Cloud based services for on-demand education

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Agenda

- Cloud Advantages in Higher Education
- Service Management Cloud Infrastructure Options
- CloudBurst 2.1 Implementation at UPB & UTBv
- The INSEED Project
- HW Architecture
- SW Architecture
- Virtual Machines
- Using Cloud @UPB
- Cloud @UPB integration with Moodle
- Conclusion

Cloud Advantages in Higher Education

- Smarter Classroom
  - Enabling student success and skills
- Smart Administration
  - Optimizing educational systems
- Innovation in research
  - Accelerating innovation
- Cost control
- Efficient resource usage
- High Availability

Service Management Cloud Infrastructure Options

Integrated Service Mgmt

Customizable

- Individual software offerings, fully customizable to the environment
- Could begin with TSAM, or could require other SM capabilities for cloud, such as security or storage mgmt.
- Designed for customized data center automation.

IBM Service Delivery Mgr

Flexible HW Configurations w/Fast Time to Value

- Integrated software-only service management offering for cloud computing.
- Same basic SW function as CloudBurst
- Delivered as a set of virtual machines for simplified deployment and faster time to value
- Allows flexibility of the HW platform, with a pre-determined set of service management tasks and workflows

IBM CloudBurst

Fixed Configurations, Faster Time to Value

- Pre-Integrated HW/SW/Services release in a pre-determined configurations
- Includes HW for System x, or Power Systems, Tivoli Service Management Software, GTS QuickStart services
- Self-contained management
- Designed for quick deployment

Customizable ⟷ **Rapid Time to Value**

CloudBurst 2.1 Implementation at UPB & UTBv

- INSEED Project
  - Consortium of 4 Universityes:
    - University Politehnica of Bucharest (UPB)
    - University “Transilvania” of Brasov (UTBV)
    - Academy of Economic Studies (ASE)
    - University of Medicine and Pharmacy Carol Davila (UMF)
- Main objective
  - to create a modern, educational framework for training and skills formating in higher education in **science, design and services management (SPMS)** and to **promote innovation in services industries** based on an **open, continous learning model** and on a distributed computing infrastructure of cloud type with **virtualized and accessible resources as services**, interconnected with European structures.
- Tools
  - IBM CloudBurst 2.1 Small Size (UTBV)
  - IBM CloudBurst 2.1 Medium Size (UPB)
    - Stand alone or interconnected

The INSEED Project

- Tools: INSER@SPACE
  - E-learning: http://e-learning.cloud.upb.ro/

UNIUNEA EUROPEANĂ

GUVERNUL ROMÂNIEI MINISTERUL MUNCII, FAMILIEI ŞI PROTECŢIEI SOCIALE AMPOSDRU

Fondul Social European POS DRU 2007 - 2013

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MINISTERUL EDUCAŢIEI CERCETĂRII TINERETULUI ŞI SPORTULUI

OIPOSDRU

Universitatea POLITEHNICA din Bucuresti

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Pagina principală

Română (ro)

Meniu principal

Pagina principală

- Cursuri

Cursuri

- Cursuri master
  - Facultatea de Automatica si Calculatoare
- Cursuri module compacte
  - Facultatea de Inginerie Electrica
  - Facultatea de Energetica
  - Facultatea de Automatica si Calculatoare
  - Facultatea de Electronică, Telecomunicaţii şi Tehnologia Informaţiei
  - Universitatea Transilvania din Brasov
  - Academia de Studii Economice din Bucuresti
- Program formare continua
  - Facultatea de Inginerie Electrica
  - Facultatea de Energetica
  - Facultatea de Automatica si Calculatoare
  - Facultatea de Electronică, Telecomunicaţii şi Tehnologia Informaţiei
  - Universitatea Transilvania din Brasov
  - Academia de Studii Economice din Bucuresti
  - Universitatea de Medicina si Farmacie "Carol Davila" Bucuresti

Caută cursuri: Execută

Minimizează Toate

Maximizează Toate

Calendar

septembrie 2013

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2	3	4	5	6	7	8
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The INSEED Project

- Tools: INSER@SPACE
  - E-learning: http://e-learning.cloud.upb.ro/
  - SSKE: http://sske.cloud.upb.ro/

Service Science Knowledge Environment

More

(Redirected from Main Page)

The main goal the **Service Science Knowledge Environment** (SSKE) is to implement a collaborative environment that would ga different academic partners with the overall aim of creating a modern educational framework in the areas of Science, Design and M services, while promoting service innovation in different service sectors.

The **Service Science Knowledge Environment** (SSKE) targets also at creating a solid knowledge-based link between academi government, along with other European institutions. It supports sharing relevant information on Service Science that would are stor way based on a common vocabulary using an integrated ontology.

The **Service Science Knowledge Environment** (SSKE) is delivered as a service in the cloud. It will be further used for *managing service system related knowledge*. It intends to exploit the best opportunities for business service innovation using IBM cloud techn used as a mean for *information service innovation* through *virtualization* and improvement of *service front ends* for academia, indus stakeholders.

It aims at fostering service innovation, sustaining this endeavor through the transfer of the research results in terms of information, and Proof of Technology methodologies aiming to develop sustainable service systems innovation solutions

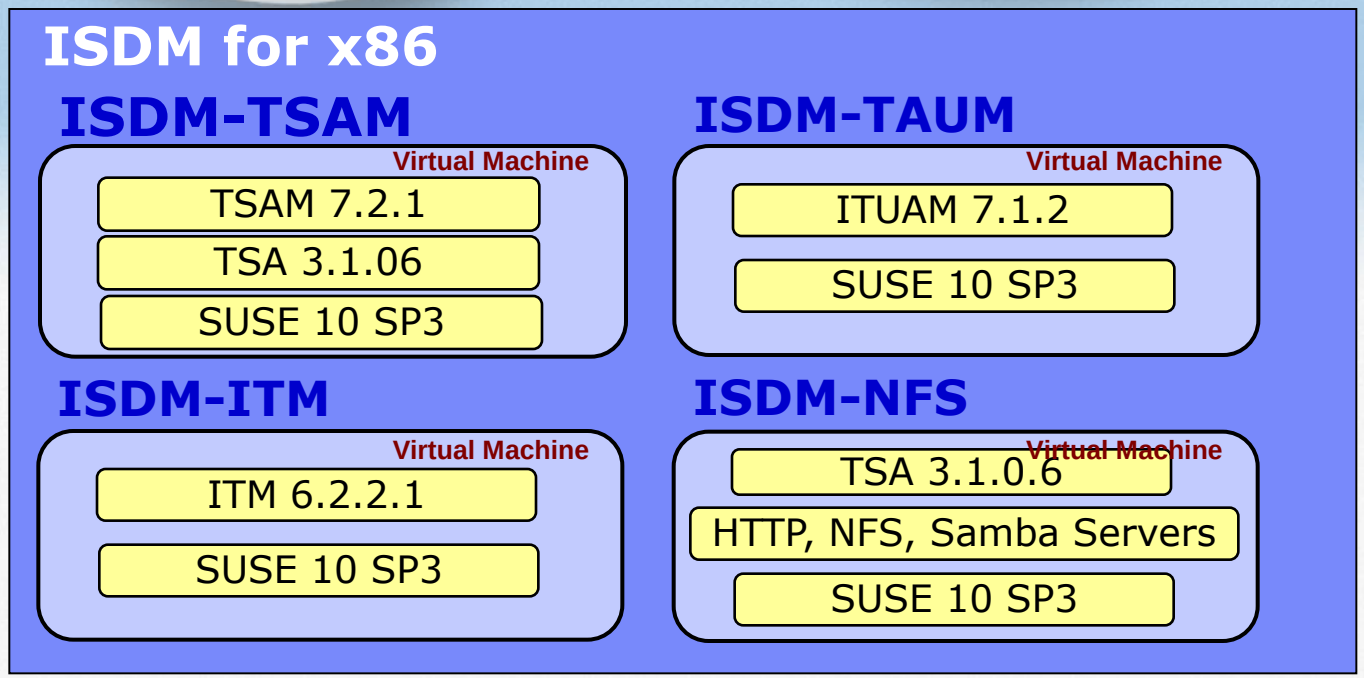
The INSEED Project

- Tools: INSER@SPACE
  - E-learning: http://e-learning.cloud.upb.ro/
  - SSKE: http://sske.cloud.upb.ro/
  - Virtual Labs
    - Access to SW applications
    - Access to SW and HW equipments

HW Architecture

- **42U Rack Cabinet**
- **Server management node (IBM System x3550 M3 with dual-socket Intel Xeon 5620 2.4 GHz 4-core processors)**
- **1 Cloud management and 13 Cloud compute nodes (BM BladeCenter H, HS22V blades with dual-socket Intel® Xeon® 5660 2.8 GHz 6-core processors, 72 GB memory)**
- **External storage 29 TB (IBM System Storage® DS3400; optional IBM Systems Storage SAN Volume Controller, EXP3000 storage expansion units)**
- **Ethernet switches (10 Gb Ethernet switches for normal operations, 1 Gb Ethernet switches for out-of-band management)**
- **Ethernet adapter (Dual 10 Gb Ethernet ports included on each blade)**
- **Fibre Channel SAN switch (8 Gb SAN switches)**
- **Fibre Channel adapters (Dual 8 Gb Fibre Channel adapters on each blade server)**
- **Software**
  - Blade operating system: VMware vSphere 4.1 Enterprise Edition
  - Server management node software: Microsoft® Windows® 2008 R2 Standard Edition 64-bit; IBM Systems Director including Network Control and Active Energy Manager; BladeCenter Open Fabric Manager
  - Cloud management node software: VMware vCenter 4.1; ISDM

SW Architecture



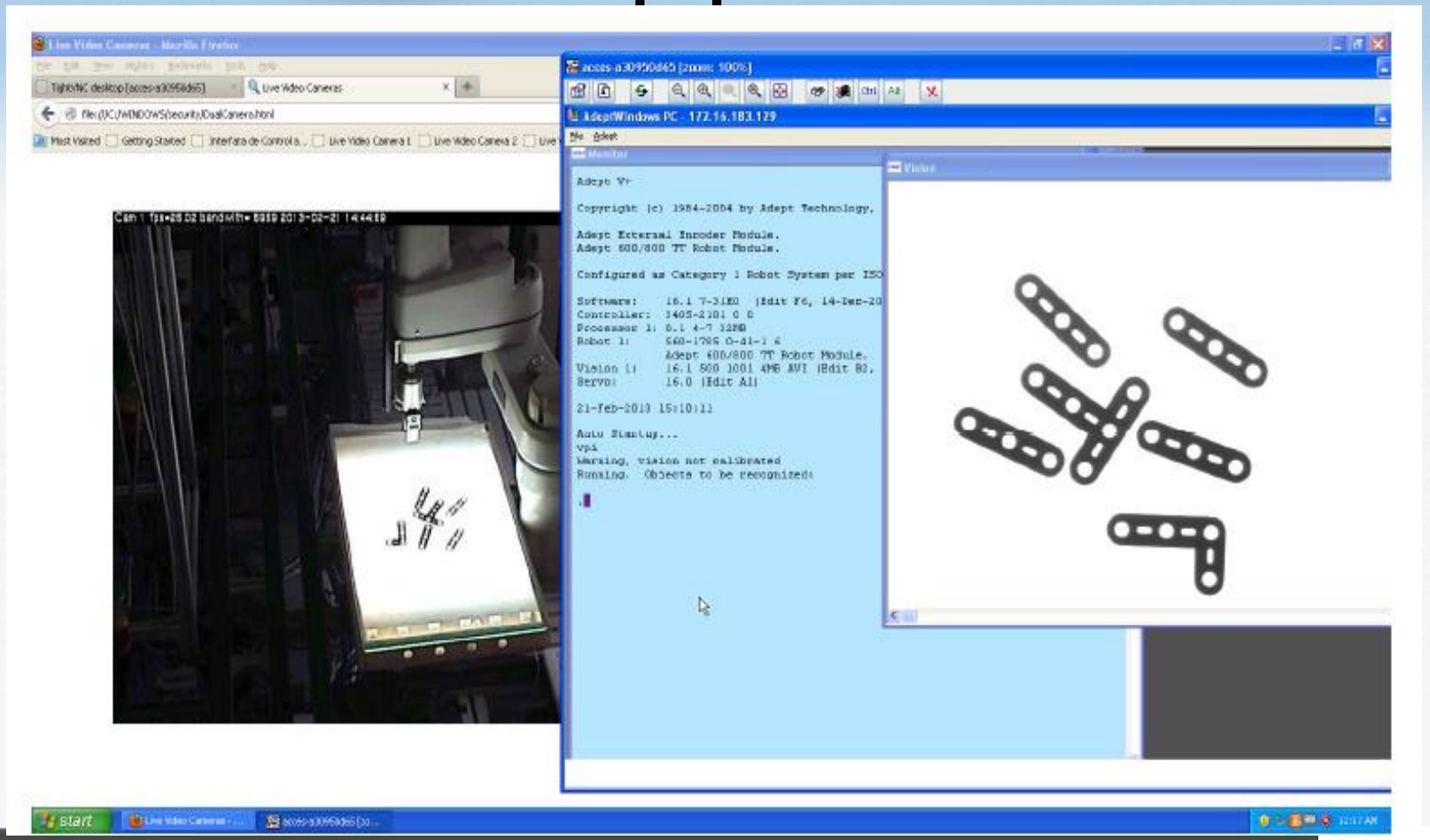
TSAM – Tivoli Service Automation Manager
TSA – Tivoli System Automation
ITM – IBM Tivoli Monitoring
ITUAM – IBM Tivoli Usage and Accounting Manager

Virtual Machines

- **Support Applications**
  - **Service Science Knowledge Environment - http://sske.cloud.upb.ro**
  - **E-learning - http://elearning.cloud.upb.ro**
  - **Video Conference**
- **Virtual Machines**
  - **Basic Templates**
    - **Windows 7 Enterprise x86, x64**
    - **Windows XP Professional x86, x64**
    - **Windows 2003 Enterprise Server x64**
    - **RedHat Enterprise Linux 5.3 x86, x64**
    - **RedHat Enterprise Linux 5.4 x86, x64**
    - **RedHat Enterprise Linux 5.5 x86, x64**
    - **SuSE Linux Enterprise Server 10 x86, x64**
    - **SuSE Linux Enterprise Server 11 x86, x64**
    - **CentOS Linux 5.6 x64**
    - **OpenSuSE Linux 11.1 x86**

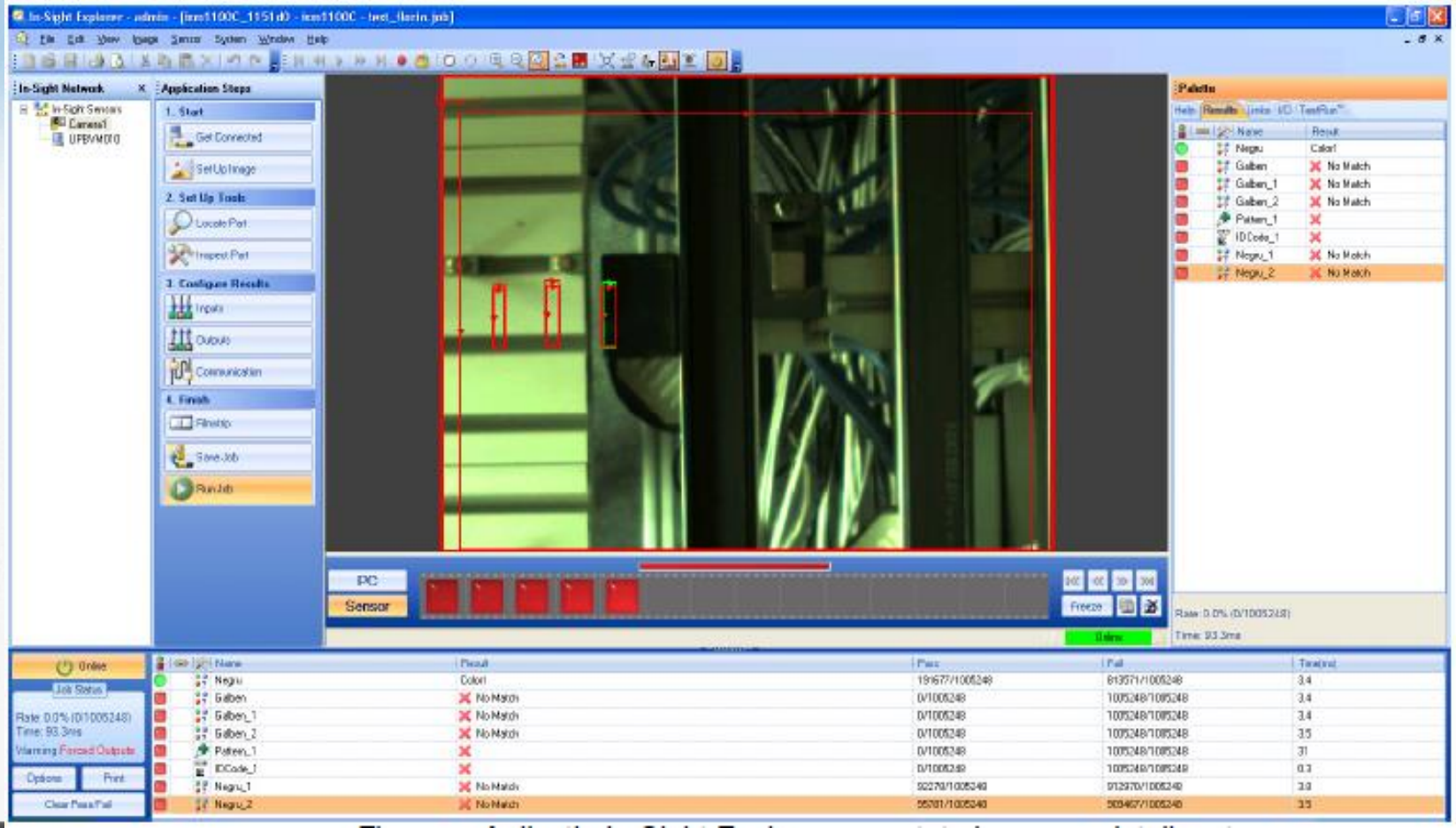
Virtual Machines

- **Virtual Machines**
  - **Access to HW Equipments: Robot-Vision**



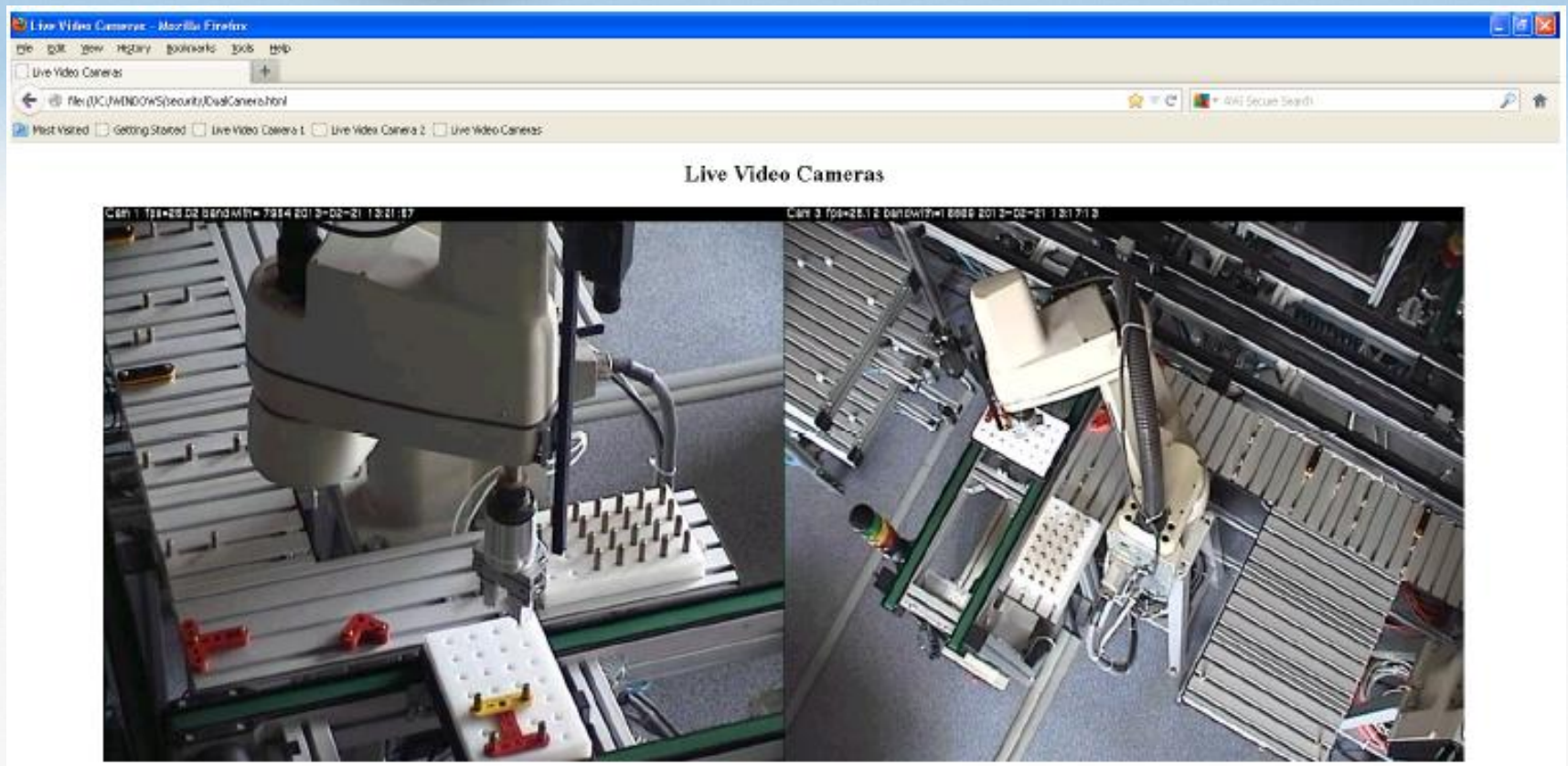
Virtual Machines

- **Virtual Machines**
  - **Access to HW Equipments: Smart Cameras**



Virtual Machines

- **Virtual Machines**
  - **Access to HW Equipments: Observation Cameras**



Virtual Machines

- **Virtual Machines**
  - **Virtual Labs**
  - **Cloud Computing**
  - **E-commerce**
  - **SOA in Cloud**
  - **SOA in Manufacturing**
  - **BAO**
  - **BPM**
  - **Business Optimization**
  - **Rational and WebSphere**
  - **Enterprise Resource Management**
  - **Supply Chain Management**
  - **.**
  - **.**

Using Cloud @UPB

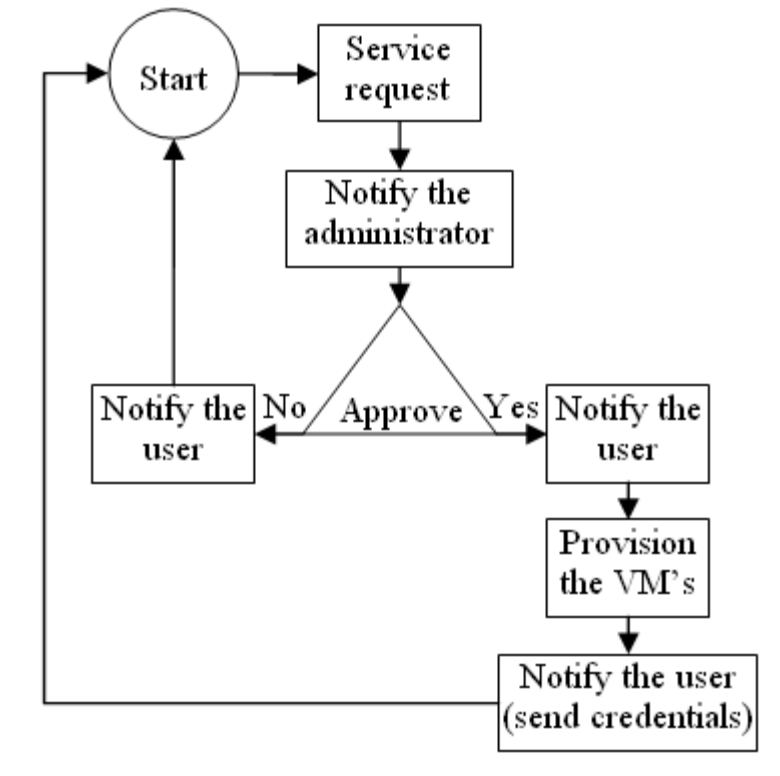
- Accessing Cloud@UPB
  - Step 1:
    - Connect to the main page:
    - http://sske.cloud.upb.ro/sskemw/index.php/Cloud@UPB
  - Step 2:
    - Register: http://sske.cloud.upb.ro/sskemw/index.php/Cloud@UPB_Register
  - Step 3:
    - Consult the Cloud Offerings: http://sske.cloud.upb.ro/sskemw/index.php?title=Special:EmbedWindow&target=Pdf%3ACloud+Offerings.pdf
  - Step 4:
    - Login and create requests: http://sske.cloud.upb.ro/sskemw/index.php/Cloud@UPB_Self_Service_Interface
    - https://141.85.204.6/SimpleSRM/
  - Step 5:
    - Access virtual machines

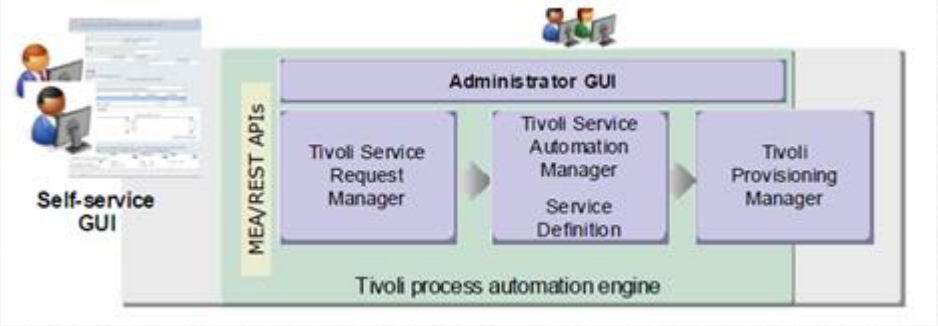
Cloud @UPB integration with Moodle

- Problem
  - Only 30% of VM used
  - Cloud resources blocked but not used
- Solution
  - Allow each student to create its own VM

Cloud @UPB integration with Moodle

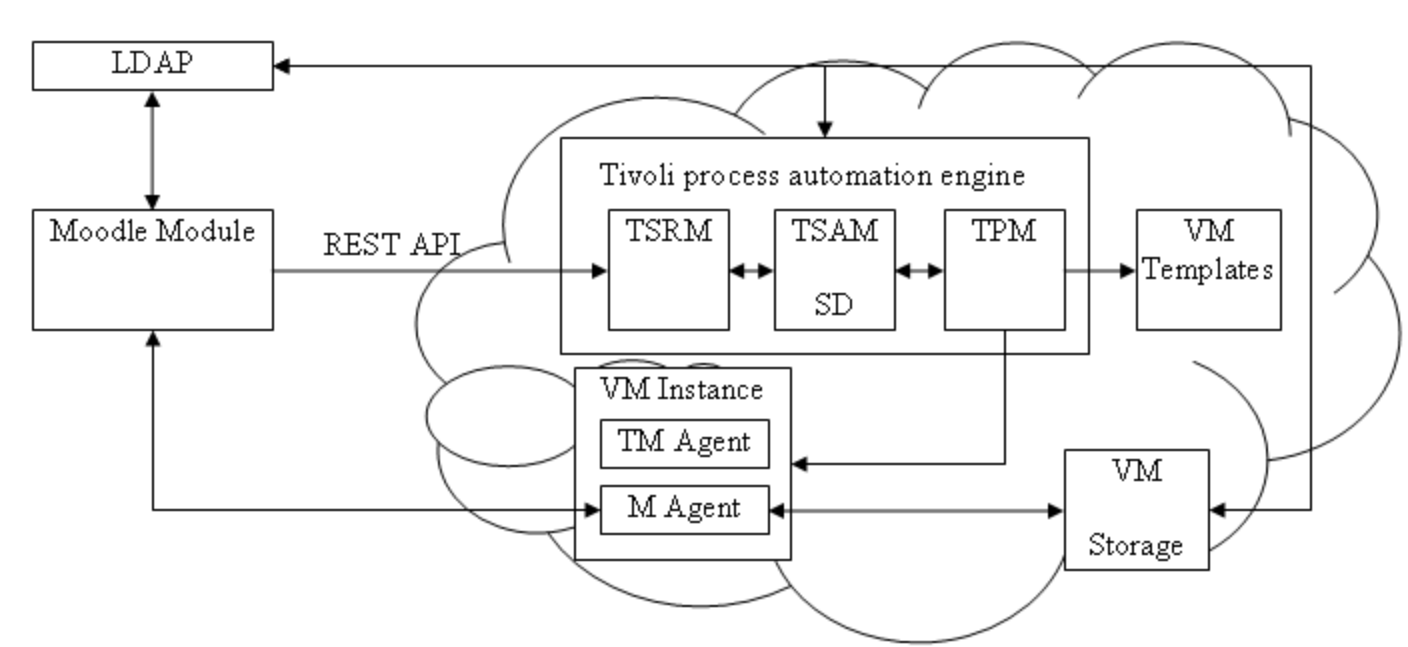
- Project provisioning



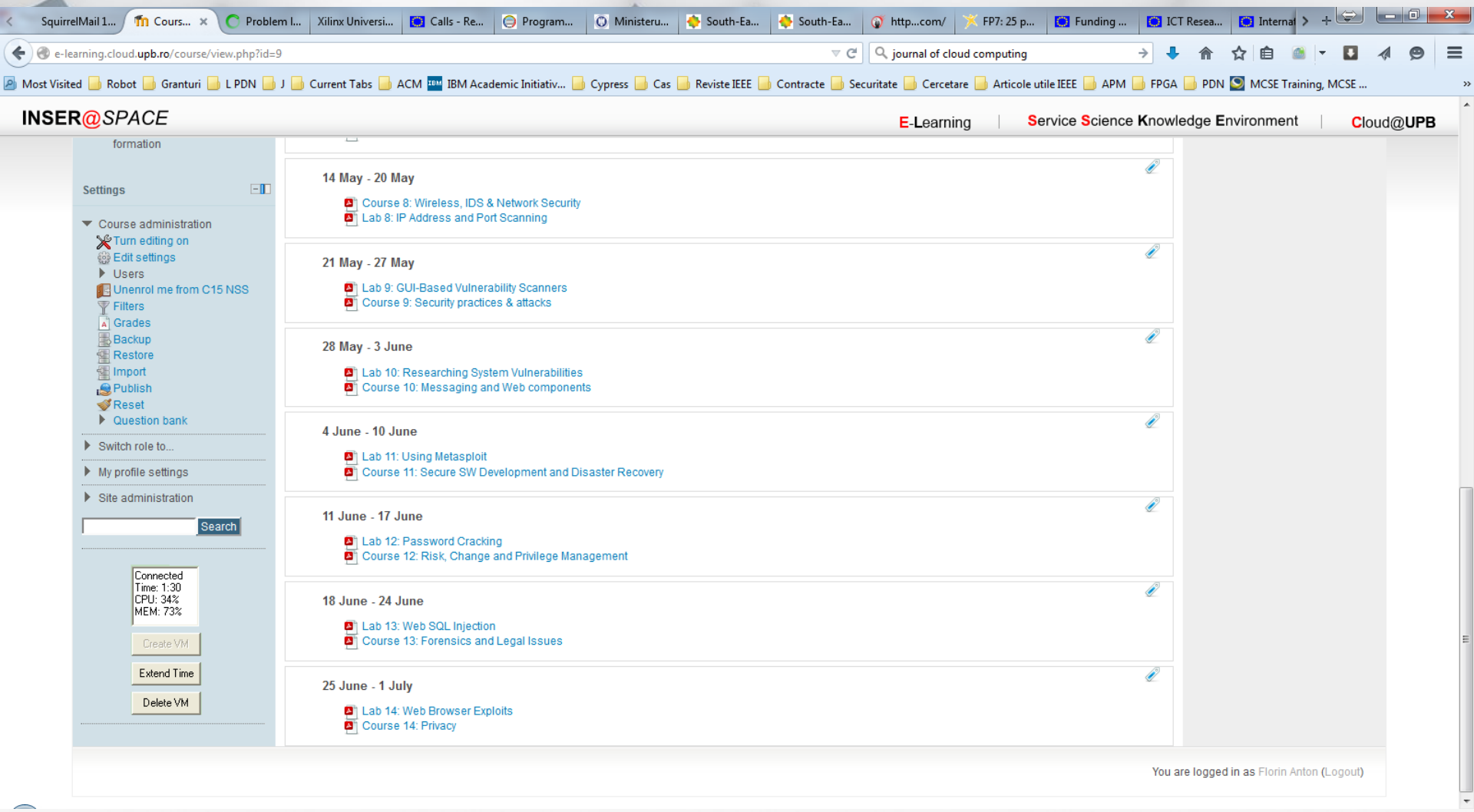


Cloud @UPB integration with Moodle

- Moodle - project provisioning



Cloud @UPB integration with Moodle



Conclusion

- Advantages
  - Optimal utilization of resources (VM lifetime – max 2 hours idle)
  - Lab progress is saved and stored for 1 month
  - Higher capacity (no of users)
- Things to do:
  - Full integration with Moodle (remote control interface for VMs)

Thank you!

Q&A