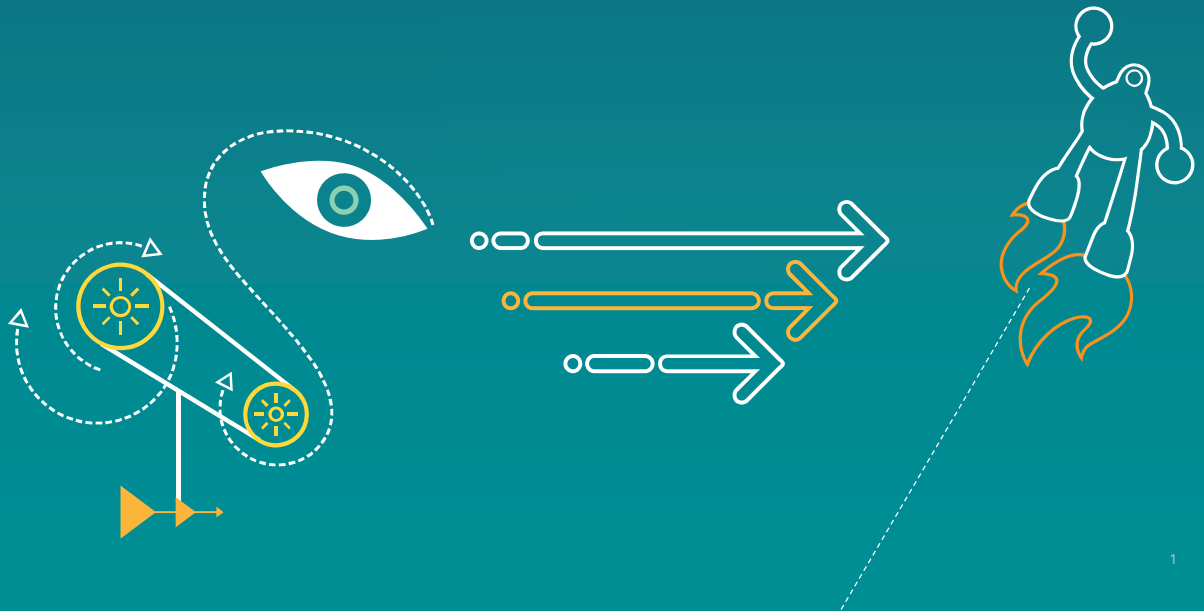FS_CIoT_5G

Structuring the work for Objectives 1-3

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FS_CIoT_5G objectives (S2-175266)

- Objective I: Enable CIoT/MTC functionalities in 5G CN.
  - The objective is to study how to support identified CioT/MTC functionalities in 5G CN with potential connectivity to WB-EUTRA (eMTC) and/or NB-IoT for 5GS capable devices.
  - The following CIoT/MTC functionalities need to be evaluated and studied how to enable them in 5G CN, if needed: [see next slide]
- Objective II: Co-existence and migration from EPC based eMTC/NB-IoT to 5GCN.
  - [...]
- Objective III: 5G System enhancements to address 5G service requirements (based on TS 22.261 and TR 38.913).
  - [...]

How to approach Objective 1

List of identified *CIoT/MTC functionalities (based on SID)*

- Infrequent and frequent small data (incl. NIDD aspects)
- Monitoring
- Enhanced coverage
- High latency communication
- Power saving functions
- Overload control
- Reliable communication
- Inter-RAT mobility support to/from NB-IoT
- Equivalent to Group communication and messaging (*)
- Equivalent overall functionalities as provided by SCEF for CIoT/MTC
- Location services procedures for IoT in 5G (*)
- Modifications to EPC-5GC interworking "baseline" specific to CIOT

- (*) partly depends on (potential) separate SIDs,

How to approach Objective 1

Objective 1: "Support identified CIoT/MTC functionalities in 5G CN with potential connectivity to WB-EUTRA (eMTC) and/or NB-IoT for 5GS capable devices" (S2-175266)

Background

- Some of the existing CIoT/MTC functionalities may be supported in 5GC using the same or similar concepts as in EPC (e.g. only minor modifications needed)
- Other existing CIoT/MTC functionalities may require more discussion and a study of solution alternatives

Goal

- Determine which of the existing concepts can be re-used and which ones need to be re-discussed

Proposal

- Document a baseline for each existing CIoT/MTC functionality summarizing how the functionality can be supported in 5GC, taking the EPC solution as a starting point.
- If a functionality has already partly been addressed by Rel-15 5GC (e.g. monitoring), then the related Rel-15 5GC principles can be listed as the baseline.
- Controversial aspects will not become part of the baseline but will be documented as open issues
  - Note: This does not preclude cases of an (almost) empty baseline for an existing CIoT/MTC functionality, if companies see the need to study specific functionalities in their entirety. Obviously, this approach cannot work for all functionalities if we aim for finishing the study in a reasonable timeframe.
- Work on Objective 1 will subsequently focus on those open issues

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How to approach Objective 1

How to document requirements, baseline and open issues

5   Key Issues

5.X   Key Issue X: <Key Issue Title>

5.X.1   Description

5.X.2   Architectural requirements

Editor's note: This clause summarizes the architectural requirements for key issue X in 5GC taking the architectural requirements that have led to the related EPC solution as a starting point.

5.X.3   Architectural baseline

Editor's Note: This clause summarizes the agreeable architectural principles to enable key issue X in 5GC taking the related EPC solution as the starting point. If part of the key issue has already been addressed in 5GC (e.g. monitoring), then the related Rel-15 5GC principles can be listed as the baseline. Clause may also remain empty if no baseline can be agreed or if the related functionality did not exist in EPC.

5.X.4   Open issues

Editor's Note: This clause lists the open issues for supporting key issue X.

How to approach Objective 1

Baseline and open issues – example

5   Key Issues

5.X   Key Issue #X: Support of enhanced coverage

5.X.1   Description

5.X.2   Architectural requirements

5.X.3   Architectural baseline

Editor's Note: This clause summarizes the agreeable architectural principles to enable key issue X taking the related EPC solution as the starting point. This clause may also remain empty if no baseline can be agreed for a key issue.

- AMF receives information for Enhanced Coverage (if available for a UE) at N2 release

- When paging, AMF includes the information for Enhanced Coverage in paging messages for the UE, unless restricted

- Use of Enhanced Coverage can be restricted per subscriber in the UDM

- If Enhanced Coverage is restricted as per subscription or based on local configuration, then AMF informs

  - the UE as part of the Registration procedure

  - the RAN whenever UE context is established in the RAN

- Whether Enhanced coverage is restricted for a UE can be queried by 3rd parties via NEF; similarly a 3rd party can enable/disable Enhanced coverage via NEF

5.X.4   Open issues

Editor's Note: This clause lists the open issues for supporting key issue X.

How to approach Objective 2

Objective 2: "Co-existence and migration from EPC-based eMTC/NB-IoT to 5GCN."

- Address support of co-existence/migration directly as part of the solutions for each key issue (specifics of interworking may vary for different key issues)

6   Solutions

6. X   Solution #X: <Solution Title>

6. X.1   Introduction

Editor's Note: This clause lists the key issue addressed by this solution.

6. X.2   Functional Description

Editor's Note: This clause outlines solution principles and documents any assumptions made.

6. X.3   Support of interworking

Editor's Note: This clause describes how EPC-5GC interworking is supported in this solution.

6. X.4   Procedures

Editor's Note: This clause describes high-level procedures and information flows for the solution.

6. X.5   Impacts on existing entities and interfaces

Editor's Note: This clause describes impacts to existing entities and interfaces.

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How to approach Objective 3

Objective III: 5G System enhancements to address 5G service requirements (based on TS 22.261 and TR 38.913).

- To be addressed also following the usual multiple key issues / solutions approach (baseline expected to be empty)

Next steps for SA2#125

Goals

- Logistics (skeleton, scope, etc.)
- Create key issues
- Identify common view on baselines for the different key issues
- Initial solution discussion (time permitting)

Next step: Split the work amongst companies (identify volunteers) to create key issues and draft baselines for

- Infrequent small data (incl. NIDD aspects)
- Frequent small data (incl. NIDD aspects)
- Monitoring
- Enhanced coverage
- High latency communication
- Power saving functions
- Overload control
- Reliable communication
- Inter-RAT mobility support to/from NB-IoT
- Equivalent to Group communication and messaging (*)
- Equivalent overall functionalities as provided by SCEF for CIoT/MTC
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    (*) depends on (potential) separate SIDs