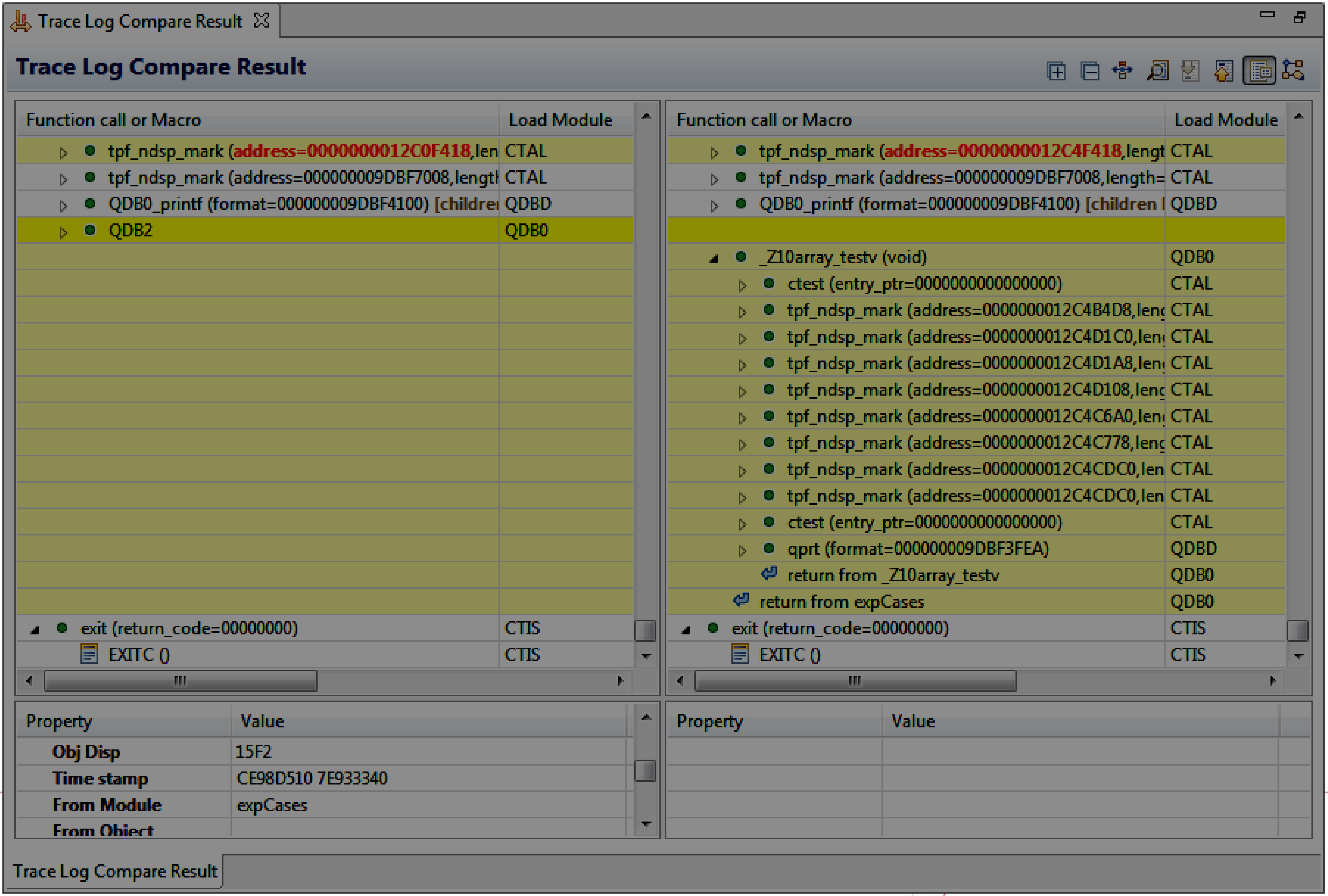
- Installation is now accomplished using IBM Installation Manager. This allows the RTC client to be installed into the TPF Toolkit instance of Eclipse.
- RTC is a software lifecycle tool from IBM. It provides source code management (SCM), defect tracking, planning, build and much more.
- TPF Toolkit RTC Integration feature is an optional component you can install into TPF Toolkit with the RTC client. It provides wizards, actions and such that link TPF Toolkit projects and RTC constructs for the TPF development environment. RTC 4.0.6 and 5.0.0 are supported.

IDE updates: Rational Team Concert (RTC)

- For more information see
  - TPF Toolkit Task force presentation from this morning.
  - “TPF toolkit RTC webinar”
    - https://www.ibm.com/developerworks/community/blogs/zTPF/entry/recording_of_introduction_to_rational_team_concert_and_tpf_toolkit_integration?lang=en
    - Topics discussed:
      - Installation of RTC integration feature
      - RTC concepts overview
      - RTC integration feature overview

IDE updates: Trace log compare

- Trace log compare editor highlights the differences between two traces.



Trace Log Compare Result

Trace Log Compare Result

Function call or Macro	Load Module
▷ ● tpf_ndsp_mark (address=000000012C0F418,len	CTAL
▷ ● tpf_ndsp_mark (address=000000009DBF7008,lengtl	CTAL
▷ ● QDB0_printf (format=000000009DBF4100) [childre	QDBD
▷ ● QDB2	QDB0
◢ ● exit (return_code=00000000)	CTIS
EXITC ()	CTIS

Function call or Macro	Load Module
▷ ● tpf_ndsp_mark (address=000000012C4F418,lengt	CTAL
▷ ● tpf_ndsp_mark (address=000000009DBF7008,length=	CTAL
▷ ● QDB0_printf (format=000000009DBF4100) [children l	QDBD
◢ ● _Z10array_testv (void)	QDB0
▷ ● ctest (entry_ptr=0000000000000000)	CTAL
▷ ● tpf_ndsp_mark (address=000000012C4B4D8,len	CTAL
▷ ● tpf_ndsp_mark (address=000000012C4D1C0,len	CTAL
▷ ● tpf_ndsp_mark (address=000000012C4D1A8,len	CTAL
▷ ● tpf_ndsp_mark (address=000000012C4D108,len	CTAL
▷ ● tpf_ndsp_mark (address=000000012C4C6A0,len	CTAL
▷ ● tpf_ndsp_mark (address=000000012C4C778,len	CTAL
▷ ● tpf_ndsp_mark (address=000000012C4CDC0,len	CTAL
▷ ● tpf_ndsp_mark (address=000000012C4CDC0,len	CTAL
▷ ● ctest (entry_ptr=0000000000000000)	CTAL
▷ ● qprt (format=000000009DBF3FEA)	QDBD
return from _Z10array_testv	QDB0
return from expCases	QDB0
◢ ● exit (return_code=00000000)	CTIS
EXITC ()	CTIS

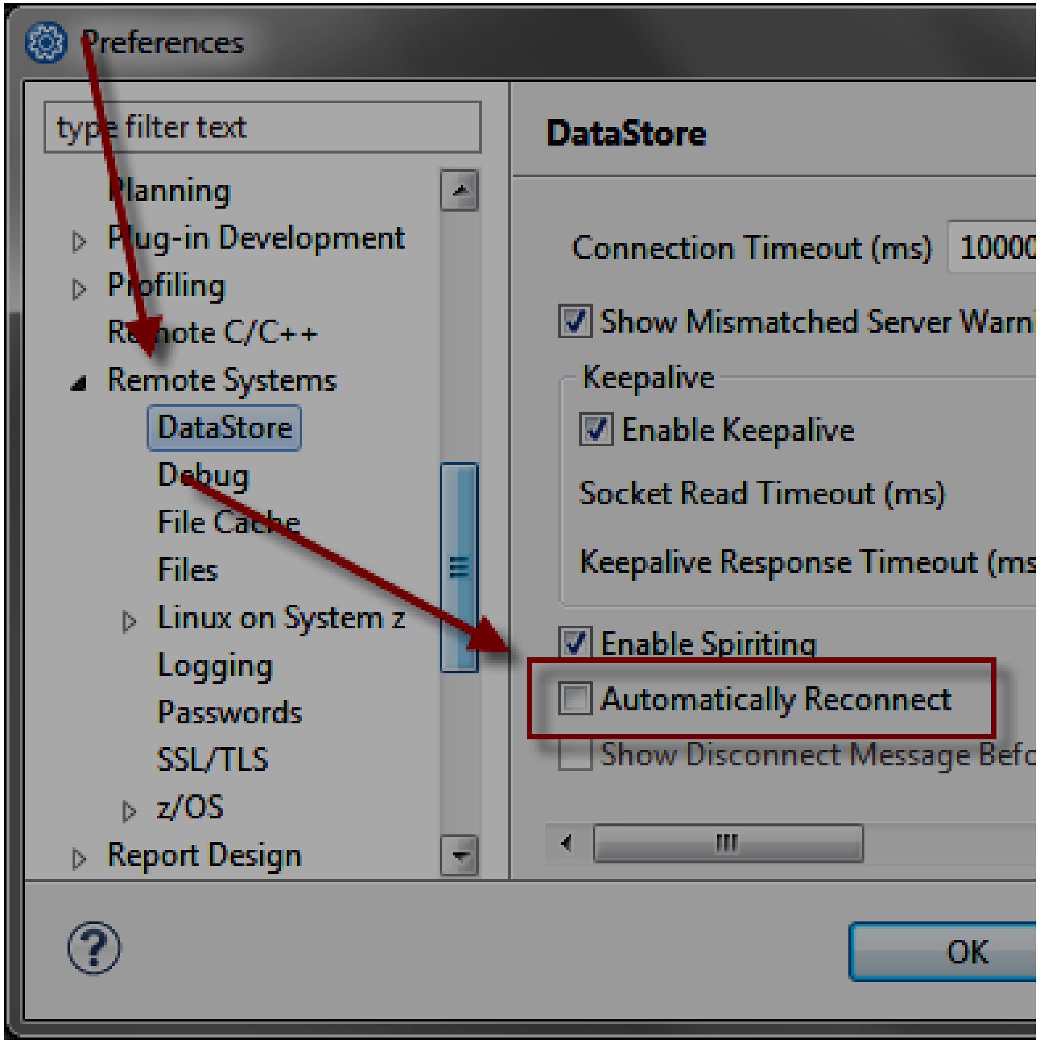
Property	Value
Obj Disp	15F2
Time stamp	CE98D510 7E933340
From Module	expCases
From Object	

Property	Value

Trace Log Compare Result

IDE updates: RSE auto reconnect

- The Remote System Explorer (RSE) has been enhanced to provide a feature to automatically reconnect a dropped connection.



DataStore

Connection Timeout (ms) 10000

☑ Show Mismatched Server Warni

Keepalive

☑ Enable Keepalive

Socket Read Timeout (ms)

Keepalive Response Timeout (ms

☑ Enable Spiriting

□ Automatically Reconnect

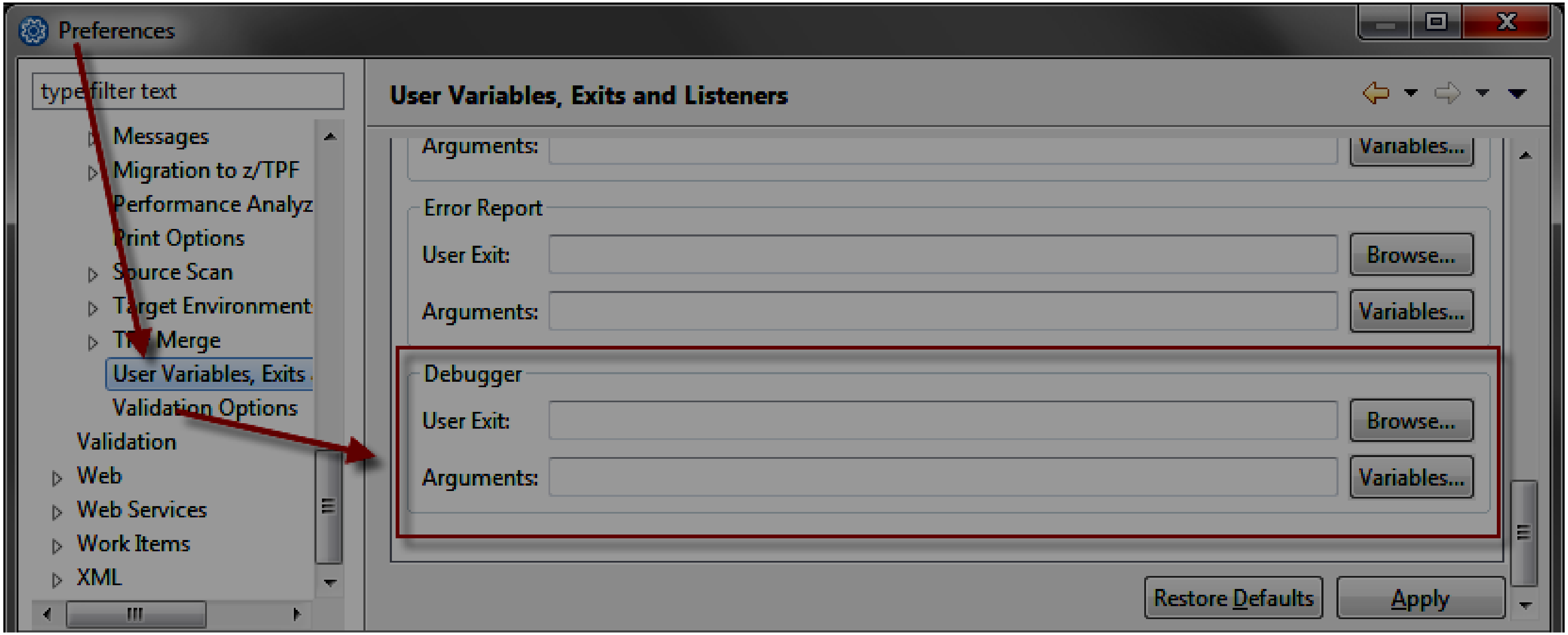
□ Show Disconnect Message Befo

IDE updates: Admin broadcast message

- Administrators can send broadcast messages to TPF Toolkit clients if they are connected to a remote host, or the next time the client connects to the remote host, through the Remote Systems Explorer dstore.

IDE updates: Debugger start up user exit

- The debug session user exit is called when a debug session is started. This user exit is run when the z/TPF debugger starts.



User Variables, Exits and Listeners

Arguments: Variables...

Error Report

User Exit: Browse...

Arguments: Variables...

Debugger

User Exit: Browse...

Arguments: Variables...

IDE Updates: Fixes and security

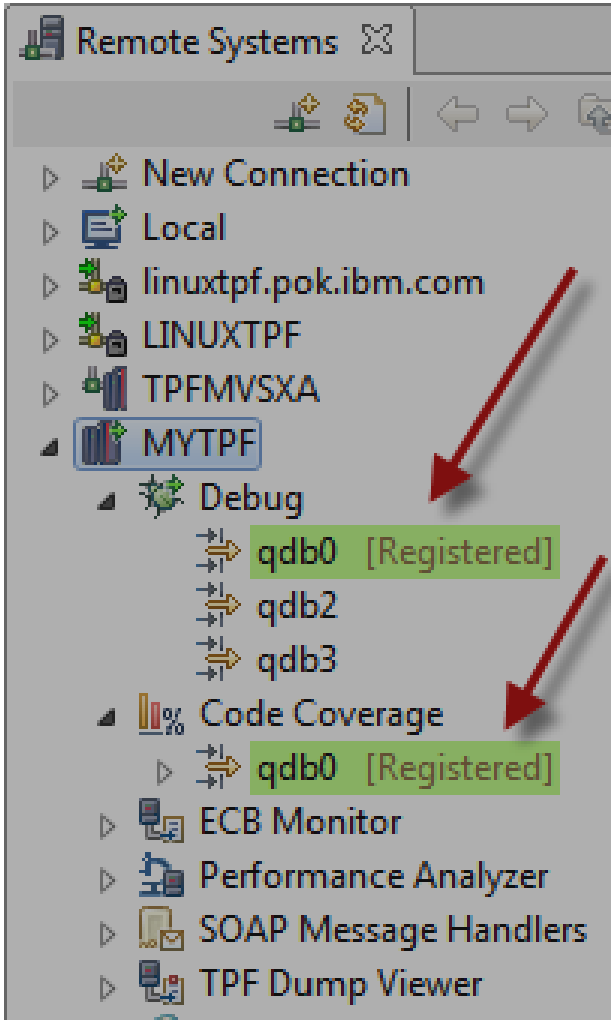
- 4.2.0 delivered Eclipse 4.2.2 and Java 1.7 support, many substantial and minor enhancements, 13 fixes, see http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?infotype=AN&subtype=CA&htmlfid=760/ENUSJP14-0276
- 4.2.1 delivered national language support, RTC 5.0 support, 2 other minor enhancements not mentioned in this presentation, 4 fixes and 2 Java security fixes, see

  http://www-01.ibm.com/support/docview.wss?uid=swg21685213
- 4.2.2 delivered 4 fixes and 4 Java security fixes, see

  http://www-01.ibm.com/support/docview.wss?uid=swg21689790
- V.Next will deliver 3 enhancements, 10 fixes and 3 Java security fixes, see support bulletin when available.

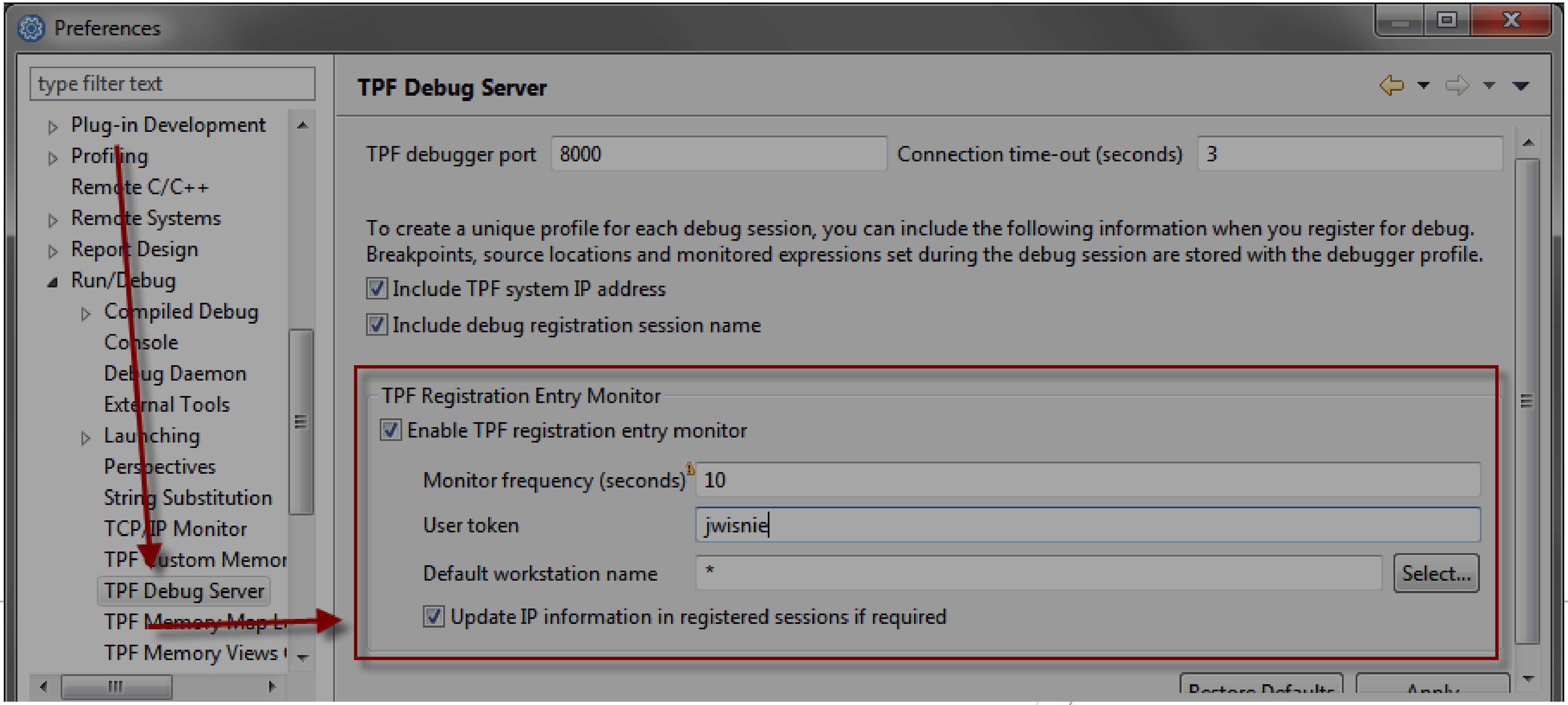
Debugger updates: Highlight registration

- The new registration entry monitor displays the status of a session - registered or not - within your TPF connections in the TPF Toolkit.



Debugger updates: Highlight registration

- This features maintains a heartbeat with the TPF system while registration is active and connectivity is available.
- In V.next, this feature active by default. You can turn it off through the TPF Debug Server Preference page.



TPF Debug Server

TPF debugger port: 8000

Connection time-out (seconds): 3

To create a unique profile for each debug session, you can include the following information when you register for debug. Breakpoints, source locations and monitored expressions set during the debug session are stored with the debugger profile.

☑ Include TPF system IP address

☑ Include debug registration session name

TPF Registration Entry Monitor

☑ Enable TPF registration entry monitor

Monitor frequency (seconds): 10

User token: jwisnie

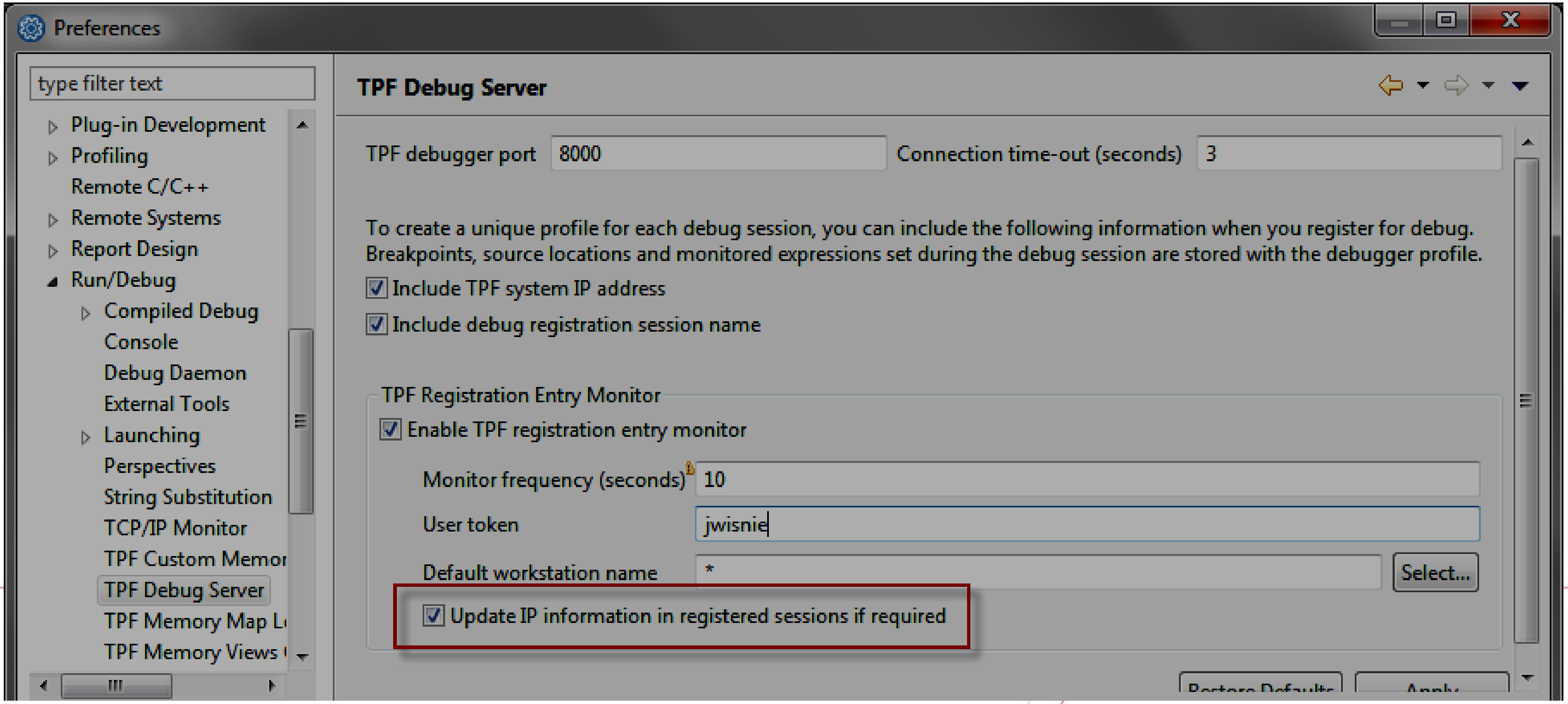
Default workstation name: *

Select...

☑ Update IP information in registered sessions if required

Debugger updates: Highlight registration

- There is a subtle built in feature here: Update IP information.
- This feature updates the workstation IP address in the active registration entries if the workstation IP address changes (ie wired to wireless, etc)



TPF Debug Server

TPF debugger port 8000 Connection time-out (seconds) 3

To create a unique profile for each debug session, you can include the following information when you register for debug. Breakpoints, source locations and monitored expressions set during the debug session are stored with the debugger profile.

☑ Include TPF system IP address

☑ Include debug registration session name

TPF Registration Entry Monitor

☑ Enable TPF registration entry monitor

Monitor frequency (seconds) 10

User token jwisnie

Default workstation name *

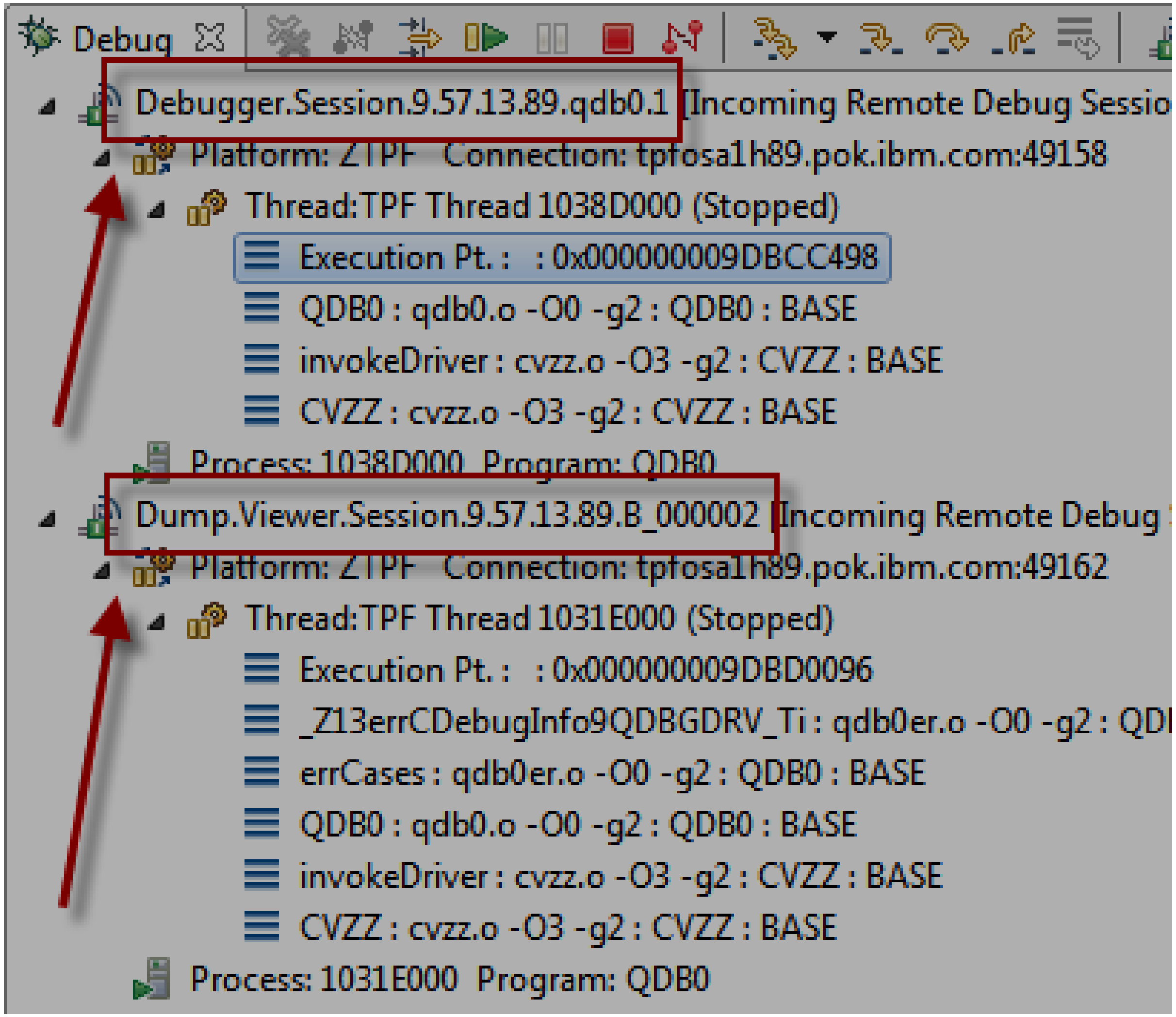
☑ Update IP information in registered sessions if required

Debugger updates: Pending cancel registration

- If a cancel registration request is made while a debugger session is active, the registration entry goes into a pending cancel state. When the debugger session ends, the registration cancelation request will complete.

Debugger updates: Session type prefix

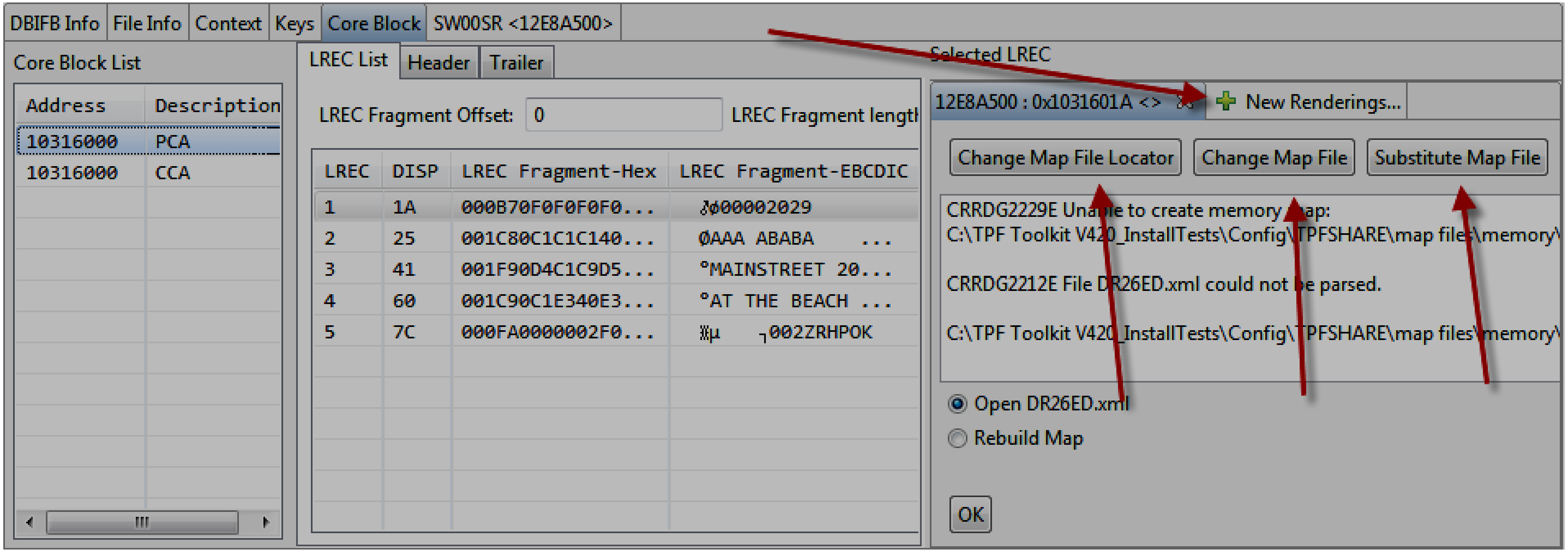
- The debug view now prefixes the type of session on the session name displayed. For example Debugger.Session vs Dump.Viewer. Session.



```
Debugger.Session.9.57.13.89.qdb0.1 [Incoming Remote Debug Sessio
  Platform: ZTPF   Connection: tpfosa1h89.pok.ibm.com:49158
    Thread:TPF Thread 1038D000 (Stopped)
      Execution Pt. :   : 0x000000009DBCC498
      QDB0 : qdb0.o -O0 -g2 : QDB0 : BASE
      invokeDriver : cvzz.o -O3 -g2 : CVZZ : BASE
      CVZZ : cvzz.o -O3 -g2 : CVZZ : BASE
  Process: 1038D000  Program: QDB0
Dump.Viewer.Session.9.57.13.89.B_000002 [Incoming Remote Debug
  Platform: ZTPF   Connection: tpfosa1h89.pok.ibm.com:49162
    Thread:TPF Thread 1031E000 (Stopped)
      Execution Pt. :   : 0x000000009DBD0096
      _Z13errCDebugInfo9QDBGDRV_Ti : qdb0er.o -O0 -g2 : QDI
      errCases : qdb0er.o -O0 -g2 : QDB0 : BASE
      QDB0 : qdb0.o -O0 -g2 : QDB0 : BASE
      invokeDriver : cvzz.o -O3 -g2 : CVZZ : BASE
      CVZZ : cvzz.o -O3 -g2 : CVZZ : BASE
  Process: 1031E000  Program: QDB0
```

Debugger updates: SW00SR view

- A variety of enhancements have been made to the SW00SR view.



Address	Description
10316000	PCA
10316000	CCA

LREC Fragment Offset: 0

LREC Fragment lengtl

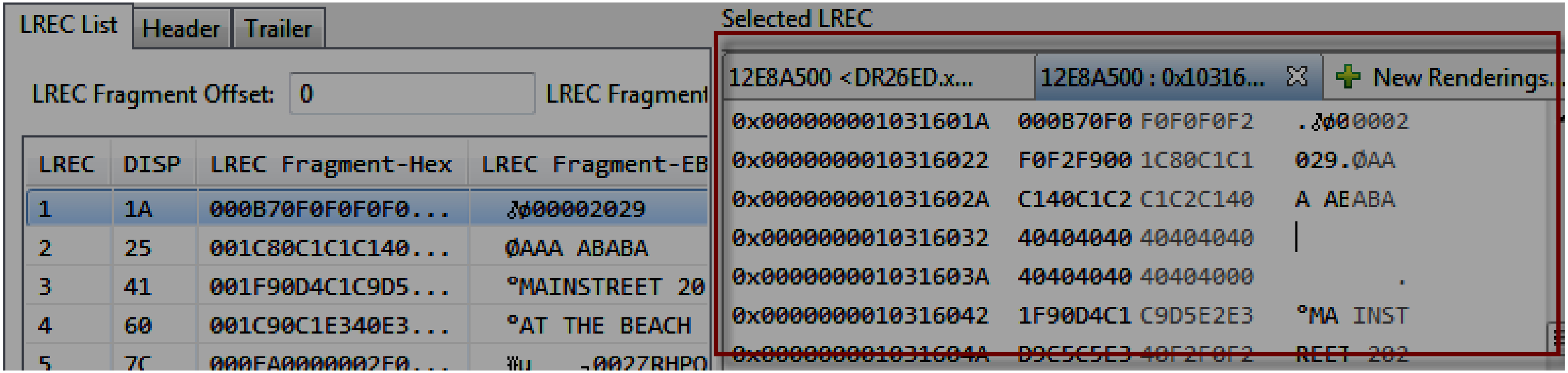
LREC	DISP	LREC Fragment-Hex	LREC Fragment-EBCDIC
1	1A	000B70F0F0F0F0...	♁ø00002029
2	25	001C80C1C1C140...	ØAAA ABABA ...
3	41	001F90D4C1C9D5...	°MAINSTREET 20...
4	60	001C90C1E340E3...	°AT THE BEACH ...
5	7C	000FA0000002F0...	‰µ ┐002ZRHPOK

```
CRRDG2229E Unable to create memory map:
C:\TPF Toolkit V420_InstallTests\Config\TPFSHARE\map files\memory\

CRRDG2212E File DR26ED.xml could not be parsed.

C:\TPF Toolkit V420_InstallTests\Config\TPFSHARE\map files\memory\
```

● Open DR26ED.xml
○ Rebuild Map

Debugger updates: SW00SR view

- You can apply any memory rendering to the Selected LREC view. There is no limit on the amount of data shown. You do not need an XML map applied.



LREC List | Header | Trailer

LREC Fragment Offset: 0

LREC Fragment

LREC	DISP	LREC Fragment-Hex	LREC Fragment-EB
1	1A	000B70F0F0F0F0...	♂ϕ00002029
2	25	001C80C1C1C140...	ØAAA ABABA
3	41	001F90D4C1C9D5...	°MAINSTREET 20
4	60	001C90C1E340E3...	°AT THE BEACH
5	7C	000FA0000002F0...	¥u ¬0027RHPO

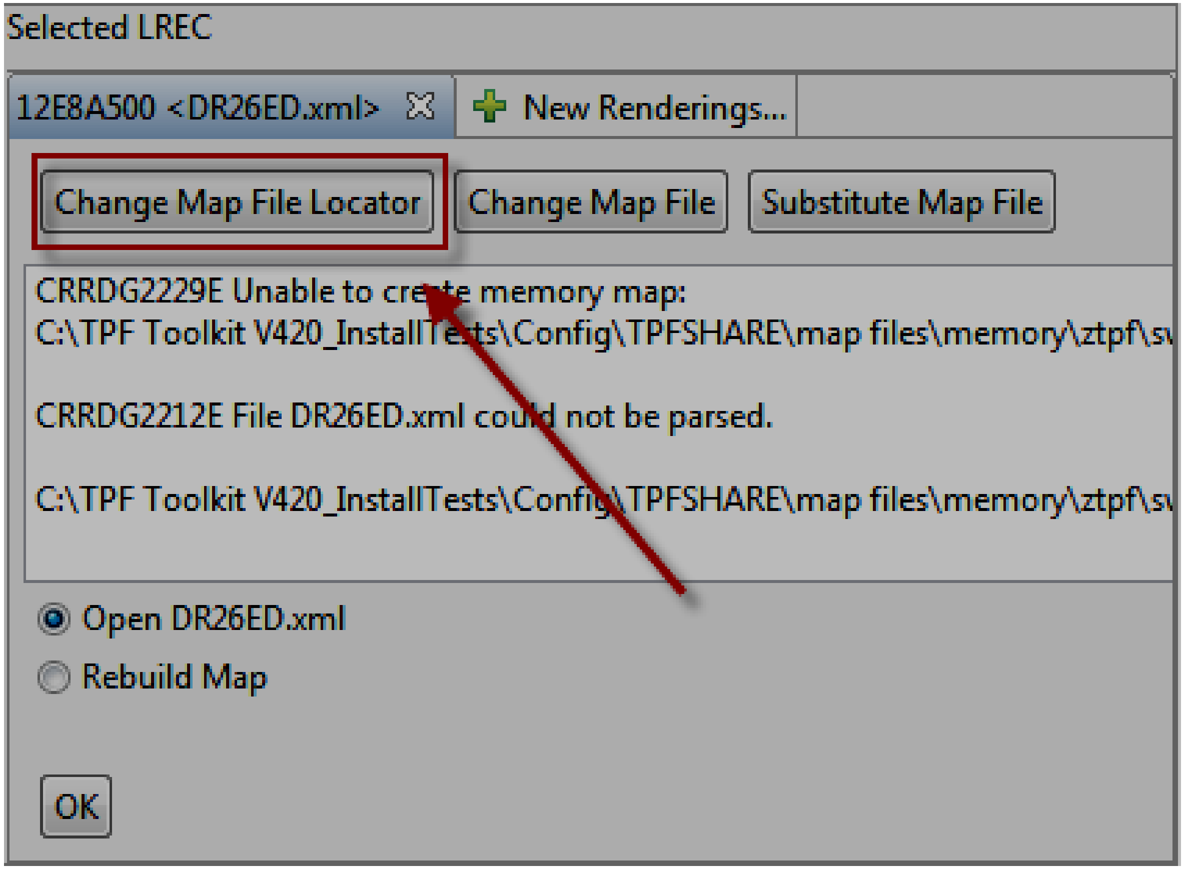
Selected LREC

12E8A500 <DR26ED.x... | 12E8A500 : 0x10316... | New Renderings...

```
0x000000001031601A  000B70F0 F0F0F0F2   .♂ϕ00002
0x0000000010316022  F0F2F900 1C80C1C1   029.ØAA
0x000000001031602A  C140C1C2 C1C2C140   A ABABA
0x0000000010316032  40404040 40404040
0x000000001031603A  40404040 40404000          .
0x0000000010316042  1F90D4C1 C9D5E2E3   °MAINST
0x000000001031604A  D9C5C5E3 40F2F0F2   REET 202
```

Debugger updates: SW00SR view

- The change map file locator feature allows you to specify a search path for the XML files.



CRRDG2229E Unable to create memory map:
C:\TPF Toolkit V420_InstallTests\Config\TPFSHARE\map files\memory\ztpf\sv

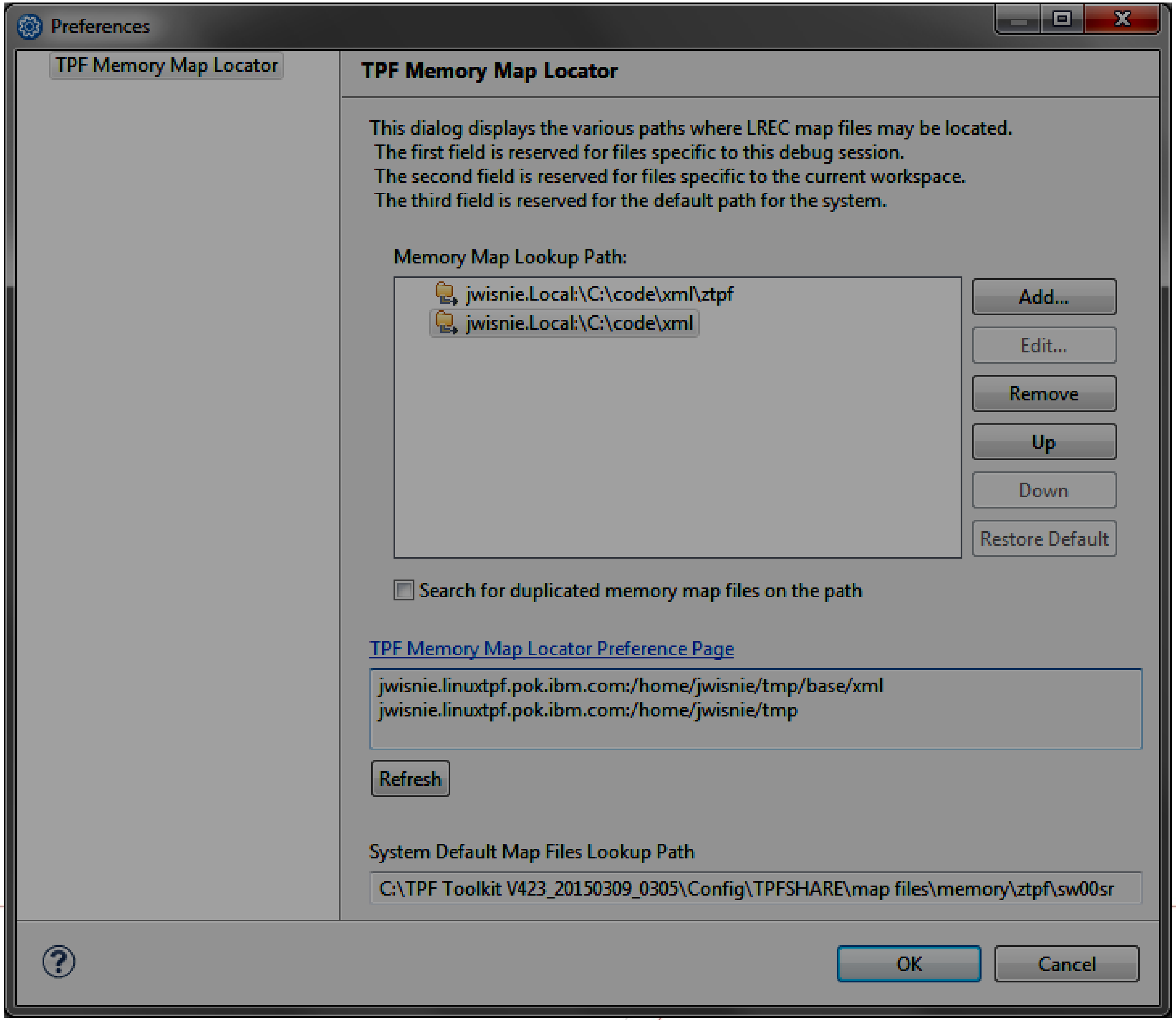
CRRDG2212E File DR26ED.xml could not be parsed.

C:\TPF Toolkit V420_InstallTests\Config\TPFSHARE\map files\memory\ztpf\sv

● Open DR26ED.xml
○ Rebuild Map

Debugger updates: SW00SR view

- The specified XML search paths also apply to the Custom ECB Summary view.



TPF Memory Map Locator

This dialog displays the various paths where LREC map files may be located.
The first field is reserved for files specific to this debug session.
The second field is reserved for files specific to the current workspace.
The third field is reserved for the default path for the system.

Memory Map Lookup Path:

jwisnie.Local:\C:\code\xml\ztpf
jwisnie.Local:\C:\code\xml

□ Search for duplicated memory map files on the path

TPF Memory Map Locator Preference Page

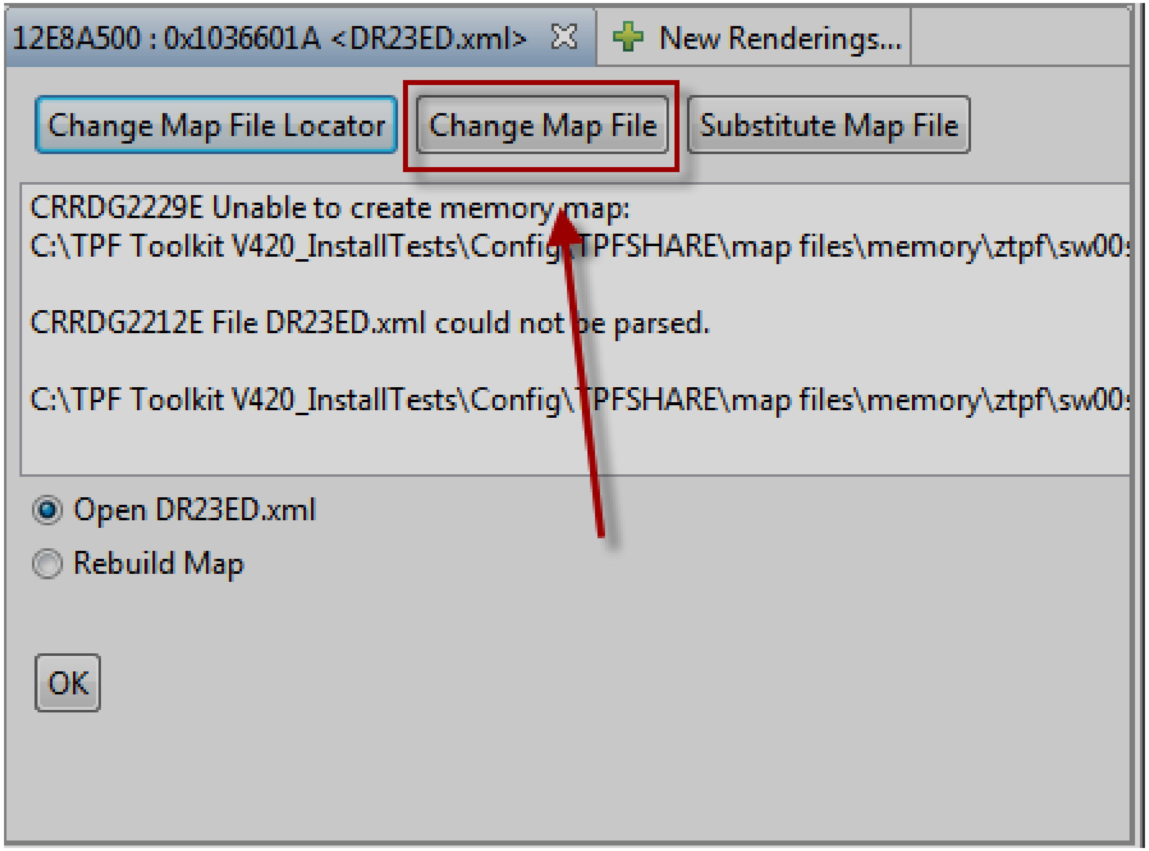
jwisnie.linuxtpf.pok.ibm.com:/home/jwisnie/tmp/base/xml
jwisnie.linuxtpf.pok.ibm.com:/home/jwisnie/tmp

System Default Map Files Lookup Path

C:\TPF Toolkit V423_20150309_0305\Config\TPFSHARE\map files\memory\ztpf\sw00sr

Debugger updates: SW00SR view

- The change map file feature allows you to apply an XML map for just this debug session.



CRRDG2229E Unable to create memory map:
C:\TPF Toolkit V420_InstallTests\Config\TPFSHARE\map files\memory\ztpf\sw00s

CRRDG2212E File DR23ED.xml could not be parsed.

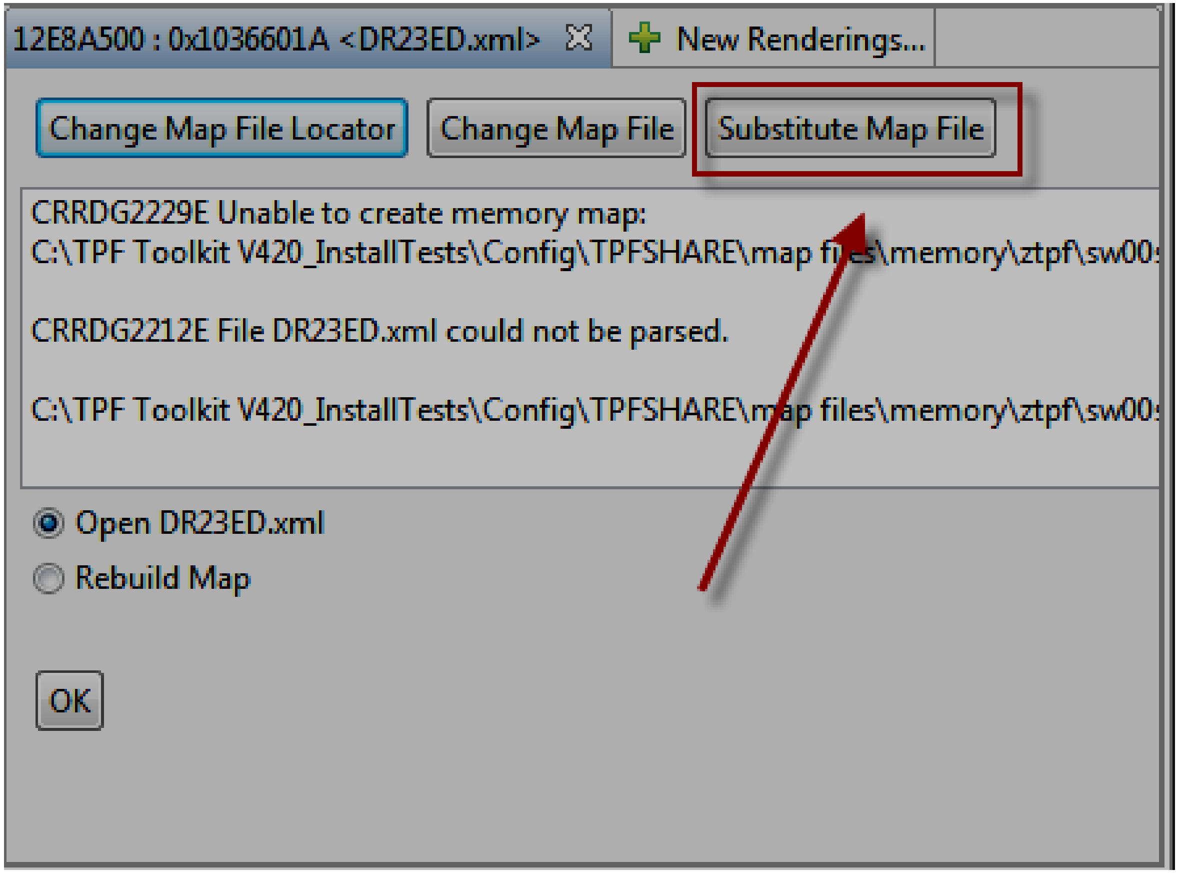
C:\TPF Toolkit V420_InstallTests\Config\TPFSHARE\map files\memory\ztpf\sw00s

● Open DR23ED.xml

○ Rebuild Map

Debugger updates: SW00SR view

- The substitute map file feature allows you to use a specified XML map for a given DSECT name.



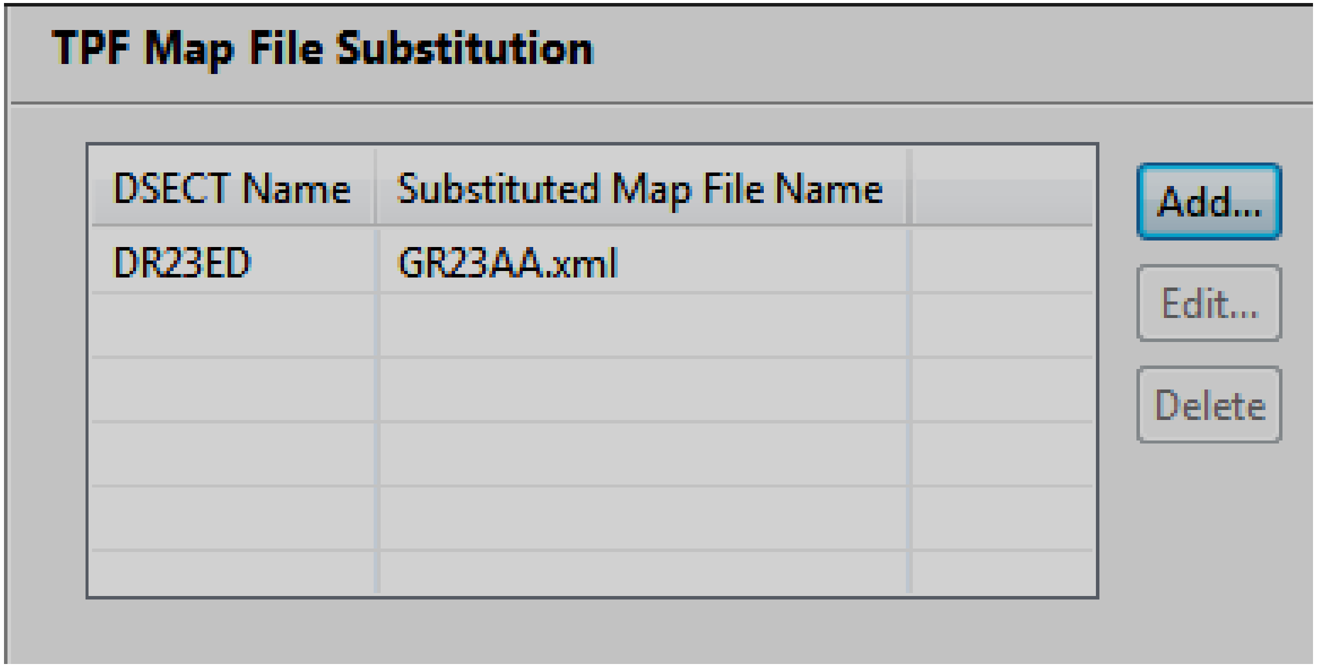
```
CRRDG2229E Unable to create memory map:
C:\TPF Toolkit V420_InstallTests\Config\TPFSHARE\map files\memory\ztpf\sw00

CRRDG2212E File DR23ED.xml could not be parsed.

C:\TPF Toolkit V420_InstallTests\Config\TPFSHARE\map files\memory\ztpf\sw00
```

● Open DR23ED.xml

○ Rebuild Map

Debugger updates: SW00SR view

- In this example, if a TPFDF file uses DSECT DR23ED, the XML map GR23AA.xml will be used to map the contents of the LRECs.

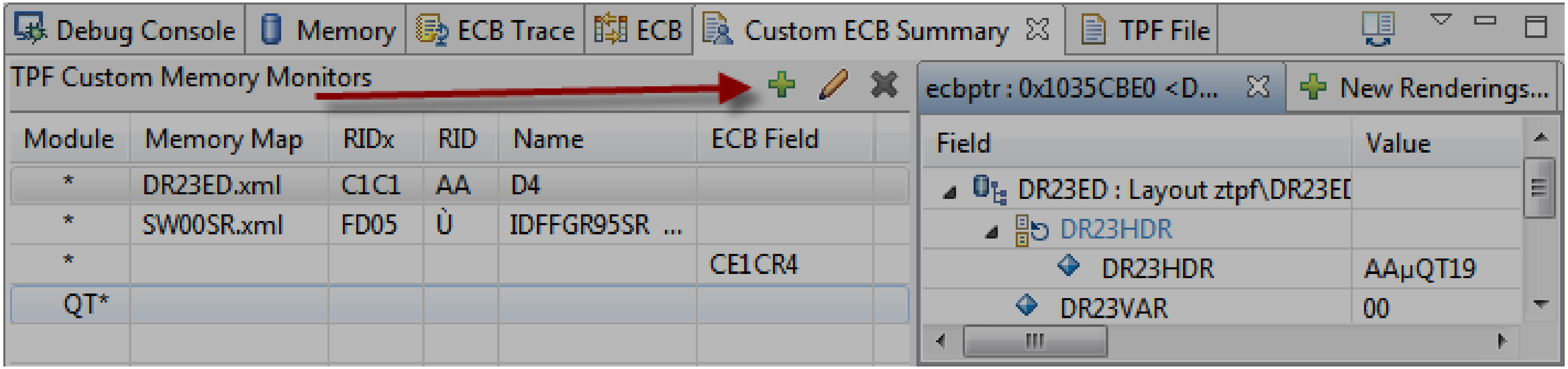


TPF Map File Substitution

DSECT Name	Substituted Map File Name
DR23ED	GR23AA.xml

Debugger updates: Custom ECB Summary

- User/Admins provide rules for data areas to be displayed.
- Rules can be based upon record id, ECB field or offset into the ECB. Rules can map memory to XML or simply show a memory rendering (ie RID == C1C1 map the block with DR23ED.xml). An XML lookup path mechanism is provided.
- As rules are satisfied, they appear in the pane on the left. Clicking a rule shows the formatted memory on the right. (ie when module name QT* show offset 20 into the ECB)

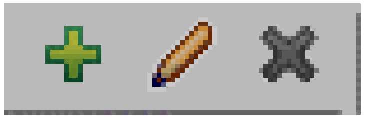


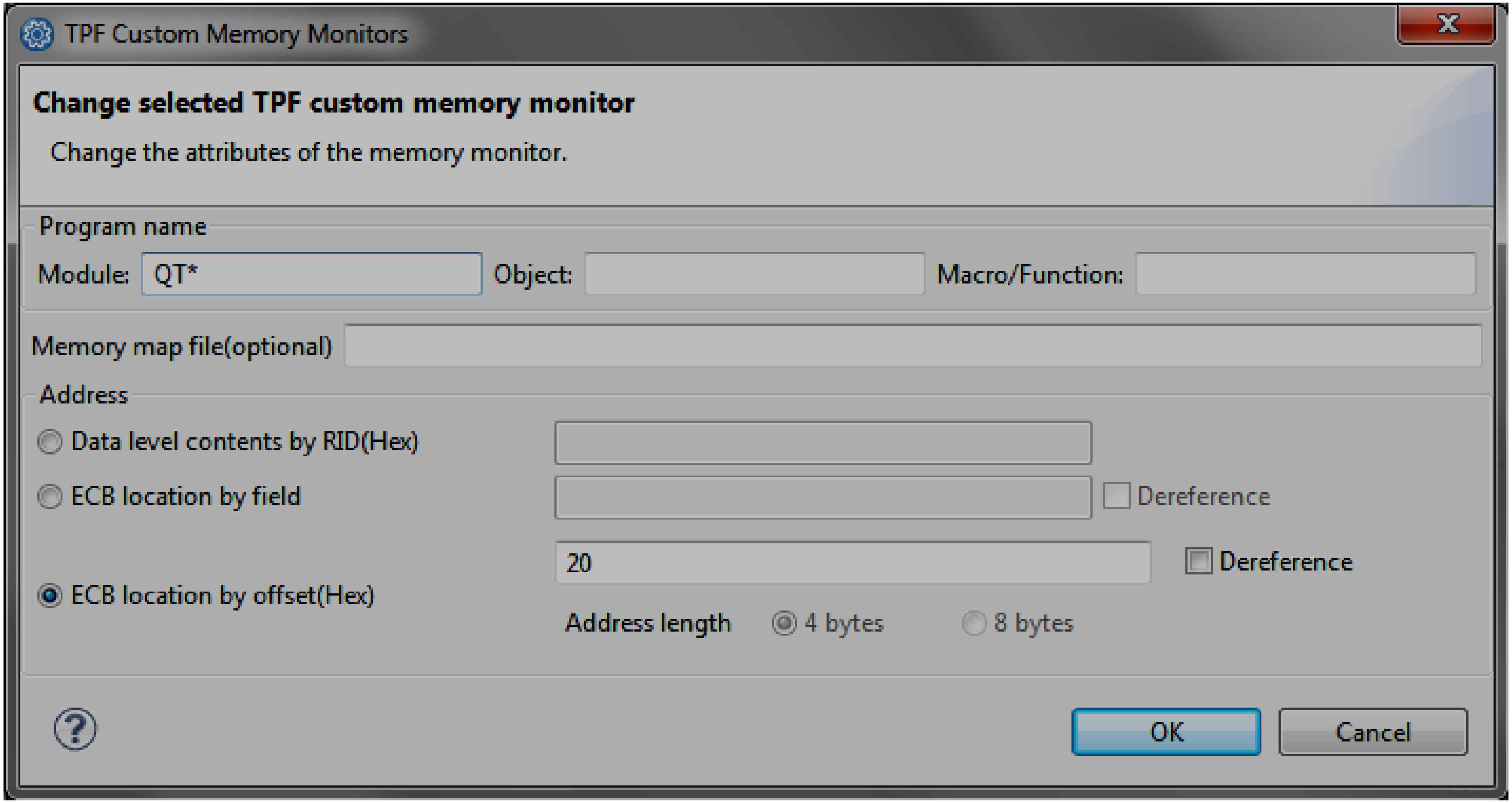
Module	Memory Map	RIDx	RID	Name	ECB Field
*	DR23ED.xml	C1C1	AA	D4	
*	SW00SR.xml	FD05	Ù	IDFFGR95SR ...	
*					CE1CR4
QT*					

Field	Value
DR23ED : Layout ztpf\DR23EI	
DR23HDR	
DR23HDR	AAµQT19
DR23VAR	00

Debugger updates: Custom ECB Summary

- The rule edit actions are available from monitors pane to create, edit or delete rules.





TPF Custom Memory Monitors

Change selected TPF custom memory monitor

Change the attributes of the memory monitor.

Program name

Module: QT* Object: Macro/Function:

Memory map file(optional)

Address

○ Data level contents by RID(Hex)

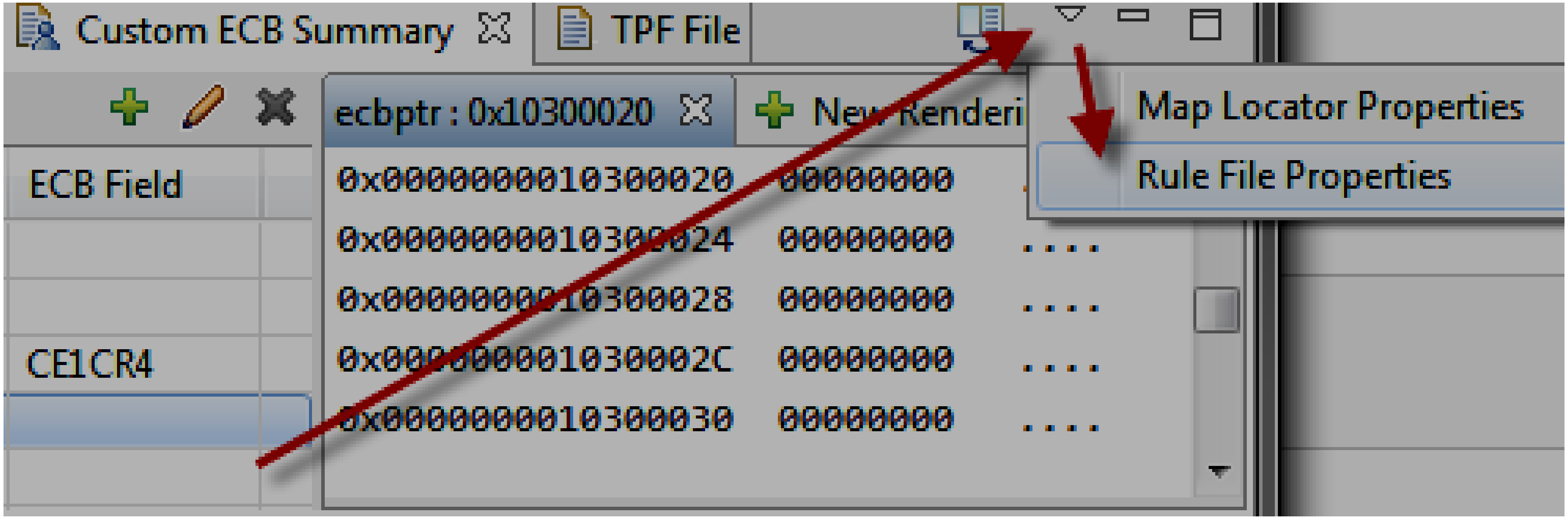
○ ECB location by field □ Dereference

● ECB location by offset(Hex) 20 □ Dereference

Address length ● 4 bytes ○ 8 bytes

Debugger updates: Custom ECB Summary

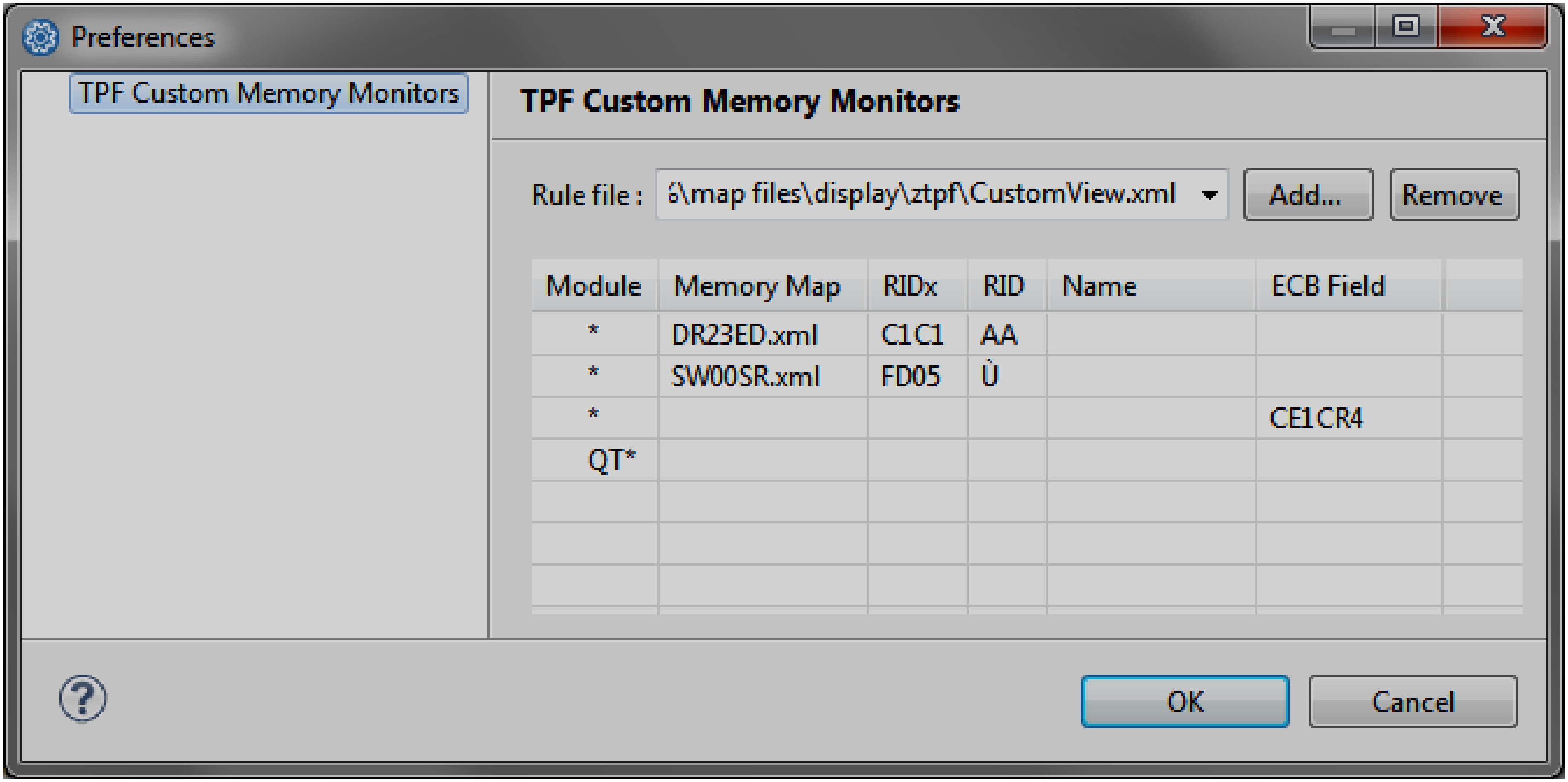
- The rule editor allows you to view, create, edit and delete all rules.



```
0x0000000010300020   00000000   .
0x0000000010300024   00000000   ....
0x0000000010300028   00000000   ....
0x000000001030002C   00000000   ....
0x0000000010300030   00000000   ....
```

Debugger updates: Custom ECB Summary

- The rule editor.



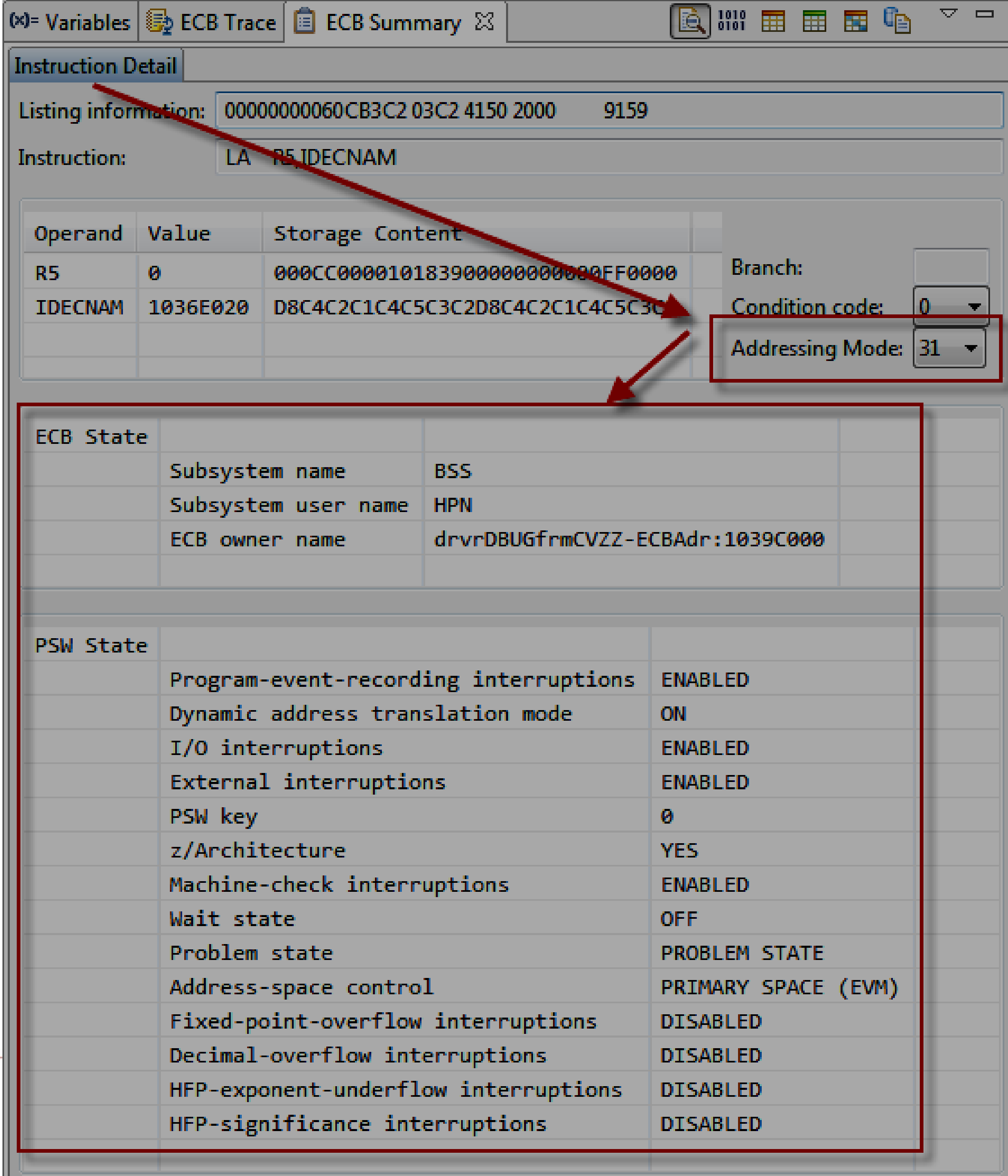
TPF Custom Memory Monitors

Rule file : 6\map files\display\ztpf\CustomView.xml

Module	Memory Map	RIDx	RID	Name	ECB Field
*	DR23ED.xml	C1C1	AA		
*	SW00SR.xml	FD05	Ù		
*					CE1CR4
QT*					

Debugger updates: ECB Summary view

- The Instruction Detail Pane has been enhanced to show the Addressing Mode (which can be modified), Subsystem name, Subsystem user name, ECB owner name, and PSW state indicators.



Listing information: 00000000060CB3C2 03C2 4150 2000 9159

Instruction: LA R5,IDECNAM

Operand	Value	Storage Content
R5	0	000CC00001018390000000000000FF0000
IDECNAM	1036E020	D8C4C2C1C4C5C3C2D8C4C2C1C4C5C3C

Branch:

Condition code: 0

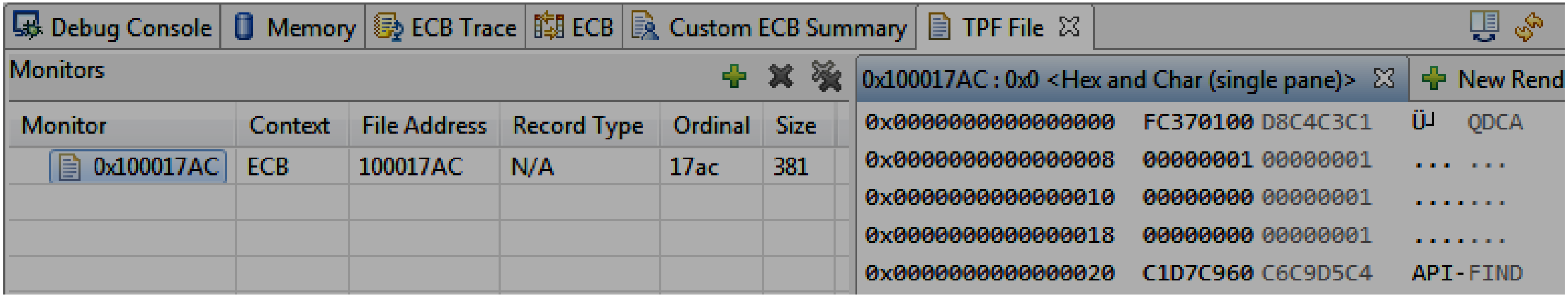
Addressing Mode: 31

ECB State		
	Subsystem name	BSS
	Subsystem user name	HPN
	ECB owner name	drvrDBUGfrmCVZZ-ECBAdr:1039C000

PSW State		
	Program-event-recording interruptions	ENABLED
	Dynamic address translation mode	ON
	I/O interruptions	ENABLED
	External interruptions	ENABLED
	PSW key	0
	z/Architecture	YES
	Machine-check interruptions	ENABLED
	Wait state	OFF
	Problem state	PROBLEM STATE
	Address-space control	PRIMARY SPACE (EVM)
	Fixed-point-overflow interruptions	DISABLED
	Decimal-overflow interruptions	DISABLED
	HFP-exponent-underflow interruptions	DISABLED
	HFP-significance interruptions	DISABLED

Debugger updates: TPF File View

- Clicking green plus allows you to monitor a TPF file by file address.
- Registers, data level, SW00SR and other views allow you to right click and monitor a file address.
- Left pane provides details about a file. Right pane shows content in a memory like view.
- Files can be viewed from system context (ZDFIL equivalent) or from the ECB context (commit scopes are honored). The ECB context shows the file content that would be retrieved if a FINDC was performed by the application at that point in the code. The ECB context does not show the contents of a file read into memory.



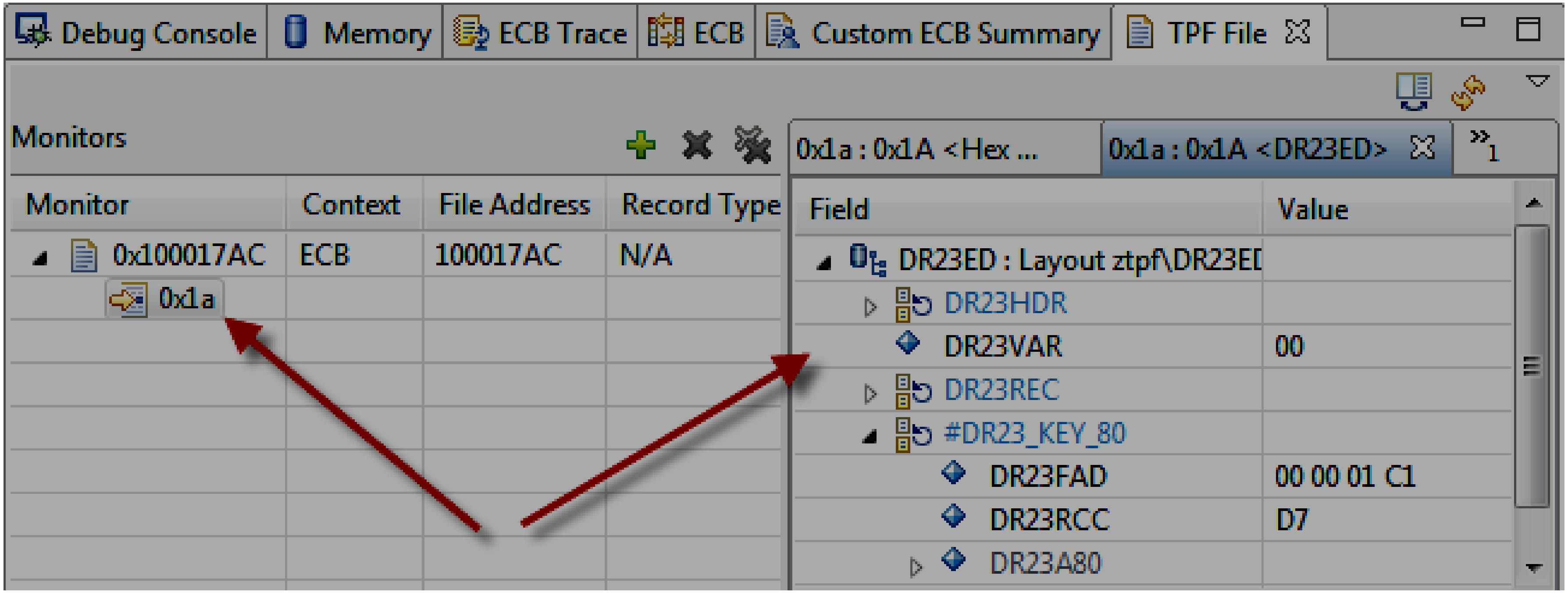
Monitor	Context	File Address	Record Type	Ordinal	Size
0x100017AC	ECB	100017AC	N/A	17ac	381

0x100017AC : 0x0 <Hex and Char (single pane)>

```
0x0000000000000000   FC370100 D8C4C3C1   Ü┘  QDCA
0x0000000000000008   00000001 00000001   ... ...
0x0000000000000010   00000000 00000001   ........
0x0000000000000018   00000000 00000001   ........
0x0000000000000020   C1D7C960 C6C9D5C4   API-FIND
```

Debugger updates: TPF File View

- Since the TPF File view is built upon the memory view base, all memory view renderings can be applied to files including XML maps.
- Right clicking on a monitor allows you to add an offset. Multiple offsets can be added. And the data renderings can be applied separately to each.

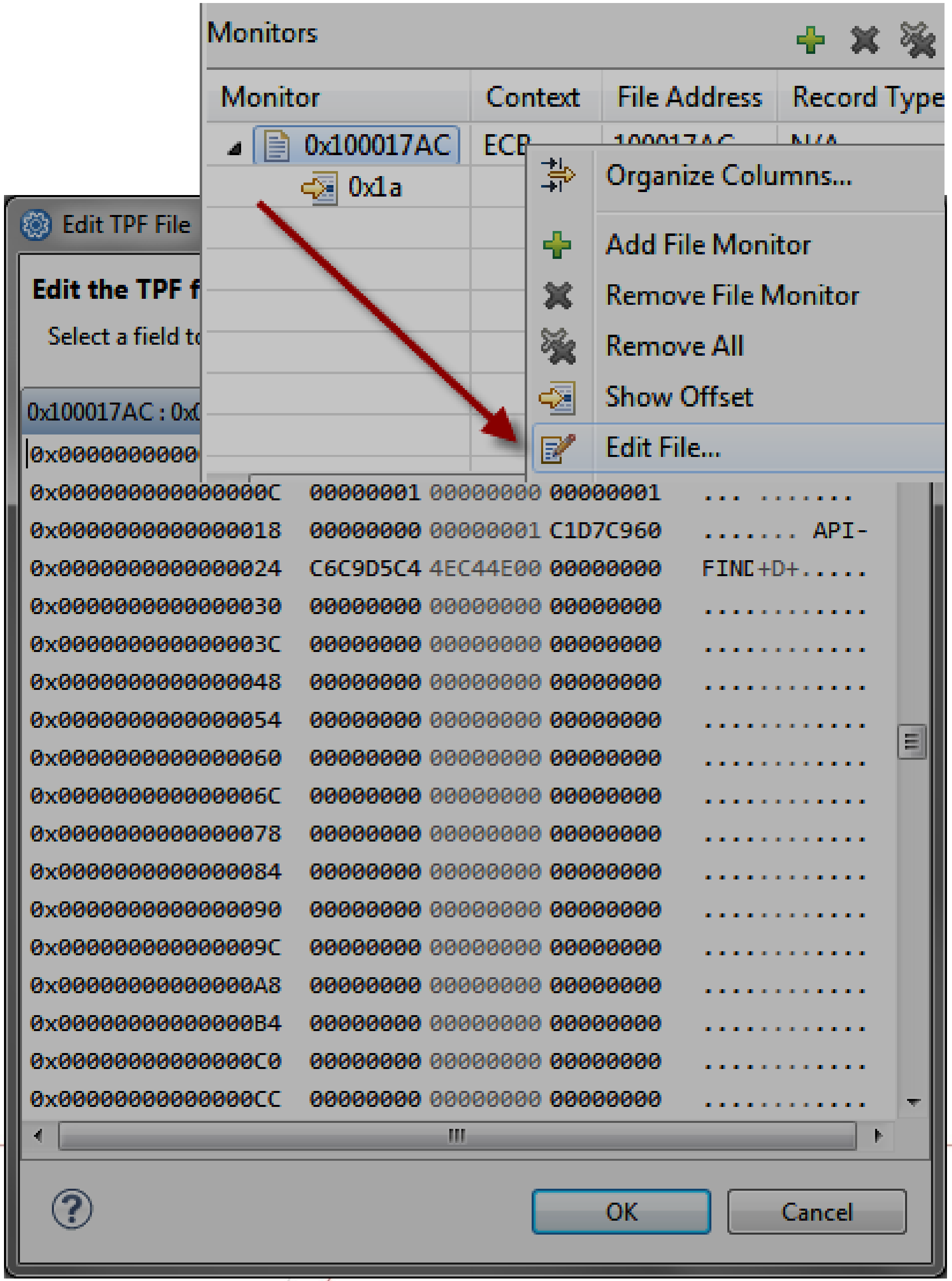


Monitor	Context	File Address	Record Type
0x100017AC	ECB	100017AC	N/A
0x1a			

Field	Value
DR23ED : Layout ztpf\DR23EI	
DR23HDR	
DR23VAR	00
DR23REC	
#DR23_KEY_80	
DR23FAD	00 00 01 C1
DR23RCC	D7
DR23A80	

Debugger updates: TPF File View

- Right clicking on the entry in the monitor pane provides the option to edit the content of the file. All changes to the file are made in the pop up window. Choosing ok writes the entire file out to disk. This edit feature differs from most other views in that changes are not made in line but is intended to help ensure the integrity of the file contents.
- The ZDBUG ACCESS command allows you to prohibit viewing and/or the editing of files on your system.



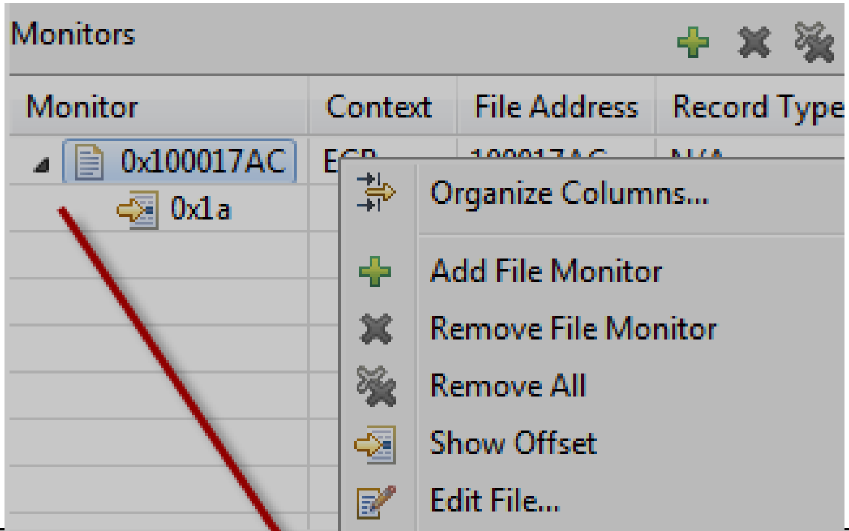
Monitor	Context	File Address	Record Type
0x100017AC	ECB	100017AC	N/A
0x1a			

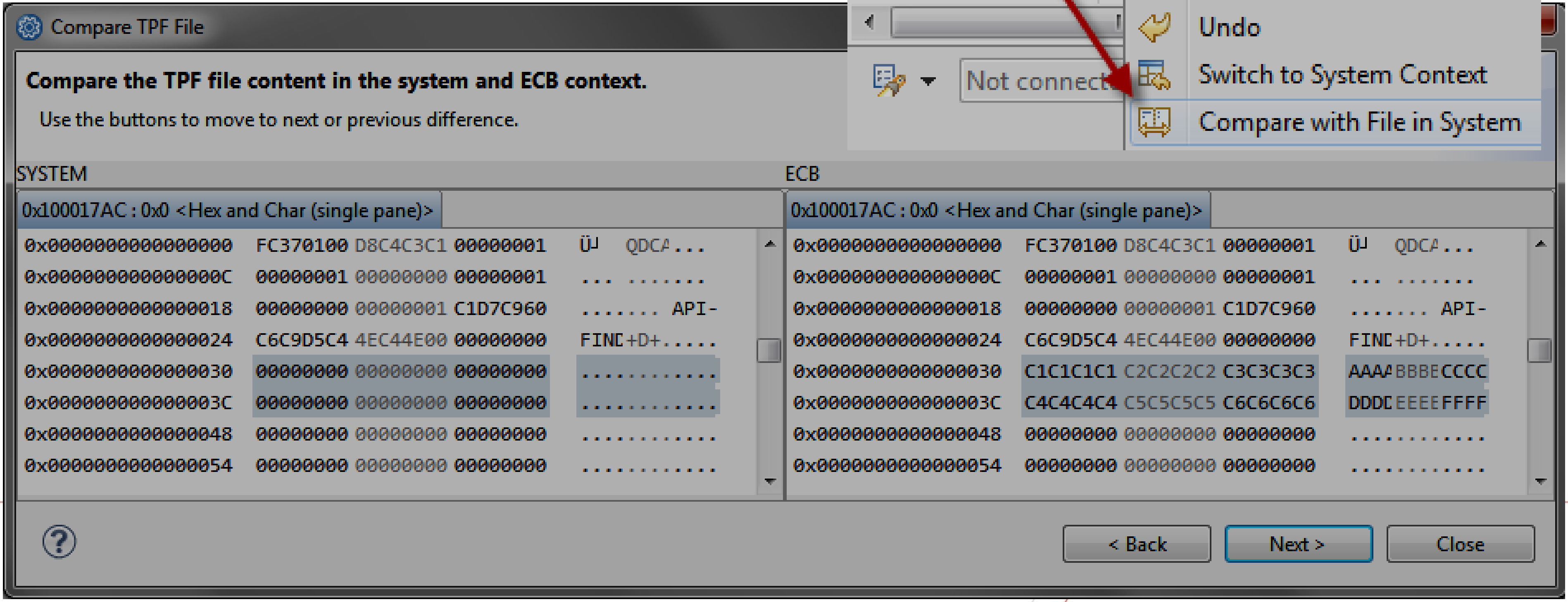
0x100017AC : 0x0

```
0x0000000000
0x000000000000000C  00000001 00000000 00000001  ... ........
0x0000000000000018  00000000 00000001 C1D7C960  ........ API-
0x0000000000000024  C6C9D5C4 4EC44E00 00000000  FIND+D+.....
0x0000000000000030  00000000 00000000 00000000  ............
0x000000000000003C  00000000 00000000 00000000  ............
0x0000000000000048  00000000 00000000 00000000  ............
0x0000000000000054  00000000 00000000 00000000  ............
0x0000000000000060  00000000 00000000 00000000  ............
0x000000000000006C  00000000 00000000 00000000  ............
0x0000000000000078  00000000 00000000 00000000  ............
0x0000000000000084  00000000 00000000 00000000  ............
0x0000000000000090  00000000 00000000 00000000  ............
0x000000000000009C  00000000 00000000 00000000  ............
0x00000000000000A8  00000000 00000000 00000000  ............
0x00000000000000B4  00000000 00000000 00000000  ............
0x00000000000000C0  00000000 00000000 00000000  ............
0x00000000000000CC  00000000 00000000 00000000  ............
```

Debugger updates: TPF File View

- The file view provides the ability to do data comparisons between the file contents in the ECB context against the file contents of the system context.





Compare the TPF file content in the system and ECB context.

Use the buttons to move to next or previous difference.

SYSTEM

0x100017AC : 0x0 <Hex and Char (single pane)>

```
0x0000000000000000  FC370100 D8C4C3C1 00000001  Ü┘  QDCA...
0x000000000000000C  00000001 00000000 00000001  ... .......
0x0000000000000018  00000000 00000001 C1D7C960  ....... API-
0x0000000000000024  C6C9D5C4 4EC44E00 00000000  FIND+D+.....
0x0000000000000030  00000000 00000000 00000000  ............
0x000000000000003C  00000000 00000000 00000000  ............
0x0000000000000048  00000000 00000000 00000000  ............
0x0000000000000054  00000000 00000000 00000000  ............
```

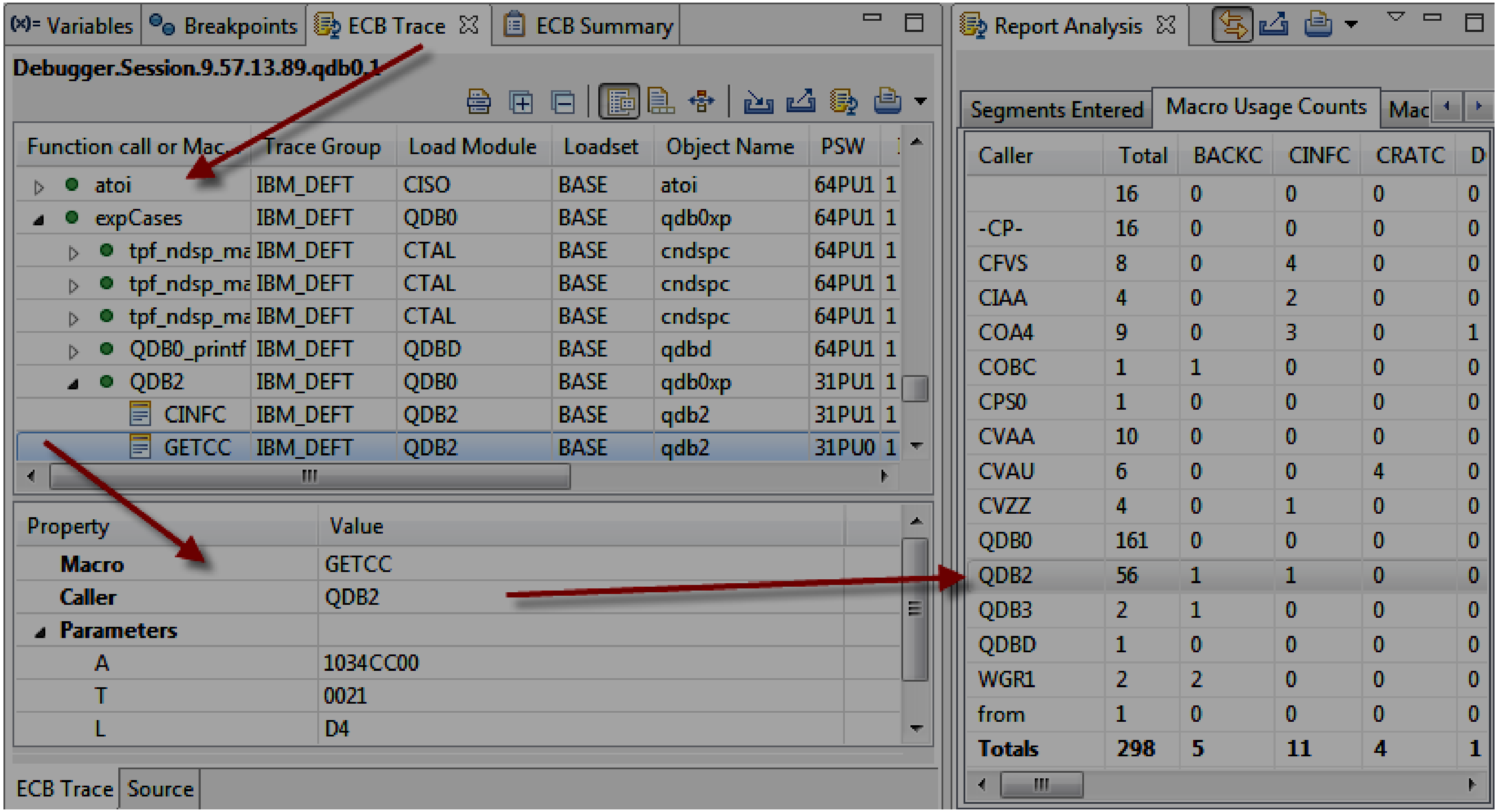
ECB

0x100017AC : 0x0 <Hex and Char (single pane)>

```
0x0000000000000000  FC370100 D8C4C3C1 00000001  Ü┘  QDCA...
0x000000000000000C  00000001 00000000 00000001  ... .......
0x0000000000000018  00000000 00000001 C1D7C960  ....... API-
0x0000000000000024  C6C9D5C4 4EC44E00 00000000  FIND+D+.....
0x0000000000000030  C1C1C1C1 C2C2C2C2 C3C3C3C3  AAAABBBBCCCC
0x000000000000003C  C4C4C4C4 C5C5C5C5 C6C6C6C6  DDDDEEEEFFFF
0x0000000000000048  00000000 00000000 00000000  ............
0x0000000000000054  00000000 00000000 00000000  ............
```

Debugger updates: ECB Trace View

- ECB Trace view shows the available call tree, details for an entry, and even an analysis similar to trace log.



Debugger.Session.9.57.13.89.qdb0.1

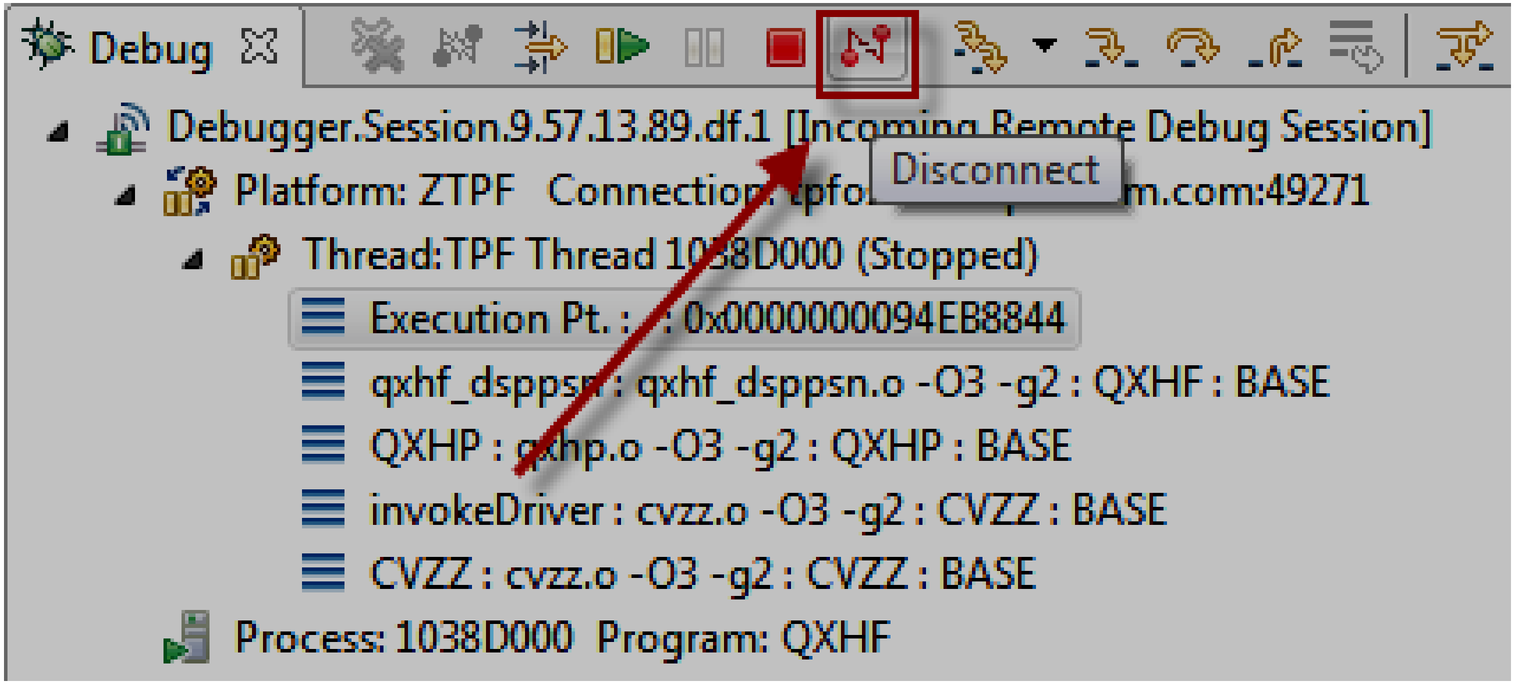
Function call or Mac	Trace Group	Load Module	Loadset	Object Name	PSW	
▷ ● atoi	IBM_DEFT	CISO	BASE	atoi	64PU1	1
◢ ● expCases	IBM_DEFT	QDB0	BASE	qdb0xp	64PU1	1
▷ ● tpf_ndsp_ma	IBM_DEFT	CTAL	BASE	cndspc	64PU1	1
▷ ● tpf_ndsp_ma	IBM_DEFT	CTAL	BASE	cndspc	64PU1	1
▷ ● tpf_ndsp_ma	IBM_DEFT	CTAL	BASE	cndspc	64PU1	1
▷ ● QDB0_printf	IBM_DEFT	QDBD	BASE	qdbd	64PU1	1
◢ ● QDB2	IBM_DEFT	QDB0	BASE	qdb0xp	31PU1	1
CINFC	IBM_DEFT	QDB2	BASE	qdb2	31PU1	1
GETCC	IBM_DEFT	QDB2	BASE	qdb2	31PU0	1

Property	Value
Macro	GETCC
Caller	QDB2
◢ Parameters	
A	1034CC00
T	0021
L	D4

Caller	Total	BACKC	CINFC	CRATC	D
	16	0	0	0	0
-CP-	16	0	0	0	0
CFVS	8	0	4	0	0
CIAA	4	0	2	0	0
COA4	9	0	3	0	1
COBC	1	1	0	0	0
CPS0	1	0	0	0	0
CVAA	10	0	0	0	0
CVAU	6	0	0	4	0
CVZZ	4	0	1	0	0
QDB0	161	0	0	0	0
QDB2	56	1	1	0	0
QDB3	2	1	0	0	0
QDBD	1	0	0	0	0
WGR1	2	2	0	0	0
from	1	0	0	0	0
Totals	**298**	**5**	**11**	**4**	**1**

Debugger updates: Detach debugger

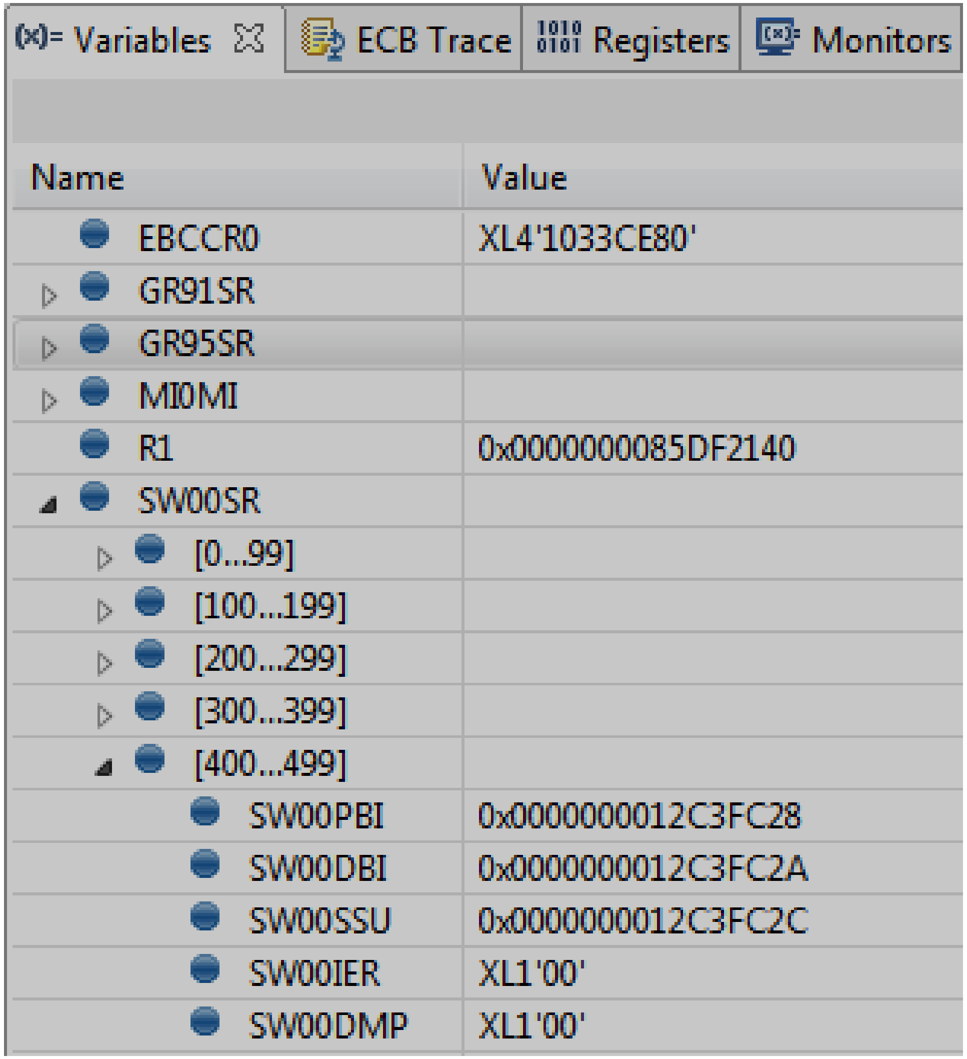
- The Disconnect button detaches the debugger from the application. The debugger exits. The application is set running and can no longer be debugged.



Debugger.Session.9.57.13.89.df.1 [Incoming Remote Debug Session]
Platform: ZTPF   Connection: tpfo... m.com:49271
Thread:TPF Thread 1038D000 (Stopped)
Execution Pt. : : 0x000000094EB8844
qxhf_dsppsn : qxhf_dsppsn.o -O3 -g2 : QXHF : BASE
QXHP : qxhp.o -O3 -g2 : QXHP : BASE
invokeDriver : cvzz.o -O3 -g2 : CVZZ : BASE
CVZZ : cvzz.o -O3 -g2 : CVZZ : BASE
Process: 1038D000 Program: QXHF

Debugger updates: Active usings

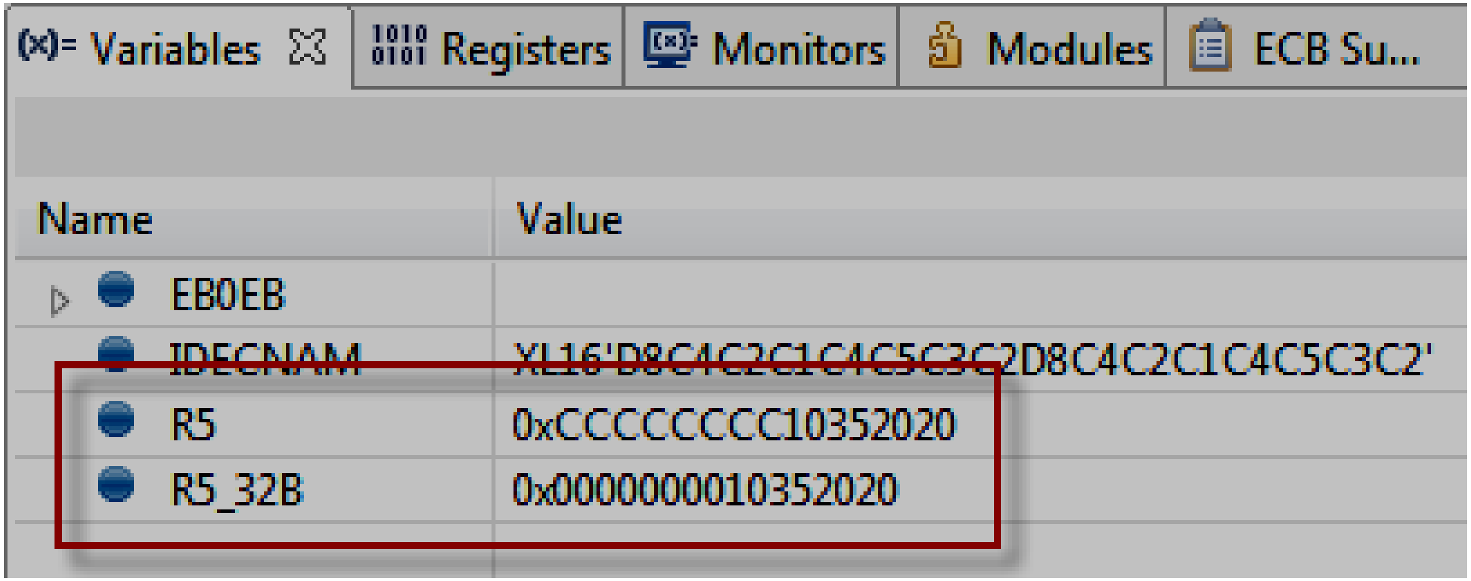
- The active usings will be shown in the variables view as the name of the DSECT and can be expanded to see the fields the DSECT contains.



Name	Value
EBCCR0	XL4'1033CE80'
▷ GR91SR	
▷ GR95SR	
▷ MI0MI	
R1	0x0000000085DF2140
◢ SW00SR	
▷ [0...99]	
▷ [100...199]	
▷ [200...299]	
▷ [300...399]	
◢ [400...499]	
SW00PBI	0x0000000012C3FC28
SW00DBI	0x0000000012C3FC2A
SW00SSU	0x0000000012C3FC2C
SW00IER	XL1'00'
SW00DMP	XL1'00'

Debugger updates: 31 bit register values

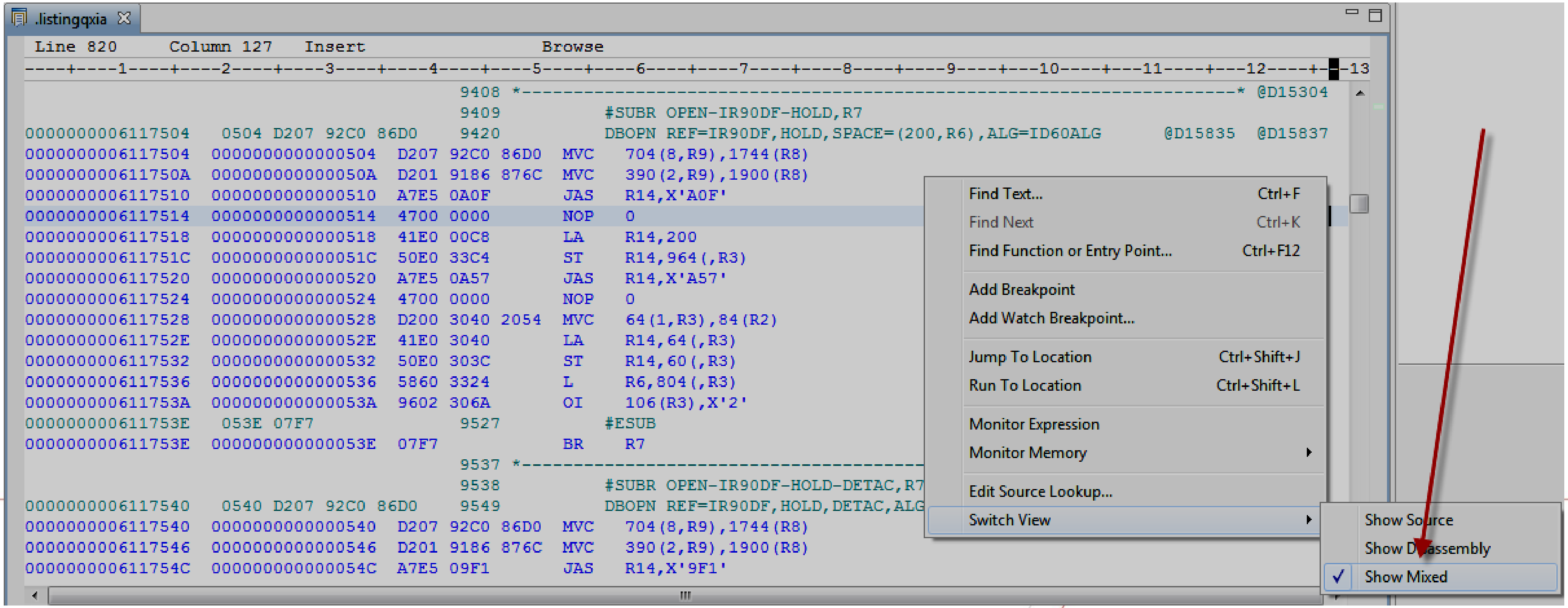
- The register value shown will contain the full 64 bit value. When a 31 bit application is being debugged, a second register value is added to the variables view to show the 31 bit value in the register.



Name	Value
▷ EB0EB	
IDECNAM	XL16'D8C4C2C1C4C5C3C2D8C4C2C1C4C5C3C2'
R5	0xCCCCCCCC10352020
R5_32B	0x0000000010352020

Debugger updates: Mixed source view

- The mixed source view shows you the assembler instructions that implement a macro with the source lines inserted as comments.
- This feature may be particularly useful debugging SPMs, TPFDF code, and etc.
- Currently, only assembler code is supported.



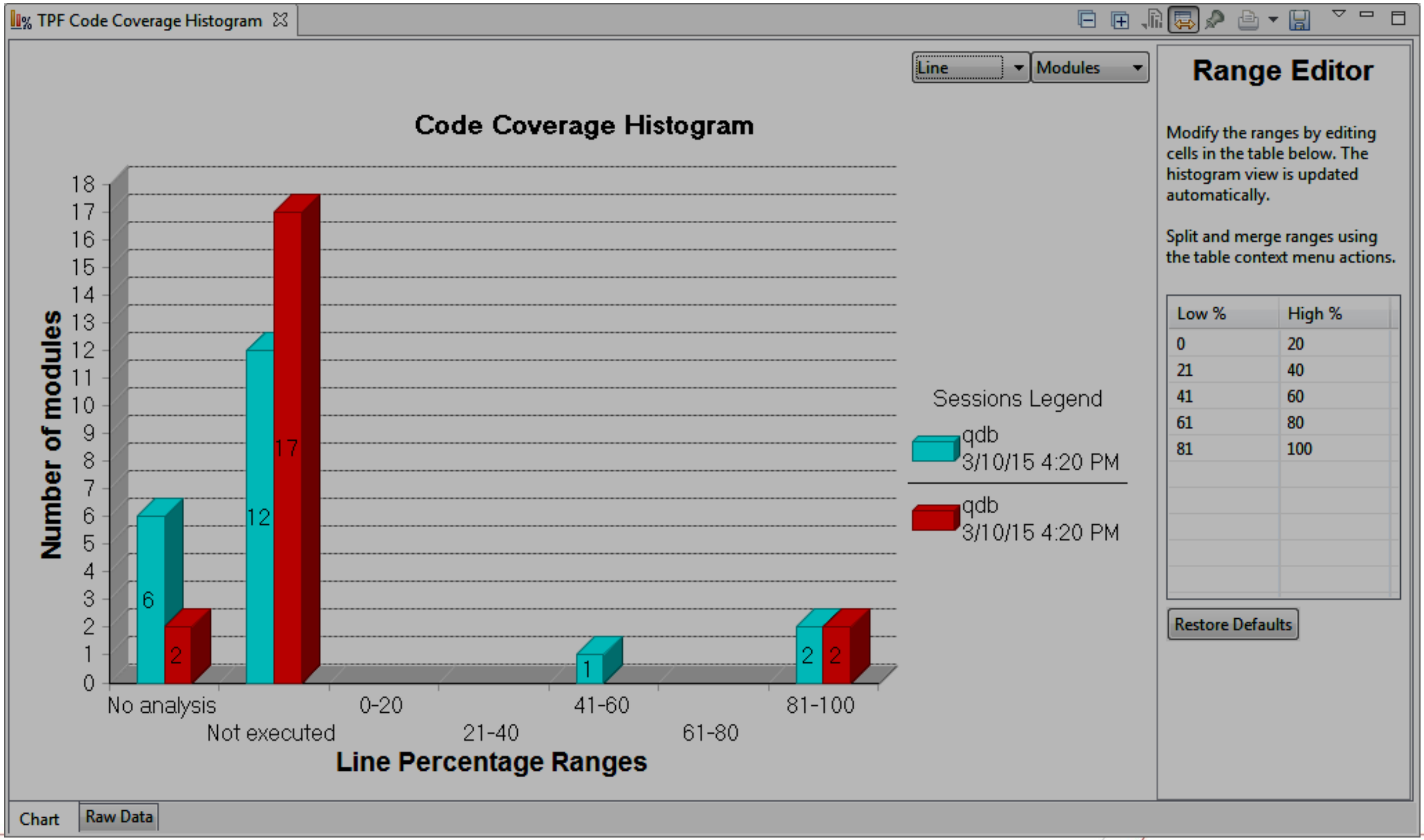
```
 Line 820      Column 127    Insert                  Browse
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8----+----9----+---10----+---11----+---12----+----13
                                          9408 *---------------------------------------------------------------------* @D15304
                                          9409          #SUBR OPEN-IR90DF-HOLD,R7
000000006117504   0504 D207 92C0 86D0     9420          DBOPN REF=IR90DF,HOLD,SPACE=(200,R6),ALG=ID60ALG      @D15835  @D15837
000000006117504  000000000000504  D207 92C0 86D0  MVC   704(8,R9),1744(R8)
00000000611750A  00000000000050A  D201 9186 876C  MVC   390(2,R9),1900(R8)
000000006117510  000000000000510  A7E5 0A0F       JAS   R14,X'A0F'
000000006117514  000000000000514  4700 0000       NOP   0
000000006117518  000000000000518  41E0 00C8       LA    R14,200
00000000611751C  00000000000051C  50E0 33C4       ST    R14,964(,R3)
000000006117520  000000000000520  A7E5 0A57       JAS   R14,X'A57'
000000006117524  000000000000524  4700 0000       NOP   0
000000006117528  000000000000528  D200 3040 2054  MVC   64(1,R3),84(R2)
00000000611752E  00000000000052E  41E0 3040       LA    R14,64(,R3)
000000006117532  000000000000532  50E0 303C       ST    R14,60(,R3)
000000006117536  000000000000536  5860 3324       L     R6,804(,R3)
00000000611753A  00000000000053A  9602 306A       OI    106(R3),X'2'
00000000611753E   053E 07F7                 9527          #ESUB
00000000611753E  00000000000053E  07F7            BR    R7
                                          9537 *------------------------------------
                                          9538          #SUBR OPEN-IR90DF-HOLD-DETAC,R7
000000006117540   0540 D207 92C0 86D0     9549          DBOPN REF=IR90DF,HOLD,DETAC,ALG
000000006117540  000000000000540  D207 92C0 86D0  MVC   704(8,R9),1744(R8)
000000006117546  000000000000546  D201 9186 876C  MVC   390(2,R9),1900(R8)
00000000611754C  00000000000054C  A7E5 09F1       JAS   R14,X'9F1'
```

Debugger updates: Non-debuggable

- A new z/TPF API is provided to prevent an ECB from being debugged: tpf_setECBDebuggableState. If TPF_ECB_IS_NOT_DEBUGGABLE or 1 is passed as the parameter, the debugger will not start for that ECB. Further, if a debugger session is already active for the ECB, the debugger will force the ECB to continue executing until the ECB becomes debuggable again (breakpoints, ECB create events, and etc are ignored).
- One circumstance where this may be useful is to set the ECB as not debuggable before locking a resource and then setting the ECB as debuggable after the lock is released.
- The tpf_setECBDebuggableState API must be coded by application or embedded in a macro called by the application. For example, in the lock illustration above, tpf_setECBDebuggableState could be coded in the lock and unlock macros.

Other tools updates: Code coverage

- The code coverage tool was enhanced to provide a histogram of your results to help visualize the breakdown.
- For more information, see demo: http://www.ibm.com/software/htp/tpf/tpfug/tgf14/tug2014_ccvhistogram.mp4



Range Editor

Modify the ranges by editing cells in the table below. The histogram view is updated automatically.

Split and merge ranges using the table context menu actions.

Low %	High %
0	20
21	40
41	60
61	80
81	100

Other tools updates: Dump viewer

- Better handle stack corruption application dumps. Debug Console View shows details about the stack area.

Deliverable details

Description	z/TPF APAR	z/TPF PUT Level	TPF Toolkit Level	Requirement
Rational Team Concert Integration Feature 4.0.6	N/A	N/A	4.2.0	Customer Request
Rational Team Concert Integration Feature 5.0.0	N/A	N/A	4.2.1	
Trace Log Compare	N/A	N/A	4.2.0 4.2.1	Customer Request
RSE auto reconnect	N/A	N/A	4.2.1	Customer Request
Admin broadcast message	N/A	N/A	4.2.0	Customer Request
Debugger start up user exit	N/A	N/A	4.2.1	Customer Request

Deliverable details

Description	z/TPF APAR	z/TPF PUT Level	TPF Toolkit Level	Requirement
Highlight registration	PJ41688	PUT11	4.2.0 4.2.1 4.2.2 V.Next	V12129
Pending cancel registration	PJ41688	PUT11	N/A	RFE 51044
Session type prefix	PJ42693	PUT12	V.Next	RFE 59000
SW00SR View Enhancements	N/A	N/A	V.Next	V09106, V14146, V14147, and RFE 46357
Custom ECB Summary view	N/A	N/A	4.2.0 V.Next	V09108S

Deliverable details

Description	**z/TPF APAR**	**z/TPF PUT Level**	**TPF Toolkit Level**	**Requirement**
ECB Summary Enhancements	PJ42751	PUT12	V.Next	V14144
TPF File View (display)	PJ41688	PUT11	4.2.0	V08024F
(modify)				V08033F
(monitor from views)				V08040F
(compare data level contents)			4.2.1	V08042S
ECB Trace View	N/A	N/A	4.2.0 4.2.1	Customer Request
Disconnect Debugger	PJ41688	PUT11	4.2.0	Customer Request
Active USINGs in the Variables View	PJ41688	PUT11	N/A	Customer Request

Deliverable details

Description	z/TPF APAR	z/TPF PUT Level	TPF Toolkit Level	Requirement
Registers in 31 bit Addressing Mode	PJ41688	PUT11	N/A	Customer Request
Mixed Source View	PJ41281	PUT10	N/A	V09113F
Set ECB Debuggable State	PJ41820	PUT11	N/A	RFE 38517
Code Coverage histogram	N/A	N/A	4.2.0 4.2.1	
Dump Viewer corrupted stack application dumps	PJ41538	PUT11	N/A	Customer Request

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