IMAGING SYSTEM
BACKGROUND PROCESSOR
USER MANUAL

Version 3.0

Includes updates for Patches 7, 3, 13 and 20

June 2006

Department of Veterans Affairs
System Design and Development
VistA Imaging

Revision Table

Date	Patch	Description
May 2002	Patch 7	Updated section 3.1.6.4 “Operational Procedures.”
Apr 2004	Patch 3	Updated section 3.1.8.10 and 5.5.7.6 to reflect transition to long file names.
May 2004	Patch 13	Expanded and updated Verifier content. Moved Verifier content from Chapter 4 to end of manual. Appendix B absorbed into Chapters 4 (Purge) and 7 (Verifier)
June 2005	Patch 13	Expanded and updated Verifier content. Moved Verifier content from the end of initial manual and created a separate manual.
June 2005	Patch 20	Updated Background Processor content in this manual. Extracted the entire Chapter 4 Verifier content and created a new manual which contains the extracted content.
Dec 2005	Patch 20	Updated Background Processor content in this manual.
Feb 2006	Patch 20	Updated sections 5.5.3 thru 5.5.5.1 “VistARad”
May 2006	Patch 20	Replaced all “VMC” with “VistA Imaging Shares”.

Preface

The purpose of this manual is to provide users with instructions on using the VistA Imaging Background Processor (BP) V. 3.0 software and system components. It includes explanations of the options and controls available from the VistA Imaging Background Processor. Instructions are provided about how to perform various system tasks. Additional information about the various VistA Imaging components such as servers, workstations, Remote Procedure Call (RPC) Broker software, and OTG-Disk Extender jukebox software can be found in the VistA Imaging Installation Guide.

The VistA Imaging System documentation suite includes…

- Release Notes
- Installation Guides
- Security Guide
- Technical Manual
- User Manuals

This manual is also available at: http://vaww.va.gov/imaging

Table of Contents

Chapter 1 Introduction

1.1 Functional Description

The VistA Imaging System is an extension to the Veterans Health Information System Technology Architecture (VistA). The VistA Imaging Background Processor (BP) runs on a dedicated Windows Workstation (WS) connected to VistA by way of a TCP/IP connection using the VistA Remote Procedure Call (RPC) Broker.

The Background Processor provides the following functions:

- Management of image storage on various shared network devices.
- Migration of image files between magnetic VistA Imaging Shares and jukebox storage units.
- Maintenance of adequate free storage space on magnetic storage devices.
- Copying of image files to the VistA Imaging Shares whenever they are requested by image display workstations.
- Validations of VistA Imaging network file references.
- Configuration of the local VistA Imaging site parameters.
- Error recovery.
- Activity and error logging.
- Importing Images into VistA.
- Exporting Images from VistA.

1.2 New Windows-based Background Processor Features in Patch 20

- The Queue Processor has a new feature to purge failed queue entries.
- The ADD/REMOVE entries have been separated out on the EDIT menu of the Queue Processor.
- The Background Processor checkbox was removed from the Background Processor Workstation Parameters form.
- Purge is now a separate executable that can be launched from the Queue Processor or as a standalone application launched from the START Menu.

1.2.1.1 Queue Manager Enhancements

- Queue Type lists have been expanded.
- Entire failed queue types may be purged in mass.
- Sites can now set the current active queue partition.
- The Purge Parameters dialog form now contains AutoPurge configuration.

1.2.1.2 Log File Enhancements

- Log files are no longer in the root \BackProc folder. They are now stored under the following folder:

  `\Program Files\VistA\Imaging\BackProc\Purge\Verifier\Log\BackProc`

  (**Note:** Old Log files are not moved to the new location, but they can be moved manually by the Imaging Manager.)

- Log files are archived in HTML format.
- Log files no longer self delete.

Chapter 2 Starting the Imaging Background Processor

2.1 Requirements for System Access

To use the VistA Imaging Background Processor, the user must have…

- An access and verify code for the VistA Hospital Information System.
- The VistA Imaging System menu option (MAG WINDOWS).
- Windows security access to the BP workstation and the VistA Imaging storage devices.

2.2 Overview of Background Processor Operation

The VistA Background Processor option will appear on the Windows START Menu under Programs on the desktop. The features of the application are evoked by two different user icons:

 This icon starts the Background Processor.

 This icon starts the BP Purge.

To activate a program, follow these steps:

Step	Action	Result
1	There are 4 methods to Start shown here below: • Click on the start button on the Windows task bar. • Click on the Programs menu. • Click on the VistA Imaging Programs menu. • Click on the Background Processor icon to launch the program.	There will be a pause and then a window should open -- the Background Processor window or the BP Purge. If there is no RPC broker session currently active, the VistA logon window will open.
2	Enter an access and verify code in	If you have access privileges, the VistA logon window will disappear and you will be able to

Step	Action	Result
	the VistA logon window.	use BP Workstation.

To operate the VistA BP Workstation Program, the BP workstation must be set up properly, including:

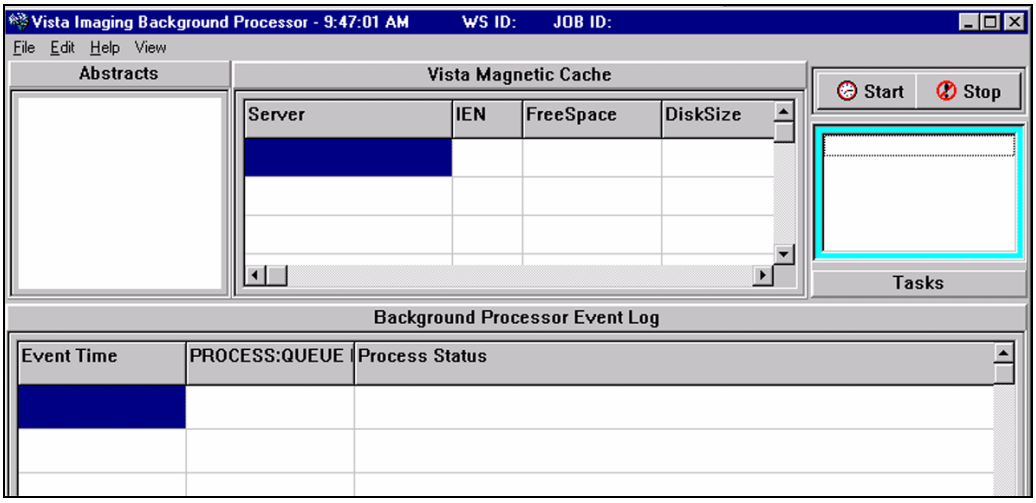
- Proper TCP/IP network configuration. (see Appendices A and B)
- Correct BP Workstation configuration. (see Chapter 3 Background Processor Operations)

Further information about BP Workstation setup is included in the Imaging System Installation Guide.

Users of the VistA Imaging Background Processor can access the Background Processor online help file by selecting the F1 key while the mouse pointer is over the Background Processor window. Left-clicking the help menu option on the BP window will also launch the online help version of this document.

Chapter 3 Background Processor Operations

3.1 Operation Options



3.1.1 Queue Processing Option

The Queue Processing option evaluates the available space on the current VistA Imaging Shares, assigns the write location to the share with the most available space, and processes the queue lists assigned to that BP Workstation. These queue lists are displayed in the TASKS list in the upper right hand corner of the main BP window.

Queue Processing may handle any of the following queues, as assigned:

- The JBTOHD queue populates the VistA Imaging Shares with images that have been used by the VistA Image Display software.
- The PREFET queue populates the VistA Imaging Shares with images that were requested based on VistA Imaging Display workstation configuration parameters.
- The ABSTRACT queue creates ABS derivative thumbnail files, based on a setting in the VistA Imaging System Manager Tool window (see VistA Imaging Installation Guide or Imaging System Manager Tools Online Help).
- The JUKEBOX queue copies images to the long-term archival storage device for clinical images.
- The DELETE queue removes images from the VistA Imaging Shares.
- The GCC queue exports image to the share specified in the Site Parameter file.

- The IMPORT queue provides a means for external applications to archive images in the VistA Imaging environment.

3.1.1.1 When to Operate and Why

- It is only necessary to configure the BPWS if the site is capturing images for storage on VistA Imaging servers.

- Queue Processing should operate continuously in order to support the archiving and retrieval processes of the image capture and display workstations.

3.1.1.2 When Not to Operate

- The Background Processor cannot operate during network outages.

- The BP should not be operated during upgrades, file server malfunctions that result in the loss of connectivity to all VistA Imaging Shares, or to all Jukebox devices.

Jukebox maladies such as configuration management tool outages, jammed picker arms, or shortages of formatted platters are all reasons to avoid having the BP queue processor active.

- The BP should not be operated during VistA hospital system outages.

3.1.1.3 Operational Procedures

The BP Workstation operator should have network security privileges to access the VistA Imaging Shares and jukebox devices.

3.1.1.3.1 Configuration

- The BP workstation should be added to the BP Workstation file (see Edit| BP Workstation Manager| Add BP Workstation) and be configured for Queue Processing (see BP Workstation Configuration).

- The VistA Magnetic Cache and the Jukebox devices must be configured (see Network Location Manager).

The operator will see the following message box when the BP application is launched from the VistA Imaging Programs menu if the workstation has not previously been configured:

3.1.1.3.2 Starting Queue Processing

- The Queue Processing option is initiated by left-clicking the START button on the upper right hand corner of the main Background Processor window.

- The TASKS list displays the Queue Processing tasks assigned to the BP workstation and the number of each to be processed. The VistA Magnetic Cache grid displays the online disk space capacity and the available disk space. The *BP Event* grid displays the file path to the BackProc.log file on its title bar. The grid itself displays all file processing activity that is occurring. These logged events display the time and date, the queue type and queue number, the source and destination of each file transfer, creation or deletion. The result of each activity is displayed on a subsequent grid line.

3.1.2 Open Log File Option

The Open Log File option provides a method of searching any of the log files associated with the BP Workstation activities and the log file archives. The log files include error and operational events for BP Queue Processing, BP Purge, and BP Verification options. The option provides search, view, print and file save functions.

3.1.2.1 When to Operate and Why

This option can be used to assist troubleshooting and documenting VistA Imaging System malfunctions.

3.1.2.2 When Not to Operate

This option is not available on the BP main window when the Queue Processing option is active.

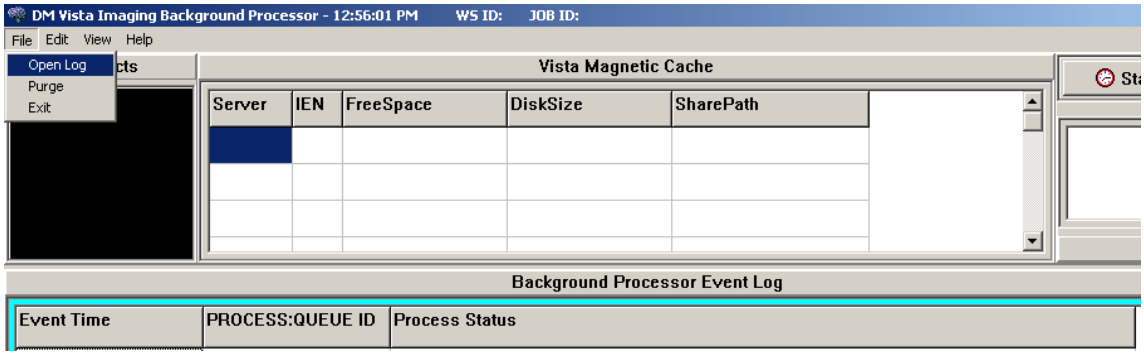
3.1.2.3 Operational Procedures

See *Evaluating Event Logs* in the *Troubleshooting* chapter of this manual.

3.1.2.4 When Not to Operate

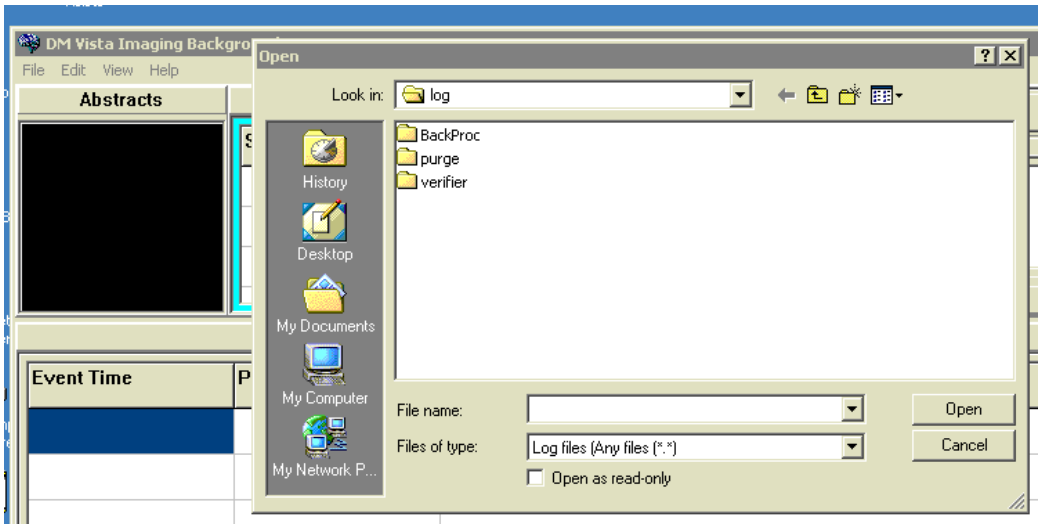
This option not available on the BP main window when the Queue Processing option is active.

3.1.2.5 Operational Procedures



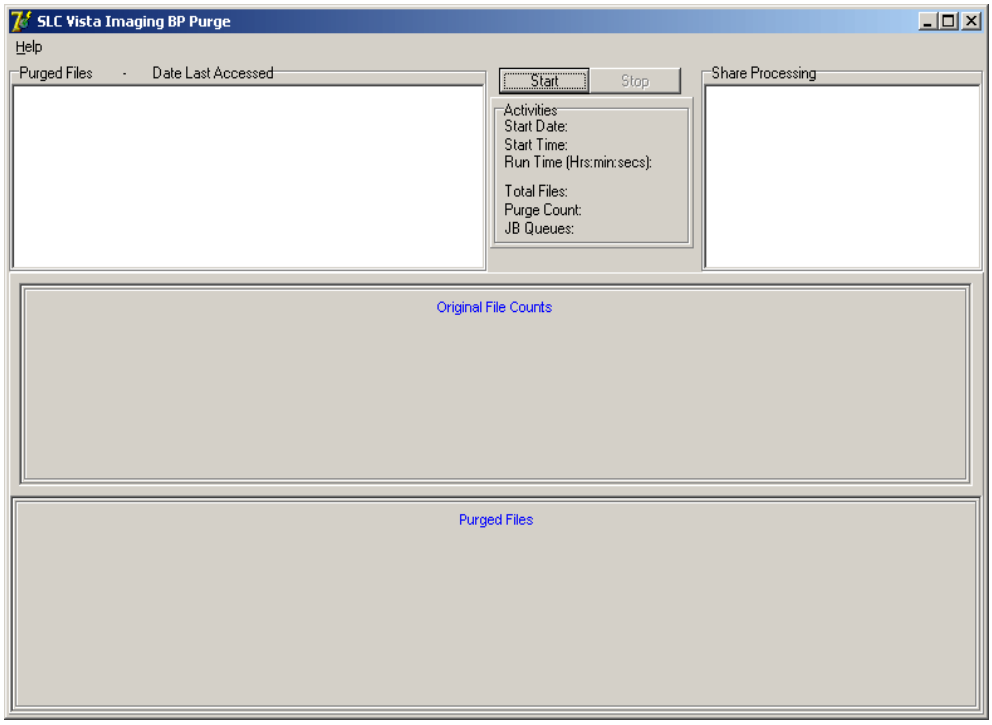
- This file dialog box opens in the application subdirectory LOG. At this directory level the "Purge", "Verifier", and "BackProc" subdirectories can be viewed. The appropriate log files for each application are at the level below, descending from these directories. The log files are archived after 1000 writes, with each restart of the application, and after midnight. The archival is in an HTML format so these files are viewable, printable, and searchable with the BP browser or they can be used with Internet Explorer (IE) or any browser of preference. The file names include the date and sequence number for each date in which the archive takes place.

  Open Log (File|Open Log)



- Refer to the Chapter 6 for the log file content.

3.1.3 VistA Imaging Shares Purge Option



This option recovers disk space on the designated VistA Magnetic Cache shares. Free space is necessary for newly acquired and recently viewed images. The Purge option validates that a copy of the image or image derivative file is on the Jukebox before purging. The files are evaluated by date of last access and by file type against the aging parameters specified by the VistA Imaging system manager using the Purge parameter option.

3.1.3.1 When to Operate and Why

It is recommended that the VistA Imaging Shares RAID devices operate more efficiently when 10 percent of disk capacity is available. Some degradation occurs as the storage devices fill and files become fragmented. The system is designed to notify the VistA Imaging system manager and the ADPAC when VistA Imaging Shares resources have reached a critical level (default is 5% free space remaining). This value is too low for normal workflow. At this point, the Automatic Write Location update option no longer operates.

3.1.3.2 When Not to Operate

Do NOT operate the purge when Jukebox or VistA Imaging Shares access is compromised. Excessive JUKEBOX copies will automatically be queued by the BP Purge as a result of not being able to verify copies on the Jukebox. The purge will be ineffective if it does not have access to the VistA Imaging Shares it is intended to purge. The BP purge will not operate if the VistA hospital system is not available, the RPC Broker Listener is not active, or the network is down.

3.1.3.3 Operational Procedures

See Chapter 4 Purge Operations chapter in this manual.

3.1.4 Add and Remove BP Workstation

Use the Edit | BP Workstation Manager| Add/Remove BP Workstation option to add or remove Background Processor Workstation (BPWS) to/from the VistA Imaging System.

3.1.4.1 When to Operate and Why

This option should be used when installing the VistA Imaging System, when retiring the current BPWS, or when adding a 'hot' spare BPWS.

3.1.4.2 When Not to Operate

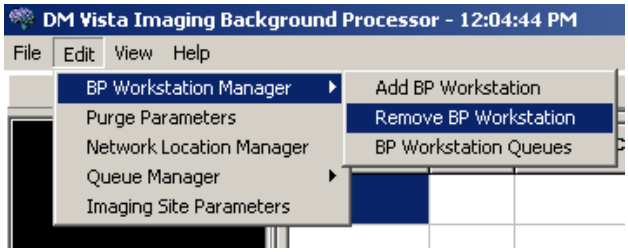
The jukebox, the VistA Host system, and at least one RAID share must be fully accessible for the purge to be effective. The purge will not purge any files that are not confirmed ably on the jukebox.

This option not available on the BP main window when the Queue Processing option is active.

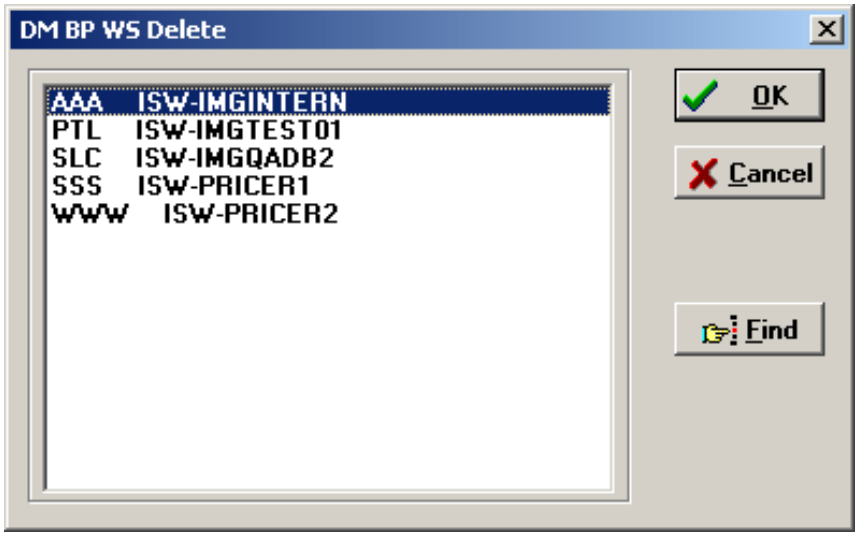
3.1.4.3 Operational procedures

3.1.4.3.1 Removing a BP Workstation

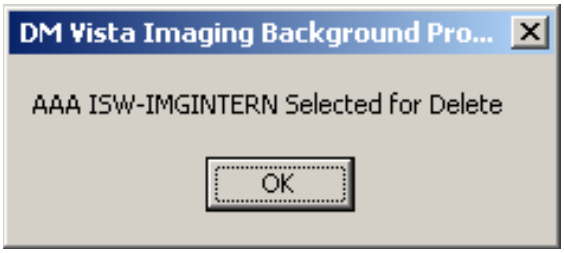
1. Select Edit| BP Workstation Manager| Remove BP Workstation from the BP main window.



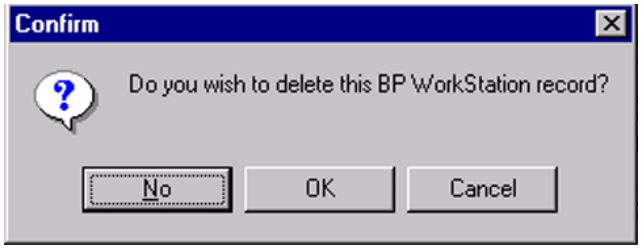
2. Select a BPWS using the Delete window by highlighting its name either with the mouse or the keyboard up or down key. Then click on the OK button.



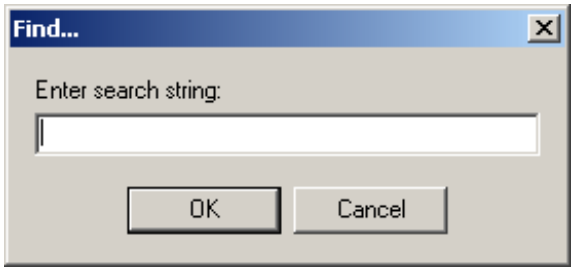
3. Click on the OK button to delete the BPWS selected.



4. Click on the OK button to complete:

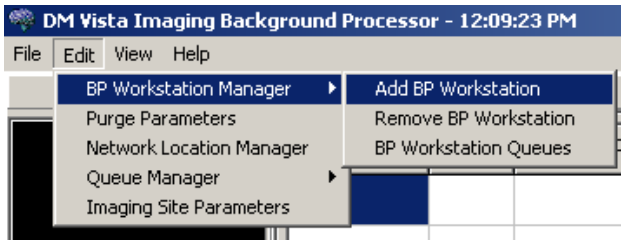


5. If a BP workstation is not on the list and needs to be deleted, click the Find button and enter a search string:



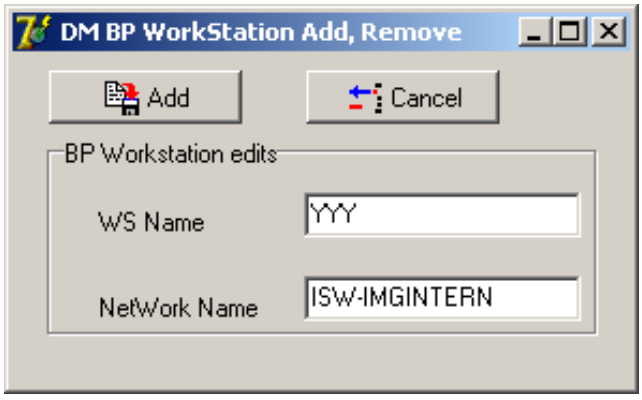
3.1.4.3.2 Adding a New Workstation

1. Select Edit| BP Workstation Manager| Add BP Workstation from the BP main window.

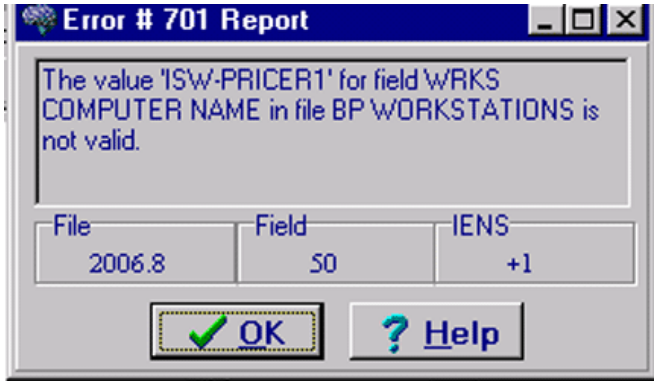


2. The Workstation (WS) Name requires a 3 alphanumeric character name (the first must be an alpha character). The Network Name must be the actual Windows name of the BPWS and it must be unique.

3. Click the ADD button in order to store the new BPWS entry.



If a name value is invalid, a FileMan message box appears as shown below:



3.1.5 BP Workstation Configuration Option

The BP Workstation Configuration EDIT window is used to view and edit the individual BPWS parameters related to the queue types to be processed.

Most sites will find that a single BP Workstation provides optimal performance. However, the VistA Imaging System can support multiple simultaneously operating BP processors.

This option configures one or more BPWS configurations. Only one Background Processor can be configured to manage each Background Processor activity. The software does not permit redundant assignments of BP activities.

3.1.5.1 When to Operate and Why

BPWS configuration should be performed when first installing the VistA Imaging System.

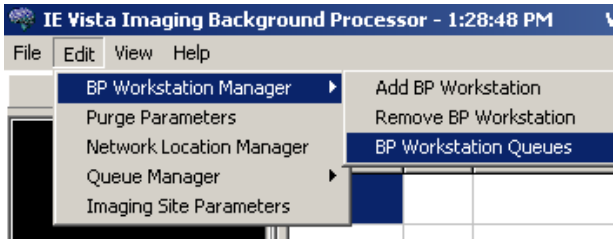
When PREFET is added to the VistA Imaging display workstation configuration, this activity must be checked on the BPWS configuration window in order to have these queue types processed.

3.1.5.2 When Not to Operate

This option is not available on the BP main window when the Queue Processing option is active.

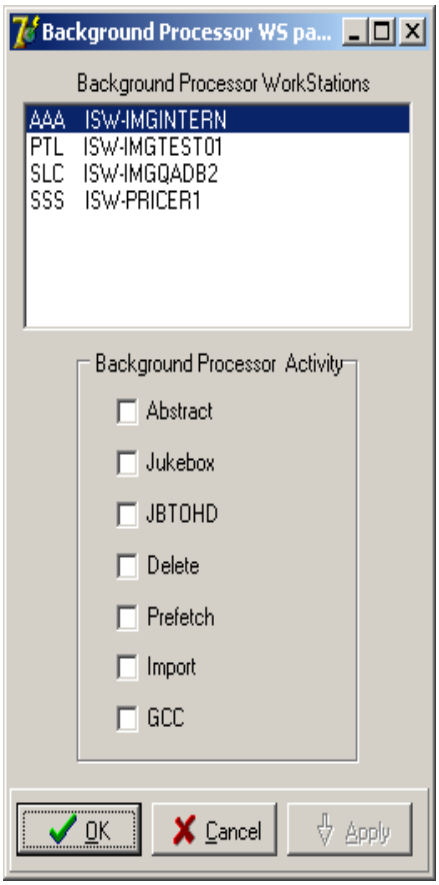
3.1.5.3 Operational Procedures

1. Select Edit| BP Workstation Manager| BP Workstation Queues from the BP main window.



2. Select the BPWS to be configured by clicking or scrolling to select it.

- The checkbox will refuse to accept the user input if the queue is already selected by another local BP workstation.
- **Abstracts** should only be checked when the workstation setting of at least one capture workstation "Abstracts created" is set to TRUE.
- The **Jukebox**, **JBTOHD**, and **Delete** checkboxes should be checked if only one BPWS is operating.
- **Prefetch** should be selected if the site has configured the VistARad workstations to Prefetch.
- **Import** may be used for processing any VHA Internal or External interfaces that require VistA Imaging for archival or retrieval VistA Imaging services. This may include but not be limited to Patient ID and Clinical Procedure interfaces.
- **GCC** (Generic Carbon Copy) queue is used for exporting images external to the local VistA Imaging network. It is currently used to deliver Health Eligibility forms to the Health Eligibility Center.



3.1.6 **Configure** VistA Imaging Shares **Purge Parameters**

This option allows the user to specify the length of time files will remain on the VistA Imaging Shares after their date of last access. This time period is specified for different types of files. Not all sites capture all the file types specified in the parameter list. The rate of capture, the size of the magnetic cache, and the percentage of each file category, help determine the file retention time.

3.1.6.1 When to Operate and Why

The site should strive to maintain the VistA Imaging Shares between 80%and 90% (or 10% and 20% free space). When the purge process results in the post purge space in excess of this criterion then either the values should be increased in order to decrease the amount of files removed from the VistA Imaging Shares or decreased in order to remove a larger volume of files from the VistA Imaging Shares. The frequency of the purge, the volume of image acquisition, the volume image file retrieval, the use of Prefetch, and the VistA Imaging Shares disk space capacity are all factors that will determine the best set of values for an individual site. Ideally,

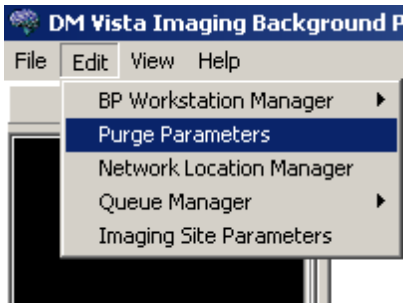
the site should be able to maintain 5 or more years of Abstracts on the VistA Imaging Shares, two years of Full files, and then 1 year of BIG files. VistA Imaging Shares sizing will heavily influence the systems ability to meet this standard.

3.1.6.2 When Not to Operate

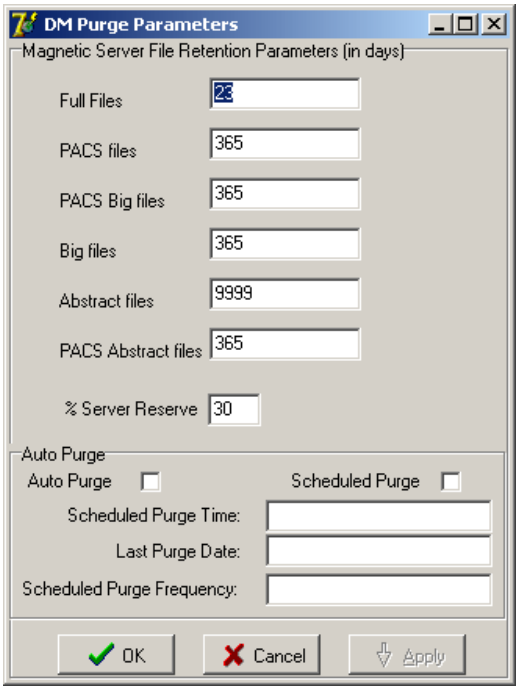
If the frequency and the results of purging are acceptable then it is not advisable to change the purge values.

3.1.6.3 Operational Procedures

1. From the main Background Processor window, select the Purge Parameters option.



2. **Enter retention time for each file type**. Enter the number of days that each file type should remain on the VistA Imaging Shares from the time the individual files were last accessed by a clinical user (as opposed to a BP operation) to the time the purge is executed and the files are evaluated by the purge process.



   - **Full files** are those imported through the Capture WS, designated at the time of capture as the primary source files used by the Clinical Display workstation.
   - **PACS files** are those that are imported through the DICOM gateway and shown by the Clinical Display workstation and VistARad.
   - **PACS Big files** are large files that have been imported through the Digital Imaging and Communications in Medicine (DICOM) gateway.
   - **Big files** are diagnostic quality image files.
   - **Abstracts** are derivative, TGA format files that are about 100 kb in size on average and have ABS extension.
   - **PACS Abstracts files** have been created

from files imported through the DICOM gateway.

3. **Percent Server Reserve.** Enter an integer between 2 and 50. The system will default to 5 if this value is outside the normal range. The parameter specifies the threshold where the Auto Write Location Update function will be deactivated and CRITICAL LOW MESSAGES will be sent out to the previously specified mail group.

4. **Auto Purge.** This option refers to the configuration of the software responsible for maintaining a minimum amount of disc space for storing clinical images on the VistA Imaging disc storage system. This storage area is often referred to as VistA Imaging Shares as well as the RAID. This utility can be operated manually, automatically upon system demand, or by scheduling.

   - By checking the **Auto Purge** checkbox, the Queue Processor will launch a purge when the percent server reserve threshold is reached.

   - By checking the **Scheduled Purge** checkbox the Queue Processor will launch a purge at the scheduled time of day, on the day specified by adding the **Scheduled Purge Frequency** to **Last Purge Date**.

   - By setting the **Scheduled Purge Time** field, the purge will run in 24hr increments. (Suggested timeframe is 1:00am).

   - The **Last Purge Date** is automatically updated at the outset of a scheduled purge. It needs to be initialized for the first purge.

   - **Scheduled Purge Frequency** – In days, this value will be added to "Last Purge Date" to launch the purge. (Suggest increments of 7).

   - Click on the Apply button to process all changes.

5. Click on the Cancel button to reverse all changes.

Note: See the VistA Imaging website for additional information on server sizing: http://vaww.va.gov/imaging

3.1.7 Network Location Manager Option

The Network Location Manager option is used to configure VistA Imaging Shares, Jukebox shares, GE/Marquette Muse shares and GCC.

3.1.7.1 When to Operate and Why

This option is used during the installation and setup of the VistA Imaging System (See the VistA Imaging Installation Guide). It is used to make new shares available to the system.

It is also used for the following maintenance functions:

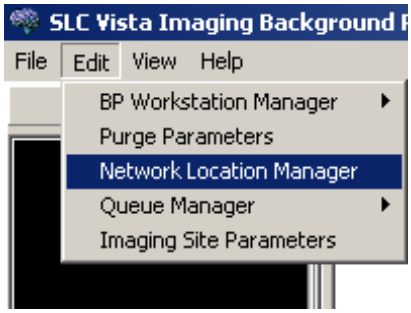
- Shares can be taken offline when maintenance is necessary and continuous operation of VistA Imaging is desired.
- Shares may be isolated temporarily by setting them as "router shares" for the purpose of excluding them from the purge and auto write location processes.
- GE/Marquette Muse shares may require version and numbering updates.
- GE/Marquette Muse security can be managed from this window.

3.1.7.2 When Not to Operate

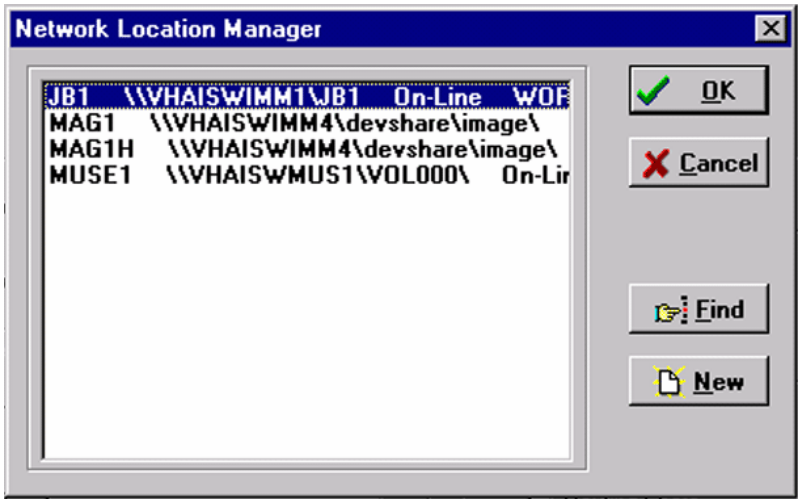
This option is not available on the BP main window when the Queue Processing option is active.

3.1.7.3 Operational Procedures

1. From the main Background Processor window, select the Network Location Manager option.

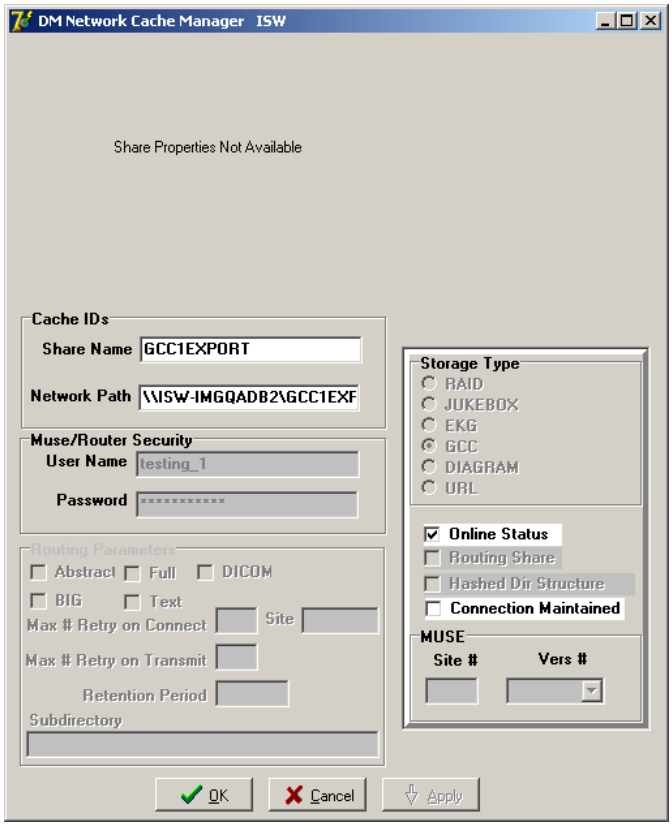


2. Click the New button to add a new share or highlight an existing share to configure it.



Creating a New Share: When creating a New share location the operator will next see the following message regarding the required set of fields which must be established in order to create a unique share.	

- The grayed fields of the Network Cache Manager window are read-only. The Online Status and Routing Share fields each provide warning messages when checked or unchecked. Hashed Dir Structure is always ghosted.



- The **Share Name**, **Network Path**, **Online Status**, and **Storage Type** are required fields and must be entered in order to save the new share entry (See the Imaging System Installation Guide for standard recommended naming conventions for both Share Name and Network Path).

- The **Muse** field set will only be enabled for Muse-EKG Storage Types and the **Muse/Router Security** fields will only be enabled for their coinciding Storage Types.

- It is important to set these entries correctly. Any changes must be made using VistA menu options. If a share is no longer used, it may be retired by setting it "off line".

3.1.7.4 Share Name

Each share name is assigned a logical name. Magnetic storage entries begin with "MAG". For example, "MAG1H" would indicate a magnetic network location that uses a hashed directory structure. All jukebox entries should start with Write Once Read Many (WORM). This is the assigned name of the physical location where images is stored.

3.1.7.5 Network Path

This is the Universal Naming Convention (UNC) style share where Image files are stored. The user should have a valid user name and appropriate network permissions for this share. Note the following information:

- Use the cluster name and share names defined in the Microsoft Cluster Configuration.
- See the Imaging System Installation Guide for Naming Conventions.
- For Muse, determine server share name on the Muse server.

3.1.7.6 User Name (MUSE and IMPORT only)

The value of this field is a user name that will be used to establish a connection with the network location. Security-related information removed. Security-related information removed.

3.1.7.7 Password (MUSE and IMPORT only)

Security-related information removed. Security-related information removed.
Do not share this account password with any users. Security-related information removed. Security-related information removed.

3.1.7.8 Routing Parameters

- **Abstract**. The value of this field indicates whether or not ABSTRACT files should be transmitted to this destination. Abstract files (also known as thumbnail or icon files) are used by Clinical Display workstations.
- **Full**. The value of this field indicates whether or not FULL files should be transmitted to this destination. Full files contain the complete image, potentially at a reduced resolution. For routing, this checkbox should be selected.
- **DICOM.** Do not use, this checkbox should not be selected. Reserve for future use.
- **BIG.** The value of this field indicates whether or not BIG files should be transmitted to this destination. Big files contain the complete image, always at the original resolution. For routing, this checkbox should be selected.
- **Text.** The value of this field indicates whether or not TEXT files should be transmitted to this destination. Text files contain the header information from the original DICOM file. For routing, this checkbox should be selected.
- **Max # of Retry on Connect.** Indicates the maximum number of successive attempts that will be made by the routing software to connect to this destination. A typical value is three attempts. If a successful connection cannot be made, the destination will be marked “off

line." After 15 minutes, the destination will be marked "on line," and the routing software will begin trying to connect to this destination again.

- **Site.** The value of this field is a code used by VistARad to identify the source of routed exams. The value of this field can be any text string. In the VistARad software, the value for this field will be shown in the RC (Remote Cache) exam list column.

- **Max # of Retry on Transmit.** Indicates the maximum number of successive attempts the routing software will make to transmit a file to this destination. A typical value is five attempts. When it is not possible to make a successful copy of an image within the number of attempts, the entry for the image in the transmission queue will be marked as failed (There is a Routing Gateway menu option to re transmit failed queue entries.)

- **Retention Period.** The value of this field determines the number of days routed image files are stored at this destination. A typical value is five days. Whenever a transmission processor connects to a destination, it checks whether or not it has executed a purge for that destination on that day. If the connection in question is the first of the day and no purge has been executed yet, a purge will be initiated. During a purge, any image files older than the number of days specified by RETENTION PERIOD are deleted (note that files are always retained at the sending site).

- **Subdirectory.** Files are typically not stored in root directories. The value of this field is the name of a subdirectory where files are to be stored. The value of this field is concatenated to the name of the network location (the 'physical name') to create the complete path-name for the location where files are to be stored. When "directory hashing" is active, additional subdirectory names will be added to the above-mentioned path-name before the file name will be appended.

3.1.7.9 On-Line Status

This device designation allows the VistA Imaging System to continue functioning when individual storage devices go down. If a storage device is impaired in any way, the VistA Imaging application will continue functioning if this checkbox is unchecked for the faulty device. Image files on an offline device are inaccessible by the VistA Imaging Display application. Images will be accessed directly from the Jukebox and then copied to an online VistA Imaging Shares device. The purge function does not evaluate files on an off-line device.

3.1.7.10 Storage Type

- **RAID**. This is the normal RAID magnetic share used to provide fast access to image files that have been recently acquired or viewed.

- **Jukebox**. This is the normal Jukebox share that refers to the OTG Jukebox.

- **EKG.** This is the device type that commonly is used to store Muse EKG data.

- **GCC.** This is the default location for Health Eligibility Center (HEC) (and Generic Carbon Copy) files to be copied to.

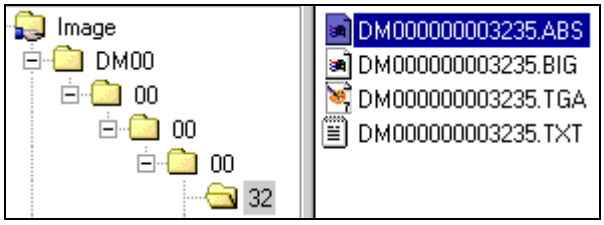
- **Diagram.** This storage type is used to isolate shares from purge and other mainstream VistA Imaging activity. The "annotation" images are currently being stored at this type of Network location.

- **URL.** This storage type is for web browser accessibility.

3.1.7.11 Hashed Dir Structure

The Hashed Dir Structure checkbox is used to configure the storage structure on the share. In most cases, image retrieval time is improved when a hashed directory structure is used.

If Hashed Dir Structure is checked, files are maintained in a 5-level deep subdirectory structure where no directory will contain more than 100 unique filenames with their various extensions For example, the file DM000000003235.TGA would be stored in DM00/00/00/00/32, as shown below.



Note: At older sites, there may be legacy hashed directory structures based on 8.3 (rather than 14.3) file names.

If the Hashed Dir Structure box is not checked, files are placed and retrieved from the root directory of the share.

Note: VistA Imaging does not recommend leaving this parameter unchecked.

3.1.7.12 Routing Share

This checkbox option performs several functions:

- The share will be isolated or immune from BP Purge activity.

- The Auto Write Location Update function will not consider this share as a candidate for selecting the current write location. However, if the Auto Write Location option is disabled then this share can manually be selected as the current write location, using the Site Parameters window.

3.1.7.13 Muse-EKG

Image files that are on a Muse-EKG share are referenced from the Muse database and displayed on the clinical imaging workstation.

3.1.7.13.1 Site

If this is a MUSE EKG network location, this field contains the MUSE site number for this location. Typically, a site with a single MUSE server that holds EKGs for one site would use 1. If a MUSE server stores EKGs for more than one site, then each site would be assigned a MUSE site number by GE/Marquette.

3.1.7.13.2 Version

This field holds the MUSE version number for Muse-EKG network locations.

3.1.8 Queue Manager

This option allows the VistA Imaging System manager to evaluate, archive, purge, and re-queue failed queues. It also provides the option of moving the current queue reference for each of the active queue types either forward or backward.

3.1.8.1 When to Operate and Why

This option should be used whenever connectivity issues arise with any of the networked VistA Imaging System components. The components include VistA Magnetic Cache devices, Jukebox shares or the Background Processor Workstation. In general when network outages occur, the JUKEBOX copy queue reference should be moved backward, and the JBTOHD reference should be moved forward. This will aid in recovering files that need archiving and circumvent populating the VistA Imaging Shares with images that may no longer need to be there.

3.1.8.2 When Not to Operate

This option is not available on the BP main window when the Queue Processing option is active.

3.1.8.3 Operational Procedures

See Chapter 6 Background Processor Maintenance section of this manual for operational details.

3.1.9 Imaging Site Parameters

This option provides system wide VistA Imaging System site parameter configuration.

3.1.9.1 When to Operate and Why

This option should be used whenever there is a need to reconfigure any of the major components of the VistA Imaging System.

3.1.9.2 Operational Procedures

See Chapter 5 entitled “Imaging Site Parameters” in this manual for details.

3.1.10 Server Size

This option graphically displays the VistA Imaging Shares free space. If the Auto Write Location Update option is enabled, then the current write location will be updated when the Server Size option is activated.

3.1.10.1 When to Operate and Why

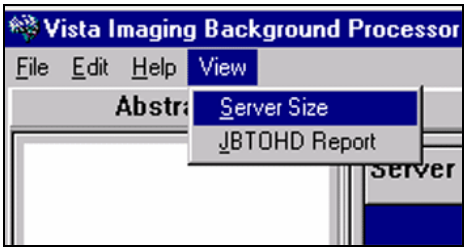
This option should be used to obtain a graphic view of the VistA Imaging Shares or to reset the current write location.

3.1.10.2 When Not to Operate

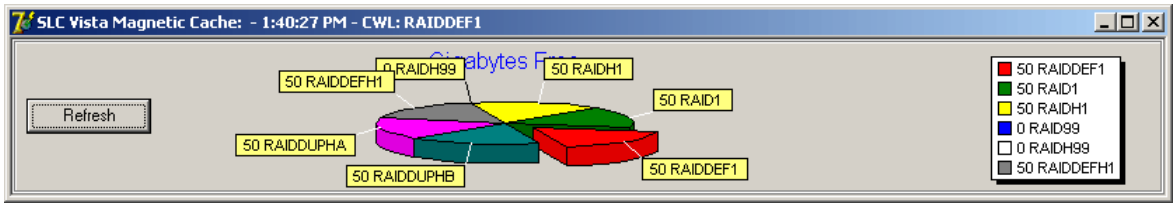
This option will not be able to provide information when the servers or network are down. The write location cannot be modified when VistA is down.

3.1.10.3 Operational Procedures

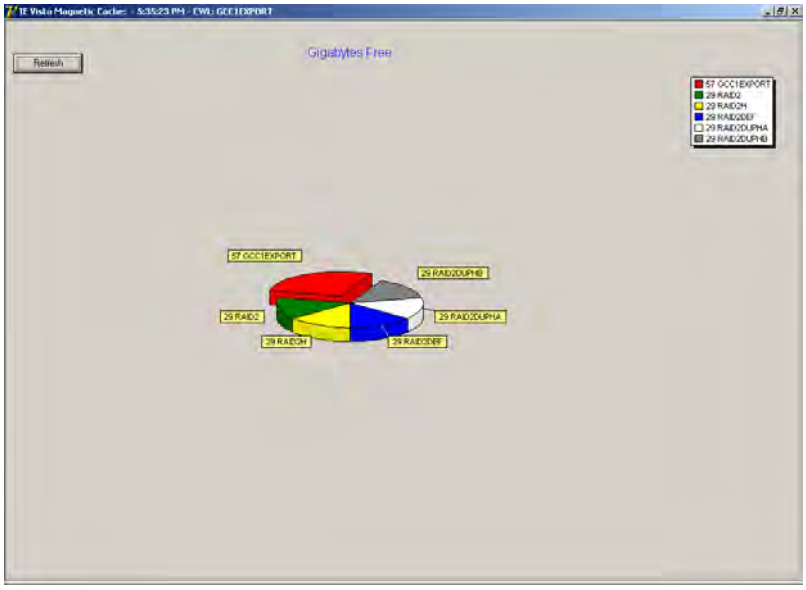
Select the Server Size option from the View menu on the main BPWS window.



The standard view:



- Clicking the Refresh button will start an update process that will reset the current write location if the Auto Write Location Update option is enabled.
- Notice the UNC share legend on the right of the full Server Size view below:



3.1.11 JBTOHD Report

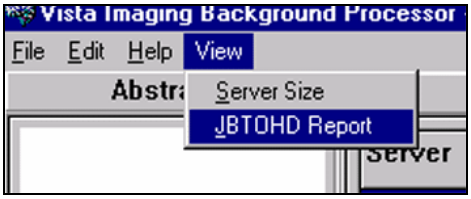
This option provides a view of the unprocessed JBTOHD queues. It enables the VistA Imaging System manager to determine where to move the current JBTOHD reference.

3.1.11.1 When to Operate and Why

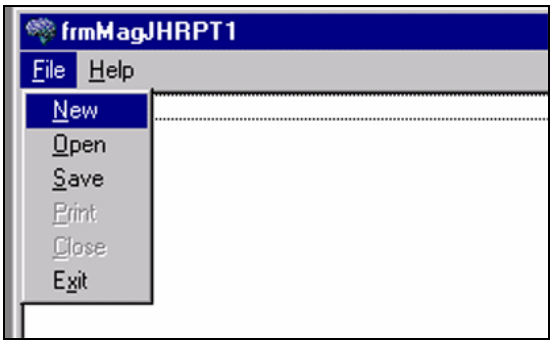
This option should be used when there is an emergency call to escalate the priority of images. This option will only help when there is a backlog of JBTOHD queues.

3.1.11.2 Operational Procedures

1. Start the JBTOHD Report option from the View menu on the main BP window.



2. Create a current JBTOHD Report using the *New* option from the JBTOHD Report File menu.



Note: See Chapter 6 Background Processor Maintenance section of this manual for further details on the interpretation of this report.

3.2 Error Messages

Error Message	Cause(s)/Solutions
Message box type error: EBrokerError: LA123456.TGA	RPC is not available, or application timeout has occurred. Restart application.
Message box type error: EBrokerError: 123456	RPC is not available, or application timeout has occurred. Restart application.
Message box type error: Broker Connection to server could not be established!	VistA RPC Broker is not currently in a listening state; the application has timed out. • Close the application and restart. • Check with the VistA system manager for the status of the Broker listener.
Message box type error: You must be assigned the "MAG SYSTEM" key to operate the Background Processor	The user does not have the MAG SYSTEM/MAG WINDOWS security key assigned.

Error Message	Cause(s)/Solutions
Message box type error: This Workstation is not yet configured!	• There is no entry for this workstation / Use the BP Workstation menu system: Edit| BP Workstation Manager| Add, Remove, BP Workstation. • The Workstation has not been assigned any Queue types to process / Use the BP Workstation menu system: Edit| BP Workstation Manager| BP Workstation Queues.
Event log message: Unable to copy to the current fileserver: Not enough storage is available to process this command.	Check the DEX Utility Software and Cluster Utility.
Event log message: Unable to copy to the Jukebox: Not enough write cache available 70 The remote server is paused or is in the process of being started.	Check the DEX Utility Software and Cluster Utility.
Event log message: Invalid jukebox volume name: \\VHAISWJB1\IMAGE1\ DEX Followed by: JBSleep \\VHAISWJB1\IMAGE1\ Jukebox is currently offline.	The Jukebox share cannot be accessed by the BP. The BP will continue processing when the Jukebox share comes back on- line. Check the Jukebox utilities for errors and operational status.

Error Message	Cause(s)/Solutions
Event log message: Unable to copy to the Jukebox: Not enough write cache available	The jukebox cache flushing mechanism is not clearing cache adequately. 1. Stop the Background Processor. 2. Use Jukebox utilities to determine if there is adequate media, check for error conditions, or there is need to re-start the cache flushing utility. 3. Restart the BP when the cache is clear.
Event log message: Invalid jukebox volume name: \\VHAISWJB1\IMAGE1\ DEX	The jukebox share label is not consistent with the VistA Jukebox file volume name. 1. Check the volume name in the site configuration (Edit|Site Imaging Site Parameters – Jukebox default) 2. Check the network properties of the Jukebox share validate that the label is 'DEX'.

3.3 Background Processor Logs

The user will have to manage these log/html files as all versions are kept.

Chapter 4 Purge Operations

It is necessary to understand the function of the VistA Imaging Shares in order to understand the function of the Background Processor Purge function. The VistA Imaging Shares provides quick access to files newly acquired from the VistA Imaging Capture application or imported through the DICOM gateway application. Files that are accessed from the Jukebox by the VistA Imaging Display and VistA RAD applications are then copied to the VistA Imaging Shares to provide quick access to this active patient's clinical images. Thus, storage space is constantly being used on the VistA Imaging Shares. The Purge function frees space on the VistA Imaging Shares by comparing the date of last access of individual files to the aging parameters defined by the VistA Imaging System manager. Files are purged from the VistA Imaging Shares only after their existence has been verified on the Jukebox and the size of the file on the VistA Imaging Shares matches the size of the file on the Jukebox.

4.1 When to Operate and Why

It is recommended that VistA Imaging Shares free space be maintained between 10 and 25 percent of total VistA Imaging Shares disk space. The exact number depends on the capacity of the VistA Imaging Shares relative to the rate of image acquisition and access. A site should have several weeks of free space available at any given time. On the other hand, a site may want to keep 6 months of clinical images and several years of abstracts online to reduce the movement of images to and from the jukebox. Achieving this balance may require monitoring VistA Imaging Shares capacity while fine-tuning the purge parameters.

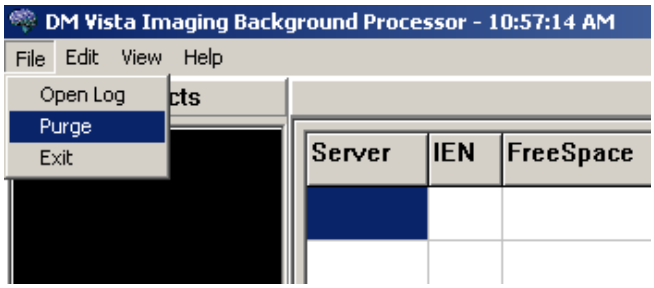
Generally, the purge should be started when the VistA Imaging Shares reaches 90 percent capacity and the result of the purge should be 15-25 percent disk space free, depending on the site's dynamics. If the VistA Imaging Shares maintains a large number of 'big' files then the 'keep' days for these files may need to be reduced to 30 or 45 percent in order to maintain optimal disk utilization. It is advised that the "% Server Reserve" value, which defaults to 5% be set higher, possibly 8%, so that if the cache reserves have reached that threshold there is enough response time to run the purge and keep the BP process active. The BP no longer manages the network write locations when there is less than 5% free space. The % Server Reserve parameter is configured on the Site Parameter form.

4.2 When Not to Operate

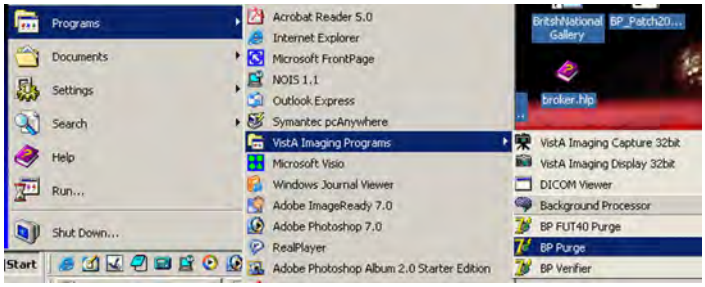
It is imperative **not to operate** the purge function when there is any connectivity impairment between the Background Processor and the jukebox share. VistA Imaging Shares files that cannot be verified on the Jukebox will be queued to the JUKEBOX copy queue unnecessarily and degrade the VistA Imaging System performance.

4.3 Operational Procedures

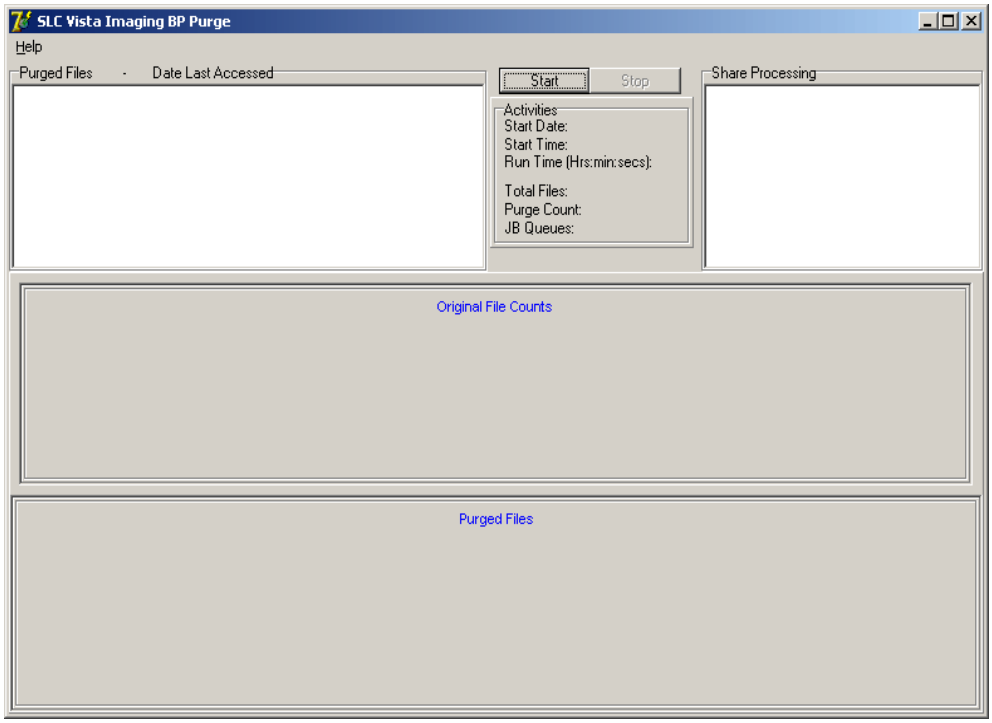
1. Select the purge option from the main Background Processor window through the File menu:



2. The Purge option can also be launched as a separate application as well:



3. Start the Purge by clicking the START button.

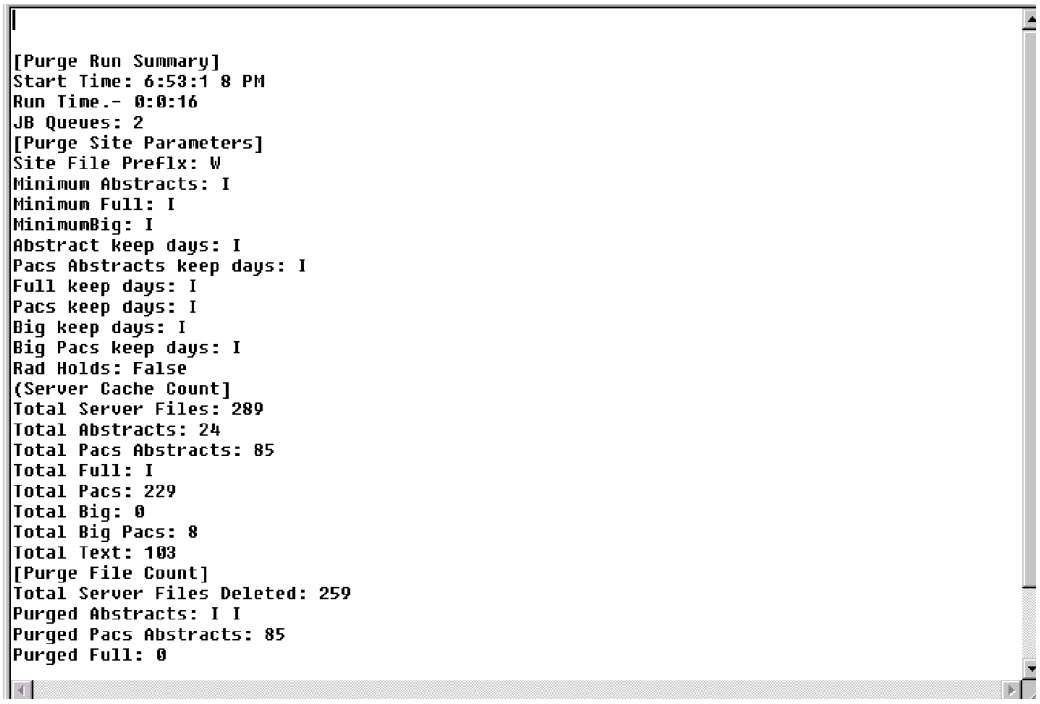


4.4 Purge Window Description

- **Start Date.** Shows the date the purge began. It is not unusual for it to take several days for the purge to complete.
- **Start Time.** Reflects the time of day that the purge began.
- **Run Time.** The total time in Hours:Minutes:Seconds that the purge operation is currently in use.
- **Total Files.** Represents the total number of files that the purge has scanned within all RAID shares that it currently has scanned.
- **Purge Count.** Reflects the total number of files that have been deleted from the RAID shares.
- **JB Queues.** Represents the total numbers of files that the purge has scanned that are purge candidates and it cannot confirm to be in archival storage.

4.5 Purge Report

In the Purge Run Summary, the purge report includes the Start Time, Run Time, and number of Jukebox queues



Note: If the Jukebox share is unavailable, the files that are purge candidates will be queued for JB copy because their existence cannot be verified on a jukebox.

In the Purge Site Parameter section, the report shows the purge related site parameters. The minimum values are used to quickly sort through files that are out of the date range for purging. This is a performance related technique. Files that are not purge candidates will not require a broker call to further gather file attributes nor will they require jukebox verification. The number of days each file type is kept is part of the candidate analysis. Whether a Radiology hold exists, it is then processed only if the site parameters indicate this.

In the [Server Cache Count] and [Purge File Count] sections, the report includes the number of each file type found and the number of each file type purged from the VistA Imaging Shares respectively.

4.6 Purge HTML Files

The html file, Purge.html, will be archived in the application subdirectory. The Purge.html file is described below. Note that entries in this log are structured differently based on the nature of the file (image vs. text) being reported on.

Purge.html (TGA, ABS, BIG extensions only)

Position	Field	Comments
1	Action	-3 = Foreign file, do not purge -2 = Queued for jukebox copy, do not purge -1 = Do not purge 0 = Purge('MAG 2005 entry)!('jukebox ptrs & 'exceptions) 1 = Purge given normal date criteria + confirmed on JB 2 = Purge given normal date criteria if TGA present 3 = Purge if file is at alternate network location site else purge if aged & update file references 4 = (**NA**) Age purge if on jukebox, update file references else update file references, queue jukebox copy 5 = Purge if at alternate site, queue jukebox if not on JB 6 = Purge given normal date criteria
2	Image Type	0 = Non-PACS 1 = PACS

3	Status	1 = No 2005 entry 2 = Radiology hold 3 = No Jukebox/jukebox pointers 4 = N/A (obsolete) 5 = Jukebox/jukebox pointers, no cache pointers, purge if confirmed 6 = Jukebox/jukebox pointers, wrong cache pointers, purge if image at alternate location 7 = Jukebox/jukebox pointers, no cache pointers, fix pointers 8 = Jukebox/jukebox pointers, cache pointers, age (if confirmed) 9 = Record not in the IMAGE file 10 = Foreign image file 11 = Not an image file 12 = File location not valid 13 = Delete 2005 entry (last location referenced) 14 = Duplicate entries for this image in 2005/2005.1
4	Jukebox pointer	Physical location of the jukebox
5	IEN	
6	RAID pointer	Location of file on RAID
7	Last Access Date	Date file was last accessed

(TXT extension – only)

Position	Field	Comments
1	"TxtLastFile"	
2	RAID pointer	Location of file on RAID
3	Last Access Date	Date file was last accessed

Chapter 5 Imaging Site Parameters

5.1 Function

The Imaging Site Parameters option of the Background Processor allows system managers to configure the VistA Imaging System.

5.2 When to Operate and Why

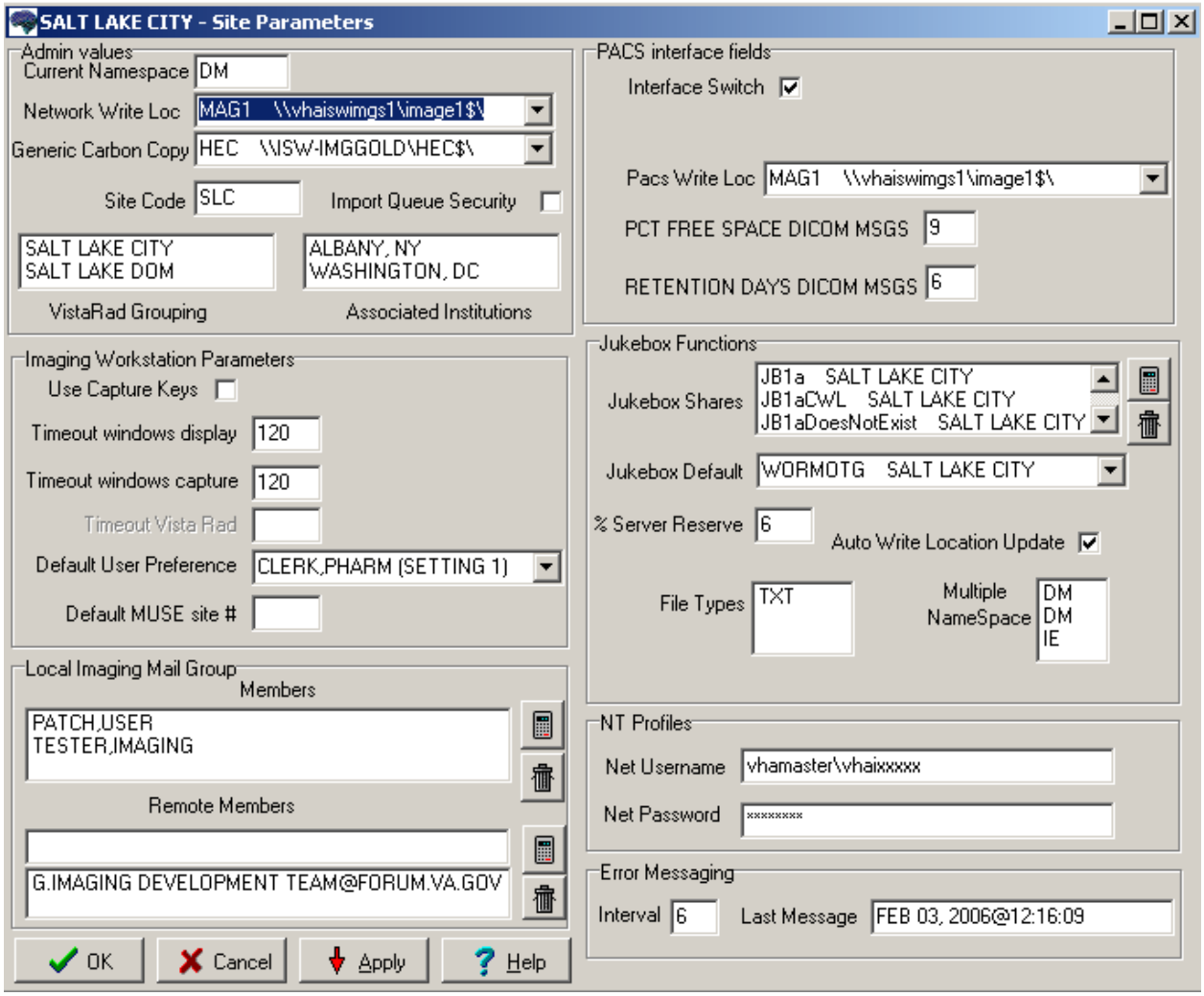
This option should be used to configure the system-wide Imaging site parameters, including image file attributes, VistA Magnetic Cache locations, display and capture workstations, DICOM gateways (PACS), Jukebox, network profiles, error messaging, and notification mail groups.

5.3 When Not to Operate

This option is not available on the BP main window when the Queue Processing option is active. However, a second copy of the Background Processor can be started on the same workstation to use the configuration options.

5.4 Operational Procedures

Open the Background Processor application and click on the EDIT|Imaging Site Parameters menu item.



5.5 Parameters

Each section below refers to a panel on the Imaging Site Parameters window. The name of each panel is shown on the top boundary of the panel. For example, the Admin Values panel is in the top left hand corner of the Imaging Site Parameters window. Each panel contains a number of controls that can be used to set the site parameter values. All of the imaging site parameters are described below.

5.5.1 General Instructions for Adding or Deleting Items from a List


This button starts an Add action. Click this button before selecting an entry to be added to a list.

 This button starts a Delete action. Select an entry to delete prior to selecting an entry to be deleted from a list.

5.5.2 Admin Values Panel

5.5.2.1 Current Namespace

This field is not site configurable. The current namespace is the first three characters of the 14-character name given to image files captured at this site. Each VHA facility has its own unique 3-character namespace. The VistA Imaging development and support teams maintain a central database of site information, including assigned namespaces. This is necessary to ensure that image file names across VHA are unique.

5.5.2.2 Network Write Loc

- This field contains the Universal Naming Convention (UNC) file share name of the image storage unit where image files are or will be written when captured or retrieved from the Jukebox.
- All images captured on clinical workstations will be saved in this location. This location will change over time depending on available space on the various magnetic cache locations. This location represents a single share in the VistA Magnetic Cache.
- If the Auto Write Location Update option is disabled, then the system manager can manually select a new location from the drop down list.
- The clinical capture software always checks this node before writing a DOS Image file to disk.
- This field is also known as the Current Write Location.

Note: Current Write Location and Network Write Location are used for the same parameter.

5.5.2.3 Generic Carbon Copy

- This field contains the Universal Naming Convention (UNC) file share name of the remote storage unit where image files copied to by default when Health Eligibility Center (HEC) / GCC copies are invoked.
- HEC Images captured on clinical workstations will be copied to this location.
- This location is selected from the GCC type network locations set up in the Network location file.

5.5.3 VistARad Site Code

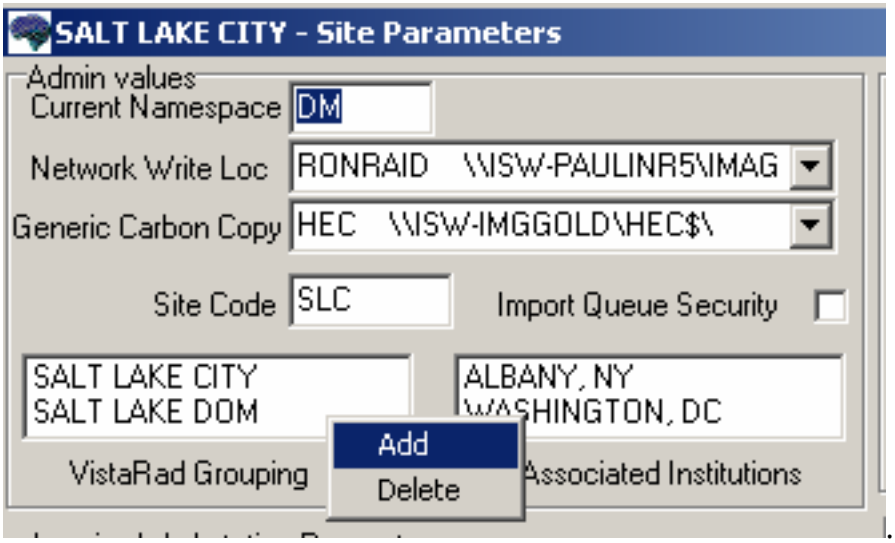
This value is used to indicate the sending site for routed images.

5.5.4 IMPORT Queue Security

- When selected, the IMPORT Queue connects and disconnects to the designated share for each Queue Entry being Processed using the user name and password designated in the Network Location file.
- If this option is deselected, then the share is accessed using the default BP network credentials. Performance may be enhanced while retaining adequate security for the data and network

5.5.4.1 VistARad Groups

This multiple field is used to define a division or group of divisions whose studies will appear on the VistARad Unread List for a user logged into the primary division of the medical center. Additionally, these unread studies are lockable for reading by radiologists.

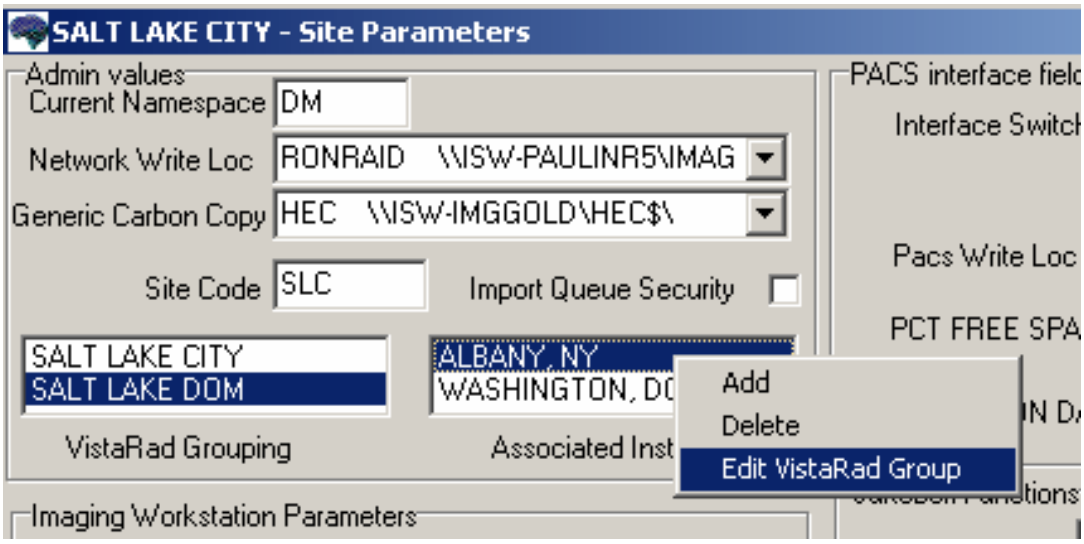


5.5.5 Associated Institutions

This list of institutions will provide users who have selected this institution at login, to have access to the VistA Imaging images that reside upon the VistA Imaging network defined by this set of Site Parameters.

5.5.5.1 Associated Institutions / VistARad Groups

This multiple field is used to define a division or group of divisions that will appear on the VistARad Unread List for a user logged into an associated institution of the primary medical center division. Additionally, these unread studies are lockable for reading by radiologists.



5.5.6 Imaging Workstation Parameters

5.5.6.1 Use Capture Keys

- This field controls whether the Image capture security keys will be used to determine whether particular users may capture images to a particular package. If this item is set to true, then the appropriate keys must be given to users for the appropriate Image capture functions. The use of capture keys is recommended, so this box should be checked.

- If this box is checked, Capture functionality and the associated procedure look up will not be allowed from the capture window if the user does not have the proper security key allocated.

- If this box is checked, the Medicine procedure selection window will only display the types of procedures for which the user has keys assigned.

5.5.6.2 Timeout Windows Display

- Enter the number of minutes (between 6 and 600) before the VistA Imaging Display Application will close due to inactivity.

- If no activity occurs for the selected number of minutes, the user will be prompted with a dialog window and given 30 seconds to CLICK on the Stay Connected button or the application will be closed.

- The Timeout can be overridden on individual workstations by utilizing the Imaging Site Manager to edit the Imaging Workstation Configuration for the workstation. If a value greater than 0 (zero) is entered for the “Workstation Timeout Minutes” field that value will override the value of this field.

5.5.6.3 Timeout Windows Capture

- Enter the number of minutes (between 6 and 600) before the VistA Imaging Capture Application will close due to inactivity.
- If no activity occurs for the selected number of minutes, the user will be prompted with a dialog window and given 30 seconds to CLICK on the Stay Connected button or the application will be closed.
- The CAPTURE timeout period will generally be longer than the DISPLAY timeout because clinical procedures can take hours. Critical images can be missed in the operating room or endoscopy lab because of a short timeout period.
- The Timeout can be overridden on individual workstations by Imaging Site Manager by editing the Imaging Workstation Configuration for the workstation. If a value greater than 0 (zero) is entered for the "Workstation Timeout Minutes" property that value will override the value of this field.

5.5.6.4 Timeout VistA Rad

Designated for future use. Do NOT change default values.

5.5.6.5 Default User Preference

- This field contains the user preference setting for first time users of the VistA Imaging System.
- This field points to the Imaging USER PREFERENCE file (#2006.18). If this field is empty, the default user preferences are created by the VistA Imaging routines.

5.5.6.6 Default Muse Site

Each GE/Marquette MUSE installation can have multiple site numbers. Enter the default site to which the VistA Imaging Display application will connect. Site numbers are usually 1, 2, 3 ... etc. If this field is empty, the application will default to 1.

5.5.7 Local Imaging Mail Group

5.5.7.1 Members and Remote Members

- This group is initialized during the install process.
- The installer is automatically added as a local member.
- The G.IMAGING DEVELOPMENT TEAM@FORUM.VA.GOV is added as a required remote recipient to comply with the Food and Drug Administration requirements.

- It is recommended that the local VistA Imaging ADPAC, Imaging Coordinator, and any Imaging managers be added as a member as well as any network administrators who are responsible for the support of the VistA Imaging system.

- It is recommended that a local text pager recipient be added as a remote member. The pager service needs to provide email pager response. The standard email addressing format is supported by this system: "name@mail_domain".

- Only individuals with the MAG SYSTEM security key will be displayed in the lookup dialogue for the local mail group.

5.5.8 PACS Interface Fields

These items refer to any DICOM systems that are interfaced to the VistA Imaging System. These may be commercial PACS systems or DICOM modalities.

5.5.8.1 Interface Switch

If there is no DICOM gateway, this box should be unchecked.

5.5.8.2 Pacs Write Loc

- Select the VistA Imaging Shares share where all images transmitted by the DICOM gateways are to be written. This location is similar to the Network Write Location described above, except it is used for images captured by a DICOM gateway.

- If the Auto Write Location Update option is disabled, then the system manager can manually select a new location from the drop down list.

- If the Auto Write Location Update option is disabled, then it is recommended that this location be set to a different location than the Network Write Location.

5.5.8.3 PCT Free Space DICOM Msgs

- Enter the minimum percentage (0 to 100) of free space for a DICOM gateway. 25% is the recommended entry.

- The value of this field is the minimum percentage of free space required for DICOM gateway message processing.

- The automatic message delete function on the text gateway is triggered when this threshold is reached.

5.5.8.4 Retention Days DICOM Msgs

- The subroutine that purges old DICOM messages will only remove messages that are older than this number of days. 30 days is the recommended entry.
- Enter the number of days (between 0 and 99999) that DICOM text messages are to be retained.

5.5.9 Jukebox Functions

5.5.9.1 Jukebox Shares

- This list box contains references to the WORM-OTG type shares in the Network Location file.
- All Jukebox shares should be added to this list in order for them to be referenced by the Jukebox default.

5.5.9.2 Jukebox Default

- If you have more than 1 jukebox, you will need to designate the active jukebox using this control. Use the pull down list to select the active jukebox network location.
- This field will designate the current Jukebox share write location where new image files will be placed.

5.5.9.3 Percent Server Reserve

- Enter an integer between 2 and 50. The system will default to 5 if this value is outside the normal range.
- This parameter specifies the threshold where the Auto Write Location Update function will be deactivated and CRITICAL LOW MESSAGES will be sent out to the previously specified mail group.
- If the AutoPurge is configured for this site, then the low water mark event will trigger the purge to launch and Auto Write Location activity will continue.

5.5.9.4 Auto Write Location Update

- This field enables or disables the background processor function that evaluates the space available on each of the online magnetic shares and assigns the network write location to the share with the greatest space available. This function controls both the PACS Write Location and the Network Write Location.

- The messaging functionality to alert system managers that the storage space has become critically low (Critical Low Message) is dependent on this activity.
- Network and PACS Write Locations must be manually changed if the Auto Write Location Update activity is disabled.
- It is recommended that this parameter be temporarily unchecked when isolating online magnetic shares for purging.

5.5.9.5 File Types

- These entries are used to specify image file derivatives to migrate with the FULL and BIG files when JUKEBOX and JBTOHD queue entries are processed. Any file of a type specified will follow its associated FULL or BIG file when copies are made between jukebox and magnetic cache locations.
- The default entry: TXT included with the VistA Imaging System installation. This entry should NOT be removed or else the TXT files will not migrate between jukebox and magnetic cache.
- Do not add TGA, ABS or BIG to this list as they are already processed as a default by the queue processor if they exist in the derivative file set.
- The intent of this field is to allow sites that have specific other derivatives such as overlays or attachments to be managed by the VistA Imaging System.

5.5.9.6 Multiple Namespace

- This feature supports the use of multiple local image file namespaces.
- The VistA Imaging purge function will purge files that are **NOT** prefixed with the current namespace or a namespace that is a member of this multiple.

5.5.9.7 Net Username

--- Security-related information removed ---

- This entry must be 3-30 characters in length.

--- Security-related information removed ---

5.5.9.8 Net Password

- This entry is the network password (between 3 and 30 characters in length) for the NET USERNAME entity.

--- Security-related information removed ---

5.5.10 Error Messaging

5.5.10.1 Critical Low Message Interval

- Enter an integer between 1 and 96. This value represents the hours between triggered error message transmissions. The Default value set during the package install is 6.
- The Critical Low Message is transmitted via Email to the members of the Local and remote VistA Imaging Mail group.
- These messages represent an attempt by the system to alert support staff that the ability of the system to store images has been compromised. The messages will continue until there is sufficient server space to maintain the specified minimum reserve or until the Auto Write Location Update feature is disabled.
- Be sure to add the local Image support staff person to the local MAG SERVER mail group and at least one pager number in the MEMBERS REMOTE multiple.

5.5.10.2 Date/Time of Last Critical Low Message

- This is a Read Only field. This field should not be edited in any way because it is updated automatically by the VistA Imaging messaging system.
- This date/time field is automatically set each time a critical message is sent.
- This parameter is used in combination with the CRITICAL LOW MESSAGE INTERVAL to determine if it is appropriate to send a new message when the VistA magnetic cache space remains below the PERCENT SERVER RESERVE value.

Chapter 6 Background Processor Maintenance

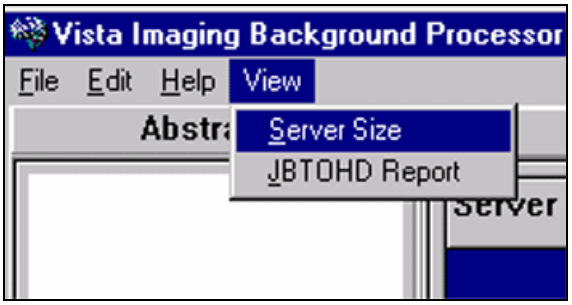
6.1 BP Troubleshooting

This section describes troubleshooting methods for types of problems that may be encountered.

6.1.1 Network Connection Problems

Check the status of all the online VistA Imaging Shares and jukebox shares by one of the following means:

1. From the Main BP window, start the *Server Size* option from the View Menu.



2. Using Explorer, show the properties of the VistA Imaging Shares and Jukebox shares.

3. From the command prompt execute a dir <sharename>/*.

If any of these methods fail, attempt to ping the devices from the command prompt. Also, ensure that the signed-in user has been assigned adequate network privileges.

6.1.2 Invalid Log In

Close and restart the application, as client applications will frequently be disabled after a system error or timeout. Possible other causes for this type of problem include:

- The MAG SYSTEM security key is not assigned to the logging on user.
- The MAG WINDOWS menu option is not designated as a user's secondary menu option.

6.1.3 Not Enough Server Cache

Examine the online status of each of the designated VistA Imaging Shares shares.

1. If the critical low threshold has been reached on all devices, disable the Auto Write Location Update option.

2. Set the write location manually to a share with cache space available.

3. Launch a second BP {Start|Programs| VistA Imaging Programs|Background Processor} and start the purge process {File|Purge on the 2nd or new BP}. See Section 4 for additional information about purging.

6.1.4 Not Enough Process Memory

Close all the applications and reboot the BP WS.

Note: If problem persists, please contact the VistA Imaging support staff through Remedy.

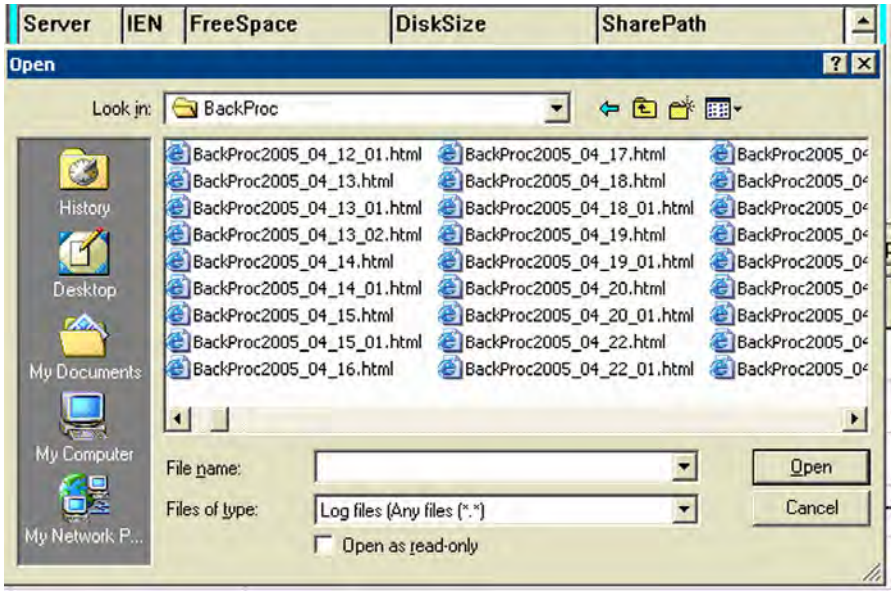
6.1.5 Not Enough Formatted and Online Jukebox Platters

Add additional optical platters to the Jukebox. For additional information see the VistA Imaging Installation Guide or Technical Manual for more information.

6.2 Evaluating Event Logs

- Event logs often contain information that will assist in troubleshooting.

  Open Log (File|Open Log)



- The Open Log provides access to the event capture and error logs for the Background Processor, Queue Processing and Purge activities. Selecting a file opens an edit session that provides search and print functions as a management tool.

6.3 Queue file management

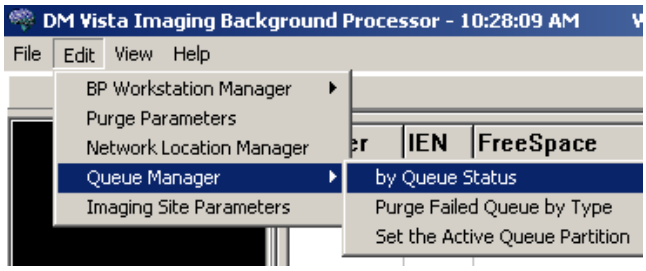
- When a foreground process such as the Clinical Workstation application requests that a clinical image be saved to jukebox or retrieved, it creates an entry in the queue file that identifies the file and the file process as part of the queue parameters. When the Background Processor successfully completes the queued request, the queue entry is deleted from the queue file. If the task fails, the queue entries remain in the queue file with a status that may help explain the reason for the failure.

- Generally, the cause of queue failure is related to network connectivity or jukebox maintenance. Often these failed queues would successfully complete if they were re-queued. However, a site that has experienced a backlog of file requests will want to avoid processing old requests because generally a small portion of these requests are still needed at a later time. It is important to RETRY (re-queue) the Jukebox copies as they represent requests to archive clinical images and must be processed.

- It is important to periodically evaluate and re-queue or purge failed queues to ease management of recent failed queues when a local network interruption event occurs.

6.4 Start the Queue Manager

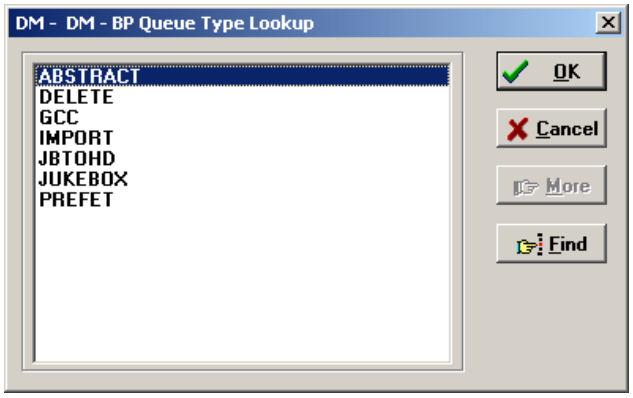
Use the Edit | Queue Manager Menu option on the Background Processor to start the Queue Manager.



- Queues are managed one type at a time.
- Queue Type Statuses may be processed one status at a time, including nil statuses, or All.

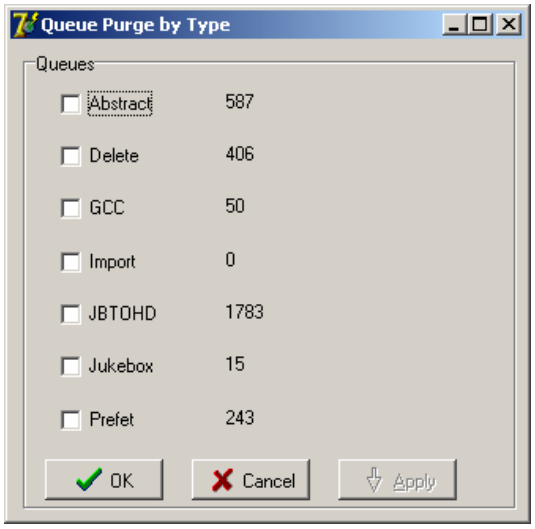
6.4.1 Select by Queue Status

Next, use the Queue Type Lookup to select the queue type to be manager:

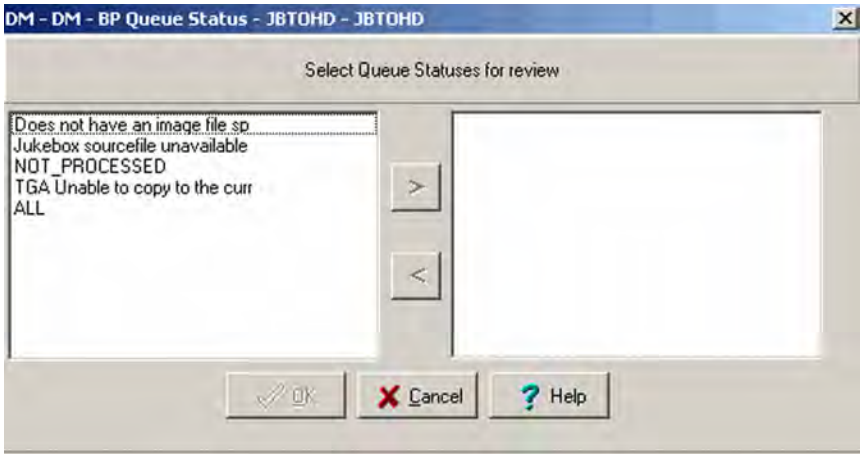


6.4.2 Select Purged Failed Queue by Type

Clicking on the Purge Failed Queue by Type will allow the user to purge the selected queue type:

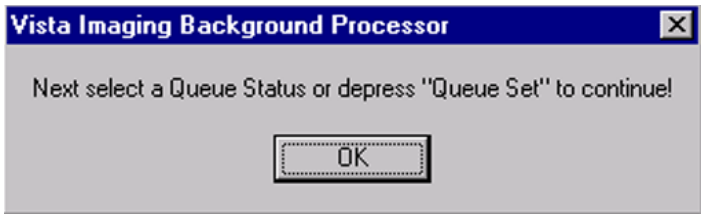


6.4.3 Select the Active Queue Partition



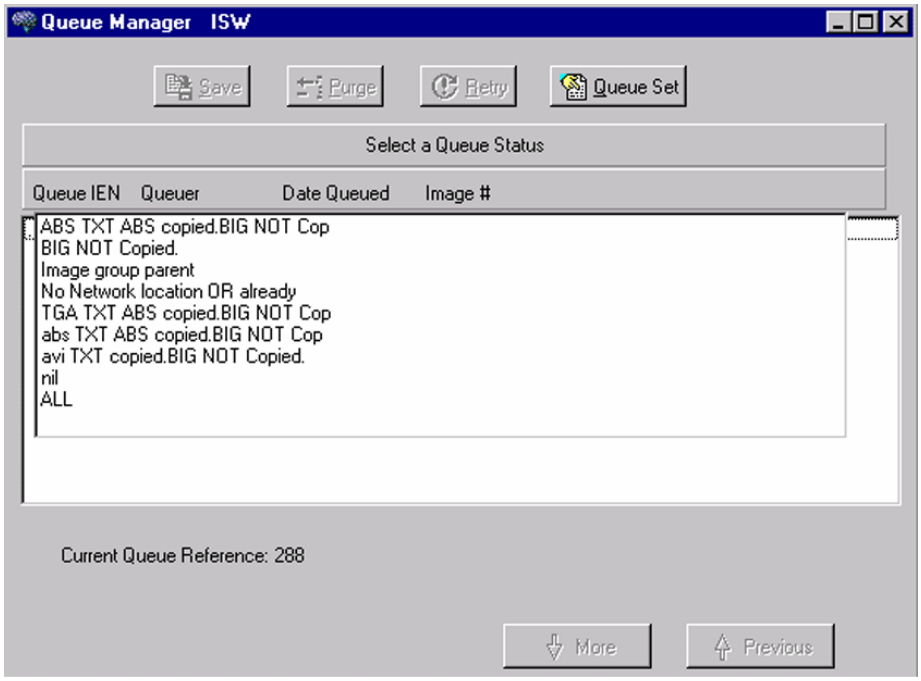
6.4.4 Select Queue Status to {Save, Retry, or Purge} or Queue Set

An instruction box will display as follows:



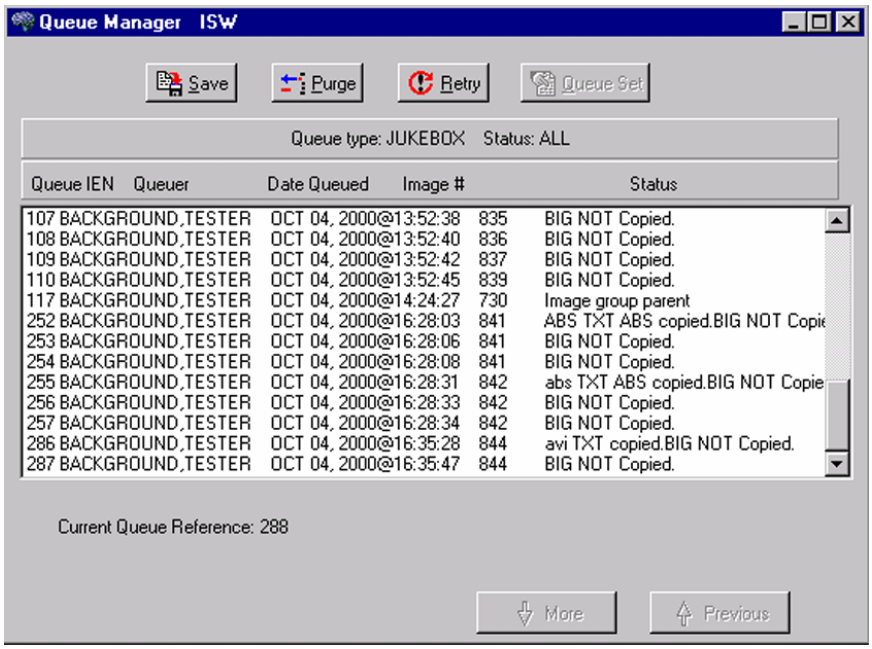
1. Either click on the long button labeled Select a Queue Status to re-queue, save, or delete queue entries, or continue:

2. Click on the button labeled Queue Set to change the point in the queue where processing is taking place.



6.4.5 Save, Retry, or Purge

This window allows selection of the queue entries defined by the Queue Type. In this case, JUKEBOX and the Status ALL were selected in the above steps.



- Individual queue entries may be selected using the mouse. Multiple sequential queue entries may be selected by highlighting the first queue entry and by holding down the shift key while highlighting the last queue entry in sequence. Another method is to hold down the shift key while depressing the keyboard down or up arrow to scan the list. Multiple non-sequential entries can be selected by holding the Ctrl key while selecting individual queue entries.

- The Save, Purge, and Retry buttons operate on selected queue entries. If NO queues are selected, the same buttons operate on ALL queue entries in the current list box.

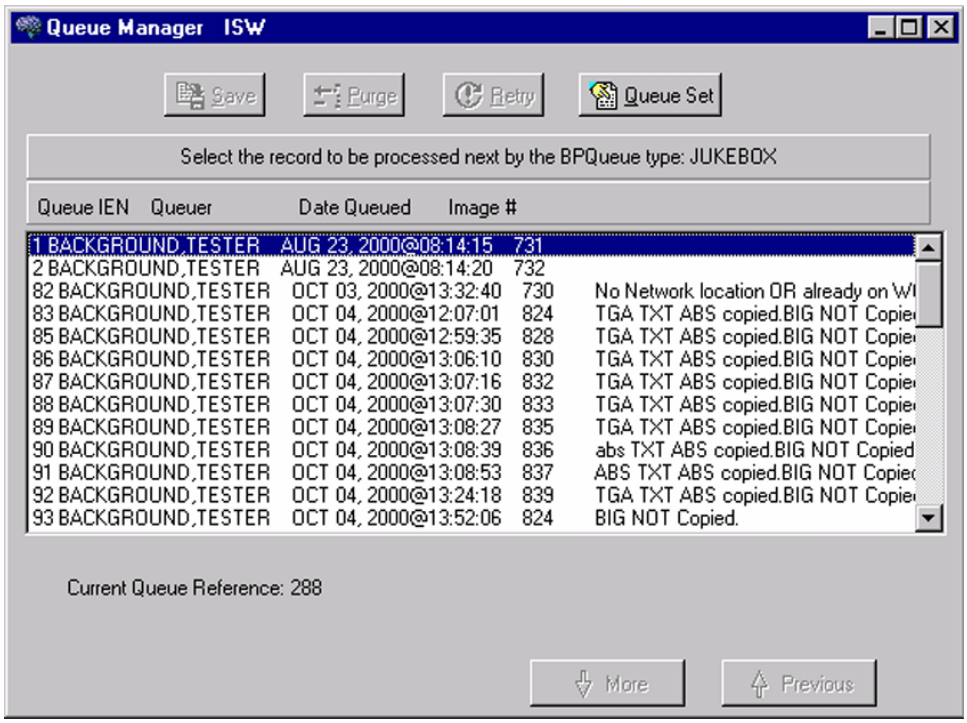
- The SAVE button initiates a “Save As” dialog for selected queue entries or ALL of the list box queue entries. This option saves entire queue entries to a text file. There are no current utilities for processing these text files; they will be archived to provide a useful history of Queue Processing failures.

- The PURGE button is used to delete the selected queue entries or ALL of the list box queue entries from the queue archive.

- The RETRY button will cause the selected (or all in the current list if none are selected) to be re-queued. This means the file requested, the queuing individual, the date of queuing and the status will be reconstituted in a new queue entry at the end of the queue list, and the selected queue will be deleted. This is useful when the cause of the previous failure has been eliminated.

6.4.6 Queue Set

The Queue Set button provides a method of determining the next queue entry to be processed. If the Queue Set button had been clicked instead of the selecting a status, the user would see the following:



An earlier queue can be selected here to reprocess failed queues or the user may wish to skip (more often the case for JBTOHDs) forward in the list of queues to avoid image archival processes that are of reduced priority or no longer necessary. Select a queue entry by highlighting a single line item. Then click the Queue Set button a second time. A confirmation message will be displayed with the new Current Queue Reference.

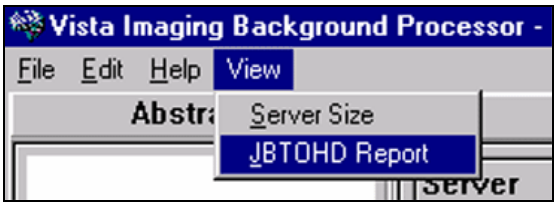
The queue entries can be displayed in a list box. The More and Previous buttons maybe used to navigate the entire queue file of the selected queue type in order to select the position of the next queue process.

6.4.7 Queue Management Considerations

Queue entries reflect requests to move files to and from the jukebox (with the exception of GCC, Abstract and Delete queue entries). Normally, old JBTOHD queue entries should not be re-queued, as these files usually reflect old requests that, for the most part, will no longer be needed on the VistA Imaging Shares. The Jukebox copies should be re-queued in order to have a jukebox backup image copy as soon as possible. The Queue Set button will request a listing of all queue entries including both active and non-active queue entries of the selected queue type. The list may be perused and the current pointer reset to the one selected by the user.

6.5 JBTOHD Report {View|JBTOHD:Report}

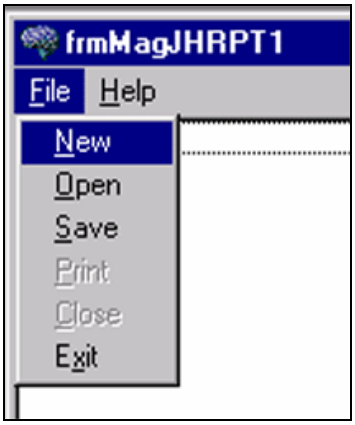
This option is designed to allow the VistA Imaging System manager to look at the content of the jukebox-to-hard drive copy queue (JBTOHD).



This information should allow the user to accurately advance the JBTOHD queue reference so that in a crisis, specific images can be made available.

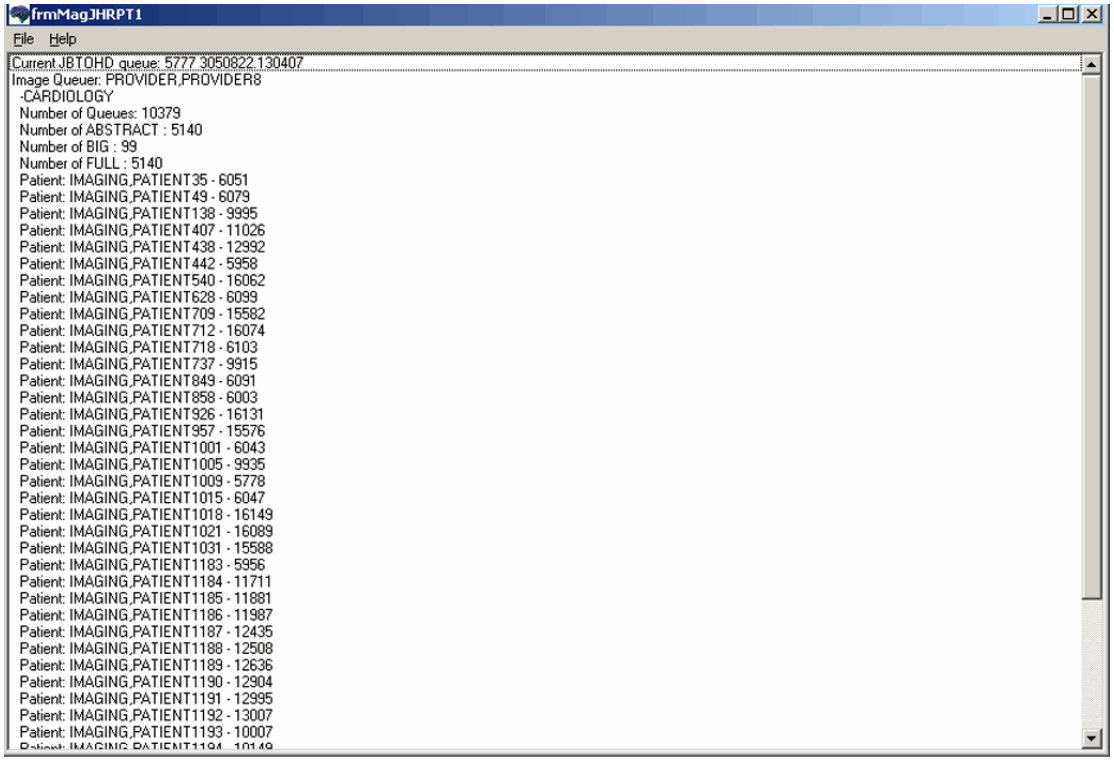
For example, at a filmless radiology test site: the hospital's local area network has experienced network connectivity issues that result in a backlog of archive retrievals (JBTOHD). An emergency arises in which a care provider requires a previous film immediately. If the VistA Imaging System Manager knows the provider and patient identity, then by listing the JBTOHD report, the queue entry can be identified and the queue process started at the right place.

Select New to create a current report.



- Reports can be Saved.
- Old reports can be Opened.
- A Print option is provided.

The JBTOHD queue display is sorted by the individual that queued the entry. It displays the number and types of queues. It displays the patient along with the queue Internal Entry Number (IEN) to facilitate advancing the queue pointer.



Appendix A

A.1 Broker Server Configuration

The following summarizes the installation of the RPC Broker Client Agent software. See the RPC Broker installation manual for more detailed information.

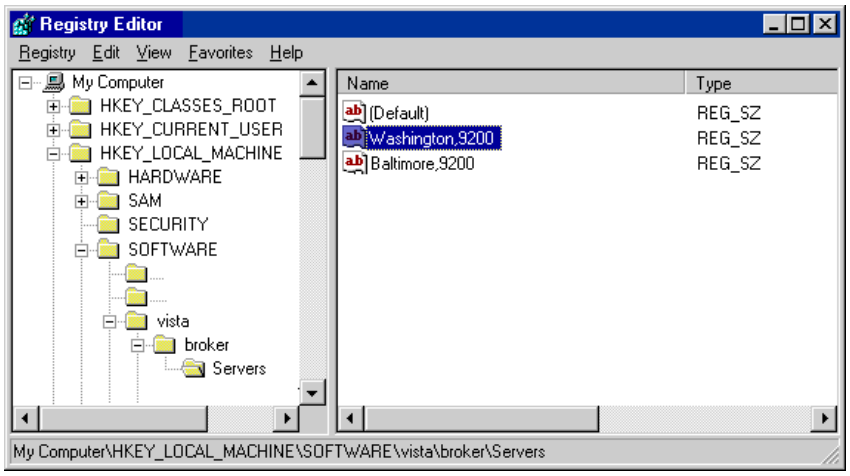
1. Login to workstation as an administrator

2. Install the RPC Broker client agent software

3. Run XWB1_*xWS*.EXE and follow the setup wizard. Answer "Yes" when given the option of running the Client Agent program on startup.

4. Log into the workstation as an administrator, start the Registry editor (Start | Run | Regedit) and navigate to: `HKEY_LOCAL_MACHINE\Software\vista\Broker\Servers`

5. Create a new string value (Edit | New | String Value). Use the remote server name and port number as the name of the value. Separate the name and the port number with a comma.



6. Close the Registry Editor.

7. If the server name does not resolve through DNS, open the HOSTS file. This file is located in either WINNT\system32\drivers\etc or WINDOWS\system32\drivers\etc.

8. Add a line to the file that includes the IP address and name of the remote site's Broker server.

```
#HOSTS
10.2.1.1 Washington
10.2.1.2 Baltimore
#END
```

9. Save and close the HOSTS file.

10. If you set up workstations to connect to a server that can be resolved automatically through domain name server (DNS) (e.g. alpha3.yourva.gov), there is no need for you to make any entries in a workstation's HOSTS file.

11. Reboot workstation

12. Run the Kernel Broker test program

    RPCTest.exe is a test program distributed and installed on your PC in the C:\Program Files\VISTA\BROKER folder when the Kernel Broker Client Agent software is installed. When executed, it can be used to test the connection to the VistA System. This is valuable in troubleshooting problems with the VistA Imaging System. Please review the Kernel Broker documentation for more information and examples on the test application.

Glossary

Abstract	A “thumbnail” version of an image, which requires less computer processing resources to display than the actual image.
Aggregate	To gather together as into a single referenced location.
Archive	The long-term storage of data or images.
Auto write update	To allow the Background Processor (BP) to set the current network writes location to the VistA Imaging Shares share with the largest percentage space available.
Background Processing	Simultaneous running of a “job” on a computer while working on another job. Examples would be printing one document while working on another, or the software may do automatic saves while you are working on something else.
BPWS	Background Processor Workstation.
Critical low message	A notification mechanism to alert key personnel that the on-line storage availability is in conflict with an active Background Processor.
Current Queue pointer	Queue type specific database reference to the next file copy, create, or destroy request.
Current write location (CWL)	The designator or reference to the network share that will be receiving VistA Magnetic bound image files. This includes both newly acquired and recently demanded images.
DICOM	Digital Imaging and Communications in Medicine.
Event log	Visual text display of activities of the Background Processor, Purge Processor, and Verifier. The displayed events are also captured in an application subdirectory ASCII text log file.
File	All the data that describes a document or image.
File server	A machine where shared software is stored.
File server cache capacity	Both a textual and graphical display of VistA Imaging Shares size and free space.
Internal Entry Number (IEN)	Defining the NUMBER field allows you to use the Internal Entry Number (IEN, also called the record number) as you would any other field.

Jukebox	A device that holds multiple optical discs and can swap them in and out of the drive as needed.
Login (Logon)	Procedure for gaining access to the system or program.
Migration	Movement of files to and from the secondary storage (the jukebox) and the VistA Imaging Shares.
Mouse	Hand driven input and pointing device.
Off-line	A VistA Imaging Shares designation used to isolate shares from auto-write candidacy and the purge function.
On-line	Connected to, served by, or available through a system and especially a computer or telecommunications system (as the Internet).
Optical disc	A direct access storage device that is written to and read by laser light. Optical discs have greater storage capacity than magnetic media. Many optical discs are Write Once Read Many (WORM).
Purging	Removing of files from VistA Imaging Shares when the last access date exceeds the age specification within the local site parameters. Files that are evaluated by the purge process must have verifiable secondary storage references or they are automatically queued for BP archival (Jukebox).
Queue	A request by the VistA Imaging System to create, move, or delete a clinical image file for the purpose of system efficiency.
Queue pointer	Database file reference to the next queue to be processed within the queue file.
RAID (Redundant Array of Independent (or Inexpensive) Disks)	Redundant Array of Independent (or Inexpensive) Disks.
Referenced network files	Image file pointers to the network locations of each of the file types stored within the VistA Imaging System.
Remote Procedure Calls (RPCs)	Callbacks provided by the client-server architecture supported by the VistA host server and the Delphi client software.
Retrieval	The ability to search for, select, and display a document or image from storage.
RPCBroker	The Client-Server interface component.

Site Parameters	A set of specifications that is configurable to meet the individual needs of each Department of Veterans Affairs Medical Center (VAMC) VistA Imaging System implementation.
Storage media	The physical device onto which data is recorded.
Verifier	A tool that validates the VistA Imaging network file references. It also consolidates Jukebox image files.
VistA (Veterans Health Information System Technology Architecture)	VistA (is built on a client-server architecture, which ties together workstations and personal computers with graphical user interfaces at Veterans Health Administration (VHA) facilities, as well as software developed by local medical facility staff.
VistA Imaging Shares	The primary storage area for recently acquired and recently accessed clinical images.
Win32	The set Microsoft Windows operating systems internal function calls which support all operating system activity.
Workstation	A computer that is dedicated to a single type of task.
Write Once Read Many (WORM)	Once written to the disc, data is only available for reading and cannot be altered.