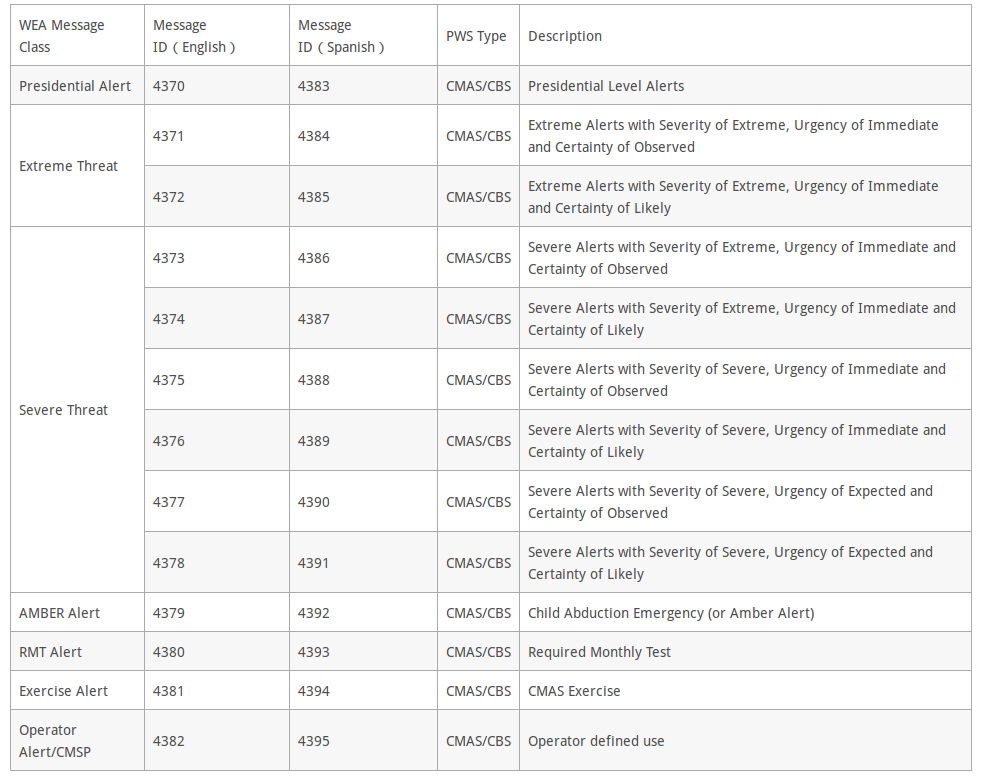
# U102 WEA模块介绍

# **WEA简介**

参考明月的文档 <WEA功能简介.doc>, 这里不再重复

# **WEA Channels ID**

参考明月文档, 这里添加了 4396-4400 的说明:

4396: Public Safety

4397: Public Safety Spanish

4398: State Local/Test

4399: State Local/Test Spanish

4400: WEA Handset Action Message

# **WEA 高通平台预置配置**

高通平台WEA相关配置初始值是通过NV配置, 涉及下面几个配置项:

1. . **NV1016** NV\_SMS\_GW\_CB\_CONFIG\_I, 配置CB 接收, 必须设置为1.

Default value - 0

This NV item will have to be set to value 1 to receive broadcast messages in GWL domain.

Set to 0 – (WMS\_BC\_CONFIG\_DISALLOW) – Not allowed to activate broadcast and receive broadcast messages.

Set to 1 – WMS\_BC\_CONFIG\_ALLOW\_TABLE – Allows broadcast messages.

Set to 2 – WMS\_BC\_CONFIG\_ALLOW\_ALL – Applicable for CDMA only.

1. . **NV1017** NV\_SMS\_GW\_CB\_USER\_PREF\_I, 配置Language filter, 接收多语言, 需配置为2.

Default value – 0

This NV item is used to enable/disable language filters for receiving broadcast message. To receive broadcast messages of all language, this NV should be set to value 2.

Set to 0 – Broadcast messages are disabled.

Set to 1 – Language Filtering is enabled.

Set to 2 – Ignores language filtering.

1. . **NV1014** NV\_ SMS\_GW\_CB\_SERVICE\_TABLE\_I, 配置具体的CB channel id列表.
2. . **NV1015** NV\_SMS\_GW\_CB\_SERVICE\_TABLE\_SIZE\_I, NV1014中Channel id 的配置表size.

这些配置初始值通过mbn在modem配置, 也提供了QMI接口供AP侧调用, 在AP初始化时, framework也会调用QMI接口配置channel ID, 最终以AP侧配置结果为准.

QMI接口为下面两个:

CellBroadcast.cpp (android\vendor\qcom\proprietary\b2g\_telephony)

1. . SetGsmCellBroadcastConfig(bool aActivate, const uint16\_t \*aList, uint32\_t aLength)

配置Channel ID, 对应NV1014, NV1015.

1. . SetGsmBroadcastActivation(this, true), 在SetGsmCellBroadcastConfig成功的回调中调用.

激活CB接收配置, 同时也会配置Language filter(在qcril中根据qcril.db中参数配置), 在提供给上层的接口中没有Language filter的配置.

KaiOS调用SetGsmCellBroadcastConfig接口在开机初始化时进行channel ID配置, 目前策略是底层配置接收所有的CMAS, UI上根据开启的channel ID进行过滤显示.

GonkCellBroadcastConfigService.js (android\gecko\dom\cellbroadcast\gonk)

在Modem log中可以查看开启的channel id:

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[2] min:4370 max:4371

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[3] min:4371 max:4373

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[4] min:4370 max:4370

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[5] min:4373 max:4379

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[6] min:4379 max:4380

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[7] min:4380 max:4383

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[8] min:4383 max:4384

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[9] min:4383 max:4383

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[10] min:4384 max:4386

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[11] min:4386 max:4392

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[12] min:4392 max:4393

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[13] min:4393 max:4396

00:51:46.698 [ lte\_rrc\_sib.c 11535] msg\_id\_range\_list[14] min:4396 max:4400

# **WEA接收流程**

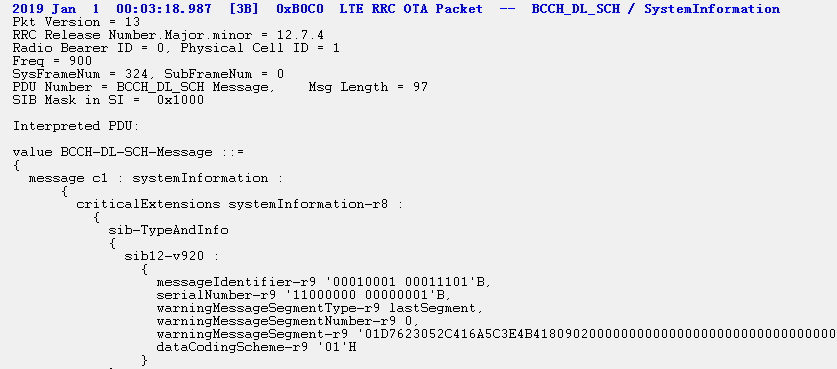
NW->Modem->Qcril->b2g\_telephony->network-alerts

1. **. WEA消息从网络下发到手机**

在LTE下通过SIB12下发, 可以在log中直接看到. 在UMTS下通过SIB5(IDLE), SIB6(CELL\_PCH/URA\_PCH)配置获得CB的schedule参数, 从而开启监听, 这部分无法直接从系统消息中看到, 只能高通解析完毕后才能看到.

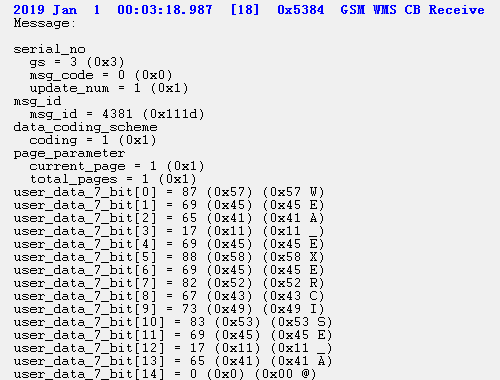
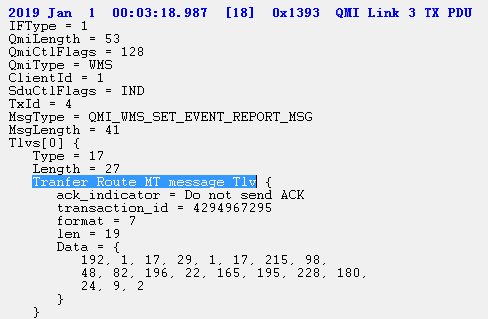
注意: CMAS的duplicate check, 高通是在modem侧完成的, 理论上不需要AP侧再进行处理.

**// LTE 下SIB12**



// 上报WEA消息. 如果没有这个上报, 可能是channel ID未配置或者重复, 需要具体分析.

// 下面是modem解析好的消息, 最终通过QMI上报给AP侧. 对于WEA 3.0的消息, WAC应也是在SIB12中携带的, 但是目前QCAT不支持, 看不到这个信息, 在QMI中可以看到.

**// UMTS下必须要在IDLE或者CELL\_PCH/URA\_PCH状态下, 才会接收CB消息**

CB消息的配置是在SIB5/6中广播, 在CTCH (Common traffic ch)信道上接收, 这部分接收, 组装都在底层进行.



// 接收完成后, 会发给NAS层接收到的消息:

01:01:31.132 [ wmsbc.c 7156] ===== CB Page Header (as\_id=0) Msg ID = 4371: ====

01:01:31.132 [ wmsbc.c 7175] Xlate DCS language = 1

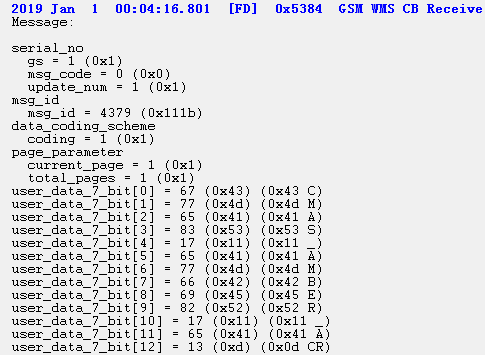
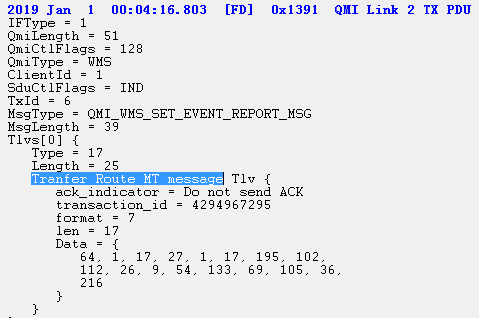
01:01:31.132 [ wmsbc.c 7179] Language Filter = 0x656e

01:01:31.133 [ wmssim.c 399] lang\_list[0]=25966

01:01:31.133 [ wmsbc.c 7209] Read 1 languages

01:01:31.133 [ wmsbc.c 7242] WMS\_BC\_PREF\_ACTIVATE\_TABLE: checking lang entries

01:01:31.133 [ wmsbc.c 7318] GW CB hdr MATCHED and Not duplicate

1. **. Modem上报CB消息到AP qcril首先进行处理**

vendor/qcom/proprietary/qcril/qcril\_qmi/qcril\_qmi\_sms.c

---> void **qcril\_sms\_process\_event\_report\_ind**(), 由于存在长的CB分多条上报的情况, 这里会先进行缓存, 待所有CB都从modem上报接收完毕后, 才汇总上报到telephony去. Qcril处理后最终上报的数据格式如下:

|head:6|page\_count:1|page1:82 -- page1\_len:1|page2:82 -- page2\_len:1|pageN...|wac len:2 -- low:high|wac data:len|

01111303E101 01 453C5D5E6E9741C9763BED2EBBE9A06B31089AB960A076793E0F9FCBA07B9A8E065D8343D0F8FD9693D3EE30BD3C07B54049F73C4D2E83E06F76FEFC76030000000000000000000000000000000000000000 3E 7D00 20B8B9D0492B5D4B9CDB52C0BAB989752D1D7B8BD552BE01B9063929A00B9924D29EB8B9B6B52A345B9D0492B5D420B8BABFD130887BA8F1534670BB7A8534D95BC1A1133B67BBF0D5316ECBB82E52F5E5BB3A152FEFFBABFD1308873028BA3A812B20B0095F3028B886092919C014003028C3B4E4A408801900100C1E

最后Qcril将上述处理后的数据上报给telephony

--> qcril\_default\_unsol\_resp\_params( 0, **RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS**, &unsol\_resp )

// 在log中可以看到上报的数据内容

02:08:04.379 D/RIL ( 358): [SUB0] **[UNSL]< RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS** {len=217,buf="01111303E10101453C5D5E6E9741C9763BED2EBBE9A06B31089AB960A076793E0F9FCBA07B9A8E065D8343D0F8FD9693D3EE30BD3C07B54049F73C4D2E83E06F76FEFC760300000000000000000000000000000000000000003E7D0020B8B9D0492B5D4B9CDB52C0BAB989752D1D7B8BD552BE01B9063929A00B9924D29EB8B9B6B52A345B9D0492B5D420B8BABFD130887BA8F1534670BB7A8534D95BC1A1133B67BBF0D5316ECBB82E52F5E5BB3A152FEFFBABFD1308873028BA3A812B20B0095F3028B886092919C014003028C3B4E4A408801900100C1E"}

1. **. b2g\_telephony收到CB消息, 处理后上报到app, WEA3.0 GEO fencing就是在这里处理的**

vendor/qcom/proprietary/b2g\_telephony/CellBroadcast.cpp

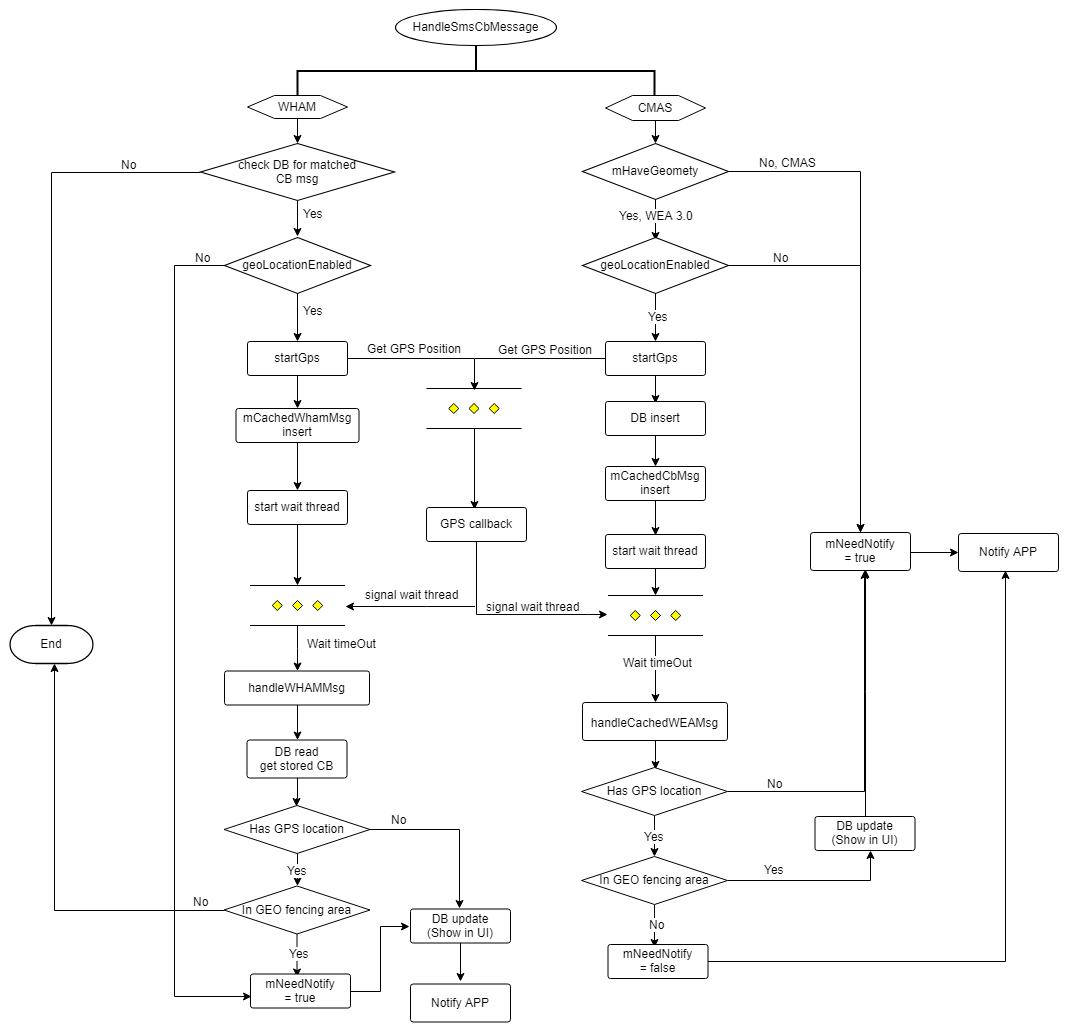
这里以统一处理普通的CMAS, WEA 3.0, WHAM流程, 具体如下:

1. 首先解析CB消息内容, 包括头信息(msg ID, serial number), 消息内容(body), GEO信息.
2. 根据msg ID判定是否是WHAM, 还是WEA 消息.
3. 根据是否包含GEO信息判定是否是WEA 3.0还是普通CMAS消息.
4. 这里为了实现WEA 3.0 Test mode功能, 会将所有收到的CMAS消息上报, 但是在上报的消息中增加了一个标志位(mNeedNotify), 如果是普通CMAS或者WEA 3.0 在区域内的消息, 置为true, 如果是WEA 3.0区域外的消息, 置为false, 上层根据这个标志位进行显示.
5. 对于WEA 3.0/WHAM匹配到的区域外消息, 会首先判断手机GPS定位是否开启, 未开启GPS定位则直接上报显示.
6. GPS开启时, 会启动GPS获取手机的位置, 并根据WEA消息中携带的等待时间设置GPS的超时时间, 如果在超时时间内未获取到GPS位置, 则直接显示上报. 获取到GPS位置后, 计算是否在WEA消息携带的GEO区域内, 如果在区域内, 则上报显示, 否则存储在本地数据库中, 供后续WHAM流程使用.
7. 收到WHAM消息时, 会检索本地存储的未显示的WEA消息, 如果有匹配的, 则启动GPS,获取位置, 如果GPS未开启或者GPS开启并且位置在区域内, 则上报app显示, 同时更新数据库中信息为已经显示上报.
8. 本地数据库中存储的信息仅保留24h, 并在开关机或者开关飞行模式后清空.

**这里有一点注意下:**

KaiOS系统中, 多线程使用要当心, 很多代码只能在主线程中执行, 比如这里调试中用到的startGPS的调用, 通知上层的NotifyMessageReceived()调用等, 如果放在创建的线程中, 系统会出现异常. 目前只有wait的操作在创建的线程中执行.

CMAS处理的主要流程如下:



WAC数据的解析如下, 是协议中定义的结构, MTK上也对比了, 是通用的.

a. POLYGON: cnt= (len-2)\*8/44, 每44bits一组坐标 (5.5 byte).

|4bits:type|10bits:len| (2 bytes)

|22bits:lat, 22bits:lng |...|22bits:lat, 22bits:lng | (len-2 bytes)

b. Circle: cnt= 1, 包含44bits lat/lng, 20bits: R (8 byte)

|4bits:type|10bits:len| (2 bytes)

|22bits:lat, 22bits:lng |20bits: R| (len-2 = 8 bytes)

c. max time: cnt=1, 8bits, (1 byte)

|4bits:type|10bits:len| (2 bytes)

|8bits:time | (len-2 = 1 byte)

下面是一组数据, 可以参考.

20FC POLYGON

9878BADF37F98785EDEF8D

98BCFEDEDD298C6FEDE9D3

98F256DE88098FAC2DEEF2

990B3ADF20898FBFEDFA7C

98B77EDFD1298917EDFB3F

9878BADF37F0

3028 Circle

BA3A812B20B0095F

100C max time

1E

1. **. b2g\_telephony通知APP应用来进行后续的处理**

vendor/qcom/proprietary/b2g\_telephony/CellBroadcast.cpp

---> NotifyMessageReceived(cbMsg);

android/vendor/qcom/proprietary/b2g\_telephony/nsCellBroadcastService.cpp

---> NotifyMessageReceived(uint32\_t serviceId, CellBroadcastMessage& cbMsg)

android/gecko/dom/system/gonk/RILSystemMessengerHelper.js

---> notifyCbMessageReceived: function(aServiceId, aGsmGeographicalScope,

android/gecko/dom/system/gonk/RILSystemMessenger.jsm

---> notifyCbMessageReceived: function(aServiceId, aGsmGeographicalScope,

--> this.broadcastMessage("cellbroadcast-received", data);

App network-alerts应用接收消息, 继续处理

android/apps/network-alerts/

--> { "cellbroadcast-received": "/index.html" }

android/apps/network-alerts/src/cmas\_alert\_startup.js

--> navigator.mozSetMessageHandler('cellbroadcast-received', this.onCellbroadcast.bind(this));

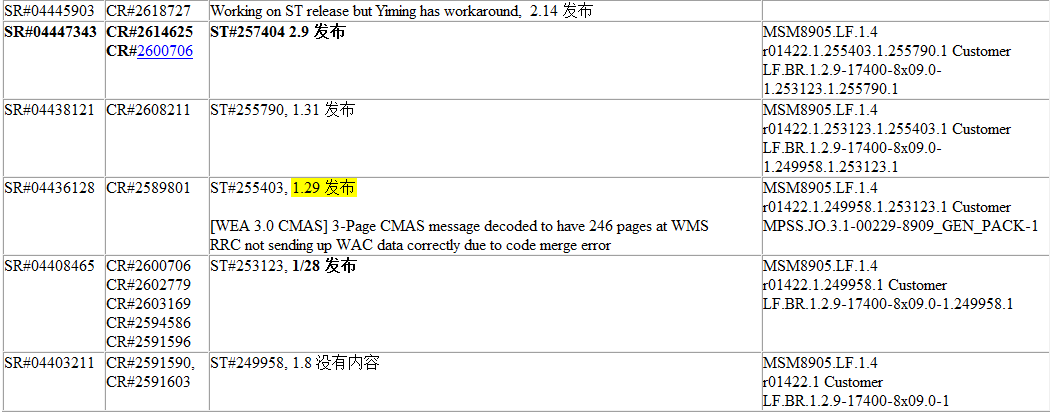
# **WHAM 消息**

WHAM(WEA Handset Action Message) 该消息的目的是对之前接收的在区域外不显示的WEA消息进行二次处理。

当接收的WEA消息(比如4370)被判断在区域外时, 会被临时存储下来, 不显示给用户. 在需要时, 比如进入新的小区等(网络来进行控制), 服务器端会再次下发一条WHAM消息, Channel ID 为4400, 携带message id + serialNumber, 来触发手机对本地保存的区域外的未显示的消息重新执行DBGF流程, 看看是否在区域内了, 如果此时已经在区域内了, 就显示出来, 如果依然在区域外, 还是不显示. 处理的流程在4章中已经介绍了.

WHAM中仅携带msg id和serial number, 可以携带多组数据.

# **WEA3.0 高通Patch**



高通WEA 3.0的patch主要包括:

1. . 2019.12.22基线升级至r01422.1, 包含支持modem侧WEA 3.0 支持, modem至AP QMI接口添加, 部分AP侧WEA逻辑实现. 初始版本高通未验证WEA3.0功能, AP侧WEA3.0基本功能都有问题.
2. . 上表中是在此基础上合入的patch, 基本都在AP b2g\_telephony模块完成WEA 3.0逻辑处理. Modem侧有一个patch (CR258901)解决LTE CMAS分段消息无法接收的问题.
3. . 我们为了实现WEA test mode功能做了部分修改: 将所有WEA消息上报, 添加一个变量mNeedNotify供UI判断是否显示.
4. . 在APP侧显示逻辑方面的修改(未列入).

# **WEA Log 分析**

以LTE-BTR-5-4588为例介绍下WEA Log过程:

// modem侧的log参考4章中介绍, 这里介绍AP侧的流程

Test Steps:

1. Power on TU and wait for registration on the E-UTRAN cell.

2. Ensure that settings to receive “All Alerts Notifications” are on and "Location" service is enabled on TU.

3. In script, ensure that WAC(Warning Area Coordinates) IE has a polygon with 20 vertices and the polygon includes the location of test area – Location A

4. In script, "Geo-fencing Maximum Wait Time" value is set for 255.

5. Send an Severe alert message (MsgID: 4376) "Severe Imminent WEA 3.0 message with 20 coordinates – Inside polygon" with a serial number XX.

6. Verify that TU receives and displays the alert message within 10 seconds. Then, dismiss the alert.

7. In script, ensure that WAC(Warning Area Coordinates) IE has a polygon with 20 vertices and the polygon does NOT include the location of test area – Location B

8. In script, "Geo-fencing Maximum Wait Time" value is set for 255.

9. Send an Severe alert message (MsgID: 4376) "Severe Imminent WEA 3.0 message with 20 coordinates- Outside polygon" with a serial number YY.

10. Verify that TU does NOT display the alert message. Wait for 40 seconds to verify.

11. From the GPS simulator, change the location setting to Location B.

12. In script, send WHAM alert that indicates WEA messages in step 5 and 9.

13. Verify that TU performs DBGF and updates the location to Location B from the GPS simulator platform.

14. Verify that TU displays the stored WEA message in step 10 within 10 seconds. Then, dismiss the alert.

15. Verify that TU does not display duplicated alert in step 5.

16. In 30 seconds, send the WHAM alert that indicates the WEA messages in step 5 and 9 but with the different serial number from step

17. Verify that TU does NOT perform DBGF by GPS simulator platform.

18. Verify that TU does NOT display the duplicated alert message. (neither step 5 nor step 9)

19. Power off TU.

// step 5, 收到在区域内的WEA

01-01 02:33:51.339 D/RIL ( 356): [SUB0] [UNSL]< RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS {len=204,buf="01111803E801

01D3B2BD2C2F8392ED76DA5D76D341D762103473C140EDF27C1E3E9741F7341D0D92C140E3F75B4E4EBBC3F4F21CD40225DDF334B90C82BFD9F9F3DB0D000000000000000000000000000000000000000000003C700021C0C3C0D8A3E96C3C41CA3F7FC3C6FCA4053C3C708A413CC3C16CA4283C3BDC8A42A6C3B948A42C2C3B5A4A429FC3B1ECA4278C3AE48A4271C3AAD0A425FC3A72CA4225C3A574A41B1C3A518A413CC3A45CA40A1C3A630A3FB8C3A730A3F43C3B21CA3F2CC3B990A3F0BC3C0D8A3E96"}

01-01 02:33:51.359 D/CELL\_BROADCAST( 356): Received unsolicited response RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS

01-01 02:33:51.359 D/CELL\_BROADCAST( 356): InitCellBroadcastMessage format:1,mGsmGeographicalScope:0,mMessageCode:62,

mMessageId:4376,serialNumber1000

01-01 02:33:51.479 D/CELL\_BROADCAST( 356): GPSProvider::startGps:0, tid:356

01-01 02:33:51.519 D/CELL\_BROADCAST( 356): Start gps and wait for max: 30 in handler thread

01-01 02:33:52.809 D/CELL\_BROADCAST( 356): GeoPositionCallback::HandleEvent (47.606202, -122.332054, 6.000000), tid:356

01-01 02:33:52.859 D/CELL\_BROADCAST( 356): performGeoFencing current location: lat: 47.606201, lng: -122.332054

02:33:52.859 D/CELL\_BROADCAST( 356): performGeoFencing ~~~~~inside the GEO~~~~

01-01 02:33:52.909 D/NS\_CELLBROADCAST\_SERVICE( 356): NotifyMessageReceived: Geographical scope : 0, Message code : 62, Message Id : 4376, Language : 'en', Body : 'Severe Imminent WEA 3.0 message with 20 coordinates - Inside polygon', Message class : 6, Cdma service category : 0, Has ETWS info : false, ETWS warning type : 65535, ETWS emergency alert : false, ETWS popup : false, SerialNumber : 1000, StrGeo : 'polygon|47.639036,-122.374821|47.648005,-122.354822|47.655902,-122.336626|47.656031,

-122.316628|47.640624,-122.288561|47.630625,-122.285557|47.618265,-122.283154|47.608266,-122.286158|47.598052,-122.289505|47.588053,-122.290106|47.578526,-122.291651|47.568526,-122.296629|47.563806,-122.306585|47.562819,-122.316628|47.560802,-122.329931|47.565823,-122.349930|47.568569,-122.359972|47.598567,-122.361946|47.619038,-122.364779|47.639036,-122.374821;', NeedNotify : true

// step 9, 收到在区域外的WEA

01-01 02:34:41.859 D/RIL ( 356): [SUB0] [UNSL]< RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS {len=204,buf="01111803E901

01D3B2BD2C2F8392ED76DA5D76D341D762103473C140EDF27C1E3E9741F7341D0D92C140E3F75B4E4EBBC3F4F21CD4023DEBF4799A5C06C1DFECFCF9ED060000000000000000000000000000000000000000003D700021C0B5E028A379CB5E258A396EB5E3E8A3AF1B5E448A3D37B5E4C4A41F2B5D634A44ADB5CCCCA483FB5BA98A4AFAB5A488A4B8BB595F8A4B68B58164A4B51B57678A46C4B56E8CA3F14B57230A3A87B57580A3866B592A4A361FB5B944A3371B5CF1CA3543B5D53CA363FB5E028A379C"}

01-01 02:34:41.859 D/CELL\_BROADCAST( 356): Received unsolicited response RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS

01-01 02:34:41.859 D/CELL\_BROADCAST( 356): InitCellBroadcastMessage format:1,mGsmGeographicalScope:0,mMessageCode:62,

mMessageId:4376,serialNumber1001

01-01 02:34:41.919 D/CELL\_BROADCAST( 356): GPSProvider::startGps:1, tid:356

01-01 02:34:41.919 D/CELL\_BROADCAST( 356): GpsHandler::Run(), tid:754, mMaxWaitTime:30

01-01 02:34:43.269 D/CELL\_BROADCAST( 356): GeoPositionCallback::HandleEvent (47.606193, -122.332070, 5.000000), tid:356

01-01 02:34:43.269 D/CELL\_BROADCAST( 356): performGeoFencing current location: lat: 47.606194, lng: -122.332069

01-01 02:34:43.269 D/CELL\_BROADCAST( 356): performGeoFencing xxxx OUT side the GEO xxxx

01-01 02:34:43.269 D/NS\_CELLBROADCAST\_SERVICE( 356): NotifyMessageReceived: Geographical scope : 0, Message code : 62, Message Id : 4376, Language : 'en', Body : 'Severe Imminent WEA 3.0 message with 20 coordinates - Outside polygon', Message class : 6, Cdma service category : 0, Has ETWS info : false, ETWS warning type : 65535, ETWS emergency alert : false, ETWS popup : false, SerialNumber : 1001, StrGeo : 'polygon|37.881289,-122.528114|37.887297,-122.488117|37.891588,-122.454901|37.892618,

-122.404947|37.893949,-122.301006|37.853951,-122.241011|37.828116,-122.162561|37.778120,-122.102566|37.717524,-122.090120|37.677526,-122.093124|37.621007,-122.095098|37.591009,-122.195091|37.569251,-122.364006|37.579250,-122.463999|37.588348,-122.510777|37.668386,-122.560816|37.774472,-122.619696|37.834468,-122.579699|37.851291,-122.558069|37.881289,-122.528114;', NeedNotify : false

// step 13, 收到WHAM, 包含step 5, 9中的msg id, serial number.

01-01 02:36:36.429 D/RIL ( 356): [SUB0] [UNSL]< RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS {len=90,buf="01113003EA45

011140111803E8111803E90000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000A"}

01-01 02:36:36.429 D/CELL\_BROADCAST( 356): Received unsolicited response RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS

01-01 02:36:36.429 D/CELL\_BROADCAST( 356): HandleSmsCbMessage pageCount 1, messageIdentifier: 4400, geoLocationEnabled:1

01-01 02:36:36.429 D/CELL\_BROADCAST( 356): messageIdentifier: 4376, serialNumber: 1000

01-01 02:36:36.429 D/CELL\_BROADCAST( 356): no matched CB, just let it go ---

01-01 02:36:36.439 D/CELL\_BROADCAST( 356): messageIdentifier: 4376, serialNumber: 1001

01-01 02:36:36.439 D/SQLITE ( 356): checkCBMsg, find: serialNumber:1001, messageId:4376

01-01 02:36:36.579 D/CELL\_BROADCAST( 356): GPSProvider::startGps:2, tid:356

01-01 02:36:36.579 D/CELL\_BROADCAST( 356): GpsHandler::Run(), tid:754, mMaxWaitTime:30

01-01 02:36:39.279 D/CELL\_BROADCAST( 356): GeoPositionCallback::HandleEvent (37.774923, -122.419411, 13.000000), tid:356

01-01 02:36:39.279 D/CELL\_BROADCAST( 356): performGeoFencing current location: lat: 37.774921, lng: -122.419411

01-01 02:36:39.279 D/CELL\_BROADCAST( 356): performGeoFencing ~~~~~inside the GEO~~~~

// Notify MessageId:4376, serialNumber1001

01-01 02:36:39.279 D/NS\_CELLBROADCAST\_SERVICE( 356): NotifyMessageReceived: Geographical scope : 0, Message code : 62, Message Id : 4376, Language : 'en', Body : 'Severe Imminent WEA 3.0 message with 20 coordinates - Outside polygon', Message class : 6, Cdma service category : 0, Has ETWS info : false, ETWS warning type : 65535, ETWS emergency alert : false, ETWS popup : false, SerialNumber : 1001, StrGeo : 'polygon|37.881289,-122.528114|37.887297,-122.488117|37.891588,-122.454901|37.892618,

-122.404947|37.893949,-122.301006|37.853951,-122.241011|37.828116,-122.162561|37.778120,-122.102566|37.717524,-122.090120|37.677526,-122.093124|37.621007,-122.095098|37.591009,-122.195091|37.569251,-122.364006|37.579250,-122.463999|37.588348,-122.510777|37.668386,-122.560816|37.774472,-122.619696|37.834468,-122.579699|37.851291,-122.558069|37.881289,-122.528114;', NeedNotify : true

// step 16, 再发WHAM, 包含的msg id, serial number与step5, 9相同, 这次不会执行DBGF

01-01 02:38:11.779 D/RIL ( 356): [SUB0] [UNSL]< RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS {len=90,buf="01113003EB450

11140111803E8111803E90000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000A"}

01-01 02:38:11.779 D/CELL\_BROADCAST( 356): Received unsolicited response RIL\_UNSOL\_RESPONSE\_NEW\_BROADCAST\_SMS

01-01 02:38:11.779 D/CELL\_BROADCAST( 356): HandleSmsCbMessage pageCount 1, messageIdentifier: 4400, geoLocationEnabled:1

01-01 02:38:11.779 D/CELL\_BROADCAST( 356): messageIdentifier: 4376, serialNumber: 1000

01-01 02:38:11.789 D/CELL\_BROADCAST( 356): no matched CB, just let it go ---

01-01 02:38:11.789 D/CELL\_BROADCAST( 356): messageIdentifier: 4376, serialNumber: 1001

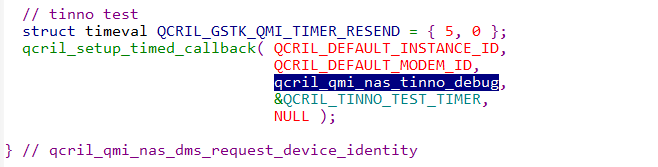
01-01 02:38:11.789 D/CELL\_BROADCAST( 356): no matched CB, just let it go ---

# **WEA本地调试方法**

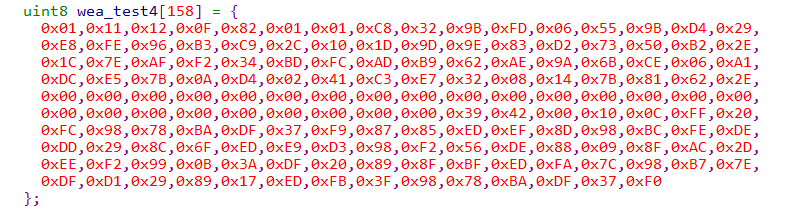
CMAS消息一般需要仪表环境才能测试, 对于debug调试工作影响很大, 如果可以本地调试将会很大的提高开发效率. 下面这个方法也可以用来模拟一些简单的主动上报消息.

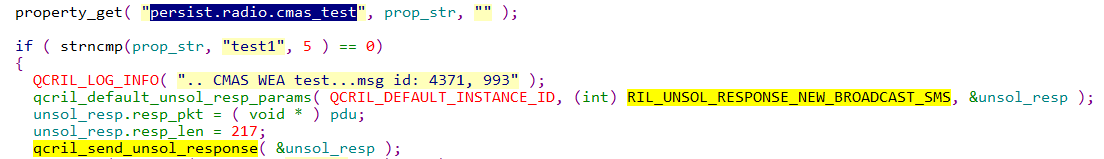
对于CMAS消息来说, 可以通过在Qcril自行构造一些CB消息通知来进行模拟, 方法如下:

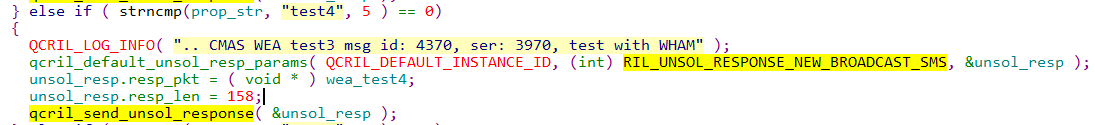
1. . 在Qcril某个代码流程(比如查询IMEI等)中添加下面一段代码, 这段代码的作用是5s后触发一个回调, 执行里面的代码.



1. . 在qcril\_qmi\_nas\_tinno\_debug()中预定义好模拟的CMAS数据, 通过设置不同的系统属性控制执行不同的分支, 上报预置的消息.







1. . 这些数据是从测试用例log中收集的, 下面一些典型的数据.

// 包含多组POLYGON, Circle以及max time的GEO信息数据

uint8 pdu[217] = {

0x01,0x11,0x13,0x03,0xE1,0x01,0x01,0x45,0x3C,0x5D,0x5E,0x6E,0x97,0x41,0xC9,0x76,

0x3B,0xED,0x2E,0xBB,0xE9,0xA0,0x6B,0x31,0x08,0x9A,0xB9,0x60,0xA0,0x76,0x79,0x3E,

0x0F,0x9F,0xCB,0xA0,0x7B,0x9A,0x8E,0x06,0x5D,0x83,0x43,0xD0,0xF8,0xFD,0x96,0x93,

0xD3,0xEE,0x30,0xBD,0x3C,0x07,0xB5,0x40,0x49,0xF7,0x3C,0x4D,0x2E,0x83,0xE0,0x6F,

0x76,0xFE,0xFC,0x76,0x03,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,

0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x3E,0x7D,0x00,0x20,0xB8,0xB9,0xD0,

0x49,0x2B,0x5D,0x4B,0x9C,0xDB,0x52,0xC0,0xBA,0xB9,0x89,0x75,0x2D,0x1D,0x7B,0x8B,

0xD5,0x52,0xBE,0x01,0xB9,0x06,0x39,0x29,0xA0,0x0B,0x99,0x24,0xD2,0x9E,0xB8,0xB9,

0xB6,0xB5,0x2A,0x34,0x5B,0x9D,0x04,0x92,0xB5,0xD4,0x20,0xB8,0xBA,0xBF,0xD1,0x30,

0x88,0x7B,0xA8,0xF1,0x53,0x46,0x70,0xBB,0x7A,0x85,0x34,0xD9,0x5B,0xC1,0xA1,0x13,

0x3B,0x67,0xBB,0xF0,0xD5,0x31,0x6E,0xCB,0xB8,0x2E,0x52,0xF5,0xE5,0xBB,0x3A,0x15,

0x2F,0xEF,0xFB,0xAB,0xFD,0x13,0x08,0x87,0x30,0x28,0xBA,0x3A,0x81,0x2B,0x20,0xB0,

0x09,0x5F,0x30,0x28,0xB8,0x86,0x09,0x29,0x19,0xC0,0x14,0x00,0x30,0x28,0xC3,0xB4,

0xE4,0xA4,0x08,0x80,0x19,0x00,0x10,0x0C,0x1E,

};

// 可以用来测试区域外的数据, 与下面WHAM联合使用可以模拟WHAM流程

uint8 wea\_test4[158] = {

0x01,0x11,0x12,0x0F,0x82,0x01,0x01,0xC8,0x32,0x9B,0xFD,0x06,0x55,0x9B,0xD4,0x29,

0xE8,0xFE,0x96,0xB3,0xC9,0x2C,0x10,0x1D,0x9D,0x9E,0x83,0xD2,0x73,0x50,0xB2,0x2E,

0x1C,0x7E,0xAF,0xF2,0x34,0xBD,0xFC,0xAD,0xB9,0x62,0xAE,0x9A,0x6B,0xCE,0x06,0xA1,

0xDC,0xE5,0x7B,0x0A,0xD4,0x02,0x41,0xC3,0xE7,0x32,0x08,0x14,0x7B,0x81,0x62,0x2E,

0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,

0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x39,0x42,0x00,0x10,0x0C,0xFF,0x20,

0xFC,0x98,0x78,0xBA,0xDF,0x37,0xF9,0x87,0x85,0xED,0xEF,0x8D,0x98,0xBC,0xFE,0xDE,

0xDD,0x29,0x8C,0x6F,0xED,0xE9,0xD3,0x98,0xF2,0x56,0xDE,0x88,0x09,0x8F,0xAC,0x2D,

0xEE,0xF2,0x99,0x0B,0x3A,0xDF,0x20,0x89,0x8F,0xBF,0xED,0xFA,0x7C,0x98,0xB7,0x7E,

0xDF,0xD1,0x29,0x89,0x17,0xED,0xFB,0x3F,0x98,0x78,0xBA,0xDF,0x37,0xF0

};

// WHAM, 携带的数据中包含wea\_test4的msg id, serial number.

uint8 wham[90] = {

0x01,0x11,0x30,0x0F,0xA0,0x01,0x01,0x12,0xC0,0x11,0x12,0x0F,0x82,0x11,0x13,0x0F,

0x83,0x11,0x14,0x0F,0x84,0x11,0x15,0x0F,0x85,0x11,0x1B,0x0F,0x8B,0x00,0x00,0x00,

0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,

0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,

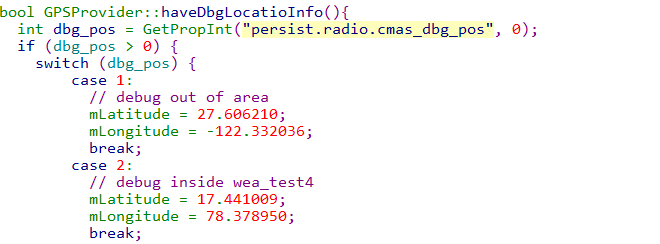
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,

0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x16

};

1. . 另外GPS定位的数据也可以进行模拟, 不受GPS实际定位位置的影响.

CellBroadcast.cpp (android\vendor\qcom\proprietary\b2g\_telephony)中添加了一个debug入口



可以配合上面模拟的WEA数据消息, 做出Inside/Outside的位置信息, 进行相应场景的模拟.

比如要模拟LTE-BTR-5-4588中WHAM测试流程, 可以使用下面的方法, qcril中模拟的代码没有默认合入, 需要先自己编译个Qcril的libril-qc-qmi-1.so库导入手机后测试.

1. 设置CMAS上报消息, 以及默认GSP位置在区域外.

adb shell setprop persist.radio.cmas\_test test4

adb shell setprop persist.radio.cmas\_dbg\_pos 1

1. 输入\*#06# 触发上报CMAS消息, 这个执行结果应该是在区域外, 在室内实际GPS应该定位不到, 需要等待超时后才能执行到我们的模拟定位结果. 应没有alert消息上报.
2. 设置WHAM上报, 修改GPS位置为区域内.

adb shell setprop persist.radio.cmas\_test wham

adb shell setprop persist.radio.cmas\_dbg\_pos 2

1. 再次输入\*#06# 触发WHAM消息上报, 应该将步骤b中的消息上报上来并显示.
2. 可以通过log检查上述过程是否是预期的.

**注意:**

将CMAS的上报放在\*#06# (查询IMEI)的流程中, 有个问题是IMEI查询有时系统也会来调用, 当设置persist.radio.cmas\_test 属性后, 会误触发CMAS调用, 这个注意下就好, 不要以为是系统异常. 可以在每次调试前设置persist.radio.cmas\_test, 然后将persist.radio.cmas\_test设置为false关闭调试.