

Use Cases for In-Network Computing

<https://www.ietf.org/id/draft-irtf-coinrg-use-cases-01.txt>

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Purpose of this draft

COIN Charter, Scope #2:

“Research on use case driven requirements analysis: [..] Identify potential benefits to these networks from in-network functionality [..]”

- **This draft until now**
 - ▶ Loose collection of use cases
- **Goal**
 - ▶ Provide input for scope #2

Changes in a nutshell

1. Regrouping the use cases

- ▶ Providing New COIN Experiences
- ▶ Supporting new COIN Systems
- ▶ Improving existing COIN capabilities
- ▶ Enabling new COIN capabilities

2. Sharpening and tightening the taxonomy

3. Preparing the analysis

- ▶ Research questions
- ▶ Requirements

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Partly aligned with draft-kutscher-coinrg-dir-02

Use case regrouping

New Use Case (X. de Foy, see IETF 111)

Set up premise for the analysis

COIN RG Terminology

Aligned with draft-kutscher-coinrg-dir-02
New

(COIN) Program: a set of computations requested by a user

(COIN) Program Instance: one currently executing instance of a program

(COIN) Function: a specific computation that can be invoked as part of a program

COIN Capability: a feature enabled through the joint processing of computation and communication resources in the network

COIN Experience: a new user experience brought about through the utilization of COIN capabilities

Programmable Network Devices (PNDs): network devices, such as network interface cards and switches, which are programmable, e.g., using P4 or other languages.

(COIN) Execution Environment: a class of target environments for function execution, for example, a JVM-based execution environment that can run functions represented in JVM byte code

COIN System: the PNDs (and end systems) and their execution environments, together with the communication resources interconnecting them, operated by a single provider or through interactions between multiple providers that jointly offer COIN capabilities

Use Case Taxonomy

1. **Description**

_____ Link to category

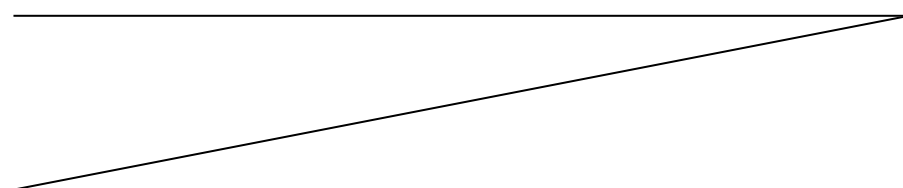
2. **Characterization**

3. **Existing solutions**

4. **Opportunities**

_____ Split up

5. **Research questions**



6. **Requirements**

▶ New: requirements for the COIN capabilities only

Next Steps

- 1. Finish aligning the use cases according to tightened taxonomy**
- 2. Continue aligning the draft with COIN RG terminology**
 - ▶ draft-kutscher-coinrg-dir-02 (will there be an update to this?)
 - ▶ Where to collect the COIN RG terminology otherwise?
- 3. Start with the analysis**
 - ▶ Condense opportunities, research questions, requirements
 - ▶ Identify aspects relevant across all use cases