mobile business

eScience and Shared Workspaces: Enabler for a next generation research environment

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ifip

Agenda

1. **Introducing Myself**
2. Starting Point for planned research
3. Introduction to the underlying Concepts
   - Cloud Computing
   - eScience
   - Shared Workspace
4. Work planned
   - Master thesis
   - PhD Research
5. Questions and Discussion

Introducing Myself
Practical and Academic Experience

Professional Roles:

- Self-employed: Technology (CAD, CIM…) and Management Consultant
- Employed: Business Development Manager, Regional CIO (Scandinavia), In-house Consultant (Banking IT), Director Technology and Communication (CE), Senior Management Consultant, Technical and IT Director (CE), CIO/CTO Educational Services, Research and Teaching Assistant

Academic Studies

- Dipl.-Ing. (FH) Electrical Engineering
- Master of Business Administration
- Master of Computer Science-> to be finished soon
- PhD Business Informatics -> starting soon

Introducing Myself
Projects and Research

- **Projects**

- PrimeLife - Bringing sustainable Privacy and Identity Management to future Networks and Services
- ***GINI*** (Global Identity Networking of Individuals) - building a Personalized Identity Management ecosystem where individual persons will control their own Individual Digital Identity (INDI)
- Industry projects on Economic and Technical aspects of Identity Management enabled Services

- **Research Interests**

- Use of Web X.0 Technologies in Enterprise and Science context
- Virtualization, Cloud Computing, Computer Architecture
- Security, Identity Management, Privacy and Trust in web based (mobile) ecosystems
- (Identity enabled) trustworthy Mobile Business

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Planned research
Starting Point

- Rising complexity, interdisciplinary, multi nationality in today's research questions involve researchers from several countries, disciplines e.g. PrimeLife involves researchers from areas like Economics, Social Science, Computer Science, Law, and others as well as from countries like Sweden, Switzerland, Germany and so forth to conduct integral research.
- The increasing amount of data to be stored and processed not only in quantum physics but more or less every scientific discipline introduces an increasing need for resource sharing.
- Cost saving initiatives, global distribution of experts and events like the breakout of the volcano Eyjafjallajökull create the need for a Plan B to overcome travel restrictions.
- International research promotions (e.g. EU-Funding Plans) by nature involve researchers from several countries and therefore introduce the need for collaborative work.

Planned research
Starting Point

- Complexity (Research Questions, Organizational, …)
- Costs pressure (Budget cuts, Funding reductions, …)
- Scarce Resources (Experts, Equipment, Time, …)
- Reusability (Raw Data, Results, …)
- Networking (Junior Researchers, Project Partners, …)
- …

- These issues aren't new but they reach levels where they put research projects at risk or at least reduce their effectiveness as well as their efficiency.

Planned research
Starting Point

- Today's concept to deal with the named issues mostly employ technologies like:
  - E-Mail (unsynchronised, offline communication)
  - Web 1.0 (Webmaster/Author managed content)
  - Remote Processing (rsh, rexec, rlogin, ...)
  - Ping Ponging of Documents
  - Face to Face Meetings
  - Mailboxes, Newsgroups, ...
- These technologies still work out as one can easily see with the amount of successful research projects completed.
- But are they as efficient and effective as they could be?

Planned research
Assumptions

- Assumption - Employment of new technologies should help better overcome the issues

  and (as side effect)
- should enable new research approaches as well.

- The selected Concept:
  - Master thesis -> focusing on Shared Workspaces as described in the Paper of Hönig and Schiffman, University of Hagen (supervisor of my master thesis):

    "Shared Workspaces: A Concept for implementing a Distributed eScience-Environment in Grid- and Cloud-based Infrastructures."

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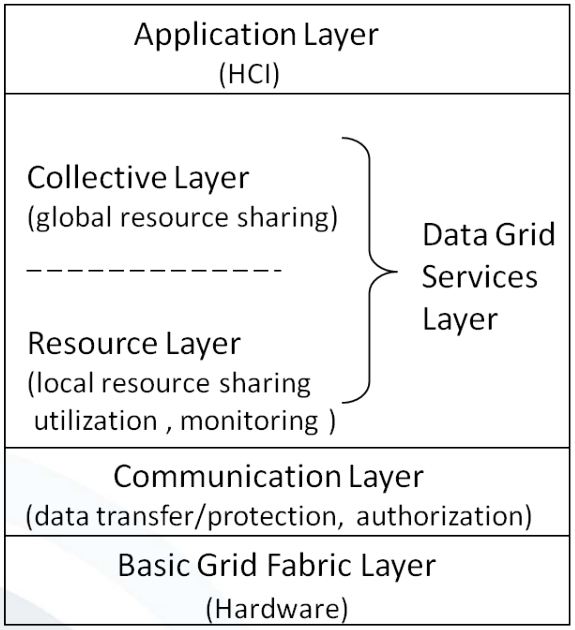
Introduction to the underlying Concepts
Cloud Computing

- *Data Cloud is the underlying Infrastructure for Shared Workspaces.*



Data Cloud = utility alike availability of storage

Introduction to the underlying Concepts
eScience

- *eScience – electronic / enhanced Science*

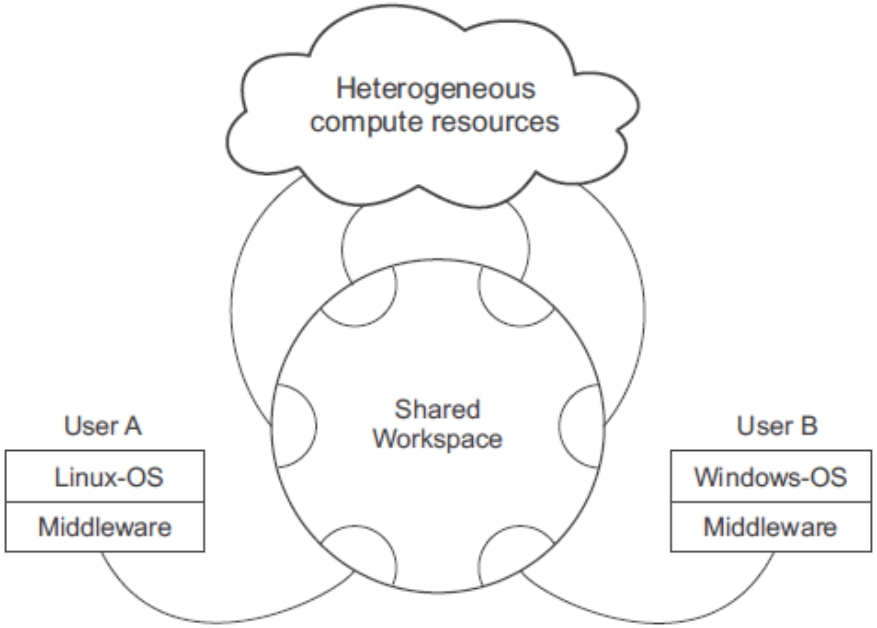
- "e-Science is about global collaboration in key areas of science …" (using very large data collections, terra scale computing resources and high performance visualisation) "…, and the next generation of infrastructure …" (Grid-Computing) "…that will enable it."

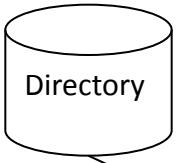
John Taylor, Director General of Research Councils Office of Science and Technology

- eScience = employment of Grid-/Cloud-based infrastructure and technical enablers to "e" scientific research

Introduction to the underlying Concepts
Shared Workspace

- *Shared Workspaces (SWS) – use Grid-/Cloud-based technologies to enable eScience*





Directory is used for locating SWS, to store data index (tags), profiling data, ...

SWS provided by User A and accessed by User B, MW seamlessly integrates SWS to File systems

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Work Planned
Steps to go

Two Steps:

1. *Master thesis*
   Focus: Evaluation of a given selection of Open-Source Social Networking Software (SNS) for the integration in SWS-Concept

2. *PhD Research*
   based on the lessons learned from Step 1 further Research

Step 1 Master thesis

- Build a Lab Infrastructure (collect experience with Private Cloud)
  - build out of desktop systems based on virtualized Linux Systems
- Analyse the Lab Infrastructure with Focus on the Usefulness for Shared Workspaces
  - collect experiences with cloud solutions
- Implement Concept of SWS to Lab Infrastructure
  - implementation of all necessary SWS components (middle ware, directory…)
  - Discover requirements for enhancement of SWS by SNS

Step 1 Master thesis

- Analyse the given SNS's with regards to how Directory data could be used for Networking, Access Control, SWS Search, …
  - Unmodified SNS's will be analysed on their capabilities to support SWS requirements

- Find a first set of necessary information to be held in the Directory -> Expert Interviews, literature study, own experience
  - Develop a first version of the directory and test it against given SNS's

Step 1 Master thesis

- Benchmark/Evaluation of the given SNS's in SWS context
  - Installation effort, Technical requirements, Feature set, Access control, Profiling capabilities, API's...

- Conclusions, Suggestions for a first version of the Directory and the usage of SNS's in the Concept of Shared Workspaces
  - what is needed to make SWS a fully useful, secure, reputable Concept
  - discovered issues, possible concept modifications
  - ideas for further research and development

  -> some ideas already exist

Work Planned
Post Master thesis

Step 1 Possible Future Research as known by now

- HCI - Usability
- Implementation of distributed Directory
- Community driven Reputation mechanisms
- Secure Documents
- Change control of data
- Security and Privacy issues
- …

Not covered by my work planed, but important questions.

Work Planned
PhD Research

Step 2 Possible PhD Research focus on

- Future Research from Step 1
- Security, Privacy (Individual/Organizational) aspects of Cloud Computing
- Organizational aspects of the employment of Cloud Computing
- Governance
- …?

Ideas for future PhD research derived from the described Master thesis.

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Questions and Discussion

- Questions for Discussion
- Master thesis related
  - What are the major issues in Interdisciplinary Research with regards to cooperative work?
  - How are they addressed today?
  - What are potential Security issues in a SWS scenario?
  - What feature should a Science/Research focused SNS to be implemented in SWS provide?
  - Is there any applicable SNS Benchmark known to you?
- PhD Research related
  - What would a promising research focus in Cloud Computing be?

My Focus

  - Security, Privacy, Governance, ITIL for the Cloud, …
  - Organizational aspects
  - Cloud of Clouds -> the one and only Cloud

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Thank you!

Comments, Feedback please sent to:

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