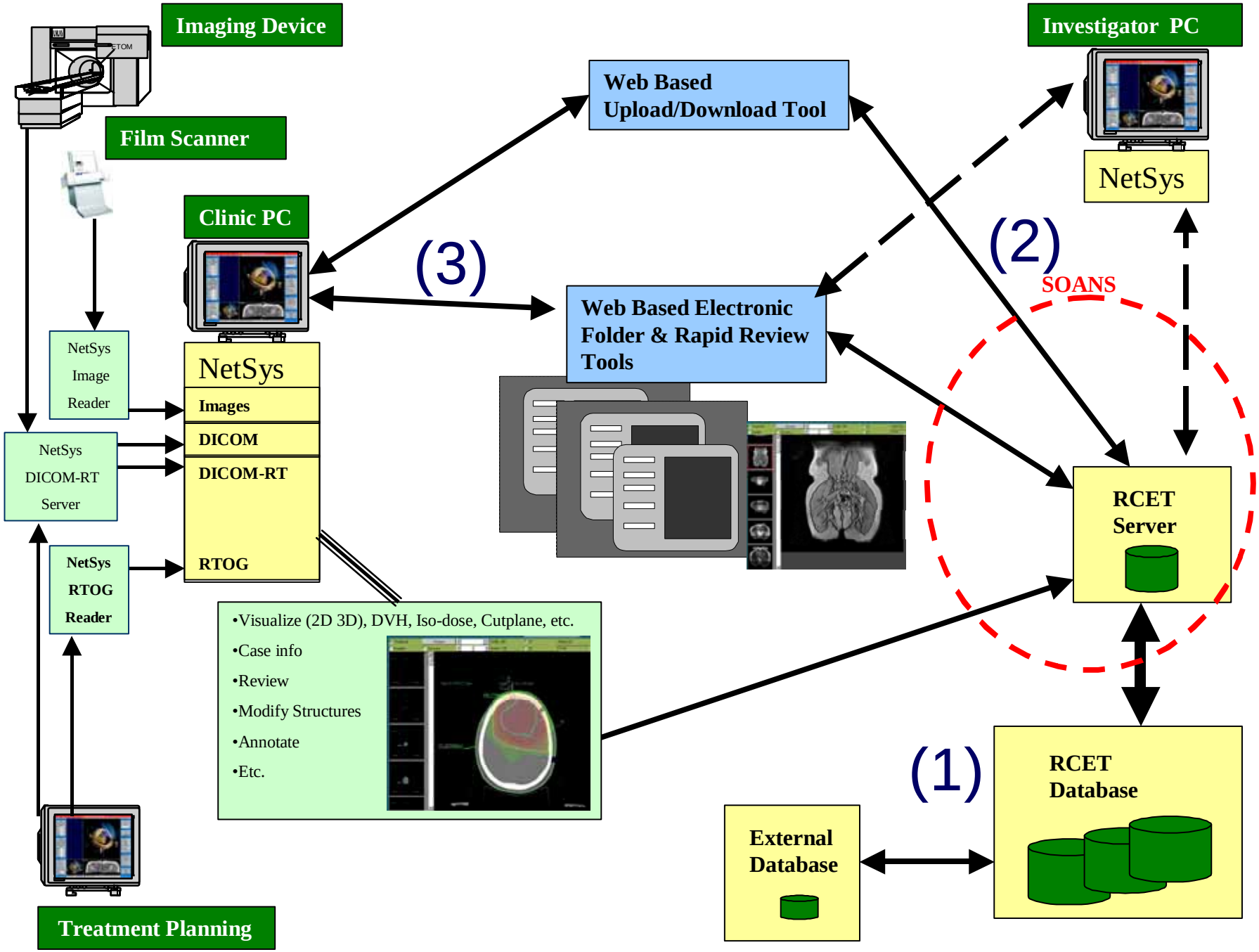
Electronic Data Archive and Review Infrastructure: ATC Method 2

The RCET System™

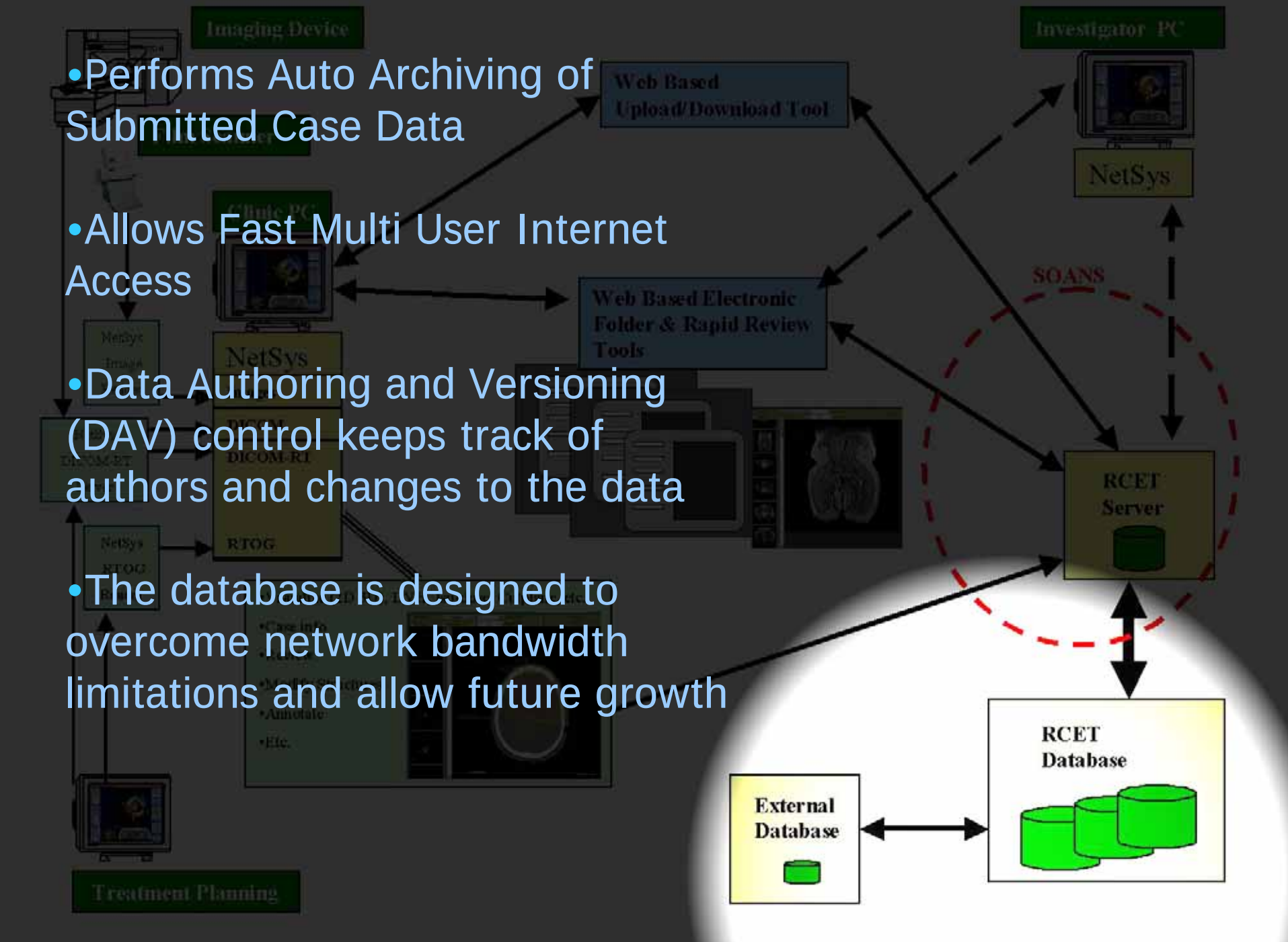
- It is an integrated system to facilitate the preparation, submission, archiving, presentation and review of radiotherapy diagnostic imaging, and textual data
- It is designed to accommodate the proliferation of data by automation and distributing processing tasks
- It employs the latest medical informatics technology;
  - DICOM database
  - Secure web services
  - Web based visualization and analysis modules
  - Web based electronic folder

The RCET System consists of three main components

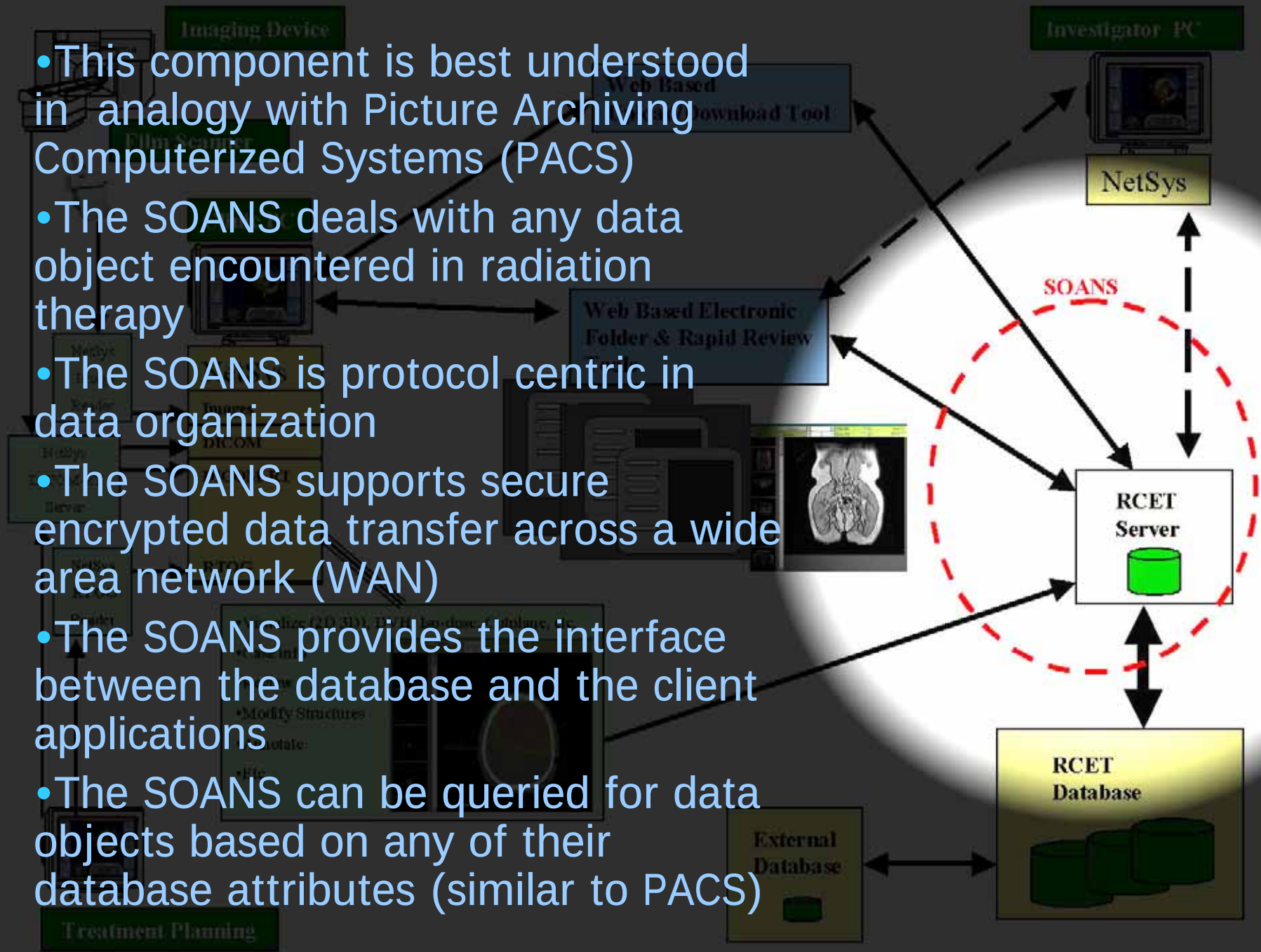
1. a centralized auto archiving database
2. a web based secure object archiving network system or **SOANS**
3. a suite of user friendly pc and web client applications for clinical data preparation, submission, and review

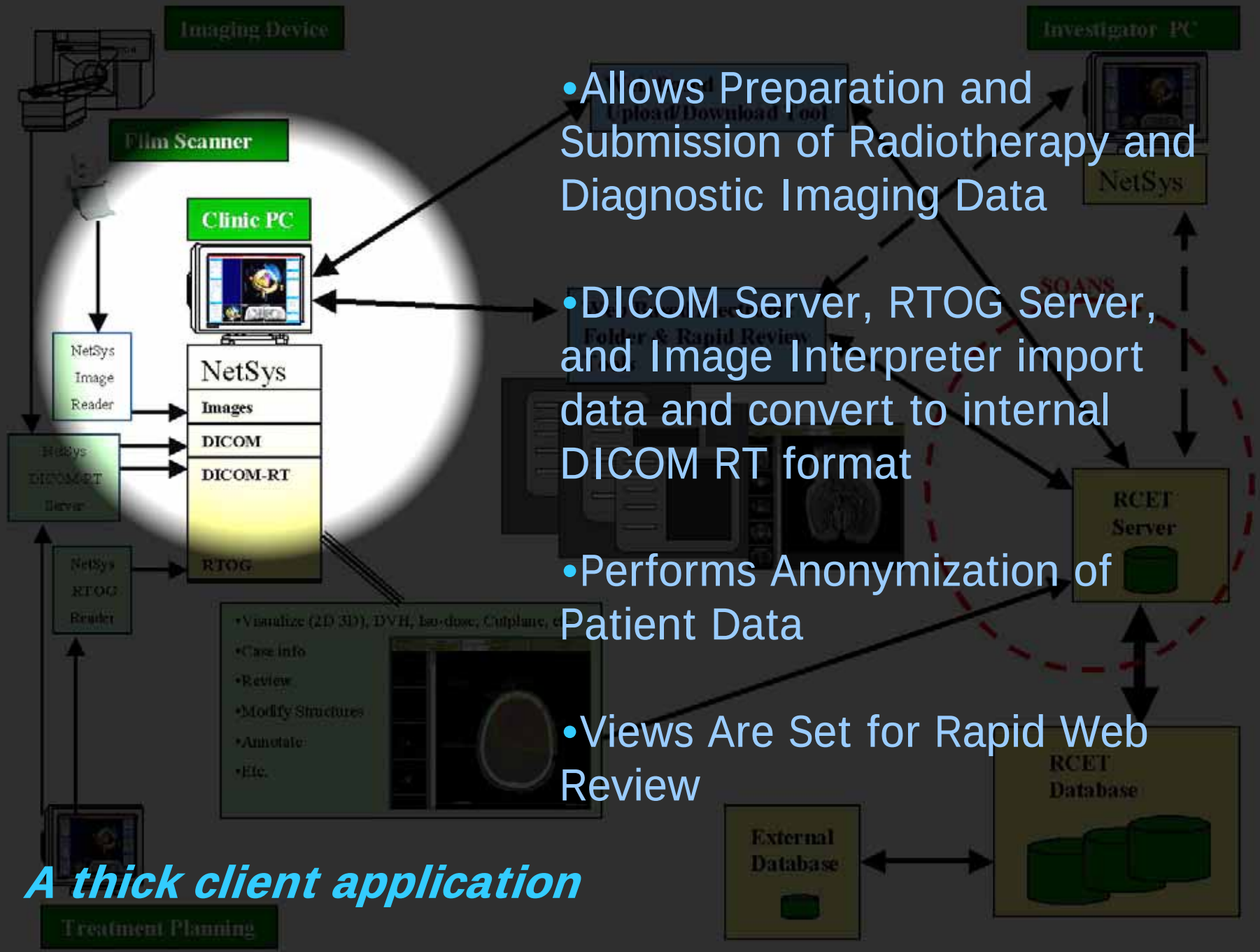

Imaging Device
Film Scanner
Clinic PC
Web Based Upload/Download Tool
Investigator PC
NetSys
(2)
SOANS
(3)
Web Based Electronic Folder & Rapid Review Tools
NetSys Image Reader
NetSys DICOM-RT Server
NetSys RTOG Reader
NetSys
Images
DICOM
DICOM-RT
RTOG
RCET Server
•Visualize (2D 3D), DVH, Iso-dose, Cutplane, etc.
•Case info
•Review
•Modify Structures
•Annotate
•Etc.
(1)
RCET Database
External Database
Treatment Planning

- Performs Auto Archiving of Submitted Case Data
- Allows Fast Multi User Internet Access
- Data Authoring and Versioning (DAV) control keeps track of authors and changes to the data
- The database is designed to overcome network bandwidth limitations and allow future growth



- This component is best understood in analogy with Picture Archiving Computerized Systems (PACS)
- The SOANS deals with any data object encountered in radiation therapy
- The SOANS is protocol centric in data organization
- The SOANS supports secure encrypted data transfer across a wide area network (WAN)
- The SOANS provides the interface between the database and the client applications
- The SOANS can be queried for data objects based on any of their database attributes (similar to PACS)

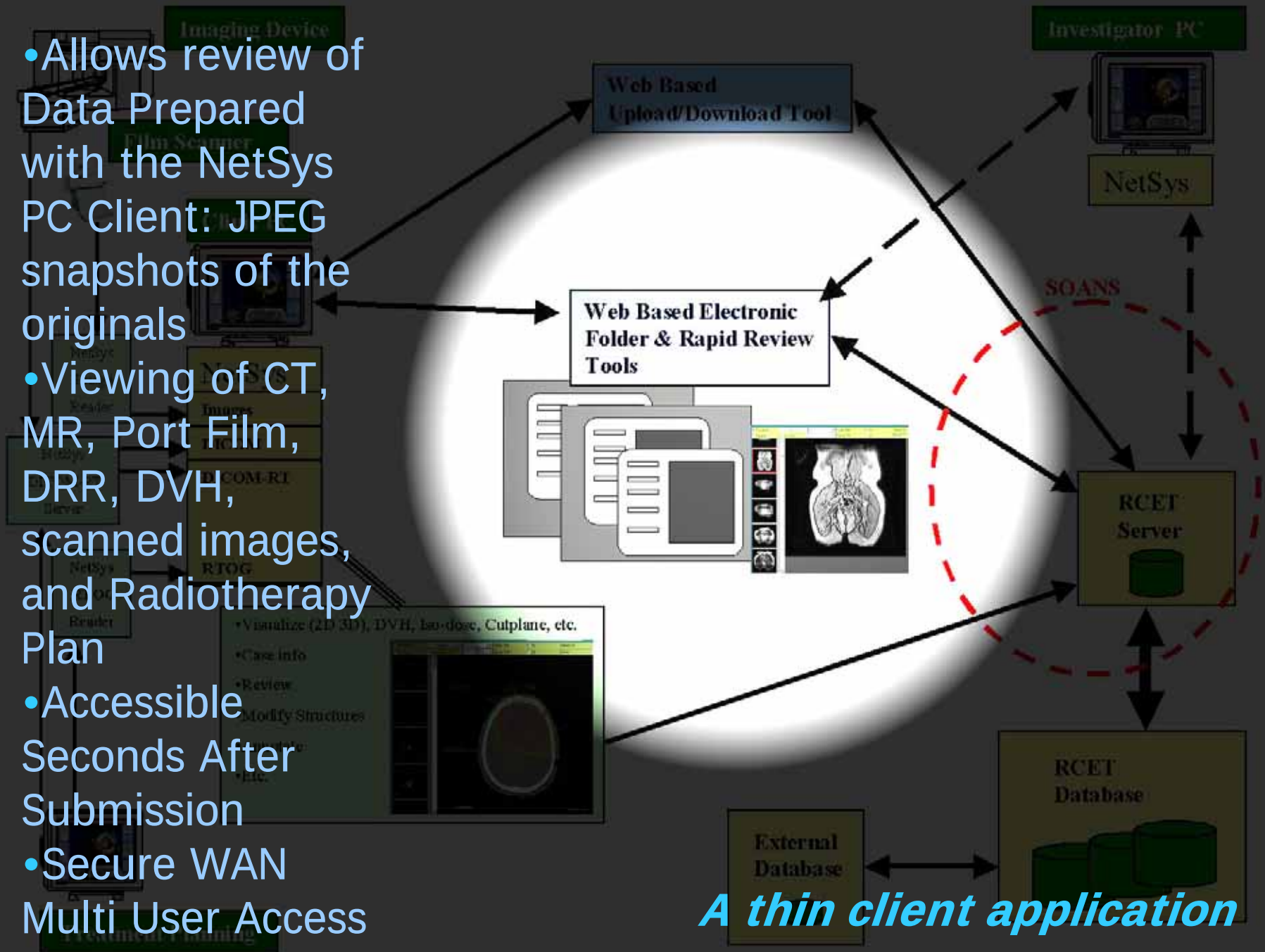




- Allows Preparation and Submission of Radiotherapy and Diagnostic Imaging Data
- DICOM Server, RTOG Server, and Image Interpreter import data and convert to internal DICOM RT format
- Performs Anonymization of Patient Data
- Views Are Set for Rapid Web Review

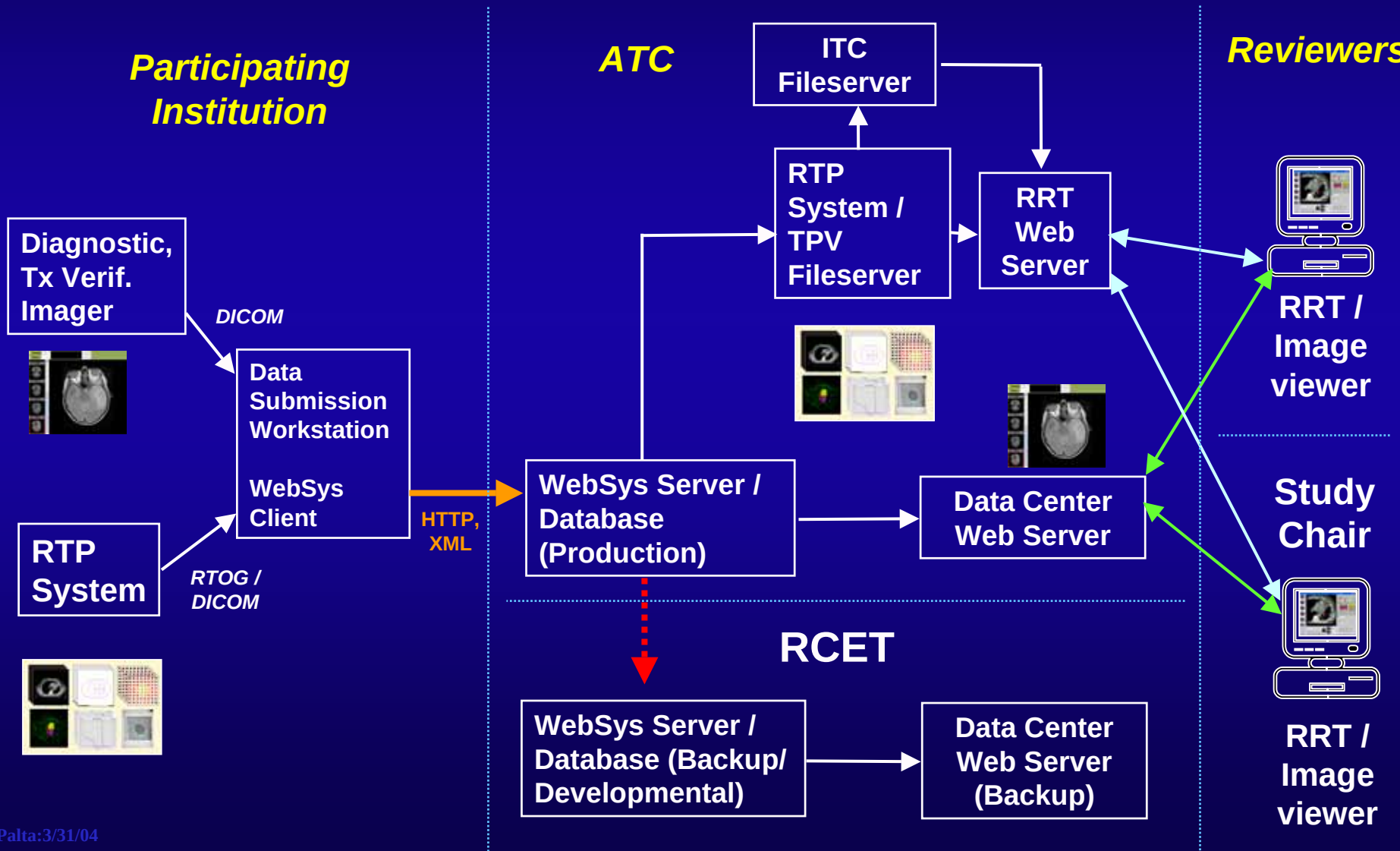
A thick client application

- Allows review of Data Prepared with the NetSys PC Client: JPEG snapshots of the originals
- Viewing of CT, MR, Port Film, DRR, DVH, scanned images, and Radiotherapy Plan
- Accessible Seconds After Submission
- Secure WAN Multi User Access

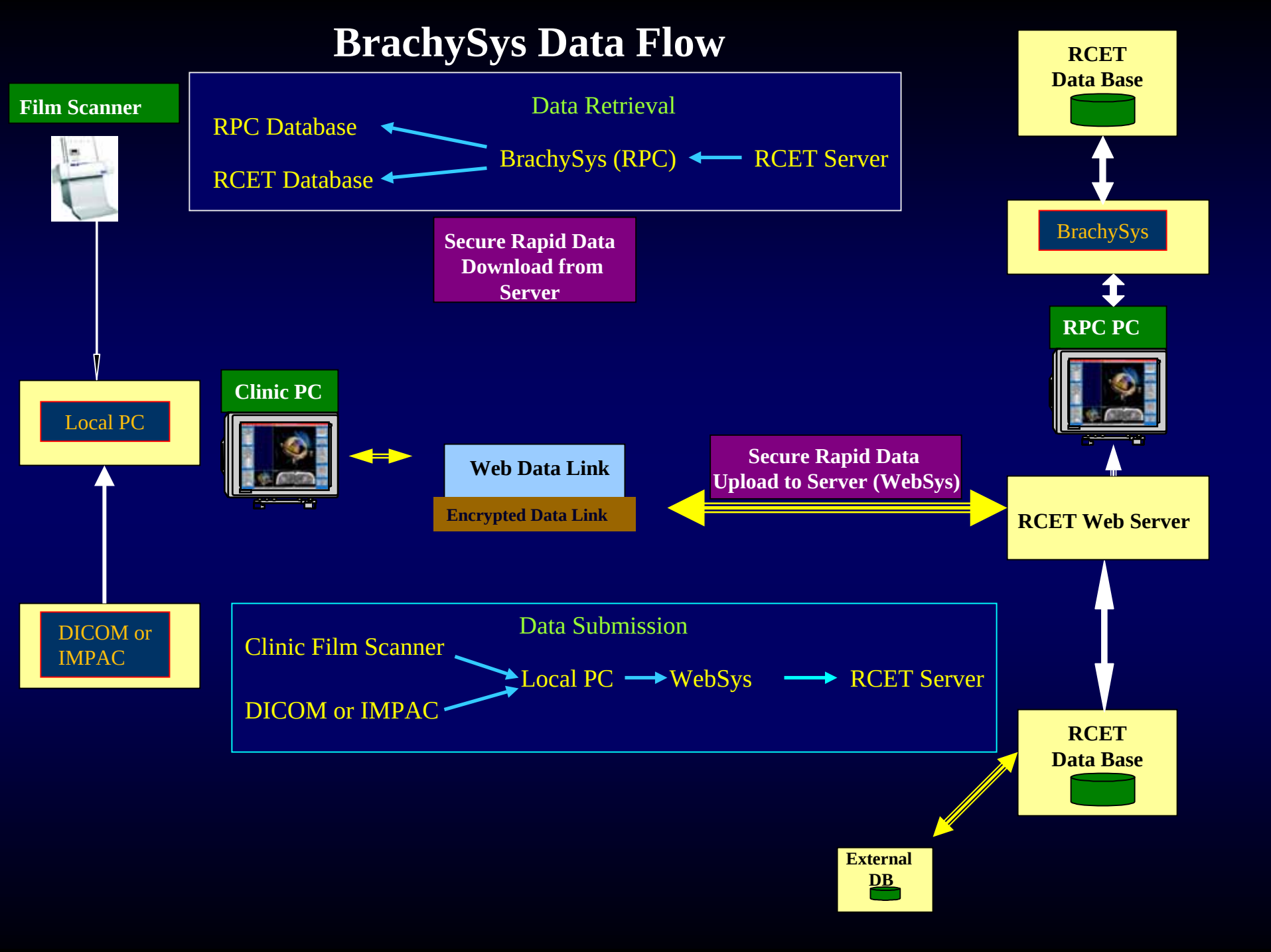


A thin client application

ATC Method 2


Participating Institution
ATC
Reviewers
ITC Fileserver
RTP System / TPV Fileserver
RRT Web Server
Diagnostic, Tx Verif. Imager
DICOM
Data Submission Workstation
WebSys Client
RTP System
RTOG / DICOM
HTTP, XML
WebSys Server / Database (Production)
Data Center Web Server
RRT / Image viewer
Study Chair
RRT / Image viewer
RCET
WebSys Server / Database (Backup/ Developmental)
Data Center Web Server (Backup)

BrachySys Data Flow



NetSys Brachy Module. V. .5

Operations Configuration Visuals Network Ops

Import Image | Image Calibration | 3D Mode | Network Operations | Utilities

Source Localization | Marker Localization

Image File Name

C:\Brachy_Images\Lat_HighRes.jp

Browse...

Flip Image

File Format

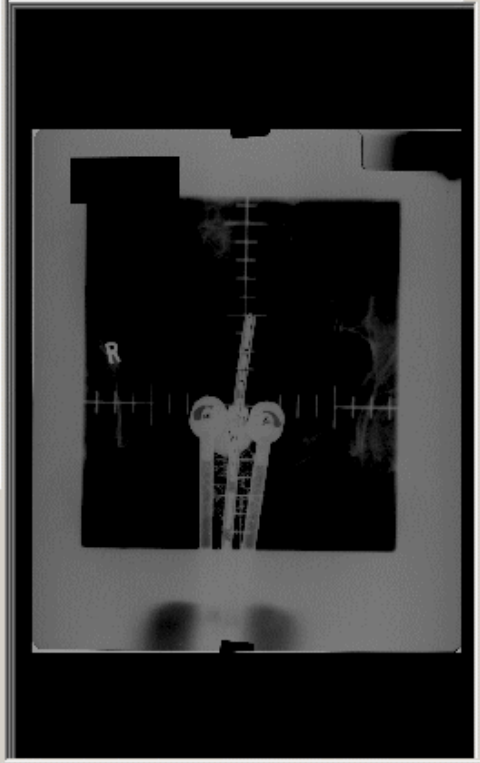
- (from file)
- AVS .x
- BMP
- GIF
- JPEG
- PBM
- SGI Image
- Sun Raster
- TIFF

JPEG 1988x2414

Import This Image

0 476

AP Image



LAT Image

IMPAC file selector

Browser...

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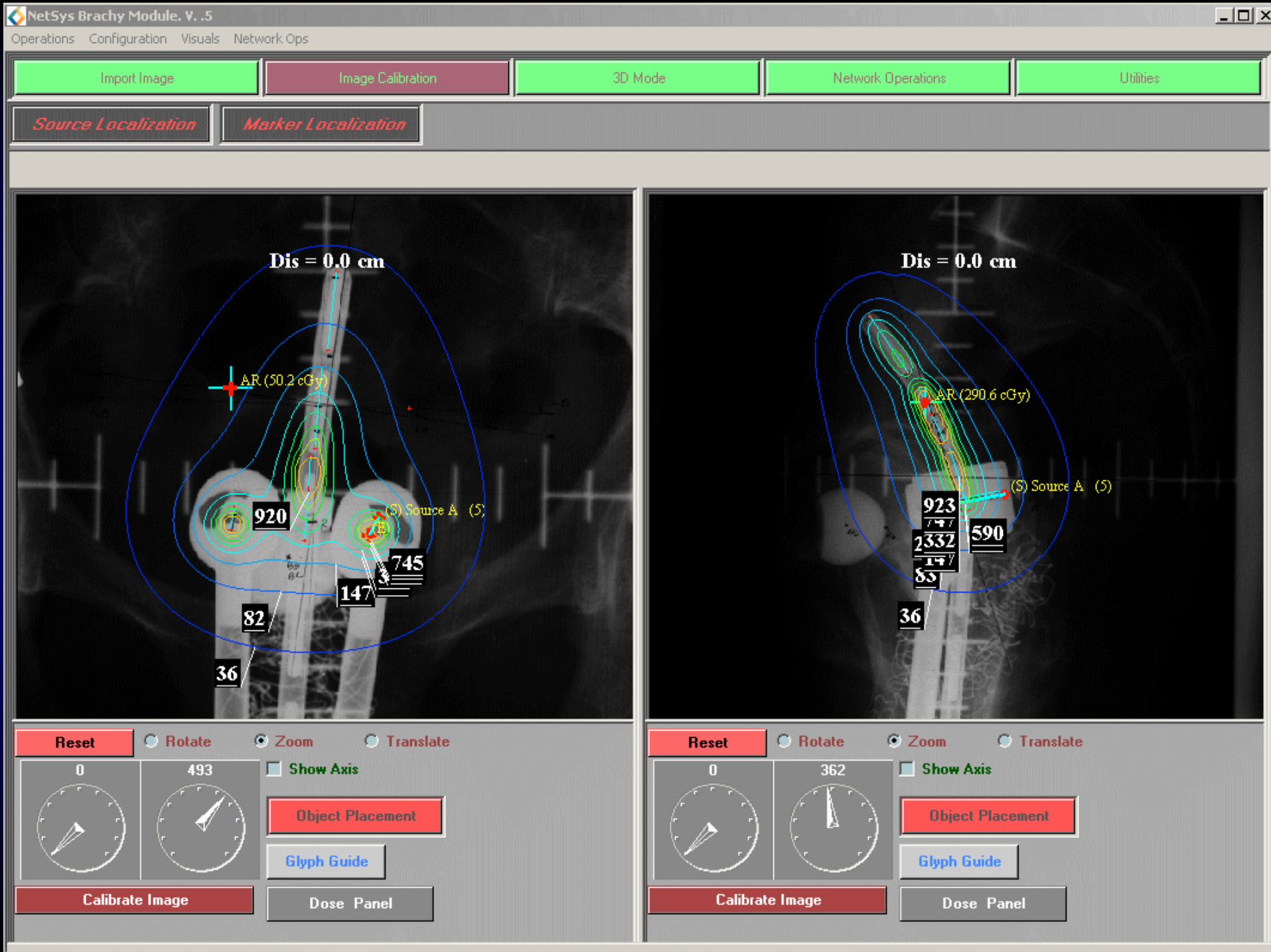
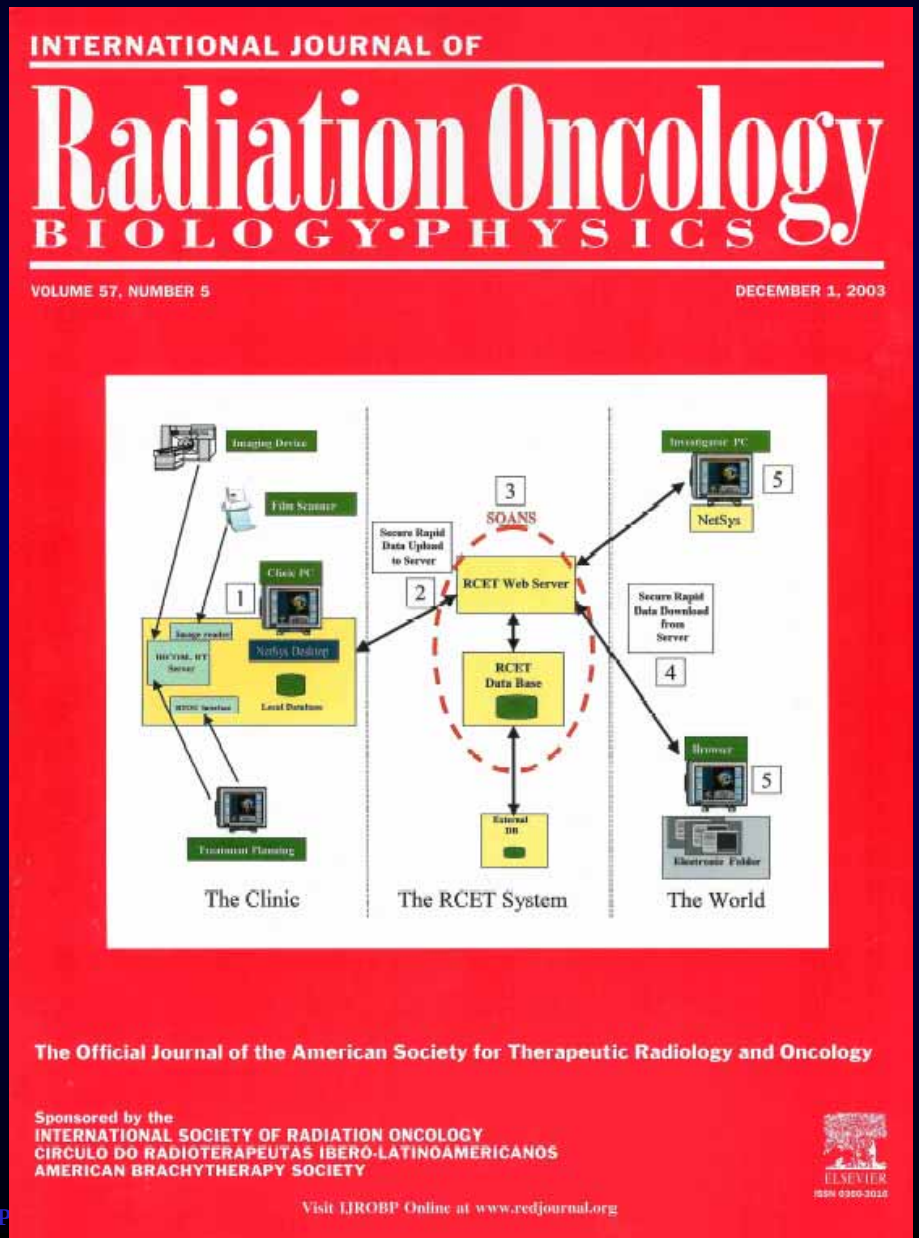
Flip Vertically

Flip Horizantally


NetSys Brachy Module. V. .5
Operations
Configuration
Visuals
Network Ops
Import Image
Image Calibration
3D Mode
Network Operations
Utilities
Source Localization
Marker Localization
Dis = 0.0 cm
AR (50.2 cGy)
920
(S) Source A (5)
745
147
82
36
Reset
Rotate
Zoom
Translate
0
493
Show Axis
Object Placement
Glyph Guide
Calibrate Image
Dose Panel
Dis = 0.0 cm
AR (290.6 cGy)
(S) Source A (5)
923
590
2332
36
Reset
Rotate
Zoom
Translate
0
362
Show Axis
Object Placement
Glyph Guide
Calibrate Image
Dose Panel



Web-based submission, archive, and review of radiotherapy data for clinical quality assurance: A new paradigm, *JR Palta, VA Frouhar, and JF Dempsey, Int. J. Rad. Onc. Biol. Phys., 57, 1427-1436, 2003*

ATC Method 2

Status: The ATC production server is being prepared to support submissions of all DICOM and DICOM-RT data. Test submissions from ITC, RCET, and volunteer institutions are underway.

Data supported: CT images, OAR/Target contours, beam geometry/seed locations, 3D dose distributions, DVH, DRR, scanned films, diagnostic CT, MR, screen captures

Submission method: secure upload to ATC Data Submission Server at ITC using the WebSys client.