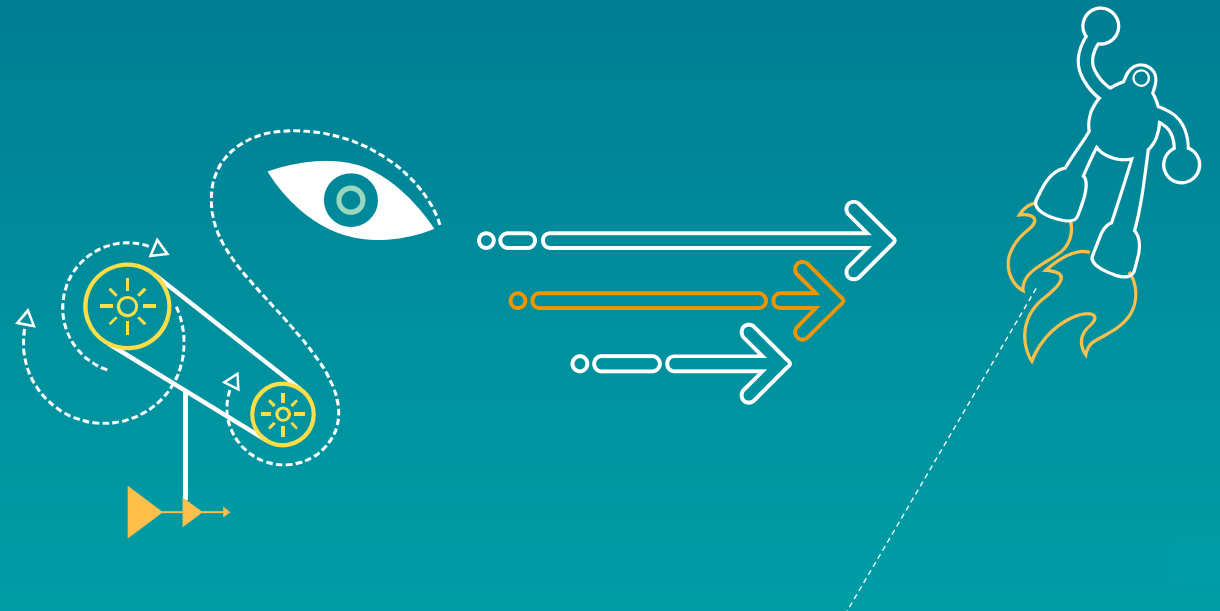


RP-151572

Unified NB-X

(NarrowBand-X)



High level principles (1)

Unified narrowband framework applicable to two different deployment scenarios

- (a) Deployment in **standalone** narrowband spectrum
 - Meet very tight spectrum mask; substantial DL PSD boost allowed
- (b) Coexistence **in-band** within an LTE deployment
 - Minimize/eliminate interference with LTE; modest DL PSD boost allowed
 - Handle overlap with existing LTE signals (e.g. CRS)
- Common **system bandwidth** of 180 KHz for both scenarios
- 164 dB MCL **coverage criterion** at least for standalone

To be noted that the difference between (a) & (b) is particularly significant for the downlink hence it is inherently easier to try and find a common solution for the uplink rather than for the downlink (see following slides)

High level principles (2)

Preserve elements optimized for standalone & maximize commonalities with in-band

(1) Common **synchronization channels** for both scenarios

- Handle overlap with existing LTE signals (e.g. CRS)

(2) Two **downlink numerologies**

- One numerology optimized towards the standalone scenario
 - 3.75 kHz tone spacing; 4x Cyclic Prefix length compared to LTE
- One numerology optimized towards the in-band-with-LTE scenario
 - 15 kHz tone spacing as in LTE; same Cyclic Prefix length as in LTE
- Further convergence during the Work Item phase is not precluded if motivated by technical evidence at RAN WG level

(3) **Select baseline for a single uplink numerology and design by November 2015**

- Options include NB-CIoT uplink (see TR 45.820) & SC-FDM uplink (including single tone allocation)

High level principles (3)

Preserve elements optimized for standalone & maximize commonalities with in-band

(4) Common **data and control channel frameworks** for both scenarios

- Tail-biting convolutional codes (TBCC) for **DL data**

(5) Common **S1-based architecture** (optimized for small data transfer), also common with eMTC

- As a result, **upper layers (PDCP, RLC, RRC)** would be based on a streamlined subset of eMTC

Thank you

Follow us on:  

For more information, visit us at:
www.qualcomm.com & www.qualcomm.com/blog

©2013-2015 Qualcomm Technologies, Inc. and/or its affiliated companies. All Rights Reserved.

Qualcomm is a trademark of Qualcomm Incorporated, registered in the United States and other countries. All trademarks of Qualcomm Incorporated are used with permission. Other products and brand names may be trademarks or registered trademarks of their respective owners.

References in this presentation to “Qualcomm” may mean Qualcomm Incorporated, Qualcomm Technologies, Inc., and/or other subsidiaries or business units within the Qualcomm corporate structure, as appli

Qualcomm Incorporated includes Qualcomm’s licensing business, QTL, and the vast majority of its patent portfolio. Qualcomm Technologies, Inc., a wholly-owned subsidiary of Qualcomm Incorporated, operates, along with its subsidiaries, substantially all of Qualcomm’s engineering, research and development functions, and substantially all of its product and services businesses, including its semiconductor business.

