



CLOUDFLOW OPEN CALL 2

Guide for Applicants (GfA)

Call identifier: CloudFlow-2
Submission Deadline: 30th September 2015, at 17:00 h (Brussels local time)
Expected duration of participation: 1st January 2016 to 30st September 2016

Foreseen budget for CloudFlow-2: up to approx. 600.000 € funding for new beneficiaries which corresponds to approx. 1 Mio. Euros budget

This amount of funding is planned to be spent on seven experiments.

- The maximum funding for new beneficiaries per experiment is expected to be: approx. 90.000 € for experiments with more than one and up to four beneficiary/-ies new to CloudFlow.
- For experiments with only one beneficiary new to CloudFlow the maximum funding for the new beneficiary is expected to be in the range between 30.000 and 50.000 €.

TABLE OF CONTENTS

1	CloudFlow	1
2	Objectives of the Open Call	2
3	New CloudFlow Application Experiments	2
3.1	Targeted manufacturing industries	2
3.2	Characteristics of Application Experiments	2
3.3	Application Experiment examples.....	3
3.3.1	Examples for valid Application Experiments.....	3
3.3.2	Examples for potentially unfeasible Application Experiments	4
4	Application Experiment Consortia	5
4.1	Examples for Application Experiment consortia	7
4.1.1	Examples for valid consortia	7
4.1.2	Examples for non-recommended consortia	7
5	Rules for proposal preparation and submission.....	8
5.1	One-stage proposal process.....	8
5.2	Proposal language.....	8
5.3	Submission of proposals	8
5.4	Acknowledgement of receipt.....	9
6	Proposal evaluation and selection.....	9
6.1	Further information.....	9
7	Funding regulations.....	10
8	Formal validation of partners.....	10

1 CLOUDFLOW

CloudFlow - Computational Cloud Services and Workflows for Agile Engineering - is a European Integrating Project (IP) in the framework of Factories of the Future (FoF) that aims at making Cloud infrastructures a practical solution for manufacturing industries, preferably small and medium-sized enterprises (SMEs). The objective of CloudFlow is to ease the access to computationally demanding virtual product / process development and simulation tools, such as CAD, CAM, CAE, etc., and make their use more affordable by providing them as engineering Cloud services.

CloudFlow is a project which is open for new (teams of) participants. With this guide we would like to stimulate you to respond to our call for proposals by submitting the description of an *Application Experiment*. Small consortia consisting of 1 to 4 partners (end users, software vendors, HPC/Cloud infrastructure providers and research organizations) have the opportunity to propose use cases involving manufacturing industries to be run in the framework of CloudFlow. In this second CloudFlow Open Call we welcome experiments that - at least partially - build on workflows, services and applications from the completed and on-going experiments complementing these. As these experiments will involve the CloudFlow Competence Center and Independent Software Vendors (ISVs) already part of CloudFlow such experiments can have as little as one new end user and no other new beneficiary.

Accepted proposers will have the opportunity

- to investigate and gather experience on Cloud Computing options for their use case,
- to explore technical benefits, e.g., better product verification by more accurate simulation results using HPC/Cloud resources, and
- to examine Cloud-based business models and their impact as well as
- to extend the range of services offered via the CloudFlow Portal.

CloudFlow offers via its Competence Center:

- Vendor-independent Cloud infrastructure already containing computational engineering services, such as CAD, CAM, CFD, PLM, etc., on which new experiments can be built.
- A tailored HPC-Cloud infrastructure (with a contractual environment protecting IPR).
- A methodology to describe and execute services and workflows in a Cloud environment.
- Independent evaluation of experiments against your requirements.
- Experience from 13 currently running experiments including consultancy on business models and participation in the I4MS ecosystem (www.i4ms.eu).

For a more detailed description of the CloudFlow project please see:

www.eu-cloudflow.eu

The initial set of and the ongoing experiments are described respectively at:

<http://www.eu-cloudflow.eu/experiments/first-wave/>

and

<http://www.eu-cloudflow.eu/experiments/second-wave/>

More information on the CloudFlow infrastructure you can find under:

www.eu-cloudflow.eu/files/open-calls_second-call_CF-infrastructure.pdf

2 OBJECTIVES OF THE OPEN CALL

This Open Call for proposals seeks to increase the number of partners and Application Experiments currently being carried out within the CloudFlow project. Application Experiments shall be rooted in computational technology for manufacturing and engineering industries, preferably small and medium-sized enterprises (SMEs), giving them affordable access to Cloud technology. Application Experiments are expected to extend the CloudFlow infrastructure and to address workflows along the value chain in and across companies. Priority will be given to innovative product development and products as described below. In this second Open Call of CloudFlow experiments are welcome that - at least partially - build on workflows, services and applications from the completed and on-going experiments complementing these.

3 NEW CLOUDFLOW APPLICATION EXPERIMENTS

Application Experiments shall be rooted in computational technology for manufacturing and engineering industries, preferably SMEs, in stages covering but not limited to:

- design (CAD),
- simulation (product, process, factory, ...),
- optimization,
- visualization,
- manufacturing planning and execution,
- quality control and
- data management

addressing workflows along the value chain in and across companies.

Priority will be given to innovative product development and products such as mechatronic systems and cyber-physical systems, including, e.g., multi-domain simulation (mechanics, electronics, software, fluid dynamics, acoustics, etc.).

3.1 TARGETED MANUFACTURING INDUSTRIES

Manufacturing industries from the following branches are welcome to the CloudFlow project:

- transportation
 - aerospace, automotive , maritime, ...
- production machinery
- consumer goods
 - furniture, electronic devices, kitchen aids, ...
- plant design and construction industry
(Architecture, Engineering and Construction - AEC).
- medical/life science/bio-technology

3.2 CHARACTERISTICS OF APPLICATION EXPERIMENTS

Application Experiments shall demonstrate as many as possible of the following characteristics:

1. An Application Experiment is driven by an end user need coming from an engineering/ manufacturing company, preferably an SME, which is the 'driver' behind the Application Experiment.

2. An Application Experiment deals with/addresses a real use case exploring business opportunities and models. The business opportunities can be twofold:
 - a) affordable access to HPC/Cloud technology for an end user and/or
 - b) provision of computation services on a pay-per-use basis for a software vendor.
3. Application Experiments should build on the CloudFlow infrastructure expanding it with new engineering Cloud services of good usability including easy access.
4. Application Experiments shall build on existing CloudFlow workflows, services and applications extending them – at least partially.
5. Application Experiments must be complementary to the existing experiments in CloudFlow (www.eu-cloudflow.eu/experiments)
6. Application Experiments have to be innovative in as many aspects as possible, e.g., with increasing priority:
 - a) to enable end users to access computational Cloud engineering services that are new to them.
 - b) to allow simulations for more complex models, developing better products, improving predictability of product behavior and assessing compliance with requirements ("design for X" and simulation/optimization).
 - c) to enable/support complex computational engineering workflows in the Cloud enhancing the interoperability of data and tools, thus the efficiency of performing /automating tasks in chains (workflows) of end users collaborating to achieve one goal
7. Application Experiments should demonstrate high potential impact to benefit from Cloud technology, e.g.:
 - a) for the end user:
 - to solve a difficult challenge that re-appears frequently and entails high costs, avoids innovation, shorter time-to-market, etc.
 - b) for the ISV:
 - the challenge of the end user is a representative case for a certain market segment, its solution can be exploited to this market segment of considerable size and possibly to related market segments where similar problems can be addressed to gain higher market share, more revenue and ultimately create new jobs.

The latter criterion (7) has to be answered in section 1 of the proposal template in all its facets, whereas the other points have to be addressed in the other sections (please see the proposal template and the guiding questions and explanations within the proposal template).

3.3 APPLICATION EXPERIMENT EXAMPLES

In this section we provide some indication of valid and possibly unfeasible experiments, respectively. Please also consult the section 4 on the set-up of Application Experiment consortia.

3.3.1 EXAMPLES FOR VALID APPLICATION EXPERIMENTS

1. Let's imagine a shoe-producing company (new end user with respect to the current CloudFlow consortium) wants to optimize air flow / circulation for a new running shoe using Numeca's CFD solution (Numeca is part of the current CloudFlow consortium) on the CloudFlow infrastructure and running on Arctur's HPC/Cloud hardware.

This addresses the above characteristics and is innovative with respect to 6a of section 3.2.

2. Let's imagine an aircraft seat manufacturing company as an end user and an ISV offering a structural mechanics solution. The weight of the seats shall be minimized through topology optimization which requires many simulation runs. The end user wants to use an HPC/Cloud infrastructure to speed up the process and to execute calculations based on more detailed numerical models to increase the predictability of the product behavior. The ISV is interested in porting its software to the CloudFlow environment.

This addresses the above characteristics and is innovative with respect to 6a and 6b of section 3.2.

3. Let's imagine the virtual development process of a mechatronic system such as an electric sunroof for a car. The sunroof supplier teams up with the carmaker, a software supplier and a research institute to integrate the three simulation domains of software, mechanics and electronics to better harmonize the interplay of these different domains. Such a co-simulation of three domains would require a lot of computational power depending on the desired accuracy of the simulation. The end users want to use the CloudFlow infrastructure to efficiently execute their simulations and to improve collaboration along the workflow bridging the two companies.

This addresses the above characteristics and is innovative with respect to 6a, 6b and 6c of section 3.2.

3.3.2 EXAMPLES FOR POTENTIALLY UNFEASIBLE APPLICATION EXPERIMENTS

A valid Application Experiment proposal may be considered unfeasible by the CloudFlow Competence Center due to the financial constraints of the overall project or the work imposed to adapt the CloudFlow infrastructure. In the following, we give two examples where there is a substantial risk that this could happen.

1. An end user wants to use software from a third party vendor that is neither part of the Application Experiment consortium nor of the current CloudFlow consortium. It may still be feasible to bring such software to the HPC/Cloud infrastructure through one of the CloudFlow partners but it needs to be checked by the CloudFlow Competence Center during the review process.

The CloudFlow Competence Center keeps the right to reject such a proposal and recommends discussing such a case with the CloudFlow Competence Center as early as possible in the process of the proposal generation.

The CloudFlow Competence Center recommends including the software vendor as a partner in the Application Experiment proposal if not already part of CloudFlow.

2. Referring to the 3rd valid example above, the proposal has to demonstrate convincingly that the proposed work can be successfully executed within the time and cost limits of an Application Experiment. The CloudFlow Competence Center again recommends discussing such a case with the CloudFlow Competence Center as early as possible in the process of the proposal generation.

4 APPLICATION EXPERIMENT CONSORTIA

An Application Experiment consortium should typically have 1-4 partners out of the following range:

- End user(s) of which one is driving (leading) the experiment with activities including:
 - providing the use-case
 - defining the workflow and its requirements
 - evaluating the experiment outcome
- Independent software vendor (ISV) with activities including:
 - bringing functionality of its software solution to the Cloud thus expanding the CloudFlow infrastructure
 - running experiments in the CloudFlow infrastructure
 - evaluating different options for business models in a Cloud setting
 - developing usable (web) applications for their Cloud services
 - training users
- HPC provider with activities including:
 - contributing their hardware environment for running Application Experiments
 - installing necessary Cloud middleware
 - keeping track of resource use for testing business models
- Research institution
 - providing technology needed to realize the experiment
 - adapting existing technology (software)
 - consulting the experiment partners

Each proposal has to include an HPC provider. We currently have three HPC providers: ARCTUR, UNIZAR-BIFI and CSUC. If a new HPC provider is proposed in an Experiment the rationale behind and the complementarity to the three HPC centres has to be explained. Please also take into consideration that the duration of experiments in the CloudFlow-2 Open Call is only 9 months. This gives little time to both port the CloudFlow infrastructure to a new HPC platform and run the experiment.

Note that all activities have to be carried out in collaboration with the existing CloudFlow partners via the CloudFlow Competence Center that offers:

- adaptation of the CloudFlow infrastructure
- additional services with new functionality
- consultancy and training

For more details on the various roles please see the following table.