National Library of Wales

The National Library of Wales (NLW) is one of the world's great libraries. Situated in Aberystwyth on the west coast of Wales, UK, it is a body of international standing contributing to a worldwide network of knowledge providers, and holds the world's largest collection of works about Wales and other Celtic nations. NLW is unusual if not unique among national libraries in collecting and giving access to recorded knowledge in almost every medium - books, periodicals, newspapers, manuscripts and archives, maps, paintings, drawings and prints, photographs, sound and moving images and electronic formats. With thousands of visitors every year, the Library offers free access to its extensive collection available on site and remotely through its rapidly growing electronic archive.

The Challenge
As a government archive, The National Library of Wales is the repository for a very wide range of cultural information and has a legal mandate to preserve records and facilitate their availability for the public. Unlike commercial organisations that operate with carefully managed data retention periods, NLW must maintain its records indefinitely.

Since 1999 the NLW has worked on a series of projects to electronically capture key collections of literary, historic and artistic content. This is part of a larger strategy to make important historical documents available to a much wider audience through a web based online interface. Their team of digital experts use a range of specialised scanning equipment to capture and enhance original content including: books, manuscripts, journals, public records, photographic collections, and art work.

Scanning as many as 2,000 documents a day, files can range in size from under 1MB (megabyte) to over 50MB for large format, high-resolution images. With their current projects, the digital archive is growing at a rate of 2-3TB (terabytes) each year.

NLW's challenge is to develop an archive strategy that will enable the long-term preservation of its digital assets. Since all objects must be kept forever, it recognises the need to migrate this data periodically to newer storage technology in order to maintain a cost-effective and accessible archive. Its objective is to extend the length of migration cycles, thereby minimising the number of migrations over time. Reduced migration frequency will save resource, time and money, while lowering the risk of loss or corruption associated with data handling.

The Solution
In order to meet its digital archive requirements, NLW has deployed a storage environment using a combination of technologies. At the heart of the archive strategy is an Enterprise Plasmon G-Series UDO library controlled by AMASS software running on a Sun server. Supported by its integration and maintenance service provider Network Attached Storage Ltd. (NAS), this archive solution provides the storage attributes and system scalability required for its environment.

"For more than four years, NAS has been providing consultation and technical support for the digital archive at the National Library of Wales. Over that period, it has established a very competent archive strategy with a clear vision of how to meet the needs of its users. Plasmon's UDO solutions play a critical role in its strategy." Barry Griffiths, managing director at NAS UK

The NLW begins their archive workflow capturing new digital content on magnetic disk RAID storage where the images pass through a strict quality

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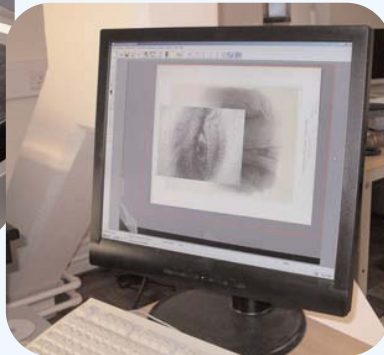> National Library of Wales

control process. Once approved, the objects are moved to the Plasmon archive for quick access. The content is also being archived on magnetic tape to provide additional redundancy.

"Our staff appreciate the performance benefit of accessing objects from the Plasmon archive, as it is much faster than tape and we depend on the greater media life for long-term preservation. Our UDO archive provides real benefits for both our IT infrastructure and those that depend on the archive," Einion Gruffudd, Senior Systems Analyst, National Library of Wales.

Second and third Disaster Recovery (DR) copies of NLW's archive data are currently stored on LTO tape media. One set of tape media is stored off-site to reduce the risk of losing data in the event of a serious site failure such as a fire. Having recently migrated a large amount of data from older LTO1 media to newer LTO3, NLW experienced first hand the cost and management resource required for a large migration project. It is now looking more closely at using UDO for its off-line DR requirements, since it has a longer life than tape and would reduce the frequency of migration cycles.

"The Plasmon archive platform provides NLW with extended retention periods that cannot be matched by other storage technologies currently available. UDO is the only storage media that

offers us an incorruptible, long-term storage archive," Owain Pritchard, Digitisation System Administrator at NLW.

NLW began with a Plasmon G438 library and UDO media. As archive capacity requirements grew, it took advantage of the flexible Enterprise configuration to expand its system to a G638. This simple field upgrade provides NLW with a 50% increase in archive capacity without having to invest in an entirely new system.

Electricity Consumption and the Environment

Another compelling benefit of the Plasmon archive solution is its energy efficiency. The UDO archive consumes far less power to operate and cool than an equivalent magnetic disk based archive. This is an increasingly important issue for NLW since the Welsh Assembly announced their "Green Dragon" initiative that targets energy reduction and environmental awareness within all government agencies. The Plasmon solution provides NLW with the secure longevity essential to their digital archive, reduces operating cost, and helps them respond to the government's environmental goals.

The Future

As a public institution, the archive requirements of the NLW are constantly evolving. New collections are being donated or acquired, and partnerships with The British Library and The National Screen and Sound Archive of Wales may place further demands on archive capacity and performance. Document and image archives will grow and diversify to include video and audio content in the near future. NLW has already expanded the media volume of the Enterprise G-Series archive and is now planning an upgrade from first to second generation UDO2, effectively doubling the potential capacity of its system. As with system expansion, it is a simple field upgrade to install new UDO2 drives. Since UDO2 is backward read compatible, all existing content will remain fully accessible and new, higher capacity, UDO2 media can be used going forward. This additional capacity will allow NLW to include new video content within their archive. The non-disruptive expansion and upgrade process provides the greatest possible data life while protecting the technical and financial investment made by NLW.

Plasmon's archive solution is a key component in the digital preservation strategy of the NLW. As part of a comprehensive archive and disaster recovery plan, its Enterprise UDO system delivers the longevity and performance fundamental to the mission of the institution. In addition, the cost-effective operation and low energy consumption help them to control long-term cost and meet emerging environmental targets. The Plasmon archive provides the National Library of Wales with a solution that addresses the diverse priorities of its users, financial director and IT management.

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