Opinion: Is It Time for 'PACSter'?

David S. Channin

MUCH HAS BEEN written lately, in the lay press, concerning a relatively new technology called "Napster" and the company of the same name that developed it. Napster primarily is a software technology for sharing digital music files on the Internet. Users of the software and the associated service can record (legally or illegally) music and store this digital music in a file format known as MP3. The local copy of the Napster software communicates a catalog or directory of the user's music collection to a Worldwide Web–based repository. Other users of the Napster software then can search for a specific piece of music, and the Napster software coordinates the identification of the nearest Napster participant that has the desired recording. The transfer of the file then is orchestrated between the 2 users.

The cataloging and transferring of large collections of information on the Internet is not new. As the Internet grew out of the ARPAnet in the 1970s and 1980s, even before the development of the Worldwide Web, tremendous collections of scientific (and other) data, software, images, and other files were available on the "net." One of the original protocols developed for the net, the file transfer protocol, or FTP, was used to transfer these files between sites. In the mid 1980s, there were at least 2 academic initiatives, named Archie and Veronica, which catalogued the FTP sites so that users could identify close sites that had copies of the desired information. The development of the hypertext transfer protocol (HTTP), and, subsequently, the Worldwide Web, large portal sites, and search engines, has somewhat replaced these prior technologies. Napster rose to fill a particular niche in this arena.

As more and more hospitals, clinics, and radiology offices deploy picture archiving and communication systems (PACS), the opportunity to exploit similar technologies in healthcare is rising. In our nearly filmless institution, we acquire, store, transport, and display over 200,000 radiologic studies per year. We still generate a significant amount of hard copy (aka film) but as time goes by more and more of this hard copy is for distribution outside the institution. In the good old days, say 3 years ago, a patient might come to our film file room, sign a release, and be given either their entire master jacket or a copy of all the images within it. We recently had a similar request from a patient directed at our now filmless operation. We had to print, from PACS, a very large number of digital images. Although it is possible to generate CDROMs or digital video disks (DVDs) of this information, what would make more sense is "PACSter."

PACSter would allow one PACS-enabled institution to query a net-based, distributed "catalog" of other PACS sites for radiology studies related to a given patient. Eventually, one PACS site could identify *all* other PACS sites that held studies from a given patient.

With appropriate security constraints (authentication, encryption, patient authorization) one institution could then transfer images to another. This implies that there is a circle of trust between participating institutions. PACSter could create such a circle of trust using existing public key certificate infrastructure.

Thus, images stored on a PACS at one facility, which a patient had visited in the past, would be made available for review and comparison or other use at a different facility at which the patient may be currently seeking treatment.

Existing standards, such as DICOM, can be used to perform the transfers; similar to the way FTP was used in the past. The technical framework of the RSNAs and HIMSS Integrating the Healthcare Enterprise (IHE) initiative (www.rsna.org/IHE) helps in this process by defining agreed-on roles to be played, by heterogeneous information systems, within a healthcare enterprise, in completing a given healthcare (imaging) task. As the IHE transactions expand to encompass more than just imaging, so too the PACSter model could be used to share more than just image information. Other

transactions based on HL-7, DICOM, and other standards could be defined for more generalized medical information communication.

Significant technical impediments to creating PACSter exist. Most important is the lack of a universal patient identifier in the United States. This makes it difficult to precisely identify or "profile" patients between institutions—difficult but not impossible. Sites could use multiple pieces of patient information to match patients. By sharing information between sites, PACSter could build a map between Electronic Master Person Indicies (EMPIs) at different institutions.

Perhaps now is the time to begin planning for this higher level of cooperation, between health-care enterprises, analogous to the cooperation provided by Napster for music files. Perhaps it is time for "PACSter."