Use Cases for In-Network Computing

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

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
**COIN RG Terminology**

**(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

2. Characterization

3. Existing solutions

4. Opportunities

5. Research questions

6. Requirements
   ▶ New: requirements for the COIN capabilities only

Link to category

Split up
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