高通Lab Test技术期刊 – 201511

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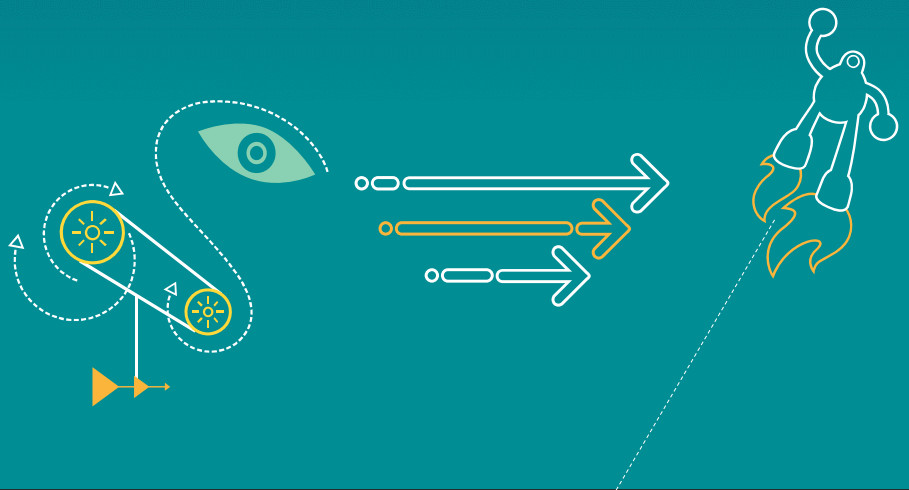

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Revision History

Revision	Date	Description
A	Oct 2015	Initial release

Note: There is no Rev. I, O, Q, S, X, or Z per Mil. standards.

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About CT B41 LTE Protocol Test

- Issue
  - For CT PA test, if UE only supports 2555~2655MHz (EARFCN 40240~41240) for China market, below LTE protocol cases will be failed due to unsupported B41 FREQ in test scenario.
- Solution:
  - Remove the SW limitation (by deleting EFS /nv/item_files/modem/lte/ML1/update_band_ragnge) on UE side to support full B41 bandwidth as 194M if there is no limitation on OEM HW for B41;
  - Or, get waiver from CT for below cases as UE can't support the test FREQs of B41.
- Affected case list (39 TCs in CT spec)

China Telecom Case No.	36.523-1 Case No.	B41 EARFCN
6.2.1 Operations in idle mode		
TC-TD LTE-PCT-01001 [Mandatory]RPLMN, HPLMN/EHPLMN, UPLMN and OPLMN / PLMN selection under auto-mode	6.1.1.1	41490/40620/39750/40970
TC-TD LTE-PCT-01002 [Mandatory]Auto-mode PLMN selection/ combinations of other PLMN and access technologies	6.1.1.2	41490/40620/39750/40970
TC-TD LTE-PCT-01003 [Mandatory]Cell reselection of ePLMN in manual mode	6.1.1.3	40620/41490/39750
TC-TD LTE-PCT-01004 [Mandatory]PLMN selection of RPLMN, HPLMN/EHPLMN, UPLMN and OPLMN / Automatic mode / User reselection	6.1.1.6	41490/40620/39750/40970
TC-TD LTE-PCT-01011 [Mandatory]Cell reselection / Equivalent PLMN	6.1.2.7	40620/41490/39750
TC-TD LTE-PCT-01012 [Mandatory]Cell reselection using cell mode and cell reservations / Access control class 0 to 9	6.1.2.8	40620/41490/39750

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About CT B41 LTE Protocol Test

TC-TD LTE-PCT-01013 [Mandatory]Cell reselection using cell mode and cell reservations / Access control class 11 to 15	6.1.2.9	40620/41490/39750
TC-TD LTE-PCT-01014 [Mandatory]Inter-frequency cell reselection	6.1.2.11	40620/40620/41490
TC-TD LTE-PCT-01016 [Mandatory]Cell reselection, Sintrasearch, Snonintrasearch	6.1.2.13	40620/41490
TC-TD LTE-PCT-01018 [Mandatory]Inter-frequency cell reselection according to cell reselection priority provided by SIBs	6.1.2.15	40620/41490/39750
TC-TD LTE-PCT-01019 [Mandatory]Cell reselection for Squal to check against SIntraSearchQ and SnonIntraSearchQ	6.1.2.17	40620/40620/41490
TC-TD LTE-PCT-01020 [Mandatory]Inter-frequency cell reselection based on common priority information with parameters ThreshX, HighQ, ThreshX, LowQ and ThreshServing, LowQ	6.1.2.18	40620/41490
TC-TD LTE-PCT-01021 [Required] PLMN selection / Automatic mode/between FDD and TDD	6.1.1.1a	1575/41490
TC-TD LTE-PCT-01022 [Required] Cell reselection of ePLMN in manual mode/between FDD and TDD	6.1.1.3a	1575/41490
TC-TD LTE-PCT-01024 [Required] Inter-band cell reselection/between FDD and TDD	6.1.2.16	1575/41490/40620
6.2.3 RRC		
TC-TD LTE-PCT-03031 [Mandatory]RRC connection reconfiguration / Handover / Success / Inter-frequency	8.2.4.6	40620/41490
TC-TD LTE-PCT-03037 [Mandatory]Measurement configuration control and reporting / Intra E-UTRAN measurements / Two simultaneous events A3 (intra and inter-frequency measurements)	8.3.1.3	40620/41490
TC-TD LTE-PCT-03038 [Mandatory]Measurement configuration control and reporting / Intra E-UTRAN measurements / Two simultaneous events A3 (intra and inter-frequency measurements) / RSRQ based measurement	8.3.1.3a	40620/41490
TC-TD LTE-PCT-03039 [Mandatory]Measurement configuration control and reporting / Intra E-UTRAN measurements / Periodic reporting (intra and inter-frequency measurements)	8.3.1.4	40620/41490/39750
TC-TD LTE-PCT-03041 [Mandatory]Measurement configuration control and reporting / Intra E-UTRAN measurements / Two simultaneous events A2 and A3 (inter-frequency measurements)	8.3.1.6	40620/41490
TC-TD LTE-PCT-03045 [Mandatory]Measurement configuration control and reporting / Intra E-UTRAN measurements / Inter-frequency handover / IE measurement configuration not present	8.3.1.10	40620/41490
TC-TD LTE-PCT-03046 [Mandatory]Measurement configuration control and reporting / Intra E-UTRAN measurements / Continuation of the measurements after RRC connection re-establishment	8.3.1.11	40620/41490
TC-TD LTE-PCT-03064 [Required] RRC connection reconfiguration / Handover / Success (with measurement) / Inter-band / Between FDD and TDD	8.2.4.13a	1575/41490
TC-TD LTE-PCT-03065 [Required] RRC connection reconfiguration / Handover / Failure / Re-establishment successful / Inter-band / Between FDD and TDD	8.2.4.14a	1575/41490
TC-TD LTE-PCT-03067 [Required] Measurement configuration control and reporting / Intra E-UTRAN measurements / Two simultaneous events A3 (inter-band measurements) / Between FDD and TDD	8.3.1.12a	1575/41490

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About CT B41 LTE Protocol Test

TC-TD LTE-PCT-03069 [Required] Measurement configuration control and reporting / Intra E-UTRAN measurements / Two simultaneous events A2 and A3 (inter-band measurements) / Between FDD and TDD	8.3.1.14a	1575/41490
6.2.4 EPS mobility management		
TC-TD LTE-PCT-04013 [Optional]Attach Procedure / Success / Last visited TAI, TAI list and equivalent PLMN list handling	9.2.1.1a	40620/39750/41490
TC-TD LTE-PCT-04015 [Mandatory]Attach Procedure / Success / List of equivalent PLMNs in the ATTACH ACCEPT message	9.2.1.1.7	40620/41490
TC-TD LTE-PCT-04016 [Mandatory]Attach / Rejected / IMSI invalid	9.2.1.1.9	40620/41490
TC-TD LTE-PCT-04018 [Mandatory]Attach / Rejected / EPS services and non-EPS services not allowed	9.2.1.1.11	40620/41490
TC-TD LTE-PCT-04019 [Mandatory]Attach / Rejected / EPS services not allowed	9.2.1.1.12	40620/41490
TC-TD LTE-PCT-04020 [Mandatory]Attach / Rejected / PLMN not allowed	9.2.1.1.13	41490/40620
TC-TD LTE-PCT-04022 [Mandatory]Attach / Rejected / Roaming not allowed in this tracking area	9.2.1.1.15	39750/41490/40620
TC-TD LTE-PCT-04023 [Mandatory]Attach / Rejected / EPS services not allowed in this PLMN	9.2.1.1.16	41490/40620
TC-TD LTE-PCT-04024 [Mandatory]Attach / Rejected / No suitable cells in tracking are	9.2.1.1.17	40620/41490
TC-TD LTE-PCT-04035 [Mandatory]Combined attach / Rejected / Tracking area not allowed	9.2.1.2.10	40620/40620/41490
TC-TD LTE-PCT-04036 [Optional]Combined attach / Rejected / EPS services not allowed in this PLMN	9.2.1.2.12	41490/41490/40620
TC-TD LTE-PCT-04064 [Optional]Combined tracking area update / Rejected / Tracking area not allowed	9.2.3.2.12	40620/41490
TC-TD LTE-PCT-04065 [Optional]Combined tracking area update / Rejected / No suitable cells in tracking area	9.2.3.2.15	40620/41490

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Disable LTE Fast Dormancy for Lab Test

- Background
  - In some commercial LTE network, eNodeB does not release LTE RRC connection within a reasonable amount of time, causing large UE power consumption.
  - QC has implement LTE fast dormancy feature to optimize such network issue. But such optimization is not complaint with 3GPP TS36.331.
  - As a result, some LTE protocol/RRM/CT SRLTE Throughput test cases failed owing to LTE Fast Dormancy feature is enabled.
- Log Snippet:

//The fast dormancy timer is started after data transfer

08:47:06.286 1967 EVENT_LTE_EMM_OTA_OUTGOING_MSG Message ID = ATTACH COMPLETE

08:47:06.290 1610 EVENT_LTE_RRC_UL_MSG UL Channel Type = UL DCCH, Message Type = UL Information Transfer

08:47:06.292 lte_mac_qos.c 3125 H UL activity detected, fast dormancy timer=29

08:47:06.302 lte_mac_qos.c 3085 H DL activity detected, fast dormancy timer=9

//Fast dormancy timer expired

08:47:16.302 lte_mac_qos.c 3115 E **fast dormancy traffic in activity timer = 10000 expired**

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Disable LTE Fast Dormancy for Lab Test

//UE release RRC connection locally

08:47:16.303 lte_rrc_ueinfo.c 2328 H UEINFO : Received UEINFO trigger with cause 0x40f0402 ctrl st 4
08:47:16.303 lte_rrc_ueinfo.c 2371 H UEINFO Trigger received for Fast Dormancy, Ignored
08:47:16.304 lte_rrc_cre.c2177 H Received LTE_MAC_RANDOM_ACCESS_PROBLEM_IND (due to FAST_DORMANCY) releasing Conn
08:47:16.304 lte_rrc_cre.c649 L CRE: Initiated Connection Release
08:47:16.304 lte_rrc_cre.c2413 H Fast Dormancy - release connection WO TAU
08:47:16.304 lte_rrc_crp.c2946 H CRP: Processing Initiate Conn Rel indication

//RLF triggered

08:47:16.304 lte_rrc_crp.c629 L CRP: Sent Connection Release Started Ind
08:47:16.304 EVENT_LTE_RRC_RADIO_LINK_FAILURE Counter = 1
08:47:16.304 EVENT_LTE_RRC_RADIO_LINK_FAILURE_STAT RLF Count since RRC Connected = 1, RLF Count since LTE Active = 1, RLF Cause = OTHER FAILURE

- So we need to disable LTE fast dormancy feature during lab test to avoid unexpected radio link failure
- This feature can be disabled by deleting EFS:

  /nv/item_files/modem/lte/L2/mac/lte_mac_fast_local_release_timer

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LTE Protocol Failures in CT Lab Testing

- Issue Description
  - During CT lab testing, FULL RAT mode is enabled before OOS timer expires due to oos_scan_cnt getting incremented. Entering into FULL RAT quickly causes certain tests to fail because they expect a long OOS time.
  - Below is the related rule defined in carrier_policy.xml on Bolt 2.6

```
<!-- Carrier Policy file for SRLTE+G with GWL+G DSDS roaming for 7+5 mode
$Header: //commercial/MPSS.BO.2.6.c1.2/Main/modem_proc/mmcp/policyman/configurations/Carrier/OpenMarket/
-->
<policy name        = "generic"
        changelist  = "$Change: 8934492 $"
        enabled     = "true"
        schema_ver  = "1"
        policy_ver  = "74.3.12"
>
    Rules to handle OOS situations and timers.
  ================================================================
  -->
  <!-- RULE #2 -->
  <rule precond="none">
    <conditions>
      <true/>
    </conditions>
    <actions>
      <boolean_set name="full_rat_eval">
        <any_of>
          <timer_expired name="noservice" />
          <all_of>
            <oos_scan_cnt test=">=" value="1" />
            <not> <have_service /> </not>
          </all_of>
        </any_of>
      </boolean_set>
      <if>
        <cond> <timer_expired name="noservice" /> </cond>
        <then> <expired_timer_handled name="noservice" /> </then>
      </if>
      <continue />
    </actions>
  </rule>
```


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LTE Protocol Failures in CT Lab Testing

- **Affected Cases:** TC-LTE_FDD-PCT-04047(36.523-1 TC9.2.3.1.4), TC-LTE_FDD-PCT-04048(36.523-1 TC9.2.3.1.5)
- **Log Analysis:**

//TS36.523-1 TC9.2.3.1.5 step 16~19:
//serving cell is set to "non-suitable cell" for 8 minutes and back to service, expecting UE send TAU request on cell 1

//The original rat_capability is CHL

21:31:52.757 policyman_rat_capability.c 725 H action <rat_capability> set Base to 0x0214 for subs 0

21:37:57.676 EVENT_LTE_RRC_DL_MSG DL Channel Type = DL DCCH, Message Type = RRC Connection Release
21:37:57.766 EVENT_LTE_RRC_NEW_CELL_IND Cause = Selection, Frequency = 1575, Cell ID = 1

//cell 1 becomes non suitable, no service reported by RRC, OOS timer start

21:38:09.969 emm_rrc_handler.c 2839 H DS: SUB 1 =EMM= RRC_SERVICE_IND - MCC: D1 0, D2 0, D3 0
21:38:09.969 emm_rrc_handler.c 2844 H DS: SUB 1 =EMM= RRC_SERVICE_IND - MNC: D1 0, D2 0, D3 0
21:38:09.969 emm_rrc_handler.c 2849 H DS: SUB 1 =EMM= RRC_SERVICE_IND - TAC 0, Cell ID 0, IMS EMC spt 0
21:38:09.969 emm_rrc_handler.c 2853 H DS: SUB 1 =EMM= RRC_SERVICE_IND - Div Duplex 0, Detach Reqd 0
21:38:09.969 emm_rrc_handler.c 2858 H DS: SUB 1 =EMM= RRC_SERVICE_IND - CSG Id = 0, Hybrid cell = 0
21:38:09.969 emm_rrc_handler.c 2862 H DS: SUB 1 =EMM= RRC_SERVICE_IND - ACQ Status = 0

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LTE Protocol Failures in CT Lab Testing

21:38:25.188 policyman_serving_system.c 3258 H condition <have_service> returns 0
21:38:25.188 policyman_timer.c 1244 H executing <timer_start> on timer 1
21:38:25.188 policyman_timer.c 237 H **Starting timer 1 for subs 0 with duration 1200 secs**

//condition oos_scan_cnt is met, set rat_capability to CHGWTL to get FULL RAT

21:38:27.324 policyman_serving_system.c 2935 H **condition <oos_scan_cnt> test 3 returns 1**
21:38:27.325 policyman_rat_capability.c 725 H **action <rat_capability> set Base to 0x0a3c for subs 0**
21:38:27.325 policyman_rf.c 455 H action <rf_bands> set for subs 0:
21:38:27.325 policyman_rf.c 735 H GW-32-MSB 0x00020000, GW-32-LSB 0x04e80387
21:38:27.325 policyman_rf.c 736 H LTE-32-MSB 0x000001e0, LTE-32-LSB 0x00000045
21:38:27.325 policyman_rf.c 737 H TDS-32-MSB 0x00000000, TDS-32-LSB 0x00000000

//rat_capability change to CHL

21:45:37.525 policyman_serving_system.c 3258 H condition <have_service> returns 1
21:45:37.525 policyman_timer.c 1292 H executing <timer_stop> on timer 1
21:45:37.525 policyman_timer.c 254 H Stopping timer 1 for subs 0
21:45:37.525 policyman_rat_capability.c 725 H **action <rat_capability> set Base to 0x0214 for subs 0**

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LTE Protocol Failures in CT Lab Testing

//local detach triggered

21:45:37.529 policyman_rat_capability.c 446 H get_rat_capability returned 0x0214
21:45:37.531 cmph.c 17667 H =CM= PS detach: Mode pref change detected. SIM state: 1
21:45:37.531 cmph.c 17695 H =CM= Marking PS detach required as TRUE

//As a result, UE triggers Attach request, other than TAU request on cell 1

21:45:37.830 EVENT_LTE_RRC_NEW_CELL_IND Cause = Selection, Frequency = 1575, Cell ID = 1
21:45:37.904 EVENT_LTE_EMM_OTA_OUTGOING_MSG Message ID = ATTACH REQUEST

- Solution:
  - Workaround: Remove oos_scan_cnt from XML or replace with a very large number , i.e., 10,000 when requiring a long OOS time.
  - Official fix: CR917412 for this issue.
  - Additional: Please make sure the OOS timer is long enough to pass those GCF cases, as defined below in carrier_policy.xml:

```
<!-- Define the OOS timer with a 20 minute interval -->
<define_timer name = "noservice" interval = "20" units = "min" id = "1" />
```


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Configuration Summary for MFBI cases

- Multiple Frequency Band Indicator (MFBI) related cases:
  - 3GPP 36.523-1 6.1.2.19 (intra-frequency case)
  - 6.1.2.20 (inter-frequency case)
  - 6.1.2.21 (inter-band case)
  - TS36.523-1 6.2.3.34/6.2.3.35 (inter-RAT cases, not required currently)

- Related PICS/PIXIT:
  - px_MFBI_FrequencyBand: An Overlapping EUTRAN Band under test
  - px_OverlappingNotSupportedFrequencyBand_MFBI: An overlapping not supported frequency band MFBI under test
  - px_MFBI_BandChannelBandwidth: bandwidth
  - pc_eBandx_Supp, the EUTRAN band supported by UE, “x” refers to any band number

- Related UE setting:
  - FGI31: should be enabled for MFBI test cases
  - NV6828: should inline with the overlap band under test

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Configuration Summary for GCF/PTCRB MFBI cases

- EUTRAN overlap band table:

px_OverlappingNotSupportedFrequencyBand_MFBI	px_MFBI_FrequencyBand
2	25
3	9
4	10
5	18, 19, 26
9	3
10	4
12	17
17	12
18	5, 26, 27
19	5, 26
25	2
26	5, 18, 19, 27
27	18, 26
33	39
38	41
39	33
41	38

- Configuration example:
  - If test TC6.1.2.20(Eband4), should set:
    - px_MFBI_FrequencyBand=4; px_OverlappingNotSupportedFrequencyBand_MFBI=10; pc_eband4_supp=TRUE; pc_eband10_sup=FLASE(refer to the above table);
    - In UE side, should disable EUTRAN band10 via NV6828.
  - If test TC6.1.2.21(Eband12-Eband17), should set:
    - px_MFBI_FrequencyBand=12; px_OverlappingNotSupportedFrequencyBand_MFBI=17; pc_eband12_supp=TRUE; pc_eband17_sup=FLASE;
    - In UE side, should disable EUTRAN band17 via NV6828.

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CTA Lab测试中CDMA 注网问题排查方法

- 若CDMA/EVDO送测手机不能正常注网，请关注以下几点：
  - 选择正确的网络模式：修改NV10为19 (CDMA And HDR only)。写入后重启手机，开机后读取NV10的值，检查是否修改生效。也可以通过手机UI里面的设置->移动网络->网络模式来设置。还有一种方式 通过Android手机工程指令*#*#4636#*#*，在网络模式里选择CDMA/HDR 模式。
  - 在UI 上关闭移动数据和数据漫游，避免手机重复发送origination Message 干扰手机驻网信息发送。
  - 若DO session 不能建立，确认NV562为1（允许混合模式）。设置ehrpd 类型NV4964=4。
  - 若DO session 不能建立，UATI 没有分配，可以设置HDR SCP session为Inactive（NV475=0）。
  - 确认手机的SID、NID 接入频点，band 设置与实验室测试系统一致；若不一致，会导致驻网不成功。
  - 测试应在屏蔽环境下进行，以避免实际网络的干扰。如果没有屏蔽环境，可以通过修改NV255，把外网SID、NID 写入，屏蔽实网干扰。

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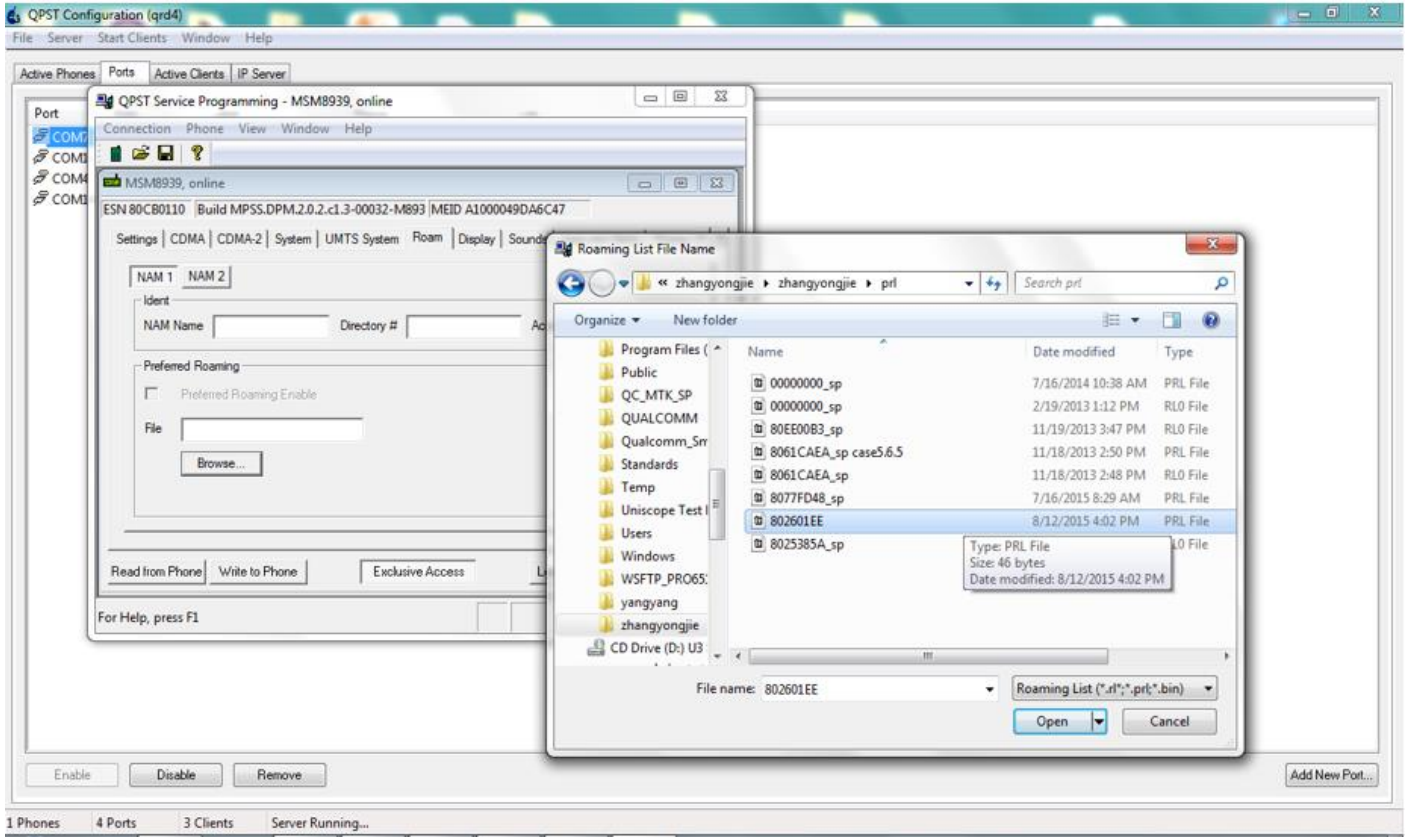
CTA测试中CDMA 注网问题排查方法

- 如果用NV only模式实现手机注网，则方法如下：
  - 在QXDM的command窗口输入spc，并修改NV855为1。
  - 在QPST configuration中选则Service Programming，选择Roam→Browse… 导入prl 文件，点击Write to Phone写入需要加载的prl。



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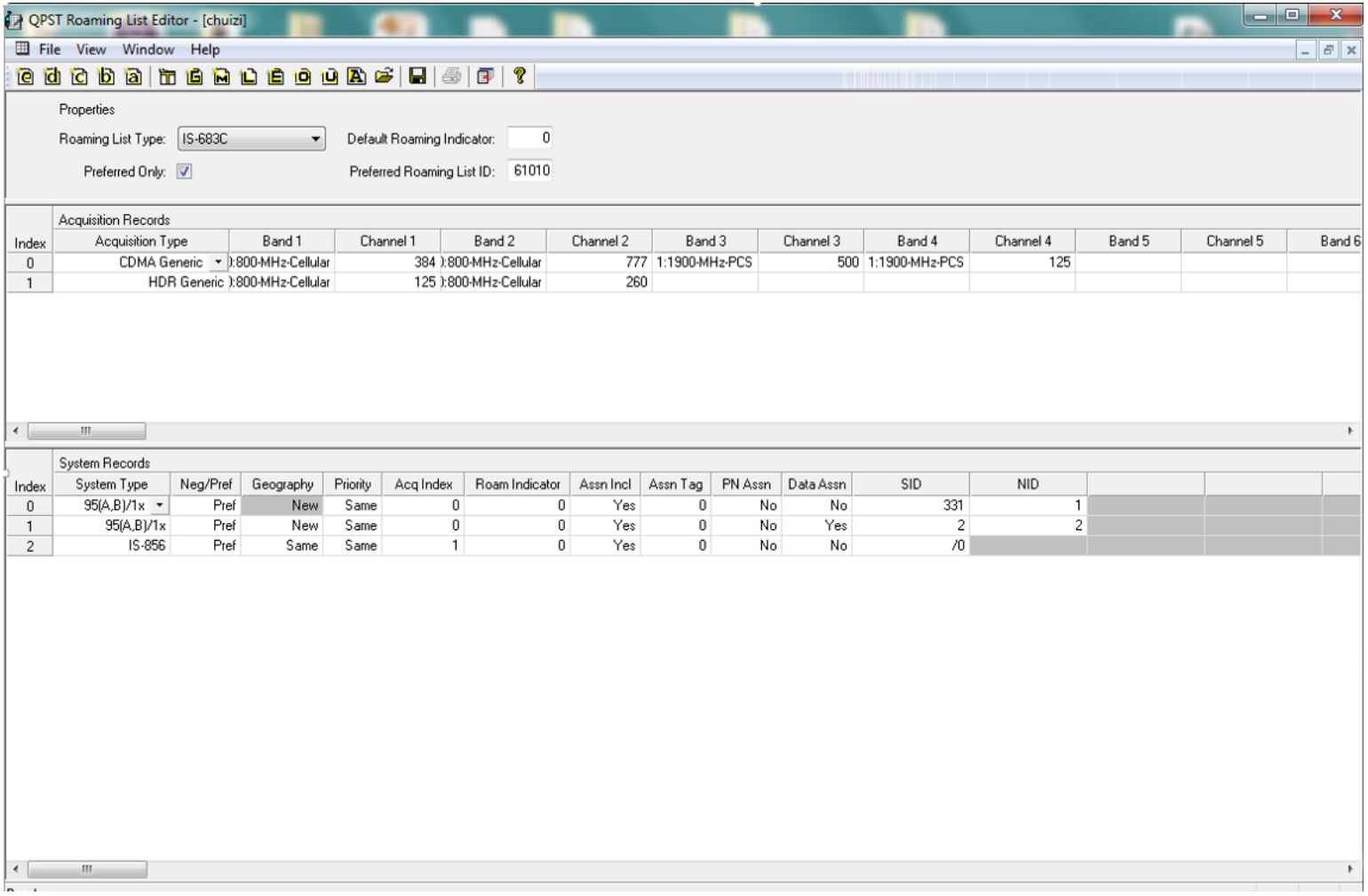
CTA测试中CDMA 注网问题排查方法

- 在导入prl 文件的同时，请确认SID、NID 、Band、channel与测试仪表设置保持一致。



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CMCC APSS测试中的常见问题

- USB debug和连接问题：中国移动要求，第一次开机没有SIM卡插入时，USB的debug功能不能开启，不能与PC端传输文件；非第一次开机无SIM卡，要有提示给用户。
- 手机外壳4G标识问题，很多客户手机在外壳没有4G标识。
- 各卡槽标识问题，很多客户手机各个卡槽没有明确的标识。
- 版本问题，注意手机实际版本要与移动存档的版本一致。
- 预装APK问题，注意要预装移动要求的APK，版本要与移动要求一致。
- 状态栏中网络模式的显示问题，包括刚开机注册时，通话时的模式切换显示等。
- 计算器，浏览器输入长度限制问题，应该有最大输入限制并在达到限制是给提示。
- 锁屏界面在各种情况下紧急呼叫的显示问题，什么时候应该显示，什么时候不应该显示需要正确。
- 备份与恢复的问题，名称是否与移动一致，是否放置在桌面上，备份时有没有各种提示等，比如SD卡提示，换机提示。
- 数据在卡1，卡2中切换功能问题。

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CMCC APSS测试中的常见问题

- 手机IMEI号显示问题，双卡手机要么显示一个IMEI号，要么显示两个相同的IMEI号，请注意不要显示两个不同的IMEI号。
- 数据网络和WLAN在各种情况下的切换提示问题，很多产品没有提示。
- 桌面时钟与屏幕右上角时钟显示不一致问题，能不能自动更新时间等。
- 终端字体设置为超大时的显示问题，桌面图标是否显示正常，各个APP是否能正常打开。
- 省电模式问题，手机要支持省电模式。

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关于CMCC VoLTE样机送测

- 若仅做变更测试（仅升级VoLTE功能）：
  - 对于lab 测试仅仅需要提交三台样机：一台标注为VoLTE MOS音频；两台标注为开口类型4（1台用于VoLTE 协议测试，另一台用于测试VoLTE NS-IOT）。
  - 目前中移动允许切换MBN，但建议对于开口类型4的样机在射频口附近进行标识：加载MBN Lab_Conf_Volte的样机标注为VoLTE PCT；加载MBN Lab_Nsiot_Volte的样机标注为VoLTE NS-IOT。
- VoLTE A库测试样机送测：
  - 正常天线开口类型样机13台，编号为62~74，具体如下：
    - 天线开口类型1：5台，激活MBN Comb_Attach_TGL；
    - 天线开口类型2 ：2台，激活Commercial MBN；
    - 天线开口类型3 ：1台，激活MBN EPS_ONLY；
    - 天线开口类型4 ：3台，激活MBN Comb_Attach_TGL；
    - 天线开口类型5 ：2台，激活MBN Comb_Attach_TGL 。
  - VoLTE样机：3台（两台开口类型4和一台VoLTE MOS音频）：
    - 样机编号#93：天线开口类型4，激活MBN Lab_Conf_Volte；
    - 样机编号#94：天线开口类型4，激活MBN Lab_Nsiot_Volte；
    - 样机编号#99：天线开口类型1，VoLTE MOS音频，激活MBN Commercial_Volte。

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References

Documents	
Qualcomm Technologies, Inc.	
Title	DCN
Local Release of LTE RRC Connection Application Note	80-NU143-1
CMCC Device Configuration and Testing Information	80-NP425-3

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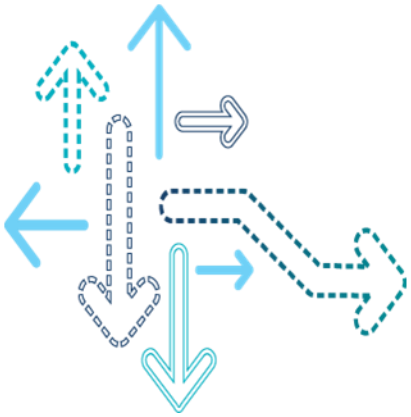

Questions?

https://support.cdmatech.com

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