Cloud Computing
Turkey's Perspective

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Chisinau, 13 April 2011

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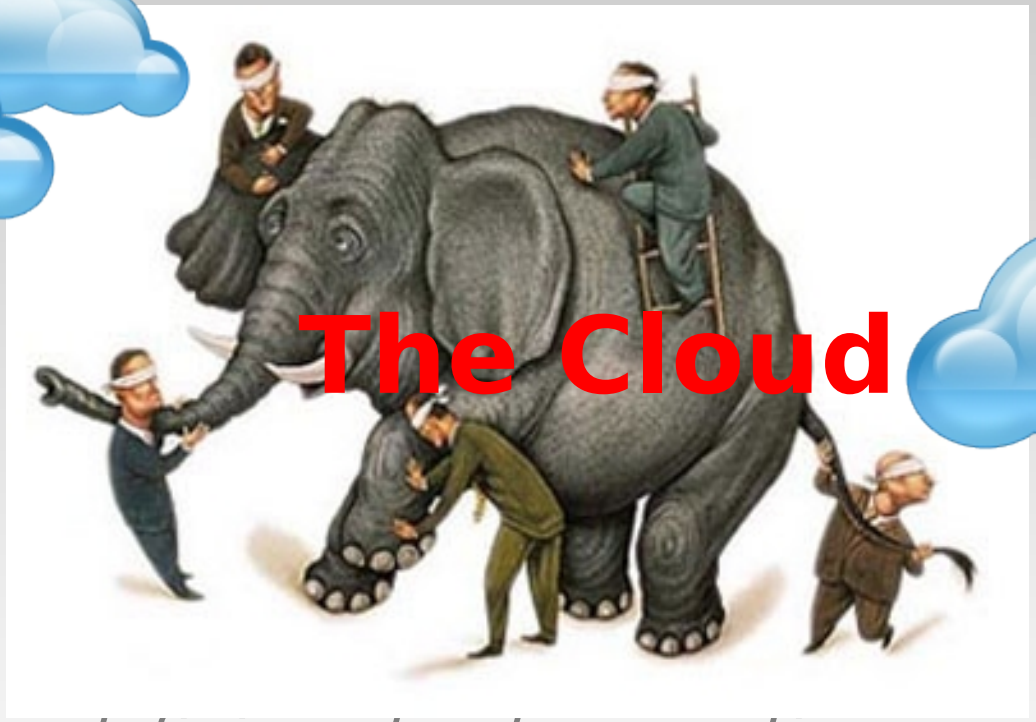
TUBITAK

Describe The Cloud To Me



21 experts are defining cloud computing

http://cloudcomputing.sys-con.com/node/612375?page=0,1

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Cloud definitions

"a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (eg, networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

Which normally means: your data/application on somebody else's data centre management.

What is Cloud Computing?

An unavoidable question during these times

Fundamentally made possible through:

- Infrastructure-as-a-Service (IaaS)
  - Software and hardware enabling utility computing and metering

- Platform-as-a-Service (PaaS)
  - Application development platform enabling software providers to develop, deploy, and deliver software as services through a cloud computing environment

- Software-as-a-Service (SaaS)
  - Web based applications delivered over the internet as services without the need of installing and running the application on endusers

Computer

What is Cloud Computing?

- Technically, it's not entirely a new thing
- From the business perspective, it's a whole new world in business computing
- Another technology marketing hype?
  - Definitely not – cloud computing is here and it's very real
  - In short, it's delivering IT services with a whole new business model, opening new windows of opportunities

What is NOT NEW in Cloud Computing?

- Almost everything about the technology are not new
- Cloud computing technologies had been around for at least 30 years (or more)
  - Grid computing, virtual machines, programming languages, on-demand applications, operating system, development platforms, etc.
- Is resource elasticity new?
  - No: Partitioning of storage, memory, and resources allocations by images
  - Yes: Resources elasticity and management are now automated for scalability

What's New in Cloud Computing?

- Everything from the business perspective is new
- Utility billing and pay-per-use:
  - All computing resources are billed as utilities like water and electricity consumptions
  - Storage space, memory, computation power, bandwidth, database consumption, etc.
- ROI:
  - Collaborative cloud development = Higher Development Efficiencies = Shorter design-build-deploy cycles
- Green computing:
  - Elastic computing = efficient computing power consumption = less energy wastage

A key distinction

Research on clouds

- Computer scientists
- Developers
- Cutting edge
- Funded to develop technology

Focus on the tools

Research (with clouds?)

- Scientists
- Programmers
- Do what works
- Funded to produce science

Focus on the answer

Cloud computing for research

Drivers and barriers

Cloud: drivers and barriers

- Political
- Economic
- Societal
- Technological
- Legal
- Environmental

Political

- Institutional strategy
- National strategy
- Research computing funding

Economic

- Hidden costs in local provision
- Cloud is not a major concern for research councils
- Double charging
- Costs and efficiencies
- Economic pressure
- Benefits and costs are misaligned

Societal

- Ownership: prestige and freedom
- Accessibility
- Researcher training
- Scaling up calculations
- Reinforce innovation?
- Learning curves
- Cloud is already here

Technical

- Support
- Compatibility
- Research characteristics

Legal

- Data protection
- Information assurance
- Contract management

Environmental

- Green agenda
- Accommodation pressure

Cloud computing for research

Where does “cloud” fit?

- More capacity
- More capability
- More flexibility

Why Invest in Cloud Computing?

- Efficient, cost effective infrastructure
  - provides access to industrial scale economies in deployment and use of infrastructure and applications
  - leads to financial benefits and in turn carbon and other environmental benefits
- Potential to cope with sudden peak demands for increased storage and compute requirements
- Provides a suitable „neutral platform“ for HEI / business collaboration.
- Lowers barriers to participation in high end computing –“e-Science for the Masses”

Financial Cost

- Large data centres can use economies of scale to be significantly cheaper and can be flexible in delivering layers of a standardised, modularised service
- Particularly attractive to smaller institutions without the capital budget for wholesale rip and replace that are able to secure access to upgraded infrastructure which they could not otherwise afford
- Requires changes in culture –specifically expectations of „fine-tuning“ of services to meet specific requirements

Capacity

- Having more storage and compute power available on demand is very useful for dealing with sudden peak usage and projects that on occasion need to crunch larger data.

Collaboration

Using Cloud can make it easier to collaborate with businesses

- For instance, if a spin-off company should come out of a project that uses web resources it may be easier to hand over control to something run on a virtual machine

- Similarly, for partnerships with industry using an external cloud provider can make it easier to collaborate as both HEIs and industry often restrict external access to their systems

What should we look to use the Cloud for?

Good candidate scenarios for Cloud deployment that are identified include those with one or more of the following characteristics:

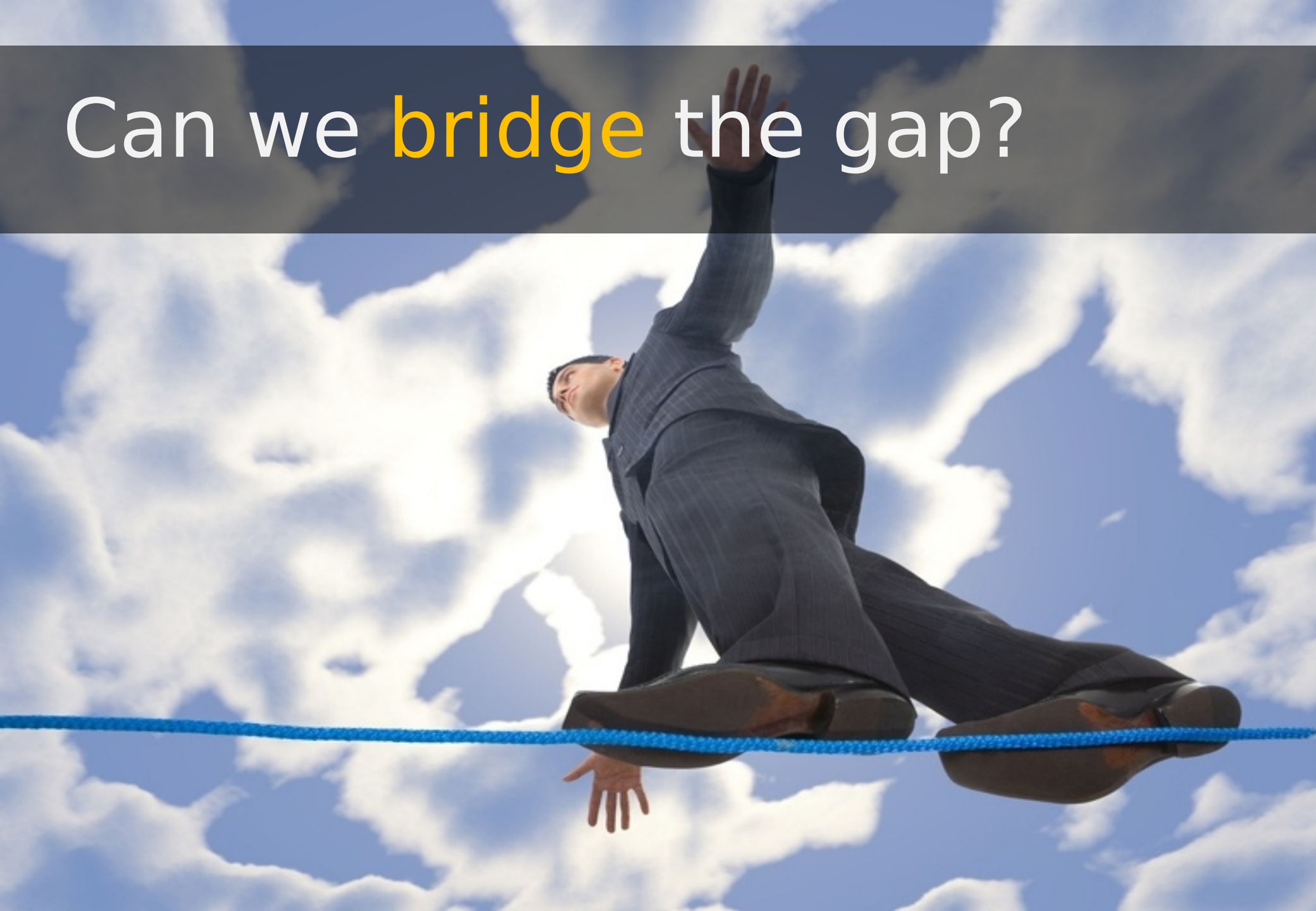
- Short timescale requirements
- Infrequent use and/or no desire to maintain infrastructure
- Dynamic scalability to larger capacity („cloudbursting“)
- Transfer to commercial use
- Flexibility with system configuration and/or frozen system configuration
- Data hosting and backup
- Cloud-based research publications
- Ad hoc activities in support of research

Cloud Computing for Our Region

Our region have a very different cultural and political landscape

- Can developing nations adopt strategies from developed nations to adopt cloud computing?
- What are our developing nations doing to stay on track with the advent of cloud computing ?

Can we bridge the gap?

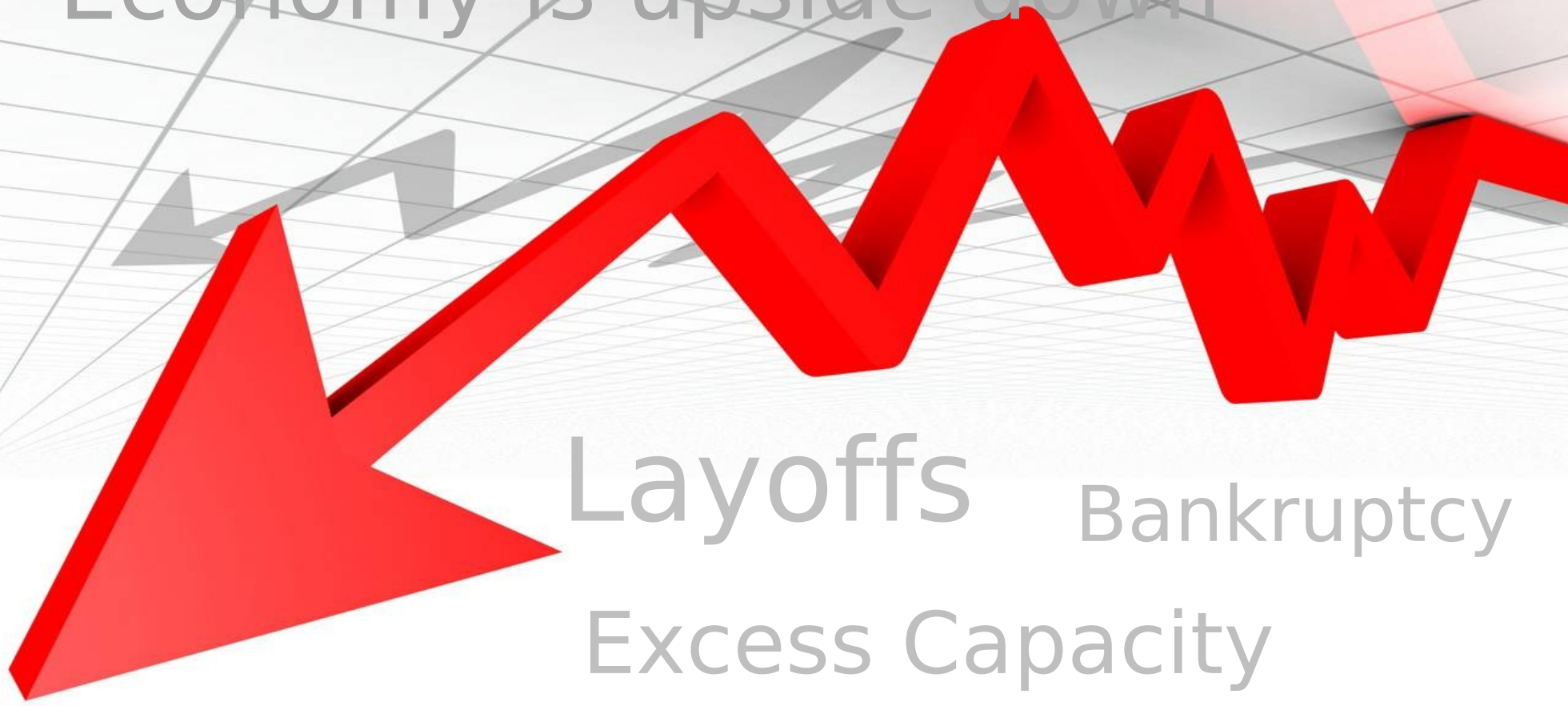


Cloud Computing Challenges for Our Region

- 3 main common challenges:
  - Costs of technologies and insufficient funds
  - Challenges in technical expertise
  - Infrastructure stability and availability
- Other challenges?
  - Mindset and cultural perspectives?

2008-09

Economy is upside down



Layoffs

Bankruptcy

Excess Capacity

Identified Benefits for Turkey so far...

Sequirity Perspective:

- Control over the openings of the pursuit of security from a single point central to all public bodies
- Ease of use, safety, planning and implementation due to the Identical virtual servers / applications
- Specialized Security personnel in the field
- The system administrator can direct a lot more servers to run with fewer but more qualified personnel.

Identified Benefits for Turkey so far-I

Cloud computing infrastructure for Public Institutions

- A cloud Computing infrastructure serving to all public institutions

OR

- Institutions in the areas of similar activities like Finance, tourism, law establishes and shares a cloud infrastructure (Federated cloud)

Identified Benefits for Turkey so far-II

With Cloud Computing Institutions will have :

- a technical infrastructure which is security enhanced and monitored by qualified personnel.
- Cost savings and efficient use of resources,
- With high flexibility, the resources can be served to the most needed institution in the required time
- To serve the same performance every time

Strategic Adoption

- A centrally managed approach to contracting Cloud Computing services as part of an overarching institutional information systems strategy is required in order to realise true efficiency benefits
- However our studies identified that HEIs do not have a formal polices on Cloud adoption or use
- There is a certain need for a comprehensive set of guides that will cover:
    - Cloud Computing and the Law
    - Service Level agreements
    - Cloud for end-users
    - Provision of a Legal Helpdesk for Cloud computing

Our Strategy

- Facilate localised joint collaborations, mainly among:
  - ISP, data centres, software providers
  - Public-private sector collaborations
- Reusing existing facilities and infrastructure
  - Existing HPC and GRID Facilities
  - Incubation centres
  - Web hosting providers, ISP
- Test-bed centres for cloud computing R&D, testing and deployment
- Incentives to encourage cloud computing initiatives

The Road to the Cloud Computing in Turkey

- Awareness Raising activities in order to increase demand
  - The Future of Cloud Computing and Its Place in Education jointly organized by Özyeğin University and IBM on 30 April 2010.
  - CloudCamp Istanbul, Sep 23, 2010
  - Microsoft IT Summit on Cloud, March 11, 2011
  - CloudCamp Ankara, Apr 9, 2011
- Feasibility study on the applicability of Cloud services on HEIs and Public Research Instutions
- Coupling of e-Gov Turkey Project with Public Cloud in order to analyse the efficiency

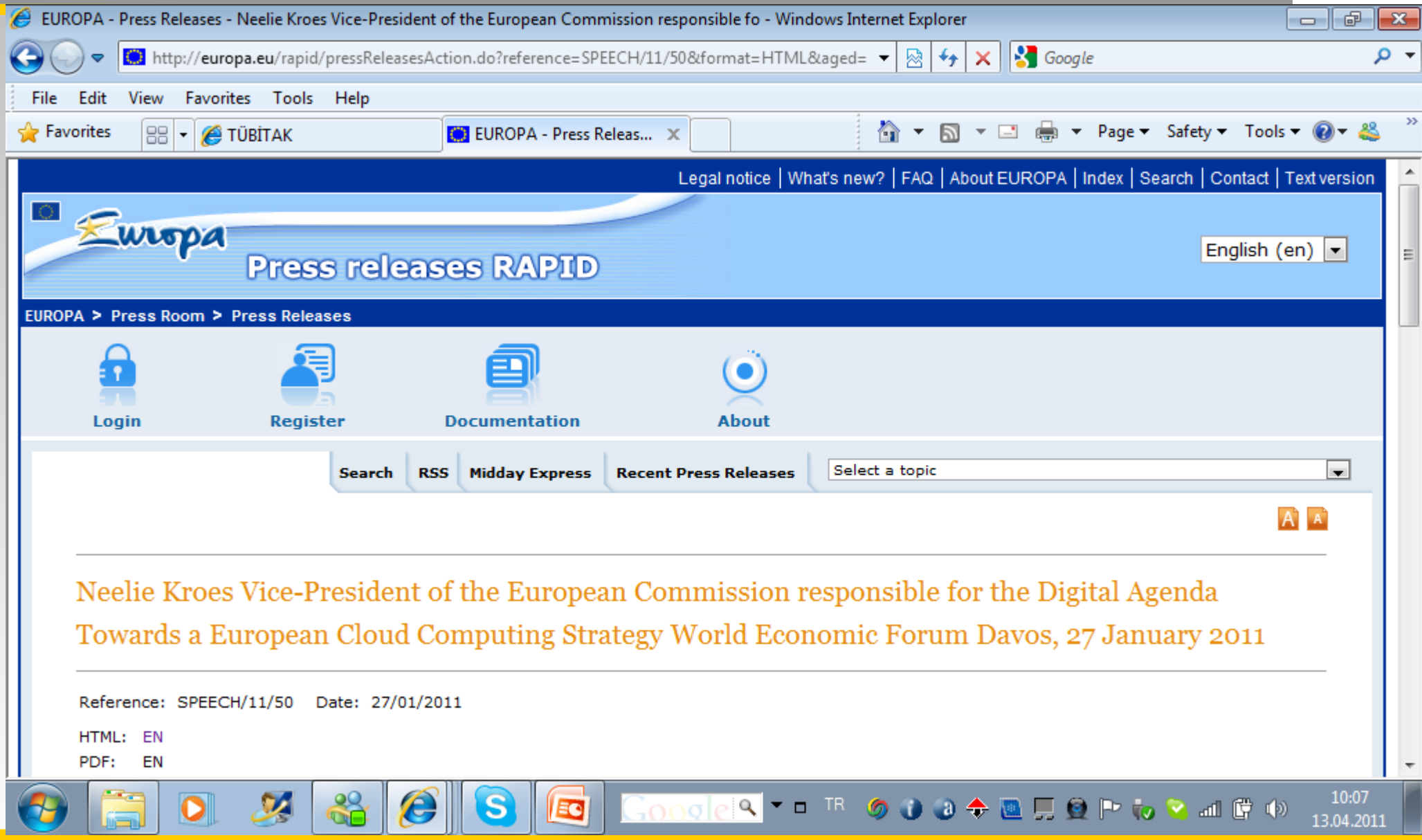
The Road to the Cloud Computing in Turkey

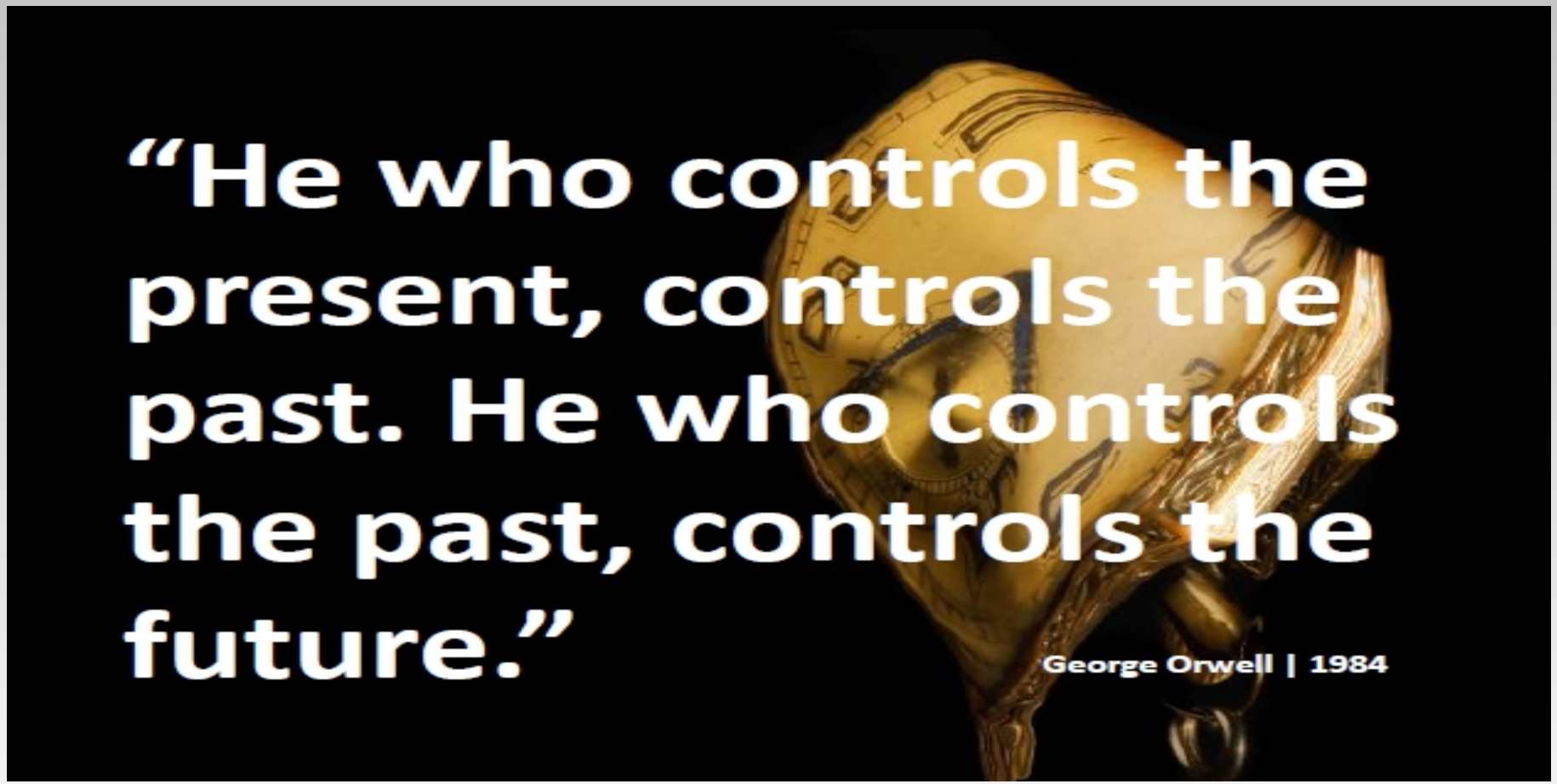
- Aligning research agenda's on policy level with other European countries in the frame of e-InfraNet ERANET Project
- Open common calls in order to expand the research community
- Recommendation to decision makers by trying to include the issue on National R&D Policy Roadmaps and RI Roadmaps

The Road to the Cloud Computing in Turkey

- ULAKBIM will submit a new project proposal to the Infra May 2011 call of State Planning Organization including: “Interoperability of Grid and Cloud Computing”
- Active participiation into the discussions and potential colloboration activities are targetted on European Cloud Initiative.

European Cloud Computing Strategy





Thanks for your interest