



CLOUDFLOW OPEN CALL 1

Guide for Applicants (GfA)

Call identifier: CloudFlow-1
Submission Deadline: 30th September 2014, at 17:00 h (Brussels local time)
Expected duration of participation: 1st January 2015 to 31st December 2015

Foreseen budget for CloudFlow-1: up to 770.000 € funding for new beneficiaries

This amount of funding is planned to be spent on seven experiments. The maximum funding for new beneficiaries per experiment is expected to be: 110.000 €.

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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 development and simulation tools, such as CAD, CAM, CAE, 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.

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.

CloudFlow offers via its Competence Center:

- A vendor-independent Cloud infrastructure already containing computational engineering services for CAD and CAM, CFD, PLM, and systems simulation provided by existing CloudFlow partners (Missler, Numeca, Jotne and ITI), including a tailored HPC/Cloud infrastructure (Arctur) with a contractual environment protecting IPR.
- A methodology to describe and execute services and workflows in a Cloud environment and independent evaluation of experiments against your requirements (UNott).
- Experience from current experiments including consultancy on business models (CARSA) 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 ongoing experiments concerning water power plant design and water turbine development (maintenance, repair and overhaul) are described at:

www.eu-cloudflow.eu/experiments

More information on the CloudFlow infrastructure you can find under:

www.eu-cloudflow.eu/files/open-calls_first-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 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.

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,
- 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).

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 and/or a 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 or
 - b) provision of computation services on a pay-per-use basis for a software vendor.
3. Application Experiments should demonstrate high potential to benefit from Cloud technology.
4. Application Experiments should build on the CloudFlow infrastructure expanding it with new engineering Cloud services of good usability including easy access.
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 services and workflows in the Cloud enhancing the interoperability of data and tools.

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 independent software vendor offering a structural mechanics solution. For optimizing topology minimizing the weight of the seat while keeping its stability, many simulation runs are needed. 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 this 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 and business models in the CloudFlow infrastructure
 - 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 new 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

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.

Type of Partner Criteria	End user	Independent software vendor - ISV	HPC provider	Research institution	Competence Center (existing CloudFlow partners)
Required number of partners	Minimum one (mandatory)	Zero or more Zero: new experiment uses only existing CloudFlow infrastructure (lower funding priority) One or more: the ISVs have to port / adapt new functionality to the CloudFlow infrastructure (higher funding priority)	One	Zero or more	n/a The CloudFlow Competence Center decides in the review process which existing partners are needed to support a specific new experiment including the necessary efforts of these partners
“Newness” of partner	New or existing CloudFlow partner	New or existing CloudFlow partner	New or Arctur (Arctur is an exciting CloudFlow partner)	New or existing CloudFlow R&D partner	Original CloudFlow partners (11 partners which constitute the initial CloudFlow consortium)
Size of company	SMEs strongly recommended	SMEs recommended			
Recommended indicative effort	6 – 12 person months (PM)	3 – 12 PM	1 – 6 PM	0 – 6 PM	5 PM on average

4.1 EXAMPLES FOR APPLICATION EXPERIMENT CONSORTIA

In the following section we draw up examples for valid consortia and indicate some that are not recommended. Please note that the examples are not exhaustive.

4.1.1 EXAMPLES FOR VALID CONSORTIA

1. A consortium that consists of just one end user. This end user wants to use the existing CloudFlow infrastructure in a new application.
2. A consortium that consists of two end users (both SME or one SME and one larger industrial company). They want to use the existing CloudFlow infrastructure in a new application, e.g., a collaborative set-up.
3. A consortium that consists of an end user and an ISV. The software of the ISV is to be ported to the CloudFlow infrastructure resulting in a new application for the end user.
4. A consortium that consists of an end user and an HPC partner. The existing CloudFlow software infrastructure has to be ported to the new HPC infrastructure to realize a new application for the end user.
5. A consortium that consists of an end user, an ISV and an HPC partner. The existing CloudFlow software infrastructure has to be ported to the new HPC infrastructure resulting in a new application for the end user involving new software components from the new ISV.
6. A consortium that consists of an end user, an ISV and a research institute. A new application for the end user is realized by a software component of the new ISV involving the help/consultancy/technology of a new research partner. The hardware infrastructure will be provided by the existing CloudFlow HPC partner Arctur.
7. A consortium that consists of an end user, an ISV, an HPC center and a research institute. The existing CloudFlow software infrastructure has to be ported to the new HPC infrastructure for a new application of the end user involving software components by the new ISV and the help/consultancy/technology of a new research partner.

4.1.2 EXAMPLES FOR NON-RECOMMENDED CONSORTIA

1. One new HPC Center that wants to implement the CloudFlow infrastructure - without any end user.
2. One ISV that wants to get funding for porting its software to the CloudFlow infrastructure - without any end user.
3. One research institution that wants to experiment with the CloudFlow infrastructure - without any end user.
4. An end user with an HPC Center that just wants to run an experiment without any relation to the CloudFlow infrastructure.

5 RULES FOR PROPOSAL PREPARATION AND SUBMISSION

5.1 ONE-STAGE PROPOSAL PROCESS

Proposals for a new Application Experiment in CloudFlow are submitted in a single stage by submitting a complete application following the proposal template found at www.eu-cloudflow.eu/files/open-calls_first-call_CF-proposal-template.docx

5.2 PROPOSAL LANGUAGE

The application as well as all corresponding documentation have to be written in English. Proposals submitted in any other language will not be evaluated.

5.3 SUBMISSION OF PROPOSALS

Proposals must be submitted electronically in PDF form via the following web-page: www.eu-cloudflow.eu/open-calls/submission-tool

Proposals not using the proposal template will not be evaluated. PDF files must not exceed 5 MB.

Proposals must be received before the closing time and date of the call:

30th September 2014, 17:00 h (Brussels local time).

Provided the call is not yet closed, the consortium can upload their proposal several times, overwriting previous versions. Only the last version received before the closing time will be considered for evaluation. Proposals handed in later or provided by any other means (e.g., by e-mail) will not be considered.

It is strongly recommended not to wait until the last minute to submit the proposal. Failure of the proposal to arrive in time for any reason including communication delays is not acceptable as an extenuating circumstance.

The time of receipt as recorded by the submission system will be definitive.

5.4 ACKNOWLEDGEMENT OF RECEIPT

Applicants will receive a formal acknowledgement e-mail as soon as possible after the close of the call. The sending of this acknowledgement does not imply that the proposal is eligible.

6 PROPOSAL EVALUATION AND SELECTION

CloudFlow will evaluate the proposals in the light of refined criteria to ensure compatibility of the new experiments with the CloudFlow infrastructure, respecting the usual evaluation goals and criteria of project proposals submitted to the European Commission.

The CloudFlow application experiment evaluation criteria and the evaluation form can be found as annexes of the proposal template at:

http://www.eu-cloudflow.eu/files/open-calls_first-call_CF-proposal-template.docx

For each proposal, the evaluation will be carried out with the assistance of two independent experts external to the CloudFlow consortium (and the proposed experiments), and one expert

representing the CloudFlow project. The experts will be individuals from the fields of industry, science and/or innovation management. Each expert will record his/her individual opinion on each proposal in an evaluation form. The three experts will then have a (remote) meeting to prepare a consensus evaluation form for the proposal.

Using the consensus evaluation forms the CloudFlow consortium will select the seven best ranked proposals for negotiations. The consortium, however, is not obliged to select a proposal if it has objective grounds for refusal, such as feasibility with respect to the CloudFlow infrastructure in the financial framework of the project. In this case the choice may pass to the next ranked proposal. The CloudFlow consortium may also conclude that even the highest scoring proposal is of inadequate quality, in which case it will make no selection. In the event of no selection being made, the CloudFlow project may or may not re-open the call at a later date.

All proposers will receive an evaluation summary report as the result of the consensus meeting of the experts that evaluated their proposal. The selected Application Experiments will be invited to negotiations for accession to the CloudFlow project's grant agreement.

6.1 FURTHER INFORMATION

For further questions please first consult our frequently asked questions list (FAQ) under: www.eu-cloudflow.eu/open-calls/faq

In case you do not find the answer to your question there, you can add a question by contacting: info@eu-cloudflow.eu

which the CloudFlow Competence Center will try to answer within 3 working days.

7 FUNDING REGULATIONS

Participation as a beneficiary in an FP7 project is on a cost-shared basis, the European Commission making only a partial contribution to the total cost of the work. Selected applicants may only receive funding via the CloudFlow project which they join if they are eligible to receive funding under the rules of the Seventh Framework Programme. The following applicants may receive EU funding in an ICT project:

- any legal entity established in a Member State or an FP7 Associated Country (including the European Commission's Joint Research Center), or created under Community law (e.g. a European Economic Interest Grouping),
- any international European interest organisation,
- any legal entity established in an FP7 International Cooperation Partner Country (ICPC). A complete list of these countries is given in annex 1 of the ICT work programme, but in principle it includes the developing countries of Africa, Asia and Latin America, as well as some lower-income European countries which are not already Member states or Associated Countries.

Organisations from other countries may also participate in ICT projects, but normally without funding. There are also a number of other conditions which exclude funding, specified in Articles 93 and 94 of the Commission's Financial Regulation. Full details of the Commission's funding arrangements can be found in the "Guide to Financial Issues" document of FP7 at:

ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html

The FP7 funding rules for EC contributions apply, i.e. 75% for SMEs and research organizations, 50% for larger industries. In addition to this funding, technical support from the CloudFlow partners is available.