



Programowanie w chmurze na platformie Java EE

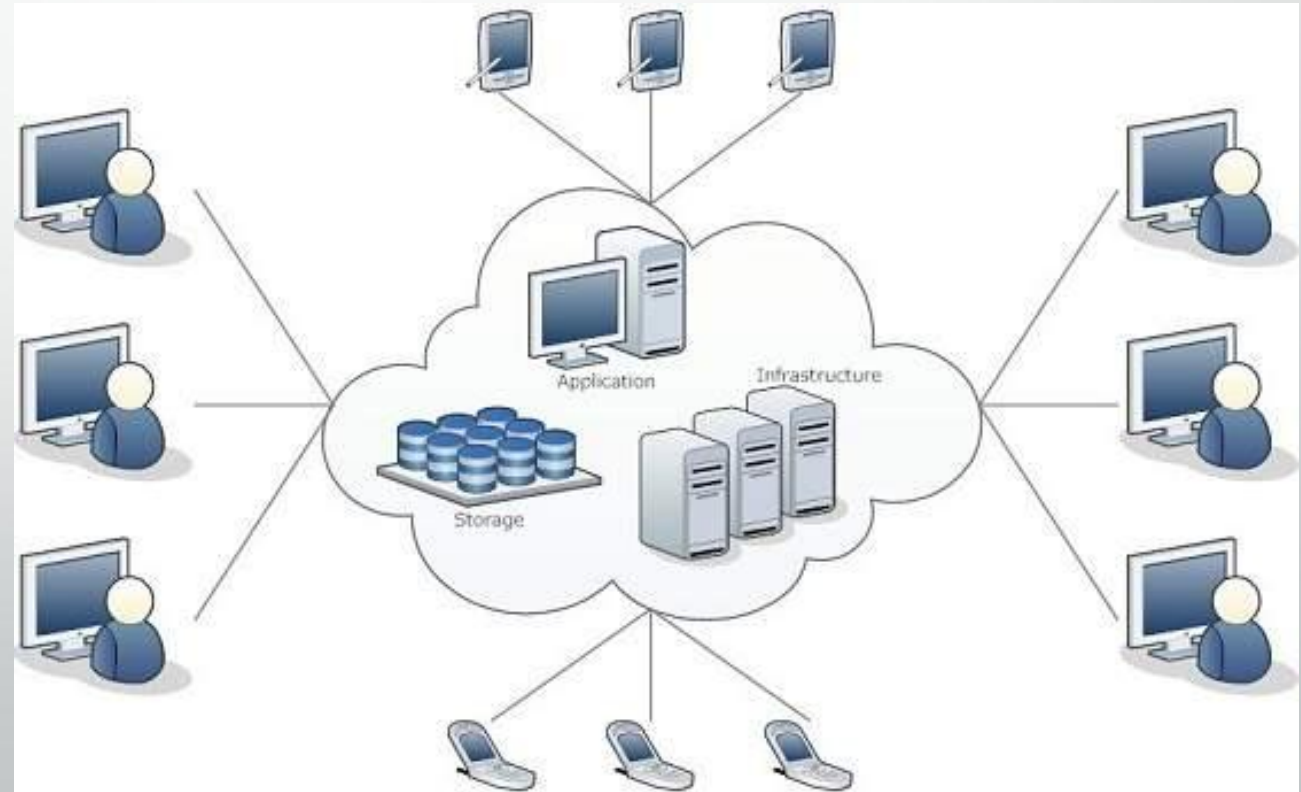
Wykład 1 - dr inż. Piotr Zając

Cloud computing definition

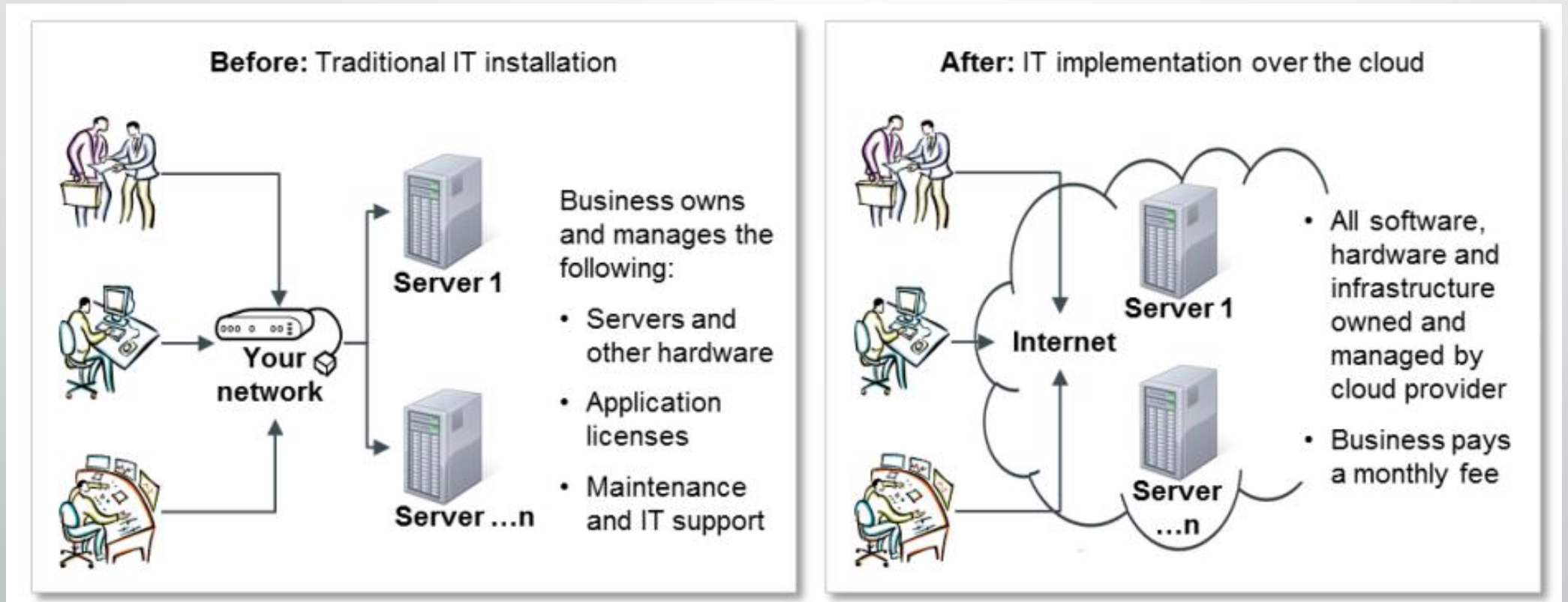
- Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.
- This cloud model promotes availability and is composed of 5 essential characteristics, 3 service models, and 4 deployment models.

What is cloud computing?

- Cloud Computing can be defined as delivering computing power (CPU, RAM, Network, Storage, OS, software) a service over a network (usually on the internet) rather than physically having the computing resources at the customer location.
- Examples: AWS, Azure, Google Cloud



Cloud computing idea



Benefits of cloud computing

The potential for cost saving is the major reason of cloud services adoption by many organizations. Cloud computing gives the freedom to use services as per the requirement and pay only for what you use.

- Lower IT infrastructure and computer costs for users
- Improved performance
- Fewer maintenance issues
- Instant software updates
- Improved compatibility between operating systems
- Backup and recovery
- Performance and scalability
- Increased storage capacity
- Increased data safety

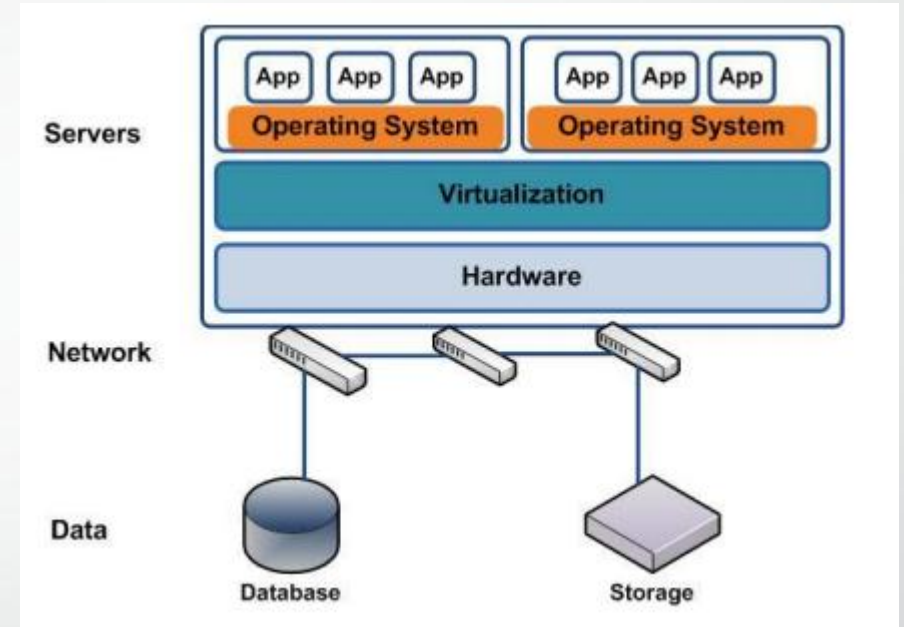
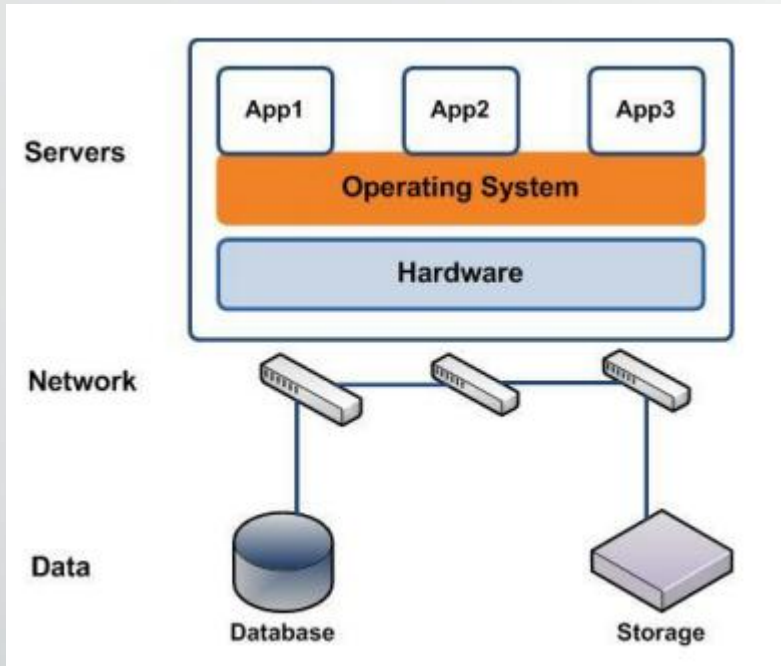
Risks of cloud computing

- Security and Privacy
 - It is always a risk to handover the sensitive information to cloud service providers.
- Lock in
 - It is very difficult for the customers to switch from one Cloud Service Provider (CSP) to another. It results in dependency on a particular CSP for service.
- Isolation Failure
- Management interface compromise
- Insecure or incomplete data deletion

Why now?

- Economies of Scale
 - The enormous growth of e-commerce, social media, and various Web 2.0 services has tremendously increased the demand for computational resources. It is more feasible to build very large data centers than many small ones
- Commodity hardware
 - Significant decrease in computer hardware costs over the past decade
- Expertise
- Virtualization
 - Ensures that hardware resources are utilized more efficiently.
- Open-source software
 - The ability to avoid expensive software license costs

Virtualization



- The operating system was installed directly to hardware, and most of the servers hosted multiple applications within the same operating system without providing physical or virtual isolation
- Virtualization isolates software from hardware and so provides a mechanism to quickly reallocate applications across servers based on computational demands

5 essential characteristics

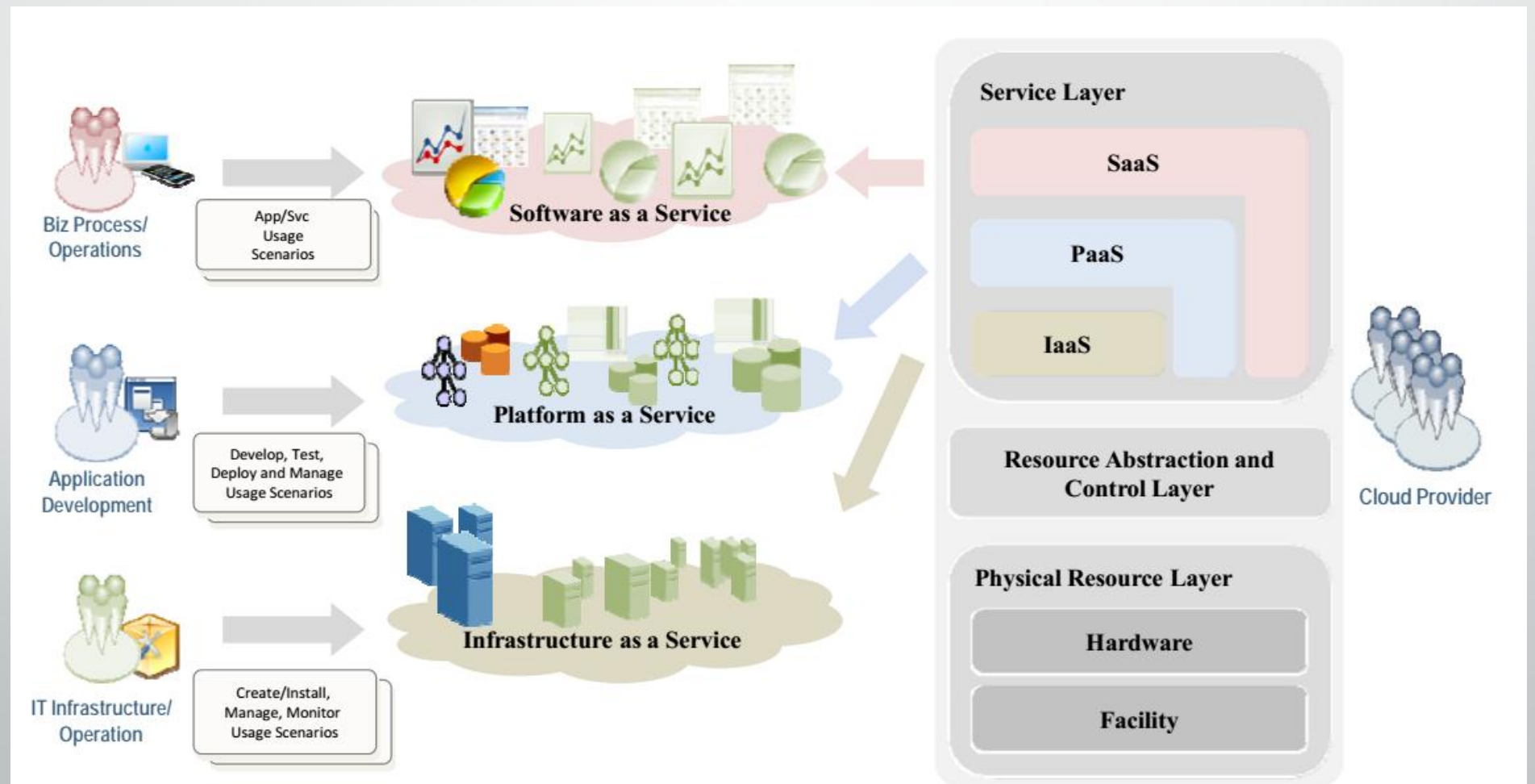
- On-demand self-service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measured service

Deployment models

- Public Cloud
 - The public cloud allows systems and services to be easily accessible to the general public. Public cloud may be less secure because of its openness.
- Private Cloud
 - The private cloud allows systems and services to be accessible within an organization. It is more secured because of its private nature.
- Community Cloud
 - The community cloud allows systems and services to be accessible by a group of organizations.
- Hybrid Cloud
 - The hybrid cloud is a mixture of public and private cloud, in which the critical activities are performed using private cloud while the non-critical activities are performed using public cloud.

Service models

- IaaS, PaaS, SaaS



Software as a service

- SaaS or software as a service is a software distribution model in which applications are hosted by a vendor or service provider and made available to customers over a network (internet).
- Google Docs, Dropbox, Salesforce, Cisco WebEx, Concur, GoToMeeting

Platform as a service

- Platform as a service (PaaS) provides a platform and environment to allow developers to build applications and services. This service is hosted in the cloud and accessed by the users via internet.
- AWS Elastic Beanstalk, Windows Azure, Heroku, Force.com, Google App Engine, Apache Stratos, OpenShift

Infrastructure as a service

- IaaS (Infrastructure As A Service) provides access to computing resources in a virtualized environment “the cloud” on internet. It provides computing infrastructure like virtual server space, network connections, bandwidth, load balancers and IP addresses.
- DigitalOcean, Linode, Rackspace, Amazon Web Services (AWS), Cisco Metapod, Microsoft Azure, Google Compute Engine (GCE)

SaaS vs PaaS vs IaaS

