



Performance of 3GPP Rel-9 LTE positioning methods

2nd Invitational Workshop on
Opportunistic RF Localization for
Next Generation Wireless Devices
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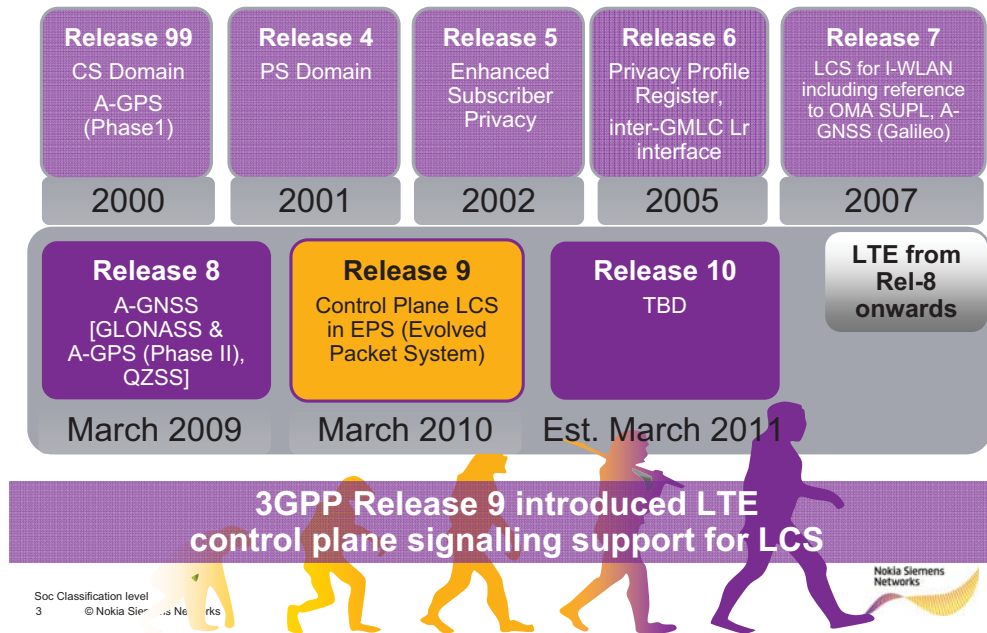
North America Market Strength

- Connecting 100M+ Mobile Subscribers
18M+ Fixed Subscribers
- Serving 150+ Customers
- Supplying 8 of the Top 10 operators
- 3,000+ employees in 25 offices throughout the U.S. and Canada

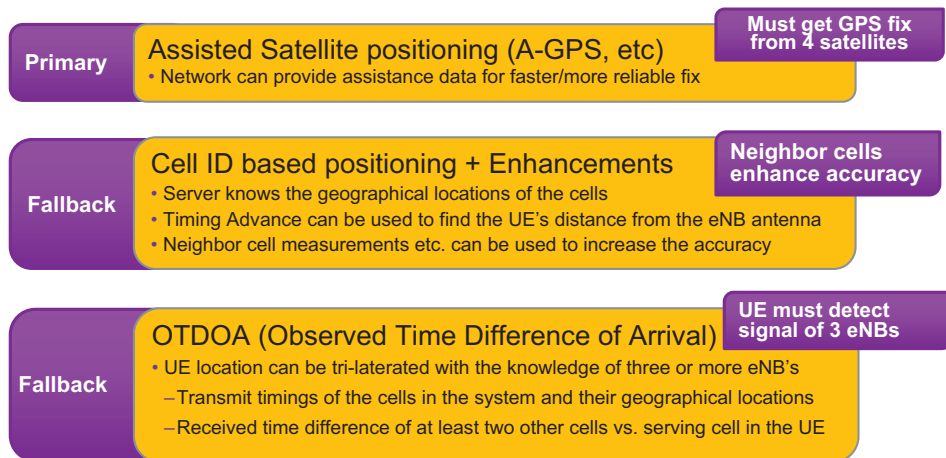




3GPP Location Standards Evolution An Overview



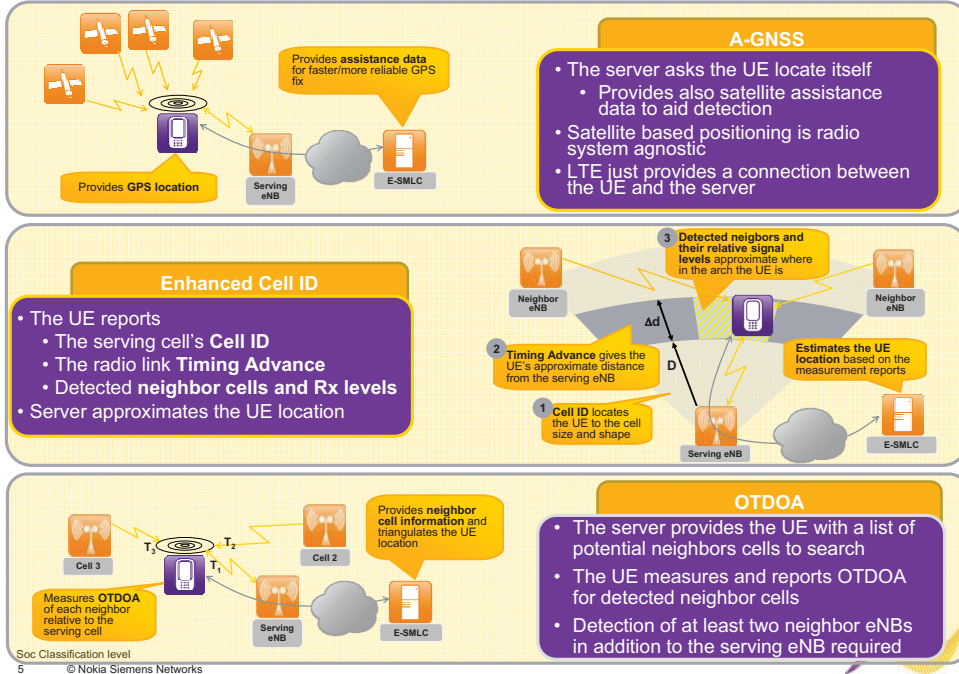
LTE Positioning Methods- overview 3GPP Release 9



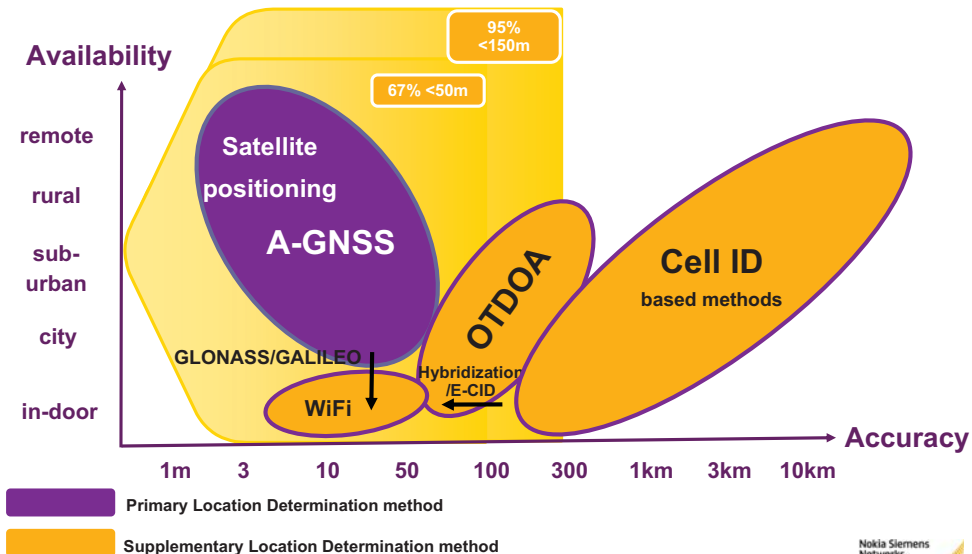
A-GPS considered the primary positioning technique in LTE
Other techniques used when GPS fix not available



LTE Positioning Methods



Accuracy expectations of the LTE positioning techniques





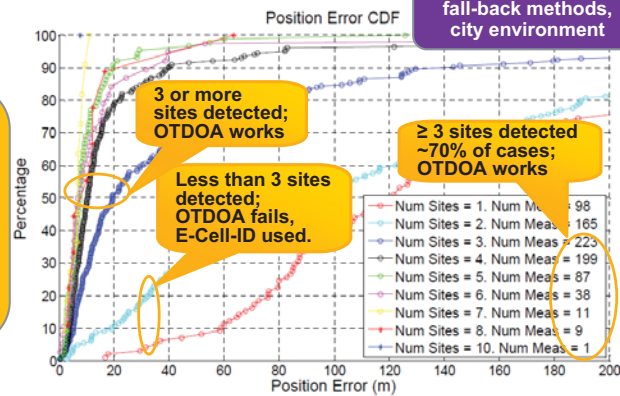
Positioning accuracy

The A-GPS performance is compromised in urban/indoor environments

- WLAN a good fall-back technique for indoors case, not used in this slide.

The performance of the fallback methods heavily depending on the deployment

- Cell sizes
- Deployment of OTDOA
- Usage of OTDOA hearability aids



	A-GPS	Fallback	Combined
P(50m)	54%	73%	78%
P(150m)	67%	85%	95%

Assume

- 67% probability for GPS fix
- 80% probability for GPS location error < 50m
- 100% probability for GPS position error < 150m

Soc Classification level
7
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Summary

- 3GPP Release 9 standardized positioning techniques for LTE
 - A-GNSS (A-GPS) as the primary method
 - Enhanced Cell-ID and OTDOA as fall-back methods
- A-GPS performance very good when GPS fix successful
 - Urban/Indoor challenging for A-GPS
- Fall-back techniques' performance heavily deployment dependent
 - Cell sizes
 - Usage of OTDOA and its hearability enhancements
 - Base station accuracy (antenna locations, transmit timings)
 - WLAN a good candidate for enhanced indoor positioning performance

Soc Classification level
8
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Thank You!

Questions ?

