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CLOUD COMPUTING I KATALOG USŁUG INFORMACYJNO –KOMUNIKACYJNYCH

Streszczenie: Ostatnio dwa pojęcia „cloud computing” oraz „katalog usług ICT” pojawiły się w architekturze oraz w centrach danych budownictwa, więc zasługują one na należyłą uwagę. Pojęcie „Cloud computing” zmieniło się w świecie technologii informacyjnych zarówno w modelu praktycznym, jak i biznesowym, bez wyłączenia sektora obronnego. Może ono zostać scharakteryzowane jako dzielenie się oprogramowaniem i oprzyrządowaniem poprzez sieć. Cloud computing jako nowy model zasobów IT może znacznie zmniejszyć wydatki na zasoby IT i ich złożoność, jednocześnie doskonaląc optymalizację nakładów pracy i zwiększając poziom usług. Platforma Cloud jest skalowalna, dostarcza większe doświadczenie użytkownikowi i może być scharakteryzowana jako nowe metody zarządzania w Internecie. Katalog ICT spełnia główne zadanie ITSM – transformację ICT w nowy model zarządzania – poprzez zarządzanie zdefiniowane jako usługi ICT. Katalog ICT jest listą różnorodnych usług dostarczanych przez ICT i usługodawcę ICT, zazwyczaj jednostkę zabezpieczającą ICT w organizacji. Powinna on posiadać dane szczegółowe dotyczące klienta i osoby odpowiedzialnej za jej utrzymanie. Dokument ten jest bardzo istotny dla pozytywnego wdrożenia procesu SLM, jak również dla całego ITSM. W rzeczywistości, pomaga on klientom i użytkownikom zrozumieć potencjał ICT.

Słowa kluczowe: Cloud computing, katalog usług

INTRODUCTION

Information technologies are undergoing rapid changes in our times and are considered the „invisible hand” with the ever growing influence in all walks of life.

Management of electrical/electronic networks, traffic, medical services, water supply, food industry and the energy sector along with the majority of financial transaction, all of them are highly dependent on computer technology.

In view of the substantial growth of informatization in the society, with the defence sector included, information itself is the most important asset even today. In most organizations, information is the most important product, and therefore, it deserves due care when ensuring its security in the phases of their retrieval, upgrading or presentation.

Management in modern organizations, also those in defence, is focused on ensuring maximum security of information as any misuse poses a great threat. Unauthorized use may result in partial or total failures of the information system and further to the loss of continuity of the organization's activities, losses in business cases and minimalization of the return on investments.

Over the recent periods, the field of data center architecture and building resonates with two phrases, namely „*Cloud Computing*“ and „*Catalogue of ICT services*“. There are only a few terms, which are so frequently used as these two. The notion of Cloud computing has changed the word of information technology in terms of the generally accepted procedures, business models, with the defence sector as no exception. Simply it can be characterized as sharing of hardware and software assets by way of a network infrastructure.

CLOUD COMPUTING

There are lots of definitions of Cloud Computing. By one of them, Cloud Computing is the latest model of making use and providing ICT services on the basis of internet technologies, by way of offering a new evolution of the paradigm applicable to the field of consolidating, virtualizing and providing ICT services – Fig. 1.



Fig. 1. Cloud Computing – Graphical view

According to notable IT companies such as the IBM, HP, EMC² and others, Cloud Computing can be defined as a new model of providing IT means, resulting in substantial reduction of costs of IT assets and their complexity while achieving optimizations for workloads and raising the level of services provided. The Cloud Computing platform is scalable and thus provides excellent user experiences and is typical for new internet-based method of economy.

Services provided in via Cloud Computing

Basically, Cloud Computing, through its IT experts, provides the customer services in terms of rather defining than consuming IT services and assets, such as:

- Hardware infrastructure
- Operational system with basic infrastructure (HTTP Server, databases etc.)
- Software (e-mail, groupware, Office functions etc.)
- Business processes, social networks and services as well as many other ones.

The services listed above can be classified into so-called service and implementation models.

Service models

Service models are divided into three basic models, such as:

- **Software as a Service (SaaS)** – User is making use of the application functionality as a service not oriented on its technical finish.
- **Platform as a Service (PaaS)** – Comprising a ready-made operational system featuring a basic software, which along with its OS is ready for use – e.g.. Net Framework, J2EE application servers, HTTP Server, Database Server etc.

- **Infrastructure as a Service (IaaS)** – Mostly comprising HW assets made ready for applications including the basic software, e.g the OS with a predefined IP address and network configuration, disk area etc.

Service models can be further divided into other models such as the **BPaaS** (**B**usiness **P**rocess **a**s **a** Service) or **Daas** (**D**esktop **a**s **a** Service), which, however, are of less importance compared to the first three ones.

Apart from the service models as above, classification is possible not only from the service level but also in view of the implementations, also termed as the so-called **iService models**.

Service models

Service models can also be divided into three levels:

- **Private cloud** - Comprising cloud services for a closed group of clients. Practically, cloud services will not be available for those outside of the intranet environment framework.
- **Public cloud** – IT services are available as a public service, i.e. anyone can use them. The model is suitable for the so-called CSPs (Cloud Service Providers), offering IT services as a public service.
- **Hybrid Cloud** – Combination of the private and public cloud.

Characteristics of Cloud Computing

Not all information systems or data centres can be taken for a system of Cloud Computing. In the field of IT, several key (essential) system characteristics were defined for us to make certain of dealing with a Cloud Computing system.

Among those essential characteristics of Cloud Computing are:

- **Self-service**; IT service is ordered on a "self-service" basis
- Services are chosen from a **standardized** offer (catalogue)
- Service is ordered **automatically**
- Cloud ensures **provisioning**, i.e. preparing the service for use
- The services can be **measured** and **invoiced** the so-called "Pay as you go"
- Flexible specification of implementation models

The IBM company has presented the key characteristics of Cloud Computing by way of a simple illustration (Fig. 2), explaining the types of services provided in via Cloud computing along with the possible implementations and the mutual links existing among them.

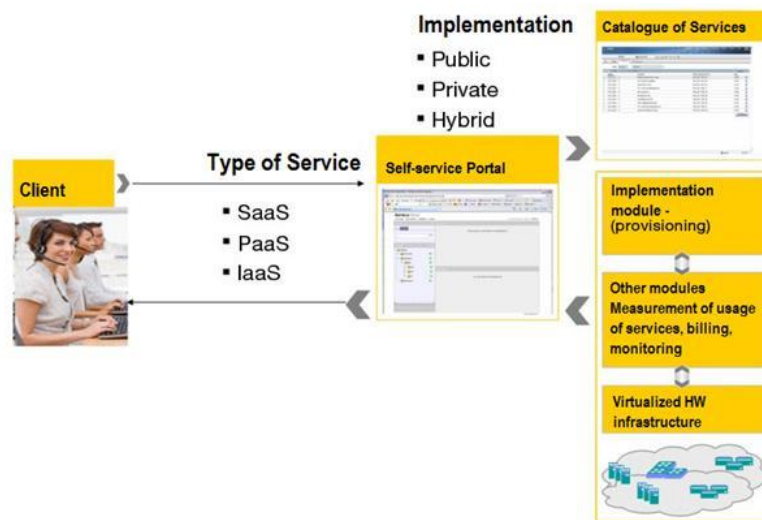


Fig. 2. Graphical illustration of the essential features and links of Cloud Computing

ADVANTAGES OF THE CLOUD COMPUTING SYSTEM

In the field of IT, since the introduction of Cloud Computing there came to the gradual selection of five essential areas, which are typical for Cloud Computing and represent its main advantages. They are as follows:

1. **Price** comes always as first, as a classic might say. It is the Pay as you go model that makes the most efficient use of Cloud Computing. A project manager does not buy a server, but it de-facto leases for a year. After a year of operation, he is no longer obliged to care for the server.
2. **Self-service** enables filing the order at any time. Within a traditional IT, some of the processes especially those related to decision-making are rather cumbersome. For most cases, obtaining an approval does not necessarily mean its fulfillment. In the world of Cloud Computing a STANDARD order is handled IMMEDIATELY, with no time wasted by waiting!
3. **Standardisation** taking the form of a service catalogue is the equivalent of a "menu card" in a restaurant. It comprises a list of services provided by the IT. Should you order for something special, usually not available in the catalogue, it takes more time and ultimately comes at a higher cost, too. It is the reason why in the Cloud system standard and routine orders are handled promptly and at discount prices. This is what ultimately represents the extra bonus for the client to the service.

4. **Flexibility** i.e. the adaptability to the changes is the key characteristics of the current IT. In a model-based scenario, when a manager is in need of increasing memory capacity, adding a disk, extending or reducing the period of „leasing“ a Linux server. All of them are bits and pieces, yet can make our life difficult in a non-cloud world not only to our model-based project managers.
5. **Utilization of the assets.** In order for us to make economic use of the IT assets, one has to make best use of them. In a Cloud system – if I no longer need the assets, they can be returned in their virtual form to the provider, who can further lease it to other clients. Statistically, it has been proved that in a Cloud environment the rate of asset utilization is as high as 80% compared to traditional environments showing as low rate of utilization as 30%. Such a reduced rate is due to the fact that historically HW are assets dedicated to concrete goals and only the advent of virtualization is the factor dramatically shifting the IT assets towards their more economic way of operation.

CATALOGUE OF ICT SERVICES CLOUD

When building modern data centers, IT specialists are recommended to develop an analysis of the ICT services provided to document the status quo in communication, information and security controls and services provided within the organization.

When analyzing the Catalogue of the ICT service, it is necessary to identify the individual candidates for ICT services and subsequently verify the kind of service to be offered. Generally, there are two levels of viewing them: business and technology. The short definitions of the individual levels are as follows:

- **Catalogue of Business Services** – representing ICT services provided directly to users/clients
- **Catalogue of Technical Services** – representing the ICT systems that provide support to the delivery of a single or multiple Business ICT Services.

In compliance with the given model and attributes for the Catalogue of the ICT Services to be developed, it is necessary to define and analyze the individual ICT services, their components and attributes.

The structure of analyzing the catalogue of services can be defined only on the basis of identified ICT systems and services. As a rule, it is inevitable to divide the

identified ICT systems into three basic areas of ICT services, i.e. into the following three ones:

- **Information Services (IS Services)** – services of information systems and applications
- **Services of Information Security (SoIS Services)** – services of security systems
- **Communication services (CS Services)** – services of communication systems.

In organizations such as the Defence sector, Ministry of the Interior and other forces, information services will be subjected to the Law No. 215/2004 on Protecting the classified facts. Their description or analyses might raise certain technical and personnel issues in terms of the levels of classification and ways how classified facts are handled.

When describing various Information services, Services for Information security and Communication services, one has to follow the generally accepted routines in compliance with ITIL best practices.

CONCLUSION

In compliance with the generally applicable recommendations, the ITIL best practices, documents such as the Catalogue of ICT Services are to be kept up-to-date and tailored to changes within the organization. Further, it is desired that the documents reflect all the external changes affecting the organization (firm) and aimed to find the most optimal balance between the needs of the organization and the technical capabilities of the IT infrastructure. Among the most important factors are economics and personnel of the organization.

Documents such as the Catalogue of ICT Services along with the analysis of the organization's transition to the Cloud Computing System are the fundamental IT documents, which in a modern and future profitable organization (firma) should be updated regularly in compliance with the latest ITIL best practices. They should turn into so –called live documents, as the management of modern organizations, and the defence sector as well, is aimed at ensuring maximum security of information, the abuse of which might pose a tremendous threat. Improper handling could result in losing continuity in the organization's activities, maximization of business losses and minimization of returns on investments.

BIBLIOGRAPHY

- Analýza služieb systému vysokej dostupnosti v podmienkách rezortu obrany, 2010
- Dziekański, P.: Information as a resource organization in the information society, Security policy in the conditions of european integration security, globalization, WSBIP Ostrowiec Świętokrzyski, 2013, s. 149-168, ISBN 978-83-936652-1-1.
- Internet, IBM, <http://www-05.ibm.com/sk/cloud/index.html> , 20122005
- Ivančík, R. - Kelemen, M.: Defence and Security of the State In a Time of the Fundamental Changes in a Global Security Environment., Journal on Law, Economy and Management, roč. 1, č. 1, 2011., s. 22-27. ISSN 977-2043-085-009-01.
- Koblen, I. - Gejdoš, A.: Smerovanie výskumu, vývoja a modernizácie, Ročenka MO SR, Bratislava 2004, s. 43-48, ISBN 80-88842-69-7
- Nečas, P. - Sopóci, M.- Bučka, P.: Integrated approach to security sector reform, Review of the Air Force Academy : the scientific informative review, No. 2 (17), ISSN 842-9238. (2010), s. 95-102.
- Nečas, P. - Bučka, P. - Ušiak, J.: Potential security strategies: sophisticated technology driven?, Academic and Applied Research in Military Science, Vol. 9, No. 1 (2010), s. 183-193., ISSN 1588-8789.
- Koblen, I.-Války, M: Slovak Approach to Offsets and Industrial Co-operation., Documentation, SMi International Conference „Offsets 2009, International Industria Co-operation“ Ankara, 26-27 January 2009.
- Kelemen M., Olak A., Bezpečnosť osôb a majetku v letectve i.: Výskum situačného riadenia bezpečnostnej edukácie pilotom. Vedecká monografia, ISBN 978-83-63359-80-5. Vydavateľstvo: AMELIA Rzeszów 2012.
- Olak, A – Tyrała, P.: Prakseologia w edukacji dla bezpieczeństwa, AMELIA Rzeszów 2012, 270 s., ISBN: 978-83-63359-04-1.
- Socha, L. - Mihalčová, B. 2009. The importance of control process and the phases., Acta Avionica., roč. 11, č. 17, s. 40-45, 2009, ISSN 1335-9479.
- Dvořák, Z. - Dolnák, I. - Soušek, R.: Informatizácia, informačné systémy a bezpečnostný management, 207 s., ŽU Žilina 2007, ISBN 978-80-8070-783-5.
- Socha, L. - Bajusz, P. 2009. Control and management. In Acta Avionica. 2009, roč. 11, č. 17, s. 164-168, ISSN 1335-9479.
- Soušek, R. a kol.: Doprava a krizový management, 260 s., IJP, Pardubice 2010, ISBN 978-80-86530-64-2.
- Bobenič Hintošová, A. - Bruothová, M. - Demjanová, L.: Innovation and industry structure relationship: evidence from Slovak food industry. In Interdisciplinary in theory and practice, Arad : Editura Adoram, 2013, nr. 2, p. 38-40., ISSN 2344-2409.

Zapatynskiy V. - Stoláriková, K.: Analysis the structure of the Ukrainian system of education of security and safety issues, Acta Avionica. Roč. 15, č. 26 (2013), ISSN 1335-9479.

CLOUD COMPUTING AND THE CATALOGUE OF ICT SERVICES

Abstrakt. Recently two phrases " Cloud Computing " and " List of ICT services " resonate in the field of architecture and building data centers. The two terms terms are the most inflected ones and therefore they deserve due attention. The notion of cloud computing has changed in the world of information technology-based practices and business models, with the defence sector as no exception. It can be characterized as sharing hardware and software resources through a network infrastructure. Cloud Computing as a new model of IT resources can significantly reduce spending on IT resources and complexity while improving optimization workloads and increase service levels. Its platform Cloud is strongly scalable, providing a superior user experience and can be characterized by new Internet management practices. The list of ICT fills the main idea of the ITSM - ICT transformation of the branch to a new model of its management activities - through supply management defined ICT services. The catalogue of ICT is a list of the various services provided by the ICT and ICT services supplier, usually representing a branch of securing ICT operation in the organization . It should contain characteristics defined by the ICT services , as well as details about the customer and the person responsible for their maintenance. This document is very important for the successful deployment of the SLM process but also for the entire ITSM . In fact, it helps customers and users understand the potentials of the ICT Department

Key words: Cloud Computing, Catalogue of services

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