Critical view on cloud computing

Nils Döring, Michael Mardaus. Sehastian Müller, Julian F. Rost

# Critical view on cloud computing

Nils Döring Michael Mardaus Sebastian Müller Julian F. Rost

December 13, 2013

Critical view on cloud computing

Nils Döring, Michael Mardaus, Sebastian Müller, Julian F. Rost

#### Gain

Cloud-Owne

Cloud-Users

Governments

#### Challenges

#### Challenge

\_\_\_\_\_

Accessi

Strategio

Modifiabilit

Customer-

Relationshi

Privacy

Integrity

ricuciiui

Security

# Gains for different groups

Winner and Prices

Who is gaining and how?

#### Gair

#### Cloud-Owners

Cloud-Users

Government

#### Challenge

#### \_ \_

Performance

Accossibility

Strategic

Modifiabili

Contraction

Relation

Risks

Privacy

Integrity

ricuciii

Securit

Paner

## Gains for different groups

Cloud-Owners

- higher utilization of the existing computing power
- lower average costs for bigger systems
- additional income for companies from other sectors

Cloud-Owner

Cloud-Users

Governmen

Challen

D. of constant

Performan

Accessibil

Strategic

Modifiabili

Customer-

Relation

riciacio

Privacy

Integrity

Coornit

Security

Paner

# Gains for different groups

Cloud-Users

- easier access to computing resources
- "scalable" resources

Cloud-Owne

Ciouu-osers

Governments

### Challenge

Porformanco

Accossibilit

\_\_\_\_

Modifiabil

Customer

Relati

Dick

Privacy

Integrit

ricuciiu

Securit

D

## Gains for different groups

Governments

 means for censorship and prosecution (Youtube and Pakistan, USA-Patriot-Act, "Great Firewall of China", BKA-"Stop-Signs") Critical view on cloud computing

Nils Döring, Michael Mardaus, Sebastian Müller, Julian F. Rost

#### Gain

Cloud-Owne

Cloud-Users

Governments

### Challenges

cinancinge

Accessi

Ch......

Customer

Relation

Privacy

Integrit

Consults

Security

Paper

# Challenges of using clouds

Obstacles and hurdles

What are we up to, if we consider to use a cloud-service?

Cloud-Owne

Cloud-Users

#### Performance

Accessii

Strategi

Modifiabili

Customer-

Privacy

Integrit

Coough

Security

Paper

### Performance challenges

Is it as fast as yesterday?

- varying performance especially in smaller and medium sized clouds load-changes have higher impact
- · latency might cause trouble with timeouts

#### Gain

Cloud-Owne

Cloud-Users

Governments

#### Challenge

#### \_\_\_\_\_

#### Performance

Accessibility

Strategi

Modificabil

Contracti

Relationsh

Privacy

Integrity

reaciia

Securit

Paper

# Accessibility/dependence challenges

Why can't I connect and when is it fixed?

- as data and service is outsourced, connection has to be highly-available
- need for outage prevention and mitigation

### Gai

Cloud-Owner

Governments

Challenge

Performance

Accessibility

Strategic

Modifiabilit

Relations

Risk

Privacy Integrity

Security

Paper

### Strategic challenges

How much do you want to pay for what?

- low-cost solution vs. better or more secure solutions (aka. Finance Dept. vs. IT Dept.)
- outsourcing of know-how
- lock-in might be more expensive in the long run (raising prices)
- need for strict auditing
- more complex communication between cloud-provider and cloud-users

#### Gair

Cloud-Users

Government

Challenges

#### Citalienge.

Performance

Accessi

Strategic

Modifiability

Customer

Privacy

Integrity Reachab

Security

Paper

### Modifiability challenges

Your code is perfect, now change it!

- given standardized protocols and software-versions
- monopolization of standards
- scalability is limited by the architecture of the cloud
- long-term SLAs might slow down development

#### Gain

Cloud-Owne

Cloud-Users

Government

### Challen

Performance

renomiano

Strategic

Modifiabili

Customer-Relationship

#### Dick

Privac

.....

Security

Paper

# Customer-Relationship challenges

What to tell on press-conferences?

- is the company allowed to store customers data in the cloud?
- are customers expecting the data to be stored inhouse?

Critical view on cloud computing

Nils Döring, Michael Mardaus. Sebastian Müller, Julian F. Rost

Risks

### Risks for all participants

What can go wrong, will go wrong?

Which problems and dangers might occur?

Cloud-Owners Cloud-Users

Governments

Challenge

Performance

Accessibility

Strategic

Modifiability Customer-

Privacy

Reachabili

Securit

Paper

## Privacy risks

My data, your data, our data!

- need for complete encryption to protect privacy, slows down computation
- laws for privacy regulation might hinder services
- national security regulations can prevent privacy
- other cloud-users share the same hardware, thus it is easier to get access to protected data
- cloud-owners can access your data nearby as they wish

#### Gair

Cloud-Owne

Cloud-Users

Governments

#### Challenge:

#### ----

Performance

MCCESSII

Strategic

Modifiabilit

.....

Integrity

Reaciia

Security

Paper

# Integrity risks

I am sure, I've checked that!

- since the processes are virtualized or layered, there are no guaranties for integrity of data or procedures
- possible loss of data, if the cloud-provider does not take care

Cloud-Owne

C-----

Government

#### Challenge:

#### Challerige

Access

Strateg

Modifiabil

Relation:

Integrity

Reachability

Security

Paper

## Reachability risks

Why is the internet offline?

- a cloud-service without connectivity is useless
- lower bandwidth inhibits effective use of services
- permanent connection is necessary, each breakdown hurts public-relations

Cloud-Owne

Cloud-Users

Government

### Challeng

Performance

Accorcibility

Strategic

Modifiabilit

Customer

116161

Risk

Privac

Reachab

Security

Paper

# Security risks

Once my machine, now your machine!

- each security breach affects the whole cloud
- broken and taken over cloud-users could infect or slow-down the whole cloud
- standardized hardware and software-stacks are preferred targets

Challeng

Strategic Modifiability

Customer-Relationshi

Risks

Integrity
Reachabili
Security

Social

### Social risks

### Some are more equal than others!

- cloud-computing leads to the centralizing of the Internet
- regions without broadband-connectivity are excluded from cloud-usage
- monopolists push other companies out of the market
- computation-power concentrates on a few players
- know-how concentrates also on a few players

Cloud-Users

Government

#### Challenges

Performance

Strategic

Modifiahi

Customer

Relations

Privacy

Integrity

Securit

Paper

### **Paper**

Where to look at

- Security and high availability in cloud computing environments - IBM (2011)
- Emerging Issues: Cloud Computing 1 of 5- South African Internet Governance (2011)
- Above the Clouds: A Berkeley View of Cloud Computing (2009)