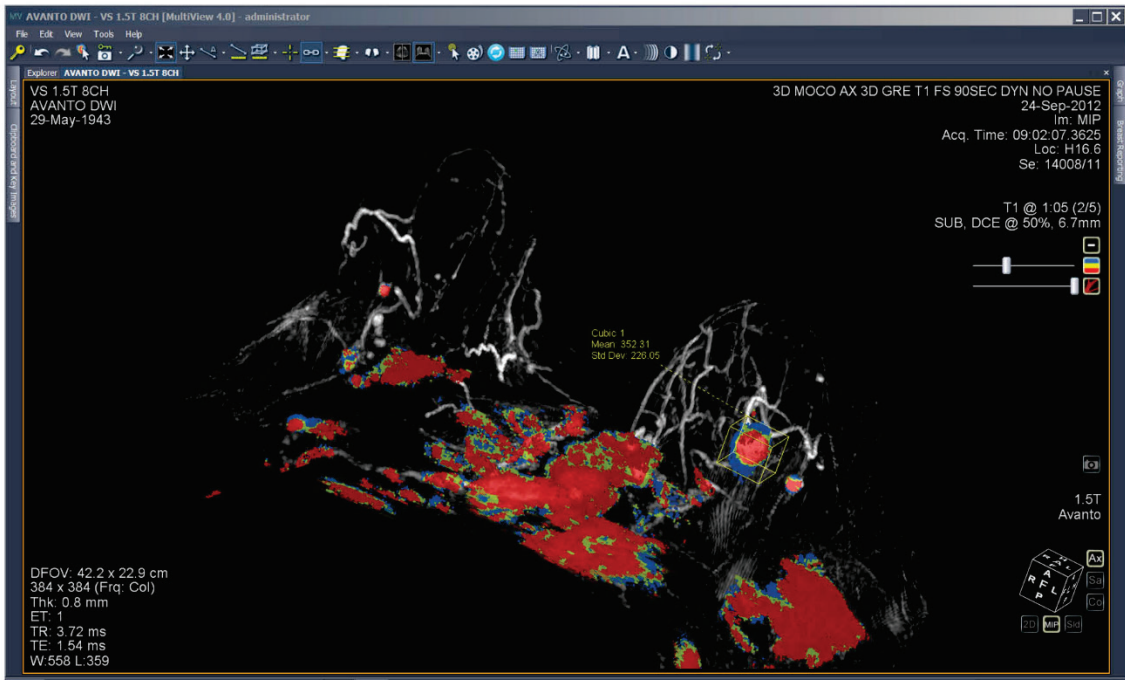# MultiView™
Software

User Guide
MAN-10458 Revision 003

HOLOGIC®

MultiView™

Multimodality Software

User Guide

For Software Version 4.1

Part Number MAN-10458
Revision 003

June 2024

HOLOGIC®

Product Support

USA:	+1.877.371.4372
Asia:	+852 37487700
Australia:	+1 800 264 073
All Other:	+1 781 999 7750
Email:	BreastHealth.Support@hologic.com

Table of Contents

Preface

CAUTION

Federal Law restricts this device to sale by or on the order of a physician. Consult the Intended Use, Limitations, and Precautions sections below.

Class II Device

Symbols and Safety Notices

The following symbols are used in this guide.

Symbol	Meaning
WARNING	An orange WARNING symbol is used to identify conditions or actions for which a specific hazard is known to exist. These conditions or actions may cause severe personal injury or substantial property damage if the instructions are not followed.
CAUTION	A yellow CAUTION symbol is used to identify conditions or actions for which a potential hazard may exist. These conditions or actions may cause minor personal injury or property damage if the instructions are not followed.
	Class II (double-insulated) electrical equipment.
	Manufacturer of the device.

Intended Use

MultiView™ is a software application that is intended for use in processing, manipulating, and displaying magnetic resonance imaging (MRI) images as well as other multi-modality DICOM medical images and data that it receives from various sources (e.g. CT, US, secondary capture devices, scanners, imaging sources, and imaging gateways).

MultiView provides various image processing and measurement tools to facilitate the interpretation of breast MRI images and enable diagnosis. These computer-aided and/or user-defined processing functions include artifact minimization, image subtractions, multi-planar reformats, and maximum intensity projections. It also includes the following automatic functions: physiological analysis tools, diffusion analysis, and segmenting of lesions. MultiView also provides tools for automated targeting for breast interventional procedures.

Lossy compressed mammographic images and digitized film screen images must not be reviewed for primary image interpretations. Mammographic images may only be interpreted using an FDA cleared monitor that meets technical specifications reviewed and accepted by the FDA.

MultiView is typically used by trained professionals, including radiologists, technologists and clinicians and may provide information to be used for screening, diagnostic and interventional procedures. Patient management decisions should not be made solely on the results of MultiView analysis.

Limitations

WARNING

Risk of Incorrect Diagnosis

- Effective use of the MultiView device requires adherence to MR imaging protocol requirements and the imaging manufacturer's instructions regarding maintenance and calibration of the MR imager.

- The measurement accuracy of MultiView is limited to the accuracy of the MR imaging system, site-specific imaging techniques, and patient motion effects.

<table>
<tr><td>

⚠️

CAUTION

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Risk of Incorrect Diagnosis

- All medical professionals and personnel using the MultiView device must be trained in the use of the device.

- Although the MultiView device is designed to be compatible with a wide range of MR imaging systems, imager-specific variations may require assistance from Hologic prior to initiating use of the device.

- Lossy compressed mammographic images and digitized film screen images must not be reviewed for primary image interpretations.

- MultiView incorporates DICOM anonymization functionality; however, it is the user's responsibility to exercise care and act in accordance with HIPAA regulations when sharing patient-specific data and information.

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Precautions

Installation and Service

MultiView shall be installed only by Hologic-authorized personnel. Only technically qualified personnel, trained by Hologic, shall perform troubleshooting and service procedures on the software and internal components.

Installation and Use of Unrelated Software

Unrelated software applications installed or used on the MultiView workstation may affect performance and may compromise or corrupt patient medical records. When installing antivirus software, ensure that files in c:\Program Files\ClearCanvas are excluded.

Data Backup Procedures

Hologic recommends using existing network procedures to back up data on a regular schedule. The MultiView system should not be used to archive or to back up data from an MR imager. Misuse of the MultiView database in this way may affect performance and compromise or corrupt patient medical records.

Introduction

MultiView Multimodality, also known as MultiView MM, is a software application intended to improve your MR diagnostic and interventional workflow. This software is a DICOM compliant application that communicates with remote DICOM devices to send and receive imaging cases. Images may be sent to, and received from, both PACS and MRI scanner workstations.

Licensing MultiView

MultiView is installed by Hologic professionals on systems that meet certain minimum requirements. However, if you purchase additional features for MultiView, you may need to update your license.

NOTE: Any changes to your MultiView Web installation must be made by a Hologic service technician.

To update your license:

1. Choose *Help > Change License*. The Register Your Software dialog appears.
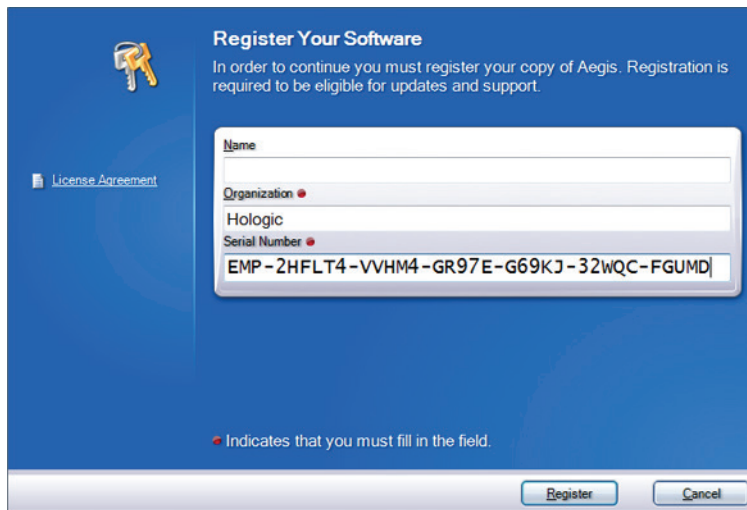
Figure 1:   Register Your Software Dialog

2. Enter the new serial number provided by Hologic and click *Register*. The Activate Your Software dialog appears.

Figure 2:   Activate Your Software Dialog

NOTE: You can use MultiView for up to 10 days without activating the software. If the license is not activated within 10 days, MultiView will not start.

3. Click *Activate manually by entering a code*. The Activate Manually dialog appears showing the serial number and your machine code. Hologic uses these two numbers to generate a unique activation code for your system.
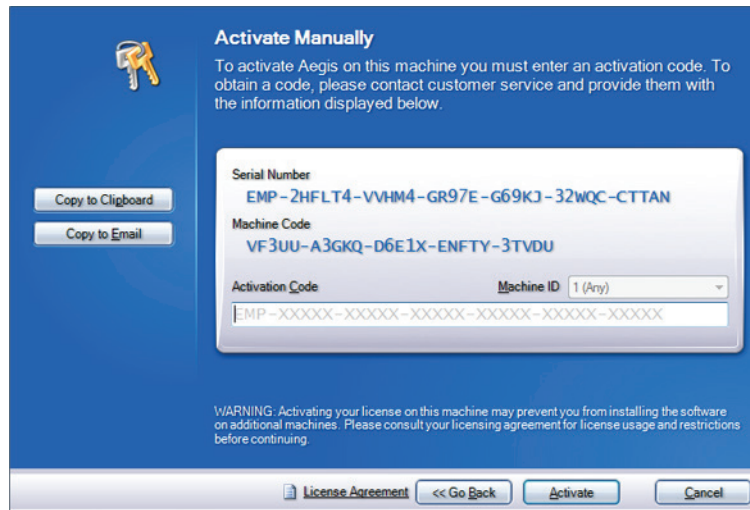
Figure 3:   Activate Manually Dialog

4. Click *Copy to Clipboard* to copy the serial number and machine code. A confirmation dialog appears indicating that the information has been copied.
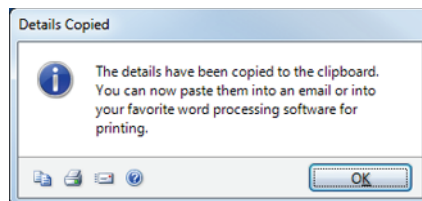
5. Click *OK*.

6. Open an email or a text file and paste the information copied from the dialog.

7. Send the information to Hologic at the following email address: BreastHealth.Support@hologic.com.

8. When Hologic sends you the activation code, enter it in the *Activation Code* field in the Activate Manually dialog (see above) and click *Activate*.

If you have problems with your assigned license number, contact Hologic Technical Support. For contact information, see Contacting Hologic on page 6.

MultiView and Third-Party Applications

MultiView works with third-party applications such as Hologic® SecurView® to provide multi-modality image analysis functionality. The following features simplify your workflow:

- Logging into or out of MultiView automatically logs you into or out of the third-party application.

- When you open a study in MultiView, MultiView can be configured to open the corresponding study simultaneously in the third-party application (assuming a corresponding study exists in that application).

- When you close the study, the corresponding study closes simultaneously in the third-party application.

Contacting Hologic

If you have comments or suggestions, or to obtain technical support you can contact Hologic in the following ways:

Phone: 1-877-371-4372

Email: BreastHealth.Support@hologic.com

Service office hours are 8:00 a.m. - 6:00 p.m. Eastern Time (ET) with emergency support available after these hours.

If you are contacting Hologic for technical support, you may be asked to provide your license/serial number.

- To find your license/serial number in the standalone MultiView client, open MultiView and click *Help > Change License*. The number is displayed in the Serial Number field.

- If you are using MultiView Web, the technical support person will instruct you how to find the license number if necessary.

Chapter 1 Getting Started

This chapter describes the first steps to using MultiView, including launching the application and logging in. It also provides an overview of the MultiView interface and instructions for how to update your license for new features.

Launching MultiView

To launch MultiView, click the MultiView icon on the workstation desktop, or choose *Start > Programs > Hologic > MultiView.*

By default, MultiView opens in a window that spans all available monitors.

Logging Into the MultiView Application

You must log into MultiView when it first launches. MultiView can be configured to use one of two types of authentication: MultiView authentication or Active Directory authentication. Contact your MultiView system administrator to learn which type of authentication is implemented at your site.

NOTE: If your user credentials have been configured as a SecurView synchronization user, or SecurView has been configured to use Active Directory authentication, you are automatically logged into SecurView when you log into MultiView.

MultiView Authentication

To log into MultiView using MultiView authentication, enter your MultiView username and password, then click *Login*.

NOTE: To obtain your MultiView username or password, contact your MultiView system administrator.

NOTE: MultiView requires a minimum password length of five characters and must include at least one letter.

Active Directory Authentication

If MultiView has been configured to use Active Directory server authentication, enter your domain username and password, then click *Login*. For more information about using Active Directory with MultiView, see the Login options on page 30.

Accessing Unique Device Identifier Information

Unique Device Identifier (UDI) is a unique numeric or alphanumeric code that identifies a medical device through distribution and use. UDI information is displayed in the About screen of the MultiView application.

To access UDI information, click *Help > About*.

Overview of the Interface

There are two parts to the MultiView interface:

- The Explorer / study manager where you will find studies, either in the local database or on other servers

- The workspace where you can view, analyze, and annotate the images in a study

Explorer / Study Manager

When you launch MultiView, it opens with the study manager displayed. Use the study manager to browse or search for studies and view information about the study such as the study date, patient information, and whether the study has been opened or read by someone else.

To access the study manager when a study is open in the workspace, click the *Explorer* tab.

#	Description
1	Explorer tab. This tab contains three sub-tabs: DICOM, Enterprise and My Computer. ▪ DICOM tab: Displays the local database (My Studies) and any servers MultiView has been configured to interact with in the Servers area. ▪ Enterprise tab: Displays studies in the local database and applicable studies available on other clients connected to the Study List Manager such as SecurView. *NOTE: The* Enterprise *tab only appears when MultiView has been configured to communicate with* Study List Manager. ▪ My Computer tab: Displays a Windows Explorer-type view of the contents of the workstation.
2	Search criteria. Use these fields to search for studies in the local database or on a server. For more information, see Searching for Studies on page 42.
3	Navigation pane. In the DICOM sub-tab, this pane displays a list of servers. In the My Computer sub-tab, this pane displays a tree view of the folders and drives on the workstation. This pane does not appear in the Enterprise sub-tab.
4	Studies list. This list displays information about the studies in the local database (My Studies) or the selected server or workstation folder. For more information, see the Working in the Study Manager chapter, beginning on page 49.

Figure 4:   Study Manager Interface

Workspace Overview

When you open a study, it opens in the workspace interface. The workspace consists of activity panes, a toolbar, and one or more viewports where you can view images and reports.
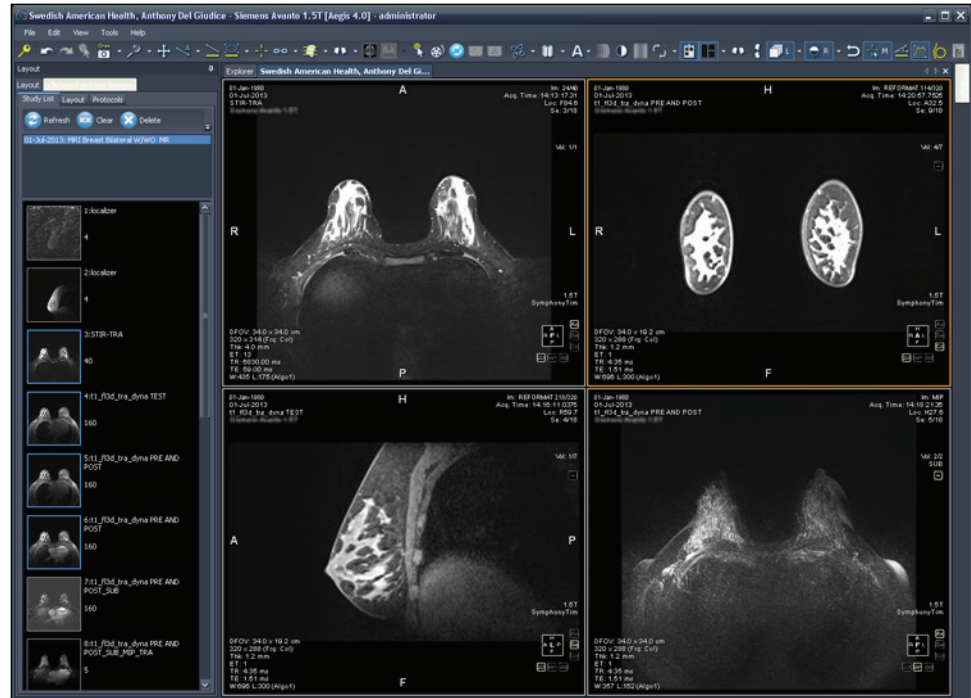
Figure 5:   MultiView Workspace Showing Four Viewports and the Layout Pane

For details about the features in the workspace, see About the MultiView Workspace on page 55.

Logging Out

To log out, or change users, click the Logout icon [icon] at the top left of the screen. In the confirmation dialog that appears, click *Yes*. The Log Into MultiView dialog is displayed allowing you or another user to log into the application.

NOTE: When application synchronization is configured, you are automatically logged out of SecurView when you log out of MultiView.

Automatic Logout

After a certain period of inactivity, MultiView automatically logs you out of the application. By default, the inactive time is 30 minutes but your system may have been configured to allow a longer or shorter period of inactivity before you are automatically logged out.

To log back into MultiView, enter your password in the Log Into MultiView dialog and click *Login*.

Chapter 2   MultiView Configuration

This chapter describes how to configure MultiView to:

- Keep multiple MultiView installations in sync

- Manage DICOM servers

- Manage disk space

- Manage a local copy of the database

This chapter also describes the options that control the MultiView display and functionality such as workspace saving.

About Remote Agent
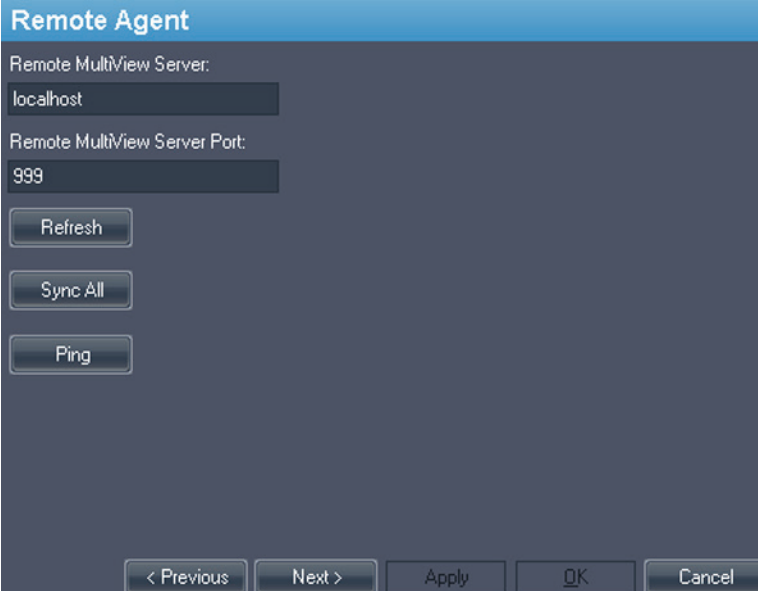
MultiView Remote Agent synchronizes user accounts across multiple MultiView workstations. It is the mechanism that stores the passwords and hanging protocols associated with each username as well as reports and study status which are not user-specific.

Remote Agent constantly monitors for any changes that occur on your local workstation and relays those changes to the server. The server propagates the changes on the other client workstations. As a result, any change done to one workstation is mirrored on all the other workstations.

You must configure the MultiView computer designated as the server and all client workstations to use Remote Agent.

NOTE: In a standalone configuration with only one MultiView computer Remote Agent configuration is not required.

To configure Remote Agent, choose *Tools > Options* and select *Remote Agent* in the tree on the left.

Figure 6:   Remote Agent Configuration Options

Remote Agent Server Configuration

On the computer designated as the MultiView Remote Agent server:

1.   Select *Tools > Options > Remote Agent*.

2.   In the Remote MultiView Server field, enter "localhost".

3.   In the Remote MultiView Server Port field, enter an available port number.

4.   Click *OK*.

5.   Make a note of the IP address of this computer since you will need it to configure the client workstations.

Remote Agent Client Configuration

On **each** MultiView client computer:

1.   Select *Tools > Options > Remote Agent*.

2.   In the Remote MultiView Server field, enter the IP address of the MultiView server.

3.   In the Remote MultiView Server Port field, enter the MultiView server port number.

4.   Click *Apply*.

To synchronize the local workstation with the latest data (usernames, passwords, hanging protocols, reports and study statuses) click *Sync All*.

Verifying Remote Agent Configuration

To check connectivity to the MultiView server, click the *Ping* button in the Remote Agent options dialog. If the local server is unresponsive, click the *Refresh* button to check for a response. If MultiView cannot contact the remote server, the following dialog appears.
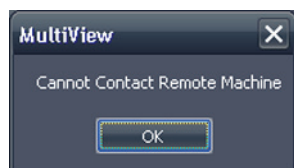
Figure 7:   Communication Error Dialog

This error usually occurs because the Shred Host service is not running on the MultiView workstation (if MultiView is running in a standalone workstation configuration) or the Shred Host service is not running on the remote server workstation (in a multi-workstation configuration).

To start the Shred Host service:

1. Open Windows Control Panel.

2. Click on *System and Security > Administrative Tools > Services*.

3. Select the *ClearCanvas Workstation Shred Host Service* item and do one of the following:

    a) If the Status column displays "Started", choose *Action > Stop* to stop the service, then choose *Action > Start* to start it again. Note that you cannot restart the service by selecting the Restart option.

    b) If the Status column is blank, choose *Action > Start* to start the service. The Status column displays "Started" when the service is running.

Configuring MultiView to Communicate with Other DICOM Devices

You can configure MultiView to communicate with other DICOM devices such as MR scanners and picture archiving and communication systems (PACSs). This is necessary if you want to acquire studies **from** other DICOM devices or send reports and derived series **to** other DICOM devices.

There are two parts to this configuration process:

1. Configure the MultiView as a DICOM device so that it is able to communicate with other DICOM devices.

2. Specify the other DICOM devices you want the MultiView workstation to communicate with.

Configuring a Workstation as a DICOM Device

To configure a workstation as a DICOM device:

1. Choose *Tools > Options > DICOM Server*.

2. Specify the properties of the workstation.
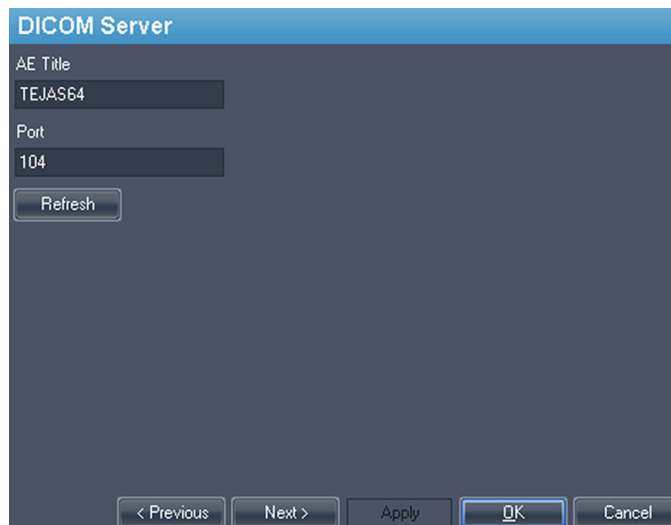
Figure 8:   DICOM Server Options

Option	Description
AE Title	(Application Entity Title) A tag that identifies the MultiView workstation as a DICOM device. Any title may be used. *NOTE: It is customary to enter the AE title in capital letters.*
Port	The network port through which workstations may communicate. The default is 104.

3. Click *OK*.

NOTE: Before the workstation can communicate with another DICOM device, that device must be configured with the workstation's AE Title and Port information. For more information, see the documentation provided with the DICOM device.

Adding a DICOM Server

When you have configured MultiView as a DICOM device, you must specify the remote DICOM device(s) you want the workstation to communicate with. Remote DICOM devices are referred to as "servers" in MultiView.

To add a DICOM server:

1. Right-click *My Servers* (or a server group folder) in the Servers pane on the DICOM sub-tab and choose *Add server* from the context menu.

2. Specify the properties in the Add New Server dialog.
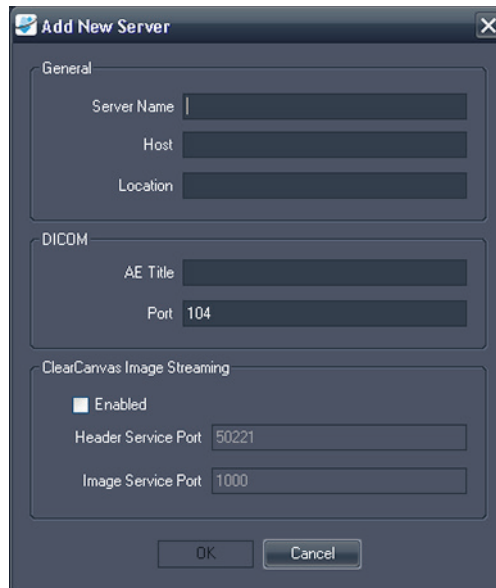
Figure 9:   Add New Server Dialog

Option	Description
Server Name	A name to identify this server.
Host	The server IP address. You may also use the server's DNS name if the network is DNS enabled; however, using the DNS name will be slower because the computer must resolve the name. It is recommended that you use the IP address, particularly in an environment where security is an issue.
Location	A description field to help identify the server.
AE Title	The AE Title of the server computer. *NOTE: It is customary to enter the AE title in capital letters.*

Option	Description
Port	The network port through which two (or more) workstations may communicate. The default is 104.
ClearCanvas Image Streaming Enabled	N/A
Header Service Port	If you are using a ClearCanvas PACS, enter the Header Service port number configured on the PACS.
Image Service Port	If you are using a ClearCanvas PACS, enter the Image Service port number configured on the PACS.

3. Click *OK*.

The new server appears in the Servers pane of the DICOM sub-tab.

NOTE: Hover over the server name to display a tool tip showing the server communication parameters.

Verifying DICOM Server Connection

To verify a server connection, right-click the server name and choose *Verify* from the context menu. This performs a DICOM C-ECHO, which confirms communication between the MultiView workstation and the remote DICOM server.
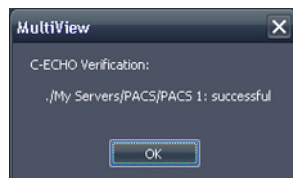
Figure 10: Successful Verification

NOTE: For a workstation to communicate with other remote DICOM servers, the other DICOM servers must be configured with the workstation's DICOM information.

IMPORTANT: If you change any information, such as the IP address, port, or AE Title on a workstation or the remote DICOM source, you must update the information about that source on every device that communicates with it. After making a change, re-verify the server communication between each device to ensure that the DICOM connections have been reestablished.

Organizing Servers

Use server groups to organize servers into meaningful categories. MultiView is installed with a default server group called My Servers. You can rename this server group or add more server groups to make the servers you access easier to find.
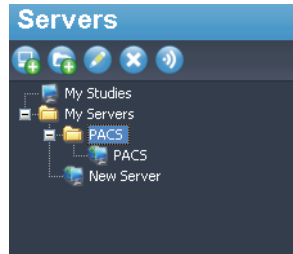
Figure 11: Servers Pane Showing a 'PACS' Server Group Under the My Servers Group

To add a new server group:

1. Right-click in the Servers pane on the DICOM sub-tab and choose *Add server group* from the context menu.

2. Enter a name for the server group in the dialog.

3. Click *OK*.

The server group appears in the Servers pane. At this point, you can either drag existing servers into the group to populate it, or add new servers as described in Adding a DICOM Server on page 17.

Server Toolbar Buttons

The toolbar at the top of the Servers pane contains icons for working with servers. You can also access the same functionality by right-clicking in the Servers pane and selecting an option from the context menu.

Table 1:   Servers Pane Tools

Icon	Function
	Add a server.
	Add a server group.
	Edit the selected server or server group settings.
	Delete the selected server or server group.
	Verify the selected server's connection.

Managing Disk Space

Diskspace Manager automatically manages your hard drive space. When the *used space* reaches the *high watermark*, MultiView begins to delete the oldest studies (based on the date the study was imported into MultiView) until the used space reaches the *low watermark*.

NOTE: To keep MultiView operating at its optimal level, try to keep My Studies to a minimum.

To configure Diskspace Manager, choose *Tools > Options* and select *Diskspace Manager* in the tree on the left.

Diskspace Manager can also be configured to automatically delete studies after specified hours. In the following example, the cut off maximum number of studies is 500.
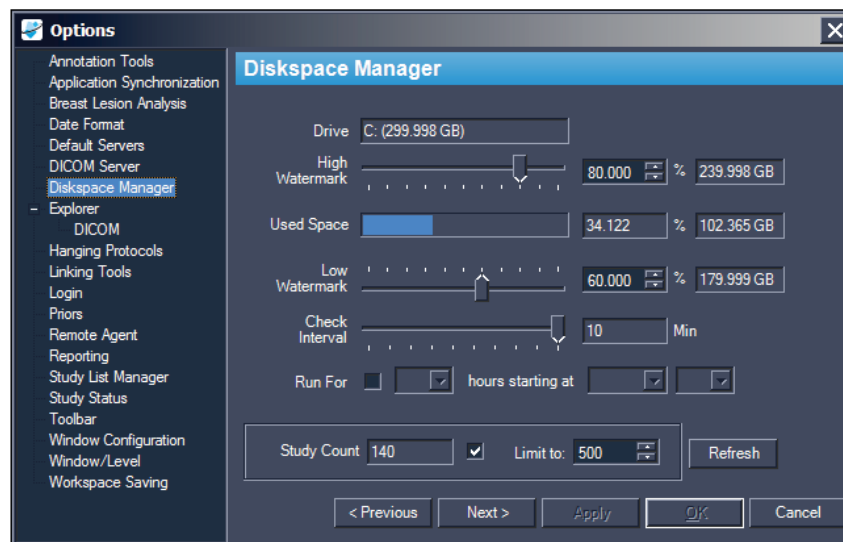
Figure 12: Diskspace Manager Options

Option	Action / Description
Drive	The hard drive capacity.
High Watermark	Sets the maximum percentage of hard disk space before files are automatically deleted.
Used Space	The amount of disk space that is currently available.
Low Watermark	The point at which MultiView will stop deleting files. Sets the percentage of hard disk space on which files will be retained.
Check Interval	Sets how often MultiView checks the hard disk to determine whether it is necessary to delete files. The default value is ten minutes.

Option	Action / Description
Run For	Select this option if you want to limit the time when Diskspace Manager runs to a certain period of the day. Select the number of hours Diskspace Manager will run for and the time of day when it will start.
Limit to	Select this option if you want to set a maximum number of studies to store in the database. Once the number of studies in the database reaches this limit, MultiView will delete older studies as necessary to keep the total number of studies below the limit. The default value is 500 studies.

NOTE: Files are deleted based on the date they were imported into MultiView not by the study date.

Alternatively, you can manually delete studies stored locally (in My Studies) to free up database storage space. For more information, see Deleting a Study from My Studies on page 50.

DICOM Database Rebuild

You can maintain a local copy of DICOM images for faster loading of images into MultiView.

When MultiView is launched it checks the local collection of DICOM images and updates the database. The *Reindex Local Data Store* option allows you to rebuild the database in case of a software update, or data corruption.

NOTE: You will not be able to interact with MultiView while re-indexing is in process.

To rebuild the local DICOM database, choose *Tools > Utilities > Reindex Local Data Store*.

NOTE: Rebuilding the database may take a while depending on the size of the DICOM database.

MultiView Options

Use the Options settings to control MultiView behavior or to specify default values for certain features.

NOTE: These options are specific to the workstation they are set on.

To access the Options dialog, choose *Tools > Options*, or press Ctrl + O. For information about the MultiView options, see:

- Annotation Tools on page 23
- Application Synchronization on page 24
- Date Format on page 26
- Default Servers on page 27
- DICOM Server on page 27
- Diskspace Manager on page 27
- Explorer/DICOM on page 27
- Hanging Protocols on page 28
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Annotation Tools

The Annotation Tools options control how MultiView behaves when you draw a region of interest (ROI).
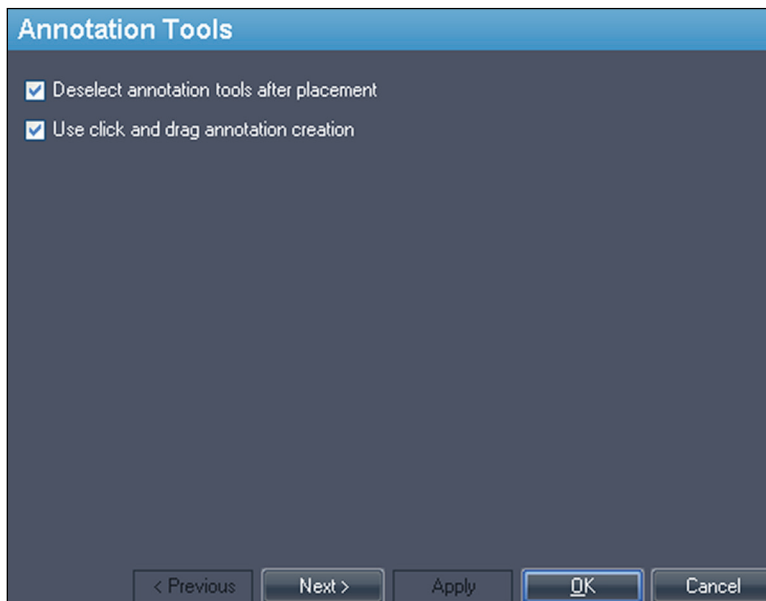
Figure 13: Annotation Tools Options

Option	Description
Deselect annotation tools after placement	Select this option to return the mouse button to the default tool (Stack for the left mouse button, Window Level for the right mouse button) after you have drawn a region of interest (ROI).
Use click and drag annotation creation	Select this option to create a region of interest (ROI) by clicking and dragging the mouse to the location where you want the ROI to end. The ROI is completed when you release the mouse button. When this option is not selected, you create ROIs by clicking, moving the mouse to the location where you want the ROI to end, then clicking again. The ROI is completed when you click a second time. For more information, see Creating Elliptical and Rectangular ROIs on page 93.

Application Synchronization

The Application Synchronization options determine how MultiView interacts with third-party applications such as SecurView through an application synchronization server.
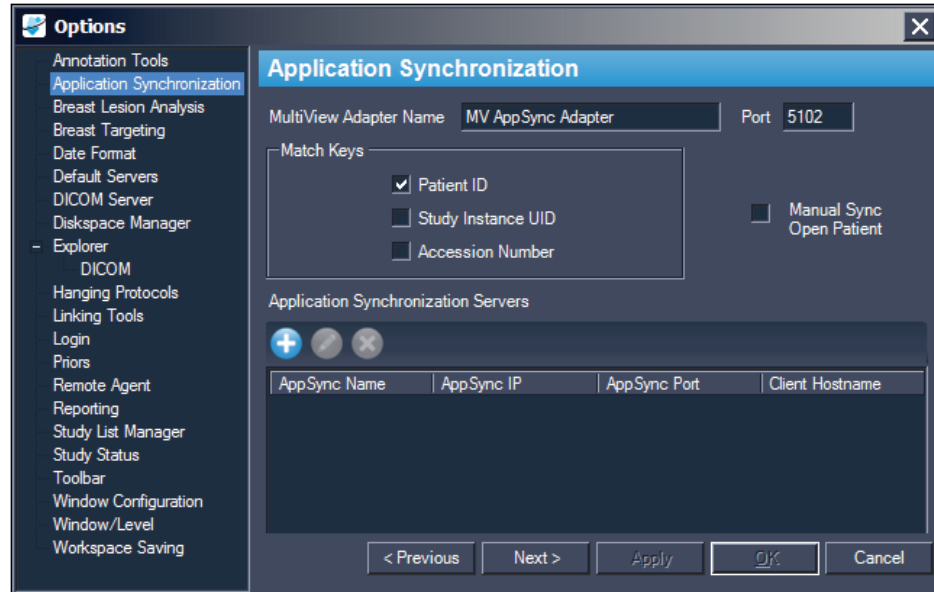
Figure 14: Application Synchronization Options

Option	Action/Description
MultiView Adapter Name	Enter the MultiView adapter name. The default name is MV AppSync Adapter. *NOTE: This value must exactly match the* Application Alias *for the MultiView application configured on the application synchronization server.*
Port	Enter the MultiView port number. The default port is 5102.
Match Keys	Select the DICOM tag(s) to use for synchronization. When a study is opened in the third-party application, MultiView will open any available studies that match the DICOM tags selected.
Manual Sync Open Patient	Select this option if you do not want a study to open automatically in the third-party application when it is opened in MultiView.

Option	Action/Description
Application Synchronization Servers	A list of application synchronization servers MultiView is configured to communicate with. ▪ To add a new server, click the *Add* icon. For more information about adding a server see Adding an Application Synchronization Server below. ▪ To edit the settings for a server, select the server and click the *Edit* icon. ▪ To delete a server, select the server and click the *Delete* icon.

NOTE: To configure MultiView to synchronize with a third-party application, you must have an application synchronization server correctly configured, and at least one MultiView user must be configured as a synchronization user in the third-party application. For more information, see the documentation provided for application synchronization and the third-party application.

Adding an Application Synchronization Server

To add an application synchronization server:

1. Click the *Add* icon 🞤.
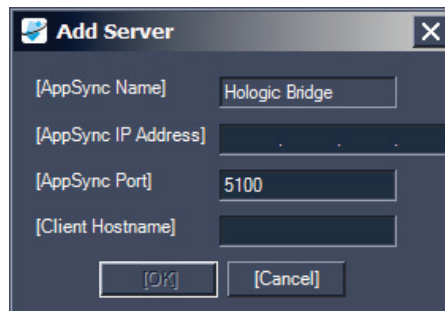
2. In the Add Server dialog enter the following information about the application synchronization server (that is, Hologic Bridge):

   • AppSync IP Address – The IP Address of the application synchronization server.

   • AppSync Port – Port of the application synchronization server. The default port is 5100.

3. Enter the hostname of the client machine. For Standalone configurations, enter **LOCAL** for the Client Hostname. For web configurations, enter the hostname for each client accessing MultiView remotely from the web.

4. Click *OK*.

NOTE: If you are using the MultiView standalone application, you can only synchronize with one application synchronization server. In MultiView Web, you can add multiple application synchronization servers.

Date Format

The Date Format options determine how MultiView displays dates. Choose either the system short or long date or select a custom date from the drop-down list.
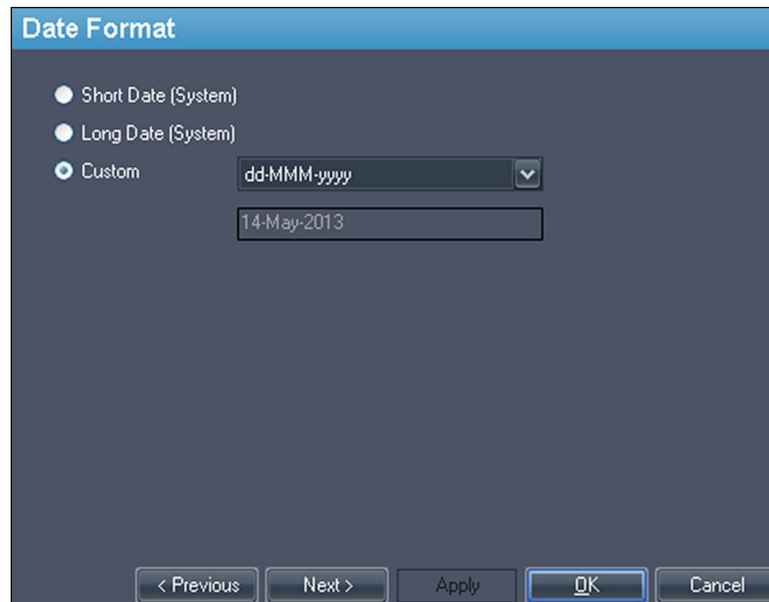
Figure 15: Date Format Options

Default Servers

The Default Servers option sets the default server(s) for automatically searching for related/prior studies and publishing key images. Select one or more servers to use the defaults.
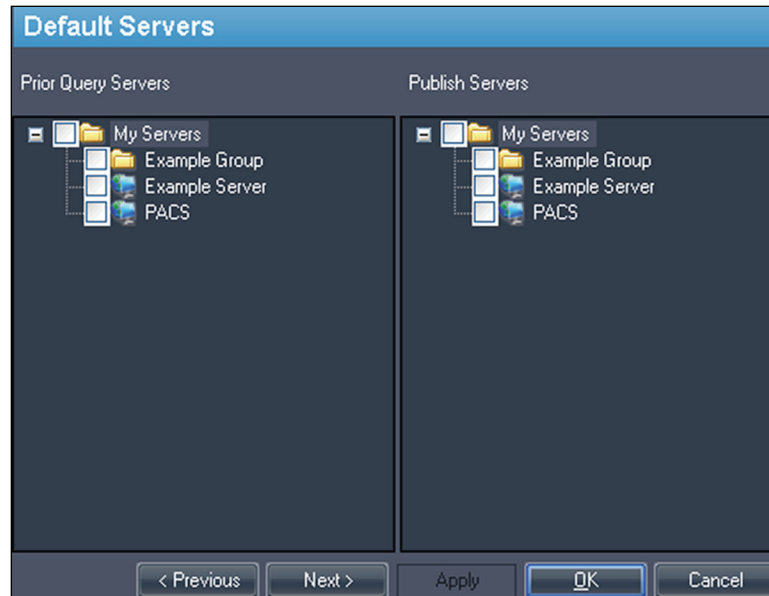
Figure 16: Default Servers Options

DICOM Server

These settings specify the MultiView DICOM device identity. For more information, see Configuring a Workstation as a DICOM Device on page 16.

Diskspace Manager

Diskspace Manager helps manage your disk space by automatically deleting old studies from My Studies when a specified amount of disk space has been reached. For more information about configuring Diskspace Manager, see Managing Disk Space on page 20.

Explorer/DICOM

Select the *Show number of images in study* option to show the number of images in a study in the Explorer window.

Select the *Show phonetic and ideographic names* option to show multibyte characters (such as Japanese characters) in MultiView when they are present in the DICOM data for a study.
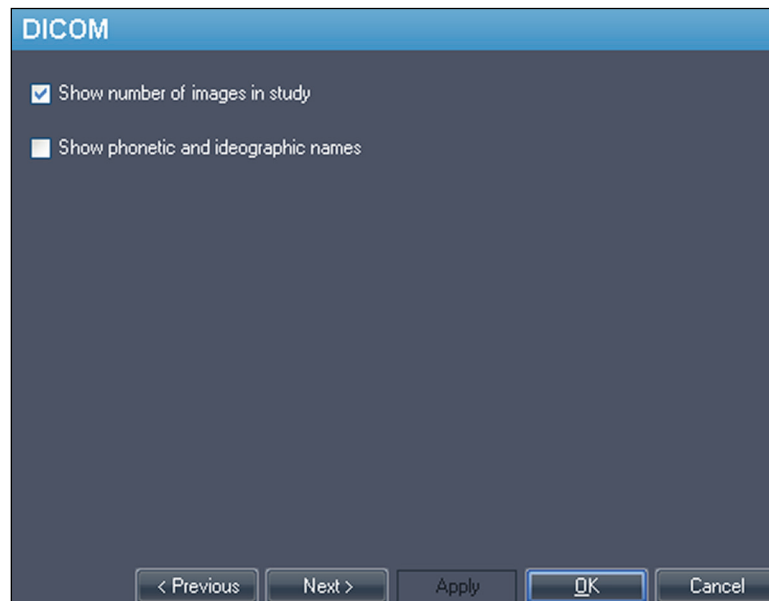
Figure 17: Explorer/DICOM Options

Hanging Protocols

The Hanging Protocols options control how hanging protocols are displayed in MultiView.
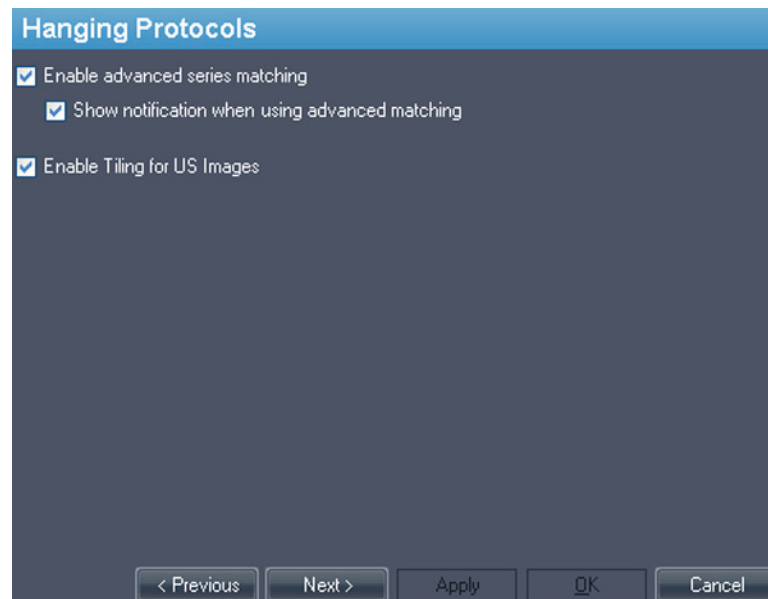
Figure 18: Hanging Protocols Options

Option	Description
Enable advanced series matching	Select this option if you want to utilize MultiView Smart MRI hanging function to automatically sort MRI series based on MR acquisition protocols rather than only rely on the series description.This option is disabled by default.
Show notification when using advanced matching	This option is not functional in MultiView.
Enable Tiling for US Images	Select this option to display ultrasound (US) images in "tiles" in the workspace viewport(s) when a hanging protocol for US studies is applied. For more information, see MultiView Default Hanging Protocols on page 70.

Linking Tools

This option sets the tolerance for images to be considered parallel for reference lines and when performing linked stacking. Enter the number of degrees in the angle to allow.
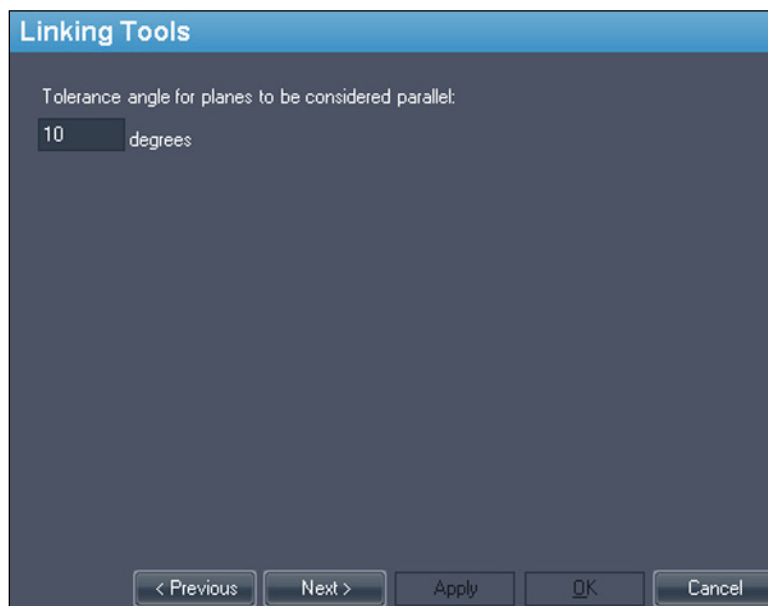
Figure 19: Linking Tools Option

Login

The Login settings allow you to change your username, full name, site name, password, and site address. You can also specify here whether MultiView should use MultiView authentication or Active Directory authentication.
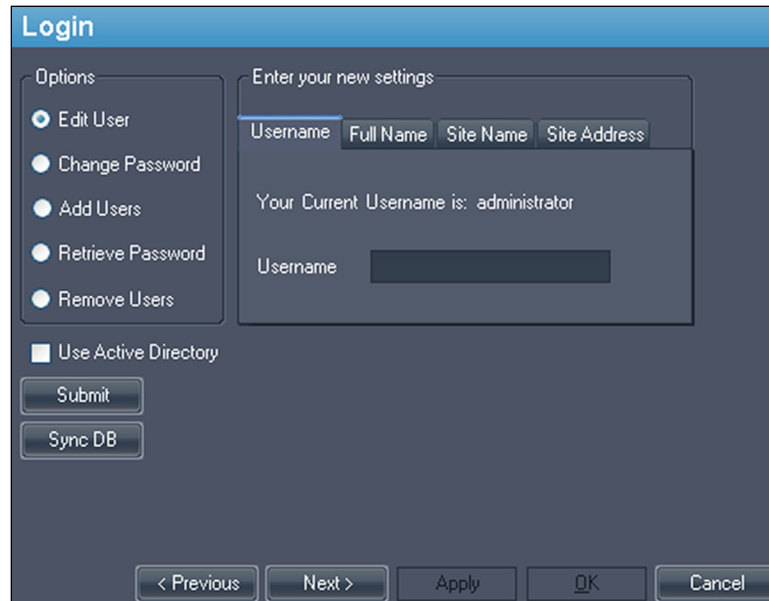
Figure 20: Login Options - Edit User Options

Option	Description
Edit User	Select this option and fill in the field on each tab to change your user information. Click *Submit* to save your information.
Change Password	Select this option and fill in the fields to change your password. Click *Submit* to save your new password. *NOTE: Your new password must be at least five characters in length and must include at least one letter.*

Option	Description
Add Users*	Select this option to add a new user to MultiView. Enter the following information for the user: ▪ Username: The username the user will use to log into MultiView. ▪ Full Name: The user's name. ▪ Site Name: A name to identify your site. ▪ Site Address: Your site's address. ▪ Password: The password the user will use to log into MultiView. Enter the password again in the Re-Enter Password field to confirm it. ▪ Status: Indicate whether this user is a regular user or an administrator. Click *Submit* to save the information.
Retrieve Password*	Select this option to retrieve a user's password if they have forgotten it. Enter the user's username and click *Submit*.
Remove Users*	Select this option to remove a user from MultiView. Enter the username of the user you want to remove and click *Submit*.
Use Active Directory	Select this option to use Active Directory user authentication. Users that exist in the Microsoft Active Directory 'Admin' group or 'User' group will be able to log into MultiView using their domain credentials. Obtain the necessary Active Directory server information from your network administrator.

* Available to MultiView administrator users only.

Click the *Sync DB* button to synchronize the local database of usernames with the workstation acting as the MultiView server using Remote Agent. Note that this is a one-way synchronization. Any users that exist on the local workstation, but not on the MultiView server will be deleted.

Priors

MultiView can automatically display a patient's relevant previous studies when you open a study. Priors are found when another study with the same patient ID exists but has a different study date. Priors can also be filtered by keyword and/or by modality.

NOTE: To use automatic prior detection, you must have a default prior query server configured. For more information see the Default Servers options on page 27.
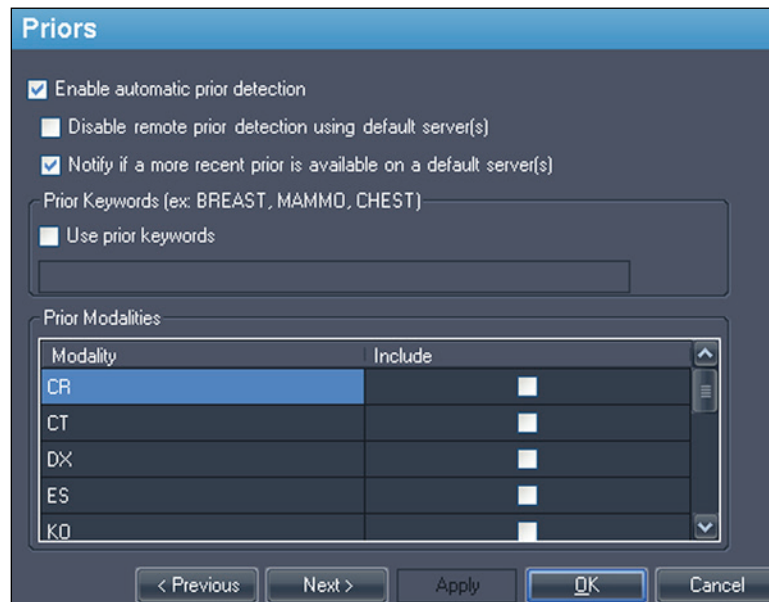
Figure 21: Priors Options

Option	Description
Enable automatic prior detection	Select this option to automatically detect and display a patient's prior studies.
Disable remote prior detection using default server(s)	Select this option if you want to see only prior studies already in the local database. Prior studies that exist on a default server but that are not in the local database will not appear in the Study List tab.
Notify if a more recent prior is available on a default server(s)	Select this option if you want MultiView to notify you when a more recent prior is available for a patient on a default server.
Use prior keywords	Select this option to filter prior studies for a patient by keywords. Enter the keywords that must appear in the study description.

Option	Description
Prior Modalities	Select the modalities you want to include in the list of prior studies for the patient.

Remote Agent

MultiView Remote Agent synchronizes user accounts across multiple MultiView workstations. For details about configuring Remote Agent, see About Remote Agent on page 13.

Reporting

The Reporting options control how the MultiView reporting and key image features behave. Only the options described below apply to MultiView Multimodality.

Report Options
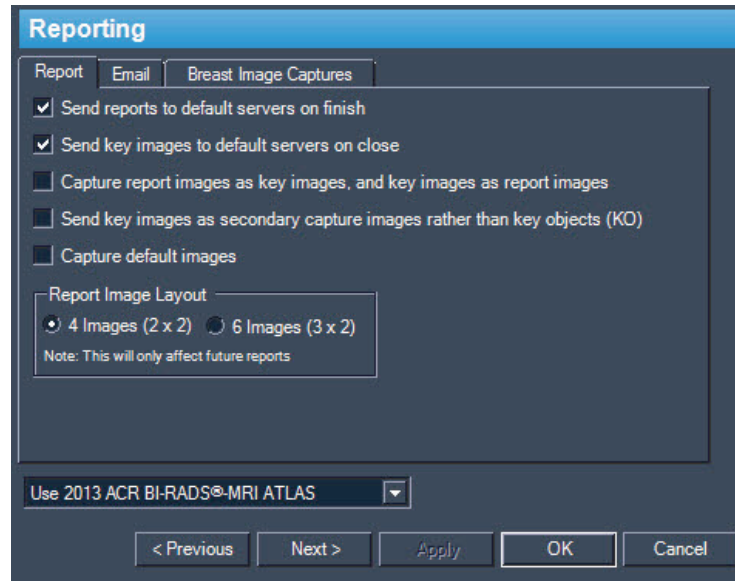
Figure 22: Basic Reporting Options

Option	Description
Send key images to default servers on close	Select this option to send any key images you created for a study to your configured default servers when you close the study.
Send key images as secondary capture images rather than key objects (KO)	Select this option if your PACS server does not support key objects.

Study List Manager

Study List Manager allows MultiView to see studies in other client databases and vice versa. To use Study List Manager, you must configure MultiView with information about the Study List Manager server.
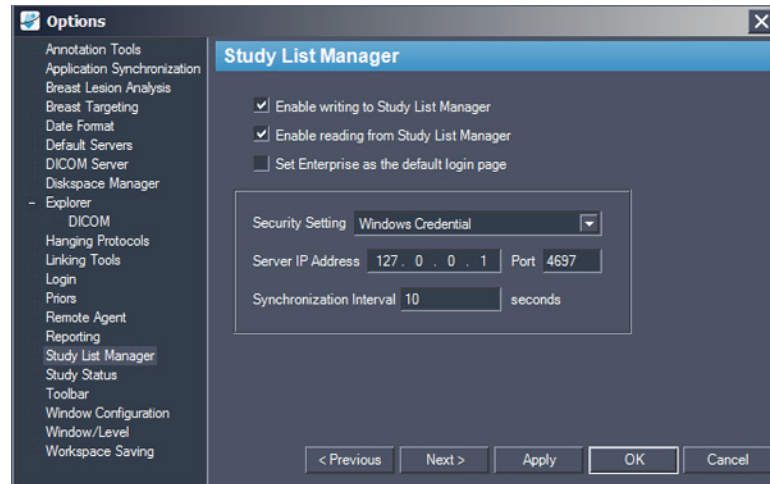
Figure 23: Study List Manager Options

Option	Description
Enable writing to Study List Manager	Select this option to enable MultiView to write to Study List Manager.
Enable reading from Study List Manager	Select this option to enable MultiView to read from Study List Manager.
Set Enterprise as the default login page	If you select this option, MultiView opens on the Enterprise tab when you log in.
Security Setting	The type of security used on the Study List Manager server.
Server IP Address	The IP address of the Study List Manager server.
Port	Use one of the following ports, based on the security setting you selected: ▪ Windows Credentials: 4697 ▪ HTTPS Anonymous Client: 4698 ▪ No Security: 4699
Synchronization Interval	The frequency, in seconds, MultiView should check for new studies in Study List Manager.
Set Enterprise as the default login page	Select this option if you want MultiView to open to the Enterprise tab when you log in.

NOTE: To see studies on a third-party application server such as SecurView, Study List Manager Server must be installed and correctly configured. The location where Study List Manager Server is installed will depend on the products you have licensed and the hardware architecture at your site. To open studies in the third-party application, Application Synchronization must be installed and configured. For more information, see Application Synchronization on page 24.

Study Status

Select the *Track the status of studies* option if you want to maintain a record of whether studies have been read.

NOTE: This option is selected by default. If you deselect this option, when you re-start MultiView, studies appear in the My Studies list without "Status" or "Processed" fields.
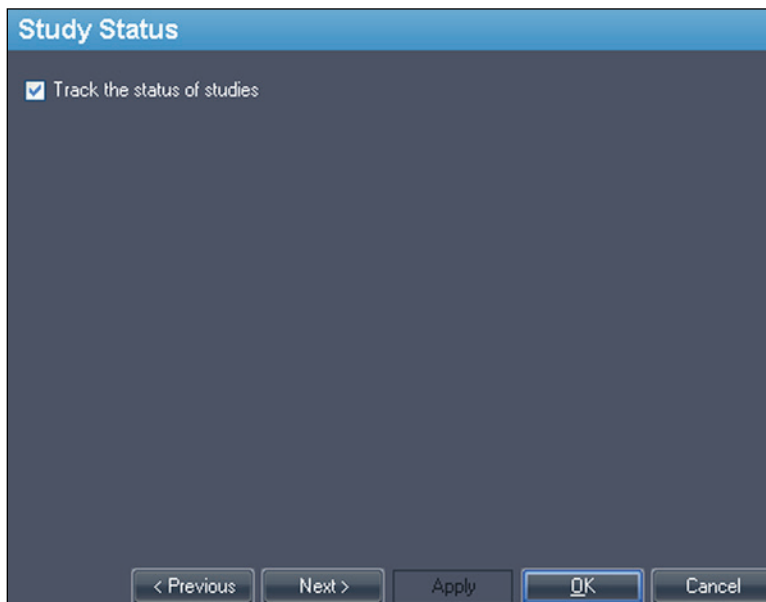
Figure 24: Study Status Tracking Option

Toolbar

The Toolbar options determine how MultiView displays the toolbar in the interface. The Toolbar Button Profile option also determines that amount of information displayed in the viewport DICOM overlay.
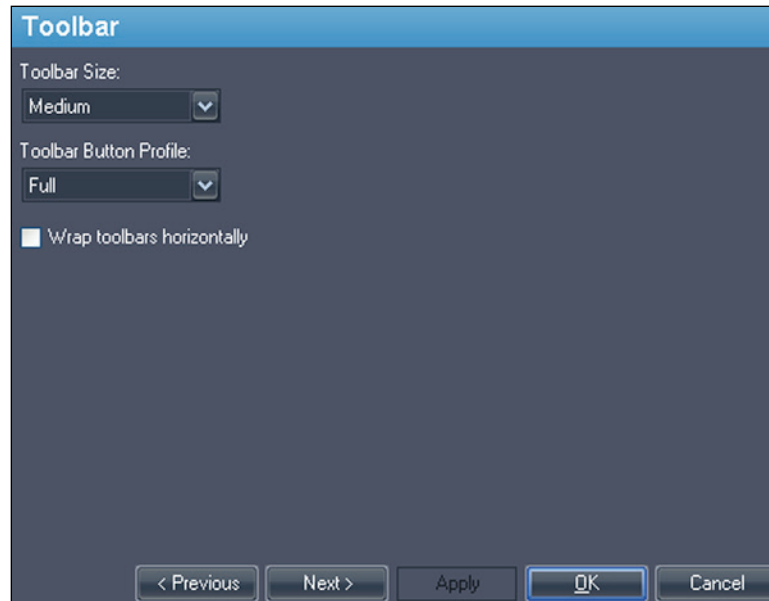
Figure 25: Toolbar Options

Option	Description
Toolbar Size	Sets the size of the toolbar buttons.
Toolbar Button Profile	Determines the number of toolbar buttons to display. Select the option that corresponds to the way you use MultiView: Simple, Advanced or Full.
Wrap toolbars horizontally	Select this option to wrap the toolbar if there are too many buttons to display in a single row.

Window Configuration

This option determines whether images open in the same window as the study manager, or in a different one. Opening images in a separate window is useful in a multi-monitor scenario where it is preferable to have the study manager open in a window on one monitor, and the image window span the remaining monitors.
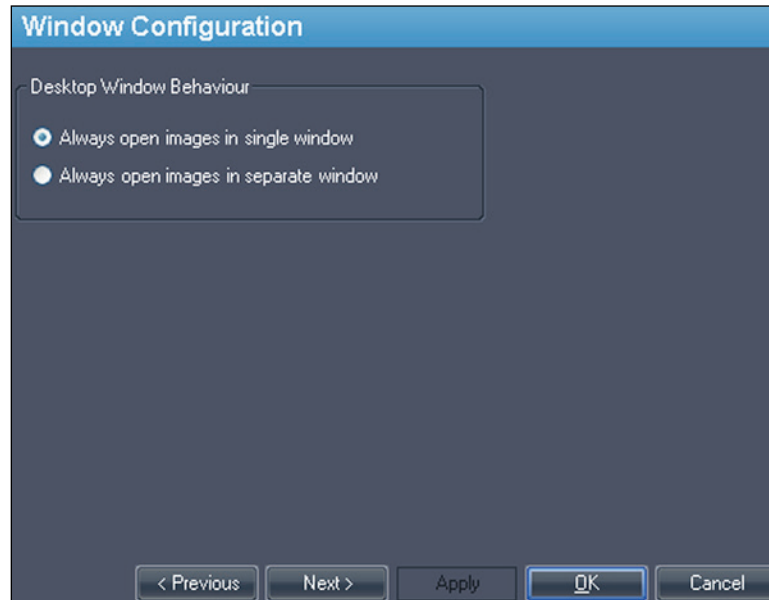
Figure 26: Window Configuration Options

Window/Level

You can add and delete window and level presets. For more information about how to use window and level presets, see Using Window/Level Presets on page 65.

To add a preset:

1. Ensure that the MR modality is selected (see the figure below).

2. Click the + icon or right-click and choose *Add*.

3. In the Add Preset dialog, choose an available keystroke to which to bind the preset.

4. Enter a name for the preset.

5. Set the *Window Width* and *Window Center* (level) values to your preferred values.

6. Click *OK*.
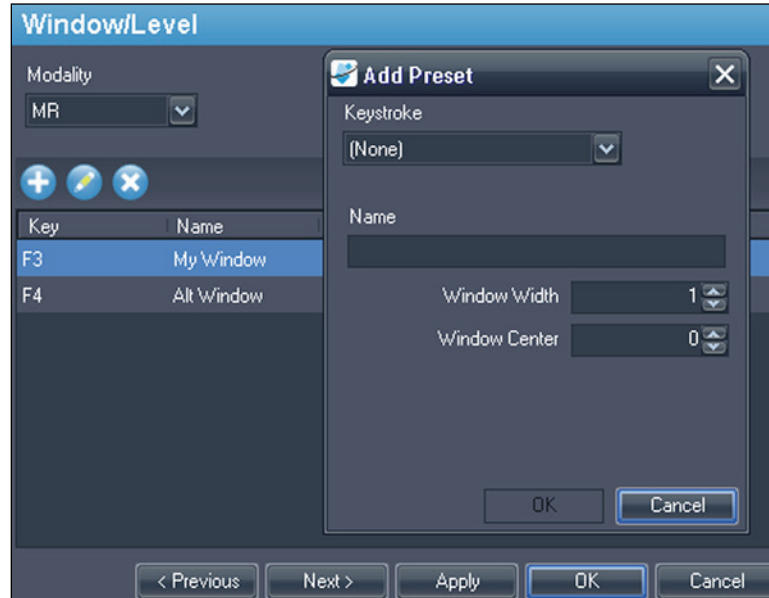
Figure 27: Window/Level Options

To edit a preset, select it in the list and click the *Edit* icon. Modify the preset values then click *OK*.

To delete a preset, select it in the list and click the *Delete* icon. Note that the preset is deleted without first displaying a confirmation dialog.

Workspace Saving

MultiView can save the workspace configuration you have set up for a study and automatically load the workspace from a previously saved state upon opening the study.
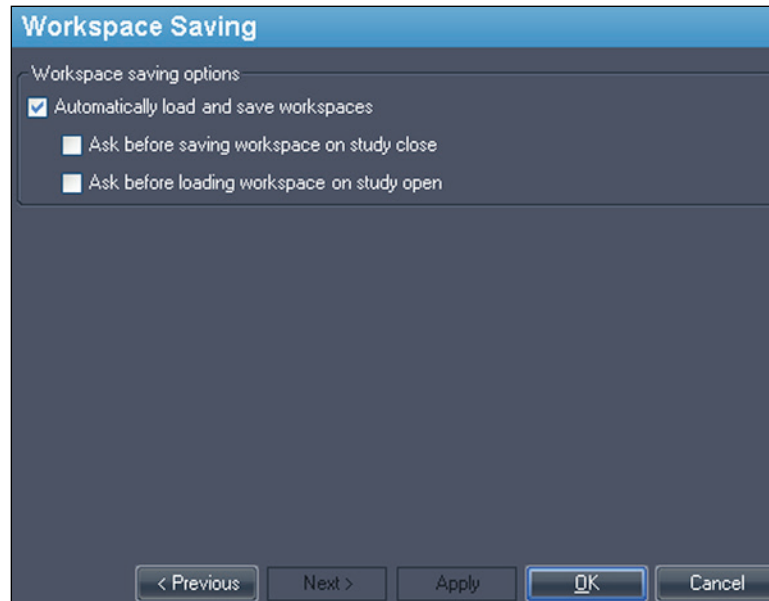
Figure 28: Workspace Saving Options

| Option	Action / Description
Automatically load and save workspaces	Select this option to save the current workspace configuration when you close a study and load the saved workspace when you open a study. *NOTE: Even if this option is not selected, in the event that the software closes unexpectedly, MultiView automatically saves the workspace before closing.*
Ask before saving workspace on study close	If you select this option, a dialog appears when you close a study asking if you want to save the workspace. If this option is not selected MultiView always saves the workspace.
Ask before loading workspace on study open	If you select this option, a dialog appears when you open a study asking if you want to load the stored workspace. If this option is not selected, MultiView always loads the stored workspace.

NOTE: To preserve disk space, MultiView periodically deletes the workspace information for studies you have deleted.

Chapter 3 Sending and Receiving Studies

Before two workstations can exchange files, they must be configured to communicate with each other. For more information, see Configuring MultiView to Communicate with Other DICOM Devices on page 15.

NOTE: Create rules in the Windows firewall to send and receive images. You may also need to configure your antivirus software to allow access to the network. Check with your network administrator for help with this.For more information, contact Hologic Technical Support. For contact information, see Contacting Hologic on page 6.

Retrieving a Study from a Remote DICOM Server

To retrieve a study from a remote DICOM server:

1. Select the remote server in the Servers pane of the DICOM sub-tab.

2. Right-click the desired study in the studies list and select *Retrieve* from the context menu (or click the *Retrieve* button at the top of the right pane).

   The Send/Receive Activity Monitor slides out from the left showing the retrieval progress. For more information about the Send/Receive Activity Monitor, see Working in the Send/Receive Activity Monitor on page 43.

When the retrieval is complete, the study appears in the My Studies list. The best practice is to open the study from the My Studies list. For more information, see Opening an Image or a Study on page 50.

You can also retrieve studies, individual series and priors from the Study List tab on the Layout pane. For more information, see About the Study List on page 57.

Importing Studies on the Workstation

To import images on the workstation:

1. If the studies you want to import are on an external storage device such as a CD or USB flash drive, insert the device into the workstation.

2. Click the My Computer sub-tab on the Explorer tab and navigate to the target image or folder.

3. Right-click on the target image or folder and choose *Import* from the context menu.

Searching for Studies

Use the MultiView search functionality to find specific studies, either in the local database or on a DICOM server.

Figure 29: Search Pane

To search for a study, select the location to search in the Servers pane (either My Studies or one of the remote servers), then enter your search criteria and click *Search*.

About the Search Criteria

You can search for studies using the following search criteria:

- *Patient ID, Patient Name, Accession #, Study Description:* Enter the criteria to search for. You can enter partial values (for example only the first few letters of the patient's name) or use the asterisk (*) wildcard to match multiple characters (for example, enter '*breast' in the *Study Description* field to find all studies whose description ends in 'breast').

- *Study Date:* Enter the range of time to search in. Click the drop-down arrow to select the *From* and *To* dates from a calendar.

- *Modality:* Click the list control [...] to select from a list of available modalities.

- *Workstation:* This option is only available on the Enterprise tab. Enter your MultiView workstation name to filter the results to show only local studies. Enter the name of another MultiView workstation to search for studies on that workstation.

When searching, you can leave some fields empty, but to reduce the time required to return results you should enter the most specific search criteria you can. If you start a search on a DICOM server without entering any search criteria, MultiView displays a warning message.
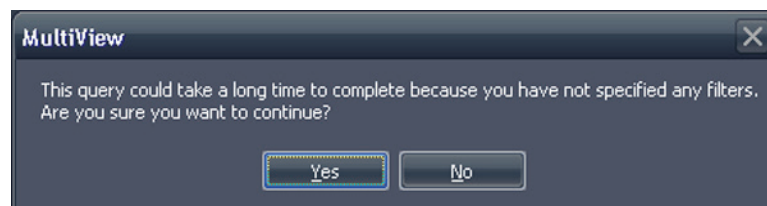

Figure 30: Remote Search Warning

Sending a Study to a Remote DICOM Server

To send a study to a remote DICOM server:

1. Right-click the desired study in the studies list of the DICOM sub-tab and choose *Send* from the context menu (or click the *Send* button at the top of the pane).

2. In the Send Study dialog that appears, select the server you want to send the study to.

3. Click *OK*.

The Send/Receive Activity Monitor displays the sending progress.

NOTE: When a study is being sent, you can still interact with MultiView and use it to perform any of its normal functions.

You can also send a series to a remote DICOM server from the Study List tab on the Layout pane. For more information, see About the Study List on page 57.

Working in the Send/Receive Activity Monitor

The Send/Receive Activity Monitor pane displays information about communications between the MultiView workstation and other servers. It opens automatically when you retrieve a study from a server or send a study to a server. To open the Send/Receive Activity Monitor pane at other times, choose *Tools > Utilities > Send/Receive Activity Monitor*.

Figure 31: Send/Receive Activity Monitor Pane

Table 2:   Send/Receive Activity Monitor Pane Icons

Icon	Name	Description
	Open Study	Studies you retrieve from a server appear in your My Studies list, but you can also open a study directly from the Send/Receive Activity Monitor pane.
	Clear Selected Item(s)	Removes the selected items from the Send/Receive Activity Monitor pane.
	Clear All Items	Removes all items from the Send or Receive sections of the Send/Receive Activity Monitor pane.
	Show Background Sends	Some features, such as reports and key images, create DICOM content that is automatically published to a remote server. Click this icon to show these send operations in the Send/Receive Activity Monitor list.

About SHREDs

A SHRED is a function, or series of functions, MultiView performs automatically based on a trigger. In MultiView Multimodality, you can send studies received by a primary MultiView workstation to secondary workstations automatically using a SHRED.

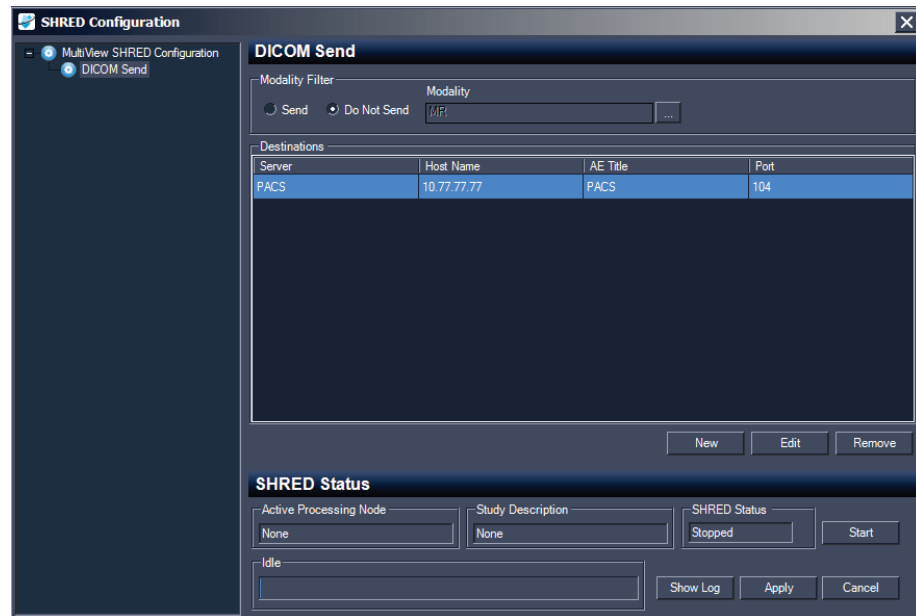To access the SHRED configuration options, choose *Tools > SHRED Configuration.*

Figure 32: SHRED Configuration Dialog

The SHRED Configuration dialog displays the currently configured SHREDs in a tree view on the left. Details of the selected SHRED appear in the details pane on the right.

NOTE: To change the order of the SHRED processes, move the SHRED nodes by dragging them to a new location in the tree configuration.

Details about the selected SHRED's status appear at the bottom of the dialog.

SHRED Tasks

You can perform the following tasks on SHREDs.

Manually Starting or Stopping a SHRED

When a SHRED is stopped, a Start button appears in the SHRED Status section. Click *Start* if you need to manually start the SHRED. The Start button changes to a Stop button while the SHRED is running. If you need to stop the SHRED, click *Stop*. You must stop a SHRED before you can edit its details.

Editing a SHRED

To edit the details of an existing SHRED, select the SHRED in the tree view and click the *Stop* button if the SHRED is currently running. Edit the information in the details pane, and click *Apply* to save your changes.

Deleting a SHRED

To delete a SHRED, right-click the SHRED in the tree view and select *Delete*. The SHRED, and any SHREDs configured under it, are deleted.

NOTE: The SHRED is deleted without first displaying a confirmation dialog.

Delete Local Content After Processing

If you do not want to keep a local copy of the studies sent to MultiView, select the *Delete local content after processing* option to delete studies after they have processed by a SHRED and sent to a workstation or other DICOM device.

Sending Studies to a Client Workstation or Another DICOM Server

You can configure the MultiView server workstation to send the studies to client workstations or other DICOM devices by adding a DICOM Send SHRED under the main MultiView SHRED Configuration node.

To send studies to a client workstation:

1. Open the SHRED Configuration dialog (choose *Tools > SHRED Configuration*).

2. If the SHRED you want to add this SHRED under is running, click the *Stop* button under SHRED Status.

3. Right-click the node in the tree view where you want to add this SHRED and select *Add New DICOM Send*. The new SHRED is added as a child

node under the node you selected. If you do not see the new SHRED, click the "+" icon to expand the node.

4. Click the *DICOM Send* node. The DICOM Send details appear.
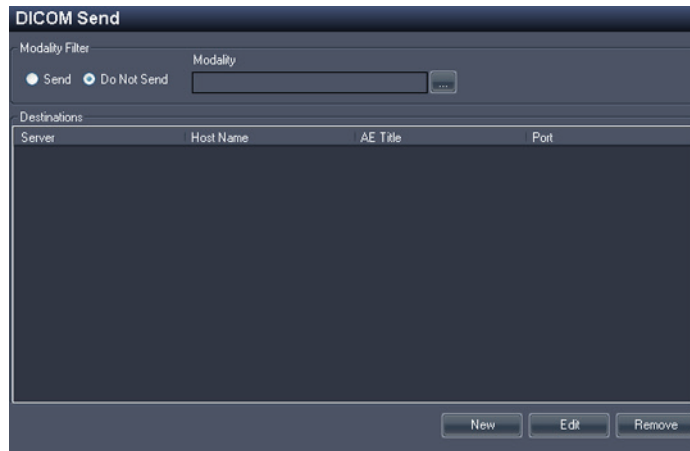
Figure 33: DICOM Send SHRED Details

5. Specify which modalities to send.

    •   If you select the Send option, only those modalities you specify will be sent.

    •   If you select the Do Not Send option, all modalities present in the study *except* the modalities you specify will be sent.

6. Click the *New* button. The New send target dialog appears.
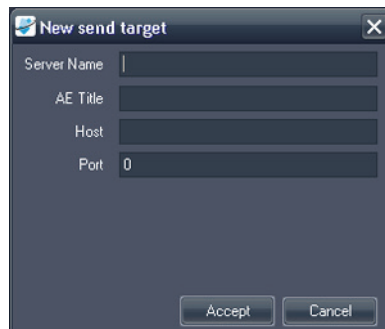
Figure 34: New send target Dialog

7. Enter the DICOM node details for the client workstation or DICOM device you want the server to send the studies to.

Table 3: DICOM Send SHRED Options

Option	Description
Server Name	A name to identify the server.

Option	Description
AE Title	The AE Title of the workstation or DICOM device. *NOTE: It is common practice to enter the AE title in capital letters.*
Host	The IP address. You may also use the domain name service (DNS) address if the network is DNS enabled; however, using the DNS address will be slower because the computer must resolve the name. It is recommended that you use the IP address exclusively.
Port	The network port for communication with the workstation or DICOM device. The default is 104.

8. Click *Accept* to close the New send target dialog.

9. To add another target, click *New* again, or click *Apply* to close the SHRED Configuration dialog.

Chapter 4   Working in the Study Manager

The studies list in the MultiView study manager/Explorer tab displays the studies available in the local database (My Studies), on a remote server, or the shared studies available on the Enterprise tab.

Figure 35: Studies List Showing Studies on a Remote Server

To sort the studies in the list, click the heading of the column you want to sort by. MultiView remembers the current sort order when it is closed and displays the same sort order the next time it is launched.

Studies Toolbar Buttons

The toolbar at the top of the studies list contains buttons for working with studies. Some buttons are only active for studies in the local database (My Studies), others are only active if they apply to the selected study.

Table 4:   Studies Pane Toolbar Buttons

Button	Name	Function
	Open Study	Opens the selected study in the workspace.
	Retrieve Study	Retrieves the selected study from the server. For more information, see Retrieving a Study from a Remote DICOM Server on page 41.
	Send Study	Sends the selected study to a remote DICOM server. For more information, see Sending a Study to a Remote DICOM Server on page 43.

Button	Name	Function
	Delete Study	Deletes the selected study. For more information, see Deleting a Study from My Studies on page 50.
	View Series Details	View information about the study. For more information, see Study Information on page 51.
	Anonymize Selected Study	Anonymize the selected study. For more information, see Anonymizing a Study on page 51.
	Mark as Read	Change the status of the selected study to "Read". For more information, see Study Status on page 52.
	Mark as Unread	Change the status of the selected study to "Unread". For more information, see Study Status on page 52.
	Send Study to SHRED	Process the selected study using a SHRED. For more information, see Processing a Study Using a SHRED.

Studies in the Local Database (My Studies)

To view the local database, click *My Studies* in the Servers pane.

Opening an Image or a Study

To open an image or study, double-click it (or select it and click the *Open* icon, or right-click and choose *Open*). The image or study opens in the workspace.

If MultiView has been configured to synchronize with a third-party application such as SecurView and to open studies automatically, the corresponding study opens in that application.

NOTE: To open multiple adjacent studies, hold down the Shift key when selecting them and then right-click and choose Open. *To open multiple non-adjacent studies, hold down the Ctrl key when selecting them and then right-click and choose* Open.

Deleting a Study from My Studies

To delete a study from My Studies, right-click the study in the right pane of the DICOM sub-tab and choose *Delete*, or select the study and click the *Delete* icon at the top of the pane. If you want to delete the oldest studies first, click the Study Date column heading in the My Studies list to sort the studies by date.

NOTE: Depending on the size of study (or studies) you selected, it may take several minutes to complete the deletion.

Study Information

To quickly view the details of a study, right-click the study and select *View Series Details* from the context menu. The Series Details dialog appears listing details about the patient, the study, and the series in the study.
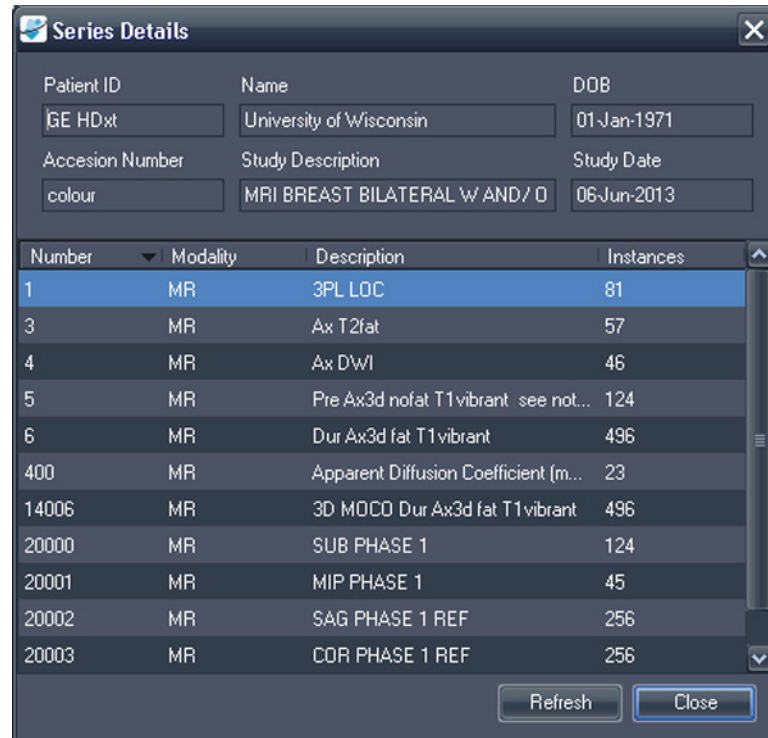
Figure 36: Series Details

Anonymizing a Study

To anonymize a study:

1. Right-click the study in the right pane of the DICOM sub-tab and choose *Anonymize* or click the *Anonymize* icon at the top of the pane.

The Anonymize Study dialog appears with default anonymization information which will be applied to the study unless you specify otherwise.
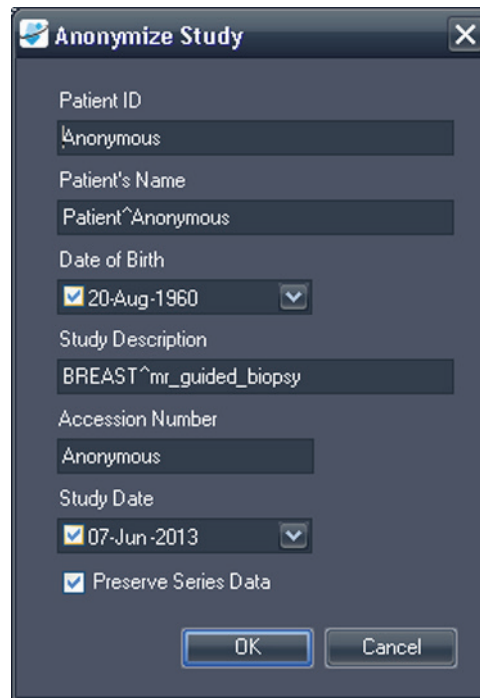
Figure 37: Anonymize Study Dialog

2. Enter the information you want to use for this study. Select the *Preserve Series Data* option if you want to preserve the series level data, as per DICOM 3.0 standard.

   NOTE: If MultiView is configured to automatically detect prior studies, you must consistently anonymize the Patient Id to be able to access prior studies for the patient.

3. Click *OK*.

   A progress window displays the anonymization progress. An anonymized **copy** of the study is generated when the process is complete. The original study is not modified.

NOTE: If the study is very large, the anonymizing process may take a few minutes during which you will not be able to interact with MultiView.

Study Status

Studies may be in one of the following statuses:

- Unread – The study has been processed by MultiView but has not yet been read by a radiologist.

- Opened – The study is currently open and being reviewed.

- Read – The study has been read by a radiologist.

When you close a study in the workspace, MultiView asks if you want to change the study status to "Read". You can also change the study status to Read or Unread by right-clicking the study and selecting *Mark as Read* or *Mark as Unread* from the context menu.

Studies on a Remote DICOM Server

Although you will usually work with studies in the local database, it is also possible to perform the following functions on studies on a remote DICOM server:

- Open the study in the MultiView workspace (for more information, see Opening an Image or a Study on page 50)

- Retrieve the study so that it is added to the local database (for more information, see Retrieving a Study from a Remote DICOM Server on page 41)

- View information about the study (for more information, see Study Information on page 51)

- Mark the study as "Read" (for more information, see Study Status on page 52)

NOTE: When opening a remote study, if the series and instance counts match that of a local copy of the study already in My Studies, MultiView will treat the remote study as if it were already local.

Studies on the Enterprise Tab

The Enterprise tab displays a combined list of studies available in the local database and studies from other clients connected to Study List Manager, such as SecurView.

Figure 38: Studies on the Enterprise Tab

To open a study, select it in the list and click the *Open Study* icon in the studies toolbar. If the study is in the local database, it opens in the MultiView workspace. If the study is from a third-party application, and application synchronization is correctly configured, the study opens in that application.

Studies on the Workstation

To work with images on the workstation, on the network, or on an external storage device connected to the workstation (such as a flash drive):

1. Use the left and / or right pane(s) in the My Computer sub-tab to navigate to the target image or folder.

2. Right-click on the target image or folder.

3. Choose an option from the context menu.

Table 5:   Context Menu Options

Option	Action
Import	Imports the file or folder into the local database.
Open	Opens an image preview of the file.
Open in Study Filters	Displays DICOM header information for an image or series of images in a study.
Dump Files	Performs a DICOM dump of the contents of the particular DICOM file. All DICOM tags are displayed in the DICOM Editor pane. Tags may be added or deleted and you can use the *Quick anonymize* button to remove all patient sensitive information. Save your changes to make them permanent.

Chapter 5   About the MultiView Workspace

About the MultiView Workspace

The workspace is composed of viewports and panes. If multiple studies are open, they are represented by tabs at the top of the viewport area. For more information, see Managing Workspace Tabs on page 56. The Explorer tab is also available at the top of the viewport area to allow you to return to the study manager.

By default, the workspace opens with the following panes open and minimized:

- Layout

- Clipboard/Key Images

- Graph
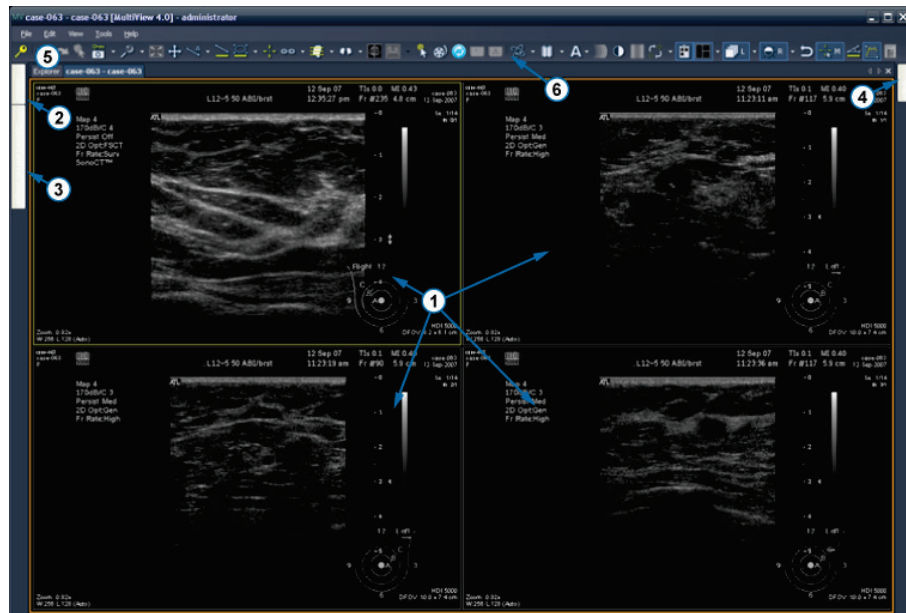
#	Description
1	Viewport tiles
2	Layout tab
3	Clipboard/Key Images tab
4	Graph tab
5	Explorer tab

6	Toolbar

Figure 39: MultiView Workspace

Managing Workspace Tabs

MultiView supports multiple tabbed viewing. If you open a new study it will appear as another tab in the workspace. You can switch between studies by clicking on the different tabs. To organize tabs, right-click on a tab and select an option from the context menu.
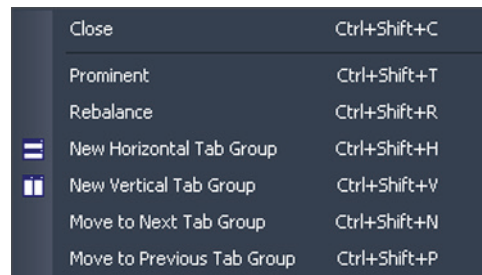
Figure 40: Tabs Context Menu

The tab context menu may have the following options:

- **Prominent:** Maximizes the tab to the full screen should the tab not be full screen already.

- **Rebalance:** Restores the maximized tab to its previous size.

- **New Horizontal Tab Group:** Moves the tab to its own new horizontal tab group.

- **New Vertical Tab Group:** Moves the tab to its own new vertical tab group.

- **Move to Next Tab Group:** Moves the tab to the next tab group if there is one present.

- **Move to Previous Tab Group:** Moves the tab to the previous tab group if there is one present.

Working with Panes

Many MultiView features appear in panes which appear when you are performing a particular task. Panes are visible when you are working with them, but "slide" out of the way when you click outside them and appear as tabs at the sides or the bottom of the workspace.

To view a pane, click its tab in the workspace.

To keep a pane visible when you aren't working it, click the pin icon in the top right corner of the pane. To hide a pane, click the pin icon again.

About the Study List

The Study List tab in the Layout pane displays the series in the open study.

If you have configured MultiView to automatically search for prior studies, any prior studies found are displayed in the Study List as well. Prior studies displayed with a bullet icon are located remotely on one of the default servers. If a prior study is displayed without a bullet icon it is already local.

To retrieve a study located remotely on a default server, double click the study name or select the study and click the Retrieve icon in the Study List toolbar (item 10 in the figure below). To retrieve a series in a study located remotely on a default server, click the Retrieve icon beside the series thumbnail (item 4 in the figure below).

For more information about configuring MultiView to search for prior studies, see Priors on page 32.

To view an image series in a viewport, double-click its thumbnail in the Layout pane or drag the thumbnail into the viewport.
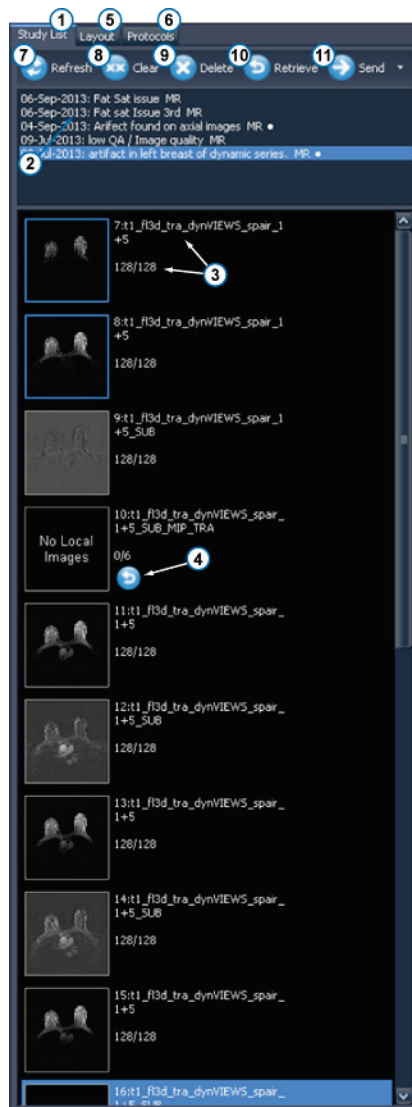
Figure 41: Study List Tab

#	Description
1	Study List tab.
2	Current and prior studies (bullet icon indicates that the study has not been retrieved from the server).
3	Series number, series name and the number of slices in the series. The blue highlight around the thumbnail indicates that the series is open in a viewport.
4	Series Retrieve icon. Click to retrieve the selected series from the remote server.
5	Layout tab. Displays the layouts that may be applied to the workspace. For more information, see Viewport Layouts on page 59.
6	Protocols tab. Shows any saved layout schemes (known as "hanging protocols"). For more information, see Hanging Protocols on page 69.
7	Refresh icon. Click to refresh the selected thumbnails in the layout.
8	Clear icon. Click to empty the viewports in the workspace.
9	Delete icon. Click to delete the selected series. For more information, see Deleting Series on page 59.
10	Retrieve icon. Click to retrieve the selected study from the remote server.
11	Send icon. Sends the selected series to a remote DICOM server. Click the drop-down arrow to select the server to send the series to.

Deleting Series

To delete a series, select it in the Study List and click the *Delete* icon. You will be prompted for confirmation before the series is actually deleted. Note that deleting a series will clear the current layout.

You cannot delete series located on remote servers – you can only delete series in the local database. Attempting to delete a series on a remote server will clear the layout, but will not delete the series from the remote server.

NOTE: Deleting a series may take several minutes during which time you will not be able to interact with MultiView.

Viewport Layouts

You can control the number and arrangement of viewports in the MultiView workspace from the Layout pane. To show the Layout pane press L on the keyboard or click the Layout tab on the left side of the workspace.
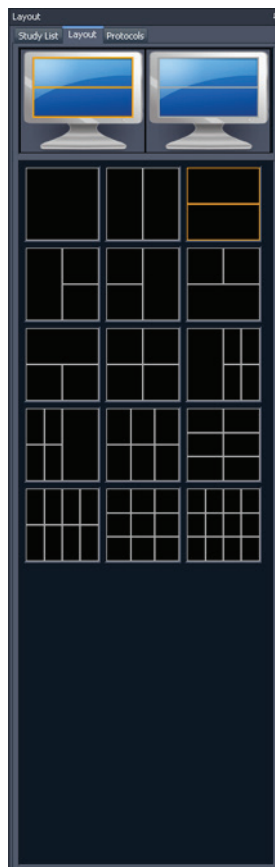
The Layout tab in the Layout pane displays the viewport layouts that can be applied to the workspace. Click a layout thumbnail to apply that layout.

If MultiView detects that you are using multiple monitors, both monitors are displayed in the Layout tab. You can apply a separate layout to each monitor.

Using multiple viewports may be particularly helpful when viewing and comparing multiple series of images. To add a series to a viewport, drag the series into the viewport from the Study List tab.

NOTE: In multi-monitor configurations, MultiView will automatically shift viewports between monitors to maximize the area of each viewport given the size and location of the main MultiView window. For example, if MultiView fills the first monitor but only half of the second, MultiView may shift some viewports to the first monitor to better balance the layout. If MultiView fills both monitors, no viewports will be shifted.

Figure 42:   Layout Tab

In a multi-viewport layout, the "active" viewport is highlighted in orange. Click in a viewport to make it the "active" one.

You can view the active viewport in the full screen by double-clicking in the viewport or by choosing *Tools > Standard > Full Screen*. Double click in the viewport or *Tools > Standard > Full Screen* again to return to the multi-pane layout.
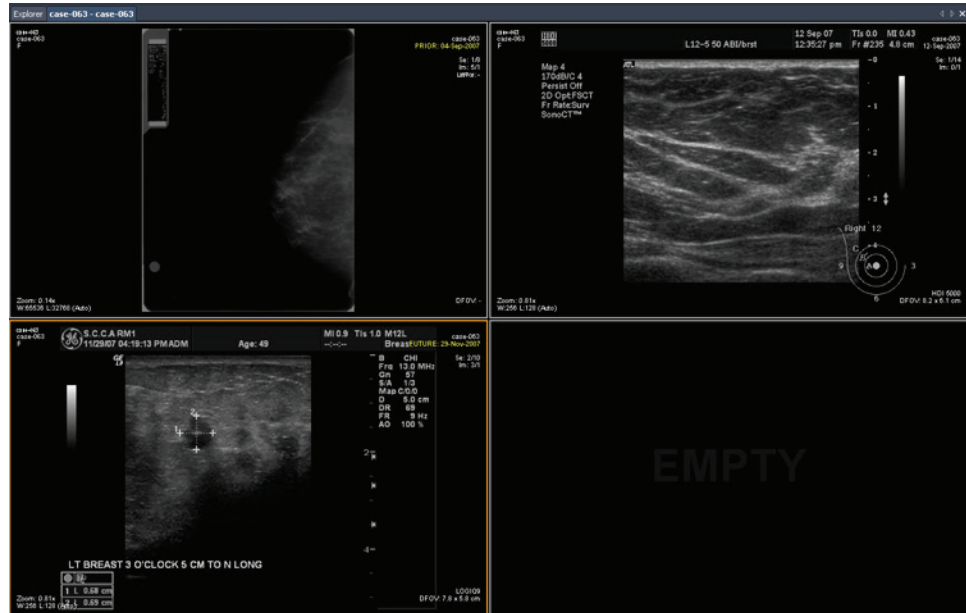
Figure 43: Multiple Series in Viewports

When you have a layout set up the way you like it, you can save it as a hanging protocol. For more information, see Hanging Protocols on page 69.

About the Viewport Overlays

The viewport overlay displays information about the patient and series, and provides controls for quickly shifting between views and rendering modes. To show or hide elements of the viewport overlay choose *Tools > Standard* then the element you want to show or hide: *Text Overlay*, *Graphics Overlay*, or *DICOM Overlay(s)*. Some features also add additional controls to the viewport overlay.
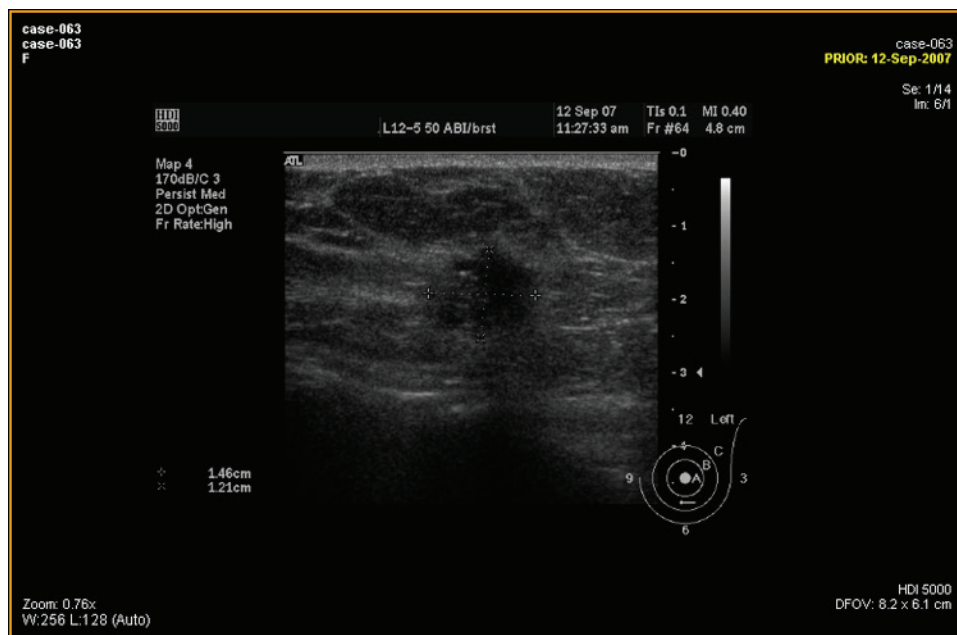
Figure 44: Viewport with Text Overlay Showing

Text Overlay

The viewport text overlay displays information about the patient and the procedure. The elements that appear in the overlay depend on the series modality and, for MG studies, your toolbar profile (configured in *Tools > Options > Toolbar*). The tables below describe the text overlay elements for US, MG, and MR studies.

Table 6: **Viewport Overlay Text in Viewport Quadrants - US and MG Series**

	Left	Right
Top	▪ Patient ID ▪ Patient name ▪ Patient sex ▪ Patient age	▪ Series description ▪ Accession number ▪ Study date ▪ Series acquisition time ▪ Slice number / series slice count ▪ Instance number / instance count ▪ Laterality / view position*
Bottom	▪ Zoom ▪ Window/level settings	▪ Manufacturer's model name ▪ Defined field of view

* Laterality / view position is only displayed for MG series.

Table 7: **Viewport Overlay Text in Viewport Quadrants - MR Series - Full and Advanced Toolbar Profiles**

	Left	Right
Top	▪ Patient ID ▪ Patient name ▪ Patient date of birth ▪ Patient age	▪ Series description ▪ Study date ▪ Slice number / series slice count ▪ Series acquisition time ▪ Slice DICOM coordinates ▪ Series number / series count ▪ Volume number / volume count
Bottom	▪ Defined field of view ▪ Image resolution ▪ Slice thickness ▪ Echo train length ▪ Scanner repetition time ▪ Scanner echo time ▪ Window/level settings	▪ Scanner magnetic field strength ▪ Scanner model ▪ Receive coil name The graphics overlay also appears in this quadrant (see below).

Table 8:   Viewport Overlay Text in Viewport Quadrants - MR Series - Simple Toolbar Profile

	Left	Right
Top	- Patient ID - Patient name - Patient date of birth - Patient age	- Series description - Study date - Slice number / series slice count - Series acquisition time - Slice DICOM coordinates - Volume number / volume count
Bottom	- Defined field of view - Image resolution - Slice thickness	- Scanner magnetic field strength - Scanner model The graphics overlay also appears in this quadrant (see below).

Graphics Overlay

The graphics overlay in the bottom right corner of the viewport includes controls for quickly toggling between views and rendering modes. Click a control to change the view or rendering mode. The active control is highlighted in the overlay.
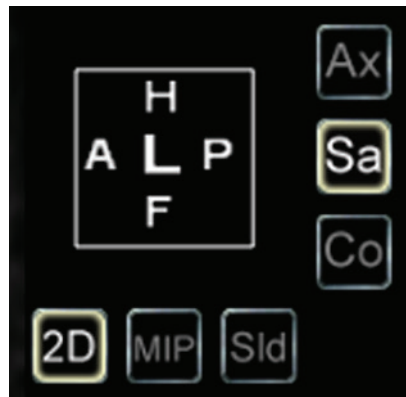

Figure 45: Highlighted Viewport Controls

Table 9:   View Controls

Control	Description
Ax	Switches the viewport to axial view.
Sa	Switches the viewport to sagittal view.

Control	Description
Co	Switches the viewport to coronal view.
Pt	Switches the viewport to interventional view. (This control only appears when you are using a plug-in that supports lesion targeting.)

Table 10: Rendering Mode Controls

Control	Description
2D	Switches the viewport to the Slices rendering mode.
MIP	On first click, switches the viewport to full MIP mode. On second click Thin MIP mode is activated. A slider control appears allowing you to control the width of the MIP. The width (in mm) is shown in real time on the screen's upper-right quadrant. For more information on rendering modes, see Views and Rendering Modes on page 65.
Sld	On first click, switches the viewport to full Solid Volume rendering mode. On second click, Thin Solid Volume mode is activated. A slider control is displayed allowing you to control the width of the thin solid volume. The width (in mm) is shown in real time on the screen's upper-right quadrant. For more information on rendering modes, see Views and Rendering Modes on page 65.

Using the Orientation Cube

The orientation cube is part of the viewport graphics overlay. It rotates in three dimensions to show the orientation of the current slice, MIP or Surface Volume being displayed. The table below describes the nomenclature associated with the faces of the orientation cube.

Figure 46: Orientation Cube (showing oblique view orientation)

Table 11: Orientation Cube Nomenclature

Letter	Description
A	Anterior
P	Posterior
F	Foot

Letter	Description
H	Head
L	Left
R	Right

NOTE: The A / P / F / H / L / R nomenclature is also used in the centers of the four sides of the viewport to indicate orientation.

DICOM Overlays

This option is not functional in MultiView 4.1.

Using Window/Level Presets

Window and level presets are pre-defined values for the viewport brightness and contrast assigned to keyboard keys. If you have created one or more window and level presets, press the assigned key to configure the viewport to those settings. For more information about creating window and level presets, see the Window/Level options on page 37.

Your window and level presets are also available from the context menu. To apply a preset using the context menu, right-click in the viewport and choose *Window/Level Presets* then your desired preset.

Press F2 to return the window and level to their default values.

Views and Rendering Modes

MultiView Views

MultiView has three standard views for MR images: axial, sagittal, and coronal. To quickly switch between these views, click the view controls in the viewport overlay, or right-click in the viewport and choose an option from the *Orientation* sub-menu in the context menu.
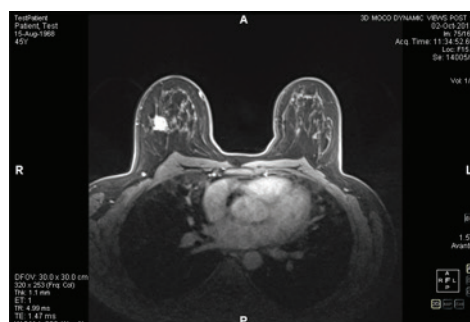
Figure 47:   Axial View
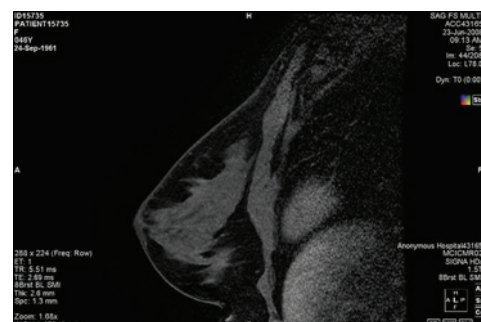
Figure 48:   Sagittal View
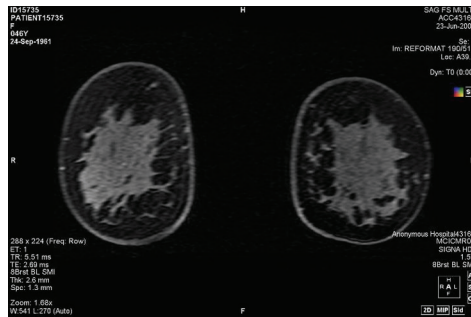
Figure 49:   Coronal View

MultiView Rendering Modes

MultiView can display (or render) images in five modes: 2D Slices, MIP, Thin MIP, Solid Volume, and Thin Solid Volume. By default, images open in the 2D Slices mode, which displays each image as a 2-dimensional slice in a stack. The other rendering modes are 3-dimensional depictions of the data.

To switch to a different mode, click the corresponding control in the viewport overlay, or right-click in the viewport and choose an option from the *Rendering Mode* sub-menu in the context menu.

Rotations may be applied in any of the 3D rendering modes. The orientation cube at the bottom right of the screen adjusts with each transformation to show the exact status of the rotation. To return to the viewport's initial view, click the [2D] viewport control or right-click in the viewport and choose *Rendering Mode > Slices* from the context menu.

MIP Mode

A MIP (Maximum Intensity Projection) displays the visualization plane where voxels that fall in the way of parallel rays traced from the viewpoint to the plane of projection are enhanced.

Figure 50: Image Rendered in MIP Mode

Thin MIP Mode

Thin MIP mode presents a small section of the MIP. This may be useful for viewing a specific area around a lesion. To adjust the thickness of the volume, drag the on-screen slider. An annotation in the top right-hand corner of the screen, displays the current thickness.
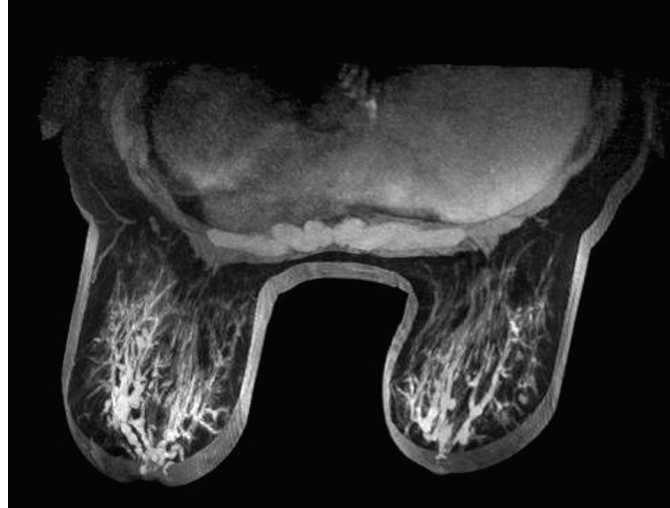
Figure 51: Image Rendered in Thin MIP Mode

Solid Volume Mode

Solid Volume mode is a 3D rendering mode resulting from the combination of all image slices within a series.
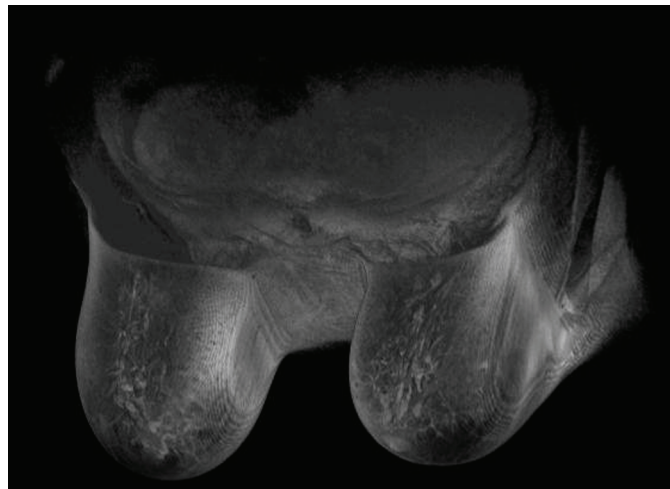
Figure 52: Image Rendered in Solid Volume Mode

Thin Solid Volume Mode

Thin Solid Volume mode displays a small section of the Solid Volume View. To adjust the thickness of the volume, drag the on-screen slider. An annotation in the top right-hand corner of the screen, displays the current thickness.
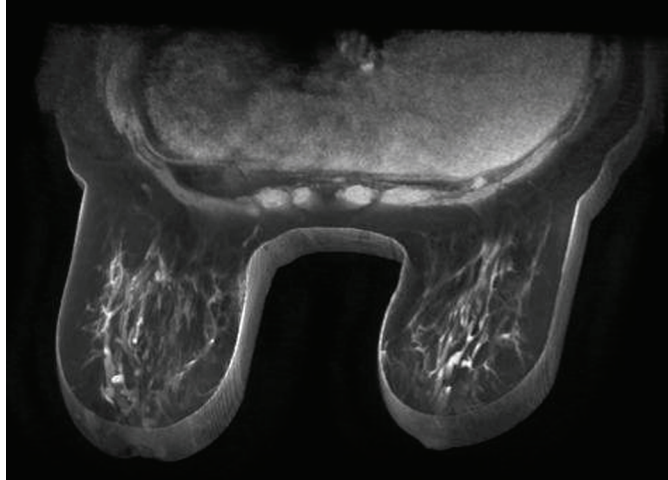
Figure 53: Image Rendered in Thin Solid Volume Mode

Subtraction

Subtraction applies to multiphase image series. It subtracts the volume at each time point from the initial mask or time point. For example, subtract a non-contrast series from a contrast series then use MIP mode to visualize the anatomy on the subtracted MIP image.
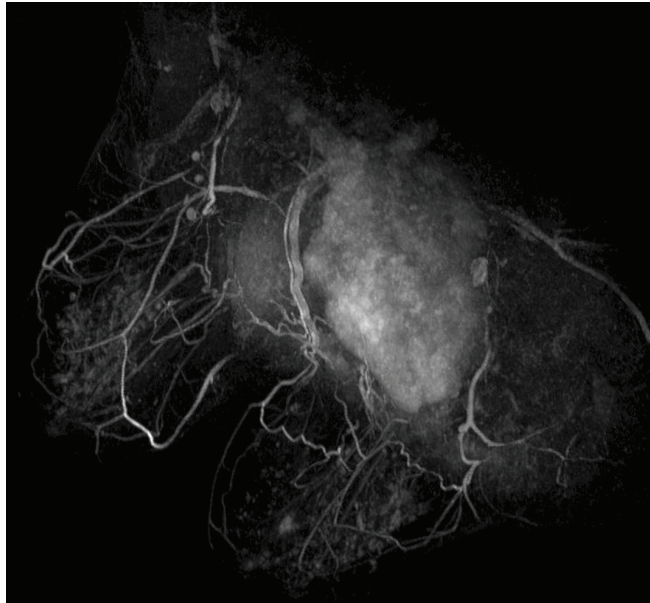
Figure 54: Visualization on a Subtracted MIP Image

To enable subtraction, right-click in the viewport and choose *Rendering Options*

> *Enable Subtraction*, or click the subtraction control [image] in the viewport overlay.

When subtraction is enabled, the word "SUB" appears under the volume annotation.

Figure 55: Subtraction Enabled Annotation

NOTE: If you are viewing the first volume when you enable subtraction, MultiView automatically switches to the second volume in the study as volume one subtracted from itself would be a blank screen.

Hanging Protocols

In MultiView, a *hanging protocol* is a saved profile of your preferred layout arrangement and settings. When you open a study, MultiView automatically applies a hanging profile based on the study parameters, if an appropriate hanging profile exists. You can manually apply a different hanging profile if you wish.

You can save the following information in a hanging protocol:

- Viewport layout configuration (number of rows and columns displayed) and the series opened in each viewport

- The rendering mode of each viewport (Slice, MIP, Thin MIP, Solid Volume, or Thin Solid Volume)

- Image manipulations such as image rotation, and image flipping

- The radial stack axis (for use with MIP rotations)

- Image orientation / transformation (for example, reformatting in Sagittal, Axial, or Coronal orientation)

- Subtraction

- Time index

- Window level

Hanging protocols appear on the Protocols tab in the Layout pane.

Figure 56: Protocols Tab in Layout Pane

MultiView Default Hanging Protocols

MultiView includes default hanging protocols for magnetic resonance (MR) and ultrasound (US) studies.

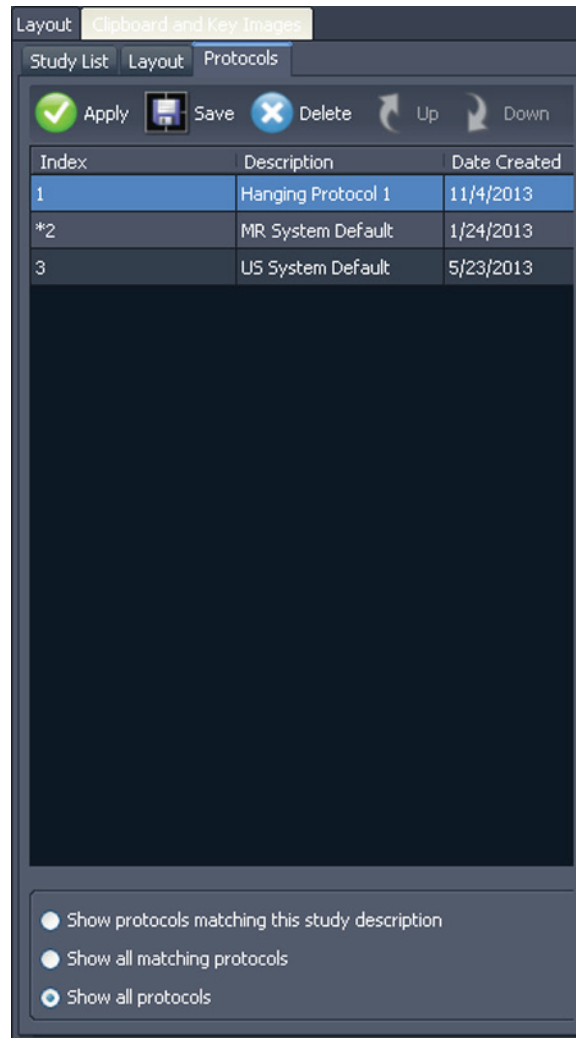The MR System Default hanging protocol is consistent with common diagnostic MR imaging practice but will not be applicable to all studies. Create custom hanging protocols as necessary based on the study conventions used at your site.

NOTE: The MR System Default hanging protocol is not initially applied automatically. You must apply it manually as described in Applying a Hanging Protocol on page 73.
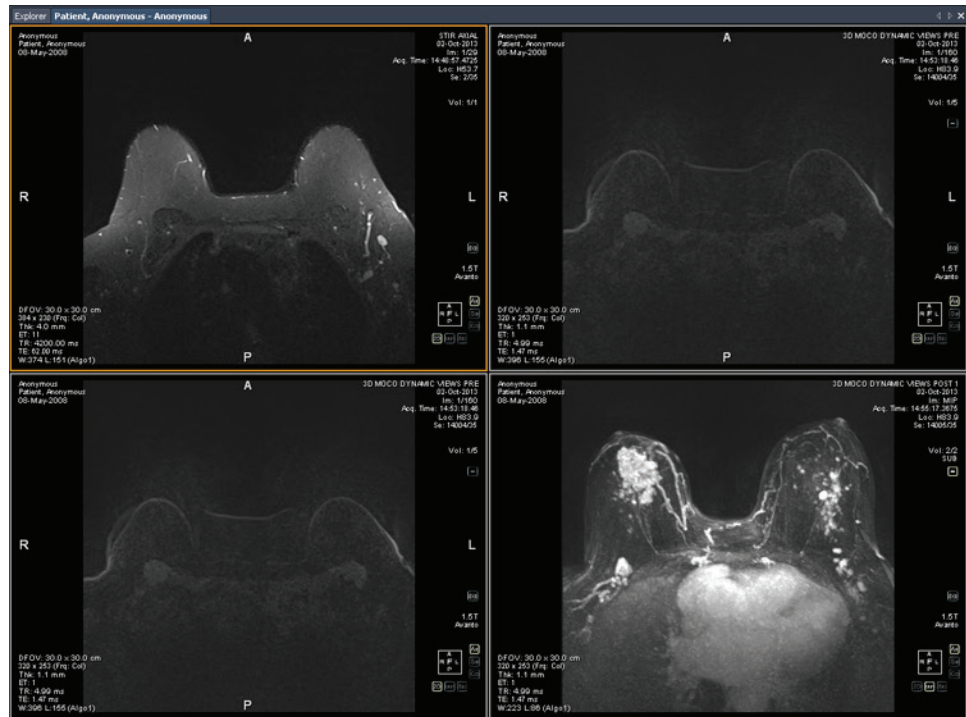

Figure 57: MR System Default Hanging Protocol Applied to an MR Study

NOTE: The MR System Default hanging protocol displays images from GE scanners with the chest wall at the top of the viewport. To view images from GE scanners with the chest wall at the bottom of the viewport, rotate the image in the viewport and save the layout as a custom hanging protocol.

US Default Hanging Protocols

The three US system default hanging protocols are US 4-on-1, US 1-on-1, and US Current-Prior. The US 4-on-1 hanging protocol displays 2-by-2 mosaic tiling that contains images in sequential order from upper left, to upper right, to lower left and lower right. The US 1-on-1 hanging protocol displays the chosen study images in full screen format. The US Current-Prior hanging protocol presents two viewports displayed side-by-side with the current study on the left and its closest prior study on the right. If there is no prior study, the right-hand viewport is empty with "NO MATCHES (1st PRIOR) EXPECTED SERIES:" displayed in the background. For studies with a prior available, the viewport contains a PRIOR label in yellow text in the upper right-hand corner of the DICOM overlay.

Use the mouse wheel to move through the US images one at a time. For the US 4-on-1 hanging protocol, for example, if the four tiles contain images 1, 2, 3, and 4, when you scroll the next set of images displayed is 2, 3, 4, and 5. Use the **Page**

Up and **Page Down** keys on the keyboard to move through US images four at a time, that is, if the four tiles contain images 1, 2, 3, and 4, when you press the **Page Up** key the next set of images displayed is 5, 6, 7, and 8.

The hanging protocol that is automatically applied when you launch a US study is a single viewport. If you have selected the **Enable Tiling for US Images** option on the **Tools > Options > Hanging Protocols** page, the viewport contains four image tiles. This hanging protocol is applied until you manually select one of the three US system default hanging protocols, or you create and apply a custom hanging protocol for US studies.

Creating a Hanging Protocol

To create a hanging protocol:

1. Select the **Layout** pane.

2. Click the **Layout** tab and click on a layout thumbnail from the list of viewport layouts that can be applied to the workspace.

3. Click the **Study List** tab and select the desired series. Hold down the left mouse key and drag and drop the series into the viewport. Use the **Ctrl** key to select multiple series for one viewport.

4. Click the **Protocols** tab and click **Save**.

    The Store Hanging Protocol dialog appears.

Figure 58: Store Hanging Protocol Dialog

5. Specify the options you want to use with this hanging protocol and click **Save**.

    Table 12: Store Hanging Protocol Options

Option	Description
Name	Enter a name for this hanging protocol.

Option	Description
Create new hanging protocol	If a hanging protocol is currently loaded, select this option to save your current layout as a new hanging protocol. If a hanging protocol is not currently loaded, this is the only available option.
Replace current hanging protocol	If a hanging protocol is currently loaded, select this option to replace it with your current layout.
Shared hanging protocol	Select this option if you want this hanging protocol to be available to other MultiView users.
Store window and level values	Select this option to store the current window and level values as part of the hanging protocol.
Store tool states	Select this option to store the tools you have assigned to the left and right mouse buttons as part of the hanging protocol.

The new hanging protocol appears in the Layout pane under the Protocols tab.

Applying a Hanging Protocol

When you open a study, the first hanging protocol listed under "Show protocols matching this study description" is automatically loaded. MultiView determines the hanging protocol to apply based on study parameters such as the study and series descriptions. This is meant to streamline the workflow so when you open similar studies with the same scanning protocols, your preferred view and rendering setup is automatically in place.

To apply a different hanging protocol, select the protocol in the Protocols tab on the Layout pane and click *Apply*. The currently applied hanging protocol is marked with an asterisk (*) in the list.

The Protocols tab pre-filters the list of available hanging protocols to show only hanging protocols that match the study description. Select *Show all matching protocols* to see all protocols that have at least one series with an exact matching series description to a series in the current study. Select *Show all protocols* to see every hanging protocol created, including ones that are not relevant to the open study.
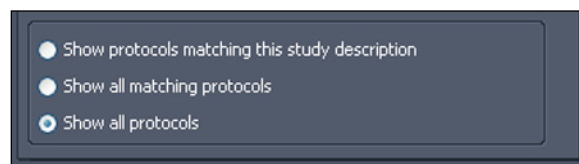

Figure 59: Protocol Filtering Options

You can also quickly apply another hanging protocol by using the + or - keys on the keyboard to apply the next (+) or previous (-) matching hanging protocol.

The previous and next hanging protocols are based on the index number assigned to the hanging protocol when you created it. You can change the index number of a hanging protocol by selecting it in the Protocols tab and clicking the Up or Down icons to move it up or down in the list.

If MultiView is unable to find a series in the current study with a description matching the saved value for the hanging protocol, the viewport displays "NO MATCHES EXPECTED SERIES:" and the description of the expected series.
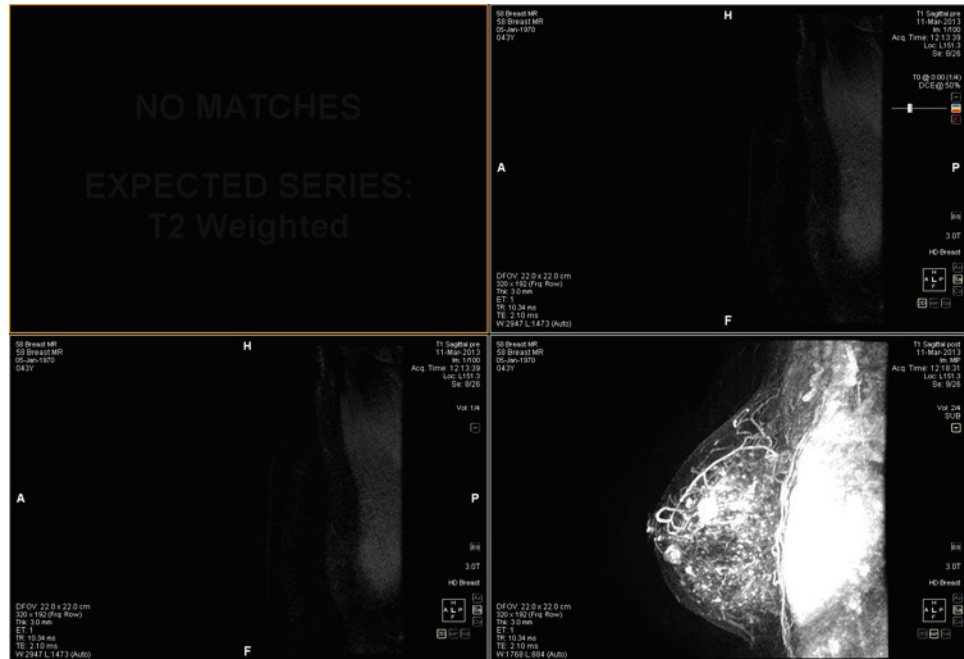

Figure 60: Missing Series in a Hanging Protocol

Similarly, if MultiView is unable to locate an expected series in a prior study, the viewport displays "NO MATCHES" and the description of the expected prior series.

NOTE: The Study List tab in the Layout pane lists the prior studies available for this patient ID. Prior studies displayed with a bullet icon are located remotely on one of the default servers. Double-click a study in the Study List tab to retrieve it.

Deleting a Hanging Protocol

To delete a hanging protocol, select it on the Protocols tab in the Layout pane and click *Delete*. If this hanging protocol is shared by other users, a confirmation dialog appears. Click *Yes* in the dialog to delete the hanging protocol.

If the hanging protocol you want to delete is not visible, select the *Show all protocols* option to show all saved hanging protocols.

Synchronizing with a Third-Party Application

When MultiView is configured to synchronize with a third-party application such as SecurView, you can quickly open a corresponding study for the patient you are viewing in the workspace by clicking the *Synchronize patient with external application* button in the toolbar .

NOTE: Use this option when MultiView has been configured to require manual synchronization. For more information, see the Application Synchronization options on page 24.

Exporting a Study as DICOM Files

You can export the study currently loaded in MultiView as a set of DICOM files.

To export a study as DICOM files:

1. Load the study in the viewport.

2. Choose *Tools > Utilities > Locate on Disk*. A Windows Explorer window appears displaying the DICOM files in the study.

3. Select the files and copy them to a folder on the workstation.

Closing an Image or Study

To close an image or study, click the *Close* button in the top right corner of the viewport. If MultiView has been configured to synchronize with a third-party application such as SecurView, the corresponding study also closes in that application.

When you close a study, a dialog appears asking whether you want to mark the study as Read. If you click *Yes*, the study's status is changed to Read. If you click *No*, the study's status remains Unread.
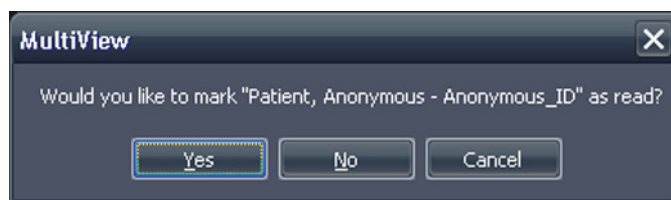

Figure 61: Change Study Status Dialog

You can also mark a study as Read in the My Studies list by selecting the study and clicking the *Mark as Read* button. To return a study to the Unread status, select the study in the My Studies list and click the *Mark as Unread* icon.

NOTE: Marking a study as Read in MultiView does not affect the study status in the third-party application.

Chapter 6   Standard Image Tools

Using MultiView Tools

All MultiView tools are available from the Tools menu. The tools that appear in the toolbar depend on the toolbar profile specified in the Toolbar options. You can also configure the tool icon size and whether MultiView wraps tools in the toolbar. For more information, see the Toolbar options on page 36.
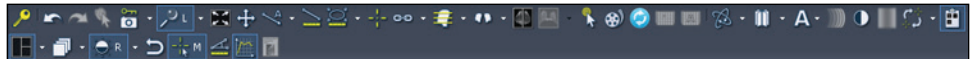

Figure 62: MultiView Toolbar Showing the Full Toolbar Button Profile

By default, the Stack tool and Window/Level tool are assigned to the left and right mouse buttons respectively, but many tools can be temporarily assigned to a mouse button. To assign a tool to a mouse button, select that tool from the Tools menu with that mouse button. Clicking in the image with that mouse button will now perform the functionality associated with the tool. The toolbar icon for the tool indicates which mouse button it has been assigned to.

Figure 63: Tools Assigned to the Left (L) and Right (R) Mouse Buttons

The measurement and annotation tools can be configured to automatically revert back to the default mouse button assignments after you complete the action associated with the tool (*Tools > Options > Annotation Tools*). For example, if you assign the Ruler tool to the left mouse button, the left mouse button reverts to the Stack tool when you complete the measurement. Other tools, such as the Pan tool, remain assigned to the mouse button until you deselect the tool in the Tools menu or assign another tool to that mouse button.

Some tools are organized into tool groups when they appear in the toolbar. A tool group has a dropdown arrow beside the tool icon. Click the arrow to access the tools in the tool group.
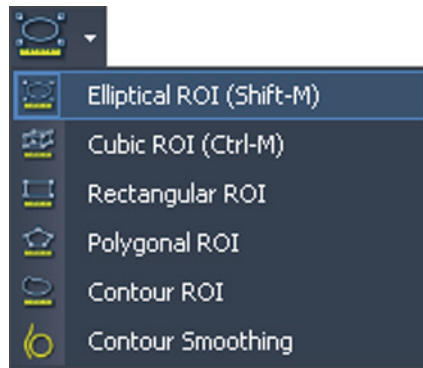
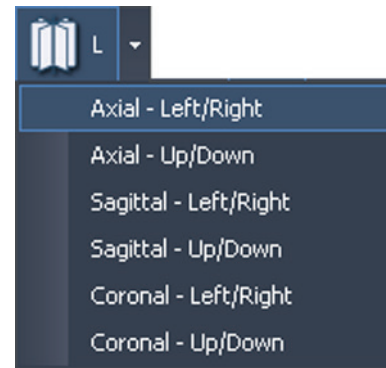**Figure 64:   Region of Interest (ROI) Tool Group**

Figure 65:   Radial Stacking Tool Options

A dropdown arrow also appears beside tools that have options associated with them. Click the arrow to select an option to use with the tool.

You can also access many tools from the Tools sub-menu in the viewport context menu (right-click in the viewport and choose *Tools*). Note that the tools are assigned to a specific mouse button and clicking them in the sub-menu with a different mouse button will change the assignment.

Image Tools

To access the standard image tools choose *Tools > Standard* then the tool you want to access. Some of the standard image tools may also appear in the toolbar depending on your toolbar configuration settings.

Table 13: Image Tools

Icon	Name	Description
	Cine	Use the Cine tool to animate stacking through slices. For more information, see Using the Cine Tool on page 81.
	Stack	Use the Stack tool to view the next or previous slice in the stack. ▪ Drag the mouse down to increase the slice index ▪ Drag the mouse up to decrease the slice index ▪ Drag the mouse left or right to stack through volumes The slice index is displayed in the top-right quadrant of the viewport. *NOTE: The stack function is also associated with the mouse scroll wheel.*

Icon	Name	Description
	Window/Level	The Window/Level tool adjusts the contrast and brightness of the images. The window and level of each view is controlled independently by moving the mouse in a pane with the associated mouse button held down. ▪ Drag the mouse left or right to adjust the window (contrast) value. ▪ Drag the mouse up or down to adjust the level (brightness) value. In the toolbar, click the drop-down arrow for this tool to select a window/level preset. For more information, see Using Window/Level Presets on page 65. The window and level values are displayed in the bottom left quadrant of the viewport pane.
	Pan	Use the Pan tool to move the image in any direction on the screen.
	Zoom	Use the Zoom tool to zoom in or out on the image. ▪ Drag the mouse down to zoom in. ▪ Drag the mouse up to zoom out.
	Radial Stacking	Use the Radial Stacking tool to stack around an axis. To define the stacking axis: 1. Select the Radial Stacking tool. 2. Click in the image to define the first point of the axis. 3. Click at the location of the second point of the axis. If you define an axis at an angle, MultiView adjusts the view so that axis becomes either a vertical or horizontal line, whichever is closest to the angle of the axis you defined. *NOTE: You can use the orientation cube in the lower-right corner of the viewport as a reference to the current position of the image.* When this tool appears in the toolbar, click the drop-down arrow beside this icon to select one of the pre-defined axes to stack around. Select the Stack tool and drag the mouse up or down (or scroll) to stack 360º around this axis.

Icon	Name	Description
	Rotate	Use the Rotate tool to rotate a MIP or Solid Volume in any direction.
		When this tool appears in the toolbar, click the arrow beside this icon and select *Discrete Rotation* to rotate the image in the up-down or left-right directions individually.
		▪ Hold down the left mouse button and drag up or down to rotate the image in increments of 10 degrees up or down.
		▪ Hold down the left mouse button and drag left or right to rotate the image in increments of 10 degrees left or right.
		NOTE: In the MIP or Solid rendering modes, scrolling with the mouse wheel rotates the image in the left-right direction, and dragging the mouse up or down while holding down the left mouse button rotates the image in the up-down direction. Note that this behavior does not apply to the Thin MIP or Thin Solid rendering modes.
	Invert	Use the Invert tool to invert the colors in the current image set.
	Show/Hide Text Overlay	Shows or hides the series and scanner information in the viewport.
		When this tool appears in the toolbar, click the arrow beside the icon to show or hide only parts of the overlay. For more information, see About the Viewport Overlays on page 61.
	Show/Hide Graphics Overlay	Shows or hides the orientation cube and related graphics in the viewport.
	Show/Hide DICOM Overlay	This tool is not used in MultiView.
	Add Text	Use the Add Text tool to add text to the image. For more information see Text Annotations on page 82.
	Add Text Callout	Use the Add Text Callout tool to add an arrow with text to the image. For more information see Text Annotations on page 82.
		When this tool appears in the toolbar, click the drop-down arrow to select the Add Text tool.

Icon	Name	Description
	Flip Horizontal	Flips the image side to side. When this tool appears in the toolbar, click the drop-down arrow to access the following tools (described below): ▪ Flip Vertical ▪ Rotate Right ▪ Rotate Left
	Flip Vertical	Flips the image top to bottom.
	Rotate Right	Rotates the image 90º to the right (clockwise).
	Rotate Left	Rotates the image 90º to the left (counter-clockwise).
	Reset	Resets the image to its original settings and orientation. (Tip: You can also press the Backspace key on the keyboard to reset the image.)

Using the Cine Tool

When you click the Cine tool, a dialog appears with options to animate forward or in reverse and set the animation speed.
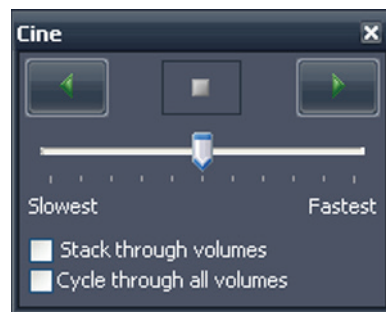

Figure 66: Cine Dialog

If you have more than one series open in the viewport, you can animate stacking through the slices in all open volumes.

Option	Description
Stack through volumes	Select this option to stack through the same slice in each volume; for example, volume 1 slice 5, volume 2 slice 5, etc.

Option	Description
Cycle through all slices	This option becomes available when you select the Stack through volumes option. Select this option to stack through all slices in all volumes; for example, volume 1 slice 5, volume 2 slice 5, volume 1 slice 6, volume 2 slice 6, etc.
Cycle through all volumes	Select this option to stack through all the slices in the first volume, then all the slices in the second volume etc.

Text Annotations

Use the text annotation tools to add comments to an image.

Text Area

To add text to an image:

1. Choose *Tools > Standard > Add Text* and click in the viewport.

2. Type your text and press Enter.

3. If necessary, click and drag the text to an appropriate location on the image.

To change the text, right-click on it and choose *Edit*.

Text Callout

The Text Callout tool draws an arrow on the image with a text caption.

To create a text callout:

1. Choose *Tools > Standard > Add Text Callout*.

2. Click on the image where you want the arrow point to appear, then move the crosshairs to where you want the arrow to end and click again.

3. Type the text you want to associate with the arrow and press Enter.

To change the text caption, right-click on it and choose *Edit*.

Chapter 7 Tools and Methods for Linking Viewports

The MultiView linking tools link two or more viewports together. Use them to facilitate comparing, contrasting, and navigating MR images. Note that the default behavior of linked image stacking can be set to on or off for images that are in the same frame of reference.

About the Linking Tools

To access the tools for linking Viewports choose *Tools > Linking* then select the tool you want to use. Some of the linking tools may also appear in the toolbar depending on your toolbar configuration settings.
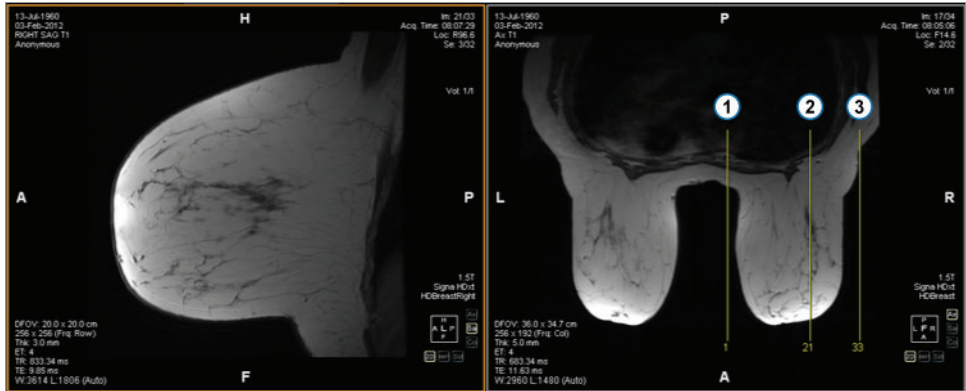
Table 14: Linking Tools

Icon	Name	Description
	Spatial Locator	Adds persistent crosshairs to all viewports to assist in cross-referencing images. For more information, see Linking Using the Spatial Locator Tool on page 87. You can also use the Spatial Locator tool to create and interact with markers in the image. For more information, see Working with Markers on page 86.
	Spatial Projection	Adds temporary crosshairs to all viewports to assist in cross-referencing images. For more information, see Linking Using the Spatial Projection Tool on page 88.
	Link Stacking	Links stacking in two or more viewports. When this tool appears on the toolbar, you can click the drop-down arrow to select whether to synchronize transforms (that is, zooming, panning, etc.) and/or volumes as well. For more information, see Using the Linked Stacking Tool on page 85.
	Unlink Studies	Unlinks viewports that contain series from different studies that have been synchronized for tandem stacking. For more information, see Using the Linked Stacking Tool on page 85.
	Link Studies	Links viewports that contain series from different studies for tandem stacking. For more information, see Using the Linked Stacking Tool on page 85.

Icon	Name	Description
	Reference Lines	Adds references lines to a non-active viewport (or viewports). Click the drop-down arrow to select whether to show or hide the first and last reference lines. For more information see Linking Using the Reference Lines Tool on page 84.

Linking Using the Reference Lines Tool

Use the Reference Lines tool to add yellow reference lines to the *non-active* viewports. Three reference lines are drawn on the non-active viewports, one for each of the first and last images in the active viewport, and one for the current image in the active viewport. The numbers below or beside the reference lines indicate the image number of active viewport. When you stack through the images in the active viewport, the line corresponding to the current image in the active viewport moves in tandem across the image in the other viewports showing the currently viewed pane as a reference.

NOTE: This functionality is available only when the images in the panes are in different orientations, for example sagittal and axial as shown below.

#	Description
1	Reference line corresponding to the first image in the series in the active viewport
2	Reference line corresponding to the image currently displayed in the active viewport
3	Reference line corresponding to the last image in the series in the active viewport

Figure 67: Reference Lines in Left Pane

To show or hide the reference lines for the first and last images in the active viewport, click the arrow beside the Reference Lines tool in the toolbar and click the *Show First and Last Reference Lines* option.

To hide all reference lines, deselect the Reference Lines tool.

Using the Linked Stacking Tool

Use the Linked Stacking tool to link multiple viewports together based on DICOM coordinates. Synchronized stacking is applied to all viewports that contain series in the same view (axial, sagittal or coronal). By default, linked viewports stack, pan, zoom, rotate and flip together.

To synchronize only stacking, click the drop-down arrow beside the Linked Stacking tool in the toolbar and deselect the *Link Transforms* option. When this option is not selected, viewports pan, zoom, rotate and flip independently of each other.

To synchronize stacking through multiple volumes, click the drop-down arrow beside the Linked Stacking tool in the toolbar and select the *Link Volume Index* option. Note that only viewports that contain the same number of volumes will be synchronized.

You can manually engage synchronized stacking on two different studies from different study dates (for example, a current scan and a prior image set having a different frame of reference) as long as both series are in the same orientation in their viewports. When you enable synchronized stacking in this case, MultiView synchronizes the studies based on DICOM coordinates.

The Unlink Studies tool applies to images in different studies where the anatomy has different start and end locations, such as priors. To manually synchronize a study and its prior, choose *Tools > Linking > Unlink Studies*, stack through one series until you reach the desired position, then choose *Tools > Linking > Link Studies* to re-link them.
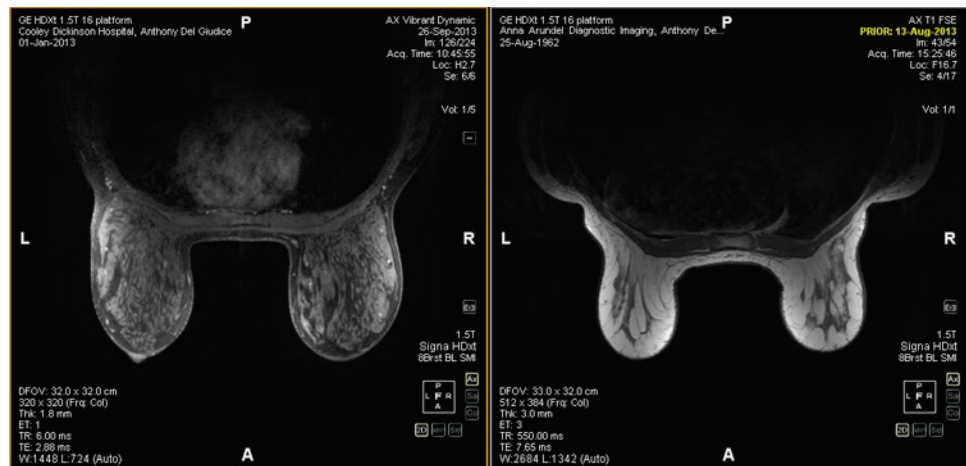

Figure 68: Two Images of the Same Orientation and a Different Frame of Reference are Synchronized

NOTE: The Spatial Locator tool does not apply across images taken in different frames of reference. So it will not apply, for example, to an image linked with its prior.

Working with Markers

MultiView represents points of interest, such as lesions, on an image with markers. Use the Spatial Locator tool to work with markers as described below.

Locating a Marker

In the 2D rendering mode, markers appear on the image slice they were created on. If you stack away from that slice, the marker annotation disappears.

To quickly locate a marker that is not visible:

1. Select the Spatial Locator tool from the toolbar.

2. Right click on the Spatial Locator crosshairs and select *Go to Marker > Go to* <marker name> (where <marker name> is the name of the marker you want to locate).

MultiView switches to the slice where the marker is located.

Moving a Marker

To move a marker:

1. Move the Spatial Locator crosshairs to the location where you want to move the marker.

2. Right-click the crosshairs and select *Move Marker Here > Move* <marker name> (where <marker name> is the name of the marker you want to move).

Measuring the Distance to a Marker

You can use the Spatial Locator tool to measure the distance between any point in an image and a marker.

To measure a distance to a marker:

1. Move the Spatial Locator crosshairs to the location you want to measure from.

2. Right-click the crosshairs and select *Distance to Target* then the name of the marker you want to measure to. The Distance to Target dialog appears.
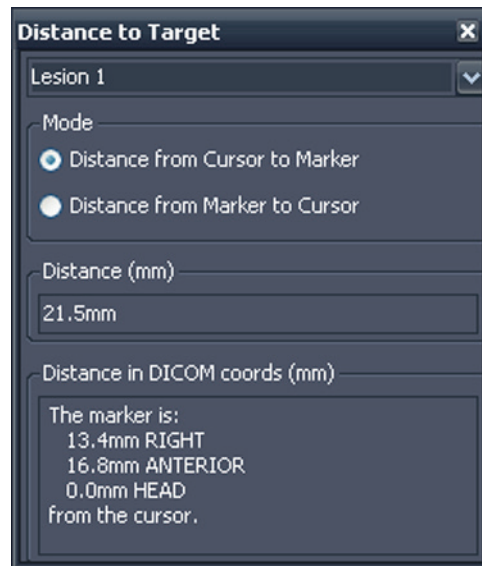
The Distance in DICOM coords (mm) section shows where the marker and cursor (that is, the Spatial Locator crosshairs) are relative to each other.

*   Select the *Distance from Cursor to Marker* option to see where the marker is relative to the cursor.

*   Select the *Distance from Marker to Cursor* option to see where the cursor is relative to the marker.

Linking Using the Spatial Locator Tool

Choose *Tools > Linking > Spatial Locator* to add a spatial locator crosshairs tool to all viewports with the same frame of reference as the active viewport.

Moving the crosshairs in one viewport will cause a change in the displayed slices in the other viewports so that the slice intersects the crosshairs coordinate. This allows the same point to be visualized in multiple image sets and from multiple orientations. Location and image information will also update in the top right corner of the viewports in real time.
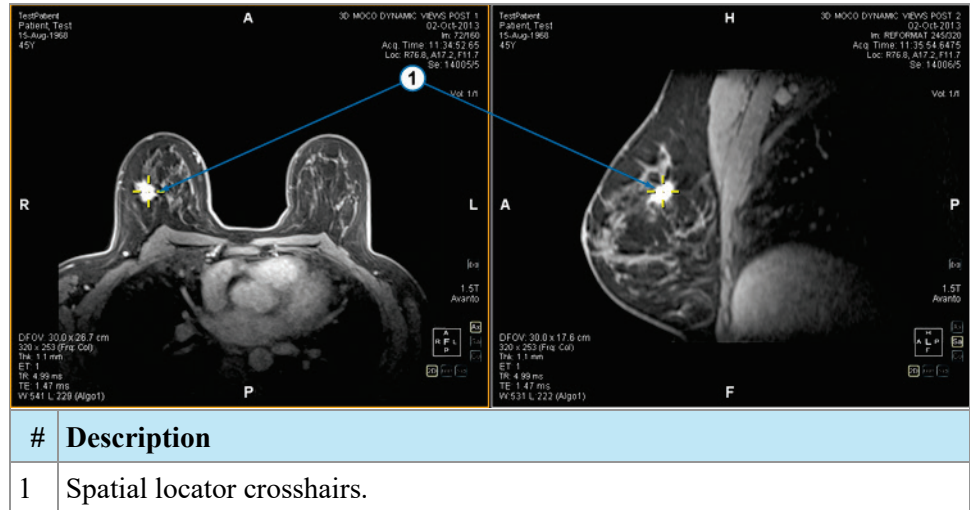
#	Description
1	Spatial locator crosshairs.

Figure 69: Viewports Showing Spatial Locator Crosshairs

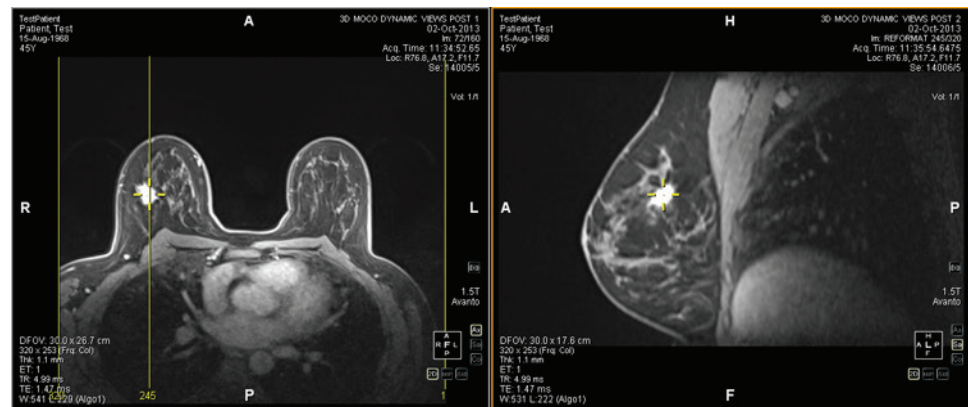You can also use the Spatial Locator tool and the Reference Lines tool together.

Figure 70: Spatial Locator and Reference Line Tools Used Together

Linking Using the Spatial Projection Tool

The Spatial Projection tool is similar to the Spatial Locator tool except that the crosshairs that appear are temporary. As soon as you release the mouse button, the crosshairs and coordinates disappear. This may be useful when you are viewing an image in MIP mode in one pane. As you follow along the vasculature (or other enhanced voxels) in the MIP rendering, MultiView uses the maximum intensity voxel you are viewing to synchronize any non-MIP images to the correct three-dimensional location.

By default, the Spatial Projection tool is assigned to the middle mouse button. Click in the viewport with this mouse button to see the Spatial Projection crosshairs.
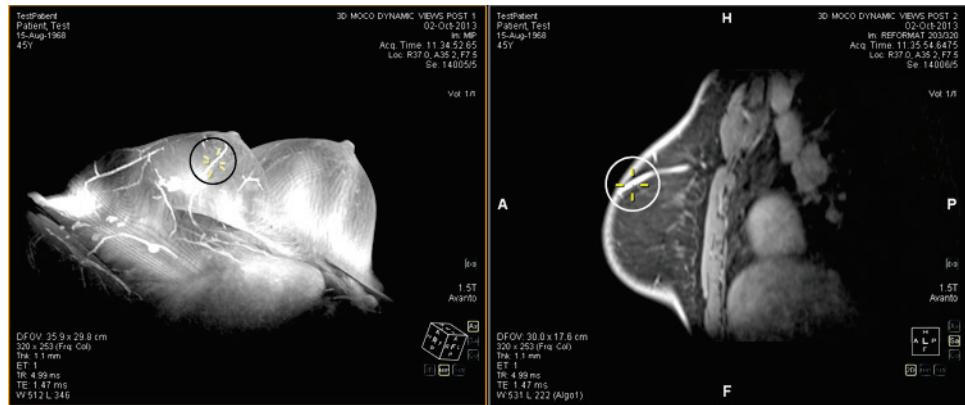

Figure 71: Position Interpolated in Right Pane from Left Pane Location

# *Chapter 8   Measurement Tools*

Use the MultiView measurement tools to get more information about a region of interest or other feature in an image. To access the measurement tools, choose *Tools > Measurement* then the tool you want to access. The measurement tools may also be available as a tool group on the toolbar, depending on your toolbar configuration settings.

To use a measurement tool, assign the tool to a mouse button and click using that button. For more information about assigning tools to the mouse buttons, see Using MultiView Tools on page 77.

To stop creating measurement annotations, assign a different tool to the mouse button or deselect the tool in the Tools menu. You can also configure MultiView to automatically switch back to the default tools assigned to the mouse button by choosing *Tools > Options > Annotation Tools > Deselect annotation tools after placement*.

Table 15: Measurement Tools

Icon	Name	Description
	Ruler	Measures an area on the image. For more information, see Using the Ruler Tool on page 92.
	Protractor	Measures an angle on the image. For more information, see Using the Protractor Tool on page 92.
	Probe	Displays the characteristics of a specific voxel. For more information, see Using the Probe Tool on page 92.
	Graph	Displays the characteristics for a voxel, region of interest (ROI), or a lesion over time. For more information, see Viewing Changes in Pixel Intensity Over Time on page 98.
	Elliptical ROI	Draws an elliptical ROI on the image. For more information, see Creating Elliptical and Rectangular ROIs on page 93.
	Cubic ROI	Draws a three-dimensional ROI on the image. For more information, see Creating a Cubic ROI on page 94.
	Rectangular ROI	Draws a rectangular ROI on the image. For more information, see Creating Elliptical and Rectangular ROIs on page 93.

Icon	Name	Description
	Polygonal ROI	Draws a polygonal ROI on the image. For more information, see Creating a Polygonal ROI on page 94.
	Contour ROI	Draws a freehand contour ROI on the image. For more information, see Creating a Contour ROI on page 96.
	Contour Smoothing	Adjusts the shape of a contour ROI. For more information, see Contour Smoothing on page 96.

Measurement Tools

Using the Ruler Tool

The Ruler tool draws a line on the image and measures its length.

To measure a feature on an image, click on the image where you want to start the measurement, then move the crosshairs to where you want the measurement to end and click again. The length of the line appears in centimeters in the annotation.

NOTE: You can also measure distances using Spatial Locator tool. For more information, see Measuring the Distance to a Marker on page 86.

Using the Protractor Tool

The Protractor tool measures the angle between two line segments.

Click on the image where you want the first line segment to begin, then move the crosshairs to where you want the line to end and click again. Move the crosshairs to where you want the second line to end and click to complete the line. The inner angle of the two lines appears in the annotation.

Using the Probe Tool

Use the Probe tool to view the characteristics of a specific voxel. When you click on a voxel with the Probe tool, the following information is displayed:

- The x and y coordinate values of the voxel

- The PIX value (pixel intensity)

Double-click in the viewport with the Probe tool to create a probe annotation for a specific voxel.

About ROIs

You can define regions of interest (ROI) on an image using the ROI tools in MultiView. Use ROIs to determine the voxel intensity statistics for a specific region of the image.

When you create an ROI, MultiView displays the area and the voxel intensity statistics (mean and standard deviation) of the ROI beside it. You can move this text by clicking and dragging it to a new location if necessary. To hide this text, right-click on the text and deselect the *Show Analysis* option. To show the text again, right-click on the ROI name and select the *Show Analysis* option.
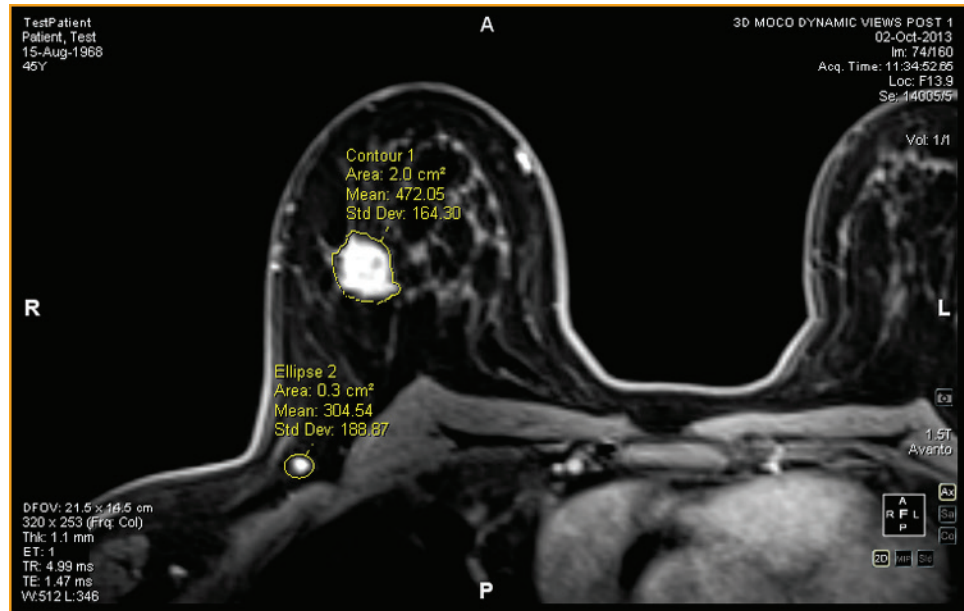

Figure 72: Two Regions of Interest

ROI Tools

To access the region of interest (ROI) tools choose *Tools > Measurement* then the tool you want to access. The ROI tools may also appear in the toolbar depending on the configured toolbar profile. If so, click the arrow on the ROI tools group in the toolbar to access all the MultiView ROI tools. The currently selected tool is displayed in the toolbar.

Creating Elliptical and Rectangular ROIs

MultiView provides two options for drawing elliptical and rectangular ROIs: a two-click method and a click and drag method. The two-click method is active by default. If you want to use the drag method, you must select the "Use click and drag annotation creation" option under *Tools > Options > Annotation Tools*.

To create an elliptical or rectangular ROI using the two-click method:

1. Assign the Elliptical ROI tool or the Rectangular ROI tool to a mouse button.

2. Click in the image where you want to start the ROI.

3. Move the mouse to where you want to complete the ROI.

4.   Click again to complete the ROI.

To create an elliptical or rectangular ROI using the click and drag method:

1.   Assign the Elliptical ROI tool or the Rectangular ROI tool to a mouse button.

2.   Click and drag around the area in the image you want to include in the ROI.

3.   Release the mouse button to complete the ROI.

Creating a Polygonal ROI

The Polygonal ROI tool creates a polygonal region of interest with any number of sides.

To draw a polygonal ROI, click on the image to start the first line, then move the crosshairs to where you want the line to end and click again. Repeat this process to create the sides of the polygon (each line starts where the last line ended). To complete the polygon, join the end of the last line to the start of the first line.

TIP: When the crosshairs are close to the start of the first line, a circle appears on the annotation and the end of the line you are drawing "snaps" to that point. Click to complete the polygon.

Creating a Cubic ROI

The Cubic ROI tool creates a three-dimensional ROI.
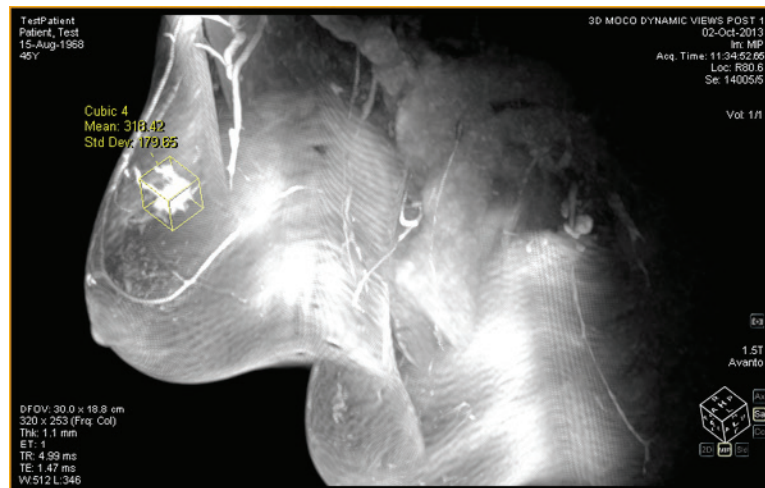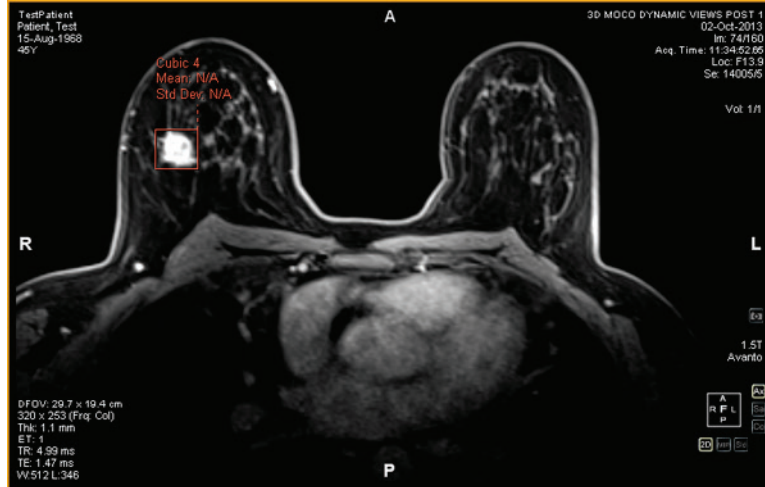

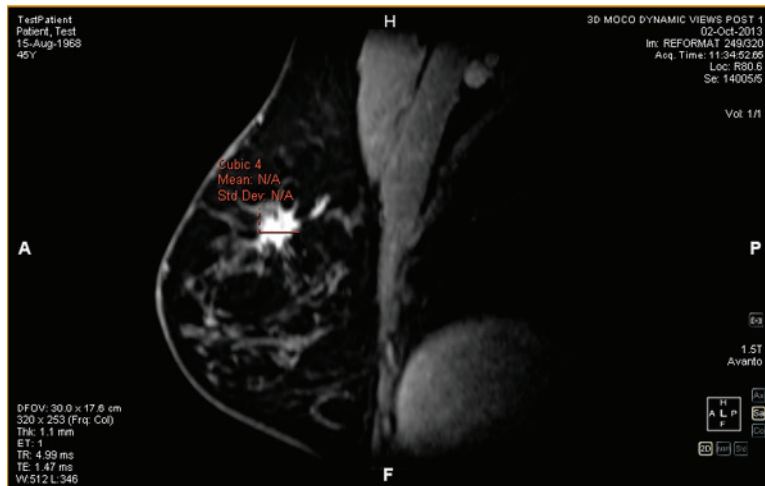**Figure 73: Cubic ROI on a MIP**

To draw a cubic ROI:

1.   Choose *Tools > Measurement > Cubic ROI*.

2. Draw a rectangle around the region of interest.

3. Switch to a different view. For example, if you drew the rectangle in the axial view, switch to the sagittal view. The ROI now appears as a line (see the figure below).

4. Select one of the ROI "handles" and drag it over the feature in the image.

5. If necessary, repeat the adjustment until the ROI completely contains the feature you are interested in.
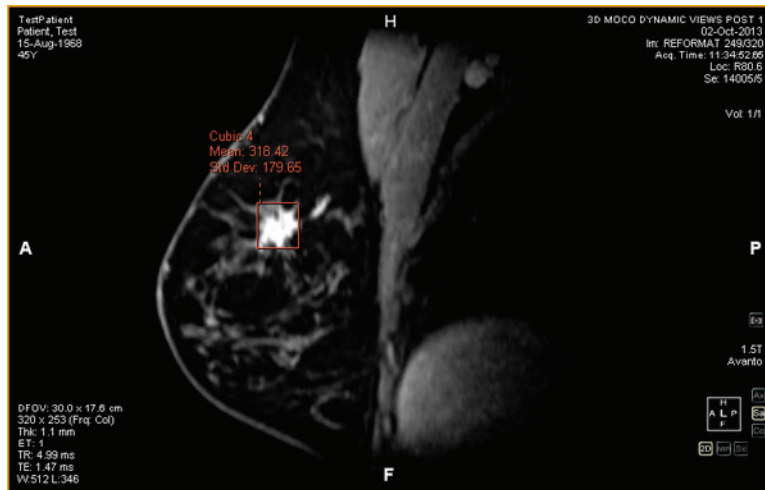
Creating a Contour ROI

Use the Contour ROI tool to draw a freehand ROI on the image.

To draw the contour ROI, click on the image and drag around the area you want to include in the ROI. To complete the ROI, join the end of your contour to the point where you started.

TIP: When the crosshairs are close to the start of the ROI, a circle appears on the annotation and the end of the line you are drawing "snaps" to that point. Click to complete the ROI.

Contour Smoothing

Use the Contour Smoothing tool to refine the boundary of a contour ROI.

• To expand the boundary of a contour ROI, with the Contour Smoothing tool assigned to a mouse button click inside the ROI and use the circle to nudge the edge of the ROI outward. Note that this is only possible for large ROIs; when an ROI is small, clicking inside of it will select the ROI.

• To shrink the boundary of a contour ROI, with the Contour Smoothing tool assigned to a mouse button click outside the ROI and use the circle to nudge the edge of the ROI inward.

• To adjust the size of the Contour Smoothing tool, hold down the mouse button the tool is assigned to and scroll with the mouse wheel.

NOTE: The Contour Smoothing tool cannot be used in the MIP or Solid Volume rendering modes.

Working with ROIs and Annotations

Working with ROIs in MIP Mode

If you create a ROI or draw a ruler when in MIP mode, the annotation may move if you rotate away from the orientation, you were in when you drew the ROI or ruler. To restore the original orientation, right-click the annotation label and select *Snap to Graphic Plane*.

Resizing ROIs and Lines

ROIs and lines are drawn with "handles" at their edges or endpoints. To resize a ROI or line, left-click a handle and drag it to a new location.

Moving Annotations

To move a ROI, line, or text annotation, click on the object you want to move and drag it to a new location.

Copying a Region of Interest

If you have multiple panes open in the viewport, you can copy a ROI from one pane to another.

To copy a ROI:

1. Right-click the ROI and select *Copy* from the context menu.

2. Right-click in the pane where you want to copy the ROI and select *Paste* from the context menu.

The ROI is copied to the new pane in the corresponding location.

NOTE: The volume in the new pane must be in the same orientation as the volume the ROI was copied from.

Deleting ROIs and Annotations

To delete a single ROI or annotation, right-click the object and select *Delete* from the context menu.

To delete all the ROIs and annotations, right-click in the viewport and select *Delete all Annotations* from the context menu.

Viewing Changes in Pixel Intensity Over Time

Use the Graph pane to view changes in pixel intensity over time for a lesion or region or interest. By default, the Graph pane is minimized to a tab on the right side of the workspace. Click the tab to open the Graph pane. Select the lesion or region of interest you want to view a graph of from the *Source* drop-down list.

Graph Pane Tools

The following tools appear in the Graph pane.

Table 16: Graph Pane Tools

Icon	Name	Description
	Save Graph	Saves the graph as a PNG, GIF, JPEG, TIFF or BMP file.
	Add Graph to Report	Not applicable to MultiView Multimodality.
	Reset Graph	Resets the graph to its original view and discards any zooming.
	Mean Graph Tool	Shows or hides the mean graph curve. For more information, see Mean Pixel Intensity Graph below.
	Source	Select the source of the data for the graph from this list. Possible sources include probes, ROIs, and lesions.
	Lock Axes	If you have more than one ROI defined, select this option to use the same axis scale for all sources.
	Show Values	When this option is selected, when you move the cursor over the line in a graph MultiView displays the data values for that point.

Mean Pixel Intensity Graph

Click the Mean icon to display the average absolute value voxel intensity within a lesion or ROI, or the intensity of a voxel selected using the Probe tool at each of the time points.

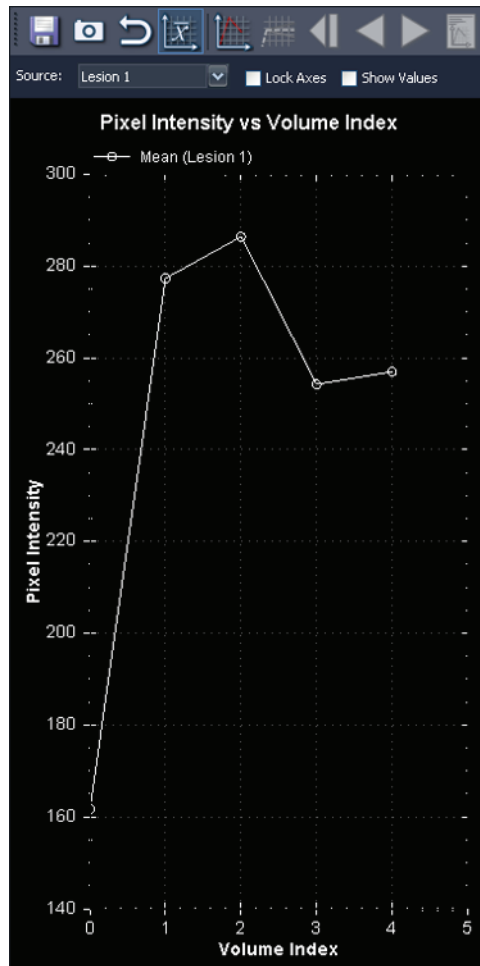The graph shows this average voxel versus the volume (time point) index.

Figure 74: Mean Graphical Representation

Chapter 9   Clipboard and Key Images

Key images are an effective way to capture the most relevant information from a study in one location for easy access later.

The clipboard is a convenient way to set aside images of interest. Once images are in the clipboard, you can export them to a different image format or create a video from them.

Key images and items on the clipboard appear in the Clipboard and Key Images pane. By default, this pane is minimized as a tab on the left side of the workspace. Click on the *Clipboard and Key Images* tab to open this pane.

About Key Images

Once you have altered the presentation state of an image by changing the windowing, zooming, panning, adding annotations, etc., you may want to capture the state of the image and store it along with the study so it can be recalled later or reviewed by someone else. The key image functionality in MultiView allows you to capture and store images with a study.

NOTE: MultiView treats key images as flat, 2-dimensional images, unlike slices, which have "thickness" in MultiView.

When key images have been saved, they are added as a series to the study. When a key image is taken of a processed image, a generated reference image will be created and will appear in the list of series in the study. If configured, key images can also be sent automatically to a server when you close the study. For more information, see Reporting on page 33.

You can also export key images to another image format, such as JPEG, by adding the key image to the clipboard. For more information, see Copying Key Images to the Clipboard on page 107.

To work with key images, click the Clipboard and Key Images tab on the left side of the workspace to open the Clipboard and Key Images pane, then the Key Images tab.
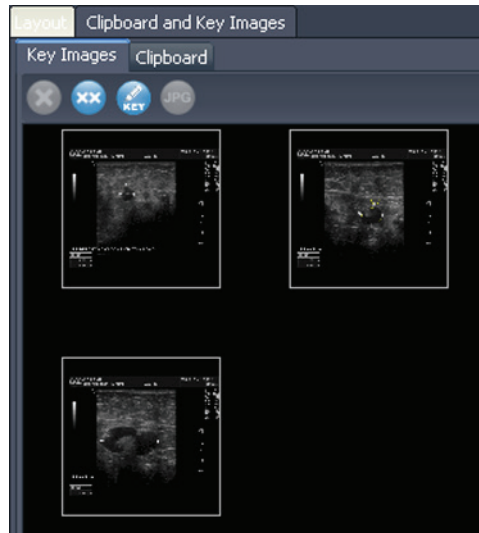

Figure 75: Key Images Tab

Key Image Tools

The toolbar at the top of the Key Images tab contains icons for working with key images.

Table 17: Key Images Tab Tools

Icon	Name	Description
	Delete Selected	Deletes the selected key image from the Key Images tab.
	Delete All	Deletes all the key images in the Key Images tab.
	Edit Key Image Information	Click to edit the key image details. For more information, see Editing Key Image Details on page 103.
	Export to different image formats	Click to export the key image as an image file. For more information, see Exporting Key Images on page 104.

Creating a Key Image

To create a key image:

1. Set the presentation state exactly as you want it to look in the image. Pay particular attention to the zoom and pan; the visible region of the image is

stored as well, so you may want to focus in on something specific and make it as large as possible.

2. Do one of the following:

- Right-click in the viewport and select *Create Key Image* from the context menu.

- Press the space bar on the keyboard to capture the active viewport.

- Hold down the SHIFT key and press the space bar to create a key image of each open viewport.

The key image is created and appears in the Key Images pane. The next time you open this study, your key images will be displayed in the Study List.

Editing Key Image Details

You can edit some basic information about the key image. This information is stored in the header of the DICOM Key Object document.

To edit key image details:

1. Select the image in the Key Images tab.

2. Click the *Edit Key Image Information* icon. The Edit Key Image Information dialog appears.
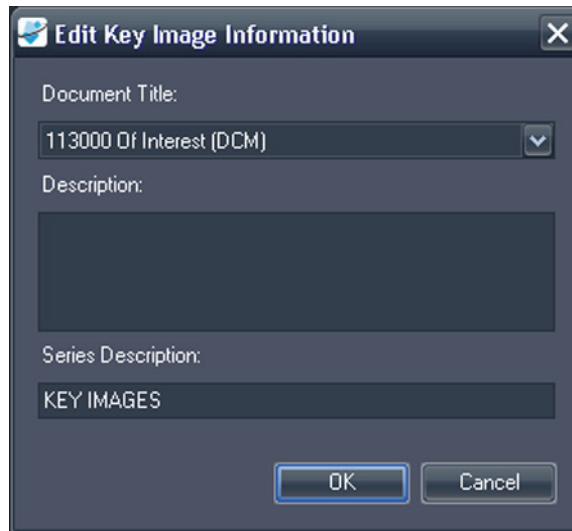
Figure 76: Edit Key Image Information Dialog

3. Enter the information for the image.

Option	Description
Document Title	Select a title from the list.
Description	Enter a description of the image.

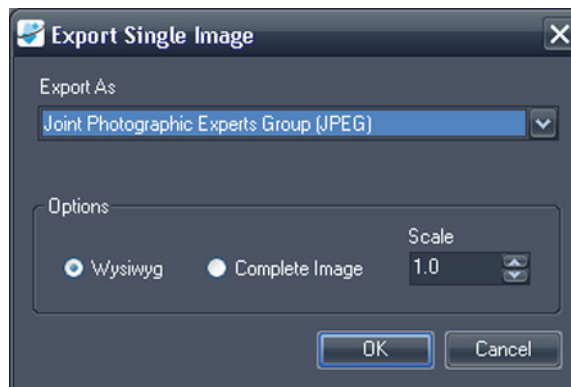| Option	Description
Series Description	Enter a description for the series. This description will appear in the series list for the study.

4. Click *OK*.

Saving Key Images

Any images in the Key Images pane are saved automatically when you close the workspace. The next time you open this study, the key images are converted into a series and displayed in the Study List.

Exporting Key Images

You can export a key image as an image file in a format such as GIF or JPEG.

To export a key image as an image file:

1. Select the key image in the Key Images tab and click the *Export to different image formats* icon.

2. Specify how you want to export the image.

Option	Description
Export As	Select the file format you want to save the image as. Supported formats are: BMP, PNG, TIFF, GIF and JPEG.
Wysiwyg	Select this option to export the key image exactly as it appears in the viewport.
Complete Image	Select this option to export the entire key image, including areas that were not visible in the viewport when the key image was captured.

Option	Description
Scale	Enter the amount to scale the image.
	▪ If you selected the Wysiwyg option, the image is scaled relative to the visible area in the viewport.
	▪ If you selected the Complete Image option, the image is scaled relative to the actual width and height of the image.

3. Click *OK*.

4. Browse to the location where you want to save the image and enter a file name for the image.

5. Click *Save*.

About the Clipboard

You can copy images to the clipboard by volume or by display set.

To work with the clipboard, click the Clipboard and Key Images tab on the left side of the workspace to open the Clipboard and Key Images pane, then the Clipboard tab.
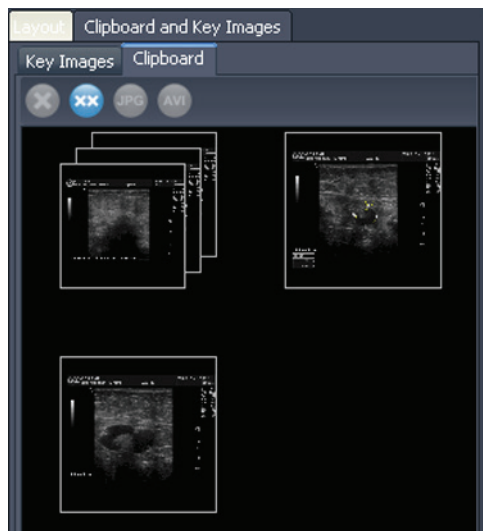
Figure 77: The Clipboard Tab

Unless you delete them, items remain on the clipboard until you close MultiView. Note that if you log out but do not close MultiView, the next user who logs in will see the items on the clipboard.

Clipboard Tools

The toolbar at the top of the Clipboard tab contains icons for working with items on the clipboard.

Table 18: Clipboard Tab Tools

Icon	Name	Description
	Delete Selected	Deletes the selected key image from the Key Images tab.
	Delete All	Deletes all the key images in the Key Images tab.
	Export to different image formats	Click to export the selected item on the clipboard as an image file. For more information, see Exporting Items on the Clipboard as Images on page 108.
	Export To Video	Click to export the selected item on the clipboard to a video file. For more information, see Exporting Items on the Clipboard as a Video on page 110.

You can also access these tools by right-clicking on a clipboard image thumbnail and selecting them from the context menu.

Copying a Volume to the Clipboard

Copy a volume to the clipboard when you want to capture all the images in the volume currently active in the viewport. You can later export one or more of the images in the volume into another format, such as JPEG, or export a range of images from the volume as a movie file.

To copy a volume to the clipboard:

1. Right-click in the viewport containing the image you want to copy.

2. In the context menu, select *Clipboard > Copy Volume to Clipboard*.

The volume appears on the clipboard as a single image.

Note that the presentation state of the images in the volume (zoom, window/level, measurements, ROIs etc.) is also captured on the clipboard.

Copying a Display Set to the Clipboard

Copy a display set to the clipboard when you want to capture all the images in all the volumes open in the viewport to the clipboard. You can later export all or some of the images in the volumes in the display set to another format, such as JPEG, or export a range of images from the volumes in the display set as a movie file.

NOTE: The option to copy a display set to the clipboard only appears when you have more than one series open in the viewport.

To copy an entire display set to the clipboard:

1. Right-click on the display set you want to copy.

2. In the context menu, select *Clipboard > Copy Display Set to Clipboard*.

The display set appears on the clipboard as a set of images.

Copying Key Images to the Clipboard

You may want to copy key images to the clipboard so that you can export them to another image format. Or, if you open multiple key images in the viewport, you can add them to the clipboard together and export them as a movie file.

To copy one or more key images to the clipboard:

1. Open the key image(s) in the viewport.

2. Right-click in the viewport and select *Clipboard* from the context menu, then one of the following options.

Option	Description
Copy Image to Clipboard	Select this option to copy the current key image to clipboard.
Copy Display Set to Clipboard	Select this option to copy all the key images open in the viewport to the clipboard as a display set.
Copy Range of Images to Clipboard	Select this option to select which key images you want to copy to the clipboard.

3. If you chose to copy a range of images, enter the range in the Copy Images to Clipboard dialog, then click *Copy to Clipboard*.
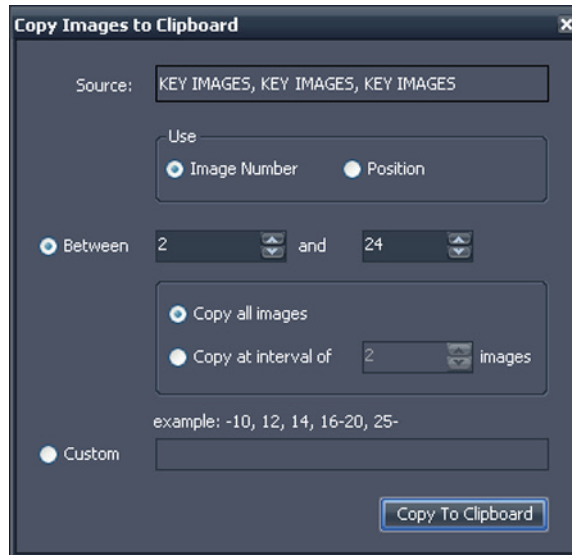
Figure 78: Copy Images to Clipboard Dialog

The image(s) are added to the clipboard.

Exporting Items on the Clipboard as Images

The options available for exporting to an image depend on whether you are exporting a key image, a volume, or a display set.

*   When exporting a key image, you can only select where to save the image and what scale to save it at.

*   When exporting a volume, you have the option to export the image that was active when you copied the volume to the clipboard, or a range of the images in volume.

*   When exporting a display set, all images, or the range of images you chose, will be exported for each volume in the set. For example, if your display set includes 3 volumes, and you choose to export images 10 – 12, images 10 – 12 from each volume will be exported and the result will be 9 images.

To export an item as an image:

1. Select the item in the Clipboard pane.

2. Click the *Export to different image formats* icon in the clipboard toolbar. The Export Images dialog appears.

Figure 79: Export Images Dialog Displaying All Possible Options

3. Specify how you want to export the image.

Option	Description
Export As	Select the file format you want to export the image to from the list.
Wysiwyg	Select this option to export only the visible portion of the image at the time it was copied to the clipboard.
Complete Image	Select this option to export the entire image, including areas that were not visible in the viewport when the image was copied to the clipboard.
Scale	Enter the amount to scale the image. ▪ If you selected the Wysiwyg option, the image is scaled relative to the visible area in the viewport. ▪ If you selected the Complete Image option, the image is scaled relative to the actual width and height of the image.

Option	Description
Stack Range	This option is only available if you are exporting a volume or display set. If you are exporting a volume: ■ Leave this option un-selected to export only the image that was active when you copied the volume to the clipboard ■ Select this option if you want to export two or more images in the volume, then enter the range of images to export If you are exporting a display set: ■ Leave this option un-selected to export all the images in all the volumes that were active in the viewport when you copied the display set to the clipboard ■ Select this option if you want to export only a range of the images in the volumes, then enter the range of images to export
Multi-volume stacking	This option is only available if you are exporting a range of images from a display set. ■ Select *In Parallel* to export the same image from each volume before moving to the next image in the range ■ Select *Serially* to export all images in the range from the first volume before moving to the next volume

4. Click *OK*.

5. In the Save As dialog, navigate to the location to save the image. If you are exporting a single image from a volume, enter a file name for the image and click *Save*. If you are exporting multiple images, MultiView creates a new folder in the location you specify and generates file names for the exported images automatically.

Exporting Items on the Clipboard as a Video

You can export a range of images, a volume, or a display set on the clipboard to a video file.

To export an item on the clipboard to video:

1. In the clipboard, select the item you want to export.

2. Click the *Export To Video* icon on the clipboard toolbar, or right-click on the item and select *Export To Video* from the context menu. The Export to Video dialog appears.
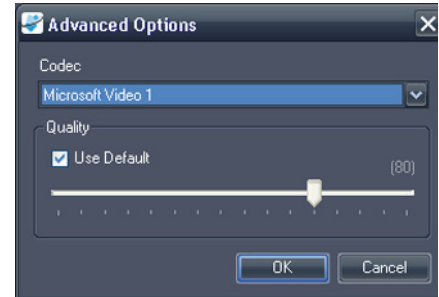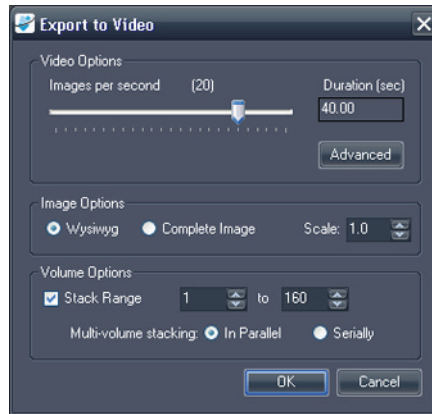
Figure 80: Export to Video Dialog

Figure 81: Video Advanced Options

3. Enter the information about the video in the Export to Video dialog.

Option	Description
Images per second	The speed at which the video should play.
Advanced Options	Click the *Advanced* button to select the codec and quality level for the video.
Wysiwyg	Select this option to export only the visible portion of the images at the time it was copied to the clipboard.
Complete Image	Select this option to export the entire images, including areas that were not visible in the viewport when the image was copied to the clipboard.
Stack Range	This option is only available if you are exporting a volume or a display set. Select this option to export only a range of the images in the volume(s), then enter the range of images to export.

Option	Description
Multi-volume stacking	The option is only available if you are exporting a range of images from a display set. ▪ Select *In Parallel* to export the same image from each volume before moving to the next image in the range. ▪ Select *Serially* to export all images in the range from the first volume before moving to the next volume.

4. Click *OK*.

5. In the Save As dialog that appears, navigate to the location where you want to save the video, then enter a file name for the video and click *Save*.

Appendix A Shortcut Keys to Common Functions

Tools

	Layout	L
	Cine	C
	Speed up playback	UP Arrow
	Slow down playback	DOWN Arrow
	Move forward	RIGHT Arrow
	Move backward	LEFT Arrow
	Stop	0 or INSERT
	Stack	S
	Window/Level	W
	Pan	P (or CTRL + LEFT CLICK) (or CTRL + ARROW KEYS)
	Zoom	Z (or CTRL + MOUSEWHEEL)
	Radial Stacking	D (or ALT + MIDDLE CLICK)
	Rotate	R
	Flip Vertical	V
	Flip Horizontal	H
	Reset	BACKSPACE

	Show/Hide Text Overlay	O (or SHIFT + O)
	Text Callout	A (or ALT + MIDDLE CLICK)
	Spatial Locator	N
	Ruler	M (or ALT + LEFT CLICK)
	Elliptical ROI	SHIFT + M (or ALT + RIGHT CLICK)
	Rectangular ROI	CRTL + M
	Polygonal ROI	SHIFT + CTRL + M
	Probe	B
	Graph	G

Window/Level

Auto	F2
Custom	F3 - F12

Fast Window/Level	SHIFT + Window/Level
Window & Level Controls	Arrow Keys

Other Functions

Stack Images Forward	PAGE DOWN
Stack Images Backward	PAGE UP
Go to First Image	HOME
Go to Last Image	END
Stack Forward in Time	CTRL + PAGE DOWN
Stack Backward in Time	CTRL + PAGE UP
Fast Stack	SHIFT + STACK
Fast Stack Up/Down	SHIFT + MOUSEWHEEL
Go to First Volume	CTRL + HOME
Go to Last Volume	CTRL + END
Rotate Volume	CTRL + RIGHT CLICK
Capture Active Viewport as a Key Image	SPACE BAR
Capture All Viewports as Key Images	SHIFT + SPACE BAR
Options	CTRL + O

Appendix B Troubleshooting

The table below lists troubleshooting tips for problems that may occur when using MultiView. If you cannot resolve a problem using the suggestions listed here, contact Hologic Support (for contact information see Contacting Hologic on page 6).

Hanging Protocols

Problem	Possible Cause	Resolution
Hanging protocols were stored but are not available	Study description naming convention has changed (hanging protocol availability is based on study and series descriptions)	On the Protocols tab in the Layout pane select the *Show All Protocols* option
	(Toshiba scanners) No study comment entered when the patient was registered	Something must be entered in the Study Comment field when registered a patient on Toshiba scanners; this text appears as the study description in MultiView
Empty viewports when hanging protocol is applied (that is, an expected series is missing)	Series was not named following the expected naming convention	Name the series following the expected naming convention
	Series was never scanned	Run the scan for the series
	Series was not sent to MultiView	Verify the connection between the scanner or PACS and MultiView
	Expected series is a motion corrected series and motion correction was not completed	Run the Motion Correction tool to create a motion corrected study

Problem	Possible Cause	Resolution
MultiView is not applying a hanging protocol	Workspace saving is being applied	Choose *Tools > Options > Workspace Saving* and deselect the *Automatically load and save workspaces option*, or select the *Ask before loading workspace on open study* option

Key Images

Problem	Possible Cause	Resolution
Key images are not arriving in PACS	MultiView is not configured correctly in PACS	PACS may need to be configured with the MultiView IP address, AE Title, and Port
	PACS does not support key objects	Choose *Tools > Options > Reporting > Report* and select the *Send key images as secondary capture images rather than key objects (KO)* option

Priors

Problem	Possible Cause	Resolution
Priors do not appear on the Study List tab in the Layout pane	Prior detection is not enabled	Choose *Tools > Options > Priors* and select the *Enable automatic prior detection* option
	The correct PACS is not configured as a default prior query server in MultiView	Choose *Tools > Options > Default Servers* and select the appropriate prior query server
	Appropriate keywords are not configured	Choose *Tools > Options > Priors* and verify that the prior keywords are specified correctly
	Remote DICOM device specified as the default prior query server does not return Study Description and Modality fields when queried	Prior detection is not possible with this remote DICOM device
Local priors are detected but not priors stored on a PACS	MultiView is not configured to query remote servers for priors	Choose *Tools > Options > Priors* and deselect the *Disable remote prior detection using default servers* option

Subtractions

Problem	Possible Cause	Resolution
Failure to subtract or different frame of reference errors	Changes to scanning protocols involving spatial resolution (for example, changes to matrix, slick thickness, FOV, partial phase FOV, slice interpolation between the pre contrast and post contrast images)	With a pre contrast image in the viewport, navigate to *Tools > Utilities > Dicom Editor*. Note the protocol parameters. With a post contrast image in the viewport, open the Dicom Editor and compare protocol changes.
	Slice locations have shifted	▪ Do not move the slice volume ▪ Copy parameters ▪ Send the correct scans to MultiView
Negative pixels	Not a MultiView issue; possibly caused by scanning inconsistencies such as the signal intensity of the pre contrast scan being higher than the post contrast scan	Determine the scanning inconsistency. For example, ensure a prescan was performed between the pre and post contrast images
	Irregular Fat Sat	▪ Ensure the protocol is optimized and shim volumes are being used following the magnet vendor's recommendations ▪ Review proper prescan procedures for fat suppression following the magnet vendor's recommendations ▪ Adjust shim volume size and/or position
	Scanner malfunction	Contact the scanner vendor for troubleshooting and service
Poor image quality	Two pre contrast images sent to MultiView (MultiView assumes the first dynamic phase is the pre contrast and the second phase is the first post contrast phase)	Send only one pre contrast scan to MultiView
	Did the protocol change (for example, bandwidth, ETL, Lines per Shot, TE, TR, intensity correction filters, acceleration factors)	With a pre contrast image in the viewport, go to *Tools > Utilities > Dicom Editor*. Note the protocol parameters. With a post contrast image in the viewport, open the Dicom Editor again and compare protocol changes.

Graph Tool

Problem	Possible Cause	Resolution
No curve appears in the Graph pane	No source of graph data is selected	Select a source of graph data from the Source drop-down list, or click on the image with the Probe tool

Glossary

2D
Two-dimensional

3D
Three-dimensional

A
Anterior

Acc
Accession

Acq
Acquisition

ADC
Apparent Diffusion Coefficient

Anterior
Closer to the front of the patient's body than to the back.

Ax
Axial

Axial
2D slices through the patient's body at a fixed superior/inferior position, i.e. slices aligned with the right/left axis and the anterior/posterior axis.

Cor

Coronal

Coronal

2D slices through the patient's body at a fixed anterior/posterior position, i.e. slices aligned with the right/left axis and the superior/inferior axis.

DFOV

Displayed Field of View

DWI

Diffusion Weighted Imaging

Ex

Exam

Fiducial

A target visible in the MR image that is used for registration of the image.

I

Inferior

Im

Image

Inferior

Closer to the patient's feet than head.

L

Left

Lateral Approach

From the side of the patient's body towards the middle.

Medial Approach

From the middle of the patient's body towards the side.

MIP

Maximum Intensity Projection.

MR

Magnetic Resonance

MRI

Magnetic Resonance Imaging

P

Posterior

Posterior

Closer to the back of the patient's body than the front.

R

Right

ROI

Region of Interest

S

Superior

Sag

Sagittal

Sagittal

2D slices through the patient's body at a fixed right/left position, i.e. slices aligned with the anterior/posterior axis and the superior/inferior axis.

Se

Series

SLM

Study List Manager

SNR

Signal-to-Noise Ratio

Superior

Closer to the patient's head than feet.

Uptake

Continued voxel-intensity increase.

US

Ultrasound

Voxel

Short for "volume pixel"; the three-dimensional equivalent of a pixel.

Washin

Continued voxel-intensity increase.

Washout

Continued voxel-intensity decrease.

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