Trazer User Manual

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Introduction

Trazer is a visualization tool that works in conjuntion with the RKH Framework built in trace facility. Trazer gives the possibility to display selectively the recording of all events of your system, state machines, queues, timers etc. Trazer helps you to faster troubleshooting especially on complex problems where a debugger is not sufficient, by providing a simple consolidated, human-readable textual output.

Given the RKH cross plataform portability, trace data may come from 8, 16, or 32 bit machines. In order to that Trazer need to be configured to support this diversity of plataform and the wide range of RKH framework configurations.

Trazer requiere these setups:

- **Command-Line Parameters** to configure comunication link and general options.
- **Configuration file** (trazer.cfg) to setup all target dependencies, such as pointer sizes, signal sizes, etc.

Command-Line Parameters

Option	Example	Comments
-h	-h	Help. Prints the summary of options

-q	-q	Quiet mode (no stdout output)
-v	-v	Visualize Traze version and compatibility with RKH framework
-o	-o trazer.txt	Produce output to the specified file
-c	-c COM1 115200 8N1	COM port and baudrate selection. Not compatible with -t, -f
-t	-t 6602	TCP/IP server and port number. Not compatible with -c, -f
-f	-f trace.bin	File input selection. Not compatible with -c, -t

Configuration file

Trazer is designed to work with all possible target CPU, which requires a wide range of configurability. For example, for any given target CPU, Trazer must "know" the size of object pointers, event size, timestamp size and so on. You can provide this information by two ways:

- including "trazer.cfg" configuration file in trazer.exe directory.
- setup the target aplication to call to RKH_TR_FWK_TCFG and perform the streaming the RKH configuration at startup.

If config file is not found, assuming default settings, any configuration streaming received overwrite settings.

the following table summarizes the "trazer.cfg" content.

Parameter	Valid Values	Must match RKH config (rkhcfg.h)	Comments
TRAZER_SIZEOF_SIG	1, 2, 4	#RKH_SIZEOF_EVENT	Event Signal size in bytes.
TRAZER_SIZEOF_TSTAMP	1, 2, 4	#RKH_TRC_SIZEOF_TSTAMP	Bytes quantity used by the trace record timestamp.
TRAZER_SIZEOF_POINTER	1, 2, 4	#RKH_TRC_SIZEOF_POINTER	Size in bytes of void pointer.
TRAZER_SIZEOF_NTIMER	1, 2, 4	#RKH_TIM_SIZEOF_NTIMER	Dynamic range of time delays measured in ticks and expresed in bytes.
TRAZER_SIZEOF_NBLOCK	1, 2, 4	#RKH_MP_SIZEOF_NBLOCK	Size in bytes of number of memory block size.
			Maximum number of elements in

TRAZER_SIZEOF_NELEM	1, 2, 4	#RKH_RQ_SIZEOF_NELEM	bytes that any queue can contain.
TRAZER_SIZEOF_ESIZE	1, 2, 4	#RKH_SIZEOF_ESIZE	Data type of event size, in bytes.
TRAZER_EN_NSEQ	0, 1	#RKH_TRC_EN_NSEQ	Enable/Disable Number of Sequence use in trace stream.
TRAZER_EN_CHK	0, 1	#RKH_TRC_EN_CHK	Enable/Disable Checksum use in trace stream.
TRAZER_EN_TSTAMP	0, 1	#RKH_TRC_EN_TSTAMP	Enable/Disable Time stamp use in trace stream.

Your must ensure that Trazer configuration, match exactly with the target system under test, otherwise will be unable to parse the trace stream, and these errors would be shown:

***** Stream Checksum Error

***** May be have lost trace info, sequence are not correlatives

Two particular trace event can be used to better trace visualization.

RKH_TRCE_OBJ: Allows to asociate any aplication object allocated in a memory address to a user defined name.

RKH_TRCE_SIG: Allows to asociate a any framework signal that generate trace events to a user defined name.

RKH user must generate this particulars trace events as described in RKHTRACE and Trazer will take care of reemplacing the numeric values by the user definition.

Human Readable Output

Trazer is a console program that converts the trace stream data in a human-readable format. Following is shown how its output looks like.
Trazer start showing version and compatibility with RKH framework, below are displayed the current Trazer configuration. For this example the trace.bin is used as trace data source.
Each identified trace show:

- Time stamp, in cpu ticks.
- Sequence Number, correlative number that identify trace event.
- System service group name.
- Trace Event Alias, user defined alias from trazer.evt
- Data asociated with the event.
- Comment.

Sequences 4, 5 and 6 are examples of RKH_TRCE_OBJ and RKH_TRCE_SIG events. After, sequences 16, 17, 32 and 33, show how Trazer identify object address and signal number replacing them by its

symbolic representation. In case that no symbolic representation has been defined for a particular object, (null) will be shown, and in same manner the numeric value for signals.

```
TRAZER Visualization Tool V2.0 compatible with RKH V2.3
Date = Jan  31 2013 13:46:48

Trace Setup

   Trace events quantity = 45
   TRAZER_SIZEOF_SIG     = 1
   TRAZER_SIZEOF_TSTAMP  = 4
   TRAZER_SIZEOF_POINTER = 4
   TRAZER_SIZEOF_NTIMER  = 2
   TRAZER_SIZEOF_NBLOCK  = 1
   TRAZER_SIZEOF_NELEM   = 1
   TRAZER_SIZEOF_ESIZE   = 2
   TRAZER_EN_NSEQ        = 1
   TRAZER_EN_CHK         = 1
   TRAZER_EN_TSTAMP      = 1
   RKH_TRC_ALL           = 1
   RKH_TRC_EN_MP         = 0
   RKH_TRC_EN_RQ         = 0
   RKH_TRC_EN_SMA        = 0
   RKH_TRC_EN_TIM        = 0
   RKH_TRC_EN_SM         = 0
   RKH_TRC_EN_RKH        = 0


-------- Parsing trace stream from file trace.bin --------

        84 [  0] MP  | INIT           : mp=(null), nblock=16  : Memory
Pool Init
        84 [  1] RKH | EPOOL_REG      : epix =1, ssize=64, esize=4
        84 [  2] MP  | INIT           : mp=(null), nblock=4  : Memory P
ool Init
        84 [  3] RKH | EPOOL_REG      : epix =2, ssize=32, esize=8
        84 [  4] RKH | SYM_OBJ        : obj=0x01091780, sym=&rkheplist[
0]
        84 [  5] RKH | SYM_OBJ        : obj=0x01091794, sym=&rkheplist[
1]
        84 [  6] RKH | SYM_SIG        : sig=1, sym=ONE
        84 [  7] RQ  | INIT           : rq=(null), sma=(null), nelem=4
        84 [  8] SMA | REGISTER       : sma=(null), prio=0
        84 [  9] SM  | INIT           : sma=(null), istate=(null)
        84 [ 10] TIM | INIT           : timer=(null), sig=(null)
        84 [ 11] SM  | ENTRY_STATE    : sma=(null), state=(null)
        84 [ 12] SM  | ENTRY_STATE    : sma=(null), state=(null)
        84 [ 13] SM  | ENTRY_STATE    : sma=(null), state=(null)
        84 [ 14] SMA | ACTIVATE       : sma=(null)
        86 [ 15] RKH | ENTER          :
```

```
      1509 [ 16] MP  | GET             : mp=&rkheplist[1], nfree=3  : Me
mory Pool Get
      1509 [ 17] RKH | ALLOC_EVENT     : esize=6, sig=ONE
      1509 [ 18] RQ  | POST_FIFO       : rq=(null), nused=1
      1509 [ 19] SMA | POST_FIFO       : sma=(null), sig=ONE
      1509 [ 20] RQ  | GET_LAST        : rq=(null)
      1509 [ 21] SMA | GET_EVENT       : sma=(null), sig=ONE
      1509 [ 22] SM  | DISPATCH        : sma=(null), sig=ONE
      1509 [ 23] SM  | TRANSITION      : sma=(null), sstate=(null), tsta
te=(null)
      1509 [ 24] SM  | COMP_STATE      : sma=(null), state=(null)
      1509 [ 25] SM  | NUM_EN_EX       : sma=(null), nentry=1, nexit=1
      1509 [ 26] SM  | EXIT_STATE      : sma=(null), state=(null)
      1509 [ 27] SM  | NUM_TRN_ACT     : sma=(null), ntrnaction=1
      1509 [ 28] SM  | ENTRY_STATE     : sma=(null), state=(null)
      1509 [ 29] SM  | CURRENT_STATE   : sma=(null), state=(null)
      1509 [ 30] SM  | DISPATCH_RCODE  : sma=(null), retcode=RKH_OK
      1509 [ 31] RKH | GC_RECYCLE      : sig=ONE
      1509 [ 32] MP  | PUT             : mp=&rkheplist[1], nfree=4
      1905 [ 33] MP  | GET             : mp=&rkheplist[1], nfree=3  : Me
mory Pool Get
      1905 [ 34] RKH | ALLOC_EVENT     : esize=6, sig=(null)
      1905 [ 35] RQ  | POST_FIFO       : rq=(null), nused=1
```

Licensing Trazer

Trazer application is licensed the same way as all other components of the RKH framework. See section licensing.

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