

Scenarios for a Learning GRID

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What is Kaleidoscope

- It is a **Network of Excellence** in technology-enhanced learning
- 23 countries, 76 research units, 800 researchers
- Supported by the **European Commission**, under the IST priority of the 6th Framework Programme
- It includes:
 - **Backbone Activities**
Academia-Industry Digital Alliance, Advanced Training Activities, Shared Virtual Laboratory, Virtual Doctoral School, Users Group
 - **Special Interest Groups**
 - **European Research Teams**
 - **Jointly-Executed Integrated Research Projects**

What is a Grid for Learning

- It is an enabling architecture based on **three pillars**:
 - Grid
 - Semantics
 - Educational Modelling
- It allows the definition and the execution of learning experiences
 - ... obtained as cooperation and composition
 - ... of distributed heterogeneous actors, resources and services
- Learning Grid is a **Special Interest Group** of Kaleidoscope
grid.noe-kaleidoscope.org

Grid + Semantics + Learning Design

- **Grid provides:**
 - transparent access to distributed services and resources
 - service orientation, dynamicity, interoperability among heterogeneous environments, security and trust, ubiquity
 - distributed collaboration and virtual organizations features
- **Semantics allows:**
 - to make explicit the knowledge about resources and services of the infrastructure, of communities and of individuals
 - automatic negotiation, discovery and composition of services allowing personalization
- **Learning Design allows:**
 - to model different learning theories in a machine understandable way in order to be interpreted and combined
 - to exploit distributed, service-oriented e-learning environments to construct learning experiences

Scenarios for a Learning Grid

- **Parallel Computing Cooperative Learning**
- **Collaborative Research Environment**
- **Collaborative Lab**
- **Analysing Information from Collaborative Learning Teams**
- **Networking Course by e-Learning**
- **Immersive Virtual Reality**
- **Virtual Laboratory**
- **Field Trip**
- **English Plan**
- **How to Elaborate a Business Plan**

Scenario 1

Parallel Computing Cooperative Learning

- **Goal:**
 - teaching a programming course on parallel algorithms
- **Teachers:**
 - assign to groups of students the building of a distributed system with some requirements
 - monitor the group work, access learners documents and code, give hints and suggestions
 - share training material, sample code, sample services
 - assess group and individual progresses
- **Learners:**
 - build interoperable services and make them available on the Grid
 - may invoke services made by other students also from different organizations
 - may share services, documents and code
 - may express feedback on services, documents and code shared by other peers
- **Learning methods:**
 - peer learning and tutoring, reciprocal teaching, project or problem based learning

Scenario 2

Collaborative Research Environment

- **Goal**
 - To let student and researchers cooperate in an “enhanced” digital library
- It takes its inspiration from **Citeseer**, a digital library which organizes scientific literature, allowing flexible searching and citation statistics
- The use of a Grid makes it possible to extend the digital library with new forms of collaborative activities
 - comments, reviews, summaries, videos, prototypes, code, ...
- **Virtual organizations can be defined**
 - research students and their supervisor(s), a research group, a whole lab, ...
- **Services can be personalized according to users**
- **It constitutes a new and useful way of supporting research activities**
 - ... allowing to easily organize and access all sort of documentation/information
 - ... and to assess individual and group progress

Scenario 3

Collaborative Lab

- **Goals:**
 - improving the communication level and coherency in collaborative activities
 - overcoming the lack of visibility of students activities to the group and to the teachers
- **Teachers:**
 - can view the activity of students and groups in the lab (who is working on which part of the training material, with whom, getting which results, ...)
 - can distribute training materials and tasks to people and groups
 - can actively gather the results of students works (answers, solutions, reports, ...)
 - can navigate through these results, and make them visible to the group, if needed
- **Learning methods:**
 - One-to-one training where one can benefit from a view of the others' activity

Scenario 4

Analysing Information of Collaborative Teams

- **Goal**
 - Provide students and tutors with valuable knowledge on the collaborative learning activity
- CSCL applications generate huge amounts of events in log files
- Log files must be processed to provide feedback to users
- This scenario uses the computational power of a Grid to provide timely feedback
- **Offered Features:**
 - Structuring of the events (task performance, group functioning, scaffolding)
 - Generating two types of log files based on time and workspace
 - Partitioning log files in chunks of arbitrary size processed in parallel
 - Storing Grid processing results in a database to compute statistics

Scenario 5

Networking Course by e-Learning

- **Goal:**
 - teaching basic concepts about computer networks
- **Learners:**
 - can access training material through different devices
 - can have the training material adapted on the basis of the used device
 - can use network simulations that run remotely to experiment network configurations and have data presented according to device properties
 - can use cooperative network design services to consolidate the work made locally by comparing it with other students
 - can contact a teacher and submit him the work made
- **Learning Method:**
 - ubiquitous, active and social Learning
- **Grid technology facilitates:**
 - the communication between heterogeneous devices
 - the collaborative use of remote resources

Scenario 6

Immersive Virtual Reality

- **Goal:**
 - teaching water table and aquifer behaviour through an e-Learning platform
- **Learners:**
 - can connect to the platform through PDA or home computer
 - can access introductory learning material to gain initial knowledge on the topic
 - can use a dynamically generated set of services that, according to their user profile and current device capabilities create an immersive virtual reality experience
 - can be informed about the requirement of special equipment like gloves and glasses and about the nearest locations where such immersions are possible
 - can reach these locations in order to go deeper on the aquifer behavior and on characteristics of water through immersive experiences
 - can meet other students in the virtual sites and interact with them
- **Learning Method:**
 - inductive/experimental, collaboration

Scenario 7

Virtual Laboratory

- **Goal:**
 - providing a virtual environment to perform scientific experiments (chemistry, physic, ...)
- **Teachers:**
 - assign to groups of students the experiment to be performed
 - lead the students in their work providing answers to questions
 - check intermediate experiment results suggesting changes and improvements
 - evaluate individual and group progress customizing the running experiment
- **Learners:**
 - set up the experiment environment choosing instrumentation, simulations, computer facilities, ...
 - define the work flow between the involved parties
 - share results with other group, discuss about them and compare them with other results
 - disconnect and reconnect being informed of the current status of the experiment
- **Learning methods:**
 - conversational process providing collaborative, experiential and contextualised learning

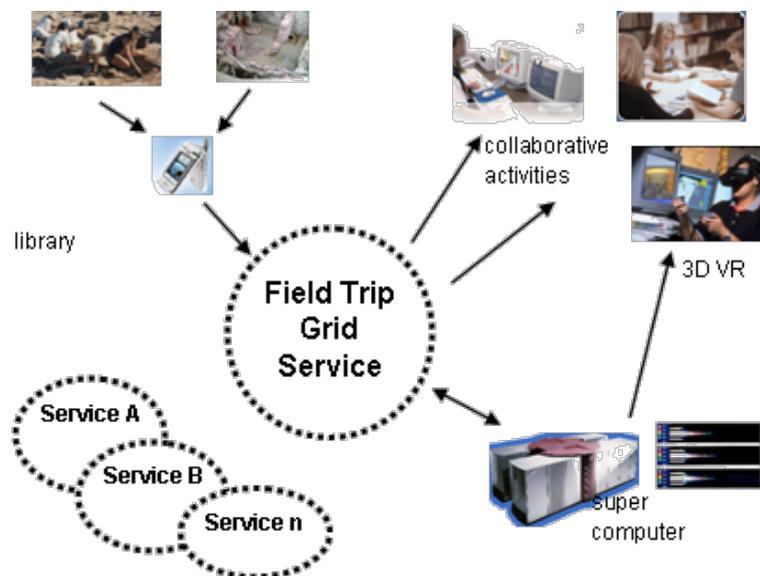
Scenario 8

The Field Trip

- **Goal:**
 - supporting students, equipped with PDAs, in an archeological field trip
- **Learners:**
 - can gather information under the form of photos, videos, text notes, audio comments, etc.
 - can access digital libraries and documents necessary for their work
 - can let remote services to automatically index this content using appropriate meta data
 - can store produced material remotely and share it with other learners
 - can exploit remote services to provide 3D reconstructions of photos
 - can use semantic based searching and location services to contact other students with similar interests or other students who are geographically near
- **Teachers:**
 - can evaluate student progress toward learning goals
- This scenario uses the typical Grid approach in combination with mobility and knowledge based services

Scenario 8

The Field Trip



Scenario 9

The English Plan

- **Goal:**
 - To support students in an immersion program consisting of a trip to New-York
- **Learners:**
 - have to send daily reports to the teacher through the PDA
 - can use a remote pronunciation testing service
 - can access on-line dictionaries and documentation, chats and forums
 - can collaborate to create virtual scenarios reproducing activities that have taken place or are planned to be held next involving remote teachers
 - can access an “Evaluators Virtual Network” via a voice authentication mechanism and perform an official remote exam
- **Learning method:**
 - Immersion program

Scenario 10

How to Elaborate a Business Plan

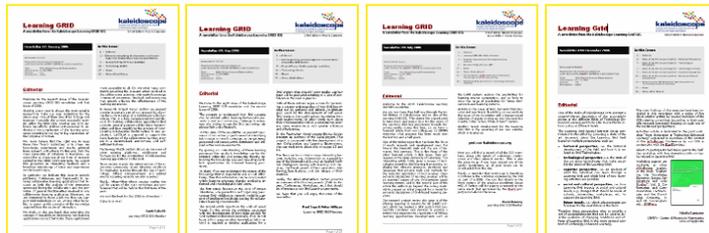
- **Goal**
 - Improving a business plan before a meeting with partners
(while flying to a meeting a business man has to complete parts of a business plan)
- **Learner-Worker**
 - can access to the corporative resources that he needs adapted to the device used
 - can download on his PDA a course about business plan
 - can seek further advice by connecting to a service that allows him to locate a tutor
 - can discuss with the tutor via a video-conference service
 - can access a profitability simulator service to match the economics data of his business plan and to complete his work
- **Learning method**
 - Learning by doing

The Learning Grid SIG

- The Program
 - Definition of challenging scenarios for distributed service-oriented e-learning
 - Analysis of technologies for creating distributed service-oriented e-Learning environments
 - Analysis of languages and frameworks for the dynamic composition of distributed e-learning resources and services
 - Consolidation of the research in the “Grid Technologies for TEL Handbook”

- The Newsletter

- It surveys projects and new technologies
- It reports news and events
- It publishes scientific papers



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The Web Site

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