QC Trace Collector

Software User Guide

1VV0301609 Rev. 6 – 2022-10-13

Telit Technical Documentation

APPLICABILITY TABLE

PRODUCTS
1.13.x-y

CONTENTS

1. INTRODUCTION

1.1. Scope

This document describes how to use qc_trace_collector, Telit tool for collecting Qualcomm-based modems debug traces.

1.2. Audience

This document is intended for Telit customers using Qualcomm-based modems who need to collect modem debug traces and coredumps.

1.3. Contact Information, Support

For general contact, technical support services, technical questions and report of documentation errors contact Telit Technical Support at:

- *TS-EMEA@telit.com*
- *TS-AMERICAS@telit.com*
- *TS-APAC@telit.com*
- *TS-SRD@telit.com*
- *TS-ONEEDGE@telit.com*

Alternatively, use:

http://www.telit.com/support

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates the user feedback on our information.

1.4. Symbol Convention

	**Danger:** This information MUST be followed, or catastrophic equipment failure or personal injury may occur.
	**Warning:** Alerts the user on important steps about the module integration.
	**Note/Tip:** Provides advice and suggestions that may be useful when integrating the module.
	**Electro-static Discharge:** Notifies the user to take proper grounding precautions before handling the product.

Table 1: Symbol Conventions

All dates are in ISO 8601 format, that is. YYYY-MM-DD.

1.5. Related Documents

- Telit Modules Linux USB Drivers User Guide, 1VV0301371
- Telit WHQL Drivers Installer User Guide, 1VV0301360
- Telit USB Drivers Installer User Guide, 1VV0301164
- Linux PCIe EP Drivers Software User Guide, 1VV0301697
- Telit PCIe EP Drivers Installer Software User Guide, 1VV0301669

2. SETUP

2.1. Overview

qc_trace_collector is a command line tool for collecting Qualcomm based modules debug traces. The tool takes as an input the debug mask (in dmc format) and produces a file readable with QXDM 5. Contact Telit Customer Support to receive the correct debug mask for collecting the traces.

qc_trace_collector is available both for Linux (source code and x64 deb) and Windows (source code and x64 binary). The tool expects the module drivers to be properly in place: refer to the related operating system Drivers User Guide for further details.

Warning: QC Trace Collector source code is released under NDA.

2.2. Package Content

The source code package has the following content:

- **qc_trace_collector**: QC trace collector source code directory
- **telit_os_abstraction_library**: operating system abstraction library source code directory

2.3. Building QC Trace Collector

2.3.1. Linux

Open a shell in the root directory of qc_trace_collector release and type:

```
$ make
```

Executable is available inside directory **qc_trace_collector/linux**

By default, qc_trace_collector requires libudev-dev to implement the automatic device identification. To disable this feature and avoid the need for libudev-dev modify the top Makefile, changing line:

```
make -C telit_os_abstraction_layer static LIBUSB=disable
```

to:

```
make -C telit_os_abstraction_layer static LIBUSB=disable
LIBUDEV=disable
```

2.3.2. Windows

Open a Visual Studio Native Tools Command Prompt in the root directory of qc_trace_collector release and type:

```
> make
```

Executable is available inside directory **qc_trace_collector\windows**

2.3.3. Android

Unpack the release archive into the directory vendor/telit of the Android tree and add to the PRODUCT_PACKAGES directive the following item:

```
qc_trace_collector
```

3. USAGE

3.1. Default Behavior

By default, qc_trace_collector is built with automatic identification of the device diagnostic port.

Command line arguments to modify this behavior are available (see paragraph 3.2).

To start the tool for collecting both traces and coredumps, the following command line can be used:

```
$ qc_trace_collector --dmc PATH_TO_DMC_FILE
```

The tool will continue taking traces and coredumps until SIGINT is sent (or an unrecoverable error happens).

The output of the tool when collecting traces is one (or more) file(s) named:

```
[PREFIX]_START DATE[_SEQ NUMBER]_END DATE.qmdl
```

e.g.

```
190618-152420_190618-152600.qmdl
```

The output of the tool when collecting core-dumps is a set of modem images inside a directory named:

```
core_dump_START DATE
```

e.g.

```
core_dump_190618-152654
```

3.2. Command Line Arguments

The following command line arguments are available to modify qc_trace_collector default behavior:

Long Argument	Short Argument	Purpose
--port	-p	Indicates the operating system device to be used for collecting traces/coredumps. Needed in the following scenarios: • Automatic device identification is disabled (e.g. Android)

		• Automatic device identification is not properly working • Modem PID is not supported • Remote trace collection using a socket as device in the form TCP:ADDRESS:PORT The diagnostic port of the composition should be used. When using this flag, the tool needs to be instructed to collect traces (with flag --traceonly) or core-dump (with flag --coreonly).
--dmc	-m	Path of the debug mask dmc file. This flag is mandatory when collecting traces from a local device. It should not be used in the following scenarios: • Collecting traces from socket • Collecting coredumps
--size	-s	Indicates an optional maximum size in MB of the trace files. If this size is reached, the tool will create a new file.
--prefix	-x	Indicates an optional trace files name prefix.
--path	-o	Indicates an optional path where trace files are saved (in Windows the trailing backslash should not be added).
--tcp	-t	Mandatory tcp port for remote tracing (not supported for coredumps).
--traceonly	-l	Instructs the tool to collect only traces.
--coreonly	-c	Instructs the tool to collect only coredumps.
--debug	-d	Enables debug logs for the tool.
--dmctobin	-b	Creates dumps of the single requests sent to the modem according to the debug mask file, then ends.
--json	-j	Print output in JSON format, see paragraph 3.4. This flag enables also --report
--report	-r	Print a final report in JSON format, see paragraph 3.4.
--no-hdlc		Force NO-HDLC protocol. Needed in the following scenarios: • Automatic device identification is disabled (e.g. Android) and modem platform is MDM9205 • Flag --port and one of --traceonly, --coreonly or --tcp are set with a MDM9205 modem
--force-hdlc		Force HDLC protocol (already default for all modems but MDM9205).

Table 2: command line arguments description

3.3. Usage Examples

Following a set of common usage examples.

- Trace and coredump collection with automatic device recognition

```
$ qc_trace_collector --dmc ./default_debug.dmc
```

- Trace only collection with automatic device recognition

```
$ qc_trace_collector --traceonly --dmc ./default_debug.dmc
```

- Coredump only collection with automatic device recognition

```
$ qc_trace_collector --coreonly
```

- Trace only collection with port overriding (no automatic device recognition)

```
$ qc_trace_collector --traceonly --port /dev/ttyUSB0 --dmc
./default_debug.dmc
```

- Trace collection with maximum size of 15MB for trace files

```
$ qc_trace_collector --dmc ./default_debug.dmc -s 15
```

- Trace collection through socket: two instances of the tool are needed, the local one running in the system where the modem is connected to and the remote one, running in the system where the trace files are to be saved. The local instance should be run with the additional flag --tcp for specifying the socket port:

```
$ qc_trace_collector --dmc ./default_debug.dmc --tcp 2000
```

- The remote instance should use only the flag --port to specify the socket:

```
$ qc_trace_collector --port TCP:10.255.252.20:2000
```

3.4. JSON Output

The JSON output of qc_trace_collector is a series of JSON messages separated by <CR><LF> written to the standard output. Following the description of the messages.

Warning: JSON output mode should be used for redirection to a file or inter-process communication: if it is printed to a shell, the process could be significantly slowed down.

3.4.1. LOG

Generic log message, with the following schema:

```
{
 "$id": "https://www.telit.com/tosal/log.json",
```

```
 "$schema": "http://json-schema.org/draft-07/schema#",
 "title": "LOG",
 "description": "Generic log message",


 "type": "object",
 "properties": {
    "timestamp": { "type": "string", "description": "time of arrival of the log line" },
    "type": { "type": "string", "description": "LOG" },
    "severity": { "type": "string", "description": "severity of the message, among the following values INF, DBG, WRN, ERR" },
    "file": { "type": "string", "description": "file the logged function belongs to" },
    "function": { "type": "string", "description": "file the logged function belongs to" },
    "line": { "type": "integer", "description": "number of the log line" },
    "msg": { "type": "string", "description": "content of the log" }
 }
}
```

Example:

```
{
  "timestamp": "1584088182.280029493",
  "type": "LOG",
  "severity": "INF",
  "file": "../boot.c",
  "function": "enter_boot_mode",
  "line": 780,
  "msg": "[+] enter boot mode OK"
}
```

3.4.2. PROGRESS

Indication of progress in an operation run by the application, with the following schema:

```
{
 "$id": "https://www.telit.com/tosal/progress.json",
 "$schema": "http://json-schema.org/draft-07/schema#",
 "title": "PROGRESS",
```

```
 "description": "Indication of progress in an operation",

 "type": "object",
 "properties": {
    "timestamp": { "type": "string", "description": "time of arrival of the log line" },
    "type": { "type": "string", "description": "PROGRESS" },
    "current": { "type": "string", "description": "absolute progress number" },
    "max": { "type": "string", "description": "maximum value that the progress number can reach (could be null if not applicable)" },
    "percent": { "type": "string", "description": "percentage of completion (could be null if not applicable)" },
    "description": { "type": "string", "description": "a description of the progress value (e.g. the measure unit if applicable)" }
 }
}
```

Example:

```
{
  "timestamp": "1584088190.572785424",
  "type": "PROGRESS",
  "current": "12345",
  "max": "65536",
  "percent": "18",
  "description": "downloaded bytes"
}
```

3.4.3. FILE

Indication of a file related event, with the following schema:

```
{
 "$id": "https://www.telit.com/tosal/qc_trace_collector/file.json",
 "$schema": "http://json-schema.org/draft-07/schema#",
 "title": "FILE",
 "description": "Indication of a file related event",

 "type": "object",
 "properties": {
```

```
    "timestamp": { "type": "string", "description": "time of arrival of the log line" },
    "type": { "type": "string", "description": "FILE" },
    "file_saved": { "type": "string", "description": "name of the file for which the event happened" },
    "description": { "type": "string", "description": "file description" }
 }
}
```

Example:

```
{
  "timestamp": "1586169769.999590537",
  "type": "FILE",
  "saved_file": "../dmc/Default.dmc.bin",
  "description": "dmc to bin file"
}
```

3.4.4. REPORT

Final report of the application, with the following schema:

```
{
 "$id": "https://www.telit.com/tosal/qc_trace_collector/report.json",
 "$schema": "http://json-schema.org/draft-07/schema#",
 "title": "REPORT",
 "description": "Final report",

 "type": "object",
 "properties": {
    "timestamp": { "type": "string", "description": "time of arrival of the log line" },
    "type": { "type": "string", "description": "REPORT" },
    "tot_bytes": { "type": "integer", "description": "total number of traced bytes" },
    "core_dumps_num": { "type": "integer", "description": "total number of core dumps collected" },
    "last_error": { "type": "integer", "description": "last error code" }
 }
}
```

Example:


```
{
  "timestamp": "1584088388.863679857",
  "type": "REPORT",
  "tot_bytes": 267640981,
  "core_dumps_num": 1,
  "last_error": -5
}
```

4. TROUBLESHOOTING

4.1. Debug Information Retrieval

When contacting customer support for help on troubleshooting issues, please make sure to carefully describe the scenario and provide the following logs:

- application output in debug mode
- kernel log

Tip: To have better support and solve the issue quickly, please follow these guidelines when collecting logs:

- Don't mix different issues in a single log
- Don't mix different runs of the same issue
- If the log is huge, provide an indication on the timing of the issue
- Provide a brief description of scenario captured in the logs

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Make sure the use of this product is allowed in your country and in the environment required. The use of this product may be dangerous and has to be avoided in areas where:

- it can interfere with other electronic devices, particularly in environments such as hospitals, airports, aircrafts, etc.
- there is a risk of explosion such as gasoline stations, oil refineries, etc. It is the responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conformed to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible for the functioning of the final product. Therefore, the external components of the module, as well as any project or installation issue, have to be handled with care. Any interference may cause the risk of disturbing the GSM network or external devices or having an impact on the security system. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed carefully in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm). In case this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

The equipment is intended to be installed in a restricted area location.

The equipment must be supplied by an external specific limited power source in compliance with the standard EN 62368-1:2014.

The European Community provides some Directives for the electronic equipment introduced on the market. All of the relevant information is available on the European Community website:

https://ec.europa.eu/growth/sectors/electrical-engineering_en

6. GLOSSARY

QC	Qualcomm
USB	Universal Serial Bus

7. DOCUMENT HISTORY

Revision	Date	Changes
6	2022-10-13	Updated to 1.13.0-0 Added --no-hdlc and --force-hdlc flags
5	2022-03-29	Updated to 1.12.0-0
4	2021-10-11	Added document 1VV0301669 to the Related Document list
3	2021-05-07	New document template and document reorganization Removed --cfg flag
2	2021-01-21	Added --cfg flag
1	2020-04-14	Added --json and --report descriptions Added JSON paragraph
0	2021-01-21	First issue

From Mod.0817 rev.1

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