Cloud Computing
voor de overheid – IBM's perspectief

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Agenda

- What is Cloud computing (IBM Perspective)
- Steps to the Cloud
  - 6 steps in the transformation process
- Cloud discussie in de overheid
Cloud: Consumption and delivery models optimized by workload

“Cloud” is a new consumption and delivery model inspired by consumer Internet services.
Cloud enables:

- Self-service
- Sourcing options
- Economies-of-scale

Cloud represents:

- The industrialization of delivery for IT supported services

Multiple types of clouds will co-exist:

- Private, Public, and Hybrid
- Workload and / or Programming Model Specific
Cloud computing promises virtualized, and possibly centralized ICT facilities, run by specialized companies. Thus allowing for cheaper, more flexible, more reliable and more powerful computing resources.
## Current cloud computing definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud computing</td>
<td>Cloud computing is a pay-per-use model for enabling available, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.</td>
<td>NIST(^1)</td>
</tr>
<tr>
<td>1 BPaaS</td>
<td>Business process services are any business process (horizontal or vertical) delivered through the Cloud service model (Multi-tenant, self-service provisioning, elastic scaling and usage metering or pricing) via the Internet with access via Web-centric interfaces and exploiting Web-oriented cloud architecture. The BPaaS provider is responsible for the related business function(s).</td>
<td>IBM(^2)</td>
</tr>
<tr>
<td>2 SaaS</td>
<td>The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure and accessible from various client devices through a thin client interface such as a Web browser (e.g., web-based email). The consumer does not manage or control the underlying cloud infrastructure, network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.</td>
<td>NIST(^1)</td>
</tr>
<tr>
<td>3 PaaS</td>
<td>The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created applications using programming languages and tools supported by the provider (e.g., java, python, .Net). The consumer does not manage or control the underlying cloud infrastructure, network, servers, operating systems, or storage, but the consumer has control over the deployed applications and possibly application hosting environment configurations.</td>
<td>NIST(^1)</td>
</tr>
<tr>
<td>4 IaaS</td>
<td>The capability provided to the consumer is to rent processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly select networking components (e.g., firewalls, load balancers).</td>
<td>NIST(^1)</td>
</tr>
</tbody>
</table>

2. IBM MI and IPR definition bridge between Gartner and IDC, Aug 19, 2010
Cloud computing delivers IT and business benefits

**Virtualized**
- Higher utilization
- Economy of scale benefits
- Lower capital expense

**Standardized**
- Easier access
- Flexible pricing
- Reuse and share
- Easier to integrate

**Automated**
- Faster cycle times
- Lower operating expenses
- Optimized utilization
- Improved compliance
- Optimized security
- End user experience

Doing more with less

Higher quality services

Breakthrough agility and reducing risk
For the transformation to the cloud, we see these strategic steps must be taken:

- Create IT Roadmap
- Establish Architecture
- Assess Workload
- Determine Enterprise & Public Cloud Mix
- Define Business Value
- Implement Cloud

* Defining business value is constant attention point throughout all other steps
Step 1: IT Transformation Roadmap*

- **Centralize**
  - Reduce data centers
  - Reduce costs

- **Consolidate**
  - Consolidate servers, storage
  - Reduce footprints

- **Virtualize**
  - Increase hardware utilization
  - Reduce software licensing costs
  - Standardize virtual images

- **Automate**
  - Automate service management
  - Migrate applications

- **Optimize**
  - Optimize resources
  - Dynamically provision services
  - Deliver services based on business value

* These are typically the steps taken by an outsourcer during transformation/in-take
Workloads may be at different levels of readiness for cloud
There is a spectrum of deployment options for cloud computing

**Private**
IT capabilities are provided “as a service,” over an intranet, within the enterprise and behind the firewall

- Enterprise data center
- Managed private cloud
- Private cloud

**Public**
IT activities / functions are provided “as a service,” over the Internet

- Enterprise
- Shared cloud services
- Public cloud services

**Hybrid**
Internal and external service delivery methods are integrated

- Enterprise
- Managed private cloud
- Hosted private cloud
- Third-party hosted and operated

- Users
We recommend a practical phased approach to cloud computing

Plan and Prepare
Define cloud strategy and roadmap
- Assess cloud deployment models, service options and workloads
- Plan cloud strategy and roadmap
- Choose initial project

Condition the existing infrastructure for cloud
- Virtualize and automate existing systems
- Add service management, service catalog

Pilot and Deploy
Start with an isolated private (or outsourced) cloud deployment
- Choose low-risk workload (such as test and development)
- Standardize applications and systems
- Deploy/Use self-service portal

Roll out cloud across the enterprise
- Enable additional workloads on private cloud
- Add new users
- Use trusted public cloud services to supplement data center capabilities

Extend and Evolve
Agenda

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Context – Motie van der Burg

Motie Van der Burg c.s. inzake Cloud Computing en Cloud First Strategie:
• Verzoekt de regering in navolging van landen als Japan, het Verenigd Koninkrijk
  en de Verenigde Staten een strategie voor de hele Nederlandse overheid te
  ontwikkelen voor Cloud Computing en een Cloud First Strategiewaarbij
  mogelijkheden voor de inrichting van de overheidscloud duidelijk omschreven
  worden met de bijbehorende voor- en nadelen,
• Verzoekt deze strategie voor 1 november aan de Tweede Kamer aan te bieden.

Overwegingen:
• dat er de afgelopen jaren belangrijke ontwikkelingen zijn geweest inzake het
  aanbod van ICT-toepassingen waarbij gebruik werd gemaakt van het internet, dit
  wordt in vaktermen als cloud computing aangeduid
• dat door deze ontwikkelingen de dienstverlening aan burgers en bedrijven en
  de bedrijfsvordering van de overheid verbetert, de kosten voor het gebruik van IT
  flink omlaag kunnen en het duurzame gebruik van IT wordt gestimuleerd;
• dat over de veiligheidsrisico’s en mogelijke afhankelijkheidsrisico’s die mogelijk
  samenhangen met deze ontwikkelingen geen onduidelijkheid mag bestaan

Scope:
Rijksoverheid
IBM sees two places to look for cloud value in the government

Global Industry Transformation and Business model innovation
- Consider the industry structure and prevalent business models
- Project the attributes of cloud technology into business model areas

Operational optimization and consolidation
- Consider the IT roadmap to an optimized dynamic datacenter
- Provide cloud services on infrastructure and platform level

Business sharing
Change the way industries work by introducing industry sharing of business contents
Optimize today's business functions by sharing IT resources

Workload optimization

Eco system
Front office
Back office
Chain partners

Software as a Service
Platform as a Service
Infrastructure as a Service
Vragen en Discussie
Clients interviewed significantly prefer private clouds over public or hybrid clouds

Overall, how appealing are the public, private and hybrid delivery models for your company?

"Very appealing" or "appealing"

Private: 64% (+113%)

Public: 38% (+68%)

Hybrid: 16%

However, adoption of Public Clouds is expected to grow by 26% CAGR between now and 2013*

From IBM Market Insights analysis, we have identified the workloads that offer the most favorable entry points in general for each of the cloud delivery models – Step 3 and Step 4 combined.

### Top public workloads
- Audio/video/Web conferencing
- Service help desk
- Infrastructure for training and demonstration
- WAN capacity and VoIP infrastructure
- Desktop
- Test environment infrastructure
- Storage
- Data center network capacity
- Server

### Top private workloads
- Data mining, text mining, or other analytics
- Security
- Data warehouses or data marts
- Business continuity and disaster recovery
- Test environment infrastructure
- Long-term data archiving/preservation
- Transactional databases
- Industry-specific applications
- ERP applications

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**Infrastructure and collaboration workloads emerge as most appropriate**

**Database, application and infrastructure workloads emerge as most appropriate**

Step 5: Determine the value - Banking example

<table>
<thead>
<tr>
<th>Payback Period (months)</th>
<th>4.85</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Initial Investment for Test Cloud</td>
<td>$1,313,958.33</td>
</tr>
<tr>
<td>Net Present Value (NPV)</td>
<td>$6,172,325.64</td>
</tr>
</tbody>
</table>

- Estimated ROI over 3 years: 469.75%
- Estimated avg. annual ROI: 156.58%

ROI projections from IBM Research Study 2009
Cloud deployment models - in reality a mixture based on type of workload

<table>
<thead>
<tr>
<th>Deployment Model</th>
<th>Private</th>
<th>Private Managed</th>
<th>Private Hosted</th>
<th>Shared-Private Hosted</th>
<th>Public Hosted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supporting Service Types</strong></td>
<td>IBM Smart Business Services</td>
<td>IBM Smart Business Systems</td>
<td>Smart Business on the IBM Cloud</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Premise</strong></td>
<td>Client (Implemented by IBM)</td>
<td>Client (Implemented by IBM)</td>
<td>IBM</td>
<td>IBM</td>
<td>IBM</td>
</tr>
<tr>
<td><strong>Run / Manage</strong></td>
<td>Client</td>
<td>IBM</td>
<td>IBM</td>
<td>IBM</td>
<td>IBM</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>Dedicated</td>
<td>Dedicated</td>
<td>Dedicated</td>
<td>Shared (by “member” clients)</td>
<td>Shared (by all clients)</td>
</tr>
<tr>
<td><strong>Access</strong></td>
<td>Internal enterprise Network</td>
<td>Internal enterprise Network</td>
<td>VPN Network, Public Internet</td>
<td>VPN Network, Public Internet</td>
<td>Public Internet</td>
</tr>
<tr>
<td><strong>Payment</strong></td>
<td>Traditional</td>
<td>Traditional</td>
<td>Hybrid (Traditional and/or Pay as you go)</td>
<td>Pay as you go</td>
<td>Pay as you go</td>
</tr>
</tbody>
</table>
So, it is simple, right?

LAST YEAR WE RECOGNISED THAT OUR PROCESSES WERE FAR TOO COMPLEX

SO WE PUT THEM INTO THE CLOUD

LET THE CLOUDS MAKE YOUR LIFE EASIER
BZK DGOBR/IR en DGBK/DRI zijn in de lead – volgende werkpakketen maken onderdeel uit van de Besluitvorming

<table>
<thead>
<tr>
<th>WERKPAKket</th>
<th>DEELTAKEN</th>
<th>WIE</th>
</tr>
</thead>
</table>
| 1. Internationale Inventarisatie | • Leading countries bronnen vaststellen  
• Strategieën en effecten  
• EC & OECD Commissies raadplegen  
• Analyse en conclusies | Marktpartij/ Internationale eGov  
DIR: LPdR, EK, DRI: TT |
| 2. Aanbod vs. Vraag | • Context bepalen (RO, ZBO’s en LO)  
• Definitie geven “Government Cloud”  
• Stakeholderanalyse  
• Relevant Aanbod bepalen, voor- en nadelen  
• Relevant Vraag bepalen/ rondetafels | Marktpartij/ Cloud met expertise in RO, ZBO’s en Lagere Overheden  
DRI: EJ |
| 3. Analyse         | • Vraag & Aanbod in verband brengen  
• Risicoanalyse breed (incl. Juridisch)  
• Relevante opties bepalen  
• Benefit Logic: effecten en bijdrage aan oogmerken vaststellen  
• Conclusies | Marktpartij Businesscase  
HEISESSIE Cloud: DRI & DGOBR: SAS DRI: EJ |
| 4. Strategie formulieren | • Samenvatten & formuleren  
• Verband met ICT Strategie RO  
• Beantwoording motie | DIR: HR & LPdR, DRI: AT |
| 5. Besluitvorming & Motie | • Notitie door ICCIO loodsen  
• Notitie door lijn loodsen  
• Beantwoording Motie/AO | DGOBR HR & LPdR  
RvB |
Conclusie ICT-Office – Visie Government Cloud Strategie

- Cloud Computing voor de overheid biedt een belangrijke impuls voor verbeterde dienstverlening
- Cloud Computing draagt bij aan verbeterde bedrijfsvoering
- Cloud Computing zorgt voor minder onderhoud – vermindert het maatwerk
- Cloud Computing draagt bij aan gereduceerde kosten incl. beweging van CapEx naar OpEx
- Cloud Computing zorgt voor een duurzaam gebruik van ICT

- Randvoorwaarden
  - Dataclassificatie
  - Businesscase moet leidend zijn voor de cloudstrategie
  - Adequate sturing vanuit de overheid
  - Borgen van interoperabiliteit door het afdwingen van open standaarden
  - Stellen van duidelijke kaders (toegangsbeveiliging, transparantie, controle)
  - Plan voor de gefaseerde migratie naar Cloud Computing
Conclusie ICT-Office – Visie Government Cloud Strategie

- **Quickwins**
  - Digitale werkplek
  - Datacenter consolidatie (consolidatie van 61 datacenters)
  - DOC-Direkt
  - Elektronisch bestellen en factureren (EBF)
  - Vernieuwing van DigiD
First place - Cloud enables global industry transformations and business innovation

Industry Vertical Portfolio of Cloud Offerings & Services

Cloud Service Provider Platform
Collaborative Care Cloud
CE Service Delivery Platform
Federal Community Cloud

Cloud Infrastructure
Enterprise-class infrastructure services & products

Industry Vertical Business Services
Designed and delivered with clients & partners

Workload Optimized Industry Cloud Platforms

On a platform of robust infrastructure services & products
Voorbeeld – Cloud voor eProcurement

PEPPOL Project

- Pan-European Public eProcurement On-Line
- Government eProcurement pilot project
- European Union-wide – 27 countries
- Any company -to- Any Government institution
  - across borders
  - electronic process from initial tendering to final payment
- EU funded project through 2008 – 2011
  - led by Denmark government IT organization