RAN-R18-WS-non-eMBB-Philips - Version 0.0.2
RAN

3GPP TSG RAN Rel-18 workshop RWS-210589

Electronic Meeting, June 28 - July 2, 2021

Agenda Item: 4.2

Source: Philips International B.V.

Title: Email discussion summary for [RAN-R18-WS-non-eMBB-Philips]

1 Introduction

This email discussion summary covers the Q&A of the following Philips document, which lists the topics that Philips thinks are important to work on in Release 18:

RWS-210509 Philips view on release 18 (from healthcare vertical perspective)

(URL: https://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_AHs/2021_06_RAN_Rel18_WS/Docs/RWS-210509.zip)

The main contents of the proposal on topics to include in release 18 can be found on slide 3. The proposed topics primarily relate to non-eMBB functional evolution.

Companies are invited to provide comments and questions on the Philips document RWS-210509 in the feedback form below.

2 Questions and comments on RWS-210509

Please provide your questions and comments in the feedback form below.

Feedback Form 1: Questions and Comments on RWS-210509

1 – Intel Corporation (UK) Ltd

<Intel>

Q1. Do you have specific numbers for latency and reliability of those scenarios which can be targeted by RAN in a potential study/work?

Q2. Could you please clarify which specific technical components are missing for efficient support of the following topics and whether proposed topics mainly target sidelink enhancements?

- RAN support for Vehicle Mounted Relays (e.g. on ambulance) providing enhanced coverage and efficient operation for first responders, their equipment and for the victims.

- Support for localized networks, e.g., temporary emergency network for mass casualty events, to ensure QoS.

- Support for Personal IoT Networks and Residential IoT networks through gateways and residential access devices.

2 – VODAFONE Group Plc

Can you please clarify the following questions

1- what benefits would you see from Temporary local ad-hoc networking between various devices and UE when the network is not available ?

2- During network offline periods how ND where would you store the data ?

3 Answers by moderator

Answer to Intel Q1: You can find target KPIs on communication latency and reliability for a variety of healthcare use cases in the release 17 SA1 study on Critical Medical Communication (TR 22.826). For positioning, some relevant KPIs can be found in Sections 5.3 and 5.4 of the SA1 study on positioning (TR 22.872). What may not be immediately apparent from those studies (although e.g. mentioned in Section 5.5.3.6 of TR 22.826), is that for several use cases (such as patient monitoring outside of the hospital and remote intervention) we need to be able to achieve those KPIs everywhere. This includes challenging coverage situations, such as deep indoor (e.g. elevators, basements, parking garages, big hospitals/apartment buildings), and also in rural areas. If you have a patient in critical condition the last thing you want is network failures, loss of communication, or e.g. failure to accurately locate them, in potentially life-or-death situations. In fact, in our findings we noticed that with current cellular IoT technologies the coverage and positioning are still poor for healthcare use cases. Hence our request for further work on relay related technologies, sidelink positioning, and other relevant work that will help to improve this.

Answer to Intel Q2:

- Regarding vehicle mounted relays we are mainly thinking about mobile IAB or other base station deployment options (i.e. improve RAN procedures for donor gNB/VMR/UE connectivity and handover), rather than sidelink relay, although sidelink relay may work as well. We refer to TR 22.839 for use cases and requirements, in particular use cases 5.14, 5.15 and 5.21.

- Regarding support for localized networks, we would like to refer to SA1 study on Providing Access to Localized Services TR 22.844, in particular use case 5.16. We expect that mobile base stations e.g. mounted on ambulances or drones, will play an important role here.

- Regarding personal IoT it will be important to enable Low-Power/IoT based relaying of data, which may indeed introduce additional enhancements for sidelink relays (such as support for unlicensed spectrum, CP/UP optimizations, NB-IoT/LTE-M/Redcap support etc.). For residential networks, as indicated in SA1 TR 22.858, it is expected to focus on extensions to residential gateways and access devices acting as base stations, e.g. adding a small off-the shelf basestation via a residential gateway to the RAN to provide good coverage in the home.

Answer to Vodafone question 1:

Assuming that this question relates to localized networks, e.g., temporary emergency network for mass casualty events, as mentioned in the presentation, we see two main instances for such temporary local network:

a) Temporary providing infrastructure for providing radio access, i.e. to provide a temporary Radio Access Network (e.g. using drones), or extension of an existing Radio Access Network (e.g. using a vehicle mounted

relay in an ambulance), or an ”ad-hoc” network using UE relays, whereby in all these instances we assume that at least one device (e.g. gNB-DU, IAB-node, VMR, UE) within this temporary emergency network infrastructure has a backhaul to a core network (e.g. via satellite link or other means). This will then give radio access for all devices in an area that may otherwise be lacking good coverage. Not only will this improve the QoS, but also e.g. the accuracy of locating victims, personnel, equipment. Using the backhaul these devices can communicate e.g. with the hospital.

b) Temporary local network with core network functionality, i.e. whereby next to a local/temporary Radio Access Network, the devices are given access a local core network (e.g. network in a box) installed e.g. in an ambulance. This can then be used for local communication between the personnel and communication between the equipment used in an emergency situation, even if communication with the outside world (e.g. with the hospital) is temporarily not available or is unstable. With such local core network a local UPF could be used and some applications/services (e.g. location service) could be deployed locally.

Note that in both cases it can be assumed that such temporary/local network will have agreement/subscription with a public network operator that will provide the backhaul connectivity, e.g. with the hospital.

Answer to Vodafone question 2:

Depends on the alternatives in the previous answer, i.e. in case of a temporary RAN or ”ad-hoc” network using UEs, some temporary caching could be done in one or more of the RAN nodes or UEs involved, whereas with a local core network a local UPF could be used and some applications/services could be deployed locally. Alternatively, one could envision the use of Edge application functionality offered by an existing network that may be deployed on such temporary infrastructure (e.g. the first responder organization may have an SLA with a public network operator to be able to provide such functionality on a temporary infrastructure).

4 Summary of E-mail discussion

Some clarifying questions were asked regarding healthcare KPIs and how we envision the concepts of vehicle mounted relays, localized networks and personal IoT networks, in particular whether these only relates to sidelink extensions or not and clarifying questions on whether backhaul is needed or that it can still be useful without backhaul. A lot of the concepts, use cases and KPIs have been described in SA1, and hence we refer to several of their studies. We did explain in a bit more detail the issues that we face with coverage and reliability (including coverage of cellular IoT devices), and also what different alternatives we see for a local network for emergency situations.