Addressing Risk Management Efforts for Cloud Services at the Technische Universität München

EUNIS 2010

Silvia Knittl
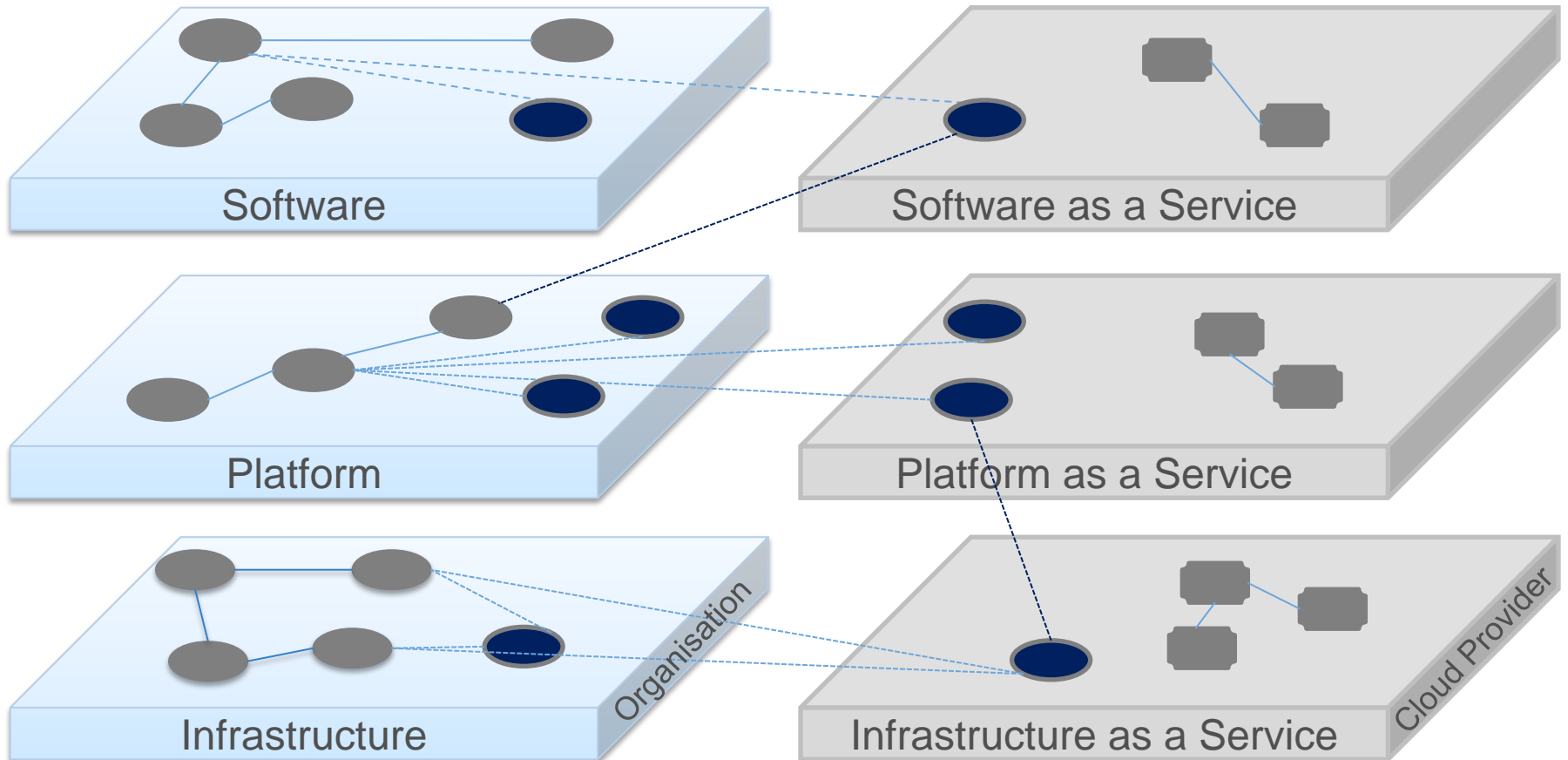
knittl@tum.de

Technische Universität München

- Sole technical university in Bavaria
- 3 main locations with local administration
- 13 departments
- 24.400 students
- 437 professors
- 5.178 academic and 2.918 non academic employees [2009]

Agenda

- Cloud Computing

- Risk Management for Cloud Computing

- TUM's efforts:

  - **Policy and Organizational Risks**

  - **Technical Risks**

  - **Risks not specific to the Cloud**

- Conclusion and Outlook

Cloud Computing: Something as a Service

Software

Software as a Service

Platform

Platform as a Service

Infrastructure

Infrastructure as a Service

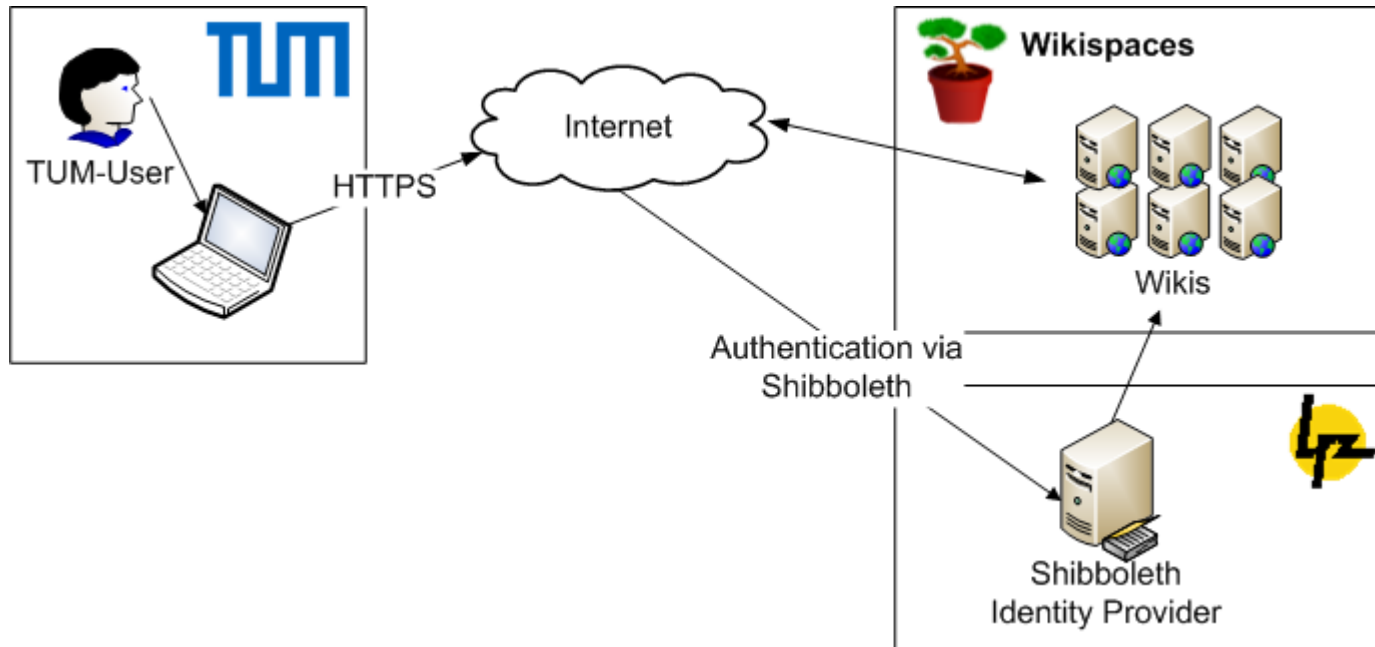Organisation

Cloud Provider

Cloud Computing: Infrastructure as a Service Storage as a Service
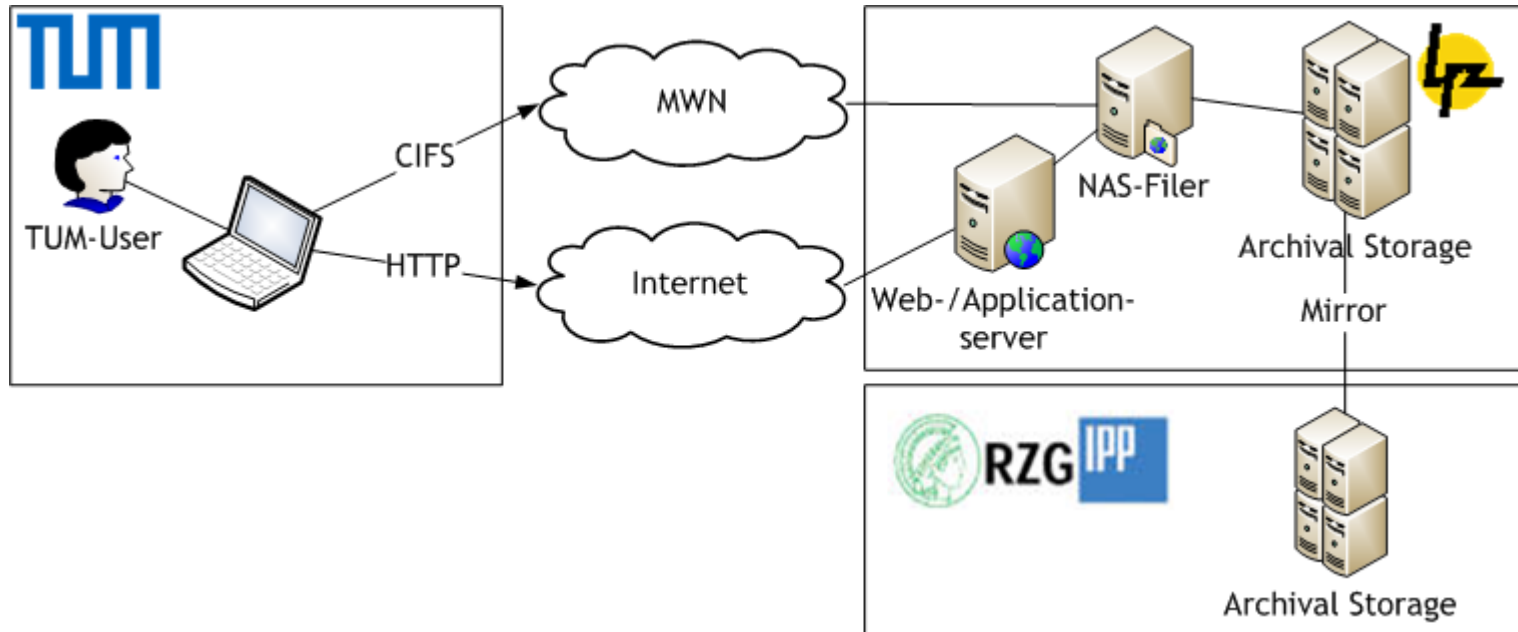
Cloud Computing: Platform as a Service

- PaaS offered by the LRZ:
    - **Computing services**
        - High Performance Supercomputing
        - Linux clusters
    - **Virtual machines, virtual web server**
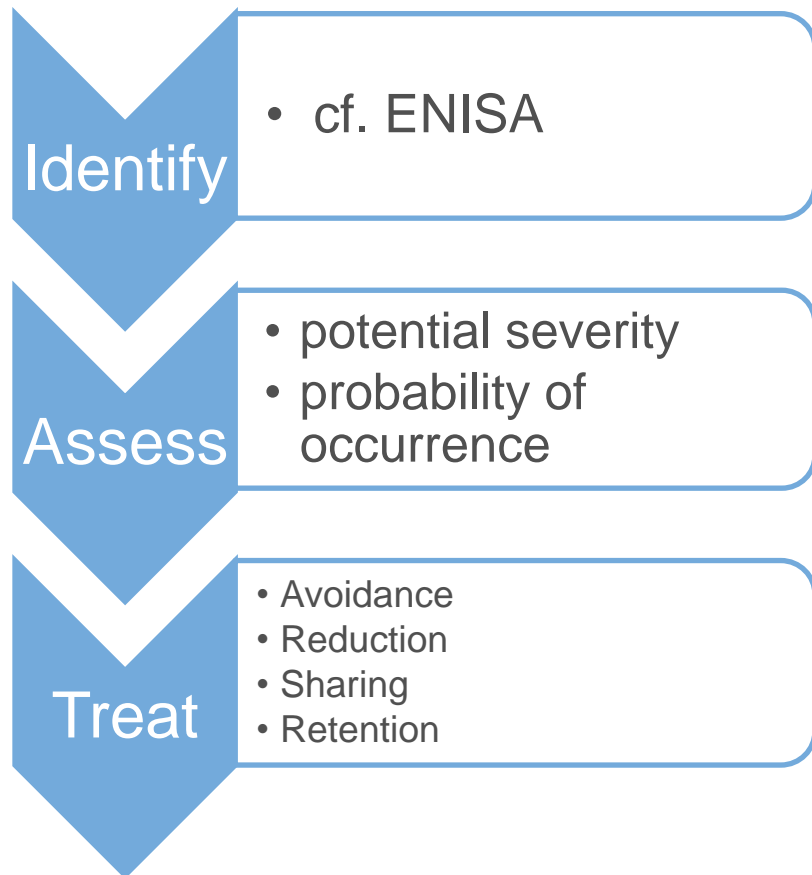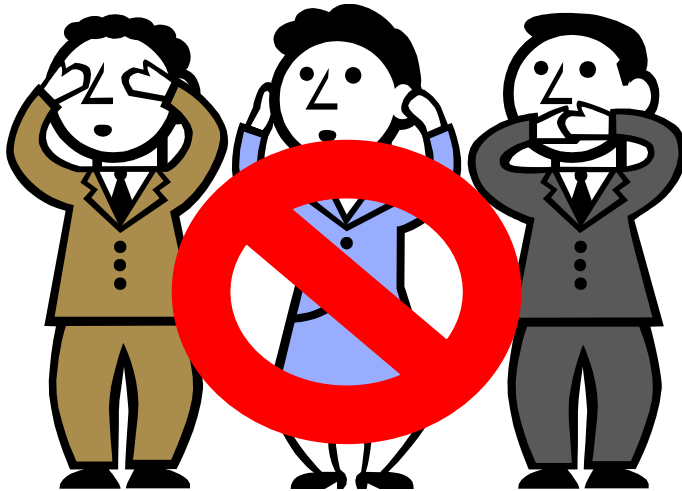   - **Database as a Service**

# Cloud Computing: Software as a Service
Wiki as a Service

Cloud Computing: Benefits

- Reduced cost
- Near instant scalability, flexibility and provisioning
- More mobility
- Concentration on core competencies

Risk Management

Identify
- cf. ENISA

Assess
- potential severity
- probability of occurrence

Treat
- Avoidance
- Reduction
- Sharing
- Retention

Silvia Knittl (knittl@tum.de)

Risk Management: Cloud Computing Risk Assessment ENISA (European Network and Information Security Agency)
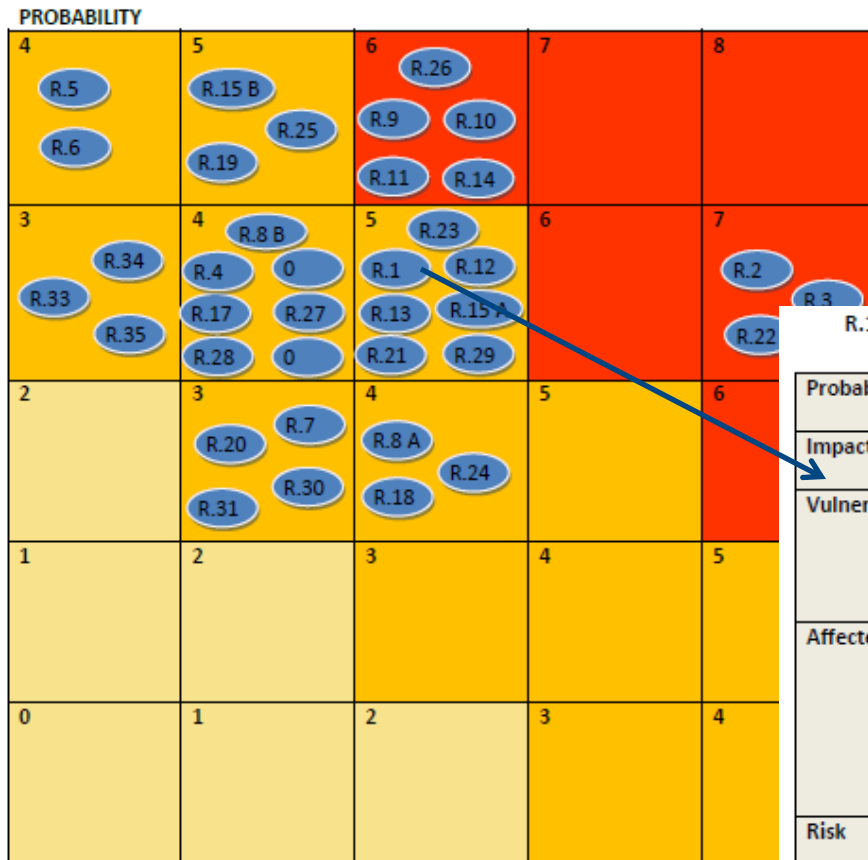
Categories:
1) Policy and Organizational Risks
2) Technical Risks
3) Risks not specified by the cloud
4) Legal Risks

R.1 Lock-in

Probability	HIGH		Comparative: Higher
Impact	MEDIUM		Comparative: Equal
Vulnerabilities	V13. Lack of standard technologies and solutions		
	V46. Poor provider selection		
	V47. Lack of supplier redundancy		
	V31. Lack of completeness and transparency in terms of use		
Affected assets	A1. Company reputation		
	A5. Personal sensitive data		
	A6. Personal data		
	A7. Personal data - critical		
	A9. Service delivery – real time services		
	A10. Service delivery		
Risk	**HIGH**		

TUM's approach
1. Policy and Organizational Risks

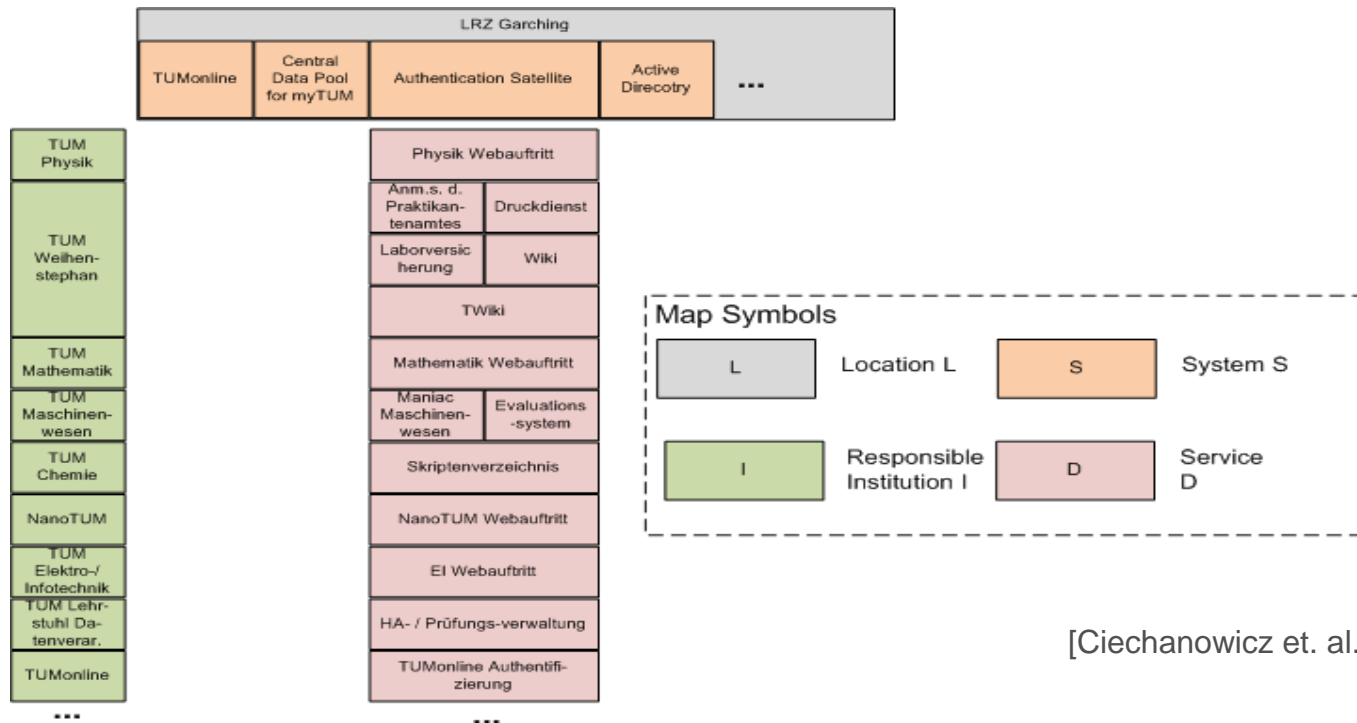| Risk	Strategy	Implementation
Loss of Governance	Risk reduction	Definition of inter-organisational IT Service Management processes

TUM's approach
1. Policy and Organizational Risks

Risk	Strategy	Implementation
Supply Chain Failure	Risk reduction	IT infrastructure maps
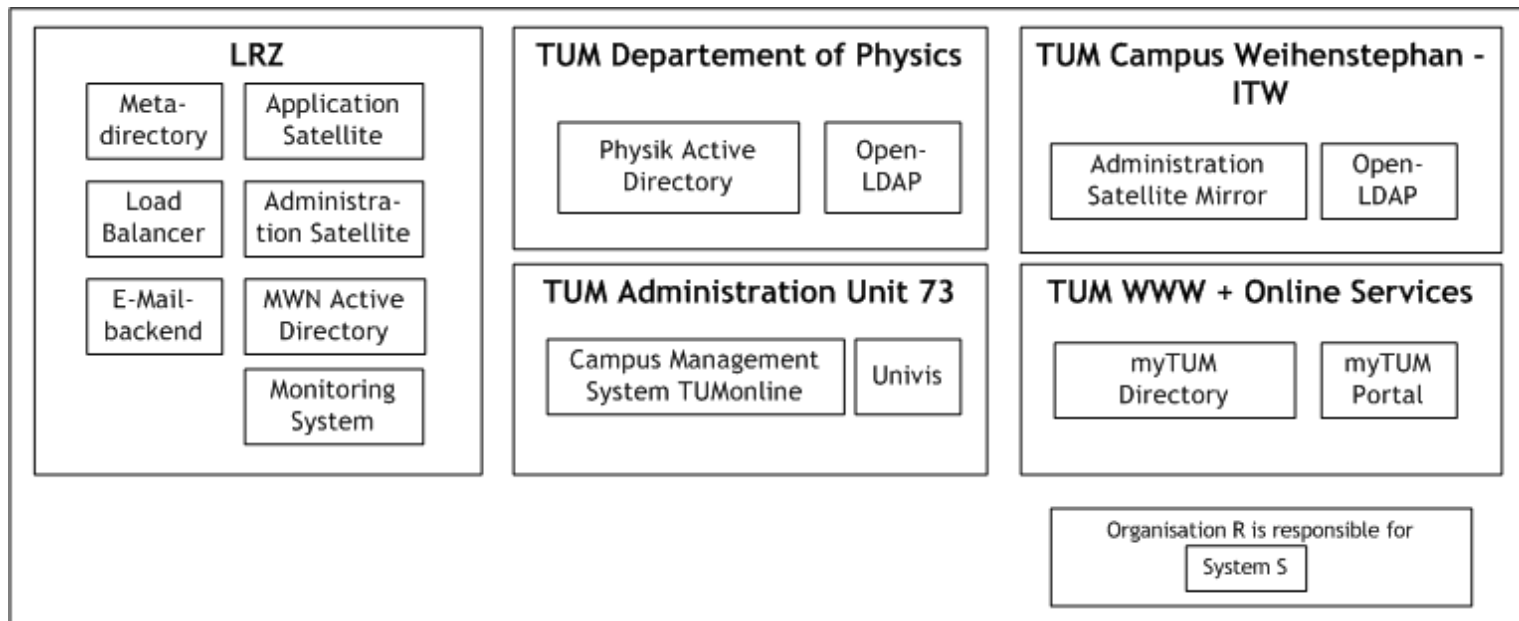
TUM's approach
1. Policy and Organizational Risks

Risk	Strategy	Implementation
Supply Chain Failure	Risk reduction	IT infrastructure maps

[Ciechanowicz et. al.]

TUM's approach:
1. Policy and Organizational Risks

Risk	Strategy	Implementation
Lock-in	Risk retention	TUM part of LRZ's governance structure
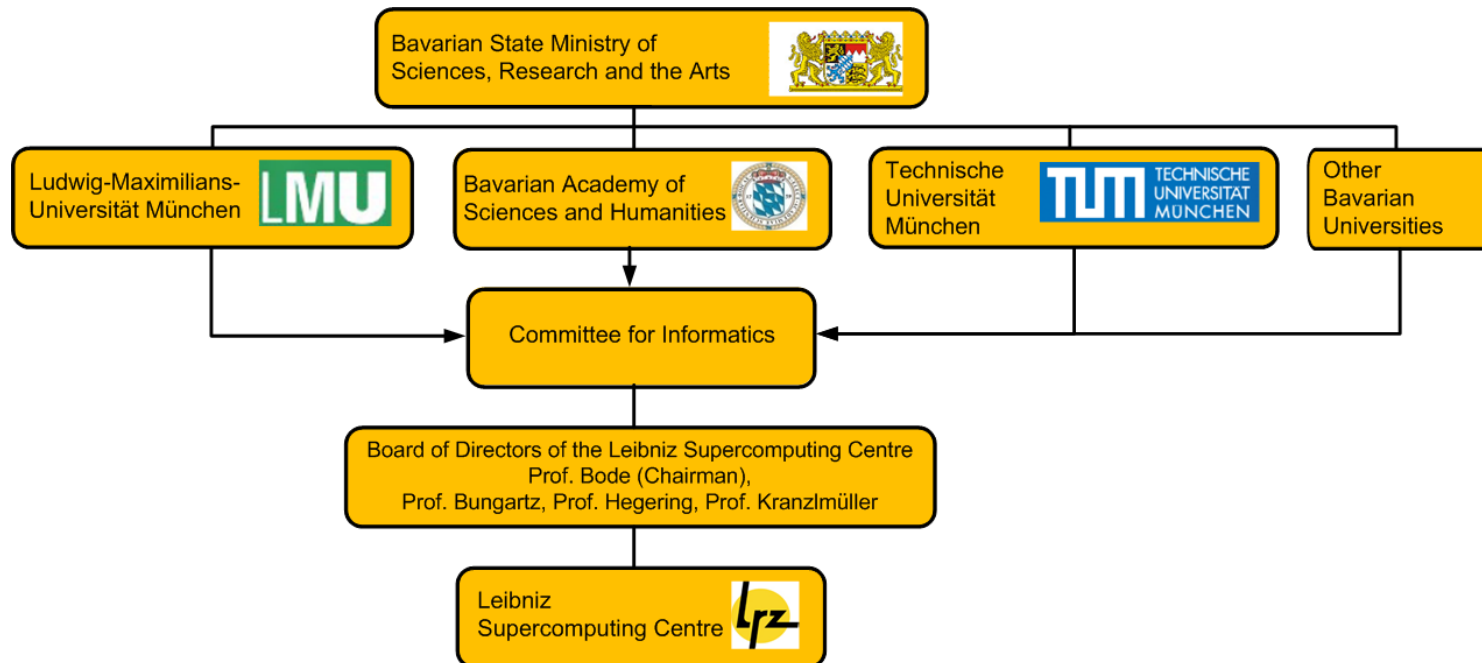
TUM's approach:
2. Technical Risks

Risk	Strategy	Implementation
Resource exhaustion	Risk sharing	Shared responsibilities
Intercepting data in transit	Risk reduction	Secured transaction channels
Isolation failures	Risk retention	-

TUM's approach:
3. Risks not specified by the cloud

| Risk	Strategy	Implementation
Network outages	Risk retention	No own implementation – Trust in Provider
Theft of computer equipment	Risk reduction	Access restriction at data centre

CONCLUSION and OUTLOOK

- Cloud Services: IaaS, PaaS, SaaS
  - **Benefits: cost savings, flexibility, ..**
  - **Risks: Policy and Organizational Risks, Technical Risks, Risks not specific to the Cloud, Legal Risks**
  - **Tool: ENISA Risk management catalogue**

- University specific Cloud Services:
  - **Campus Management as a Service?**
  - **Lab as a Service**

OUTLOOK: Lab as a Service

- Lab before:
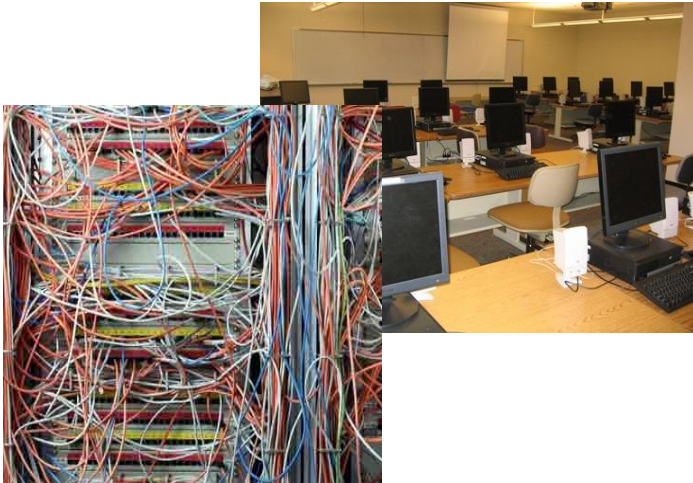
  - **Frequent changes in set-up necessary**
  - **Resource shortages**

- Lab after

  - **Whole set-up virtualized**
  - **No resource shortages any more [Lindinger et. al.]**

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Thank you for your attention!

Questions ??

BACKUP

Cloud Computing: Software as a Service
Exchange as a Service