Universal Production Partners Inc. (UPP) is the largest post-production studio in central Europe and provides a wide range of digital post-production services to leading film production companies worldwide. Services include all post-production work, from processing digital records to visual effects. It is one of a few European studios that offers 4K-resolution video processing, which is extremely demanding in the volume and transfer speed of data. A storage solution based on Hitachi NAS Platform proved to be the best fit for the task.

The solution by Hitachi Data Systems more than satisfied our expectations, not only with its performance, but also its price. We were pleasantly surprised with the quality of load balancing, which prevented a noticeable drop in speed, regardless of the number of connected stations.

Ivo Marák
Chief Technical Officer
Universal Production Partners

Post-Production by UPP
Universal Production Partners ranks among Europe’s most popular post-production studios, and therefore must have the corresponding technical equipment at its disposal. Preparing photorealistic 3-D effects for high-definition films involves computing processes performed on more than 1000 processors. The process uses dozens of terminal stations with all the mainstream operating systems and various demands work in parallel with film data from network attached storage (NAS).

Studio Achievements
The studio was established in 1994 and today provides the full services of a digital laboratory, digital offline editing, 2-D composition, 3-D animation, visual effects, environment and color grading. It also produces all necessary outputs for digital cinemas, TV or video on demand.

For example, UPP worked on the Tibetan segment of Emmerich’s epic film, “2012,” and also developed the complete digital 18th-century Paris for the film “Perfume: The Story of a Murderer.” Many other successful films underwent the post-production process at UPP. The Prague studio was responsible for making magic in “The Illusionist” from Neil Burger in 2006, as well as the dream scenes in the picture “Tetro” by Francis Ford Coppola. UPP also contributed to one the most well-known Czech films, “Dark Blue World.” For this film, the studio created

Universal Production Partners Inc.

INDUSTRY
Communications: Media

SOLUTION
File and Content

HARDWARE
Hitachi NAS Platform 3090 (2)
Hitachi Adaptable Modular Storage 2500
Hitachi Unified Storage 110 (2)

SOFTWARE
Hitachi NAS Platform (ultra software bundle)

SERVICES
Provided by Hitachi TrueNorth Partner Comparex CZ
Film post-production is a creative sector, which cannot do without flexible and reliable technologies that can grow with increasing demands of the industry. Prior to choosing HNAS, we tested many solutions, but HNAS was the only one capable of covering an entire scale of our various demands and respecting the parameters defined in the technical specifications, though sometimes surpassing them.

Ivo Marák
Chief Technical Officer
Universal Production Partners

many 3-D fighter plane models as well as the scene with the attack on an armoured train. UPP took advantage of this experience in its largest trick project to date, “Red Tails” by Lucasfilm. Visual effects for “Kooky” or “Empties” are also the work of UPP, and Vaclav Havel’s “Leaving” could not have done without digital tricks and environment sketches.

Studio Workflow
During the post-production process at UPP, dozens of workstations accommodating graphic designers, editors and other specialists work in parallel with an enormous volume of data. Photorealistic graphics fully utilize the computing performance of more than 1000 processor cores and the demands on data volume and quality continue to grow. As mentioned by Ivo Marák, chief technical officer at UPP, the existing data storage was not sufficient for the demands of today and was the bottleneck of the entire system.

Digital video processing is very demanding of data, considering the required quality of 4K (maximum resolution 4096 x 2304px) with a data flow of thousands megabits per second. Not only is a high storage capacity required, but also extreme throughput and high-speed transmission. The sequential processing of extensive data files is only one part of the post-production process. The creation of digital effects requires the fastest random and multiple reading. Satisfying such demands requires a versatile storage solution. It requires both high capacity and speed, as well as the ability to process a large number of IOPS (input/output operations per second).

Maximum Speed and Capacity: Key Requirements
Considering the size of processed data, one of the fundamental requirements was the option of expanding the storage to 1PB while maintaining the high response and transfer speeds. The solution serves as a central data storage for the entire post-production process, from editing to digital effects. Therefore, it must cope with both the sequential writing and reading of film fields, as well as the random and multiple reading for demanding simulations and photorealistic calculations. UPP demanded at least 100,000 IOPS in total for NFS and CIFS. Another important factor was the option to divide the NAS to multiple drive units for the future expandability and easier user role and access management.

Another key requirement in the film industry is data security as well as the easy management of access rights to individual files for each film project. Thus, UPP sought solutions supporting authentication via an LDAP server, which facilitates the dynamic allocation of user rights depending on the currently processed project. Also among the primary requirements were the backup and restoration of this critical data during a failure and high availability of the entire solution.

“We needed a solution, the speed and capacity of which would cope with the constantly growing demands of the film industry. A solution that could be expanded quickly would ensure high data security and enable us to use LDAP. The existing solution has already reached its limits, and the lack of live file system expansion support resulted in downtime for each expansion,” said Ivo Marák, summarizing the key requirements.

To cooperate on the matter, UPP chose a system integrator from Comparex CZ, a company that has been serving the IT market approximately 20 years. Comparex CZ has a strong background in providing migration, implementation and repair services. After
analyzing available solutions and considering the experience and recommendations of other post-production studios based in the United States, Comparex CZ and UPP chose the complex solution by Hitachi Data Systems. The HDS solution included Hitachi NAS Platform (HNAS) 3090 cluster and 5 storage systems, implemented in 2 phases.

The HDS solution was the only solution that met the high demands of the UPP studio. HDS offered some parameters that even exceeded these demands, and offered flawless LDAP support and rapid expansion. In addition to this, the final price of the entire system was lower than for less-powerful solutions that the competition had to offer.

**How Is a Film Stored?**

The primary NAS solution used for the initial capacity phase of the implementation included: HNAS 3090 and Hitachi Adaptable Modular Storage (AMS) 2500 with 195 SATA II drives and capacity of 3TB. HNAS enables control over multiple storage systems. Therefore, the 2nd phase of the implementation could include the use of 2 Hitachi Unified Storage 110 storage systems and 240 high-speed SAS drives with a capacity of 900GB. This solution more than meets the required parameters and also facilitates trouble-free capacity expansion in the future despite the 1PB required.

The HNAS 3090 cluster with hybrid core architecture offers a throughput up to 1100MB/sec with sequential data processing and over 95,000 IOPS per node for random reading. The solution built on HNAS 3090 enables upscaling to 8PB, offers thin provisioning for the easy allocation and rapid expansion of capacity and also supports RAID-6. Up to 480 drives with a total capacity of 1,417TB can be mounted to the connected AMS 2500. The 2nd phase will consist of using HUS 110 for 120 drives with a maximum capacity of 108TB (SAS drives) and up to 360TB for NL-SAS. The entire solution will be provided via NAS Platform software ultra cluster bundle with CIFS, NFS protocols.

The implementation alone took about a month, while the solution was tested and adapted to the needs of UPP within a period of 2 weeks. Given the volume of data exceeding 100TB, the complete data transfer from the original HNAS solution took 2 days, and demonstrated the speed of the existing solution fell well behind.

"The solution by Hitachi Data Systems more than satisfied our expectations. We were pleasantly surprised with the quality of load balancing, which prevented a noticeable drop in data transfer speed, regardless of the number of additional stations connected. Data protection for which switching to a backup controller leads to a failure of 2 network packets at maximum, is excellent," said Marák.