



IBM Software Group

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# Using TPF Toolkit to convert to Single Source

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TPF Toolkit Education Session

**AIM Enterprise Platform Software**

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## Single Source tools are a work in progress

- The single source tools shown today are still being developed
  - Good time to offer suggestions for improvement
- Planned availability
  - Summer 2005



## What is Single Source?

- Goal: Create source code that will run now on TPF 4.1 and later on z/TPF.
- Single Source APARs introduce changes into TPF 4.1 that are required for z/TPF
  - Allows the changes to be made to applications while they are running in TPF 4.1
  - Don't need two copies of application source.
  - Enables the same application source to be built for TPF 4.1 or z/TPF without any conditional code.
- Other Single Source Changes
  - Not all required / recommended changes have an associated APAR.

# Changes

- Change Types



## Detect & Fix

The tools can identify that there is definitely a migration issue and they can also automatically correct the problem.



## Detect

The tools can identify that there is definitely a migration issue but they cannot automatically correct the problem.



## Suggest

The tools can identify areas that may be a migration issue.

# Changes

- Detect & Fix

**Example:**

CE1SVP is obsolete on z/TPF.

**Detect:** Load instructions that load the program base

e.g.           L   R8,CE1SVP

**Fix:** Replace with Load Program Base Macro

e.g.           LBASEC REG=R8

# Changes

- Detect

**Example:**

Use of long double should be avoided.

**Detect:** Usage of variable type long double

e.g.            long double result;



# Changes

- Suggest

**Example:**

(PJ29575) Pointer changes from 4 bytes to 8 bytes.

If an application is using a pointer in a structure mapped by an assembler DSECT or written to a file, the pointer should be 4 bytes.

The scanning tools can flag places where this may be the case. Code must be manually examined and fixed if required.

# Using TPF Toolkit to Convert to Single Source

- Usage Scenarios

- **Bulk Conversion**

- All source code is scanned and all problems are resolved.

- **Maintain single source**

- Ensure no new errors are introduced into source code after initial conversion is complete.



# Using TPF Toolkit to Convert to Single Source

- Overview



# Using TPF Toolkit to Convert to Single Source

- Scan Invocation
  - Wizard
  - tpftool commands
  - Scan while editing

## Rules

- Migration scan uses rules to detect changes.
  - One APAR may result in multiple rules.
- Enabling / Disabling Rules
  - Allows migration to be done in phases.

Click to open help related to the change.

Enable	Rule ID	Description	Language	Fixable		Details
<input checked="" type="checkbox"/>	PJ29218	Replace calls to L RX,CE15VP with LBASEC mac...	HLASM	✓		
<input checked="" type="checkbox"/>	PJ29593tpf	Update TPF-unique header file names to use _ ...	C\CPP	✓		
<input checked="" type="checkbox"/>	PACKP	Replace #pragma pack(packed) with #pragma ...	C\CPP	✓		
<input checked="" type="checkbox"/>	PACKR	Replace #pragma pack(reset) with #pragma p...	C\CPP	✓		
<input checked="" type="checkbox"/>	PJ29593cs	Add include statement for moved compare-and...	C\CPP	✗		
<input checked="" type="checkbox"/>	PJ29593cds	Add include statement for moved compare-dou...	C\CPP	✗		

# Using TPF Toolkit to Convert to Single Source

- Results
  - TPF Error List View
  - File

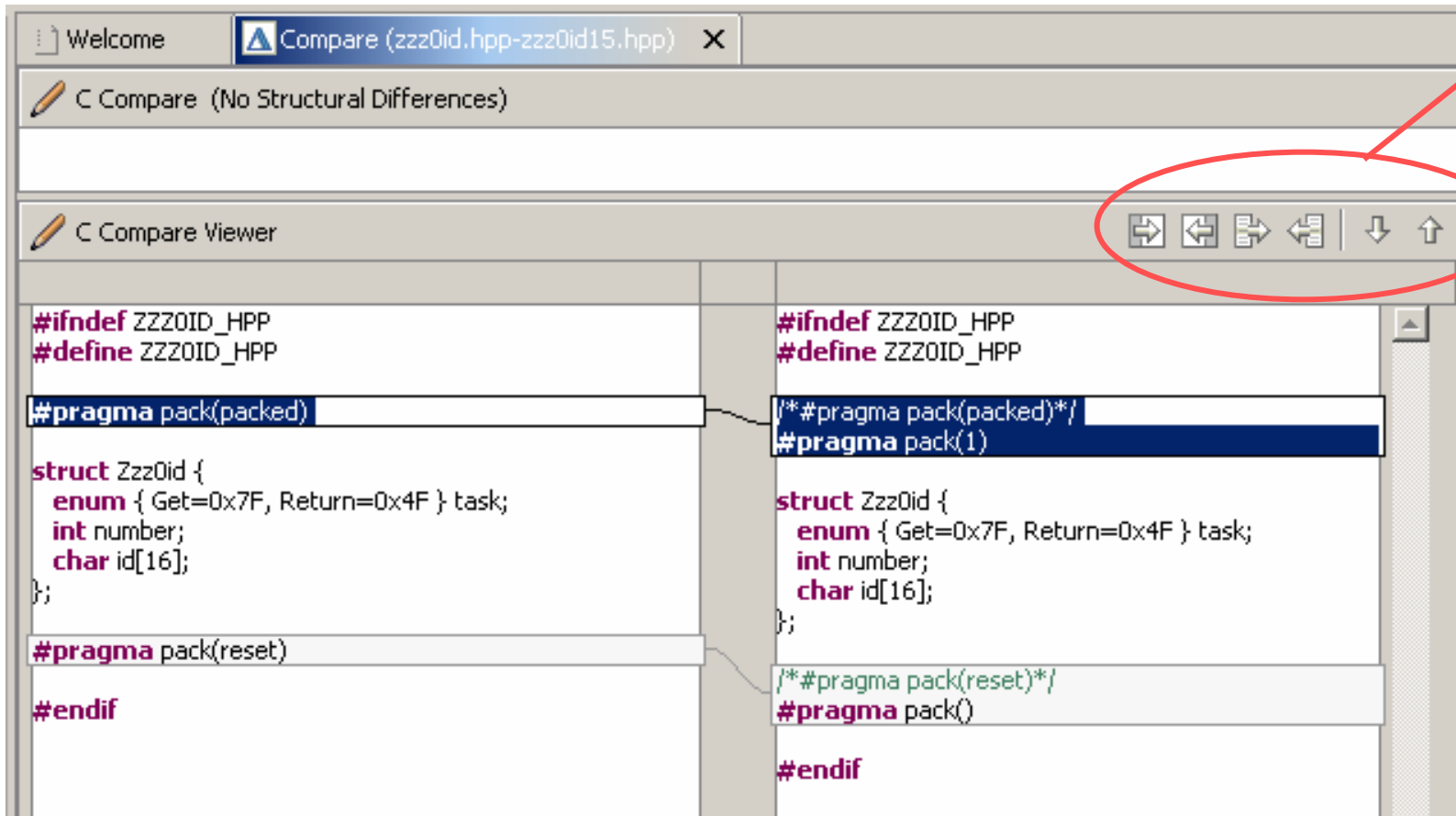
ID	Message	Line	Location	Host Name	Date
PJ29593_1	TPF-unique header files moved to /include/tpf	3	/u/vaide/proj41/src/idFunctions.cpp	TPFMV5XA.POK.IBM.COM	Apr 16, ...
PJ29218	CE15VP obsoleted in z/TPF	15	/u/vaide/proj41/src/zzz0.asm	TPFMV5XA.POK.IBM.COM	Apr 16, ...
PACKR	"reset" parameter recognized by IBM compiler only.	12	/u/vaide/proj41/include/zzz0id.hpp	TPFMV5XA.POK.IBM.COM	Apr 16, ...
PACKP	"packed" parameter recognized by IBM compiler only.	4	/u/vaide/proj41/include/zzz0id.hpp	TPFMV5XA.POK.IBM.COM	Apr 16, ...

# Using TPF Toolkit to Convert to Single Source

- **Fix**
  - From the TPF Error List view
    - Compare File
    - Auto Correct
  
  - From the editor
    - Quick Fix
    - Manually

## Fixing Detected Problems

- Compare
  - Side by side view of original file with changed file.
  - Makes it easy to review and insert changes.



Buttons to navigate and transfer changes

Auto-Generated with Changes



## Fixing Detected Problems

- Auto Correct
  - Source file is changed automatically.

 TPF Toolkit Console

```
TPFI2000I - Single Source Migration: PJ29218 - CE15VP obsoleted in z/TPF  
File: 'TPFMWSXA.POK.IBM.COM : /u/vaide/proj41/src/zzz0.asm' Line: 15 - Replaced 'L R8,CE15VP' with 'LBASEC REG=R8'
```

# Fixing Detected Problems

- Quick Fix

- Done in editor
- Comments not added

Light bulb icon indicates a quick fix is available.

The screenshot shows a code editor window with the following text:

```

ERROR0      DS      OH                                @PJ21452
            LA      R5,ERROR0      Set up new code base.      @PJ21452
            DROP   R8                                @PJ26147
            USING  ERROR0,R5        @PJ21452
            L      R8,CE1SVP        Point to caller's program header.
            LBASEC REG=R8
            ICJMSG GE
            DUMP_DATA L
            L
            DROP   R4                                @PJ24530
            SPACE 1                                @PJ24530
            LTORG ,                                @PJ21452
            FINIS ,                                @PJ21452
    
```

A yellow light bulb icon with a red 'x' is positioned to the left of the error line. A yellow callout box with a red 'x' and a lightbulb icon is overlaid on the code, containing the text "Replace with LBASEC". An arrow points from this callout to the code line "LBASEC REG=R8". Another yellow callout box is overlaid on the right side of the code, containing the text "A preview of the changed source is shown." with an arrow pointing to the same code line.

# Commenting

- Preserving Original Code

- Option to keep a commented version of the original code.

Original line is preserved  
as a comment

Corrected code is  
inserted below.

```

Welcome | idFunctions.cpp | clgjmp.asm X
Row 262 Column 42 Replace
-----+-----+-----+-----+-----+-----+-----+-----+
* not compatible with the current state of DSA/DLM when called from *
* the same DLM. Issue SNAPC and exit ECB. *
*****
ERRORO DS OH @PJ21452
LA R5,ERRORO Set up new code base. @PJ21452
DROP R8 @PJ26147
USING ERRORO,R5 @PJ21452
* L R8,CE1SVP Point to caller's program header.
LBASEC REG=R8 @Demo
LA R3,JMPBUF_LEN Get jmpbuf length @PJ24530
SNAPC E,(CA9CIA),MSG=ICJMSG,PREFIX=I,LIST=DUMP_DATA,
REGS=YES,ECB=YES USE ECB MDBF DATA TO EXIT @PJ24530
SPACE 1 @PJ21452
ICJMSG GENMSG TEXTONLY='INCOMPATIBLE JMPBUF PASSED TO LONGJMP FUNCTIO
N' @PJ21452
  
```

## Commenting

- Flagging Changed lines
  - Small comment to identify change.

```
Row 262      Column 42      Replace
-----+-----1-----+-----2-----+-----3-----+-----4-----+-----5-----+-----6-----+-----7-----+
* not compatible with the current state of DSA/DLM when called from *
* the same DLM. Issue SNAPC and exit ECB. *
*****
ERROR0      DS          OH                                @PJ21452
            LA          R5,ERROR0      Set up new code base.    @PJ21452
            DROP       R8                                @PJ26147
            USING     ERROR0,R5          @PJ21452
*           L           R8,CE1SVP      Point to caller's program header.
            LBASEC    REG=R8                                @Demo
            LA          R3,JMPBUF_LEN  Get jmpbuf length        @PJ24530
            SNAPC     E,(CA9CIA),MSG=ICJMSG,PREFIX=I,LIST=DUMP_DATA,
            REGS=YES,ECB=YES          USE ECB MDBF DATA TO EXIT @PJ24530
            SPACE     1                                @PJ21452
ICJMSG      GENMSG    TEXTONLY=' INCOMPATIBLE JMPBUF PASSED TO LONGJMP FUNCTIO
            N'                                           @PJ21452
```

“Auto Comment”  
generated and inserted  
on line.

# Bulk Conversion

- Run a scan
  - Right click a project and invoke the Migration wizard.
  
- Work with Results
  - Compare – Easily review and insert changes.
  - Auto Fix – Apply fix to file with no editing
  
- [Demo – Bulk Conversion](#)

## Maintaining Single Source

- Single file scan performed when file is edited
- Options for fixing problems
  - Quick Fix
- [Demo – Maintaining Single Source](#)



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