ARM semihosting with virtual target in TRACE 32 Open Discussion

- H HUGUET
- **Forum name:** #Debugging

Hello
using the CADI protocol provided by ARM fast models, I am able to connect trace 32 on a virtual platform embedding a model of Cortex R. Reading the Trace 32 command manual and the ARMv8-R debugger document, I've understood that I have to use commands TERM.METHOD ARMSWI and TERM.GATE in order to use ARM semihosting feature with TRACE 32. Addionnally, I have updated my embedded code , executing in AArch32 state, so that it uses SVC 0x123456 to authorize the debugger to trap the semihosting call. I have rewritten low level putc/getc function called by printf in order to generate the SVC 0x123456. Nevertheless, when debugging in step by step in Trace 32, I have checked that the SVC is executed, but nothing appears within the terminal created by TERM.GATE at the beginning of the session. Do I miss some configuration step in Trace 32 to allow the ARM semihosting working with my virtual target in Trace 32 ?

Many thanks for your help

Frederic

Comments (3)

Lella-Aicha Ayadi
2 years ago

Hello Frederic,

We do provide demo for semi hosting emulation
~~/demo/arm/etc/semihosting_arm_emulation/armv8_aarch32/swisoft_armv8.cmm

Please note that Cortex-R52 is by default in HYP mode, and that SVC instructions do not work in HYP mode. To make it work, the SVC must be set using Register.Set M 0x13 command (line 38). Please try it and let me the findings.

In case you are still having problems, please send me the system information report about your TRACE32 configuration and the script you are using. The system information can be generated by selecting the TRACE32

menu 'Help' > 'Support' > 'System Information...', click 'Save to File' and send the resulting text file as an attachment to your e-mail.

Regards,

Aicha

H **HUGUET**
2 years ago

Hello Aicha,

I followed your advice by completing my trace32 script with the register.set M 0x13 command but it still does not work.

Here is the relevant part of my script (cadi config simplified here):

```
SYStem.CPU CortexR52

SYStem.CADIconfig.RemoteServer *****

SYStem.CADIconfig.Traceconfig *****

SYStem.CADIconfig.TraceCore 1.

CORE.NUMber 1.

CORE.ASSIGN 1.

SYStem.CONFIG.ListCORE

SYStem.CONFIG.CORE "*** |cr52_core.cpu0"

SYStem.UP

Register.Set M 0x13

sYmbol.SourcePATH.SetRecurseDir

Data.LOAD.Elf /NoCODE

; set breakpoint to SVC (SWI) vector

Break.Set 0x08

; configure and open semihosting channel

TERM.HEAPINFO 0x6A202000 0x6A202FFF 0x6A203FFF 0x6A203000

TERM.METHOD armswi

TERM.Mode string

; open some windows

WinCLEAR

WinPOS 0% 0% 100% 48%

List.auto

WinPOS 0% 50% 50% 48%

Frame /Locals /Caller

WinPOS 50% 50% 50% 48%

TERM.GATE
```

below you will find the system information report

Company :

Prefix :

Firstname :

Surname :

Department :

Street :

P.O.Box :

City :

State :

ZIP :

Country :

CountryCode :

Telephone :

FAX :

EMAIL :

Serial No : L23050009924 (Cable L23050009924)

Product :

Target CPU : CortexR52

Hostsystem : Linux (x86_64)

Compiler :

Realtimekernel:

Interface : CADI Interface

Environment :

Date : 13. May 2024, 10:25:13

Diagnosis Tool: support.cmm 21830 2023-11-21 20:13:47Z hlohn

Maintenance : L23050009924 valid until 2024/05

User ID : t32

Host ID : 0. (00-00-00-00-00-00)

Host IP : 10.131.104.49

Host OS : Linux (x86_64) QT:5.12.8 LIBC:2.31.0

PodBus Chain : 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF

| -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --

Usemask : 0xFFFFFFFFFFFFFFFF

PowerView Vers: R.2023.09.000165015 (release compilation)

| 64-bit version of PowerView

Vers.Software2: TRACE32 for ARM

| Release Sep 2023 SP1 (64-bit)

| Software Version: R.2023.09.000165015

| Build: 162405--165015.

| ----------

| /installation/lauterbach/trace32/2023.09/bin/pc_linux64/t32screenqt5.so

| Nov 29 2023 QT5 Screen Driver (R.2023.09.000165015)

| Project : t32screenqt5

| LastChangedRev : 165015.

| LastChangedTime: 1701259200. (2023-11-29)

| Revision : 165015

| BaseRevision : 162405.

| RemoteAPI : 161819.

| EmuMciAPI : 0x8000000E

| PodBusDriver : 0x8169

| RepoURL : https://svn.intern.lauterbach.com/svn/t32/tags/cd/2023_09_release_sp1

| BuildTime : 1701221796. (2023-11-29T01:36:36Z)

| BuildHost : compile-server8

| BuildUser : baumeister

| BuildEnv : GCC 11.4.1 20231012 (Red Hat 11.4.1-9)

| /installation/lauterbach/trace32/2023.09/bin/pc_linux64/t32marm

| Nov 29 2023 PowerView for ARM (R.2023.09.000165015)

| Project : t32marm

| LastChangedRev : 165015.

| LastChangedTime: 1701259200. (2023-11-29)

| Revision : 165015

| BaseRevision : 162405.

| RemoteAPI : 161819.

| EmuMciAPI : 0x8000000E

| PodBusDriver : 0x8169

| RepoURL : https://svn.intern.lauterbach.com/svn/t32/tags/cd/2023_09_release_sp1

| BuildTime : 1701223810. (2023-11-29T02:10:10Z)

| BuildHost : compile-server8

| BuildUser : baumeister

| BuildEnv : GCC 11.4.1 20231012 (Red Hat 11.4.1-9)

| /installation/lauterbach/trace32/2023.09/help.t32

| Oct 10 2023 Help Index

Other Files :

| t32.men 2024/01/11 14:39:42 43852

| T32Start.exe missing! (/installation/lauterbach/trace32/2023.09/bin/windows)

| fcc.t32 2024/01/11 14:39:04 31864464

| help.t32 2024/01/11 14:39:04 24407200

| config.t32 2024/01/11 14:43:37 929

| user-preferences.cfg 2024/04/16 10:19:03 143 (/local/user/.trace32)

| autostart.cmm 2024/01/11 14:43:30 12895

| support_v21830.cmmx 2024/05/13 10:25:09 81560 (/var/tmp)

VERSION.ENV : OS: Linux (x86_64)

| ID: t32

| SYS: /installation/lauterbach/trace32/2023.09

| TMP: /var/tmp

| HELP: /installation/lauterbach/trace32/2023.09/pdf

| HELPIDX: /installation/lauterbach/trace32/2023.09/help.t32

| HOME: /local/user/

| UAD: /local/user/.trace32

| EXE: /installation/lauterbach/trace32/2023.09/bin/pc_linux64/t32marm

| CONFIG: /installation/lauterbach/trace32/2023.09/config.t32

| AUTOSTORE: /var/tmp/t32store.cmm

| LIBC: 2.31.0

| QT: 5.12.8

| RLM_LICENSE:5056@10.52.183.117

Host Version : Content of '/etc/lsb-release':

| 1 : DISTRIB_ID=Ubuntu

| 2 : DISTRIB_RELEASE=20.04

| 3 : DISTRIB_CODENAME=focal

| 4 : DISTRIB_DESCRIPTION="Ubuntu 20.04.6 LTS"

| Content of '/etc/os-release':

| 1 : NAME="Ubuntu"

| 2 : VERSION="20.04.6 LTS (Focal Fossa)"

| 3 : ID=ubuntu

| 4 : ID_LIKE=debian

| 5 : PRETTY_NAME="Ubuntu 20.04.6 LTS"

| 6 : VERSION_ID="20.04"

| 7 : HOME_URL="https://www.ubuntu.com/"

| 8 : SUPPORT_URL="https://help.ubuntu.com/"

| 9 : BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"

| 10 : PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"

| 11 : VERSION_CODENAME=focal

| 12 : UBUNTU_CODENAME=focal

AutoStart Log : Content of '/var/tmp/t32_t32marm_00_autostart.log':

| 1 : // LOG.DO, Started via /installation/lauterbach/trace32/2023.09/autostart.cmm, TRACE32 for ARM, GUI ID: t32, Date: 2024-05-07T11:43:55Z

| 2 : DO /installation/lauterbach/trace32/2023.09/autostart.cmm // (added by autostart.cmm)

| 3 : AutoSTOre /var/tmp/t32store.cmm

| 4 : ENDDO

Config. file : Content of '/installation/lauterbach/trace32/2023.09/config.t32':

| 1 : ;

| 11 :

User-Pref. : Content of '/local/user//.trace32/user-preferences.cfg':

| 1 : ; TRACE32 user preferences file

| 2 :

| 3 : Connection.Solution = "OTHER"

| 4 : Connection.Other.Interface = "CADI"

| 5 : Connection.CADI.Library.Path = "t32cadi.so"

Vers.Hardware2: CADI Interface

Symbols : 0.

Licenses : Serial:

| L23050009924 (t32.frontend.arm)

| Maintenance : Valid up to version 05/2024 based on License Client RLM14.2BL5

| Software Version:

| TRACE32 PowerView for ARM, R.2023.09.000165015

| Release 09/2023 SP1, Build 162405--165015.

| Floating License Status:

| 1. FRONTEND 't32.frontend.arm' (2023.09)

| received 't32.l23050009924.maint' (2024.05)

| source: RLM (OK) 10.52.183.117

version.t32 : Release Sep 2023 SP1

| Software Version : R.2023.09.000165015

| Build : 162405--165015.

| Compiled: Nov 29 2023 (09:39:17Z)

STOre SYStem : B::

| SYStem.RESet

| SYStem.CPU CortexR52

| SYStem.CONFIG CoreNumber 1.

| SYStem.CONFIG CORE 255.

| CORE.ASSIGN 1.

| SYStem.MemAccess Denied

| SYStem.CpuBreak Enable

| SYStem.CpuSpot Enable

| SYStem.CONFIG SLAVE OFF

| SYStem.CONFIG TAPState SELectDRscan

| SYStem.Mode Down

| SETUP.RADIX Hex

FLASH : B::

| FLASH.RESet

| 0x1303 Target flash algorithm information:

| FLASH.TARGET:

| No target flash algorithm declared

| FLASH.TARGET2:

| No target flash algorithm declared

| built-in flash algorithm:

| No target flash algorithm declared

| 2nd built-in flash algorithm:

| No target flash algorithm declared

Rrc.PowerViewT: 0x1f01 Enumerate Component Tree

| +-+ N:Root:Host UID:0 IDX:# TN:Root TID:1 RTN:Component RTID:0 (0x14)

| +-+ N:TargetSystem UID:0 IDX:# TN:TargetSystem TID:2 RTN:Component RTID:0 (0x14)

| | +-+ N:RTSTraceAnalysis UID:2 IDX:# TN:RTSTraceAnalysis TID:74 RTN:Component RTID:0 (0x10)

| | | +-- N:UID V:<0, 0x0> UID:2 IDX:# TN:int32_t TID:17 RTN:int32_t RTID:17 (0x410)

| | +-+ N:Chip UID:0 IDX:0 TN:Chip TID:3 RTN:Component RTID:0 LOCALE (0x12)

| | +-- N:LogOptions UID:6 IDX:# TN:Component TID:0 RTN:Component RTID:0 LOCALE (0x12)

| | +-+ N:ThreadCompound UID:0 IDX:254 TN:ThreadCompound TID:4 RTN:Component RTID:0 LOCALE (0x12)

| | | +-- N:SMPMode V:<1, 0x1> UID:4 IDX:# TN:uint8_t TID:11 RTN:uint8_t RTID:11 LOCALE (0x412)

| | | +-+ N:Core UID:0 IDX:0 TN:Core TID:5 RTN:Component RTID:0 LOCALE (0x12)

| | | | +-- N:CoreName V:<"CORTEXR52"> UID:0 IDX:# TN:string TID:41 RTN:string RTID:41 LOCALE (0x412)

| | | | +-- N:CoreSpecialName V:<""> UID:1 IDX:# TN:string TID:41 RTN:string RTID:41 LOCALE (0x412)

| | | +-- N:CPUName V:<"CortexR52"> UID:6 IDX:# TN:string TID:41 RTN:string RTID:41 LOCALE (0x412)

| | | +-- N:CPUArchName V:<"ARM"> UID:8 IDX:# TN:string TID:41 RTN:string RTID:41 LOCALE (0x412)

| | | +-- N:GUIIndex V:<0, 0x0> UID:10 IDX:# TN:uint32_t TID:13 RTN:uint32_t RTID:13 LOCALE (0x412)

| | | +-- N:GUISRClientID V:<0, 0x0> UID:11 IDX:# TN:uint32_t TID:13 RTN:uint32_t RTID:13 LOCALE (0x412)

| | +-+ N:CoresightTraceIDResMan UID:56 IDX:# TN:CSTraceIDResMan TID:251 RTN:CSTraceIDResMan RTID:251 LOCALE (0x12)

| | | +-- N:Used V: UID:1 IDX:# TN:Or_Junction_0 TID:38 RTN:Or_Junction_0 RTID:38 LOCALE (0x412)

| | | +-- N:Protocol V: UID:2 IDX:# TN:uint32_t TID:13 RTN:uint32_t RTID:13 LOCALE (0x412)

| | +-+ N:NexusTraceIDResMan UID:86 IDX:# TN:CSTraceIDResMan TID:251 RTN:CSTraceIDResMan RTID:251 LOCALE (0x12)

| | +-- N:Used V: UID:1 IDX:# TN:Or_Junction_0 TID:38 RTN:Or_Junction_0 RTID:38 LOCALE (0x412)

| | +-- N:Protocol V: UID:2 IDX:# TN:uint32_t TID:13 RTN:uint32_t RTID:13 LOCALE (0x412)

| +-+ N:GUIS UID:3 IDX:# TN:GUIS TID:45 RTN:Component RTID:0 (0x14)

| +-+ N:GUI UID:0 IDX:0 TN:GUI TID:46 RTN:Component RTID:0 (0x10)

| +-- N:MainWindowTitle V:<"TRACE32 PowerView for ARM"> UID:0 IDX:# TN:string TID:41 RTN:string RTID:41 (0x410)

| +-- N:ClientID V:<0, 0x0> UID:1 IDX:# TN:uint32_t TID:13 RTN:uint32_t RTID:13 (0x410)

Rrc.PowerViewX: <?xml version="1.0" encoding="UTF-8" standalone="yes"?>

|

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| UID V:(0, 0x0) UID:2 IDX:NONE

|

|

| LogOptions UID:6 IDX:NONE

|

| SMPMode V:(1, 0x1) UID:4 IDX:NONE

|

| CoreName V:("CORTEXR52") UID:0 IDX:NONE

| CoreSpecialName V:("") UID:1 IDX:NONE

|

| CPUName V:("CortexR52") UID:6 IDX:NONE

| CPUArchName V:("ARM") UID:8 IDX:NONE

| GUIIndex V:(0, 0x0) UID:10 IDX:NONE

| GUISRClientID V:(0, 0x0) UID:11 IDX:NONE

|

|

| Used V:(L:T G:T NUM:1 SUM:1) UID:1 IDX:NONE

| Protocol V:(CORESIGHT (0, 0x0)) UID:2 IDX:NONE

|

|

| Used V:(L:T G:T NUM:1 SUM:1) UID:1 IDX:NONE

| Protocol V:(NEXUS (1, 0x1)) UID:2 IDX:NONE

|

|

|

|

|

| MainWindowTitle V:("TRACE32 PowerView for ARM") UID:0 IDX:NONE

| ClientID V:(0, 0x0) UID:1 IDX:NONE

|

|

|

END

Many thanks for your help

Best Regards

Frederic

H **HUGUET**
2 years ago
Sorry for the bad message formatting