

Management of IT environment end users and the impact of new technological solutions

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Abstract

The paper deals with the effects of current technological solutions ensuring and providing IT services and resources to end-users in corporate environments. Current trend of use and mainly of providing access to corporate data and resources from any location changes previously clearly defined working environment and requires defining of new rules of their administration and security. While the management of end-users' desktops is usually realized with a uniform procedure, in case of necessity of expansion the possibilities of access to corporate data are missing, or more precisely, there are not well-defined working rules and the security rules. An important part remains enhancing of the safety awareness of employees as the safety of IT resources and services depends mainly on the way of using. The object of the contribution is providing the information about the way of the management of the IT environment of end-users on the Faculty of Economics and Management of Slovak University of Agriculture in Nitra.

Keywords: cloud computing, end-user computing, IT security, management IT, Microsoft Deployment Toolkit, mobile computing

JEL Classification: C63, M1, O33

1. Introduction

Implementation of new technological solutions in the field of information and communication technologies (ICT) in all activities of the organization is now necessary and undeniable phenomenon that affects the quality of all internal/external processes of the organization. Last years in ICT have brought several trends that significantly change the traditional IT environment of the organization, are examples of cloud-based solutions, the concept of BYOD (Bring Your Own Device), social networks and related growth of mobile communications. The procedural changes which need to be applied for the introduction of the organization relate not only to the organization itself, but the particular end users. The paper deals with changes in the management of the IT environment at the Faculty of Economics and Management that brought with yourself these technology solutions. In the first part we address oneself to changes in the management of desktop infrastructure. The second part deals with changes in the online IT services (based on SPI model¹) and changes in the provision of mobile access to corporate data and resources and the resulting changes in IT security.

1.1 ICT organization and the end user

Information infrastructure of the organization is a complicated complex hardware and software resources. Its main task is to provide open access to information to a wide range of users from the internal and external environment of the organization. A key role of the management and operation of the IT infrastructure of the organization is to create a favorable

¹ SPI is an acronym for the most common cloud computing service models, Software as a Service, Platform as a Service and Infrastructure as a Service.

working environment for the end user. According to Chaffey and Wood (Chaffey & Wood, p. 558) the term end-user computing has traditionally been used to refer to the study of the management issues involved with providing services for non-specialist users of information systems. That is essentially anyone who is not an IT specialist who may be involved in developing or supporting systems. Deployment of new technology solutions is changing the style of its work but mostly its end-user environment. EMC company (Robidoux & Norris, 2014) for the main steps in the transformation and treatment of end-user environment considered:

- Characterize users.
- Create an end-user app catalog.
- Design and build a well-managed architecture.

In heterogeneous IT environment with a lot of end users the full process requires a considerable degree of abstraction. According to Cassano (Cassano, 2014) end-user computing is no longer about managing laptops and desktops. Today, you need to support user access to applications and data services on any device and in any locations (see Figure 1).

Figure 1 Current end-user environment



Source: <http://www.unisystems.com/en/news-inside/ekdiloseis/2014/item/504-it-directors-forum-14.html>, End-user computing is not a trend, it's a transformational shift, Cassano, A.

2. Characteristics of selected components of an end-user environment at FEM

Information infrastructure of the Faculty of Economics and Management has undergone in recent years changes, that arise from changes of the information infrastructure of the university and they are affected by global developments in ICT. Workplace Centre of Information Technologies (CIT) provides comprehensive infrastructure management and it is the main point of contact for resolving all user requirements and incidents.

2.1 Management of desktop infrastructure

At the Faculty of Economics and Management of Slovak University of Agriculture (SUA) is currently operates an extensive infrastructure of hardware devices - for work on the network is registered approximately 400 PCs and notebooks, 70 thin clients (Oláhová

& Ujlaky, 2015). Stated number of devices represents part of the desktop infrastructure without network hardware such as printers and hardware devices connected through WiFi network. The predominant operating system is Microsoft Windows operating system, especially MS Windows 7 Enterprise MS 64/32 bit versions, in a smaller number occurs Microsoft Windows 8 and Microsoft Windows 10. Operating system Microsoft Windows Server 2012 R2 is used by users working on the thin client. Desktop, in disregard of the type of operating system and hardware, has a standardized end-user environment for the operating system (hostname and workgroup, user accounts), application programs and intranet applications.

As almost half of the terminal equipment is used in the direct teaching process (computer labs) critical factors are PC uptime, operating system stability and minimal preparation time/restore PC. The classical method of installing a new PC was the total preparation time of about three hours. A complete reinstallation of the PC occupies 5-6 hours, which was associated with backup user data and settings specific applications and their resumption after installing the operating system. At a stated number of terminal equipment it is necessary to implement a method of preparing a desktop that allows unattended automated (scripted) installation of the desktop with minimal IT intervention staff and the possibility of remote installation.

First, partially automated method PC installation was at FEM used in the years 2001-2009 and it was based on the image installation of the reference PC. A disadvantage of this method was a significant rigidity (several variants image PC depending on the hardware configuration). In year 2011 was reworked methodology of automated installation PC with using tools of Microsoft Deployment Toolkit (MDT). The main change is in the application of automated installation of PC controlled by using scripts. An administrator uses a console MDT Deployment Workbench which is used to configure the deployment environment. By considerable simplification of the new methodology we can the whole process divide into two basic steps and tasks that were required fulfill:

1. Preparation of the reference PC - manual installation and creation of the image in format WIM (Windows Imaging Format). This image is then imported into the deployment repository.
2. Installation of the MDT tools and configuration of the deployment environment which includes:
 - Creation of the deployment repository, adding resource files OS, OS updates, hardware device drivers and user applications.
 - Creation of a so-called "Response file" - a sequence of tasks to be carried out after initiating an unattended installation of the reference PC.
 - Creation of a so-called deployment point and generate a customized version of Windows PE. This is triggered by preparing PC and initializes automated unattended installation.

The final process of installation of the PC is based on the strategy with minimal intervention of the administrator (Lite Touch Installation, LTI), with a total time of installation and the settings of the PC is about 2 hours, which represents a shortening of the preparation time the PC about 67 percent. It should be emphasized that the used method of preparation is always necessary to modify the introduction of new versions of the OS and application software user requirements to complete a new application. The benefits of automated and scripted installation of the desktops are:

- The possibility of mass installation with minimal interventions during the installation.
- Uniform environment of desktops and the possibility of remote administration.
- Reduce the time demands and the total cost of administration of the desktop infrastructure. Reduction of time requirements and total cost of ownership (TCO) of desktop administration infrastructure.
- More effective management of desktop infrastructure.

2.2 Cloud solutions Microsoft Office 365

Another solution available to end users is a cloud-based solution of the Office365 from Microsoft. These solutions generally allow the user to gain "independence" from the desktop computer at work because of all the applications and documents can be accessed from anywhere. Cloud technology is emerging as a viable option for companies that want to cut costs, increase agility or augment their own IT resources without building out new infrastructure (Buchanan, 2012).

SUA implemented a cloud-based solution Office 365 in 2013. From the technological point of view is Office365 model of the cloud services type Software as a Service (SaaS) and makes a number of services for all workers and students. A brief survey of the teaching staff FEM showed that pre-deployment Office365 using other cloud-based solutions (Dropbox, Google Drive, iCloud) for private purposes and also in the education process. For user authentication to Office 365 is used the same login details as to the internal information system. The basic services that are currently used by most users FEM include:

- Outlook for e-mail. UIS system of the Slovak University of Agriculture provides users with 300/600 MB of disc space. Email migration to Office 365 user gets a capacity of 25 gigabytes. Another benefit is a more effective way of email filtering and eliminating spam.
- OneDrive for online storage and file sharing, user has to 1 TB of personal storage space. Benefit is the ability to save files to the online storage OneDrive and offline PC. If the user is working offline, after connecting OneDrive updated online version of the changes made offline.
- Online applications of the MS Office 2013.

Despite these advantages, it is clear that the "transition" to a user of this service is slow, according to the information administrator UIS transition to only 175 university staff. The principal objections that users mentioned in the survey include:

- Possible access to services (on loss of Internet connection).
- Less flexibility in need of treatment services, such as configuration and customization email box according to your own requirements.
- Issues related to the protection of personal data and files stored on servers outside perimeter of the university network and the fear of the loss, respectively misuse.

2.3 Wireless WiFi network and users mobility

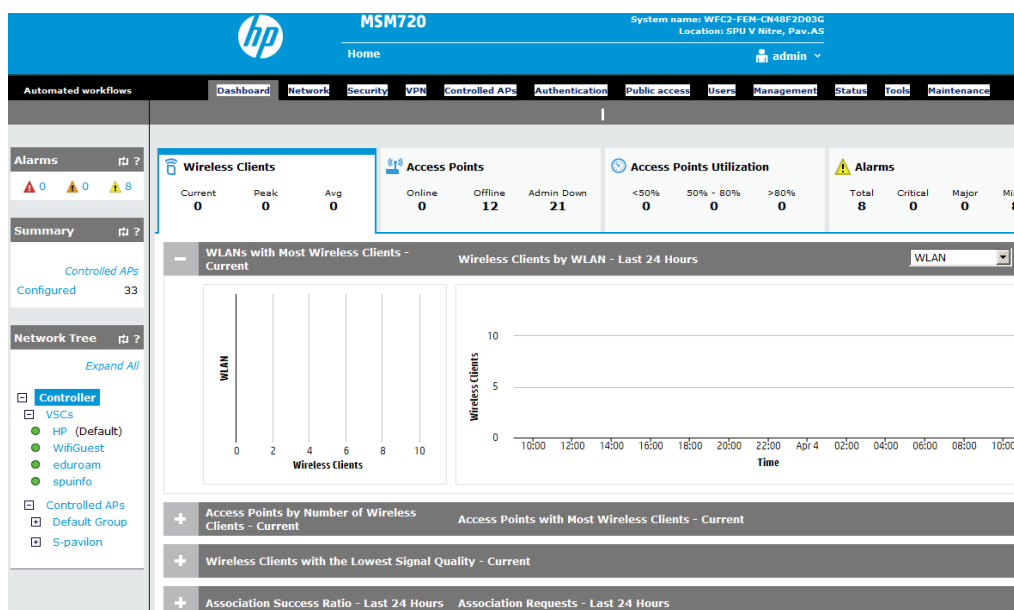
The first solution of the wireless Wi-Fi network has been to FEM implemented in year 2006. Hardware infrastructure consisted access points Cisco and for network management and end-users approach was used by the RADIUS server. Lack of the network was small of availability, as the network covers only part of the faculty premises and the low bit rate. User access requires registration of a WiFi card and then entering the password. After year 2010, management of the WiFi network came under the central institutes. For end-users is made available to the following networks:

- Network spuinfo with free access to intranet web site of the university.
- Network eduroam is designed for employees/students and requires user authentication and allows access to the intranet and Internet.
- Network WifiGuest is for external guests SUA (conference participants).

In 2015 was the original hardware platform of the WiFi network modified and extended to include installations of HP company (MSM Controllers, Access Points) for centralized management. Changes touched also underlying network infrastructure, where multiple switches are replaced by a switch with PoE (Power over Ethernet), allowing the expansion of network availability to areas where there is no electricity available. For end users, these changes WiFi network had the following benefits:

- Extending opportunities for mobile internet access/Internet.
- Available networks throughout the faculty building (in sum 22 access points).
- Increasing the transmission speed network to 300 Mbps (formerly 54 Mbps).
- The possibility of automatic roaming between access points when moving within the building.
- Increasing the safety of WiFi network because HP equipment in addition to conventional security mechanisms used intrusion detection system (IDS) and built-in firewall to filter access to network services.
- In terms of network administrator the benefit is a tool for remote configuration and management which is available through a secure web browser (Figure 2).

Figure 2



Source: own processing

3. Conclusion

The end-user of information infrastructure of organization uses in their work not only PC/notebook, but increasingly also mobile devices type of BYOD New technological solutions put the right to supplement his knowledge and adaptation. Unless the transition to these solutions is not compulsory, but founded on a voluntary basis, these solutions by end-users ignored and unused. Therefore one of the key tasks of the IT department within an organization remains the support of users, their further education (in the form of lectures and workshops). Mobile user access and use of cloud services, blurring the boundaries between work and personal data or files stored on those premises, which requires education of end-users and IT security issues.

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