



eRAD PACS™ OPERATOR MANUAL

Version 6.1

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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.

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

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

1.2 Indications of Use

The eRAD PACS system acquires image and patient information from any one of several types of medical imaging modalities. The eRAD PACS open software architecture enables hospital network users to enter, review, archive and print patient demographic and radiographic study information received from a hospital information system (HIS) and/or a radiology information system (RIS). The patient demographics and order information can be routed through the hospital network structures and sent along with the diagnostic images to remote hosts for viewing and printers for hard copy imaging. The open system architecture allows for the adoption of changes in technology so hardware can be switched while maintaining consistent workflow.

Follow all safety labels on the equipment.

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.

eRAD Inc. Technical Support

United States/North America

9 Pilgrim Road
Greenville, SC 29607
Office: +1.864.234.7430
Support: +1.866.414.eRAD (3723)
FAX: +1.864.234.7412

Europe

Maros u. 12
Budapest H-1122, Hungary
Voice: +36.1.489.4700
FAX: +36.1.489.4709

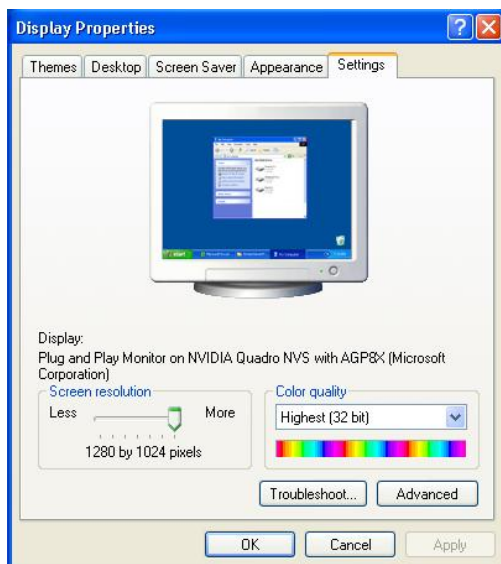
2. Getting Started

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 2000, XP and Vista which may impact the information contained in this manual. By default, all Windows operations are shown for Windows XP.

2.1 Adjusting Monitor Resolution

Before accessing the eRAD PACS software, make sure your Windows monitor settings are correct for the best results. The workstation should be configured for a 32-bit color map or the highest possible color map if 32-bit is not available.



To check or change the resolution on your Windows computer:

- Open the display settings panel from the desktop by right clicking on a blank area and selecting Properties. You can also open the display setting window from the Windows Control Panel.
- Select the Settings tab.
- Adjust the resolution with the slider bar under Screen Area. The recommended screen resolution is 1280 by 1024 pixels.
- Set the Colors drop down to 32-bit color, or the highest possible setting.
- Click Apply, and then OK.
- When prompted to save the settings, click OK.

2.2 Initiating a Browser Session

Use a workstation connected to a network with access to the eRAD PACS server, and Microsoft Internet Explorer or Mozilla Firefox. Launch the web browser and enter the URL of the eRAD PACS server into the address line. 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.eradimagedmedical.com
http://pacs.eradimagedmedical.com
https://192.168.10.1

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 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 2.2.1 *Accepting Certificates*.

2.2.1 ACCEPTING CERTIFICATES

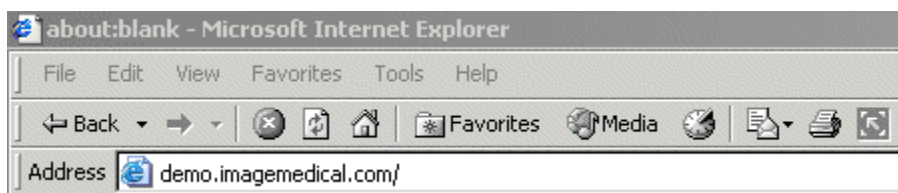
When using eRAD PACS across a wide area network (WAN), additional security is necessary to protect the data. A digital certificate verifies the server with which the user communicates is actually a valid eRAD PACS server, and confirms the software and data have not been modified by an unapproved entity. 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.

eRAD PACS supports both Microsoft Internet Explorer and Mozilla web browsers. Each has a different method of saving certificates. Follow the instructions below for the browser you are using.

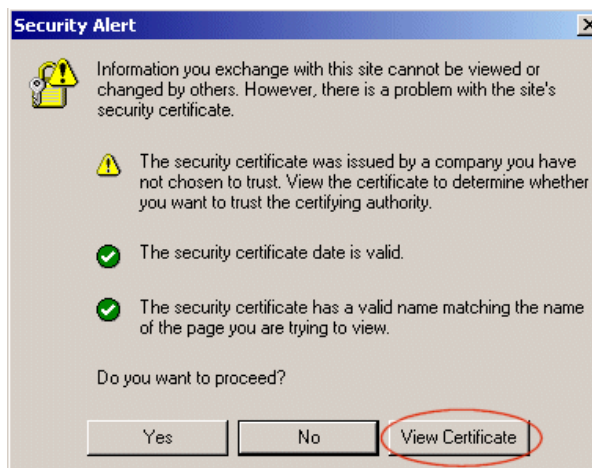
2.2.1.1 Adding a Certificate in Internet Explorer

The process for adding a certificate to Internet Explorer v6 (IE6) and v7 (IE7) requires an invocation of the installation wizard. The browser prompts the user for all the necessary information. In general, accept all the defaults and Internet Explorer will automatically install the certificate.

- Open the browser and enter the web address (URL) for your eRAD PACS server. Click *Go*, or press the Enter key to initiate the session.



- When the browser finds the server, it checks the certificate against all the approved certificates on your PC. If your PC has not accepted the eRAD PACS certificate previously, a security alert window appears. The alert to the right is from IE6. The alert displays the company you have not chosen to trust issued the security certificate. The alert should also indicate the certificate date is valid and the certificate has a valid name. To install the certificate, click *View Certificate*.

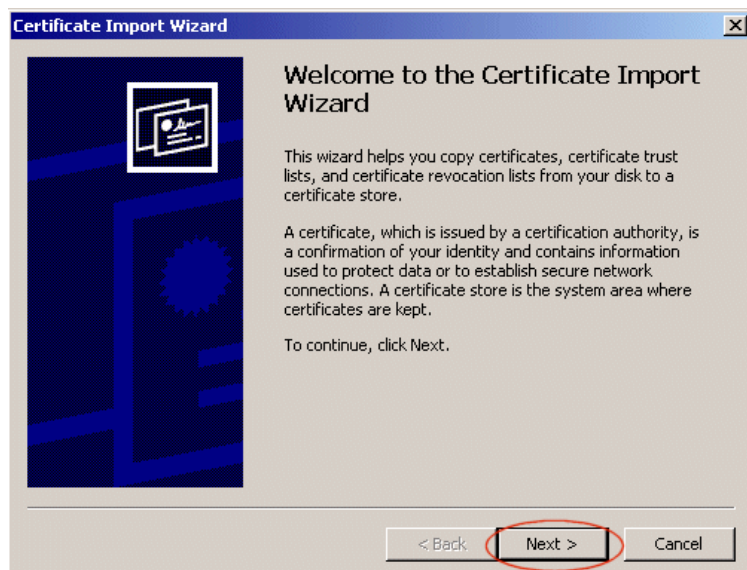


In IE7, the alert indicates there is a problem with the website's security certificate. To reach the web site, verify you entered the correct URL and select the option to *Continue to this website*. If the site's SLL certificate is not registered with a certificate authority, the IE7 browser may display *Certificate Error* at the top. To eliminate this warning, you must purchase a registered SSL certificate for your servers from a certificate authority.

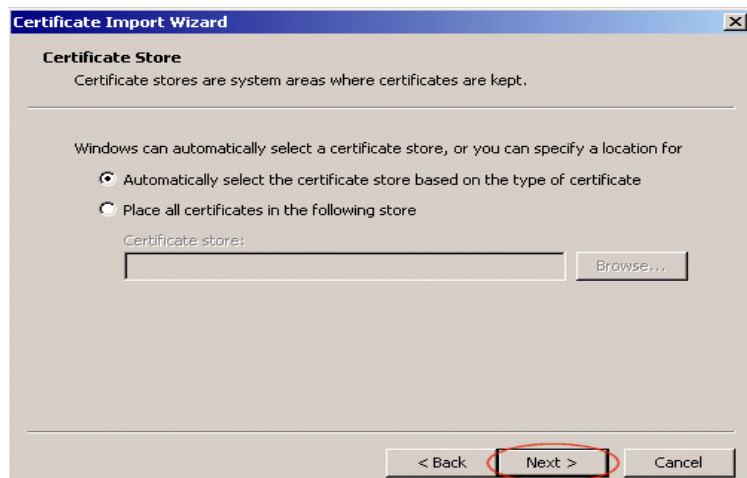
- The certificate information appears in a window. It lists the name of the company or web site issuing the certificate, along with the valid dates of the certificate. To continue installing the certificate, click the button *Install Certificate...*



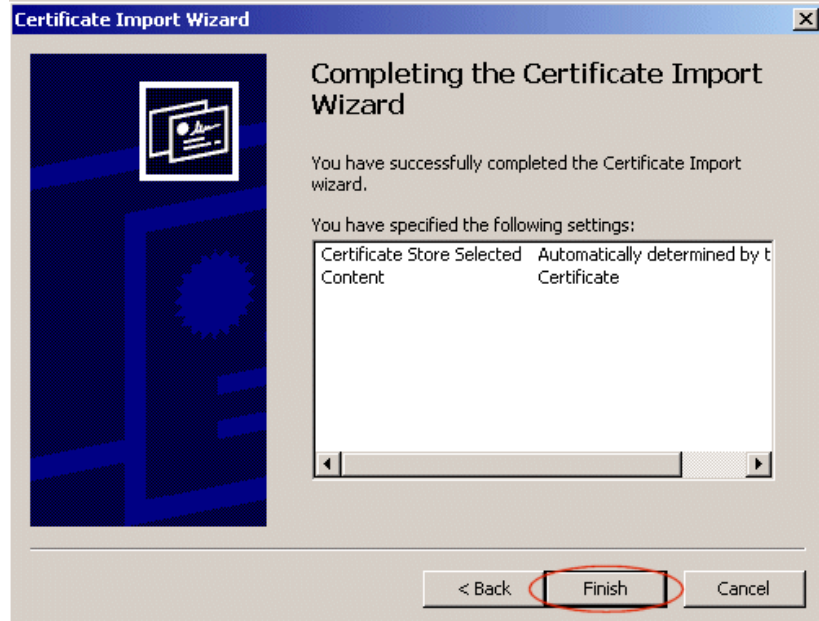
- The certificate import wizard appears. This tool assists you in installing the certificate. Start by clicking on the *Next* button.



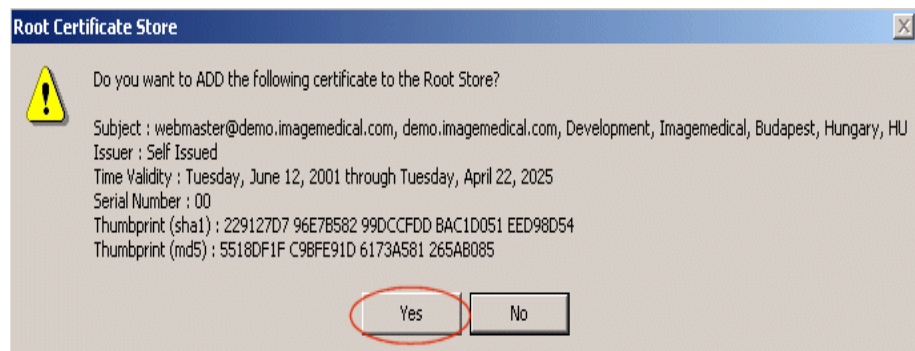
- Continue by selecting to store the certificate based on the type of certificate, and click the *Next* button.



- Complete the import wizard by clicking on the *Finish* button.

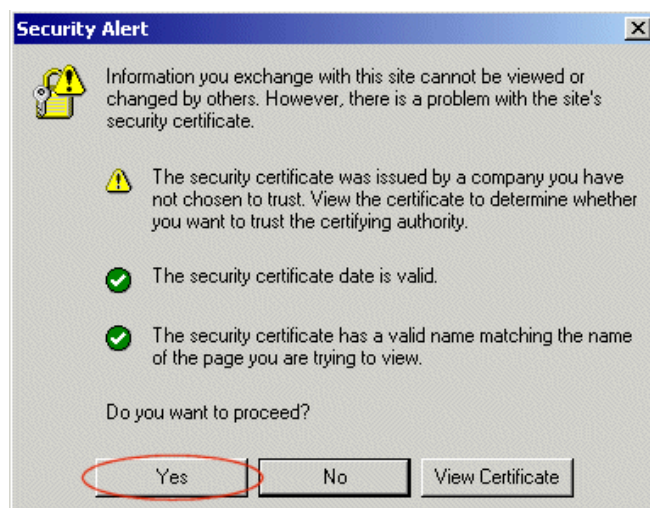


- A prompt appears asking for a confirmation to add the certificate to the Root Store. Select *Yes* to store the certificate. A final popup notice appears indicating the certificate was properly imported. Click *OK* to complete the importing process.



- In IE6, this returns you to the original certificate notice. Click *Yes* to proceed.

In IE7, a popup notice reports the import succeeded. Click *OK*. In the Certificate Information window, click *OK*.



Even after importing the certificate, IE7 may display a certificate warning if the URL is unregistered. Previous versions of Internet Explorer support instructing the browser to trust specific sites. You can do the same in IE7, but you still receive the warning.

2.2.1.2 Adding a Certificate in Firefox

The process for adding a certificate to Mozilla Firefox involves a single popup notice from the browser. In general, elect to accept the certificate permanently, and Firefox automatically installs the certificate.

➤ When the notice appears, select *Accept this Certificate permanently*. Click the *OK* button, and Firefox installs the certificate on your workstation.



2.2.2 CUSTOMIZING BROWSER SETTINGS

Some browsers use default settings that may conflict with eRAD PACS functions.

2.2.2.1 Internet Explorer v7 Setting Changes

The following default setting in Internet Explorer v7 need to change to avoid extra pop up windows, notifications and errors.

- **Automatic prompting for file downloads**

When eRAD PACS attempts to open a locked study, IE7 prevents the viewer from downloading the data. To correct for this, enable automatic file downloads.

1. Open an IE7 browser.
2. Select the Tools menu.
3. Click *Internet Options*.
4. Select the Security tab.
5. Click the Custom Level button.
6. In the Downloads section, change the setting for *Automatic prompting for file downloads* from Disable to Enable.

2.3 Basic Function Overview

eRAD PACS is a web-enabled system accessible from a common web browser. As a result, many of the familiar conventions you find when visiting other web sites are available in eRAD PACS. The home page is the first page you encounter when you gain access to the server. The system information is collected in a hierarchy of other pages that you access by clicking on hyperlinks. Click the browser *Back* button to return to the previous page. Save a particular page in your Favorites folder. Create a link to the eRAD PACS server on web pages you have the rights to modify.

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 *eRAD PACS*.

Quick Start Instructions – Signing On

- Launch Internet Explorer or Firefox.
- 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 groups 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.

2.3.2 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.

2.3.3 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 *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:

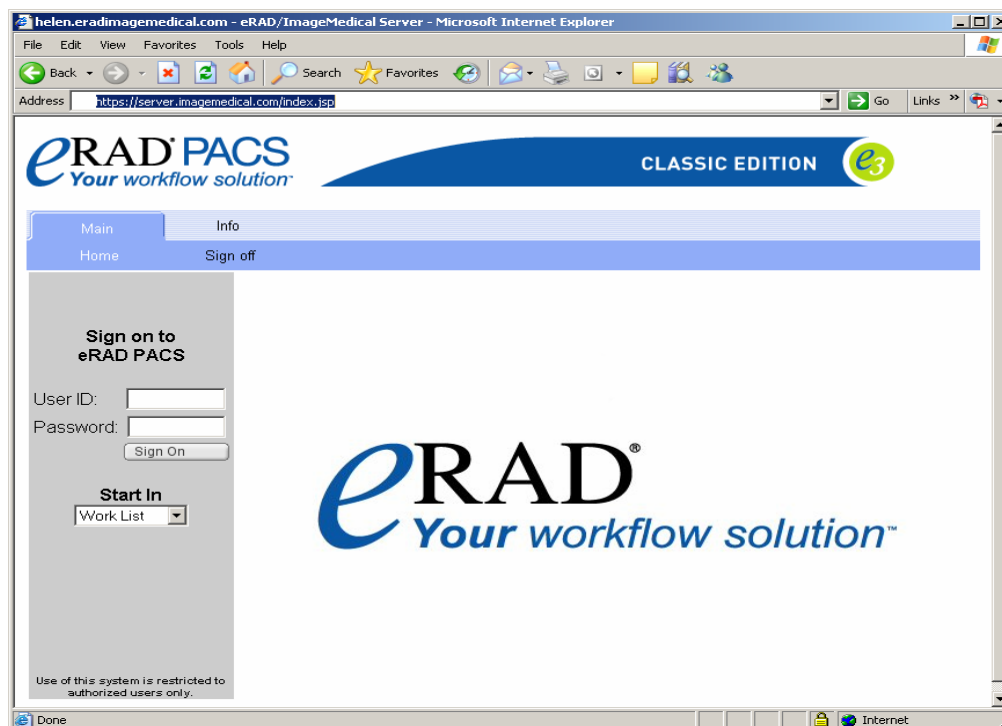
- If no template or hanging protocol is defined, the viewer displays the layout manager when loading a study. Select the viewer grid format, then double-click or drag and drop a series to load it into the desired grid frame. Click outside the layout manager or close the layout manager window to continue.
- 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".

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 Pages 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 eRAD PACS Sign On

To sign on to the eRAD PACS server, you must have been given a user account. The user account is used to identify you throughout the system. This allows eRAD PACS to download your personal profile from the server providing you with the same custom interface regardless of your location. eRAD PACS also uses your account information to tag your actions automatically, so you do not have to explicitly enter your identification information each time you create, modify or delete data.

Enter your user ID and password in the fields on the Main page. Both the user ID and password are case sensitive. By default, you will go to the Worklist page after eRAD PACS verifies your account information. If you wish to go to a different page, select the page from the dropdown menu just beneath the user ID and password fields. Click the *Sign On* button or press the enter key to continue.

Quick Start Instructions – Signing On

- Launch Microsoft Internet Explorer or Firefox.
- Enter your eRAD PACS server URL from your Favorites list, or type the IP address or host name into the address textbox.
- Enter your User ID and password. Both are case sensitive.
- Click the Sign On Button.

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 2.2.1 *Accepting Certificates*.

3.3 Signing Off

To sign off eRAD PACS, click *Main/Sign Off*. A message prompts you for confirmation. Click the *Sign Off* Button to complete the log out.

eRAD PACS includes an auto-logout feature. If enabled by the administrator, the system logs you off of eRAD PACS if your session remains inactive for the specified period of time. If this period is short enough to disrupt your workflow, speak with your system administrator to get the timeout period increased. If the auto-logout timer expires, eRAD PACS displays a new login prompt. Enter your User ID and password and you will return to the page last displayed. Alternatively, you can return to the Main page and sign on again.

Quick Start Instructions – Signing Off

- Go to the Main Page.
- Click the Sign Off Tab.
- Click the *Sign Off* Button.

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@eradimagemedical.com

eRAD Inc. Sales

+**1.864.234.7430**

E-mail: info@eradimagemedical.com

eRAD 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>*.

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

4.3 About eRAD

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

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 Changing Your Password

To change your password, click *Preferences/User Information*. Place your cursor in the *Old Password* field and type your existing password. Then enter a new password in the *New Password* field. Enter your new password again in the *Retype Password* field for confirmation. To finish the process, click the *Change Password* button.

Quick Start Instructions – Changing Password

- Go to the Preferences page.
- Click the User Information tab.
- Type the existing password.
- Type your new password.
- Retype your new password.
- Click the *Change* button.

5.2 Changing User Information

To change your personal user information, select *Preferences/User Information*. A new page showing your first name, last name, e-mail address and starting web page appears. This information is linked to your user account and includes the user name you used to sign on. To change your settings, click into the respective field, delete the old entry and type in a new one. To complete the process, click the *Change* Button.

Quick Start Instructions – Changing User Information

- Go to the Preferences page.
- Click the User Information tab.
- Type the new user information.
- Click the *Change* button.

5.3 Changing Workstation Settings

To change the workstation setting, select *Preferences/Workstation*. A page showing the workstation's current eRAD PACS browser interface settings appears. This information is linked to the browser on this workstation. The value is assigned to any user logging into this workstation. As a result, changes you make affect other users as well. To change workstation settings, click into the respective field, delete the old entry and type in a new one. To complete the process, click the *Change* Button.

Quick Start Instructions – Changing Workstation Settings

- Go to the Preferences page.
- Click the Workstation tab.
- Type the new user information.
- Click the *Change* button.

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.


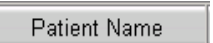











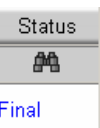

The worklist table is organized with one study record per row. The user manipulates the worklist by selecting the study information columns, sorting the data in those columns, and filtering the information to show a subset of the studies in the worklist table. For frequently applied worklist configurations, 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 worklist 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. A hidden filter is one applied to a column that is not displayed on the current 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.
Sort worklist		Set the sorting preference on one, two or three columns in the displayed worklist.
Batch open, delete, forward, merge and sign reports		To operate on multiple worklist records, 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.
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.
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		Export the current worklist to a tab-delimited file.
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 AFFECT 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 page number, page size, refresh time, and Change buttons.

- **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 Button** activates changes made to the page size and refresh time.

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	Blue, medium blue, and light blue	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.
Selected study	Blue	On the relevant cases page, the study selected from the worklist appears highlighted.
Folder shortcut	Brown	Shortcuts referring to studies which exist in a user-defined folder.
Stat	Red/Pink	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	Dark pink	Study priority state is set to High and the Normal flag on the report is cleared.
Flagged report	Orange	The Normal flag on the report is cleared, indicating the report has been tagged to draw attention to it.
Expired order	Yellow	Expired orders are those whose scheduled procedure date and time has passed.
No condition	White or grey	Rows with no condition applied appear in alternating white and grey.

6.2.2 CUSTOMIZE WORKLIST COLUMNS

Each column header identifies a field within a database record. There are actually many more fields within each record than are shown in the Worklist. The complete list of fields is available when you use the Edit Fields button, .






Change the information displayed on the worklist by adding, removing or deleting columns. Make these changes on the Edit Fields page. Click on the Edit Fields button at the top of the worklist. The *Edit Fields* page shows the relative position of each column (*Pos*), and the attribute whose value will occupy this column (*Field*). Insert and remove columns by using the insert  and remove  buttons on the right side of the table. To move a column, first remove it and then insert it in the new location. To change an existing column attribute, click the pull down menu and select from the popup list. The complete list of attributes available for display in the worklist is given in Table 6.2.2-1. When finished, click the *Done* button. To save these changes for later use, save a worklist filter. See 6.2.4.5 Saving Worklist Filter Definitions for details.

Table 6.2.2-1 – Worklist Column Attributes

Attribute	Description/DICOM Tag
Accession Number	(0008,0050)
Acquisition Date	(0008,0022) and (0008,0032)
BI-RADS	BIRAD values assigned to a mammography report
Body Part	(0018,0015)
Changed flag	Study changed flag
[Study] Comments	(0032,4000)
[Instance] Creation Date	(0008,0012) and (0008,0013)
[Instance] Creator	(0008,0014)
[eRAD PACS] Date	Stored value used as study date. Used when the DICOM object does not properly include a study date value. There are rules for generating this date based on other date values, receive date, etc.
[Patient] Date of Birth	(0010,0030) and (0010,0032)
[Study] Description	(0008,1030)
File Name	Image file names (Used for debug)
Folder Link Flag	Flag indicating the study belongs to a folder
HUB	Hub server on which study resides (Worklist servers only)
ICD-9 Code	ICD-9 code received in HL7 object
Image Date	(0008,0023) and (0008,0033)
Image Number	(0020,0013)
Image Size	Rows (0028,0010) times columns (0028,0011)
Image Type	(0008,0008)
Institution Name	(0008,0080)
Manufacturer	(0008,0070)
Manufacturer Model	(0008,1090)
MIN SOP I UID	Lowest Instance UID in study (used for debug)
Modality	(0008,0060)
Modalities in Study	(0008,0061)
Modality AE Title	(0040,0241)
Normal	Flag indicating report is Normal
Number of Frames in Study	(0028,0008)
Number of Images in Study	(0020,1208) or number of images in the study
Number of Objects in Study	Total of images, report files, and other objects
Number of Series in Study	(0020,1206) or number of series in the study
Number of Sources	Number of hub servers on which study resides.

Attribute	Description/DICOM Tag
Object size	Size of an object file
Patient Age	(0010,1010)
Patient ID	(0010,0020)
Patient Name	(0010,0010)
Percent Downloaded	Percent of study data downloaded to workstation cache. Available for registered workstations only.
Performing Physician	(0008,1050)
Physician of Record	(0008,1048)
Priority	(0032,000C)
Procedure Code	Procedure code received in HL7 object
Procedure ID	(0040,1001)
Proposed Study UID	Study UID created for Modality Worklist
Radiologist	Stored value used depending on state of entry. It starts as the requested reading physician, then reading physician, and finally interpretation author.
Reading Physician	(0008,1060)
Receive Date	Date and time received the object
Referring Physician	(0008,0090)
Referring Physician Address	(0008,0092)
Report Date	Date and time the report was created (v5.2.1 only)
Report Status	Status of main report text, not including addendums
Retrieved from Archive	Study was retrieved from the archive
Scheduled Date	(0032,1000) and (0032,1001)
Scheduled Procedure Step	(0040,0009)
Scheduler Order Number	Identifier linking a study to an order created by eRAD Scheduler
Series Date	(0008,0021) and (0008,0031)
Series Description	(0008,103E)
Series Number	(0020,0011)
Series UID	(0020,000E)
[Patient] Sex	(0010,0040)
SOP Class UID	(0008,0016)
SOP I[ntance] UID	(0008,0018)
Station Name	(0008,1010)
Store Level	Archive state
Study Date	(0008,0020) and (0008,0030)
Study ID	(0020,0010)
Study Size	Sum of Image Size for all objects in study
[Study] Status	State of the study
Study UID	(0020,000D)
[Custom] User Fields (1-10)	Ten custom fields defined by system administrator
Warning	List of warnings/conditions entered into Scheduler for procedure

Quick Start Instructions – Customizing Worklist Columns


- From the worklist, click the Edit Fields button, .
- Insert a new column into the respective position by clicking on the insert icon  and selecting an attribute from the pull down list.
- Remove an existing column by clicking on the remove icon  for the row you want deleted.
- Change an existing column by selecting an attribute from the pull down list.
- After making all changes, click *Done*.

6.2.3 SORTING THE WORKLIST

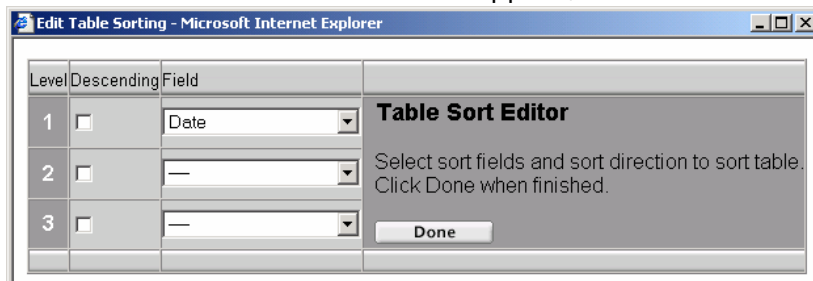
eRAD PACS sorts the worklist columns in either ascending order, descending order, or in a procedural order. Each column used for sorting appears highlighted blue. All columns are

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

Most unfiltered worklists consist of more entries than a user can easily manage. To search through the worklist and find one or more specific studies, apply a worklist filter. A worklist filter is a set of matching criteria eRAD PACS applies to the data in the worklist. An example is a worklist 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 display a filter window. A popup window appears prompting you to enter a search pattern. 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

Depending on the Filter List setting, a list of 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. Click on one of these values in place of typing the string. Select multiple values in the list by pressing the ctrl or shift key while you click the value. When complete, click the *Apply* button to display the filtered worklist. The filter button at the top of the column shows the applied filter.

The filter request can search for an exact pattern match, a match anywhere in the data, or for data void of the search criteria. The behavior associated with each checkbox is as follows:

<i>Is</i>	Find all records matching the pattern exactly, including leading and trailing spaces.
<i>Contains</i>	Search for records containing the search pattern anywhere in the string.
<i>Is Not</i>	Find everything except the exact pattern specified.
<i>Does Not Contain</i>	Find all records that do not contain the pattern anywhere in the data string.

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, and remove the checkmark from the *Contains*, *Is*, *Does Not Contain* or *Is Not* checkboxes. Click the *Apply* button to display the modified worklist.

Quick Start Instructions – Searching the Worklist

- On the worklist, click the column filter icon, .
- Enter a search pattern, or select a predefined value from the list, if present.
- Click Apply.


6.2.4.2 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.


Figure 6.2.4.2-1 – Multiple Filters Page

Visible Filters	
Fields	Settings
Date	<input checked="" type="checkbox"/> older than 14 months <input type="checkbox"/> after Jan <input type="checkbox"/> or <input type="checkbox"/> before Jan <input type="checkbox"/> In the future: <input type="checkbox"/> beyond <input type="checkbox"/> within <input type="checkbox"/> minutes
Day of week	<input type="checkbox"/> is Sunday <input type="checkbox"/> is Monday <input type="checkbox"/> is Tuesday <input type="checkbox"/> is Wednesday <input type="checkbox"/> is Thursday <input type="checkbox"/> is Friday <input type="checkbox"/> is Saturday
Time of day	<input type="checkbox"/> is between Start time (hh:mm) <input type="checkbox"/> is not between End time (hh:mm) Enter time using 24 hour format
Patient Name	<input type="checkbox"/> contains <input type="checkbox"/> is Pref: First: MI: Last: Suf: <input type="checkbox"/> is Adams, Daniel B <input type="checkbox"/> does not contain <input type="checkbox"/> is not <input type="checkbox"/> is not Adams, Daniel A <input type="checkbox"/> is not Adams, Daniel F
Status	<input type="checkbox"/> is Ordered <input type="checkbox"/> is Scheduled <input type="checkbox"/> is In Process
Modality	<input type="checkbox"/> contains <input type="checkbox"/> is <input type="checkbox"/> is not <input type="checkbox"/> is not CR <input type="checkbox"/> is not CT <input type="checkbox"/> is not DR

From the Worklist, click the Filters button, , at the top of the worklist. A page appears, as seen in Figure 6.2.4.2-1, showing all columns in your current worklist. From here, enter the search criteria for each field. Check the checkbox at the far left of each row to activate the filter, and fill in the required fields for the filter. Click the *Apply* button, and the worklist displays the results.

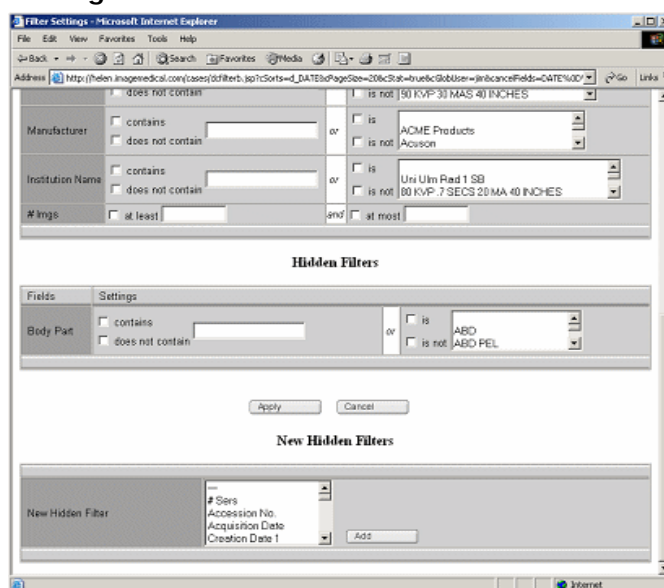
By default, the Filter window provides fields for each of the columns displayed in the worklist. eRAD PACS also allows you to filter on data not displayed in the current worklist. This method would be used, for example, if you want to define a filter using the Body Part field, but you do not want to show the Body Part column in the worklist. At the bottom of the Filter window is a section called New Hidden Filters, as shown in Figure 6.2.4.2-2.

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.

Figure 6.2.4.2-2 – Hidden Filters Window




Quick Start Instructions – Searching the Worklist


- On the worklist, click the Filters button, .
- Enter a search pattern, or select a predefined value from the menu, for each attribute by which you wish to filter the worklist.
- To search on an attribute not present in the worklist, find it in the Hidden Filter list, click *Add*, and then enter the search pattern.
- Click *Apply*.

6.2.4.3 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.

6.2.4.4 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.

6.2.4.5 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.

6.2.4.6 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.

All defined worklist filters are listed under *Worklist/Other Lists*. A shortcut button 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.

Quick Start Instructions – Applying Worklist Filters

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

6.2.4.7 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*.

6.2.4.8 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*.

6.2.5 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 on the eRAD PACS server to the local workstation. When opening a study, the data is loaded from the local workstation rather than downloading it across the network, greatly improving the load time.

The data staged to the workstation is based on two user-defined worklists. The *Prefetch* worklist stages entire studies. The *Prefetch Thumbnails* worklist stages preliminary study data. 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.

To activate prefetching, create the prefetch filter and enable it from the eRAD PACS viewer.

1. Set up the filter criteria as you would for any worklist filter, listing everything you want to automatically download to your workstation.
2. Scroll to the bottom of the worklist to save the filter.
3. Under *Save List As*, select *Prefetch* (download all the data) or *Prefetch Thumbnails* (download image thumbnails and preliminary data), and click *Save*.

After defining the prefetch filters, you must still enable prefetching. To enable prefetching, 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.

Quick Start Instructions – Prefetch Worklist

- Set filter criteria.
- Scroll to the bottom of the worklist.
- At *Save List As* field, select Prefetch.
- Click Save.
- Open viewer and enable prefetching as described in Viewer Manual.

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 7.5.1.1.3 *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 6.7.2 *Auto-Forward Filters*.

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 Preprocess 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 preprocess the data before any workstation requests it using the Compress Action feature.

The Compress Action is available on the Other Lists page. Since it is a system action, it is best to create it 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 Compress, 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. The Scheduling option instructs the server when to process the data (usually immediately upon arrival).
7. Click the Configure button to activate the action.

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

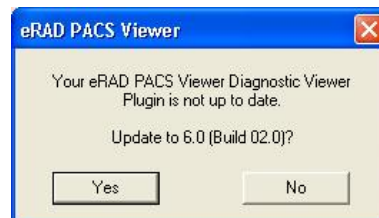
6.3 Viewing Images

eRAD PACS has two mechanisms for viewing 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 whenever you open a study. If you have not downloaded and installed the viewer application, or do not want to load the application on your PC, you can opt to view static JPEG images on your browser. Web-based JPEG images are available from the browser on the eRAD PACS Quick View page.

Sections 6.3.1 Downloading the Viewer through 6.3.3 Opening Multiple Studies explain how to download the Viewer and install it on your PC, and then how to launch a study into the Viewer. Section 6.3.4 Viewing Images with the Browser, explains how to use the browser to look at static JPEG images.

6.3.1 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 appears on the screen 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:

- Step 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*.
- Step 2. Read the License Agreement, check the box to accept the terms, and click *Next*.
- Step 3. If the default location for eRAD PACS is acceptable, click *Next*. Otherwise, select a new location and click *Next*.
- Step 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.

6.3.2 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 6.3.3 *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

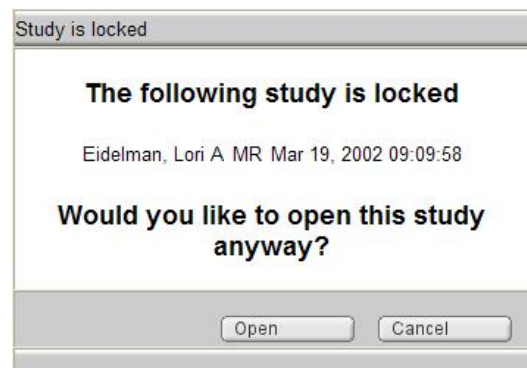
- Click the *Worklist* tab.
- Click the Patient Name, or the Open button  in the study row.

6.3.2.1 Record Locks

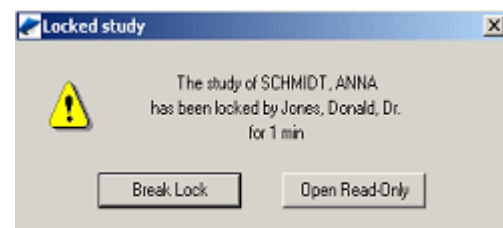
When opening or editing a study, there is the chance another user may attempt to open or edit the same record at the same time. The last user to save changes may overwrite the changes the other user made. eRAD PACS employs record locking to protect against these conflicts.

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 one or two popup notices. The first notice is immediate and appears in a browser window. It appears when your requested action can modify data, including opening it in the viewer, adding a report, editing the demographics, or merging it with another study. In some cases, you can continue the operation without the editing rights, or take the lock away from the original user. These options are listed in the popup notice. If you wish to move on to another study, click *Cancel*.




A second message appears when the viewer opens. This message 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. If you simply want to display the images and do not intend to make any changes, click *Open Read-Only*. You will have access to the full fidelity images, but cannot make any changes to the data, including saving 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.

6.3.2.2 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.




6.3.3 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 6.3.5 *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.



6.3.4 VIEWING IMAGES WITH THE BROWSER













The Quick View page provides you with a tool for displaying patient images in a read-only format, without launching the 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.





6.3.5 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 7.3.2.3 Matching Criteria for details.

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.

Main Info Preferences Work List Admin Archive Accounting									
Default List Other Lists Folders Scheduling Corrections Group Orders Download Viewer Help									
jim2 : --- Unnamed ---       Page 1									
Batch	Date	Patient Name	Status	Modalities	Description	# Imgs			
Select All None									
	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	/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			
Page 1 2 3 4 Page size: 4 Refresh time: 30 min <input type="button" value="Change"/> <input type="button" value="Export"/>									

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.

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 Page 1									
Previous Study Next Study Back to List									
Batch	Date	Patient Name	Status	Modality	Description	Referring Physician	Reading Physician	# Imgs	Source
Select All None									
	Oct 28, 2005 22:02:58	BLAST, BRIANA	Preliminary	CT	TRAUMA BRAIN	Baker, Paul		35	LOCAL
	Oct 28, 2005 22:02:58	BLAST, BRIANA	Read	CT	TRAUMA SERIES	Baker, Paul		234	LOCAL
	Oct 28, 2005 22:02:58	BLAST, BRIANA	Preliminary	CT	C SPINE - TRAUMA SERIES	Baker, Paul		138	LOCAL
	Oct 28, 2005 22:02:58	BLAST, BRIANA	Read	CT	HIPS - TRAUMA SERIES	Baker, Paul		28	LOCAL
Page 1 Page size: 20 <input type="button" value="Change"/>									

The blue, highlighted row in the worklist is the entry you selected. 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.

Quick Start Instructions – Listing Relevant Cases

From the worklist or relevant cases worklist,

- Click the patient name hyperlink in the study row. If relevant cases exist, a new worklist page appears.

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.

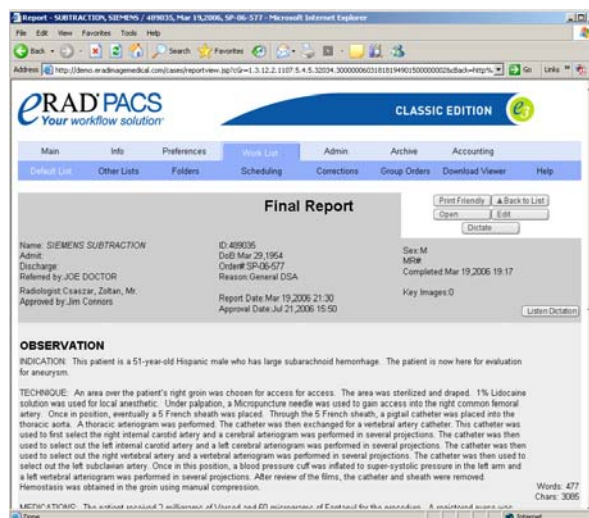
The report page consists of patient demographic information at the top, followed by information on who wrote the report and when. The remainder of the report page displays the Observation and Impression sections of the report, as well as addendums that have been added to the original report. If an addendum 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 Report or Transcribe 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.

The following additional buttons exist on the report page:

Figure 6.4.1-1 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.

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 7.3.2.2 *Layout Customization*.

If a report addendum exists, a hyperlink appears in the header of the report page. The hyperlink can be added or removed with the report customization tools.

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 as well. 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 or Transcribe privileges. For such users, the *Edit* button on the top right of the Report page is enabled, as shown in figure 6.4.1-1. Click the *Edit* button to go to the report editing page.

When you open a report for editing, you have locked the study for writing. Until you close the report by clicking the *Save* or *Cancel* button, no other user will be able to edit the report or open the study in the eRAD PACS viewer. Clicking the browser Back button also releases the study.

In eRAD PACS versions before 5.1, the report edit page was a web page, similar to the report page with many of the fields editable. This editable web page still exists for legacy systems. All reconfigured or new servers use an updated report editing tool, describe through the remainder of this section. For instructions on using the older version of the report editor, refer to eRAD PACS v5.0 operator manual.

The Report Editor is a popup window which looks similar to the report panel in the eRAD PACS viewer, and shown in Figure 6.4.3-1. The eRAD PACS viewer must be installed and running in standby mode before opening the report editor. Once open, change the report text, radiologist of

Figure 6.4.3-1 Report Editor

record, date of record, and insert or edit a radiologist note.

If a recorded report exists, the Dictate button is active and displays the length of the recording. To play back a dictated report, click the *Dictation* button.

To add a radiologist note, type it into the Note field. To enter report text, type or paste it into the Observation or Impression field. The word count fields update automatically as you type. To enter formatted text, use the format controls in the Format toolbar at the top of the screen, or use the control sequences listed in the table to the right.

Format Function	Control Sequence
Bold	Ctrl-B
Italics	Ctrl-I
Underline	Ctrl-U

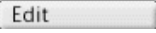
Approved studies in the *Final* state cannot be modified. To amend an approved report, add an addendum. An addendum section appears at the bottom of the report edit panel. Follow the same procedure as above for entering the addendum text.

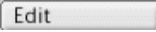
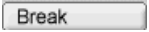
After completing the changes to the report or addendum, update the study state by selecting the relevant state (on the left) and clicking the *Send Report* button, or simply close the viewer. If you have not submitted the changes, a popup window prompts you to save or ignore the changes. To return to the report editor, click the *Cancel* button.

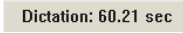
Quick Start Instructions – Editing a Report

- Click the *Worklist* tab.
- Click the study Status column value.
- Click the *Edit* button.
- Enter the changes to the report.
- Click the *Send Report* button or close the window.

6.4.4 TRANSCRIBING A REPORT

Transcribe a dictation and save it as part of the study using the transcription tools. Transcribing a report requires Transcribe or Report rights, which the system administrator must assign to your account, and the eRAD PACS viewer. 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 window consists of editable text fields for typing the report text. There is also a 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.

From the worklist page, filter the worklist to find the studies in the Dictated state. Click the left mouse button on the *Status* column value. The report page appears. Select Edit  from the buttons on the upper right side of the screen. In most cases, you go directly into the report edit panel. If another user has the study locked, you receive the lock message, as described in section 6.3.2.1 Record Locks. The lock message contains the name of the user who currently holds the lock. Inform the user you need to edit the report, and click the break button  to take the lock from the other user. Click *Cancel* to return to the report page.

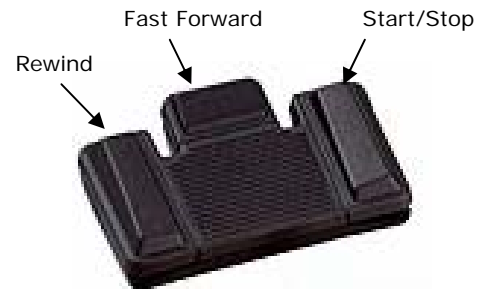
If a dictation is recorded and stored on the server, select the playback button  to start playing back the audio file. Use the audio control on the user interface to stop, rewind, restart and control playback speed. The audio control toolbar is available from the Toolbar option in the View menu. You can also use the Philips SpeechMike or foot pedals.

Enter the text into the Observation or Impression fields. The cumulative word count appears above each field. When finished, save your work by clicking the *Send Report* button or simply close the window. If you have not submitted the changes, a popup window prompts you to save or ignore the changes. To return without saving any changes, click the *Ignore Changes* button.

6.4.4.1 Philips Foot Control Pedal

The Philips Foot Control 210 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.

The device has three pedals. Two play modes exist, Push-to-Play mode and Play/Stop mode. In Play/Stop mode, the default, the right pedal starts and stops the dictation playback, changing between play and stop each time you press the pedal. In Push-to-Play mode, the right pedal plays the recording when pressed and stops when released.



There are also two rewind/fast forward modes. In Steps mode, each time you push the middle pedal, the recording fast forwards 2 (default) seconds, and the left pedal rewinds 2 seconds with each press. If you hold down the pedal for half a second (default), the recording rewinds or fast forwards to the beginning or end, respectively. In Continuous mode, the recording fast forwards continuously if you press and hold down the middle pedal, until you release it. Similarly, the records rewinds continuously while you press the left pedal.

The mode settings and default values for using the foot pedal are defined in the Dictation panel under Customize Settings in the viewer. Refer to section 4.1.13 in the eRAD PACS Viewer Manual for more information.


6.4.5 APPROVING REPORTS

To approve a report, you must have Report 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 also 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 eRAD PACS batch signing feature to approve them. Batch signing simplifies the approval process by consolidating the steps needed to call up, review, 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 the report and select one of the available options. These are listed in the following table.

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.

Each report and addendum pending approval is displayed, one report at a time. If you want to approve the report and move on to the next, click the Approve button. To skip the report and move on to the next, click the Next Study button. Continue this process until you reach the end of the list of studies. You cannot edit a report while in the middle of the batch signing process. To edit a report, skip it, complete the signing process, and edit it from the worklist.

When you approve the final study, or click the Finish button, the summary table appears. This page lists all of the reports, along with the pending approval status. If a checkmark appears in the Approved column, it means the report is about to be officially signed. If the field contains a "X", the report will not be signed. You can 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

Interpretations to be approved:

Patient name	Patient ID	Modality	Study Date	Radiologist	Transcription date	Approved
BOSLEY, GORED SOXS	PVH00-34233	NM	Jun 22, 2005 07:35:00	Horvath, Gabor,	Jan 09, 2006 09:52:52	✓
Robinson, Jane	123456987	CT	Jul 28, 1999 20:42:07	Horvath, Gabor	Oct 12, 2005 09:32:02	✓
Pumpkin, Jack	123654-78	CT	Oct 13, 1999 10:59:11	Horvath, Gabor	Oct 12, 2005 09:45:44	✓
CLAMPETTE, JED	456398	CT	Feb 14, 2000 09:10:14	Horvath, Gabor	Oct 12, 2005 10:37:23	✓
SANFORD, ENSON	20369	MR	Nov 27, 2000 11:23:14	Horvath, Gabor	Feb 03, 2005 11:26:22	✕

Approve

Cancel

The reports have not been signed yet. If you want to return to the worklist without saving any of the changes, meaning without signing any of the reports, click the Cancel button. When you are ready to approve the reports, click the Approve button. There is one more confirmation prompt. To finish this operation, click the Approve button again. At this point, all 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 and approving 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.

6.4.6 BATCH PRINTING REPORTS

Automatically print reports based on filter criteria using the batch printing action. To schedule report printing, first define a worklist filter satisfying the condition of interest. For example, if you want to print all reports that became *Final* today, create a filter with the Status column set to *Final*. Since the feature only acts on the studies new to the filtered list since the last time it printed reports, do not include any time criteria in the filter.

After saving the filter, click the *Other Lists* tab. Find the new filter in the table and click the box in the Print Report column to display the configuration window. Click to put a check in the *Enable* field, check *Apply to current content* to print all existing reports, set the scheduling parameter, and check *Print Images* to include key images. If multiple printers are configured in the eRAD PACS server, select the printer from the *Printer* field.

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

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*, 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*.

Quick Start Instructions – Batch Printing Reports

- Define a worklist filter.
- Scroll to the bottom of the worklist.
- Name and save the new worklist filter.
- Click the *Other Lists* tab.
- Click the button in the Print Report column for the new worklist filter.
- Select *Enable*, set schedule, select image setting and click *Apply*.

6.4.7 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.

6.5 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 Transcribe or 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 DEMOGRAPHICS

To edit patient and study demographics, click the Edit button  to the left of the patient name. 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.


When the Edit page appears, select the field containing the information you want to change and delete the existing value. Type in the new value or select it from the pull down menu, which if present, contains pre-defined values for some of the fields. After making the change, click the *Save* button at the bottom of the page. To return without editing the study, select *Cancel*.

By default, the most common demographic fields appear at the top of the page. To see additional patient and study-level attributes, scroll to the bottom of the page.

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.

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.

Quick Start Instructions – Editing Demographics

- Click the *Worklist* tab.
- Click the Edit button  in the study row.
- Click the field you want to change.
- Type in the new value or select it from the list.
- Click the *Save* Button.

6.5.2 SPLIT STUDIES

To separate a single study into two or more studies, go to the Quick View page and click the *Split* button. 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, 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.
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. 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.

6.5.3 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.

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.

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.

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 6.5.4 *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.










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.



6.5.4 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.

Click the *Corrections* tab to see a list of all current and expired orders. To the right of each order is a list of possible matching image studies. To merge an order with a set of images, select the study from the list and click the *Merge* button . If the study you want does not appear on the list, search the entire worklist by first clicking the *More Studies* button, , finding the study you want, and then clicking the *Merge* button (on the search page). When you click the *Merge* button, the data summary appears. Change any setting or enter a new value in the text field. Click *Apply* to merge the order and images. When you return to the worklist, the data will have been merged into one entry and the order no longer exists.


Main	Info	Preferences	Work List	Admin	Archive	Accounting
Default List	Other Lists	Scheduling	Corrections	Download Viewer		Help
Corrections		Edit Fields	Filters		Page 1	
Corrections	Date ▾	Patient Name	Patient ID	Accession No.	Modality	Matching Studies
						
 ... 	Mar 03,2004 09:15:00	Roe, Bobby	111-22-3333	33	CT	 NONE ▾
Page 1		Page size: 20 				

Quick Start Instructions – Matching Orders to Images

- Click the *Worklist* tab.
- Click the *Corrections* tab.
- For the order, select a study from the pull down list to the right.
- To use a study not on the list, click the More Studies icon, , and locate the study.
- Click the Merge icon, .

- Confirm the settings, making changes where necessary.
- Click *Apply* to save.

6.5.5 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.

Main		Info		Preferences		Work List		Admin		Archive	
Default List		Other Lists		Folders		Corrections		Download Viewer		Help	
Correct study resides on multiple HUB servers											
Patient Name	SCHMIDT, L			Accession No.	493			Modality	CT		
Patient ID	27			Study Date	Feb 10, 2007 14:00:23			Description	CT CHEST W/CONT		
Target Server	<input checked="" type="radio"/> harbor <input type="radio"/> harborhub2 <input type="button" value="Apply"/> <input type="button" value="Cancel"/>										
Field	harbor			harborhub2							
Number of images	139			139							
Study Status	Final			Final							
Number of missing objects	0 <input checked="" type="checkbox"/> Keep missing object(s)			0 <input checked="" type="checkbox"/> Keep missing object(s)							
Report	Final + 1Addendum <input checked="" type="checkbox"/> Keep report(s)			Final + 1Addendum <input type="checkbox"/> Keep report(s)							
Changed	None			Changed							
Receive Date	Jan 22, 2008 22:09:54			Jan 24, 2008 11:32:52							
Study Size	74919202			74960196							


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 table lists details from each server, such as the number of images and reports, the study state, and the number of missing objects. Below this general information are all the fields whose values differ between servers.

Using the information available in this table, select the server you want the study to end up on. The server highlighted in blue is the one the system thinks is the best location. Select the radio button for the server you want to contain the final study, and click *Apply*. A progress page appears, displaying the result of each step. If any of the steps fail, cleanup requires manually intervention from eRAD support. If all the steps succeed, the study has been moved and the operation is complete.

6.6 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.

Quick Start Instructions – Dump DICOM Data

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


6.7 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 6.10 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.

6.7.1 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.

6.7.2 AUTO-FORWARD FILTERS

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

To set up an automatic forward action based on a study's properties, perform the following steps:


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.
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. 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.
7. Choose the destination(s) from the Targets list. Use CTRL-click to select multiple targets.
8. Check the *Updates* box to forward all subsequent edits and additions made to the studies.
9. 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.
10. 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.
11. Click *Apply* to complete the setup.

Enable:	<input type="checkbox"/>
Apply to current content:	<input type="checkbox"/>
Scheduling:	Immediately at <input type="text"/> :00
Targets:	host5 barco Demo
Updates:	<input checked="" type="checkbox"/>
Report only:	<input type="checkbox"/>
Thumbnails only (Viewer only)	<input type="checkbox"/>

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*.

6.7.3 WRITING DICOM MEDIA

To write a selection of studies and an eRAD PACS viewer to a DICOM CD or DVD, create the ISO file and load it into the CD/DVD-writing application on your PC. If the Server has a CD/DVD-writing device installed, you can write the ISO file directly to it. Exporting data requires Forward/Export rights. If you do not have the Export button, , on your worklist, contact your system administrator.


Select the studies you want on the CD/DVD and click the single or batch Export button. At the bottom of the targets list, check the box next to the entry *Create DICOM CD*. Click the *Forward* button. On the confirmation page, select to include or exclude the eRAD PACS viewer and the report object, and indicate whether compressed data is to be uncompressed. Click *Continue*. eRAD PACS builds the ISO file and when finished prompts you to either download the file, write the file to the Server CD/DVD writer, or remove the file and return to the Worklist. When you choose to download the file, select to Open the file when completely downloaded. This launches the CD/DVD-writing application installed on your PC. The CD/DVD-writing application is not included with eRAD PACS.

Quick Start Instructions – Writing DICOM Media

To export a study:

- Click the worklist Export button  next to the study you want to transmit.
- Check *Create DICOM CD* and click Forward.
- Check *Add Viewer* to include a Viewer on the CD.
- Click the *Continue* Button.
- Click *Get ISO File* to download the ISO file.
- Use a PC application to write CD.

To export multiple studies at one time:

- Check the box on the far left of each worklist study to include on the CD.
- Click the batch Export button .
- Follow the directions as above.

6.7.4 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.

6.8 Deleting

eRAD PACS is a storage solution intended on 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, and access to it should be limited to administrators who understand the ramifications of their actions.

6.8.1 DELETING STUDIES FROM A SERVER

To permanently remove one or more studies from the eRAD PACS server, click the Delete button, , to the left of the patient name. To delete multiple studies at the same time, select each study you want to remove by placing a checkmark in the box on the far left of each row, and click the batch Delete button. A confirmation message appears. Confirm the deletion by clicking the *Delete* button. Click *Cancel* to return to the Worklist without deleting.


The delete function requires certain privileges. If the Delete button does not appear on your worklist, you are not authorized to use this feature. Contact your system administrator to obtain rights to delete studies.

Quick Start Instructions – Deleting Studies

To delete a study:

- Click the *Worklist* tab.
- Click the Delete button  for the study you want to remove.
- Click *Delete* on the confirmation page.

To delete multiple studies at one time:

- Click the *Worklist* tab.
- Put a checkmark in the box on the far left of each study row to remove.
- Click Batch Delete  at the top left corner of the worklist.
- Click *Delete* on the confirmation page.

6.8.2 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.
3. Find the new worklist in the table, and click the button in the Purge column. The delete action configuration page appears.
4. Check the *Enable* box to turn purging on.
5. 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.
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.

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. Click Configure to finish.

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

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 eRAD PACS server. See section **Error! Reference source not found.** for further details.


6.8.3 DELETING STUDIES FROM THE ARCHIVE

In earlier versions of eRAD PACS, data may have been kept in a separate storage device. In the current version of eRAD PACS, this separate device does not exist. All actions applied to data from the eRAD PACS user interface, including deleting, apply to all copies of the data on that server. Studies deleted from the worklist are permanently erased from the eRAD PACS system.

The delete function requires administrator privileges. If the Delete button does not appear on your worklist, you are not authorized to use this feature. Contact your system administrator to obtain rights to delete studies.

6.9 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 all of 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.

Enter the patient and study information into the Scheduling page. 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. To copy just the name into a field, click the More Information button in the particular name field. After entering all the necessary information, click *Save*. If you failed to enter any 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. If the scheduled date and time passes and no images appear, the order is highlighted in yellow on the worklist.


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


Quick Start Instructions – Creating Orders

- Click the *Worklist* tab.
- Click the *Scheduling* tab.
- Enter the patient and study information.
- Click *Save* to store order.

6.9.1 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.

6.10 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 just shortcuts to the actually study, meaning a change in either the main study or the one in the folder will be reflected throughout the eRAD PACS system. Explicit copies of studies are actually independent duplicates. These studies can be sanitized and modified, and the original study is not affected. Referenced studies appear in the folder list shaded gray. 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. 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. Scroll to the bottom of the Export table and check the *Add to Folder* box.
3. Select the folder you want the studies to belong to. Select the name of an existing folder from the pull-down list, or enter the name of a new folder.
4. Select *Make a Copy* to create an independent instance of the study in the folder, or *Make a Shortcut* to create a reference pointer to the actual study.
5. Click *Forward* to complete the operation.


If you are making an independent copy, the process may take a little extra time. When complete, you are automatically returned to the worklist.


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.
2. 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 Convert 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.

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' sub-tab is active, displaying a table of users. The table has columns for User ID, User Name, Email Address, Address, Phone Number 1, Phone Number 2, Group, and Rights. Below the table are pagination controls (Page 1, 2, 3), a 'Page size' dropdown set to 6, an 'Export' button, and a 'Save list as' section with a dropdown 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*.


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 *User Groups*.

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.

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:

- **Use Group Rights** (g) – Account permissions default to those assigned to the selected Group. To set these permissions individually, uncheck this box.
- **Admin** (A) - administrative rights.
- **Archive** (S) - access to the archived data, including third-party archives.
- **Billing** (B) - access to the Accounting (summary) information.
- **Correction** (Q) - manipulate the correction queue.
- **Delete** (D) - purge images from the server.
- **Edit** (E) - edit study information.
- **Forward/Export** (F) – send a set of images to a configured destination.
- **Open** (O) - open the eRAD PACS viewer and view images stored on the server.
- **DICOM Printing** (P) – print film using DICOM print from the viewer.
- **Report** (R) - edit and approve reports, from the Viewer or from the web page.
- **Transcribe** (T) - edit reports without the ability to approve them.
- **Scheduling** (H) - create orders.
- **List Saving** (W) – save filters and worklist layouts.



Enter a password for the account. By default, the password does not expire. To create a temporary account, or to enforce some password management, choose to make the password 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 or not 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. The available settings are the report XML templates, hanging protocol templates, preset window and level settings, prefetch settings, DICOM field settings, canned report templates, and worklist filter definitions.

7.1.2.1 Copying Account Settings When Creating a New Account

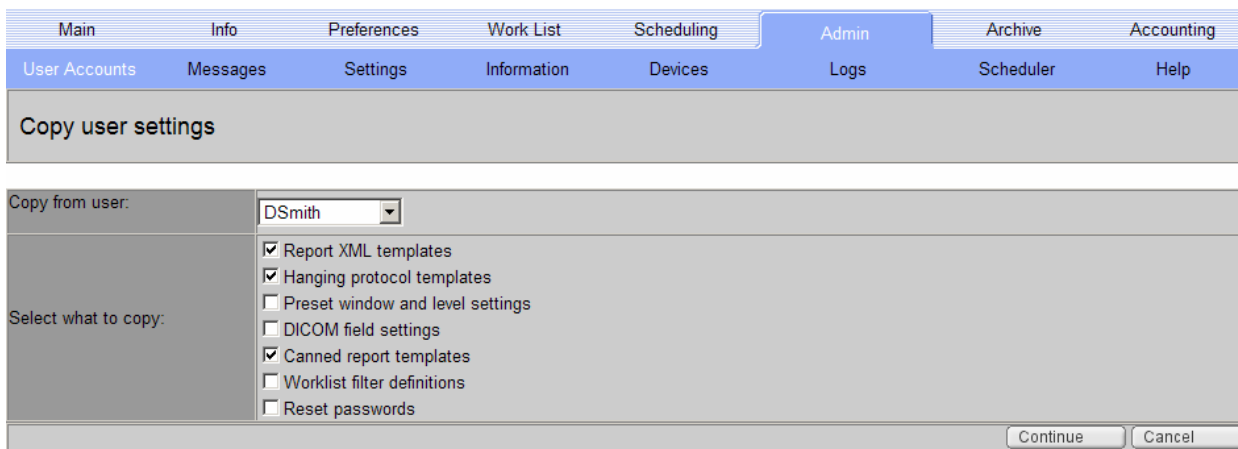
When creating a new user account, import all the settings from an existing account using the copy user function from the Admin/User Accounts page.


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 attribute(s) to copy.
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).
7. Press the *Copy* button.

Passwords can also be set for multiple users from the Copy page using the *Reset passwords* feature. When setting passwords, the source user is omitted. 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.

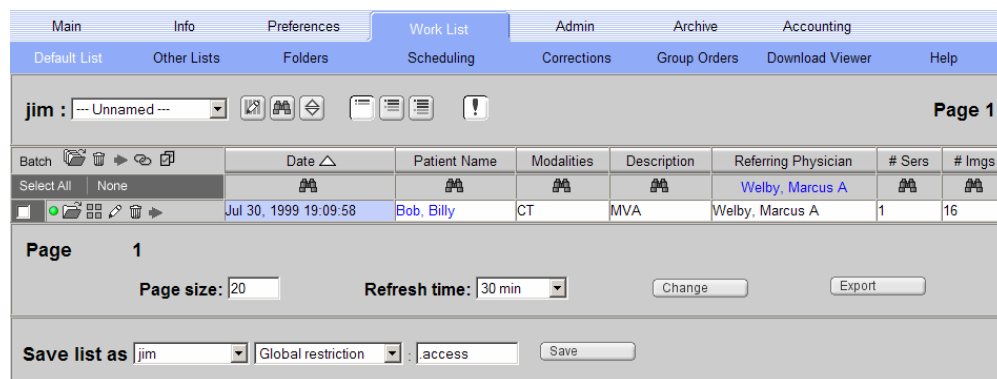
Quick Start Instructions – Editing User Accounts

- 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.



Batch	Date	Patient Name	Modalities	Description	Referring Physician	# Sers	# Imgs
Select All	None				Welby, Marcus A		
	Jul 30, 1999 19:09:58	Bob, Billy	CT	MVA	Welby, Marcus A	1	16

Page 1

Page size: 20 Refresh time: 30 min Change Export

Save list as jim Global restriction .access Save


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.


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.


















7.2 User Groups

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.


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

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	O			
  	Physician	SFOTP			
  	Radiologist	OR			
  	Technologist	SQEFO			

Page	1	Page size: 20	Change
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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.

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.

7.3 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 affect 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 Pages and Logos

The customizing pages and logos feature provides the ability to change the eRAD PACS web page banner and logo backgrounds, as well as the Main Page graphic.

To customize pages and logos, go to *Administration/Settings*. Scroll down until you see the Web Server Settings. Select the *Customize Pages and Logos* option. Scroll down until you see the page or logo you want to edit. Enter a file name, or use the Browse Button to locate a file, and select the Upload button to apply the change.

Quick Start Instructions – Web Server Settings

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll down to the Web Server Settings.
- Select *Customize Pages and Logos*.
- Go to the page/logo to customize.

- Enter the file name.
- Select *Upload* to make the change.

7.3.1.2 Customizing Directions Page

The Directions page under the Settings tab is available to administrators who wish to provide information on the facility to its users. The page is a common HTML web page. The administrator can upload any HTML software, including images and graphics. The resulting HTML software appears whenever a user clicks on the Directions Page.

Quick Start Instructions – Customize Directions Page

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll down to the Web Server Settings.
- Select *Set Directions* page.
- Insert the HTML code into the text area, or enter the file name into the file area.
- Insert the referenced files into the file section.
- Select *Save* to upload the code.

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 Disabling the Prefetch Function

Enabling the Prefetch Function, which you do from the eRAD PACS viewer, causes your system to automatically download studies the image server has queued up for delivery to your workstation. Prefetching can improve the time it takes to load image studies by performing the network transfers in the background while you are not using the viewer. When you load the prefetched study, the viewer loads it from your local disk rather than downloads it from across the network.

You can configure the server to disable prefetching at certain times of the day. From the Disable Prefetch page, enter in the periods you want to disable all prefetching.

Quick Start Instructions – Disabling Prefetch Function

- Go to the Administration page.
- Click the *Settings* tab.
- Scroll down to the System Settings section.
- Select *Set Prefetch Disable Intervals*.
- Enter the times to disable prefetching.

7.3.2.2 Layout Customization

Administrators can build a custom report page and email notification templates to use in the eRAD PACS browser interface. The custom layout can:

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

7.3.2.2.1 Report Customization

The report page is generated using the eRAD PACS 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. 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*.

Note that the eRAD PACS viewer does not reflect the same layout as the browser page. The viewer report panel uses a fixed layout.

7.3.2.2.2 Email Notification Customization

The email notification layout is generated using the eRAD PACS 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*.

7.3.2.3 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 Sources Table:** Specifies the source of the default data value used when merging an order and images. Select the source and set by clicking *Change*.
- **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.
- **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.
- **Relevant Cases List Criteria:** Defines the matching pattern used to search remote archives for prior studies matching the current study.

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.

7.3.2.4 Customize Field Labels and Lists

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, meaning they are generally grouped by function or source. Select the table containing the fields you want to customize from the menu at the top of the page. The contents of the table appear. 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. This allows you to create short labels for use in most cases and eliminate conflicts in other cases. 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". If you were to create a web page or report that contained both the patient name and the facility, two fields would be labeled "Name". To eliminate the confusion, define a table prefix. 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".

There are cases when you want to create an enumerated list of values when a field is available on the user interface. Create and edit the list of values by clicking on the Edit button, , in the field's row. Edit the list by entering a single value per line. Click *Save* to update the list.

Quick Start Instructions – Customized Field Labels

- Click the *Administration* tab.
- Click the *Settings* tab.
- Under System Settings, click *Customize Labels*.
- Enter the custom label value(s).
- Click *Save* to save changes.

7.3.3 DICOM SERVER SETTINGS

To edit the eRAD PACS DICOM SCP settings, you need support rights. Set the value(s) and click *Save and Restart*. Restarting the server may cause current uploads to abort. The following parameters are available:

- IP address (not configurable here)
- TCP (non-secure) port number
- TLS (secure) port number
- Storage Application Entity (AE) Title

- Archive Query AE Title
- Transfer syntax
- PDU size
- Send and receive timers
- Query request case sensitivity
- Empty field matching setting

TLS connections support the DICOM security enhancements protocol. To disable TLS or TCP (non-secure) connections, set the respective port number to zero.

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.

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.

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.

The send and received timers are the defaults used for each DICOM association. For more information, refer to the DICOM Services table.

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.

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 *Empty Matching* checkbox if the server is to include NULL values as successful matches.

Many of these settings can be customized for each DICOM device. See section 7.5.1.1.1 *Adding a DICOM Device* for details.

Quick Start Instructions – DICOM Server Settings

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

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. The following HL7 parameters are configurable:

- Enable/Disable HL7 communications
- TCP port number
- HL7 Application ID
- HL7 Facility ID

The TCP port number is the address of the HL7 process checks for TCP connections. Both the Application ID and Facility ID are defined in the interface specification agreed to by both communicating HL7 entities. Refer to the HL7 Standard for format specifications.

Quick Start Instructions – HL7 Server Settings

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll to the HL7 Server Settings.
- Make the necessary changes and click *Save*.

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 Enterprise, Classic, PAL 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 3D rendering or orthopedic templating. 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 NORMALITY SETTINGS

The default setting for the Normal flag, used to flag a report on the worklist, is configurable. By default, the flag is set so the report is assigned the *normal* status. This has no visible affect on the study in the worklist. When the Normal flag is in the *alert* state, the worklist entry appears highlighted. The setting is defined on the Settings page, under Normality Settings.


When *Default state of the normality filed in report page is Normal* is checked, the default state of the Normal flag is *normal*. When cleared, *alert* is the default. If you change the default setting, you must exit the viewer from standby mode and restart it before it takes affect. Regardless of the default setting, the user can change the state from the report panel in the viewer or transcription panel.

The Normal flag label displayed on the report panel is also configurable. To change the label, edit the label defined in the field *Displayed Label of Normality State*. The default label is **Normal**.

To remove the Normal field from the report panel completely, clear the box labeled *Show normality status on the report edit panel*. When checked, the field appears on the report panel. After changing this setting, you must exit and restart the viewer.

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 affect. 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 7.3.2.2 *Layout 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.

Quick Start Instructions – Filtering Lists

- Go to the *Administration* page.
- Click the *Settings* tab.
- Enter maximum number of values allowed in a list into the Filtered List Setting box.
- Click the *Change* button.

7.3.14 SECURITY SETTINGS

The security settings give administrators the ability to secure all network traffic between a user and the server. Secure traffic uses encrypted (SSL) transmission protocols. The security settings also include an inactivity timer before automatically logging the user off of the system.

The Secure Connection setting forces any eRAD PACS transmissions to/from the server to use HTTP when set to *Off*, and secure HTTP (HTTPS) when set to *On*. The *Auto* option instructs eRAD PACS to inspect the IP address of the device and if it is in one of the defined LAN-accessible domains, it will use HTTP. If not a LAN-accessible device, HTTPS is used. The additional security can negatively impact network performance, and possibly slow down delivery of images to the user. The change takes effect after you click the *Change* button. This option defaults to the *Off* position.

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 Inactivity Time Out specifies the number of minutes of inactivity allowed before the server automatically logs the user off of the system. To set an inactivity time-out, enter the number of minutes desired into the field, and click the *Change* button. A value of zero indicates no time-out.

Quick Start Instructions – Security Settings

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll down to Security Settings.

- Set the parameter and click Change.

7.3.15 TIMER SETTINGS

Only one editable instance of a study exists. If a user does not explicitly close the study after opening the editable copy (e.g., in the Viewer or editing a report), 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.

Quick Start Instructions – Timer Settings

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll down to Timer Settings.
- Set the parameter and click Change.

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 eRAD 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 EDIT AND CORRECTION SETTINGS

eRAD PACS supports two modes for editing study information. The hard edit mode makes the changes to the data object on the local machine, and then forwards the modified objects to the necessary parent and child servers. The soft edit mode records the changes in a separate control object, and eRAD PACS applies the changes each time the data is accessed. When propagating soft edits, eRAD PACS transmits the control object only. To modify edit and correction settings, support rights are required.

The Correction Mode is the default Edit Mode used when a user edits a study from the Edit page. This is active only when either of the *User Can Override* Edit Mode settings is specified. 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.

The default for the override checkbox corresponds to the setting in the *Correction Mode* parameter.

Quick Start Instructions – Edit and Correction Modes

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll down to Edit/Correction Settings.
- Select the edit modes and click *Change*.

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, go to the Settings page and scroll down to the Date Formatting section. Using the pull down menus, select the format you want. If you need delimiters between some of the fields, such as a comma between the day and the year, enter it into the respective field. If you do not want delimiters, clear the field. The delimiter fields only support a single character. After selecting the format, click the *Format* button to save the changes.

Names appear in eRAD PACS in one of two forms. The first form is a name on a list, such as the name of a patient, or physician on the worklist. The second form is when the name appears in normal text. It is common for names in lists to appear one way, such as “DOE, JOHN Q”, and names in normal text to appear another, such as “JOHN Q. DOE.” To change the default name format, go to the Name Formatting section on the Server page. For both the common name and list name, select the name component from the pull-down list and enter the component separators, if necessary. To leave a component empty, select <empty>. When finished, 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. By default, the user is required to do this by inserting a caret (^) character between the individual strings, in the order last^first^middle^prefix^suffix. If the *Use Person Name Filter* setting is checked, EP displays individual text boxes for each of the names.

Quick Start Instructions – Formatting Options

- Go to the *Administration* page.
- Click the *Settings* tab.
- Scroll down to Date or Name Format section.
- Set the format and click *Change*.

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.

7.4.1.1 Queue Management

The queue management page provides access to the system task queues, allowing an administrator the ability to manipulate the scheduled processes. Be aware that modifying the tasks in the queues directly impacts performance and data validity. Do not make changes to the system queues without fully understanding the consequences.

To view the queue management table, select *Admin/Information*, and click the Task Queue Server link in the server status section. The queue table appears, showing the number of tasks that haven't been checked (Not Unscheduled), are scheduled (Scheduled), need to be retried (Retry), are permanently rejected (Failed), and have been manually suspended (Suspended). Click the link for the queue you want to investigate. The task table for that queue is displayed.

Each task table contains a series of columns showing the task priority, number of retry attempts already made, the task type, date and time of last modification, date and time of last or next retry, and the command. The number of entries on each page is limited. To move to a new page, click the page number at the bottom of the table. Change the table size by increasing or decreasing the value in the Page Size text box at the bottom of the table.

Buttons exist to filter the entries in the task table, sort the entries, and return to the previous page. Some of the tables allow you to move the entry to the failed or suspended queue, or remove it from the system. These buttons appear on the left of the table. The entry on a particular row applies to the entry. Click to check the box to the far left of each row and use the batch operation buttons at the top of the table to apply the function to the selected rows.

The suspended queue is for tasks that need to be removed from its current queue for a short period of time. All data associated with this task remains on the server. The expectation is that at some point in the future, the admin will restore a suspended task to the scheduled or retry queue. On the suspend queue, an edit function is available in the buttons to the left of each entry for reprioritizing the task. Do not make changes to task priorities without understanding system priority levels.

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 *Update disk utilization* link refreshes the disk utilization graph. The *Update and Clean* link invokes the data purging process and then updates the graph.

Quick Start Instructions – Disk Usage

- Go to the *Administration* page.
- Click the *Information* tab.
- Scroll to the Disk Usage section.

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 count and study size are calculated values based on the previous four weeks of system usage.

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:

ID	The label used to uniquely identify the device.
IP/Host	The IP address or host name of the device.
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.

If the IP/Host value of the device is a host name, such as server.hospital.com, the IP address can change. If it does, eRAD PACS may have difficulty resolving it. Click the *Refresh IP Addresses* link at the bottom of the Devices table if this condition exists. This updates the host names with their current IP address.

Other eRAD PACS servers exist in the Devices table with a Type value of Parent or Child. Each server is uniquely identified with a Server ID throughout the EP hierarchy. Updating the configuration of any Parent or Child server requires each server be updated. After updating the device table on every EP server, update the information in the DotCom configuration file. Click the link *Recollect Dotcom Info* at the bottom of the Devices table. You must do this on every server in the EP hierarchy.

7.5.1.1 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:

Child	An eRAD PACS child server.
DICOM	A DICOM entity. Assign the supported DICOM services on the DICOM Device Settings page. See section <i>7.5.1.1.1 Adding a DICOM Device</i> .
HL7	An HL7 entity. Assign the supported HL7 services on the HL7 Device Settings page. See section <i>7.5.1.1.2 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.

Quick Start Instructions – Adding a New Device

- Click the *Administration* Page.
- Click the *Devices* tab.
- In the Devices table, enter the device ID, IP address, Port, Protocol and Type.
- Click the *Add* button.
- Follow the type-specific instructions in the sections below.

7.5.1.1.1 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.

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:


AutoGet, AutoRtv	Search this device for prior studies. AutoGet uses C-GET DIMSE service. 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:

Transfer syntax	Preferred/supported transfer syntax
Store SCU 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
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
Supported SOP Classes	The DICOM Storage SOP Classes eRAD PACS accepts or offers when communicating with this device.

7.5.1.1.1.1 Data Coercion

Data coercion adds or modifies attribute values to DICOM Storage objects when acquired by eRAD PACS. To define coercion rules, go to the Devices page and click  to edit the device you want to configure. In the Data Coercion section, type the commands into the text box. If needed, select DICOM tags from the pull-down menu and click Add Tag. When you have completed all the rules, click Save.

Coercion rules do not propagate between linked servers. At this time, coercion works for DICOM alpha-numeric attributes only.

The general encoding rules for coercion commands is as follows:

General Syntax:

<lvalue>=<expression>

lvalues:

DICOM Tag – This is in the form, "(gggg,eeee)". It represents the target attribute. After the expression is evaluated, the results are assigned to this attribute.

Expressions: Can be either a Value or a Function.

Values

- (gggg,eeee) – 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 \'\'.
- Unquoted string – Non-quoted strings can be used when they contain only contiguous, alphanumeric characters.
- (gggg,eeee),"d",n – (Retired) This returns the *n*th field in the DICOM tag (gggg,eeee) value as separated by the delimiter *d*.

The coercion functions are defined in the table below.

Function	Description
and(a,b)	Return "true" if both <i>a</i> and <i>b</i> are non-NULL.
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 "true" if string <i>a</i> exists in string <i>b</i> . Otherwise it returns NULL.
<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.
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.
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.

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 as follows:

(0008,0050)=if((0008,0050) , concat("PFX",(0008,0050)) , NULL())

In this example, 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.

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. 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.

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 affect a coercion rule will have, contact eRAD support for guidance.

7.5.1.1.1.2 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. A default redirection setting always exists in the field labeled *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 or secure (HTTP or HTTPS) protocol.

In the field labeled *URL Used in Redirection*, enter the URL or IP address of this device used during redirection. If left empty, the IP address listed in the devices table is used. In the *LAN-accessible IP Addresses for Child Formats* table, list the IP address of workstations that will redirect to the *URL Used for Redirection* address. Refer to section 7.3.16 *Local IP Settings* for instructions on address domains and exceptions formats.

Redirection settings		
URL to be used in redirection: <input type="text" value="http://172.0.0.146"/>	LAN-accessible IP Addresses for child formats: 193.91.67.* or 193.91.67.0/8	<div> *. *.*.*.* -192.168.1.0/24 -192.168.2.0/24 -192.168.4.0/24 </div> <input type="button" value="Test"/>
Default redirection rule: <input type="text" value="http"/> <input type="text" value="//192.168.161.128"/>	*.*.*	

After making all changes, click the *Save* button to save the changes, and restart the DICOM service when prompted.

Quick Start Instructions – Creating DICOM Devices

- Go to the *Administration* page.
- Click the *Devices* tab.
- Enter the device IP address, port number protocol and type=DICOM.
- On the DICOM setup page, check the DICOM services supported by the device.
- Enter the AE Title of the device and time-out settings.
- Click *Save*.

7.5.1.1.2 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*.

7.5.1.1.3 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. On Windows XP, find and set the computer name by opening the Control Panel, clicking on System, and selecting the Computer Name tab.

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 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 7.5.1.1.1 *Adding a DICOM Device*. For information on editing an HL7 device, refer to section 7.5.1.1.2 *Adding an HL7 Device*. To edit a Viewer device, refer to section 7.5.1.1.3 *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*.

7.5.1.3 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.

7.5.1.4 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.

7.5.1.5 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*.

For each configured device supporting HL7 orders, configure the flow of orders from source to destination device in the Order Flow section. To enable the transfer of orders, place a checkmark in the corresponding device checkbox and click *Save*.

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 eRAD 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 Logs

The Logs Page displays a table with actions a specific eRAD PACS 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
Changed value	New value applied to an action.
Filename	Name of the file containing the object the action is applied to.
Initiating user	User ID of the user who initiated the action.
Log date	Date and time log entry was created.
Message	Log message.
Object size	Size of the object's file.
Patient name	Patient name to which the action was applied.
Peer device	Source or target device specified in the action request.
Program	The Linux program which logged the entry.
Study	Study UID to which the action was applied. Only valid if <i>Task Level</i> is STUDY.
Task ID	Currently unassigned.
Task level	Level the action was performed at. Options are STUDY, IMAGE, ADMIN, OTHER.
Task type	Log entry type. Options are ERROR, WARNING or INFO.

From the Action column, select the actions you want included in the log report. Hold down the CTRL key when clicking to select multiple actions.

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).

7.7 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 Add Filters Page 1			
Messages	User ID [↕]	Message Name [↕]	Active [▽]
	jim	System Down For Maintenance	Active
Page 1 Page size: 20 Change			

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 affective 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.

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.

Click the *External* tab to display the attributes available for searching. It is best to limit the search with specific criteria, preventing queries from downloading the entire database and flooding the network with unnecessary data. Enter the search criteria, select the archive from the Source list, and 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 device in the devices table. Refer to section 7.5.1 *Devices Table* for information on the devices table.

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. The Scheduling field allows you to perform the retrieve action immediately after something matches the filter criteria, executed in 5 minute cycles, or at a specific time on the day.
6. Click Configure to finish.


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

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

The Media page provides access to DICOM-compliant removable media inserted into the eRAD PACS server drive, or if certain settings are configured, into the user workstation drive. After clicking the *Archive/Media* tab, select the device from the pull down list at the top of the page. eRAD PACS locates the device on the server and reads the contents. The media must comply with DICOM Part 10, and contain a valid DICOMDIR file. Using this file, eRAD PACS displays the contents of the media.

Data stored on a DICOM-compliant CD/DVD inserted into the drive on the local workstation can be imported as well. For the server to find the CD/DVD drive on your workstation, it must be set up as a shared Windows drive. The workstation must be on the same local area network as the server the user is currently logged into. Insert the media into the local drive, go to *Archive/Media*. Check the List Local Drives button, . The device appears on the device pull down list, using the share name assigned when setting up file sharing. Select the drive for your workstation. A worklist appears containing the studies available on the media.

To import one or more of the studies on the media, click the checkbox to the left of the entries and click the Retrieve button, . The data is read from the media and registered on the server worklist (which may take time).

Data manually imported from removable media is not sent to the eRAD PACS archive.

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. Accounting Pages

The Accounting Page contains a system activity report, showing all of the studies eRAD PACS has processed over a specified period of time. The report period is user definable, and you can export it into Microsoft Excel for formatting, analysis, or other review function.

Select the *Accounting* tab to display accounting activity over the last month. Access to the *Accounting* tab requires Billing rights. If you need to access this information, consult with your system administrator.

9.1 Customer Report

The Accounting page summarizes the activity over a defined period of time. The default period is the current day. To change the summary period, set the *From* and *To* dates in the upper right corner and click *Update*. The new information appears. Be aware reports covering a large time period may require a long time to complete.

The Accounting page consists of two tables. The first table consists of the total number of studies eRAD PACS acquired, and the amount of disk space those studies occupy. The second table is a listing of each individual study included in the report for the defined period. You can sort the table by clicking on any of the column headers. Unlike the other lists in eRAD PACS, the *Accounting* table is not configurable.

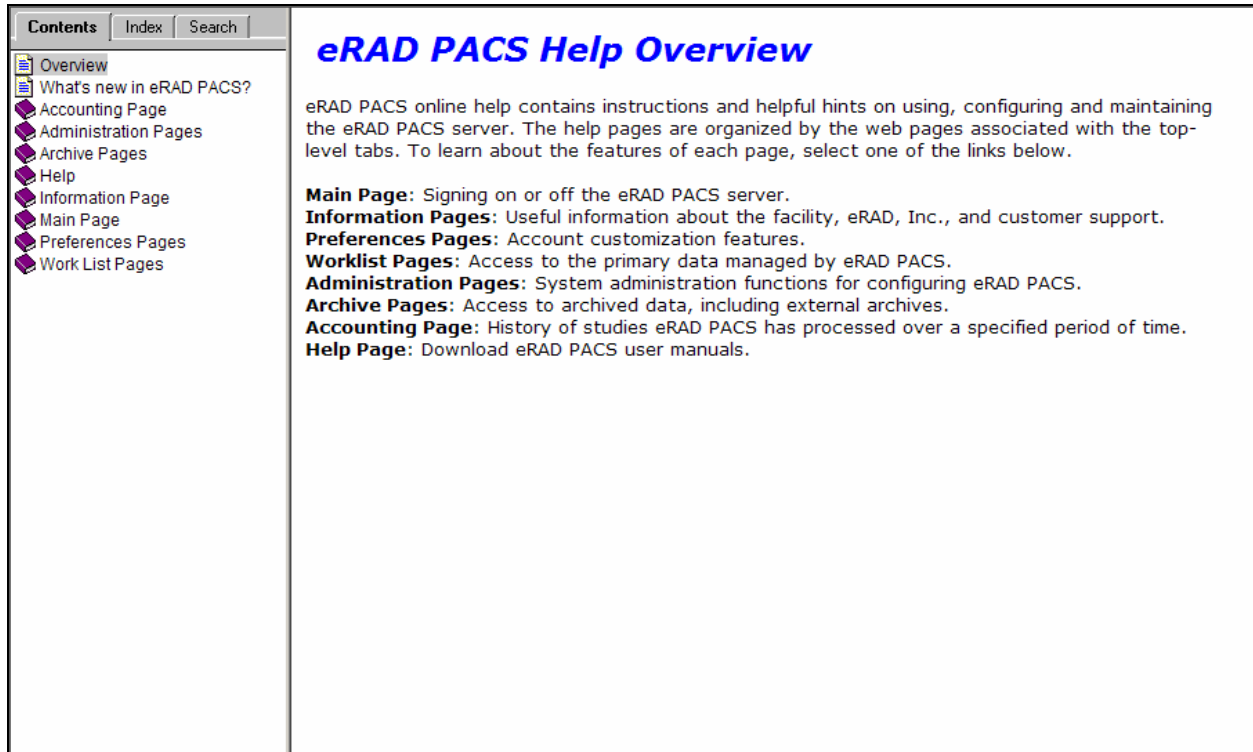
Two buttons exist for exporting the account summary information: *Print Friendly* and *Export*.

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.

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.




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. The 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 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 on the folder button, , at the left of the appropriate row. Section *6.3.2 Loading Studies Into the Viewer* contains information on opening a study in the eRAD PACS viewer.

Refer to the eRAD PACS Viewer Operator Manual for additional information on using the eRAD PACS Viewers.

Appendix A

Defined Terms for the Modality

AU = Audio
BI = Biomagnetic imaging
CD = Color flow Doppler
CR = Computed Radiography
CT = Computed Tomography
DD = Duplex Doppler
DG = Diaphanography
DR = Digital Radiography
DX = Digital X-ray
ECG = Electrocardiography
EPS = Cardiac Electrophysiology
ES = Endoscopy
GM = General Microscopy
HC = Hard Copy
HD = Hemodynamic Waveform
IO = Intra-oral Radiography
IVUS = Intravascular Ultrasound
LS = Laser surface scan
MA = Magnetic resonance angiography
MG = Mammography
MR = Magnetic Resonance
MS = Magnetic resonancespectroscopy
NM = Nuclear Medicine
OT = Other
PR = Presentation State
PT = Positron emission tomography (PET)
PX = Panoramic X-Ray
RF = Radio Fluoroscopy
RG = Radiographic imaging (conventional film/screen)

RTDOSE = Radiotherapy Dose
RTIMAGE = Radiotherapy Image
RTPLAN = Radiotherapy Plan
RTRECORD = RT Treatment Record
RTSTRUCT = Radiotherapy Structure Set
SM = Slide Microscopy
SR = SR Document
ST Single-photon emission computed tomography (SPECT)
TG = Thermography
US = Ultrasound
XA = X-Ray Angiography
XC = External-camera Photography

Retired Terms:

AS = Angioscopy
CF = Cinefluorography
CP = Culposcopy
CS = Cystoscopy
DF = Digital fluoroscopy
DM = Digital microscopy
DS = Digital Subtraction Angiography
EC = Echocardiography
FA = Fluorescein angiography
FS = Fundoscopy
LP = Laparoscopy
VF = Videofluorography

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