



# University of Illinois Case Study



*"Real provides an easy-to-administrate, robust and scalable server infrastructure for streaming media to over 15,000 students and faculty. With Real's SureStream™ technology — combined with the cross-platform compatibility of the RealPlayer® — we only have to do a single encode into one file for most of our media. But we are still assured that our media will work for nearly all our users, whether they are on Macs, PCs or Linux boxes."*

**Paul Riismandel**

*Manager, Digital Media Production and Support, University of Illinois Urbana-Champaign*

Paul Riismandel provides technology support services to the departments and administration in the College of Liberal Arts and Sciences at UIUC. Mr. Riismandel's group, Digital Media Production and Support, provides production services, support for audio-visual needs and the internet infrastructure to support online and streaming media. They produce video programs both in studio and on location, using single-camera and multi-camera techniques. We sat down with Mr. Riismandel recently to learn more.

## How do you use streaming media at the University of Illinois? What are the biggest benefits to your faculty and students?

We began using streaming media as a replacement for traditional physical media, like audio cassettes and media labs. Prior to implementing streaming media, we provided language lessons to students on cassette, in special-purpose language labs and via a voicemail system.

Since making the full transition to streaming in 2000, we have greatly expanded our use of this technology. At this time streaming has almost entirely replaced physical media for most needs, although DVDs are often produced for archival purposes. Streaming is used extensively in order to make it easier for students and faculty to attend virtually lectures, conferences and events that their schedules might otherwise prevent them from experiencing.

Streaming allows faculty to re-use guest lectures and other special class presentations in future semesters without having to re-invite the guest, who often is not able to return each year. The videos of these lectures can then simply be assigned to students to watch in-class or as homework, out-of-class.

We also make use of streaming to help instructors in evaluating student performance. In the languages and humanities students are often called upon to give class presentations. Having these presentations recorded and made available to the instructor and students allows the instructor to review the presentations more closely, in addition to allowing for additional peer evaluation and for the student presenter to review and self-evaluate his/her performance.

Finally, we video record and stream class lectures for many advanced courses in the sciences that cover complex materials in a visual fashion. Motivated students then have the opportunity to review portions of the class lecture to help study and prepare for tests.

Prior to adopting streaming my department was able to provide many of these services, but on a much smaller scale. The time and labor required to copy and distribute physical media greatly limits our ability to produce it quickly and get it into the hands of faculty and students. At one time we had to employ a team of undergraduate workers who spent most of the day just duplicating audiocassettes and videocassettes.

Now with streaming we simply provide links to faculty and students to watch or listen to their media, allowing us to greatly shorten our turnaround time. As a result we are able to serve many more students, faculty and departments without having to increase our staff exponentially.

A nice result of using streaming has been the high degree of satisfaction that faculty and students express about the quality and convenience of the media we create for them. Students no longer have to come to campus to listen to lessons, or buy tapes. Faculty no longer have to check out cassettes or try to find a working VCR or cassette player in their department.

Thus streaming has moved from being a supplemental service to something that is absolutely critical for many departments and courses.

## **What challenge led to your decision to invest in streaming media?**

The challenge was figuring out how to serve a growing student population with important curricular media without having to invest in more physical media resources, from duplication equipment to building specialized media classrooms.

We first engaged with Real in 1996 to begin serving some audio programs over the web for specialized language teaching and research purposes. The primary use of our first RealServer® was to support research in the burgeoning field of Computer Assisted Language Learning (CALL).

We chose Real in 1996 because at the time it offered the most robust streaming media serving infrastructure.

We upgraded our license in 2000 in order to increase our client capacity and therefore support a growing number of applications. We were slowly expanding into video, while greatly increasing our audio streaming. At the time we still had a very large number of clients using dial-up connections to the Internet, but we didn't want to force users on the broadband university network to have to use low bandwidth media as a lowest common denominator.

Unfortunately, we found that many of our users in 2000 still didn't understand the concept of bandwidth, and would select to view a high-bandwidth video even when connected by dial-up. These users would get frustrated leading to a poor opinion of our service.

Real's implementation of SureStream made it easy for us to support both low and high-bandwidth users in a simple way that wasn't confusing to the user. All users could use the same link, but get the proper bitrate media for their internet connection. Using SureStream all but eliminated our tech support calls for playback issues.

## **Which Real technologies do you use, and how are they deployed?**

In 1996 we first used the RealServer on Linux. In 2000 we switched to Windows in order to better connect with the Windows desktops used for production in our department. We've stayed with the Windows version of Helix Server because it continues to work well within our campus Active Directory environment.

In the last few years my department and our whole campus have greatly increased the number of live streaming events we produce. In order to better serve large numbers of simultaneous streams, our campus acquired a site license for the Helix™ Server Unlimited in 2005 in order to build out a scalable load-balanced network of streaming servers on campus. We are still building out the network as more departments join in this enterprise, but initial tests have shown an ability to accommodate many more streams than in the past.

My department, in particular, makes extensive use of SMIL (Synchronized Multimedia Integration Language) in order to enable us to have a workflow resulting in fast turnaround of video recorded events. Because we have a large, geographically dispersed campus of buildings that are more than 50 years old, we still primarily do video acquisition by bringing cameras to classrooms and venues. In order to speed capture, we record video directly to portable hard drives (Capdiv, Firestore) in addition to tape. Because they use the Win32 disk format, these hard drives store the DV video in 2 GB files of 9 minutes each.

After recording we upload these AVI files to a computer and batch convert them into RMs using Cleaner XL. We then create SMIL files to play these 9 minute RMs in sequence, trim heads and tails, and add titles and lower-thirds. Using SMIL this takes much less labor than it would to edit the video together in a NLE and then export it in RealVideo.

Using SMIL also enhances the user-friendliness of our streaming media. We are able to provide a link to a SMIL file to our users





prior to a live event or an archive event that has yet to be recorded. Our users can then place the link on their webpages at any time. When a viewer clicks the link before an event, s/he gets a message saying when the event will be available. Once the files are uploaded or the event has begun, a simple edit to the SMIL file means the viewer now gets the program. With this method we don't have to try and send new links to our users and therefore have many fewer problems with users who try to watch a video that is not yet available.

### **Which product features have proved to be the most valuable?**

The most valuable features have been SureStream and SMIL, as well as the robustness of the Helix Server, its scalability and the ease of administering it.

*"Helix's support for Windows Media, QuickTime and MPEG4 means that we have the ability to accommodate other formats when the need arises without having to run multiple platforms. We're not locked into a single media format, which increases our flexibility in choosing other streaming applications, such as course recording systems."*

### **Why did you choose Real products over other competing products?**

We have considered using both Windows Media Server and QuickTime/Darwin Server. The primary benefit of these products is that they are included free with their host operating systems. Since we already run Windows Server, the Windows Media Server, in particular, would have entailed no additional cost.

However, at the time we were making our platform decision, neither Windows nor QuickTime offered a bandwidth adaptive solution on par with SureStream, and it was most definitely SureStream that made us stay with Real in 2000. The fact that Real has added QuickTime, MPEG and Windows Media support over the years has convinced us to stick with Real. Although the Helix Server is not free, the benefit of having to run only one streaming server platform is a cost-savings when it comes to administration and labor.

Without Real we would probably have to run both a Windows Media Server and a QuickTime Server, especially since the support for Windows Media on the Mac OS platform has become worse. We would also have to encode our media into multiple formats more quickly, so that we would be sure to accommodate our Mac and Linux users in addition to our majority Windows users.

The fact that RealPlayer is available on Windows, Mac and Linux makes our world much easier because it means we don't have to do multiple encodes for most purposes.

### **Have you been able to determine whether your streaming media strategy has been successful?**

Measuring success is difficult, and we're still trying to figure out what our metric is. One rather anecdotal but powerful metric is the user response we get when a piece of media doesn't work. Most of the time these problems are due to human error (mistyped links, errors in encoding, etc) rather than server errors. But when students or faculty can't get the media they expected, we sure do hear about it. That is one of the strongest indicators to us that streaming media has become an essential service.

We have seen an 80% increase in our media production output every year since 2003. I attribute much of this growth in demand and output to how streaming media allows us to better distribute high-quality content. I think if we were still distributing video on VHS videocassettes we would be seeing increases in the single-digits like we had prior to 2000.

Real has allowed us to use our limited production labor resources more efficiently. More time is spent in actual production — shooting, editing, authoring — than in duplication and distribution. Faculty clients with whom we work on large-scale production projects really like being able to get "dailies" and rough edits from us very quickly by RealVideo rather than having to wait for us to get them a DVD or VHS.

The raw throughput of our Helix Server has also increased on the order of 60% each year since 2003, which is roughly commensurate with the growth in the number of users served.

### **How will you use streaming media in the future?**

In the future I see my department providing streaming media of nearly all lectures and events that happen in the College of Liberal Arts of Sciences. Additionally, we will provide streaming media in support of approximately 50% of the courses taught, whether that is recordings of class lectures, or supplemental materials to be viewed out-of-class.

I hope we will accomplish this growth in five years. In the coming year I expect we will continue the growth we've seen over the past few years. The factors that most inhibit this growth have to do with administrative support, not the capacity of our Real infrastructure.

Our College administration is just starting to become aware of the possibilities of streaming media. This past year the administration started using streaming video for student recruiting. I expect this to grow. Another growth area will be alumni relations, using video to keep alumni informed of important news in the College and accomplishments of students and faculty. This area is very important, since alumni giving will become a much more significant source of revenue for the university.

### **About ATLAS at the University of Illinois Urbana-Champaign**

ATLAS (Applied Technologies for Learning in the Arts and Sciences) provides information technology services that support and enhance the educational, research and administrative activities of students, faculty and staff in the College of Liberal Arts & Sciences at the University of Illinois Urbana-Champaign. Learn more about ATLAS at [www.atlas.uiuc.edu](http://www.atlas.uiuc.edu)

### **About RealNetworks, Inc.**

RealNetworks, Inc. is the global leader in Internet media delivery. It develops and markets software products and services designed to enable users of personal computers and other consumer electronic devices to send and receive audio, video and other multimedia services using the Web.

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