# VIRTUALISATION – A NEW BUSINESS MODEL

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***Abstract:***
*In the virtual environment, the virtual machines are completely isolated from the host machine or other virtual machines. The whole environment which is compatible with the hardware standards is saved as a single file, easy to back-up, move or copy. Today's trend is that a physical machine is created to support multiple virtual machines which then can fully benefit from the hardware capabilities. Studies show that more than a third of the responders identify the server, data storage and cloud virtualization as an important element in the decision making process regarding investments. Also, the study indicated the fact that virtualization influences the investment decision making during optimization activities, wireless computing or other aspects regarding security.*

***Key words***: *cloud computing, virtual environment, virtual machines, data storage*

***JEL Classification***: C80, C88

## 1. Introduction

Cloud computing is a convenient way of having network access on demand to a group of configurable computing resources (such as networks, servers, storage hardware, applications and services) which can be made available to the user easily, with minimum effort, as the National Institute of Standards and Technologies shows. The most important technique behind cloud computing is virtualization. Installing several virtual servers on a single physical server, companies have the ability to reduce the costs which can arise buying hardware equipment and additional costs regarding maintenance and energy consumption.

## 2. What is virtualization?

Through virtualization, the IT resources are considered a common part which can be allocated through a controlled process to the virtual machine, multiple applications and operating systems can run on a single physical system, and servers can be consolidated as virtual machines. Virtualization is a concept which means, for example, running an operating system on virtual machines using dedicated software. The virtual machine is a file which simulates the hard-disk drive and additional configuration files. Generally an informatics system dedicated to office activities will use 10% of its available resources. For example, servers' resource usage is around 40%, which means that desktop systems do not use 90% of the available resources while servers do not use 60% - which is a lot of computing resources.

Companies are investigating the way virtualization platforms, products and offered solutions respond to their needs. The strategic vision regarding the use of a virtual infrastructure allows for automatic business adjustment by using all of the

computing resources for achieving the business goal. Image number 1 shows the benefits of virtualization technology and the way it benefits the optimization model structure.

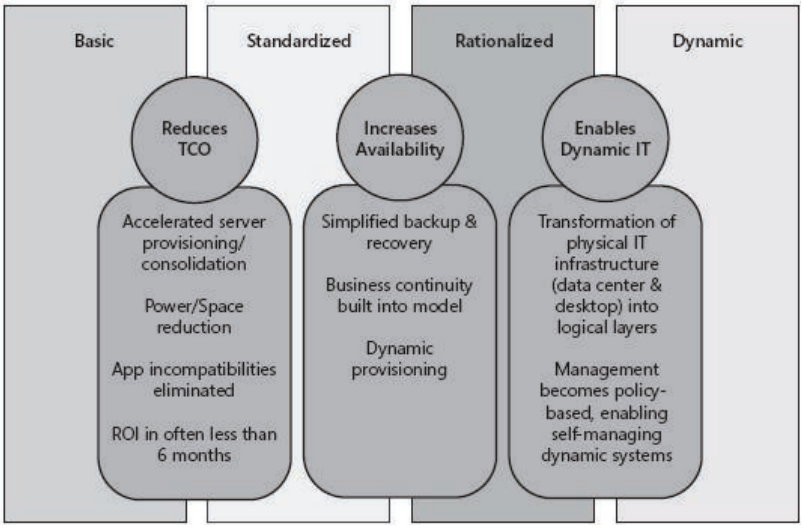


Figure 1: Benefits of virtual structure

These benefits refer to:

- Requirements regarding used power and space. Reducing the number of physical computers needed to host services and applications, virtualization helps reducing the number of physical components, energy and costs.
- Server consolidation. Allows the consolidation of multiple servers, a few physical computers, making the users more efficient while using IT resources
- Eliminating application incompatibility. Allows running older applications in a virtual environment simultaneously with newer applications, compatibility between the two being guaranteed.
- Rapid return of the investments. All benefits mentioned above regarding the use of virtualization technology can be standardized.

From a business perspective, virtualization can help through the process of standardizing to rationalizing and raising the application availability and business services.

Virtualization allows the following:

- Simplifying the backup and recovery procedure. Allows supporting and backing up the virtual machine, manages the backup and process restoration making them easy to use.
- Continuous business improvement. Allows creating restore points allowing a system roll-back if needed.
- Activation of dynamic storage. Virtualization allows adding or removing virtual storage resources if needed.

From a business perspective, virtualization allows changing the infrastructure from a streamlined stage to a dynamic stage by increasing the infrastructure flexibility and responsiveness by:

- Creating a logic IT infrastructure. Allows previewing and managing the IT infrastructure like a series of logical layers, instead of a collection of hardware. Virtualization simplifies the provisioning, management and application systems troubleshooting.

• Self-managing dynamic systems. Allows improving the dynamic capabilities of the users, processes and technology.

The benefits of virtualization are:

- Lowering the overall cost of the investment. The cost of the investment is the most important element for upgrading the infrastructure and implementing a new virtual solution, and that is why the main objective is lowering the cost of investment by efficiently using the hardware's resources, using consolidated servers.
- Increased availability. In a business, many virtualization solutions can be implemented, which use different virtualization technologies.

Reducing the cost of the investment, means taking action in 3 major segments: data center virtualization – the base of IT infrastructure dynamics; client virtualization – operating system and user application virtualization; cloud virtualization – allows extending IT infrastructure by offering the users all the needed resources for the activity. These three pylons, are not enough and a fourth pylon is added: a unified management system which administers all the aspects regarding the physical resources, virtual resources, cloud computing, including hardware, servers, desktops, applications and user data and settings.

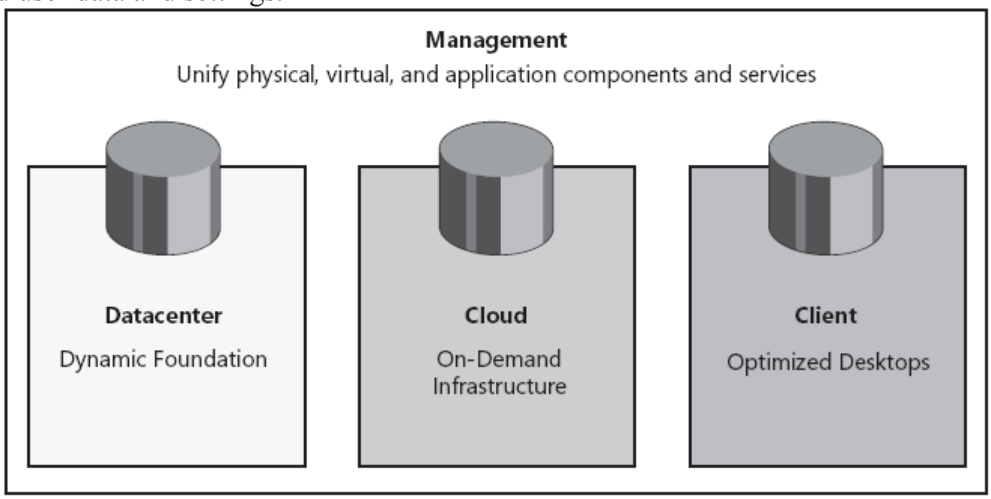


Figure 2: The four pillars that enable dynamic infrastructure

An important benefit of virtualization technologies is server virtualization – the server's ability to manage virtualized tasks. Server virtualization can reduce the number of physical servers by using consolidated servers.

Cloud computing can be implemented using three models:

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)

These models allow creating distinct computing services for the companies that use them.

- SaaS – offers business applications used individually or simultaneously by several companies (email services by Microsoft (Hotmail), Google (Gmail), Yahoo! (Yahoo! Mail). This way the client does not have to buy the software. He only rents a system for which he pays only the amount of resources that he uses. Usually this kind of service is a complete package, including both software, hardware and support. The user is able to access the service through authorized means.
- IaaS – Offers online processing or data storage capabilities. IaaS has the ability to share computing power, storage, networks and other resources needed for

basic computing, allowing the clients to implement and run different software which may include even running an entire operating system.

- PaaS – offers an application developing environment for application developers. Different instruments and standards are offered for both development and different distribution channels and payment methods.

The cloud computing models offered to the clients are found under three categories: private, public and hybrid.

- Private Cloud Model – the user is a company (different departments inside the same company).
- Public Cloud Model – the principle is making available computing resources through the internet, at the same time, for different users.
- Hybrid Cloud Model – is a combination of the models presented above. Companies can run applications in the public cloud while the data and private applications are stored in a private cloud.

## 3. Security

In order to analyze the level of security, first we must study each level of security for the following: physical security, application security and data security.

Physical security – These are the physical security procedures enforced by the service provider.

Application security – because the cloud computing means offering an application, an operating system or the infrastructure, discussing security applications means analyzing system security (done in most of the cases via access keys), communication security (done via specialized firewalls and APIs) and data access method.

Data security – means encrypting stored data and protecting the information while it is being transmitted.

In order to protect data against this threat, encrypted access methods can be used, such as SSL.

## 4. Conclusions

The main cloud computing characteristics are: ease of access - the user's ability to access the needed software easily; reduced cost – hardware and software related costs are supported by the provider; location independence – the user does not have to access the application from his computer; security – access is secure; maintenance – easy to do, by the provider. Cloud computing has a major impact on IT industry, technological innovations will sustain the new directions of the software domain, and hardware changes.

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