

Benefits of Rohde & Schwarz Storage Solutions in Media Environments

For 30 years, Rohde & Schwarz has been very successful in the professional film, video post-production and broadcast markets, developing hard- and software optimized to suit the challenging requirements in media workflows. With the mastering station R&S® CLIPSTER being the first turnkey system capable of processing 4K in real-time, Rohde & Schwarz focused mainly on cinema post production. Based on this knowledge, Rohde & Schwarz developed storage solutions that especially tuned to meet the requirements of uncompressed- and RAW-workflows.



Challenges in media environments

In media facilities as well as in IT environments, huge amounts of data are being produced day by day, but they have different requirements. Media files – in contrast to files in IT environments such as word documents or data bases which might reach a size of up to 1GB – will easily grow up to dimensions between 40 GB and several TB for just one cinema movie. These huge file sizes lead to an ever growing demand for storage capacity.

But it is not just the size of the media files that makes them unique. It is even more the way the media files such as DPX, TIFF or J2K are set up. A DPX file for example will not just be one big file, instead it will contain of hundred to thousand single files as each frame will be its own file. Therefore these kinds of files have to be handled in a special way to ensure the high performance that is needed in media workflows.

Guaranteed high bandwidth even for huge media files is a must in media workflows such as uncompressed and RAW workflows in cinema post production as there are always tight deadlines in which the creative processes as well as the storing processes have to be accomplished. In such time critical workflows, Rohde & Schwarz enables the operator to concentrate on the creative work by providing storage solutions that optimize the read and write operations in the background.

Another challenge special in media environments is the fact that in most cases different third party systems such as editing stations are connected to the storage accessing it in different ways at different times.

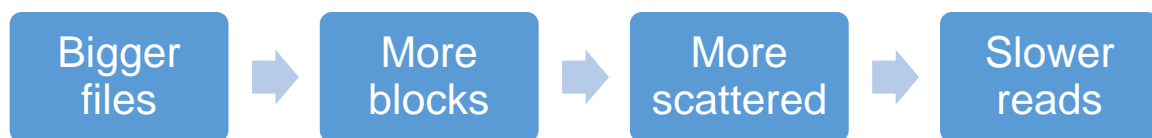
Unique features of Rohde & Schwarz Storage Solutions to meet these challenges

To meet this tackling requirement, Rohde & Schwarz has optimized its storage solutions in different ways based on the knowledge gained through thirty years of media experience. These optimizations affect hardware configuration as well as the integrated content control software R&S® Spycer. Teamed up as one solution, both become the perfect match for demanding requirements in moving image workflows.

Benefits of Rohde & Schwarz Storage Solutions in Media Environments

Features making Rohde & Schwarz Storage Solution outstanding in media environments

- **Optimized handling of media files to improve bandwidth and degree of capacity utilization:** Rohde & Schwarz storage solutions optimize effective use of the storage capacity and minimizing read accesses and thereby increasing bandwidth. These goals are achieved by allocating a certain amount of storage within milliseconds while the file is written to a folder. The allocation is necessary because media files have special requirements that need to be faced in an optimized way to gain constant high bandwidth. In IT storage solutions, files are written sequentially one block after another. If erasure of an existing file takes place, the gap will be filled with some blocks of the next file. This will lead to the necessity of several read accesses just to read one file. This issue gains even more weight for media files because its large size increases the probability of blocks being scattered all over the hard disks.



- **Multi Pathing:** In Media environments storage has to be accessible at all time to meet tight deadlines. To meet this demanding requirements DVS-SANs are equipped with dual active RAID controllers combined with dual channel Fibre Channel host adapter on the client side. This hardware configuration provides multi pathing functionality, granting access to the content even in case of either controller failure or corrupted paths. This setup leads to increased security in mission critical workflows as there will always be more than one I/O path between the workstation and the LUNs.
- **Integration of the whole solution:** Based on its long lasting experience in media workflows Rohde & Schwarz is not only providing storage solutions with bandwidth optimized to handle distributed accesses by editing systems. Moreover it allows for the storage systems being seamlessly integrated into the existing or newly set up infrastructure. Providing integration of third party systems like editing stations – no matter if they are Linux, Mac OS or Windows based – reduces the effort of implementing extensive workflows tremendously.

Benefits of Rohde & Schwarz Storage Solutions in Media Environments

Unique features of the content control software R&S® Spycer

R&S® Spycer the innovative content control software is integrated in every R&S product and is also available as standalone software for other clients attached to the R&S storage solutions. R&S® Spycer offers a lot of features making it essential for media workflows especially in the combination with R&S storage solutions.

Ability to store media files such as DPX, TIFF or J2K as one sequence: Storing media files as one sequence lead to an immense increase in read performance. Enabling our storage solutions to read such files with only one read access at a single location on the disk instead of performing multiple accesses saves a lot of time which can be invested in the creative process. In addition R&S® Spycer enables fast copy processes during the whole production chain and thereby accelerating saving of time in an enormous way. Increase in copy speed is achieved by R&S® Spycer through indexing all different sub-files while writing them to the disks enabling even sequential write during or sequential read after a later performed copy process. The reason why handling files like DPX could lead to restrictions is that they consist of several single files as each frame of the movie will be its own file. On IT storage solutions this characteristic would lead to storing the different files belonging to one movie at different places on the hard drive. In such a case reading the whole DPX file would cause several read accesses at multiple locations on the disks – resulting in a tremendous loss of performance.

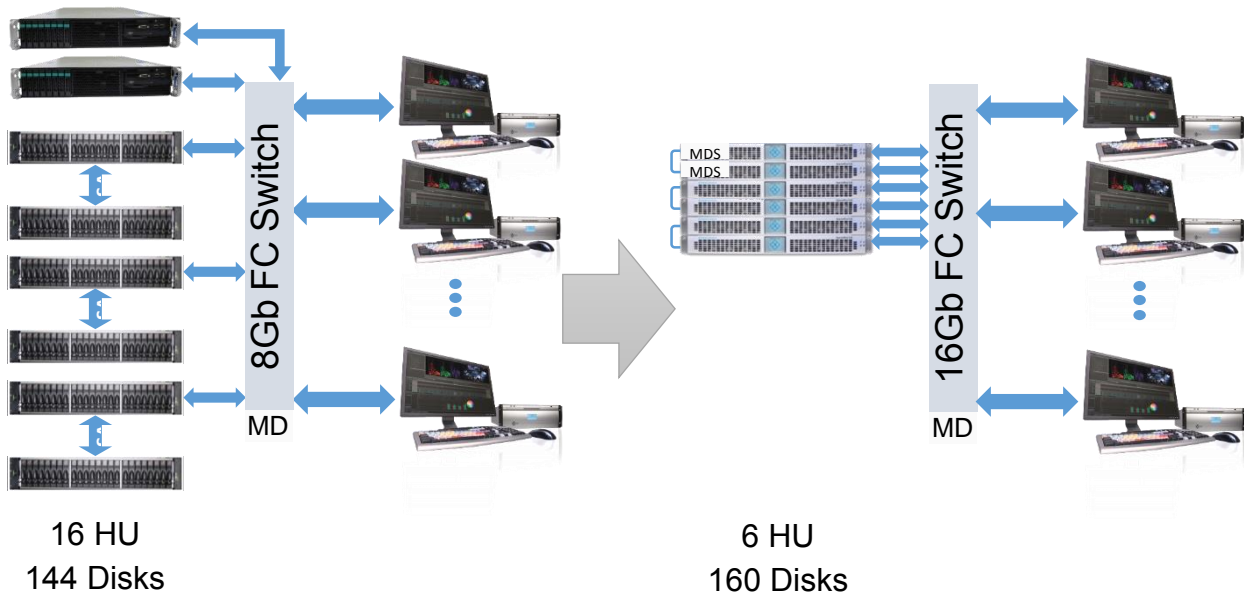
- **R&S® Spycer high speed copy:** High speed copy enables R&S® Spycer to copy a 2h hour XDCAM HD movie in less than two minutes instead of half an hour. R&S® Spycer high speed copy accelerates the copy speed for files up to a size of several TB as it recognizes the source and destination of a file, selecting the best route to copy within Ethernet networks. The unique copy protocol developed by Rohde & Schwarz makes it possible to use 99% of the theoretical bandwidth if required by the customer whereas NFS or CIFS for example always just use 40%-60%.
- **Metadata indexing:** When it comes to tight deadlines, R&S® Spycer helps the customer focus on the creative part by making it possible to find the content by every property or even custom indexes in a short amount of time. To ease the management of the huge amounts of content, R&S® Spycer offers the functionalities of adding custom metadata improving searching for or comparing content.



Benefits of Rohde & Schwarz Storage Solutions in Media Environments

Unique features of the media optimized R&S® SpycerBox Family

R&S® SpycerBox compresses all the above mentioned advantages combined with additional hardware benefits. As a single-box-solution R&S® SpycerBox can either be configured as SAN, NAS or even both at once making it easy to integrate the storage into every infrastructure in the most efficient way. Moreover, while traditional SANs always consists of several separate components, R&S® SpycerBox combines all the necessary equipment to fulfill the customer requirements in one Box.



- **Compact Scalable solution:** By reducing hardware and rackspace needed, R&S® SpycerBox becomes a cost effective solution minimizing the cost of investment. With this space-saving architecture R&S® SpycerBox uses less rackspace even in large installations. One R&S® SpycerBox Cell as an entry-level solution is already capable of handling 4K but is still just requiring 1HU rackspace, making it the best in class performance per density solution. Once the demand for capacity and/or performance grows it is effortlessly possible to combine up to ten R&S® SpycerBox Cell systems in a single installation which would still just occupy 10 HU of the limited rackspace but now supporting a bandwidth of 25 GB/s and a capacity of up to 600TB.
- **Reducing cost of ownership:** With its easy-to-use Management Tool SAN Remo administration and configuration of the R&S® SpycerBox, installations can be handled with ease as all the necessary steps can be performed via the web user interface, reducing administrative efforts. Moreover R&S® SpycerBox is made of low power components to minimize power consumption. All these outstanding features help the customer reducing cost of operation.

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About Rohde & Schwarz DVS

For more than 25 years, Rohde & Schwarz DVS GmbH has been very successful in the professional film, video post production and broadcast markets. The specially developed and manufactured hardware and software are applied to the production of popular TV series, Hollywood blockbusters and in Digital Cinema. R&S CLIPSTER was the first system in the world to make real-time 4K processing possible. The future-proof ingest and production server R&S VENICE offers a flexible solution for modern, file-based workflows in broadcast environments. Rohde & Schwarz DVS offers a variety of customized storage solutions that is tailored to deliver best-in-class performance for formats up to 8K.

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