Snapshot of a development environment

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KEY HIGHLIGHTS

Targets set with regard to virtualisation
- Meeting business requirements faster and more flexibly by more efficient setup and operation of the development environments
- Better re-utilisation of liberated hardware resources in new projects
- Establishment of a server environment easier to manage remotely and with higher availability
- Reduction of IT costs

Results achieved
- Setup of a new development environment in just under 1 hour instead of days or weeks
- By creating a snapshot, the earlier state of the development environment may be restored in seconds
- In case of a hardware malfunction, the virtual machines restart automatically in a few minutes on another host, without any downtime
- Almost 1:7 virtualisation ratio, the number of server was reduced from 100 to 15
- Energy consumption savings in the order of one million HUF monthly
- More efficient supervision, a single system administrator can supervise more than 150 servers instead of the 50 earlier
- Re-use of liberated hardware resources in new projects
- Faster than expected return on investment, under 1.5 year

EPAM Systems Kft

The USA-based EPAM Systems is an international IT outsourcing company providing software engineering and counseling services and it has established development headquarters in Central and Eastern Europe. The company's competences include software design and development, testing and maintenance as well as supporting business critical applications and industry IT counseling.

EPAM has more than 6000 employees and its client base includes the largest companies of the world present on the Fortune 2000 list. Apart from North America, the company opened sales offices in several Western European countries and recently in Poland, too. Its development headquarters operate in Russia, Belorussia, Ukraine, Kazakhstan and in Hungary - we have headquarters in Budapest, Debrecen and Szeged.

Geographically distributed environment

All the organizations in the widespread client base of EPAM – including banks, manufacturing firms, media and telecommunication companies – require fast, precise and quality work from their service provider. The international development team of the company works on numerous parallel projects, with widely varying extent, may extend over several years, and in many cases they make use of the resources of multiple development centres. Therefore, the project managers need to know precisely in each and every moment who works on each project in the different centres, how they are progressing, do they keep deadlines or intervention or reorganisation is required. In order to accomplish the projects successfully, organisation and control take place by widely varying and dynamic processes.

"Our company's IT department needs to make sure that every project and all development experts receive the necessary resources, and that infrastructure does not limit but support and promote the dynamics that is typical of our work" said Tibor Borzák, IT research and development manager of EPAM Systems Kft. "Before virtualisation, we found it difficult to meet this expectation."

In the first phase of the development process aiming at the establishment of an IT environment that would adapt more flexibly to business requirements, EPAM centralised infrastructure management first, concentrated the monitoring of the server environment, network and communication in Minsk, Belorussia, and established a spare helpdesk team in the Ukraine headquarters.

"In our local responsibility, only tasks like desktop support, backup, UPS monitoring and taking physical asset inventories remained, while servers and storage systems were placed under remote supervision" explained Tibor Borzák. "Although we managed to establish the conditions for consolidated operations on the HR side, the question emerged as of how the central IT department could manage the systems operating in each country with higher efficiency and reliability. "

Elastic infrastructure

Therefore, EPAM Systems decided to virtualise the development and test environments established for the projects in the second phase of the developments in the summer of 2006.

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"Earlier, the establishment of the necessary development and test environment took much longer at the beginning of a new project due to the procurement of the necessary hardware, the finding and deployment, installation and configuration of the free resources on stock" said Tibor Borzák. "This procedure could take from a few days to as much as several weeks. Development engineers and project managers pressurized with deadlines were impatient with a reason. The other problem was that after the completion of a project, the liberated hardware assets could not be utilised well by our company, because resources did not adapt well to the requirements of the new projects. Our management wanted to rationalise these expenses, too, when they decided to implement an elastic infrastructure that is quick and flexible to transform, is scalable and configurable for the given project, allowing a much better resource utilisation and recycling.

EPAM achieved a two-digit growth in revenues and employed staff in recent years – this was reflected in IT costs, too. It was clearly the management's goal to make sure these grow slower than revenues.

"Virtualisation promised a solution for both problems, so from the autumn of 2006 we tested all virtualisation solutions available in the market from VMware through Microsoft Hyper-V and Citrix up to Xen, and finally we decided to have VMware" – explained Tibor Borzák. "Our development engineers use the widest scope of operating systems, and in this respect, the support of VMware proved to be the widest. VMware is, at the same time, a stable and reliable platform, having been present for more than ten years in the market and receives support from hardware manufacturers, too. This was valued much more than the fact that certain virtualisation software itself has no licence costs. These were either found immature or they were lacking a wide range of support. We were preparing for the virtualisation of our business-critical development environment, therefore the maturity and support of the solution to be introduced was most important to us, and these were only to be found in VMware."

Out-of-the-box projects

The virtualisation of EPAM's development environments started in the Budapest headquarters, although IT supervision was moved to Minsk earlier. This setup, however, provided a good opportunity for further testing of VMware, since the Minsk team could gain extremely positive experiences in a short time regarding the remote management of the virtualised environment.

"During lab work, we planned the future hardware infrastructure using VMware's great Capacity Planner tool, and we also used it for mapping our existing environment" said Tibor Borzák. "It was proved that it will be possible for us to use several of our 100 dedicated servers as hosts, bringing a huge cost advantage to us. As a result of virtualisation, we reduced the number of our physical servers by a 1:7 ratio to 15, and out of these only 5 pieces were bought as new."

The EPAM experts deployed the hosts with the cooperation of the partners delivering the new hardware – the HP blade servers and NetApp storage system. Virtualisation of the dedicated servers started in the summer of 2007.

"The work progressed in the evenings, with a downtime of 1-2 hours, seamlessly, and our development engineers started work in the morning on the projects in the virtualised environment without noticing anything of the changeover" emphasised Tibor Borzák. "The management of the virtualised environment was taken over by our colleagues in Minsk entirely without any problems and it was a wonderful experience to see all this working easily and properly. We changed over our development and test environment completely in just 1.5 month, while our development engineers were working on more than 15 international projects. The results were obvious. Thanks to VMware-based virtualisation, we are able to set up the development environment of a starting project several magnitudes faster, just under 1 hour instead of several days or weeks.

The other big advantage of virtualisation is that development managers can take a snapshot of the environment before testing a new version or service pack of

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the software under development or before verifying the version compatibility of a new database manager. Thus, in case of a problem, they are able to revert to the previous state in seconds, there is no more offtime caused by the rebuilding of the environment as earlier was. Simply said, there was no possibility for this in the environment built on dedicated servers.

„The snapshot function of VMware provides a high degree of security for development work" – emphasized Tibor Borzák. "Using this system, it is faster and easier to test our software and we are able to provide an even higher standard of service to our customers. While our earlier infrastructure may have limited this process, our virtualised environment has become the drive behind our business. This shows in the field of availability, too. Earlier, we used separate physical machines for all our projects, and if any malfunctioned, work stopped until we eliminated the problem, and overtime was therefore usual for keeping the deadlines. This problem was completely eliminated by VMware HA providing a high degree of availability. If a host shuts down, the virtual machines running on it automatically restart on another host, the downtime was reduced by several magnitudes compared to earlier times and it can be expressed in minutes.

EPAM calculated a 3-year return originally for virtualisation, based on the cost burden that could have been incurred by the continued operation of the former dedicated servers in such a time interval. As it turned out, the time of return on the investment was much shorter.

"In our Budapest headquarters, energy consumption fell to half since the completion of migration, allowing a monthly saving of a million HUF" - emphasized Tibor Borzák. "Thanks to the achieved virtualisation ratio of 1:7, the operation of our server environment became much more cost effective and so our project broke even in just one and a half year. More effective monitoring provided further savings. Earlier, one system engineer operated about 50 physical machines, now he is able to supervise 100-150 virtual machines remotely. Although our IT environment grew in proportion to the number of projects started, the management staff did not have to grow with the same rate. Seeing the outstanding results of our Budapest project, four of our other development headquarters also virtualised their servers on VMware basis in Kiev, Minsk and Moscow. The whole virtualised environment with 750 virtual machines running is managed by a staff of 5 from Minsk, meaning a great advantage in labour costs for the business. The resources liberated after the completion of projects may now be assigned flexibly to starting projects, also increasing our cost efficiency. The limits imposed by our former infrastructure were completely eliminated by VMware-based virtualisation, and our projects are not enclosed in boxes anymore."

Following the successes, EPAM decided at the end of 2010 to extend virtualisation to the desktop environment, too. Tests have proved that it is possible to provide the same kind of working environment to development engineers on a thin client with VMware's View VDI solution in 99 percent of cases as on a thick client – including the intensive use of media-rich content, animation and video playback, duplex voice connection and VoIP.

This project is started by EPAM in 2011 in Minsk, and then extends the VDI environment to four other development headquarters, too.