The most important thing we build is trust

ADVANCED ELECTRONIC SOLUTIONS | AVIATION SERVICES | COMMUNICATIONS AND CONNECTIVITY | MISSION SYSTEMS

CN-003 Export TM500 Logs (EXT-MUE GUI)

June 2016

Connected – Seamless – Wireless

主要内容

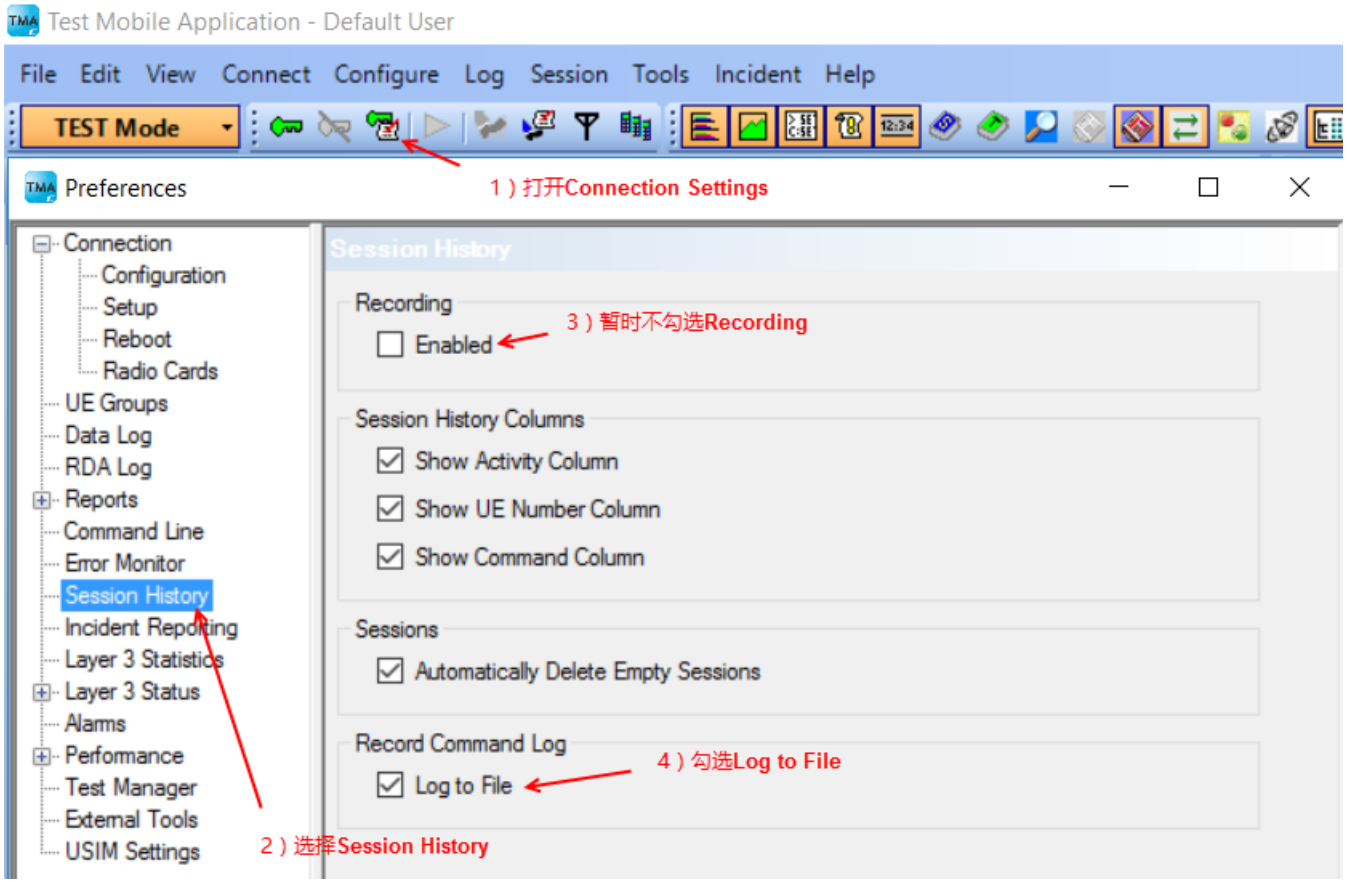
- 配置TMA Preferences
- 基本TM500 logs
- 如何抓取基本TM500 logs
- 进阶TM500 logs
- TM500帮助文档

配置TMA Preferences

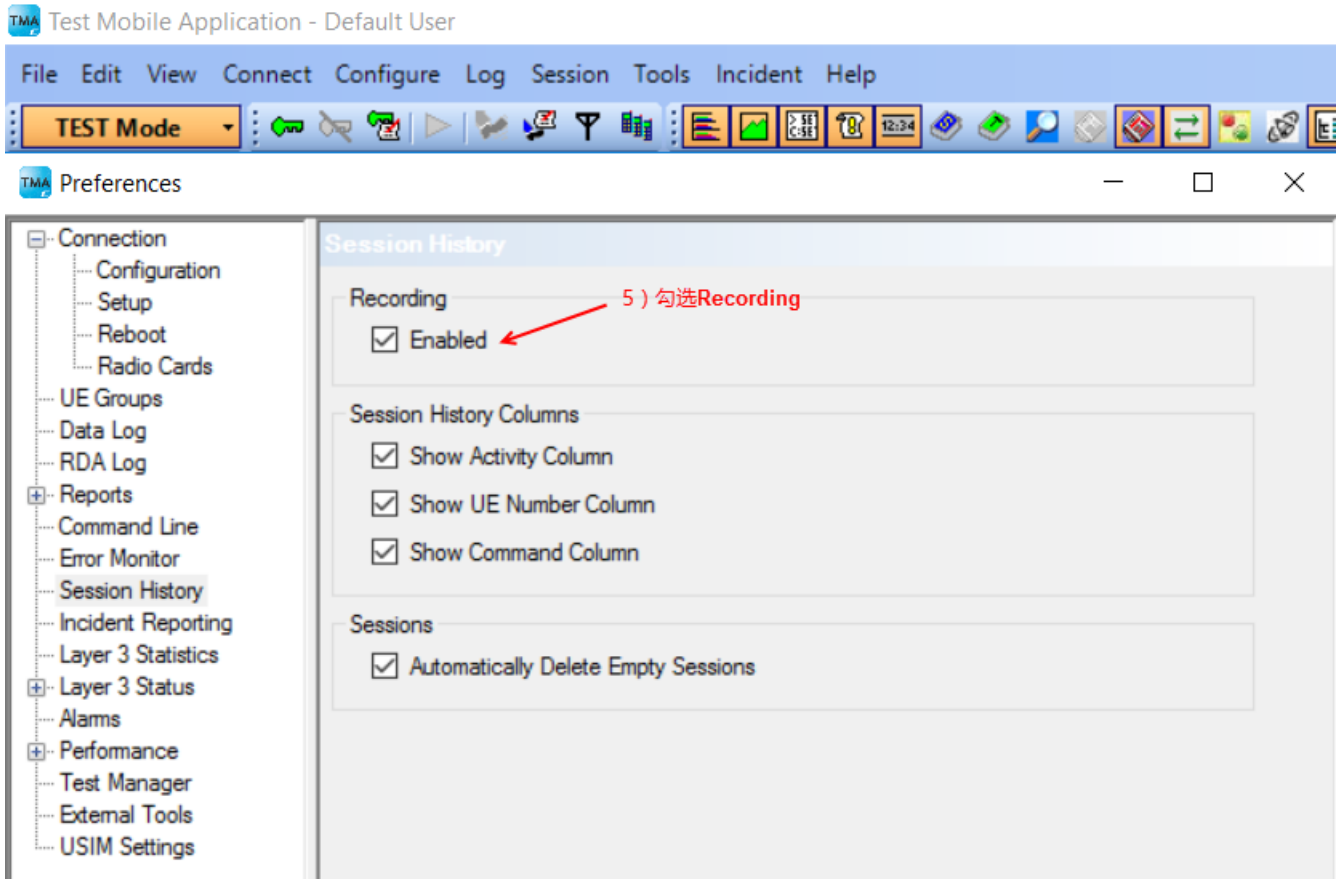
- 配置Session History
- 配置Incident Reporting
- 配置Reboot

配置Session History

- 如图步骤1至5所示配置Session History，同时使能Log to File和Recording.



配置Session History

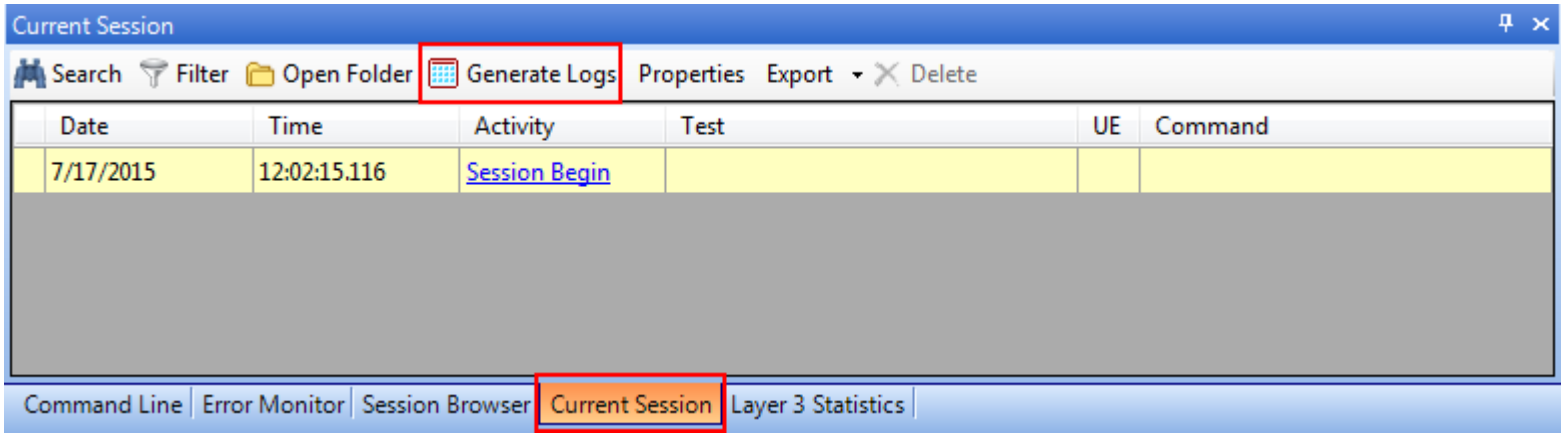


- **Log to File**: Command Line log以文本格式保存，文件保存在Current Session所在文件夹的根目录下。
  - 优点：测试过程中可以通过文本编辑工具随时直接查看文件内容；

配置Session History

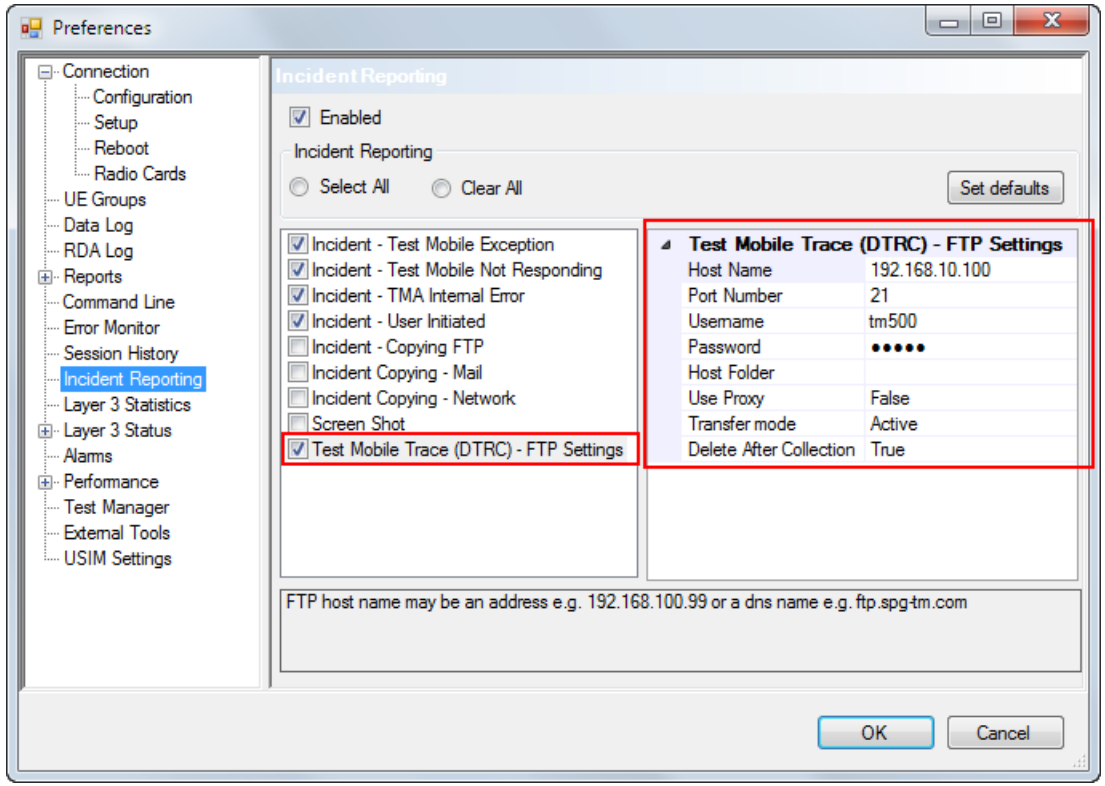
- 缺点：无法完整过滤出某个UE对应的所有Command Line log。

- **Recording**: Command Line log以.xml格式保存，文件保存在Current Session所在的文件夹的SessionHistory子文件夹下。
  - 优点：方便过滤过某个UE对应的所有Command Line log ；
  - 缺点：需要通过Current Session -> Generate Logs把Command Line log由.xml格式转换为文本格式（.log），以方便查看。



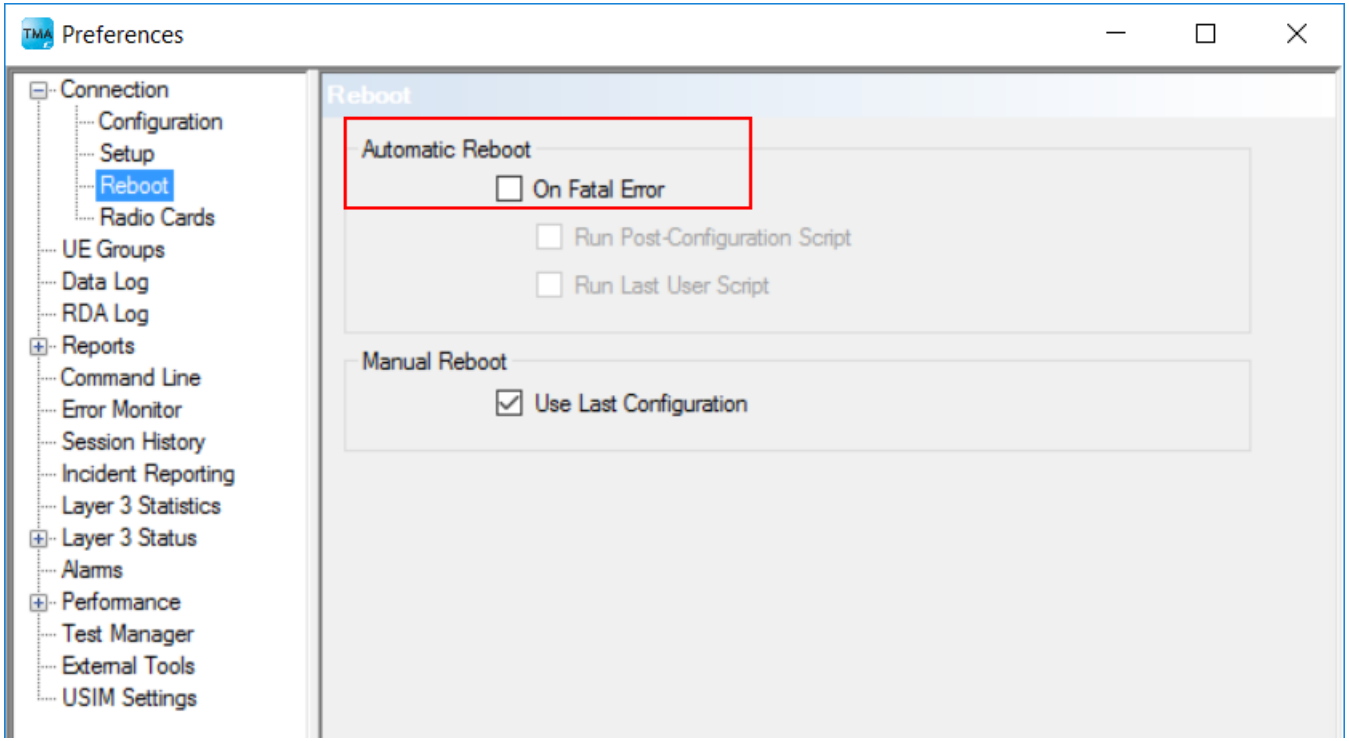
配置Incident Reporting

- Test Mobile Trace (DTRC) – FTP Settings
  - Host Name: TM500控制电脑IP.
  - Username/Password: TM500（或FileZilla Server）配置的用户名和密码，默认值*tm500/tm500*。



配置Reboot

- 不要勾选Automatic Reboot On Fatal Error.

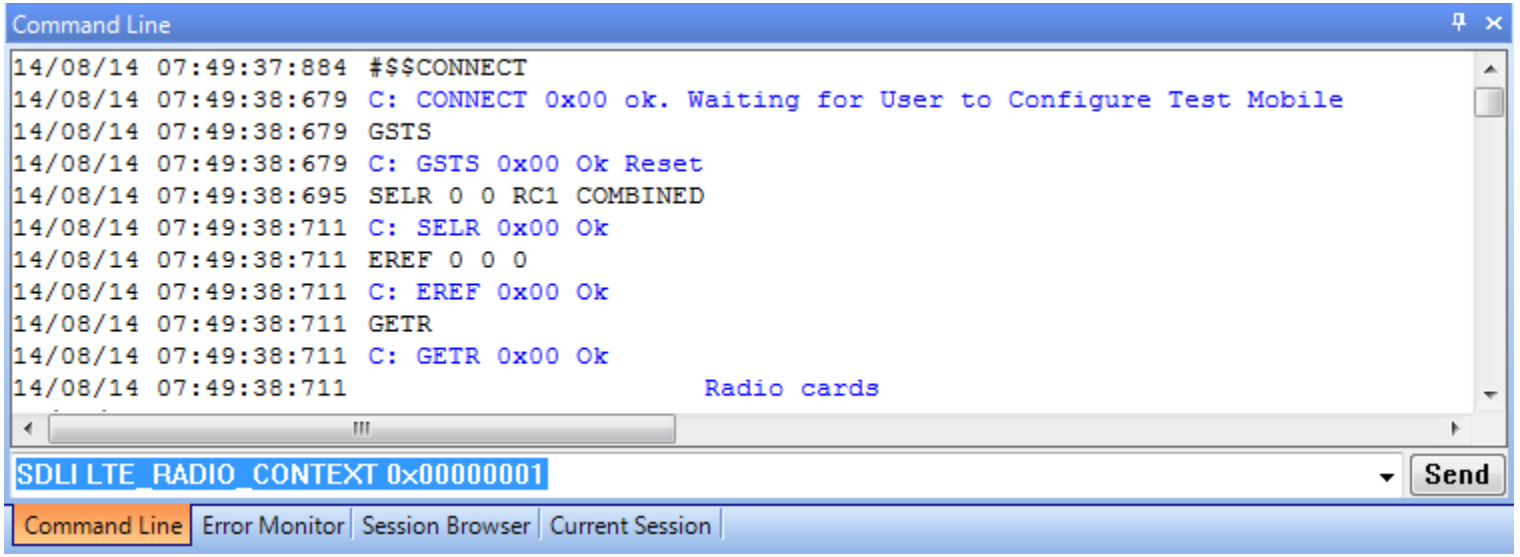


基本TM500 logs

- Command Line log
- Measurement log (GUI log)
- Serial log
- Dump Trace (DTRC log)

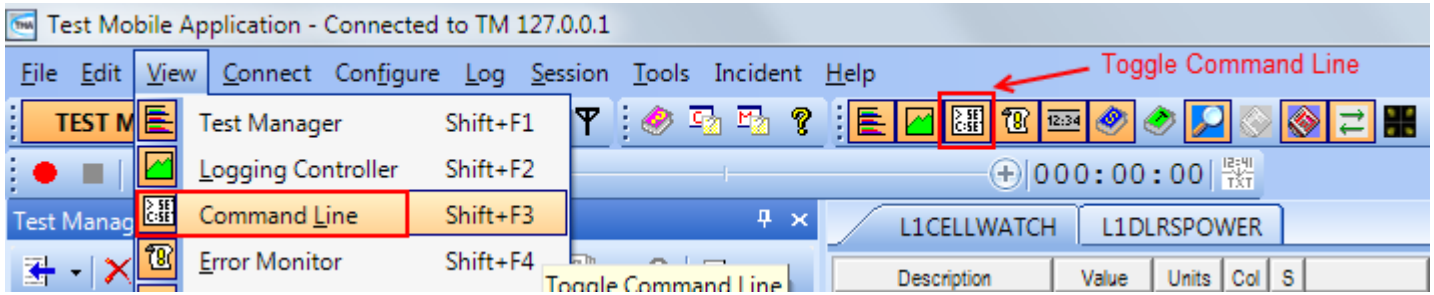
Command Line log

- Command Line log是运行脚本时，由TM500 控制电脑发送给TM500的所有命令，以及由TM500返回的响应或指示。
- 测试过程中，可以在Command Line窗口实时看到log。

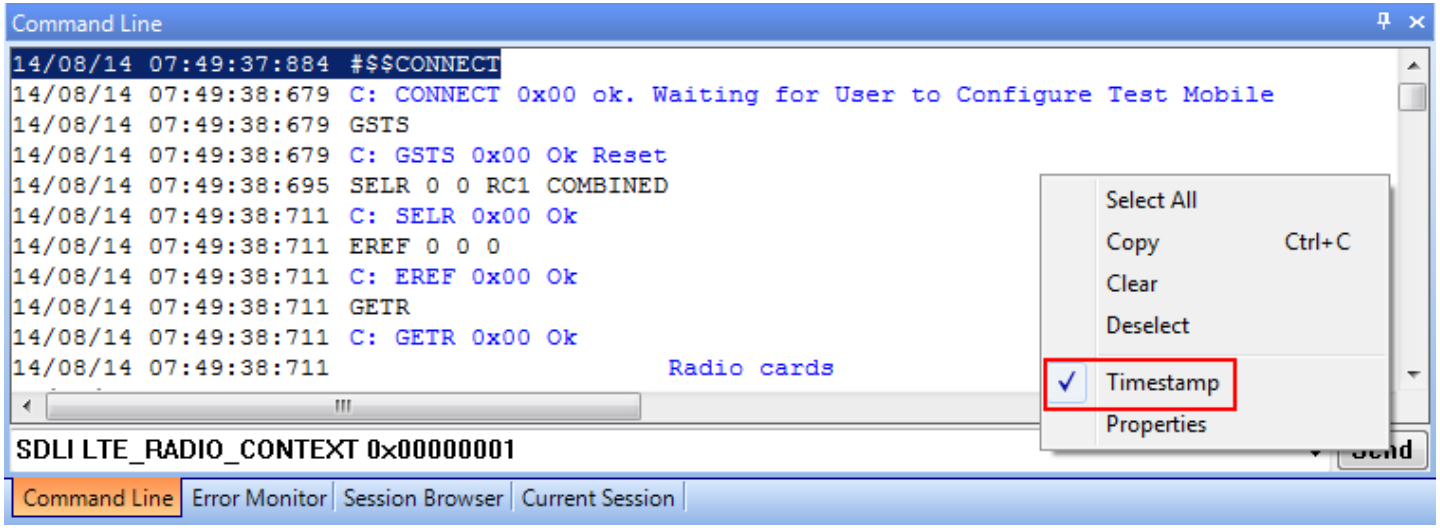


Command Line log

- 如果Command Line窗口在TMA界面未显示的话，请通过菜单栏或是快捷方式打开。



- 请确保Command Line窗口的时间戳是打开的，点击右键可以确认。

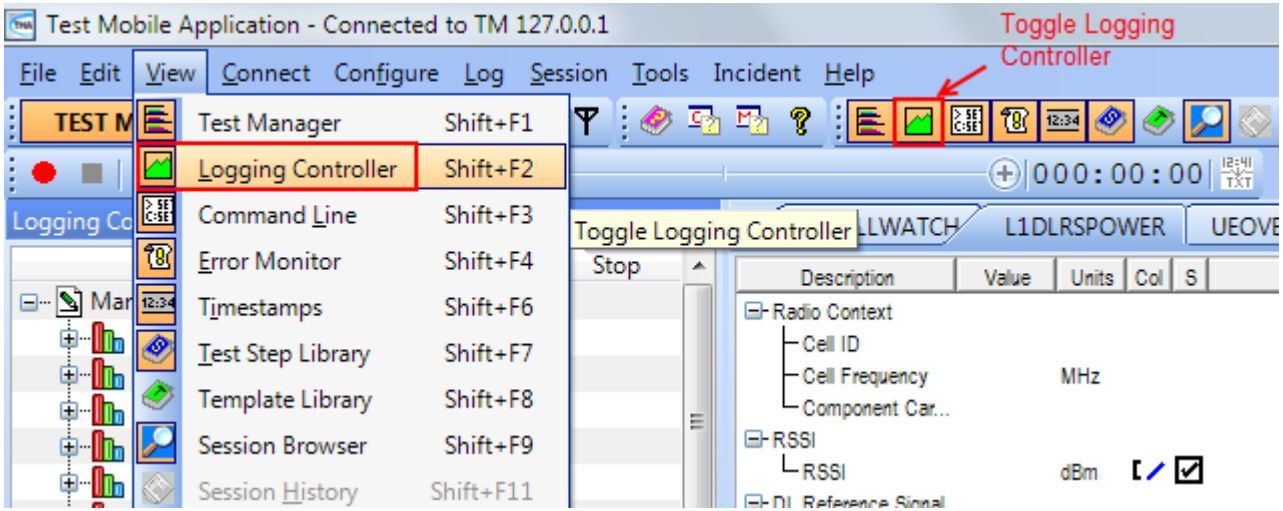


Command Line log

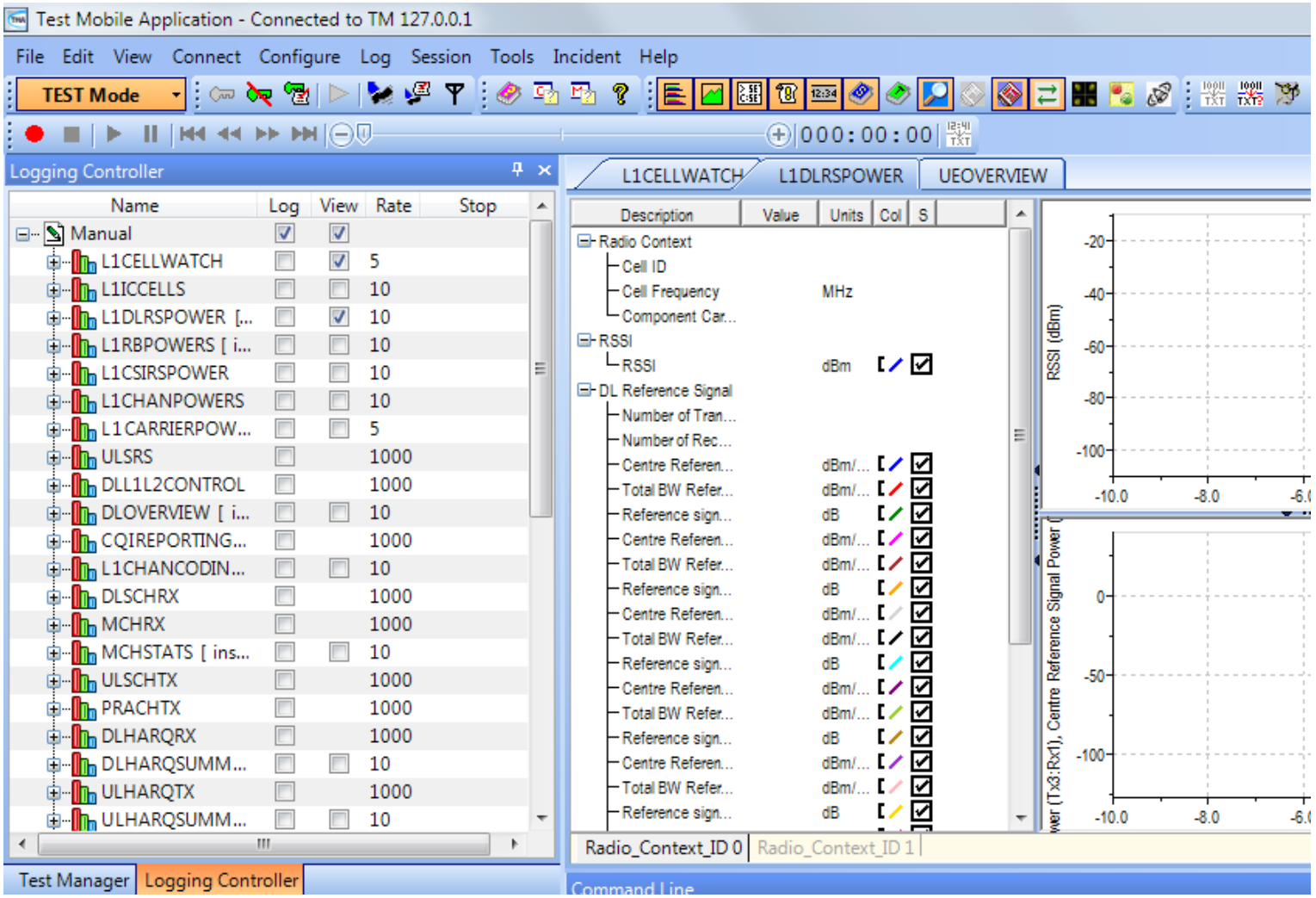
- 关于每个TM500命令对应参数的含义，请参阅TM500 Command Reference Manual。

Measurement log

- Measurement log用于测试过程中实时记录或查看调度和统计信息；log可转换为.log或.csv的格式，用于线下分析。
- 打开Logging Controller。



Measurement log



Measurement log

- 必选SUE/MUE log
  - L1CELLEATCH, L1DLRSPOWER, L1RBPOWERS, PRACHTX, CQIREPORTING, DLL1L2CONTROL, DLSCHRX, DLHARQRX, ULSCHTX, ULHARQTX, MACTX, MACRX, UEOVERVIEW, Protocol log.
- 可选SUE/MUE log
  - MACRXSTATS, MACTXSTATS, RLCRXSTATS, RLCTXSTATS, PDCPRXSTATS, PDCPTXSTATS.
  - SYSOVERVIEW (MUE only).
- 每个log的含义及其所能抓取的信息，请参考TM500 Measurement Reference Manual。

Measurement log

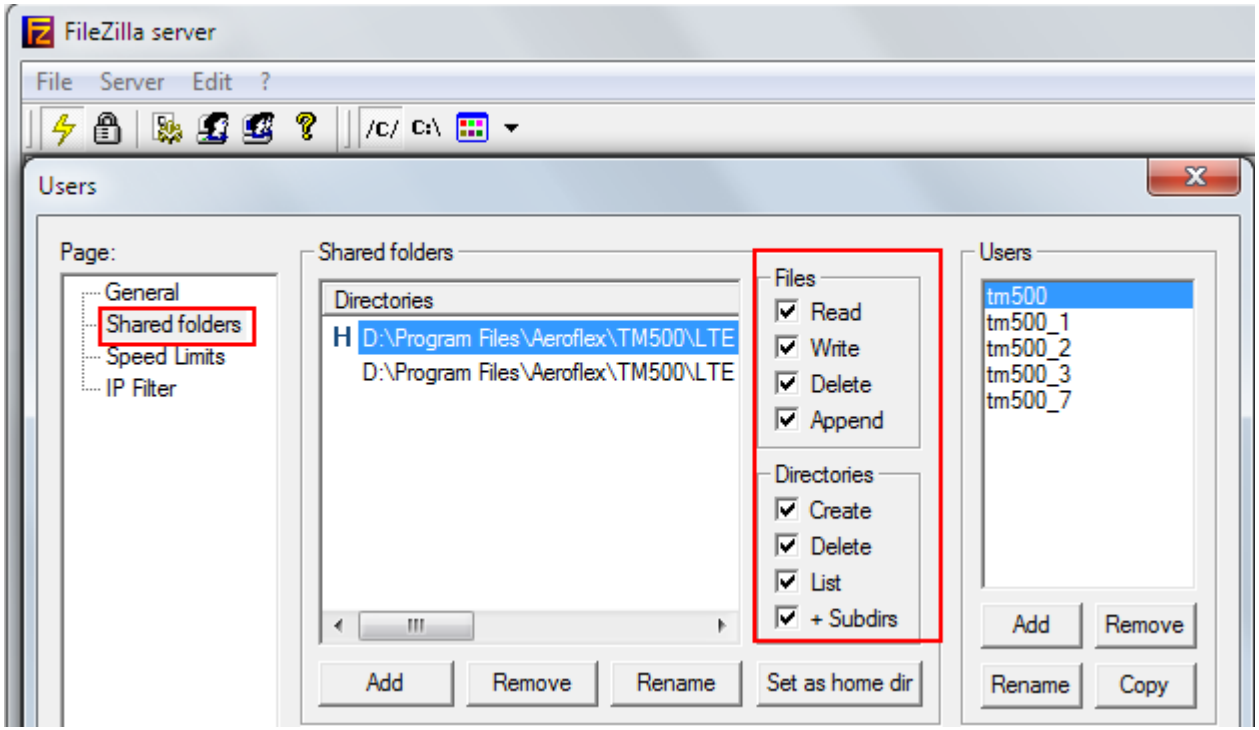
- 必选CUE log
  - L1CELLWATCH, SYSOVERVIEW, Protocol log.
- 可选CUE log
  - L1DLSTATS, L1ULSTATS, MACRXSTATS, MACTXSTATS, RLCRXSTATS, RLCTXSTATS, PDCPRXSTATS, PDCPTXSTATS, L1CELLDLOVERVIEW, L1CELLDLCARRIEROVERVIEW, L1CELLULOVERVIEW, L1CELLULCARRIEROVERVIEW, THROUGHPUT3D, CARRIERTHROUGHPUT3D, RRCSTATS, NASSTATS, RACHSTATS.
  - Functional Testing Logging
    - 最新的CUE新增了类似SUE/MUE的TTI级别的logging，最多支持前32个UE，默认最长抓取10分钟后自动停止，可以通过（*TMA Preferences -> Data Log -> Functional Test Logging*）配置。
      - L1L2FTL
      - L1DLRSPOWER, CQIREPORTING, DLL1L2CONTROL, DLSCHRX, DLHARQRX, ULSCHTX, ULHARQTX, MACTX, MACRX, UEOVERVIEW

Serial log

- Serial log记录TM500运行过程中的调试信息。
- 最好从TM500上电开始抓取Serial log。
- 请参阅”CN-005-TM500_Serial_Log_MK3.pptx”， 了解串口log的抓取方法。

Dump Trace

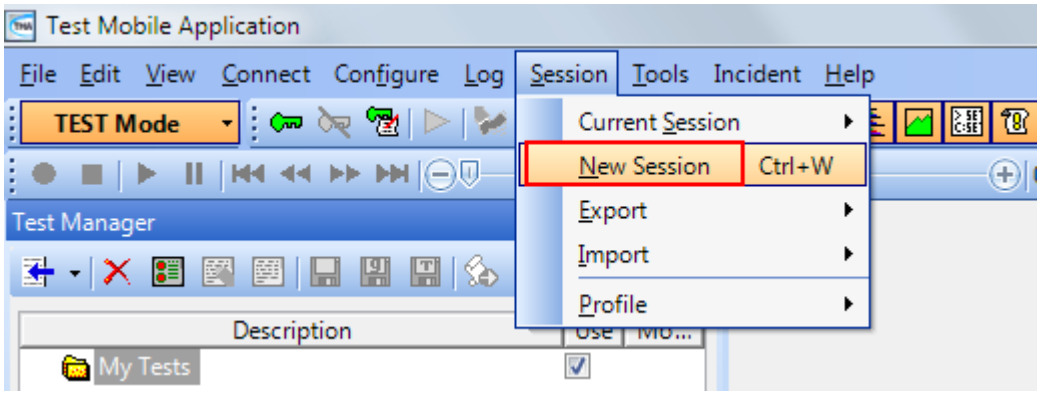
- 当TM500出现ASSERT (crash)时，通过Dump Trace导出内存数据用于后续分析。
- 打开FileZilla Server，确保*ftp_root*对应*Files*和*Directories*的所有选项都已勾上。



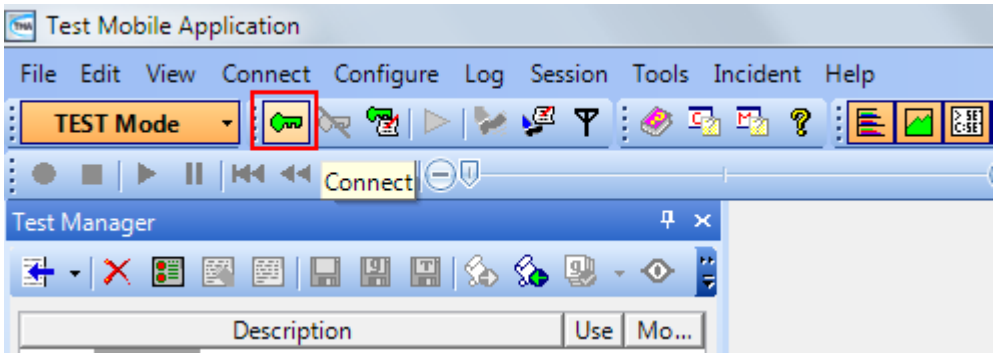
如何抓取基本TM500 logs

如何抓取TM500 logs

- 1) 连接TM500之前，请先New Session.

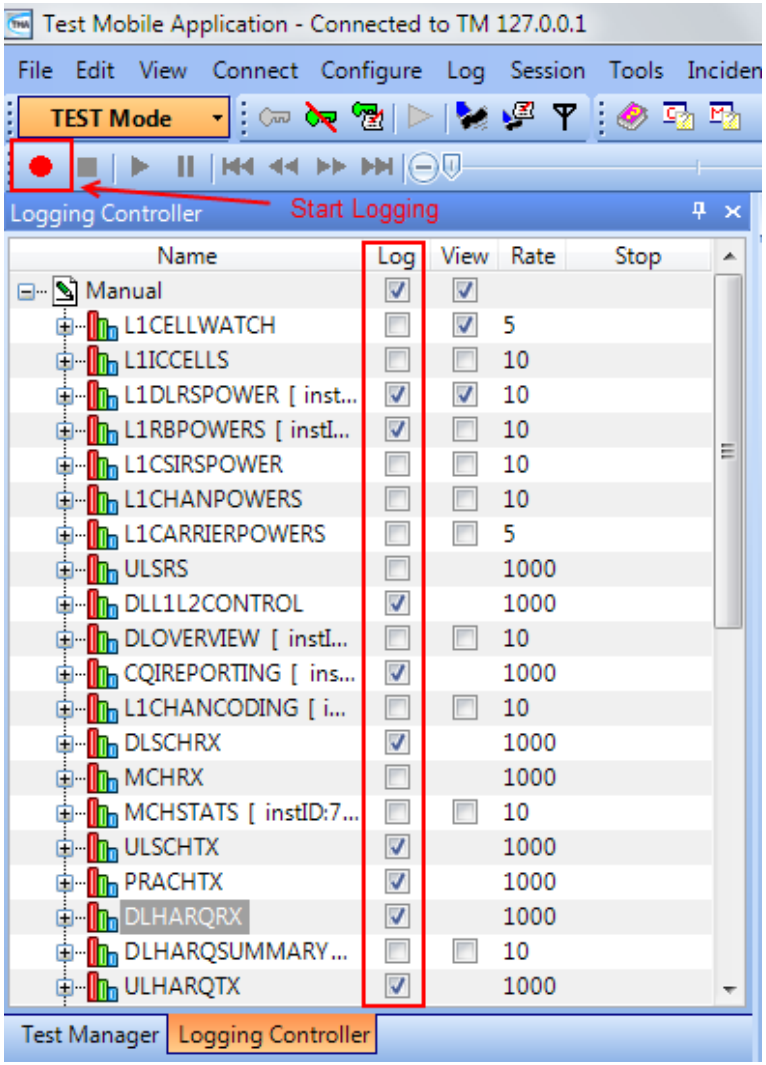


- 2) 点击绿色小钥匙连接TM500.



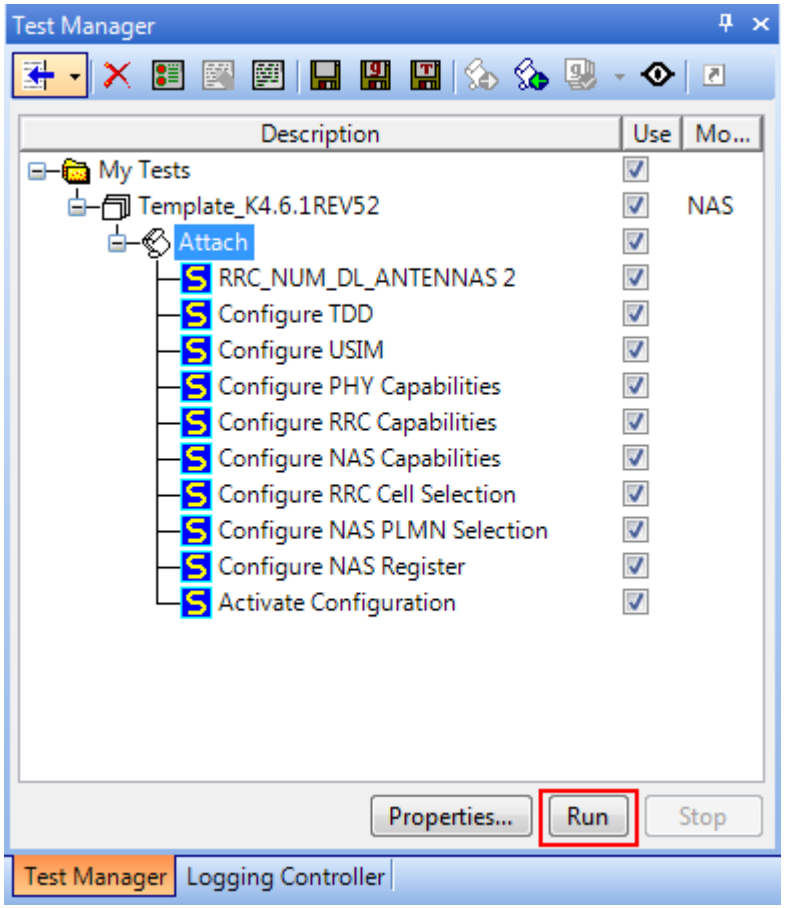
如何抓取TM500 logs

- 3) 选择所需抓取的log选项，然后点击红色圆形按钮开始抓取log。



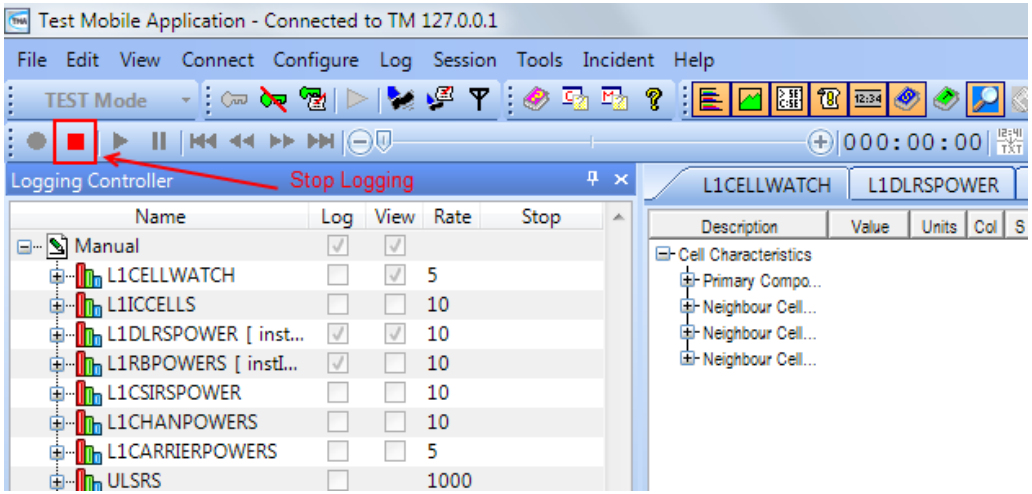
如何抓取TM500 logs

- 4) 运行TM500脚本。

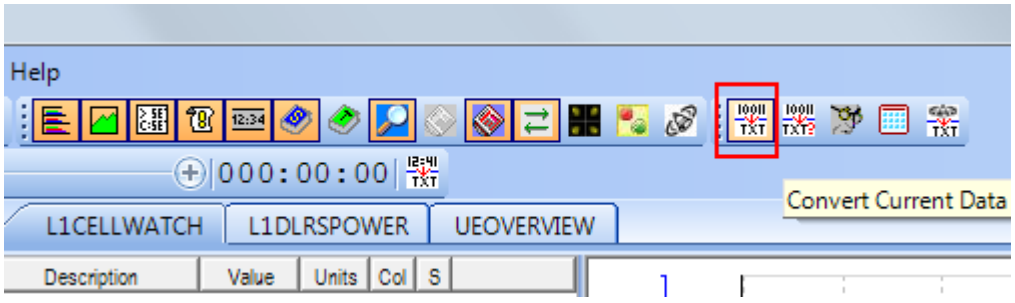


如何抓取TM500 logs

- 5) 测试完成后，点击方形红色按钮停止抓取log。



- 6) 点击“Convert Current Data”转换log为.csv格式。



如何抓取TM500 logs

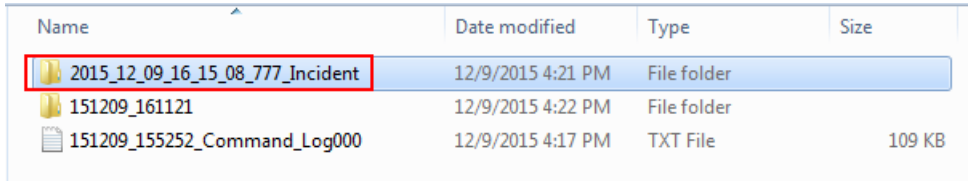
- 7) 如果测试过程中，Command Line窗口打印ASSERT，例如：

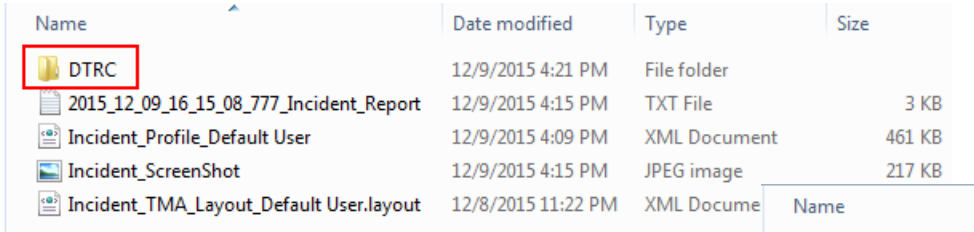
  24/02/14 11:29:28:287 I: ERNO 0x00000002 0x00000000 0x00000000 Assert Fail: "

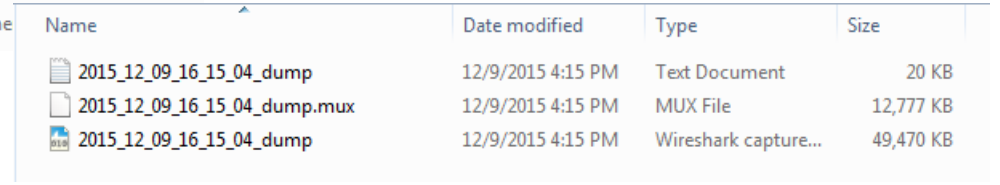
  24/02/14 11:29:28:287 >>>Remote Node Assert:

  *24/02/14 11:29:28:287 "*** DSP 13.0 ASSERTED:*
  *..\lte_dsp_app\dl_srp\code\dl_srp_ctrl_scheduler.c, 1416: DL SRP scheduler: Channel estimate queue overflow., Assert param: 0x00000003 ***""*

  – TM500将自动发送命令抓取DTRC log，并保存在Current Session所对应的文件夹，例如：







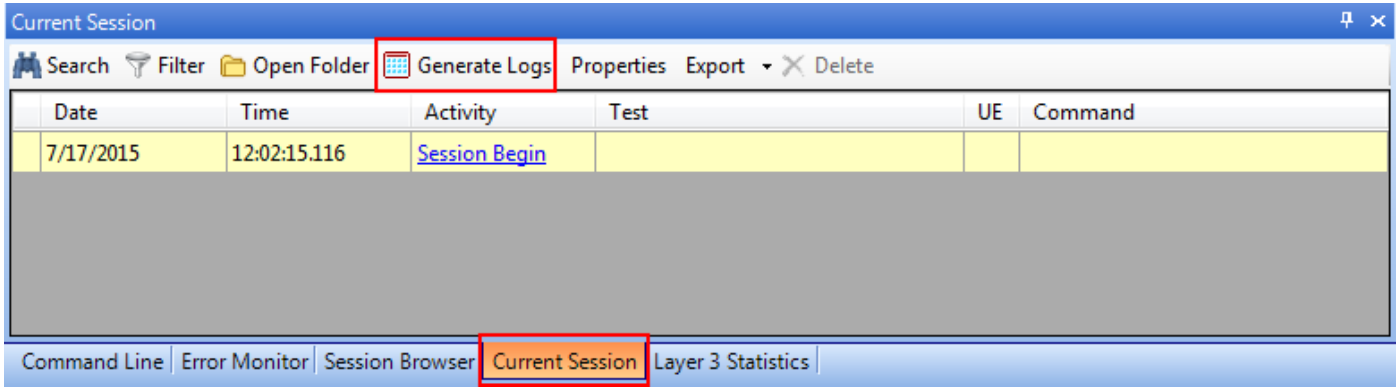
如何抓取TM500 logs

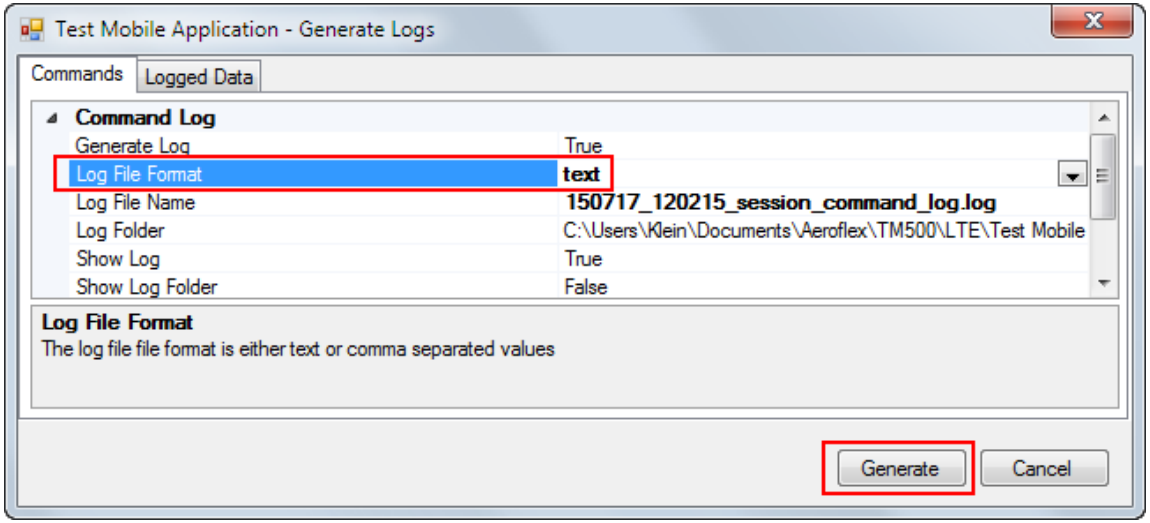
- 如果TM500没有自动抓取DTRC log成功的话，请在Command Line窗口运行“*DTRC dumptrace*”，然后在FileZilla Server配置的*ftp_root*目录下生成三个文件：*dumptrace.log*, *dumptrace.trc & dumptrace.mux*，这就是Dump Trace log。

备注：如果测试过程中没有出现ASSERT的话，不需要抓取Dump Trace log。

如何抓取TM500 logs

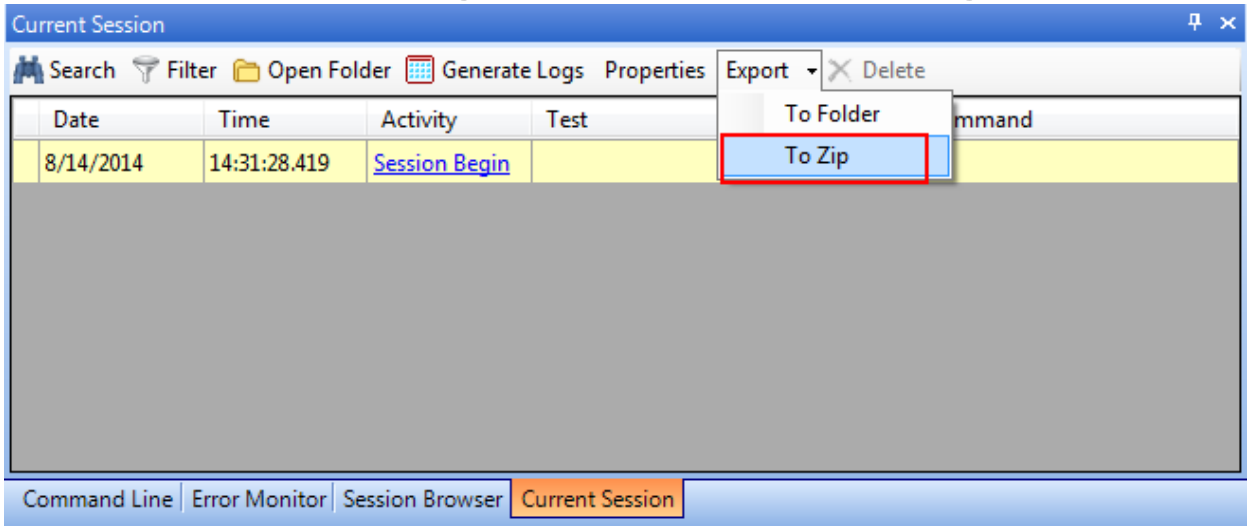
- 8) 选择*Current Session*，点击*Generate Logs*并配置*Log File Format*为*text*，“*Generate*”生成log.

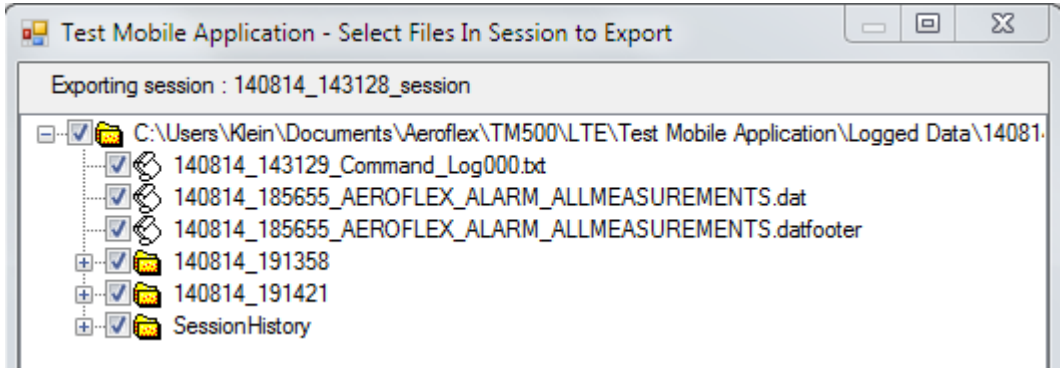




如何抓取TM500 logs

- 9) 点击*Export*的“*To Zip*”导出Session log，文件包含Command Line log和Measurement logs.





如何抓取TM500 logs

- 通过以上9个步骤，所抓取的log包含：
  - Command Line log;
  - Measurement logs;
  - Dump Trace log (如果出现TM500 ASSERT);
  - Serial log (从TM500上电开始抓取);

  以上4个log对于定位TM500相关问题非常重要，请尽可能在第一时间提供完整的log。

  备注：如果是硬件问题或者TMA 无法连接TM500的问题，请务必提供Serial log.

如何独立抓取Logical Channel/Radio Bearer/Access Bearer log - SUE

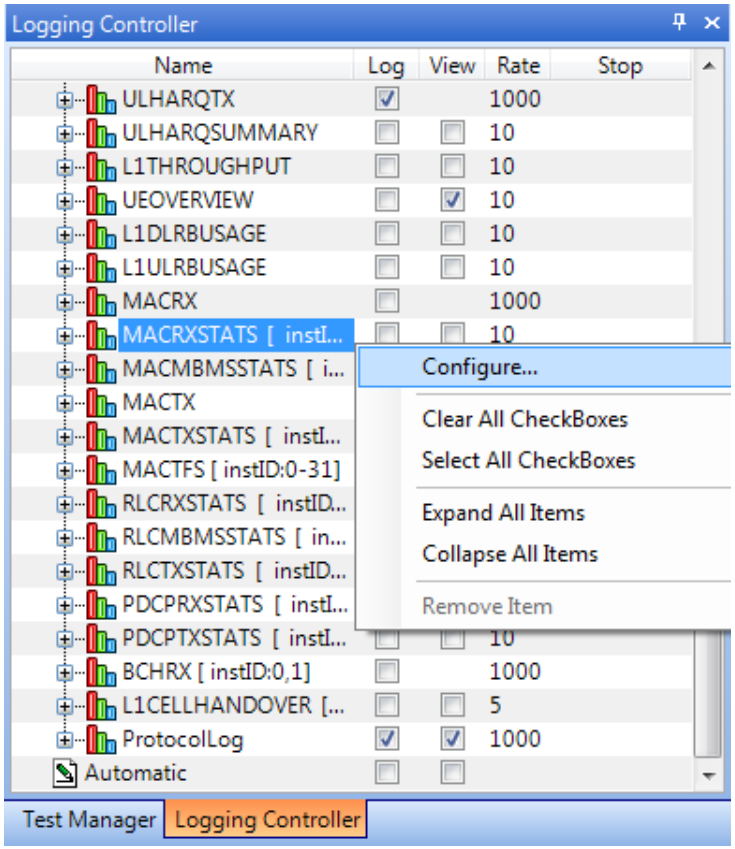
- 以Logical Channel 3和4为例：

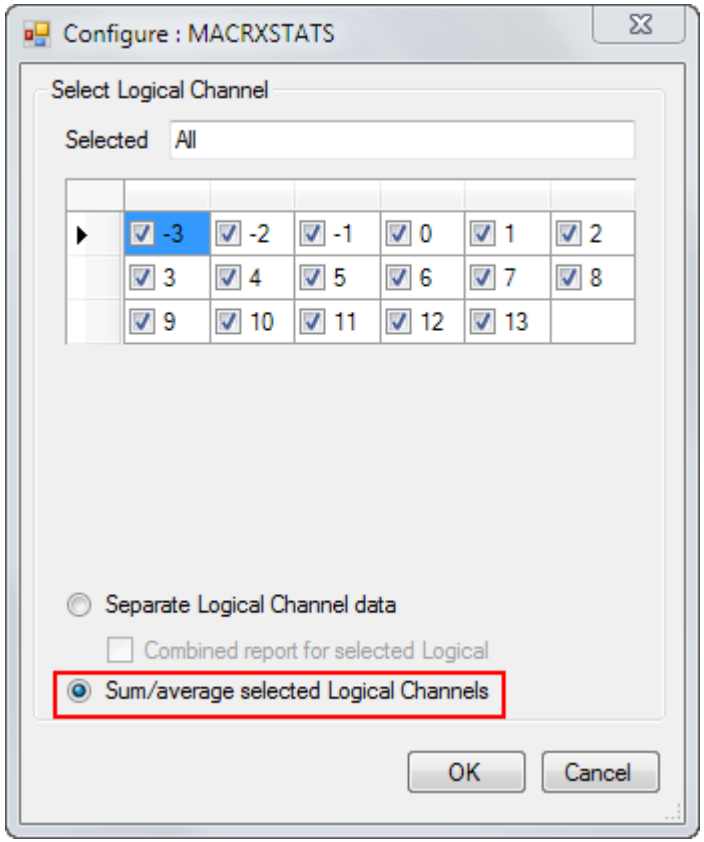
```
drb-ToAddModList {
  {
    eps-BearerIdentity 5,
    drb-Identity 4,
    pdcp-Config {
      discardTimer ms750,
      rlc-AM {
        statusReportRequired TRUE
      },
      headerCompression notUsed : NULL
    },
    rlc-Config am : {
      ul-AM-RLC {
        t-PollRetransmit ms120,
        pollPDU p64,
        pollByte kB750,
        maxRetxThreshold t16
      },
      dl-AM-RLC {
        t-Reordering ms50,
        t-StatusProhibit ms50
      }
    },
    logicalChannelIdentity 3,
    logicalChannelConfig {
      ul-SpecificParameters {
        priority 10,
        prioritisedBitRate kBps8,
        bucketSizeDuration ms100,
        logicalChannelGroup 3
      }
```

```
drb-ToAddModList {
  {
    eps-BearerIdentity 6,
    drb-Identity 5,
    pdcp-Config {
      discardTimer ms750,
      rlc-AM {
        statusReportRequired TRUE
      },
      headerCompression notUsed : NULL
    },
    rlc-Config am : {
      ul-AM-RLC {
        t-PollRetransmit ms120,
        pollPDU p64,
        pollByte kB750,
        maxRetxThreshold t16
      },
      dl-AM-RLC {
        t-Reordering ms50,
        t-StatusProhibit ms50
      }
    },
    logicalChannelIdentity 4,
    logicalChannelConfig {
      ul-SpecificParameters {
        priority 9,
        prioritisedBitRate kBps8,
        bucketSizeDuration ms300,
        logicalChannelGroup 3
      }
```

如何抓取每个Logical Channel的log

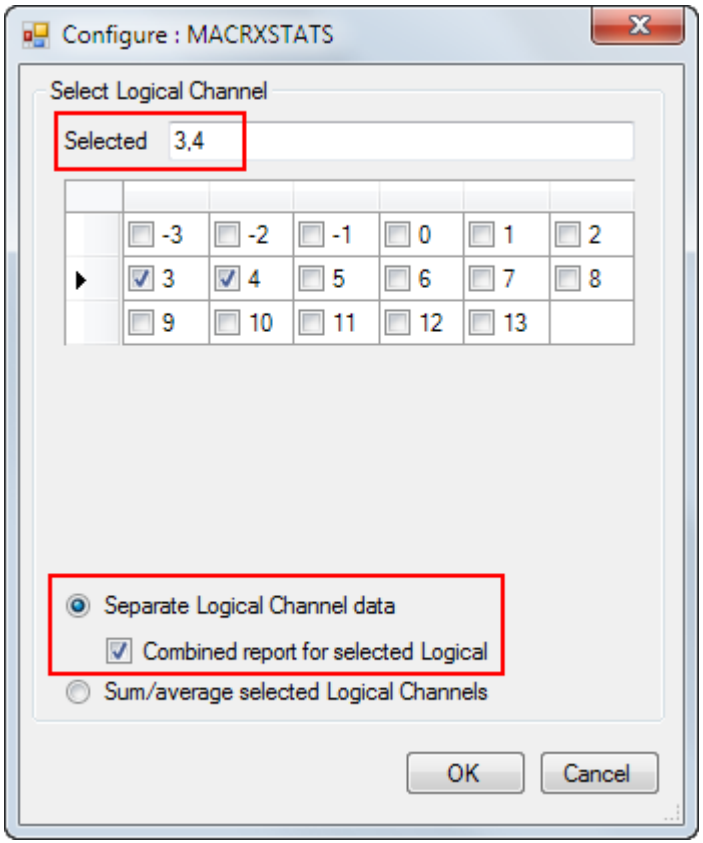
- SUE
  - MACRXSTATS/MACTXSTATS
    - 默认设置：所有Logical Channel合并统计，以MACRXSTATS为例。





如何抓取每个Logical Channel的log

- 分别抓取每个Logical Channel的log，以MACRXSTATS为例。
  - 根据测试需要，选择所希望抓取的Logical Channel，其中Logical Channel ID对应Protocol log的“*logicalChannelIdentity*”.

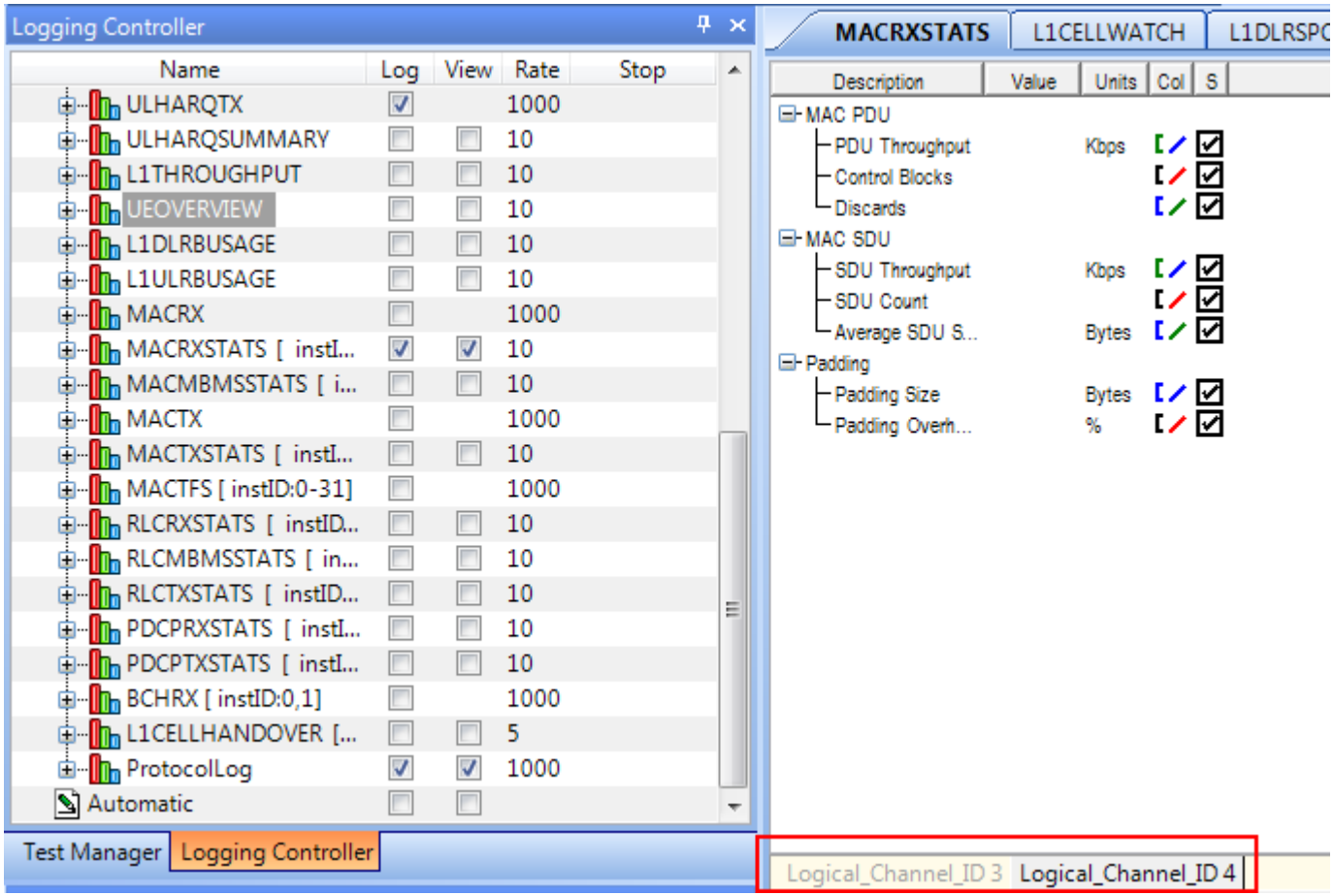



```
logicalChannelIdentity 3,
logicalChannelConfig {
  ul-SpecificParameters {
    priority 10,
    prioritisedBitRate kBps8,
    bucketSizeDuration ms100,
    logicalChannelGroup 3
  }
}
```

```
logicalChannelIdentity 4,
logicalChannelConfig {
  ul-SpecificParameters {
    priority 9,
    prioritisedBitRate kBps8,
    bucketSizeDuration ms300,
    logicalChannelGroup 3
  }
}
```

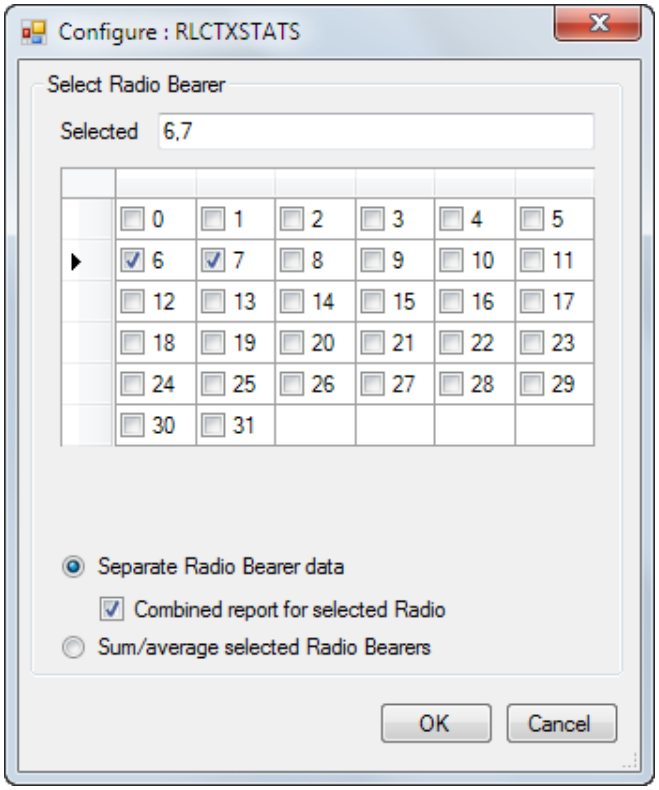
如何抓取每个Logical Channel的log

– 配置完成后，实时抓取和查看每个Logical Channel的统计信息。



如何抓取每个Radio Bearer的log

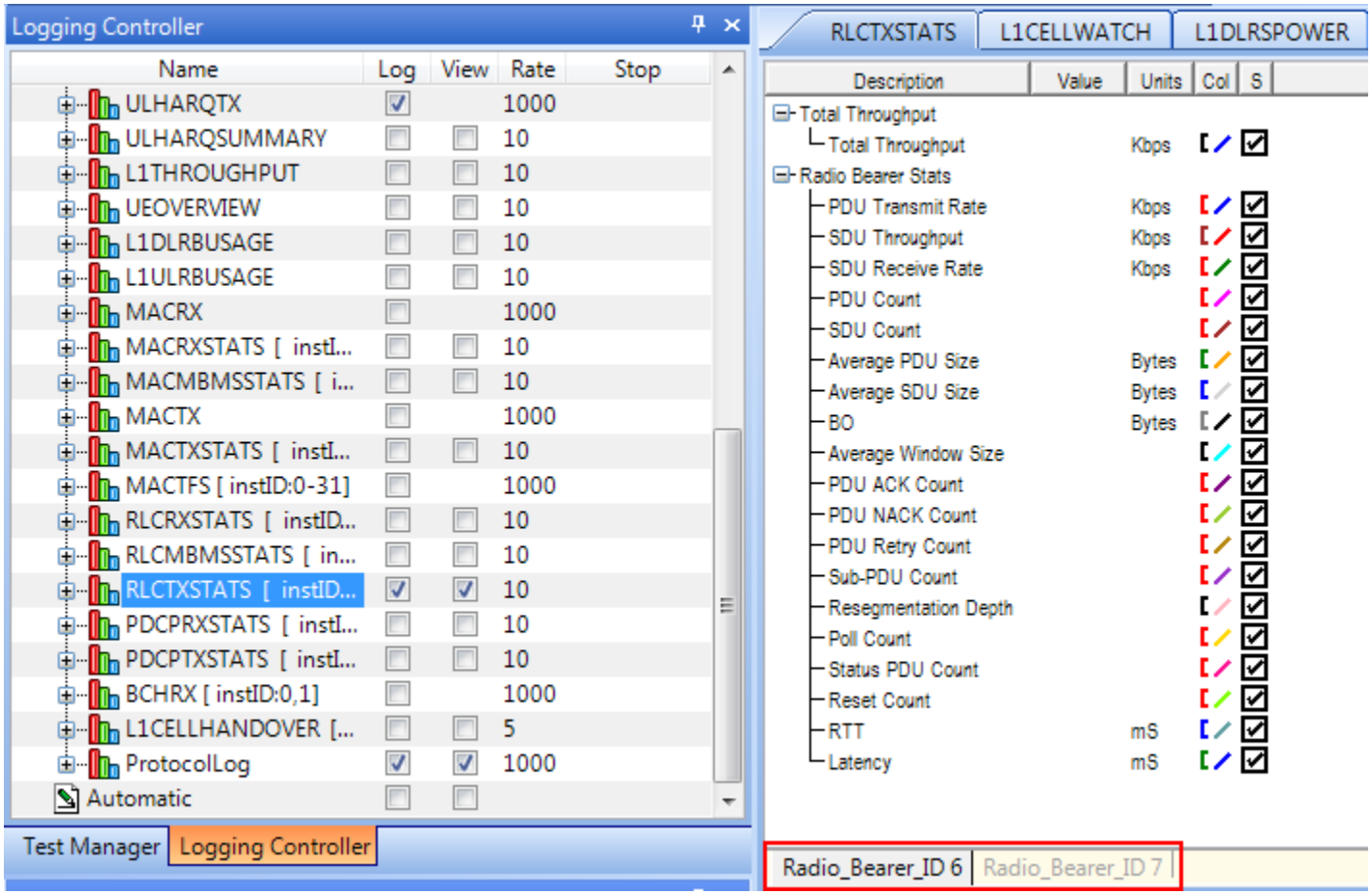
- SUE
  - RLCRXSTATS/RLCTXSTATS
    - 方法和配置MACRXSTATS/MACTXSTATS类似。
      - *Radio Bearer ID = "drb-Identity + 2".*




```
drb-ToAddModList {
  {
    eps-BearerIdentity 5,
    drb-Identity 4,
    pdcp-Config {
      discardTimer ms750,
      rlc-AM {
        statusReportRequired TRUE
      },
      headerCompression notUsed : NULL
    },
drb-ToAddModList {
  {
    eps-BearerIdentity 6,
    drb-Identity 5,
    pdcp-Config {
      discardTimer ms750,
      rlc-AM {
        statusReportRequired TRUE
      },
      headerCompression notUsed : NULL
    },
```

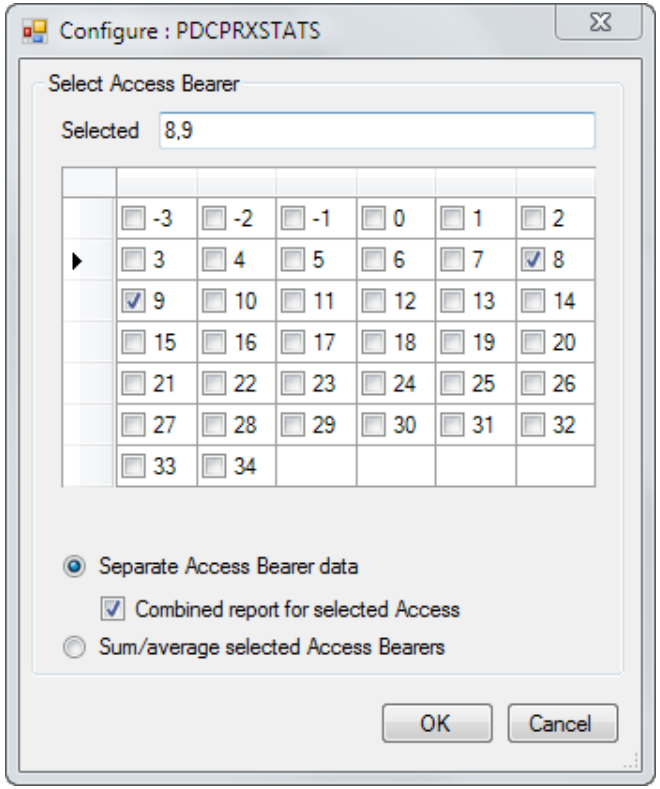
如何抓取每个Radio Bearer的log

– 配置完成后，实时抓取和查看每个Radio Bearer的统计信息。



如何抓取每个Access Bearer的log

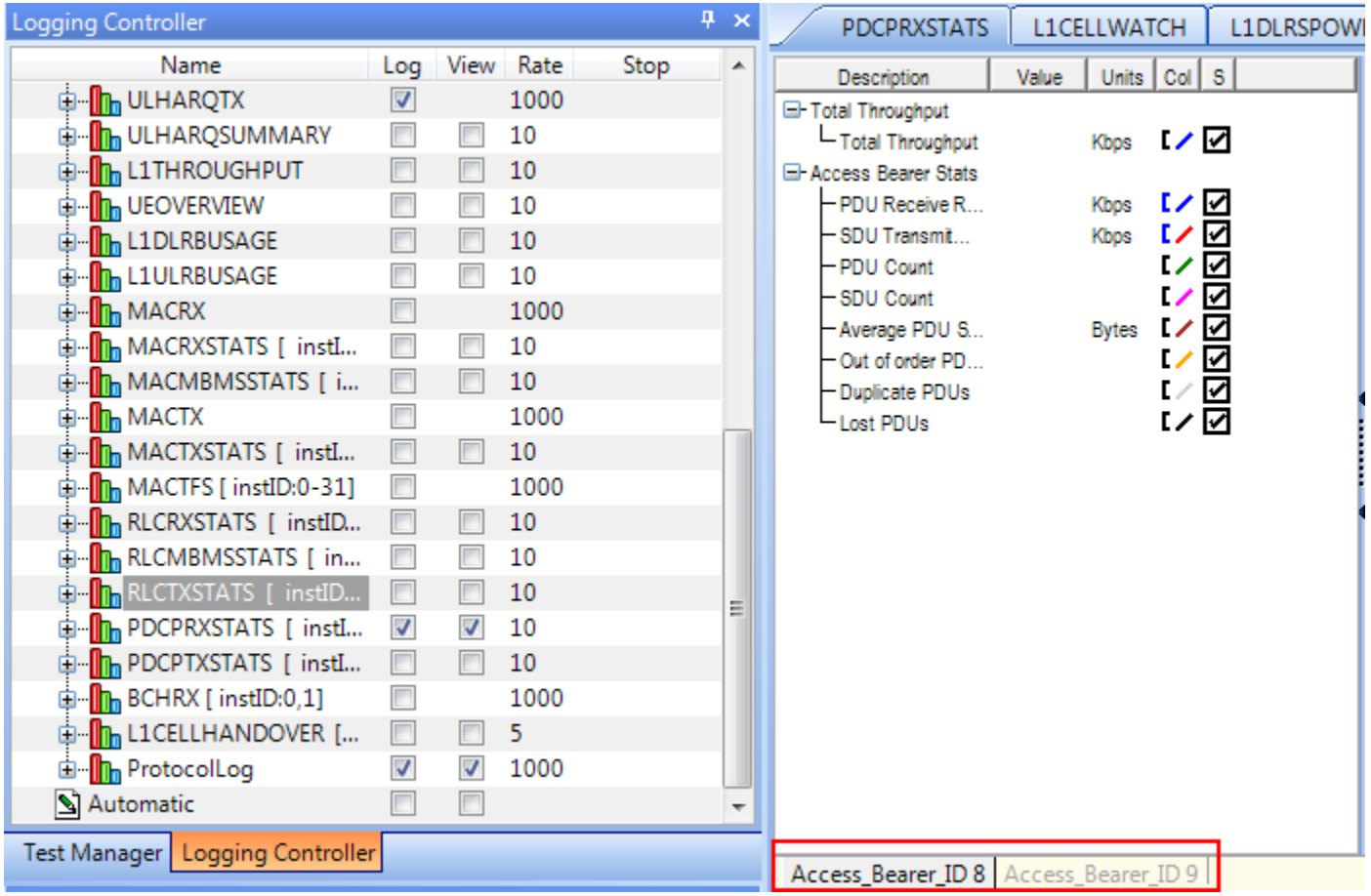
- SUE
  - PDCPRXSTATS/PDCPTXSTATS
    - 方法和配置MACRXSTATS/MACTXSTATS类似。
      - *Access Bearer ID = "eps-BearerIdentity + 3".*




```
{
  eps-BearerIdentity 5,
  drb-Identity 4,
  pdcp-Config {
    discardTimer ms750,
    rlc-AM {
      statusReportRequired TRUE
    },
    headerCompression notUsed : NULL
  },

{
  eps-BearerIdentity 6,
  drb-Identity 5,
  pdcp-Config {
    discardTimer ms750,
    rlc-AM {
      statusReportRequired TRUE
    },
    headerCompression notUsed : NULL
  },
```

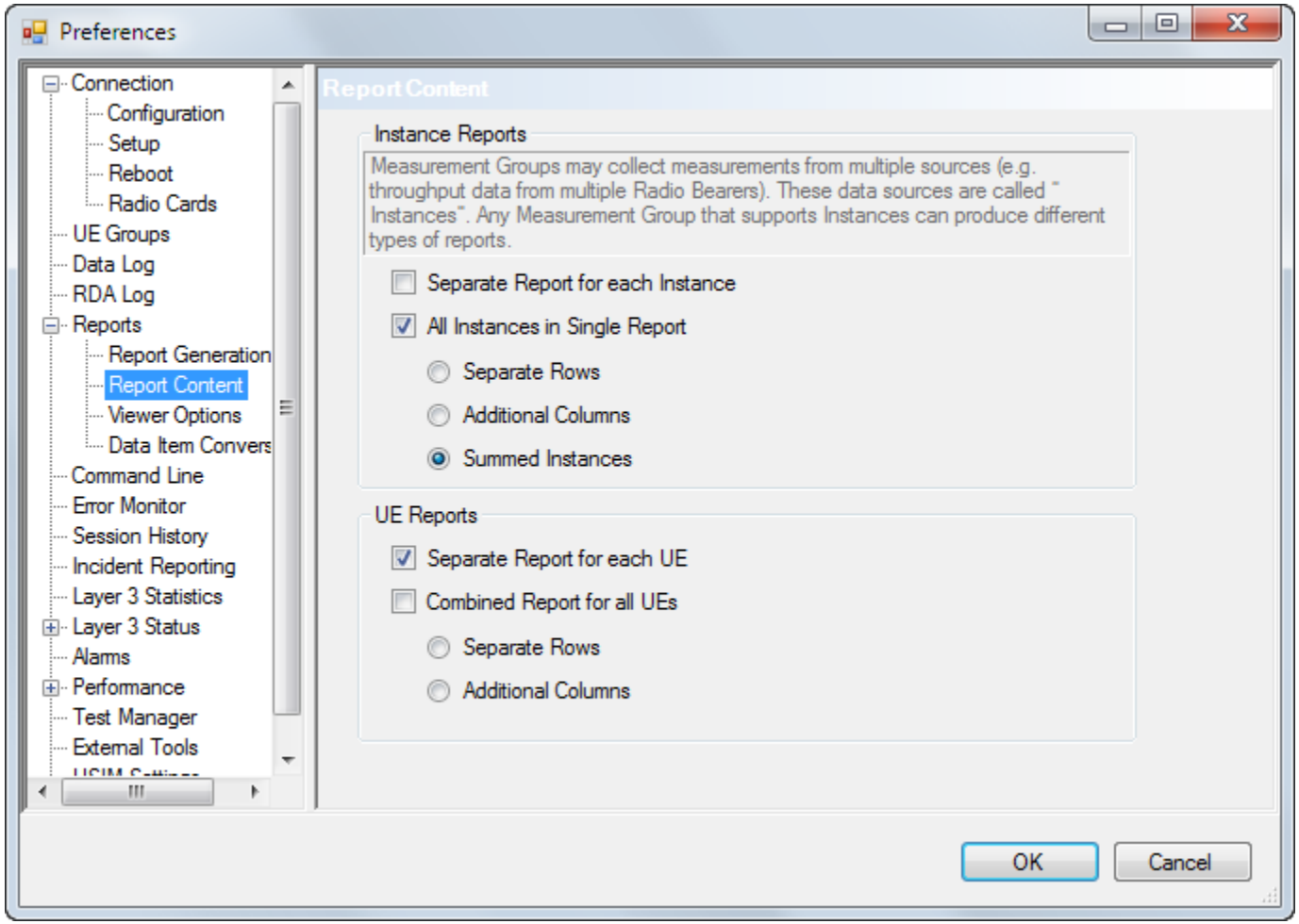
如何抓取每个Access Bearer的log

– 配置完成后，实时抓取和查看每个Access Bearer的统计信息。



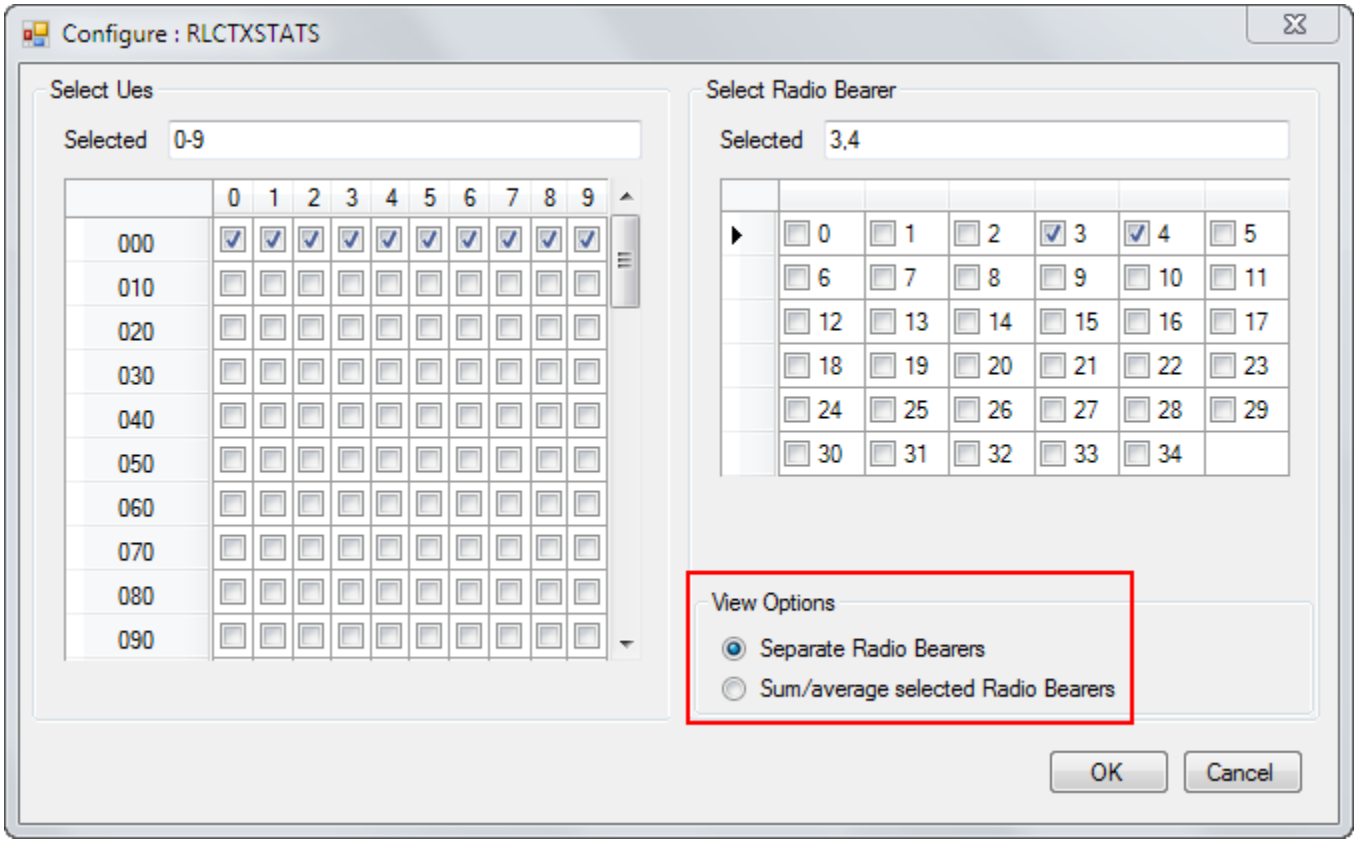
如何独立抓取Logical Channel/Radio Bearer/Access Bearer log - CUE

- 配置“*Report Content*”.



如何独立抓取Logical Channel/Radio Bearer/Access Bearer log - CUE

- 配置方法和SUE类似。

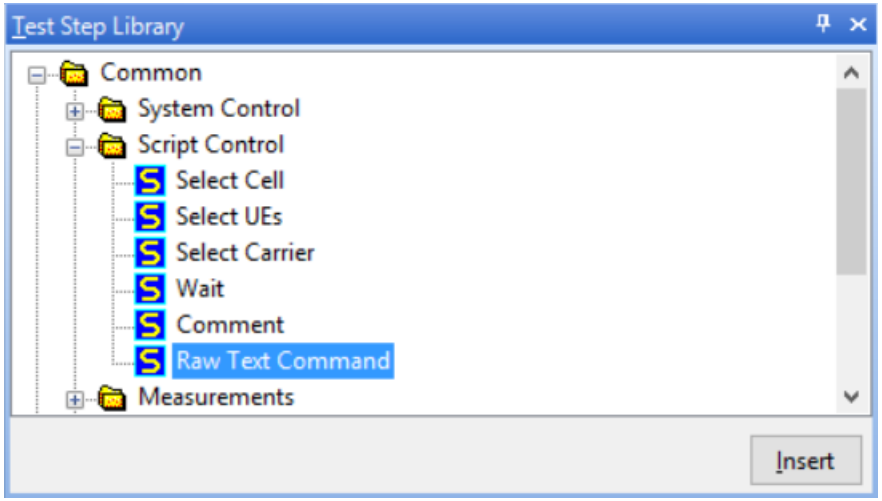


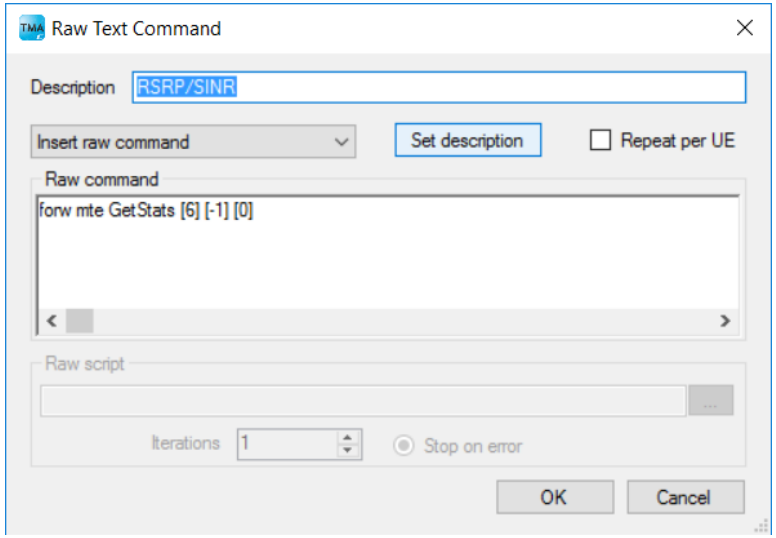
进阶TM500 logs

- RSRP/SINR
- BLER/L1 Throughput
- Display UE Status
- Display KPI Statistics
- Display RACH Statistics
- Layer 3 Statistics
- System Summary
- DSP/HLC log

RSRP/SINR

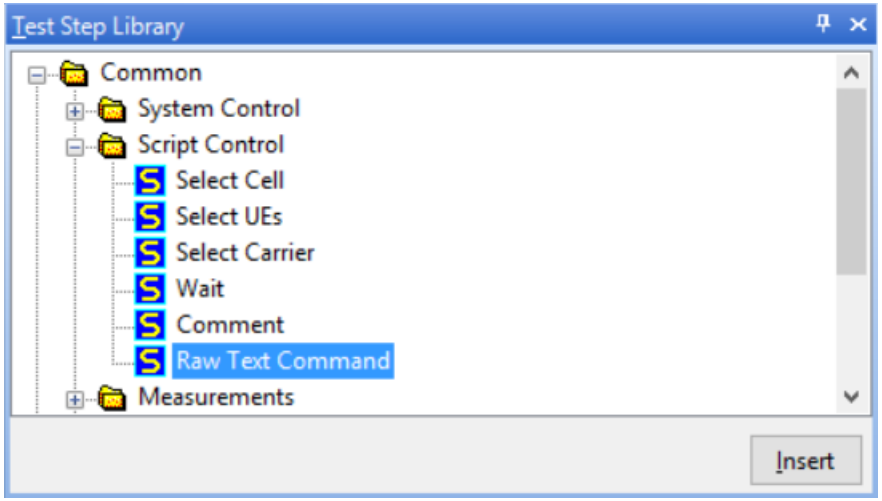
- 功能：查询每个小区的RSRP/SINR
  - **Raw command**: *forw mte GetStats [6] [-1] [0]*
  - **Description**: RSRP/SINR

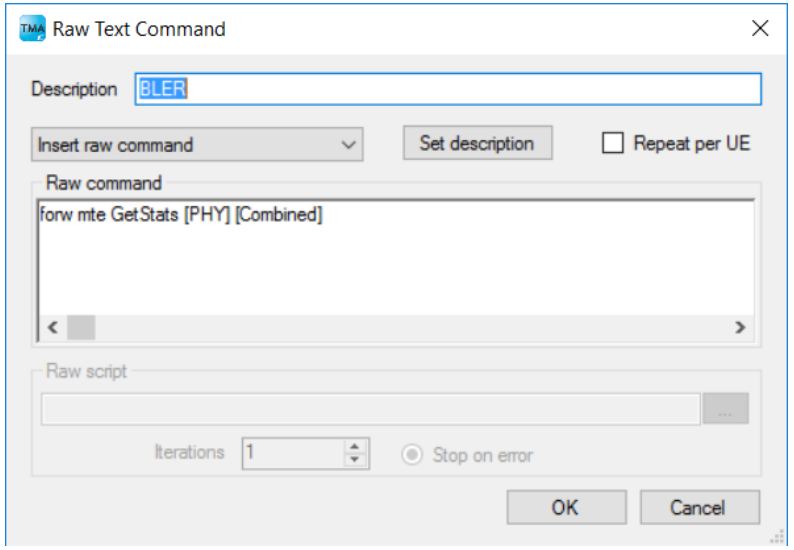




BLER/L1 Throughput

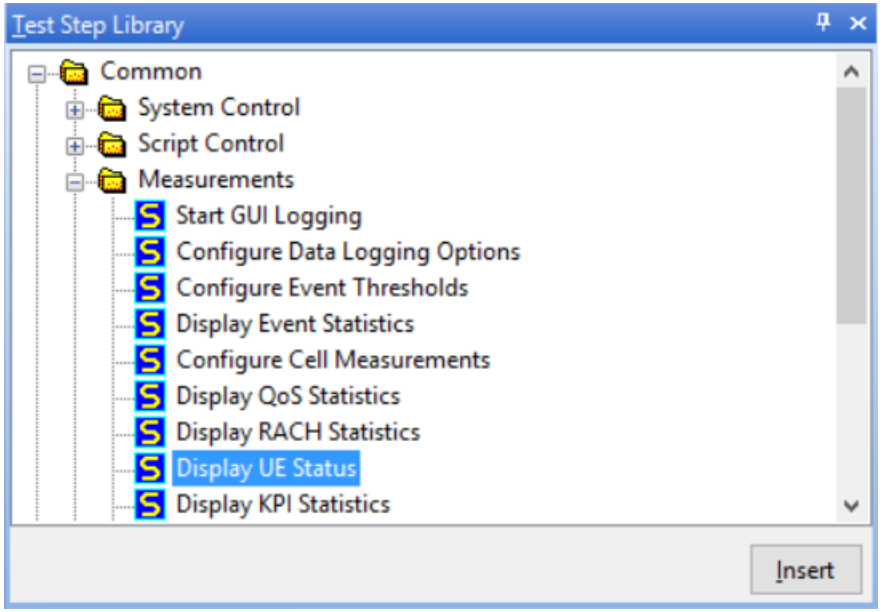
- 功能：查询每个小区的BLER以及物理层吞吐量。
  - **Raw command**: *forw mte GetStats [PHY] [Combined]*
  - **Description**: BLER





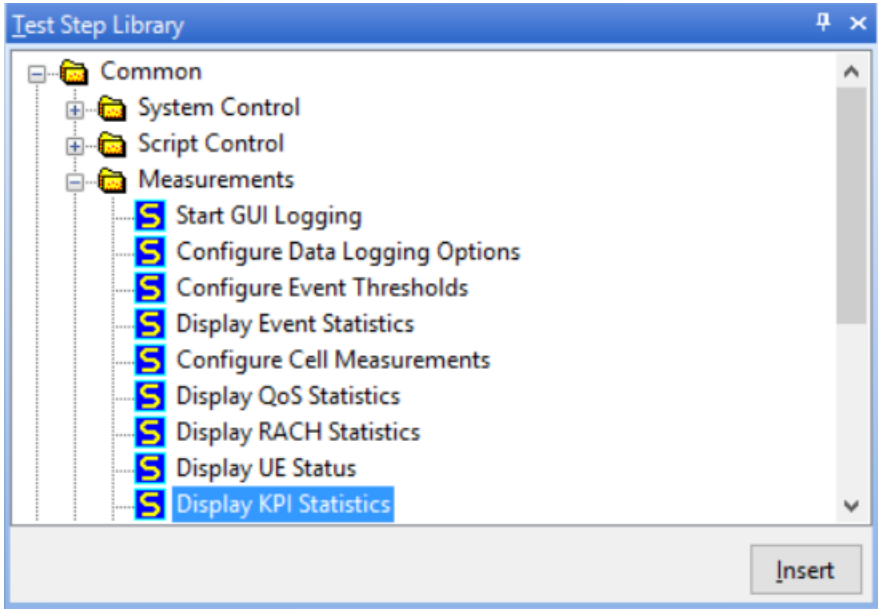
Display UE Status

- 功能：查询UE的RRC/NAS/DTE/MTS Traffic/MTS Mobility状态。



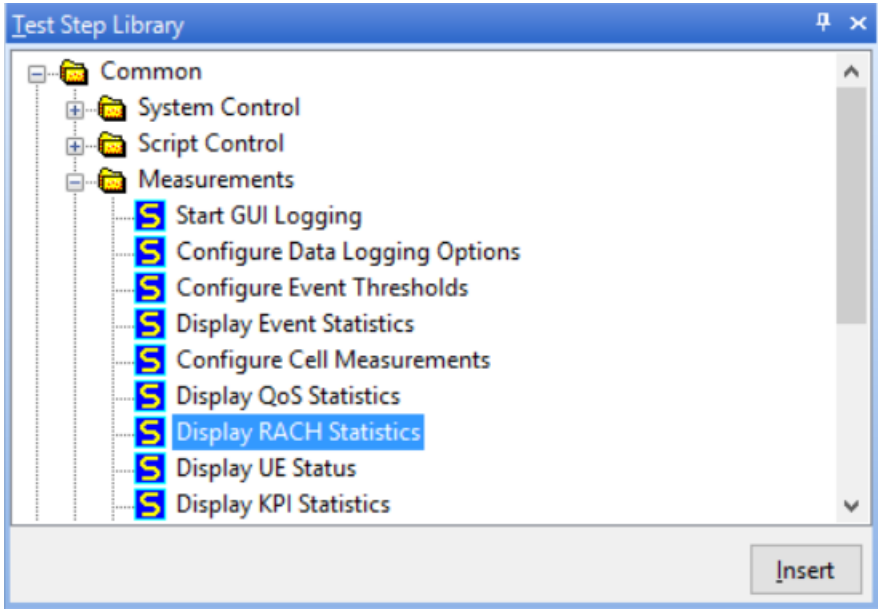
Display KPI Statistics

- 功能：查询RRC/NAS各项KPI.



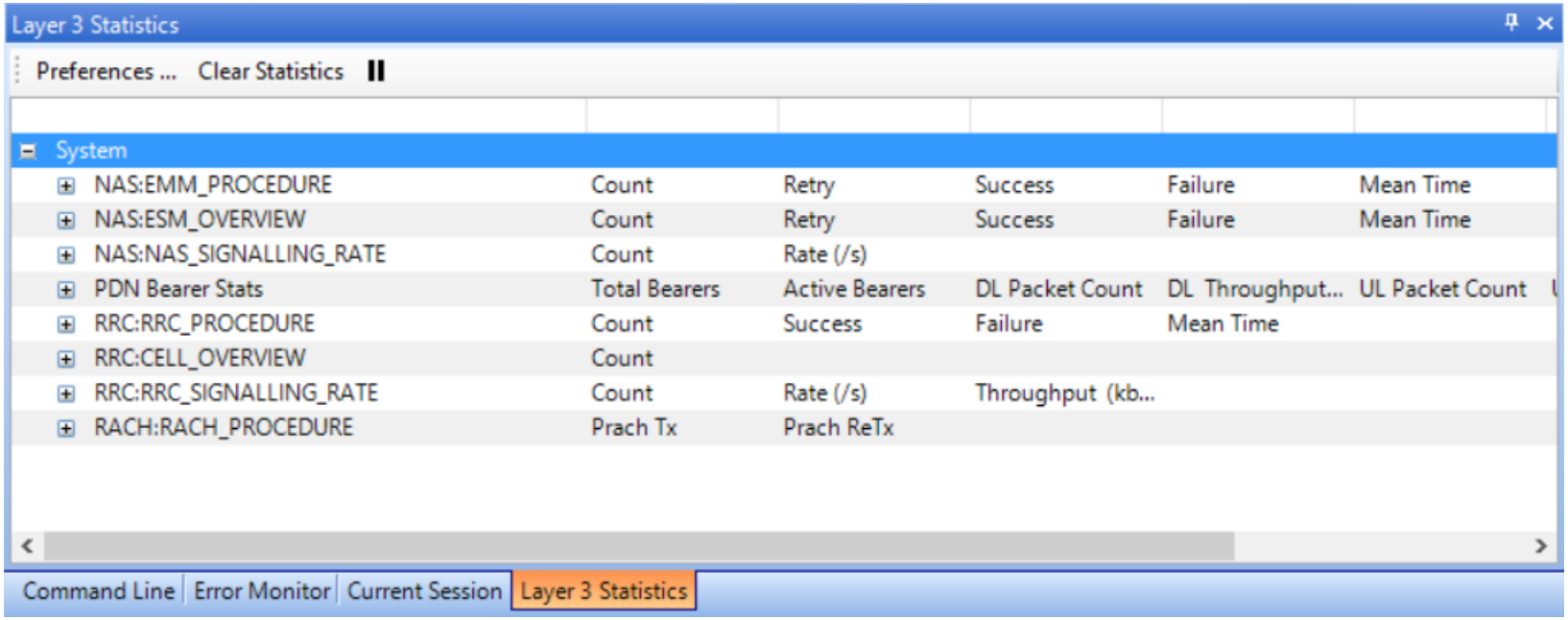
Display RACH Statistics

- 功能：查询RACH相关的各项KPI.

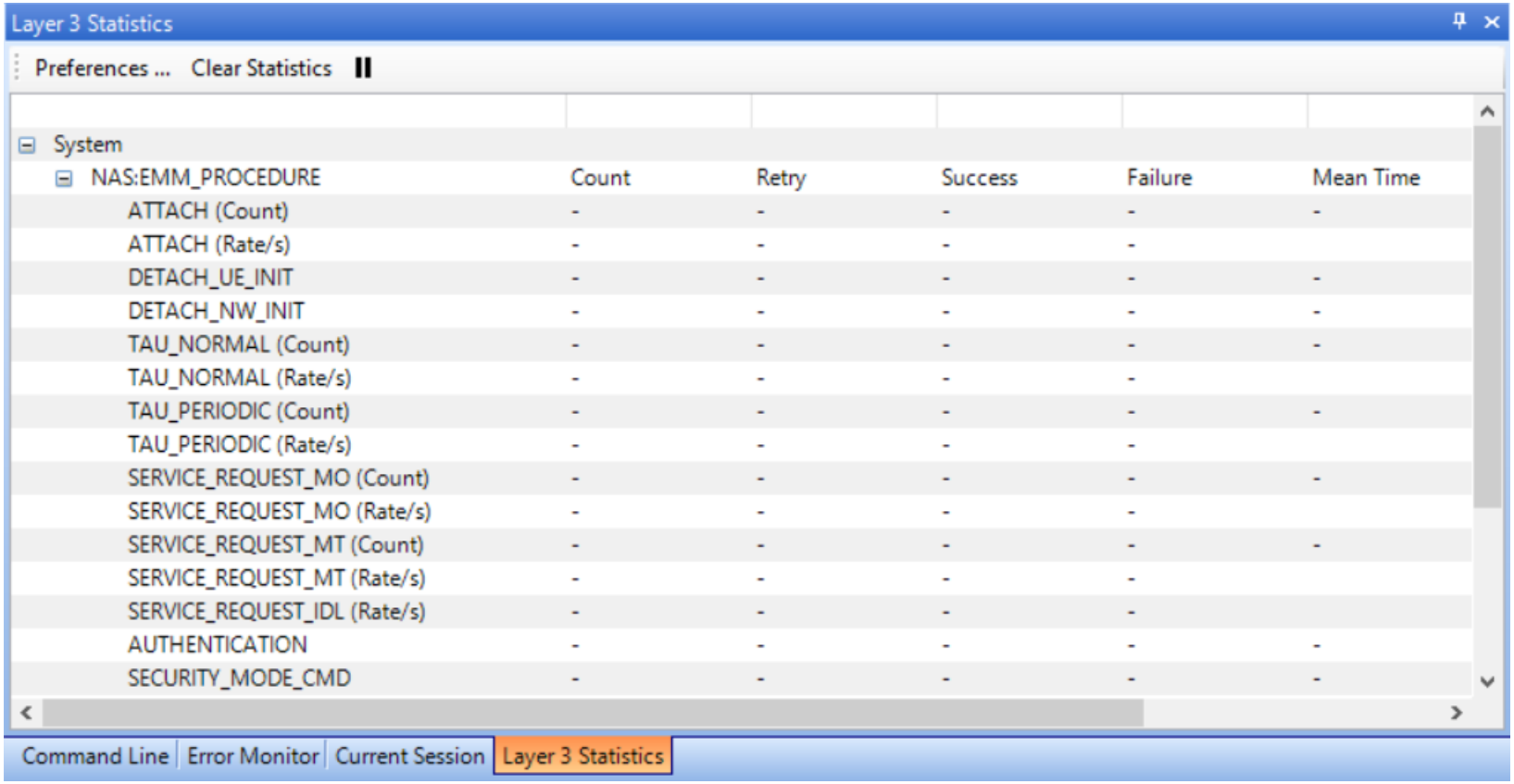


Layer 3 Statistics

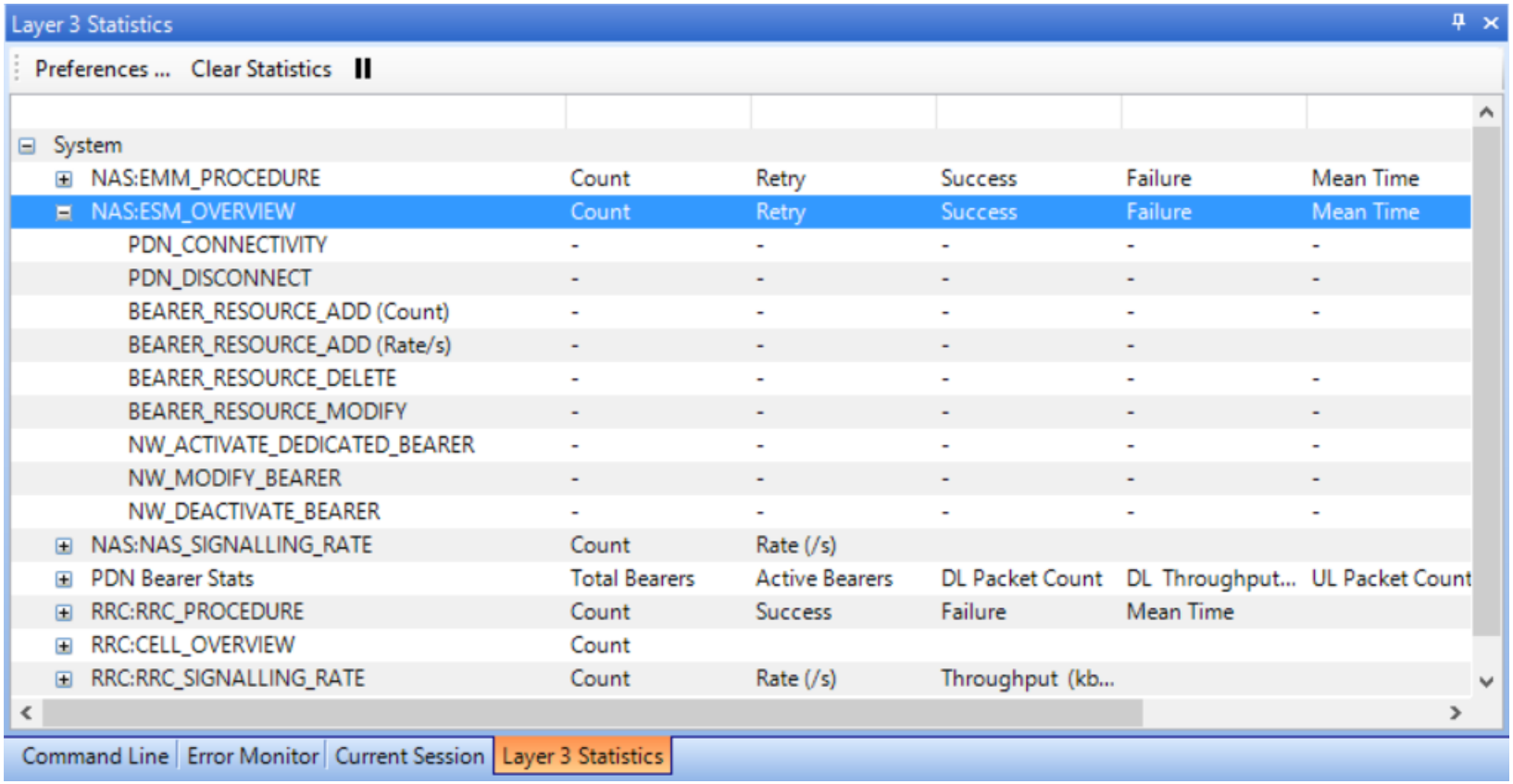
- 实时查看系统或小区的RRC/NAS KPI.
  - 可以用Display KPI Statistics将结果打印至Command Line log.
  - GUI log: RRCSTATS/NASSTATS



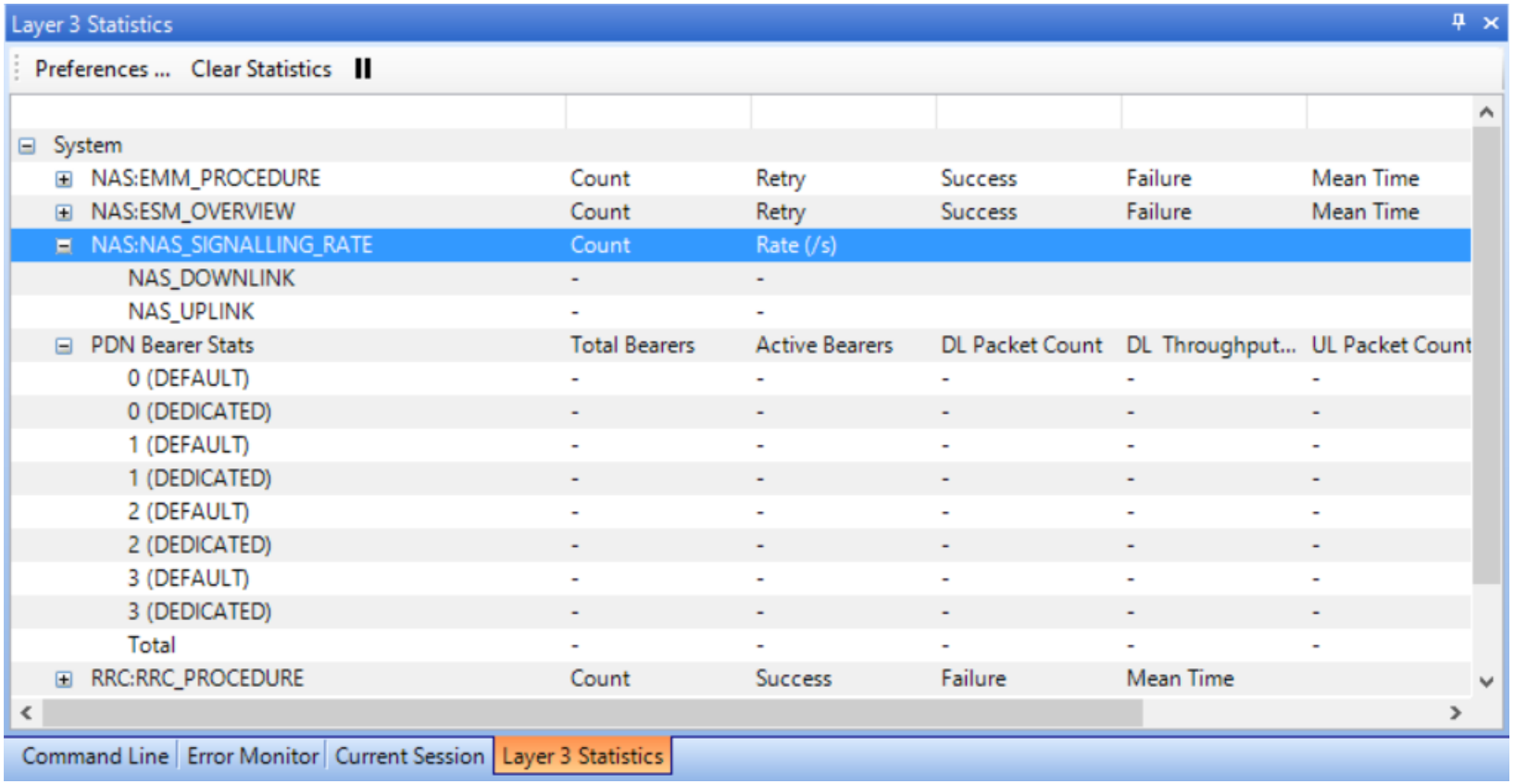
Layer 3 Statistics



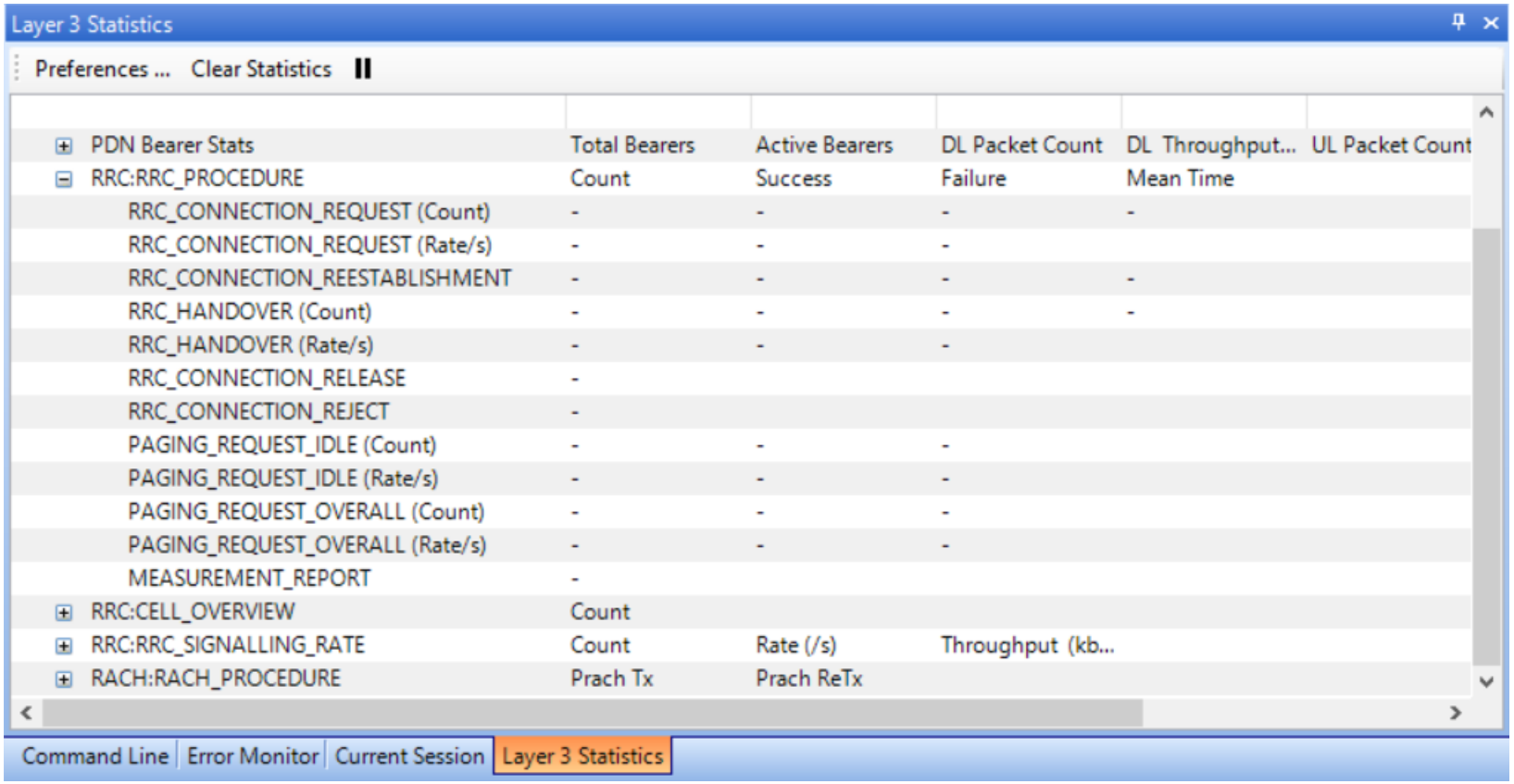
Layer 3 Statistics



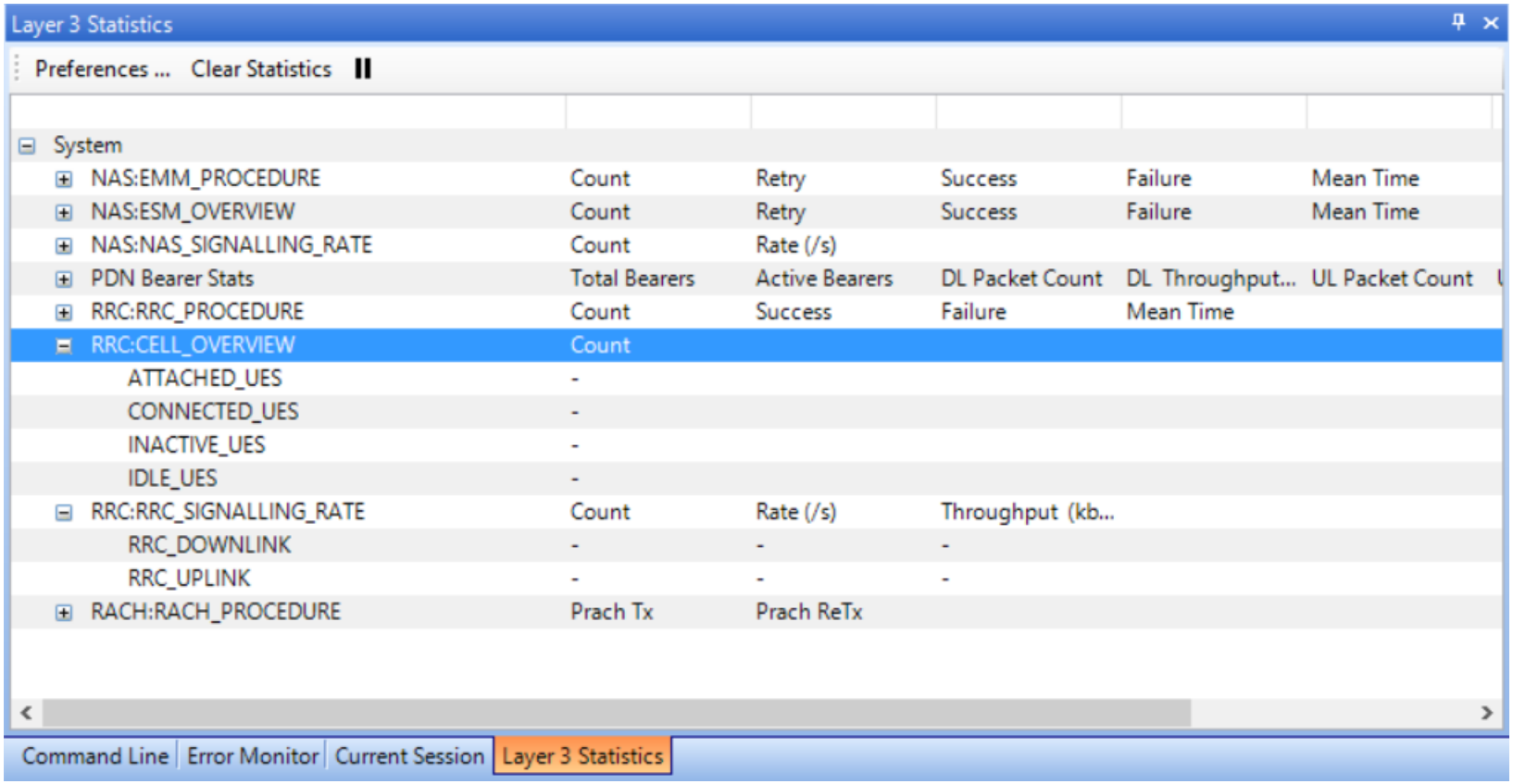
Layer 3 Statistics



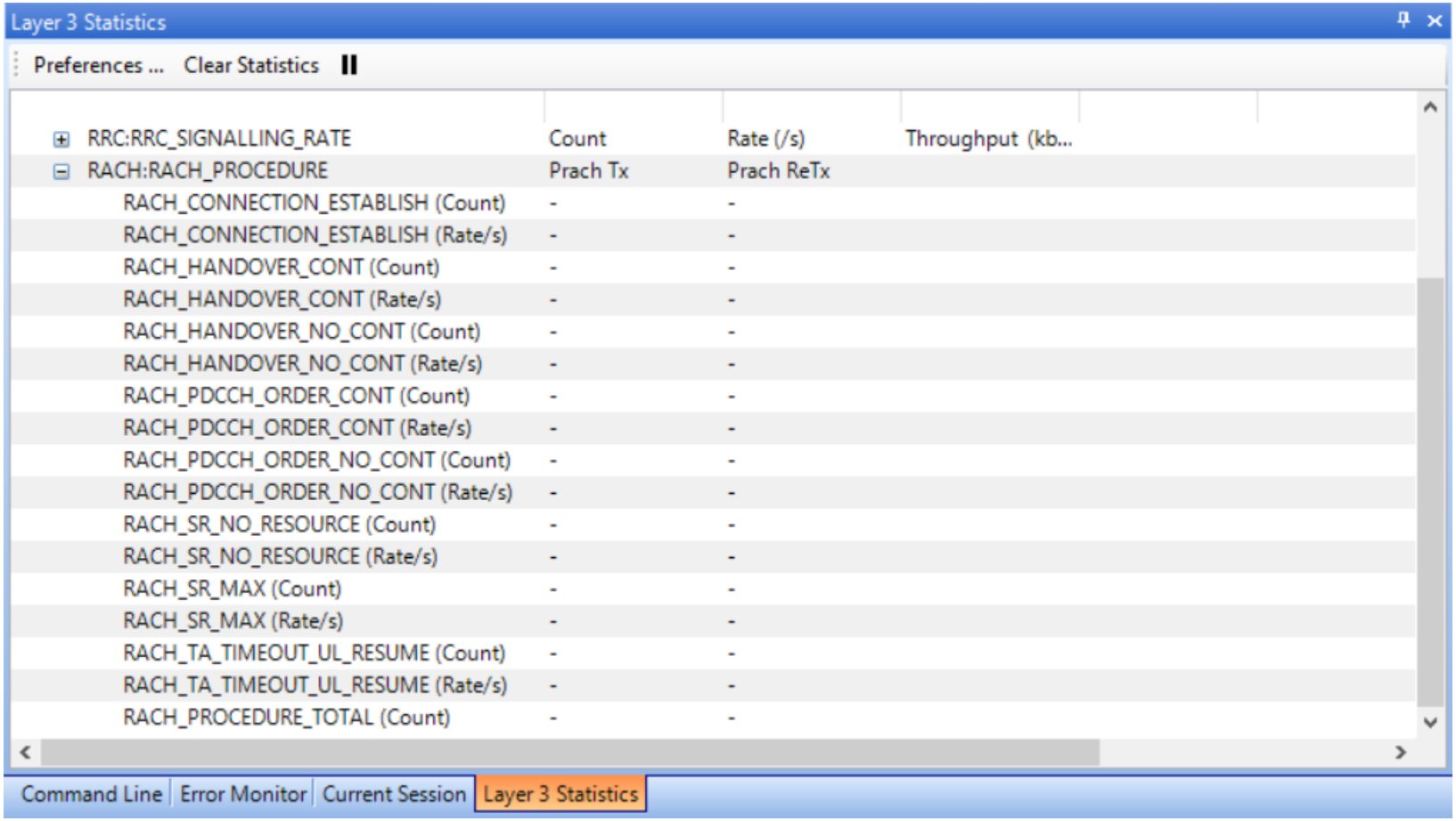
Layer 3 Statistics



Layer 3 Statistics

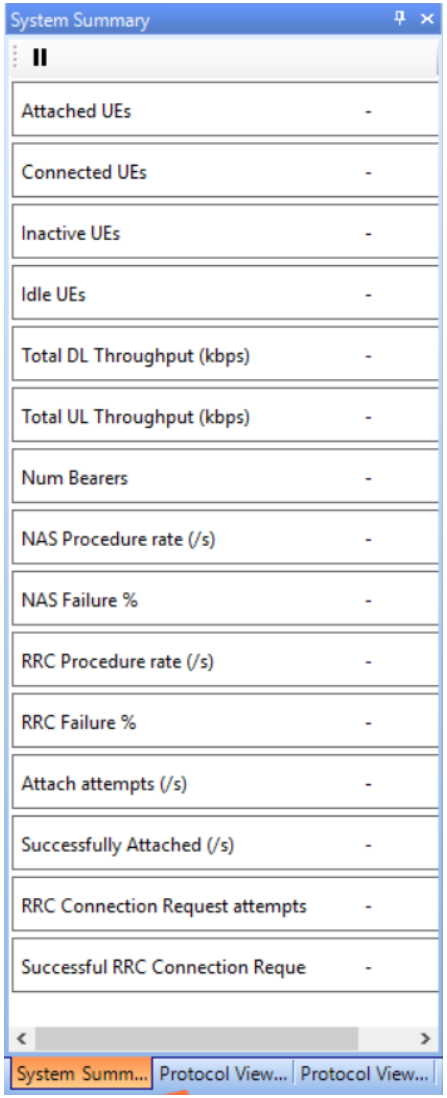


Layer 3 Statistics



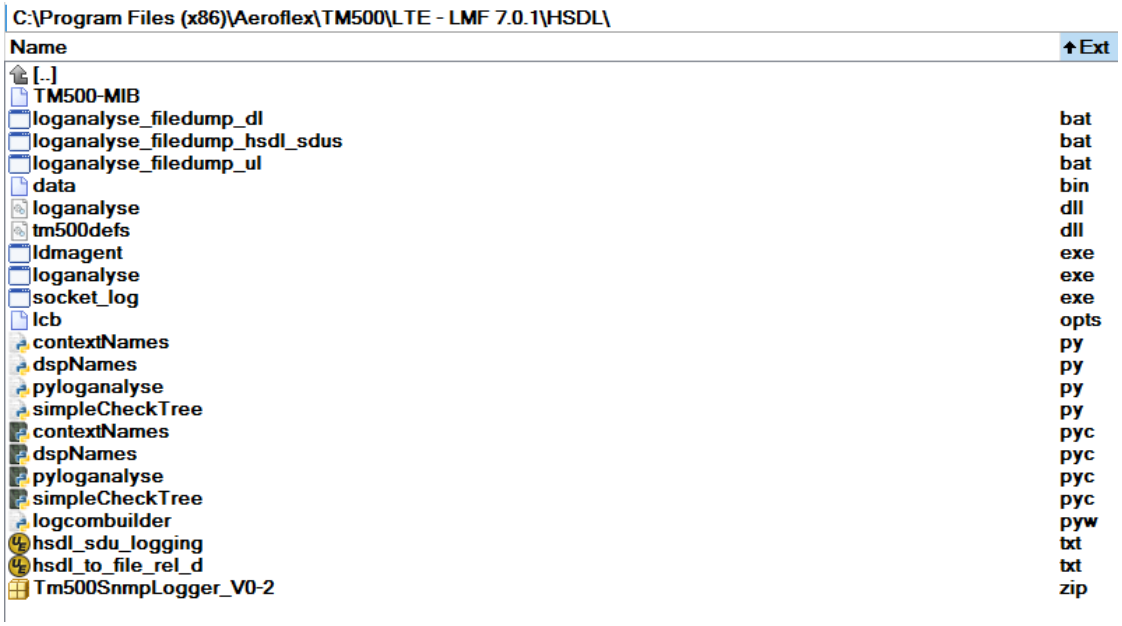
System Summary

- 实时查看系统级统计。



DSP/HLC log

- 除了GUI log，TM500还支持调试级别的DSP/HLC log，非常详细打印出L1/MAC/RLC/PDCP/RRC相关信息，最小时间粒度是TTI.
  - DSP log: L1相关相关。
  - HLC log：MAC/RLC/PDCP/RRC相关信息。
- 每个T500软件安装目录下自带HSDL文件夹，DSP/HLC log抓取相关的文件包括
  - socket_log.exe
  - loganalyse.exe/loganalyse.dll/tm500defs.dll



DSP/HLC log

- DSP/HCL log抓取之前需要运行DSP logging mask，以打开不同的log开关。针对不同问题的定位，请咨询TM500 FAE获取对应的logging mask。
- 抓取DSP/HLC log时，请严格按照TM500 FAE建议的步骤抓取。
- ***socket_log***和***loganalyse***都可以用于抓取DSP/HLC log，但为避免流控，先用socket_log抓取二进制码流，然后再离线用loganalyse解析二进制码流为文本格式。
- 不同TM500软件之间的*socket_log*基本是通用的，但为保险起见，建议还是采用当前使用的TM500软件HSDL文件夹下的*socket_log*.
- 不同TM500软件之间的*loganalyse/tm500defs*有区别，所以请务必采用当前使用的TM500软件HSDL文件夹下的*loganalyse/tm500defs*，否则将导致DSP/HLC log解析异常。

DSP/HLC log

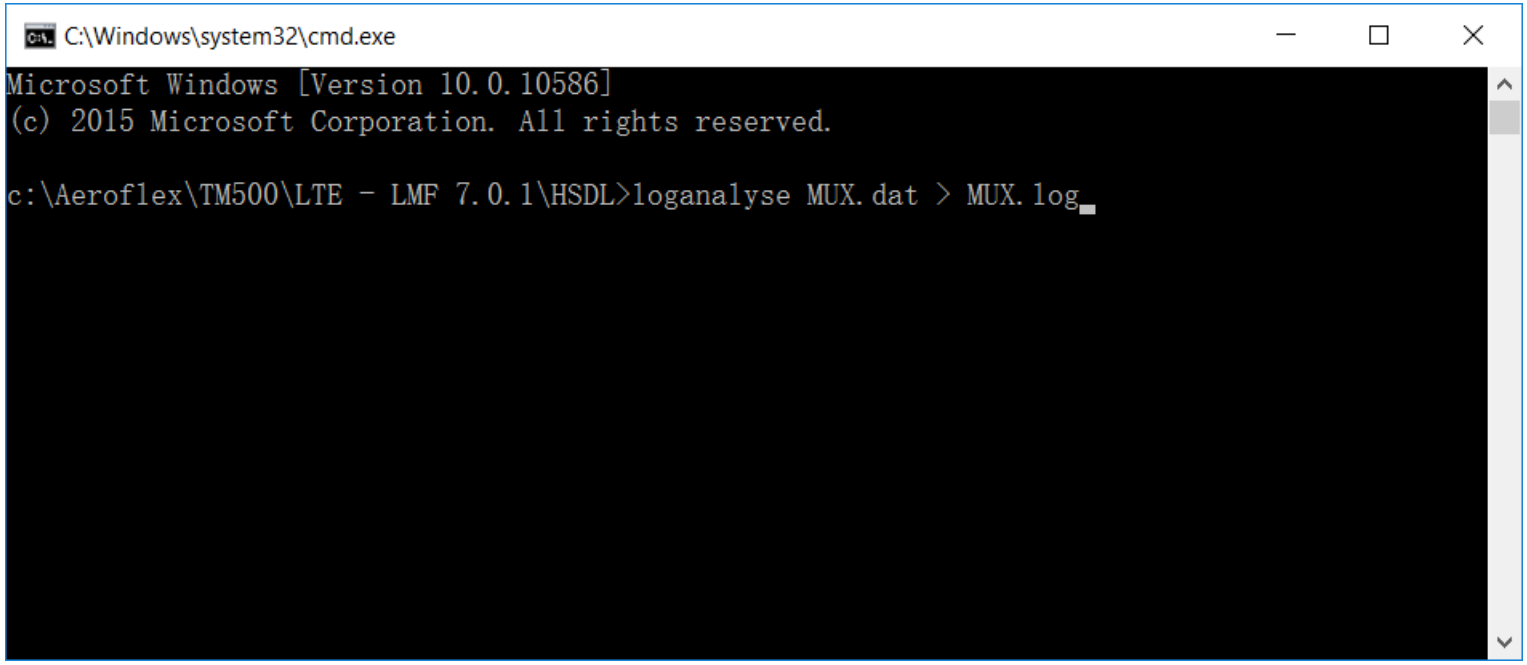
- DSP/HLC log都通过统一的端口*25700*输出，命令格式例如：

socket_log.exe 192.168.10.70 25700 -f MUX.dat -s 200 -l 20

-f: 保存的文件名
-s: 指定文件大小进行分段，建议以200MB分段。
-l: log抓取的时间

loganalyse

- loganalyse解析
  - 请在loganalyse所在文件夹下打开DOS窗口，然后运行解析命令。
  - 请参阅后续*loganalyse Options*更多解析选项。

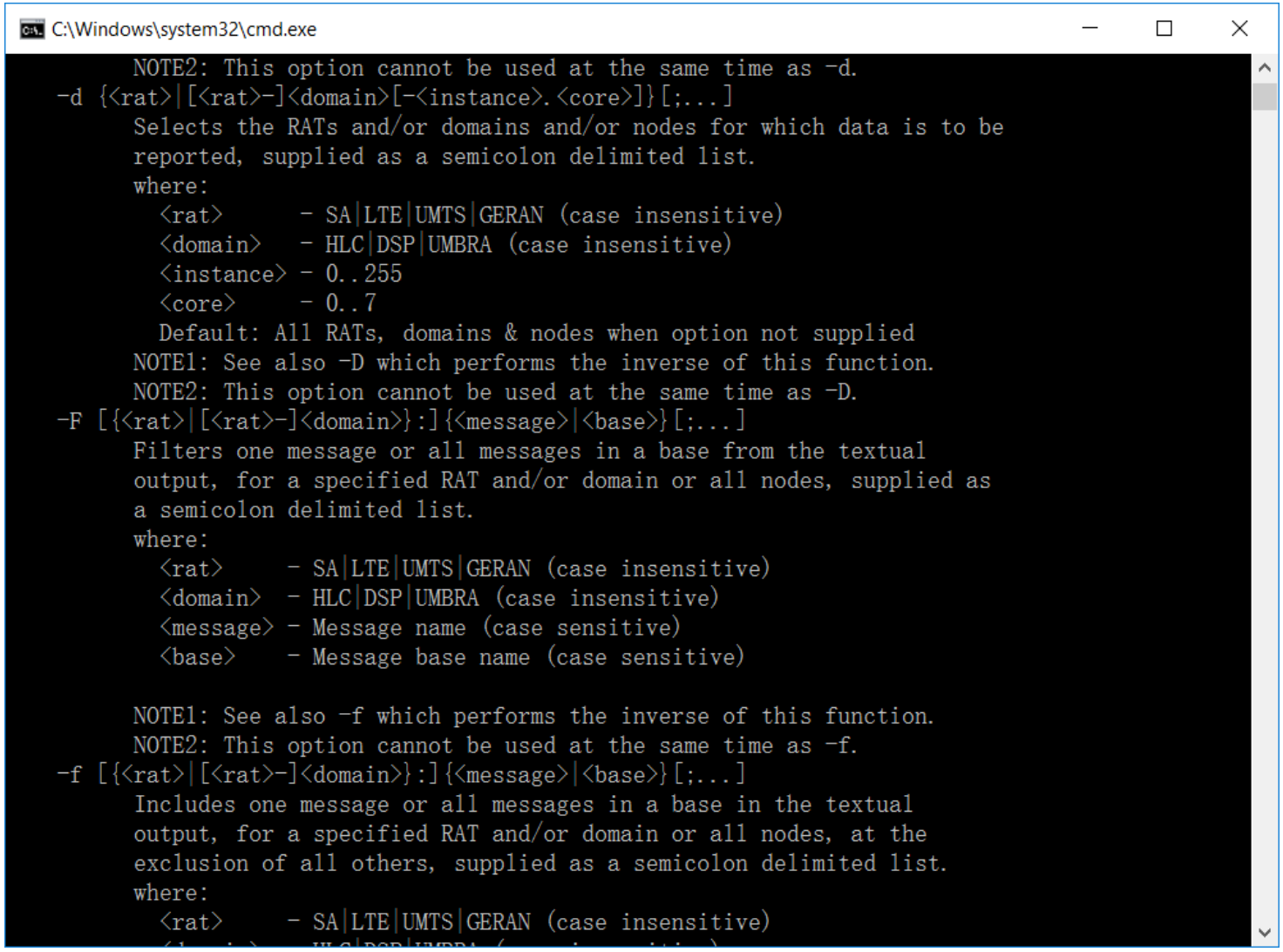


loganalyse Options

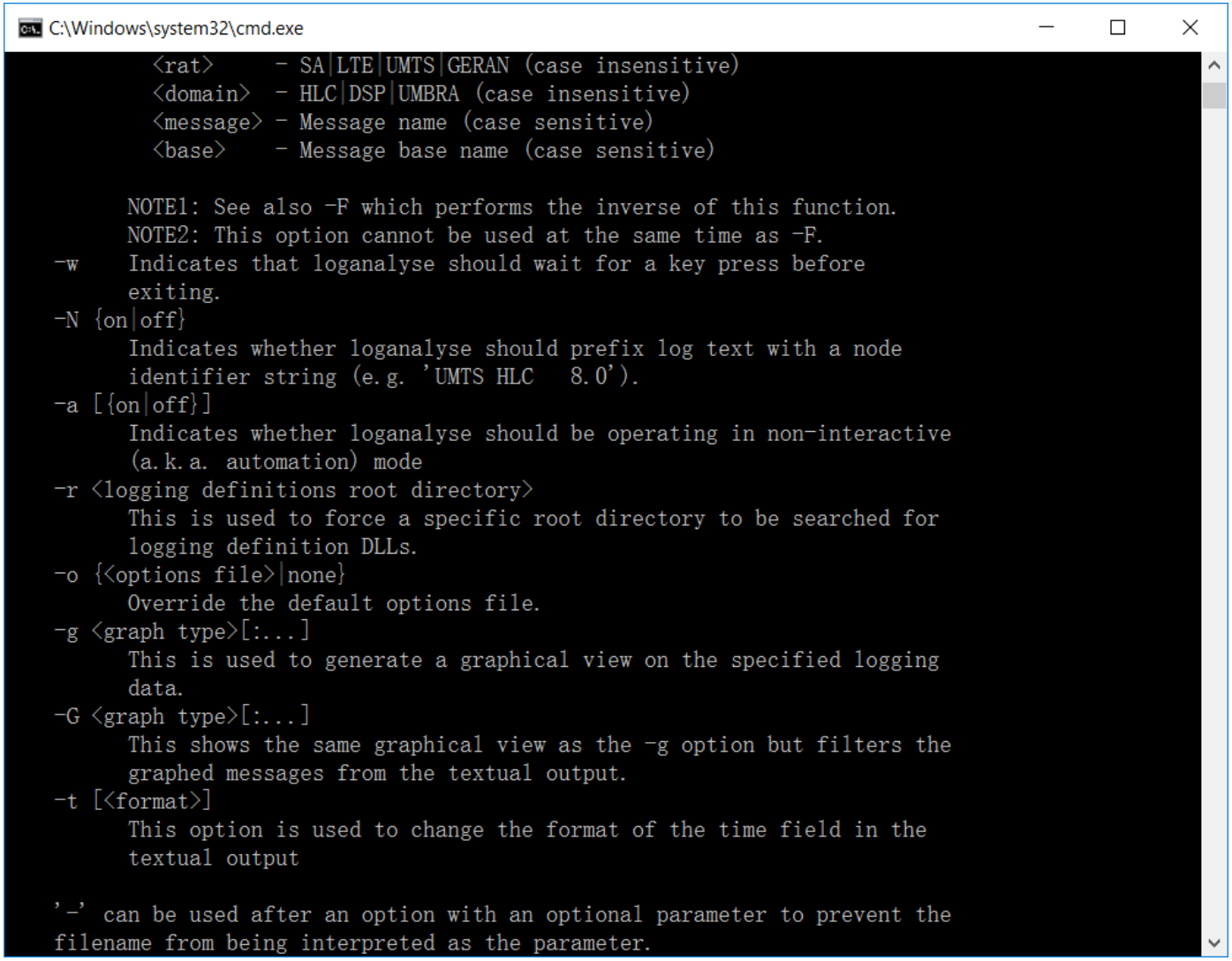
C:\Windows\system32\cmd.exe

```
Microsoft Windows [Version 10.0.10586]
(c) 2015 Microsoft Corporation. All rights reserved.

c:\Aeroflex\TM500\LTE - LMF 7.0.1\HSDL>loganalyse -h

Usage: loganalyse [options] [-] [filename]

  Options:
    -h [<option>]
          Prints detailed help for <option>. If <option> not specified, prints
          available options.
    -v    This is used to report version information for loganalyse and each
          successfully loaded logging definition DLL.
    -i {<IP address>:<port>|<IP address>:|:<port>}
          Indicates that a TCP/IP socket should be used for input rather than
          a file.
    -D {<rat>|[<rat>-]<domain>[-<instance>.<core>]}[;...]
          Filters specified RAT and/or domain and/or node from the output,
          supplied as a semicolon delimited list.
          where:
            <rat>      - SA|LTE|UMTS|GERAN (case insensitive)
            <domain>   - HLC|DSP|UMBRA (case insensitive)
            <instance> - 0..255
            <core>     - 0..7
            Default: All RATs, domains & nodes are output when option not
          supplied
          NOTE1: See also -d which performs the inverse of this function.
          NOTE2: This option cannot be used at the same time as -d.
    -d {<rat>|[<rat>-]<domain>[-<instance>.<core>]}[;...]
          Selects the RATs and/or domains and/or nodes for which data is to be
```

loganalyse Options



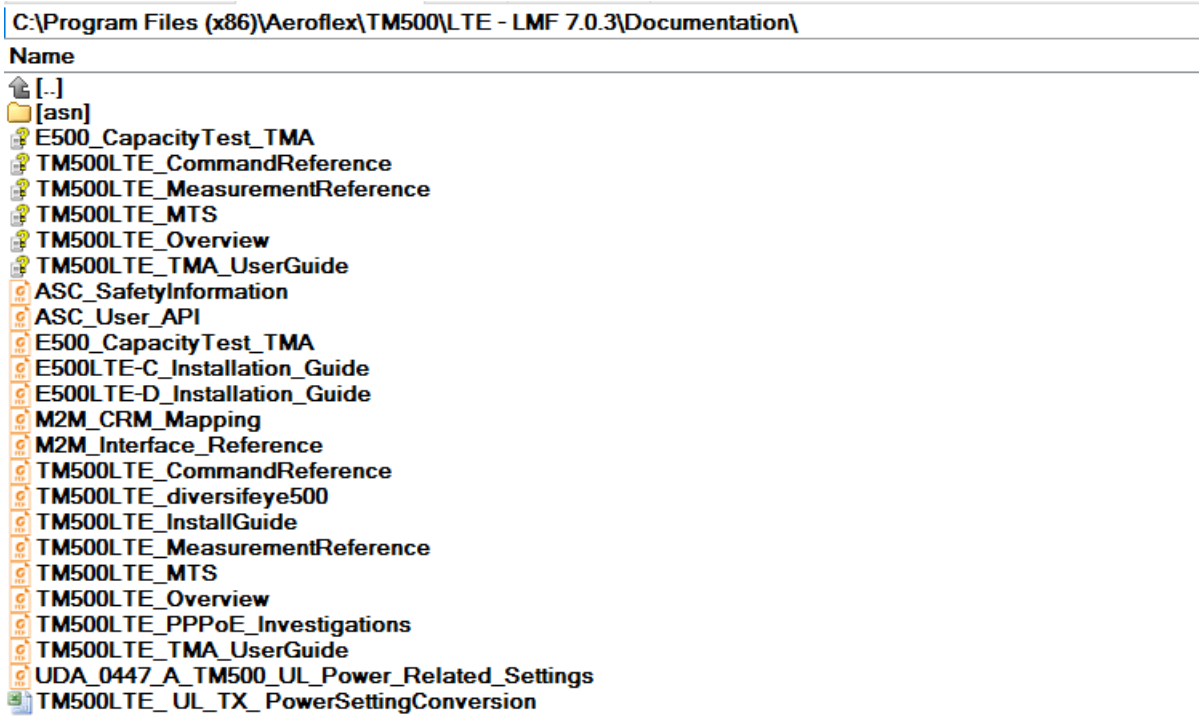
loganalyse Options



TM500帮助文档

TM500帮助文档

- 每个TM500软件的安装目录下都有*Documentation*的文件夹，例如：



TM500帮助文档

- Command Reference Manual
  - TM500所有命令及参数的描述。
- MTS Reference Manual (CUE)
  - Mobility and Traffic Mode (MTS)相关命令及参数描述。
- Measurement Reference Manual
  - TM500所有log的描述。
- TM500/E500 Install Guide
  - TM500/E500环境搭建及配置，包括如何配置Hyper Terminal抓取Serial log。
- TMA User Guide
  - Test Mobile Application (TMA)用户界面的介绍和使用。

References

- TM500LTE_TMA_UserGuide.pdf
- TM500LTE_MeasurementReference.pdf

Change History

Version	Date	Author	Reviewed by	Approved by	Change history
0.1	13/05/2016	Klein Jiang	NA	NA	Initial draft
0.2	29/05/2016	Klein Jiang	NA	NA	Reviewed by Corey/Sining
0.3	21/06/2016	Klein Jiang	NA	NA	Reviewed by Klein

Connected – Seamless – Wireless