



TPF Toolkit

TPF Users Group – 2012 Comparing Code Coverage Results

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AIM Enterprise Platform Software
IBM z/Transaction Processing Facility Enterprise Edition 1.1.0

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Agenda

- **Judging the effectiveness of tests**
- **Code Coverage in TPF Toolkit**
- **Comparing Code Coverage Results**
- **Demo**
- **Questions**

Judging the effectiveness of tests

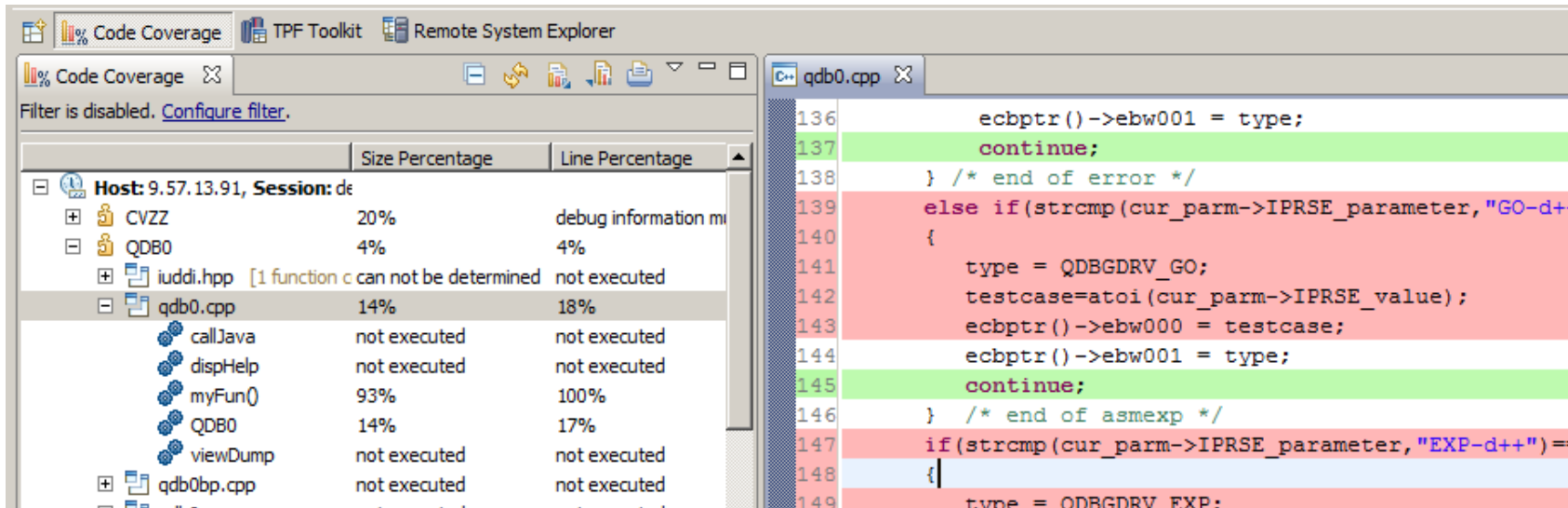
- **A useful measure of the effectiveness of tests is the *coverage* of the tests**
 - Of the code that is meant to be tested, how much is actually executed in response to test programs?
- **Increased confidence in results of tests if they cover a significant portion of the code that is being tested**
 - This provides increased confidence in quality of product

Code Coverage in TPF Toolkit

- **Code Coverage tool released with TPF Toolkit v3.6 (requires TPF APAR PJ37973, included in PUT 8)**
 - Allows users to measure the coverage of their TPF applications in response to test transactions
 - Coverage is measured at different levels:
 - Module level (e.g. QDB0)
 - Object level (e.g. qdb0.o)
 - Function level (e.g. printf(...))
 - Code coverage data is collected per module not transaction

Code Coverage in TPF Toolkit

- **Source analysis feature released in TPF Toolkit v3.6.3 (requires APAR PJ38995, included in PUT 8)**
 - Analyze modules, objects and functions to determine which lines are executed in response to test programs



Module/Function	Size Percentage	Line Percentage
Host: 9.57.13.91, Session: de		
CVZZ	20%	debug information m
QDB0	4%	4%
iuddi.hpp [1 function c can not be determined		not executed
qdb0.cpp	14%	18%
callJava	not executed	not executed
dispHelp	not executed	not executed
myFun()	93%	100%
QDB0	14%	17%
viewDump	not executed	not executed
qdb0bp.cpp	not executed	not executed

```

136     ecbptr()->ebw001 = type;
137     continue;
138     } /* end of error */
139     else if(strcmp(cur_parm->IPRSE_parameter, "GO-d+
140     {
141         type = QDBGDRV_GO;
142         testcase=atoi(cur_parm->IPRSE_value);
143         ecbptr()->ebw000 = testcase;
144         ecbptr()->ebw001 = type;
145         continue;
146     } /* end of asmexp */
147     if(strcmp(cur_parm->IPRSE_parameter, "EXP-d++")=
148     {
149         type = ODBGDRV_EXP;

```

Collecting Coverage Data

- **To collect code coverage data, do the following:**
 - Start collection for code coverage session
 - Optionally, you may enter annotations to be associated with the *timestamp directory* generated for this collection
 - Annotations are plain text and may provide information about the programs that were executed, etc.
 - Run test programs on z/TPF system
 - Save and stop collection for code coverage session

Analyzing Coverage Data

- **The collected data contains information at the module level only**
- **To obtain coverage information at the object and function level, perform size or source analysis on the timestamp directory generated for the collection**
 - Size and source analysis can be performed through the Code Coverage subsystem or the TPF Code Coverage view

Viewing Coverage Results

- **After collection and analysis is complete, you can view the code coverage results in the TPF Code Coverage view**
 - You can filter the results to:
 - Show only specific modules by name
 - Show only modules/functions/objects where the size/line percentage lies within a certain range (e.g. only show those modules that are covered < 50% by tests)
 - You can sort the results by size/line percentage or by name
 - You can export the results to a file for further processing (e.g. CSV data, etc.)

What if your tests need improvement?

- **Source analysis results are useful for pointing out areas where your testing can be improved**
 - E.g. Modules that have very low coverage, etc.
- **But how can you judge whether your tests *are* improving?**
 - Run code coverage analyses after modifying your tests

An effective method for comparing code coverage analysis results is required...

Code Coverage Comparison Tool

- **New Code Coverage Compare editor allows you to compare size and source analysis results for multiple sessions**
 - Compare results at several levels:
 - Module level (e.g. QDB0)
 - Object level (e.g. qdb0.o)
 - Function level (e.g. printf(...))
 - You can filter the results to:
 - Show only specific modules by name
 - Show only modules/functions/objects where the size/line percentage lies within a certain range (e.g. only show those modules that are covered < 50% by tests)
 - You can sort the results by size/line percentage or by name

Demo – Code Coverage Compare

Questions

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