

RapiTime v2.3 - the latest in advanced worst-case execution time software

RapiTime uniquely provides analysis of timing and code coverage from target measurements.

The latest enhancement - RapiTime v2.3 - includes, among other features, a debug support facility which will allow you to follow execution forwards and backwards through recorded traces of embedded real-time applications.

Introduction to RapiTime

RapiTime is an automated performance measurement and timing analysis tool. Targeted at real-time, embedded applications, RapiTime provides code coverage metrics, performance measurement, determination of worst-case execution time, and guidance for your optimization efforts.

In general terms RapiTime works as follows:

- *Instrumentation code* which highlights the execution of a specific section of code is automatically added.
- As the application is executed on the target, an *execution trace* is collected. This trace is a sequence of time-stamped values that show when the instrumentation code is executed.
- Using the trace RapiTime identifies the parts of the source code which have and have not been executed (code coverage), and *performance metrics* for each part of executed code.
- Using the performance and coverage data, RapiTime can also predict worst-case execution time, and identify the best locations for *optimization*.

RapiTime v2.3

RapiTime currently collects traces from embedded, real-time applications to determine code coverage,

measure timing behaviour, assess worst-case execution time and direct optimization effort.

The new version features **Rewind**, a facility which uses these execution traces to provide you with advanced debugger-like functionality.

How Rewind works - moving from *where* to *why*

Figures 1 and 2 demonstrate how RapiTime Rewind works:

1. You have generated your trace data, as mentioned earlier.

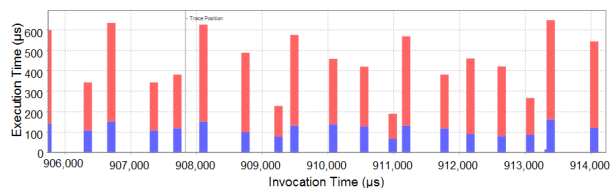


Fig 1: An illustration of short and long times

2. Now you can begin to investigate *where* the short and long times occur (see Fig 1 above).
3. Unlike a regular debugger, with Rewind you can move forwards or backwards from any point in the code (see Fig 2 below). This allows you to examine *why* specific runs take unusually short or long amounts of time.

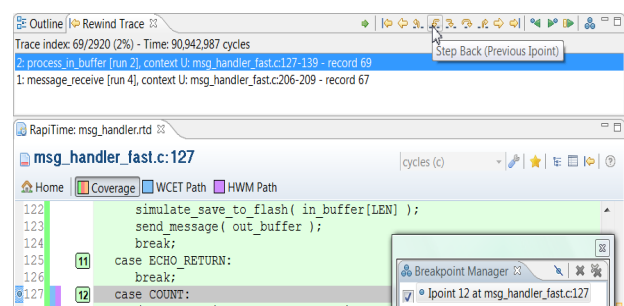


Fig 2: How to move between pieces of code

Additional features of RapiTime v2.3

Function pointers with no annotations. Function pointers previously required manual annotations. The new software automates the job of providing function pointer annotations for you.

Roots as loops, not functions. A lot of embedded code uses a loop as the top-level function for each thread/process. Examples include DEOS, VxWorks and Lynx OS.

Most of the work in the root function is dispatching code into helper functions. Using the new software, you can construct an alternative root function that calls all of the helper functions.

This indicates that the root is a loop, not a function, and that the time to be taken for the loop iteration is the time taken between blocking calls to receive.

Inserting ASL tags. You can add local annotations without modifying the source code. This keeps the source code "clean".

Covparser: Coverage only analysis. It may be desirable to run coverage-only analysis at certain times. RapiTime now supports coverage-only analysis where data requirements are considerably lower.

Summary

RapiTime v2.3:

- gives users added functionality and advanced ways to check code
- shortens the time needed to generate reports by reducing annotations
- simplifies analysis of RTOS-based applications
- helps maintain "clean" code
- offers coverage-only analysis

About Rapita Systems

Rapita Systems Ltd develops software tools to reduce the cost of measuring and optimising the timing performance of large, real-time software systems such as avionics or automotive applications.

RapiTime is the only product on the market that can tell users exactly where to focus optimization effort to minimize worst-case execution time.

Using RapiTime, customers have been able to reduce worst-case execution times by up to 50% with only a few days effort.

Rapita Systems Distributors

China. CinaWind

Email: xiaoming@cinawind.com.cn

Web: <http://www.cinawind.com>

Tel: +861 062521452

France. CirrusIM

Email: Philippe.cartau@cirrusim.com

Web: <http://www.cirrusim.com>

Tel: +33 5 62 13 76 92

Germany. Embedded Tools GmbH

Email: info@embedded-tools.de

Web: <http://www.embedded-tools.de>

Tel: +49 251 98729-0

Japan. A. I. Corporation

Email: ueda@aicp.co.jp

Web: <http://www.aicp.co.jp>

Tel: +81 3 3493 7981

UK. SDC Systems Ltd

Email: sales@sdcsystems.com

Web: <http://www.sdcsystems.com>

Tel: +44 (0)845 6588554

Our software supports Microsoft Windows (XP, 2000, Vista and Windows 7) and Linux.

RapiTime Rewind was developed within ALL-TIMES, part of the European Commission's 7th Framework Programme on Research, Technological Development and Demonstration.

The project is concerned with embedded systems that are subject to safety, availability, reliability, and performance requirements.

Since these requirements often relate to correct timing, most notably in the automotive and aerospace areas, the need for appropriate timing analysis methods and tools is rapidly growing.

The ALL-TIMES project aims to combine research results into a consistent methodology, integrate available timing tools into a single framework, and develop new timing analysis methods and tools where appropriate.

More information can be found at www.rapitasystems.com



IT Centre
York Science Park
Heslington
York YO10 5DG
United Kingdom

Tel No: +44 (0)1904 567747
Fax No: +44 (0) 1904 567719
Email: enquiries@rapitasystems.com
Website: www.rapitasystems.com
Registered in England & Wales 5011090