

Additional Test Cases for IMS Emergency Calling

ITU-T Webinar - Digital transformation of testing:
Federated testbeds as a service

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Agenda

- Background - VoLTE Interop Issues in the media
- GSMA Investigation of issues & findings
- VRE Task Force Creation & Recommendations on Emergency Call Handling
- Gap Analysis of Emergency Call Tests in GSMA PRD IR.25
- New Test Cases for Emergency Call Handling
- Co-ordination with other industry groups

VoLTE Interop Issues in the Media

- Issues highlighted in the media in mid 2022 regarding VoLTE interop, in particular the impact on PS emergency call availability in both US & Europe (EENA)
 - <https://www.capacitymedia.com/article/2a9s377bx0f611rx9lfr5/news/voltegate-tomia-says-50m-visitors-to-us-this-year-will-be-cut-off-from-voice-roaming>
 - <https://www.youtube.com/watch?v=sHjyLmFt-eg&list=PLAuBrNEvppxF5hsE4KiePOIjz7GeYPSBC&index=30>

This becomes a major issue if CS emergency call is not available due to 2G/3G Sunset.

Investigation of Reported Issues

- It is noted that 3GPP has specified IMS Emergency Call (“PS Emergency”), including dealing with S8HR challenges (“anonymous IMS emergency call”) and profiled in GSMA PRD IR.92,
 - IMS Emergency Call is distinct and separate from “normal” VoLTE (emergency attach, emergency registration etc.),
 - Emergency Call should be supported/available in a network (CS and/or PS) even in the event of “normal voice”/VoLTE not being available (“limited service state” or “reduced voice mode”)
- Surveys carried out by GSMA with a number of OEMs to determine device behaviour regarding emergency call in the event of there being no “normal” VoLTE service available due to “blocking” of VoLTE.

Reasons for VoLTE Blocking / Inhibition of IMS

- Three different types VoLTE blocking on the device :-
 - Blocking of unknown networks (i.e. networks with which 1:1 testing has not been completed) – typically impacts on smaller MNOs, who cannot obtain devices to perform 1:1 testing and applied by OEMs
 - Blocking of VoLTE Roaming due to historical reasons at the request of MNOs,
 - “Regional” blocking of IMS (e.g. device targeted at Asia would disable IMS if US SIM inserted) and applied by OEMs (sometimes at request of MNO),
- VoLTE is also inhibited if no VoLTE Roaming agreement in place (VOPS=No) – which is correct behaviour.
- VoLTE can also be blocked by Networks by disallowing (normal) IMS Registration (IMSI/IMEI check)

OEM Survey Feedback & Analysis

- Devices were found to be a mix of compliant and non-compliant to 3GPP standards,
- Different behaviours observed across different OEMs, within a single OEM dependent on models, and even between the same model based on OS version,
- Inbound roamers to a given country may not get a voice service if one of the blocking types encountered.....
- ...more seriously, an emergency call will not be possible in some cases if no CS-emergency available,
- It is very difficult to predict what will happen for a given device / SIM combination / VPMN
- This was seen as a ticking timebomb with potential for massive reputational damage

Formation of VRE Task Force

- The GSMA Board acted promptly and formed a Task Force to look at the issues raised and expedite solutions for PS emergency call and VoLTE Interoperability in general,
- The VoLTE Roaming & Emergency (VRE) TF was formed in Q3/22
- VRE Scope included :-
 - Emergency Call support
 - VoLTE Interoperability in general
 - VoLTE Roaming (increase agreements)
 - ...plus aid the managing of communications to media/industry
- VRE work was completed in Q1/23
 - Defined requirements and success criteria for the above scope items
 - This presentation will focus on Emergency Call

Emergency Call Recommendations

- Requirement:
 - A device shall try every means possible to make emergency calls, regardless of restrictions requested or made by the network or operator (including limited-service state).
- Success Criteria:
 - VoLTE-capable devices always attempt an emergency call in reduced-service mode via circuit switched / packet switched / either dependent on network capability support (the network broadcasts whether emergency bearers are supported for circuit switched / packet switched).
 - Existing VoLTE-capable devices, which do not comply with criterium 1, can be upgraded over the air (e.g. via operating system upgrade) to become compliant – ideally without user intervention.
 - Existing VoLTE-capable devices, which do not comply with criterium 1 and cannot be upgraded, are identified and device refresh initiated.
 - Existing non-VoLTE capable devices must be refreshed.
 - An element of education / publicity to reach users with BYO devices to trigger refresh from individual users.
 - Enhancement of testing procedures of both networks and devices to ensure devices always attempt an emergency call in limited-service state and that networks permit/block such call as set out by local regulations

Gap Analysis for Additional Test Cases

- GSMA launched a VoLTE Testing service in mid 2021 to test both networks and devices both solely and in combination for both non-roaming and roaming scenarios.
- Test cases are documented in PRD IR.25 which covers voice, SMS and emergency call services.
- Emergency call tests included both CS and PS technology (dependent on N/W support) and also included UE-detected and non-UE detected emergency call....
- ...however, there were no tests covering the use cases of the device being in limited service state or reduced voice mode.

New Emergency Call Test Cases

- IR.25 was enhanced to include further tests to ensure UE attempted a PS emergency call for:-
 - Reduced voice mode, roaming with no VoLTE Roaming agreement (VOPS=No),
 - Unauthenticated SIM on board,
 - No SIM on board (“SIM Less”).
- Network is also tested to see if it accepts or rejects an emergency call attempt from the UE under the circumstances above
 - This is subject to national regulations/policy

See <https://www.gsma.com/newsroom/resources/ir-25-volte-roaming-testing-v8-0/attachment/ir-25-v5-0/>

**Any
Questions?**