



**eRAD PACS™**  
**OPERATOR MANUAL**

Version 7.3



eRAD PACS Operator Manual  
Document Control Number: IMC-0404-UM.1  
April 7, 2016  
File: PBServerManual\_v7.3.doc

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## Revision Table

<b>Revision</b>	<b>Date</b>	<b>Author</b>	<b>Comments</b>
1.0	02-Mar-2004	MM	Original version
1.1	05-Aug-2004	JKC	Update for version 5.0
1.2	13-Jul-2005	JKC	Update for version 5.1
1.3	07-Sep-2006	JKC	Update for version 5.2
1.4	25-Sep-2006	RWS	Update for version 5.3
1.5	24-Apr-2007	JKC	Update for version 6.0
1.6	31-Jul-2008	JKC	Update for version 6.1
1.7	20-Oct-2009	JKC	Update for version 6.2
1.8	13-Jul-2011	JKC	Update for version 7.0
1.9	12-Apr-2011	JKC	Update for version 7.1
2.0	14-Mar-2013	JKC	Update for version 7.2
2.1	15-Feb-2016	JKC	Update for version 7.3



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## 1. Introduction

eRAD PACS™ is a picture archive and communication system (PACS) and teleradiology system used to receive DICOM images, scheduling information and textual reports, organize and store them in an internal format, and make the information available across a network via web and customized user interfaces. eRAD PACS is for hospitals, imaging centers, radiologist reading practices and any user who requires and is granted access to patient image, demographic and report information. eRAD PACS provides information management and distribution services. The system is comprised of acquisition components, a central system manager component, diagnostic and review workstation components and an archiving component.

The sections that follow provide instructions on installing, configuring and using eRAD PACS.

### 1.1 General Safety Information

eRAD PACS system components are not approved for direct patient contact applications.

The eRAD PACS system components and associated cables must not be operated in the presence of moisture.

To avoid excessive product leakage of contents and maintain product compliance to medical protective guidance requirements, the PACS and workstations power cords shall be connected directly to hard-wired AC receptacles.

The eRAD PACS system components must not be carried by the connecting cables.

Federal law prohibits this device for sale to, or use by, anyone other than a medical professional.

Federal law restricts this device to sale by or on the order of a physician.

### 1.2 Indications of Use

eRAD PACS is a PACS software product used to receive DICOM images, scheduling information and textual report, organize and store them in an internal format, and to make that information available across a network via web and customized user interfaces.

The eRAD PACS viewer software is intended for use as a primary diagnostic and analysis tool for diagnostic images. eRAD PACS is for hospitals, imaging centers, radiologists, reading practices and any user who requires and is granted access to patient image, demographic and report information.

The eRAD PACS viewer displays images from CT, computed radiography, MRI, mammography, nuclear medicine, PET, secondary capture, ultrasound, x-ray angiography, x-ray fluoroscopy and visible light modalities.

Lossy compressed mammography images and digitized film screen mammography images must not be reviewed for primary image interpretations. Mammography images may only be interpreted using an FDA approved monitor that offers at least 5 mega-pixel resolution and meets other technical specifications reviewed and accepted by FDA.



### **1.3 Patient Contact**

The PACS system components are not approved for direct patient contact applications. The user must follow hospital cleaning and decontamination policies and procedures.

### **1.4 Product Safety**

The eRAD PACS system has been classified as an acceptable application of use in accordance with Medical Device regulations. The use of accessory equipment and/or hardware not complying with the equivalent product safety and EMC requirements of this product may lead to a reduced level of safety and/or EMC performance of the resulting system.

### **1.5 Contact Information**

For more information concerning eRAD PACS, or to report a problem with this manual or the software, contact eRAD Inc. technical support.

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## 2. Getting Started

This section provides information on initiating an eRAD PACS session and getting to the user default worklist. eRAD PACS requires a web-enabled workstation capable of executing a browser. eRAD PACS supports most Microsoft Internet Explorer and Mozilla-based browsers.

The information provided in this section assumes the workstation is running a version of Microsoft Windows supported by eRAD PACS. There are differences between Microsoft Windows which may impact the information contained in this manual. By default, all Windows operations are shown for Windows 10.

### 2.1 Adjusting Monitor Resolution

Before accessing the eRAD PACS software, make sure your Windows monitor settings are correct for the best results.

To check or change the resolution on your Windows computer:

- Right click Start and select Search.
- In the search field, type *display settings*.
- In the Display Settings panel, select *Adjust resolution*.
- Select the resolution from the pull down list. The minimum recommended screen resolution is 1280 by 1024 pixels.
- Click Apply to save your settings.

### 2.2 Web Browsers

eRAD PACS supports Microsoft Internet Explorer 9, 10 and 11, Firefox and Google Chrome browsers for all general user and administration functions.

Some features, such as the Scheduler module's calendar page, importing from DICOM media and scanning/uploading attachments, require Java Runtime Environment. Java is available as a browser plug-in. Google Chrome version 42 and later does not support this plug-in module. To use java-enabled features, you must use one of the other supported web browsers.

The web viewer requires some additional browser features. These include HTML5, WebGL, websockets and other web protocols. Compliant browsers include Mozilla Firefox v12, Google Chrome v20, Apple Safari v6 in MAC OS X 10.6, and Opera Presto v2.11. Some might have WebGL or websockets disabled by default. These must be enabled before using the web viewer.

Microsoft Internet Explorer 9 and 10 are not WebGL compliant. Microsoft IE 11 includes some of the support. When running the web viewer in Microsoft Internet Explorer, the software falls back to a software emulation to make up for the deficiencies.

When the browser does not support the required technology, the web viewer does its best to detect the missing component and display a notification.

Note that WebGL requires hardware compliance as well. The workstation's display controller must support WebGL in order for the images to appear in the web viewer.



### **2.2.1 INITIATING A BROWSER SESSION**

Request the facility-dependent URL from your system administrator. The URL can be a hostname or an IP address. The following examples are indicative of eRAD PACS URLs:

pacs.hospital.com  
http://pacs.hospital.com  
https://192.168.10.1

Launch the web browser and enter the URL of the eRAD PACS server into the address line.

When the browser connects to the eRAD PACS server, it displays the Main page. Regardless of which URL you entered, eRAD PACS forces your connection to use secure HTTP (HTTPS) if the server is configured to provide secure communications to your workstation. If HTTPS is required, you may be prompted to verify the digital certificate, as described in section 2.2.2 *Accepting Certificates*.

### **2.2.2 ACCEPTING CERTIFICATES**

When using eRAD PACS across a wide area network (WAN), additional security is necessary to protect the data. A digital certificate verifies the server with which the browser communicates is actually a valid eRAD PACS server, and confirms the software and data have not been modified by an unapproved entity. You can accept the eRAD PACS certificate each time you log onto the server, or you can save the certificate on your local workstation. The advantage to saving the certificate locally is you do not receive a warning notice each time you log into the server.

Each supported browser has a different method of saving certificates. Follow the instructions provided by your browser to accept and save a certificate.

## **2.3 Basic Function Overview**

The information in the sections below provides a brief overview of eRAD PACS basic functions. Find more detailed descriptions of each function, along with options and configuration settings, elsewhere in this manual.

### **2.3.1 SIGNING ON TO ERAD PACS**

Before accessing data stored in the eRAD PACS system, log on by entering a valid User ID and password. For detailed information about signing on to eRAD PACS, refer to section 3.1

#### *Quick Start Instructions – Signing On*

- Launch one of the supported web browsers.
- Enter your eRAD PACS server URL by choosing from your Favorites list, or typing the IP address or host name into the address textbox.
- Enter your User ID and password.
- Click the Sign On Button.







### **2.3.2 TABBED PAGE LAYOUT**

Tabs displayed across the top of the web page group the eRAD PACS functions. The specific tabs available to you depend on the privileges assigned to your user account by your system administrator. Examples include Main, Worklist, Admin and Archive. Click the tab to access the web pages available in a specific functional area.

The second and any subsequent rows of tabs provide access to information and tools within the domain of the main subject, as indicated in the selected tab. To proceed to a feature, click the tab in the second row. When you select a first row tab, eRAD PACS displays the page corresponding to the first item in the second row by default. When the browser displays a specific page, the corresponding tab hyperlink is disabled.

### 2.3.3 OVERVIEW OF WORKLIST FUNCTIONS

Following is a description of the basic features of the eRAD PACS worklist:

- Single click the patient name to open the study, which will automatically display a list of relevant studies first if any exist. The open folder button opens a study without first displaying a list of any related studies. 
- If more than one study exists for a patient, such as relevant priors, a second work list shows all of the studies. Click the patient name to open a single study. To open more than one, place check marks in the box on the far left, and click the batch open icon, which is located at the top of the worklist. 
- Click a column header to sort the work list by the selected field. The first click sorts in ascending order. Click again for descending order.
- To search the worklist for a specific study, click the filter button in the column header for the field you want to search. If you want to search on multiple columns at one time, click the Filters button at the top of the worklist. 
- Single click the Quick View button to display a page containing JPEG images of each image in the study. 
- Select the Edit Fields button to customize your Work List columns and choose the fields you wish to see. After choosing the columns, save the worklist configuration by scrolling to the bottom of the Work List and clicking the Save List As button. 
- The Edit button allows simple changes to patient or study demographics. This feature makes permanent changes to the official copy of the study. 
- If a report exists for a study, the status becomes a hyperlink. Click the hyperlink in the Status column to display the report. Click the *Back* button to return to the Work List.

### 2.3.4 OVERVIEW OF VIEWER FEATURES

Most eRAD PACS functions are available through the web browser, except those available in the diagnostic image viewer. To display full-resolution image data, install the eRAD PACS viewer on your workstation. Using the viewer requires special privileges assigned to your eRAD PACS user account. You also need MS Windows permission to install software on your workstation. If you need any of these privileges, contact your system administrator.

The first time you log in each calendar day, eRAD PACS checks to see if you need to install or upgrade the diagnostic image viewer. If the viewer is needed, eRAD PACS attempts to install it automatically. Confirm you want to download the viewer to proceed. A complete description of this process, including instructions on using the installation wizard, is available in section 6.3.1.1 Downloading the Viewer.

The viewer does not start automatically after installation. Open a study, or manually start the viewer under Start/Program Files/eRAD PACS. When eRAD PACS is running, an icon appears in the taskbar.

The basic features of the eRAD PACS viewer are:

- If no template or hanging protocol is defined, the viewer displays the layout manager when loading a study. Select the viewer grid format, then double-click or drag and drop a series to load it into the desired grid frame. Click outside the layout manager or close the layout manager window to continue.
- The thumbnail panel is hidden by default. To display the panel and a thumbnail view of each series in the study, place the cursor over the left border of the image frame until the cursor changes to a bi-directional arrow, then drag to the right, or press *Alt-T*. Drag the border to size the window to display one or more columns of thumbnail images.
- Double click a multi-image series to display the series in its own window. Cine, annotation tools, window and leveling, and orientation tools can now be used on the image.
- Hold down the right mouse button and drag the mouse to set the image window width and center. Drag left and right to set the window width, and up and down to set the window center.
- In a stack view frame, with the left mouse button held down, drag the mouse up and down to scroll through the images. The up and down arrows on the keyboard also scroll through the images. If you are using a mouse with a scroll wheel, rotating the wheel also scrolls through the images.
- Some function keys are defined to bring up or remove information about the images (in viewer mode only):
  - F5 Display current image frame in full-screen mode
  - F6 Show/Hide layout manager
  - F7 Show/Hide the information panel
  - F8 Show/Hide the report panel
  - F9 Show/Hide annotations
  - F10 Show/Hide image overlay information
  - F11 Show/Hide orientation indicators
  - Alt-F11 Show/Hide orientation cube
  - F12 Show/Hide localizer lines and hash marks
  - Alt-F12 Show/Hide all localizer lines and hash marks
- To save window/level presets:
  - Set the window and level values for the image, or in the Window/Level toolbar.
  - Click the Preset Window/Level *Save* Button on the Window/Level toolbar.
  - Type the label you want to use for this window/level setting.
  - Press *Add* to complete the definition. The preset can now be selected from the Window/Level dropdown menu.
- To set the fields you want to display in the image overlays, click *Settings/Customize Settings/DICOM Fields*. Select the modality (CT, MR, US, etc.) or select Default to modify the default setting used for all modality types. Set the Display Location to Top, Bottom, Left or Right. Un-check the "Use the default list for this display location" to

change the defaults for a single modality. Then, add the attributes to the list by selecting an attribute, and clicking “Add Tag”.

### 2.3.5 TIME ZONES

Servers recognize and adjust date and times for time zone offsets. Most dates and times displayed on web pages and entered by users reflect the user’s current time zone. Adjusted dates and times are displayed on the web pages in green text. Raw dates and times, when used, appear in black text.

When you log in, your time zone is defined by the selected reading location. If reading locations are disabled, it’s the user’s preferred time zone. If the user has not configured a preferred time zone, the user’s group’s time zone is used. If no user or group time zone has been set up, the server’s (specifically, the server you logged into) time zone is used.

Your effective time zone is displayed immediately above the main tabs in the top, right corner of the web page.

Time zone settings can be assigned as described in the following table.

Setting	Default	Setting Location	Description
Server	System clock	Terminal session	Defined by the Linux system clock. This setting cannot be changed from a web page.
Group	System default	Group account Edit page	The default time zone for users belonging to the defined user group.
User	Group default	User account Edit page, User preference settings page	The time zone used when the user is logged into the server.
DICOM Device	System default	DICOM device Edit page	The time zone in which the device exists. Used primarily when the device is in a different time zone than the server.
Reading Location	System default	Reading location Edit page	When using reading locations, this time zone overrides all other time zone settings, including the user’s configured preference.

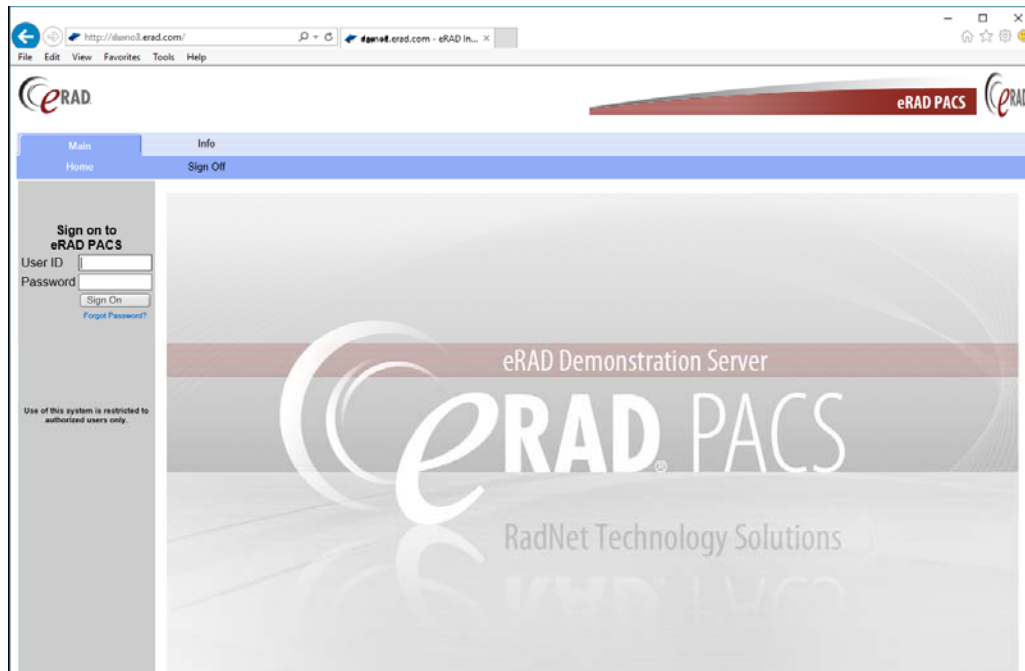
Dates and times defined in filters assigned to Actions are interpreted using the system time zone, regardless of the filter’s account owner.



## 3. Main Pages

The Main page tab provides access to the eRAD PACS home page and the user sign on area. The home page may be the default, as shown in Figure 3-1, or may look different if customized by your facility. For more information on customizing the eRAD PACS home page, refer to section 7.3.1.1 *Customizing Skins and Logos*.

**Figure 3-1 eRAD PACS Main Page**



You can save the address of the eRAD PACS home page under your Favorites menu to easily locate it in the future. In Microsoft Internet Explorer, click *Favorites*, and then click *Add to Favorites*. Save the URL using the default name, or create your own. When you open your browser, open the Favorites menu and click the name you have defined for eRAD PACS.

### 3.1 Signing On

To sign on to the eRAD PACS server, you must have been given a user account. The user account identifies you throughout the system, allowing eRAD PACS to load your personal profile. eRAD PACS uses your account ID to tag your actions automatically, so you do not have to explicitly enter identification information each time you create, modify or delete data.

Before logging into eRAD PACS, obtain an account ID, password and server URL from your system administrator. Then perform the following steps:

1. Open your web browser and enter the URL for your eRAD PACS server.
2. If not already on the Main page, click the Main tab.
3. Enter your account ID in the User ID field.
4. Enter your password in the Password field.
5. Click the *Sign On* button or press the enter key to continue.
6. If prompted, read the Terms of Use agreement and if you agree to comply, click the Approve button.



Both the account ID and password are case sensitive. You can save the eRAD PACS server URL in your browser's Favorites list.

Users who forget their account password can request the system to reset it. This feature requires your user account is configured with a valid email address. When you log onto the system the first time, enter or update your account's email address from the User Information page under the Preferences tab.

To request a reset password, perform the following steps:

1. From the Main login page, click the *Forgot Password?* link.
2. Enter your user account ID and click OK. The system sends an email to the address registered for the user account.
3. Check your email inbox for the message and follow the directions to reset your password.

### 3.2 Security Alert

To protect the user when visiting secure web sites, web browsers check the server certificate against a database of registered sites managed by a certification authority. For companies participating in this service, the validation is done in the background and the user sees nothing unless a security problem occurs.

By default, your eRAD PACS server is not registered with a certification authority. For this reason, accessing the eRAD PACS home page may display a Security Warning dialog. This warning informs the user the site certificate was issued by a source which cannot be verified by the certification authority.

While most users simply choose to accept the certificate and proceed each time they access the server, it is possible to prevent the message from displaying in the future. To do so, accept the new site certificate as a trusted source. Complete instructions on accepting and storing the eRAD PACS security certificate on your workstation are available in section 2.2.2 *Accepting Certificates*.

### 3.3 Session Status Bar

The account status bar displays information about the current session. Information includes the user's account ID, applied time zone and, if enabled, the user's reading location.



The account status bar appears at the top of each web page, immediately above the top row of tabs. The fields are defined in the table below.

Feature	Description	Link
User ID	The user's account identifier	Sign off
Time zone	The applied time zone. Dates and times displayed in the same color are converted to this time zone.	
Reading location	The user's current reading location. Appears if the reading location feature is enabled. This value is recorded in each clinical report created during this session.	Change the current reading location.



### **3.4 Signing Off**

To sign off of the system,

1. Click *Main* tab.
2. Click the Sign Off tab
3. At the confirmation prompt, click the *Sign Off* button.

eRAD PACS includes an auto-logout feature. If enabled by the administrator, the system logs you off if your session remains inactive for the specified period of time. If the auto-logout timer expires, a new login prompt appears. Enter your User ID and password and you will return to the page last displayed.

## 4. Information Pages

The Information Page contains instructions for contacting eRAD Inc, customizable directions to the customer facility, and useful links to other web sites.

### 4.1 Contact Us

The information on the Contact Us page contains contact numbers, the email address and mailing addresses for eRAD Inc.

eRAD Inc. Support  
United States/Canada: +1.866.414.eRAD (3723)  
Europe: +36.1.489.4700  
E-mail: support@erad.com

eRAD Inc. Sales  
+1.864.234.7430  
E-mail: [info@erad.com](mailto:info@erad.com)

Support assigns a unique site identifier to each customer when configuring servers. Customers calling the support center should reference this site ID. The ID is displayed on the Contact Us page, as follows:

When calling support, please provide the following Site ID: <site ID number>.

See section 7.3.1.2 *Customizing Web Page Content* for instructions on customizing this page.

### 4.2 Directions

The Directions page is for use by the customer as a place to display directions to the facility. An administrator can upload customized directions using HTML from the *Web Server Options* section of the Server page.

This page is blank by default. For instructions on uploading a customized set of directions, see section 7.3.1.2 *Customizing Web Page Content*.

### 4.3 About eRAD

This page contains a link to the eRAD Inc. corporate web site.

### 4.4 System Documents and Configuration Files

System files include default configuration files distributed by eRAD PACS and used by third party applications. These files are uploaded into these other applications and activate features that can be controlled from eRAD PACS. The files available from this page include the following:

Label	Application	Description
FluencyDirect- RadiologyRecognizer.msi	M*Modal Fluency Direct	The Fluency Direct radiology dictionary.

<b>Label</b>	<b>Application</b>	<b>Description</b>
XKey_config.mw3	XKeys XK-24 USB Keypad Control Tool	The default accelerator keys for an expansion XKeys XK-24 USB Keypad. The accelerator keys are specifically for use when using the mammography tools.
dragon_commands.xml	Nuance Dragon Naturally Speaking	The eRAD PACS speech commands for Dragon.

To download available system files, do the following:

1. Log onto the PACS server.
2. Click the Info tab.
3. Click the Documents tab.
4. From the document list menu, select the document you want to download or replace.
5. To download the file to your workstation, click the Download button.

Users with administrator privileges can replace any of the default files with a customized one. To replace one of the files, continue as follows:

6. Click the Browse button and enter the file that will replace the built in default.
7. Click the Replace button to upload the file.



## 5. Preferences Page


The Preferences Page provides instructions for changing your user and workstation settings. Select the Preferences tab to open the user information page. To access other pages, click the appropriate tab. For more information on administering user accounts and passwords, see section 7.1.3 *Editing User Accounts*.

### 5.1 User Information


Your personal user information is available for review and editing. The fields available are as follows:

- First and Lasts name
- E-mail address
- Postal address
- Telephone numbers
- Radar CTRM Group ID. Available is CTRM license is assigned to the user account.
- Password

To change your personal information,

1. Select the User Info tab under the Preferences tab.
2. Select and replace the information in the user information field.
3. Click the Save button, .

To change your password,

1. Enter your current password into the *Old Password* field.
2. Enter a new password in the *New Password* field.
3. Enter your new password again in the *Confirm Password* field.
4. Click the Save button, .

### 5.2 Workstation Settings


To change the workstation setting, select *Preferences/Workstation*. The available workstation settings are described in the following table.

Link	Function Description
Set Scan Source	Select the default scanner.
Set Scanner Defaults	Activate the scanner's setup application to set the scanner settings.
Scan Test into JPG with Defaults	Test the scanning function creating JPEG files using the configured settings.
Scan Test into JPG with Settings Page	Test the scanning function creating JPEG files by activating the scanner's setup application.
Scan Test into PDF with Settings Page	Test the scanning function creating PDF files by activating the scanner's setup application.
Fast scan test into JPG with Settings Page	Test the scanning function creating JPEG files using a fast scan setup.

Click the link to get to the respective setting. The window that pops up is generated from the scanner device. If no options are available, check to see the scanner device has been properly connected to the workstation and the scanner software have been properly installed. Refer to the scanner's documentation for additional details.

## 5.3 Application Settings

Individual user preferences are editable from the Settings page under the Preferences tab. Customizable fields include the following general options and media options, as described below.

Save your settings by clicking the Save button, , at the top or bottom of the page.

### 5.3.1 GENERAL OPTIONS

The following general options can be customized for your user account.

Setting	Description
Language	Language profile applied to web pages and viewer.
Default start page	The web page that displays after logging in.
Quick view thumbnail size	Default size of the JPEG images displayed on the quick view page. Options include 64 <sup>2</sup> , 128 <sup>2</sup> and 256 <sup>2</sup> .

### 5.3.2 MEDIA OPTIONS

The following options for creating DICOM media can be customized for your user account.

Setting	Description
Media type	Your default media type: CD, Compact flash, DVD, DVD-RAM, Multimedia card, Secure digital card, USB device.
Preferred compression	Your default compression setting: As is, JPEG, JPEG 2000, uncompressed.
Add viewer	Include a viewer on the media.
Omit structured report objects from DICOMDIR	Include structured report objects with the images and other objects.

### 5.3.3 WEB VIEWER OPTIONS

The following options apply to the web viewer for your user account.

Setting	Description
Double-click speed	Multiple clicks within the defined time period are recorded as a double-click action. Default is 500 msec.
Dynamic help	If enabled, pop up the help bubble when the cursor hovers over a control area of the screen.
Default size of the report area	The percentage of the screen allocated to the report when displayed. Default is 30%.
Show scanned documents	If enabled, include objects tagged as scanned documents in the web viewer.

### 5.3.4 REPORT PANEL OPTIONS

The following user settings are available for configuration on the Preferences→Settings page. Where applicable, they override the system default setting.

Setting	Default	Description
Clear delimiters when submitting report	Enabled	Remove field marker delimiters and leave the embedded text in the report when sending the report to the server.
Leading delimiter	[[	Leading field marker delimiter.
Trailing delimiter	]]	Trailing field marker delimiter.

## 6. Worklist Pages

The Worklist consists of a table listing orders, studies and reports currently available in eRAD PACS. The default worklist page contains the worklist table and the tools used to display images, manage orders, edit patient demographics, view reports, and forward studies. The worklist page also provides access to user-scheduled action settings, viewer download and installation, manual correlation of orders and images, transcription services, and DICOM media creation.

The worklist table is organized with one study record per row. The user manipulates the worklist by selecting the study information columns, sorting the data in those columns, and filtering the information to show a subset of the studies in the worklist table. For frequently applied worklist configurations, the user can save the table layout and filter settings using a custom label. The dropdown menu next to the user name at the top-left of the worklist page provides quick access to the list of saved worklist filters.
















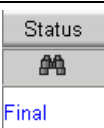
### 6.1 Worklist Functions

Table 6.1-1 describes the basic worklist actions. More information on these actions is given later in this chapter. Some functions are protected through account privileges your system administrator may not have granted to you.

**Table 6.1-1 Basic Worklist Actions**

Action	Link	Description
Apply worklist filter		Apply a saved worklist filter
Select columns		Select the columns appearing on your worklist.
Search		Enter matching criteria for searching the data in the worklist. The red button indicates a hidden filter is applied to the resulting worklist.
Sort worklist		Set the sorting preference on one, two or three columns in the displayed worklist.
Expand worklist		Expand the worklist entries to show priors.  expands the worklist with relevant priors.  expands the worklist with all prior studies.  collapses the worklist.
List STAT procedures at top of worklist		Sorts all records according to selected field(s) but display STAT (high priority) worklist entries at the top of the worklist.
Show procedures loaded in local cache		If the workstation is configured as a Viewer device, this function lists the studies currently available in the workstation's local cache.
Show deleted with references		(Admin only) Show studies marked for deletion but not yet deleted due to outstanding references.
Batch open, delete, forward, merge and sign reports		To operate on multiple worklist entries, check the box on the left of the row, and select  or  to open the studies in the viewer,  to delete the studies from this server,  to forward the studies to a remote device,  to merge the studies into one study or  to approve multiple reports.



Action	Link	Description
Sort worklist	 	Click the column header label once to sort the worklist records in ascending order. Click the same column header label a second time to sort in descending order.
Study open indicator	 or 	The study is currently open by another user (red) or not (green).
Open study in viewer	 or click patient name	Opens the study in the image viewer. Selecting the Patient Name checks for relevant cases. Selecting the open button does not.
Open study group in viewer		On expanded worklists, open the selected priors in the image viewer. If no studies are selected, open all priors.
Open web viewer		Open the study in the web viewer. Present if user does not have the image viewer installed or does not have permission to use the full-featured image viewer.
Open patient folder		Open the patient folder for this study. For details, refer to the eRAD PACS Viewer Manual.
Worklist record overview		Display a brief summary of header file information and JPEG images. Click an image to display the image at its full resolution.
Edit worklist record information		Edit the study data.
Delete worklist record		Permanently delete the study from this server.
Export study to remote device, media, or a folder		Forward the study to one or more configured devices, create a DICOM media (CD/DVD) or put it in a user-defined folder.
Display complete list of studies		Using the patient matching criteria on the current worklist entry, list all studies on all servers and archives. Available if Priors setting is Local Only.
Data consistency warning		Data for this study exists on multiple sources.
Detach study from source		Convert a shortcut study to an independent copy.
Display report	 Final	Once a report exists for a study, the Status value becomes a hyperlink. Click the link to display the report, dictation and key images.
Change number of records displayed per page	Page size: <input type="text" value="100"/>	Change the number of worklist records displayed on the page. Smaller numbers of records allows the list to build quickly when refreshed.
Modify worklist refresh rate	Refresh time: <input type="text" value="5 min"/>	Change or disable the worklist automatic refresh rate.
Export worklist	<input type="button" value="Export"/>	Export the current worklist to a tab-delimited file.
Color legend	<input type="button" value="Color Legend"/>	Display legend of highlighted row colors.
Save worklist modifications	Save list as rad <input type="text" value="Default"/>	Save the current worklist settings as a new worklist filter, or overwrite an existing worklist filter.

### 6.1.1 EFFECT OF A WORKLIST SERVER CONFIGURATION ON WORKLIST FUNCTIONS

A consolidation worklist server, or simply worklist server, is a special eRAD PACS server. Its purpose is to provide users with a complete list of everything available in the EP environment. For performance reasons, a worklist server contains only bits of information

about each study, order and report, but it does not contain the actual data itself. The real data exists on EP Hub servers, and the consolidation worklist server redirects all requests for information to the Hub server most capable of servicing the request.

Since worklist servers do not have a local copy of all the data, some of the batch functions are unavailable or have restrictions. From a worklist server, the user can request batch open, report approval and delete functions. Other batch operations (forward, merge) result in a warning message when the selected studies do not reside on the same server. For all other operations involving multiple worklist entries (correction, group order scheduling), log into the Hub servers on which the data resides.

Similar to the limitations of batch operations, worklist actions are limited. Only Notify actions are supported on worklist servers. All other actions need to be configured on a Hub server, and will reflect only the data that passes through that server.

## 6.2 Customizing the Worklist

Users can customize the worklist to present the information needed in a format best for them. Every user account has a default worklist, showing all the studies available to the account. Users can modify their default worklist, and create and save additional, customized worklist filters based on their own preferences.


### 6.2.1 WORKLIST PAGE CHARACTERISTICS

The Default worklist appears when you select the *Worklist* tab. The page consists of the study table with function buttons (icons) to the left of each entry, control buttons above the study table, and fields and buttons at the bottom of the page.

The fields and buttons at the bottom include the following:

- **Page Number** indicates which page you are viewing in the displayed worklist. Click the page number to display the study entries on the corresponding page.
- **Page Size** indicates the number of studies that appear on each page. To change it, click the number in the text box and enter the number of studies to display per page. Then click the *Change* button.
- **Refresh Time** indicates the time between automatic worklist refreshes. To change the refresh time, select a value from the dropdown menu. Then click the *Change* button.
- **Change** activates changes made to the page size and refresh time.
- **Export** converts the contents of all pages of the current worklist into a tab-delimited format and saves it to the local file system as a .csv file.
- **Color Legend** displays the color codes highlighting study conditions on the worklist. Each row in the legend lists the two colors used in row striping. If striping is disabled, a single color appears for each state

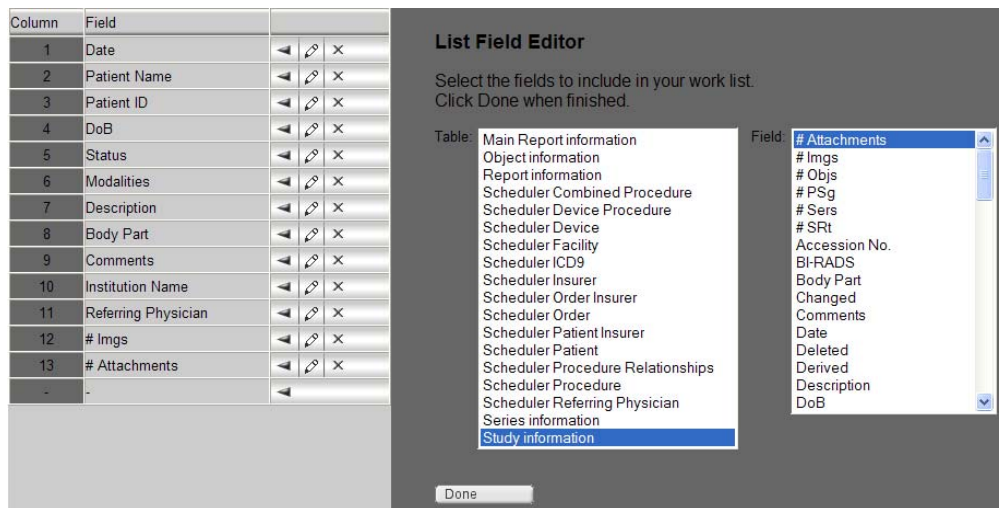
Worklist rows and columns use color to indicate certain conditions. The colors and the condition they represent are defined in the following table.

Condition	Highlight Color	Comment
Sort order		The worklist can be sorted using one, two or three columns. The applied priority is the blue column, the medium blue column and then the light blue column.

Condition	Highlight Color	Comment
Selected study		On the relevant cases page, the study selected from the worklist appears highlighted.
Folder shortcut		Shortcuts referring to studies which exist in a user-defined folder.
Stat		Study priority state is set to High. The Stat highlight color supersedes the expired order condition, meaning expired, high priority orders will also appear using this highlight color.
Stat with flagged report		Study priority state is set to High and the Normal flag on the report is cleared.
Flagged report		The Normal flag on the report is cleared, indicating the report has been tagged to draw attention to it.
Expired order		Expired orders are those whose scheduled procedure date and time has passed.
No condition		Rows with no condition applied appear in alternating white and grey.

### 6.2.2 CUSTOMIZE WORKLIST COLUMNS

To customize the worklist columns, select the Edit Fields button, , on the Worklist page to display the column configuration page.



The section on the left lists the columns shown on the worklist table. The Table and Field lists on the right show the available tables and their respective records.

To insert a new column,


1. Select the table in the Table list containing the field.
2. Select the field in the Field list.
3. Click the Insert button, , where you want to insert the new column.
4. Click Done to display the worklist.

To change the field in a column,

1. Select the table in the Table list containing the field.
2. Select the field in the Field list.
3. Click the Replace button, , for the column this field is to occupy.

4. Click Done to display the worklist.

To remove a column,

1. Click the Remove button, , for the column you want to delete.
2. Click Done to display the worklist.

When configuring worklist columns, fields from the Study Information table return faster and place less demand on the system. Fields from other tables should be used sparingly or for special worklist filters.

The fields available for use on the worklist are listed in the tables below. Note that the labels used here are the default, and may have been modified by your system administrator. Custom fields are not listed.

Study information fields:

Field Label	Description
#Attachments	Number of attachments in study. It's the sum of # <i>Order Attachments</i> and # <i>PACS Attachments</i> . The number in parenthesis is the total number of attachments available to the user based on the document type restriction settings.
#Imgs	Number of images in study.
#Key Images	Number of key images in study
#Objs	Number of objects in study, including images, reports, presentation states, and private objects.
#Order Attachments	Number of attachments scanned into the Scheduling module
#PACS Attachments	Number of attachments stored by the PACS as DICOM objects
#Sers	Number of series in study.
Accession Number	Study's order number.
Bi-RADS	Display the BIRAD value(s) assigned to each report component.
Body Part	Part of the body imaged.
Changed	Study changed flag
Corrected	Study has been corrected (ie, merged) with its order
Date	The date the study was created. This is a composite field, taking the first of the following fields containing a value: Study Date, Series Date, Acquisition Date, Image Date, Content Date, Received Date.
Deleted	Study has been removed from the worklist. Admins rights required.
Derived	Indicates if study was merged, split, copied or a shortcut.
Description	The requested study procedure or completed study description.
DOB	Patient's date of birth.
Download Percentage	Percentage of study downloaded to workstation. Available only for registered Viewer devices.
Folder Link Flag	Study linked to another study, in a folder.
HUB	The Hub server on which the study resides.
ICD Code	ICD-9 or ICD-10 code.
Institution Name	Acquiring facility name.
Last Menstrual Cycle	Patient's last menstrual cycle, taken from the eRAD Scheduler.
Manufacturer	Manufacturer of the imaging modality.
Manufacturer Model	Imaging modality manufacturer's model name.
Min SOP I UID	Minimum SOP Instance UID, used to define database values.
Modality	Modality type(s) used to create the study (eg, MR, CT, DR).
Modality AE Title	AE Title of the device sending the study.
No. of Sources	Number of Hubs servers on which the study resides.
Normal	Report flag (normal, not normal).



Field Label	Description
Patient Age	Patient's age.
Patient Allergies	List of patient allergies as entered into the eRAD Scheduler.
Patient ID	Patient identifier.
Patient Medical Alerts	List of medical alerts specified by the eRAD Scheduler.
Patient Name	Patient's name.
Performing Physician	Name of physician performing the study.
Physician of Record	Physician of record.
Pregnant or Breast Feeding	Pregnancy and breast feeding status, taken from the eRAD Scheduler.
Priority	Study priority (High, Regular).
Procedure Code	RIS procedure code.
Procedure ID	Procedure ID.
Proposed Study UID	Proposed study UID for modality worklist queries.
Radiologist	Name of the physician assigned to read the study or the author of the report.
Reading Physician	Radiologist assigned to read the study.
Reason for Order	Reason the study was performed, taken from eRAD Scheduler.
Receive Date	Date the server received the study.
Referring Physician	Name of the physician who requested the study.
Referring Physician Addr.	Referring physician address.
Referring Physician Phone	Referring physician phone number.
Report Date	Date report was created or approved.
Report Exists	A preliminary or final report exists for this study
Report Status	Status of the original report.
Retrieved from archive	Flag meaning study was retrieved from an archive.
Scheduled Date	RIS schedule date.
Scheduler Order Number	Internally defined identifier linking the study to the order created by eRAD Scheduler.
Sex	Patient's sex.
Source Study UID	Study UID of the source study, which could be the study itself.
Station Name	Modality's unique identifier.
Status	Study status (eg, Viewed, Final).
Study Comments	Comments or notes concerning the study or procedure.
Study Date	Date the study was acquired.
Study ID	Study identification number.
Study Size	Number of bytes in study.
Study UID	DICOM Study UID.
Warning	List of warnings and conditions entered into the Scheduler for this procedure.

Series information fields:

Field Label	Description
Series Date	Date the series was acquired.
Series Description	Description of the series.
Series Number	The series number.
Series UID	DICOM Series UID.

Object information fields:

Field Label	Description
Acquisition Date	Date of acquisition
Creation Date	Date the study was originally created.

Field Label	Description
Creator	Study creator.
Filename	Object's file name.
Image Date	Date an image was created.
Image Number	The image number.
Image Size	The dimensions (rows x columns) of an image.
Image Type	Type of image (eg, primary or secondary, original or derived, etc.)
Modality	Modality type that created this object.
No. of Frames	Number of frames.
Object Size	Total study size (in bytes).
SOP Class ID	DICOM SOP Class UID.
SOP I UID	DICOM SOP Instance UID.
Store Level	Internal storage level

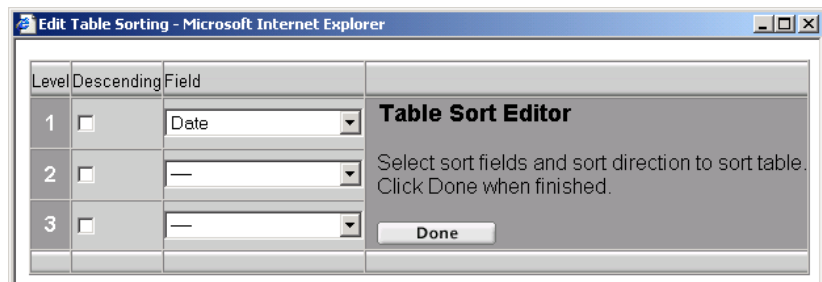
Main report and report information fields: The main report is the primary report component, containing the first impression and observation. Additional report components include addenda and other report objects.


Field Label	Description
Approval Date	Date and time main report was approved.
Approved By	Physician approving the main report.
BI-RADS Code	Bi-rad code assigned to main report.
Dictated By	Physician who dictated the main report.
Dictation Date	Date and time main report was dictated.
Interpretation Author	Physician who created the interpretation.
Interpretation ID	Internal identifier of the interpretation.
Interpretation Type	(Report information only) Report type: addendum, other.
Key Images	Number of key images in the main report component
Normal	Normal flag for the main report.
Results ID	Main report identifier.
Results SOP I UID	SOP Instance UID of the main report object.
SR SOP I UID	SOP Instance UID of the DICOM SR object.
Status/Interpretation Status	Status of the report. Status is used for the main report information. Interpretation Status is used for report information.
Transcribed By	Transcriptionist who transcribed the main report dictation.
Transcription Date	Date and time main report was transcribed.

### 6.2.3 SORTING THE WORKLIST

eRAD PACS sorts the worklist columns in either ascending order, descending order, or in a procedural order. Each column used for sorting appears highlighted blue. All columns are sorted epigraphically, except state-oriented columns (e.g., Status, Priority), which are sorted in the relative order of workflow. .

To sort the worklist, click the column header label of the column you want to sort. By default, a column is sorted in ascending order. Click the arrow button in the column label to invert the sort order. To sort the worklist on a value that does not appear, add the field to the worklist




eRAD PACS permits sorting on up to three columns. Click the Sort button, , on the Worklist page to open the sorting window. Select up to three columns for your sorting criteria. Check the *Descending* checkbox to sort the selected attribute in descending order instead of ascending order. Click the *Done* button to apply your changes to the worklist. When displayed, each column included in the sort is highlighted. The highest precedence column appears in a shade of blue which gets lighter as the precedence decreases.

#### Quick Start Instructions – Sorting Worklist Columns

Quick sorting:

- On the worklist, click the label in the column header.
- To invert the sort order, click the label in the column header again.

To sort on multiple columns


- On the worklist, click the Sort button, .
- Select a study attribute from the pull down menu(s).
- Select descending (checked) or ascending (cleared) order.
- Click *Done* to display the worklist.

#### 6.2.4 FILTERING WORKLISTS

To search for a specific study or group of studies on a worklist, apply a filter. A worklist filter is a set of matching criteria applied to the complete study list. An example is a filter to list all the CT procedures, or all the exams for a specific patient. Take care when applying filters because they may exclude records you want to access.

When applying a filter to a worklist, the matching criteria are displayed at the top of the worklist column in the location normally occupied by the filter icon, and the worklist contains only the records that satisfy them. If the filter area of a particular column header contains the filter icon (i.e., the binoculars icon), no filter is applied to this column.

##### 6.2.4.1 Searching the Worklist

To filter the worklist by a single attribute, click the filter icon  just under the column heading to pop up a filter window.









Enter one or more patterns separated by semi-colons, with no spaces. Use the asterisk ('\*') as a wild card, matching one or more characters in the string. To apply the filter, select one of the options below.

- |                   |   |
|-------------------|---|
| Apply Alone       | Apply the defined criteria by itself, ignoring any other criteria that may already exist. |
| Apply Combined    | (Default) Add this filter criteria to existing filter criteria.                           |
| Apply w/o Context | When a Combined Worklist Filter is applied, clear the context and then apply the filter.  |



Depending on the Filter List setting, predefined values may exist on the right side of the search criteria window. When present, these values are either an enumerated list of defined values, such as study states, or the list of values currently in the database, such as the list of patient names. Select one or more of these values in place of typing it. Select multiple values in the list by pressing the ctrl or shift key while you click the value.

When defining filter criteria, users can specify an exact match, a starting string or a string found anywhere in the data. Users can also negate the matching type. For example, change an exact match (*Is*) to one where the string does not exist at all (*Is not*). The behavior associated with each filter option is as follows:

Option	Button	Description
Is		The field value matches the specified criteria exactly as entered, including white characters such as spaces.
Is not		The field value does not match the specified criteria exactly as entered.
Begins		The field value begins with the specified criteria.
Does not begin		The field value does not begin with the specified criteria.
Contains		The field value contains the specified criteria anywhere in the data.
Does not contain		The field value does not contain the specified criteria anywhere in the data.

The default setting for each field is configurable by Administrators. Refer to the section 7.3.2.3.3 Customize Field Selection List Setting for details.

If the Person Name Filter setting is not used, you must delineate the first, middle and last names of the person. The format of a name field is as follows:

lastname^firstname^middlename^prefix^suffix

where the caret (^) character is used to separate the name components. For example, a search pattern defined as

SMITH^A

searches for all entries containing a last name of SMITH and a first name starting with the letter 'A'. Filters are not case sensitive in eRAD PACS.

To remove a filter, click the filter button or the current criteria at the top of the worklist column, deselect the filter type button, click the *Apply* button to display the modified worklist.

#### 6.2.4.2 Referenced Value Filters

Filter criteria can be defined generically using the current user's account information. This permits copying worklist filters between user accounts without having to customize each one for user-specific criteria. For example, filter the database for all studies whose report was transcribed by the person running the filter, or find all studies assigned to the user based on their user account ID.



To define filter criteria by reference, use the following syntax in the filter definition:


\$\$<COLID>\$\$

where <COLID> is the identifier of the database field.

The COLID must be one of the fields available in the User Account database table. These values are listed in the COLID column on the Customize Labels page when the Table selection is *User Accounts*.


#### 6.2.4.3 Multiple Field Filters

Multiple field worklist filters contain search criteria for multiple worklist columns. The resulting worklist reflects all the filters applied at the same time. An example of a multiple field filter is one which matches all CT studies performed today between 8:00 AM and 11:00 AM. You can create these filters one column at a time as described in section 6.2.4.1 *Searching the Worklist*, or all at once using the *Filters* page, as follows:

1. From the Worklist, click the Filters button,  , at the top of the worklist. The worklist filter page appears showing the columns in your current worklist.
2. Enter the search criteria for each field.
3. Select the filter criteria type button or checkbox at the far left of each row to activate the filter
4. Enter or select the filter criteria.
5. Click the *Apply* button, and the worklist displays the results.

By default, the Filter window provides fields for each of the columns displayed in the worklist. eRAD PACS also allows you to filter on data not displayed in the current worklist. This method would be used, for example, if you want to define a filter using the Body Part field, but you do not want to show the Body Part column in the worklist. At the bottom of the Filter window is a section called New Hidden Filters.


From the list, select the field on which you want to filter and click *Add*. The field then becomes available for searching in the section under the heading Hidden Filters.

When the hidden filters section appears on the screen, enter the search criteria as you would for any other attribute. Click *Apply*, and the worklist appears with the filter applied, but not displayed. To indicate a hidden filter applies to the current worklist, the Filter button at the top of the worklist will blink a few times, and turn red,  . Click the red Filter button to see which hidden filters are applied to the current worklist.


If you are having trouble locating a specific worklist record, first check for filters applied to the worklist. As mentioned above, filters are displayed in the column header, and a red Filters button denotes hidden filters. Clear all filters, or select the Default worklist from the Filter pull-down menu at the top of the worklist and look again at the worklist for the worklist record you need. Be aware your Default worklist may have filters applied by the system administrator.

#### 6.2.4.4 Combined Worklist Filters

The filter combination feature allows you to combine the results of individual filters into one worklist filter. This tool is available on the Other Lists page, and involves pairing together defined worklist filters.

To create a combined filter result, the individual worklist filters must already exist. Start by using the Filter tools to identify your matching criteria, and save each filter. When all the individual filters exist, go to the Other Lists page. To combine the results, check the box to the left of each individual filter you want included in the results, and click the batch Merge button  in the top left corner of the table. eRAD PACS performs each filter search individually, and then combines the results into a single worklist. This is effectively a Boolean OR operation. Save the combined search as an independent filter by entering a name and clicking on Save, at the bottom of the worklist.

#### **6.2.4.5 High Priority (Stat) Studies**

eRAD PACS displays high priority studies at the top of the worklist if the STAT button, , is pressed. If the field does not contain a STAT button, the worklist is sorted without regard to the study priority. Regardless of the STAT setting, all high priority studies appear in the worklist highlighted in red.

eRAD PACS makes no assumption about what constitutes a STAT study. What the STAT button denotes are entries in the worklist marked as High priority. If interfacing to a RIS system, eRAD PACS can map multiple priority levels to High, in which case they will all appear highlighted in red. Any user with study editing privileges can change a study priority.

#### *Quick Start Instructions – Display High Priority (STAT) Studies*

- From the worklist, click the STAT button, .

To include a study in the STAT list

- From the worklist, click the Edit button
- Set the Priority value to High.

#### **6.2.4.6 Saving Worklist Filter Definitions**

If you use the same filter often, it is sometimes helpful to store the search criteria so you can reapply it quickly without having to define it again. To save the filter, use the *Save List As* option at the bottom of the page. The Save List As field appears when the worklist filter does not match an existing filter, and the label in the filter pull down list shows *-Unnamed-*. Select a user account, which is your own unless you are the Administrator, in which case you can select any account on the server, and a list type, *New*, *Default*, *Global Restriction*, *Archive Filter*, *Prefetch* or *Prefetch Thumbnails*.

Select *New* if you are creating a new worklist filter. Enter a name for the list in the third field. Once you have labeled your filter, click the *Save* button.

To override your default worklist, select *Default* and save it. A popup message appears prompting you to confirm this change. Click OK to save it.

*Global Restriction* filters let the administrator define a filter on an account to restrict access to only those studies matching the filter. For example, to prohibit referring physicians from accessing studies requested by other physicians. Only system administrators with Admin privileges can define Global Restriction filters. Set the user account in the Save List As field to the respective account to save the filter in the selected account.

*Archive* filters define which studies get archived. For information on this, refer to section 8.4 *Archive Filters*.

To define *Prefetch* or *Prefetch Thumbnail* filters, refer to 6.2.5.1 *Prefetch Worklist*.

#### *Quick Start Instructions – Saving Worklist Filters*


- Set filter criteria and scroll to the bottom of the screen.
- At Save List As field, select New.
- Enter filter label.
- Click Save.


#### **6.2.4.7 Applying Defined Worklist Filters**

Predefined filters appear in the pull down list on the top left corner of the worklist. Select one of the filters to apply it to the current worklist.


To apply a worklist filter, perform these steps:

1. Click the *Worklist* tab.
2. Select a predefined filter from the pull down list at the top left of the worklist.

All defined worklist filters are listed under *Worklist/Other Lists*. A shortcut button, , to the Other Lists page exists next to the filter menu. If you are an Administrator, you can view all users' worklist filters as well. Click the filter label on this page to apply it to the worklist.

When a user account and the group to which it is assigned have filter lists with the same label, the row on the Other Lists table represents the individual account's list. The existence of the hidden group list of the same name is denoted by an icon, , in the table row.

The column on the Other Lists page reporting the number of items that match the filter is hidden by default. Display the column as follows:

1. Click the Other Lists tab under the Worklist tab.
2. Click the Show/Hide Number of Items button, .

#### **6.2.4.8 Editing Defined Worklist Filters**

Modifying an existing worklist filter consists of applying the defined filter to the worklist, making the necessary changes, and then saving it again using the same name.

To remove a predefined filter, go to the *Other Lists* page and click the delete icon next to the filter label. In the confirmation window, click *Delete* to complete the removal.


To rename a predefined filter, go to the *Other Lists* page and click the rename icon next to the filter label. In the popup window, enter the new name, and click *Rename*.

#### *Quick Start Instructions – Editing Worklist Filters*


Modifying an existing filter:

- Click the *Worklist* tab.
- Apply a predefined worklist.
- Make the changes to the worklist.
- Save the worklist using the same label.

Deleting an existing filter:

- Click the *Worklist* tab.
- Click the *Other Lists* tab.
- Click the delete icon  next to the filter label.
- Click *Delete* to confirm.

Renaming an existing filter:

- Click the *Worklist* tab.
- Click the *Other Lists* tab.
- Click the rename icon  next to the filter label.
- Enter the new name in the popup window and click *Rename*.

#### 6.2.4.9 E-Mail Notifications

Emails can be sent to notify users when some action completed in the PACS. For example, when the state of a study changes from Ordered to Unviewed, or from Dictated to Final. To accomplish this, eRAD PACS links the worklist filters to the notification function. When a study matches the criteria of a filter that has notifications enabled, the result is an email sent to the address registered for the account. The email includes a hyperlink to the worklist entry, the images, the report for the study, and to open the study in the viewing application.

To receive email notifications, create and save a worklist filter that satisfies the condition of interest. For example, if you want to receive a notice when a report is approved, create a filter with the Status column set to Final. After saving the filter, click the *Other Lists* tab. Find the new filter in the table and click the box in the Notify column to display the configuration window.

To activate, check the *Enable* box. If you want an email sent reflecting all existing studies, check the box labeled *Apply To Current Content*. Otherwise, notices apply to new studies only. Under *Scheduling*, select *Immediately* if you want emails sent when the event occurs, or *Daily* and enter a time if you want emails sent all at once. Add additional email addresses if necessary, separated by spaces. Click *Apply* to complete.

Enable:	<input checked="" type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Scheduling:	immediately at <input type="text"/> :00
E-mail:	DrSmith@physicians.com

To disable the notification, open the configuration window on the *Other Lists* page again, uncheck the *Enable* box, and click *Apply*.

#### Quick Start Instructions – E-mail Notifications

- Define a worklist filter, scroll to the bottom of the worklist, and save it.
- Click the *Other Lists* tab.
- Click the button in the *Notify* column for the new worklist filter.
- Select *Enable*, set schedule and click *Apply*.

#### 6.2.4.10 Duplicating Studies

The Copy action creates a copy or a shortcut of a study. The studies are defined by a filter. When setting up the action, you can define the type of copy to make, the folder in which it resides and coercion rules to customize some of the study and patient demographics. This action is useful for automatic sanitizing of patient demographic data.

To set up a copy action, follow the steps below:

1. Define and save a worklist filter to identify the studies.
2. Click the *Other Lists* tab under the *Worklist* tab.
3. Find the worklist filter and click the X in the *Copy* column to display the configuration page
4. Check the *Enable* box to set up the action for this filter.
5. Check the *Apply to Current Content* box to apply the action to studies existing on the server.

6. Enter the maximum number of studies to process each cycle. See details below.
7. Select the time to schedule the action
8. Select the location the copy will reside in. The Worklist target means the shortcut appears on the worklist.
9. Check the Shortcut box to create a shortcut. Clear the checkbox to create a duplicate copy. Some targets do not support duplicate copies. For these, the box is checked and inactive.
10. Define the optional coercion rules to apply to the study data. For information on coercion rules, refer to the Data Coercion section of the eRAD PACS Operator manual.
11. Click the Configure button.



If a batch size is defined, the system maintains a first-in-first-out queue. Studies that match the filter criteria at the time the action cycle occurs are appended to the end of the queue. Then the system applies the action to studies at the head of the queue. The action's *Batch Size* setting defines the number of studies processed. The procedure repeats with each action cycle until the queue is empty.

When an action is enabled, the X button on the Other Lists page changes to a ✓ button. To disable an existing action, click the ✓ button, uncheck the Enable checkbox and click Configure.

Actions run at scheduled intervals. At the next interval, the system will search the studies for studies that match the filter, create a copy, and apply the coercion rules. The study will then appear in the assigned folder.

The Source Study UID field of a shortcut contains the Study UID of the source study. For duplicate copies, the Source Study UID and the Study UID are the same and reference the copy.

### 6.2.5 PRESTAGING STUDIES TO A WORKSTATION

eRAD PACS supports two mechanisms for prestaging studies on a workstation. Prefetching uses defined worklists to select studies to download in the background while a user is logged onto a workstation. Auto-routing automatically forwards studies to a specified workstation, independently of user personal settings. Auto-routing is similar to prefetching except it is available for registered eRAD PACS workstations only.

#### 6.2.5.1 Prefetch Worklist

Prefetching downloads selected studies from the eRAD PACS server to the local workstation. As a result, opening a study loads the data from the local workstation rather than from across the network, greatly improving the load time.

The data staged to the workstation is based on two user-defined worklists: *prefetch* and *prefetch thumbnails*.

<i>Prefetch:</i>	Download the entire study
<i>Prefetch thumbnails:</i>	Download the study's meta-data only

When you log into a server from a workstation, eRAD PACS looks up your prefetch worklist and begins downloading the matching studies in the background. eRAD PACS continues to prefetch data using your prefetch list after you sign off. The applied prefetch list changes when a new user logs in from the same workstation.

Activate prefetching as follows:

1. Set up the filter criteria listing the studies you want to automatically download.
2. Scroll to the bottom of the worklist to save the filter.
3. Under *Save List As*, select *Prefetch* or *Prefetch Thumbnails*. The list name is set automatically. Do not alter the name.
4. Click *Save*.
5. Open the viewer and enable prefetching as described below.

After defining the prefetch filters, you must enable prefetching from the Viewer. Open the eRAD PACS viewer and check the Enable box in the Customize Settings' Prefetch panel. Refer to the eRAD PACS Viewer Manual for details.

Note: In earlier versions of eRAD PACS, prefetching used the *Default* worklist filter if no *Prefetch* filter existed. If upgrading from v5.1, you must define a *Prefetch* filter.

Prefetching performance and effectiveness start with a well-defined search. Some suggestions for an efficient prefetch filter are as follows:

- Prefetching downloads a limited number of studies per cycle. The viewer runs the prefetch filter(s) every cycle to collect the most recent list of studies matching the criteria. The viewer then selects the first N studies on the list for processing. The number, N, depends on many factors, but is usually in the range of 10-20. Defining a worklist filter matching more than this number has no benefit. A filter on the Date field equal to three or four times the prefetch cycle time should be sufficient.
- Prioritize the studies by the sort order. To make sure prefetching is downloading relevant studies, make sure your prefetch list places the newest studies at the top of the list.
- Inefficient filters can impact system performance. Prefetch automatically executes a worklist query every cycle. If the query criteria uses object level fields, non-indexed fields or returns excessive number of matches, you may notice poor performance. Apply your prefetch filters from the Worklist page to confirm the results are returned quickly. If this isn't the case, modify the filter criteria and remove unnecessary fields/columns.

#### **6.2.5.2 Auto-Routing**

Workstations that have a fixed IP address and a defined computer name can be registered in the *Devices* table, and can define a worklist filter for auto-routing studies before a user logs in and loads them in the viewer. When the workstation is turned on, connected to the server and has prefetching enabled, auto-routing is active, even when no user is currently logged on at the workstation. When a user is logged into the workstation, the auto-routing filter is combined with the user's personal prefetch filter.

The prerequisite to workstation prefetching is to register the workstation on the Devices page. Refer to section 7.5.1.2.3 *Adding a Viewer Device*. Once the workstation is registered, it appears on the list of destinations available when setting up a Forward action. To configure the workstation prefetch, create a filter and attach it to a Forward action, using

the workstation as the destination. For information on setting up a Forward action, refer to section 6.9.2 *Auto-Forward Action*.

Activate workstation prefetch from the Prefetch tab in the Customize Settings panel in the eRAD PACS viewer. Refer to the eRAD PACS Viewer Manual for details. Once enabled, prefetching begins after the next prefetch refresh cycle expires, which is typically between 5 and 30 minutes.

### 6.2.5.3 Post-process Cached Studies Action

Studies acquired by an eRAD PACS server get registered in the database and stored on the disk. By default, they are not processed for viewing until a workstation requests the data. When such a request occurs, the server processes the data by extracting pixel data, creating thumbnail images, and building compressed data files. If the user initiated the request to open a specific study before a prefetch took place, this processing is done while the user waits. To help improve download performance, the server can process the data before any workstation requests it using the Post Process Action feature.

*Note: In earlier versions of the system, the Post Process Action was named the Compress Action.*

The Post Process Action is available on the Other Lists page. Since it is a system action, it is best to create the filter as the system administration, and attach it to the @system user. Follow these steps to use this feature:

1. Create and save a worklist filter identifying which studies you want to preprocess.
2. Go to the Other Lists page, and find the new filter on the list.
3. Under Post Process, click the X to display the configuration window.
4. Check the Enable box to enable the action.
5. Check the Apply to Current Content box if you want the server to process all the data on the current worklist (not recommended).
6. Enter the maximum number of studies to process each cycle. See details below.
7. The Scheduling option instructs the server when to process the data (usually immediately upon arrival).
8. Click the Configure button to activate the action.

Enable:	<input type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Batch size:	<input type="text"/>
Scheduling:	immediately <input type="text"/> at <input type="text"/> :00

If a batch size is defined, the system maintains a first-in-first-out queue. Studies that match the filter criteria at the time the action cycle occurs are appended to the end of the queue. Then the system applies the action to studies at the head of the queue. The action's *Batch Size* setting defines the number of studies processed. The procedure repeats with each action cycle until the queue is empty.

### 6.2.5.4 Compress Data Action

The Compress Data action compresses data stored in a repository. It is intended for recovering some storage space by compressing data that is no longer used.

Set up an action to compress data as follows:

1. Create and save a worklist filter identifying which studies you want to compress.
2. Go to the Other Lists page, and find the new filter on the list.
3. Under Compress Data, click the X to display the Compress Action configuration window.



4. Check the Enable box to enable the action.
5. Check the Apply to Current Content box if you want the server to process all the data on the current worklist (not recommended).
6. Enter the maximum studies processed during each cycle in Batch Size.
7. The Scheduling option instructs the server when to process the data (usually immediately upon arrival).
8. Select the compress format: JPEG Lossless, JPEG 2000 Lossless, JPEG Lossy.
9. Select the override option:
  - a. Always – Always apply the configured format.
  - b. Only if uncompressed (Default) – Compress to the configured format only if the data is uncompressed.
  - c. If not in a supported compression format – Compress to the configured format if the current format is not one of the available compression formats.
10. Enter the size difference in Override Size Difference. The compressed file is saved only if the size difference exceeds the defined percentage value. An empty or 0% setting disables the check and the compressed file is saved regardless of the resulting size difference.
11. Click the Configure button to activate the action.



Enable:	<input type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Batch size:	<input type="text"/>
Scheduling:	immediately <input type="button" value="v"/> at <input type="text"/> :00
Compression format:	JPEG 2000 Lossless <input type="button" value="v"/>
Override current compression:	Only if uncompressed <input type="button" value="v"/>
Override size difference:	<input type="text"/> %

### 6.2.6 LISTING RELEVANT CASES

Relevant prior cases for a given study can be listed on an expanded worklist or on the relevant cases page. Relevant cases may be historical exams or other current exams. The system administrator configures the selection criteria used to match relevant cases. Refer to section 7.3.2.2 Matching Criteria for details.

**Figure 6.2.6-1 – Relevant exams in an expanded worklist**

Batch	Date	Patient Name	Status	Modalities	Description	# Imgs
	Jun 30, 2006 08:06:29	EIDELMANN, LORI	Read	CT	W & W/O CONTRAST	101
	Mar 19, 2002 09:09:58	Eidelman, Lori A	Preliminary	MR	f/u Pituitary tumor (demo demo)	92
	Dec 19, 2001 15:23:14	EIDELMANN, LAURIE A	Read	MG	Demonstration Study FOR PROC	4
	Feb 20, 2006 09:41:05	ADAMS, BILLY	Preliminary	CR	DR- HAND RT COMP (MIN3V)	1
	May 04, 2004 07:39:44	eRad_Test_One_Association	Read	MG	Screening-Bilateral Mammography FOR PROCESSING	4
	Mar 16, 2004 09:09:07	TORR, IADOR PS	Read	CR		8

The worklist expansion buttons display relevant cases, , or all related cases, , based on the configured matching criteria. When expanded, the worklist lists the primary exam first, followed by the relevant exams, as shown in figure 6.2.6-1.

The relevant cases page appears if you use the patient name hyperlink to open a study. Click on the patient name, and the system finds the relevant cases. The results appear on a new worklist page, as shown in figure 6.2.6-2.



Figure 6.2.6-2 – Relevant cases page

Main		Info	Preferences	Work List	Admin	Archive	Accounting			
Default List		Other Lists	Folders	Scheduling	Corrections	Group Orders	Download Viewer	Help		
Relevant cases for BRIANA BLAST							<input type="button" value="Previous Study"/> <input type="button" value="Next Study"/> <input type="button" value="Back to List"/>	Page 1		
Batch	Date	Patient Name	Status	Modality	Description	Referring Physician	Reading Physician	# Imgs	Source	
<input type="checkbox"/> Select All <input type="checkbox"/> None										
<input checked="" type="checkbox"/>	Oct 28, 2005 22:02:58	BLAST, BRIANA	Preliminary	CT	TRAUMA BRAIN	Baker, Paul		35	LOCAL	
<input checked="" type="checkbox"/>	Oct 28, 2005 22:02:58	BLAST, BRIANA	Read	CT	TRAUMA SERIES	Baker, Paul		234	LOCAL	
<input checked="" type="checkbox"/>	Oct 28, 2005 22:02:58	BLAST, BRIANA	Preliminary	CT	C SPINE - TRAUMA SERIES	Baker, Paul		138	LOCAL	
<input checked="" type="checkbox"/>	Oct 28, 2005 22:02:58	BLAST, BRIANA	Read	CT	HIPS - TRAUMA SERIES	Baker, Paul		28	LOCAL	
<b>Page 1</b>									Page size: 20	<input type="button" value="Change"/>

The blue, highlighted row in the worklist is the entry you selected. If the selected study was a shortcut, the highlighted row will be light brown instead. This list shows only the studies immediately available if the Priors Setting is set for local-only studies. Otherwise, all local and archived studies appear on the relevant cases list. The Source column indicates whether or not the study is locally available. Only studies marked Local can be opened from the Relevant Cases page. Load one or more studies at the same time using the Batch Open function.

### 6.3 Viewing Images

eRAD PACS has three ways to view images. To view diagnostic-quality images, where the user needs access to full fidelity images and the necessary tools to manipulate those images, there is the eRAD PACS viewer. The viewer is an application that installs itself on your PC, yet functions like a plug-in when you open a study.

If you have not downloaded and installed the eRAD PACS viewer, you can use the web viewer. This is a WebGL-compliant, browser-based viewer displaying full-fidelity images and offering a suite of image manipulation tools.

If your browser does not support the required technology to use the web viewer, use your browser to view static JPEG images. Web-based JPEG images are available from eRAD PACS Quick View page.

#### 6.3.1 THE eRAD PACS VIEWER

Sections 6.3.1.1 *Downloading the Viewer* through 6.3.1.3 *Opening Multiple Studies* explain how to download, install and launch the primary Viewer.

##### 6.3.1.1 Downloading the Viewer

Downloading and installing the eRAD PACS requires Microsoft Windows administrator rights and eRAD PACS Open privileges. When you first display the Worklist page, a popup notice may appear prompting you to download and install the latest viewer. If you clear the notice without installing the viewer, you will be prompted once each day until you upgrade. When you consent to the upgrade, eRAD PACS downloads the viewer and invokes the installation wizard. Depending on your version of Windows, you have the option to download and store the eRAD PACS setup file and activate it manually, or to download and activate (Open) it when complete. There is no need to save the setup file to disk, so open the file when downloaded.

If you do not have Windows administrator rights, you cannot install the eRAD PACS viewer but can upgrade a previously installed version. The upgrade is performed from the viewer. When you open a study, the viewer checks the server for a newer version. When one is found, the viewer prompts you to upgrade it. Check the box and click OK. The viewer downloads and prepares itself for install. When you close the viewer, the upgrade completes automatically.

To manually download and install a copy of the eRAD PACS viewer, click *Download Viewer* from under the *Worklist* tab. eRAD PACS downloads the viewer and invokes the installation wizard. As in the automatic install, there is no need to save the setup file to disk, so choose to open the file when downloaded. The eRAD PACS installation wizard takes you through the installation process step by step. The process is as follows:

1. The installation wizard launches. Read the panel, take any necessary actions. Press the Ctrl and Esc keys simultaneously to view the task bar if you need to quit any other applications. It is not required to quit the browser. Click *Next*.
2. Read the License Agreement, check the box to accept the terms, and click *Next*.
3. If the default location for eRAD PACS is acceptable, click *Next*. Otherwise, select a new location and click *Next*.
4. Click *Finish* when the install is completed.

The viewer starts automatically in stand-by mode. It appears as an icon, , in the taskbar.

#### *Quick Start Instructions – Downloading the Viewer*


- Go to the Work List.
- Click *Download Viewer*, and select *Run the Program from its Current Location*, if asked. If it asks you to save the file, save it, find it and double-click the file icon.
- InstallShield© Wizard will take you through the setup. Follow the instructions, and click *Finish* to complete.
- Single-click a patient name to launch the viewer and open the study.

#### **6.3.1.2 Loading Studies Into the Viewer**

The patient name in the worklist is a hyperlink. Click on the patient name to launch the viewer and load the study.

The association between the hyperlink and the eRAD PACS viewer is made by the file type .pbs. When the viewer was installed, the association is automatically defined. If Windows prompts you for a program to use on open file, the association was not made. You can manually make the association by opening a Windows Explorer session, select *Tools/Folder Options*, select the File Type tab, click *New*, enter *PBS* as the file extension type, and click OK. Then click on *Change*, browse for *c:\Program Files\PracticeBuilder\pbuilder.exe*, and click OK.

After selecting a study from the worklist, eRAD PACS searches the database and attached archives for related studies, such as relevant priors. Note that the search includes the archive only if the Prior Setting parameter is not set for local-only searches. If EP finds any priors, a filtered worklist appears. To open one or more of the listed studies, put a check in the box to the left of each study you want to open and click the batch open button. See section *6.3.1.3 Opening Multiple Studies* for additional details. If you want to open only one study, click the patient name again.



To open a study without searching for priors, or if the patient name is empty and no hyperlink exists, open the study using the Open button, . Click the Open button in the row corresponding to the study you want to view.

*Quick Start Instructions – Loading Studies Into the Viewer*

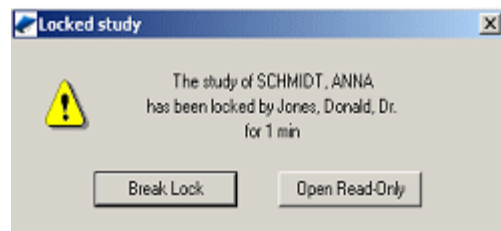
- Click the *Worklist* tab.
- Click the Patient Name, or the Open button  in the study row.

### 6.3.1.2.1 Record Locks

When opening or editing a study, there is the chance another user may attempt to open or edit the same record at the same time. The last user to save changes may overwrite the changes the other user made. eRAD PACS employs record locking to protect against these conflicts.


An open study indicator light exists on the worklist to provide some guidance as to which studies are locked. The indicator light appears on the far left of each worklist entry. A green light  indicates the study is available. A blinking green light means the study is being edited by you. A red indicator light  indicates some other user has the study open for editing. To get an accurate reading, users need to be logged into the same server. If a user opened the study on an eRAD PACS child server, the indicator light may appear unlocked on the parent server. For this reason, you may still receive the lock warning, below, even when the indicator indicates unlocked.

A user gets the record lock when he opens the study for editing. This prevents other users from editing this study until he is finished with it. To inform the second user the study is already locked, the system displays a popup notice when the viewer opens. It contains the study identification information, plus the name of the user who currently holds the record lock. The name is provided so you know who to contact if you must take the lock away from the other user. To display the images and not to make any changes, click *Open Read-Only*. You will have access to the full fidelity images, but won't be able to save changes, including key images or a report. If you need to save changes, inform the other user you intend to take the lock, and then click *Break Lock*.



Use caution in breaking record locks. Breaking another user's lock prevents him or her from saving changes. If you break the lock of a study opened in the viewer, the other user receives a notice informing them you have taken the lock. However, they do not get an opportunity to save their work to the server, at least, not until they reclaim the lock. To avoid this scenario, open a read-only copy of the study or contact the person who currently holds the lock and request it verbally before breaking it.

### 6.3.1.2.2 New Object Indicator

After a user reviews a study, the study may change. For example, new images arrive from the modality. EP notifies the user of this by highlighting the affected entry on the worklist. If the EP server registers a change to the study after the study status is Viewed, the Change flag is set to *New* or *Changed* and the Open button on the worklist changes to red, .

The Change flag is a worklist parameter that can be used to create a worklist filter. The field value can be None, New or Changed. *New* means the study acquired a previously


unregistered image since the last state or report change. *Changed* means the study data has been altered in some way, which may or may not be relevant, since the last state or report change. *None* or a NULL field denotes all other states. A user can use this field to create a default reading worklist. Anything New or Changed would typically require review by a radiologist.

Clear the change flag by opening the viewer and either updating the report, or checking the Clear Change Flag box on the popup window that appears when closing a study.




### 6.3.1.3 Opening Multiple Studies Into The Viewer

eRAD PACS lets you open multiple studies from the worklist and load them into the viewer at the same time. One method for doing this is to use the batch open function. The other is to use the group open function.

#### Batch Open Method


1. Display the studies on a single worklist page. Filter the worklist or increase the worklist page size if necessary.
2. Check the box on the far left of the study row.
3. Click the Batch Open button  at the top-left of the worklist table.

#### Group Open Method

1. Expand the worklist to display relevant priors, , or all priors, .
2. To open all the studies in the group, click the group open button, .
3. To open a subset of the group, check the box on the far left of the study row, and click the group open button next to the primary study, or at the top of the worklist in the batch functions.

Opening multiple studies is possible from the relevant priors page as well. After clicking on the patient name field on the worklist, a filtered list of relevant studies appears if prior studies exist. The highlighted row is the entry you selected. To open one or more of the listed studies, follow the steps above for the batch open method. For more information on relevant prior studies, see section 6.2.6 *Listing Relevant Cases*.

#### *Quick Start Instructions – Loading Multiple Studies into the Viewer*

- Click the *Worklist* tab.
- Check the box to the left of each study.
- Click the Batch Open icon  at the top left corner of the worklist.



### 6.3.2 THE WEB VIEWER

The web viewer displays images in the web browser. Basic tools are available to manipulate the images including scrolling, window/level, magnification, cross sectional references and linear measurements.




The web viewer is available for browsers supporting HTML5, WebGL and websockets. See section **Error! Reference source not found.** for details.





Activate the web viewer from a browser on a workstation as follows:

1. From the Worklist, click the Quick View button, , for the study.
2. Click the Open Web Viewer button, . The button in the study tool group opens the web viewer to the series mode view. The button in a series header opens the web viewer to the image mode for the respective series.


The web viewer consists of series and image views. The series view displays the series in a study. Click on a series to display the images in the image view. The available tools are listed in the Browser column in the table below.

Feature	Browser Control
Load viewer	Click Open button
Close viewer	From series view, click the browser's Back button or the Close button,  , in the study header.
Select series	From Series View, left click series image. From Image View, left click on left or right screen edge.
Return to series view	Left click in the top left corner while in Image view or click the Close button,  , in the study header.
Display report	To display the report for the current study, click the Report button,  , at the top of the web viewer.
Next/Previous series	Left click along the left edge while in Image view to skip to the previous series. Left click along the right edge to advance to the next series.
Scroll series page	Left drag
Scroll image page	Left drag along either edge, center mouse button drag or scroll wheel
Window	Right drag horizontally
Level	Right drag vertically
Grayscale invert	Double right click image to toggle
Pan	Left drag
Magnify	Left+right drag
Rotate	Left drag starting along the image edge
Flip	Double click the screen edge

Feature	Browser Control
Show/hide reference image	If the study contains orthogonal series in the same frame of reference, it appears by default in the lower left or right corner. Double left-click on the orthogonal image to hide it. Double left-click in bottom corner to display it.
Select reference image	Left click on orthogonal image then left click on series
Move reference image	Double left click on target corner
Linear measurement	Left click on ruler. When blinking, position cursor at the starting position, left click+drag to ending position and release mouse button.
Edit linear measurement	Drag the ruler edges using left mouse button
Reset ruler	Double-click ruler
Reset image	Double-click image
Show/hide help	The available web viewer controls are summarized in an overlay. To display the help information for the current view, click the Help button,  , at the top of the web viewer.
Enable/disable dynamic help	When enabled, dynamic help pops up a bubble when the mouse hovers over an active control area. This setting is configurable in the web viewer settings from the Preferences tab. Temporarily enable/disable the dynamic help tool by double-clicking on the Help button,  .

### 6.3.3 DISPLAYING STATIC IMAGES

The Quick View page provides you with a tool for displaying patient images in a read-only format, without launching a viewer. The Quick View page displays JPEG images and does not support image manipulation tools such as window/level, zoom or stack views.

To display the Quick View page for a study, click the Quick View button  to the left of the patient name for the study you want to open. The images are displayed in one of three sizes. To increase or decrease the size, click any one of the three *Image Size* icons. For a full-resolution image, click the image. If the monitor does not support the full resolution, a maximum screen resolution results.

## 6.4 Reports

When a study on the eRAD PACS worklist is in the *Completed* state, or contains images and is in the *Viewed* or later state, you can display the report. The first step in creating a report is to open the study in the eRAD PACS viewer, set the state to *Viewed* or some later state, and save the report when closing the study. If the study does not contain images, which can happen if the imaging procedure is performed on a non-digital modality or the modality is not connected to the PACS, go to the Edit page and set the study state to *Completed*. Once the study state is *Completed* or at least *Viewed*, you can display the report (in the browser or in the eRAD PACS viewer), edit it, and print it. Users with both study editing and report editing privileges can change the study state to *Viewed* from the Edit page, meaning they do not have to use the Viewer to change the study state.

### 6.4.1 VIEWING REPORTS IN THE BROWSER

When the study state is *Completed*, *Viewed* or later, the worklist's Status column becomes a hyperlink to the report. To display the report, click the status value for the study whose report you want to view. The report page appears, as shown in figure 6.4.1-1.



The report page consists of patient demographic information at the top, followed by information on who wrote the report and when. The remainder of the report page displays the Observation and Impression sections of the report, as well as addendums that have been added to the original report. If an addendum does exist, a hyperlink to the last addendum appears immediately above the Observation section.

The buttons at the top right corner of the report let you perform certain actions on the report. The available actions are as follows:

- **Back to List:** Returns to the worklist.
- **Edit:** Edit the report. Enabled if you have Edit Report rights. When editing a report, use the *Cancel* or *Save* button to release the report for editing by others. On some browsers, the browser's *Back* button leaves the study locked.
- **Open:** Open the study in the viewer. Enabled if you have Open rights.
- **Print Friendly:** Print a formatted copy of the report and the key images.
- **Dictate:** Record dictation for this study. Enabled if you have Report rights.

Figure 6.4.1-1 Report Page



The following additional buttons exist on the report page:

- **Approve:** Officially approve the report. Once approved, changes are recorded as an addendum. Enabled if you have Report rights.
- **Listen:** Listen to the dictated report, if one exists.
- **Redictate:** Edit the existing dictation, if one exists.
- **Unfinal:** Users with Admin permissions have a link to restore a report state to Preliminary for subsequent editing and approval.
- **Delete:** The last unapproved addendum in a study can be removed using the Delete button.

The browser report page is customizable. You can define the patient demographics that appear on the report, which text sections exist, reposition some of the areas, and customize the facility information. For details, refer to section 7.3.2.1 XML Template Customization.

### 6.4.2 VIEWING REPORTS IN THE VIEWER

In addition to viewing reports on the browser, you can see the report from the eRAD PACS viewer. You must have Open rights to use the EP viewer. The viewer can display the report for the current study, plus any reference study you open in the viewer at the same time.

When in the eRAD PACS viewer, select a series in the study of interest, and click the report panel window to display the report. Refer to the eRAD PACS viewer for more details on displaying a report in the viewer report panel.

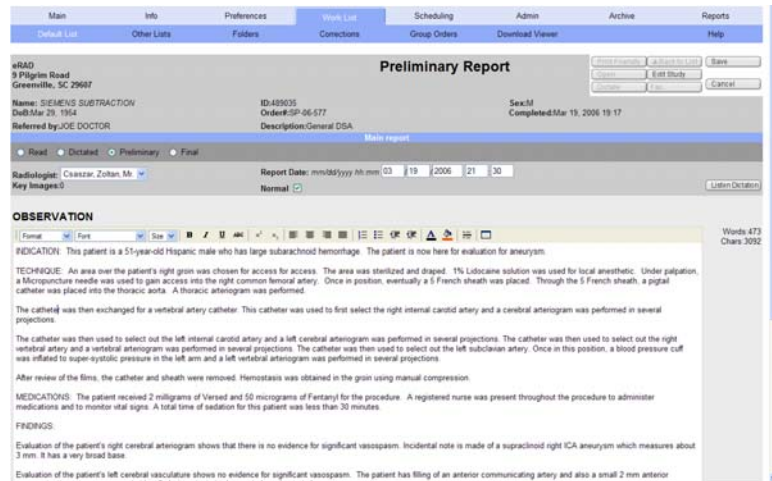
### 6.4.3 EDITING A REPORT

To edit a report, you must have report editing privileges. For such users, the *Edit* button on the top right of the Report page is enabled. Click the *Edit* button to go to the report editing page.

The Report Editor displays an XML template. An example of one of the default templates is shown in Figure 6.4.3-1. Since your template may differ, some features may appear differently or not exist at all. Generally, the report editor displays the patient and study demographics at the top, followed by the report details such as the report creator and report date, and finally the editable report content.

If addendums exist, they are available by selecting the appropriate tab.

Figure 6.4.3-1 Report Editor



The editable fields on the page consist of the study status, birad value, report author and date, the report normality flag, study notes, and the report content.

The report content area is one or two expanding rich-text fields. The rich text features include font type, size and color, bold, italics, underline, bulleted and numbered lists, and tables.

The buttons at the top right corner and elsewhere in the report editor let you perform certain actions on the report. The available actions are as follows:

- **Edit Study:** Edit the patient and study information.
- **Save:** Save the changes.
- **Cancel:** Cancel changes are return to the report page.
- **Listen:** Listen to the dictated report or addendum, if one exists.

Approved studies in the *Final* state cannot be modified. To amend an approved report, add an addendum. An addendum section appears as a new tab or at the bottom of the report edit panel, depending on the report template.

Some servers may be configured to use the eRAD PACS viewer's report panel for editing the report. This panel uses the same XML report, and includes some tools the browser report editor does not support, including spell checking, canned reports and foot pedal controls. If using the viewer's report panel for editing, refer to the eRAD PACS Viewer Manual for information.


#### 6.4.4 DICTATING A REPORT

To dictate into a report, you must have dictation privileges and have the eRAD PACS viewer installed. For such users, the Dictate button on the top right of the Report page is enabled, as shown in figure 6.4.1-1. To dictate a report,


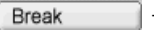
1. From the worklist page, filter the worklist to find the study.
2. Click the *Status* column value. The report page appears.
3. Click the Dictate button. The viewer's report panel pops up.
4. Refer to the eRAD PACS Viewer Manual for instructions on dictating into the viewer's report panel. When done, save the dictation.
5. Click Back to List.



### 6.4.5 TRANSCRIBING A REPORT

Transcribing a report requires report editing rights, which the system administrator must assign to your account. If you have these rights, the edit button  on the report page is enabled. Click this button to open the report editor, shown in Figure 6.4.3-1. The report editor is a template which may appear different on your system. Generally, the report editor consists of editable text fields for typing the report text. There is also a Listen button for playing back the dictation. You can control playback using your mouse, the Philips SpeechMike, Philips foot pedal, and some other supported devices. Contact customer support for a list of supported devices.

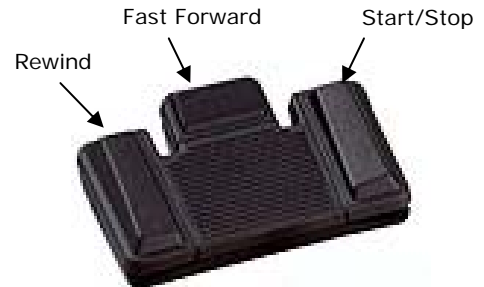
To transcribe a report, do the following:

1. From the worklist page, filter the worklist to find the studies in the Dictated state.
2. Click the left mouse button on the *Status* column value. The report page appears.
3. Select Edit  from the buttons on the upper right side of the screen. If another user has the study locked, you receive a message, as described in section 6.3.1.2.1 *Record Locks*. Inform the user listed in the message that you need to edit the report, and click the break button  to take the lock from the other user.
4. Click the Listen button to start playing the dictation.
5. Enter the report text into the Observation, Impression or Addendum text field.
6. Click Save to save the report.

When playing the dictation, use the audio control on the application playing the wav file to stop, rewind, restart and control playback speed. You can also use the Philips foot pedals.

#### 6.4.5.1 Philips Foot Control Pedal

The Philips Foot Control LFH2330/00 foot pedal is an integrated device for controlling audio file playback. Install the device and drivers according to the instructions provide with the kit. Once installed, you can use this foot pedal to start, stop, rewind and advance the dictation file.



Two playback modes exist: push-to-play and play/stop.

Mode	Description
Play/stop mode	(Default) The right pedal starts and stops the dictation playback, changing between play and stop each time you press the pedal.
Push-to-play mode	The right pedal plays the recording when pressed and stops when released.

To use play/stop mode on a Philips LFH 2330/00 foot pedal when using Windows 7, change the device's default Play setting from the Philips foot pedal configuration wizard in Philips SpeechExec Transcribe Application (bundled in Philips LFH7177 transcription kit)

1. Follow Philips' instructions for installing the Philips SpeechExec software and plugging in USB Smart Key License and the foot pedal.
2. Open the SpeechExec Transcribe Application from Windows start, All Programs.
3. Select the Settings, General Settings, from the menu; then Foot Control configuration.
4. Select (Blue) Start Wizard...
5. The Wizard will guide you through selecting pedal layout
6. Select next, and the wizard will guide you through selecting mode of operation

- You will want to use start/stop play mode with eRAD, and close application.

Two rewind/fast forward modes exist as well: steps mode and continuous mode.

Mode	Description
Steps mode	Push the middle pedal, the recording fast forwards 2 seconds. Push the left pedal, it rewinds 2 seconds. Hold down the pedal for half a second and the recording rewinds or fast forwards to the beginning or end, respectively.
Continuous mode	Press and hold the middle pedal to fast forward continuously, until you release it. Press and hold the left pedal to rewinds continuously.

The mode settings and default values for using the foot pedal are defined in the Dictation panel under Customize Settings in the viewer. The device type for a Philips foot pedal is *None*. Refer to section 4.1.13 in the eRAD PACS Viewer Manual for more information.


#### 6.4.6 APPROVING REPORTS

To approve a report, you must have Approve rights. When a report is in the Preliminary state, an *Approve* button appears on the Report page. To officially sign a report, click the *Approve* button. A confirmation screen appears. If you wish to proceed and record your name as the official signer of the report, click Approve. Otherwise, click Cancel.

You can approve a report from the report editor by setting the state to Final. A confirmation panel appears to confirm the action. Click Approve to continue, Cancel to stop.

When you have multiple reports to sign, use the batch signing feature to approve them. Batch signing consolidates the steps needed to display, review, edit, approve and move on to the next report.

Batch report signing works best if you create a worklist filter containing the reports you need to review. Although your specific environment may differ, this generally means a worklist filter showing all studies with a State equal to Preliminary. You may want to increase the default page size so all the studies appear on a single worklist page. Save this worklist as a named filter by scrolling to the bottom of the worklist, enter a label in the text field, and click Save.

When you are ready to approve reports, select the reports you want to review by checking the box to the far left of the respective worklist entry or click *Select All* just under the Batch section, and click the batch report signing button  in the Batch section of the worklist header. The first report in the worklist appears. Review and edit the report as needed. Edits made during the review process are recorded when you click Approve or move to another report page. When finished reviewing, select one of the available options.

Button	Function
Next Study	Advance to the next study, making no changes to the current study.
Previous Study	Return to the previous study, making no changes to the current study.
Approve	Mark the study for final approval, and advance to the next study on the list.
Finish	Skip the remaining reports and jump to the final confirmation stage.
Cancel	Terminate the signing process, ignoring all changes made to this point.
Listen Dictation	Listen to the dictation attached to the report.

When you approve the last study or click the Finish button, the summary table appears. This page lists all the reports, along with the pending approval status. If a checkmark appears in the Approved column, the report is about to be officially signed. If the field contains an 'X', the report will not be signed. Toggle this setting by clicking on the value in

the Approved column. To jump back to a specific report, click the value in the Radiologist or Transcription Date column.

Main		Info		Preferences		Work List		Admin		Archive		Accounting			
Default List		Other Lists		Folders		Scheduling		Corrections		Group Orders		Download Viewer Help			
<b>Interpretations to be approved:</b>															
Patient name	Patient ID	Modality	Study Date	Radiologist	Transcription date	Approved									
BOSLEY, GOREDSOXS	PVH00-34233	NM	Jun 22, 2005 07:35:00	<a href="#">Horvath, Gabor</a>	<a href="#">Jan 09, 2006 09:52:52</a>	✓									
Robinson, Jane	123456987	CT	Jul 28, 1999 20:42:07	<a href="#">Horvath, Gabor</a>	<a href="#">Oct 12, 2005 09:32:02</a>	✓									
Pumpkin, Jack	123654-78	CT	Oct 13, 1999 10:59:11	<a href="#">Horvath, Gabor</a>	<a href="#">Oct 12, 2005 09:45:44</a>	✓									
CLAMPETTE, JED	456398	CT	Feb 14, 2000 09:10:14	<a href="#">Horvath, Gabor</a>	<a href="#">Oct 12, 2005 10:37:23</a>	✓									
SANFORD, ENSON	20369	MR	Nov 27, 2000 11:23:14	<a href="#">Horvath, Gabor</a>	<a href="#">Feb 03, 2005 11:26:22</a>	✗									
												Approve		Cancel	

Reports have not been signed yet. Return to the worklist without finalizing the reports by clicking the Cancel button. Note that edits made to the report text have been recorded already and will remain in the report. When you are ready to approve the reports, click the Approve button. At the confirmation prompt, click the Approve button again. At this point, the reports listed with a check in the Approved column of the summary page are signed.

The entire time you are batch signing, the study remains locked, meaning any user that attempts to open or edit the study while you are reviewing it will receive a lock warning. If they steal the lock, the approval process for that one study will fail. The study state remains unchanged, and appears on your worklist as it did before the batch report signing process.

#### 6.4.7 MANUAL REPORT PRINTING

To print a report from the report page without all the browser details, click the Print Friendly button on the report page. A new browser window pops up displaying the formatted report, along with the printer's dialog box. Select the printer from those configured into the workstation and click Print.

To display the patient and study information on all the pages printed from the browser, display the browser page's Title. The page Title is constructed from the following information:

- Prefix (equal to "Report - ")
- Patient Name
- Patient ID
- Study Date
- Accession Number

The details for displaying the Title on a printed page are specific to the browser you are using. On Internet Explorer 8, the procedure is as follows:

1. From the browser's File menu, select Page Setup.
2. In either the Header or Footer section, select Title from the pull-down list.
3. Click OK.

In Internet Explorer 7, the Window Title field is &w. Insert this code into the Header or Footer field to display the Title on the printed page.

#### 6.4.8 BATCH PRINTING REPORTS

Automatically print reports based on filter criteria using the batch printing action. To start, define a worklist filter satisfying the condition of interest. For example, print all reports that became *Final* today, create a filter with the Status column set to *Final*. Since the action acts on the studies new to the filtered list since the last time it printed reports, exclude any time criteria in the filter.

After saving the filter,

1. Click the *Other Lists* tab.
2. Find the filter in the table and click the box in the Print Report column to display the configuration window.
3. Click to put a check in the *Enable* field.
4. Check *Apply to current content* to print all existing reports.
5. Enter the maximum number of studies to process each cycle in *Batch size*. An empty batch size value disables the limit setting and all studies matching the filter criteria will be executed during the action cycle.
6. Set the scheduling parameter.
7. Check *Print Images* to include key images.
8. Select the printer from the *Printer* field. Printers are postscript printers configured on the server through a terminal session.
9. Click *Apply*.

Enable:	<input checked="" type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Scheduling:	immediately at <input type="text"/> :00
Print images:	<input checked="" type="checkbox"/>
Select printer:	HAZ_lexmark


If a batch size is defined, the system maintains a first-in-first-out queue. Studies that match the filter criteria at the time the action cycle occurs are appended to the end of the queue. Then the system applies the action to studies at the head of the queue. The action's *Batch Size* setting defines the number of studies processed. The procedure repeats with each action cycle until the queue is empty.

By default eRAD PACS prints reports within 5 minutes of them satisfying the filter criteria. If you want to schedule the print to execute at a specific time of day, select *Daily* in the Scheduling section, enter in the print time using 24-hour time, and click *Apply*. If the printer is unavailable when it comes time to print the reports, eRAD PACS continues to try for one hour, after which it will reschedule for the next day.

To disable report printing, open the configuration window on the Other Lists page again, remove the checkmark from the Enable box, and click *Apply*.

#### 6.4.9 REPORTING FILM-BASED STUDIES


When eRAD PACS receives images from a modality, the user opens the viewer to look at the diagnostic images and create a report. When no digital images exist, the viewer cannot be used to create the report. For this situation, study orders that transition into the *Completed* state have access to the Report page so a user can either dictate or type a report using the browser.

The study must appear on the worklist as a RIS- or manually-created order. To get to the Report page, the order status must be set to *Completed* by the RIS or manually by clicking on the Edit button  and changing the study Status to *Completed*. When completed, click the worklist entry Status value to get to the Report page. Depending on your account privileges, the Report page may have a *Dictate* and *Edit* button.

Select the *Dictate* button to pop up a dictation window similar to the one available in the eRAD PACS viewer. Using this window and your microphone, dictate your report, set the study state to *Dictated* and send the report.

Select the *Edit* button to get to the Report Edit page, from which you can type a report and set the study state. Click *Save* to save the report text.



#### *Quick Start Instructions – Reporting Film-based Studies*

- Go to the Worklist page.
- Click the *Scheduling* tab and create a *Completed* order, or
- Click the Edit icon  and change the order Status to *Completed*.
- Click the order status in the Worklist.
- Click the *Dictate* button to dictate a report, or
- Click the *Edit* button to type a report.
- Set the study Status to *Dictated* or *Preliminary* and save the report.



#### **6.4.10 RESENDING REPORTS AND ORDERS UPDATES VIA HL7**

Under normal circumstances, the system automatically propagates order updates and reports to the appropriate HL7 device when necessary. Occasionally, atypical data modifications are required making it difficult for the system to conclusively determine an update is warranted. In these cases, the administrator can manually forward an order update or report to the RIS, EMR or other HL7 device.

To manually forward a report to an HL7 device, do the following:

1. Search the Worklist for the study containing the report you need to send.
2. Click the Quick View button, , in the study row.
3. Click the Send Report button, .

To manually initiate an HL7 ORM update to the RIS or EMR, do the following:

1. From the Worklist, click the Quick View button, , for the study.
2. Click the Send Order Update Message button, .

There is a confirmation notice displayed if the message was successfully queued for transmission. Simply queuing the message does not imply delivery. The completion status is reported in the same manner as internally scheduled HL7 transmission requests.


The Send Report and Send Order buttons are active only on servers connected to an HL7 device. The system determines the appropriate target device based on the source of the order and existing HL7 configuration settings.

### **6.5 Editing Studies**


To edit the patient demographic data, you need to have Edit privileges. To manually assign scheduled orders with complete images, you need to have Correction rights. To edit a report, you need to have Edit Report rights. If your account has these privileges assigned, you will have the buttons needed to perform the activity available from the worklist. For details on how to access and edit study data, refer to the sections below.

### 6.5.1 EDIT STUDY DEMOGRAPHICS

To edit patient and study demographics from the worklist, perform the following steps.

1. Click the Worklist tab
2. Click the Edit button  to the left of the study row.
3. Select the field containing the information you want to change, delete the existing value, and type in the new value or select it from the pull down menu
4. Check the *Shred* box, if available, to force EP to edit all the objects in the system, as opposed to make a reference change. Be aware that shredding the previous data may place a load on the system. Unless you have a specific reason to use the Shred option, leave it unchecked.
5. Click the *Save* button at the bottom of the page. To scan documents and attach them to this study, click *Save & Scan*. To upload documents and attach them to this study, click *Save & Upload*.

Use the batch editing tool to modify the multiple studies at the same time, as follows:

1. On the Worklist, check the box on the left of each study's row.
2. Click the Batch Edit button, , at the top of the worklist.
3. Enter the values into the available field.
4. Click Save.



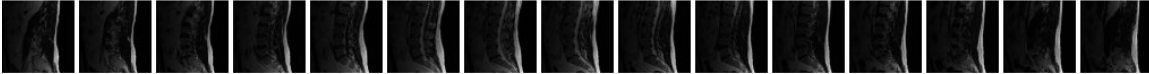



When batch editing, fields values with a white background are unmodified and remain unchanged after submitting the edit request. Fields with a green or grey background contain modifications and will change for all selected studies. A field with a grey background and no value means the value will be cleared for each study.


If the Edit button does not appear on your worklist, you are not authorized to use this feature. If you need the ability to edit the study data, contact your system administrator.

Studies that have been retrieved from an archive are write-protected and cannot be edited. If you attempt to edit data in an archived study, you will receive a notice indicating the fact when you click the Edit button.

### 6.5.2 EDITING SERIES DATA



Edit series data from the study's Quick View page. Each study is preceded with a study header displaying a fixed list of series-level attributes. To the left of the series values is an Edit button. The images in each series follow.

	Series Number	Modality	Series Date	Series Description	# Objs	# Imgs
 	3	MR	May 15, 2008 09:12:07	SAG T2	15	15
						
 	4	MR	May 15, 2008 09:15:16	SAG T1	15	15
						

To edit a series, scroll the quick view page to the header of the series and click the Edit button, . The list of editable fields appears. Enter the value and click Save.

### 6.5.3 EDITING DOCUMENT TYPES

To edit a document type after completing the scanning operation, do the following:

1. Click the Worklist tab.
2. Search the worklist to find the study containing the scanned documents.
3. Click the Quick View button, .
4. Scroll to the bottom of the page, to the Attachments section and click the *Attachments* hyperlink in the attachments section header.
5. Position the mouse over the thumbnail of the document whose type you want to check and click the Edit button, .
6. From the Document Type pull-down list, select the new document type.
7. Click Save.

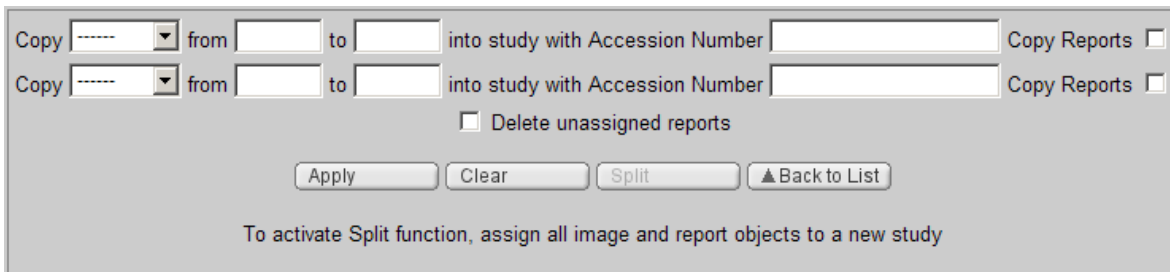
### 6.5.4 SPLIT STUDIES

Separate a single study into two or more studies from the Split Study page. Users with Edit permissions have a Split button on the Quick View page. The Split Study page consists of three sections. The top section is the control area where you identify the new groupings.

The remainder of the page displays the images in the study, separated by series, followed by icons for each report object (main report, addendum, private report file) in the study.

To separate a group of images, place the mouse over the image or report to determine its reference number. When you have this information, follow these steps:

1. Select Series or Image from the *Copy* pull-down list, enter the starting and ending Series/Image number, and the starting and ending report number. An ending number must be present, so for a single series or image, enter the same value in the starting and ending fields.
2. Enter a new accession number.
3. Check *Copy Reports* to include a copy of each existing report in the new study.
4. To remove all the report objects from all new studies, click the *Delete Unassigned Reports* box. (This option requires the user have Delete permissions.)
5. Click *Apply*.



The image groups get color-coded. All series, images and reports assigned to the same Accession Number will be put onto the same study group. Referenced objects such as CAD reports and presentation states get assigned to the study containing the image they reference. When all the image and report objects are assigned to a new group, the *Split* button activates.

6. Click *Split*.



7. Modify the patient demographic information by using the Edit function from the worklist.


A study retrieved from a remote archive cannot be separated using this tool. If your attempt to separate a study fails, check to see if the study was retrieved from an archive.

Studies saved to folders as a Copy are split the same as ordinary studies using the *Split* button on the Quick View page. Split copies appear in the same folder as the copy.

Since a shortcut is actually a link to the original study, splitting a study with shortcuts splits each shortcut into the same number of studies. The resulting shortcuts appear in the same folder as the original shortcut.

The *Split* button is available on the shortcut study's Quick View page. When pressed, the system offers to take the user to the original study's split page.

### 6.5.5 MERGE STUDIES

To merge two or more studies into a single study, start on the Worklist page. Select all the studies by checking the box to the right for each entry, and click the *Merge* button  listed with the Batch operations at the top of the worklist. The Merge page appears. Choose the study to use as the primary study. The primary study is the one whose data will not change. Start the merge by clicking the *Save* button. The system updates the study information of all studies to match the study information of the primary study. The list of modified fields includes the Study UID, Accession Number, Patient Name, and Patient ID.

If multiple reports (which can be in any state from Read to Final) exist for the studies, the one registered for the primary study will become the main report and the others will be added as addendums. If you prefer to keep the primary study report and purge the rest, clear the mark in the *Keep All Reports* checkbox.

Primary Study	Date	Patient Name	Accession No.	Modality
<input checked="" type="radio"/>	Aug 21,1999 15:56:32	BERT, PHIL		CT
<input type="radio"/>	Aug 21,1999 16:01:41	BERT, PHIL		CT

The patient and study information in the Primary Study gets copied into the other studies.


Keep all reports. If checked, reports from other studies are attached as addendums to the Primary Study's report. If cleared, reports from other studies are purged.

Matching a scheduled procedure request (i.e., an order) with a set of acquired images is different from merging studies. To match an order with a study, see section 6.5.6 *Match Orders to Study Images*.

A study retrieved from an archive cannot be merged with another study. If you attempt to merge a study and it fails, check to see if it was retrieved from an archive.

Merging is unavailable for shortcuts in folders.

#### Quick Start Instructions – Merge Studies

- Click the *Worklist* tab.
- Select two or more studies using the checkbox on the left of each study row.
- Click the Merge button  at the top of the worklist.
- Identify the primary study.
- Click Merge to complete.



### 6.5.6 MATCH ORDERS TO STUDY IMAGES

The Corrections page is for manually associating a scheduled order with a set of images. eRAD PACS attempts to automatically match imaging studies with existing orders, but depending on the configured matching criteria and image demographics, it may be unable to find a match. At this point, manual intervention is required.

To match orders to imaged studies, do the following:

1. Click the *Worklist* tab.
2. Click the *Corrections* tab.
3. For the order, select a study from the pull down list to the right.
4. To use a study not on the list, click the More Studies icon, , and locate the study.
5. Click the Merge icon, . The data summary page appears.
6. Confirm the settings, making changes where necessary.
7. Click *Apply* to save.

### 6.5.7 CORRECTING INCONSISTENT DATA

In a multiple server environment, when a study or part of a study resides in more than one server branch, it must be cleaned up with administrator's guidance. When the system detects this data inconsistency, a data inconsistency button, , appears in the row for the study. Admin privileges are required to see and access the data inconsistency tool.

The data inconsistency cleanup tool lists study identification information at the top of the page, followed by a table consisting of a column for each server on which the study resides. The page details are as follows:

Field	Description
Patient and exam information	Patient and study identification information including the patient name, ID, accession number, study date, modality and study description.
Target server	A list of all servers on which some portion of the data currently resides. The highlighted (blue) server indicates the one the system believes the data should reside on. The selected server (ie, the one whose radio button is marked) is the server the data will be moved to.
Field column	Lists all the fields that contain different information on the listed servers. For example, if one server contains a report object and the other does not, a row with a Field labeled "Report" appears.

Field	Description
Server columns	For each field listed, the server column lists what exists on the respective server. For example, if a "Report" row exists, the server column lists what report objects exist on each server. Additional prompts may exist in this column to indicate actions to take when cleaning up the study. For example, if multiple reports exist, the user has the option to keep the reports on a specific server or drop them.
Apply and Cancel buttons	The Apply button initiates the clean-up operation. A target server must be selected before the button becomes active. Cancel exits the tool without making any changes.

Using the information available in this table, select the server you want the study to end up on and click Apply. A progress page appears, displaying the result of each step. If any of the steps fail, clean up requires manually intervention from support. If all the steps succeed, the study has been moved and the operation is complete.

#### **6.5.8 COPY ACTION FOR AUTOMATIC DEMOGRAPHIC SANITIZATION**

To hide sensitive patient and study demographics from specific users, configure the system to automatically sanitize the data. The system uses the Copy action and its coercion rules to sanitize the data automatically.

To automatically sanitize a study, perform the following steps:

1. Create a worklist filter to identify the list of studies to be sanitized.
2. Enable a copy action for the filtered list. See section 6.2.4.10 *Duplicating Studies* for details.

The procedure for setting up a user to have access to only the sanitized version of a study is as follows:

1. Create a worklist filter identifying the list of studies you want to sanitize.
2. Set up a copy action on the worklist filter to automatically create a sanitized shortcut to each study. In the copy action configuration,
  - a. Set the target as *Worklist*.
  - b. Define the coercion rules to encrypt the demographic fields you want to mask. In the coercion rules, include a format to indicate the study has been sanitized, such as a unique prefix on a patient name or ID, or in a user-defined field.
3. For each user account, create a global restriction filter using the special format applied by the coercion rules.

Users with no global restrictions applied will be able to see both the original study and the sanitized study. Additionally, the referenced study is listed in the Shortcut or Source Study table on each study's Quick View page.

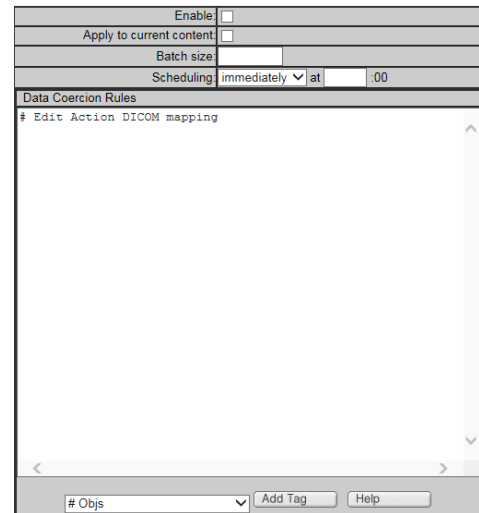
To replicate the sanitization on multiple servers, including parent and child servers, duplicate the filter definition and coercion rules on each server. The copy action configuration does not automatically propagate across servers.

#### **6.5.9 EDIT ACTION**

The edit action modifies study data based on some conditional event. For example, the action can automatically update the study state if a user scans in the procedure worksheets. To create edit actions, you must have Edit permissions assigned to your user account.

To set up an edit action, perform the following steps:

1. Define and save a worklist filter identifying the studies that need to be edited.
2. From the Worklist tab, select the Other Lists tab.
3. Find the saved worklist filter from Step 1 in the table and click the button in the Edit column in that row. The edit action configuration page displays.
4. Check the Enable box to enable edit actions for this filtered list.
5. Check the Apply to Current Content box to apply the edit actions to existing studies on the list.
6. Enter the maximum number of studies to process each cycle in *Batch size*. An empty batch size value disables the limit setting and all studies matching the filter criteria will be executed during the action cycle.
7. Define the time the edit occurs. Select *immediately* to apply the edit(s) the first time actions run after the study matches the filter criteria. Select *daily* and a time to schedule them for a specific time of day.
8. Define the edit commands. Refer to the coercion rules section for details.
9. Click Configure to apply the changes.



If a limit is defined, the system maintains a first-in-first-out queue. Studies that match the filter criteria at the time the action cycle occurs are appended to the end of the queue. Then the system applies the action to studies at the head of the queue. The action's *Batch Size* setting defines the number of studies processed. The procedure repeats with each action cycle until the queue is empty.

Edit actions operate at the study level using values assigned in the object with the lowest SOP Instance UID. The coercion rule is evaluated once and the result is assigned in compliance with the edit mode settings.

## 6.6 Scanning Documents

Document scanning tools permit users to attached scanned documents to orders and studies. Scanning requires an optional license. Access is controlled through the scanning permission.

### 6.6.1 SCANNER CONFIGURATION

eRAD PACS supports TWAIN-compatible document scanners. The scanner's drivers must be installed according to the scanner's installation manual. Once the scanner is installed and configured, it becomes available to eRAD PACS automatically. Depending on the capabilities of the scanner, you can scan single and dual sided documents, driver's licenses, insurance cards, assorted notes and forms.


The default scanner settings are defined for each workstation. To set them, perform the following on each scanning workstation:

1. Click the Preferences tab.
2. Click the Workstation tab.

3. Click the Set Scan Source link to select the scanner. Windows pops up a source selection window.
4. Select the scanner from the list and click Select.

From the Workstation page under the Preferences tab, you can also set the scanner's default settings and scan a test page.

Link	Function Description
Set Scan Source	Select the default scanner.
Set Scanner Defaults	Activate the scanner's setup application to set scanner settings.
Scan Test with Defaults	Test the scanning function using the configured settings.
Scan Test into JPG/PDF with Settings Page	Test the scanning function by activating the scanner's setup application. The scanned document is stored as either JPG or PDF, depending on the selected link.

Documents can be scanned as JPEG images or PDF files, depending on the configuration. This can be set in the user interface or by using the format-specific version of the generic Scan button, . Note that JPEG format supports a single image per file while PDF supports multiple pages. If scanning a multi-page document, PDF is recommended. PDF documents require Adobe Reader to display.

Scanned documents appear under the Attachments section of the Quick View page and from the Attachments page. You may need to refresh the web page to see them immediately after scanning.


Documents scanned by eRAD Scheduler are available in the Attachments page.

Scanned documents can be available in the viewer if the report template includes them. Refer to the *eRAD PACS Report Customization Manual* for details.

### 6.6.2 DOCUMENT SCANNING USER INTERFACE

The scanning user interface appears when you click on any of the scan buttons, which are generally available from the Quick View page, the PACS and Scheduler order entry pages and the Scheduler patient entry page.

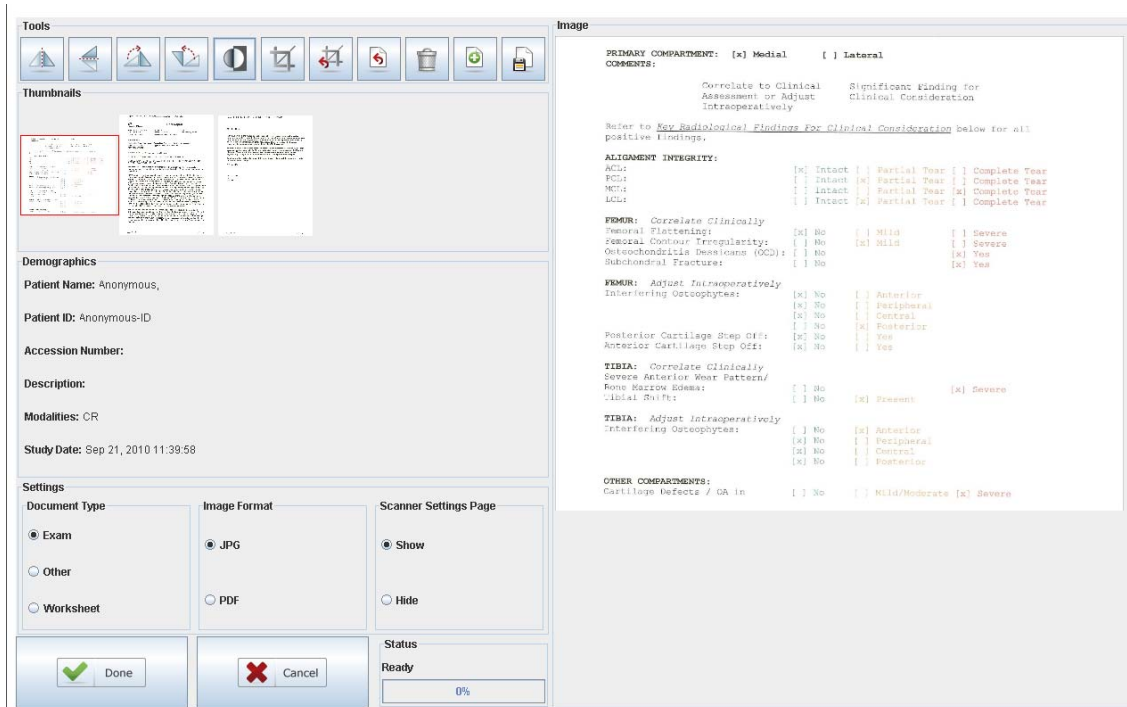
To scan one or more documents, do the following:

1. Place the documents to scan in the scanner.
2. Click the Scan button, . The Document scanning user interface opens.
3. The documents are scanned depending on the Scanner Setting Panel's setting:
  - a. If configured to show the scanner manufacturer's scanner setting panel, it appears automatically. Follow the instructions for the scanner control software. Once scanning is complete the scanned images are added to the document scanning user interface for review and correction if necessary.
  - b. When no scanner control software is required, scanning automatically starts.
4. Use the scanner user interface to make adjustments.
5. Click Done to submit the scanned images to the server and close the user interface.

Note: The maximum number of documents that can be scanned in one session is thirty (30).

The scanning user interface consists of the following sections:

Tools	Image manipulation, scanning and other functions.
Thumbnails	Renderings of each scanned sheet. The section is used to select a specific image and to re-organize their order.
Demographics	Patient and study information describing the study the documents are being attached to. The contents of this section are server-configurable. See section 7.3.21 <i>Scanning UI Demographic Data Settings</i> for details on customizing the demographic information.
Settings	Image and scan settings applied to the selected study or image.
Image	Readable-sized rendering of the selected scanned document.
Status	Progress bar showing the scan status.

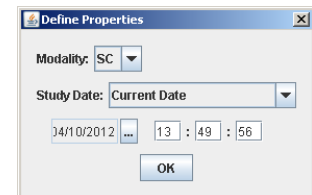


The properties of each section are described in the table below.

Section	Tool	Description
Tools		Flip the selected image vertically.
		Flip the selected image horizontally.
		Rotate the selected image to the right 90°.
		Rotate the selected image to the left 90°.
		Invert the grayscale of the selected image.
		Right-drag the cursor to draw a region of interest on the selected image and crop everything outside it when the mouse is released.
		Undo the last crop operation.
		Reset the image's orientation, cropping and grayscale.

Section	Tool	Description
		Remove the selected sheet so it will not be uploaded to the server.
		Add a new sheet to the list of scanned documents for this study.
		Upload the scanned documents displayed in the thumbnail list to the server.
		Edit the assigned attributes. Active when the selected Document Type is an <i>Image</i> type.
		Upload all unsent documents and close the scan interface.
		Drop all the unsent documents and close the scan interface.
Thumbnails	Left-click	Select the image and place it in the Image area.
	Left-click and drag	Reposition the image in the thumbnail section.
Settings	Document type	List of configured document types available for assignment to the selected image. See section 7.3.22 <i>Document Type Configuration</i> for details on setting up and assigning restrictions to document types.
	Image format	The format of the stored images. JPEG images are stored one image per file/object. PDF documents store all the current scanned images into a single PDF file. See section 7.3.20 <i>Scanning User Interface Settings</i> for details on setting the default.
	Scanner setting page	Show or hide the scanner's control panel. Some scanners require scanning be initiated from its own control panel. If you wish to modify the scanner settings such as bit depth, resolution or page size, you must use the scanner's control panel as well. See section 7.3.20 <i>Scanning User Interface Settings</i> for details on setting the default.
Image	Left-click	Toggle through the available image sizes. Three sizes exist: fit to window; fit width; and full resolution.
	Left/Right scroll bar	When the image is larger than the available area, use the scroll bars to reposition the viewable part of the image in the image area.

When the Document Type setting is an *Image* type, you might be prompted to select some attribute values. Their defaults are configured by the system administrator as described in section 7.3.22 *Document Type Configuration*. These settings are applied to all the documents uploaded during this scanning session.



### 6.6.3 VIEWING SCANNED DOCUMENTS

Scanned documents are available on the Quick View page, the Attachments page, the Scheduling patient and order pages, the Viewer and the patient folder. The existence of scanned documents can be displayed on the worklist using the # *Attachments* worklist column.

The availability of scanned documents is by document type. Documents are assigned a type from the scanning UI or when acquired from a third party device. Access to specific

document types can be limited by location for users and groups. Details for creating and restricting access to document types are in section 7.3.22 Document Type Configuration.

On the Attachments page, each attachment is represented by a thumbnail image of the attachment file's contents. Click the thumbnail to display the attachment in the view area on the right. Depending on your browser's settings, the view area embeds the application appropriate for the attachment's file type, or launches it in a separate window.

Note: The setting to embed PDF documents into the browser window is in Adobe Reader. From the Edit menu, select Preferences. In the Categories list, select Internet. Check the *Display PDF in browser* box.

If the attachment is an image (e.g., a JPEG file or DICOM object), position the mouse over the thumbnail to display the attachment at a quasi-readable resolution. For non-image file types (e.g., a PDF file), the attachment's file name appears.


Note: When the view area is occupied by a non-image object, such as the Adobe Reader, the browser loses control of the area. A consequence of this is the mouse-over popup windows appear behind the object in the viewer area. The recommended solution is to configure Adobe Reader to open in a separate window rather than embed into the browser.

The main image area supports three display modes.

Display Mode	Description
Full image mode	Display the image at full resolution, adding vertical and horizontal scroll bars to reposition the viewable area
Page-width mode	Fit the page width to the image area, adding a vertical scroll bar if necessary.
Full page mode	Fit the entire image to the image area.

To change the display mode, position the cursor over the image in the main image area and click the left mouse button. The modes advance from page-width to full image to full page to page-width.

Attachments can be deleted from the Attachments page, as follows:

1. On the Attachments page, position the cursor over the attachment thumbnail to display the toolbar.
2. Click the Delete button, .
3. Review the attachment details and click Delete to remove the attachment from the study.

## 6.7 Uploading Documents

Image files can be uploaded as attachments to studies and orders. The following file types are supported:

BMP, JPEG, PDF, PNG, TIFF

The following limitations apply:





- Alpha transparencies applied to PNG files are removed.
- 16-bit and 48-bit RGB PNG files are not supported.

Uploaded files are treated as scanned documents, appearing in the Attachments section of the Quick View page, the Attachments tab in the report panel, the Attachments carousel in the Patient Folder, and the viewer's thumbnail panel and image frames.

Uploading documents requires Java VM. Download this from the Internet and install it prior to uploading documents.


To upload a file to an existing study, do the following:

1. Find the study on the Worklist and click the Quick View button, .
2. Click the Upload Document button, . This launches the Upload panel.

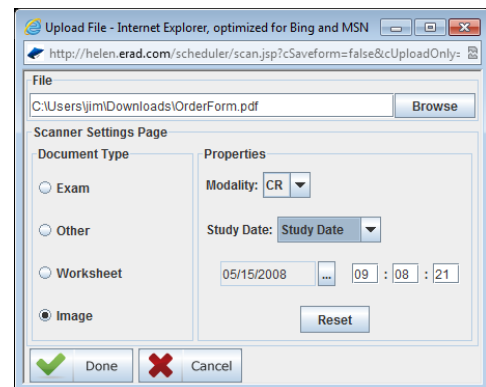
Additional upload buttons are available when editing a study or order.

### 6.7.1 DOCUMENT UPLOAD USER INTERFACE



Uploading files is done using the Upload panel. It provides a user interface for selecting one or more files, assigning a document type and additional data, and uploading it all to the PACS. The uploaded files are attached to the specified study, patient record or order.

To initiate the Upload panel, click the Upload Document button, , on one of the following pages: Quick View page, Scheduler's Patient Edit page or Scheduler's Order Edit page. The Upload panel is also accessible from the study Edit page and the PACS Scheduling Order Creation page. When the Upload panel appears, continue as follows:

1. Click the Browse button to display the browse window. Use the browse tool to go to the folder in which the document(s) reside.
2. Select one or more files in the folder.
3. Click *Open*.
4. Select the Document Type. Depending on the selected type, additional properties might be required.
5. Click *Done*.




The properties of each section are described in the table below.

Section	Tool	Description
Tools	Filename	File to be uploaded
	Browse button	Press the Browse button to locate the file.
	 Done	Upload documents and close the user interface.
	 Cancel	Close the panel.
Settings	Document type	List of configured document types available for assignment to the selected image. See section 7.3.22 <i>Document Type Configuration</i> for details on setting up and assigning restrictions to document types.
	Properties	When the Document Type is <i>Image</i> , additional information is required.
Status	Status bar	Progress bar showing the scan status.




## 6.8 Display DICOM data

To dump an object's DICOM data, click the Quick View button, , on the worklist entry to get to the Quick View page. From there, click the image whose data you want to dump. A window pops up containing a full size copy of the image. To view a dump of the DICOM object for the image, click *DICOM Dump*. A new window appears, displaying the contents of the DICOM object file.


The *DICOM Dump* link requires Dump permissions.

### *Quick Start Instructions – Dump DICOM Data*

- Click the *Worklist* tab.
- Click the Quick View button, .
- Click the image to dump.
- Click *DICOM Dump* in popup window.


## 6.9 Exporting

Forwarding studies instructs eRAD PACS to establish a DICOM Association with one or more entities and send the images and report objects to them. Exporting is also used for creating DICOM media and copying studies into user-defined folders. Folders are discussed in section 6.12 Custom Folders.

Exporting requires Forward/Export rights. If your account has these rights, the forward button, , appears on the left side of the worklist row.

### **6.9.1 FORWARDING STUDIES**


Forwarding studies queues the images, reports, annotations and overlays associated with a study to one or more selected DICOM destinations. Forwarding data to another DICOM device requires Forward/Export rights. If you do not have the forward icon on your worklist, contact your system administrator.

Click the Forward button, , to the left of the patient name to forward a study. To forward multiple studies, select each study you want by putting a check in the box for the row, and click the batch Forward button at the top of the left column of the Work List. A list of configured destinations appears. Select one or more destination by clicking the checkbox on the left. Click the *Forward* button at the bottom of the page to queue the studies. A confirmation page appears notifying you the study is queued.


By default, all subsequent edits to and new images for the selected studies get forwarded to the destination. The system default setting is set on the *Admin/Settings* page. A device-specific setting exists on the individual device's Edit page for customizing this setting for each device.

### *Quick Start Instructions – Forwarding Studies*

To forward one study:

- Click the *Worklist* tab.
- Click the Forward button  next to the study you want to transmit.
- Select destination(s).
- Check/Clear *Keep sending updates* box.
- Click the *Forward* Button.

To forward multiple studies at one time:

- Click the *Worklist* tab.
- Check the box on the far left of each study to transmit.
- Click the Batch Forward button .
- Select destination(s).
- Check/Clear *Keep sending updates* box.
- Click the *Forward* button.

### 6.9.2 AUTO-FORWARD ACTION

To forward select studies to one or more destinations automatically, eRAD PACS uses the worklist filters and the auto-forward action. To enable auto-forwarding, your account must have Forward/Export rights.

Configure an automatic forward action based on a study's properties as follows:

1. Create and save a worklist filter that satisfies the condition of interest. For example, if you want to forward all studies from a particular institution to a particular workstation, create a filter with the *Institution Name* column set to the facility name.

Enable:	<input type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Batch size:	<input type="text"/>
Scheduling:	immediately <input type="button" value="v"/> at <input type="text"/> :00
Targets:	72-h21 conductor0 dev2
Updates:	<input checked="" type="checkbox"/>
Report only:	<input type="checkbox"/>
Thumbnails only (Viewer only):	<input type="checkbox"/>

2. Go to the *Other Lists* page.
3. Find the new filter in the table and click the box in the Forward column to display the configuration window.
4. Check the Enable field.
5. Check the Applying to Current Content box to send all studies on the current worklist matching the filter. If this box is unchecked, only new (future) studies will be forwarded.
6. Enter the maximum number of studies to process each cycle in Batch size. An empty batch size value disables the limit setting and all studies matching the filter criteria will be executed during the action cycle.
7. Select *Immediately* to forward studies within 5 minutes of them satisfying the filter criteria. Select *Daily* and enter a time using 24-hour format to schedule the action to happen at a specific time of day.
8. Choose the destination(s) from the Targets list. Use CTRL-click to select multiple targets.
9. Check the *Updates* box to forward all subsequent edits and additions made to the studies.
10. Check *Reports Only* to forward just the reports to the target device. Reports consist of Basic Structured Report objects, private eRAD PACS PbR and PbD objects, and any image objects attached to the report as a key image.
11. Check the *Thumbnails Only* checkbox, if enabled, to prefetch only thumbnail images to a configured eRAD PACS Viewer. If cleared, the entire dataset gets sent.
12. Click *Apply* to complete the setup.

If a limit is defined, the system maintains a first-in-first-out queue. Studies that match the filter criteria at the time the action cycle occurs are appended to the end of the queue. Then the system applies the action to studies at the head of the queue. The action's *Batch Size* setting defines the number of studies processed. The procedure repeats with each action cycle until the queue is empty.

The Targets list contains all registered *DICOM* and *Viewer* devices. DICOM devices must be configured as DICOM Storage SOP Class SCPs. Registered Viewers are eRAD PACS

workstations set up with prefetching enabled. Creating an auto-forward filter for these devices creates a worklist prefetch list. Similar to user prefetch, worklist prefetch downloads the studies matching the worklist filter to the workstation, even when the user is not logged in. This allows an administrator to auto route studies to specific workstations.

To disable auto forwarding, open the configuration window on the Other Lists page again, remove the checkmark from the Enable box, and click *Apply*.


Note: When using the auto-forward action to selectively send studies to an external archive, the system requires instructions on the disposition of studies that are not archived. If your archive is configured as an external archive, has the device's auto-forward setting disabled, and your system is configured for daily housekeeping (making room for new studies), add a delete action, defined in section 6.10.4 Delete Actions, to clear non-archived studies from the server. If you're unsure about your server's current configuration or need assistance defining the appropriate delete action, contact your support representative.

### 6.9.3 WRITING DICOM MEDIA


To write a selection of studies and a viewer to a DICOM-compliant removable media, use the study forwarding feature. Exporting data requires Forward/Export rights.

DICOM compliant CD, DVD, DVD-RAM, and USB connected devices, compact flash drives, Multimedia cards and secure digital cards can be created. The format is selected from the Media Type pull-down list on the media setup page, after selecting *Create DICOM Media* from the Export targets page.

To export a single study, do the following:

1. From the Worklist page, find the study in the worklist.
2. Click the Export button, , next to the study you want to transmit.
3. Check *Create DICOM Media* and click the Forward button.
4. Select the media type you want to create.
5. Select the compression algorithm you want to apply.
6. Check *Add Viewer* to include the Viewer.
7. Check *Omit Structured Report objects from DICOMDIR* to exclude the report.
8. In the *User For Viewer Profile* list, select the user account ID for the viewer profile included on the media.
9. Click the *Continue* Button. Wait for the Creating ISO file progress bar to complete.
10. Follow the instructions on the page to download the packaged files.

To export multiple studies at one time, do the following:

1. From the Worklist page, filter the worklist so all the studies appear on a single page.
2. Check the box on the far left of each worklist study to include on the media.
3. Click the batch Export button, .
4. Follow the directions as above starting at step 3.

Data collected for some media such as a USB connected device is downloaded in a self-extracting ZIP file and can be saved to the media directly. CD, DVD and DVD-RAM media requires the data be put into an ISO file that a commercial CD/DVD-writing application can burn to the media. This application is not provided with the system.

When the packaged studies are ready for download, retrieve the studies as follows:

1. Click the Download and Burn ISO File button.
2. When the download completes, you are prompted to save the data.
  - a. If the media supports a ZIP file, browse to the device with the media and click OK. The data is extracted from the ZIP file and copied to the media.
  - b. If the media supports an ISO file, save the file to your disk. Open the file. If your workstation is configured to launch your CD/DVD writing application, it will launch automatically. Otherwise, start your CD/DVD writing application manually and load the saved ISO file.

DICOM media created by eRAD PACS is serialized with a unique identifier. The identifier is logged in the system and includes the user ID and timestamp when it was created. It is also copied to the media in a README file that is electronically signed. To obtain the identifier from the logs, search the Action entries for the *export* request for the study. Add the Information column to the table. The identifier is the string following "UID:".

#### **6.9.4 EXPORTING WORKLISTS**



The worklist can be exported into a tab-delimited file so you can import it into a spreadsheet or report application. Create the worklist you want by using the filtering and layout tools. eRAD PACS only exports the information on the displayed page, so increase the page size if you need to get more information on the worklist. Click the *Export* button at the bottom of the worklist when the data is ready. A spreadsheet appears containing the information. Save this data as a text file, an Excel spreadsheet, or some other file format. An application that can open tab-delimited files must be installed on your PC in order for you to save this information.

##### *Quick Start Instructions – Exporting Worklist Data*

- Filter the worklist to display all the studies you want on a single page.
- Click the *Export* button at the bottom of the worklist.
- Save the file to disk.

#### **6.9.5 MOVING STUDIES BETWEEN HUB SERVERS**

In a worklist-hub server environment, admin users can move a study from one hub server to another from the browser interface.

1. Find the study on the worklist, from any server, and click the Quick View button, .
2. Click the Move button, , to display the target selection page.
3. Select the target Hub server
4. Click Move to start the data move or Cancel to return with no changes.
5. When the operation completes, click the Back button to return to the Quick View page.

The system moves the study from the source Hub server to the target Hub server, archives the data on the new Hub server's archive if available, purges the study from the source Hub server's archive (eRAD PACS archives only), and updates the references on the worklist server. The progress is reported on the progress table. When all this is complete, the study is unlocked and available for use.


This feature exists for a multi-server dotcom configured as a single enterprise solution.

## 6.10 Deleting

eRAD PACS is a storage solution for acquiring and managing image and report data. Nevertheless, there are times when it is necessary to remove data from the system. Purging is a restricted function, requiring Delete permissions.

### 6.10.1 DELETING STUDIES FROM A SERVER

To permanently remove one or more studies from the eRAD PACS server, perform the following steps.


1. Click the *Worklist* tab.
2. Filter the worklist to find the study or studies you want to delete.
3. To delete a single study, click the Delete button, , of the study row.
4. To delete multiple studies at the same time, check the box on the far left of each study row and click the batch Delete button at the top of the worklist.
5. If the study contains a report, a report disposition checkbox appears on the delete confirmation page. When unchecked, the study's report objects are removed from the server along with its image objects. When checked, the report objects, key image objects attached to the report and the private objects are retained.
6. Check the Immediate box to terminate all pending operations for the study and remove it from the entire system immediately.
7. Click the *Delete* button to complete the deletion. Click *Cancel* to return to the worklist without deleting.

When manually removing a study from the system, two modes are available:

Remove the study from the local server. The primary purpose for this method is to free disk space on the local server. Copies of the data queued for transmission to other servers or outside systems, waiting to be archived, or part of any other pending operation shall remain on the server until all such operations complete successfully. When the Immediate checkbox is empty, studies are removed from the local server only.


Remove the study from the entire system. The primary purpose for this method is to remove the data system-wide so it can be reacquired as though it was the first time. Pending forwards, archive writes, etc., are immediately terminated. When the Immediate checkbox is checked, studies are removed from the entire system.

The delete function requires certain privileges. If the Delete button does not appear on your worklist, contact your system administrator to obtain rights to delete studies.

Studies marked for deletion but still resident due to an outstanding reference, such as a pending transmission request, are available on the worklist for Admin users. Press the Show Deleted Studies with References button, , to include these on your worklist.

### 6.10.2 DELETING SERIES FROM A STUDY

Remove select series from a study from the study's Quick View page. Each study is preceded with a study header displaying a fixed list of series-level attributes. To the left of the series values is a Delete button. Beneath the header are the images in the series, defined by the Series UID value.




To delete a series from a study, scroll the quick view page to the header of the series and click the Delete button, . The series is removed permanently from study. To extract the

series into a standalone study or to merge it with another study, refer to details on splitting and merging studies.

	Series Number	Modality	Series Date	Series Description	# Objs	# Imgs
	3	MR	May 15, 2008 09:12:07	SAG T2	15	15
	4	MR	May 15, 2008 09:15:16	SAG T1	15	15

### 6.10.3 DELETING OBJECTS FROM A SERIES

To manually remove an image, presentation state, CAD marker, scanned document object from a study, do the following:

1. From the Worklist, click the Quick View button, , for the study containing the object(s) to remove.
2. Position the cursor over the object you intend to purge. If the object can be deleted, a popup menu, , appears over the image.
3. Select the Delete button, , in the popup menu. A confirmation window appears.
4. Click Delete to remove the object. Click Cancel to abort the request.

Deleted objects are removed from all servers in the server hierarchy and from eRAD PACS archives.

Deleting individual report objects including DICOM Structure Report objects is unsupported via this tool. When positioning the cursor over an undeletable object, the delete button is unavailable.

Manually deleting individual objects requires delete permissions.

### 6.10.4 DELETE ACTIONS

To automatically delete studies from the server, set up a delete action. For example, you may want to delete specific studies acquired by some modality or from a specific institution.

1. Define the worklist containing the studies you want to delete and save it as a filter.
2. Go to the Other Lists page. Find the new worklist in the table, and click the button in the Purge column. The delete action configuration page appears.
3. Check the *Enable* box to turn purging on.
4. Check the *Apply to Current Content* box if you want the purge to consider all the existing data on the worklist. Leaving it clear applies to new (future) studies only.
5. Enter the maximum number of studies to process each cycle in Batch size. An empty batch size value disables the limit setting and all studies matching the filter criteria will be executed during the action cycle.

Enable:	<input type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Batch size:	<input type="text"/>
Scheduling:	immediately <input type="text"/> at <input type="text"/> :00
Keep report:	<input type="checkbox"/>
Immediate:	<input type="checkbox"/>
Purge matching objects	<input type="checkbox"/>



6. The *Scheduling* field allows you to perform the purging immediately, executed in 5 minute cycles, or at a specific time on the day.
7. Check the *Keep Report* box to purge everything except the report objects. Report objects include Basic Structured Report objects, the private EP PbR and PbD objects, and any image objects attached to the report as a key image.
  - a. Note: Purging non-report objects from eRAD PACS Classic model archive, third party archives attached to eRAD PACS, and disaster recovery storage is unsupported.
8. To delete the studies immediately and permanently from all servers in the dotcom, check the *Immediate* box.

If a limit is defined, the system maintains a first-in-first-out queue. Studies that match the filter criteria at the time the action cycle occurs are appended to the end of the queue. Then the system applies the action to studies at the head of the queue. The action's *Batch Size* setting defines the number of studies processed. The procedure repeats with each action cycle until the queue is empty.

To define the specific objects to remove from the studies matching the filter defined in Step 1, continue as follows:

9. Click the *Purge Matching Objects* box. The expanded configuration options appear in the configuration panel.
10. Select the criteria for the objects within the study. The following fields are available:



    Conversion Type: Identifies the type of SC attachment.

    Modality: Modality of the objects to purge.

    Series Description: Purge series matching the entire string value.

    SOP Class: Purge objects by SOP class UID.

Enable:	<input type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Batch size:	<input type="text"/>
Scheduling:	immediately at <input type="text"/> :00
Keep report:	<input type="checkbox"/>
Immediate:	<input checked="" type="checkbox"/>
Purge matching objects:	<input checked="" type="checkbox"/>
Attachment Type	Exam Order Data Other
Conversion Type	DI - Digital Interface DF - Digitized Film DRW - Drawing
Modality	CR CT DX
Series Description	<input type="text"/>
SOP Class	AmbulatoryECGWaveformStorage BasicVoiceAudioWaveformStorage BlendingSoftcopyPresentationStateStorage

11. Use the Preview button to see which objects match your criteria. On the preview page, click the Show Details button, , to select a study from the list at the top to see which objects in this study match the criteria. To return to the configuration page, click the Back button, , at the top of the study list.

Note that when purging matching objects, the following occurs:

- The delete defaults to "Immediate". It is recommended that partial deletes be purged using this setting.
- The Keep Report option is disabled. The keep report option is available only when purging the entire study.
- The Mark As Deletable Only option is disabled. This option exists when the server is configured with an "external" archive. Marking studies as deletable applies to the entire study only.

Whether specifying select objects or purging the entire study, continue with the following to complete the configuration:

12. Click Configure to finish.

Note that PB Report objects, PB Dictation objects and Basic Text SR objects cannot be purged using the individual purge feature. The only way to remove them is to purge the entire study.

The individual purging feature is mutually exclusive of the *Keep Reports* option and the *Mark As Deletable Only* option.


The logs will contain an OBJECT level entry with action of *delete* for each object purged from a study, and a STUDY level entry for a partial delete. The name of the worklist filter (list) used in the delete is contained in the Partial Rules field on the Logs page.

eRAD PACS Enterprise solutions maintain a single list of studies. There is no difference between studies on the worklist or in the archive. The delete action permanently removes all copies of a study from the server.

#### **6.10.5 DELETING STUDIES FROM THE ARCHIVE**

The eRAD PACS archive may consist of an option storage device. When it is not present, the archived copy of the study is the copy on the worklist. In this case, deleting a study from the archive is the same procedure as deleting it from the worklist. See section 6.10.1 Deleting Studies from a Server for details.

When a separate storage device is used for archiving, the Archive tab is available to users with archive privileges. From the archive list, users with delete permissions can remove studies from the archive storage device as follows:

1. Click the *Archive* tab.
2. Enter the search criteria for the study you want to delete. Click the Apply button.
3. Click the Delete button  to the left of the study row.
4. Click *OK* on the confirmation page.

The delete function requires delete privileges. If the Delete button does not appear on your worklist, contact your system administrator to obtain rights to delete studies.


### **6.11 Creating Orders**

eRAD PACS automatically receives and registers scheduling and order information from a connected RIS. When no RIS is connected, and eRAD Scheduler is not installed, users can manually create scheduled orders by clicking on the *Scheduling* tab. The Scheduling page collects the information you can enter for an order. An imaging modality supporting DICOM Modality Worklist Management SOP Class can download the order data created by the RIS or manually.

Creating scheduled orders required Scheduling rights. If you do not have the *Scheduling* tab, contact your system administrator to request the necessary rights.

To create an order,





1. Click the second-tier Scheduling tab under the first-tier Worklist tab to display the Scheduling page.
2. Enter the patient and study information.
  - a. To make a copy of an existing order (or study), select the More Information button, , in the Patient Name label and select an existing record.
  - b. To copy just the name into a field, click the More Information button in the particular name field.
3. After entering the necessary information, click *Save*. To scan documents and attach them to this order, click *Save & Scan*. To upload documents and attach them to this order, click *Save & Upload*.

If you failed to enter required data, the confirmation page instructs you to return to the Scheduling page and enter the missing information. The new scheduled order appears in the worklist.

### **6.11.1 GROUP ORDERS**


Group orders are multiple orders performed as a single imaging procedure. For example, a patient may be scheduled for a chest CT, abdomen CT, and pelvis CT exam. This results in three order requests. When the patient enters the CT examination room, the technologist performs a single imaging procedure. The PACS system receives a single image set containing the images for all three orders. eRAD PACS can handle this situation if the individual orders are logically marked as a Group Order.

When a RIS submits orders to eRAD PACS, it can mark orders that will become a single grouped order. If the RIS is unable to support this configuration, or for some reason multiple orders appear on the eRAD PACS worklist need to be grouped, use the Group Order function available on the Worklist page. Click the *Group Orders* tab to display the group orders page. The page lists the scheduled orders. To group two or more together, check the boxes on the far left of the row containing the order, and click the batch merge button, , at the top of the list. The orders are now grouped. On the main worklist, each order still exists. This lets you review and edit each order separately.

To ungroup a grouped order, click the *Group Orders* tab to display the group orders page. Find the order group, and click the More Information button, . The individual orders in the group appear in a list. Check the box on the left for the order you want to remove from the group, and click the *Ungroup* button. If you want to remove more than one order from the existing group, and group them into their own group, check the boxes for the studies to remove, and click the *Split* button. The two groups now appear on the group list.

When an image set arrives for any one of the orders, as identified by the Study UID or when merged into the order, automatically or manually, all the orders disappear from the worklist. eRAD PACS tracks the image set as corresponding to all orders in the group, so when it updates the RIS with a status or a report, it sends the update once for each order attached to the image set.

#### *Quick Start Instructions – Grouping Orders*

- Click the *Worklist* tab.
- Click the *Group Orders* tab.
- Check the box for the orders to group.
- Click the Batch Merge button .

**Quick Start Instructions – Ungrouping Orders**

- Click the *Worklist* tab.
- Click the *Group Orders* tab.
- Click the More Information button
- Check the box for the order you want to remove from the group.
- Click the Ungroup button.

**6.11.2 CREATING ORDERS FROM STUDIES**

When using eRAD Scheduler, the order can be created from the demographic information entered at the modality and present on the PACS worklist. This is accomplished from the Corrections page. This tool requires the scheduling edit order permission.

1. Click the Corrections tab under the Worklist tab.
2. Select Unmatched Studies from the pull-down list to display the list of studies that were not matched to any order.

Main		Info	Preferences	Work List	Scheduling	Admin	Archive	Accounting
Default List		Other Lists	Folders	Corrections	Group Orders	Download Viewer	Help	
Corrections		Unmatched Studies				Page 1		
Unmatched Studies	Date	Patient Name	Patient ID	Accession No.	Modalities			
	Jan 01, 2025 10:00:00	SMPTE, Pattern	092883861067		OT			
	Mar 19, 2009 10:27:42	Anonymous, Femi	99999-99	99-99	MG			
	Feb 27, 2009 14:25:07	GE PETCT 2,	43232	454	PTCT			
	Feb 27, 2009 10:38:37	GE PETCT 1,	5543	3243	PTCT			
	Feb 12, 2009 11:14:33	CHAVEZ, IRMA,	MO911	LTSHOULDER	MR			

3. If necessary, use the filter tools to find the study in the table.
4. Click the Get Order button, , to retrieve the order from eRAD Scheduler. This option is available if the order is found in the eRAD Scheduler but not in the PACS worklist. The accession number in the study is used to find the matching order. Skip the next step.
5. Click the Create Order button, , to initiate the wizard to walk you through creating the order. The screens that follow prompt you to select, in order, the acquisition device, the procedure, the patient, the referring physician, and the procedure details. In each case, select the value from the pull-down list or click the More button, , to pop up a detailed list. In the case of patient demographics, click the Add New button, , to create a new patient record using the study's data to pre-initialize it. When done, click the Save button.

After completing the wizard or retrieving the order from eRAD Scheduler, the system automatically combines the order and procedure using the Default Correction Sources configuration, and creates the order in eRAD Scheduler. The study will disappear from the Unmatched Studies list.

If the study in the table matches other orders or studies, additional buttons may exist in the study row.

- List Orders, Show orders with the same Accession Number.
- List Studies, Show studies with the same Accession Number.

To initialize the lists of devices, procedures, patient data and referring physicians used by the wizard, set up the matching criteria tables. Refer to the Scheduler's Matching Criteria section, 7.3.2.2 Matching Criteria, for instructions.

Note: Creating orders for unscheduled procedures is available when the eRAD Scheduler is licensed.


Note: Studies already matched to orders generated by RIS systems other than eRAD Scheduler are included in the list of unmatched studies.

## **6.12 Custom Folders**


eRAD PACS supports custom folders, where a user can save copies of studies in specified groups. The user creates a folder by giving it a name, and then adds and removes studies into the folder for easy reference. Studies can exist in a folder by reference or explicitly.

Referenced studies are shortcuts to the actual study, meaning a change in either the main study or the one in the folder are reflected throughout the eRAD PACS system. Shortcuts appear in folders highlighted in light brown.

Explicit copies of studies are actually independent duplicates. These studies can be sanitized and modified, and the original study is not affected. Independent copies appear in the folder list like they do in the worklist.

The first step in using a custom folder is to create the container under *Worklist/Folders*. The *Folders* page lists all the created folders for your account. Click the Add button, , to create a new folder. Enter a folder name and click *Add*. The new folder appears on the list. You can also create a folder when you add a study using the Forward function. Enter a name under the *New* field, and the folder is automatically created.

To add a study to a folder, export it. To do this, you need Forward/Export rights. To create a copy, you also need Copy rights. The procedure is as follows:


1. From the worklist, find the study you want to add to a folder, and select the Export button, . If you want to add multiple studies to a single folder at one time, check the box to the far left of each study, and select the batch Export button at the top corner of the worklist. The Export page appears.
2. Check the box for the row labeled Create Copy/Shortcut to.
3. If copying the study to an existing folder or to the worklist (folder), select it from the pull-down list. If copying the study to a new folder, select New Folder from the pull-down list, enter a folder name in the New text box.
4. Select either the *Make a Copy* or *Make a Shortcut* button. A copy creates a standalone instance of the study by duplicating all the associated files. A shortcut creates a link to the original study meaning any modification to either the original or shortcut appears on the other.
5. Click the *Forward* button at the bottom of the page.


Users cannot share folders, but if you have administrator privileges, you can add to another user's folder by selecting the user ID account.


To view the contents of a folder,

1. Click the Folder tab to go to the Folders page.

- Click the folder in the Folder Name column. The folder list appears, with the folder name displayed in the filter menu.

Any change you make to the folder worklist is retained for future use. The basic functions available on the worklist are also available on the folder list, including loading the study into the viewer, editing the study data, forwarding the study to another device, deleting the study, etc. For studies that reference the actual study, you can convert it to an independent copy by clicking on the Detach button, . It is not possible to change an independent copy of a study into a shortcut to the actual study. To do this, remove the copy in the folder, return to the worklist, and start again, selecting Shortcut this time.











To delete a folder and all the contents in it, go to the Folder page, find the folder you want to remove, and click the Delete button, . You are prompted to confirm your request. Click Delete to complete.

To rename a folder, go to the Folder page, find the folder you want to rename, and click the Rename button, . Enter the new name, and click Done.

If a study exists in a folder when eRAD PACS determines it is time to purge it from the worklist, the study remains in the folder. Specifically, if the folder contains a copy, the original is purged from the worklist and the copy remains in the folder until the user explicitly removes it. For shortcuts to studies, the original data remains in the data directory and appears only in the folder, but not on the worklist. When the last shortcut is removed, the original data purges from the data directory.

The predefined folder called Worklist is the user's worklist. Worklist copies and shortcuts have special properties not applied to copies or shortcuts placed in user folders.

- Worklist copies are auto-forwarded and archived. Copies sent to individual folders are not.
- Worklist shortcuts and worklist copies can be accessed by all users, provided it satisfies the user's global restrictions.
- Worklist shortcuts are referenced on the source study's Quick View page. They are listed in the Shortcuts table following the study details.

Shortcuts	Date 	Patient Name	Patient ID	Status	Modalities	Description	Body Part	# Imgs
								
	May 15, 2008 09:08:21	CLEMSON, BART	8b3a5a5	Unviewed	MR	LUMBAR SPINE W/O CON	SPINE	113

Conversely, the source study is referenced on the shortcut's Quick View page in a Source Study table. These shortcut reference tables do not exist for shortcuts saved to individual folders. The data in the Shortcuts and Source Study tables does not refresh automatically like the values at the top of the Quick View page.

Note: If you attempt to load both the original study and one of its shortcuts into the viewer, or load multiple shortcuts from the same source study, the viewer will list only one study in the thumbnail panel.

Note: The system does not save post processed images for a shortcut study.

Note: At this time, it is not possible to merge or forward a shortcut study.

Note: Deleting a study removes all shortcuts to that study.



## 7. Administration Pages


The eRAD PACS Administration pages contain the information and settings for the server. The *Admin* tab on the first row of tabs provides access to these pages. Administration pages include the server identification and configuration parameters, the user and group accounts, a list of external devices that communicate with the server, the message board, and access to the system logs. Access to the Administration pages is restricted to users with Admin privileges. If you require access to these pages and do not have the *Admin* tab displayed in your browser, contact your system administrator.


### 7.1 User Accounts

The User Accounts page allows administrators to add, edit and remove user accounts, assign group affiliations, specify user rights, review user profile information, and find out when a user last accessed the system, and from where. To display the Users list, select *Users List* from the menu.

The screenshot shows the eRAD PACS interface with the 'Admin' tab selected. The 'Users list' is displayed in a table format. The table has columns for User ID, User Name, Email Address, Address, Phone Number 1, Phone Number 2, Group, and Rights. The table contains six rows of user data. Below the table, there are navigation controls for pages (1, 2, 3) and a page size selector set to 6. At the bottom, there is a 'Save list as' section with a dropdown menu set to 'jim' and a 'Save' button.

Users	User ID	User Name	Email Address	Address	Phone Number 1	Phone Number 2	Group	Rights
	DJones	Jones, Donna MD.					Radiologist	SQEFORTPW
	JSmith	Smith, John					Technologist	SBQDEFOTPHW
	JWalker	Walker, Jamie					Radiologist	SBQEFORTPW
	KWahl	Wahl, Kim					Admin	ASBQDEFORTPHW
	MWilliams	Williams, Michael MD.					Physician	SBFOPW
	WGeary	Geary, Wallace MD.					Physician	SEFOPW

Filter the user list similar to the way you filter a Worklist. Click the table or column filter button, , to find a specific entry. From the filter selection page, select the filter criteria, and click *Apply*. The User Accounts page layout can be saved as a preset layout and filter. The tools are the same as for creating, editing and deleting saved layouts and filters for other table pages.


For the list of users currently logged into eRAD PACS, click the Show Current Users button, . To obtain specific information about a user's last session, click the "X" or checkmark to the left of the user name. A page appears showing the date and time a user last logged in, logged out, and last made any type of request. The information also contains the IP address of the workstation used.

#### 7.1.1 ADDING A NEW USER

Use the User Accounts page to add a new user account to eRAD PACS. Your eRAD PACS license defines the maximum number of supported user accounts. This information is available in the User License Information section of the Server page.

Before creating user accounts, define your user groups. User groups consist of default settings, such as privileges, worklists, filters, and viewer profiles. Assigning a user account to a group is required. To create a user group, see section 7.2 *Group Accounts*.

To create a user account, do the following:

1. Select *Admin/User Accounts*.
2. Click the add user button, , at the top of the user table. The Add New User page appears.
3. Create a unique User ID. This is the ID used to log into eRAD PACS.
4. Fill in the remaining fields.
5. Click *Save* to create the user account.

Once a user ID is created, you cannot change it. Instead, create a new account, copying the existing account to start, as described in section 7.1.2.1 below. Then, delete the unwanted account.

The E-mail Address field contains the e-mail address eRAD PACS uses when sending an email notification to the user or to assist the user in resetting a forgotten password.

Set the user permissions by clicking in the checkboxes for the privileges you wish to assign to the user account. The permissions are defined as follows:

Permission	Code	Description
Use Group Rights	g	Account permissions default to those assigned to the selected Group. To set these permissions individually, uncheck this box.
Accounting	B	Access to the account summary information.
Admin	A	Administrative rights. Admin permissions override other permission settings with the following exceptions: Scan, Scheduling, Dump.
Archive	S	Access to the archived data, including third-party archives.
Break Locks	1	User is permitted to break locks held by other users.
CD Import	M	Import studies from CD/DVD using Media Import feature.
Copy	C	Create a copy of a study in a folder.
Correction	Q	Manipulate the correction queue.
Create View	I	Save a worklist view (filter).
CTRM	6	Create and monitor CTRM messages. Available if CTRM license is installed.
Delete	D	Purge studies from the server.
Dump	U	Dump DICOM data.
Edit advanced settings	5	User is permitted to edit the viewer's Advanced settings.
Edit memory settings	4	User is permitted to edit the viewer's memory settings.
Edit overlay settings	2	User is permitted to edit the viewer's overlay field configuration.
Edit prefetch settings	3	User is permitted to edit the viewer's prefetch settings. This does not affect the user's ability to define or edit the prefetch worklist filter.
Edit Report	T	Edit the report text or upload post-processed images. See the table below for dependent permissions
Edit Study	E	Edit study information, including uploading post-processed images from the eRAD PACS viewer.
Forward/Export	F	Send a set of images to a configured destination.
Log Display	I	Display the system logs.



Permission	Code	Description
Manage User Accounts	7	The ability to create, edit and delete user accounts. Disabled by default except in the case of upgrade in which existing user accounts with Admin privileges are assigned this permission.
Open	O	Open the eRAD PACS viewer and view images stored on the server. See the table below for dependent permissions.
Restricted Query	8	The ability to perform queries that exceed the maximum query time.
Scan	N	Scan documents into PACS and/or Scheduler.
Scheduling	H	Access the Scheduler pages. Available when eRAD Scheduler is licensed. See the table below for dependent permissions.
Set Status	G	Set study status. Implicitly assigned to users with Report or Transcribe permissions.
Worklist Configuration	W	Modify the worklist table settings.

Note: Permissions restricting access to Customize Settings in the viewer prohibit configuration until a user logs into the viewer. For example, after installing the viewer, a user with Edit Prefetch Settings permissions must log into the viewer before the prefetch settings can be set up.

Edit Report permissions are required before the following can be assigned:

Permission	Code	Description
Approve	R	Approve a report.
Dictate	J	Create a dictated report.
Note	K	Enter or edit a note.

Open permissions are required before the following can be assigned:

Permission	Code	Description
DICOM Printing	P	Print film using DICOM print from the viewer.

Scheduling permissions are required before the following can be assigned:




Permission	Code	Description
Cancel Orders	x	Cancel orders.
Check In/Out Patients	c	Check patients in and out.
Delete Orders/Patients	d	Delete orders and patient records.
Double Book	b	Double book a time slot.
Edit billing data	e	Create and edit procedure billing records.
Edit Insurance Providers	i	Create and edit insurance provider records.
Edit Orders	o	Create and edit exam orders.
Edit Patients	p	Create and edit patient records.
Edit Referring Physicians	r	Create and edit referring physician records.
Schedule Orders	s	Assign a date, time and location to an order.
View Calendar	v	Display the calendar page. Ignored if Schedule Orders permission is assigned.

Users with certain privileges get other privileges automatically. These implied rights are indicated on the Edit account page as grey checks in the permission field. It is not possible to remove an implied permission except to take away the controlling permission first.

Use the *Accessible Server* field to restrict a user to a subset of servers in a multi-server, non-enterprise server hierarchy. From the pull-down list, select the top server of the branch the user may access. Accounts with no restrictions (the default) have access to all branches. Access restrictions are inherited from the administrator creating the user account.



By default, a user with Forward/Export permission can send studies to any configured target device. To restrict the available targets, configure the Targets list in the user's account settings, as follows:

1. In the Forward Targets field, click the Select Forward Targets button, .
2. To add targets, select it in the Available Forward Targets list on the right and click the Add button, .
3. To remove targets, select it in the Selected Forward Targets list on the left and click the Remove button, .
4. When the assignments are complete, click the Apply button.

If the CTRM license is installed, the *Radar Group ID* field exists for each user and group entry. This value is assigned by Radar to identify the user group or customer site the user has access to.

The default report editor, defined by the Default Report Editor setting in the Settings page and the group account settings, can be customized for each user account from the user account's edit page by setting the Report Editor setting to one of the following:

Use Default	Use the system default.
Viewer	Use the viewer's report editor panel.
Browser	Use the report editor web page.



Enter a password for the account. By default, the password does not expire. To create a temporary account, or to enforce some password management, set the password to expire after a specified number of days or logins, or require the user to change their password the first time they log in. The *Revalidated By* field selects whether the user can change an expired password (Password Change) or the Administrator must do it (Admin Only).

### **7.1.2 COPYING USER ACCOUNT SETTINGS**

Copy the settings from an existing account when creating a new account, or copy select settings from one account to another existing account.

#### **7.1.2.1 Copying Account Settings When Creating a New Account**


When creating a new user account, import all the settings from an existing account using the copy user function from the Admin/User Accounts page.

1. From the *User Accounts* page, click on the Add User button, .
2. Select the existing user account from the pull down list.
3. Click the Copy button, .
4. The existing account information initializes the fields on the page. Edit these values as needed.
5. Click the Save button at the bottom of the page.

When creating multiple users from a single existing user account, use the *Save* button appearing after the Phone Number 2 field to save the entered values and open another new user page using the same template account. The password defaults to *<userid>1* and is required to change after the first login. If you modify the user rights or enter a password on this page, those values will be used in place of the default.

### 7.1.2.2 Copying Accounts Settings between Existing Accounts

To copy settings between one or more existing accounts, use the copy settings function from the Admin/User Accounts page.


1. From the *User Accounts* page, click the Copy Settings button, .
2. Select the source user account from the *Copy from user* list.
3. Check the box indicating which attributes(s) to copy, whether to reset passwords or to reset user permissions to the assigned group's permissions. The settings available for copying are the following:

Setting	Description
Calendar settings	Scheduler's calendar page settings
Canned report templates	Canned reports templates
DICOM field settings	Fields, layout and characteristics of overlay date
Hanging protocol templates	Hanging protocol rules and layouts
Keyboard macros	Keyboard macros
Preferences	User's browser settings
Preset window and level settings	Preset window and level settings
Print layouts	Print layout templates
Report XML templates	Report templates used in the report panel
Worklist filter definitions	Worklist filters

4. Click the *Continue* button.
5. Select the target user account(s) you want to copy to, holding down the Ctrl button to select multiple target accounts.
6. Select the settings from each category you want to copy to the user account(s). If resetting passwords, indicate whether to reset them to the system default. If resetting user permissions to group permissions, check the reset box to confirm.
7. Press the *Copy* button.


When setting passwords, the source user is ignored. After clicking Continue, if the *Use system default password for all selected users* checkbox is checked, the password of selected users is assigned a value of `<userid>1` and set to be changed after the first login.

### 7.1.3 EDITING USER ACCOUNTS

To change the user account information, go to the User Accounts page, and find the entry in the user account table. Click the Edit button, , and make the necessary changes. When finished, click *Save* to record the changes.

To change the User ID, you must create a new account. Copy the existing user account information into the new account before removing the existing account. See section 7.1.1 *Adding a New User* for more information.



#### Quick Start Instructions – Editing User Accounts

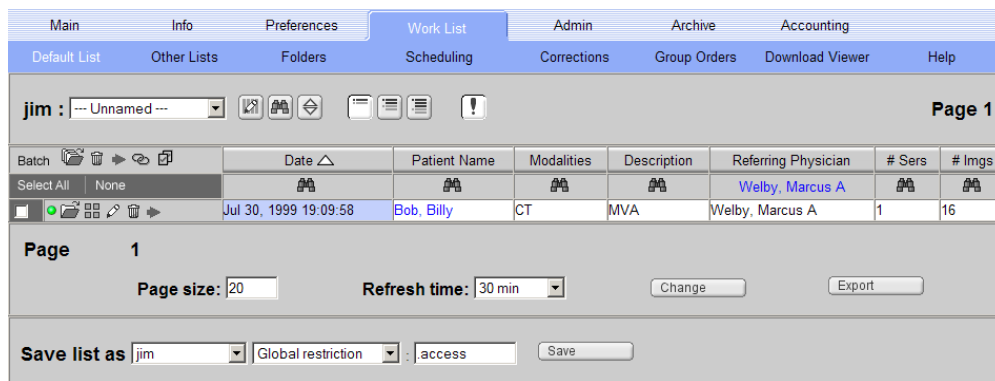
- Go to the *Administration Page*.
- Click the Edit button, , for the account you want to edit.
- Click the field to alter and enter the changes.
- Click *Save*.

### 7.1.4 SETTING USER GLOBAL RESTRICTIONS

By default, a user account has unlimited access to all the data in the eRAD PACS database. It is possible to limit access by defining a Global Restriction Filter. As defined in the worklist section, a filter contains matching criteria that eRAD PACS uses to identify a subset of the

available information. Administrators have the ability to define a filter the user cannot edit and assign it to an account. As a result, the user sees only the information the administrator allows him or her to see. For example, create a Global Restriction Filter for a referring physician, using the Referring Physician attribute set to the referring physician's name as the filter. The user will then see only studies in the database that have his name assigned to the Referring Physician field.

The first step in defining a Global Restriction Filter is to create the user. Then go to the Worklist page. Using the tools available for creating a worklist filter, set up the worklist as you want the user to see it. For example, click Edit Fields, , to set up the columns you want to display. Then click Filters, , and enter in the matching criteria, such as the name in the Referring Physician field. Refer to section 6.2.4 *Filtering Worklists* for instructions on defining a worklist filter.




To make this filter the default worklist for the user, save it as a Global Restriction. As an administrator, the user account field in the *Save List As* section of the worklist page is editable. Select the user account for which you want to set this worklist as the default. In the next column, select *Global Restriction* from the pull-down menu. The next field automatically fills itself in with *.access*. Do not change this. To save the filter, click *Save*.

To set a global restriction for another user, reset your worklist by clearing out the filter values, and start adding new filters, select the new user account ID and save it. If you want to create the same filter for multiple users, create the worklist filter once, and then save it for each user account.

When a user signs on to the system, the default worklist appears, filtered by the Global Restriction filter. The user does not see the criteria applied by the Global Restriction filter and therefore cannot modify it. All other worklist filter and customization features are available, and apply to only those studies appearing in the user default worklist.


Global restrictions can be defined for groups as well. This filter is applied before user global restrictions and user-define filter criteria. To create a group global restriction, select the group ID from the user ID list and *Group Global Restriction* from the list type menu when saving a worklist filter. A group global restriction's list name is *.groupaccess*.

### 7.1.5 REVIEWING USER INFORMATION


To review all account settings, including a detailed list of account worklist filters, go to the User Accounts page and click the View, , button to the left of the particular User ID. The General User Data table shows the user identification information associated with the account, followed by the list of the account worklist filters. The list contains the filter name,

the columns the worklist will display, the specific filter criteria, the sorting column and order, the refresh period, the default page size, whether or not a notification occurs when a study belongs on the filtered list, and the number of studies in the current database satisfying the filter criteria. Click the *Back* button to return to the user table.

*Quick Start Instructions – Reviewing User Accounts*


- Go to the *Admin/User Accounts*.
- Click the View button  for the account you want to review.

**7.1.6 DELETING A USER ACCOUNT**

From the User Accounts page, click the Delete button, , to the left of the User ID. A message appears prompting you to confirm your selection. Click *Delete* to remove the account from the user list. Click *Cancel* to abort the operation.

Only users with administrative rights can delete user accounts.

*Quick Start Instructions – Deleting a User Account*

- Go to the Administration Page.
- Click the Delete Button  for the account you want to delete.

**7.1.7 MANAGE USER ACCOUNTS PERMISSION**



The Manage User Accounts permission has the following capabilities and embedded conditions:

- Manage user accounts within the same account group and configured groups. This includes the ability to copy user settings between user accounts.
- Assign worklist filters and folders to users in the same account group.
- Assign only the rights assigned to the user account, with the exception of Manage User Account rights.
- Save worklist filters and folders to another user account.
- Change a user account's Group setting to any of one's configured groups.

Admin privileges and the Manage User Accounts right are required to do the following:

- Edit group account settings
- Edit a user's managed user groups list.
- Save worklist filters and folders to group accounts.
- Assign Manage User Account right to any user or group account.

By default, a user with Manage User Accounts right can create, edit and delete user accounts in the user's assigned group. Additional groups can be added to the list, as follows:

1. From the User Account Edit page, scroll to the Manage User's Group section and click Add, .
2. Click the Select button, , to display the list of available groups.
3. Click *Apply* for the group ID you want to add.
4. Click Save.

To remove a group from the list, expand it and click the Remove button, .

Managing user account settings via HTTP API commands has special configuration requirements, especially if the API client user does not have Admin rights. See the HTTP API manual or the *HTTP Interface Enhancements* section for details.

### 7.1.8 ACCOUNT-SPECIFIC AUTHENTICATION AGENT

When LDAP is configured on a server, user and group accounts can select a specific LDAP server the system as the authentication agent. When the system is selected, authentication is done using the account and password data stored in the PACS server. If one of the LDAP servers is selected, the account information is passed to the LDAP server and it authenticates the user.

The system's default authentication agent is defined by the Authentication Agent field in the Security Settings section of the Settings page. Options include the following:

- Built In - the system's authentication software
- LDAP servers (optional) – configured LDAP servers.

An individual group or user account's setting will override the system default authentication agent. On the group account edit page, the field is the Group Authentication Agent field. In addition to the agents listed above, group accounts can select the following:

- System default – the system default authentication agent.

On the user account edit page, the setting is the Authentication Agent field. In addition to the agents listed above for both the system and group, user accounts can select the following:

- Group default – the user's group account authentication agent.

For details on the LDAP configuration, refer to the *7.3.2.6 LDAP Configurations* section.


## 7.2 Group Accounts

User accounts can be assigned to and managed as groups. Changes made to a group get applied to all user accounts in the group. Users have the ability to customize some of the default parameters and settings applied to their account.

The Groups page, located by selecting the Groups List menu option on the Admin/User Accounts page, allows an administrator to create, edit, copy, and save user groups. For example, select and save user rights for all members of the radiologist group, or the physicians group, rather than selecting and administering them individually.


Main		Info	Preferences	Work List	Scheduling	Admin	Archive	Accounting
User Accounts		Messages	Settings	Information	Devices	Logs	Scheduler	Help
Groups		Groups list					Page 1	
Groups	Group ID	Group Rights						
Admin	ASBQDEFORTPH							
Generalist	0							
Physician	SFOTP							
Radiologist	OR							
Technologist	SQEFO							
Page 1								
Page size: 20		Change						

Default groups include Admin, Generalist, Physician, Radiologist, and Technologist. Add to or modify these groups as necessary, or create new groups.

Use the Add Group button, , to create a new user group. Enter the Group ID, select the account permissions and add a note, if necessary. Group permissions are the same as those available to user accounts, as described in 7.1.1 Adding a New User. Click *Save* to create the group.

The default report editor, defined by the Default Report Editor setting in the Settings page, can be customized for each group account from the group account's edit page by setting the Report Editor setting to one of the following:

Use Default	Use the system default.
Viewer	Use the viewer's report editor panel.
Browser	Use the report editor web page.

Use the Filter button, , to search through the list of groups to find ones matching your defined criteria. View, edit, or delete groups using the view, edit and delete buttons to the left of each group entry. Copying group settings from one group to another is not supported.

### **7.2.1 DENYING PERMISSIONS TO GROUP MEMBERS**

When assigning permissions to group accounts, the administrator can explicitly deny the group a right. When denied, the right cannot be assigned to a member of that user group from the user account edit page.

To prohibit a user right to a group account, do the following:

1. Click the Admin tab.
2. Click the User Accounts tab.
3. Select Group List to display the group accounts list.
4. Click the Edit button to edit the group account settings.
5. For each prohibited permission option, click the check box until a red X appears.
6. Click Save.

When a right is forced off for a group, the permission on the user's edit page will appear with an X in place of the check box.

## **7.3 Server Configuration**

The Server page contains the eRAD PACS server configuration, runtime status, web options, DICOM settings, system timer defaults, formatting defaults, filtering defaults and security settings. Displaying and editing the settings on this page require Administrator rights. Access to some settings requires rights granted to certified system administrators only. When relevant, this requirement and its effect are noted.

### **7.3.1 WEB SERVER SETTINGS**

The Web Server settings offer the ability to customize web page content, graphics and logos. Refer to the following sections for details.

#### **7.3.1.1 Customizing Skins and Logos**

Customizing skins and logos changes the web page skin (colors, fonts, etc.), banners, and logos. To customize the skin and logos,

1. Click the Admin tab and then the Settings tab
2. Select the *Skin and Logos* link from the Web Server Settings section.
3. To select a skin, select the skin name from the pull-down list in the Web Page Style section.
4. To upload a new banner or logo, click the Browser button to find the image file and click Upload.

Color configuration for the browser interface uses Cascading Style Sheets (CSS) to define how HTML elements are displayed on the web page. Style sheets allow you to define the appearance of multiple web pages in a single control document. Customizing style sheets requires familiarity with HTML/XHTML. For details on creating custom style sheets (skins) and loading them onto the server, contact Support or refer to the *eRAD PACS Color Configuration Manual*. Skins apply to the server on which they exist. Skin files are not propagated by the system.

### 7.3.1.2 Customizing Web Page Content

The HTML content used in the main part of the Main page, the content of the Contact Us page and the information displayed on the facility Directions page are configurable. To upload a custom page, follow these steps:

1. Click the Admin tab and then the Settings tab
2. Select one of the following links in the Web Server Settings section.
  - a. Main Page – HTML content displayed on the Home page under the Main tab.
  - b. Contact Us Page – Contents of the Contact Us page under the Info tab.
  - c. Directions Page – Contents of the Directions page under the Info tab.
3. Edit the HTML directly into the text editor, or use the Browse button to locate the HTML file containing the code for the page.
4. If the HTML file contains references to additional files, such as image files, use the Browse buttons in the Upload Other Images section to locate them and enter the filename in the text field.
5. Click Upload.

### 7.3.1.3 Default Language

English is the default language used for the browser and viewer. This can be changed to another supported language from the Settings page. All supported languages are listed in the menu.

1. Click the Admin tab.
2. Click the Settings tab.
3. In the Web Server Settings section, expand the list in the Default Language setting.
4. Click Change.

Available languages include the following:

English (US) – System default  
Hungarian  
Portuguese (BR)

The configured language setting propagates to all servers in the dotcom. Individual users can override the system setting from the Preferences→Settings page.

Users with support privileges default to English regardless of the system setting.



The viewer available for download is defined by the language setting at the time the download is performed. The Viewer installed on a workstation is not automatically upgraded. If you require a local-language viewer, download it after configuring the language setting.

### 7.3.1.4 Upload Bundles

Bundles can be used to baseline multiple servers to a common configuration. Bundles are tar files containing the configuration files that override the built-in defaults and define customer-specific settings.

Uploading bundles requires support permissions. If assigned, the tool is available in the Web Server Settings section of the Settings page. Click the Browse button to select the bundle file and then Upload. It might be necessary to restart the server, depending on the files included in the bundle.

### 7.3.2 SYSTEM SETTINGS

System settings include the prefetch period settings, report page customization, defining matching criteria, and label customization. Refer to the following sections for details.

#### 7.3.2.1 XML Template Customization

Administrators can build custom report templates, web pages and email notifications. The custom layout can:

- display patient and study information available from the database
- use custom labels to identify this information
- organize the report page using an assortment of tables and text areas
- add, remove and relocate buttons
- show the Institution Name text, a graphic, or both to identify the facility

Default XML templates for reports, notifications and assorted web pages can be assigned to individual users and user groups. To assign a template,

1. Click the Admin tab and then the Settings tab.
2. Select Customize Layout XML Files from the Systems Settings section.
3. Select the layout from the Layout Type list at the top of the page.
4. To assign a specific template to a user, select the user and template from the respective lists in the User's Template section, and click Set As Default.
5. To assign a specific template to a user group, select the group and template from the respective lists in the Group's Template section, and click Set As Default.

The following layout types exist.

Layout Type	Description
Administrative reports	Administrator's report templates
Device categories page	Data entry page for a new device category
Document types page	Document Types page layout
Logs page	Log details page layout
Notification message	Email notification format
PACS create/edit order page	Order entry page. Present if eRAD Scheduler is not licensed
PACS study edit page	Data entry page for editing a PACS study
Patient folder main structure	Patient folder master template in which the study list, study details template and report view template appear

Layout Type	Description
Patient folder report view	Report template used when displaying a report in the patient folder
Patient folder study details	Study information encapsulated into the study details section of the patient folder.
Radar CTRM panel	Defines the contents of the web page displayed inside a Radar CTRM panel launched from a web page or the viewer.
Report edit page	Report template used when editing a report
Report view page	Report template used when displaying a read-only report

The following layout types exist if the eRAD Scheduler is licensed.

Layout Type	Description
Scheduler's device page	Data entry page for a modality room
Scheduler's facility page	Data entry page for a facility
Scheduler's ICD9 page	Data entry page for an ICD9 or ICD10 code
Scheduler's insurance provide page	Data entry page for insurance provider information
Scheduler's order cancel page	Data entry page for canceling an order
Scheduler's order check-in page	Order-level data entry page for checking in a patient
Scheduler's order check-out page	Order-level data entry page for checking out a patient
Scheduler's order information page	Data entry page for an order
Scheduler's patient check-in page	Patient-level data entry page for checking in a patient
Scheduler's patient information page	Data entry page for a patient record
Scheduler's print layout	Order information displayed when printing attachments
Scheduler's procedure page	Data entry page for a procedure definition
Scheduler's referring physician page	Data entry page for a referring physician record

### 7.3.2.1.1 Report Customization

The report page is generated using the Layout Customization Tool (LCT). The LCT is an XML editor built into eRAD PACS that lets an administrator design the layout of a report page, and assign content to the different sections. The tool requires knowledge of XML and eRAD PACS internal structures.

To get to the LCT, click *Customize Layout XML File* under *Settings/System Settings*. The layout customization page appears. Select Report Page from the menu. To upload a new report file, enter the file name in the Upload XML File text box and select *Upload*.

To create or modify an existing report file, select the report file from the Existing XML files menu and select *Edit*. If you intend to preserve the existing version, first export the XML file, rename it, and upload it again before making changes. Template files may propagate to other servers, so do not duplicate template files names on different EP servers. For complete instructions on constructing a report file, refer to the *eRAD PACS Layout Customization Manual*. After creating and saving a report file on your PC, select it from the pull-down list in the System template section and click *Set As Default*.

### 7.3.2.1.2 Email Notification Customization

The email notification layout is generated using the Layout Customization Tool (LCT). To get to the LCT, click *Customize Layout XML File* under *Settings/System Settings*. The layout customization page appears. Select Notification Message from the menu. To upload a new email template, enter the file name in the Upload XML File text box and select *Upload*.

To create or modify an existing template, select the template file from the Existing XML files menu and select *Edit*. If you intend to preserve the existing template, first export the XML file, rename it, and upload it again before making changes. For complete instructions on constructing a report file, refer to the *eRAD PACS Layout Customization Manual*. After creating and saving an email template file on your PC, select it from the pull-down list in the System template section and click *Set As Default*.

### 7.3.2.2 Matching Criteria

eRAD PACS attempts to match orders to incoming imaging studies, current studies to prior studies, and other object pairs. The rules used to determine which two objects belong together are defined on the Matching Criteria page. The link to the Matching Criteria page is located under *Settings/System Settings*. Click the *Set Matching Criteria* link to set the criteria. The Matching Criteria page consists of the following sections:

- **Default Correction Sources:** Specifies the source of the default data value used when merging an order and images. Select the source and set by clicking *Change*. The Temporary column indicates the value is taken from the source device and used when displayed in the browser or viewer, but the value is not stored in the actual image object.
- **Show Free Text Fields:** When manually correcting studies to orders, users can select values from the order, the study or insert any value from the web page. If an administrator wishes to remove the option to enter a value manually, set this setting to *No*.
- **Correction List Criteria:** Defines the criteria used to build the matching studies list on the correction page. The study list is sorted in the order displayed in this list. Put the most likely set of matching fields at the top of the list.
- **Auto-correction Matching Criteria:** Defines the fields that must match in both the order and image object in order for the system to automatically merge the two.
- **Patient Matching Criteria:** Defines the matching pattern used to search remote archives for prior studies matching the current study.
- **Scheduler: Device Matching Criteria:** When creating an order from a study, this defines the study fields used to identify the matching device. Available when the eRAD Scheduler is licensed.
- **Scheduler: Procedure Matching Criteria:** When creating an order from a study, this defines the study fields used to identify the matching procedure. Available when the eRAD Scheduler is licensed.
- **Scheduler: Patient Matching Criteria:** When creating an order from a study, this defines the study fields used to find a patient record. Available when the eRAD Scheduler is licensed.
- **Scheduler: Referring Physician Matching Criteria:** When creating an order from a study, this defines the study fields used to find a referring physician record. Available when the eRAD Scheduler is licensed.

#### *Quick Start Instructions – Matching Criteria*

- Click the *Administration* tab.
- Click the *Setting* tab.
- Under System Settings, click *Set Matching Criteria*.
- Change matching criteria settings.
- Click the *Change* or *Add* button.

### 7.3.2.3 Customize Field Labels and Settings

The default labels used to identify the patient and study demographic fields are configurable. These labels appear on the report page, worklist, edit page, filter lists, and


other places. To change one or more of them to match the terminology or language used at your facility, go to *Settings/System Settings/Customize Labels*.

The fields are organized by database table. Select the table containing the fields you want to customize from the menu at the top of the page. The table contains the Column ID (used for configuring page templates), DICOM attribute tags, the SQL label (used for configuring Crystal Report templates), the default label, and the customized label. Edit the label by selecting the string in the Label column, entering a new value, and clicking *Save*.

The *Label Prefix* field is used to preface the defined label when it is used in a context other than its default. For example, Patient Name in the Study Information table can be defined as "Name". When used in reference to a study, the label appears as "Name". Under the Scheduler Facility table, the Facility Name field can be defined as "Name" as well. The label prefix is used to differentiate between the two "Name" fields on a web page or report containing both the patient and facility name fields. When fields from that table are used in a section (of a web page, report, etc.) in which the base context does not refer to the table, the field label is preceded with the prefix. In this example, if the Scheduler Facility contained a prefix of "Facility", the facility name field would contain "Facility Name" rather than just "Name".

#### 7.3.2.3.1 Customize Field Lists


There are cases when you want to create an enumerated list of values when a field is available on the user interface.

1. Select the Admin tab and then the Settings tab.
2. Click Customize Labels in the System Settings section.
3. Select the table containing the field you intend to customize.
4. Click the Edit button, , in the field's row.
5. Edit the list by entering a single value per line.
6. To override the current list or text field on the edit page(s) with the contents of this list, check the *Limit selection to List Values entries* box.
7. Click *Save* to update the list.

#### 7.3.2.3.2 Customize Field Selection Filter Source Setting


When generating filters for enumerated (enum) fields, the database scans the database for existing values to add to the list of enumerated values. This extra effort can take a long time and burden the database performance.

To disable this process for fields that do not require the extra search, set the *isStrict* flag, as follows:

1. Click the Admin tab.
2. Click the Settings tab.
3. In the Server Settings section, click the Customize Labels link.
4. From the Table list, select the table containing the enumerated value field you want to edit.
5. Click the Edit button, , for the field you want to edit.
6. In the Select Filter Source section, check the *is Strict Enum* box. Note that if this setting is not available for the selected field, the feature does not exist and therefore cannot be configured.
7. Click *Save*.


### 7.3.2.3.3 Customize Field Selection List Setting

To override the server's default Filter Selection List setting for a particular field, change it from the Customize Labels page.

1. Select the Admin tab and then the Settings tab.
2. Click Customize Labels in the System Settings section.
3. Select the table containing the field you intend to customize.
4. Click on the Edit button, , in the field's row.
5. Enter a value in the Filter List Settings field. The value defines the threshold (ie, number of values) for which the list will appear. A value of -1 indicates no limit and displays the full list unconditionally.
6. Click *Save* to update the list.

### 7.3.2.3.4 Customize Field Search Filter Type Setting


To override the default search criteria type assigned to a particular search field, change it from the Customize Labels page.

1. Select the Admin tab and then the Settings tab.
2. In the System Settings section, click the Customize Labels link.
3. Select the table containing the field from the Customize Labels Table list.
4. Click the Edit button, , for the field.
5. In the Filter Type Setting section, select the default setting.
6. Click the Save button.

### 7.3.2.3.5 Calculated Fields


Calculated fields are virtual fields available for display on a (worklist) table, for use in filters and for use on XML templates including reports. The values are the result of operations performed on one or more actual database fields. For example, the turnaround time for a study can be calculated as the difference between the report date and the study date, and then used to set up a notification when it exceeds some defined period of time.

Creating calculated fields requires administrator permissions. To create a calculated field, perform the following steps:

1. Click the Admin tab and then the Settings tab
2. Select Customize Labels in the System Settings section.
3. From the Table menu, select the table containing the information you want to use in the new field.
4. Click the New Calculated Field button, , at the bottom of the table.
5. Define the label and the expression. Use the Add Tag button to select the COLID of the field. Only fields listed in the Add Tag list are available for the selected table.
6. Click Save. The system verifies the expression for correctness. If it is valid, a COLID is assigned and the field is stored on the server.

Field labels are regular language text strings used to identify the field in the selection list or in the worklist column header. Expressions consist of COLIDs, constants and methods tied together through operators. For a detailed description of these components, refer to the *eRAD PACS Calculated Fields User Manual*.

To edit an existing calculated field, find the entry in the calculated field table at the bottom of the respective page, and edit the string in the text field. Click Save to have the syntax verified and the changes stored.

To delete an existing calculated field, find the entry in the calculated field table at the bottom of the respective page, and click the delete button, . You will need to manually edit all worklist filters, XML templates, validators and other places where this COLID existed.

There is a limit of 100 calculated fields per database table.

When a calculated value is a time interval, such as the turnaround time defined in the example above, the resulting value's format is defined by the Time Interval Format defined in the Date Format section of the Settings page. To change the default format, select the option from the pull-down list and click the Format button.


Note: Calculated fields do not propagate between eRAD PACS servers.




Note: Calculated worklist fields are not available for all database tables. If the Calculate Fields button does not appear as described above, the tool is unavailable for the information on that table. At this time, the study and object database tables used by the PACS Worklist page are not available for use with this feature.

### 7.3.2.4 Callback Hooks



Advanced system administrators can attach callback functions to logged events that could be used to send XML commands to third party servers. The format of the command and what the third party does when it receives is outside the scope of the PACS.


To set up the callback, do the following:

1. Click the Admin tab.
2. Click the Settings tab.
3. Scroll to the System Settings section and click the *Register Callback Hooks* link to display the callback hooks table.
4. Click the New Callback button, , to display the callback edit page.

Edit callback hook	
Field	Value
Callback Name	<input type="text"/>
Enable	<input type="checkbox"/>
Callback URL	<input type="text"/>
Message Format	XML 
Trigger actions	
Notification fields	Log: Action Log: Event Date/Time Local Log: Partial Rules Log: Study UID Log: User ID 
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

5. Enter a callback name.
6. Click Enable to activate the callback. To create the callback without enabling it, clear the Enable checkbox.

7. Enter the callback URL. Include the entire URL, including the prefix (http:// or https://) and the server address. The format of this URL complies with the command structure defined by the recipient of the command.
8. Select the message format. *XML* sends the data in XML-compliant format. *Text* sends the data in a flat text format.
9. Select the trigger actions that will result in this callback sending the URL. Click the Add Trigger button, , and select one or more log actions from the list, move them to the left side of the window, and click Apply. The trigger actions appear in the Trigger Actions section.
10. Select the study and other fields to include in the data sent to the destination. Click the Add Field button, , and select one or more database fields from the list, move them to the left side of the window, and click Apply. The fields appear in the Notification Fields section.
11. Click Save.

To edit an existing callback, including temporarily disabling it without deleting it, click the Edit button, , in the callback's row. The same edit panel described above appears. Make your changes and click Save.

#### 7.3.2.5 Custom Outbound HTTP Commands

Administrators can define custom HTTP commands and assign them to a button on a customized web page. When a user presses the button, the associated command is sent to the defined server. The setup uses custom web page templates and integration hooks, as follows:

- Using the web page template editor, place a button on a customized web page using a *button* macro. The macro has the format `type="button" subtype="log"`. For further details, including parameters for assigning the button graphic and log action, refer to the *XML Template Customization Manual*.
- Configure the log action in the User Actions section of the Settings page. Enter one action per line. Each line lists one action. The defined actions appear in the callback setup's trigger list as *User\_<action>*. Use the Validate button to confirm the entry is found in a button macro in at least one custom XML template.
- Create a callback function for the action (*User\_<action>*) defined in the button macro and configured in the User Actions section of the Settings page. In the callback function, specify the parameters included in the HTTP command. See *Integration Hooks* for callback configuration details.

Once all pieces are configured, when the user clicks the button, the server logs the action and invokes the callback which issues the defined HTTP command.

The following layout types, available from the XML Layout Customization page, support custom-defined buttons:

##### PACS web pages

PACS order edit page  
PACS study batch edit page  
PACS study edit page  
Report edit page

##### Scheduler web pages (available if eRAD Scheduler is installed)


Scheduler's device page



Scheduler's facility page  
Scheduler's ICD9 page  
Scheduler's insurance provider page  
Scheduler's order cancel page  
Scheduler's order check-in page  
Scheduler's order check-out page  
Scheduler's order information page  
Scheduler's patient check-in page  
Scheduler's patient information page  
Scheduler's procedure page  
Scheduler's referring physician page

### **7.3.2.6 LDAP Configurations**

A server can be configured to authenticate users internally or externally, using one or more authentication agents. An authentication agent can be an eRAD PACS server or a configured LDAP server. To configure an LDAP server into the system,

1. Click the Admin tab and then the Settings tab.
2. In the System Settings section, click the LDAP Configurations link
3. Click New LDAP Configuration, .
4. Enter the LDAP configuration settings
  - Configuration ID – (Required) Unique identifier for this LDAP agent
  - Server URI – (Required) LDAP server's URI
  - Search Base – Excluded area identifiers to narrow LDAP searches
  - Search Bind – LDAP server's bind address domain name
  - Search Password – LDAP server's password
  - UID Filter – Filter string sent to LDAP server to find the user.
5. Click Save.

LDAP configuration settings proliferate throughout the dotcom. For details on the LDAP configuration fields and other setup information, refer to the *eRAD PACS LDAP Configuration Manual*.

When at least one LDAP server is configured on a server, admins can assign the default authentication agent for the server and a specific authentication for each group and user account. See section *7.1.8 Account-Specific Authentication Agent* for details.

### **7.3.2.7 Format External Reports**

Some structured report objects acquired from external devices are presented in a common format. One example is CT dose reports. Most structured report objects contain device-specific information requiring device-specific parsing controls. To accommodate these objects, the external report formatting tools allow administrators to define parsing rules that present the information in a human-readable form.

Details on structured report objects and the external report configuration tool are found in the *eRAD PACS SR Format Configuration Manual*.

The external report formatting tool can be found by selecting the *Format External Reports* link in the System Settings section of the Settings page.

### **7.3.3 DICOM SERVER SETTINGS**

DICOM server settings define parameters for DICOM communications. Editing the DICOM SCP settings requires support rights. To set the DICOM settings,

1. Go to the *Administration* page.
2. Click the *Settings* tab.
3. Scroll to the DICOM Server Settings.
4. Make the necessary changes and click *Save and Restart*.

The following settings are available:

Setting	Description
IP address	Server's IP address. Not configurable here.
TCP port	Port number for non-secure DICOM communications over TCP. To disable (non-secure) TCP connections, set the port number to zero.
TLS port	Port number of secure DICOM communications over TLS. TLS connections support the DICOM security enhancements protocol. To disable TLS connections, set the port number to zero.
Storage AE Title Archive Query AE Title	Queries sent to the Storage AE Title return information about all the data in the system. Some devices require using a different AE Title when sending and querying a PACS. The Archive Query AE Title can be used when a second AE Title is required. Note: In earlier versions of eRAD PACS, the Archive Query AE Title was used to search the entire archive. Existing devices using this configuration can still use the Archive Query AE Title for this purpose.
Transfer syntax	The preferred transfer syntax displays the requested DICOM transfer syntax used when transferring DICOM objects over an established association. Change the default by selecting the preferred value from the list.
PDU size	The maximum receive PDU size is the number of bytes the eRAD PACS DICOM server accepts in a single DICOM PDU. Change the default value by selecting the preferred value from the list.
Send, receive, connection and wait timers	The send and received timers are the defaults used for each DICOM association. For more information, refer to the DICOM Services table. The connection timer is the number of seconds a DICOM Association has to get established, from request to confirmation. The wait timer is the number of seconds permitted between PDUs (i.e., DICOM data blocks) before the Association is considered abandoned and terminated.
Storage process flags	The Storescu flags are passed to the application the sends DICOM objects to other AEs.
Case sensitivity	By default, DICOM queries are case sensitive. eRAD PACS prefers to support case insensitive queries. To have eRAD PACS enforce case sensitivity on the query parameters, put a checkmark in the box.
Empty field matching	When a DICOM query request contained attributes with a value defined, the service class provider is supposed to match records that match the defined value. In previous versions of eRAD PACS, if the value in the database record was NULL, it would consider the record as a match. eRAD PACS now adheres to a more literal interpretation of the DICOM standard. However, some installed servers may have a problem as a result. Set the <i>Empty Matching</i> checkbox if the server is to include NULL values as successful matches.
Query/Retrieve limit	The Query/Retrieve Limit defines the maximum number of matches returned in response to a query request.
Remove private tags	System default setting for removing private tags when forwarding studies to remote DICOM AEs.
Sending updates	System default setting for forwarding updates made to a study that was previously forwarded.
Association heartbeat	System default setting for keeping DICOM associations open between transmission requests.

Many of these settings can be customized for each DICOM device. See section 7.5.1.2.1 Adding a DICOM Device for details.

### 7.3.4 HL7 SERVER SETTINGS

To edit the eRAD PACS HL7 server settings, you need support rights. Set the value(s) and click *Save*. Restarting the server may cause current communications to abort. To set the HL7 settings,

1. Go to the *Administration* page.
2. Click the *Settings* tab.
3. Scroll to the HL7 Server Settings.
4. Make the necessary changes and click *Save*.

The following HL7 parameters are configurable:

Setting	Description
HL7 Communications	Enable/Disable HL7 communications. Disabling HL7 communications disables the listener only, but leaves the application running. A restart is required to make the new setting take effect.
TCP port	The TCP port number is the address of the HL7 process checks for TCP connections.
HL7 Application ID	Defined in the interface specification agreed to by both communicating HL7 entities. Refer to the HL7 Standard for format specifications.
HL7 Facility ID	Defined in the interface specification agreed to by both communicating HL7 entities. Refer to the HL7 Standard for format specifications.
Send updates for non-Corrected studies	Send ORM update messages to the HL7 device for studies that have not corrected to existing orders.
Apply patient updates to studies newer than X days	Apply ADT update messages to all studies and orders whose DICOM Study Date value is newer than X days. Set the value on the server connected to the HL7 device. The setting propagates to other servers. Set value to 0 to disable ADT updates.

### 7.3.5 DISK LIMIT SETTINGS

The disk limit settings define watermarks for the free space and the cache space. Support rights are required to edit these settings.

The *Safety Free Limit* is the free space high water mark. This value should be set to 2-5% of the disk. Half of this is the low water mark. When the available disk space reaches the low water mark, the server purges unneeded data until it reaches the high water mark.

The *Minimum Cache Size* is the desired cache space. The cache size should be set to 3-5 times the daily study volume, entered as a percentage of the disk size. Once each day, the system purges unneeded data to make room for the minimum cache.

#### *Quick Start Instructions – Disk Limit Settings*

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll down to the Disk Limit Settings section.
- Set the watermarks and click *Change*.

### 7.3.6 PRODUCT TYPE SETTINGS

To switch the configured EP version between eRAD PACS, eRAD RIS/PACS, uniRAD and any private labeled version name, select the respective item from the Product Type Settings section of the Settings page. The selected configuration is automatically loaded, switching the banners, graphics, reference pages and help files. This section of the Settings page only appears for users who have support rights.

### 7.3.7 PLUG-IN CONFIGURATION SETTINGS

The plug-in configuration setting section is used to assign plug-in rights to specific users. Some of the viewer features are implemented as plug-in modules, such as multi-planar reconstruction and image fusion. These plug-in modules download to an EP workstation if the server is licensed to use them. Some plug-ins, such as the embedded speech recognition tool, require an additional user license.

The plug-ins licensed for this server are shown in the table in this section. If a checkbox contains a mark, it means the particular plug-in module is available to specific users. To configure which users will have access to the plug-in check the box, click the *Change* button and then click the *Configure* button to proceed to the configuration page.

On the plug-in user configuration page, click to place a check in the box corresponding to the user accounts permitted to use the plug-in module. If the plug-in has a limited number of licenses, the administrator must ensure only the licensed number of accounts contain checkmarks. If more accounts are checked than licenses exist, eRAD PACS will assign the licenses to some subset of checked users.

#### Quick Start Instructions – Plug-in Configuration Settings

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll to the Plug-in Configuration section.
- Check the plug-ins requiring user-specific permissions.
- Click *Change* to save the settings, and the *Configure* to assign rights to users.

### 7.3.8 REPORT SETTINGS

The following report settings can be configured from the Report Settings section of the Settings page.


Setting	Default	Description
Default report editor	Browser	The default report editor launched when editing the report from the browser user interface. Options include Browser and Viewer.
Displayed label of Normality state	Normal	Label used on the report editor to identify the normality state value.
Show normality state	Enabled	Show or hide the normality state field in the report editor.
Normality state <i>Normal</i> by default	Enabled	The default (normal) state of the normality state field in the report editor. When cleared, the default state is <i>alert</i> .
Clear delimiters when submitting report	Enabled	Remove field marker delimiters and leave the embedded text in the report when sending the report to the server.
Leading delimiter	[[	Leading field marker delimiter.
Trailing delimiter	]]	Trailing field marker delimiter.

If you change the Normality State Normal by Default setting, you must exit the viewer from standby mode and restart it before it takes effect.

### 7.3.9 LISTING PRIORS SETTINGS

The list of relevant priors displayed by clicking to open a study include entries resident in the configured archives if the Priors setting is set to search the archive. By default, the relevant priors search includes only eRAD PACS. The admin can change the default setting to include all configured archives.

The setting for including the archive when searching for relevant priors is on the Settings page, under the *Admin* tab. In the section labeled Prior Settings, check the *Enable Local-*

Only Version of Prior Page to exclude remote archives when looking for prior while opening a study. When local-only searches are enabled, the search button, , exists on the worklist for searching third-party archives manually.

Querying third-party devices may take some time to complete. If no priors are found, the search unnecessarily delays loading data into the viewer. If the only archives connected to the server are third-party devices, using the local-only setting is recommended.

### **7.3.10 CHANGE STATE SETTINGS**

The Changed State flag is a worklist parameter used to inform the user that the study has been modified since its state was last updated. It is a worklist field available for filters, plus it changes the icon used for the Open button depending on the configured setting. This setting is in the Change State Settings section of the Settings page. It is displayed for users with support privileges.

The setting can be *None*, *newOnly* or *anyChange*. *None* disables the change state feature. It is the default setting. *NewOnly* means the study acquired a previously unregistered object (e.g., an image) since the last state or report change. *AnyChange* means the study data has been altered in some way (e.g., edit patient name) since the last state or report change.

### **7.3.11 DATA PURGING SETTINGS**

By default, eRAD PACS manages the disk usage automatically, but it never removes primary image data, report data or orders unless the administrator explicitly instructs it to do so. Even then, eRAD PACS only does so when it needs additional disk space. This means no purging occurs until the Free Space Limit (see section 7.3.5 Disk Limit Settings) is reached, even if a study is older than the specified purge period. All purging will be processed during off-peak hours, usually in the early morning. Therefore, after you change these settings, you must wait until eRAD PACS runs the purging process before the settings take effect. Stopping and restarting the server will not invoke the purge process.

To set the purge rules, go to the Settings page, and scroll down to the Regular Tasks section. Only users with support rights can edit these settings. There are four options to specify:

- **Purge Regular Studies:** maximum number of days a study will exist on the server.
- **Purge Preliminary/Final Studies:** maximum number of days Preliminary or Final state will exist on a server.
- **Purge Orders:** maximum number of days an expired order remains in the worklist.
- **Keep New Studies For:** number of days a study must exist on the server before it can become eligible for purging.

#### *Quick Start Instructions – Data Purging Options*

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll to Regular Tasks.
- Set the purge values.
- Click the *Change* button.

### **7.3.12 INSTITUTION INFORMATION**

On the report web page and formatted printouts (reports, study accounting summaries), a section of the header is reserved for customized text. The customer can enter institution-specific information so all printed reports contain the institution name. The field only supports text, meaning there is no way to enter a graphic or logo into this field, although

the report customization tool supports this. Refer to section 7.3.2.1 XML Template Customization for details.

To define the Institution Information, go to the Institution Info text box on the Settings page. Enter information into the text box. It appears exactly as you enter it, so format it. When done, click *Change* to save the changes. To review the changes, display a report page and see the text in the upper left corner of the report.

*Quick Start Instructions – Institution Information*

- Go to the *Administration* page.
- Click the *Settings* tab.
- Enter institution information into the Institution Info text box.
- Click the *Change* button.

**7.3.13 FILTER LISTS SETTINGS**

On many eRAD PACS pages, specifically the Edit and Filter pages, the user has the ability to type in a value or to select a predefined option from a menu. If the menu contains variable data, such as a list of patient names, or a list of referring physician names, it can be quite large. When this occurs, the web page can take a long time to download, especially over a slow network connection. Additionally, depending on who has access to these pages, an administrator may consider the presence of this information a security risk and opt to eliminate the menu.

The administrator can limit the availability of the menus, or eliminate them altogether by setting the Filter List Setting, which appears on the Settings page. A value of *-1* (the default) means display all available options in a menu. A value of *0* means disable the menu entirely. Any other positive number instructs eRAD PACS to display the list only when the number of items in a particular menu consists of fewer than the number specified. In this last case, lists containing a limited number of values (study states) will have a pull down list available, but larger lists (list of patient names), will be eliminated.

The system default can be overridden for each field in the database. For details, refer to section 7.3.2.3.3 Customize Field Selection List Setting.

**7.3.14 SECURITY SETTINGS**

The security settings give administrators the ability to secure network traffic between a user and the server, terminate inactive user sessions and define minimum password strength.

Setting	Description
Secure connection	Off: Transmissions use unencrypted, HTTP protocol. (Default) On: Transmissions use SSL-encrypted HTTPS protocol. Auto: Inspects the IP address of the device. If it is in one of the defined LAN-accessible domains, the system uses HTTP. If not a LAN-accessible device, HTTPS is used.
Inactivity timeout	Number of minutes of inactivity allowed before the server logs the user off of the system. '0' disables the inactivity timer.
Minimum password strength	Low, Medium or High. Default is Low.
Minimum password length	The default, 0, is no minimum length.
Upper case character	At least one upper case character is required. Default is False.
Lower case character	At least one lower case character is required. Default is False.
Numeric character	At least one numeric character is required. Default is False.
Authentication agent	(Optional) When one or more LDAP servers are configured, this field identifies the system default authentication agent.

Encrypted communications can negatively impact network performance. The Secure Connection setting does not control the security of the DICOM communications. Secure DICOM is configured through the definition of the DICOM TLS port and protocol in the Devices table. See section 7.3.3 DICOM Server Settings for details.

The password strength requirements force users to define strong passwords. Passwords that fail to meet these requirements cannot be saved.

Security Settings	
Secure Connection:	Off <input type="button" value="v"/>
Inactivity Timeout: <small>(minutes, 0 for no timeout)</small>	0 <input type="text"/>
Minimum password strength:	low <input type="button" value="v"/>
Minimum password length:	0 <input type="text"/>
Required characters:	<input type="checkbox"/> upper case <input type="checkbox"/> lower case <input type="checkbox"/> numeric
<input type="button" value="Change"/>	

To set the security settings, do the following:

1. Go to the *Administration* page.
2. Click the *Settings* tab.
3. Scroll down to Security Settings.
4. Set the parameters.
5. Click the *Change* button.

When LDAP is configured on a server, the system can be configured to use the built in authentication agent or one of the available LDAP servers. The setting is the Authentication Agent field. The available options are the following:

- Built In - the system's authentication software
- LDAP servers (optional) – configured LDAP servers

### 7.3.15 TIMER SETTINGS

If a user does not explicitly close the study after opening the editable copy, the study remains locked. The Lock Timeout setting releases a locked study if the specified number of minutes transpires and no activity is recorded on the user account. A setting of zero disables this feature.

The curl timeout setting should not be changed at any time.

To set the timer settings, do the following:

1. Go to the *Administration* page.
2. Click the *Settings* tab.
3. Scroll down to Timer Settings.
4. Set the parameter and click the Change button.

### 7.3.16 LOCAL IP SETTINGS

eRAD PACS can optimize communications between the Viewer and Server when all the communicating servers and workstations exist on a protected LAN. Use the Local IP Settings section to define the IP address and domain ranges that make up a protected LAN. Devices in these domains do not compress or encrypt any data, yielding better download performance across a LAN.

The local IP setting is also used to optimize data volume by redirecting downloads to the viewer from its nearest server. To configure these server and workstation associations, you need support rights. Contact support for additional information.



Insert the domain ranges using the IP address with mask format, as in 192.168.4.0/24, or using asterisks, as in 192.168.4.\*. IP addresses preceded by a minus sign (-) specify exceptions to the domain range listed immediately before it. Multiple levels of exception are permitted by inserting another minus sign before the address range. All exceptions must be subsets of the range that immediately precedes it on the list.

*Quick Start Instructions – Local IP Settings*

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll down to Local IP section.
- Enter the IP addresses and domains and click Change.

**7.3.17 STUDY OPERATION SETTINGS**

Operation settings include edit mode, correction mode, shortcut editing mode, delete mode and media creation limits. Some of these settings require support rights to change.

**7.3.17.1 Edit and Correction Modes**

The system supports two modes for editing and correcting study information. Hard edits are the changes to the data object and the modified object gets forwarded to other servers. Soft edits record the changes in a separate control object and applies them each time the data is accessed. When propagating, only the control object is transmitted.

The *Default Edit Mode* is the edit mode used when a user edits a study from the Edit page. *Correction Modes* are the same, without the override option. If the *user can override* the edit mode, a checkbox labeled *Shred* appears on the Edit page. This checkbox lets the user override the system default on a case-by-case basis.

<b>Edit/Correction Mode</b>	<b>Description</b>
Soft (user can override)	Soft edit mode applied. Non-admin users permitted to apply a hard edit when editing patient and study data.
Soft (user cannot override)	Soft edit mode applied and enforced for all non-admin users.
Hard (user can override)	Hard edit mode applied. Non-admin users permitted to apply a soft edit when editing patient and study data.
Hard (user cannot override)	Hard edit mode applied and enforced for all non-admin users.

**7.3.17.2 Shortcut Editing Modes**

Edits made to a source study apply to all original values of each shortcut study. Edits to shortcut studies apply to shortcuts only unless the user explicitly applies them to the source study. To set the level of user control, set the Edit Shortcut setting to one of the following:

<b>Shortcut Edit Mode</b>	<b>Description</b>
Apply to Source Study	User decides to change to the original study when editing a shortcut. When set, an Apply to Shortcut checkbox appears on the Edit page so the user can override the setting. (Default)
Apply to Shortcut	Changes apply to the shortcut only. When set, the Apply to Shortcut checkbox is hidden on the Edit page.

When editing a shortcut, the Apply to Shortcut checkbox is forced to checked when the shortcut was previously edited while the Edit Shortcut setting was *Apply to Shortcut*, or the shortcut was created using a Copy action in which coercion rules were applied.

### 7.3.17.3 Delete Modes

The server's default delete mode is defined by the *Delete Mode* setting in the Study Operation Settings section on the Settings page. Users with admin rights can select one of the following options:

Delete Mode	Description
Remove References	Remove the study from the local server (Default)
Delete Immediately	Remove the study from the entire system.

### 7.3.17.4 Media Creation Settings

Multiple DICOM media creation jobs can run at the same time. The default is for three simultaneous creation processes, and 10 pending file downloads, but the numbers are configurable. Change the defaults as follows:

1. Click the Settings tab under the Admin tab.
2. In the Study Operation Settings section, enter the number of simultaneous media creation processes in the *Simultaneous Media Export Processes* field.
3. Enter the number of completed download files (ISO files, ZIP files, etc.) the system can accommodate in the *Undownloaded Media Export Files* field.
4. Enter the maximum amount of disk space the system can allocate to media creation before it starts queuing user requests in the *Media export disk space threshold* field. The default is unlimited.
5. Enter the timeout period for abandoned export media downloads.
6. Click the *Media Export Default Profile User* menu and select the default user's account ID. Choose *Self* to apply the profile of the user creating the media.
7. Click the Change button.

A server has finite disk space and media export files require a lot of it. Permitting too many simultaneous export operations may result in other operations, such as study acquisition, to fail temporarily. Be sure your server has adequate disk space before editing these parameters.

### 7.3.18 FORMATTING SETTINGS

The administrator has the ability to define formats used in worklists, reports, summaries and elsewhere in the system. Configurable formats exist for:

- date and time formats
- format used to display names.

To define the date format, perform the following steps:

1. From the Admin tab, click the Settings tab
2. Scroll to the Date Formatting section.
3. Using the pull down menus, select the date, time and interval format you want.
4. Insert delimiters (such as periods and commas) between fields, if necessary.
5. Click the *Format* button to save the changes.

Time intervals are periods of time, such as *5 minutes* or *4 days*. The delimiter fields supports a single character.

Names appear in eRAD PACS in one of two forms.

- List name            A name on a list, such as the name of a patient or physician on the worklist. For example, DOE, JOHN Q.
- Common name      The name as it appears in common text. For example, JOHN Q. DOE.

To define the name format, perform the following steps:

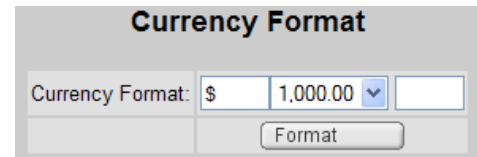
1. From the Admin tab, click the Settings tab.
2. Scroll to the Date Formatting section.
3. For both the common and list names, select the name component from the pull-down list. To leave a component empty, select <empty>.
4. Enter the component separators, if necessary.
5. Click Format.

When entering a name into a field, it is beneficial to separate it into first name, last name, middle name, a prefix and a suffix. When a single field is used, the user must manually separate the name parts using a caret (^) character between the individual names, in the order lastname^firstname^middlename^prefix^suffix. The *Use Person Name Filter* setting defines how many text fields are used for entering a name.

Setting	Description
None	Single text field. User must separate names using the caret (^)
Simple	First and last name fields are available.
Full	First, middle and last names plus a prefix and suffix are available.

### 7.3.19 CURRENCY FORMAT SETTINGS

Currency values displayed on table pages such as the Procedure Table page in eRAD Scheduler or the Worklist in eRAD PACS use the format defined in the Currency Format section of the Settings page.



Enter the currency symbol either before the value or after it. Select the American or European value separators (commas and decimal points) from the pull down list. Click the Format button to save the settings.

### 7.3.20 SCANNING USER INTERFACE SETTINGS

The Administrator can configure the default settings used in the scanning user interface. This includes the image format and use of the scanner's control panel.

Modify the default settings as follows:

1. Click the Admin tab.
2. Click the Settings tab.
3. Scroll to the Scan Settings section.
4. Select the *Image Format* from the pull-down list. The following options exist:
  - JPG        Save each document as a JPEG image, one per file.
  - PDF        Save all documents into a single PDF file.
  - Prompt    When using the generic scan button in which a format is not specified, prompt the user when scanning.
5. Select the state of the *Scanner Settings Page* as follows:
  - Show      Automatically launch the scanner's control panel.
  - Hide        Suppress the scanner's control panel until the user launches it.
6. Set the JPEG compression quality factor applied when scanning documents.
7. Click Change to save the setting.

### 7.3.21 SCANNING UI DEMOGRAPHIC DATA SETTINGS

The Administrator can configure some of the information displayed in the scanning user interface. This includes the demographic information displayed and the settings defaults.

Modify the patient and study demographic information as follows:

1. Click the Admin tab.
2. Click the Settings tab.
3. Scroll to the Scanning Demographics Data section. There is a section corresponding to each of the web pages from which the user can initiate the scanning.

Section	Web page
Study data	Quick View page
Order data	Scheduling module's order edit page
Patient data	Scheduling module's patient edit page

4. For each section, insert the COLID corresponding to the field you want to display, followed by the label you want to appear in the scanning interface. If you leave out the label, the default field label is used. COLIDs can be found on the Customize Labels page.
5. Click Change to save the settings.

### 7.3.22 DOCUMENT TYPE CONFIGURATION

Document scanning configuration consists of creating document types that are used to categorize each scanned sheet, and assigning restrictions to each document type so they appear only when needed and only by authorized users.

Document types are site-specific categories assigned to each scanned document. Examples include exam documents such as procedure request forms, worksheets such as technologist spec sheet, and general documents such as patient identification and insurance verification cards. Document type options appear on the scanning interface so users can assign them to each scanned document.

To define and edit document types, do the following:

1. Click the Admin tab.
2. Click the Settings tab.
3. Scroll to the System Settings section.
4. Click the *Document Type Settings* link to display the document type web page.




ID	Name	Category	Quick View Access	Attachment Page Access	Viewer Report Panel Access	Viewer Thumbnail Panel Access	Patient Folder Access
1	Exam	Study	Yes	Yes	Yes	Yes	Yes
2	Worksheet	Study	Yes	Yes	Yes	Yes	Yes
3	Other	Study	Yes	Yes	Yes	Yes	Yes
4	Other 2	Order	Yes	Yes	Yes	Yes	Yes


5. To create a new document type,
  - a. Click the New button, , to display the document type definition page.

ID	<input type="text" value="1"/>
Name	<input type="text" value="Exam"/>
Category	<input type="text" value="Study"/>
<b>Set As Default For Pages</b>	
Quick View Page Default	<input type="checkbox"/>
Attachment Page Default	<input type="checkbox"/>
Scheduler Order Page Default	<input type="checkbox"/>
Scheduler Patient Page Default	<input type="checkbox"/>
<b>Access Restrictions by System</b>	
Quick View Access	<input type="text" value="Yes"/>
Attachment Page Access	<input type="text" value="Yes"/>
Viewer Report Panel Access	<input type="text" value="Yes"/>
Viewer Thumbnail Panel Access	<input type="text" value="Yes"/>
Patient Folder Access	<input type="text" value="Yes"/>
Scheduler Order Page Access	<input type="text" value="Yes"/>
Scheduler Patient Page Access	<input type="text" value="Yes"/>
<b>Access Restrictions by Group</b>	
<b>Access Restrictions by User</b>	
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

- b. Enter the required information, identified by the yellow background.

Field	Description
ID	Computer-assigned identifier to identify the document type. You can override if you need to coordinate types between different systems.
Name	Human-readable name used to identify the document type.
Category	Image Appears when scanning Scheduler-side order documents and PACS-side documents. These types are scanned and processed as DICOM images. The Conversion Type attribute is set to "SI". When scanned into an order, the order state changes to a completed study. The resulting image appears in the image count.
	Order Appears when scanning Scheduling-side documents, such as from the order or patient entry page. Data is stored as a format-specific data file on a single server. These documents do not propagate through the dotcom or to archives. Data is unavailable for display in the viewer's thumbnail panel.
	Study Appears when scanning PACS-side documents, such as from the Quick View page. When scanned into an order, data is stored as a format-specific data file on a single server. When scanned into a study or when the order transitions to a study when images are acquired, the data is stored as a DICOM object with a Conversion Type attribute set to "WSD". The object is listed in the object count but not the image count.
Attributes for Image	Modality Editable Indicates if the Modality is editable by the user from the scanning GUI. Disabled by default
Category Attachments - present when	Default Modality The Modality value assigned to the image object(s). This field cannot be empty. The list is defined on the Scheduler device table's Modality field, COLID=0DTY.
Category is	Study Date Indicates if the Study Date is editable by the

Field	Description	
<i>Image.</i>	Editable	user from the scanning GUI. Disabled by default.
	Default Study Date	The default Study Date assigned to the image object(s). Options include no default (requiring the user enter it), the scheduled exam date/time or the current date/time.
	Target Hub Editable	Indicates if the user can edit the hub server on which scanned <i>Image</i> documents reside. Available when a worklist server exists in the server hierarchy.
	Default Target Hub	The hub server on which scanned documents are stored. Available in the scanning GUI when scanning into orders and a worklist server exists in the server hierarchy.
Set As Default For Pages	Quick View	Default type when scanning from Quick View page.
	Attachments	Default type when scanning from Attachments page.
	Scheduler Order	Default type when scanning from Scheduler's Order Edit page. Available when eRAD Scheduler is licensed.
	Scheduler Patient	Default type when scanning from Scheduler's Patient Edit page. Available when eRAD Scheduler is licensed.
Access restrictions by System – present when Category is <i>Study</i> or <i>Order</i> .	Yes	Show this document type on the specified page.
	No	Do not show or reference this document type on the specified page.
	Hidden	Reference but do not show the document type. The user can see it by clicking the <i>More Attachments</i> button,  , in the thumbnail section of the page. Hidden is applicable to the Quick View and Attachments pages only.
Access restrictions by group	Click the Add button,  , to create group-specific settings to override the system settings. Select the group from the Group Name list. Then assign Yes, No and Hidden for each page whose setting needs to override the system default. This field is present when Category is <i>Study</i> or <i>Order</i> .	
Access restrictions by user	Click the Add button,  , to create user-specific settings to override the system or group settings. Select the group from the User ID list. Then assign Yes, No and Hidden for each page whose setting needs to override the system or group default. This field is present when Category is <i>Study</i> or <i>Order</i> .	



- c. Click Save to save the changes.
6. To edit an existing document type, including the system defaults, click the Edit button, , in the row for the type definition to display the document type definition page. Follow the instructions listed above for creating a document type to modify the type's settings.

To assign a document type to a scanned document sent into the PACS system using Secondary Capture SOP Class and a Conversion Type setting, (0008,0064), equal to SD or

WSD, define a coercion rule. Assign the corresponding document type's ID value to attribute (F215,xx75).

By default, unassigned objects identified as scanned documents comply with the restriction rules defined for *Undefined* types. This is a system-defined document type available for editing on the Document Types Settings table.

Deleted document types are retired and cannot be reused because of the possibility of conflicts in existing data. As a result, they are never really deleted from a dotcom. In the event a document type ID must be reinstated, a user with support rights can restore it.

1. From the Document Types list page, click Show Deleted, .
2. For the document type, click the Edit button, .
3. Set the Deleted field to "No".
4. Click Save.

### **7.3.23 LOG SETTINGS**

The Logs page employs a configurable setting defining the maximum number of entries a server returns for a single query request. The system default limit is 400 entries. If the entries of interest fall outside this limit, using better search criteria is recommended over increasing this setting.

The setting is in the Log Settings section of the Admin→Settings page. To change the setting, enter a new value in the *Collected Log Limits per Server* field.

### **7.3.24 READING LOCATIONS**

The system supports tracking the user's reading location. When active, a user must select a reading location from a configured list before he/she is able to create a clinical report. The following sections provide details on enabling, configuring and selecting reading locations.


#### **7.3.24.1 Enable Reading locations**

By default, reading locations are disabled. They can be enabled for the entire system, for specific user groups or for individual user accounts.

Configure the default reading location for all users and groups as follows:

1. Click the Admin tab.
2. Click the Settings tab.
3. In the Location Settings section, set the Enabled field to one of the following:
  - a. No. Do not require reading locations for any group or use account.
  - b. Yes. Require reading locations for all groups and user accounts.
4. Click Change.


Override the system default for a group account as follows:

1. Click the Admin tab.
2. Click the User Accounts tab.
3. Select Groups List from the lists menu.
4. Click the Edit button, , for the group account you want to edit.
5. In the Location Enabled field, select one of the following:
  - a. Use Default. Use the system default for members of this group account.
  - b. No. Do not require reading location for members of this group account.








- c. Yes. Require reading location for members of this group account.
6. Click Save.

Override a group account default for an individual user account as follows:

1. Click the Admin tab.
2. Click the User Accounts tab.
3. Click the Edit button, , for the user account you want to edit.
4. In the Location Enabled field, select one of the following:
  - a. Use Default. Use the group account default for this user account.
  - b. No. Do not require reading location for this user account.
  - c. Yes. Require reading location for this user account.
5. Click Save.

### 7.3.24.2 Configure Reading Locations

Reading locations are selected from a list of configured records. Add and modify reading locations as follows:

1. Click the Admin tab.
2. Click the Settings tab.
3. In the System Settings section, click the Reading Locations link to display the reading location table.
4. To create a new reading location, click the Add New Location button, . To edit an existing reading location, click the Edit button, . In both cases, the reading location edit page is displayed.
5. Enter the Registered Location ID (required). This field is the unique identifier assigned to this registered reading location.
6. Enter the reading location label (required). This is the string used throughout the system to identify the reading location.
7. Enter the location's address details.
8. Select the time zone of the reading location (required).
9. Add user accounts using the Add button, . These are the users who will have this reading location available as an option when they log in.
  - a. Check the Set as Default for the User box if this reading location is the primary reading location for the user. As a result, this reading location will be the default one in the user's list.
10. Remove user accounts by clicking the Expand button, , and then the Remove button, , to remove this reading location from the associated user account.
11. Click Save.

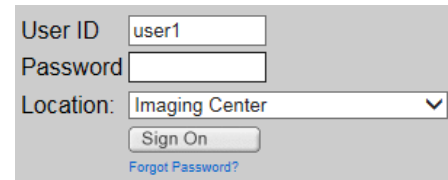
An alternative method for populating the reading location table is to upload a comma-separated file. Each line in the file will create a single reading location record. See section *7.8.1 Importing Data Into Database Tables* for details.

To remove a reading location, click the Delete button, , from the reading location table.

Reading location table changes automatically proliferate to all servers in the dotcom.

### 7.3.24.3 Select Reading Location

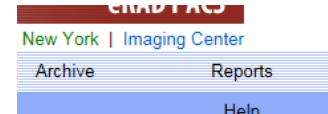
A reading location is selected when logging into the system. When enabled, the reading location field appears on the login page after the user enters a user ID. The field is populated with the reading locations assigned to the user account.



When the user selects his or her reading location, the value appears at the top of the web pages, above the tab row.

You can change your reading location without logging out as follows:

1. Click the reading location link at the top of your browser window. The Change Location panel pops up.
2. From the Change Location panel, select a location.



The user always has the option to select *No Location* in which case no reading location is declared for the user session. However, when no reading location is declared, reporting is disabled.

When a report is created, the reading location is stored in the report object. A separate reading location is stored for each report component (i.e., the initial report and each addendum).

The reading location can be displayed on the report provided the report template includes the field. The reading location is not displayed on any built-in report template. Refer to the *eRAD Layout XML Customization Manual* for template details.

## 7.4 Server Information

The Information page shows the server runtime status, disk utilization, installed components and their version numbers, and license information. From this page, the administrator can access the system queues, showing which system and network tasks are currently scheduled for completion.

### 7.4.1 SERVER STATUS

The Server Status section contains the DICOM, HL7 and task manager runtime status. When the task is running, the status reports *OK*. Unlicensed components report *Disabled*. When the task is unavailable, the status displays another value, such as *STOPPED* or *ERROR*. To restart the server, select the *Restart* link directly to the right of the status value.

#### Quick Start Instructions – Server Status

- Go to the *Administration* page.
- Click the *Information* tab.
- Scroll to the Server Status section.

### 7.4.2 DISK USAGE

The Disk Usage section graphically indicates the disk space used by eRAD PACS. The disk and cache utilization section displays the amount of disk space available for storing DICOM objects (Data and Archived Data), processed data (Processed) and cached files (Cache). The remaining space (Free) is available for any use. The available space is listed in megabytes and as a percentage of the entire disk.

The disk usage information appears under *Admin/Information*. The following links are also available:

Link	Description
Update disk usage information	Refresh the disk utilization graph.
Update disk usage information and clean unnecessary data	Invoke the data purging process and then updates the graph.
Validate repository configuration	Run the repository validation tool. Requires support privileges.

#### **7.4.3 SERVER REGISTRATION AND STUDY VOLUME STATUS**

Servers are registered with the eRAD PACS Site Manager to help eRAD monitor runtime performance and maintain a current database for all installed servers. Offline registration is available for servers disconnected from the eRAD monitoring center. All servers with direct Internet access to the Site Manager should register directly. Offline registration limits site management features, and diminishes e-mailing functions. User mail is allowed, but Watson and other support related mail traffic is disabled.

The registration information appears under *Admin/Information*. It contains the registration status, a time stamp, a server identifier and the name of the primary site manager.

The study volume performed by the server is listed in the Volume Information section of the *Admin/Information* page. The predicted annual study and order counts, and the study size are calculated values based on the previous four weeks of system usage. An order whose state becomes *Scheduled* counts as one order, no matter what happened with it thereafter.

#### **7.4.4 LICENSE AND PLUG-IN INFORMATION**

The License Information section contains details on the eRAD PACS license installed on the server. It contains the period for which the license is valid, the number of user accounts, DICOM devices and workstations it will support, the licensed study volume, and list of optional modules.

The Plug-in License Information section contains details on the eRAD PACS plug-in modules installed on the server. Each plug-in module has its own license. The information contains the module and version number, server IP addresses permitted to download the plug-in, and whether or not the plug-in applies user account license restrictions. If the plug-in does support user account licensing, refer to section 7.3.7 *Plug-in Configuration Settings* for information on how to assign the license to each account.

#### *Quick Start Instructions – License and Plug-in Information*

- Go to the *Administration* page.
- Click the *Information* tab.
- Scroll to the License Information or Plug-in Information section.

#### **7.4.5 VERSION INFORMATION**

The version information lists the version of all the modules installed on the server, along with the current patch level.

## **7.5 External Device Setup**

The Devices page gives administrators the ability to add, edit and delete DICOM entities, HL7 devices, and workstations, and to define their services. The Devices page consists of the following sections: device table showing all devices, a DICOM services table for general

DICOM settings, an HL7 services table for the general HL7 configuration settings, HL7 message routing tables, and a separate section for DICOM printer configuration.

### 7.5.1 DEVICES TABLE

The Devices table lists all of the external devices with which the eRAD PACS server communicates. If eRAD PACS is not in Promiscuous Mode, or if the server is licensed to support a limited number of modalities, define each of the communicating devices in the Devices table. The table consists of the following:


Field	Description
ID	The label used to uniquely identify the device.
IP/Host	The IP address or host name of the device. If the value is a host name, such as server.hospital.com, and the IP address changes, click the <i>Refresh IP Addresses</i> link at the bottom of the Devices table to update the host names with their current IP address.
Port	The port address of the DICOM application, required when the device accepts Association requests.
Protocol	TCP connections are for default DICOM and HL7 communications. TLS connections support DICOM Security Enhancements.
Type	The device type. Updating the configuration of any Parent- or Child-type server requires each server be updated. After updating the device table on every EP server, update the information in the DotCom configuration file by clicking <i>Recollect Dotcom Info</i> at the bottom of the Devices table on every server in the EP hierarchy.
Category	The device category defines the maximum number of connections all members of the Category can have established at any given point in time. See section 7.5.1.1 Device Categories for details on defining and assigning a category.


#### 7.5.1.1 Device Categories

Each device is assigned to a device Category. Two system categories exist: LAN and WAN. Administrators can create their own. By default, devices are assigned to the WAN and LAN categories based on the Local IP Settings.

The Category defines the maximum number of connections all members of the Category can have established at any given point in time. Categories are hierarchical, meaning the maximum number of connections includes connections established by parent Categories. For example, assume Category A is permitted a maximum of two connections, and Categories B, C and D are each permitted a maximum of one connection. If Categories B, C and D share the same parent, Category A, there can be only two open connections amongst all Category B, C and D devices at any one time.

Categories must be created before assigning them to devices. To create a new category, follow these steps:


1. Select the Devices tab under the Admin tab.
2. In the Categories table, click the Add Category button, .
3. Enter the category label.
4. If the category has a parent, select it from the pull-down list.
5. Enter the maximum number of connections. For an unlimited number of connections, enter no value or zero.
6. Click Save.
7. If prompted, restart the task manager.

A category assigned to one or more devices cannot be deleted. To remove an existing category, remove the category from all devices, find the entry in the Categories table and click the Delete button, .


To assign a category to a new device, follow these steps:

1. Select the category from the pull-down list in the Devices table.

To change the category for an existing device, follow these steps:

1. Click the Edit button, , for the device in the Devices table.
2. In the Category column, select the new category from the pull-down list.
3. Click the Save button.

For each device, you can override the maximum number of connections defined by the Category the device belongs to by performing the following steps:

1. From the Devices table, click the Edit button, , in the device's row.
2. In the device details section on the device edit page, enter the maximum number of connections this device can allocate in the Maximum Connections column.
3. Click the Save button.

### 7.5.1.2 Adding a Device

To add a DICOM or HL7 device, enter the ID, IP address, Port number, Protocol and Type fields into the first line of the Devices table, and click the *Add* button. The new device is added to your list.

Select the type from one of the following:

Type	Description
Backup Source	A device that sends data to the Backup Target device. See section <i>7.5.1.2.3 Adding a Backup Device</i> .
Backup Target	A DICOM-compliant device intended as an offline data backup server. See section <i>7.5.1.2.3 Adding a Backup Device</i> .
Child	An eRAD PACS child server.
DICOM	A DICOM entity. Assign the supported DICOM services on the DICOM Device Settings page. See section <i>7.5.1.2.1 Adding a DICOM Device</i> .
HL7	An HL7 entity. Assign the supported HL7 services on the HL7 Device Settings page. See section <i>7.5.1.2.2 Adding an HL7 Device</i> .
Parent	An eRAD PACS parent server.
Viewer	An eRAD PACS workstation, specifically one using workstation prefetch. See section <i>6.2.5.2 Auto-Routing</i> .
Workstation	(Retired) An eRAD PACS Dedicated Workstation.

To add a device to the Devices table,

1. Click the *Administration* Page.
2. Click the *Devices* tab.
3. In the Devices table, enter the device ID, IP address, Port, Protocol and Type.
4. Click the *Add* button.
5. Follow the type-specific instructions in the sections below.

#### 7.5.1.2.1 Adding a DICOM Device

After adding a device to the device table with Type set to DICOM, the DICOM device setup page appears. On this page, enter the DICOM-specific configuration for the device plus the data coercion rules applied to objects received from this device.

Administrators can limit the maximum number of outbound send tasks and inbound registration tasks associated with a specific device. These typically do not require changes. To change the settings from this page, in the Task Limits section enter values into the following fields, as needed.

Setting	Description
<i>Maximum</i>	The maximum number of tasks the system can run at one time for any inbound or outbound operation associated with this device.
<i>DICOM Out</i>	The maximum number of outgoing DICOM (ObjectForward) tasks the system can run at one time to this device. Configurable for parent and child devices only.
<i>HTTP Out</i>	The maximum number of outgoing HTTP (e.g., StudySynchronizer) tasks the system can run at one time to this device. Configurable for parent and child devices only.
<i>Store Date In</i>	The maximum number of Storescpreg tasks the system can run for incoming data from this device at any point in time. Configurable for DICOM, parent and child devices only.
<i>Registration</i>	The maximum number of Dcreg tasks the system can spawn for incoming data from this device at any point in time. Configurable for DICOM, parent and child devices only.

In the DICOM Setting table, select the supported DICOM services of the external device, enter the DICOM AE Title, and change the send and receive timers. To use the default timer settings (see section 7.3.3 DICOM Server Settings) assigned to this server, enter an asterisk (\*) in the text boxes. The services are as follows:

Service	Description
AutoGet,	Search this device for prior studies. AutoGet uses C-GET DIMSE service.
AutoRtv	AutoRtv uses C-MOVE DIMSE service. Select only one, preferably AutoRtv.
AutoFwd	Send a copy of every DICOM object received to the associated device.
UnEdit	Disallow editing of retrieved prior studies.
Store	Support Storage SOP classes.
Q/R	Support Query/Retrieve SOP class.
MWL	Support Modality Worklist SOP class.
ResMan	Support a collection of Study and Result Management SOP classes for exchanging RIS information.
Commit	Support Storage Commitment SOP class.
MPPS	Support Modality Performed Procedure Step SOP class.

The Additional DICOM Settings section displays the DICOM-specific settings for the device. The System Settings column displays these current settings, which default to the DICOM Server Settings defined on the *Admin/Settings* page. The Current Value column allows you to override each attribute by entering in a new value. Activate the modified value by checking the box next to it, or selecting a new value from the pull-down list.

The following attributes can be configured on a per device basis:

Attribute	Description
Transfer syntax	Preferred/supported transfer syntax
Storescu flag	Flags to be passed to <i>storescu</i> (i.e., storage SCU application)
Case sensitive	DICOM Q/R search is case sensitive
Empty matching	Empty value matches anything in Q/R queries
Remove private tags	Remove private EP tags when forwarding to this device

Attribute	Description
Query/Retrieve limit	Cancel the Q/R request if the number of responses exceeds this limit
Send timeout	Time to wait for acknowledgement of a sent PDV (packet)
Receive timeout	Time to wait for next received PDV (packet)
Connection timeout	Time to wait for acknowledgement of connection request
Wait timeout	Time to wait for next C-MOVE response message to arrive
Sending updates	Automatically send modifications made to studies previously forwarded to this device
Associate heartbeat	System default setting for keeping DICOM associations open between transmission requests.
Propagate permanent delete requests	Propagate or withhold propagating permanent (Immediate) delete requests to this device. Available for devices whose Type is not Parent, Child or Backup Target. The default is defined by the Sending Updates setting.
Hard edit	Coerce edited values into their respective DICOM fields when forwarding. <i>Auto</i> coerces data if the DICOM negotiation fails to establish a presentation context supporting eRAD's private SOP class.
Time zone	Time zone of the device's clock.
Trigger outbound HL7 report messages	Inbound report objects acquired from other eRAD PACS systems initiate outbound HL7 update messages.
CD Writer	If set to Yes, the device is a DICOM File Set Creator (FSC), capable of creating DICOM media. As a result, the processed data used by the CD viewer to load quickly is included in the enhanced SR object sent to the device.
Supported Storage SOP Classes	The DICOM Storage SOP Classes eRAD PACS accepts or offers when communicating with this device. When requesting an association for sending, this list is used when proposing all available presentation contexts, meaning the -R option is not specified. To configure, click the Edit button in the Current Value column.

#### 7.5.1.2.1.1 Creating a *Self* Device


The *Self* device is used in specific situations to refer to the server. To add the *Self* device, perform these steps:

1. From the Admin tab, click the Devices tab.
2. Add a new device as follows:
  - a. ID = "Self", or any label that will be used to identify this server.
  - b. IP/Host = the *IP Address* value listed in the DICOM Server Settings section of the Settings page.
  - c. Port = the *TCP Port* value listed in the DICOM Server Settings section of the Settings page.
  - d. Protocol = "TCP"
  - e. Type = "DICOM"
  - f. Category = "LAN"
  - g. Click Add
3. On the device settings page, complete the device configuration as follows:
  - a. AE Title = the *Storage AE* value listed in the DICOM Server Settings section of the Settings page.
  - b. Store U checkbox = "✓"
  - c. Clear all other DICOM services check boxes for this device
  - d. Click Save.



### 7.5.1.2.1.2 Device-Specific Data Coercion

Data coercion adds or modifies attribute values to objects when acquired by the system, including acquiring from a networked device or scanner, or transmitted to the viewer. To define device-specific coercion rules,

1. Go to the Devices page
2. Click  to edit the device you want to configure. For scanning, create and use the *Self* device as defined in section 7.5.1.2.1.1 *Creating a Self Device*.
3. In the Data Coercion section, type one or more commands into the text box. If needed, select DICOM tags from the pull-down menu and click Add Tag.
4. Click Save.

Coercion rules do not propagate between linked servers. At this time, coercion works for DICOM alpha-numeric attributes only.

Coercion rules apply to all DICOM C-STORE messages arriving from the device. Multiple rules can exist for a single device. They are applied in the order used in the definition list.

Coercing data elements may impact the DICOM compliance of an object, and may lead to inoperability in eRAD PACS and third party systems. If unsure of the effect a coercion rule will have, contact support for guidance.

The coercion rules are found in section 7.5.1.2.1.5 *Coercion Rules*.

### 7.5.1.2.1.3 Generic Server Coercion

Two sets of server coercion rules exist that the system applies to all acquired objects, whether the device is registered or not. The first set of rules is the preceding coercion rules and is applied before any device-specific rules are applied. The second set of rules is the trailing coercion rules, applied after the device-specific rules.

The generic coercion commands are identical to the device-specific commands. They are configured in the Preceding Global Coercion Rules and Trailing Global Coercion Rules sections of the Devices page. To inform administrators that these generic rules exist, they appear in uneditable tables before and after device-specific coercion rules on the Edit Device page.

The coercion rules are found in section 7.5.1.2.1.5 *Coercion Rules*.

### 7.5.1.2.1.4 Viewer Coercion

Viewer coercion rules modify data loaded into a viewer session when it initializes. The coercion rule set is the same as that which is used for server coercion rules. The rules are server-specific and get downloaded or re-downloaded to the viewer each time the user logs onto the server. The rules are applied to the data when the viewer loads it, whether from cache or on-demand.

The primary difference between server and viewer coercion is viewer coercion does not affect the original data stored on the server. The modified data exists in the viewer session only. When the viewer session terminates, the modified data ceases to exist.

To define viewer coercion rules, do the following:

1. Click the Admin tab.

2. Click the Devices tab.
3. In the Viewer Global Data Coercion Rules section, enter the coercion rules.
4. Click Save.

The coercion rules are found in section 7.5.1.2.1.5 *Coercion Rules*.

### 7.5.1.2.1.5 Coercion Rules

The general encoding rules for coercion commands is as follows:

General Syntax:

<lvalue> = <expression>

Data types:

Type	Description
gTag	The first part of a DICOM tag representing the attribute group. Expressed as four hex digits.
eTag	The second part of a DICOM tag representing the attribute element. Expressed as four hex digits.
Integer	Numeric value used and returned in some expression functions, including arithmetic functions.
String	Group of ASCII-numeric and control characters. When non-contiguous, strings must be encapsulated within double quotes (""). Control characters must be preceded by a backslash, as in "\n", "\\\" and \"\".

lvalues:

lvalue	Description
(gTag,eTag)	DICOM attribute tag. The parentheses are required. After the expression is evaluated, the results are assigned to this attribute.
SEQ(gTag1,eTag1, INo1,gTag2,eTag2 [,INo2,gTag3,eTag3...])	A DICOM sequence attribute. Specified by Tag2 within the INo item in the sequence specified by Tag1, where 0 represents the first item in the sequence. If the sequence Tag1 does not exist in the object, the entire expression is ignored.
USER(fieldName)	Custom database fields in the form USER( <i>fieldName</i> ) where <i>fieldName</i> is the Field Name defined in the database configuration file dcflds.conf. Custom database fields are valid on the left and right side of assignments.
\$(varName)	Temporary variable in the form \$( <i>varName</i> ) where <i>varName</i> is a unique string used to identify the variable.

Expressions: Can be either a Value or a Function.

Values

Value	Description
(gTag,eTag)	This returns the value of a DICOM tag. If the DICOM tag does not exist, NULL() is returned. The parentheses are required.
Quoted string	This is in the form, "<string>". Returns the literal string <string>. The string can contain escaped characters, including "\n", "\\\" and \"\".
SEQ(gTag1,eTag1, INo1,gTag2,eTag2 [,INo2,gTag3,eTag3...])	Returns the contents of the DICOM attribute specified by Tag2 within the sequence specified by Tag1. INo indicates the sequence item instance, where 0 represents the first item in the sequence. Returns NULL() if the attribute does not exist in the INo item of the sequence.
Unquoted string	Non-quoted strings can be used when they contain only contiguous,

Value	Description
	alphanumeric characters.
USER(fieldName)	Custom database field in the form USER(fieldName) where fieldName is the Field Name defined in the database configuration file dcfields.conf.
\$(varName)	Temporary variable in the form \$(varName) where varName is a unique string used to identify the variable. Uninitialized temporary values return NULL.
(gTag,eTag),"d",n	(Retired) This returns the <i>n</i> th field in the DICOM tag (gggg,eeee) value as separated by the delimiter <i>d</i> .

### Functions

Function	Description
add(n1,n2[,n3...])	Returns the sum of the integers.
and(a,b)	Return "true" if both <i>a</i> and <i>b</i> are non-NULL.
between(n,min,max)	Returns <i>true</i> if integer string <i>n</i> is greater than or equal to <i>min</i> and less than <i>max</i> . Otherwise, it returns NULL.
codenumber(n)	Returns a coded numeric string based on <i>n</i> . Both <i>n</i> and the result are ascii numeric strings >= 0. Result contains the same number of digits as in <i>n</i> .
codestring(s[,x])	Returns a coded string based on the string <i>s</i> . Characters in string <i>x</i> , if present, shall not exist in the result.
concat(a,b[,c...])	Concatenate the values <i>a</i> and <i>b</i> (and <i>c</i> , etc.) NULL values are treated as an empty string, "".
contains(a,b)	Return <i>b</i> if string <i>b</i> exists in string <i>a</i> . Otherwise it returns NULL.
dicomAge(d1,d2)	Returns the value d1 - d2 in calendar years, months or days in DICOM-compliant format: nnnY, nnnM, or nnnD. If either d1 or d2 is an invalid date value, or d2 predates d1, NULL is returned.
<empty string>	This is the empty string, "".
equals(a,b)	Return "true" if <i>a</i> and <i>b</i> are equal, NULL if they are not equal.
if(cond,a,b)	Return <i>a</i> if <i>cond</i> is not NULL, <i>b</i> if <i>cond</i> is NULL.
indexOf(a, p)	Return the starting position of pattern <i>p</i> in string <i>a</i> . The first position in string <i>a</i> is 0. Returns -1 if <i>p</i> is not found in <i>a</i> . Returns NULL if <i>p</i> or <i>a</i> is NULL.
not(a)	Return "true" if <i>a</i> is NULL, NULL if <i>a</i> is not NULL.
NULL()	Delete the target lvalue.
or(a,b[,c...])	Return the first non-NULL value.
rnd(n[,seed])	Returns a random number string based on <i>seed</i> , if present, between 0 and <i>n</i> -1.
split(a,d,n)	Return the <i>n</i> th field in <i>a</i> using <i>d</i> as the field delimiter.
strlen(a)	Return the number of characters in string <i>a</i> , or NULL if string <i>a</i> is NULL.
sub(n1,n2)	Returns the sum <i>n1</i> - <i>n2</i> .
substr(a,from[,len])	Return the <i>len</i> characters in <i>a</i> , starting at position <i>from</i> . The first position is '0'. If <i>from</i> extends past the end of the string, the NULL string is returned. If <i>len</i> is omitted, the remaining string is returned.
translate(a,d,i1,o1[,i2,o2...])	Returns the output value, oN, if the input string, iN, matches the source string, a. If the source string matches no input string, the function returns the default value, d. Source string, a, and input strings, iN, must be String types or NULL(). The default value, d, and output values, oN, can be any type but must all be of the same type.

Note that in the evaluation of expressions, NULL is not the same as the empty string, "". If a DICOM attribute does not exist, it is NULL. If it exists, but contains a 0-length value, it is the empty string, "".

An example of a coercion rule to insert a prefix, "PFX", before the Accession Number (0008,0050) is below. If the attribute 0008,0050 exists, even if it contains a 0-length value, insert "PFX" into the beginning of the existing value and assign it back to the original attribute. If the original attribute does not exist, return NULL(), which prevents it from being added to the object.

```
(0008,0050)=if( (0008,0050) , concat("PFX",(0008,0050)) , NULL() )
```

Another example is to coerce a comma-separated patient name, (0010,0010), defined as "LASTNAME,FIRSTNAME[,MI]" into DICOM-compliant patient name string, "LASTNAME^FIRSTNAME[^MI]".

```
(0010,0010)=concat(split((0010,0010), ",", 1), "^", split((0010,0010), ",", 2),  
if(split((0010,0010), ",", 3), "^", ""), split((0010,0010), ",", 3)  
)
```

An example of translating a string of defined values to an enumerated set of values for conventional or space-saving purposes, such as in mammography view positions, might look like the following. It converts "cranio-caudal" to "CC" and "medio-lateral oblique" to "MLO", and assigns the abbreviated value to the Series Description attribute. In this example, the view code value is obtained from the first sequence item in the View Code Sequence (0054,0220).

```
(0008,103e)=translate( SEQ(0054,0220,0,0008,0104),  
SEQ(0054,0220,0,0008,0104),  
"cranio-caudal", "CC",  
"medio-lateral oblique", "MLO"  
)
```

\* Note: that the line breaks in each example are inserted for readability only. To work, these commands must be entered on a single line.

To swap two values, define a three-step process: assign the value from one attribute to a temporary attribute; copy the value from the second attribute to the first attribute; then copy the value in the temporary attribute to the second attribute.

#### 7.5.1.2.1.6 Redirection

If the device Type is Parent or Child, and redirection is enabled, the Redirection Settings table appears at the bottom of the DICOM device editing page. The redirection settings are as follows:

Field	Description
Default Redirection Rule	The default redirection rule. This is the normal access URL for the server, used from all accessible IP addresses. The only option here is to select whether this access is via open (HTTP) or secure (HTTPS) protocol.
URL Used in Redirection	The URL or IP address of this server used when redirecting. If left empty, the IP address listed in the Devices table is used.
LAN-accessible IP Addresses for Child Formats	The IP address and address ranges of workstations that use the <i>URL Used for Redirection</i> address when accessing this server. Refer to section 7.3.16 <i>Local IP Settings</i> for instructions on address domains and exceptions formats.

After making all changes, click the *Save* button to save the changes, and restart the DICOM service when prompted.

#### 7.5.1.2.2 Adding an HL7 Device

After creating a device in the devices table with the Type set to HL7, the HL7 settings page appears prompting for the device configuration details. Upload the specific virtual mapping database (VMD) file, select an acknowledgement timer setting, select the supported services by placing a check in each corresponding box, and specify the Application ID and Facility ID. It is necessary to upload the Sorter mapping file as well. When finished setting up this device, click *Save*.

To change an existing map file, download it by clicking on the checkbox to the left of the VMD Upload field. When prompted, select to *Save* the file on your local disk. Import the file into the map generator program, make changes, and then upload the new file as described above.

##### *Quick Start Instructions – Creating HL7 Devices*

- Go to the *Administration* Page.
- Click the *Devices* tab.
- Make sure a Sorter VMD file has been uploaded.
- Enter the device IP address, port number protocol and type=HL7.
- On the HL7 setup page, upload the mapping file.
- Enter device settings, services, and IDs.
- Click *Save*.

#### 7.5.1.2.3 Adding a Viewer Device

Workstations having a fixed IP address or defined computer name can be registered in the Devices table. Registers workstations can use the auto-routing function described in section 6.2.5.2 *Auto-Routing*.

After creating a device in the devices table with the Type set to Viewer, the viewer settings page appears. Enter both an IP address and a workstation ID. The IP address is the address of the workstation as recognized by the server, which may be different than the address configured into the workstation. The workstation ID, entered in the *Workstation ID* field on the device setup page, is the workstation computer name. Workstation IDs must be unique.

##### *Quick Start Instructions – Creating Viewer Devices*

- Go to the *Administration* Page.
- Click the *Devices* tab.
- Enter the workstation IP address, port number protocol and type=Viewer.
- On the viewer setup page, enter the Workstation ID.
- Click *Save*.

#### 7.5.1.2.3 Adding a Backup Device


A Backup Target device is a DICOM-compliant device intended as an offline data backup server. A Backup Source device is the device that sends data to the Backup Target device. The relationship has the following characteristics:

- Support only DICOM Storage SOP Classes
- Continuously sends updated between servers. (*Keep Sending Updates* is forced On.)
- User account settings are propagated

- Included in Recollect Dotcom Info requests
- Included in Dotcom Validation requests
- Does not propagate orders
- Will not be searched for real-time data collection (such as prior study searches)
- Does not pass ownership
- Does not receive manual delete requests but will receive and process obsolete requests.


Adding and editing backup source and target devices requires support rights.

### 7.5.1.3 Editing Device Information



To edit a device in the *Devices* table, find the device entry in the table and click the Edit button, . The device edit page appears. This page layout depends on the device Type. For information on editing a DICOM device, refer to section 7.5.1.2.1 Adding a DICOM Device. For information on editing an HL7 device, refer to section 7.5.1.2.2 Adding an HL7 Device. To edit a Viewer device, refer to section 7.5.1.2.3 Adding a Viewer Device.

After making the necessary changes, click the *Save* button to record the changes and return to the original list.


#### *Quick Start Instructions – Editing Device Information*

- Click the *Administration* page.
- Click the *Devices* tab.
- Click the Edit button, , for the entry.
- Edit the values and click *Save*.

### 7.5.1.4 Disabling a Device


When a device is temporarily offline, it is better to disable it rather than delete it and all the configuration information from the *Devices* table. Users with support rights have the ability to temporarily disable a device. From the *Devices* table, find the device you want to disable. Click the Device State button, . Enter in the period of time you wish the device be disabled, and click OK. When disabled, the Device State button appears red, . To re-enable a disabled device, click the Device State button, set the time period to 0, and click OK.

### 7.5.1.5 Deleting a Device


To delete a device, find the device in the *Device* table and click the Delete button, . A message prompts you to confirm the delete request. Click *Delete* to complete the deletion process, or *Cancel* to cancel and return.

After deleting a device, rebuild the DotCom information by clicking the *Recollect DotCom Info* link on every server in the eRAD PACS hierarchy.

#### *Quick Start Instructions – Deleting a Device*

- Click the *Administration* page.
- Click the *Devices* tab.
- Click the Delete button, , for the entry to remove.
- When prompted for confirmation, click *Delete*.
- Recollect the DotCom information on all eRAD PACS servers.

### 7.5.1.6 Testing a Device

To confirm communication between the eRAD PACS server and another device, issue a ping command or a DICOM Echo request from server. Click *Administration/Devices* to display the list of configured devices. Click the Test button, , for the device you need to check. If the device Type is DICOM, Parent or Child, a DICOM Echo request is executed. For HL7 devices, a ping command is executed. The results page appears. If the device successfully received and acknowledged the Echo request, you will see a line:


*Echo [1], Complete [Status: Success]*

If the device successfully received and acknowledged a ping request, you will see a line:

*N packets transmitted, N packets  
received, 0% packet loss*

If one of these line does not appear on the result page, or if the Status does not show *Success*, the device is either not on the network, or not running DICOM services. Click *Back* to return to the Devices page.

#### *Quick Start Instructions – Deleting a Device*

- Click the *Administration* page.
- Click the *Devices* tab.
- Click the Echo button, , for the device you want to test.

### 7.5.2 DICOM SERVICES TABLE

The General section of the DICOM Services table on the Device pages contains additional DICOM settings, including the Modality Worklist day range to include in the worklist query requests and the promiscuous mode setting.

The Modality Worklist day range defines the range used in modality worklist requests issued by eRAD PACS to a MWL SCP. Negative days correspond to the past as in yesterday (-1). Positive days correspond to future day as in tomorrow (+1, or simply 1).

With Promiscuous Mode enabled, eRAD PACS accepts valid DICOM associations from any entity. To restrict access to the server and only accept associations from known entities, clear the checkbox and click *Save*.

### 7.5.3 HL7 CONFIGURATION AND MESSAGE FLOW TABLES

The Sorter mapping file applies to all HL7 devices, and is required before any specific mapping configuration can be applied to an HL7 interface. Check the configuration by clicking on *Check HL7 Config*. If an error in the configuration is detected, a warning message identifying the problematic devices will be displayed. Correct the problem, upload the new map file, and check the configuration again.

For each configured device accepting HL7 reports, configure the flow of reports from source to destination device in the Report Flow section. To enable the transfer of reports, place a checkmark in the corresponding device checkbox and click *Save*.

Study and order updates can trigger an HL7 update message. State changes are handled separately from the respective setting on the Order Flow table. The Study Update setting triggers an HL7 event for non-state changes to the study data.



To trigger an HL7 update for non-state changes, check the *Study Update* box in the Order Flow table.

The details of the HL7 message are provided in the VMD file. See the *eRAD PACS HL7 Interface Configuration Manual* for details.

#### 7.5.4 DICOM PRINT CONFIGURATION

To add a DICOM Printer to the server, modify the print configuration file. A separate instruction manual exists explaining the structure and parameters of this file. Contact customer service to request the *eRAD PACS DICOM Print Configuration Manual*. Make the necessary changes and click the *Save* button. The DICOM printer is available from the eRAD PACS viewer the next time you start the viewer.

If your viewer is running in standby mode, i.e. you have an eRAD PACS icon in the system tray, next to the system clock, right-click the icon and select *Exit*. The next time you open a study, the viewer restarts and the printer appears in the list in the viewer's print panel.




## 7.6 System Information

System information consists of server logs and study details.

### 7.6.1 SYSTEM LOGS

The Logs Page displays a table with actions a specific server has performed over a specified period of time. To display the log, click *Admin/Log*.

Note: A consolidation worklist server instructs other (hub) servers to do the actual work. As a result, the logs on a consolidation worklist server may not contain everything you expect. Search for specific actions on hub servers.

Customize the logs table using the edit fields button, . Select the fields you want displayed on the Logs page, and click *Done*. Use the filter button, , to enter search criteria. The filter button at the top of the list offers all the available Logs page fields. The filter button at the head of each column applies just to that column. Enter the search criteria and click the *Apply* button. Use the sort button, , to define the sorting rules.

The available fields on the Logs table are as follows:

Attribute	Description
Accession No.	Accession number
Action	Action performed
Body Part	Body part
Changed value	New value applied to an action.
Derived	See <i>Derived</i> section below for details.
Description	Study description
Event Date/Time	Date and time event occurred
Event Date/Time Local	Local server's date and time event occurred
Information	Renamed <i>Message</i> field
Level	Renamed <i>Task Level</i> field
Logging Server	Server on which logs were created. Defaults to the local server.
Modality	Modality
Order/Study Status	Logged status for the order/study
Parent Server	Logging server's parent server
Partial Rules	See <i>Partial Rules</i> section below for details.
Patient ID	Patient ID

Attribute	Description
Patient Name	Patient name
Peer device	Source or target device specified in the action request.
Reason	Reason for exam
Scheduled Start/ End Date/Time	Scheduled start and end date/time for the exam
Study Date/Time	Study date and time
Study UID	Study UID
Time Difference	Time difference between logging servers
Type	Renamed <i>Task Type</i> field
User ID	Renamed <i>Initiating User</i> field

From the Action column, select the actions you want included in the log report. Hold down the CTRL key to select multiple actions.

To access PACS log entries recorded prior to v7.0, or to access object-level log entries, use the old PACS log page, as describe below.

1. Select the Logs tab under the Admin tab to display the Logs page.
2. Scroll to the bottom of the page.
3. Click the *Classic PACS Logs Page* link to display the archived PACS logs page.
4. Use the archived PACS logs page to search these archived logs as in previous releases.

#### 7.6.1.1 Study Level Field

*Study* level log entries correspond to study-level actions, such as the editing of a patient name. *Object* level log entries correspond to image-level actions, such as the transmission of an individual image. *Admin* log entries are tasks performed by system administrators, such as changing the system configuration. *Other* log entries correspond to system actions that may not apply to any object.

NOTE: Red line entries on the Logs page mean the action failed. The same action should appear later in the log with a successful completion, or the task should be in the queues (scheduled, retry or failed).

#### 7.6.1.2 Partial Rules Field

The Partial Rules field denotes the portion of a study on which an operation is performed. Possible values are as follows:

report	Action applied to report objects and referenced key images
non-report	Action applied to every object except report and referenced key images
series[M]	Action applied to <N> series

Along with the STUDY level entry on partial operation there will always be an OBJECT level log entry for each object affected by a partial operation. In the case of series operations there will also be a SERIES level log entry (series[N])

Partial Rules entries exist for delete, edit and forward log actions.

For delete operations,

- *report* means the report and key images were deleted.
- *series[N]* means N series were removed and the specific series information is displayed in the Changed Values field.

- no value means everything was deleted.

For edit operations,

- *series[N]* means N series were modified and the specific series information is displayed in Changed Values.
- no value means the entire study was edited.
- *report* and *non-report* do not exist for edit entries.

For forward operations,

- *report* means the report and key images were forwarded. The target is displayed in the Peer Device field.
- *non-report* and *series[N]* don't exist but may be introduced in the future.
- no value means everything was deleted.



### 7.6.2 CONSOLIDATED LOGS

In a multi-server, hierarchical environment, users can collect logs from one or more servers from a single web page. Log onto the top-most server of the group of servers, such as the Worklist server, and define your search criteria. Using the *Logging Server* column, select the servers whose logs you wish to consolidate into a single table. The server issues the query request to each of the selected servers, collects the matching entries, and displays them in the browser according to the defined sorting rules.

Collecting logs from multiple servers may take a long time and can place a burden on the servers and the network. Some guidelines for collecting logs from multiple servers are as follows:

- Define your search criteria and sort order using the local server only, before adding servers to the Logging Server field. This limits the number of time-consuming query requests issued across the network.
- Make your default Logs table filter search the local server only. (This is the default.) Otherwise, you issue a time-consuming data collection by clicking on the Logs tab.

### 7.6.3 STUDY DETAILS

Admin users have access to study details from the browser. Click the Quick View button, , for a study. In the study control section, click the Details button, . The study details window appears.

Study Info	References	Integrity
------------	------------	-----------

Study Directories	
Data	/home/medsrv/data/dicom.repository/0N/Q6/DG/1.2.826.0.1.3680043.2.93.2.1539412291.358.1206552335.4
Processed	/home/medsrv/var/processed.repository/0N/Q6/DG/1.2.826.0.1.3680043.2.93.2.1539412291.358.1206552335.4
Cache	/home/medsrv/var/cache.repository/0N/Q6/DG/1.2.826.0.1.3680043.2.93.2.1539412291.358.1206552335.4
Info	/home/medsrv/data/dicom.repository/0N/Q6/DG/1.2.826.0.1.3680043.2.93.2.1539412291.358.1206552335.4/info

Study Table	
Accession No.	424411172
Patika Name	Balog*Endre*ri
Patient ID	1785157168
Modalities	US
Study Date	19700829_173927
Description	modality simulator
Status	0
Report Status	0
Folder	
Deleted	no

Store State	
ProcessMode	Process
StudyOwner	yes
Version	1

The study details window contains tabs. Click the tab to display the information described in the table below.

Tab	Description
Study Info	Study data repositories, study table details and store state information.
References	Study and object references.
Integrity	Access to the integrity checking utility. Users with administrator privileges can run the integrity checker. Clearing integrity conflicts is limited to support users.

#### 7.6.4 TASK MANAGER

Schedule jobs are displayed on the Tasks page, located under the Admin tab. Three task tables exist: Jobs, Sub-jobs and Tasks. Select the table from the Table pull-down list at the top of the task table.

- Jobs table List of running, pending, failed and suspended jobs at the study level. Jobs consist of one or more sub-jobs. Actions applied to an entry in the Jobs table apply to all related sub-jobs across all servers in the server hierarchy.
- Sub-jobs table List of running, pending, failed and suspended sub-jobs. Sub-jobs consist of one or more tasks. Actions applied to an entry in the Sub-jobs table apply to all related tasks.
- Tasks table List of running, pending, failed and suspended tasks. Tasks list activity at the object level. Actions applied to an entry in the Tasks table apply to that entry alone.




Task tables can be customized and filtered. Select the columns to display on the Tasks page from the Edit Fields button, , at the top of the table. The following fields are available on the task table.

Table	Field	Description
Job	#Sub-jobs	Number of subjobs in the job
	#Tasks	Number of tasks in the sub-job
	Base Pri.	Base priority
	Creation Date	Date job was created
	Initiating User	Account ID of user who initiated the job
	Job ID	Job ID

Table	Field	Description	
	Job Name	Job name	
	Peer	Peer device	
	Queue	Queue the job is currently on	
	Rel. Pri.	Relative priority	
	Resources	System resource controlling the job	
	Script name	Script or application the task is running	
	Study UID	Study UID the task is operating on	
	Sys. Pri.	System priority	
	Type	Job type	
	Sub-jobs	#Tasks	Number of tasks in the sub-job
		Base Pri.	Base priority
		Command	Executable command and parameters
		Creation Date	Date sub-job was created
Initiating User		Account ID of user who initiated the job	
Job ID		Job ID	
Job Name		Job name	
Peer		Peer device	
Queue		Queue the job is currently on	
Rel. Pri.		Relative priority	
Resources		System resource controlling the job	
Script name		Script or application the task is running	
Study UID		Study UID the task is operating on	
Tasks	Sub-job ID	Sub-job ID	
	Sub-job Name	Sub-job name	
	Sys. Pri.	System priority	
	Type	Job type	
	Base Pri.	Base priority	
	Command	Executable command and parameters	
	Creation Date	Date task was created	
	Initiating User	Account ID of user who initiated the job	
	Job ID	Job ID	
	Job Name	Job name	
	Peer	Peer device	
	Queue	Queue the job is currently on	
	Rel. Pri.	Relative priority	
Resources	System resource controlling the job		
Retry Date	Date of next retry		
Retry Number	Number of retry attempts		
Running Time	Total runtime for task		
Script name	Script or application the task is running		
Study UID	Study UID the task is operating on		
Sub-job ID	Sub-job ID		
Sub-job Name	Sub-job name		
Sys. Pri.	System priority		
Task ID	Task ID		
Type	Job type		

To filter the Tasks table, use the Filter button, , at the top of the page or top of the column. For more information on creating and applying custom table layouts and filters, refer to *6.2.4 Filtering Worklists*.

To display a summary of recorded tasks, click the Show Task Summary button, , at the top of the table.

## 7.7 System Message Board

An administrator can post a message to all users using the system message board. After creating a message, it appears on the browser pages after the user logs on. Messages do not propagate to all servers. They appear when the user logs onto the server containing the message definition. The user has the ability to acknowledge the message, after which it no longer appears (for that user).

System messages			
Messages	User ID	Message Name	Active
N	jim	System Down For Maintenance	Active

To create a message, click *Admin/Message*. The new message page appears showing the message table. The table lists all defined messages, along with tools for creating and editing them. The table controls are the same as for other eRAD PACS tables. To sort the table, click the column header, and search for a specific entry using the filter button, . When the number of messages in the table exceeds the defined page size, additional pages are used. Click the page number to advance through the multiple pages.

### 7.7.1 CREATING A MESSAGE


To create a new message, go to *Admin/Message*, and click the Add button, at the top of the table. This brings up the new message editor. The components of a message are explained in the following table:


Field	Function
Creator	The message creator, which is always your user ID.
Message Name	Label used to identify this message.
Display To...	List of message recipients. Click each user name while holding down the Ctrl key to add a recipient. Selecting no recipients is the same as selecting all. Select a set of recipients using their Group designation.
Display For...	Number of minutes, hours or days the message is displayed to users.
Content	Message text. Use the Preview button to see how the message text appears prior to saving it.

After filling in the required parameters, click *Save* to register the message. The message becomes available to all users when they refresh their browser page.

After creating a message, review its settings and determine who received it by displaying the Content page. Find the message on the Message table and click the Content button, . The fields described in the table above are displayed, plus the Notified Users field. The Notified Users field lists the users who have acknowledged the message, along with the date and time they acknowledge it.

### **7.7.2 EDITING A MESSAGE**


To change the message label, go to *Admin/Message*, and click the Rename button, , for the respective entry in the Message table. Enter the new label to use for the message and click *Rename*.

To edit the message contents, active period or list of recipients, click the Edit button, , for the respective entry in the Message table. Make the necessary changes and click Save. The changes become effective immediately. If you check the box labeled *Reset Message State* at the bottom of the page, the list of users who already acknowledged the message is reset, and the edited message will be reposted to all selected user accounts.


To disable a message, change the Display For setting to 0 days. To reactivate an inactive message, set the Display For field and click Save.

### **7.7.3 ACKNOWLEDGING A MESSAGE**

When one or more messages exist, they appear in the browser just under the tab bar. The message is outlined in red and contains an OK button. To dismiss the message, click the OK button.

Users acknowledging a message are listed on the Content page for each message. From the Message table, find the message in the table and click the Content button, . The list contains the date and time the user acknowledged the message.

### **7.7.4 DELETING A MESSAGE**

To delete a message, go to *Admin/Message*, find the message on the table and click the Delete button, . The message is immediately removed from all users' browsers and from the message table.

## **7.8 Database Schema**

The database schema can contain site-specific custom fields. The system default database schema includes a number of custom fields per database table. These can be removed if unused. Additional fields can be added during first install or any time after.

Some strict rules apply, including

- The defined schema, meaning the configuration files defined in this section, must be identical throughout the server hierarchy. Since a server must be in a defined state before these files can be edited, auto-propagation of these files is not possible.
- The system must be stopped and all pending operations completed or terminated before editing the schema files.
- Some custom database field names, IDs and other settings must be unique across the database, meaning the same value cannot be used by multiple database tables.

Some special features of the custom database schema:

- Support for record types. For example, you can create a string, numeric, date and other fields having the properties commonly found for their field types. Most DICOM types are supported, but not all.
- Support for multi-field records.
- Custom fields are available for coercion, calculated fields and HL7 configuration.
- Moving data from one database field to another is supported, but requires support assistance to move the data after the required database fields exist.



Database configuration must be performed by a certified system administrator or support personnel. Contact your support representative to discuss options for customizing your database.

### **7.8.1 IMPORTING DATA INTO DATABASE TABLES**

Some database tables can be initialized by uploading a comma-separated value (CSV) file. The contents of the same tables can be exported into a CSV file for editing and importing into the same or another server. These features are available to users with Admin privileges.

The tables supporting the import and export features are the following:

Reading locations (Admin/Settings/Reading Locations page)  
Scheduler tables, except Scheduler/Order table

The file must conform to the required format, as follows:

Row	Format	Description
1	"COLID"[, "COLID"...] \n	The four-letter column ID (COLID) for a database field. COLID values can be found on the Customize Labels page (Admin/Settings/Customize Labels)
2-N	"Value"[, "Value"...] \n	Values assigned to the respective COLID field, separated by commas and terminated with a newline character. Values must be in DICOM-compliant format and the number of values in each row must equal the number of COLID's defined in Row 1.

To initialize one of the supported database tables, do the following:

1. On the applicable page, click the Import button.
2. In the popup window, click Browse.
3. Find the CSV file and click Open.
4. Click Import.

Imported records are appended to existing records. No validation is performed on the imported data, including checks for duplicate or existing entries. A formatting error in any row means no records are imported. Import attempts are logged in the system log with Level=OTHER and Action=Import Table.

To export the contents of one of the supported database tables, do the following:

1. On the applicable page, click one of the following buttons:
  - a. Export – export the database records in CSV format
  - b. Export Raw – export the database records with DICOM formatting removed
2. When prompted by your browser, save the file to a folder on your workstation.



## 8. Archive Pages

The Archive Pages provide access to data stored in external archives and on removable media. You can list archived studies, and import studies to the local server.

Select the *Archive* tab to display the default page. If an archive from eRAD PACS v5 and earlier still exists, the *Studies* page appears by default. For eRAD PACS v6 and later, the *External* page provides access to attached third-party archives.



Access to the Archive pages requires archive privileges. Contact your system administrator to obtain archive access rights.

### 8.1 Archived Studies


Studies archived by eRAD PACS are always accessible from the worklist. Studies stored in a third-party device, such as an off-site archive or another PACS system, are accessible from the Archive pages.


Search for studies in a remote archive as follows:

1. Click the *Archive* tab then select the *External* tab
2. Enter the search criteria. It is best to specify some criteria to prevent queries from downloading the entire database and flooding the network with unnecessary data.
3. Select the remote archive from the Source list.
4. Click Apply.

The results appear in a table. Use the Filter button, , to refine the search. Sort the list using the Sort button, .

To appear in the Source list, a remote archive must exist as a Query/Retrieve SCP device in the devices table. Refer to section *7.5.1 Devices Table* for information on the devices table. Each source is listed as <deviceID>@<serverHostname>, where serverHostname is the EP server whose Devices table defines deviceID. The query is issued to the device *deviceID*. If retrieved, the study is sent to the server *serverHostname*.

If a Retrieve button, , appears in a row on the resulting table, the study is off-line, meaning it does not reside on the server. Before you can open it in the viewer or edit the contents, retrieve it using the Retrieve button. If the retrieve button exists but is grayed out, the study is in the process of being retrieved. If no retrieve button exists, the study already exists on the worklist.

The Move button, , exists in a row, you can forward the study to a third-party device. Click the Move button, and select the destination devices. The device must be configured into the archive on which the study already resides. Since the forward is between the archive device and the target device, eRAD PACS cannot provide details on the progress of status of the move.

Like the worklist, batch operations are available on the Archive table. Select the studies you want to use by clicking in the checkbox to the left of each entry. Click the batch retrieve or batch delete button in the Batch section of the table header. The requested procedure is applied to the selected studies.

## 8.2 Archiving Rules

Archiving rules govern the manner in which eRAD PACS moves the data from the parent server to the long-term archive device. The administrator can configure the following rules by contacting the customer support line.

- *Enable/Disable Archive:* Archiving refers to the archive functions prior to eRAD PACS v6. If archiving is set to *On*, data is sent to an off-line archive. This setting should be set to *Off* for eRAD PACS v6 and later. Do not alter this setting without first consulting a customer service representative.
- *Mount point:* The storage device currently configured to store long term data.
- *Studies Expire After:* Indicates the number of years eRAD PACS will keep the studies in the archive.
- *Keep the studies until the patient's age is:* Regardless of the expiration setting, a study will not be removed from the archive until the patient reaches the specified number of years of age. This rule only works for studies that have a patient birth date specified in the study objects.

### 8.2.1 ARCHIVE RETRIEVE ACTION

To selectively schedule when to automatically retrieve studies from a third-party archive, set up a retrieve action. For example, you may want to retrieve priors for procedures scheduled for the following day.

1. Start by defining the worklist containing the studies you want to retrieve and saving it as a filter.
2. Select *Worklist/Other Lists*, find the new worklist in the table, and click the 'X' button in the Retrieve column. The retrieve action configuration page appears.
3. Check *Enable* to turn retrieving on.
4. Check *Apply to Current Content* if you want to retrieve priors for all existing studies on the worklist. Leaving it unchecked performs the action for new studies only.
5. Enter the maximum number of studies to process each cycle in Batch size. An empty batch size value disables the limit setting and all studies matching the filter criteria will be executed during the action cycle.
6. The Scheduling field allows you to perform the retrieve action immediately after something matches the filter criteria, executed is in 5 minute cycles, or at a specific time on the day.
7. Click Configure to finish.

Enable:	<input type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Batch size:	<input type="text"/>
Scheduling:	immediately ▼ at <input type="text"/> :00

If a limit is defined, the system maintains a first-in-first-out queue. Studies that match the filter criteria at the time the action cycle occurs are appended to the end of the queue. Then the system applies the action to studies at the head of the queue. The action's *Batch Size* setting defines the number of studies processed. The procedure repeats with each action cycle until the queue is empty.

If no retrieve action exists, a default setup is used. The default is to check all new orders and studies for priors when they reach the first server in the eRAD PACS system.

## 8.3 Archive Media



Importing and exporting studies from/to DICOM media is available as an archive tool. The following media types are supported, all based on the respective DICOM application profile:

CD, compact flash drive, DVD, DVD-RAM, multi-media card, secure digital card, and USB-connected device.

### 8.3.1 IMPORTING STUDIES FROM DICOM MEDIA



The Media page provides access to DICOM-compliant removable media inserted into the server's CD/DVD drive or from the user workstation. Users must have CD Import permissions to import studies from DICOM media.

To import studies from removable media on a user workstation, do the following:

1. From the Archive tab, click the Media Import tab.
2. In the Search On field, select Client. This downloads and activates the import applet. Your browser must be configured to permit downloads and applet loads from your eRAD PACS server. When the applet is loaded, the Select button is enabled.
3. Click the Select button. A window appears for browsing your workstation's file system.
4. Browse to the root directory of the DICOM media. For example, if you're importing from a DVD, select the DVD drive.
5. Select the DICOMDIR file in the root directory of the DICOM media.
  - a. If no DICOMDIR file exists on the DICOM media, change the file type setting to *Individual Files* and browse to the directory containing the object files. Select the file you want to import. Press the Ctrl button while clicking to select multiple files.
6. Click Open. The contents of the media appear on the web page in your browser.
7. Import the studies.
  - a. To import multiple studies, check the box on the left of each study row and click the batch Import button,  , at the top of the table.
  - b. To import a single study, select the Import button,  , in the study's row.
8. The progress bar displays the status. When it's complete, the page refreshes.

In step 5a, when no DICOMDIR object exists, all the selected files are uploaded to the server, regardless of whether they are DICOM objects or not. The server inspects them and if found to be DICOM objects, includes them on the selection list. This can take a long time to complete.

To import studies from a CD/DVD loaded into your server's drive, do the following:

1. From the Archive tab, click the Media Import tab.
2. In the Search On field, select Server. The contents of the CD/DVD appear on the web page.
3. Import the studies.
  - a. To import multiple studies, check the box on the left of each study row and click the batch Import button,  , at the top of the table.
  - b. To import a single study, select the Import button,  , in the study's row.
4. When importing completes, the page refreshes.

When importing studies from DICOM media in a worklist-hub environment, the software stores the selected studies on a default hub server. You can override the system default by selecting a specific hub from the *Target Hub* list. This field appears when logged into a Worklist server, after you select the DICOMDIR or files in the browse panel.

Data imported from removable media is not sent to the archive.

### **8.3.2 MONITORING MULTIPLE DICOM MEDIA CREATION JOBS**

Pending media creation jobs are listed on the Media Creation page, under the Archive tab. The information is continuously updated to reflect the latest status of each media export job.

Users with Admin permissions, and depending on the configuration, users with Export permissions can, terminate pending jobs from the Media Creation page by clicking Cancel.

The number of pending media creation jobs permitted is defined by the media creation limits, defined by the study operation settings.

## **8.4 Archive Filters**

By default, eRAD PACS archives all data it receives. It is possible to instruct eRAD PACS to archive a subset of the data by setting up an archive filter. All administrator accounts have the privileges needed to set up an archive filter.

To set up an archive filter, use the worklist filter tools to define the criteria matching the studies you want sent to the archive. Save the archive filter as you would any other filter, using the user ID @system and the .archive filter type.

## 9. Report Pages


The report pages contain activity reports, template administrative reports and access to generic scanned documents and files.

### 9.1 Server Activity Accounting

The Accounting page summarizes the activity over a defined period of time. It contains information such as patient identifiers, study identifiers, institution details and volume summaries.

Access to the *Accounting* tab requires Billing rights.

To generate a server activity report, do the following:

1. Click the Report tab.
2. Click the Accounting tab.
3. Click the Edit Fields button to select the columns you want displayed on your report page. For instructions on selecting fields, refer to the Customizing Worklist Columns section of the Server manual.
4. Click Done.
5. Apply filters to the report table, such as a date range, by clicking the filter button, , at the top of the column.
6. Apply sort order to the columns in the report table by clicking the column header label.

The Accounting page layout can be saved and recalled from the list of list filters. Saving a layout requires worklist configuration permission. To save the Accounting page layout, do the following:

7. At the bottom of the report table, select the user ID from the Save List As menu.
8. In the list type field, select Default to overwrite your default report layout, or New to create a new one.
9. Enter a label for the new layout.
10. Click Save.

The report label appears in the list of saved layouts at the top of the page.

The Exclude Derived Studies option available in previous releases is available as a field (column) for users with support rights. On the Edit Fields page (step 3, above), select the Log table and the Derived field. To filter out derived studies, filter the column for "No".

Reports can be emailed to a list of email addresses at configured times. See *9.1.1 Send Summary Report Action* section for details.

The following buttons and settings exist for exporting the account summary information:

Button	Function
Print Friendly	Format the tables and send it to a local printer.
Export	Format the tables into a tab-delimited file format and save the data to disk. This file can then be imported into a spreadsheet program, such as Microsoft Excel.



### 9.1.1 SEND SUMMARY REPORT ACTION

Accounting reports can be automatically send via email at scheduled times. The report is a configured email containing a hyperlink to the matching accounting report page.

To configure the server to automatically send accounting summary reports, do the following:

1. From the Accounting page, create and save a report layout.
2. Click the Worklist tab.
3. Click the Other Lists tab.
4. In the list menu, select Accounting Lists.
5. Use the search tools to find the report layout filter created in Step 1.
6. Click the Send Summary column's button for the row for the report layout filter. The send summary action configuration page appears.
7. Check the Enable button.
8. Define the scheduling settings.
9. Enter the recipient email addresses.
10. Click Configure.

Enable:	<input type="checkbox"/>
Scheduling:	<input checked="" type="radio"/> Monthly on day <input type="text" value="1"/> <input type="radio"/> Weekly on <input type="text" value="Sunday"/> <input type="radio"/> Daily
	at (hh:mm 24 hour format) <input type="text" value="08"/> : <input type="text" value="00"/>
Email addresses: (one address per line)	

When scheduled to run, the action runs the selected filter and sends an email to the recipient list containing a link to the results. Click the link in the email and enter your user credentials to log in and access the report.



The email template is available from the Admin→Settings→Customize Layout XML Files page. From the Layout Type list, select Accounting Message. For details on customizing an XML template, refer to the *eRAD Layout XML Customization* manual.

## 9.2 Administration Reports

Generic forms and documents can be stored on the server and printed or attached to patient or procedure records. Documents must be accessible from the local machine, either residing on the local disk or media inserted into the local drive, or on a network accessible machine.

To upload or update a form, create and upload an XML template using the Layout Type of Administrative Reports.

To run a report using an existing template, follow the steps below:

1. Click the Reports tab.
2. Click the Administration tab.
3. Under the section Administrator Reports, select the report file from the list.
4. To display a report, click the Open button, . The report appears in a new browser window.
5. To print a report, click the Print button, .

## 9.3 Documents

Generic forms and documents can be stored on the server and attached to various XML templates and web pages. To upload documents, they must be accessible from the local machine, either residing on the local disk or media inserted into the local drive, or on a

network accessible machine. To upload or update a form initialized by eRAD Scheduler, follow these steps:

1. Click on the Admin tab.
2. Click the Settings tab.
3. Click the Customize Layout XML Files link in the System Settings section.
4. In the Documents on Server section, enter the filename in the text field, or locate it using the Browse button.
5. Click the Upload button.

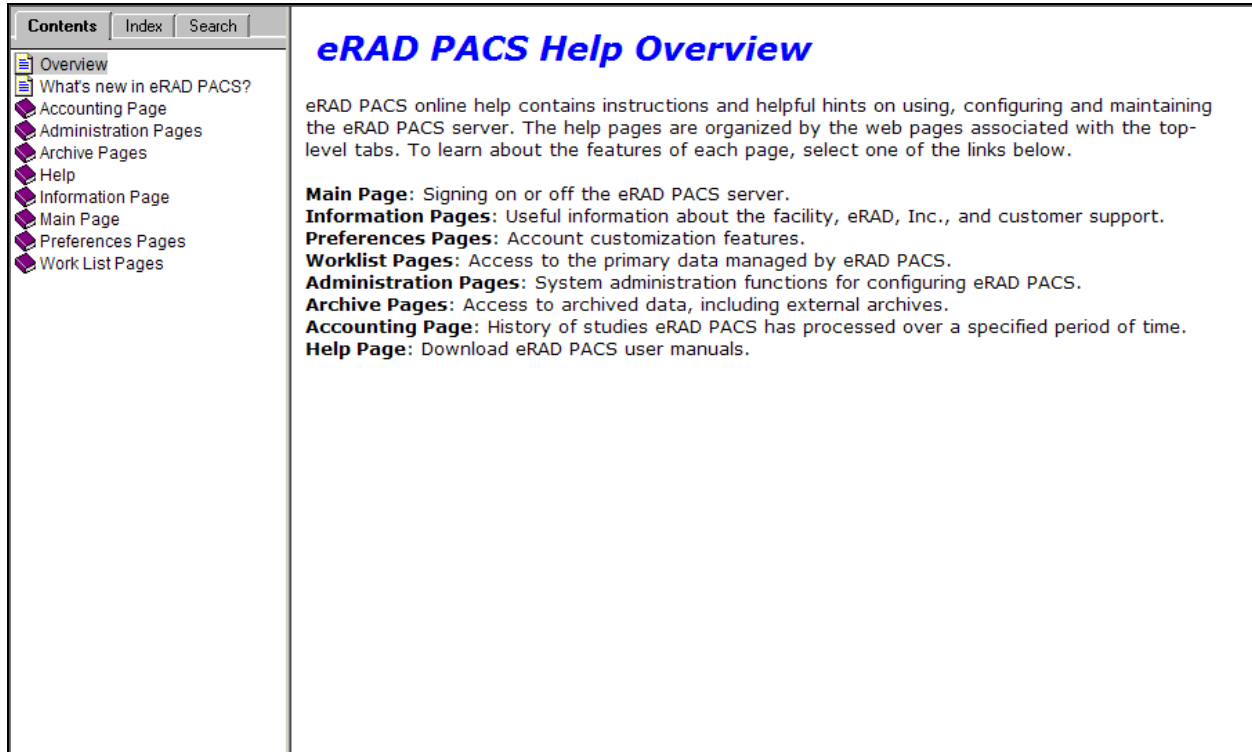
To download a copy of an un-initialized form or document, go to the Documents tab under Reports. Scroll through the list of files to find the one you want, and click the open button,





## 10. Help Pages

eRAD PACS online help is a collection of pages containing instructions and helpful hints on using, configuring and maintaining the eRAD PACS Server. To view the help files, click the *Help* tab, available on any of the eRAD PACS web pages.



**eRAD PACS Help Overview**

eRAD PACS online help contains instructions and helpful hints on using, configuring and maintaining the eRAD PACS server. The help pages are organized by the web pages associated with the top-level tabs. To learn about the features of each page, select one of the links below.

**Main Page:** Signing on or off the eRAD PACS server.  
**Information Pages:** Useful information about the facility, eRAD, Inc., and customer support.  
**Preferences Pages:** Account customization features.  
**Worklist Pages:** Access to the primary data managed by eRAD PACS.  
**Administration Pages:** System administration functions for configuring eRAD PACS.  
**Archive Pages:** Access to archived data, including external archives.  
**Accounting Page:** History of studies eRAD PACS has processed over a specified period of time.  
**Help Page:** Download eRAD PACS user manuals.


The help pages are constructed with a Quick Start summary at the top of the page, when the page actually describes an activity and not just an overview. Follow the Quick Start instructions to perform the function. If you need additional information, or the Quick Start instructions are not clear, a more in-depth discussion of the topic follows.



## 11. eRAD PACS Viewer

The eRAD PACS web pages allow the user to manipulate meta data about the study. The eRAD PACS viewer manipulates and annotates full fidelity images and generates reports.

The eRAD PACS viewer is a local application which resides on your workstation. It is downloaded and installed when the first study is opened and is regularly updated to add functionality. See section 6.3.1.1 Downloading the Viewer for instructions to download and install the eRAD PACS viewer.

Launch the viewer by clicking on the patient name. This also loads the study. Or, launch the viewer by clicking the folder button,  at the left of the appropriate row. Section 6.3.1.2 Loading Studies Into the Viewer contains information on opening a study in the eRAD PACS viewer.

Refer to the eRAD PACS Viewer Manual for additional information on using the eRAD PACS Viewers.





## 12. Radar CTRM Module


Radar's Critical Test Results Management (CTRM) system can be invoked directly from eRAD PACS. Access is available from the Viewer, the report page and panel, and other configurable web pages. Radar CTRM requires a server license. User access to the CTRM tools requires the CTRM user permission.


### 12.1 Customizing the Radar CTRM Template

Two XML template components exist for customizing the Radar CTRM solution. They are a Radar CTRM template used to define the CTRM panel when called up from a web page or the viewer, and a Radar CTRM Element node used to define a web page button that activates the CTRM panel.

The Radar CTRM panel template is available from the XML template editor control page. To customize this template, do the following:

1. Select the Admin tab.
2. Select the Settings tab.
3. In the System Settings section, click the Customize Layout XML Files link.
4. In the Layout Type list, select Radar CTRM panel.
5. Select the template you want to edit, click Edit and make the necessary changes. For details on editing and saving an XML template, refer to the eRAD XML Template Customization Manual.
6. The XML code defined in the CTRMRoot element in this template contains the information passed to the Radar CTRM server. It includes user account information, study information and referring physician contact information, among other details. The default XML code provides the minimum information required by Radar CTRM. Refer to the Radar CTRM documentation for details on this XML code.
7. Save the template and exit the template editor.
8. Assign the custom template to the system, groups and users as necessary. When the user loads the Radar CTRM panel, the respective template is used.

To provide CTRM functionality to a web page, add the button to a web page template, such as the Report View Page. To add a button to a web page template, insert a RadarCtrmElement node in an XML template, as defined in the *eRAD XML Template Customization Manual*. The node adds the Create CTRM button, , on the web page. When the button is pushed, the Radar CTRM panel pops up. The panel uses the Radar CTRM Panel template as its content.

The Viewer comes with a CTRM toolbar already configured. It includes the Create CTRM button, , to active the Radar CTRM panel.

### 12.2 Creating a Radar CTRM Message

Activate a Radar CTRM session from a web page by pressing the Create CTRM button on the web page. The button exists if the web page has been configured to display it. Not all web pages display the Create CTRM button. A common location is the report page. When it exists, the button is active if your account has been assigned the CTRM permission. After pushing the Create CTRM button, the Radar CTRM panel pops up in its own browser window.



For information on using the Radar CTRM panel to create a CTRM message, refer to the Radar CTRM User Manual.

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