An Internet based REAL-time RT-PACs System for sharing DICOM-RT objects: implementation for quality assurance centers

Resource Center for Emerging Technologies (RCET) is a new initiative by NCI as a part of Advanced Technology Consortium. RCET has implemented an Internet based real-time system, which enables participant in a protocol based study share and compile RT treatment information and DICOM-RT Objects.

DICOM-RT objects are used as the fundamental data objects for exchanging, modifying and storing 3D radiotherapy treatment plans. AAPM RT (RTOG data exchange) objects are also supported to enable import of treatment plans from most commercial systems. High-resolution hard-copy images are automatically converted to DICOM objects.

Users interact with our centralized database via distributed client components and browsers. An *Electronic Folder* presents a compilation of all phases of patient treatment data.

Our system architecture is based on two parts:

1. Browser based user interface uses Java and ActiveX applets to provide advanced 2D and 3D image processing and real-time interactivity.

2. Thin client-server architecture for uploading, downloading and remote rapid review. The client software is a set of components that are loaded and controlled by both server and the client for:
    - Reading, analyzing and modifying the local DICOM-RT objects, which in turn are transmitted to the server for archiving.
    - 2D and 3D visualization and modification of DICOM-RT objects contained in a treatment plan.
    - Remote computer control in a multi-user topology for rapid review and teaching.

The system has been be used as a secure web based RT PACs. A real-time demonstration of the system will be presented.