Success story: CloudSME in the EU I4MS programme

Prof. Peter Kacsuk
MTA SZTAKI
kacsuk@sztaki.hu

CloudSME – Cloud-based Simulation platform for Manufacturing and Engineering

Funding: 4.5 million Euros
Duration: 1 July 2013 – 31 December 2015
The current consortium: 12 SMEs + 4 academic partners

Project coordinator: University of Westminster (UK)
Project partners:
* SZTAKI – Hungary
* University of Zaragoza – Spain
* Brunel University – UK
* ScaleTools AG – Switzerland
* CloudBroker GmbH - Switzerland
* CloudSigma AG - Switzerland
* Ascomp GmbH – Switzerland
* Simul8 Corporation Ltd. – UK
* Ingecon – Spain
* 2MoRO Solutions - France
* Saker Solutions Ltd. – UK
* Eurobios SAS – France
* Podoactiva – Spain
* Cutting Tools Ltd. - UK
* SanderWerbung GmbH - Germany

10 further SMEs to join following open call

Academic partners

Cloud platform and resource providers

Simulation software providers

End-users

Marketing

Antecedent EU FP7 project: SCI-BUS

No	Participant organisation name	Part. short name	Country	Expertise & Experience
1	Magyar Tudomanyos Akademia Szamitastechnikai es Automatizalasi Kutato Intezet	MTA SZTAKI	Hungary	Coordinator in EDGeS, EDGI, SHIWA, developer of WS-PGRADE
2	Academisch Medisch Centrum bij de Universiteit van Amsterdam	AMC	The Netherlands	Gateway developer for the medical user community
3	Simsoft Bilgisayar Teknolojileri Ltd. Sti.	SIMSOFT	Turkey	Gateway developer for business process modeling
4	E-GROUP Ict Software Informatikai Zrt	EG	Hungary	Gateway developer for Web 2.0
5	Eidgenössische Technische Hochschule **Zürich**	ETH Zurich	Switzerland	Gateway developer for bioscience
6	Middle East Technical University	METU	Turkey	Gateway developer for seizmology
7	Scaletools Ltd.	ST	Switzerland	Gateway developer for clouds
8	Eberhard Karls Universität Tübingen	EKUT	Germany	Gateway developer for computational chemistry
9	University of Westminster	UoW	UK	Developer of UK NGS P-GRADE
10	Universidad de Zaragoza	Unizar	Spain	Gateway developer for PireGrid SMEs
11	CloudBroker GmbH	CB	Switzerland	Gateway developer for clouds
12	4D SOFT SZAMITASTECHNIKAI KFT	4D SOFT	Hungary	Gateway developer for ETICS-2
13	Istituto Nazionale di Astrofisica	INAF	Italy	Gateway developer for astrophysics
14	Laurea-ammattikorkeakoulu oy	Laurea	Finnland	Gateway developer for Blender
15	The Provost Fellows & Scholars of the College of the Holy and Undivided Trinity of Queen Elizabeth near Dublin	TCD **3**	Ireland	Gateway developer for helio-physics

Integrated WS-PGRADE/CloudBroker Platform to access multi-clouds
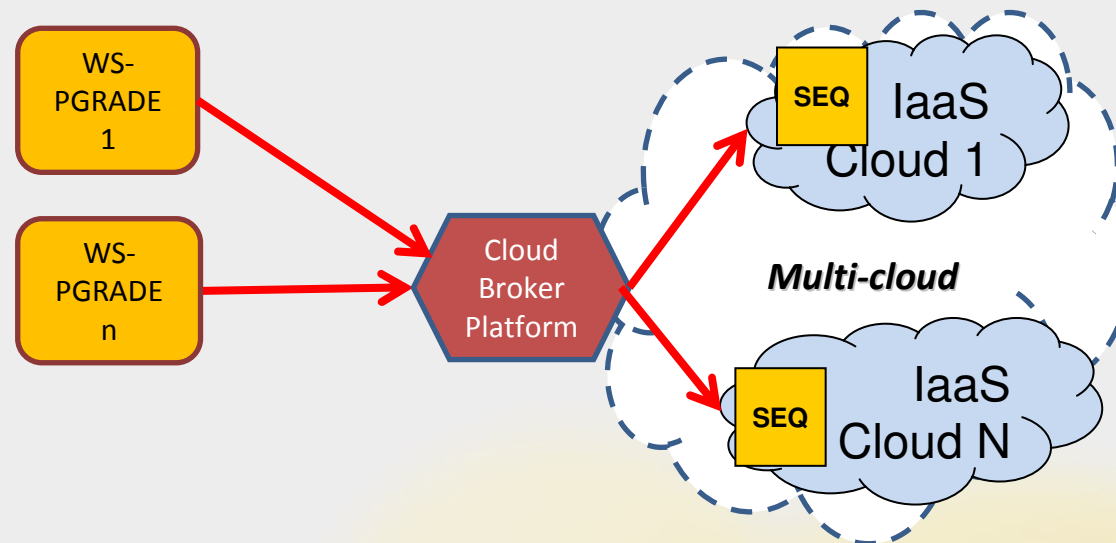
- Supported clouds: Amazon, IBM, OpenStack, Eucalyptus, OpenNebula
- **SaaS solution**:
  - Preregistered services/jobs can run from WS-PGRADE
- **IaaS solution**:
  - any services/jobs (e.g. BoT jobs) can run from WS-PGRADE

Project objectives

1. **Build a simulation platform** that allows seamless access to multiple **heterogeneous cloud resources** and provides a high level of abstraction to users when accessing these resources for simulations **in a one-stop-shop solution.**

2. Provide a **Platform as a Service** (PaaS) solution

3. Create a **generic simulation platform** for engineering and manufacturing.

4. Enable simulation software providers to offer cloud-based **SaaS** simulation solutions

5. Enable **SMEs** in the manufacturing and engineering domain to access simulation services

6. Implement the CloudSME Simulation Platform in a way that is **independent from the underlying cloud infrastructure**

Project objectives

7. Provide seamless access to **HPC resources** in order to speed up the simulations on-demand

8. Illustrate the usability of the developed CloudSME Simulation Platform by implementing several **use-cases** for manufacturing/engineering SMEs

9. Operate a production quality **cloud infrastructure**

10. Disseminate the results of the project in the manufacturing/engineering domain and **raise awareness** of the CloudSME Simulation Platform

11. Lead and significantly contribute to the **standardisation** of cloud-based simulation services

12. Define generic and concrete **business models** for SMEs in the manufacturing/engineering sector to facilitate the take-up of cloud-based simulation solutions

Partnership in detail

|	
End users	Utilise SaaS solution based on the CloudSME Simulation Platform - **Podoactiva (E), Saker Solutions (UK), Eurobios (F), Cutting Tools (UK), ~7 new end-users**
Simulation platforms providers	Utilise PaaS based on their software packages to build custom simulation solutions for end-users – **Ascomp (CH), Simul8 (UK), INGECON (E), 2MoRO (F), ~3 new simulation software providers**
Gateway provider	Provide customised gateway as the basis for the PaaS solution: **SZTAKI (H)**
Cloud Platform provider	Provide seamless access to potentially heterogeneous cloud platforms: **CloudBroker (CH)**, **Scaletools (CH)**
Cloud infrastructure providers	Academic and commercial clouds Commercial: **CloudSigma (CH)**, Academic: **SZTAKI (H), UoW (UK) and Unizar (E)**

Development of end-user case studies – **Brunel University (UK), UoW (UK)**

Dissemination and Marketing - **Unizar (E), Sanderwerbung (D)**

Project coordination - **Uow (UK)**
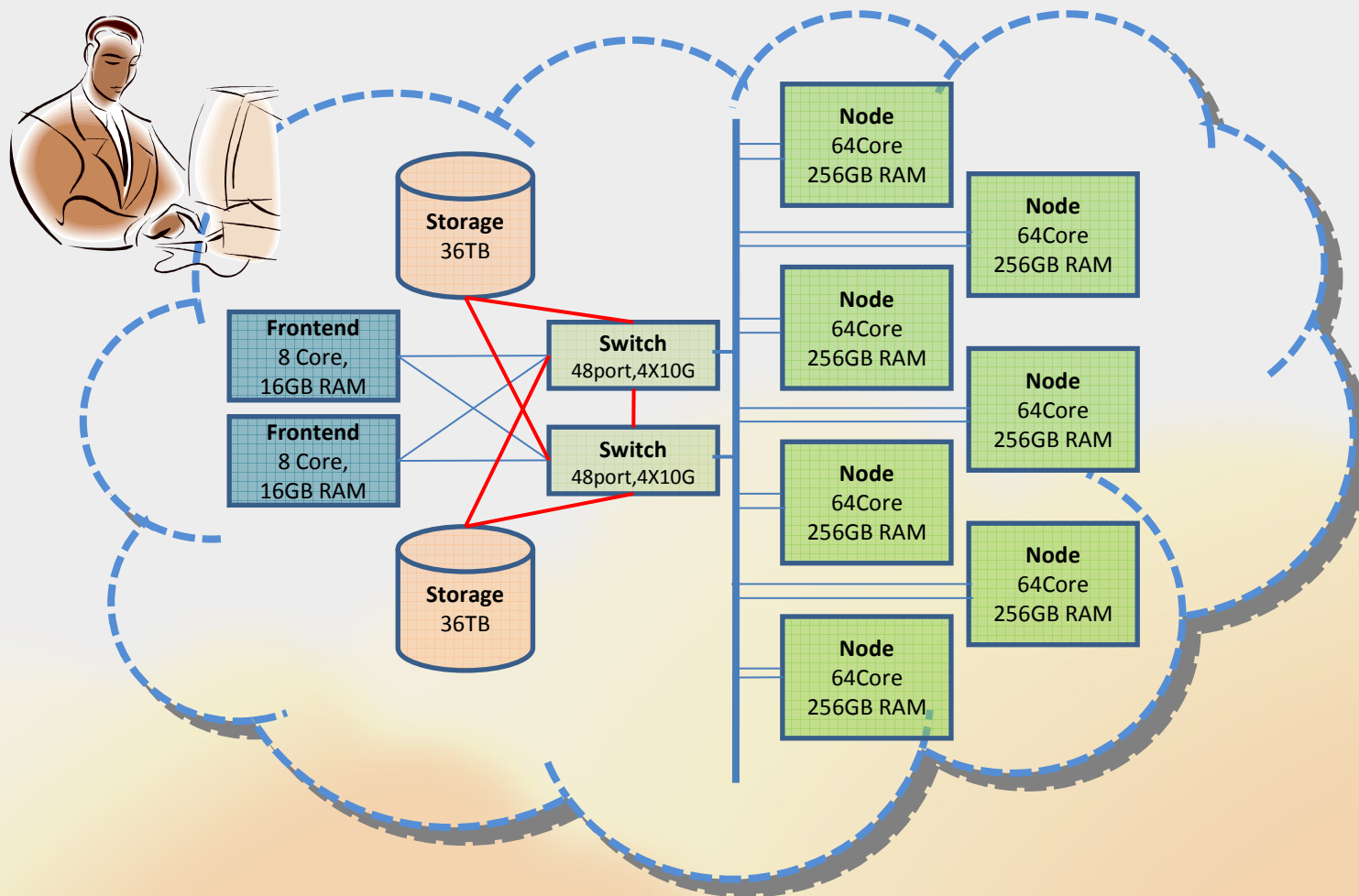
The CloudSME Simulation Platform
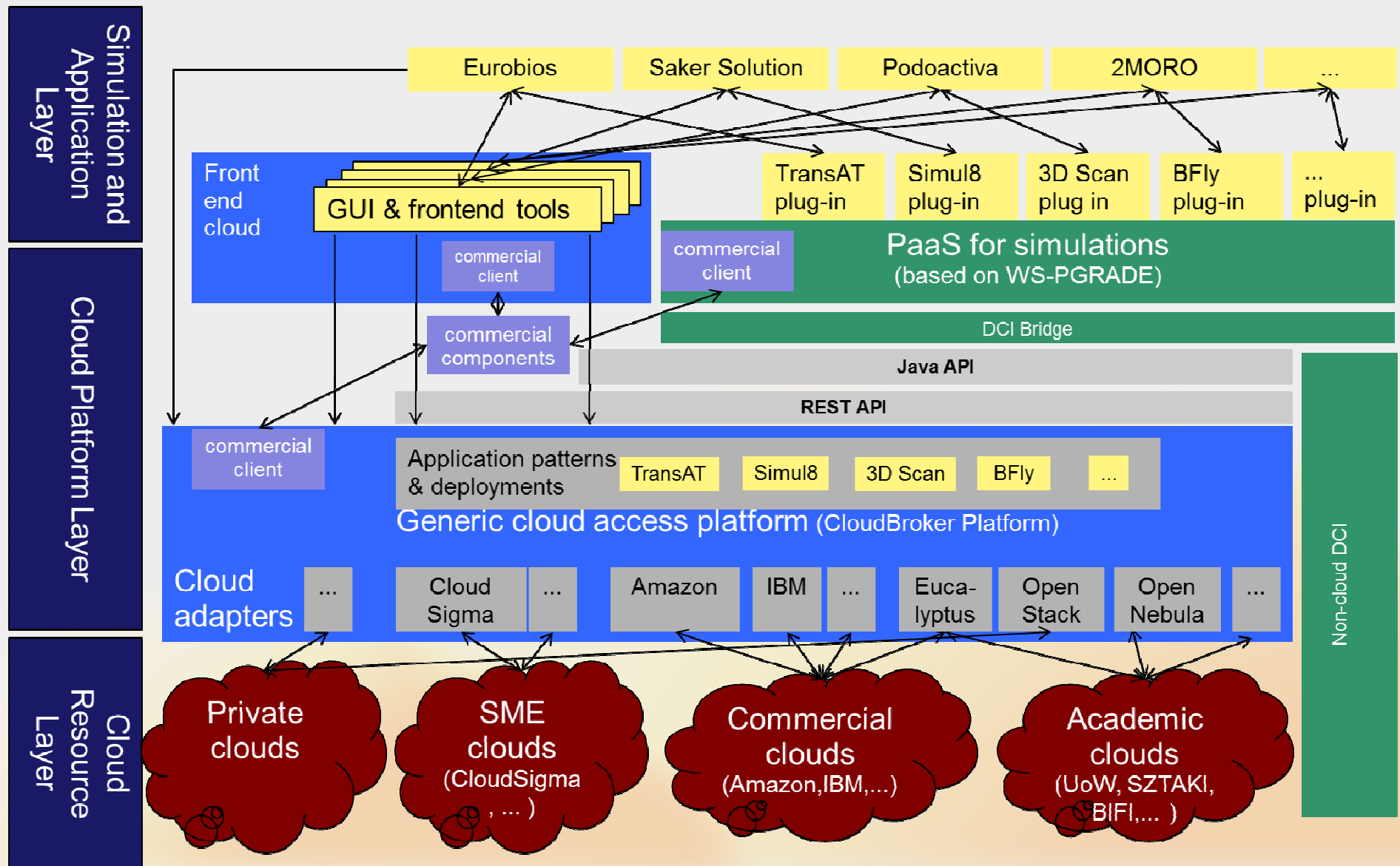
WP5 Cloud-based Simulation Service Provisioning (MTA SZTAKI)

* Integrating academic and commercial IaaS clouds

* Operating CloudSME simulation testbed to support platform development

* Establishing and operating production CloudSME simulation platform to support use-case development and benchmarking

SZTAKI Cloud Architecture

WP6 Development of Industrial Cloud-based Simulation Software and Applications - (Brunel University)

* Porting simulation software products of current partners to the CloudSME platform

* Implementing use-cases of current partners

    * Environmental fluid mechanics by Eurobios and Ascomp

    * Discreet event simulation by Saker and Simul8

    * Aircraft maintenance by 2MoRO

    * 3D Scan insole design by Podoactiva and Ingecon

    * Use-case of a newcomer to simulation software - CTOOLS

WP9 Cloud-based PaaS for Simulations – (MTA SZTAKI)
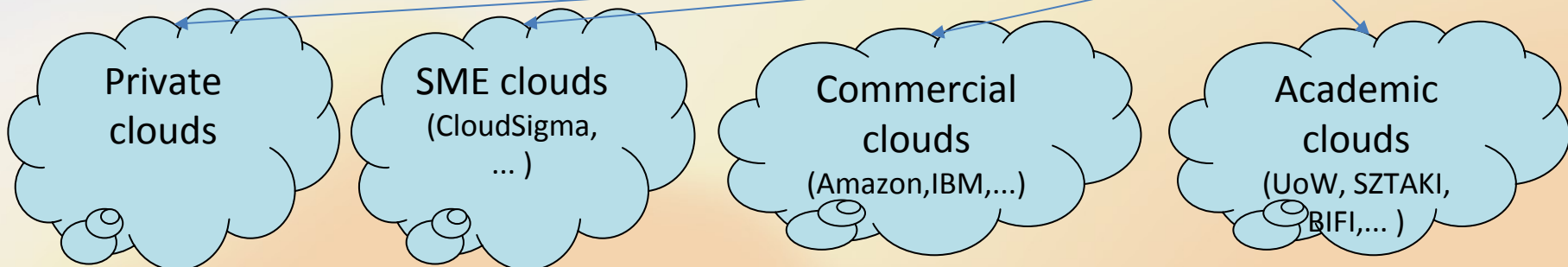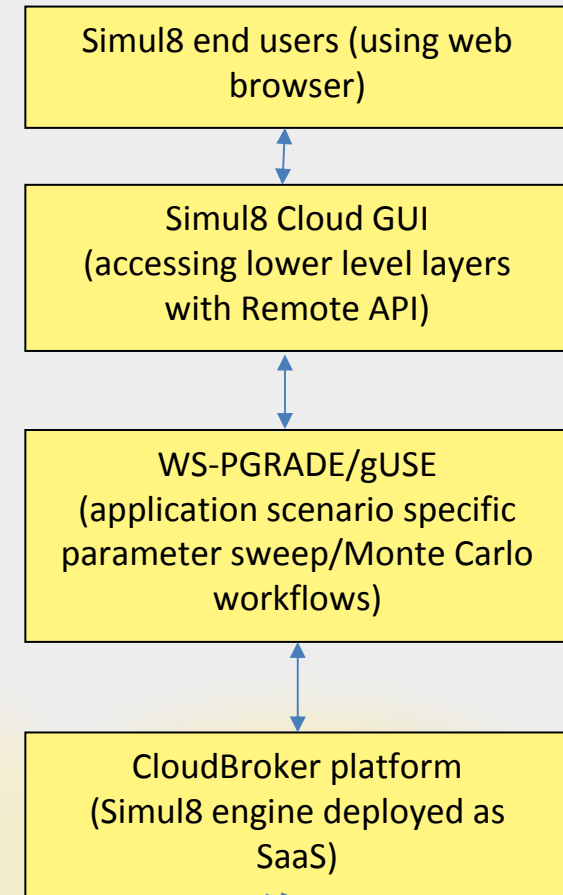
* Implementing the CloudSME Simulation Platform as PaaS based on the WS-PGRADE/gUSE framework

  * Providing a platform for fast development of new simulation applications

  * Enabling the creation of complex workflows supporting simulations

  * Giving access to a wide variety of cloud and other HPC resources

  * Extending WS-PGRADE GUI to support the specific requirements of simulation software

Simul8 use-case

cloudSME

Contributors:

*Simul8 – with the Simul8 software

*SZTAKI: with WS-PGRADE

*CloudBroker/ScaleTools: with the CloudBroker platform

*Brunel: with application support at simulation level

*UoW: with application support at WS-PGRADE and cloud levels

Simul8 end users (using web browser)

Simul8 Cloud GUI
(accessing lower level layers with Remote API)

WS-PGRADE/gUSE
(application scenario specific parameter sweep/Monte Carlo workflows)

CloudBroker platform
(Simul8 engine deployed as SaaS)

Private clouds

SME clouds
(CloudSigma, …)

Commercial clouds
(Amazon,IBM,...)

Academic clouds
(UoW, SZTAKI, BIFI,...)

Overview of the Open Call for further partners/use-cases

* **Aim of the Open Call:**

  * To find 10 further SMEs representing at least 6 different use-cases to demonstrate the capabilities of the CloudSME Simulation platform

* **Companies who are eligible to apply:**

  * Manufacturing/engineering SMEs who are potential customers of current simulation software provider project partners

  * "New" simulation software providers with existing or potential clients in manufacturing/engineering

  * Manufacturing/engineering SMEs who are potential customers of simulation software providers applying for the call

  * Potential applicants:

    * individual SMEs applying as potential end-user of one of current simulation software (Simul8, Bfly, 3D Scan, TranAT)

    * group of SMEs including one "new" simulation software provider and one or more end-user of the provider's product.

Overview of the Open Call

* **The timeline**

    * **Publication of Open Call – M10.5 (mid May 2014)**

    * **Close of the call – M12 (30 June 2014)**

    * **Start of the new experiments – M18 (1 January 2015)**

* **The available budget:**

    * 400K Euro to be distributed between the 10 selected companies (not necessarily evenly)

The selection process

* **The content of proposals:**
  * Summary/abstract
  * Industrial relevance, impact and exploitation plans
  * Work-plan (implementation) and concept
  * General information about the consortium and/or individual proposers
  * Justification of costs and resources (overall and requested budget, budget distribution

The selection process

* **Evaluation criteria:**

  1. Impact (industrial relevance, impact and exploitation plans) –threshold of 3 and carries double weight
  2. Soundness of concept and innovation (including the work plan) - threshold of 3
  3. Quality of the consortium - threshold of 3
  4. Resources required

* **Every criteria is marked 0-5**

Further information

* **SCI-BUS:**
  * http://www.sci-bus.eu/
* **CloudSME**
  * http://cloudsme.eu/
* **WS-PGRADE/gUSE**
  * http://sourceforge.net/projects/guse/
* **CloudBroker Platform**
  * https://platform.cloudbroker.com

cloud**SME**

Solutions for
manufacturing & engineering

*Thanks for your attention.

*Any questions?