Cloud Computing perspectives & solutions

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ФАКУЛТЕТ ЗА ИНФОРМАТИЧКИ НАУКИ
И КОМПЈУТЕРСКО ИНЖЕНЕРСТВО

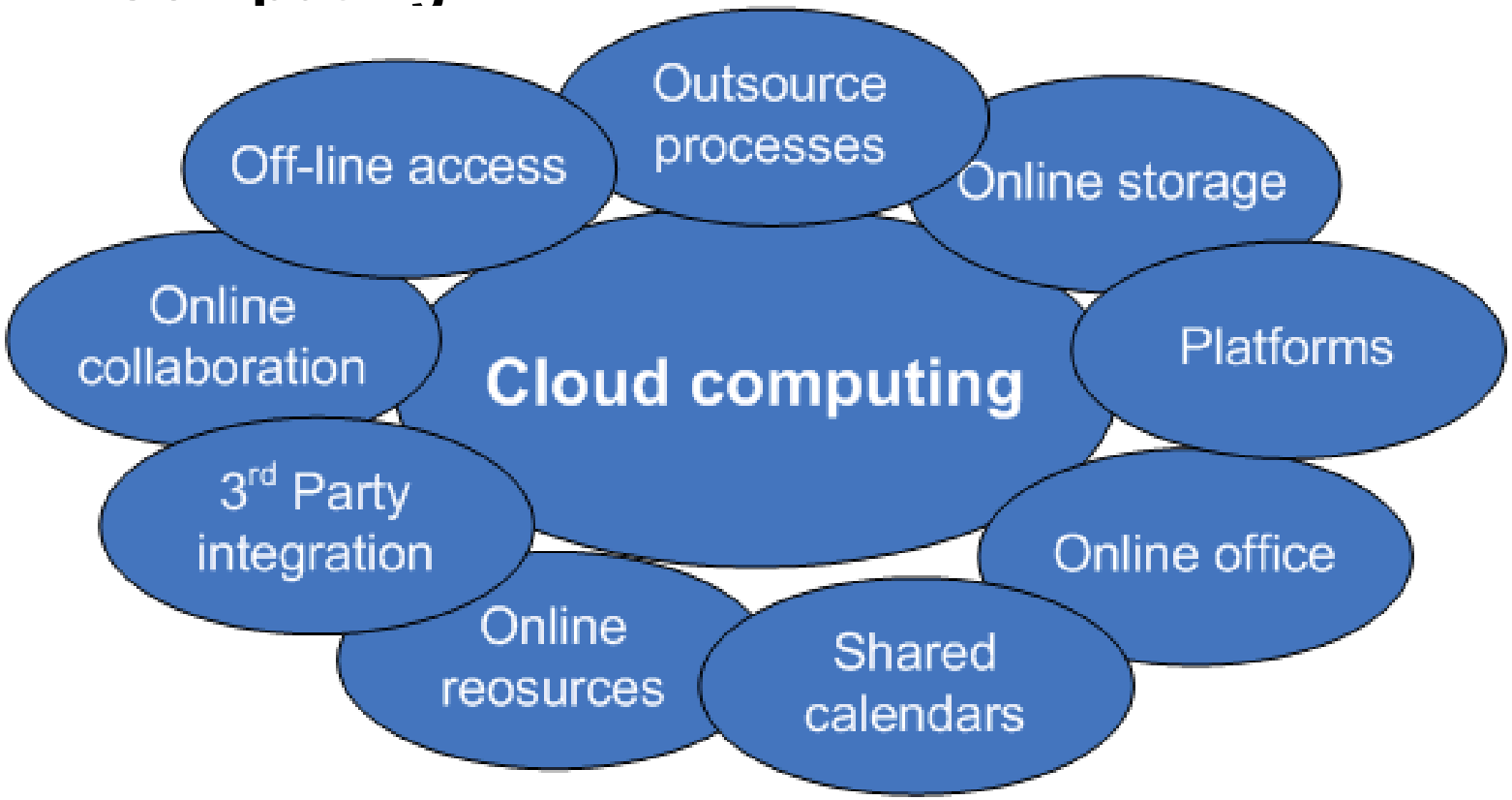
Cloud Computing Overview

- What is it?
- History
- Examples
- Definition

- also explain
- How to teach and learn for clouds?
- Experience for SaaS – where is the problem?

The name

- **Cloud** is synonym for **Internet**
- **Cloud computing** is synonym for **Internet Computing**



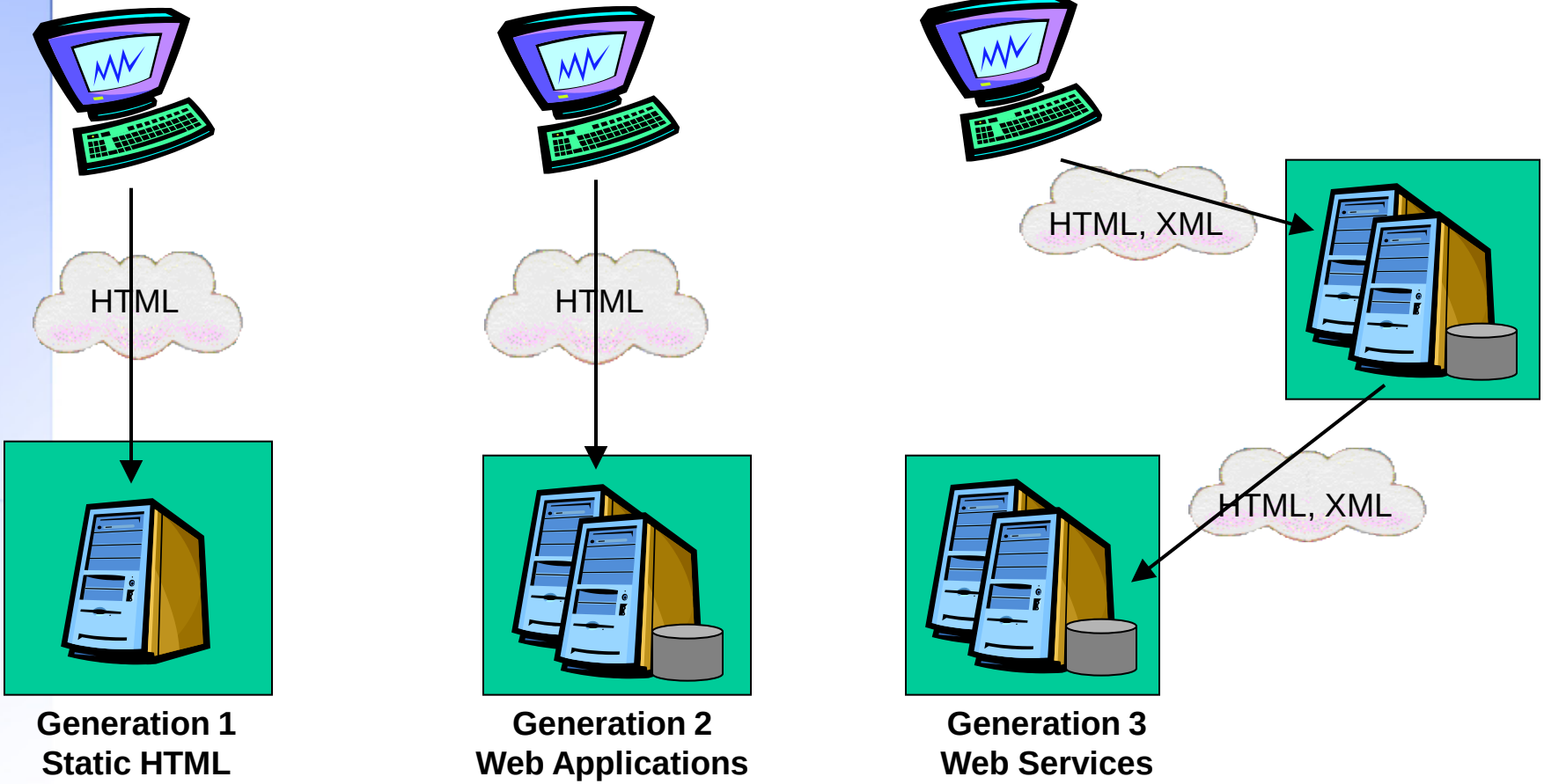
History about research

- Starting from 2001
- The idea behind Service Oriented Architecture and web services, and Application Service Providers

Three ages of computing

- First age – before Internet
- Second age – rise of Internet
- Third age – change in attitude and business (scalable and “use it on the way”)

Evolution of the Web



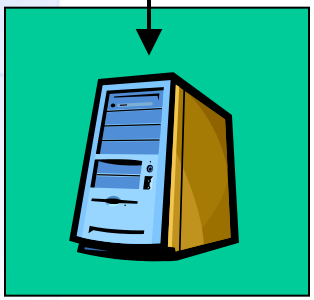
Generation 1
Static HTML

Generation 2
Web Applications

Generation 3
Web Services

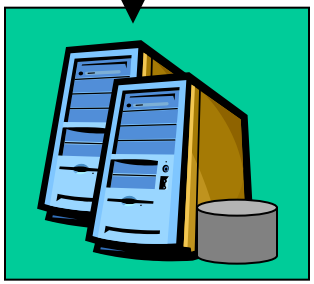
Evolution of Computing

Standalone and
robust applications



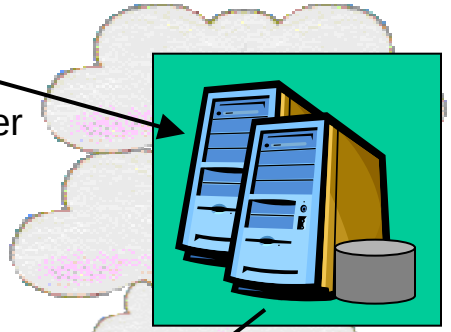
Age 1
Before Internet

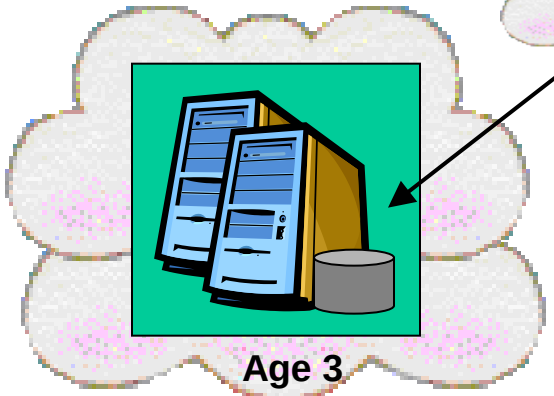
Web applications



Age 2
Rise of Internet

Web browser

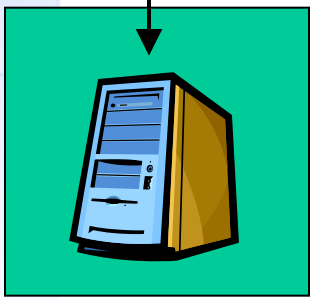




Age 3
Clouds

Evolution of Computing

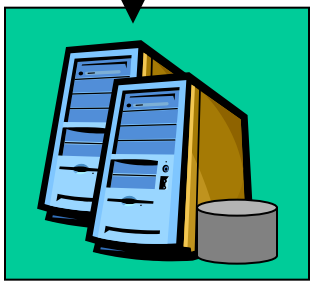
My server
in the office



Age 1
Before Internet

Web applications

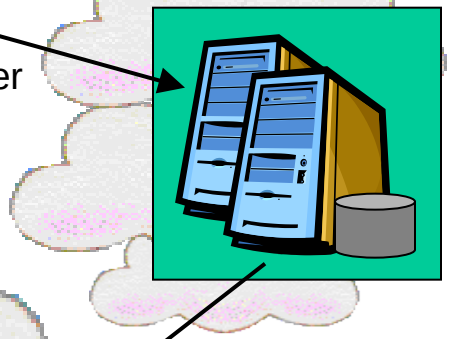
My server
on Internet

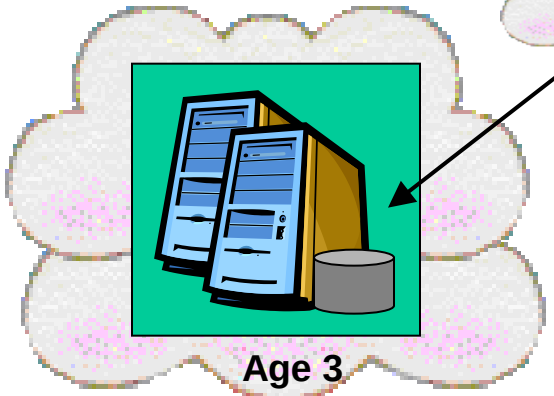


Age 2
Rise of Internet

Web browser

No server
just rent





Age 3
Clouds

First age – Before Internet

- 1950s up to mid 1990s
- The focus was on automating particular operations, creating supporting business processes, and of course, always improving efficiency.
- Yes, there were big networks for data exchange and interaction with narrow focus.
- Big infrastructure (mainframe and servers), hierarchical networks
- Answers: **Is this possible?**

Second age - rise of Internet

- Mid 1990s to mid 2000s
- Browsers, data centers, search engines, distributed HW & SW architectures, client – server computing …
- It is no longer a question of "**is this possible**,"
- but rather "**how, when, and where**."

Third age of computing

- From mid 2000s
- The data collection and processing of state on Internet, had to be as absolutely automated as possible.
- The infrastructure would be constructed out of commodity components (cheap stuff).
- Data storage needed to be done in a simple, yet fairly reliable manner to facilitate scaling.
- Operations needed to be as automatic and dependable as possible.

Major layout

Software as a Service (SaaS)

Platform as a Service (Paas)

Infrastructure as a Service (IaaS)

On-premises vs cloud

On premises	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Runtimes	Runtimes	Runtimes	Runtimes
SOA / Integration	SOA / Integration	SOA / Integration	SOA / Integration
Databases	Databases	Databases	Databases
Server SW	Server SW	Server SW	Server SW
Virtualization	Virtualization	Virtualization	Virtualization
Server HW	Server HW	Server HW	Server HW
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

Third age – cloud examples

- Google – scale a basic search facility and do so cheaply
- Amazon – from heavy servers, with traditional relational databases to scalable architecture
- Salesforce.com – offering services

Google

- The first cloud computing killer application – gmail – persuade the customers to keep their mails on Internet and use e-mail application by web browser

Amazon

- In 2006 Amazon started to offer basic computing resources: computing, storage, and network bandwidth in highly flexible, easily provisioned, services, all of which could be paid for ‘‘by the drink.’’

amazon.com

Salesforce.com

- The first public cloud service that was targeted at the enterprise customer and required those customers to store very sensitive data outside of their own facilities.
- Keep the customers and use customer relationship management as a service!

Definition – Third age

- **Cloud computing** is a **style** of computing where computing resources and are easy to obtain and access, simple to use, cheap, and just work.

Characteristics

- Scalable (Aggregate)
- Elastic
- Self-Service
- Ubiquitous Access (Services and More)
- Complete Virtualization: Acts as One
- Relative Consistency
- Commodity

Other characteristics

- Measured Service (By the Drink)
- Multiple Tenants
- Multiple Applications
- Scalable (Individual Applications)
- Reliable

History

Different names to some known terms

- Browser-based computing
- Application hosting
- Server hosting

IaaS known also as

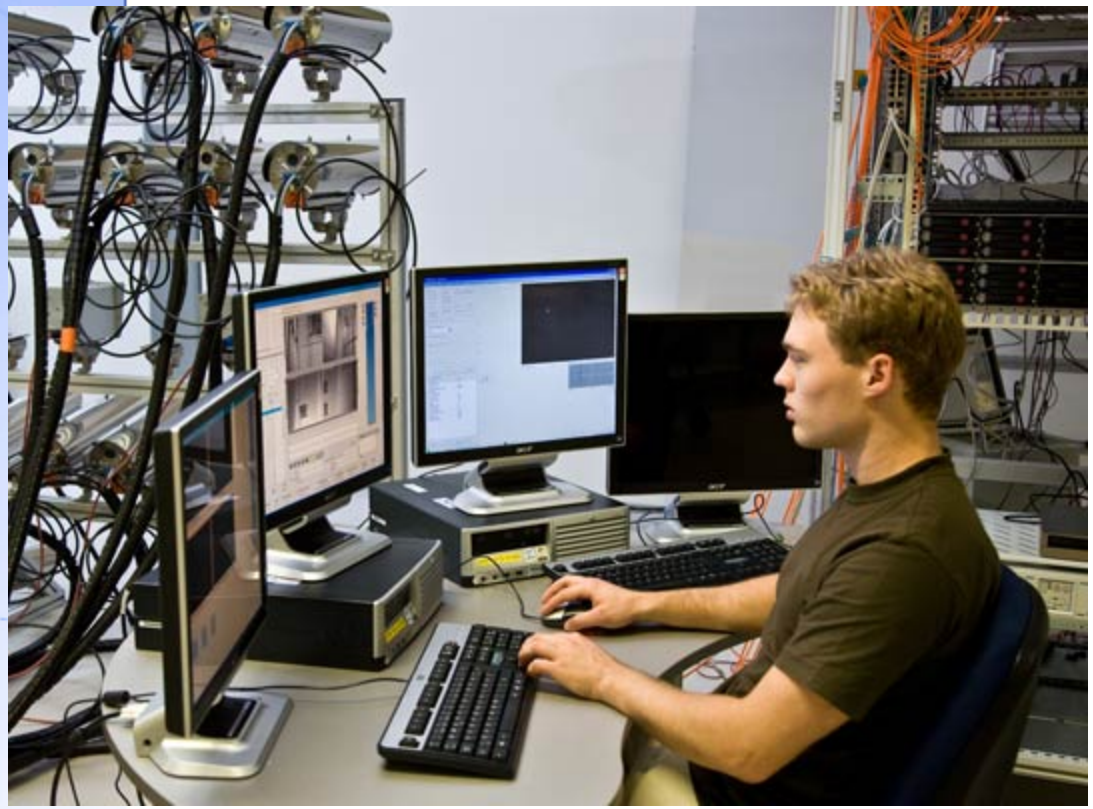
IaaS known as

- Server hosting
- Domain hosting
- etc...

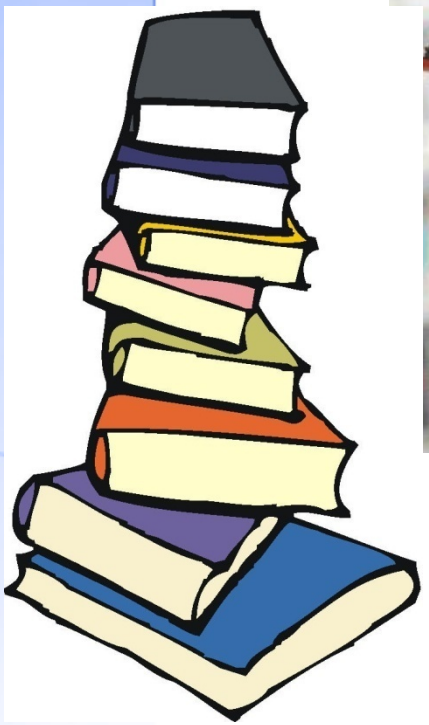
Instead of a lot of servers

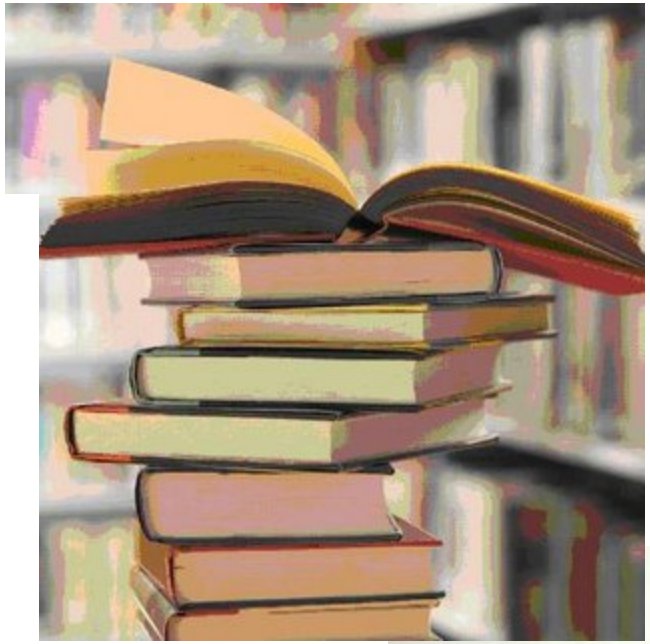
- Either you buy servers at your premises or you buy servers and host them at other locations

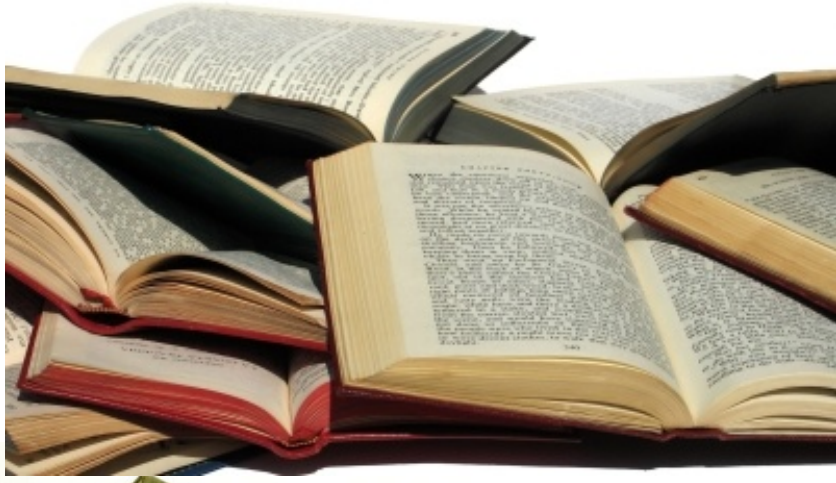
Instead of a lot of staff



Instead of new versions







Use servers in the cloud

Just plug in

- It costs less

Gmail example

- No server
- No storage
- No application
- No technical team
- No training
- No upgrade

- Just browser and Internet
- That’s the power of cloud computing!

Not thinking about apps

- Not interested in software applications
- Just business applications!

- No facilities
- Cost less
- More scalable
- More secure
- More reliable

Cloud

- You scale as much as you need – just switch on

- You get more power instantly from a cloud
- It works like electricity or water supply

Do not focus on platform

- You don’t care – you just use

- Three main advantages:

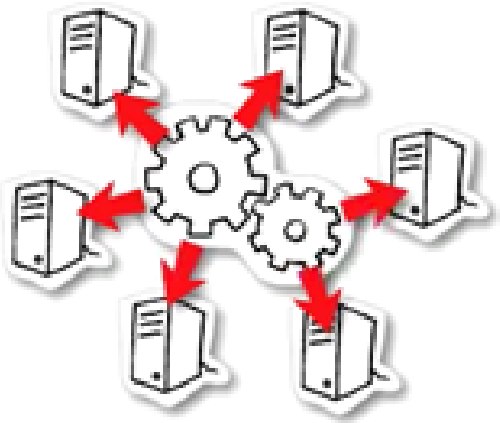
1. Scalability
2. Instant
3. Saving

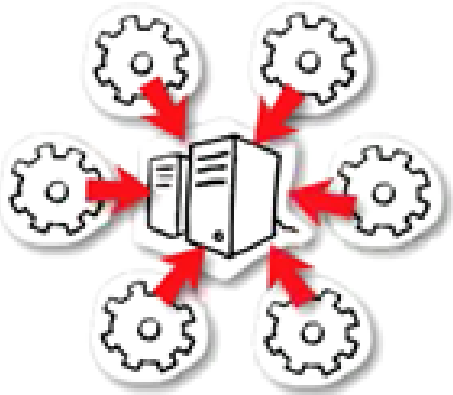
Scalability

Instant

Convergence of 3 trends

1. Virtualization
   - Applications separated from infrastructure
2. Utility computing
   - Server capacity accessed across a grid
3. Software as a Service
   - Applications available on demand on subscription basis





Why buy

Don’t worry about

- machines – servers
- experts

They take care about

Why lease or rent?

- You can use hosting

But still you can not
change inside, upgrade…

You pay monthly
You pay maintenance
- It is Software as a Service

Use taxi

- When you need – take the ride

- It is cloud computing
- Pay as you go!
- No maintenance, or tolls

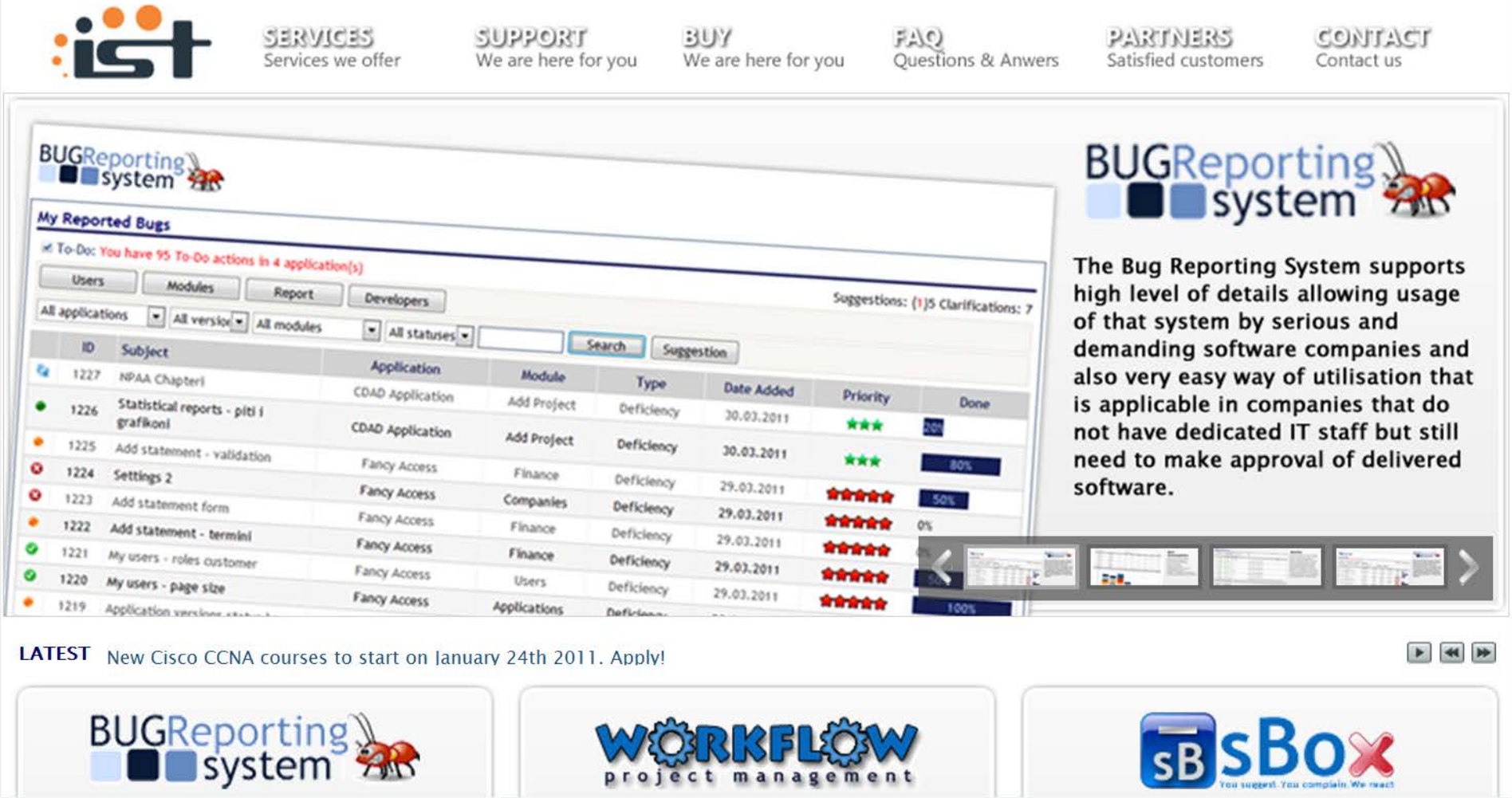
Focus

- Instead enterprises to use different applications
- they use same application –
- they share
- it is flexible

- Like shared office space services (security, …)

- Why buy, when you can rent!
- Do not buy hardware, software – just rent
- Focus on projects and business

Research and development



Fancy innovations

Current week

Next week >>

Days of week	Name of day	New	Pending	InProgress	Resolved	Closed	Rejected	TOTAL
28/03/2011	Monday	1	3	1	1	3	2	11
29/03/2011	Tuesday	3	2	0	0	3	2	10
30/03/2011	Wednesday	2	2	4	4	0	0	12
31/03/2011	Thursday	0	1	2	2	0	0	5
01/04/2011	Friday	0	0	0	0	0	0	0
02/04/2011	Saturday	0	0	0	0	0	0	0
03/04/2011	Sunday	0	0	0	0	0	0	0
TOTAL:		6	8	7	7	6	4	38

Main functionalities

- Bug reporting functionality
- Document management
- Time stamp and tracking
- Search and view
- Email notifications
- Managing the bug reporting
- Adding/Editing bugs
- Reports – Statistics and Analytical
- Application/Modules administration

LATEST New Cisco CCNA courses to start on January 24th 2011. Apply!

BUGReporting system

Bug Reporting System is leading cloud computing software solution in quality assurance and task management. The usage is quick, simple and easy as using e-mail web client. It allows organizations to collect, track and assign bugs ...

WORKFLOW project management

The aim of the WORKFLOW MANAGER is to provide a tool to set tasks and track their execution. Old fashion management approach allows each manager on whatever managerial level, to manage effectively from 3 to 5 subordinates. This cl...

sBox You suggest. You complain. We react

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Cloud applications

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EMM E-MAILMARKETINGMODULE

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survey DATA COLLECTION SERVICE

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SALES automation

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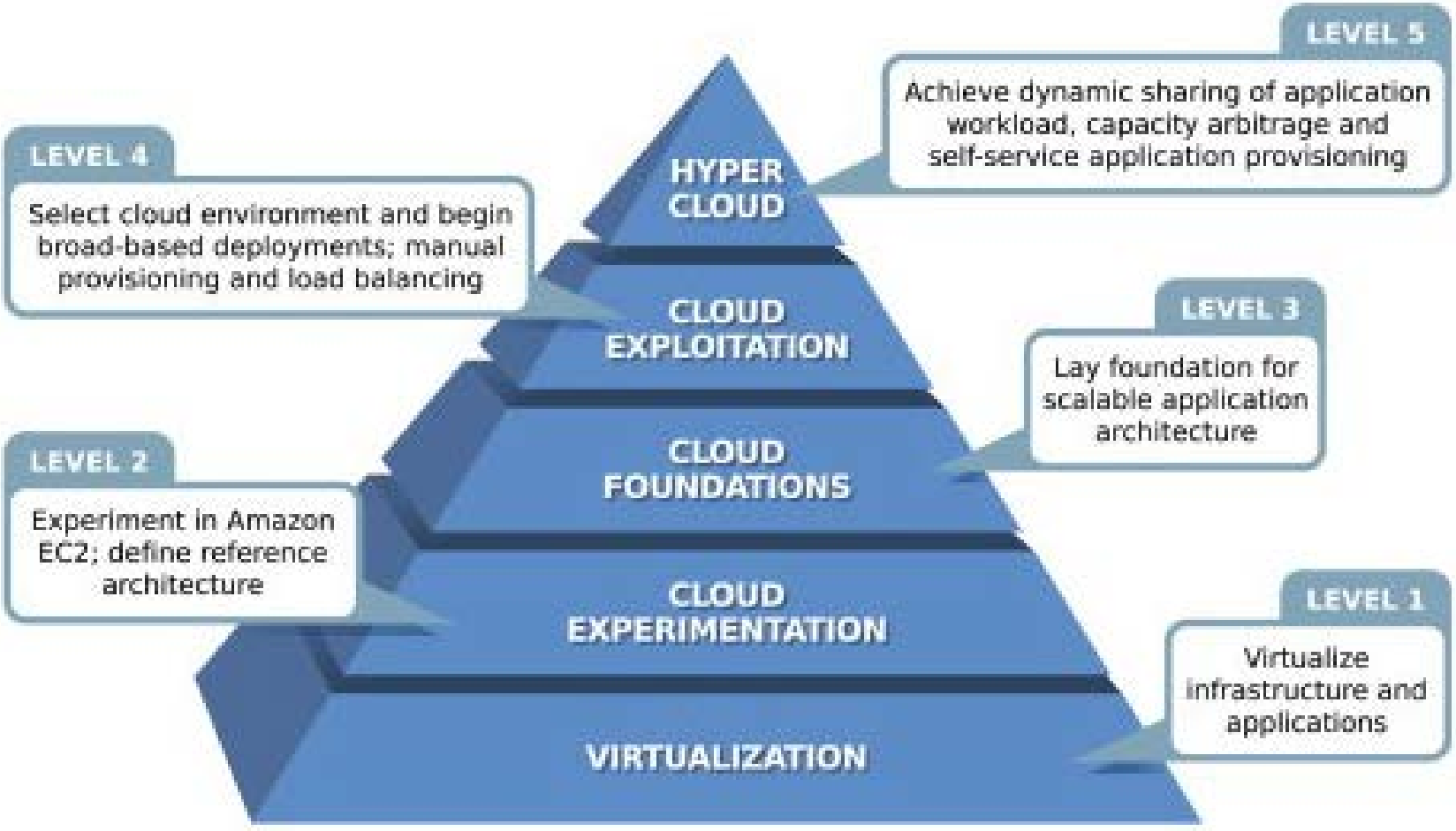
Adoption Model



Cloud providers

Cloud applications

Benefits and problems

From http://blogs.zdnet.com/Hinchcliffe

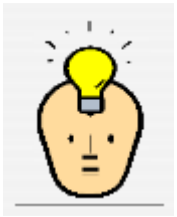
Future

Expected in next 10 years

- Smiling cloud solutions

What is Innovation?

Inspiration



Idea

Why does IT matters?

Invention

Application

Innovation

Benefit

INNOVATION

InnovationAcademy