Imagine sitting in a public-policy classroom and being able, instantly, to set up a brief video conference with Sen. Trent Lott, the Mississippi Republican, to discuss a proposed constitutional amendment protecting the flag. Or being able to do a quick search using the key words "flag" and "Senator Lott" to retrieve C-Span video clips of Mr. Lott's previous public statements on the amendment.

Neither of those things can be done on the Internet today. But on experimental high-speed networks supported by the Internet2 consortium, researchers are making rapid progress in using high-resolution digital video as a teaching and research tool.

"This stuff is coming along very fast," said Joel J. Mambretti, director of the International Center for Advanced Internet Research at Northwestern University.

On Tuesday, Mr. Mambretti announced that the research center would work with C-Span, the IBM Corporation, and Internet2 to build an experimental indexing-and-retrieval system for a large-scale, digital archive of C-Span's broadcasts.

The same partners are also contributing to an experimental digital-video "portal" site where students and researchers will be able to look up any archived C-Span broadcast they want -- quickly. "It's a nice tool for education," Mr. Mambretti said.

The C-Span project is part of a larger Internet2 effort to create a national digital-video network for higher education, he said.

The archive is being developed by Internet2 researchers using a technique that automatically finds major scene changes in digitized versions of C-Span footage. Special software developed by IBM converts the audio portion of the video to text -- and creates "pointers" back to the video scenes for indexing purposes.

"You don't want to spool through the whole video to see what's on it," Mr. Mambretti said.

At the Spring 2000 Internet2 meeting that ended here Wednesday, Mr. Mambretti showed just how far Internet2 researchers have come in transforming digital video, which produces a disappointingly small
and jerky picture on the regular Internet but can appear as a large and vivid movie when transmitted on a high-speed digital research network.

Viewers at the conference watched a live C-Span2 news conference -- Mr. Lott was speaking in a Senate hallway -- that was being broadcast over two high-speed digital networks, the Internet2 Abilene network and the Metropolitan Research and Education Network.

"Just as good as viewed over cable," Mr. Mambretti observed. The quality will get even better, he said, when a new encoding technology -- called MPEG-2 -- replaces MPEG-1, which was used in Tuesday's demonstration. All of Northwestern's dormitories, he said, are getting new high-speed connections for displaying high-resolution digital video.

Mr. Mambretti said that C-Span "is interested in all of this, because they understand that the digital world is an important part of their future." Digital video on the Internet, he said, is going to be much easier to use, and more accessible, than "the old analog media."

It remains to be seen how quickly Internet2 researchers can solve the problems of "scalability" that he said are bound to arise when not just a few but 10,000 or 100,000 students try to access the archive simultaneously. "Those standards haven't been finished yet," but many people are working on them, he said.

Digital-video conferencing is technically demanding in a different way than digital-video archiving, Mr. Mambretti said. Just as students and faculty members today have individual e-mail addresses, in the future they will have their own video-conferencing addresses stored, with their e-mail addresses and telephone numbers, in a central campus directory.

Mr. Mambretti, who is chairman of the Internet2 digital-video steering committee, said that a prototype for such an addressing scheme was being developed. He also predicted that everyday use of digital-video conferencing for spontaneous communication -- using handheld, wireless Internet devices -- was not far off.

As a footnote, members of the Internet2 consortium learned Wednesday that a team of researchers from the University of Washington, the University of Southern California Information Sciences Institute, Microsoft Corporation, and Qwest Communications International Inc. had the winning entry in the first Internet2 "land-speed record" contest.

Internet2 officials said the team had set a new transcontinental-speed record for the Internet protocol by transferring 8.4 gigabytes of data from Redmond, Wash., to Arlington, Va., in less than 82 seconds over a Defense Department high-speed network. At that rate -- 823 megabits per second -- the data was transferred 15,000 times faster than would be possible using a typical computer modem, they said.