CLOUDFLOW: COMPUTATIONAL CLOUD SERVICES AND WORKFLOWS FOR AGILE ENGINEERING – CURRENT SUCCESS STORIES, NEW APPLICATION EXPERIMENTS & OPEN CALLS

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IDEA

Cloud Computing + Work Flow

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Cloud Computing

Work Flow
Objectives

- support engineering workflows
- enable design, engineering and manufacturing of complex products
- develop CloudFlow Infrastructure based on standards
- run 3 waves of experiments
- exploit via CloudFlow Portal and CloudFlow Competence Center
3 WAVES OF EXPERIMENTS

30.6.2015: 2nd Open Call
PARTNERS IN WAVE 1

- End user: Stellba Hydro
  - Water turbine maintenance, repair and overhaul (MRO)
  - German SME interested in
    - designing
    - simulating
      - flow, systems, machining
  - assuring quality and managing data
  - Representative engineering company
PARTNERS IN WAVE 1

- End user: Stellba Hydro
  - Wish to use these functionality Cloud-based for
    - Faster time-to-market
    - Better products
    - More cost-efficient development
  - Leveraging HPC resources for
    - More complex physical-based simulation
    - Higher spatio-temporal resolution
    - Variant simulation
PARTNERS IN WAVE 1

- Independent SW vendors
  - Missler (CAD, CAM)
  - Numeca (CFD)
  - Systems sim. (ITI)
  - PLM (Jotne)
- Research
  - SINTEF (QA)
- 4 European ISV SMEs to cloudify their solution
PARTNERS IN WAVE 1

- HPC Center: Arctur
- European SME
- to provide the new SW tools via the CloudFlow Portal
PARTNERS IN WAVE 1

- User requirements analysis and evaluation
  - University of Nottingham

- Business modelling
  - CARSA

- Infrastructure
  - SINTEF
  - DFKI
  - Fraunhofer
6 EXPERIMENTS IN WAVE 1

- Systems simulation
  - Safe water power plants
- CAD
  - Designing turbine blades faster
- PLM
  - Efficiently manage data
- CFD
  - Generating more green energy
- CAM
  - Find optimum machining paths
- Point clouds vs CAD comparison
  - Ensure product quality
## WHAT WE ACHIEVED

**IMPACTS FROM CLOUDFLOW (selected)**

<table>
<thead>
<tr>
<th>Process</th>
<th>SME User Impact</th>
<th>SME Provider Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>From 8 hours to 20 min.</td>
<td>New &quot;Plug-in&quot; software</td>
</tr>
<tr>
<td>PLM</td>
<td>25% improvements</td>
<td>Growth in software sales</td>
</tr>
<tr>
<td>Efficiency optimization</td>
<td>Factor of 30 times</td>
<td>New CFD software</td>
</tr>
<tr>
<td>Machine Simulation</td>
<td>Almost 70% reduction</td>
<td>New employments</td>
</tr>
<tr>
<td>Safety Analysis</td>
<td>Reduce 10k€ per project</td>
<td>New Workflow software</td>
</tr>
<tr>
<td>QA</td>
<td>Factor of 5 times</td>
<td>New employments</td>
</tr>
</tbody>
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2ND WAVE OF EXPERIMENTS

started 1. Feb. 2015
ND WAVE OF EXPERIMENTS

- 7 additional application experiments
  - Electronic Design Automation (EDA)
  - Lighting Systems (Automotive)
  - Biomass Boilers (Energy)
  - Bio-reactors (chemical / pharma industries)
  - Plant simulation
    - Steel structures (AEC)
    - Welding (automotive)
  - Compressor design (mechanical engineering)
2\textsuperscript{ND} WAVE OF EXPERIMENTS

- 18 new partners incl. 7 new end users involved in 7 additional application experiments
HOW WE TAKE IT FURTHER

- Sustainability, Exploitation and Expansion
- Evolution from IaaS to SaaS
- New clients all over EU with long term prospects
- New software partners, new tools and solutions
- New expertise, new industry domains
- The CloudFlow Competence Center (CF CC)
- The CloudFlow Portal and integrated services
2ND OPEN CALL

http://www.eu-cloudflow.eu/open-calls/second-call.html

30.6.2015: 2nd Open Call

30.9.2015: closing date
2ND OPEN CALL

- seeks to increase the number of partners and Application Experiments

- Application Experiments
  - shall be rooted in computational technology for manufacturing and engineering industries, preferably SMEs giving affordable access to Cloud technology
  - are expected to extend the CloudFlow infrastructure and to address workflows along the value chain in and across companies

- Priority on innovative product development and products, such as mechatronic systems, including, e.g., multi-domain simulation (mechanics, electronics, software, fluid dynamics, acoustics, etc.)
2ND OPEN CALL

- Important documents for download
  - Announcement of 2nd Open Call for CloudFlow
  - Guide for Applicants (GfA)
  - Short Technical Description of the CloudFlow Infrastructure
  - CloudFlow Open Call 2 for Application Experiments
  - Proposal Template for Open Call 2

2ND OPEN CALL: PROPOSAL TEMPLATE

- Importance of Industrial Relevance (Section 1)
  - Which product or process is to be simulated or optimized?
  - What is the duration and cost of the corresponding design/engineering task?
  - Which software is to be used/cloudified on an HPC-resource?
  - Which benefits are intended to be achieved for the end user(s)?
  - Please quantify in terms of:
    - Product innovation, Cost savings, Time reduction [engineering hours / engineering duration / compute time / compute duration], Product/process quality improvements, Job creation
2\textsuperscript{ND} OPEN CALL: PROPOSAL TEMPLATE (CONT’D)

- Importance of Industrial Relevance (Section 1)
  - In which market is the above product positioned? What is the market size and share?
  - What is the expected growth of your market share given that the above benefits are achieved in a 1 to 3 years perspective?
  - Please characterize potential further market segments that you want to address with the results in a similar way.

- Similar questions for the ISV
- Discussion of technical and economic aspects
  - technical/economic impact on the CloudFlow infrastructure
2ND OPEN CALL

- Webinar: 28th July, at 11am to 12am CET.

- Don’t miss the chance to gain more insight into the recently launched Open Call. Learn how to participate in this third wave of experiments and how to benefit from the consortium.

- If you have any further questions, do not hesitate to contact us:
  - info@eu-cloudflow.eu
THANK YOU!

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