Challenges And Solutions For Medical Imaging Bandwidth Requirements

A Picture Archiving and Communications System (PACS) is integral to the smooth, timely, and quality delivery of health care in every medical setting today. Not only are they integral but they are crucial to the clinical and business aspects of radiology practice as we know it. However, PACS have long faced challenges in delivering this digital imaging support to such diagnostic modalities as X-ray, ultrasound, computed tomography (CT), magnetic resonance imaging MRI , Positron Emission Tomography (PET), and Teleradiology. The main issue has always been the availability of sufficient bandwidth (load and speed).....at a reasonable cost.....to support the growing demand for quick easy web-based access by medical providers. As Medical Imagery becomes more and more digitalized....with bandwidth improvements, communication will be faster and easier, and it will be possible to transmit heavier studies in less time and with high quality.An internal (facility owned) PACS leverages a common infrastructure for all the digital imaging modalities and provides image storage and archiving....with recall as needed....for an entire medical facility or campus. By instituting a web enabled distribution system a facility PACS is able to provide ready image access to the immediate radiology department as well as the full range of clinicians and specialists, especially surgeons and referring physicians. To ensure functionality at the high level required means facing the heavy bandwidth appetite of the modalities supported.Even an Application Service Provider (ASP) company that hosts applications, manages them and rents access to images from a centrally managed facility is not immune to the bandwidth concern. ASP providers allow an institution to outsource information technology applications infrastructure, management, support and maintenance. As defined by the ASP Industry Consortium, ASP service is designed to “deliver and manage applications and computer services from remote data centres to multiple users via the Internet or a private network.” therein lies they're challenge....a high bandwidth requirement delivered over often a subtantial difference on an on-demand basis.PACS manufacturers have developed numerous solutions to get around the bandwidth problem. They've compressed images, supported standard network interfaces and protocols such as Ethernet and TCP/IP, and deployed local area networks (LANs) with high bandwidths to link hospitals or referring physicians in a contained environment. But how do they handle bandwidth when institutions are separated by tens or hundreds of miles, especially since images have become larger and more complicated?Some PACS vendors rely on the communications infrastructure in an area, which varies with the bandwidth that is available from the local telephone company and the price a hospital is willing to pay, said Frederick Wagner, manager of PACS for Toshiba. Other PACS providers offer streaming technology that transports high-quality images in real time over any bandwidth, including telephone lines and enterprise-wide LANs.Another contributing solution is a technology called Pixels-on-Demand by Real Time Media. This technology speeds processing by capturing images from archives or PACS storage without waiting for preprocessing, immediately streams data from selected regions of interest, and delivers the most visually important features of an image to the viewer first.The underlying solution to the bandwidth issue goes beyond even system technologies, network interfaces, image compression, and infrastructure protocols. It lies with the provision of the appropriate bandwidth capacity (circuits)....at a reasonable cost....via leveraging the fiber-optic infrastructure available throughout the United States. Enabling direct fiber-optic connectivity internally, or between hospitals and distant data centers, is the most cost-effective application of bandwidth. Use of Optical Carrier (Sonet Ring) bandwidth (likely OC3 or OC48) or Gigabit Ethernet allows a medical facility to optimize it's Local Area Network (LAN). While ASP organizations can scale their application service provider (ASP) service to small imaging centers as well as large, far-flung health systems.To find a fiber optic infrastructure provider which can deliver the right bandwidth solution for your medical imaging application.....

About the Author

Promotes studies related to the historical evolution of hospitals from their beginnings to the present day. Conferences, advisory.