

Live
presentation
of test
coverage on
Android

Roland Bär

Introduction

What is test
coverage

What is Testwell
CTC++

The outcome

Native
applications
with NDK

Java
applications
with SDK

Thanks

Test coverage shown live on a Android phone

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Verifysoft Technology GmbH, Offenburg, Germany

Droidcon, Amsterdam, November 2011

Outline

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- What is test coverage
- What is Testwell CTC++
- The outcome

2 Native applications with NDK

3 Java applications with SDK

4 Thanks

Why test coverage is required?

- Required for certifications like DO-178B/C
- Identify dead code, code not reached and tested
- Identify which code/features outside beta users have tested

This is the only proof, that shows that you have tested anything. . .

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Testwell CTC++

- A proprietary tool of Testwell Oy, Tampere, Finland
- With Host-Target add-on work with any compiler on any target
- With Bitcov add-on also on e.g. 8-bit uController
- With CTC++ Java and Android add-on for . . . Android

What does it

- **measuring** test coverage
- dynamic analyses
- at any testing phase
- for C or C++ code
- also Java and C#

Example report

Start/ End/

True False - [Line](#) Source

```
1 /* File calc.c ----- */
2 #include "calc.h"
3 /* Tell if the argument is a prime (ret 1) or not (ret 0) */
```

[Top](#)

9	0	4	int is_prime(unsigned val)
		5	{
		6	unsigned divisor;
		7	
2	7	8	if (val == 1 val == 2 val == 3)
1		8	T _ _
0	-	8	F T _
1		8	F F T
	7	8	F F F
		9	return 1;
5	2	10	if (val % 2 == 0)
5		11	return 0;
58	2	12	for (divisor = 3; divisor < val / 2; divisor += 2)
		13	{
0	58	14	if (val % divisor == 0)
0	-	15	return 0;
		16	}
2		17	return 1;
		18	}

***TER 82% (14/17) of SOURCE FILE calc.c

CTC++ preparation

- Add arm-linux-androideabi-gcc to the ctc.ini settings
- Copy Host-Target source files to jni/
- Add targ*.c to jni/Android.mk

```
LOCAL_SRC_FILES := plasma.c targdata.c \  
targcust.c targsend.c
```

- Mention function name to dump data out

```
EMBED_FUNCTION_NAME = \  
Java_com_example_plasma_PlasmaView_renderPlasma
```

Building NDK application with CTC++

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Building

- **Compiler with**

```
ndk-build TARGET_CC= \  
"ctc -i m arm-linux-androideabi-gcc"
```

We assume, compiler is in \$PATH

- **Build the package**

```
ant debug
```

- **Install with**

```
adb install -r bin/Plasma-debug.apk
```

- **Run the application**

Data transfer and reporting

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Getting report

■ Getting data

```
adb pull /data/data/PKGNAME/MON.txt .
```

The place, where you can store e.g. highscores

■ Convert date

```
ctc2dat -i MON.txt
```

■ **MON.dat** gets born

■ proceed as on host:

```
ctcpost MON.dat -p - | ctc2html
```

■ Have a look

```
firefox CTHTML/index.html
```

Building Java application with CTC++

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Compiling

- `ctc.jar` has to be added to the `CLASSPATH`
- CTC++ android library project stored somewhere
- Mention the function to trigger data write out in `ctc-java-cs.ini`

```
EMBED_FUNCTION_NAME=onPause
```

- Build it

```
ant debug \  
-Dbuild.compiler=fi.testwell.ant.ctc \  
-Dbuild.compiler.ctcopts="-i m"
```

- `adb install yourpackage.apk` on your Android
- Run it, play around, get coverage data

Data transfer until report

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Questions?

Any questions?

Thank you

Thank you very much for attention

Availability

- Evalversions available at <http://www.verifysoft.de/>