Streaming Media: Real-time Video and Audio on the Internet

The broadcast of “live”, video and audio over the Internet is another indication of the increasing importance of multimedia in Web based communication and instruction. Most Internet users do not have the modem speed or patience to wait for multi-megabyte audio and video files to download to their computers before viewing. This near instantaneous or “real-time” delivery of audio and video to your computer screen can now be accomplished by one of the Internet’s newest tricks called “streaming media.”

Potential for Enhancing Instruction

Streaming media has the potential to add a richer multimedia and interactive experience to text based online courses. Video, audio, animation, graphics, photos, text and PowerPoint can all be broadcast on the Web using streaming technology. Recent releases of streaming software go far beyond merely sending audio and video to your computer. Programming or cue “tracks” can now be embedded in the streaming media file which allow for such advanced effects as automatic URL page-flipping, interactive hyperlinks, text captioning, and synchronization of animation and graphics to audio. Not only could distance learning students benefit from this richer online learning experience, but on-campus students could see their traditional classroom experience enhanced as well with the anytime, anywhere capabilities of streaming media.

Several ISU instructors have begun working with ITC and the Computation Center to develop streaming instruc-

18 Media Enhanced Classrooms Upgraded for Fall Semester

Eighteen classrooms were upgraded with new media equipment and other structural remodeling this summer. This brings the number of Media Enhanced Classrooms to more than eighty general classrooms and computer laboratories on the ISU campus. The newly equipped Media Enhanced Classrooms are Gilman 1104, Town 270, Molecular Biology 1420, and Lagomarcino W262. Fourteen other existing Media Enhanced Classrooms have new multimedia projectors that produce brighter images and accept higher resolution computer input. Check the ITC web site for a complete listing of all the Media Enhanced Classrooms and auditoriums.

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Instructional modules to supplement their on-campus courses. By shifting lectures, or one-way information delivery, out of the classroom and onto the Internet, instructors can use valuable in-class face-to-face time for questions, discussions or cooperative learning activities. Students who preview streamed course content from a computer lab, dorm room or home computer come to class better prepared for lab work or active learning strategies. Additionally, the streaming media “players” like RealPlayer G2 or QuickTime4 have controls similar to a VCR so learners can pause, rewind and replay online instructional modules for note taking and reviewing course content. (see “Getting Started” insert)

**Designing Streaming Media for Instruction**

Designing and developing short instructional modules which take advantage of streaming media's strengths while avoiding its technical limitations is the challenge. While it may seem a simple innovation to offer streaming playback of traditional lectures on the Web, in reality the results of recording an in-class presentation are very poor. Generally, dim classroom lighting, poor acoustics and instructional visuals not formatted for electronic presentation conspire to create poor quality video. The picture and audio quality of these recorded lectures is eroded further by the compression and encoding process required to prepare the media files for broadcast over the Internet.

Short, salient chunks, or modules, of instruction play to the strengths of streaming media and keep the learner's interest. Examples of these modules might include an animation illustrating a biological function, a mechanical device in motion, a short laboratory procedure or a 10-15 minute synchronized audio and PowerPoint presentation. ITC's experience with this new technology indicates PowerPoint presentations, photos and traditional classroom visuals usually need to be reformatted or specifically designed for broadcast on the Internet. Multimedia instruction not reformatted for the Internet will often have unreadable graphics or difficult to understand audio and creates a frustrating experience for the online learner.

**How Streaming Media Works**

In its simplest form, streaming technology takes an existing video or audio file and encodes, or re-structures it for delivery across the Internet in small individual data packets. When your computer requests an audio or video file from a remote computer server, the streaming media player begins to receive and then gather these pieces for storage in temporary memory. This process, called “buffering”, smooths out the data stream so that the computer always has enough information in memory to display even if there is a temporary slowdown in the Internet.

When the computer decides it has enough media pieces to stay ahead of the incoming stream of data packets, it begins assembling the packets sequentially and displaying the media clip on your screen through the streaming player. What the user experiences is unbroken audio or video that appears to be playing in real-time.

**Not Quite Ready for Prime Time**

While the technology for streaming media is quickly improving, current Internet transmission speeds are too low to support the higher quality TV images we are accustomed to. A television can play a full-screen image of 640 pixels wide by 480 pixels tall at 30 frames per second. Video streamed over the Internet...
Getting Started Viewing and Creating Streaming Media

Like most aspects of computer mediated communication and education, streaming media is in a constant state of evolution. Currently there are two streaming technologies dominating the market. Real Network’s encoding and playback technology is currently the most popular format for Internet streaming with a reported 72 million users. The Computation Center holds a limited server license for hosting RealMedia streaming files at ISU. Apple’s new QuickTime reports over 20 million users and requires an Apple OSX server to stream content files. Both players are cross platform and free for download at www.real.com or www.apple.com/quicktime/.

The Instructional Technology Center can create streaming media files from your existing video or audio, or create new streaming presentations. Working with the Computation Center, ITC can provide solutions for storage and distribution for streaming media files as well. If you need streaming media services, or simply wish to explore the possibilities of how this technology can work for you, contact Jim Twetten, Manager, Creative Services, at 294-2316.

To save file size and transmission time most streaming media clips are reduced in image size and highly compressed. Programs that encode or prepare video for streaming may reduce a video to as little as 1/200 of its original size. Shrinking the picture size and compressing it at a high rate can cause a dramatic degradation of image quality and an unsatisfactory experience for the viewer.

Future advances of high bandwidth Internet access into the home, along with more powerful multimedia software and computers, promise a highly interactive multimedia experience with streaming media. Until these advances arrive, successful use of streaming media files for web pages and online instruction requires careful planning and refined authoring techniques to overcome the current limits of this technology.

- Jim Twetten, Mike Wilson, and Allan Schmidt—Creative Services

Lloyd Appointed to Instructional Development Position

Tom Lloyd has been appointed to the Instructional Development Specialist position jointly supported by the Instructional Technology Center and the Center for Teaching Excellence. He will be working with both centers to develop and present training for university faculty and staff on integrating educational technologies into teaching strategies. He will also be available for consultation with individual faculty members and departments.

Tom has an M.S. Degree in Curriculum and Instructional Technology from Iowa State, and specializes in distance education. The last two years he has researched the use of distance education technologies in Iowa for the Dept. of Curriculum and Instruction at Iowa State. Prior to coming to Iowa State, Tom served in the US Army as a training management and standardization officer. He also did short-term development training for small companies in the Des Moines area.

Tom is a retired Army Officer and a certified flight instructor for airplanes and helicopters. He continues to provide aviation training consultation in his free time. Lately his free time has been severely limited as he finishes his Ph.D. in Curriculum and Instructional Technology.

Tom and his wife Cheryl have three children and reside in Ankeny, IA.
Fall 1999 Workshops and Seminars for Support of Teaching, Learning and Instructional Technology at ISU

For more information about these workshops or to request new workshop topics, contact Allan Schmidt, Instructional Development Coordinator (294-2316, aschmidt@iastate.edu). Updates on workshop availability and information on up-coming training events can be found on the Instructional Technology Center web site at: http://www.itc.iastate.edu/instruct/seminars.

Web Course Delivery using WebCT
Facilitators: Allan Schmidt, Instructional Development Coordinator, ITC, and Linda Briesacher, WebCT

This workshop will provide a general overview of WebCT, a web course development and delivery software package. WebCT is currently the most widely used commercial web instruction product in higher education. ISU has licensed the product for evaluation and made WebCT available to instructors to support both on- and off-campus instruction. Software developers from Universal Learning Technologies will demonstrate the newest version of WebCT and talk about future directions for integrating WebCT with other non-instructional campus web services. The workshop will include demonstrations of many of the tools and features of WebCT from both a learner’s and instructor’s perspective.

Wednesday, September 15, 3:30-5:30 p.m.

Faculty Transformation: The Key to the Virtual Campus (co-sponsored with Center for Teaching Excellence)
Live PBS Teleconference

With the expansion of Web-based learning and the rapid evolution of virtual campuses, you won’t want to miss this timely learning opportunity. You’ll find out how a systematic approach to faculty transformation can facilitate institutional change; empowering your institution to make innovative uses of information technologies in order to deploy a full-scale virtual campus. This live event is for faculty, administrators, and educational technologists who are eager to hear from peers about recently learned lessons in higher education.

Participants will learn:
• strategies to foster faculty transformation
• systematic and programmatic approaches to technological innovations
• about readily available technological tools
• practical methods for institutionalizing faculty development
• how to scale up Internet or Web-based course offerings
• how to sustain a climate for institutional change
• what obstacles and barriers need to be overcome

Thursday, September 23, 1999, 1:00-3:00 p.m. Fee: $10

Selecting and Purchasing a Digital Camera
Facilitators: Matt Darbyshire, Manager of Classroom Services, Julie Hanson, Computer Specialist, ITC

If your department or project is considering the purchase of a digital camera, this workshop will help you decide which model is right for you. Topics to be covered include camera brands and models, prices and image storage options. A basic overview of the production process will demonstrate how to incorporate your images into publications, PowerPoint, and web pages.

Tuesday, October 5, 2:10-3:30 p.m. Fee: $10

Using Streaming Media for Online Instruction
Facilitator: Mike Wilson, Project Coordinator, ITC

New media technologies like QuickTime and RealMedia can now broadcast, or stream, interactive audio, video, animations, text, and graphics across the Internet and display them on your desktop computer. This session will cover the basics of streaming media including: what it is, how it is created, and how it can be used to enhance online instruction for both on- and off-campus learners. Participants will see examples of streaming media used for instruction at ISU, learn how to create their own streaming media files, and find out what campus services are available for instructional design, development, and delivery of this new medium.

Friday, October 8, 10 a.m.-12 p.m. Fee: $10

Libraries, Copyright, and the Internet
Live PBS Teleconference

With Internet access becoming a key service of libraries everywhere, librarians and faculty need to know the basics of copyright law. This program will cut through the myths and misinformation about the way fair use and cyberspace law apply in a library setting. Topics covered include restrictions that are truly necessary to avoid the risk of lawsuits and the liabilities of patrons, librarians, and libraries. A follow-up to the award-winning Am I a Crook? satellite event, this program is essential for all academic, school, and public libraries.

Thursday, October 14, 1:30-3:00 p.m. Fee: $10

A Beginner’s Guide to Creating Web Pages for Instruction
Facilitators: Allan Schmidt, Instructional Development Coordinator and Frank H. Keis, Graduate Assistant, ITC

This is an entry-level hands-on workshop for creating instructional web pages. Participants will learn how to use two simple and readily available tools, Microsoft Office and Netscape Composer, to convert existing documents to web pages as well as create new pages. Topics to be covered include strategies for effective instructional web pages, programs for creating web pages, and
the pros and cons of converting existing documents to web pages. Faculty will also demonstrate how they are using the web to enhance instruction in their courses. Basic skills with Microsoft Word, PowerPoint, and Netscape Navigator are required.

**Wednesday, October 20, 10:00 a.m.-12:00 p.m. Fee: $10**

**Basic PhotoShop - Making PhotoShop Work for You**

Learn to make use of the premiere image manipulation package on both Windows and Mac platforms. In this hands-on session you will learn how to navigate the tools palette and menus of Adobe PhotoShop. Topics to be covered include importing images into PhotoShop through scanning or file conversion, image selection, sharpening, re-sizing, lightening/darkening, changing file formats, saving in proper file formats for the web or PowerPoint and more. This session assumes you have some experience with desktop computers, but little or no experience with PhotoShop.

**Tuesday, October 26, 2:10-4:00 p.m. Fee: $10**

**Intermediate PhotoShop - Making PhotoShop Do More for You**

Learn some of the more advanced capabilities of Adobe PhotoShop. Topics to be covered include layer manipulation, image retouching, compositing, importing clip art, color manipulation and more. In this hands-on session you will learn how to navigate the manipulation palettes and sub-menus of Adobe PhotoShop to optimize images and prepare them for reproduction in printed documents or for use in web sites, PowerPoint or the electronic classroom. This session assumes you have some basic experience with PhotoShop and its menus. If you are in doubt, sign up for the basic class first.

**Tuesday, November 9, 2:10-4:00, p.m. Fee: $10**

**Introduction to Web Course Delivery using WebCT**
Facilitator: Allan Schmidt, Instructional Development Coordinator, ITC

This seminar-style workshop will provide a general overview of the web course delivery package called WebCT. It is intended for instructors who are considering adding an online element to an existing course or who anticipate providing a complete online course. The workshop will demonstrate many of the tools and features of WebCT from both a learner's and the course designer's perspective. Guest faculty who have used WebCT in conjunction with for-credit courses at ISU will offer valuable insights and tips for incorporating WebCT into your courses for on-campus or off-campus instruction.

**Monday, November 22, 10:00-11:30 a.m.**

**Online Testing A How-To for Faculty**
(co-sponsored with Center for Teaching Excellence) Live PBS Teleconference

Testing and testing services continue to be issues on the front burner for distance learning faculty and program administrators. As colleges and universities consider institutional policies, software applications, hardware availability for online testing, this program will lay out some of the available options. The teleconference will address such issues as new approaches to evaluating student performance, security concerns, and obtaining institutional support when introducing new policies and procedures.

**Thursday, December 2, 1:30-3:00 p.m. Fee: $10**

**Events Scheduled Spring 2000**

**Virtual Universities Online and On-Target?**
Live PBS Teleconference

How successful are virtual universities? Are they fulfilling their mission or falling short? Changing the face of higher education or distorting its vision? Will they be pacesetters over the long haul, increasing access to high-quality instruction, or will they add to the confusion about the future of teaching and learning without adding value to the educational process? Representatives of leading virtual universities will bring participants up to date on what they are doing and the impact they are having on traditional colleges and universities. Participants can take advantage of this live, interactive forum to evaluate and compare these new approaches, ask their own questions about “virtual” education, and add fresh insights to the strategic planning activities of the institutions.

**Thursday, February 3, 2000, 1:30-3:00 p.m. Fee: $10**

**How to Customize an Online Course**
Live PBS Teleconference

An increasing number of faculty across the country are interested in teaching online. At the same time, many institutions recognize the considerable benefits of using externally produced or departmentally produced online materials. These materials can be adopted by many faculty members, much the way course textbooks are. This program will illustrate how online courses work and demonstrate how instructors can evaluate and select options to give courses their personal and institutional stamp. Participants will obtain guidelines for implementing online courses and tips for designing asynchronous interaction with students, for testing, and for managing their own time.

**Thursday, April 6, 2000, 1:30-3:00 p.m. Fee: $10**

**Workshop and Seminar Registration**

Registration is required. To enroll, contact the ISU Training and Development office at 294-8914, or by e-mail (hrstandd@iastate.edu). Please provide your name, department, campus address, phone number, classification (faculty, P&S, merit, TA, etc.), and workshop name and date. For workshops with fees please submit payment (cash, check or intramural) with registration form to Training and Development, 321 Beardshear Hall. An online registration form can be found at: http://www.public.iastate.edu/~training_info/. Event locations will be provided to those who have registered.

**Limited Enrollment - For Registration Call 294-8914**
What is a Media Enhanced Classroom?
The Media Enhanced Classroom project began in the summer of 1993 as a joint initiative by Facilities Planning and Management and the Instructional Technology Center to improve the environment of the general teaching classrooms on campus.

A Media Enhanced Classroom has permanently installed media equipment that enables an instructor to display computer and videotape output on a video projector. The presenter has to provide a computer to connect to the display projector. The data jack or Ethernet port in these rooms is active and the jack I.P. (Internet Protocol) number is posted in the media cabinet. A media cabinet or lectern in the classroom contains a VCR, audio amplifier, video projector remote, and other media equipment.

Key holders can be teaching in several locations at several different times but use the same key. As teaching assignments change to different classroom locations, media cabinets can be reprogrammed to accept the instructor’s key. The user keeps the same key while they are teaching at ISU, but must inform ITC of new teaching locations at the beginning of each semester for lock reprogramming.

Accessing Media Cabinets Requires MARLOK Key
If you are teaching in one of ISU’s Media Enhanced Classrooms you will need a personalized MARLOK key to open the media equipment cabinet. Media cabinet access at ISU is controlled by the computer programmed MARLOK system. Limiting classroom media access to authorized instructors, or teaching assistants, helps ITC prevent equipment tampering and theft. Because each key can be individually programmed, one MARLOK key can be used in multiple lock locations around campus. Not only can the lock be programmed to allow access to a specific key; it can also be programmed to allow access only during a specific time frame.

Key holders can be teaching at ISU, but must inform ITC of new teaching locations at the beginning of each semester for lock reprogramming.

Changes to MARLOK keys usually require two working days to accomplish. Keys, changes, room demonstrations, and training can all be arranged by contacting the Classroom Services at 294-8022.

Classroom Orientation and Technical Support Available for Instructors
“I need a key . . . how do I connect my computer . . . can you show me how to use the equipment . . . which classrooms have laser disc players . . . can I get an Ethernet connection in my classroom?” These are just a few of the questions asked by instructors at the beginning of the semester. The ITC Classroom Services staff can answer those questions and more. Contact them at 294-8022 for assistance with:

- Equipment demonstrations and training for the Media Enhanced Classrooms.
- MARLOK Key access to cabinets, lecture podiums, and projection rooms.
- Displaying computer output in the Media Enhanced Classrooms.
- Media Equipment Satellite equipment storage locations in classroom buildings.
- Equipment scheduling for classroom use.
- Classroom media capabilities.
Construction and Remodeling Nears Completion on ITC’s New Facilities

As part of the remodeling project the main entrance to the Communications Building will be relocated to the east side of the building. The entrance and lobby will contain two new pieces of public artwork.

The remodeling and new construction activities of the Communications Building projects continue on schedule. Major progress has been made to reequip the University studios and on the new facilities for the Instructional Technology Center. Much of the work has been completed on rewiring of the studios and installation of the digital video equipment, which is switchable between the current 4 by 3 television aspect ratio, and the wider screen 16 by 9 aspect ratio that digital television (DTV) will bring in the near future.

These facilities will be shared by several university departments for their teaching and production activities. The ITC has been coordinating this project and has provided much of the installation labor from its engineering and repair staff. The studios project will require nearly 2,500 hours of installation labor, utilizes over nine miles of cable, 3,000 connectors, and over 150 video monitors. These facilities will open during the 1999 fall term for the teaching and production activities of the ITC, Greenlee School of Journalism, Extension Communications, and WOI-AM/FM Radio.

The construction of a new Communications Building entrance and the related ITC support service spaces also are nearing completion. At this writing, the facilities are awaiting the installation of acoustical ceilings, millwork, and carpet. The projected completion date is mid-September. The ITC has already relocated its engineering staff to completed space in the remodeled studio area. Full ITC relocation to the Communications Building will take place during the week of Thanksgiving break with the transfer of ITC Classroom Services from Pearson Hall and the ITC Creative Services and Instructional Development staff from Exhibit Hall.

An open house and building dedication is being planned for the second semester of 1999-2000.

Denny Goodrich, Project Coordinator, ITC, tests a video switcher in the control room of one of the University’s new digital television studios.

Artwork Pieces Commissioned for Building

The Art in State Buildings Program (AiSB) provides that all state construction projects incorporate public art in their construction budgets. The Communications Building project is meeting this requirement through the commissioning of two major pieces of artwork for the building. Working with the building architect, Savage-VerPloeg & Associates, and Lynette Pohlman, Director of University Museums, the ITC art committee has selected two artists; Marc Moulton, Cedar Falls, and Jack Wilkes, Iowa City, to create two pieces for the Communications Building. The artwork, a large sculpture (Moulton) and a series of six acrylic panels (Wilkes) will be installed in the open lobby area.

The artwork pieces are entitled “Lingo” and “Link” and are based on the history and symbols of communication. They incorporate sign, symbol, light, and metaphor through color to create dialogue with the public viewer. A dedication and program on these major AiSB artwork items will be held following their installation.

- Don Rieck, Director

Denny Goodrich, Project Coordinator, ITC, tests a video switcher in the control room of one of the University’s new digital television studios.
ITC Staff Profile

Rod Myers
Television and Radio Tech II
Creative Services Team

“Rod, I need help!” is a common cry in the television studio and edit suites of the Instructional Technology Center. Rod has worked at the ITC for the past 18 years where he is responsible for maintenance and repair of professional broadcast audio and video equipment. He is currently part of the installation team remodeling the old WOI-TV television studios in the Communications Building.

Rod has served as a consultant and installation engineer for many past ITC projects including a trip to Egypt to work on a video equipped classroom at the University of Cairo. He was also part of the installation team for a media enhanced classroom for the Naval Surface Warfare School in Newport, Rhode Island. Before working at ISU, Rod worked for seven years in the consumer electronics industry and prior to that was a television and cable engineer for the Army Intelligence School, Fort Huachuca, Arizona.

When Rod is not repairing TV cameras or adjusting videotape recorders he enjoys fishing lakes in Iowa, Minnesota, and Canada for walleyes, crappies, and bass. He also enjoys being a grandpa to his two year old granddaughter, Jessie. Rod’s home is a busy place with a major remodeling project in progress. It is also a playground for two dogs, a Japanese Akita named Sidney and Saint Bernard puppy named Saint Thomas. Rod’s wife, Janet, works as the dispatcher for ISU Transportation Services.

112 Pearson Hall
Iowa State University