

**CNI Spring 2008 Task Force Meeting**  
**Streaming from the Institutional Repository**  
**By: Geneva Henry, ghenry@rice.edu**  
**Diane Butler, diane@rice.edu**

Preserving the digital scholarship of an institution can require more than archiving text documents. The Shepherd School of Music at Rice University is one of the preeminent music performance schools in the U.S. In 2004, preliminary discussions began about archiving the student and faculty performances in a digital format since the school's inception 30 years ago. This would allow these performances to be enjoyed by audiences worldwide. The library has partnered with the Shepherd School of Music to provide an archive where the performances can be managed and preserved long-term.

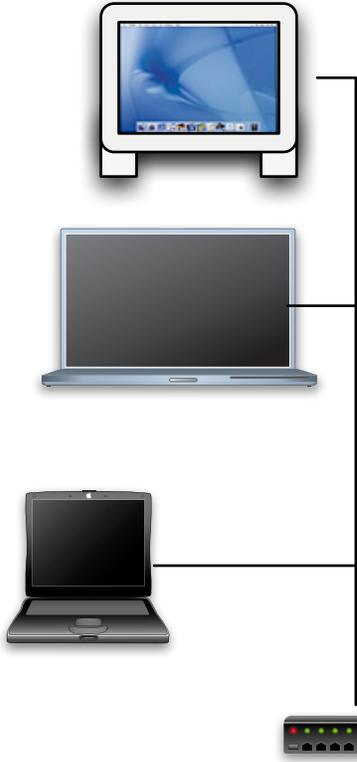
Using the DSpace institutional repository platform would provide many of the features desired for managing the files once they had been digitized, with modifications made to the DSpace software to accommodate METS/MODS metadata. A challenge, however, was the size of the musical performances. DSpace's architecture assumes that the files it manages will be downloaded to the requesting clients for them to enjoy and use locally on their own computers. This places a tremendous burden on the infrastructure, requiring sufficient networking bandwidth to accommodate the downloads on both the client and server sides. To overcome this issue, we needed an approach that would allow the files to be delivered via streaming by the appropriate technology for the specific file type, yet still be managed by the DSpace archive. A storage system with robust performance in delivering audio and video was needed, with modifications to DSpace to accommodate sharing of a file. Thus, the file would be managed by DSpace, stored in a common storage cluster, and then delivered through an appropriate streaming server.

We selected the Isilon IQ9000i storage cluster as it presented the best means for storing audio and video files. The DSpace software is being modified to store the metadata on the DSpace server and the bitstream on the Isilon cluster. When a client requests a music performance or a video file from the archive, Dspace returns a streaming url with the mime type and object url to the browser. The browser then sends that information to the selected streaming server, which receives the request, retrieves the file from the Isilon cluster and streams it to the requesting browser. This architecture provides the scalability and efficiency needed for a long-term solution.

Once we decided on this approach, we sought additional partners around campus to help us fund the purchase of the Isilon system. We quickly found others with the same types of needs: Rice's Language Resource Center, The Baker Institute for Public Policy, and Rice's Central IT department. Our architectural needs also had to accommodate these other groups' needs for managing audio and video files. This process has allowed us to collaborate across departments and build a trust and partnership with these departments as well as strengthen our ties to Central IT. We see much potential for future collaborations among other departments with the shared storage system and with archiving more of the different forms of multimedia scholarship produced by the university.

# DSpace Managed Multimedia Files using Isilon Clustered Storage with Streaming Delivery Servers

Clients



scholarship.rice.edu  
(DSpace repository)

Turi Hoiseith, violin, Master's Recital

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|                             |  |
|-----------------------------|--|
| date.accessioned            | 2007-05-07T18:40:33Z   |
| date.available              | 2007-05-07T18:40:33Z   |
| date.issued                 | 2004-11-19   |
| identifier.uri              | http://hdl.handle.net/1911/3780  |
| description                 | This recital is given in partial fulfillment of the requirements for the degree Master of Music. Ms. Hoiseith is a student of Kenneth Goldsmith.   |
| description.provenance      | Made available in DSpace on 2007-05-07T18:40:33Z (GMT). No. of bitstreams: 3<br>Maple-Leaf-Rag.mp3: 784219 bytes, checksum: 9590763d97641997d533b9bda181f745 (MD5)<br>Fur-Elise.mp3: 625081 bytes, checksum: ee6db3ceaa4bd05cd5c6b92127fcbbe8 (MD5)<br>sugar-plum-fairy.mp3: 403543 bytes, checksum: 46a56d58432baacfd0106d9b4585f221 (MD5)            |
| description.provenance      | Submitted by Monica Rivero (mpr1@rice.edu) on 2007-05-07T18:40:33Z No. of bitstreams: 3<br>Maple-Leaf-Rag.mp3: 784219 bytes, checksum: 9590763d97641997d533b9bda181f745 (MD5)<br>Fur-Elise.mp3: 625081 bytes, checksum: ee6db3ceaa4bd05cd5c6b92127fcbbe8 (MD5)<br>sugar-plum-fairy.mp3: 403543 bytes, checksum: 46a56d58432baacfd0106d9b4585f221 (MD5) |
| description.tableofcontents | Allemanda -- Corrente -- Sarabanda -- Giga   |
| description.tableofcontents | Allegro -- Adagio molto espressivo -- Scherzo: Allegro molto -- Rondo: Allegro ma non troppo   |
| description.tableofcontents | Program: Sonata no.5 in F major, op. 24 "Spring," Ludwig van Beethoven (1770-1827) -- Partita no. 2 in D minor, S.1004, Johann Sebastian Bach (1685-1750) -- Sonata no. 2, Charles Ives (1874-1954)  |
| description.tableofcontents | Autumn -- In the barn -- The revival   |
| subject.icsh                | Sonatas (Violin and piano)   |
| subject.icsh                | Suites (Violin)  |
| title                       | Turi Hoiseith, violin, Master's Recital  |
| type                        | classical music  |
| type                        | sound recording-musical  |
| title.other                 | Sonaten und Partiten, violin, BWV 1001-1006. Partita, no.2, Selections.  |
| title.other                 | Sonatas, violin, piano, no. 5, op. 24, F major   |
| title.other                 | Sonatas, violin, piano, no. 2  |
| contributor.composer        | Charles Ives, 1874-1954  |
| contributor.composer        | Bach, Johann Sebastian, 1685-1750  |
| contributor.composer        | Ludwig van Beethoven, 1770-1827  |
| creator.performer           | Moeling, Robert  |
| creator.performer           | Hoiseith, Turi   |
| coverage                    | Lillian H. Duncan Recital Hall, Rice University, Houston, TX   |

**Files in this item**

| Files                                | Size    | Format      | View                       |
|--------------------------------------|---------|-------------|----------------------------|
| <a href="#">Fur-Elise.mp3</a>        | 625.0Kb | audio/basic | <a href="#">View/Open</a>  |
| <a href="#">Maple-Leaf-Rag.mp3</a>   | 784.2Kb | audio/basic | <a href="#">View/Open</a>  |
| <a href="#">sugar-plum-fairy.mp3</a> | 403.5Kb | audio/basic | <a href="#">View/Open</a>  |
|                                      |         |             | <a href="#">Need help?</a> |

