



# **VistA Imaging DICOM Gateway**

## **Routing Setup and User Guide**

July 2010 – Revision 6  
MAG\*3.0\*53

Department of Veterans Affairs  
Office of Enterprise Development  
Health Provider Systems

**Routing Setup and User Guide  
VistA Imaging 3.0 Patch 53  
July 2010**

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# Introduction

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This manual explains how to configure and use the routing capability of the VistA DICOM Gateway. This manual also explains how to use the on-demand routing capability of the VistARad diagnostic workstation software.

This manual is intended for the following users:




- Imaging/radiology department staff who are responsible for setting up and maintaining a Routing Gateway.
- Clinical staffers who need to use VistARad for on-demand routing.

For technical staff, this manual assumes familiarity with the DICOM Gateways, the VistA system in general, and Windows networking. For clinical staff, this manual assumes familiarity with the Windows environment and the VistARad diagnostic workstation software.

## Terms of Use

In compliance with Food and Drug Administration (FDA) and VA policies, authorization to use the software described in this document is contingent on the execution of a Site Agreement between the VistA Imaging development group and the site where this software is installed.

Once a routing system is enabled at a site, an updated Site Agreement must be filed before the configuration of a routing system can be significantly altered. In addition to any restrictions noted in the Site Agreement, the following restrictions apply:

-  Caution: Federal law restricts this device to use by or on the order of either a licensed practitioner or persons lawfully engaged in the manufacture or distribution of the product.
-  No modifications may be made to this software without the express written consent of the VistA Imaging National Project Manager.
-  The Food and Drug Administration classifies this software as a medical device. Modifications to the computer where this software is installed, such as the installation of unapproved hardware or software, will adulterate the medical device. The use of an adulterated medical device violates US Federal Law (21CFR820).



- Keyboard keys are shown in bold and in brackets.
- Cross-references are underlined. If this document is being used online, cross-references are shown in blue and are active links.

## Revision Table

Date	Rev.	Notes
15 Apr 2010	6	Minor updates for patch 53 in Other Properties section. P53 introduced the capability to use the value of 205,45 (Origin Index) in a routing rule. General corrections and clean-up. <b>REDACTED</b>
01 Oct 2009	5	Updates for patch 54 (“if” allowable in routing rules, change to study-based, rather than image-based evaluation logic). Expand conventions section. Expand and clarify content related to DICOM Storage SCPs. Rewrite “Routing Overview” chapter. Clarify instructions in Appendix B. General corrections and clean-up. <b>REDACTED</b>
03 Apr 2006	4	Minor updates for patch 18. Change bars in margins indicate updated content. <b>REDACTED</b> (formerly rev 1.3)
30 Jul 2005	3	Updates for patches 11 and 51. Change bars in margins indicate updated content. <b>REDACTED</b> I (formerly rev 1.2)
22 Sep 2003	2	Minor p22 updates in VistARad chapter. Added info about routing rules and priority that was not included in original rev. Minor clarifications and corrections throughout. <b>REDACTED</b> (formerly rev 1.1)
20 Mar 2003	1.0	Final version for p9 release. <b>REDACTED</b>
25 Jun 2002	.9	Draft. Based on 23 Sep 1999 “Autorouting Tutorial.” Updated for Patch 9, test 2 distribution.

## Related Documents

The following documents contain additional information about routing:

- Patch Descriptions for patches 9, 11, 51, and 54
- Routing Guidance Document

The following documents contain additional information about components in the routing system:

- DICOM Gateway User Guide
- DICOM Gateway Installation Guide

- VistARad User Guide

These documents are available at **REDACTED**



# Routing Overview

---

This chapter explains how routing functions within the VistA Imaging system. It covers the following topics:

- [Routing Explained](#)
- [Routing Prerequisites](#)
- [How Routing Works](#)

## Routing Explained

In VistA Imaging, routing is the combination of methods and software used to identify and transmit exams produced at one site to a storage location at another site. Scenarios where routing can be used include the following:

- Workload sharing between institutions or service providers
- Rapid access to exams at remote clinics or other facilities
- Remote specialist interpretation or consultation
- Off-hours, holiday, or emergency services
- Off-site contract radiology services for primary interpretation

Routing is a function of the DICOM Gateway software. When properly configured, any DICOM Gateway can function as a Routing Gateway. Typically, a Routing Gateway runs on a dedicated computer. However, at sites that produce only a small volume of images, a Routing Gateway can coexist on the same computer as an Image or Text Gateway.

Routing takes two forms: automatic and on-demand.

- In automatic routing, newly acquired exams are sent to one or more destinations based on a pre-defined set of routing rules.
- In on-demand routing, manually selected exams are transmitted to one or more destinations using VistARad or DICOM Gateway option 2-8-2 (Select DICOM Images for Transmission).

Images can be routed to two different types of destinations:

- Imaging destinations, which are typically used by VistARad users for remote reading.
- DICOM Storage SCP (Service Class Provider) destinations, which are typically non-VistA Imaging components, such as a film printer or an external PACS (Picture Archiving and Communication System).

















### Operators in Rules

The most frequently used operator in a rule is =, which indicates that a specific image property must match a supplied value in a condition for a rule to apply. In the following sample rule, all CR images are sent to Kansas City:

#### Send CR images to Kansas City

```
send("KANSASCITY")
  when MODALITY="CR"
```

Other operators can also be used. The following example uses !=, indicating that all images *except* CR images should be sent to Kansas City.

#### Send non-CR images to Kansas City

```
send("KANSASCITY")
  when MODALITY!="CR"
```

Operators are described in detail on page [17](#).

### Wildcards in a Rule

Use wildcards in a rule when you want a condition to be valid for more than one value. In the example below, all images, regardless of modality, will be routed.

#### Send all images to Kansas City

```
send("KANSASCITY")
  when MODALITY="*"
```

Wildcards are described in detail on page [18](#).

### Date/Time Conditions in Rules

A rule using date/time conditions can be used to route images based on date, time of day, or type of day (such as weekday, holiday, and so on). A rule to route all CR images on certain days would look like:

#### Send CR images to Kansas City Mon and Fri

```
send("KANSASCITY")
  when MODALITY="CR"
      NOW={MON 00:01AM to 11:59PM;
          FRI 00:01AM to 11:59PM}
```

Date/time conditions are described in detail on page [18](#).







Instrument.dic. For images acquired before Patch 11, ACQUISITION SITE is not populated.)

- If there is no value for ACQUISITION SITE, the credentials of the user are checked. If a value is defined for the current division (i.e., the location code for the DICOM Gateway from which the evaluation processor was started), the number of this division will be used.
- If the division number cannot be derived from a user's credentials, the KERNEL SITE PARAMETER field for the number of the institution will be used.

#### **Other Properties**

##### **ABSTRACT\_REF**

The network storage location of the image abstract.

##### **ACQUISITION\_DEVICE**

The name of the device that generated the image as defined in the ACQUISITION DEVICE File (#2006.04), see **Note** below.

##### **BIG\_JUKEBOX\_PATH**

Full file path on jukebox for .BIG images.

##### **BIG\_MAGNETIC\_PATH**

Full file path for .BIG images. This field indicates on which magnetic server this file resides.

##### **CLASS**

The class of the image, as stored in the CLASS INDEX field (#2005, 41). Typical values are CLIN, ADMIN, CLIN/ADMIN, and ADMIN/CLIN, see **Note** below.

##### **CLINIC**

If an image is associated with a patient encounter (visit), the value of this parameter is the name of the clinic where the appointment occurred.

##### **DESCRIPTIVE\_CATEGORY**

This is mainly for Document Imaging; it further describes the type of document image.

##### **EXAM\_TIME**

Used to compare the date/time of the procedure to a user-supplied value. For more information about date/time-based comparisons, see page [18](#).

**Note** In older versions of the software, variations of this property (EXAM\_TIME\_FIRST, EXAM\_TIME\_LAST) could be used to base the comparison on the newest or oldest image in an exam. The current version of the software evaluates the first image encountered only, so all variations of this property are handled the same way.

**EXPORT\_REQUEST\_STATUS**

The value of this field, if defined, indicates if MailMan will send or has sent the image to another site. There are two possible values:

- 1 = EXPORT REQUESTED
- 0 = EXPORTED

**FILE\_REF**

The unique filename of the image, as stored on the magnetic server and/or jukebox.

**IMAGE\_SAVED**

Used to compare the date/time of the image capture to a user-supplied value. For more information about date/time-based comparisons, see page [18](#).

**Note** In older versions of the software, variations of this property (`IMAGE_SAVED_FIRST`, `IMAGE_SAVED_LAST`) could be used to base the comparison on the newest or oldest image in an exam. The current version of the software evaluates the first image encountered only, so all variations of this property are handled the same way.

**IQ**

Indicates if an image has questionable integrity, as specified in the IQ field (#2005, 13). This field is either empty or equal to YES. Note that images with questionable integrity may not be displayed by the software on the receiving system. (In VistARad, a warning is displayed if a user opens an image with questionable integrity.)

**LAST\_ACCESS**

Used to compare the date/time of an image's last access to a user-supplied value. For more information about date/time-based comparisons, see page [18](#).

**Note** In older versions of the software, variations of this property (`LAST_ACCESS_FIRST`, `LAST_ACCESS_LAST`) could be used to base the comparison on the newest or oldest image in an exam. The current version of the software evaluates the first image encountered only, so all variations of this property are handled the same way.

**MAGNETIC\_REF**

The path for the network location of the stored image.

**MICROSCOPIC\_OBJECTIVE**

Free text description of the Microscopic Objective selected by the pathologist.

**OBJECT\_NAME**

The natural language name for the image, usually consisting of the patient name, social security number, and image description.

**OBJECT\_TYPE**

The object type (such as still image, black and white image, or x-ray) as described in the OBJECT TYPE File (#2005.02).

**ORIGIN\_INDEX**

The field indicates the source of image. There are five possible values:

D = DoD

F = Fee-basis study ordered by VA to be performed at a contract facility

N = Other

V = VA

<null> = VA

**PACKAGE**

An abbreviation for the name of the package that the image is attached to, as defined in the PACKAGE INDEX field (#2005, 40). Possible values are: RAD, LAB, MED, NOTE, CP, SUR, PHOTOID, NONE, or CONS.

**PACS\_PROCEDURE**

The name that identifies the procedure in the radiology reports file.

**PACS\_UID**

The unique 26-character image identifier of the PACS image.

**PARENT\_DATA**

The name of the file that contains the "Parent Data." See also

PARENT\_DATA\_FILE\_IMAGE\_POINTER, PARENT\_GLOBAL\_ROOT\_D0 and  
PARENT\_GLOBAL\_ROOT\_D1.

**PARENT\_DATA\_FILE\_IMAGE\_POINTER**

In the file identified by "Parent Data," a multiple-valued field may exist that identifies groups of images. When there is such a "multiple," the value of this parameter is the entry number in this multiple that points back to the parent image of the current image.

**PARENT\_GLOBAL\_ROOT\_D0**

The internal entry number in the file identified by PARENT\_DATA.

**PARENT\_GLOBAL\_ROOT\_D1**

The value of this parameter is defined only for laboratory images to record the third subscript of ^LR(D0,"SP",D1) as a backward pointer for use in report display and image deletion.

**PATH\_ACCESSION\_NUMBER**

The Anatomic Pathology accession number — the identifying number for the slide.

**PATIENT**

The name of the patient.

**PROCEDURE**

An abbreviation for the procedure as stored in the PROCEDURE field (#2005, 6).

Typical values are COL for colonoscopy, SUR for surgery, SP for surgical pathology, or XRAY for radiology.

**PROCEDURE\_OR\_EVENT**

The name of the procedure or event for which the image was created, as stored in the PROC/EVENT INDEX field (#2005, 43), see **Note** below..

**PROCEDURE\_TIME**

This property works the same way as EXAM\_TIME, described earlier in this section.

**RADIOLOGY\_REPORT**

The name of the Radiology Report associated with the image.

**SAVED\_BY**

The name of the person who logged in to capture the image.

**SHORT\_DESCRIPTION**

A one-line description of the image or object record.

**SPECIALTY**

The specialty (or sub-specialty) for which the image was acquired, as stored in the SPEC/SUBSPEC INDEX field (#2005, 44), see **Note** below..

**SPECIMEN**

The specimen number of the slide given in the LAB DATA File (#63).

**SPECIMEN\_DESCRIPTION**

The description given to the specimen in the LAB DATA File (#63).

**STAIN**

Free text description of the Histological Stain.

**SUMMARY**

A flag that indicates whether or not the image functions as a summary for a group. The value of this property is either empty, or equal to 0 (NO) or 1 (YES).

**TRACKING\_ID**

The package that performed the Import (value looks like package name : ID-code).

**TYPE**

The type of image, as stored in the TYPE INDEX field (#2005, 42). Typical types are IMAGE, DIAGRAM, CONSENT, etc., see **Note** below.

**URGENCY**

A code indicating the clinical urgency of the exam. Possible values are ROUTINE, URGENT, and STAT.

**WORM\_REF**

The network location of the jukebox platter where the image is stored (provided there is a jukebox in the Imaging system).



**Note** There is a problem with the keywords ACQUISITION\_DEVICE, CLASS, PROCEDURE\_OR\_EVENT, SPECIALTY and TYPE. The documentation says that the name of the referenced entry should be used. The name matching for these keywords does not work and the pointer value in the IMAGING file (#2005) must be used for matching instead. This problem will be corrected in a later patch so that the name of the reference entry can be used for matching, instead of having to use the pointer value.

The following table shows the referenced file that is used to determine the value of the pointer that is needed for the match.

Property Name	Field #	Referenced File
ACQUISITION_DEVICE	107	2006.04
CLASS	41	2005.82
PROCEDURE_OR_EVENT	6	2005.85
SPECIALTY	44	2005.84
TYPE	42	2005.83

You must use FileMan to determine the number that must be used for the match. This example shows how to do this for CLASS.

```
DVA>D P^DI

VA FileMan 22.0

Select OPTION: PRINT FILE ENTRIES

OUTPUT FROM WHAT FILE: IMAGE// 2005.82  IMAGE INDEX FOR CLASS
(4 entries)
SORT BY: NAME//
START WITH NAME: FIRST//
FIRST PRINT FIELD: NAME
THEN PRINT FIELD: NUMBER
THEN PRINT FIELD:
Heading (S/C): IMAGE INDEX FOR CLASS LIST  Replace
DEVICE:  HERE
IMAGE INDEX FOR CLASS LIST                      FEB 26, 2010
07:46      PAGE 1
NAME                                NUMBER
-----
ADMIN                                8
ADMIN/CLIN                            9
CLIN                                  1
CLIN/ADMIN                            7
```

Select OPTION:

If you wanted to match on “CLIN”, you would have to match on the number 1, that is CLASS=1.



The most frequently used date/time property is `NOW`. `NOW` can be used to select the times that a staff member will be present by specifying certain days and times of day.<sup>1</sup> Note that all day abbreviations use the first three letters of the day name (Thursday = Thu).

**Send CR images to Kansas Mon/Wed/Fri**

```
send ("KANSAS")
  when MODALITY="CR"
    NOW={MON 08:00AM to 17:00PM;
        WED 08:00AM to 15:30PM;
        FRI 08:00AM to 17:00PM}
```

Date/time properties can also be used to specify holidays. In this context, holidays are those days that are marked as such in the sending site's `HOLIDAY` File (#40.5). A rule to send images on holidays would be specified as:

**Send CR images to Kansas on Holidays**

```
send ("KANSAS")
  when MODALITY="CR"
    NOW={ HOLIDAY }
```

Date/time ranges use a 24-hour clock. While use of AM or PM indicators is not required they can be useful when the hours specified are 0:00 AM (midnight) and 12:00 PM (noon).

When the routing software compares a date/time property in an image entry to a specified value, the date/time value is broken into components:

Day of week	Hour
Day of month	Minute
Month	Second
Year	

The use of each component in an actual comparison depends on the specified value.

<sup>1</sup> The actual value of `NOW` is the moment when the rule is evaluated.





When the **balance** command is used, two things determine which destination receives a given exam: the percentages specified in the rule and internal counters set by the routing software.

The first time a load balancing rule is applied, the routing software begins distributing exams the same way a deck of cards is dealt: the first destination receives one exam, the second destination receives the next exam, and so on. Exams are evenly distributed until the destination with the lowest value specified in the **balance** command has received its allotted percentage of exams. Then that destination is skipped until the counter resets. Since load balancing is based on percentages, the counter is reset each time 100 exams have been sent.

For example, if a rule specifies...

```
balance ("DEST1"=10%, "DEST2"=40%, "DEST3"=50%)  
  when MODALITY="CR"
```

- The first 30 exams will be distributed evenly, with each destination receiving 10 exams. After `DEST1` has received 10 exams, `DEST1` is skipped until the counter resets.
- The next 60 exams are split evenly between `DEST2` and `DEST3` until `DEST2` and `DEST3` each have 40 exams. `DEST2` now has its allotment of 40 exams, and will be skipped until the counter resets.
- The remaining 10 exams are sent to `DEST3`, giving that destination a total of 50 exams.
- Once 100 exams have been sent, the routing software resets its counters to zero, and starts distributing exams to all three destinations again.

### Resetting the Load Balancing Counter

When routing rules are imported, the counters used for load balancing are all reset to zero. You can take advantage of this trait if you need to fine-tune or troubleshoot situations where load balancing is used. Note that it is not necessary to change routing rules to achieve this; you only need to re-import them.

## Routing Rule Tips

The following tips may be useful while creating or editing routing rules:

- When defining multiple conditions for a rule, list the most restrictive condition first. This will reduce the amount of time needed to process the rule.

- The number symbol (#) can be used for comments, or to disable a rule. When disabling a rule, precede each line in the rule with #.
- For rules that serve DICOM Storage SCP destinations, use **dicom** instead of **send**.
- Either **when** or **if** can be used to set up comparisons in a routing rule.
- Make sure that there are no spaces between operators (described on page [17](#)) and other parameters in a rule.

When rules are imported as described on page [41](#), the routing software will check the syntax used and will report on any problems detected.

This page is intentionally blank.















### Editing the NETWORK LOCATION File at the sending site

1. Log into the VistA Hospital Information System.
2. Use FileMan to select the NETWORK LOCATION File (#2005.2) for editing.

```
Select OPTION: E ENTER OR EDIT FILE ENTRIES

INPUT TO WHAT FILE: 2005.2 NETWORK LOCATION (7 entries)
EDIT WHICH FIELD: ALL// <Enter>
```

3. When you are prompted to select a network location, enter the name that you want used for the destination.

```
Select NETWORK LOCATION: TESTDEST
Are you adding 'TESTDEST' as a new NETWORK LOCATION (the 11TH)?
No// YES
```

**Note** The name must be entered in uppercase, cannot contain punctuation or spaces, and must be unique.

4. Skip the prompt for PLACE. This field is not used for routing purposes.
5. At the next prompt, enter the computer name and share name specified for the destination.

```
PHYSICAL REFERENCE: \\VHAxxxxxx\images$\
```

6. At each new prompt, enter the desired values for each field. Be sure to enter Y at the ROUTER prompt.

**Note** Typical values for a routing destination are shown below. For more detailed information about a particular field, enter "?" at the prompt, or refer to the next section.

```
...
STORAGE TYPE: MAG MAGNETIC
TOTAL SPACE: <blank>
SPACE USED: <blank>
FREE SPACE: <blank>
OPERATIONAL STATUS: 1 On-Line
HASH SUBDIRECTORY: <set as appropriate for your site>
ABSTRACT: N No
FULL: Y Yes
BIG: Y Yes
TEXT: Y Yes
DICOM: N No
```

```

COMPRESSION: <blank or J2K>
USER NAME: <Use the "routing user name" here>
PASSWORD: <Use the "routing password" here>
MAINTAINCONNECTION: <blank>
MAX # RETRY ON CONNECT: 3
MAX # RETRY ON TRANSMIT: 5
SYNTAX: U UNC
SUBDIRECTORY: <blank>
Select USER <blank>
RETENTION PERIOD: 5
LAST PURGE DATE: <set by routing software>
SITE: <set as appropriate for your site>
ROUTER: Y YES
TIME OFFLINE: <blank>
MUSE SITE #: <blank>
MUSE VERSION #: <blank>

```

### Imaging Destination Definition using the Background Processor

The Background Processor software can also be used to define an Imaging destination in the NETWORK LOCATION File (#2005.2). (In the Background Processor, choose **Edit | Network Location Manager**). A destination definition worksheet is also located on page [69](#).

### Imaging Destination Values

Fields in the NETWORK LOCATION File are described below. These fields are listed in the order that they are defined in the file, and their descriptions assume that a routing destination is being defined.

#### NETWORK LOCATION

This field serves as the destination name for the location where image files will be sent, and is used in routing rules. The routing software will accept uppercase alphanumeric characters, but will not accept values that use lowercase characters or other punctuation marks.

#### PLACE

Not used for routing.

#### PHYSICAL REFERENCE

This field identifies the physical network location where routed images will be stored. This value must contain the computer name and the share name of the directory where routed images will be stored.

```

\\ISWIMG01\IMAGE1$\
\\TeleRad\Wichita$\

```

This value must be entered using UNC (Universal Naming Convention) standards. This field is limited to 63 characters in length, and must end in a backslash (\).



**TOTAL SPACE, SPACE USED, FREE SPACE**

These fields are not used for routing.

**OPERATIONAL STATUS**

The value for this field can be 0 (off-line) or 1 (on-line). The routing software will set this value appropriately as it is operating. When no connection can be established, the routing software will set this field to 0 (off-line). Once this field is set to 0, the routing software will not attempt to reach the storage location referenced in this entry for 15 minutes. After 15 minutes have passed, the routing software will reset this field to 1 and then try to connect again.

**STORAGE TYPE**

The value of this field describes the media type for the storage location identified above. For routing destinations, the value will be `MAGNETIC`.

**HASH SUBDIRECTORY**

The value of this field determines if routed image files are stored in one single directory (value is `Yes`), or in a hierarchy of directories (value is `Yes`). This value should be set based on the needs of your site.

**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**

Set to `Yes` for routing. 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. (If an image is stored in DICOM format, the “full” file is a DICOM file, not a Targa file.)

**BIG**

Set to `Yes` for routing. 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.

**TEXT**

Set to `Yes` for routing. 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.

**DICOM**

Do not use.

**COMPRESSION**

A code that indicates which type of compression will be used for routed images. When the value of this field is equal to “J2K”, JPEG 2000 compression will be

applied before the file is transmitted. When the value of this field is None, or if the field is empty, no compression will take place. All images that are sent to the destination will be treated in the same fashion, that is: either compressed or uncompressed.

**Note** If compressed images are to be sent to a VistARad workstation, the MAG\_Decompressor software will need to be installed on the workstation. See Appendix B for more information.

**Note** You will need to purchase an Aware JPEG2000 Toolkit **client** license for each system that is receiving routed images. (Even if that system serves as a centralized temporary storage for multiple workstations, only a single client license is needed). For each system (DICOM Gateway) that is transmitting compressed routed images, you will need to purchase an Aware JPEG2000 **server** license. For more information, contact Clinical Project Support.

**USER\_NAME**

The user name of the account that the routing software will use to log into the shared folder defined in the `PHYSICAL_REFERENCE` field.

**PASSWORD**

The password of the account that is used by the routing software to log into the destination. The password is case-sensitive and is stored in an encrypted format.

**MAINTAINCONNECTION**

This field is not used for routing, and should be left blank.

**MAX # RETRY ON CONNECT**

Indicates the maximum number of successive attempts that will be made by the routing software to connect to a 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.

**MAX # 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. If the transmission fails after the defined 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.)

**SYNTAX**

Indicates the format for the name of the physical location. Currently, only UNC (Universal Naming Convention) is accepted.

**SUBDIRECTORY**

Typically, this field is left blank. The value of this field determines if a subdirectory (under the directory specified in `PHYSICAL REFERENCE`) should be used to store files for this destination. If hashing is turned off, all transmitted files will be stored in the subdirectory specified in this field; if hashing is turned on, all transmitted files will be stored in subdirectories of this subdirectory.

**Select USER**

Do not use.

**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, the maximum value that may be set is 365 days.

Whenever a transmission processor (3-1) 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).

**LAST PURGE DATE**

Do not change. This field is set by the transmission processor (3-1) when it executes a purge.

**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.

**ROUTER**

The value of this field indicates whether or not the shared folder defined in the `PHYSICAL REFERENCE` field is being used as a routing destination. For routing, the value of this field must be `Yes`. Refer to the *Background Processor User Manual* for other uses of this field.

**TIME OFFLINE**

The value of this field will be filled in by the transmission processor (3-1) if it marks a destination as off-line. For more information, see `MAX # RETRY ON CONNECT`.

**MUSE SITE #, MUSE VERSION #**

These fields are not used for routing.



3. Add the information for each Storage SCP destination as shown below (comment lines are preceded by #). Specific fields are defined in the next section.

```
# User Application List
# Format:
# line 1:App Name|Called AE|Calling AE|Destination IP Address|Socket
# line 2:|Presentation Context Name|Transfer Syntax Name
# line 3:||Transfer Syntax Name (if there are more than one)
#
MERGE EFILM|VistA_Storage|VistA_Send_Image|111.222.33.44|4006
|Modality Worklist Information Model - FIND|Implicit VR Little Endian
|Verification SOP Class|Implicit VR Little Endian
```

4. Save the file.
5. Open a terminal window and log into the DICOM Gateway software.
6. In the first menu, enter 4 (System Maintenance).
7. In the second menu, enter 2 (Gateway Configuration and DICOM Master Files).
8. In the third menu, enter 5 (Update SCU\_List.dic).
9. When you are prompted to update the file, enter Y.

```
Ready to read dictionary file "<x>:\DICOM\Dict\SCU_List.dic"? y// Y
<Enter>
```

10. The file will be updated.

## Field Definitions

Fields defined in SCU\_List.dic are described below. These fields are listed in the order that they appear in SCU\_List.dic.

### App(lication) Name

The name that will be used to identify the receiving application, and to identify the destination in a routing rule. The value for this field may be up to 31 characters long, is case-insensitive, and allows the use of punctuation.

### Called AE

The Application Entity Title of the application that is being called. The value of this field is dictated by the system that will be receiving the DICOM transmission.

### Calling AE

The Application Entity Title of the application that initiates the call (i.e., the Transmit DICOM Images to a DICOM SCP function of the DICOM Gateway). The value for

this field may be up to 16 characters in length, is case-insensitive, and allows the use of punctuation.

**Destination IP**

The TCP/IP address of the machine that will be receiving the DICOM transmission. The IP address can be numeric (123.46.57.89), symbolic (xxx.yyy.med.va.gov), or a name stored in the local “hosts” file.

**Socket**

The TCP/IP port number of the system that will be receiving the DICOM transmission.

**Presentation Context**

The name of a presentation context supported by the system that will be receiving the DICOM transmission. Refer to the current DICOM standard for a complete list of possible values.

**Transfer Syntax**

The transfer syntax supported by the system that will be receiving the DICOM transmission. There are four possible transfer syntaxes:

- Implicit VR Little Endian
- Implicit VR Big Endian
- Explicit VR Little Endian
- Explicit VR Big Endian

## Defining “Route Priors” Logic

### Verifying that Prefetch is Enabled

For priors to be included with automatically routed exams, prefetch must be enabled on VistA. Prefetch is generally enabled at sites using Vistarad.

You can verify that prefetch is enabled by checking the following settings.

- In the PROTOCOL File (#101), use FileMan to verify that MAGJ PREFETCH/SEND ORM is defined as a Subscriber to the RA REG protocol.
- In the APPLICATION PARAMETER File (#771), verify that MAGJ CLIENT is set to “Active.”

**Note** The PREFETCH ACTIVE? setting in the VISTARAD SITE PARAMETERS FILE (#2006.69) does not affect the automatic routing of priors.

For more information, refer to chapter 3 in the *Imaging System Installation Guide*.

## How Prior Exam Routing Works

The logic for automatically routing prior exams is triggered when a `prior study` statement is used in a routing rule. The baseline logic for routing priors is:

For each exam being automatically routed, also route up to one matching prior exam up to 1800 days (about five years) old.

**Note** Only priors from the same site as the current exam are considered. Priors from sites other than the current exam cannot be routed automatically (they can, however, be routed on-demand).

This logic is stored in the MAG RAD PRIOR EXAMS LOGIC File (#2006.65). This file:

- Identifies, based on procedure name/CPT (Current Procedural Terminology) code, what qualifies as a prior exam.
- Determines the maximum number and age of exams to automatically route as priors.
- Determines the maximum number and age of exams to retrieve from the jukebox for VistARad prefetch.

## Changing “Route Priors” Logic

To change the logic used for automatic routing of prior exams, you will first need to identify the procedure name/CPT code of the current exams in question. Then you will need to edit the MAG RAD PRIOR EXAMS LOGIC File (#2006.65) as described below.

**Note** Altering the settings used to identify a prior will affect VistARad’s prefetch function, as well as the auto-route priors capability. However, the settings that determine the number and age of priors to be automatically routed can be set independently from the similar settings used for prefetch.

### To change “route priors” logic

1. Log into the VistA Hospital Information System.
2. Use FileMan to select the MAG RAD PRIOR EXAMS LOGIC File (#2006.65) for editing.

```
Select OPTION: E ENTER OR EDIT FILE ENTRIES
INPUT TO WHAT FILE: 2006.65 MAG RAD PRIOR EXAMS LOGIC (288 entries)
```

3. Select fields .01, 1, 2, and 3 for editing.

```

EDIT WHICH FIELD: ALL// .01 <Enter> CURRENT CASE CPT GROUP
THEN EDIT FIELD: 1 <Enter> PRIOR CASE MATCHING CPT GROUP (multiple)
  EDIT WHICH PRIOR CASE MATCHING CPT GROUP SUB-FIELD: ALL// .01
<Enter> MATCHING CPT GROUP
  THEN EDIT PRIOR CASE MATCHING CPT GROUP SUB-FIELD: 1 <Enter>
AUTO-DISPLAY?
  THEN EDIT PRIOR CASE MATCHING CPT GROUP SUB-FIELD: 2 <Enter> DAYS
LIMIT/AUTO-DISPLAY
  THEN EDIT PRIOR CASE MATCHING CPT GROUP SUB-FIELD: 3 <Enter>
VERSION LIMIT/AUTO-DISPLAY
  THEN EDIT PRIOR CASE MATCHING CPT GROUP SUB-FIELD: <Enter>
THEN EDIT FIELD: <Enter>
STORE THESE FIELDS IN TEMPLATE: <Enter>
    
```

4. At the following prompt, enter the CPT code or description for the types of current exams you want to alter the route priors logic for. (Enter “?” to see a list of CPT codes and descriptions.)

```

Select MAG RAD PRIOR EXAMS LOGIC CURRENT CASE CPT GROUP:
    
```

5. At the Select MATCHING CPT GROUP prompt, enter a CPT code that has been previously entered as being a match for the current exam, or enter a new CPT code to match to the current exam.

**Note** Altering the settings for this prompt will affect VistARad’s prefetch function, as well as the auto-route priors capability.

6. Set the following three prompts as desired for automatically routing priors. Details follow.

```

AUTO-DISPLAY: YES//
VERSION LIMIT/AUTO-DISPLAY: 1//
DAYS LIMIT/AUTO-DISPLAY: 1800//
    
```

**AUTO-DISPLAY?**

Set to “YES” if exams that match the MATCHING CPT group selected in step 5 should be considered priors.

**DAYS LIMIT/AUTO-DISPLAY**

The value of this field should be set to an integer number. Studies that precede the current image by more than this number of days will not be candidates for automatic routing. Only studies that are less than the number of specified days will be included.

**VERSION LIMIT/AUTO-DISPLAY**

The value of this field should be set to an integer number. This number indicates



the maximum number of prior studies that will be automatically routed for the current image.

7. Select additional fields to edit, or exit FileMan.

## DICOM Gateway Configuration

Sites that want to send images to other sites using routing will need to set the configuration file for **all** Image and Routing Gateways as described in the following sections.

**Note** No configuration changes are needed for Text Gateways in a routing system.

### Image Gateway Configuration

Image Gateways at a site using automatic routing will need to have their configuration file set as described below.

**Note** The following steps cover only routing-related configuration parameters. For information about other configuration parameters, refer to the DICOM Gateway Installation Guide.

#### To configure Image Gateways

1. Open a terminal window and log into the DICOM Gateway software.
2. Select option 4-2-2 (Update Gateway Configuration Parameters).
3. Set the prompts indicated in bold below to Yes.

```

...
Will this computer be a DICOM Image Gateway? YES// YES

Will this computer be a DICOM Text Gateway? NO// NO

Will this computer be a Routing Gateway? NO// NO

Will this computer be part of a system where autorouting is active?
NO// Yes

Send text to a commercial PACS, Mitra Broker, et cetera? NO// NO
...

```

4. Press **<Enter>** to cycle through the rest of the prompts and to exit the program.

## Routing Gateway Configuration

The system being used as a Routing Gateway will need to have its configuration file set as described below. Completing these steps will make the Routing Gateway menu option and its submenus available in the main DICOM Gateway Menu.

**Note** The following steps cover only routing-related configuration parameters. For information about other configuration parameters, refer to the DICOM Gateway Installation Guide.

### To configure the Routing Gateway

1. Open a terminal window and log into the DICOM Gateway software.
2. Select option 4-2-2 (Update Gateway Configuration Parameters).
3. Set the prompts indicated in bold below to Yes.

```
...
Will this computer be a DICOM Image Gateway? YES// NO

Will this computer be a DICOM Text Gateway? NO// NO

Will this computer be a Routing Gateway? NO// Yes

Will this computer be part of a system where autorouting is active?
NO// Yes

Send text to a commercial PACS, Mitra Broker, et cetera? NO// NO
...
```

4. Press <Enter> to cycle through the rest of the prompts and to exit the program.

## Importing Routing Rules (Route.dic)

This section covers the following topics:

- [Creating and Importing a Routing Rules File](#)
- [Verifying Imported Rules](#)
- [Routing Rules and Multiple Routing Gateways](#)

### Creating and Importing a Routing Rules File

Routing rules are initially defined in the `\DICOM\Dict\Route.dic` file, which is stored on the Routing Gateway. This file can be created and modified using any text-editing program.



```
nnn rules stored in the database  
Press <Enter> to continue:
```

**Note** If you are using load balancing, importing routing rules will cause internal counters that control load balancing to be reset. For more information, see page [22](#).

**Note** If multiple Routing Gateways are present, the steps for importing the modified rules file must be performed for **all** Routing Gateways, so all Gateways will use the same set of rules.

### Verifying Imported Rules

1. On the gateway where the rules reside, open a terminal window and log into the DICOM Gateway.
2. Select option 3-10 (Display Routing Rules).
3. The current set of routing rules will be displayed:

```
Routing rules:  
  
SEND(IMAGPROVIDER1)  
  If: MODALITY=CT  
  
SEND(IMAGPROVIDER2)  
  If: MODALITY=CR  
  
SEND(BAL2)  
  If: MODALITY=XA  
  Priority: HIGH  
  
Press <Enter> to continue...
```

4. After the rules are displayed and double-checked, press <Enter> to return to the menu.

### Routing Rules and Multiple Routing Gateways

If multiple evaluation processors need to be active (as could be the case at a consolidated site), each Routing Gateway can use its own local set of rules.

However, it is usually better for all Routing Gateways to use a single set of rules stored in a shared directory. Using the same set of rules will make maintenance easier (changes to rules need to be made in only one `Route.dic` file, rather than several). This also allows each gateway in the pool to function as a backup for any other gateway.







Routing System Change	Related Configuration Change
Change of radiology staff at sending or receiving site	<ul style="list-style-type: none"> <li>• Review and update routing rules if needed.</li> <li>• Review NETWORK LOCATION File entry for destination and adjust if needed.</li> <li>• Determine if new staff members need on-demand routing privileges.</li> </ul>
Addition of new VistARad workstation	Update VistARad workstation MAGJ.INI.
Retirement of an existing destination	Remove destination reference from rules, stop the transmission processor for that destination, and disable/remove the destination definition parameters. See page <a href="#">52</a> for details.



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2. On the Image Gateway that you want so use, open a new terminal window and log into the DICOM Gateway software.
3. Select option 2-8-2 (Transmit DICOM Images to a Storage SCP).
4. At the Ready to send DICOM Images from VistA? prompt, enter Y.

**Tip** The “Transmit DICOM” processor can be stopped and restarted later to add any additional destinations that need to be serviced. (This logic does not apply to the transmission processor for Imaging destinations.)

5. If entries from other locations are present, you will be prompted to select which entries you want to process.

**Note** In this context, “location” is relative. For entries for automatically routed images, location is based on Instrument Name in `instrument.dic`. For images routed on-demand, location is based on the location specified in the configuration of the VistARad workstation or Image Gateway from which the image was routed.

```
There are entries in the transmission queue for other locations
than the one that is currently served by this DICOM Gateway.
Enter any number from the list below to include this location
in the current selection (prefix a number with a - (minus sign)
to remove it from the current selection.
  660: SALT LAKE CITY
Add to or remove from selection: 660 <Enter>

There are entries in the transmission queue for other locations
than the one that is currently served by this DICOM Gateway.
Enter any number from the list below to include this location
in the current selection (prefix a number with a - (minus sign)
to remove it from the current selection.
  660: SALT LAKE CITY (Selected)
Add to or remove from selection: <Enter>
```

7. Position and size the terminal window for subsequent monitoring.

























- In the **Route To** field, the first destinations listed are Imaging destinations (such as remote VistARad workstations).
  - If there are any DICOM Storage SCP destinations available (such as film printers), they will appear at the bottom of the **Route To** list and will be preceded by dcm.
  - Use the **Default Route To** box near the bottom of the dialog to choose a single destination for all listed exams.
6. For each exam, use the **Priority** field to select the priority used to send the exam.
- Use the **Default Priority** box near the bottom of the dialog to choose a single priority for all listed exams.
  - The priority assigned to exams for on-demand routing is not related to the exam priority indicated in VistARad's exam lists.
7. Confirm that the settings in the Route Request dialog are correct.
- You can choose not to route a listed exam by selecting the **Route To** box for that exam and choosing the [Do Not Route] option.
  - You can click **Cancel** to close the Route Request dialog without routing any exams.
8. Click **OK** to route the exams.
9. When the exam is routed, the RC column entry for that exam will show the name of the receiving site. (Note that this only applies to exams routed to Imaging destinations. The RC column will not indicate if an exam has been routed to a DICOM Storage SCP.)













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## Appendix A: Routing Worksheets

---

This appendix contains worksheets that can be used while setting up a routing system. They can also be used for record-keeping purposes. The following worksheets are provided:

[Imaging Destination Worksheet](#)

[DICOM Storage SCP Destination Worksheet](#)

[Routing Rule Definition Worksheet](#)

[Routing Setup Checklist](#)

## Imaging Destination Worksheet

*Use this worksheet to record information about a specific Imaging destination. A sample Network Location File definition is provided on the next page.*

Destination name<sup>1</sup> \_\_\_\_\_

Site served by destination \_\_\_\_\_

General purpose of this destination \_\_\_\_\_

Alternate/backup destination \_\_\_\_\_

Storage folder name \_\_\_\_\_

Destination computer/share name<sup>2</sup> \_\_\_\_\_

User name/password for destination \_\_\_\_\_

Associated user group (if any)<sup>2</sup> \_\_\_\_\_

File types transmitted to destination (circle those that apply) <sup>3</sup>          Abstract / Full / Text / Big

Retention period? (in days)<sup>3</sup> \_\_\_\_\_

---

<sup>1</sup> Specified in the .01 field in the NETWORK LOCATION file. Referenced in routing rules (Route.dic), and in the CacheLocationID parameter for VistARad workstations at receiving sites.

<sup>2</sup> Specified by receiving sites when creating a storage folder. Referenced sending site's NETWORK LOCATION file.

<sup>3</sup> Specified in sending site's NETWORK LOCATION file.







## DICOM Storage SCP Destination Sample

For detailed information about specific fields, see page [36](#).

```
# User Application List
# Format:
# line 1:App Name|Called AE|Calling AE|Destination IP Address|Socket
# line 2:|Presentation Context Name|Transfer Syntax Name
# line 3:|Transfer Syntax Name (if there are more than one)
#
MERGE EFILM|VistA_Storage|VistA_Send_Image|111.222.33.44|4006
|Modality Worklist Information Model - FIND|Implicit VR Little Endian
|Verification SOP Class|Implicit VR Little Endian
```



List conditions that will trigger the execution of the rule (fill in all that apply):

a Exam modality of: \_\_\_\_\_

b Off hours/holiday coverage (specify hours/days)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

c Other \_\_\_\_\_

---

**Rule Impact/Review** (to be completed by Imaging Coordinator)

Estimated amount of storage needed at each destination for this rule: \_\_\_\_\_

Bandwidth available between sending and receiving sites: \_\_\_\_\_

Total number of exams expected to be transmitted per month: \_\_\_\_\_

Rule adheres to routing policies established by sending site (circle one): Yes No

Rule adheres to routing policies established by receiving site (circle one): Yes No

**Rule Implementation** (to be completed by staff responsible for Routing G/W)

Rule as entered into the Route.dic file: (sample rules listed below)

---

---

---

---

---

---

---

---

Route.dic imported to Routing Gateway (circle one): Yes No

Rule tested and found to be functional (circle one): Yes No

Date \_\_\_\_\_

## Sample Rules

The following sample rules use the fictional destinations listed below:

Imaging destinations (entered in the NETWORK LOCATION File (#2005.2))

```
Archive
Contractor1
Contractor2
Contractor3
ContractingReader
LocalJukeBox
LogBook
```

DICOM Storage SCP destinations (entered in the DICOM TRANSMIT DESTINATION File (#2005.587) via SCU\_List.dic):

```
E-FilmApplication
LaserShare
```

### Example #1:

```
# auto-route all images from a specific modality to a
# contractor who reads this type of images, using standard
# copy for transmission

Send("ContractingReader")
  When MODALITY="CT"
```

### Example #2:

```
# auto-route all images to an archive, using standard copy
# for transmission

Send("Archive")
  When MODALITY="*"
```

### Example #3:

```
# auto-route all images from a remote site back to local
# storage at that site, using standard copy for
# transmission

Send("LocalJukeBox")
  When MODALITY="*"
  SOURCE="StElseWhere"
```

### Example #4:

```
# auto-route all important studies to an internal
# workstation, using standard copy for transmission

Send("LogBook")
```

```
When MODALITY="*"
    URGENCY="STAT"
```

**Example #5:**

```
# auto-route all images from a specific modality to three
# contractors, balancing the load, so that each contract
# receives a pre-determined fraction of the studies and
# leaving a pre-determined fraction for interpretation by
# local staff, using standard copy for transmission
```

```
Balance("Contractor1"=20%, "Contractor2"=40%,
"Contractor3"=20%, <LOCAL>=20%)
    When MODALITY="XA"
```

**Example #6:**

```
# auto-route all images from a specific modality to a
# contractor who reads this type of images, using standard
# copy for transmission and giving these transmissions a
# high priority
```

```
Send("ContractingReader")
    When MODALITY="XA"
    Priority High
```

**Example #7:**

```
# auto-route all images from a specific modality to a
# printer, using the DICOM protocol for transmission and
# giving these transmissions a low priority
```

```
Send("LaserShare")
    When MODALITY="CT"
    Priority Low
```

**Example #8:**

```
# auto-route all images from a specific modality to a DICOM
# repository, using the DICOM protocol for transmission and
# including images from prior studies
```

```
Send("E-FilmApplication")
    When MODALITY="CT"
    PriorStudy Yes
```

## Routing Setup Checklist

### Imaging Destination Setup

- a User name and password available for each destination? \_\_\_\_\_
- b Folders created and shared for each destination? \_\_\_\_\_
- c Ability to access and write to each storage folder verified? \_\_\_\_\_
- d Network location entry defined for each destination? \_\_\_\_\_
- e VistARad site parameters set up at sending site? \_\_\_\_\_
- f CacheLocationID set on workstations at receiving sites? \_\_\_\_\_

### DICOM Storage SCP Destination Setup

- a Destination information added to `SCU_List.dic`? \_\_\_\_\_
- b `SCU_List.dic` updated on DICOM Gateway? \_\_\_\_\_
- c Destination application accessible? \_\_\_\_\_

### DICOM Gateway Setup

- a Image Gateways configured properly? \_\_\_\_\_
- b Routing Gateway configured properly? \_\_\_\_\_

### Routing Rule Setup

- a Rules defined in `Route.dic`? \_\_\_\_\_
- b `Route.dic` imported successfully? \_\_\_\_\_

### Routing Activation

- a Image Gateways processing images? \_\_\_\_\_
- b Routing Gateway evaluation processor activated? \_\_\_\_\_



- c** Transmission processor(s) for all destinations activated? \_\_\_\_\_
- d** Images routed successfully? \_\_\_\_\_
- e** Images at receiving site purged at end of retention period (Imaging dests. only) \_\_\_\_\_

## Appendix B: Using MAG\_Decompressor

---

This section explains how to install and configure the Automatic Decompression Service (MAG\_Decompressor).

MAG\_Decompressor can be installed on a system serving as an Imaging destination (such as a VistARad workstation). MAG\_Decompressor cannot be used on DICOM Storage SCP destinations, or on a DICOM Gateway.

Once it is configured, MAG\_Decompressor runs in the background and will de-compress routed images as they are received by the destination system.

This service does not need to be installed on systems that receive only uncompressed routed images.

### Licensing

You will need to purchase an Aware JPEG2000 Toolkit **client** license for each system that is receiving routed images. Even if that system serves as a centralized temporary storage for multiple workstations, only a single client license is needed. For each system (DICOM Gateway) that is transmitting compressed routed images, you will need to purchase an Aware JPEG2000 **server** license. For more information, contact Clinical Product Support.

### Setup

#### Distribution

The decompression software installation file, MAG\_Decompressor\_Setup.exe, is distributed with the DICOM Gateway software, and is also available at the Imaging FTP site.

#### Installation

1. As an administrator, log onto the system that will be receiving compressed images.
2. Copy MAG\_Decompressor\_Setup.exe to a local location and double-click the file.
3. As the InstallShield script is executed, click on **Next**, **OK** and **Finish** as appropriate. The software will be installed into its own folder under C:\Program Files\VistaA Imaging.

4. Use Windows Explorer to create a folder named <drive>\Complog, where <drive> is the drive where routed images are stored.
5. Make sure the administrative user has write permission to this folder. (Right-click the new folder, click **Properties**, click the **Security** tab, and check the permissions list on the tab.)
6. In the new \Complog folder, create a new file named log.txt. This “seed file” will become the decompression log file once the decompression service is started.
7. Open the Environment Variables dialog as follows:
  - a. Right-click **My Computer**, and choose **Properties**.
  - b. In the System Properties dialog, click the Advanced tab, then click **Environment Variables**.
8. For each variable below, select the variable, click **Edit**, then change the value as follows:

**DECOMP\_LOG\_FSPEC**

Enter the full path and file name of the log file created in steps 6 and 7 above.  
decompression service log file.

**DECOMP\_LOG\_FILE\_MBYTES**

Set the maximum size permitted for the decompression service log file. The recommended value is 10MB. When the stated limit is reached, a new instance of the log file will be generated. (The 10 most recent files are retained).

**DECOMP\_WATCH\_DIR**

Specify the root folder to be monitored by the decompression service (the folder that is receiving compressed images).

**DECOMP\_DELAY\_MS**

Optionally, you can set the number of milliseconds that the service will wait after detecting a compressed file before beginning the decompression process. The default of 50ms is usually sufficient.

9. Click **OK** to step back through the various dialogs and to apply your changes.
10. Activate MAG\_Decompressor as follows
  - a. Open a command line window (click **Start | Run**, then enter **cmd**), then switch to the MAG\_Decompressor installation folder:

```
cd \Program Files\Vista\Imaging\MAG_Decompressor <Enter>
```







computer. Also, the set of menu options in the DICOM Gateway software specific to routing.

**routing rules** The information used by the Routing Gateway to select images for automatic routing.

**routing system** All of the software and hardware components related (but not necessarily limited to) routing. Parts of the routing system include the Routing Gateway, Image Gateways, and VistARad workstations.

**evaluation queue** The queue used to determine whether newly acquired images will be automatically routed. This queue is populated by Image Gateways. Entries in this queue are compared to routing rules by the evaluation processor. Entries that meet the criteria in routing rules are added to the transmission queue.

**SCU\_List.dic** A dictionary file used by the DICOM Gateway that stores information about each DICOM Storage SCP that can receive routed DICOM images from VistA Imaging.

**SEND QUEUE (#2006.035)** The FileMan file where transmission queue entries for Imaging destinations are stored. Entries can be added to this file by the evaluation processor (for automatic routing) or by a VistARad user (for on-demand routing).

**transmission processor** The generic term for either of the two processes responsible for sending routed images to destinations. Imaging destinations are served by one or more instances of the transmission processor 3-1 (Start the Transmission Processor) associated with the Routing Gateway. DICOM Storage SCP destinations are served by one of more transmission processors 2-8-2 (Transmit DICOM Images to a Storage SCP) associated with the Image Gateway.

**transmission queue** The generic term for either of two queues used by transmission processors. Entries in these queues identify images to be routed and where the images are to be sent. See also: SEND QUEUE File (#2006.035) and DICOM IMAGE OUTPUT File (#2006.574).

**VistARad** The software used to display and interpret radiology exams. VistARad is also the primary tool used to display routed exams and to route exams on-demand.







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