

(An oversimplified overview)

Cloud Computing



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Cloud Computing (An oversimplified overview)

The WHATs

The HOWs

The WHENs

The OSes



The WHOs

The WHYs

The WHEREs

The NEWs

Cloud Computing (An oversimplified overview)

- The **WHATs** :
 - What it **IS** ...
 - What it's **NOT** !
 - What are the **PROS** ?
 - What are the **WORRIES** ?
 - What **NEXT** ?
- The **HOWs** :
 - How it's **done** ?
 - How it's **used** ?
 - How it's **priced** ?
- The **WHENs** :
 - When to do it ?

- The **WHOs** :
 - Who's **doing** it ?
 - Who's **adopting** it ?
- The **WHYs** :
 - Why **adopt** it ?
 - Why **not** ?
- The **WHEREs** :
 - Where to **use** ?
 - Where to **avoid** ?
- The **NEWS** :
 - Clouds are **cool** and **HOT** !
- The **OSes**

Cloud Computing (An oversimplified overview)

- What it IS :

- **IT Infrastructure**

- as a whole

- as a service

- with a Twist (*)

- Storage

- Processing

- Software

- (*) ***Ubiquitous access***

- ***Pay-per-use & "Always-ON"***

- ***Massively scalable***



and YES – you've seen this (*picasa, youtube, del.icio.us, adrive, googledocs*)

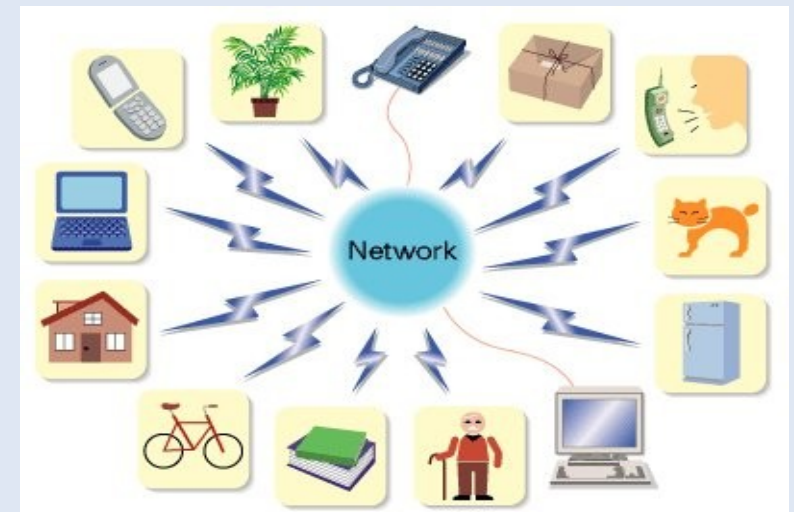
Cloud Computing (An oversimplified overview)

What it's **NOT** (*):

- Grid computing
- Autonomic computing
- Utility computing
- Ubiquitous / Pervasive computing

(*) It's **NOT** the same as, but ...

- May be grid-powered
- Billed like utility computing
- Access is ubiquitous



Cloud Computing (An oversimplified overview)

• What are the PROS :

- COST of usage
- COST of access HW (*)
- COST of providing
- SAVINGS
 - Energy
 - Licenses
 - Administration
 - Learning
 - Outsourcing (BTW...why ?)
 - TIME

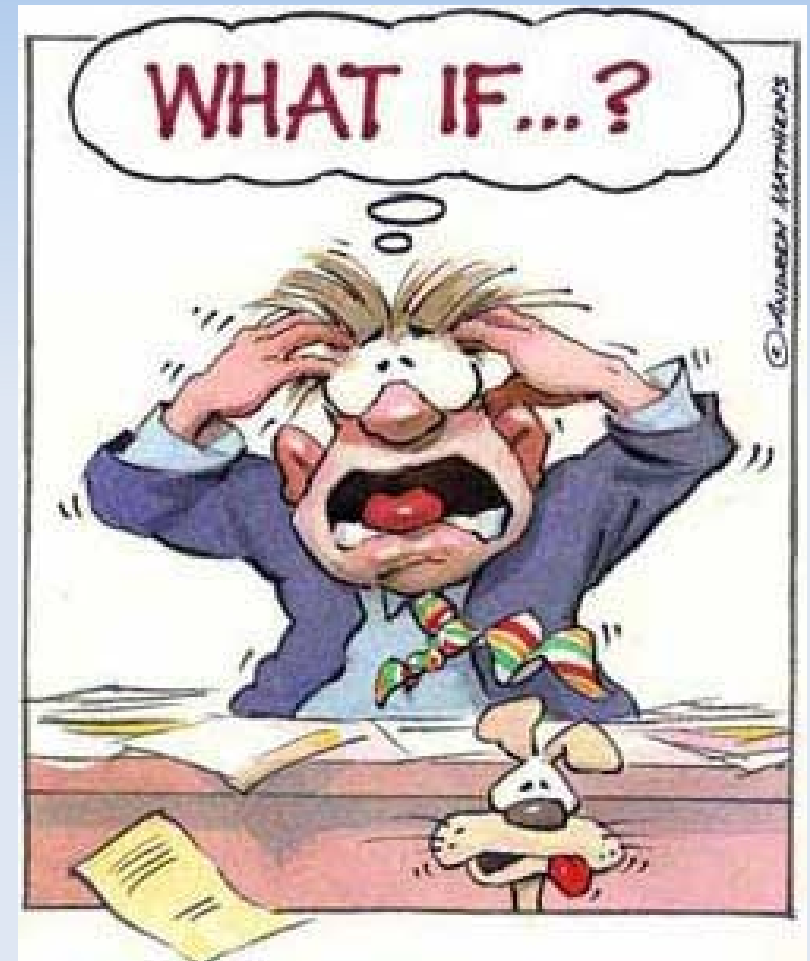


- (*) Recall W95...XP...Vista... Now EEPC, SmartPhone...

Cloud Computing (An oversimplified overview)

- **What are the WORRIES :**

- Security
- Privacy
- Compliance (SOX,PCIDSS)
- Reliability
- Culture
- Budget
- Risk
- The IT dept.
- Backup (BTW why ? - when you have GFS...)



Cloud Computing (An oversimplified overview)

• What NEXT ?

- Standards
- Policies
- SLAs
- Training
- Interoperability (data portability)
- Internal vs. external
- API
- VPN
- Your needs ... (taylorred)



Cloud Computing (An oversimplified overview)

- **How it's done ? (Strategy)**

- Massive computing power
- Web Client Applications
- Whatever Server Applications
- Global Storage
- Virtualization Technologies
- Fast provisioning & deployment
- Capacity upgrade on-demand
- Service-oriented
- **Open-source tools**



Cloud Computing (An oversimplified overview)

How it's done ? (some) enabling / support technologies



Linux
Xen



Hadoop (Core)

Cluster FS / Shared Disk FS / SAN FS

IBM GPFS – General Parallel FS

VxCFS - Veritas Cluster FS

Sun Lustre | Gluster CFS (free)

VMware VMFS - Cluster FS

Oracle OCFS - Cluster FS (GPL)

(HP) PolyServe - Cluster FS

Apple XSan - Cluster FS for MAC OS X

RH GFS - Global FileSystem

RH GULM - Grand Unified Lock Manager



HDFS - Hadoop Distributed FileSystem

Google FS - Distributed(Networked) FS

DLM - Distributed Lock Manager



Cloud Computing (An oversimplified overview)

How it's done ? (some) enabling / support technologies



enomalism 2.0
ELASTIC COMPUTING PLATFORM

Hadoop (Core)

Scalable : to Petabytes.

Economical : distributed across clusters of 1000s of ordinary computers.

Efficient : process in parallel.

Reliable : keeps multiple copies with automatic on-failure redeployment.



VPLS - Virtual Private LAN Service

Layer 2 VPN

TLS - Transparent LAN Service

EVCS - Ethernet Virtual Connection Service

EoM - Ethernet over MPLS

LDP - Label distributed protocol

LSP - Label switched path



API

Google App Engine

Enomalism RESTful API

Tilana Cloud API



Disk

AoE - ATA Over Ethernet

iSCSI



Cloud Computing (An oversimplified overview)

• How it's used ?

- Webby
 - Anywhere
 - Anytime
 - Friendly
- As-A-Service
 - On-demand
 - Instantly
- Powerfully
 - Scalably
 - Virtually
 - Sharedly

CloudSourcing (*)

SaaS – Software as a service

PaaS – Platform as a service

DaaS – DataBase as a service

AaaS – Application as a service

..... – Storage you name it !

*aaS – Anything as a service



(*) World-, Web-, Global-, Planet-Sourcing

Cloud Computing (An oversimplified overview)

• How it's priced ?

- “pay-per-use”
- “pay-as-you-go”



Amazon S3

United States

Storage — Current Pricing (thru October 31st)

- * \$0.15 per GB-Month of storage used

Storage — New Pricing (effective November 1st)

- * \$0.150 per GB – first 50 TB / month of storage used
- * \$0.140 per GB – next 50 TB / month of storage used
- * \$0.130 per GB – next 400 TB / month of storage used
- * \$0.120 per GB – storage used / month over 500 TB

Data Transfer

- * \$0.100 per GB – all data transfer in
- * \$0.170 per GB – first 10 TB / month data transfer out
- * \$0.130 per GB – next 40 TB / month data transfer out
- * \$0.110 per GB – next 100 TB / month data transfer out
- * \$0.100 per GB – data transfer out / month over 150 TB

Requests

- * \$0.01 per 1,000 PUT, POST, or LIST requests
- * \$0.01 per 10,000 GET and all other requests*
- * No charge for delete requests

Europe

Storage — Current Pricing (thru October 31st)

- * \$0.18 per GB-Month of storage used

Storage — New Pricing (effective November 1st)

- * \$0.180 per GB – first 50 TB / month of storage used
- * \$0.170 per GB – next 50 TB / month of storage used
- * \$0.160 per GB – next 400 TB / month of storage used
- * \$0.150 per GB – storage used / month over 500 TB

Data Transfer

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Requests

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Cloud Computing (An oversimplified overview)

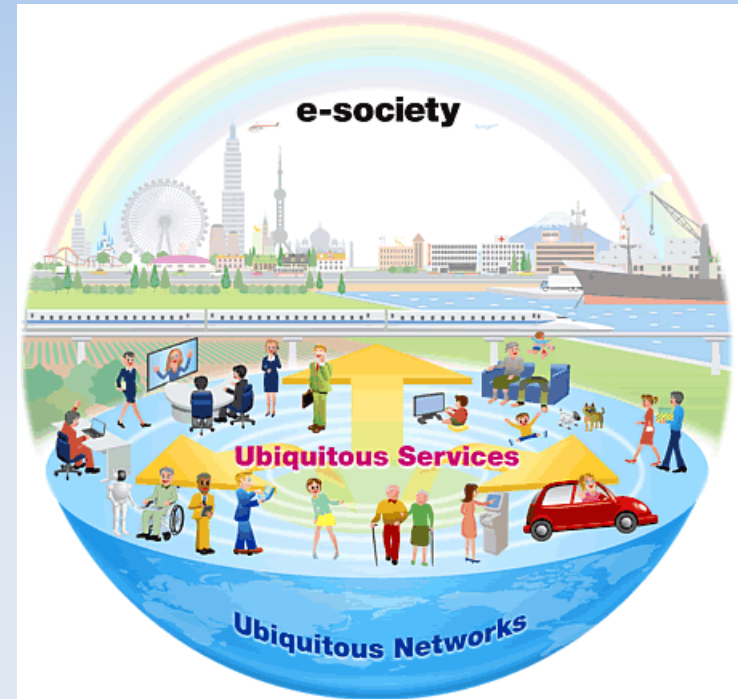
- **When to use it ?**
 - **RIGHT NOW !**

We are living in an ubiquitous society

Access wherever, whenever, whatever

We have what it takes

Bandwidth, Processing power,
Technology (eg. Virtualization)



Cloud Computing (An oversimplified overview)

- Who is doing it ?

Who	What
3Tera	Server
Amazon EC2	Server
Amazon S3	Storage
Amazon SimpleDB	Database
Box-Net	Storage
Dell DCS	Server
EMC Mozy	Storage
Flexiscale	Server
Google Apps	Application
HP AiaaS	Server
IBM Blue Cloud	Server
iCloud	Application
Joyent	Server
Microsoft SSDS	Database
Sun Caroline	Server



Cloud Computing (An oversimplified overview)

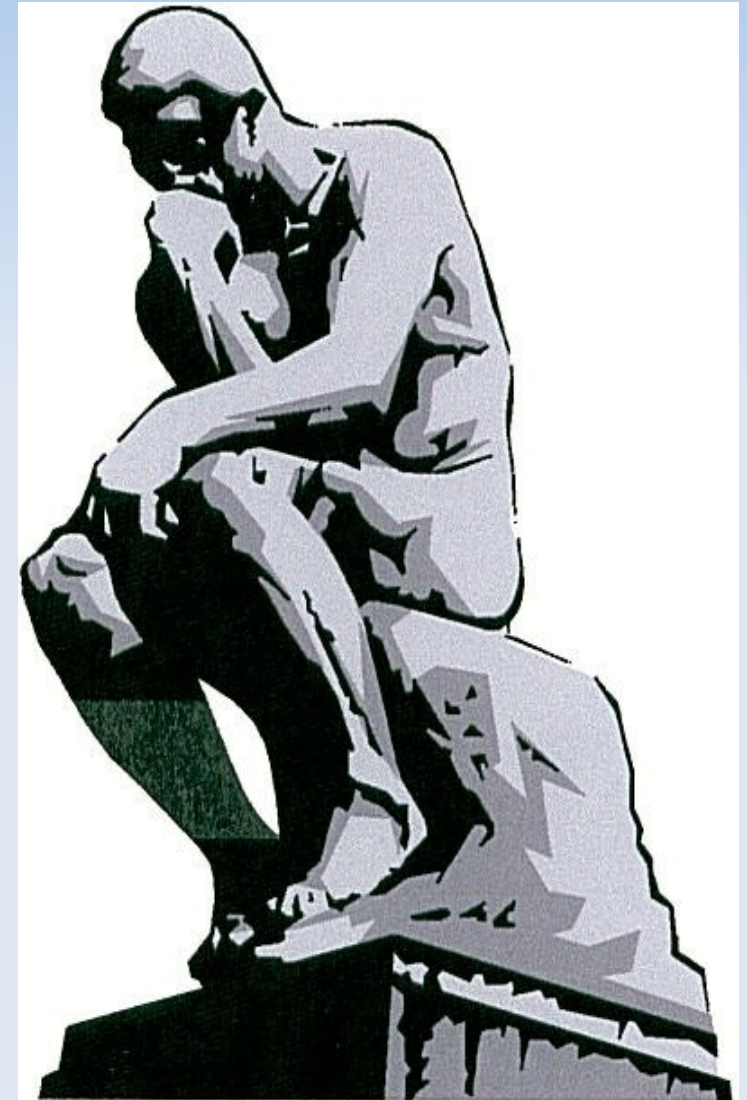
Who is adopting it ?

- VISTA Innovation Portal (VIP) - Vietnam Government
- Wuxi China Cloud Computing Center
- L'Oreal
- Procter & Gamble
- General Eletric
- Nexans Cables
- Essilor Lenses
- Valeo Autoparts France
- Utah state university
- Arizona state university
- Daily Telegraph



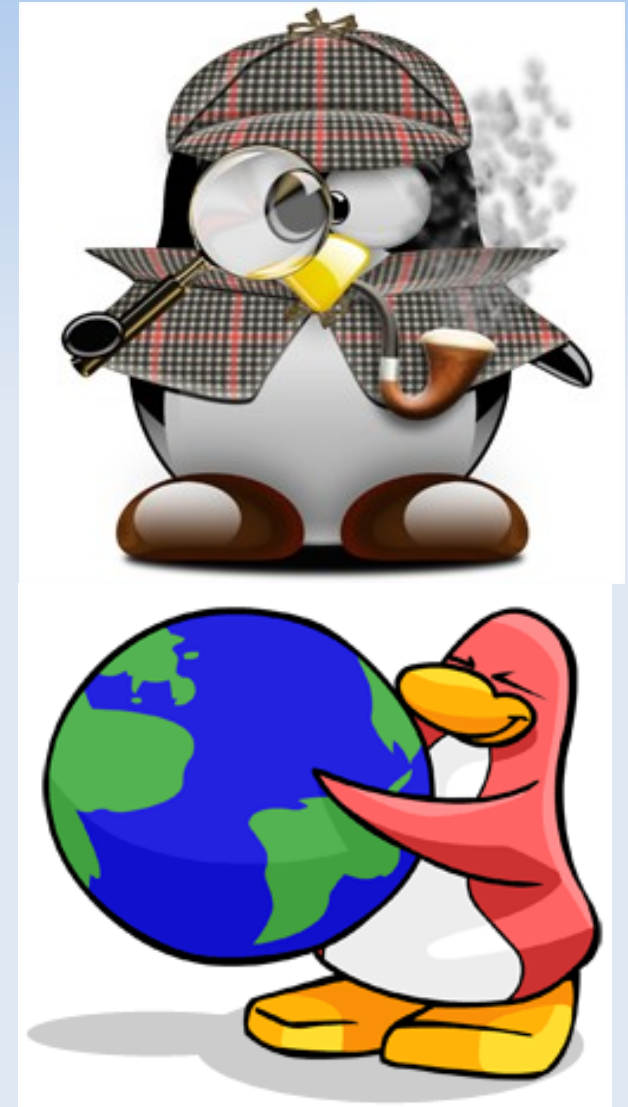
Cloud Computing (An oversimplified overview)

- **Why adopt it ?**
 - It's **Cost-efficient**
 - It's **Mature**
 - It's **GREEN**
 - It's *savvy*
- **Why not ?**
 - Customization (for now...)
 - Special hardware
 - Legacy (non-web) SW
 - Compliance



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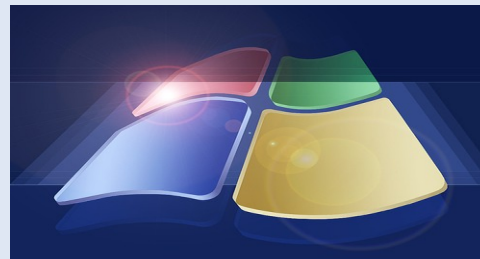
- **Where to use it ?**
 - Home ... SMB ... Fortune500
 - Low (non-24x7) SW utilization
 - High disk usage
 - Seasonal resource allocation
- **Where to avoid it ?**
 - Extreme TP performance
 - Non-web Legacy SW only
 - BIG clients (eg. Aerospace, CAD)
 - CAM / Print Services
 - Regulatory-demanded local data



Cloud Computing (An oversimplified overview)

• Cloud OS (*)

- EyeOS
 - OpenSource web desktop (PHP, XML, JS)
- XIOS/3
 - Xcerion XML Internet Operating System/3 (the technology)
 - I-Cloud (the service)
- Windows STRATA
 - Microsoft CloudOS
- YouOS
 - WebOS (deprecated)



• (*) **NOT an OS !**

Cloud Computing (An oversimplified overview)

• The NEWS

• “We think this is a big move in the market and we are going to make a big move behind it.” – Bill Zeitler, Senior VP of IBM’s Systems and Technology Group, quoted in a Reuters article from November 15, 2007

• ”IBM Introduces Ready-to-Use Cloud Computing - Collaboration Services Get Clients Started with Cloud Computing ” – Armonk, N.Y. and Shanghai, China - 15 Nov 2007

• ”IBM Announces European Cloud Computing Hub in Dublin - Unveils New Cloud Computing Service for Generating New Business Ideas via Social Networking” – DUBLIN, IRELAND and ARMONK, NY - 19 Mar 2008

• ”Gartner Says Cloud Computing Will Be As Influential As E-business - Special Report Examines the Realities and Risks of Cloud Computing” – STAMFORD, Conn., June 26, 2008

• ”IBM Opens Africa's First "Cloud Computing" Center, Second Cloud Center in China” – BEIJING, CHINA and JOHANNESBURG, SOUTH AFRICA - 24 Jun 2008

• ”Microsoft will float cloud OS this month” – Oct 02. 08 by John Fontana - www.networkworld.com

• ”Microsoft Windows Azure Cloud Platform Revealed” – By Darryl K. Taft – eweek.com - 2008-10-27

Cloud Computing (An oversimplified overview)

- **The KEY points**
 - Ubiquitous access
 - Pay-per-use
 - “Always ON” QOS
 - Rapid “on-demand” VL scaling
 - Service-oriented (No marriage)
 - OS / Platform - independent
 - No “extra” installation
 - Shared / Virtual resources

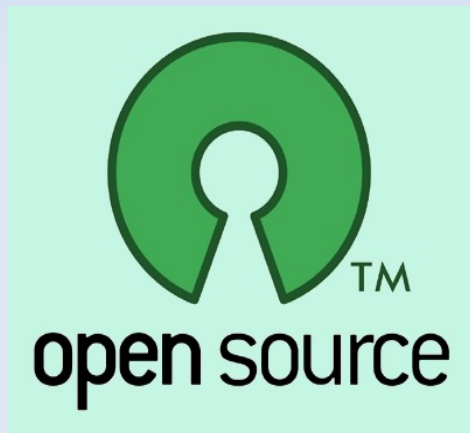


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OBRIGADO – THANKS – GRACIAS – DANKE – СПАСИБО – MERCI – GRAZIE



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