NB-IoT in OpenAirInterface

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- NB-IoT project in OAI
  - Contributing members
  - Current teams
  - Main targets

- NB-IoT project history
  - Code development progress
  - Workforce
  - Git repositories status

- Targets status of NB-IoT project

- Conclusion
• **NB-IoT project in OAI**  
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• **Targets status of NB-IoT project**

• **Conclusion**
NB-IoT contributing members

- Contributing members

  - Eurecom
  - EURECOM
  - NB-IoT
  - b com
  - TAIWAN TECH
  - NTUST University
  - NOKIA Bell Labs
  - TCL
  - Bologna University

07/11/2017 OAI Workshop Paris
Current teams:

**NTUST**
- Ray Cheng
- Calvin Hsu
- Nick Ho
- Eric Hsieh
- Kenny Chen
- Alan Lee
- Xavier Liu

**Bcom**
- Stephane Paquelet
- Vincent Savaux
- Matthieu Kanj
- Rodolphe Legouable

**UBologna**
- Michele Paffetti

**Eurecom**
- Raymond Knopp
Main targets for NB-IoT

- **First phase:**
  - Development of eNB functionality (PHY, MAC, ...)
  - nFAPI interface for NB-IoT
  - Integration with Nokia μcore
  - Testing with NB-IoT devices

- **Second phase:**
Main targets for NB-IoT

- First phase:
  - Development of eNB functionality (PHY, MAC, ...)
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- Second phase:
  - Development of UE functionality
  - Unitary simulators for NB-IoT channels
  - Wiki doc: Tutorial for OAI + Code documentation
  - Set of PPT presentations for NB-IoT standard
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How NB-IoT works in OAI
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First physical meeting between Eurecom & BCOM/Orange/Nokia/TCL

14/03/2017

OAI Workshop Paris
First physical meeting between Eurecom & BCOM/Orange/Nokia/TCL

14/03/2017

05/04/2017

Creation of git repo: branch “develop-nb-iot”
First physical meeting between Eurecom & BCOM/Orange/Nokia/TCL

14/03/2017

Creation of git repo: branch “develop-nb-iot”

05/04/2017

OAI Workshop Paris

07/11/2017
First physical meeting between Eurecom & BCOM/Orange/Nokia/TCL

14/03/2017

Creation of git repo: branch "develop-nb-iot"

05/04/2017

Start of testing phase + Demo

04/12/2017

OAI Workshop Paris

07/11/2017
Creation of git repo: branch "develop-nb-iot"

05/04/2017

EURECOM

01/08/2017

b.com

4 months

07/11/2017

OAI Workshop Paris

2018

- Development progress

OAI Workshop Paris

07/11/2017

b.com

0 %

RRC

0 %

PDCP

0 %

RLC

0 %

MAC

0 %

PHY

RRC

95 %

PDCP

100 %

RLC

100 %

MAC

30 %

PHY

50 %

RRC

98 %

PDCP

100 %

RLC

100 %

MAC

98 %

PHY

98 %
Development progress

Creation of git repo: branch “develop-nb-iot”

05/04/2017

4 months

01/08/2017

3 months

07/11/2017

1 month

2018

Testing with UE in December 2017

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<td>01/08/2017</td>
<td>OAI Workshop Paris</td>
<td>3 months</td>
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<tr>
<td>07/11/2017</td>
<td>Testing with UE in December 2017</td>
<td>1 month</td>
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**Timeline:**
- Creation of git repo: branch “develop-nb-iot“: 05/04/2017
- OAI Workshop Paris: 01/08/2017
- Testing with UE in December 2017: 07/11/2017

**Approximation:**
- 4 x at 100%
Git repositories status

- Creation of git repositories
  - 05/04/2017
  - 2017

- OAI Workshop Paris
  - 07/11/2017
  - 2018

- Code integration
  - 01/08/2017

- 4 months
  - Develop-nb-iot-rrc
  - Develop-nb-iot-mac
  - Develop-nb-iot

- 3 months
  - Merge

- Current working branch
  - Develop-nb-iot-mac

- Develop-nb-iot-rrc
  - Develop-nb-iot-mac

07/11/2017

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Phase 2:
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Targets status of NB-IoT project

- **NB-IoT code volume:**
  - **Configuration files**
  - **RRC**
    - `RRConnectionReestalishment generation (still to do)`
    - `Paging (still to do)`
  - **RLC & PDCP**
    - Code adaptation for NB-IoT
  - **MAC**
    - Scheduling of MIB, system information (SIBs)
    - Scheduling of data and ACK in DL & UL
  - **NFAPI interface**
    - Implementation aligned with small-cell forum NFAPI
  - **PHY**
    - **TX:** NPBCH, NPDCCH, NPDSCH, NRS, NSSS, NPSS
    - **RX:** NPRACH, NPUSH, DMRS
    - **R14:** Positioning signal (still to do)
Outline

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There will be NB-IoT in OAI very soon!
- Testing will be possible during December 2017
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By the end of February 2018, there will be:
- Tutorial for NB-IoT part of OAI

How NB-IoT works in OAI
There will be NB-IoT in OAI very soon!
- Testing will be possible during December 2017

By the end of February 2018, there will be:
- Tutorial for NB-IoT part of OAI
- Wiki doc:
  - Code documentation
  - Improved code structure
  - PPT presentations for NB-IoT standard

How NB-IoT works in OAI
Thanks

{ Matthieu.KANJ@b-com.com }