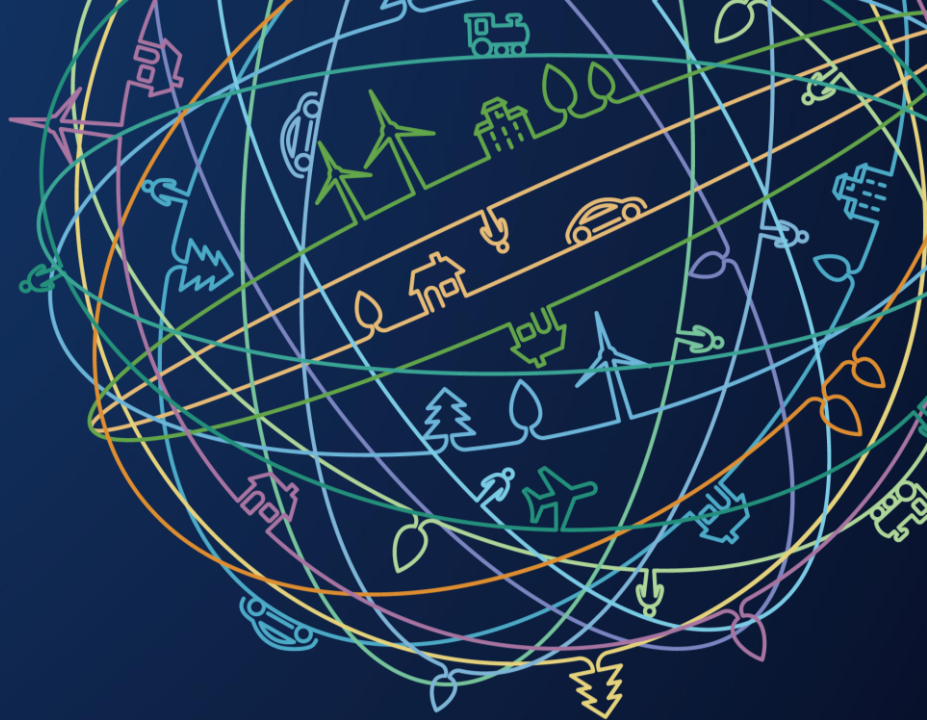


RP-161711

Motivation for Work Item on VoLTE enhancements

RAN#73, September, 2016

Huawei, CMCC, China Telecom, HiSilicon

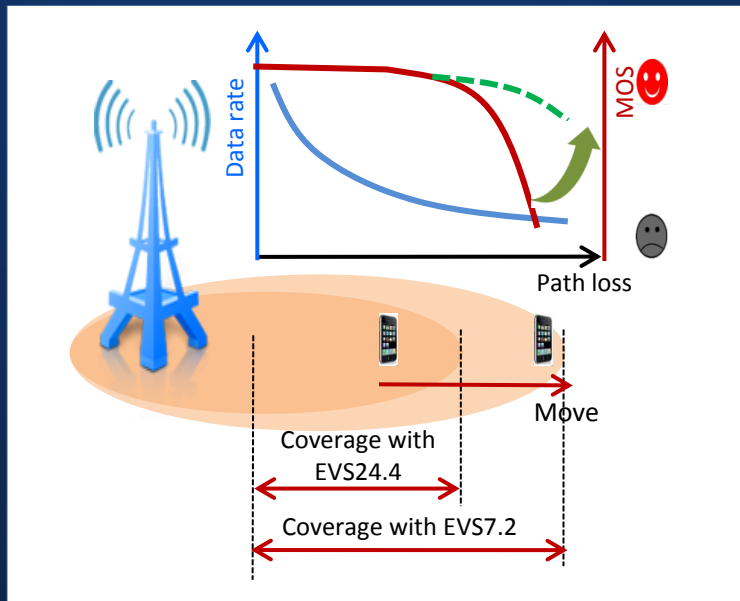


Motivation

The three aspects below are necessary for improving voice/video quality and performance:

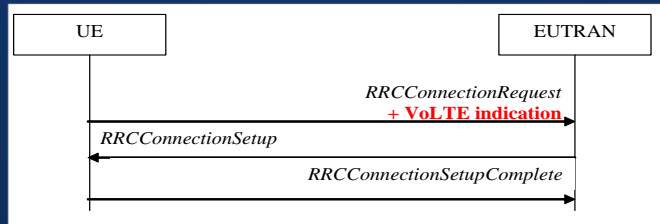
- Codec mode/rate selection and adaptation.
RAN flexibility for adjusting the codec rates is essential to enable the high rate usage in VoLTE networks and ensure the quality/continuity at cell edge.
- VoLTE signalling optimization.
VoLTE/video calls can be treated with higher priority when identified at the beginning. Keeping the bearer during re-direction can save call drop.
- VoLTE/video enhancements to improve quality.
Improve voice/video quality with further coverage enhancement is useful to guarantee the quality of the end user experience.

Codec Adaptation Enhancement

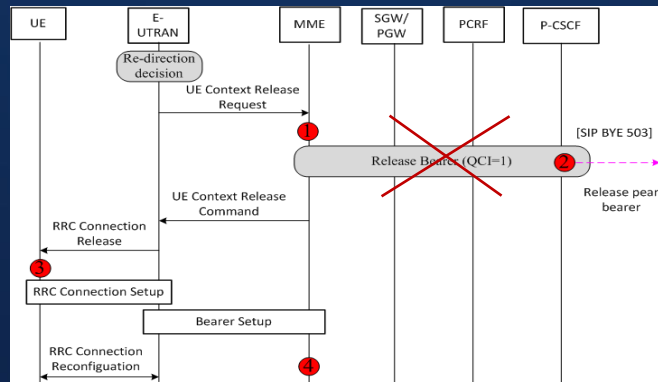


- Codec rate adaptation during an on-going call have been identified as useful and agreed to be addressed
- RAN-assisted solution is beneficial and feasible.
- Either dedicated RRC message or MAC CE can be selected to perform the codec adaptation.
- The solution details e.g. the message type and formats, the form of the recommended bit rate, the UE assistance information, are going to be further developed in the work item

VoLTE Signaling Enhancements

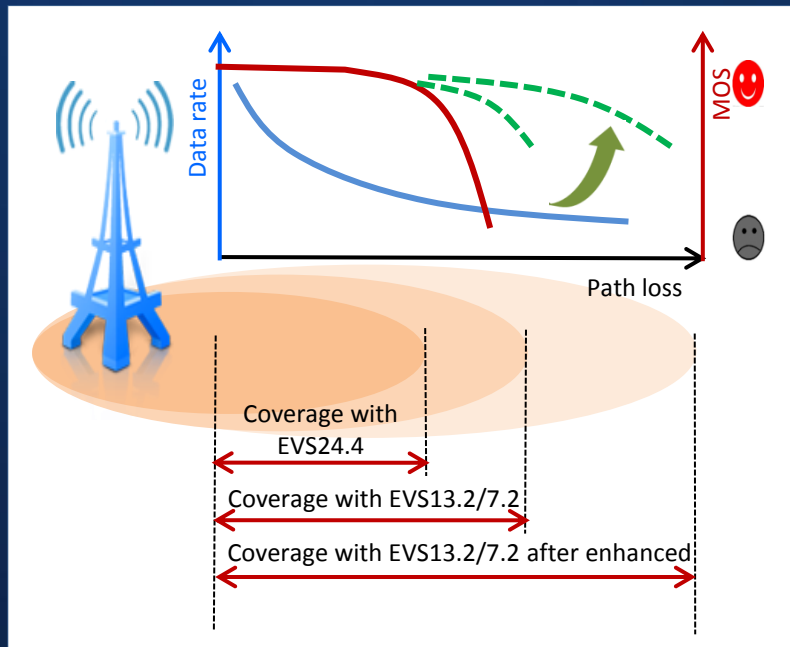


- For the prioritization of MO Video call the recommended solution is to reuse the MO voice cause value in MSG3 and hence additional clarifications are needed in RAN2 and CT1.



- For the mobility related use cases, the recommended solution is to keep the voice bearer in both UE and core network during the redirection procedure (RAN3).

Further Coverage Enhancement



- VoLTE coverage can be effectively enhanced by relaxing the air interface delay budget, and UL HARQ transmission, different repetition, RTP packet bundling are also beneficial.
- The multi-subframe frequency hopping technique that was specified in CE mode A, which enables cross-subframe channel estimation, can be used to enhance the VoLTE coverage effectively.
- The coverage for half-duplex FDD/TDD UEs is less than the coverage for full-duplex UEs. Opportunities to enhance the half-duplex/TDD UE coverage enhancement have been identified.

Objectives of the Work Item (RP-161539)

This work item will study the following enhancements for VoLTE:

1. The codec mode/rate selection and adaptation solution details specification (RAN2)
 - a. Further down-selection of either of the two alternatives, i.e. dedicated RRC message or MAC CE, on codec adaptation procedure, including the message carrying recommended bit rate on the Uu interface between the UE and eNB.
 - b. Develop the necessary details of the concerning codec adaptation procedures and messages, e.g. the procedural exchange of messages, the message type and formats, the form of the recommended bit rate, the UE assistance information.
2. VoLTE/ViLTE signalling optimization:
 - a. MO Video call cause value in MSG3 for MO video calls (RAN2)
 - b. Voice bearer keeping in both UE and core network during redirection procedure (RAN3)
3. VoLTE quality/coverage enhancements
 - a. Specify the mechanism to enable the air interface delay budget relaxation, by e.g. the eNB awareness of available delay in air interface budget by e.g. the report from UE (RAN2)
 - b. Specify asynchronous UL HARQ transmission, bundle hopping enabling multi-subframe estimation, and different repetition levels for the UEs with Category 0 and above (RAN1)
 - I. Support the scheduling by PDCCH and by EPDCCH
 - II. Support the scheduled bandwidth up to 20MHz

THANK YOU

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