



KIV/SI

Přednáška č.10

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Cloud



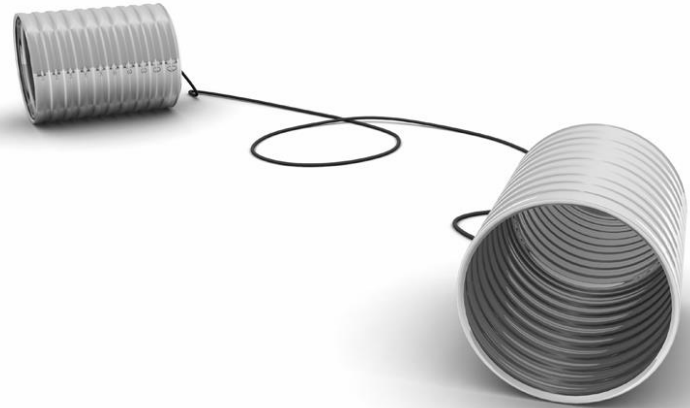
A man with a mustache and goatee is lying on his back on a white surface. A black leather boot is placed on his forehead. He has a confused expression on his face.

I'm Cloud Confused

Demystifying Cloud Computing

<http://www.slideshare.net/Guppers/im-cloud-confused>

What the say:



“Biggest Paradigm Shift in 20 years”

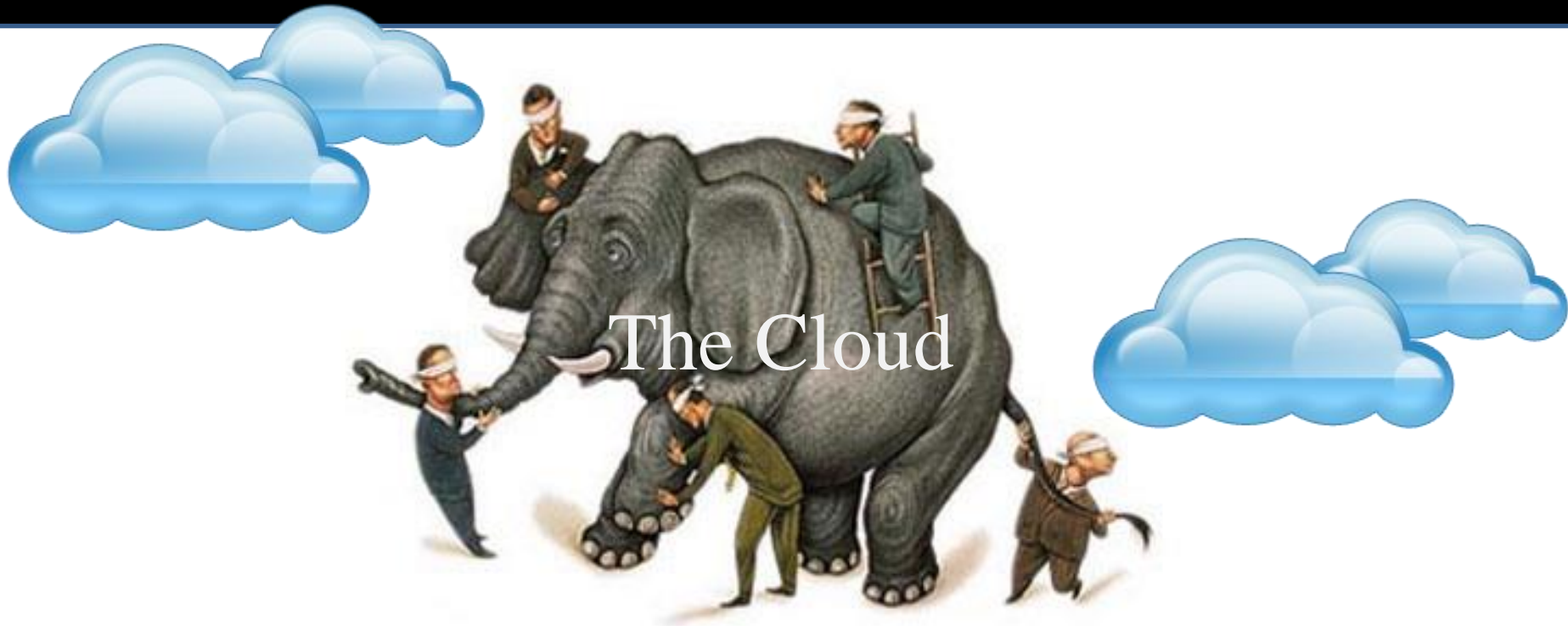
“Game Changers”

“Just On”

“Pay As You Go”

“Tremendous Cost Cutting”

Describe The Cloud To Me



21 experts are defining cloud computing <http://bit.ly/C6jIm>

**Picture taken under Creative Common license*

As **an end-consumer**, believe it or not
you've been using **Cloud** for long times



Yes, most of them are

Free



In return, you're willing to give away

**BIG
SALE**

your information
for ads and other purposes

- Cloud computing
- datacentrum

- SaaS
 - Google Apps (Gmail...)
 - Salesforce
 - Microsoft Office 365
 - IBM Docs
- PaaS
 - Amazon (AWS)
 - IBM Smartcloud
 - Microsoft Azure



But you've been enjoying

High Reliability Service
(ok, ok, most of them are)

Unlimited Storage

Connecting, Sharing

OK, Now tell that to the business owner

*Give up your **data**, then
you can use this infrastructure for free*

This is how their CEO would feel





My Business Needs...

Security

Privacy

Reliability

High Availability



Building Enterprise Software

is like....

Building

Medieval **Castle**

Stone Wall

Fire-proof

Moat

Army

Death Hole

Let's Hire an Army of IT Engineers



Software Upgrade

Support

Backup/Restore

Service Pack

Development

Network issues

Let's Build Huge Data Center

Capacity Planning

Cooling Management

Disaster Plan

Server Crashes





Requires

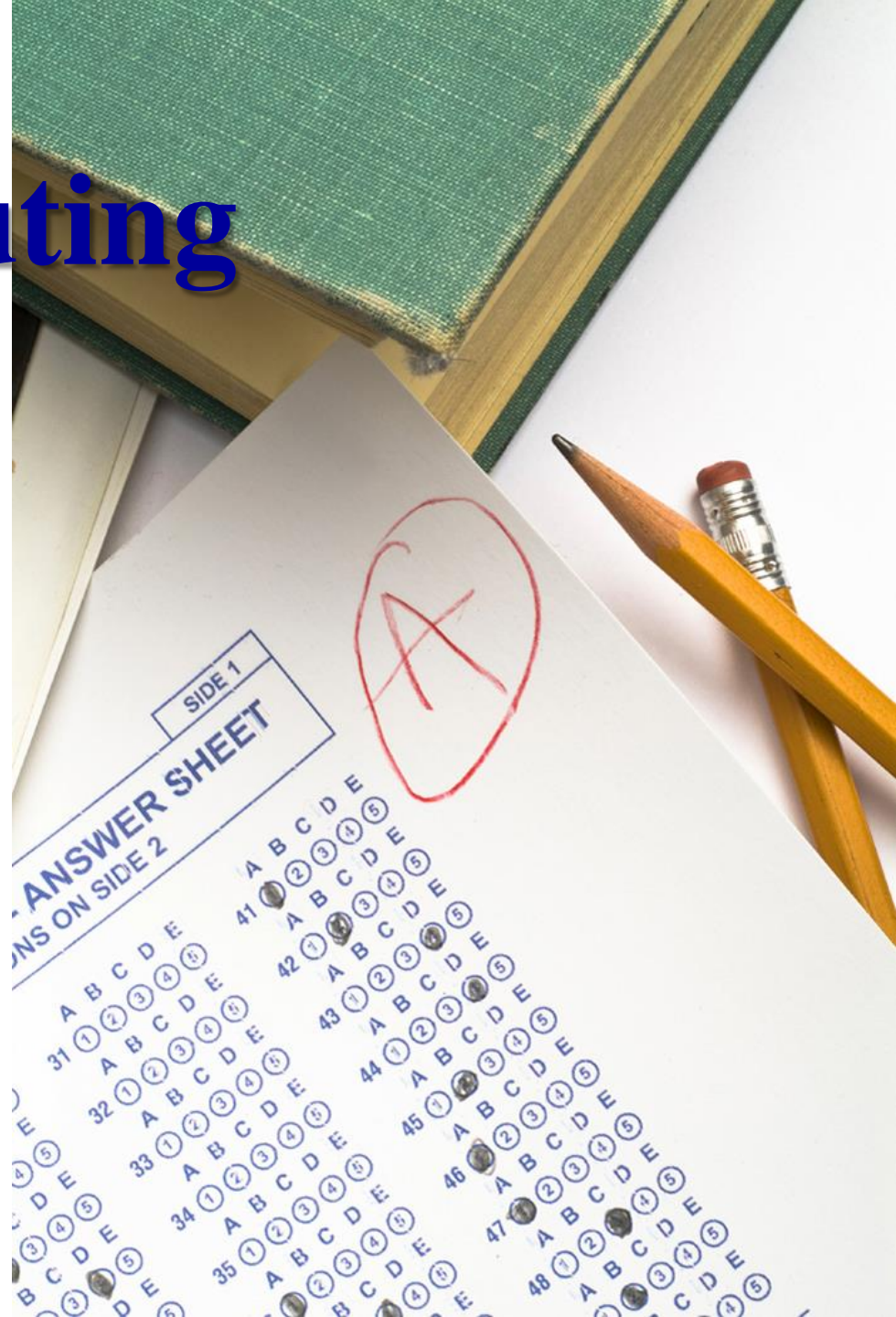
a **New Way**
of **Thinking**

Cloud Computing

is *not*

the **answer**

for all



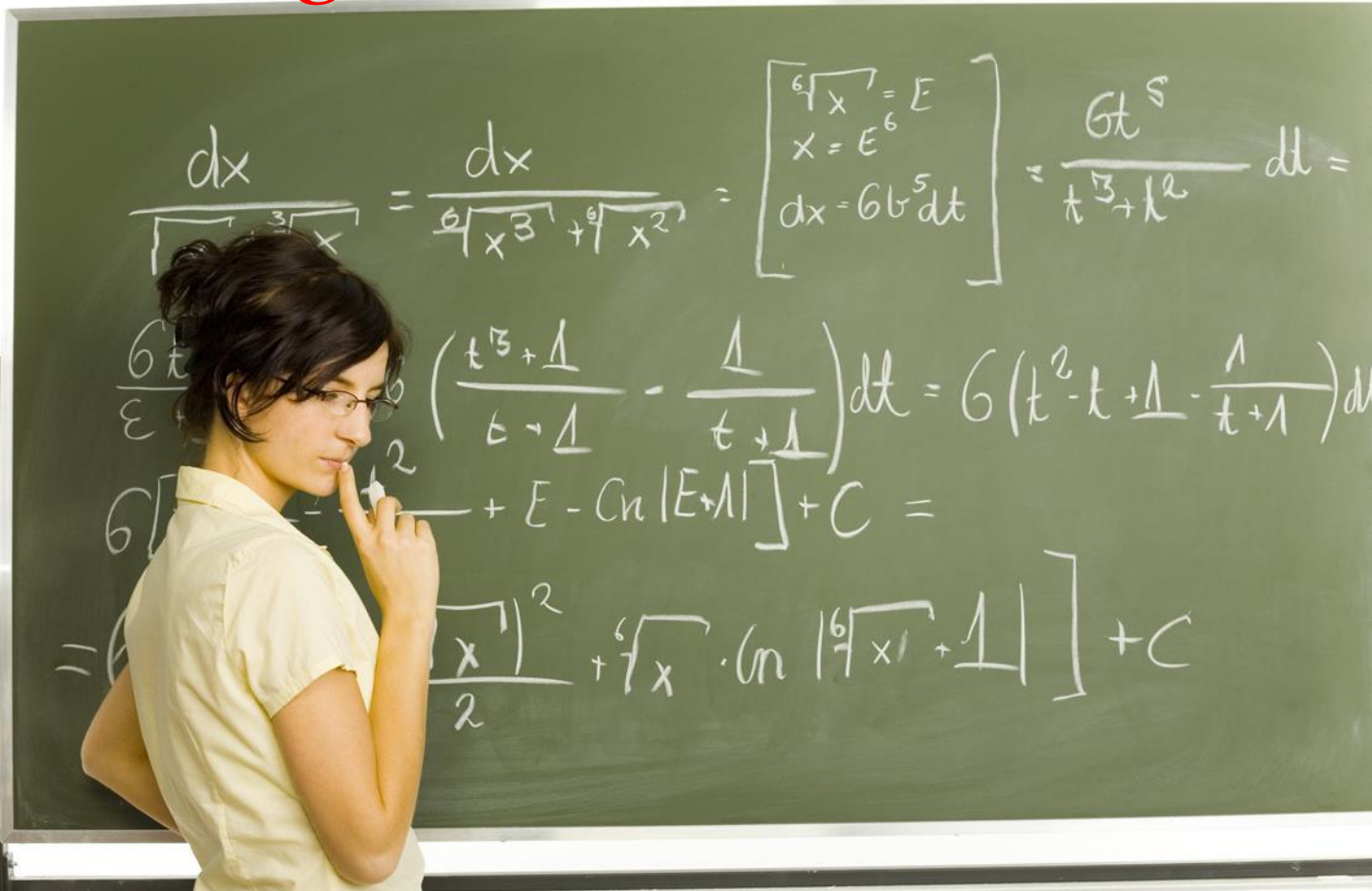
But it could **simplify** our lives....



Leave it the experts

who have a lot of money to spend to build

***giant** datacenters across the globe*



Your data is replicated
3 or 4 times in their data center



High Availability

High Traffic?

A close-up photograph of a hand clicking a computer mouse. The mouse is silver and black, and the hand is positioned over it. The background is a blurred, light-colored surface.

Adding “**servers**” is a click away.
Running in just **minutes**, not **days**



It can even **load balance**
your server traffic



Expect your *Cloud*

Network

is always **up**

You can pick **where** your data resides



Business Contraction?



Just reduce your
computing power, storage



Wait,

What is the catch?



Cloud Computing

is relatively **new** technology



Growing Pains



We all learn from it

Only a handful of major players
can build
this massive **infrastructure**

Microsoft

Windows Azure Platform

amazon.com



Google

Google app engine

Not many software written yet to take
advantage of **cloud** infrastructure



Sensitive Data in the Cloud?
are there yet?

Encryption

Data at Rest

Data in Motion



Yes, you're loosing some controls

physical security

some configurations

only subset of APIs

Let's pick a simple story

You worked hard this year,
you bought a pile of **gold** bars



Where should you **store** them?

House?

Bank?



Your House



Your Bank

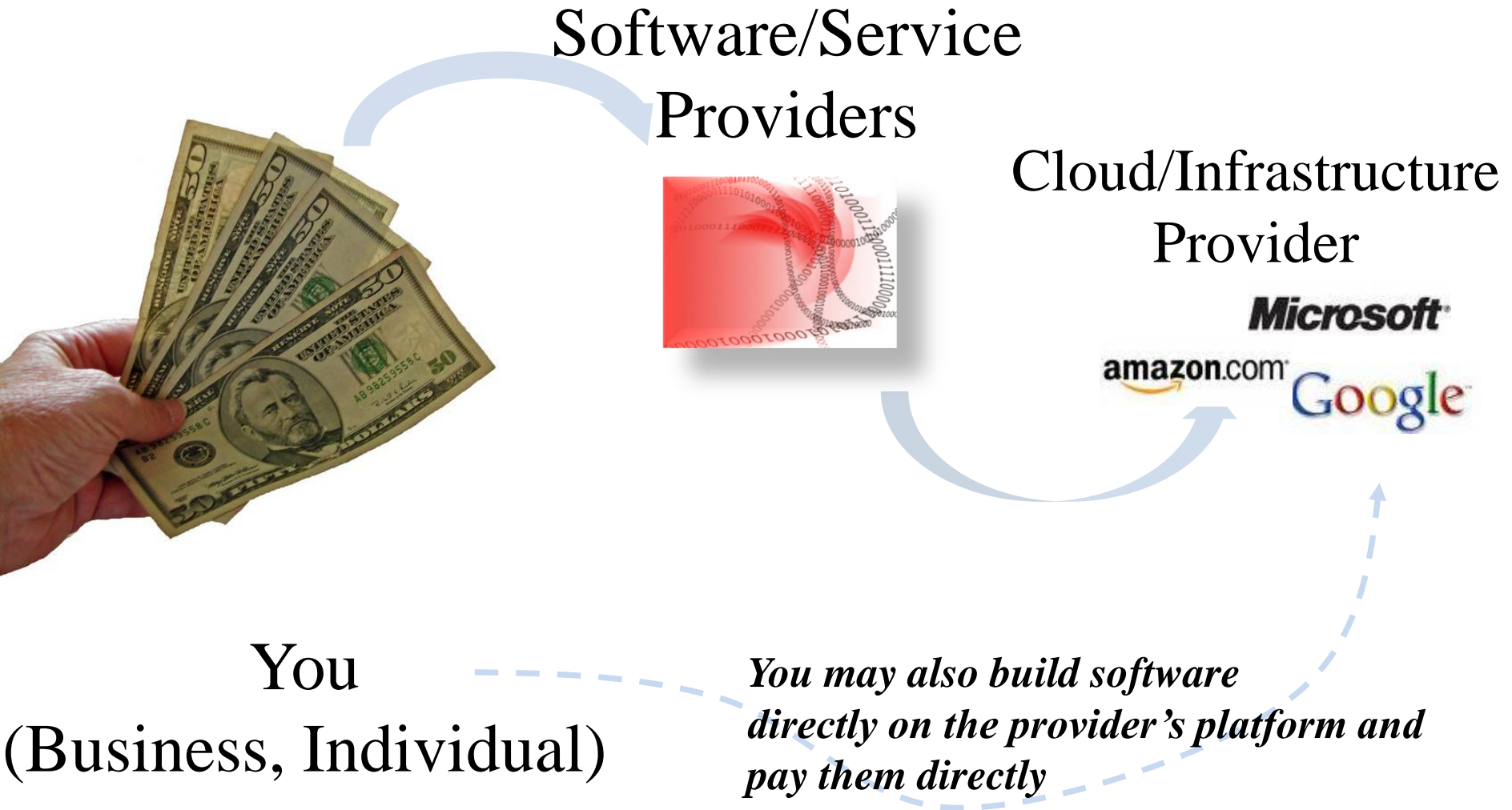
Let's clear common **confusions**
about Cloud Computing



Who is paying whom?



Typical Scenarios

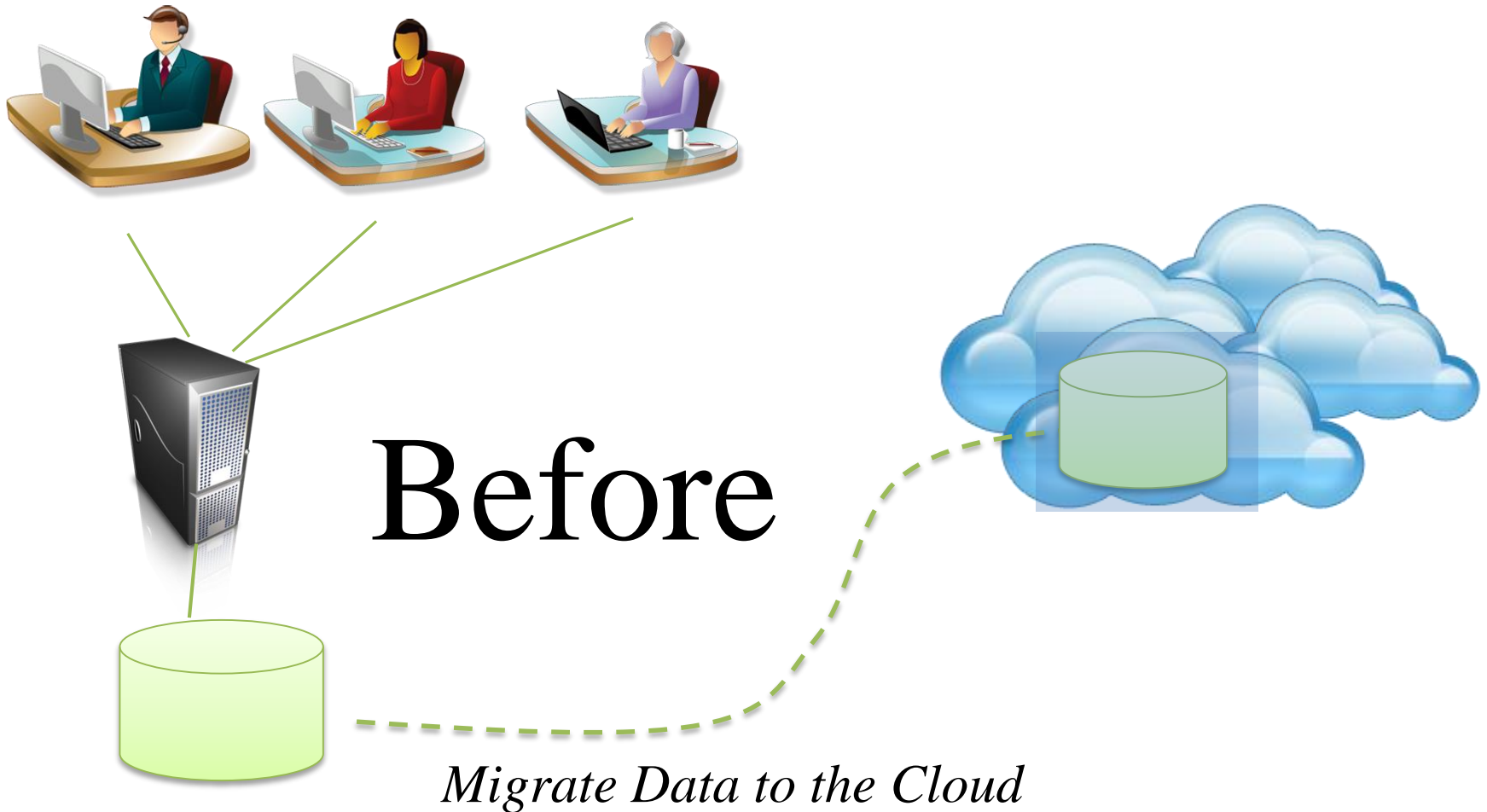




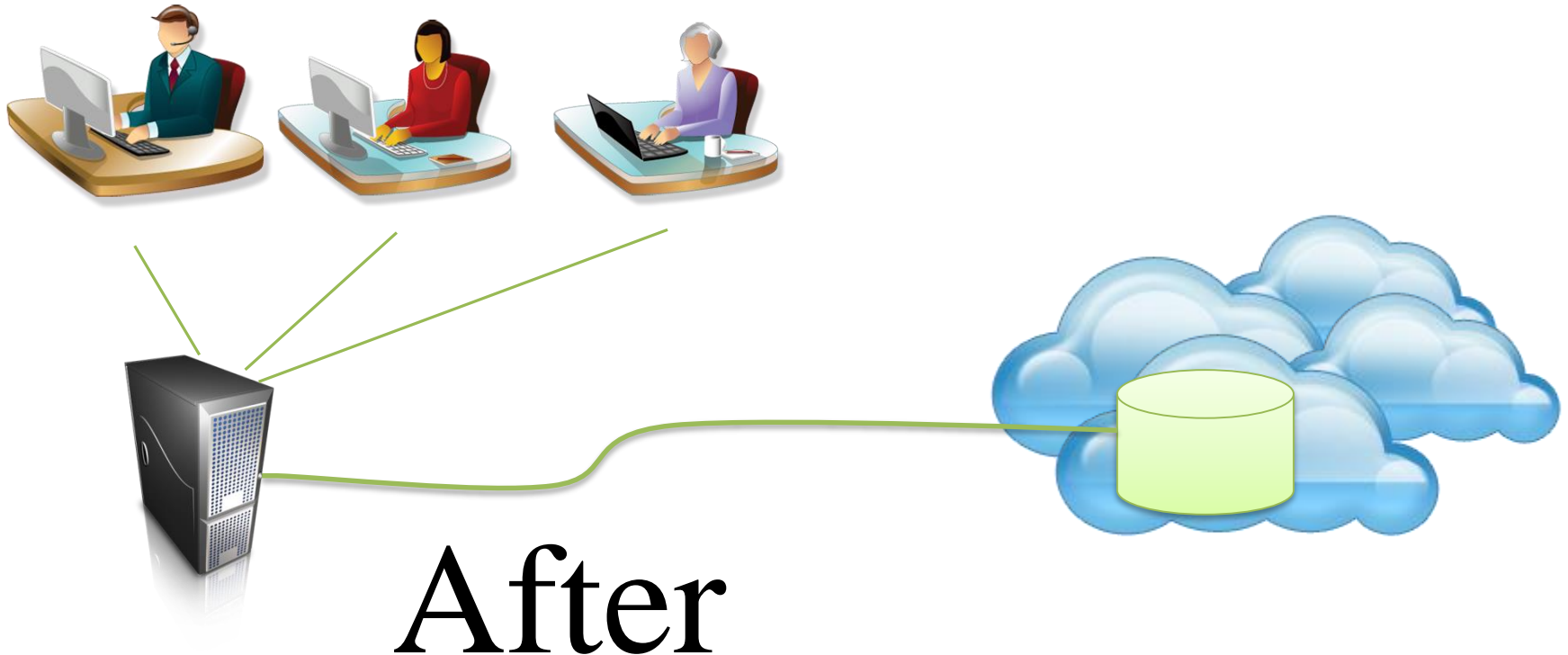
Do I have to start over?



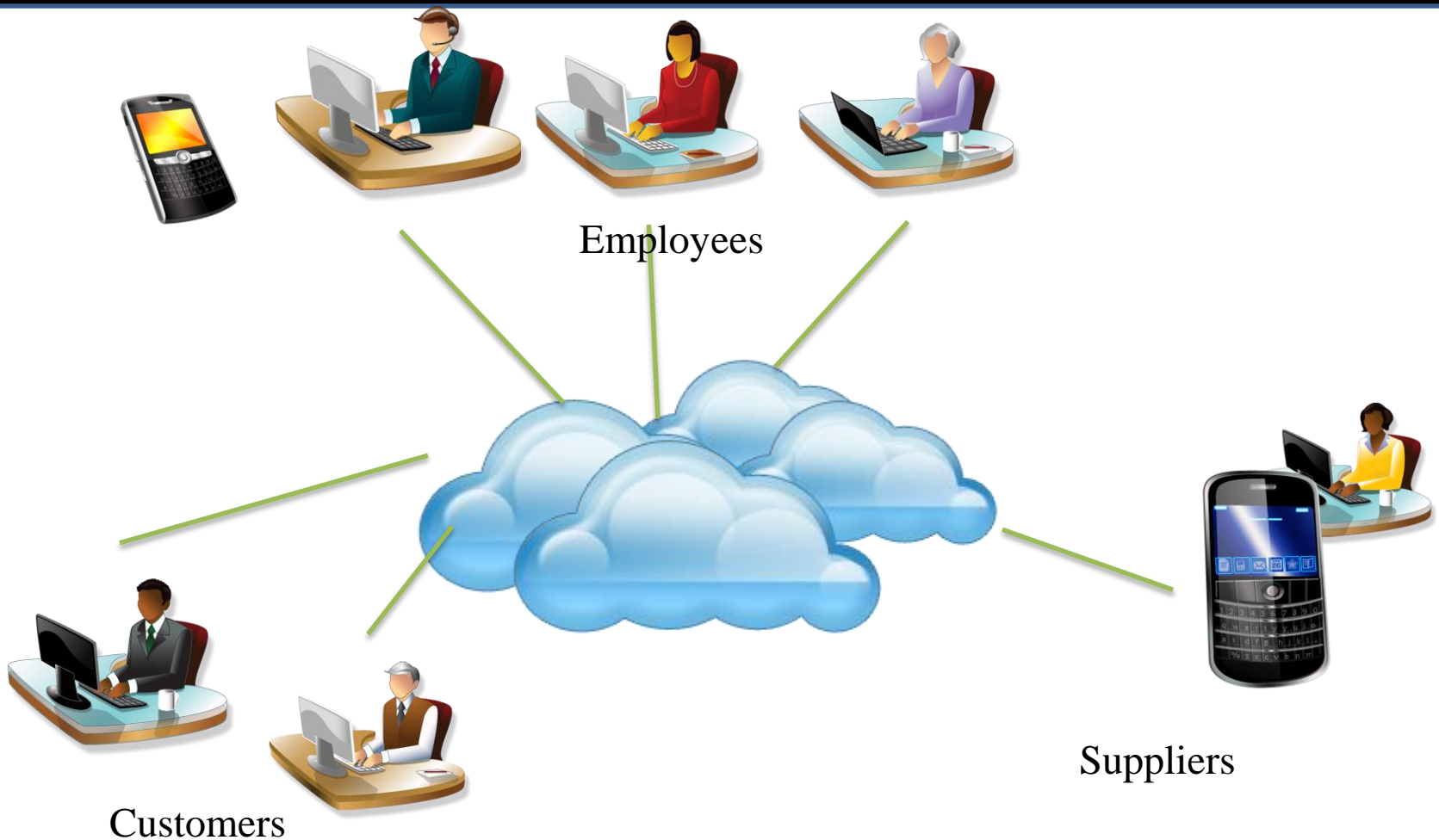
In some cases,
you could **redirect** your data to the cloud



In some cases,
you could **redirect** your data to the cloud



However, to take **advantage fully**,
migrate all or create new apps on the cloud





Is this just Hosting 2.0?



No, they have different architectures and business model

Cloud Players



Only few can afford billions dollar investment on data centers

Hosting Players

Hundreds of them around the world



Your contracts



Cloud Players

Pay As You Go



Pay only what you use

Hosting Players



Often yearly

Reliability, High Availability, Capacity Elasticity



Cloud Players

*Virtually unlimited
storage, computing power*



Built-in Redundancy

Hosting Players

*Bring your own or rent
servers to increase capacity*

*You have to manage
reliability, fail over yourself*





The end of PC ?



NO?



Most cloud applications that will be built are accessible from PC.

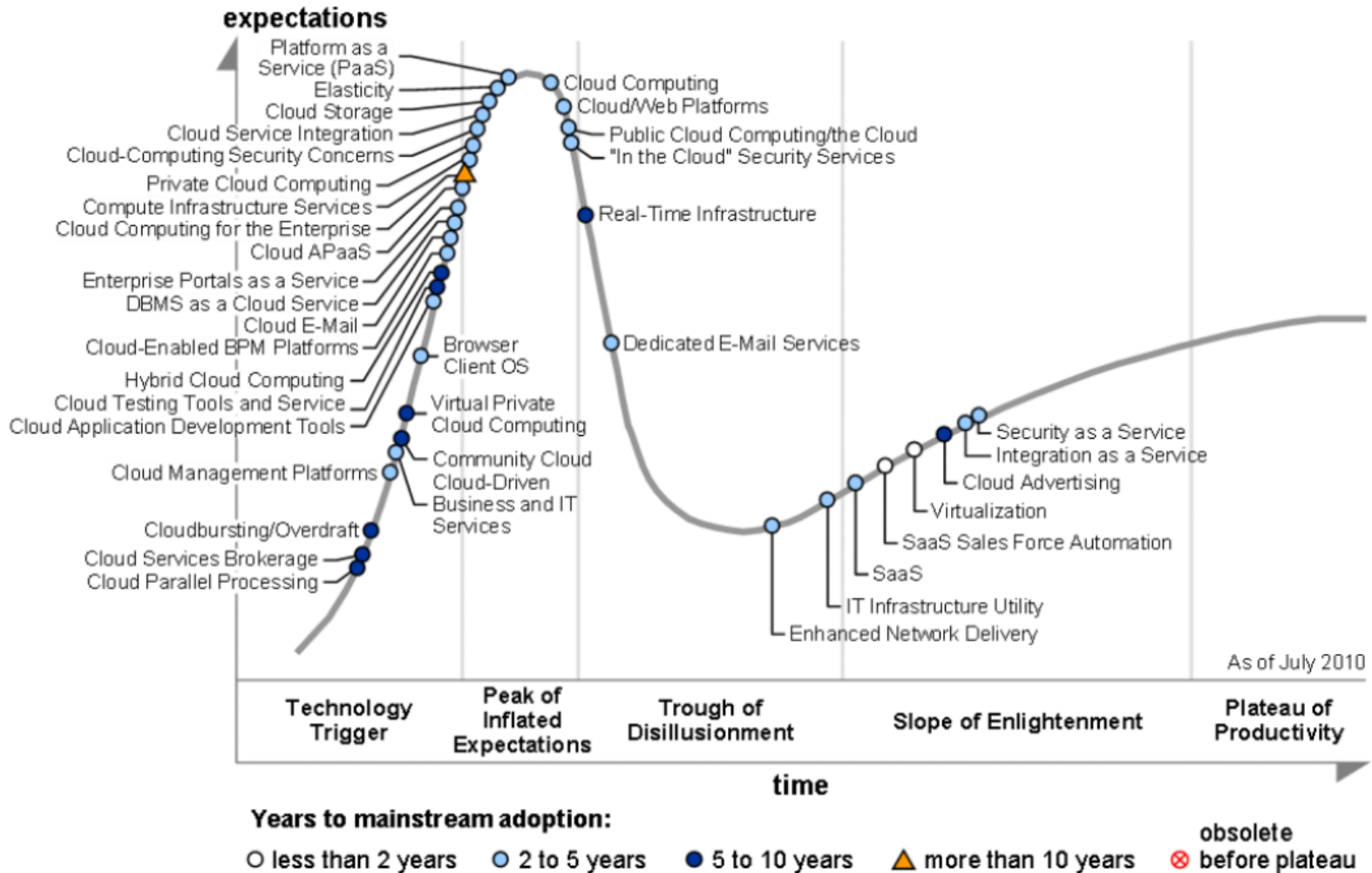
Applications can be a browser base, application running on PC accessing data and services on the cloud

So will the mobile applications



Hype Cycle for Cloud Computing, 2010

Figure 1. Hype Cycle for Cloud Computing, 2010



Source: Gartner (July 2010)

Virtualized

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



Doing more with less

Standardized

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



Higher quality services

Automated

- Faster cycle times
- Lower operating expense
- Optimized utilization
- Improved compliance
- Optimized security
- End user experience



Breakthrough agility and reducing risk



Různé typy cloudů



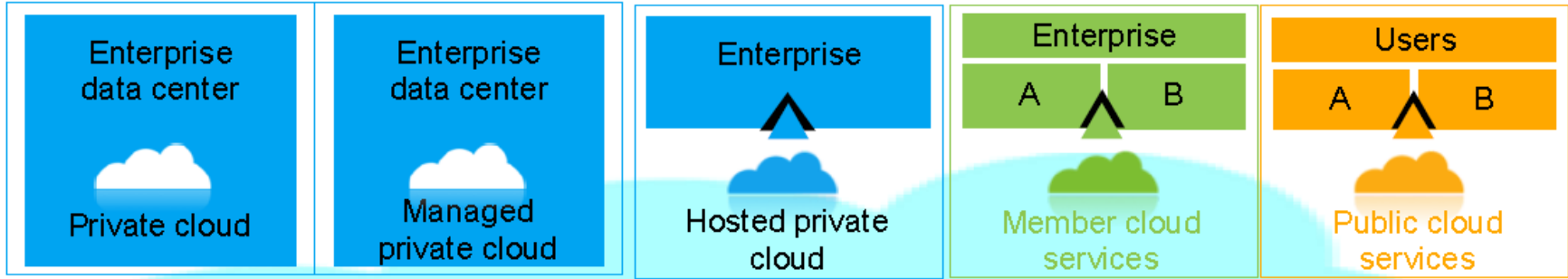
- Private
- On client premises
- Client runs/ manages

- Third-party operated
- Client owned
- Mission critical
- Packaged apps
- High compliancy
- Internal network

- Third-party owned and operated
- Standardization
- Centralization
- Security
- Internal network

- Mix of shared and dedicated resources
- Shared facility & staff
- VPN access
- Subscription or membership based

- Shared resources
- Elastic scaling
- Pay as you go
- Public Internet



Různé role firem

CLOUD INFRASTRUCTURE PROVIDERS

"I want to build and operate a public cloud infrastructure (IaaS and PaaS)"



CLOUD BUILDERS

"I want to help my clients to design, build, manage their private cloud"



CLOUD APPLICATION PROVIDERS

"I want to deliver my application / asset as a cloud service"



CLOUD AGGREGATORS

"I want to aggregate a portfolio of public cloud services for my clients"



CLOUD TECHNOLOGY PROVIDERS

"I want to extend and add value other providers' clouds"

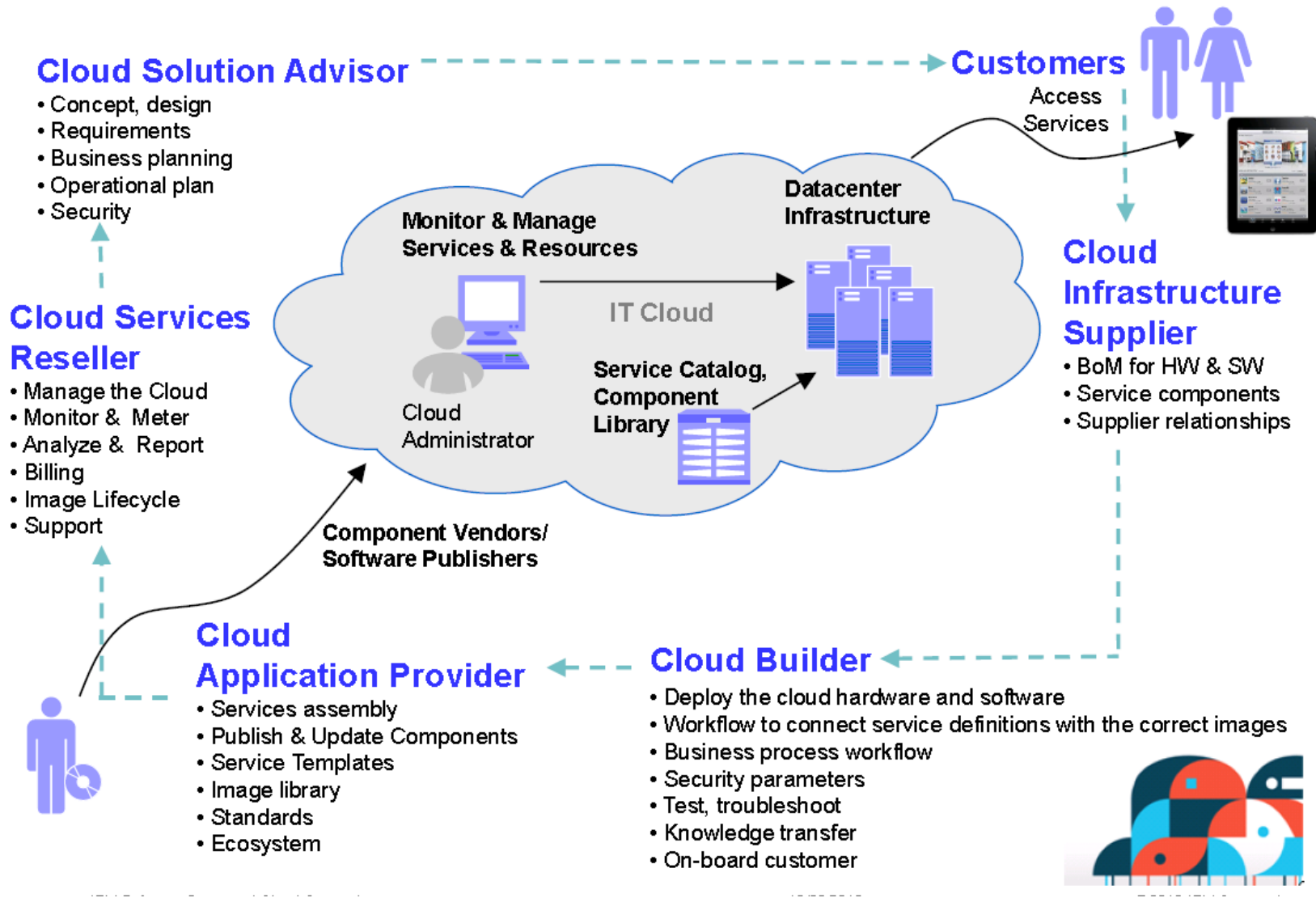


CLOUD SERVICES RESELLERS

"I want to resell a portfolio of public cloud services"



Cloud a role IT firm



Byznys a IT benefity jsou reálné...



| | | | |
|----------------------------------|----------------------------|--------------|---------------|
| Increasing speed and flexibility | Provisioning | Weeks | Minutes |
| | Change management | Months | Days/hours |
| | Release management | Weeks | Minutes |
| | Service access | Administered | Self-service |
| Reducing costs | Standardization | Complex | Reuse/share |
| | Metering/billing | Fixed cost | Variable cost |
| | Server/storage utilization | 10–20% | 70–90% |
| | Payback period | Years | Months |



People and identity

Mitigate the risks associated with user access to corporate resources



Data and information

Understand, deploy and properly test controls for access to and usage of sensitive data



Application and process

Help keep applications secure, protected from malicious or fraudulent use, and hardened against failure



Network, server and end point

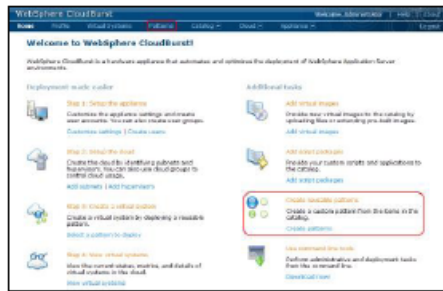
Optimize service availability by mitigating risks to network components



Physical infrastructure

Provide actionable intelligence on the desired state of physical infrastructure security and make improvements

1) WebSphere CloudBurst Appliance (hardware)



2) CloudBurst dispenses WebSphere Application Server Hypervisor Edition Servers into a set of other machines

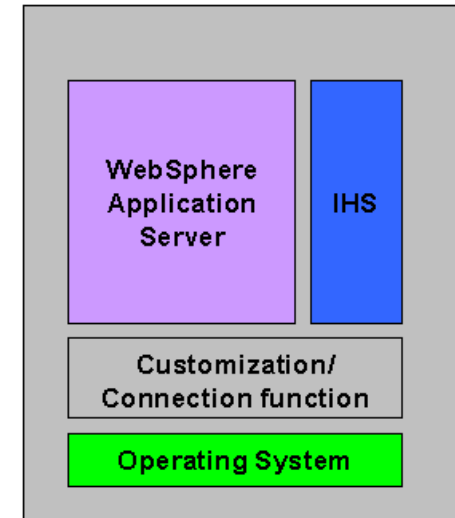


1) User requests WebSphere Application Server Hypervisor Edition Environment to be dispensed



3) User can access WebSphere Application Server Hypervisor Edition Servers (Virtual Image)

2) WAS Hypervisor (Virtual Image-software)



The WebSphere CloudBurst appliance dispenses these virtual images into a private cloud



Adopce cloudu bude „workload-driven“



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

Top public workloads

- Audio/video/Web conferencing
- Service help desk
- Infrastructure for training and demonstration
- WAN capacity, VOIP Infrastructure
- Desktop
- Test environment infrastructure
- Storage
- Data center network capacity
- Server

Source: IBM Market Insights, *Cloud Computing Research*, July 2009. n=1,090





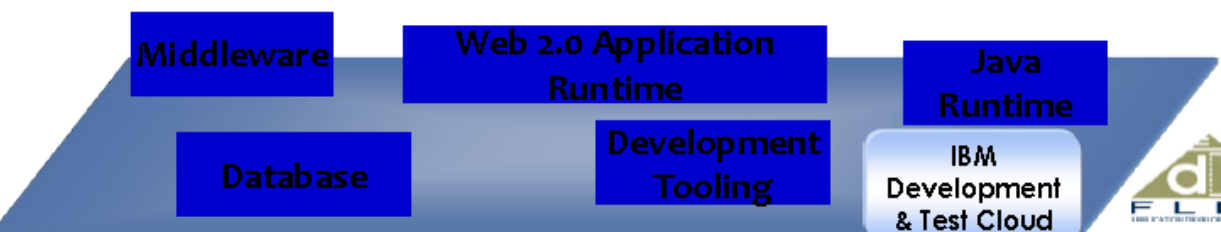
Four main Cloud Service categories



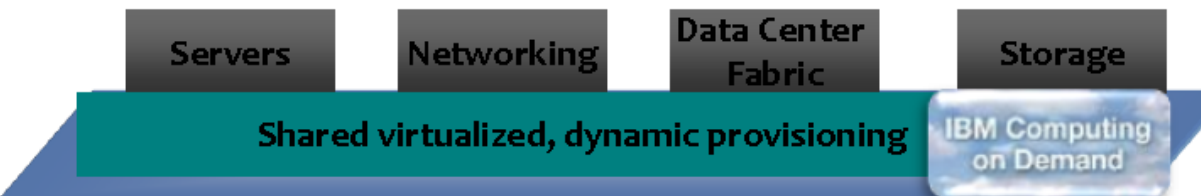
Business Process as a Service (BPaaS)



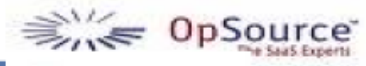
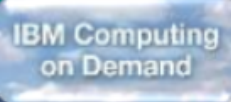
Software as a Service (SaaS)



Platform as a Service (PaaS)



Shared virtualized, dynamic provisioning



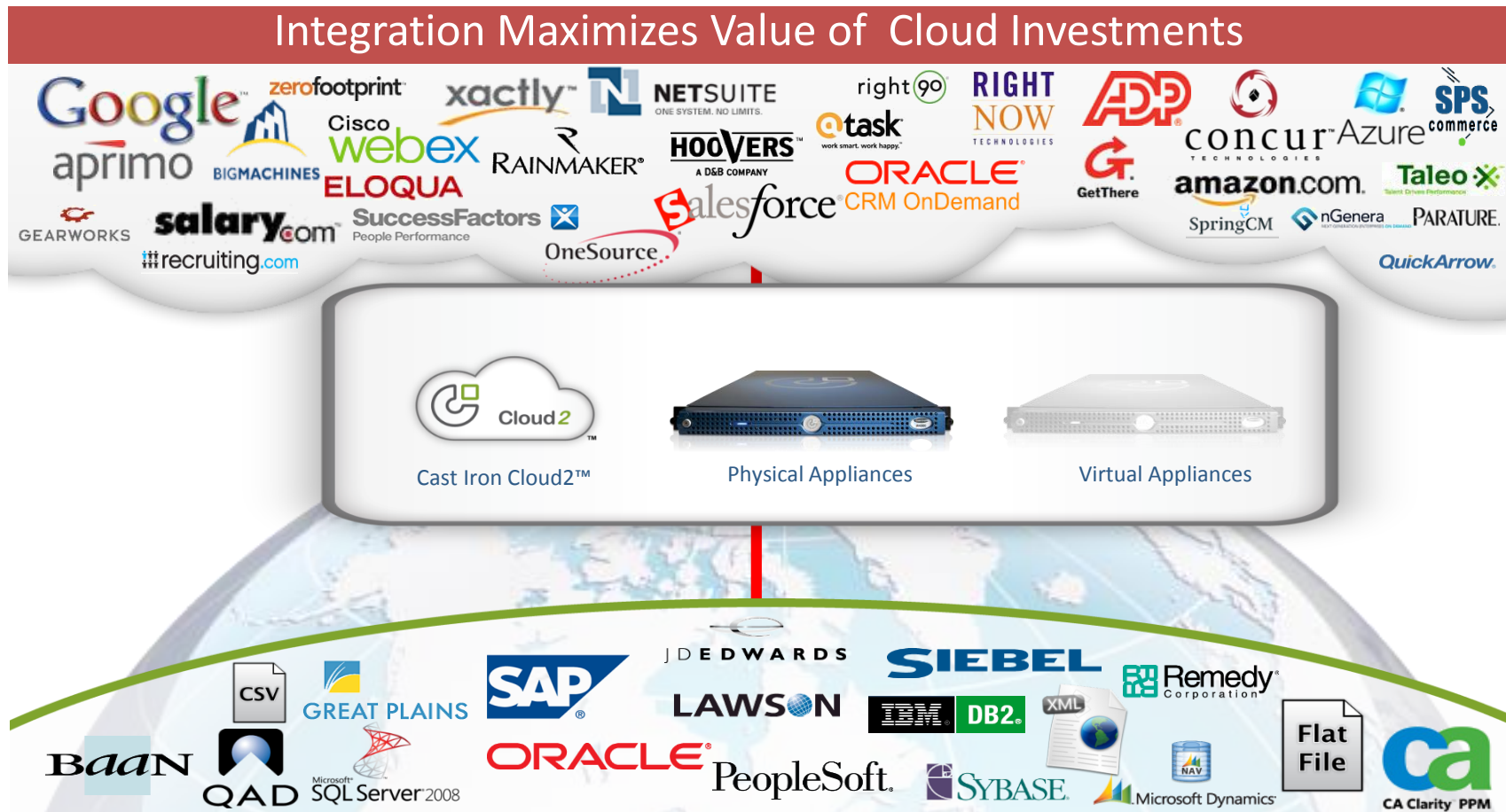
Infrastructure as a Service (IaaS)



- Logický důsledek virtualizace
- Strategická iniciativa
- Využití HW
 - Pořízení, provoz, servis, údržba, správa
 - Green IT – elektřina, chlazení
 - Prostor (plocha serveroven)
- Optimalizace SW a licencí
- Optimalizace nákladů

Integrace v cloudu a s cloudem

- Integrační (mediační vazba) 1:1
- Příklad řešení Cast Iron:



IBM Pure Flex System



Shared

Built-in expertise

Fast time to value

Pre-configured and pre-integrated

Integrated management and monitoring of system-delivered components

Single point of support for system-delivered components

IBM Pure Application System



Customers who ...

want to reduce complexity and improve performance with great economy

want fully integrated and seamless managed IT with utmost performance

want ultimate control over component configurability

want to upgrade system components independently

seek broad technology choices (x86, VMware, Win, AIX, etc.)

prefer an infrastructure centric view of IT; aligned to current IT processes

purchase middleware separately

want automated infrastructure provisioning and virtual image support to deploy applications

Customers who ...

want a platform optimized for enterprise applications

want to achieve business value with application systems

want single part number integrated platform systems with minimal configurability for time to value and factory optimization

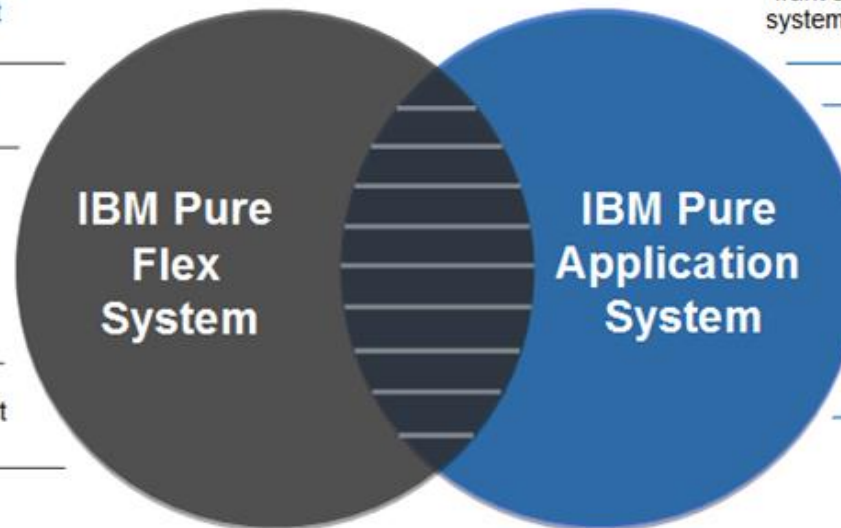
want expert integrated middleware

want SLA driven automated deployment, management, scaling and elasticity of web and database applications

prefer an application centric view of IT; aligned to new IT processes

want zero down time upgrades

want unified maintenance for all system delivered components



- Závislost na cloud providerovi
- Dostupnost konektivity
- Ochrana dat (a fyzické umístění)
- Legislativa (efektivní právo)
- Není cesta zpět

- Zkrácení distribučního řetězce
- Změna obchodních vztahů
- Změna podpory a „vlivu“ dodavatele u zákazníka
- Změna finančních toků
 - Cachflow, ziskovost v čase...

- **Není plánováno, chybí strategie**
 - Co dát nebo nedat do cloudu
 - Integrace mezi cloudem
 - Intgerace cloud s on-premises
- **Cloud nakupují byznys uživatelé (dělají IT rozhodnutí)**
- **O cloud se nikdo nestará (nulová správa)**
 - Definice dat, význam dat...
 - Reporty, vyladění..
- **omezená customizace**
- **Ztráta kontrolu (nestandardní situace)**
- **Nevěnuje se pozornost detailům (licenční podmínky)**