

Agenda Item: 4.3

Source: Samsung

Title: Positioning Enhancement for 5G Advanced

Document for: Discussion and Decision

Motivation

- ◇ Positioning for public safety and mission critical communications requires both accurate location information and its availability, i.e., location information should be available in anytime/anywhere
 - ◆ Accuracy: Sidelink positioning can increase accuracy further because sidelink channels between UEs can be LOS (line-of-sight) with high probability thanks to short distance between UEs
 - ◆ Availability: Sidelink positioning can be a complementary solution when positioning based on GNSS and/or network is not available

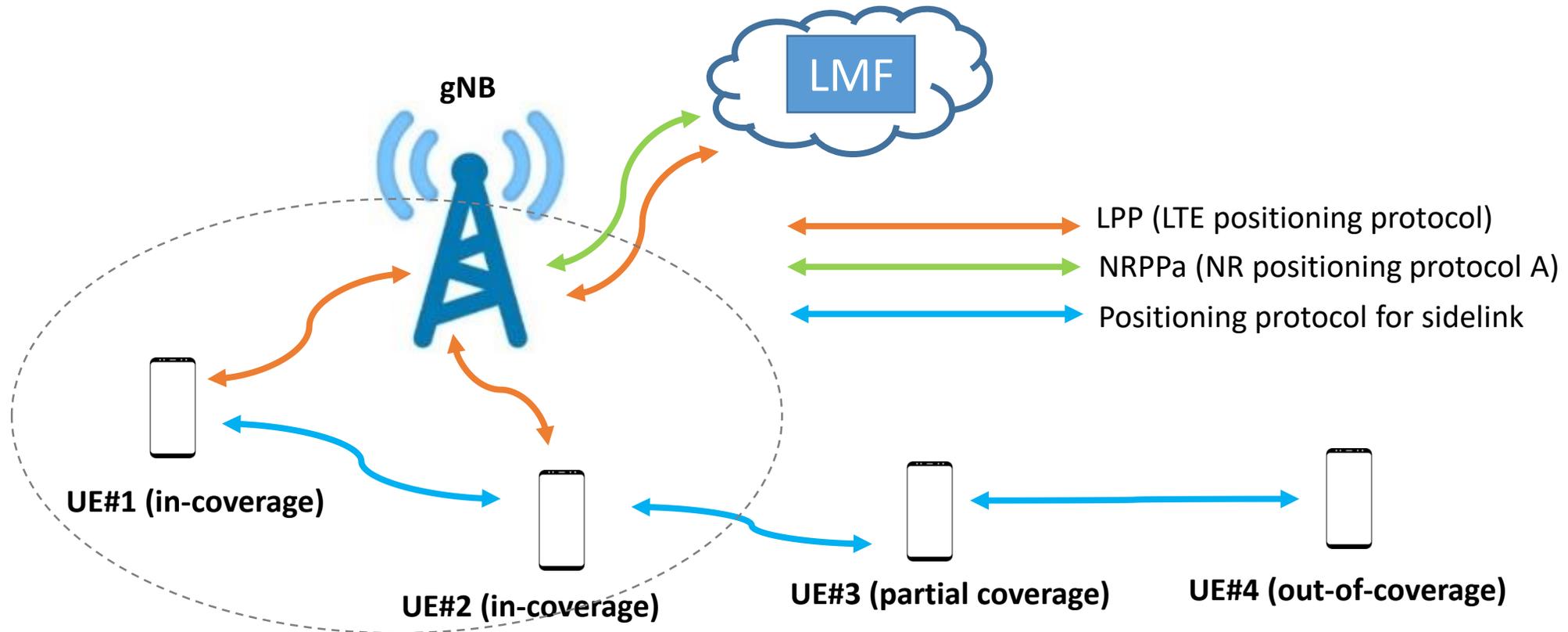
Use cases from TS22.261 and TS22.186			Public safety	V2X on tunnel	UAV (Unmanned Aerial Vehicle)
					
Requirements	Accuracy	Horizontal	< 1m	< 0.1 m	0.1 ~ 0.5m
		Vertical	< 2m and 0.3m (relative)	< 0.5 m (for platooning)	0.1 ~ 0.3m
	Availability	Collapse of network	No network and GNSS	No GNSS functionality	

Key Features (1/2)

LMF: Location management function
LPP: LTE Positioning Protocol
NRPPa: NR Positioning Protocol A

◇ Design of SL positioning protocol

- ◆ How to design positioning protocol for sidelink between UEs
- ◆ How to support SL positioning for out-of-coverage UEs where LPP or NRPPa is not available



Key Features (2/2)

◇ Scenarios

- ◆ Whether to introduce a new type of device designated for sidelink positioning
- ◆ Whether to support both absolute positioning and relative positioning, or either of them
- ◆ Whether to support UE-assisted (i.e., LMF-based), UE-based or both

◇ Positioning techniques

- ◆ Time-based schemes (e.g., TDOA, RTT), angle-based positioning schemes (e.g., AoD, AoA)
- ◆ Whether/how to use existing RAT-dependent and/or RAT-independent positioning schemes for SL positioning

◇ Sidelink PRS (Positioning Reference Signal) design and corresponding UE measurement

◇ Positioning accuracy enhancement (e.g., extend accuracy improvements specified for DL, UL, or DL + UL in Rel-17 positioning enhancements to include sidelink)