

# Public vs. Private Cloud

Opportunities and challenges for public institutions

**StorageExpo**

Johan Loeckx

Dienst onderzoek



# Overview

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- **Introduction**
- Cloud concepts
- Threats & Opportunities
- Market & Organisation
- Conclusions



# Smals: ICT for the Social Sector



- **1500 employees**
- **From research to monitoring**
  - Outsourcing
  - Development
  - Contact Center
  - Hosting & colocation
  - **Research & consultancy**
- **Awards**
  - **UN Public Service Award**  
→ Crossroads Bank
  - **Belgian egovernment Award**  
→ aandeslag.be, eMazout



# Embrace your future!

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- **Realisations**

- Portal [socialsecurity.be](http://socialsecurity.be) (16kvisits/day)
- **eHealthplatform**: secured platform for information exchange in the entire healthcare sector
- **Dimona**: Declaration of employment
- **SiS card**
- ...



# Cloud Computing?

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- Many definitions but simply put:  
**Delivering services through the internet**



- *... like shopping in a supermarket!*
  - **Multi-tenant:** a lot of customers
  - **Supplier determines** offerings
  - Take **as much/little** as you want
  - Only **pay** for what you "use"
  - A **simple bill**



# Storage?

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- **Covers a lot of aspects:**
  - Security & Compliance
  - Disaster recovery
  - Capacity
  - Cost effectiveness
  - Robust & Long term
  - Continuity (public procurement!)
- **50–80% increase of data volume/year**
- Lots of businesses: **no formal SLAs yet!**



# Cloud Storage: *why now?*

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- **Internet**
  - New business delivery model
  - Web 2.0: A *lot* of data
- **Industrialization**
- **Service oriented world**
- **Virtualization**
- **Economics**



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# Cloud Computing: NIST definition

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- **Definition (shortened)**  
a model for enabling on-demand access to a shared pool of configurable computing resources that can be **rapidly provisioned and released** with minimal management effort or service provider interaction.
- **Characteristics**  
on-demand, self-service, elastic, pay-per-use
- **Deployment models**  
Public, private, virtual private, hybrid
- **Service models**  
IaaS, PaaS, SaaS, BPaaS,...



# Everything-as-a-Service (XaaS)

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- **Infrastructure-as-a-Service (IaaS)**
  - DaaS: Desktop
  - NaaS: Network
- **Platform-as-a-Service (PaaS)**
  - APaaS: Application Platform
  - AIaaS: Application Infrastructure
- **Software-as-a-Service (SaaS)**
  - BPaaS: Business Process-as-a-Service



# Public vs. Private cloud

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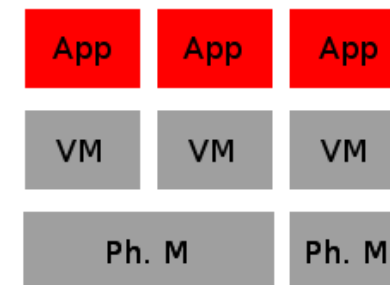
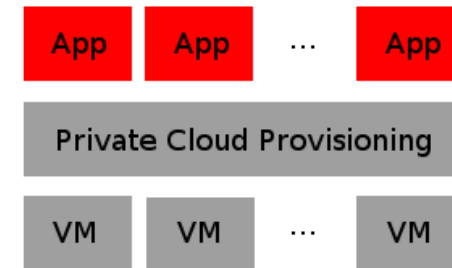
Private	Both	Public
Single tenant	Efficient	Multiple tenant
Minimal Total Cost	Highly Available	Minimal Upfront Cost
Many contractual constraints	Elastic	Limited variety



# Cloud computing vs. virtualization

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- **Private Cloud Computing**
  - Service delivery
  - Virtualization not intrinsic
  
- **Server virtualization**
  - Technology
  - Different abstraction



## Cloud computing: dreamers vs. cynics

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- Fast deployment
- Highly available
- Service oriented
- Agile & elastic
- Efficient, Low cost
- Low entry barrier
- No OpEx
- Security
- Quality of Service
- Integration
- Regulatory
- Vendor lock-in
- Network



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# Cloud Storage service

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- **A service that includes**
  - Backup/recovery
  - **Monitoring**
  - Security, **UAM**
  - Capacity & availability planning
  - **Asset management**, performance, configuration
- Three main delivery models: **hosting**, **outsourcing** and **cloud storage**.



# Cloud Storage service

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- **Watch out:**
  - Storage and servers are **separated**
  - Integration of **UAM**
  - **Encrypt** sensitive data
  - Costs depend on data access (BW)!
  - Impacts the **network**
- **Good for:**
  - **Long-term** storage
  - Off-site **backups & archives** (lower tiers)



# Checklist

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- **Business case**
  - Delivery model appropriate?
  - Cost breakdown?
  - Does the business roadmap of cloud provider corresponds with ours?
- **Compliance**
  - Integrity & security guaranteed?
  - Is the supplier accredited?
  - Where is the data?
  - Can the necessary control be exerted?



# Checklist

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- **Economical**
  - Exit strategy: costs?
  - Vendor lock-in?
  - Stable market? Impact of bankruptcy?
  - Know-how available in consultancy?
  - Reputation (continuity, // with Open Source)
- **Business processes**
  - Integration in User Access Management?
  - Standard contracts (no negotiation)
  - SLA: Negotiate for meaningful remedies



# Checklist

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- **Technical**

- Data migration
- Upgrades transparent?
- Impact on the network?
- Can the scalability be delivered?
- Latency due to internet connectivity
- Very big files, lots of small, frequent access



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- **Security**
  - Endpoint dataloss prevention (**EDLP**)
  - **Backup** encryption
  - Access management
- **Organizational**
  - Provisioning policy to **avoid proliferation**
  - **Reporting** possibilities?
  - Experience in cloud-contracts?



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## Public cloud

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- Currently a game of **big players**:
  - Amazon, Rackspace, GoGrid,...
  - Google, Microsoft, Joyent, ...
  - Salesforce, Yahoo, Omniture, NetSuite, ...
- **Consolidation** is yet to happen
- In general, great interest but moderate adoption
- Hype: **SoSaaS**=Same-old-Software-as-a-Service



# Private Cloud

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- For the enterprise market, main focus at **Platform-as-a-Service**:
  - IBM Cloudburst
  - Oracle "PaaS=natural strategy"
  - MS towards hybrid cloud
  - ...
- Though **virtual private cloud** as well
- "Cloud" vendors still looking for their part of the pie



## Evolution to a private cloud

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- **Centralize** IT management
  - Track IT assets *and configurations*
- **Standardize** your configurations
- **Virtualize & consolidate**
- **Automate** your processes
- **Prepare processes for** self-service and APIs



# Open Source

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- A lot of initiatives exist
- **Eucalyptus** is well established:
  - IaaS, compatible with Amazon's AMIs
  - Developed at University of California
  - Integrated in "Ubuntu Enterprise Cloud"
- OpenNebula, Abicloud, Nimbus, ...
- Too early to tell...



# Cloud Storage

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- **Market share** is increasing!
  - 9% (\$1.5 billion) of IT cloud services revenue
  - Cloud Storage Initiative (CSI)
- **Big Players** for public solutions:
  - Amazon S3
  - Nirvanix Storage Delivery Network
  - EMC Atmos
  - ...
- **Internal cloud** storage is a viable option  
(if you can profit from the scale and can manage it...)



## Various

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- **Government context**
  - Sensitive data
  - data locality
  - e-discovery
  - Legacy
  - procurement, ...
  - A lot of initiatives (UK, USA,...)
- Cloud is **important for science**
  - computation=basis of all sciences



## Remember: the cloud context

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- Service Oriented
- Standardized
- Loosely coupled
- Modular
- ... often still a long way to go!



## Case: Cost of Infrastructure hosting

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	Amazon	Hostway	Combell
<b>Location</b>	USA/Europe	USA	Belgium
<b>Availability</b>	99.9%	99.9%	99.9%
<b>Traffic</b>	4 Tb.	4 Tb	1 Tb
<b>Delivery time</b>	Minutes	Hours	24 hours
<b>Price</b>	€660 / month	€280 / month	€369 / month
	<b>Agility</b>	<b>Performance</b>	<b>Belgium</b>

**Flexibility & provisioning**  
is the real cost-cutter !



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## Conclusions

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- Cloud computing is **disruptive**, but...
- Consider the **real business case!**
  - integration
  - migration
- Market **not yet mature**, but use time to adapt internal processes
- **Embrace change & technology**, rather than trying to control it

