Providing efficient mass storage for large environments serving the mining industry is the mandate and challenge faced by COIG S.A. As its aging systems accrued high costs in both operations and maintenance, the company set out to find a powerful, efficient and cost-effective solution. The search resulted in the decision to employ 2 Hitachi Unified Storage VM (HUS VM) systems. COIG S.A. built a consolidated data management environment, providing high performance and high capacity storage for its clients’ demanding applications. The solution reduced power costs by the factor of 3, freed several server rack cabinets in the data center and simplified the management of the mass storage environment.

About COIG S.A.
The company Centralny Ośrodek Informatyki Górnictwa S.A. (COIG S.A.) was established in 1951 as an entity providing computing services to the mining sector. It is one of the oldest and most experienced Polish IT companies. At present, the company serves the biggest mining companies in Europe, various branches of industry, large entities of local government, and the healthcare sector. COIG S.A. provides end-to-end IT services, including business consulting, application design and development and implementation services. It also offers application management services and process outsourcing related to application maintenance and development.

The company partners with most of the major technological platform providers. Due to the nature of clients’ operations, and the sensitivity of the data processed in the systems on their behalf, COIG S.A. is certified in the scope of the Information Security Management System ISO 27001:2005. The systems developed and maintained by COIG S.A. are multi-application enterprise resource planning (ERP) systems, process and document management systems, various transaction platforms and large analytical and reporting environments. These solutions are used by more than 20,000 employees of companies who are clients of COIG S.A. The environments managed by COIG S.A. include more than 50 Oracle databases, VMware and Oracle.
VM infrastructure with more than 600 virtual machines, as well as numerous content and document repositories.

Challenge: Keep the Efficiency, Reduce the Maintenance Costs

Providing efficient processing for so many large environments requires efficient mass storage systems. Until recently COIG S.A. used several mass storage systems, including IBM® DS8000 and IBM DS4000 series as well as a solution from Nexsan. Storage controllers and disks, constituting the entire mass storage environment existing so far, populated almost 6 rack cabinets in the server room. Management and maintenance of this environment was generating high costs.

"Maintenance of so many arrays was generating serious costs. In total, all equipment was using approximately 20 kW of energy, not including energy used for cooling which costs, too." explains Wojciech Romowicz, Head, Department of Corporate Platforms Management, COIG S.A.

Costly technical support and very high prices of expansion were also a problem. "When the load on our biggest mass storage systems began to reach 90% of the nominal performance, we started to analyze the possibilities of further scaling," explains Romowicz. "From the point of view of the total cost of ownership (TCO), the purchase of a mass storage system, however, is something more than just the equipment, its performance and capacity. Equally important are the costs of expansion, licenses, support, service, training, management and so on," Romowicz explains. "We analyzed systems of various manufacturers, using the total cost of ownership in the period of 6 years as the most important criterion. The conclusions were unequivocal: The lowest TCO, while satisfying all functional requirements, was provided by Hitachi Unified Storage VM systems," he reports.

Within the current environment, no optimization whatsoever was possible: one system might have performance and capacity room, while another might "choke" under the load of transactions and data. This is why COIG S.A. opted to consolidate its mass storage environment. "After initial analyses, it seemed clear that consolidation was desirable and feasible. From the point of view of the total cost of ownership (TCO), the purchase of a mass storage system, however, is something more than just the equipment, its performance and capacity. Equally important are the costs of expansion, licenses, support, service, training, management and so on," Romowicz explains. "We analyzed systems of various manufacturers, using the total cost of ownership in the period of 6 years as the most important criterion. The conclusions were unequivocal: The lowest TCO, while satisfying all functional requirements, was provided by Hitachi Unified Storage VM systems," he reports.

The Hitachi offer was the most attractive one for several reasons. "The HUS VM system provided foreseeable costs of expansion which, from our perspective, was just a matter of time," says Romowicz. "Licenses for software, including the management of remote replication and execution of coherent logical copies, required no extra cost, regardless of the size of data or the number of controllers. Also the support and service offered on the market had attractive prices," he explains.

The purchase of a consolidated environment seemed attractive also because of the optimization of power costs. Modern solutions consume much less energy than the older equipment. Hitachi systems have the leading position in the market for both performance and energy efficiency. According to calculations made while preparing the purchase, COIG S.A. could reduce the direct energy consumption of the mass storage environment from 20 kW to less than 6 kW. The overall decrease in power costs were estimated to be 3-fold within 6-7 years.

When all application environments utilize one disk space, the available resources of performance and capacity are being used effectively. And, thanks to the Hitachi Command Suite software, we have a very precise control over resources. Depending on momentary needs, we can change the priorities assigned to individual applications. As a result, the more demanding processing threads, such as payroll computing or end-of-term report generation, are executed more efficiently."

Wojciech Romowicz, Head, Department of Corporate Platforms Management, COIG S.A.
In the end, COIG S.A. replaced its aging storage environment, consisting of several systems totaling 176TB of usable capacity with 2 Hitachi Unified Storage VM systems. At the time of purchase, each of the 2 new systems used only 22 rack units (44 rack units in total, compared to 251 rack units of the previous environment), and still, it offered greater usable capacity of 400TB. SAS disks operating at 15,000 RPM were installed in the storage systems for transaction serving. They constitute approximately 30% of the total number of disks. The remaining 70% are slower but also cheaper 7200 rpm disks with SAS interface.

As expected, within one year of purchasing the original HUS VM systems, COIG further expanded them. Each system now has 2 pairs of system management controllers and 2 pairs of cache controllers. Further, for communication with servers and remote replication, one system now uses 16 Fibre Channel ports and the other uses 24 ports. Besides, the systems were placed in 2 remote locations and connected with dedicated coarse wavelength division multiplexing (CWDM) links. After expansions, the usable capacity of each system has grown to more than 500TB. Nevertheless, the total direct energy consumption of the HUS VM systems is still relatively small: below 6 kW.

Benefits: Unlimited Scaling With No Unplanned Costs

By implementing the Hitachi Unified Storage VM systems, COIG S.A. achieved several goals at once. First of all, it acquired an environment that allows many-fold scaling of performance and capacity. Each of the 2 Hitachi mass storage systems implemented by COIG S.A. allows the expansion to 1152 disks of total usable capacity, exceeding 3PB. “We will not have to look for a new mass storage environment for the next 5-6 years unless extraordinary circumstances occur which we are not able to foresee today. The one we built [with Hitachi Unified Storage VM] gives us a sufficient reserve of performance and capacity,” says Romowicz.

The purchase of the HUS VM systems let COIG S.A. perform a fundamental consolidation of the mass storage environment. At the initial stage of implementation, solutions of computing power and capacity significantly greater than the environment being replaced were installed in a more than 5 times smaller physical space. “Our data center is big, but we know from experience that every amount of space can be filled up quickly if caution is not exercised. Each additional rack cabinet entails an increase of the costs of power, as well as cooling. These are serious yearly costs to bear and they influence the pricing of services we provide to our clients,” Romowicz emphasizes.

The consolidated environment enables COIG S.A. to flexibly manage the mass storage resources. “When all application environments utilize one disk space, the available resources of performance and capacity are being used effectively. And, thanks to the Hitachi Command Suite software, we have a very precise control over resources. Depending on momentary needs, we can change the priorities assigned to individual applications. As a result, the more demanding processing threads, such as payroll computing or end-of-term report generation, are executed more efficiently,” explains Romowicz.

Consolidation significantly affects COIG S.A.’s ability to manage the costs of maintenance and scaling, because the performance and capacity demand grows gradually, not abruptly. Individual applications almost never peak in load at the same time, which makes the total average load relatively stable. “The gradual growth of loads and the relatively low amplitude of load variations in the consolidated environment make it easier to plan its expansion. This is what we were missing when we had many environments operating independently,” reports Romowicz.

The reserve of performance and the stability of average loads allow COIG S.A. to diagnose the problems with applications more quickly and easily. Looking at the investment from a business perspective, COIG S.A. made a good choice also because of the simple licensing model of the Hitachi management software. COIG S.A.’s operating model assumes technology investment brings about economies of scale. When the dynamics of the operational costs related to maintaining the infrastructure necessary for providing services surpasses the dynamics of revenue, the model is no longer working. The Hitachi mass storage, which is a huge part of the overall capital investment lets the company keep the costs under control.

An essential component of the maintenance costs of mass storage systems are the expenses for technical support and service. The purchase of Hitachi systems led to a very significant drop in the share of the costs of these services in the total costs of environment maintenance. “Hitachi is a partner who does not force their clients to purchase a new array after 3 years because of a high cost of contracts for support and service. Such cooperation is definitely beneficial for the client, because after 3 years, the disk arrays are usually still fully operational equipment,” says Romowicz.

COIG S.A. innovates with information

By employing Hitachi Unified Storage VM with Hitachi Command Suite, COIG S.A. improved performance and accessibility for its information stores. Anomalies in application environments are now detected before they become a problem to the users. The company relies on this new detection process and its new capability to easily provide high performance to applications during peak times: No delays in payroll computing or report generation mean employees receive the information they need and receive paychecks in a timely manner.