GE Healthcare

# Centricity* Universal Viewer Zero Footprint Client

## Operator Manual

Version 5.0

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# Copyright Information



## Trademark Information



## Confidentiality and Proprietary Rights



## Publication Date and Document Numbers

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## Service Pack

SP6

# Restricted Sale

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

# CE Marking Information

## Compliance

The Universal Viewer Zero Footprint client bears CE mark "CE-0459", indicating its conformity with the provisions of the Council Directive 93/42/EEC concerning medical devices and fulfilling the essential requirements of Annex I of this directive.

The standards the product complies to are listed in the *General Information* and *Certifications* sections.

The country of manufacture can be found on the equipment labeling.

The safety and effectiveness of this device has been verified against previously distributed devices. Although all standards applicable to presently marketed devices may not be appropriate for prior devices (i.e. electromagnetic compatibility standards), this device will not impair the safe and effective use of those previously distributed devices.

## General Information

This manual is an integral part of the product and describes its intended use. Observance of the manual is a prerequisite for proper product performance and correct operation and ensures patient and operator safety.

The symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. Within this system, the backlight lamps in the monitor display contain mercury.

Information, which refers only to certain versions of the product, is accompanied by the model number(s) of the product(s) concerned. The model number is given on the nameplate of the product.

Warranty does not cover damages resulting from the use of accessories and consumables from other manufacturers.

GE Healthcare is responsible for the effects on safety, reliability, and performance of the product, only if

- assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by GE Healthcare
- the electrical installation of the relevant room complies with the requirements of the appropriate regulations; and
- the device is used in accordance with the instructions for use.

The manufacturer is not responsible for any interference caused by using other than recommended interconnect cables or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the users' authority to operate the equipment.

The GE Healthcare quality management system complies with the international standards ISO 9001:2008, ISO13485:2003 and the Council Directive on Medical Devices 93/42/EEC Annex II Section 3.

## General Definitions of Symbols

| Symbol | Definition |
|---|---|
|   | This symbol indicates the **AUTHORIZED REPRESENTATIVE IN THE EUROPEAN COMMUNITY** of the product. |
|  | This symbol indicates the **MANUFACTURER** of the product. |
|  | This symbol indicates the **DATE OF MANUFACTURE** of the product. |
|  | This symbol indicates that the operator should **CONSULT INSTRUCTIONS FOR USE** for further information. |
|   | This symbol indicates the manufacturers **BATCH CODE**, or lot number of the product. |
|  | The symbol for **CAUTION** highlights the fact that there are specific warnings or precautions associated with the device. |
|  0459 | The product bears **CE mark** indicating its conformity with the provisions of the Council Directive 93/42/EEC, concerning medical device and fulfills the essential requirements of Annex I of this directive. |
|  | The **WEEE** symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. |
| **Rx Only** | For products distributed in the US, the symbol for "**Rx Only**" indicates:<br>Caution: Federal law restricts this device to sale by or on the order of a licensed healthcare practitioner. |

# Contents

# 1

# About ZFP

The Centricity Universal Viewer Zero Footprint client (ZFP) has review-only capabilities and provides clinicians with easy access to images and reports, regardless of location.

Universal Viewer ZFP allows trained professionals to display and manipulate images stored in Centricity Enterprise Archive, Centricity PACS, or other DICOM archive devices. These trained professionals include but are not limited to physicians, radiologists, nurses, medical technicians, and assistants.

Universal Viewer ZFP has the added advantages of a zero installation time, with no download of any software (web or product) to the user's desktop, with zero administrative rights required on the user's device.

Universal Viewer ZFP desktop version is not intended for primary diagnosis.

When accessed from the Apple® iPad®, ZFP can only be used in review only mode and is not meant for primary diagnosis. Other mobile devices, smartphones and tablets have not been validated.

Specific features or functionality, which are relevant to only one version of the product, will be identified at the beginning of each section or specific instruction throughout this manual.

## 1.1 Monitor Display Requirements

**For ZFP Desktop**

The system supports the monitor configurations listed below. Use of other configurations may produce unpredictable results.

- The monitor should have a minimum resolution of 1024 horizontal x 768 vertical pixels
- The monitor should support 1024 grayscales (10/12) and a contrast ratio of 850:1
- The monitor should have a 32–bit color depth

## 1.2 Use Environment

The ZFP viewer must be used in the following environments:

Table 1–1 Use Environment

| Environment: | Definition: |
|---|---|
| Reading Room | The typical environment of a radiology reading room, with the following characteristics:<br>● Ambient light in the range of 50-150 lux.<br>● A workstation (PC or Mac) that meets or exceeds the minimum hardware and software requirements for radiology diagnostic usage.<br>● The network that connects the workstation to the server has a bandwidth of 100 mbps or better, and latency of 30 ms or less.<br>● A single landscape or portrait monitor that meets or exceeds the minimum requirements. |
| General Area Workstation / Physician's Office | The typical environment for the workstation located outside of the radiology reading room, with the following characteristics:<br>● Ambient light in the range of 150 to 500 lux.<br>● A workstation (PC or Mac) that meets or exceeds the minimum hardware and software requirements for radiology diagnostic usage.<br>● The network that connects the workstation to the server has a bandwidth of 30 mbps or better, and latency of 30 ms or less.<br>● A single landscape or portrait monitor that meets or exceeds the minimum requirements. |
| Mobile environment (not for diagnostic use) | The typical environment for the workstation located outside of the radiology reading room, with the following characteristics:<br>● Ambient light in the range of 150 to 500 lux.<br>● An iPad that meets or exceeds the minimum hardware and software requirements.<br>● The network that connects the iPad to the server has a bandwidth of 30 mbps or better, and latency of 30 ms or less. |

# 1.3 Supported Operating Systems

**ZFP Desktop**

The supported operating systems for ZFP desktop are any Windows or Macintosh OS that can run the supported browsers.

**ZFP iPad**

The supported operating systems for ZFP iPad are any Macintosh iOS that can run the supported browsers.

**Note** Use iOS 6.0 or later to run ZFP iPad.

# 1.4 Contacting GE Support

## 1.4.1 Contacting the ROC

Use the following information to contact the ROC (Remote Online Center).

Table 1–2 Online Center contact information

| OLC/USA | OLC/Europe | OLD/ANZ |
|---|---|---|
| 1–855-762-6650 (US/Canada) | +33 (0) 30 831300 | 61-2-316-3700 |
| Latin America: contact your field service representative | | |

## 1.4.2 Applications Support and Service Support (Asia Regions)

To request applications support or service support for the Asia regions, refer to the following phone numbers.

Table 1–3 Applications support and service support (Asia regions)

| Country | Support Phone Number |
|---|---|
| Australia | 1800659465 |
| China | 8008108188 |
| Hong Kong | 21006288 |
| India | 1800114567 |
| Japan | 0120055919 |
| Korea | 15446119 |
| Malaysia | 1800883911 |
| New Zealand | 0800659465 |
| Singapore | 63880932 |
| Taiwan | 0800021770 |

## 1.4.3 Applications Support Using iCenter, eService, and Applications Answerline

To request applications support, English-speaking customers may open a support request in GE Healthcare iCenter™ or eService. Other customers should contact their GE Field Engineers or support personnel.

With iCenter or eService you can:

- Initiate requests for service and applications support from the web
- Get rapid, online access to the Remote Online Center (ROC) where expert service engineers review and respond to service requests quickly
- View the status of open service requests

- View service history and reports about your systems, including uptime, remote fix and service call trends, and other service delivery metrics

If you do not have access to iCenter or eService, contact your Director of Service or Service Engineer to open an account. English-speaking customers can also use the following resource:

- GE PACS Applications Answerline 1-800-437-1171, Option 3 (available for US and Canadian customers)

## 1.4.4 Contact Information for GE Healthcare Offices

Addresses and phone numbers for GE Healthcare offices are listed below.

### Corporate Headquarters

GE Healthcare
540 W Northwest Highway
Barrington, IL 60010 USA
Tel: +1-800-321-7937 (US and Canada)
Fax: +1 847 277-5240


### European Authorized Representative

GE Medical Systems SCS
283 rue de la Minière
78530 BUC, France

### Asia Headquarters

GE Healthcare
1 BLD-3F
No. 1 Hua Tuo Road, Zhang Jiang Hi-Tech Park
Shanghai 201203 China
Tel: 8621-38777888
Fax: 8621-38777499

### Turkish Authorized Representative

Türkiye'ye İthalatçı

GE Medical Systems Türkiye Ltd. Şti.

Esentepe Mah. Harman Sok. No: 8

34394 Şişli-İstanbul

Türkiye

# 1.5 Documentation Conventions

## 1.5.1 Text

Table 1–4 Text convention descriptions

| Description | Example |
|---|---|
| This typeface represents all buttons, entry fields, menus, and other user interface controls. | On the **File** menu, click **New**. |
| This typeface represents window and dialog box names. | This opens the *Preferences* dialog. |
| This typeface represents text you enter in a user interface control. | Enter ***localhost*** in the proper field. |
| This typeface represents user names and passwords and commands you type in response to a command prompt. | Default user name: **`sysadmin`**. |
| This typeface represents file path names. | Open *lib\readme.txt*. |
| This typeface represents cross-references and other hypertext links. | See Documentation Conventions. |

## 1.5.2 Screen Captures

The example screens in this manual may not represent what you see on your screen. Use them only as guidelines.

## 1.5.3 Demographic Information Disclaimer

Any patient identifiable information contained in this manual, including but not limited to name, age, gender, date of birth, medical record number and exam date is fictitious information and was generated for the purposes of illustration only.

# 1.6 Safety

## 1.6.1 For Your Safety

### 1.6.1.1 Indications for Use

There are two different indications for use for the ZFP product, based on the use of either the desktop or iPad version of the ZFP product. Review the appropriate statements below based on the specific ZFP platform that you are using.

### ZFP Desktop

The Universal Viewer zero footprint option is not intended for primary diagnosis.

For Safety information and Indications for Use for the Universal Viewer, see the *Universal Viewer Operator Manual*.

### ZFP iPad

Centricity Universal Viewer Zero Footprint client for iPad is intended for non-diagnostic review. The Universal Viewer Footprint client for iPad is not intended for primary image interpretation or diagnosis.

## 1.6.1.2 Terminology

The terms *danger*, *warning*, and *caution* are used throughout this manual to point out hazards and to designate a degree or level of seriousness. Hazard is defined as a source of potential injury to a person.

Familiarize yourself with the terminology descriptions listed in the following table:

Table 1–5 Terminology descriptions

| Notice Type | Description |
|---|---|
| Danger | Indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury. |
| Warning | Indicates a potentially hazardous situation, which, if not avoided, **could** result in death or serious injury. |
| Caution | Indicates a potentially hazardous situation, which, if not avoided may result in minor or moderate injury. |
| Important | Indicates important information pertaining to a non-hazardous situation. |
| Note | Indicates informational messages providing application tips or other useful information that do not pertain to a hazard. |

## 1.6.1.3 Typical Users

The following classes of users are expected to use the system; these users will use the system in standalone mode or in integration with various information systems and advanced visualization packages:

**Radiologist**- reviews, manipulates, and interprets content of imaging studies, with the purpose of rendering diagnosis and documenting it in the form of notes, reports, key images, annotations, and other information.

**Technologist** - acquires imaging studies, performs quality control, and creates additional clinical evidence for further use by Radiologist in interpretation process.

**Clinician** - reviews results of interpretation by Radiologist to determine further steps in clinical care.

**Referring Physician** - uses the system or a CD/DVD generated by the system to review results of interpretation by a Radiologist.

**Clinical Admin** - clinically knowledgeable administrative user, such as a PACS administrator or Chief Technologist, who performs tasks such as splitting and merging studies, exception resolution, etc.

**Radiological Resident** - uses the system to create preliminary reports which are later reviewed and signed by the attending radiologist.

**Clinical Staff** - (nurses, film library clerks, front desk staff, etc.) access and modify patient records by adding notes, scanning documents, viewing, printing, and exporting studies.

**System Administrator** - Manages and maintains system configuration to achieve optimal performance and reliability.

The system is not intended for use by patients.

## 1.6.2 System Safety

The safety statements in this chapter refer to the equipment in general. Additional safety statements specific to particular operations of the product can be found in the applicable chapter describing that operation.

### 1.6.2.1 Dangers

There are no dangers that refer to the equipment in general. Specific "Danger" statements may be given in the respective sections of this manual.

### 1.6.2.2 Warnings

The warning statements in this section refer to the equipment in general. Additional warning statements specific to particular operations of the product can be found in the applicable chapter describing that operation.

**Warning:** **When calibrating projections images, the calibration object should be at the same distance from the detector as the anatomy to be measured.**

**Warning:** **Lossy image compression may reduce image quality.**

**Warning:** **Images that were accepted into the system using Lossy compression may have reduced image quality. Pay attention to Lossy indicator on images to recognize images that have been subjected to lossy compression.**

**Warning:** **Minifying (zooming out) an image may reduce image quality.**

**Warning:** **Secondary Capture images may have reduced image quality.**

**Warning:** **Derived images may have reduced image quality.**

**Warning:** **The display setting should be configured for 32-bit color for best image quality; there is a potential reduction in image quality if the viewer is launched with a display color setting less than 32-bit.**

#### 1.6.2.3 Cautions

There are no cautions that refer to the equipment in general. Specific "Caution" statements may be given in the respective sections of this manual.

#### 1.6.2.4 Ergonomics

Improper or prolonged keyboard or mouse use may result in injury. Viewing the monitor screen for extended periods of time may result in eye strain. Users should follow the Ergonomic Guidelines specified by the vendor/ manufacturer of their PC equipment.

### 1.6.3 Certifications

The Centricity PACS with Universal Viewer system meets the following:

- Council Directive 93/42/EEC of 14 June 1993 concerning medical devices

The software meets the following:

- IEC 62304: Medical device software – Software life cycle processes
- IEC 62366: Medical devices – Application of usability engineering to medical devices

The hardware components of the system meet the following:

- Safety of Information Technology Equipment, EN 60950 or an equivalent information technology equipment safety standard

### 1.6.4 Acronyms and Abbreviations

Table 1–6 Acronyms and abbreviations used in this manual

| Term | Definition |
|---|---|
| DICOM | Digital Imaging and Communication in Medicine |
| GSPS | Grey Scale Presentation State |
| KIN | Key Image Note |
| MIP | Maximum Intensity Projection |
| MPR | Multi-Planar Reconstruction |
| ROI | Region of Interest |
| VR | Volume Rendering |
| ZFP | Zero Footprint |

## 1.7 Software License; Intellectual Property

### 1.7.1 Preamble

Any software provided to the customer is subject to the specific license terms and conditions of the applicable agreement, or shrink-wrap, or click-wrap license.

In the event of any conflict between those specific terms described below, the specific terms will supersede and prevail.

Generally those terms provided are as follows.

## 1.7.2 License Grant

GE grants to Customer a limited non-transferable license to use the Licensed Software subject to the limitations imposed under this Agreement and to the following:

The Permitted Users shall use the Licensed Software only on the Equipment located at the Site and solely for the purpose of processing, storing, and transmitting images and data related to Customer's patients. Customer must obtain a supplementary license from GE (which GE may or may not grant, at its option) before using the Licensed Software (a) in connection with any equipment components other than the Equipment (except as expressly contemplated by this Agreement or any applicable Software documentation); (b) at any location other than the Site, or (c) to process, store, or transmit data related to patients other than Customer's patients.

Customer may make one copy of the Licensed Software in machine-readable form solely for backup purposes and shall reproduce on any such copy the copyright notice and any other proprietary legends that were on the original copy.

Customer shall comply with all restrictions on the use of Licensed Software that Customer is subject to as a licensee or sublicensee of GE under the terms of licenses or other agreements or arrangements with third parties.

## 1.7.3 Restrictions

Except as necessary for Customer to exercise its express rights hereunder, Customer may not itself or allow any third party to (i) make copies of the Licensed Software, (ii) distribute the Licensed Software to others, (iii) electronically transfer the Licensed Software from one computer to another over a network, or (iv) decompile, reverse engineer, disassemble, or otherwise reduce the Licensed Software to a human perceivable form. CUSTOMER MAY NOT MODIFY, ADAPT, TRANSLATE, RENT, LEASE, LOAN, RESELL FOR PROFIT, DISTRIBUTE, NETWORK, OR CREATE DERIVATIVE WORKS BASED UPON THE LICENSED SOFTWARE OR ANY PART THEREOF.

## 1.7.4 Ownership of Media

The media on which the Licensed Software is recorded or fixed is Customer's property. If Customer receives Licensed Software hereunder that renders Licensed Software that Customer has previously received redundant, Customer will return the redundant Licensed Software to GE or certify in writing that all copies of such Licensed Software have been erased.

## 1.7.5 Proprietary Service Materials

In connection with the installation, configuration, maintenance, repair, and/or de-installation of the Equipment, Seller may deliver to or store at the Site, or attach to or install on the Equipment, and use an InSite Package. Buyer acknowledges that it has not purchased or

licensed from Seller any InSite Package. Buyer hereby consents such delivery, storage, attachment (provided that such attachment does not affect functionality or performance of the Licensed Software or the System), installation, and use, and to the presence of Seller's locked cabinet or box at the Site for storage of all or part of the InSite Package, and to Seller's removal of all or any part of the InSite Package at any reasonable time, all without charge to Seller. The presence of the InSite Package at the Site will not give Buyer any right or title to the InSite Package or any license or other right to access or use the InSite Package. Any access to or use of the InSite Package by anyone other than Seller is prohibited. Buyer shall use reasonable efforts to protect the InSite Package against damage or loss and to prevent any access to or use of the InSite Package contrary to such prohibition.

## 1.7.6 Damage in Transportation

All packages should be closely examined at time of delivery. If damage is apparent write “Damage in Shipment” on ALL copies of the freight or express bill BEFORE delivery is accepted or “signed for” by a GE representative or hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

Call Traffic and Transportation, Milwaukee, WI (414) 785 5052 or 8*323 5052 immediately after damage is found. At this time be ready to supply name of carrier, delivery date, consignee name, freight or express bill number, item damaged and extent of damage.

Complete instructions regarding claim procedure are found in Section S of the Policy and Procedures Bulletins.

14 July 1993

## 1.7.7 Certified Electrical Contractor Statement

All electrical installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineer. All of GE’s electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE’s field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

### 1.7.8 Third-Party Software

No third-party software is to be loaded onto any subsystem of the Universal Viewer system, including the Universal Viewer. Loading of software other than that supplied by and authorized by GE Healthcare is prohibited and will void the workstation warranty.

# 2

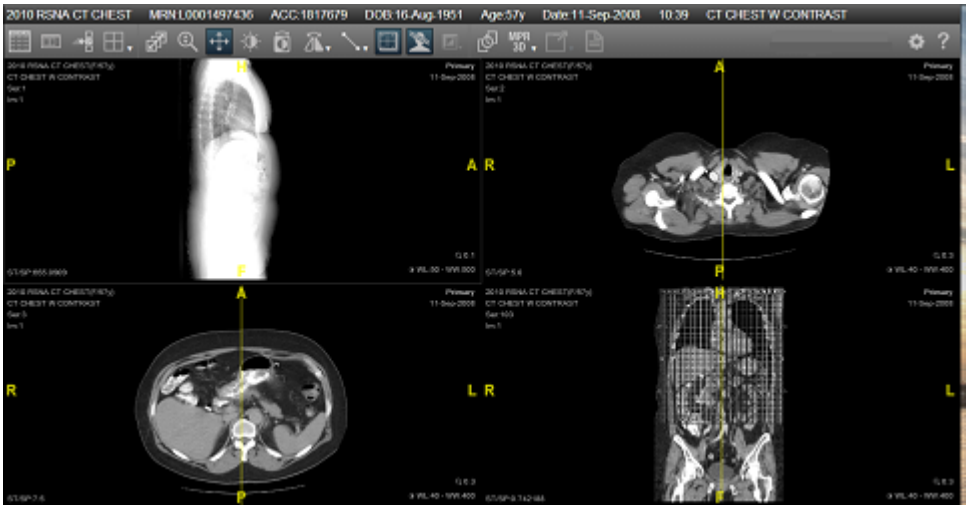
# ZFP Features

## 2.1 User Interface Themes

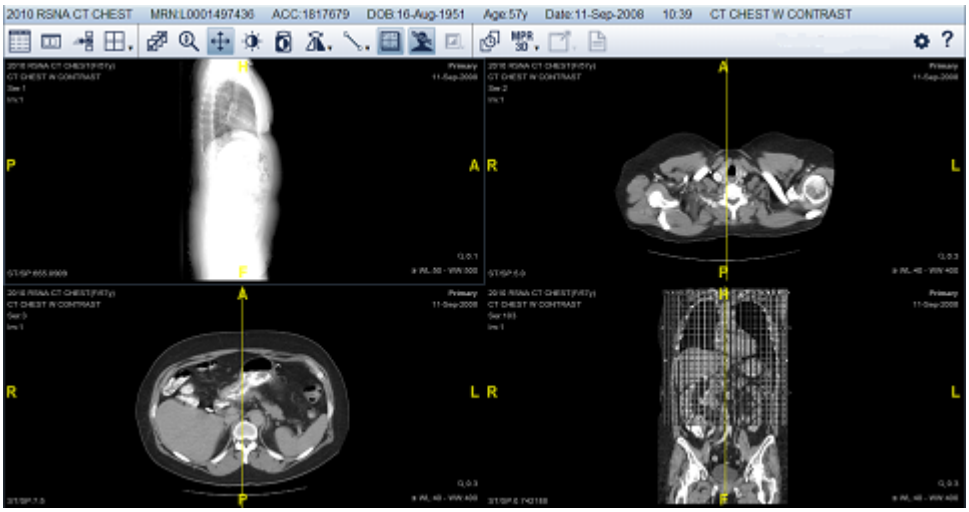
The ZFP user interface themes are not configurable. The appearance of the user interface for ZFP viewer is dependent on the parameters passed from the invoking application. If you are accustomed to using a certain theme, note that some buttons might have a different appearance to them when a different theme is displayed. However, the button's function remains the same.

1. To determine which theme the ZFP viewer is using, see the following theme samples:

   - **Lights Off:** This theme is used in dark rooms, with additional features such as a color change or monochrome shade change in the UI when selecting UI elements. A sample of this theme is shown.




   - **Lights On:** This theme is used in lighted rooms, with additional features such as a color change or monochrome shade change in the UI when selecting UI elements. A sample of this theme is shown.




## 2.2 Creating a URL that Automatically Applies Settings

You can set up a shortcut or a bookmark to ZFP that automatically applies certain settings.

1. Do one of the following:

| For: | Do this: |
|---|---|
| ZFP desktop | Locate and copy the URL for the ZFP that you are using and paste it into a text editor. The format is typically as follows. ***https://aa.bb.cc.d/ZFP?sui=xxx&[URL parameter(s) here, no braces]*** |
| ZFP iPad | Locate the URL for the ZFP that you are using and move on to the next step. |

2. Add to the end of the URL one of the following parameters, the text in bold only, for the automatic application of the theme.
   - **Lights=On** (for the lights on theme)
   - **Lights=Off** (for the lights off theme)
3. Add to the end of the URL one of the following parameters, the text in bold only, for the automatic inclusion or exclusion of the menu bar and title bar for the initial view after launching.
   - **&titleBar=On** (for the title bar to display)
   - **&titleBar=Off** (for the title bar to not display)
4. With the URL created from the steps above, do one of the following:

| For: | Do this: |
|---|---|
| ZFP desktop | Create a desktop shortcut or a bookmark in the browser. |
| ZFP iPad | Create a bookmark in the browser. |

## 2.3 Using the Safari Browser

When using the Safari browser, it is helpful to do the following:

- Periodically clear cookies and browsing-related data.
  1) Open **Settings**.
  2) Tap **Safari**.
  3) Tap **Clear Cookies and Data**.
  4) Select **Clear**.
- Add a Safari ZFP icon shortcut to your Macintosh desktop or iPad home screen.
  1) Open ZFP using the Safari browser.
  2) Tap the icon to the left of address bar.
  3) Tap **Add to Home Screen**.
  4) Enter a valid name for the ZFP icon shortcut, such as **GE ZFP Application**.
  5) Tap **Add**. An icon shortcut is added to your Macintosh dekstop or iPad home screen.

## 2.4 Performing an Ambient Light Test

**Note** This topic is for the ZFP iPad version only.

The purpose of the ambient light test is to ensure that the environmental lighting is optimal to display and review images. This test is based on visual inspection of two patterns named TG18-CT and TG18-MP, developed by The American Association of Physicists in Medicine (AAPM). You should review the suggested patterns and determine whether the ability to view the test patterns is comparable to ideal lighting conditions.

**Important** The ambient light test should be done upon first launching ZFP iPad or Macintosh, upon powering up or upon moving to a new environmental lighting condition. If you are unable to discern the test pattern information, you will be instructed to find a more appropriate lighting environment before using ZFP iPad.

1. On the toolbar, tap the Ambient Light Test icon  .

   *Result:* The “Light Test” page displays with information about the ambient light User Assessment and information about the test.
2. After reading the information on the Light Test page, tap **Perform Light Test**.
3. When the TG18-CT pattern displays, make sure you can see an image of a half moon in each of the 16 luminance regions. After you are successful, either swipe on the page from right to left or tap **TG18-MP** in the upper-right corner of the screen.
4. When the TC18–MP pattern displays, make sure you can distinguish clearly between the successive grayscale bands. After you are successful, tap **Done**.

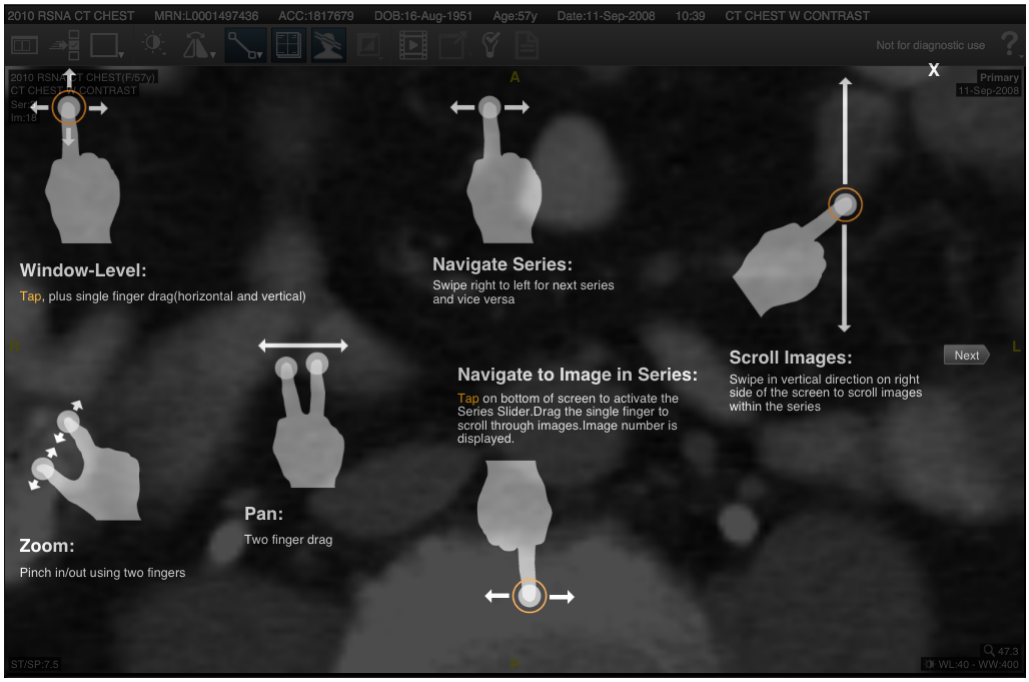
   *Result:* A confirmation message displays requesting you to confirm the test results.
5. If you select **Yes**, then ZFP iPad launches. If you select **No**, then the Ambient Light Test application instructs you to find more suitable ambient lighting.

# 2.5 Supported Gestures

**Note** This topic is for the ZFP iPad version only.

ZFP iPad supports finger gestures on the screen. The actions supported by gestures are shown in the Gestures Help.

1. To display the Gesture help page, at the top of the screen, tap **Help** and then **Gesture Help**.




**Note** Gestures do not work when annotation icons are selected. De-select any highlighted annotation icon before performing gestures.

In addition to the tap gesture to interact with the icons and menus in the application, the main supported gestures are shown in the Gestures Help. The supported gestures include but are not limited to the following.

Table 2–1 Supported Gestures

| To: | Perform this gesture: |
|---|---|
| Change the window/level or window/width | For window/level, tap the viewport and swipe a single finger up and down in the vertical direction to change the brightness.<br>For window/width, tap the viewport and swipe a single finger left and right in the horizontal direction to change the contrast.<br>**Note** When using the tap and swipe gestures for window/level or window/width, make sure that you swipe your finger within two seconds of the tap. If you do not do this, the intended gesture combination of tap and swipe does not work, and the system ignores the tap and treats the swipe as a scroll image gesture. |
| Pan | Tap on the image with two fingers and drag to the desired position. |
| Zoom | Pinch in and pinch out using two fingers. |

| To: | Perform this gesture: |
|---|---|
| Activate the Series Slider / slider bar for image navigation | Tap near the bottom of the screen to activate the Series Slider / slider bar. |
| Navigate through the images in the series | Drag your finger on the Series Slider / slider bar |
| Navigate to the next series | To navigate to the first image of the next series, use a single finger in the viewport to swipe from right to left. If you are viewing the final image in a series, no action happens in the viewport when you swipe from right to left. |
| Navigate to the previous series | To navigate to the first image of the previous series, use a single finger in the viewport to swipe from left to right. If you are viewing the first image in a series, no action happens in the viewport when you swipe from left to right. |
| Use single finger drag in vertical direction to scroll within a series | When a series is launched in the viewport, navigate to the next image within a series by swiping from top to bottom with a single finger on the right side of the viewport, and navigate to the previous image by swiping from bottom to top.<br>● To view the next image within a series, swipe from top to bottom using a single finger on the right side of the viewport. If end of the screen area is reached, continue to hold with single finger on the screen to navigate to the next image within a series.<br>● To view the previous image within a series, swipe from bottom to top using a single finger on the right side of the viewport. If end of the screen area is reached, continue to hold with single finger on the screen to navigate to the previous image within a series.<br>● No other action other than image navigation takes place within a series using single finger drag on the right side of the viewport in a bottom-to-top or top-to-bottom direction. If the viewport is below the date, image navigation within the series takes place.<br>● The slider bar is disabled if single finger drag is used in vertical direction on the right side of the viewport. |

## 2.6 Title Bar Overview

The title bar for ZFP summarizes patient and study information, such as patient name, medial record number (MRN), accession number, patient date of birth (DD-MMM-YYYY), patient age, study date (DD-MMM-YYYY), study time (HH:MM), and study description / study modality.

The formats listed above are defaults and these can be configured to be localized.

**Note** If the ZFP viewer is embedded within another application and not being viewed in a separate window, the title bar might not be visible.

# 2.7 Toolbar Overview

Table 2–2 ZFP Toolbar Icons and Descriptions

| Icon: | Description: |
|---|---|
|  Study Search | Select this icon to display the Study Search screen.<br>When ZFP is launched from an external system using SUID or an accession number and a patient MRN, then the Study Search icon is not available unless the site-wide setting for Search parameter is set to true. |
|  External Application | Select this icon to launch a web-based external application from the drop-down menu. |
|  Navigator | Select this icon to display the Navigator. |
|  Overlay | Select this icon to show or hide the overlays. |
|  Series Selector | Select this icon to display the Series Selector. |
| Layout | Select this icon to change the layout of the active viewport. The toolbar shows the currently displayed layout in the active viewport. Options in the drop-down menu include:<br>**ZFP Desktop:**<br>  **Full**<br>  **View_H**<br>  **View_V**<br>  **View_1+2**<br>  **View_2+1**<br>  **View 2x2**<br>**ZFP iPad:**<br>  Full<br>  View_H<br>  View_V |

| Icon: | Description: |
|---|---|
|  Synchronize | Select this icon to synchronize parallel series.<br>This icon is for the ZFP desktop version only. |
|  Scroll | This icon helps you use your mouse to scroll through images in a series.<br>This icon is for the ZFP desktop version only. |
|  MIP/MPR | Hover over this icon when you want to construct standard MPR, MIP, or volume rendering (VR) images for a study.<br>This icon is for the ZFP desktop version only. |
|  Presentation State | Use this icon to select and apply a different presentation state or to reset a presentation state. |
|  Window/level | Select this icon to activate the window/level tool. |
| Annotations and Measurements | Options in the drop-down menu include:<br>**ZFP Desktop:**<br>  **Distance**<br>  **Angle Measurement**<br>  **Elliptical Region**<br>  **Ellipse**<br>  **Freehand**<br>  **Rectangle**<br>  **Text**<br>  **Arrow**<br>  **CTR Measurement**<br>  **Rectangle Shutter**<br>**ZFP iPad:**<br>  Distance<br>  Freehand<br>  CTR Measurement<br>  Rectangle Shutter<br>  Delete Annotation |

| Icon: | Description: |
|---|---|
|  Zoom | Select this icon to help zoom in and out on an image. |
|  Pan | Select this icon to pan an image. |
| Rotate an image<br>Flip an image | Options in the drop-down menu include:<br>  Rotate an image to the right<br>  Flip an image vertically<br>  Flip an image horizontally |
|  Invert | Select this icon to invert the grayscale of the image in the active viewport. |
|  Report | Select this icon to view a report for a study, if one is available for that study. |
|  Cross Reference | Select this icon to turn on or turn off cross reference lines. |
|  Cine | Select this icon to apply the cine controls to the active viewport<br>This icon is for the ZFP iPad version only. |
|  Ambient Light Test | Select this icon when performing an ambient light test.<br>This icon is for the ZFP iPad version only. |
|  Toolbar Options | Select this icon to display the remaining toolbar icons in a drop-down menu. This icon displays whenever the browser window is too narrow to show all toolbar icons. This icon will not display when all toolbar icons are visible.<br>This icon is for the ZFP desktop version only. |

| Icon: | Description: |
|---|---|
|  Lossy/Lossless Image Quality | With this icon selected, lossless progression is disabled for image display. Images are loaded as lossy only.<br>With this icon not selected, lossless progression is enabled for image display. This is the default.<br>The tooltip shows the current network bandwidth. ZFP tests your network speed after downloading all lossy images for a study. If your network speed is 25 Mbps or lower, then ZFP selects this icon while the images are loading so that you can view images faster.<br>See Viewing Lossy Or Lossless Images for details.<br>This icon is for the ZFP desktop version only. |
|  About | Select this button to access the *About* dialog box.<br>This icon is for the ZFP desktop version only. |
|  Help | Select this icon to access the ZFP online help. |
|  Logout | Select this icon to log out of ZFP.<br>This icon displays only when ZFP is configured with a CPACS back-end. |

## 2.8 Changing Your Password

**Note** This task is valid only for ZFP with a CPACS back-end.

1. From the login screen, select **Change Password**. The Change Password screen displays.

   **Note** ZFP will redirect you to this screen if you attempt to log in with an expired password.

2. Enter your user ID and old password (your current password) in the appropriate fields.
3. Enter a new password in the **New Password** field.

   Password requirements:

   - Must be between 6 and 12 characters.
   - Must use a combination of upper-case and lower-case characters.
   - Must have at least 1 numeric character.
   - Must have at least 1 special character.

     Valid characters are: { ~ ` ! @ # $ % ^ & * () - _ = : ; < . , > ? }

4. Re-enter the new password in the **Confirm New Password** field to verify the change.
5. Click **OK**.

*Result:* You are redirected to the login screen. You can now log in to ZFP using your new password.

# 2.9 Opening a Study

The Study Search screen lets you search for and open a study using different search criteria.

The Study Search screen is fully accessible as long as you access ZFP without any patient/study identifier arguments in the URL, and without the EMR supplying this information. For other examples of scenarios where the Study Search screen is not accessible, see the limitations list at the end of this topic.

Launching ZFP results in ZFP opening to a worklist. This method lets you search for studies based on your configured worklists.

**Note** For information about configuring worklists or changing this setting, contact your Site Administrator or GE Service Representative.

To open a study:

1. The Study Search screen displays by default. If it is not open, select the Study Search icon  on the toolbar.

   The Filter pane is on the left and the worklist results pane is on the right.

   **Note** If ZFP is connected to a Centricity PACS back-end server, the Study Search screen displays a default domain that is based on the user's "Assigning Authority" value in the Centricity Administration Tool (CAT). For information about the Assigning Authority for your user account or to change this setting, contact your Site Administrator or GE Service Representative.

2. In the Filter pane, select the desired search criteria. If you need to clear the search criteria and return to the default settings, select **Reset**.
3. Select **Search** or press the **Enter** key on the keyboard.
4. From the worklist results pane, select the study. One of the following occurs:

| If: | Then: |
|---|---|
| Opening an online study | The study opens in the viewer. |
| Opening a partially online study | ● With Direct Streaming *enabled* (the default), the study opens in the viewer.<br>or<br>● For ZFP with a CPACS back-end with an EA archive, if Direct Streaming is *disabled*, then a dialog box displays. Select **Yes**. ZFP fetches the offline images, and the entire study opens in the viewer. Or select **Display Partial Study** to ignore the offline images; only the online images are opened in the viewer. |
| Opening an offline study | ● With Direct Streaming *enabled* (the default), the study opens in the viewer.<br>or<br>● For ZFP with a CPACS back-end with an EA archive, if Direct Streaming is *disabled*, then a dialog box displays. Select **Yes**. ZFP fetches the offline images, and the study opens in the viewer. |

**Note** For sites configured with a Centricity PACS back-end server and NHS ID support, the patient's NHS ID number and patient location display in the viewer title bar.

**Note** **For ZFP desktop only**: ZFP tests your network speed after downloading all lossy images for a study. If your network speed is 25 Mbps or lower, then ZFP disables lossless progression while the images are loading so that you can view images faster. Lossless progression remains disabled after the images are loaded.

The Lossy/Lossless Image Quality icon  is selected when lossless progression is disabled. To resume lossless progression, click the Lossy/Lossless Image Quality icon to turn it off.

5. **This step is for ZFP desktop only**: If your site is configured to launch studies using an external application, you can do one of the following steps to open the study into the external application.

   a. Right-click the study in the study list and select the external application from the resulting right-click menu.

      *Result:* For sites with a Centricity PACS back-end server, for exam searches using a study UID (SUID): If the exam selected has one study associated with it, the external application selected launches. If the exam selected has more than one study associated with it, the external application selected does not launch and a message displays.

   b. Open the study in the viewer and hover over the External Application icon  in the toolbar. Select the external application from the drop-down menu.

   **Note** For information about enabling the launching of external applications for your site, contact your Site Administrator or GE Service Representative.

   Limitations of access to the study search screen are listed below.

   - If ZFP is launched in open API proxy mode or from an external application URL, and there are multiple studies, then the studies will display on the Study Search screen with no access to filter criteria or worklists.
   - When ZFP is launched from an external system using SUID or an accession number and a patient MRN, then the Study Search icon is not available unless the site-wide setting for Search parameter is set to true.
   - When ZFP is launched using a patient MRN as a URL parameter, then the study search control lists all the studies for the given patient MRN. You can select the study from the available list, and the ZFP viewer loads the study. There is no access to search functions or configured worklists.

     To return to the study list, select the Study Search icon.

     If there is a single study associated with the MRN, then it is launched in the Viewer directly, and no access to study search is allowed.

   **Note** For more information about your site's setting for the worklist or Search function, see your system administrator or GE Field Engineer.

## 2.9.1 Filter Pane

Notes about the Filter pane:

- In open API proxy mode, all filters (and the **Reset** and **Search** buttons) are disabled. The search criteria cannot be changed.
- In inbound mode, all filters (and the **Reset** and **Search** buttons) are disabled unless a system-wide configuration property is enabled. With the property enabled, all filters and buttons are enabled and the search criteria can be changed. See your GE Service Representative for details.

- **Wildcard search in open API proxy mode**: With ZFP connected to either a Centricity PACS or Enterprise Archive back-end server, a study search while in open API proxy mode does not apply wildcards automatically. You must enter the wildcard manually in order to conduct a wildcard search. The CPACS wildcard is the percent sign (%), and the EA wildcard is the asterisk (*).

The Filter pane on the Study Search screen includes the following search fields:

Table 2–3 Search Fields in the Filter Pane

| Search Field: | Description: |
|---|---|
| Patient Name | Use this field to search on a patient's name. You can use a comma to separate the last name from the first name. For example, "Doe,John A".<br>**For Chinese, Japanese and Korean languages (CJK):** For sites with a Centricity PACS back-end server, you can search for a patient name using ideographic and/or phonetic symbols. The worklist will return results containing the ideographic and/or phonetic symbols and Latin symbols (if ZFP is configured to support Latin).<br>When searching for a patient name in CJK, the equal sign delimiter (=) is required. You can use one or two delimiters in the search field. By default, if no delimiter is used, the search will be in Latin only. Anything after the first delimiter means a search for ideographic name. Anything after the second delimiter means a search for phonetic name. |
| Pt Identifier | Use this field to search on a patient's medical record number (MRN).<br>Search results display in the **Pt Identifier** column in the worklist results pane.<br>When displayed in the viewer, the primary study includes the patient ID in the title bar.<br>For sites with a Centricity PACS back-end server that are configured to support NHS patient IDs, this field will read **Patient Identifier**. Use this field to search on a patient's MRN ID or NHS ID within the NHS domain configured for your site. Search results in the worklist will display an **NHS** column next to the **Pt Identifier** column. |
| Pt ID Institution | This field allows you to limit your search criteria to studies that reside in a specific institution (or domain). You can widen the search to include all institutions that are integrated with ZFP. Search results display in the **Pt ID Inst** column in the worklist results pane. When displayed in the viewer, the primary study includes the name of the institution in the title bar.<br>For ZFP with a CPACS back-end, this field displays only when ZFP is configured with more than 1 institution.<br>For ZFP with an EA back-end, this field displays only when ZFP is configured with Cross Enterprise Display. Cross Enterprise Display is supported with ZFP on an EA back-end only. By design, a search on a specific institution (using Cross Enterprise Display) will also retrieve correlating studies from other configured institutions in order to provide a more accurate patient history. |
| Accession Number | Use this field to search on a study's accession number. |
| Date of Birth | The valid date format is ***dd-mmm-yyyy***, for example, ***12–Feb-1994***. |

| Search Field: | Description: |
|---|---|
| Referring Physician | If only one referring physician is configured for the My Studies worklist (for sites with a Centricity PACS back-end server), then this search field is disabled with the referring physician's name displayed in the filter field.<br>If multiple referring physicians are configured for the Studies worklist (for sites with an Enterprise Archive back-end server), then this search field is not displayed.<br>**For Chinese, Japanese and Korean languages:** For sites with a Centricity PACS back-end server, you can search for a referring physician using the ideographic and/or phonetic symbols. The worklist will return results containing the ideographic and/or phonetic symbols and Latin symbols (if ZFP is configured to support Latin). |
| Study Description | Enter criteria to filter your search based on a study description. This field is disabled when the **All** option is selected in the **Exam Date** field. |
| Exam Status | Options from the drop-down list include: Completed, Cancelled, Dictated, Ordered, Transcribed, Verified, Scheduled, Arrived.<br>Enterprise Archive does not support this search criteria. |
| Modality | Select the modalities that you want included in your search.<br>When the active worklist is configured to include all modalities, then the **All** check box is selected and all modality check boxes are disabled. This configuration will include all modalities in your search. You can narrow your search by selecting individual modalities. Selecting modalities individually automatically disables the **All** check box. |
| Exam Date | **All** is the default exam date period. |

## 2.9.2 Worklists

ZFP worklists provide a custom view of studies that are based on a user group's level of interaction with ZFP.

Worklists allow a site to restrict users from accessing all studies. A configured set of filters help create the worklists. The filters are assigned to user groups based on a site's configuration needs.

Worklists display as tabs on the Study Search screen. The worklists are on the right-hand pane of the screen, which is also known as the worklist results pane. If more than 4 worklists (or tabs) are configured for a system, then a drop-down arrow displays on the last tab. Select the arrow to display a drop-down list box with the additional worklist items.

If no worklists are configured for the Study Search screen, then the following prompt displays when you launch ZFP: "No active worklists have been configured. Please contact system administrator."

**Note** Worklists are not supported and will not display in the Study Search screen when ZFP is configured in open API proxy mode.

### Default Worklists

ZFP includes default worklists. Default worklists are dependent on the back-end server for the system.

| Default worklist: | With back-end: | Description: |
|---|---|---|
| All Studies | Centricity PACS<br>Enterprise Archive | From this worklist you have access to all studies on the system. All search criteria is enabled from the Filter pane. |
| My Studies | Centricity PACS | From this worklist you have access to all studies for a single referring physician.<br>If a referring physician is configured for this worklist, then the **Referring Physician** search field in the Filter pane is disabled with the referring physician's name displayed in the filter field.<br>All other search criteria is enabled from the Filter pane.<br>This worklist is based on specific referring physicians based on groups in the IMS database. |
| Studies | Enterprise Archive | From this worklist you have access to all studies related to referring physicians or a group of referring physicians.<br>If multiple referring physicians are configured for this worklist, then the **Referring Physician** search field in the Filter pane is not displayed.<br>All other search criteria is enabled from the Filter pane.<br>Access can be defined by creating a group in the Active Directory that the worklist can access. |
| Referring Service | Centricity PACS | This worklist is based on specific referring services identified by groups in the IMS database. |
| AE Title | Enterprise Archive | This worklist provides access to multiple virtual archives. All search criteria is enabled from the Filter pane.<br>You can have multiple AE Titles defined within the same worklist. |

## Worklist Icons

| Icon: | With back-end: | Description: |
|---|---|---|
|  <br>Report | Centricity PACS or Enterprise Archive | A report icon indicates that a report is available for the study. A report contains a summary of the clinical findings of the study. Open the study to view the report. |
|  <br>Online Study * | Centricity PACS with an EA archive | This icon indicates that all images and data for the study are stored online (that is, not offline in long-term storage). |

| Icon: | With back-end: | Description: |
|---|---|---|
|  Partial Online Study * | Centricity PACS with an EA archive | This icon indicates that some images and data for the study are stored online. The remaining images are offline. |
|  Offline Study * | Centricity PACS with an EA archive | This icon indicates that all images and data for the study are stored offline in long-term storage. |

* This icon displays only when Direct Streaming is disabled. By default it is enabled. See your GE Service Representative for details on how to disable Direct Streaming.

## Notes Regarding the Filter Pane and the Worklists

- Any worklist can be filtered using criteria in the Filter pane to narrow the search results.
- The results of the search criteria in the Filter pane are applied to the opened worklist only. Selecting another worklist returns the Filter pane to its default settings.
- Search criteria that is applicable to the displayed worklist is pre-populated within the search filters.
- If additional filter criteria is added to a worklist, in order to return to the newly configured worklist, do one of the following:
  - Select the **Reset** button.
  - Select a different worklist and then return to the newly configured worklist.
  - Launch a study and then return to the newly configured worklist.
- If ZFP is launched in open API proxy mode or from an external application URL, and there are multiple studies, then the studies will display on the Study Search screen with no access to filter criteria or worklists.
- To refresh the worklist to view an updated status of offline/partial studies, select the **Search** button. Studies that are now online are updated in the worklist with the Online Study icon.

## Configuring a Worklist

Worklists can be configured. For information about configuring worklists, contact your Site Administrator or GE Service Representative.

## Sorting Worklist Results

In the worklist results pane, the default view is sorted in descending order by exam date. You can select the exam date column heading to toggle between sorting in descending order or in ascending order.

To sort the results by a value other than exam date, select one of the other column headings in the worklist results pane. Select the column heading to toggle the sort between ascending order or descending order.

A triangle pointing downward indicates a descending sort. A triangle pointing upward indicates an ascending sort.

## Im Column

On the worklist results pane, the **Im** column shows the number of images in each study. The **Im** column displays if ZFP is running on a Centricity PACS back-end server or an

Enterprise Archive (EA) back-end server. If the database has 0 (zero) for an image count, then a 0 displays in the image count column.

If the EA is connected to a non-EA archive, then a blank image count is displayed, due to not having series-level information. Multi-frame series are referenced as 1 img for each multi-frame set in the series.

#### Se Column

On the worklist results pane, the **Se** column lists the total number of series for each study.

### 2.9.3 Default Settings for Opening a Study

There are several default displays for opening a study. The default display used by ZFP depends on the information available in the study.

- **When a study contains a report, Key Image Notes (KIN), and images:** The report displays on the left half of the screen and the Key Images display on the right half of the screen by default when the study is opened.
- **When a study contains only Key Image Notes (KIN) and images:** The Key Images only display on the screen in a single viewport by default when the study is opened.
- **When a study contains only images:** For the ZFP desktop, the images display in a 2x2 layout by default for CT, MR, PET/CT, and NM modalities, and in View_H (horizontal layout) by default for all other modalities. For the ZFP iPad, the images display in Full View layout by default for all modalities.

ZFP also displays the label for each study, whether it is Primary or Comparison. Although these labels might appear in other locations in the application, this label also appears in the following locations in the application.

- At the top of the viewport where the study is displayed
- In the Navigator

For ZFP iPad and ZFP iPad mini, the first images displayed when you open a study are lossy (compressed) images. This is the default behavior. To view the lossless image for the displayed image only, tap the “Lossy” label in the bottom corner of the active viewport.

## 2.10 Launching Web-based External Applications

The configuration of external applications is done on a site-wide basis. For information about external applications installed at your site, see your System Administrator or GE Field Engineer.

To launch a web-based external application:

1. Make sure you have a study open in the viewer.
2. Make the viewport of the study active.
3. In the toolbar, hover over the External Application icon  and select the external application from the drop-down menu.

   The external application launches.

   **Note** If you want to open a study for a different patient during the current session, make sure you close the external application first. The following

message displays if an external application is open and you try to open a study for a different patient during the same session: “You have opened an external window during this session. Make sure it is closed before selecting another patient.”

## 2.11 Maximizing and Restoring Viewports

**Note** This topic is for the ZFP desktop version only.

Viewport maximize and restore lets you maximize a viewport to a larger view and then to restore the viewport(s) to the original layout. This feature lets you quickly switch views without switching layouts, for faster access to viewing enlarged images.

1. To maximize a viewport, double-click a viewport that is not already maximized.

   *Result:* The viewport is maximized to fit the area of the entire screen.

2. To restore a maximized viewport to its original layout, double-click the viewport.

   **Note** When you switch between maximized and restored views, annotation(s), image manipulation(s), and image selection(s) do not change. If the Full View layout is selected from the Layout menu, then the double-click action is disabled. When you select a layout from the Layout menu, the selected layout setting is applied.

## 2.12 Viewing Lossy or Lossless Images

**Note** This topic is for the ZFP desktop version only.

With a study open in the viewer, you can enable or disable lossless progression for image display. This applies to the primary study and all comparison studies.

**About lossy compression**: The study's data is compressed and delivered to your computer in that form to enhance system performance. "Lossy" means that some of the image data is lost in the compression; therefore, the image quality is compromised. You can enrich the image quality at any time by requesting a lossless compression.

**About lossless compression**: The study's data is compressed and delivered to your computer in the form of lossy, but the image gradually receives the rest of the data after the initial display. Thus, the lossless data is transmitted, and there is no loss to the image quality. The benefit of lossless compression is that it provides enough image data for you to begin the diagnosis while you wait for the rest of the transmission.

Lossless progression is the default behavior.

Table 2–4 Enable and Disable Lossless Progression

| To: | Do this: |
|---|---|
| Enable lossless progression for image display | The Lossy/Lossless Image Quality icon in the toolbar  is selected when lossless progression is disabled. Click the icon to turn it off and enable lossless progression.<br>Any lossy data being downloaded will progress to lossless. |

| To: | Do this: |
|---|---|
| | In the visible viewports, lossless download starts for each series that is already downloaded as lossy. Once lossless images are downloaded, the “Lossy” overlay on the viewport is removed.<br>Subsequent series are loaded as lossy with a progression to lossless.<br>**Note**: If your network speed is 25 Mbps or lower, then ZFP disables lossless progression while the images are loading so that you can view images faster. Lossless progression remains disabled after the images are loaded. To resume lossless progression, click the Lossy/Lossless Image Quality icon to turn it off. |
| Enable lossless progression for a single image | Click the “Lossy” overlay on the viewport. Once the lossless image is downloaded, the “Lossy” overlay for that viewport only is removed. The system behavior as lossy is maintained.<br>**Note**: If the original image quality is lossy compression, then lossless image quality cannot be retrieved. When you select the “Lossy” overlay, a tooltip displays to indicate that lossless progression for the image is unavailable. |
| Disable lossless progression for image display | From the toolbar, click the Lossy/Lossless Image Quality icon.<br>Any lossless data being downloaded when this option is selected is stopped immediately.<br>Subsequent images and series are loaded as lossy only.<br>Lossless data that is already downloaded remains lossless.<br>A “Lossy” overlay is positioned in the lower-left corner of each viewport that displays a lossy image. |

**Note** The Lossy/Lossless Image Quality icon does not display in the toolbar for 3D studies (MIP, MPR, or volume rendering).

# 2.13 Showing and Hiding Overlays

The Overlay icon  on the toolbar is a toggle button for showing or hiding the overlays in a viewport.

**For ZFP desktop:** When an image is loaded, Overlay Enhancement turns off automatically if the pixel size is smaller than 256 to allow the user an unobstructed view of the image. Overlay Enhancement turns on again when the browser is adjusted to a higher size and no side is 256 pixels or lower. The pixel value of 256 is based on viewport size.

Viewport overlays include:

- In the upper-left corner: Series name and description, series number, and image number.
- In the upper-right corner: Study descriptor “Primary” or “Comparison”, series date and time.
- In the lower-left corner: “Lossy” (if applicable)
- In the lower-right corner: “Key Image” (if applicable), “Calibrated” (if applied), zoom factor, and window/level and window/width values.

Notes about overlays:

- The yellow orientation overlay remains visible when you hide overlays. The Overlay icon does not control the orientation overlay.
- With Cross Enterprise Display enabled, information displayed on an overlay for a comparison study derives from data that is saved on the actual archive (that is, it is not consolidated with the primary study). If a name on a comparison study differs from the name on the primary study, both names will show up when displayed in their respective viewports.

## 2.14 Using the Navigator

Use the Navigator to load an image series, a report, key image notes (KIN), or to identify studies in the ZFP viewer.

The Navigator's image thumbnails display borders to indicate which series are displayed in the viewports. The image thumbnail with a blue border indicates the active viewport.

**Integration with Cross Enterprise Display:** With ZFP integrated with Cross Enterprise Display, the Series Selector will contain all studies associated with the primary study. This includes comparison studies with matching patient ID, name, and institution, and correlating studies for the same patient with different patient IDs and names from across all institutions configured for the site. This behavior provides a more accurate patient history.

**Note** Cross Enterprise Display is supported with ZFP on an EA back-end only.

**Note** For information about integrating ZFP with Cross Enterprise Display, contact your GE Service Representative.

Table 2–5 Using the Navigator

| To: | Do this: |
|---|---|
| Display the Navigator | By default, the Navigator displays automatically when a study is opened in the viewer.<br>The Navigator displays vertically on the left side of the screen. It contains all the studies available for the patient in chronological order. If present, the report, KIN, and SR information are grouped under the appropriate study.<br>To open and close the Navigator manually, select the Navigator toolbar icon  .<br>You can configure the Navigator so that it does not display automatically when opening a study. Contact your GE Service Representative for details. |
| See the details for a study | Select the study in the Navigator.<br>Thumbnail images display for KIN and series, which you can drag into the required viewport.<br>The middle image in a series is the thumbnail image. For a series with multi-frame images, the middle frame image is the thumbnail image. This applies to studies for configurable modalities. The default modalities are CT, MR, NM, US, XA and PT. For studies from all other modalities, the first image in the series is the thumbnail image.<br>If a report is available, a report icon  displays. |

| To: | Do this: |
|---|---|
| Open a series from an online study | Do one of the following:<br>● Double-click (double-tap for ZFP iPad) the series thumbnail in the Navigator to display the series in the selected viewport.<br>● Drag and drop the series from the Navigator into a viewport. |
| Open a series from a partially online comparison study | Do one of the following:<br>● With Direct Streaming *enabled* (the default), select the study from the Navigator, and then drag and drop the series into a viewport.<br>● For ZFP with a CPACS back-end with an EA archive, if Direct Streaming is *disabled*, do the following:<br>**1)** Select the study from the Navigator. A dialog box displays.<br>**2)** Select **Yes**. ZFP fetches the offline images, and the Navigator is expanded with image thumbnails for the entire study. Or select **Display Partial Study** to ignore the offline images and display image thumbnails for the online images only.<br>**3)** Drag and drop the series into a viewport. |
| Open a series from an offline comparison study | Do one of the following:<br>● With Direct Streaming *enabled*, select the study from the Navigator, and then drag and drop the series into a viewport.<br>● For ZFP with a CPACS back-end with an EA archive, if Direct Streaming is *disabled*, do the following:<br>**1)** Select the study from the Navigator. ZFP prompts you if you want to fetch the study from the long-term archive.<br>**2)** Select **Yes**. ZFP fetches the study, and the Navigator is expanded with image thumbnails for the study.<br>**3)** Drag and drop the series into a viewport. |
| Open a report for a study | Double-click (double-tap for ZFP iPad) on the report icon for the study for which you want to view the report. The report displays in a pane between the Navigator and the image viewports. |
| Close a report you opened using the Navigator | Double-click (double-tap for ZFP iPad) the report icon in the Navigator. |

Table 2–6 Navigator Icons

| Icon: | With back-end: | Description: |
|---|---|---|
|  <br>Report | Centricity PACS or Enterprise Archive | A report icon indicates that a report is available for the study. A report contains a summary of the clinical findings of the study. Open the study to view the report. |
|  <br>Online Study * | Centricity PACS with an EA archive | This icon indicates that all images and data for the study are stored online (that is, not offline in long-term storage). |

| Icon: | With back-end: | Description: |
|---|---|---|
|  Partial Online Study * | Centricity PACS with an EA archive | This icon indicates that some images and data for the study are stored online. The remaining images are offline. |
|  Offline Study * | Centricity PACS with an EA archive | This icon indicates that all images and data for the study are stored offline in long-term storage. |

* This icon displays only when Direct Streaming is disabled. By default it is enabled. See your GE Service Representative for details on how to disable Direct Streaming.

# 2.15 Using the Series Selector

The Series Selector allows easy access to comparison studies for a patient. The comparison studies are identified based on MRN, for sites with multiple identifiers on EA. ZFP displays other studies with an MRN that is in the same domain.

**Integration with Cross Enterprise Display:** With ZFP integrated with Cross Enterprise Display, the Series Selector will contain all studies associated with the primary study. This includes comparison studies with matching patient ID, name, and institution, and correlating studies for the same patient with different patient IDs and names from across all institutions configured for the site. This behavior provides a more accurate patient history.

**Note** Cross Enterprise Display is supported with ZFP on an EA back-end only.

**Note** For information about integrating ZFP with Cross Enterprise Display, contact your GE Service Representative.

Table 2–7 Using the Series Selector

| To: | Do this: |
|---|---|
| Display the Series Selector | Do one of the following:<br>● Select the Series Selector icon  on the toolbar.<br>● In the viewport for an open study, select the study date.<br>● In an empty viewport, right-click from the ZFP desktop, or tap from the ZFP iPad. |
| Display the studies in the Series Selector | On the Series Selector bar, select the symbol (>). In the Series Selector, the primary series displays in bold. Other series for a patient that are currently displayed in at least one viewport have a check mark ✓ next to them in the Series Selector. |
| Expand or collapse the tree view in the Series Selector | Select the symbol (>). |
| Filter the list | Use the modality filtering controls at the top of the Series Selector. |
| Open a series from an online study | Select the row for the series. |

| To: | Do this: |
|---|---|
| Open a series from a partially online comparison study | Do one of the following:<br>● With Direct Streaming *enabled* (the default), select the row for the series.<br>● For ZFP with a CPACS back-end with an EA archive, if Direct Streaming is *disabled*, do the following:<br>**1)** Select the study from the Series Selector. ZFP prompts you if you want to fetch the rest of the study from the long-term archive.<br>**2)** Select **Yes**. ZFP fetches the offline images, and the Series Selector is expanded with series information for the entire study. Or select **Display Partial Study** to ignore the offline images and display series information for the online images only.<br>**3)** Select the row for the series. |
| Open a series from an offline comparison study | Do one of the following:<br>● With Direct Streaming *enabled* (the default), select the row for the series.<br>● For ZFP with a CPACS back-end with an EA archive, if Direct Streaming is *disabled*, do the following:<br>**1)** Select the study from the Series Selector. ZFP prompts you if you want to fetch the study from the long-term archive.<br>**2)** Select **Yes**. ZFP fetches the study, and the Series Selector is expanded with series information for the study.<br>**3)** Select the row for the series. |
| Close the Series Selector | Select the “X” at the top right of the Series Selector dialog box, select anywhere else on the screen, or select the Series Selector icon on the toolbar. |
| Open a report using the Series Selector | Select the row listing the report that you want to view. The Report icon is not available in the Series Selector. |

Table 2–8 Series Selector Icons

| Icon: | With back-end: | Description: |
|---|---|---|
|  <br>Online Study * | Centricity PACS with an EA archive | This icon indicates that all images and data for the study are stored online (that is, not offline in long-term storage). |
|  <br>Partial Online Study * | Centricity PACS with an EA archive | This icon indicates that some images and data for the study are stored online. The remaining images are offline. |
|  <br>Offline Study * | Centricity PACS with an EA archive | This icon indicates that all images and data for the study are stored offline in long-term storage. |

* This icon displays only when Direct Streaming is disabled. By default it is enabled. See your GE Service Representative for details on how to disable Direct Streaming.

## 2.16 Using Layouts

You can use layouts to select a desired arrangement of viewports on a screen.

The series loaded in each viewport is according to the layout shown. When you change layouts, the series loaded in each viewport displays according to the new layout selected. If there are fewer series than the viewports in the layout, then the remaining viewport(s) remain blank.

1. To change layouts, use the toolbar to select one of the options from the **Layout** drop-down menu.

Table 2–9 Layout Options

| Layout: | Description: | For ZFP desktop? | For ZFP iPad? |
|---|---|---|---|
|  Full | A single viewport is displayed. If you switch from a multi viewport layout to a full view layout, the series displayed in the first viewport is displayed in Full View mode. To change from another view to Full View, double-click (double-tap for ZFP iPad) the viewport.<br>This is the default layout for ZFP iPad. | Yes | Yes |
|  View_H | Two viewports are displayed. The layout is divided horizontally with one viewport on the left side of the window and one viewport on the right side of the window.<br>For ZFP desktop, this is the default layout for all the modalities except for CT, MR, PET/CT, and NM. | Yes | Yes |
|  View_V | Two viewports are displayed. The layout is divided vertically with one viewport on the upper half of the window and one viewport on the lower half of the window. | Yes | Yes |
|  View_1+2 | In this layout there are three viewports displayed. The first three series from the study are displayed in the available three viewports. The first viewport is in the left half of the layout area. The second and third viewports are in the right half of the layout area and are split vertically. | Yes | No |

| Layout: | Description: | For ZFP desktop? | For ZFP iPad? |
|---|---|---|---|
|  View_2+1 | In this layout there are three viewports displayed. The first three series from the study are displayed in the available three viewports. The first and second viewports are in the left half of the layout area and are split vertically. The third viewport is in the right half of the layout area. | Yes | No |
|  View 2x2 | There is one series displayed in each of the four viewports. The first series is in the top left viewport. The second series is in the top right viewport. The third series is in the bottom left viewport. The fourth series is in the bottom right viewport.<br>This is the default layout for the CT, MR, PET/CT, and NM modalities. | Yes | No |

# 2.17 Synchronizing Parallel Series

**Note** This topic is for the ZFP desktop version only.

Prerequisites:

- The series to be synchronized must be open.
- The series to be synchronized must be in the same plane of reference, such as all series being coronal, all series being sagittal, or all series being axial.

1. Click the Synchronize icon  in the toolbar to activate it.

   *Result:* All open series with the same plane of reference are synchronized.

2. To add more series to synchronize, use the Navigator or Series Selector to add the series to a viewport.

3. To manually scroll through series that are synchronized, select the Scroll icon  in the toolbar. Then either click and drag your mouse or use your mouse wheel.

4. To navigate to the first image or the last image of a synchronized series, make one of the synchronized viewports active and press the Home key or End key on the keyboard.

# 2.18 Using Presentation States

When you open a study in the ZFP viewer, the program that invokes the ZFP viewer automatically passes to the ZFP viewer the presentation state information that was saved in the study, such as measurements, annotations, zoom, pan, flip or any grayscale presentation states (GSPS). The presentation state information is automatically available when you open the study in ZFP.

If one presentation state is saved in the study in the application passing the study to ZFP, then that presentation state is automatically applied to the study when you open it in ZFP.

If presentation state information is available, the most recent presentation is applied when you open the study. If there is more than one presentation state for the study, you can select it.

1. If more than one presentation state was saved in the study in the application passing the study to ZFP, you can select and apply different presentation states using the **Presentation State** toobar icon. 
   - The drop-down menu for this icon contains all the presentation states related to the opened study. The presentation states are applied only to the images that are relevant.
2. Select the desired presentation state from the **Presentation State** drop-down menu to apply it.
3. To reset the presentation state or remove any presentation state applied to a study, hover on the **Presentation State** toolbar icon and select **Reset Presentation State** from the resulting drop-down menu.
4. If connected to a Centricity PACS back-end server, and the ZFP viewer contains a study with an RPPS object generated by CPACS, do the following.
   **1)** Using the Navigator or study list, open the study for viewing.
   The most recent RPPS Presentation State is displayed.
   **2)** On the toolbar, hover over the **Presentation States** icon to open the drop-down menu.
   The RPPS Presentation State is displayed as an option called **System** in the drop-down list.

# 2.19 Scrolling Through Images in a Series

**Note** This topic is for the ZFP desktop version only.

Scrolling lets you use your mouse or the keyboard to page through an image series or multi-frame image.

1. Make sure the Scroll icon  is selected in the toolbar. By default the Scroll icon is selected when you open a study. You can also select the Scroll icon from within the viewport in which you are working by selecting the “Ser / Img” overlay.
2. To scroll through the images, do one of the following from inside the active viewport:
   - To increase the image number (to move toward the end of the series), hold down the left mouse button and drag the mouse down once. ZFP scrolls continuously through the images. Release the left mouse button to stop scrolling.
   - To decrease the image number (to move toward the start of the series), hold down the left mouse button and drag the mouse up once. ZFP scrolls continuously through the images. Release the left mouse button to stop scrolling.

   **Note** The scrolling stops automatically when you reach the end or start of the series.

   **Note** **Scroll wheel:** As an alternative, you can roll the scroll wheel down / toward you to scroll forward through a series of images, or roll the scroll wheel up / away from you to scroll backward through a series of images.

   **Note** **Fast scroll:** To quickly navigate through a series of images, hold down the Shift key while you scroll. Fast scrolling will skip 10% of the total

number of images at a time as you scroll through the series. Use fast scrolling with either the left mouse button or the scroll wheel.

**Keyboard shortcuts:** You can also use the following keyboard shortcuts to navigate through an image series or multi-frame image:

**Note** Make sure the intended series is active before using keyboard shortcuts.

| Action: | Keyboard Shortcut: |
|---|---|
| Navigate to the first image in the series, or to the first frame of a multi-frame image series. | Press the **Home** key on the keyboard. |
| Navigate to the last image in the series, or to the last frame of a multi-frame image series. | Press the **End** key on the keyboard. |
| Navigate to the next image in the series or to the next frame of a multi-frame image series.<br>or<br>Navigate from the last frame of a multi-frame series to the first frame of the multi-frame series. | Press the right arrow key on the keyboard.<br>Hold down the right arrow key to scroll forward continuously through the images. Use the right arrow key with the Shift key to fast scroll through the images. |
| Navigate to the previous image in the series or to the previous frame of a multi-frame image series.<br>or<br>Navigate from the first frame of a multi-frame series to the last frame of the multi-frame series. | Press the left arrow key on the keyboard.<br>Hold down the left arrow key to scroll backward continuously through the images. Use the left arrow key with the Shift key to fast scroll through the images. |
| Navigate to the next KIN/ image/ series in the study.<br>or<br>Navigate to the next series in a global stack. | Press the down arrow key on the keyboard.<br>**Note** This keyboard shortcut is not valid when the last KIN/ image/ series is loaded in the active viewport. |
| Navigate to the previous KIN/ image/ series in the study.<br>or<br>Navigate to the previous series in a global stack. | Press the up arrow key on the keyboard.<br>**Note** This keyboard shortcut is not valid when the first KIN/ image/ series is loaded in the active viewport. |
| Navigate to the middle image of a series. | Press the **Insert** key on the keyboard. |

# 2.20 Using Global Stack

**Note** This topic is for the ZFP desktop version only.

In global stack mode, all series or images associated with a series or image in the active viewport in which global stack is applied are combined into a single, new physical series. You can scroll through the single physical series in sequence, with no interruption between series.

**Notes about global stack:**

- You can synchronize and cross-reference a global stack series.
- Global stack is not applicable to studies that contain multi-frame images.

- Global stack is automatically applied and displays in Full View whenever you load images of the following modality types.
  - CR
  - DX
  - DR
  - RF
  - MG

  If you change the layout for an image series of type CR, DX, DR, RF, or MG from Full View layout to any other layout, global stack is automatically removed from these series, and manipulations applied are not retained.

To apply a global stack to a series:

1. Right-click in the viewport and select **Global Stack** from the pop-up menu. The global stack series is displayed. The text “GLOBAL STACK” displays in the upper-left corner of the viewport for each image that is included in the global stack.
2. To navigate to the next or previous series in a global stack, press the down and up arrow keys respectively on the keyboard.

# 2.21 Cine Overview

Cine lets you see all multi-frame images in the study in a cinematic "loop." Each image in the study is displayed sequentially as cine automatically pages forward through the stack. You can pause or stop the cine. You can also use paging/scrolling to go to the next image in the sequence. The default speed of cine is 30 frames per second (fps).

The following image manipulation tools are supported while playing cine in auto cine mode for multi-frame images and in manual cine mode for non-multi-frame images:

- Overlay On/Off
- Zoom
- Pan
- Rotate Right
- Flip (horizontal and vertical)
- Window/Leveling and Window/Width
- Invert
- User-selected preset window

**Note** Manual cine cannot be applied to multiple viewports in parallel.

## 2.21.1 Using Cine with a Study

To use cine with a study:

1. Do one of the following:

- For ZFP desktop, if the viewport contains a multi-frame image, cine plays automatically once the required data is finished loading. Cine also plays automatically on multiple viewports even when you change to a different layout.

  For non-multi-frame images, right-click in the viewport and select **Cine** from the pop-up menu.

- For ZFP iPad, select the cine icon  from the toolbar to apply the cine controls to the active viewport.

The text “Cine” displays in the upper-left corner of the viewport.

2. Use the cine control buttons as necessary to adjust the cine.

Table 2–10 Cine Control Buttons

| Control button: | Description: |
|---|---|
|  Pause/Play | This is a toggle button. To pause the cine in the active viewport, select the Pause button. The Pause button changes to a Play button and the cine pauses. To resume the cine, select the Play button. The Play button changes to a Pause button and the cine resumes.<br>**Note** When you pause cine for multi-frame studies with monochrome images, you can use the toolbar (or the right-click menu for ZFP desktop users) to adjust the Window Width or Window Level settings for the series. |
|  First | Displays the first frame of the multi-frame image. |
|  Last | Displays the last frame of the multi-frame image. |
|  Next | Displays the immediate next image. If the cine loop is in play mode, it stops the play and displays the immediate next image. |
|  Previous | Displays the immediate previous image. If the cine loop is in play mode, it stops the play and displays the immediate previous image. |
|  Stop | Stops the cine in the active viewport. For mutli-frame images, the cine controls remain shown when cine is stopped. For non-mutli-frame images, the cine controls close in the active viewport when cine is stopped. |
|  Slider | Changes the speed at which the cine plays. |

## 2.21.2 Using Multi-slice Cine with a Study

Multi-slice cine lets you play in cine mode a study with more than one image, such as CT, MR, PET/CT, or NM. One viewport at a time can play multi-slice cine. The default frame rate for multi-slice images is 5 frames per second (fps).

The following image manipulation tools are supported while playing cine in auto cine mode for multi-frame images and in manual cine mode for non-multi-frame images.

- Overlay On/Off
- Zoom
- Pan
- Rotate Right
- Flip (horizontal and vertical)

To use multi-slice cine with a study:

1. Click the viewport containing the multi-slice image.
2. Do one of the following:
   - For ZFP desktop, right-click on the active viewport and select **Cine** from the pop-up menu. The viewport changes to cine mode and starts playing lossy cine and then lossless cine.
   - For ZFP iPad, select the cine icon  from the toolbar. The viewport changes to cine mode and starts playing lossy cine only.
3. To play multi-slice cine for a different viewport, pause the currently running cine, right-click the desired viewport and select **Cine** from the pop-up menu.

   When cine mode starts in the currently active viewport, the cine controls toolbar displays.
4. Use the cine control buttons as necessary to adjust the cine.

# 2.22 Window/Level and Window/Width Overview

Window/level and window/width let you change the brightness and contrast settings of images, including RGB color images. Changing the window/level changes the image brightness, and changing the window/width changes the image contrast. The window and level values display in the lower-right corner of each viewport.

## 2.22.1 Adjusting Window/Level and Window/Width Settings

Window/level changes are applied to all images in a study, including RGB color images.

**Note** Window/level is supported while playing cine in auto cine mode for multi-frame images and in manual cine mode for non-multi-frame images.

**Note** **Handling lossy images:** Any window/level or window/width adjustment done to lossy images will also be done to the lossless images upon download. The viewer will then propagate the new windowing value to all lossless images in the same series.

See the table below for how to adjust window/level and window/width settings.

Table 2–11 Adjusting Window/Level and Window/Width Settings

| To: | Do this for ZFP desktop: | Do this for ZFP iPad: |
|---|---|---|
| Adjust the window/level (brightness) | Right-click and drag the mouse pointer up or down. Release the right mouse button to accept the displayed brightness level. The window/level changes are applied to all images in the study.<br>**Alternative option:**<br>**1)** Do one of the following to activate the window/level tool:<br>● Click the window/level icon  on the toolbar.<br>● In the viewport, click the W/L information in the overlay.<br>● Right-click in any viewport and select the tool from the pop-up menu.<br>**2)** Click and drag the mouse pointer on the image up or down. Release the mouse button to accept the displayed brightness level. | Tap the viewport and swipe a single finger up and down.<br>**Note**: When using the tap and swipe gestures, make sure that you swipe your finger within two seconds of the tap. If you do not do this, the intended gesture combination of tap and swipe does not work, and the system ignores the tap and treats the swipe as a scroll image gesture. |
| Adjust the window/width (contrast) | Right-click and drag the mouse pointer left or right. Release the right mouse button to accept the displayed contrast. The window/width changes are applied to all images in the study.<br>**Alternative option:**<br>**1)** Do one of the following to activate the window/level tool:<br>● Click the window/level icon  on the toolbar.<br>● In the viewport, click the W/W information in the overlay.<br>● Right-click in any viewport and select the tool from the pop-up menu.<br>**2)** Click and drag the mouse on the image left or right. Release the mouse button to accept the displayed contrast. | Tap the viewport and swipe a single finger left or right.<br>**Note**: When using the tap and swipe gestures, make sure that you swipe your finger within two seconds of the tap. If you do not do this, the intended gesture combination of tap and swipe does not work, and the system ignores the tap and treats the swipe as a scroll image gesture. |

### 2.22.2 Adjusting Window/Level and Window/Width Preset Settings

Window/level and window/width changes are applied to all images in a series, including RGB color images. To apply window/level preset settings only to certain images in a series, select the desired images before adjusting the settings.

**Note** **Handling lossy images:** Any window/level or window/width preset setting (including invert) applied to a lossy image will also be applied to the lossless image upon download. The viewer will then propagate the windowing value to all lossy images in the same series.

To apply window/level preset settings only to certain images in a series:

1. Select the viewport for which you want to adjust the window/level preset settings.
2. Do one of the following:
   - For ZFP desktop, right-click in the viewport and select **Window Preset** from the pop-up menu.
   - For ZFP iPad, tap **Window Preset** on the toolbar.

   For particular modalities, specific window/level and window/width presets are available in the pop-up menu to help you to directly view the image at the window/level preset settings.

   For the **Window Preset** menu, the list that displays is a site-wide configuration.
3. Select the desired setting.

Table 2–12 Window/Level and Window/Width Preset Settings

| Setting: | Description: |
|---|---|
| Recommended | This setting applies the optimal settings, as determined by the scanner and sent as DICOM data. This setting displays in the menu only if the scanner sends DICOM information.<br>**Note** If there is no window/level data in the DICOM header, the system automatically applies the **Auto Series** W/L setting, and **Auto Series** is selected in the pop-up menu. Also, in this case, **Recommended** is then disabled in pop-up menu. |
| Auto Series | This setting applies the optimal window/level setting from the exact center of the image to the whole image and then applies that window/level setting to every image in the series. |

*Result:* The window/level preset setting is applied to the selected viewport.

## 2.23 Using Annotations and Measurements for 2D

ZFP supports annotations and measurements for 2D. However, saving annotations and measurements is not supported.

The Annotation icons are grouped together for easy access on the toolbar.

Active and inactive annotations are shown in a different color. Active annotations (selected) are yellow, and inactive annotations (not selected) are blue.

1. On the toolbar, select the Annotation icon to open the drop-down menu.

   For ZFP desktop, you can also right-click in a viewport and select **Annotations** from the pop-up menu.

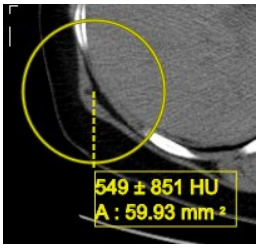
2. Select an icon to apply the action based on the selected annotation.

   The icon selected moves to the top and closes the drop-down menu. It stays active on the toolbar until another annotation is selected.

   The annotation options are listed below.

Table 2–13 Annotation Options for 2D

| Select this icon: | To do this: | For ZFP desktop? | For ZFP iPad? |
|---|---|---|---|
|  Distance | Measure a distance.<br>To edit a distance annotation:<br>● Select the end of the line to resize and reposition the line from that end.<br>● Select the middle of the line to move the entire line to another location.<br>● Select the label to move it to another location.<br>● The distance annotation cannot be edited on the iPad.<br>**Note**: For Ultrasound images with Regional Calibration values and for non-squared pixel images, a line segment drawn using the Distance annotation tool will result in a 0.0 value. The image calibration tool can be used instead to get an accurate line segment value for these types of images.<br>To use the Distance annotation tool on the iPad, do the following:<br>**1)** Touch the point in the DICOM image from where you want to start drawing the line, drag your finger to the point where the line annotation is to be drawn, and hold your fingertip at the end of the line on the screen. The length of the line is displayed in millimeters at the end of the line just drawn.<br>**2)** To stop using the tool, tap the icon on the toolbar to deactivate it. | Yes | Yes |
|  Angle Measurement | Measure an angle.<br>To edit an angle measurement annotation:<br>● Select the end of one of the lines to resize and reposition the line from that end.<br>● Select the label to move it to another location. | Yes | No |

| Select this icon: | To do this: | For ZFP desktop? | For ZFP iPad? |
|---|---|---|---|
|  <br>Elliptical Region | Draw an elliptical region around a region of interest (ROI).<br>The elliptical region displays with a label identifying the surface area for the region of interest, which is shown in average Hounsfield units with a standard deviation (for CT images only). By design, Hounsfield values display as '0' (zero) on lossy CT images.<br>The Elliptical Region icon can be selected if there are multiple annotations created.<br>To edit an elliptical region annotation:<br>● Hover over the circle and select an edit handle, then move or resize the elliptical region.<br>● Select the label to move it to another location.<br>An example of an elliptical region:<br>  | Yes | No |
|  <br>Ellipse | Draw an ellipse (oval) around a region of interest. | Yes | No |
|  <br>Freehand | Freehand draw around a region of interest.<br>To use the freehand annotation tool on the iPad, do the following:<br>**1)** Touch the point in the DICOM image where you want to start drawing the freehand and cover the Region of Interest.<br>**2)** Trace the area (any shape, length and which is to be marked in the annotation).<br>**3)** Once you have traced the Region of Interest, lift your finger from the screen. A line connecting the start and end is automatically created.<br>**4)** To stop using the freehand annotation tool, tap the icon on the toolbar to deactivate it. The toolbar annotation icon is deselected. | Yes | Yes |

| Select this icon: | To do this: | For ZFP desktop? | For ZFP iPad? |
|---|---|---|---|
| Rectangle | Draw a rectangle around a region of interest.<br>With the rectangle selected, you can grab a side or a corner and drag the rectangle to change its size. The Rectangle icon can be selected if there are multiple annotations created. | Yes | No |
| Text | Add a text annotation. | Yes | No |
| Arrow | Add an arrow pointer as an annotation. | Yes | No |
| CTR Measurement | Perform a CTR measurement of the heart and chest. | Yes | Yes |
| Rectangle Shutter | Neutralize (exclude) the display of any of the pixels located outside of a shutter shape. | Yes | Yes |

3. To delete the most recently added annotation, do one of the following:

   - For ZFP desktop: Press the **Delete** key on the keyboard, or right-click on the annotation and select **Delete Annotation > Delete** from the pop-up menu. Each time you press the **Delete** key or click the Delete icon on the annotations toolbar, you can continue to delete annotations in the reverse order in which you added them. For example, to delete the three most recently added annotations, press the **Delete** key three times or click the Delete icon three times.
   - For ZFP iPad: Tap the Delete icon on the annotations toolbar . Each time you tap the Delete icon, the new most recently-added annotation that was drawn is deleted. For example, to delete the three most recently added annotations, tap the Delete icon three times.

   The annotation that was drawn most recently on the DICOM image is deleted.

   After the most recently added annotation is deleted and if there are any other annotations on the image, the new most recently added annotation is highlighted in yellow to show that it is active and selected.

# 2.24 Using Annotations and Measurements for 3D

**Note** This topic is for the ZFP desktop version only.

ZFP supports annotations and measurements for 3D. However, editing and saving annotations and measurements is not supported. The options listed below are also available when you right-click in any viewport and select the desired option from the pop-up menu.

The Annotation icons are grouped together for easy access on the toolbar.

Active and inactive annotations are shown in a different color. Active annotations (selected) are yellow, and inactive annotations (not selected) are blue.

1. On the toolbar, hover over an annotation icon to open the drop-down menu.
2. Click on an icon from the drop-down menu to apply the action based on the selected annotation.

   The icon selected moves to the top of the drop-down menu and closes it. The icon stays on the toolbar until another annotation is selected.

   **Note** ZFP will not have the annotation selected as default when returning back to 2D mode from MPR 3D.

Table 2–14 Annotation Options for 3D

| Select this icon: | To do this: |
|---|---|
|  Distance | Measure a distance.<br>**Note** For Ultrasound images with Regional Calibration values and for non-squared pixel images, a line segment drawn using the Distance annotation tool will result in a 0.0 value. The image calibration tool can be used instead to get an accurate line segment value for these types of images. |
|  Ellipse | Draw an ellipse (oval) around a region of interest. |
|  Rectangle | Draw a rectangle around a region of interest.<br>With the rectangle selected, you can grab a side or a corner and drag the rectangle to change its size. The Rectangle icon can be selected if there are multiple annotations created. |
|  Arrow | Add an arrow pointer as an annotation. |

3. To delete the most recently added annotation, press the Delete key on the keyboard, or select **Delete** in the right-click menu as a submenu under **Delete Annotation**.
   - The annotation that was drawn most recently on the DICOM image is deleted.
   - After the most recently added annotation is deleted and if there are any other annotations on the image, the new most recently added annotation is highlighted in yellow to show that it is active and selected.
   - Each time you press the **Delete** key on the keyboard or click the Delete icon on the annotations toolbar, you can continue to delete annotations in the reverse order in which you added them. For example, to delete the three most recently added annotations, press the Delete key on the keyboard three times or click the Delete icon three times.

# 2.25 Zooming In and Out on an Image

**Important** **Zooming an image may cause some of the image to be moved out of the visible area.**

**Note** Make sure the intended series is active before using the mouse shortcuts.

1. To zoom in and out on an image, do one of the following:
   - For ZFP desktop:
     1) Do one of the following:
        - Click the Zoom icon on the toolbar.
        - In the viewport, click the zoom information in the overlay.
        - Right-click in the viewport and select **Zoom** from the pop-up menu.
     2) Hold down the left mouse button and slide the mouse towards you to zoom in, or slide the mouse away from you to zoom out.

        **Note** As an alternative, you can press and hold the scroll wheel or the middle mouse button and then slide the mouse towards you or away from you to change the zoom factor.
   - For ZFP iPad, pinch in and pinch out using two fingers.

### 2.25.1 Zoom Factor and Layout

On the first display of images in a layout, the images display with a default zoom factor applied, which is based on the viewport dimensions. The default zoom factor is the minimum zoom in that particular layout. You can manually increase zoom, and there is no maximum zoom factor limit.

For each viewport there is a default zoom factor which will be the maximum fit to the viewport. This zoom factor is the minimum zoom possible in the layout.

- When the zoom of the image is less than the default fit zoom of the new layout and you switch the layout, the zoom factor changes and the image is zoomed to the default fit of the new layout.
- When the dimensions of the scaled image are greater than the dimensions would be for the new layout and you switch the layout, the zoom factor applied to the image is retained.

## 2.26 Panning an Image

1. To pan an image, do one of the following:
   - For ZFP desktop:
     1) Select the Pan icon on the toolbar, or right-click in a viewport and select **Pan** from the pop-up menu.
     2) Click and hold the left mouse button and slide the mouse in the direction in which you want to pan.

     Make sure the intended series is active before using mouse shortcuts.
   - For ZFP iPad, do a two-finger drag to pan the image in a viewport.

# 2.27 Rotating an Image

**Note** The Rotate Right option is available in 2D mode only.

1. To rotate an image to the right, select the Rotate Right icon  from the drop-down menu on the toolbar.

   **Note** For ZFP desktop, the Rotate Right icon is also available in the right-click menu as a submenu under **Flip/Rotate**.

   *Result:* The Rotate Right icon moves to the top of the drop-down menu and closes it. The icon remains on the toolbar until another flip or rotate icon is selected.

# 2.28 Flipping an Image

**Note** The Flip option is available in 2D mode only.

1. To vertically flip on an image, select the Flip Vertical icon  from the drop-down menu on the toolbar.
2. To horizontally flip on an image, select the Flip Horizontal icon  from the drop-down menu on the toolbar.

   **Note** For ZFP desktop, the flip icons are also available in the right-click menu as a submenu under **Flip/Rotate**.

   *Result:* The icon selected moves to the top of the drop-down menu and closes it. The icon remains on the toolbar until another flip or rotate icon is selected.

# 2.29 Inverting an Image

Invert grayscale inverts the grayscale of the image in the active viewport. The inversion reverses each pixel on the image, and it also reverses the background.

Inversion done on any one image of the series is applied to all the images of that series (or is applied to all the frames of a multi-frame image).

The invert tool is a toggle tool, so applying the invert tool changes the image to the opposite of the currently displayed grayscale for the image.

Invert is supported while playing cine in auto cine mode for multi-frame images and in manual cine mode for non-multi-frame images.

1. Select the viewport that has the image that you want to invert.
2. Select the Invert icon  on the toolbar.

   **Note** From the ZFP desktop, the invert tool is also available when you right-click in any viewport and select it as a submenu under **Window Preset**.

# 2.30 Using the Rectangle Shutter

The rectangle shutter tool is a manual shutter. It is a geometric mask that you can apply to an image for presentation purposes in order to neutralize (exclude) the display of any of the pixels located outside the shutter shape.

**Notes about shutters**

- The ZFP viewer supports one shutter per image.
- A shutter that you create manually is called a manual shutter. A shutter that dynamically displays because it was saved with a study is called a DICOM shutter or a display shutter.
- You can delete rectangle and ellipse DICOM shutters. To redisplay a rectangle or ellipse DICOM shutter that was saved with a study and that you deleted during your session, close the study and reopen it or reload the study.
- ZFP supports the display and deletion of rectangle and ellipse DICOM shutters that were saved with the study outside of ZFP. Manual creation of rectangle shutters is supported. Manual creation of ellipse shutters is not supported.
- While you are creating a shutter, the area outside the shutter displays as black.
- You can add annotations inside, outside, and across a rectangular shutter.
- If you manipulate an image after applying a shutter to the image, only the image area that remains inside the shutter is visible.

Table 2–15 Using the Rectangle Shutter

| To: | Do this for ZFP desktop: | Do this for ZFP iPad: |
|---|---|---|
| Apply a shutter | **1)** Select the Rectangle Shutter tool  from the annotation drop-down menu on the toolbar.<br>You can also right-click in a viewport and select the tool from the pop-up menu.<br>**2)** In the viewport, click and drag the mouse pointer diagonally to create a square or rectangular shutter for the area you choose. Release the mouse button to apply the shutter to the image. | **1)** Select the Rectangle Shutter tool  from the annotation drop-down menu on the toolbar.<br>**2)** In the viewport, tap and drag your finger diagonally to create a square or rectangular shutter for the area you choose. Lift your finger from the screen to apply the shutter to the image. |
| Pan a shutter | Click on the word “Shutter” and drag the mouse pointer. | ZFP iPad does not support this action. |
| Resize a shutter | Hover over any part of the shutter until the mouse pointer changes to a double arrow shape. Then drag the shutter to resize it. | Tap the word “Shutter” or tap any part of the shutter. When the shutter changes to display shaded circles on its corners, drag your finger on one of the shutter corners to resize it. |
| Delete a shutter | Right-click on the word “Shutter” and select **Delete** from the pop-up menu, or double-click on the word “Shutter.” | Use the Delete Annotation icon  in the Annotation drop-down menu. |

# 2.31 Printing an Image

**Note** This topic is for the ZFP desktop version only.

**Note** Depending on the site's browser settings, you may need to allow pop-ups from ZFP in order to enable printing.

1. Right-click on an image and select **Print Image** from the pop-up menu.
2. From the *Print Document* screen, click **Print**.
3. From the *Print* dialog box, click **OK**.

# 2.32 Removing Annotations and Manipulations From a Series

ZFP supports removing annotations and manipulations from a series.

1. In the viewport, do one of the following:
   - For ZFP desktop, right-click and select **Reset** from the pop-up menu. If the **Reset** option is disabled, then there are no manipulations or annotations applied to the series.
   - For ZFP iPad, use the Delete Annotation icon  in the Annotation drop-down menu.

   *Result:* The following changes from all images in the series are removed:
   - Zoom
   - Pan
   - Window/Level and Window/Width (WL/WW)
   - Invert
   - Rotate
   - Flip
   - Annotations
   - Rectangle Shutter

   **Note** If a zoom or WL/WW operation is removed from a series, then at the time of series load, the zoom value and the WL/WW value reset to the state at which they were when you opened the series.

# 2.33 Viewing Key Images and Key Image Notes

Key Images and Key Image Notes (KIN) are accessible using the Navigator.

1. In the Navigator, locate the **Study** section. Key Images and Key Image Notes are located in this section.
2. Drag a series to the viewport to display it.
3. To display the KIN information, do one of the following:

- From the ZFP desktop, mouse over the **Notes** tab to expand the KIN within the viewport.
- From the ZFP iPad, tap the **Notes** tab to expand the KIN within the viewport.

*Result:* The **Notes** tab opens to display a pane with the key image notes information for the study. For studies with Key Image Notes or Significant Images, the words “Key Image” display as an overlay in the lower-right corner of the viewport.

4. To close the **Notes** tab, do one of the following:
   - From the ZFP desktop, move the mouse pointer away from the **Notes** tab.
   - From the ZFP iPad, tap the **Notes** tab.

   Key Images and Significant Images display as separate thumbnails in the Navigator prior to the series and both are referenced as Key Images.

   If applicable, Significant Images are contained in a single series that is listed prior to any Key Images in the Navigator. In the Navigator, a series that contains only Significant Images does not have a subject heading.

# 2.34 Working With Reports and Exam Notes

Notes on accessing reports and exam notes for a study.

- If a study has a report associated with it, then a report icon displays:
  - In the toolbar 
  - In the Navigator and the Series Selector 
  - In the worklist results pane on the Study Search screen 
- ZFP supports the display of Centricity PACS reports associated with a study. If your system has a Centricity PACS back-end server, you can view exam notes for a study.
- If the study is the primary study, and if there is a report, the Report pane displays automatically after you open the study.
- If the study is not the primary study, you can use the report icon in the toolbar to open the report.
- If there is an exam note but no report for a study, open a report window and then open the exam note.
- For studies with a report and exam notes, you can toggle between the Report and Exam Note tabs.

Table 2–16 Working with Reports and Exam Notes

| To: | Do this: |
|---|---|
| Hide reports for all studies | ZFP must be configured to hide the reports for all studies. For more information, contact your GE Service Representative. |
| View hidden exam notes | ZFP does not support hidden exam notes. |
| Close the report view | Select the close button on the report view, or select the Report icon in the toolbar or in the Navigator. The viewports resize to their previous state. |

| To: | Do this: |
|---|---|
| Copy and paste text from a report | Press Ctrl+A to capture all text in the report, or highlight selected text and press Ctrl+C, and then paste to an external document.<br>You cannot copy images or exam notes. |
| Print a report | **Note**: Printing a report is for ZFP desktop only.<br>**Note**: Depending on the site's browser settings, you may need to allow pop-ups from ZFP in order to enable printing.<br>**1)** Right-click on the report and select **Print Report** from the pop-up menu.<br>**2)** From the *Print Document* screen, click **Print**.<br>**3)** From the *Print* dialog box, click **OK**. |

# 2.35 Working With Basic Structured Reports on EA

If a study has a report associated with it, then a report icon displays:

- In the toolbar 
- In the Navigator and the Series Selector 
- In the worklist results pane on the Study Search screen 

Table 2–17 Working with Basic Structured Reports on EA

| To: | Do this: |
|---|---|
| View a report | Open the study for which you want to view a report. By default the latest report displays on one side of the screen and the study resizes to display on the other side of the screen. Although there might be other reports available for the study, only the latest report displays.<br>With a study already open, select the Report icon from the toolbar, the Navigator, or from the Series Selector. |
| Close the report view | Select the close button on the report view, or select the Report icon in the toolbar or in the Navigator. The viewports resize to their previous state. |

| To: | Do this: |
|---|---|
| Copy and paste text from a report | Press Ctrl+A to capture all text in the report, or highlight selected text and press Ctrl+C, and then paste to an external document.<br>You cannot copy images. |
| Print a report | **Note**: Printing a report is for ZFP desktop only.<br>**Note**: Depending on the site's browser settings, you may need to allow pop-ups from ZFP in order to enable printing.<br>**1)** Right-click on the report and select **Print Report** from the pop-up menu.<br>**2)** From the *Print Document* screen, click **Print**.<br>**3)** From the *Print* dialog box, click **OK**. |

# 2.36 Using the Image Scroll Slider

**Note** This topic is for the ZFP iPad version only.

By default, the ZFP client launches with a single viewport layout and with the image scroll slider displayed at the bottom of the viewport. See below.

Table 2–18 Gestures for Using the Image Scroll Slider

| To: | Do this: |
|---|---|
| Activate the Series Slider / slider bar for image navigation | Tap near the bottom of the screen. |
| Redisplay the image scroll slider | Once the viewport layout is changed to either the View_H or View_V layout, tap the bottom of the viewport. |

# 2.37 Saving an Image to a Local Drive

**Note** This topic is for the ZFP desktop version only.

ZFP supports saving an image to a local drive, including all annotations and manipulations done to the image.

1. If not already done, configure the browser to prompt you where to save images.
2. In the viewport, right-click and select **Save Image** from the pop-up menu.
3. If you configured the browser to prompt you, then save the image with a name and a location that you specify on the local drive. If the browser does not prompt you, then the image is saved to a default location on the local drive.

   *Result:* The image is saved as a JPG to the local drive and includes all annotations and manipulations.

# 2.38 Constructing Standard MPR Images for a Study

**Note** This topic is for the ZFP desktop version only.

Multi-Planar Reformatting (MPR) is a method of reconstructing cross-sections of other planes (such as coronal planes or sagittal planes) from the original plane used in the study (such as axial). Standard MPR renders new slices from an original image.

1. Open the desired study and select the desired series. On the toolbar, hover on the **MPR 3D** drop-down icon and select **MPR**, or open the right-click menu and select **MPR 3D > MPR**.

   *Result:* The MPR viewport displays in fourview, with three panes of localizer images, which are source data from the selected series. The target image, also known as the rendered image, is in the lower right pane The viewport is arranged as shown.

| | |
|---|---|
| **Localizer: coronal** plane of source — upper left pane | **Localizer: sagittal** plane of source — upper right pane |
| **Localizer: axial** plane of source — lower left pane | **Target Image: new slices are rendered** in this dimension — lower right pane |

2. To switch between a 2x2 viewport layout and a 3+1 viewport layout, select **Layout** on the menu bar and select the desired layout.
3. On the toolbar, use the manipulation tools to manipulate an image in any one of the four panes. See the following table for manipulation tools supported, based on the viewport type:

| Viewport Type | Manipulation Tools Supported |
|---|---|
| **Target Viewport** | • Overlay On/Off button to control overlays<br>• Pan – as default<br>• Zoom<br>• Window Level / Window Width<br>• Annotation – Line measurements, Ellipse, Rectangle, and Arrow<br>• Scroll – using left-click or the middle scroll wheel<br>• Rotate – right-click menu<br>• Slab – 4mm, 6mm, 8mm, 12mm, 16mm, 20mm, 25mm, 30mm – right-click menu<br>• Views (Planes) – Sagittal view, Coronal View, and Axial view (as default) – right-click menu<br>• Slice Thickness and Slice Spacing – Located in the bottom of the Target viewport |
| **Localizer Viewport** | • Cross Reference On /Off button to control Cross reference<br>• Pan – as default<br>• Zoom<br>• Window Level / Window Width<br>• Annotations – Line measurements, Ellipse, Rectangle, and Arrow<br>• Scroll - using left-click or the middle scroll wheel |

Initially, the target image (lower right) is axial; this means that the reformatted slices will be axial slices. You can take slices of any plane by using the right-click menu.

Select **Sagittal** to make the target view sagittal and to create sagittal slices, or select **Coronal** to make the target view coronal and to create coronal slices.

For the localizer viewports, the annotations are retained while scrolling. For the target MPR viewport, annotations can be added, but if the MPR rendering is scrolled, changed in views (planes) or rotated, the annotations are not retained.

4. To change the slice thickness for MPR, find the *Thickness Bar* text box at the bottom of the MPR viewport and set the desired value in millimeters.
5. To change the slice spacing for MPR, find the *Slice Spacing* text box at the bottom of the MPR viewport and set the desired value in millimeters.
6. To rotate the 3D images in the viewport using the mouse, right-click and select **Rotate**. Hold down the mouse and move the mouse across the image to rotate it.
7. To close the MPR viewport, click **MPR 3D** on the menu bar and select **Close**, or right-click on the image and click **Close** from the pop-up menu.

**Note** ZFP does not support saving an MPR viewport.

# 2.39 Constructing MIP Images for a Study

**Note** This topic is for the ZFP desktop version only.

Maximum Intensity Projection (MIP) is a rendering mode for reconstructing images. MIP uses the most dense part of the image and renders it at a certain pixel.

1. Open a study and select the desired series. On the toolbar, hover on the **MPR 3D** drop-down icon and select **MIP**, or right-click in the viewport and select **MPR 3D > MIP** from the drop-down menu.

   *Result:* The MIP viewport displays in stacked view, with three panes of localizer images, which are source data from the selected series. The target image, also known as the rendered image, is on the right. The viewport is arranged as shown:

| | |
|---|---|
| **Localizer: coronal** plane of source — upper left pane | **Target Image: a three-dimensional model** — right pane |
| **Localizer: sagittal** plane of source — middle left pane | |
| **Localizer: axial** plane of source — lower left pane | |

2. To switch between a 3+1 viewport layout and a 2x2 viewport layout, select the desired layout from the toolbar.
3. On the toolbar, use the manipulation tools to manipulate an image in any one of the four panes. See the following table for manipulation tools supported, based on the viewport type.

| Viewport Type | Manipulation Tools Supported |
|---|---|
| **Target Viewport** | ● Overlay On/Off button to control overlays<br>● Pan– as default<br>● Zoom<br>● Window/Level and Window/Width<br>● Annotation – Ellipse, Rectangle, and Arrow<br>● Rotate – right-click menu<br>● Views (planes) – Sagittal view, Coronal View, and Axial view (as default) – right-click menu |
| **Localizer Viewport** | ● Cross Reference On /Off button to control cross reference<br>● Pan– as default<br>● Zoom<br>● Window/Level and Window/Width<br>● Annotations – Distance, Ellipse, Rectangle, and Arrow<br>● Scroll - using left-click or the middle scroll wheel |

4. From the toolbar, you can use the Distance tool (for localizer viewports only), Ellipse tool, Rectangle tool, and the Arrow tool to annotate.

   - For the localizer viewports, the annotations are retained while scrolling. For the target MIP viewport, annotations can be added, but if the MIP rendering is panned, zoomed, changed in views (planes) or rotated, the annotations are not retained.

5. To rotate the 3D images in the viewport using the mouse, right-click and select **Rotate** from the pop-up menu. Hold down the mouse and move the mouse across the image to rotate it.

6. To close the MIP viewport, click **MPR 3D** on the toolbar and select **Close**, or right-click in a viewport and click **Close** from the pop-up menu.

   **Note** ZFP does not support saving a MIP viewport.

# 2.40 Constructing Volume Rendering Images for a Study

**Note** This topic is for the ZFP desktop version only.

A series can be rendered as a three-dimensional image.

Data from a single series is used as the source and generates a three-dimensional volume from all the images in that series. Alongside the rendered three-dimensional volume, three orthogonal planes are also displayed: transverse, sagittal and coronal. You can modify the volume by zooming, panning, and rotating it.

1. Open a study and select the desired series. On the toolbar, hover on the **MPR 3D** drop-down icon and select **Volume Render**, or right-click in the viewport and click **MPR 3D > Volume Render** from the pop-up menu.

   *Result:* The Volume Rendering viewport displays in stacked view, with three panes of localizer images, which are source data from the selected series. The target image, also known as the rendered image, is on the right. The viewport is arranged as shown:

| | |
|---|---|
| **Localizer: coronal** plane of source — upper left pane | **Target Image: new slices are rendered in this dimension** — right pane |
| **Localizer: sagittal** plane of source — middle left pane | |
| **Localizer: axial** plane of source — lower left pane | |

2. Initially, the target image (the right pane) is coronal; this means that the reformatted slices will be coronal view. You view any plane, however, by clicking a different target series by using the right-click menu to make the target view sagittal or axial.
3. To switch between a 3+1 viewport layout and a 2x2 viewport layout, select the desired layout from the toolbar.
4. On the toolbar, use the manipulation tools to manipulate an image in any one of the four panes. See the following table for manipulation tools supported, based on the viewport type.

   For the localizer viewports, the annotations are retained while scrolling. For the target Volume Rendered viewport, annotations can be added, but if the Volume Rendering is panned, zoomed, changed in views (planes) or rotated, the annotations are not retained.

| Viewport Type | Manipulation Tools Supported |
|---|---|
| **Target Viewport** | • Overlay On/Off button to control overlays<br>• Pan – as default<br>• Zoom<br>• Annotation – Ellipse, Rectangle, and Arrow<br>• Rotate – right-click menu<br>• Views (planes) – Sagittal view, Coronal View, and Axial view (as default) – right-click menu |
| **Localizer Viewport** | • Cross Reference On /Off button to control Cross reference<br>• Pan – as default<br>• Zoom<br>• Window/Level and Window/Width<br>• Annotations – Distance, Ellipse, Rectangle, and Arrow<br>• Scroll - using left-click or the middle scroll wheel |

5. To rotate the 3D images in the viewport using the mouse, right-click and select **Rotate** from the pop-up menu. Hold down the mouse and move the mouse across the image to rotate it.
6. To close the Volume Rendering viewport, click **MPR 3D** on the toolbar and select **Close**, or right-click in a viewport and select **Close** from the pop-up menu

   **Note** ZFP does not support saving a Volume Rendered viewport.

# 2.41 Working with 2D Cross Reference Lines

Cross reference lines allow cross-referencing of different image planes, such as the sagittal, coronal, and axial image planes, to a specific level or specific point.

In 2D, if cross reference lines exist in the study, they show the opposing planes of a different series of the same study. If a series for a different study is loaded then cross reference lines do not display, even if the opposing image or series is in a different plane.

You can do manipulations and annotation regardless of whether cross reference lines are on or off.

Cross reference lines are yellow, and they are displayed by default.

1. To turn on or turn off cross reference lines, select the Cross Reference icon  from the toolbar.

# 2.42 Working with 3D Cross Reference Lines

**Note** This topic is for the ZFP desktop version only.

Cross reference lines are displayed to show precisely where the image is located in reference to images that are in other planes and also to aid in correlating different planes in the localizers.

If cross reference lines exist in the study, they are displayed by default. Cross reference lines on all localizers display as yellow lines.

You can do manipulations and annotation regardless of whether cross reference lines are on or off.

Table 2–19 Using 3D Cross Reference Lines

| To: | Do this: |
|---|---|
| Turn on or turn off cross reference lines. | Click the Cross Reference icon  on the toolbar. |
| Move a cross reference. | Select and drag the cross reference to the desired new location. |

The other localizers update to correspond to the new location of the cross reference.

# 2.43 Image Calibration

**Note** This topic is for the ZFP desktop version only.

Use image calibration to change the calibration of the active viewport.

Calibrated images contain the overlay *Calibrated* in the lower-right corner of the viewport. Non-calibrated images have no overlay in the viewport. If image calibration is performed on one series in a global stack display, then the *Calibrated* overlay displays in the viewport for that series only in the global stack.

To use the image calibration feature:

1. With a study open in the viewer, right-click in a viewport and click **Image calibration** from the pop-up menu.

   *Result:* The *Image calibration* dialog box displays.

2. Draw a line segment on the image.

   *Result:* The length of the line segment is recorded in millimeters in the *Image calibration* dialog box.

3. If necessary, adjust the length of the line segment by entering a different measurement (in millimeters) in the dialog box.

4. Click **Apply to Series**.

   *Result:* The following prompt displays:

   *It is quite likely that other images were acquired at a different magnification. Using this calibration on such images will yield incorrect measurements. Do you still wish to apply this calibration to other images?*

5. Click **Yes**.

*Result:* The calibration value is applied to the active viewport. The overlay *Calibrated* displays in the lower-right corner of the viewport. To remove the image calibration and the overlay, select **Reset** from the right-click menu.

# 2.44 Measuring a Cardio-Thoracic Ratio

Cardio-Thoracic Ratio (CTR) is the ratio of the maximum transverse diameter of the heart to the maximum diameter of the thorax. The CTR Measurement tool measures the heart size (usually less than 50% is normal) to prevent cardiac diseases. The CTR Measurement tool is primarily used for CR, DX, and CT images, however, any modality is supported.

**Note** CTR measurements are estimated values. Confirm and adjust the placement of the lines as needed.

1. With an image displayed in a viewport, select the annotation toolbar icon and select the CTR Measurement icon  from the drop-down menu.

   **Note** From the ZFP desktop, you can also right-click on the image and select **Annotation > CTR Measurement** from the pop-up menu.

2. Select anywhere on the image.

   *Result:* The following text overlay displays: “Please adjust lines to measure outer and inner diameters.” Also, four vertical boundary lines display across the image. The two outer lines indicate the boundaries for the diameter of the chest, and the two inner lines indicate the boundaries for the diameter of the heart.

3. Adjust the boundary lines to produce the desired results. To move a boundary line, select and drag it. Boundary lines cannot cross other boundary lines.

   *Result:* As you move boundary lines, the measurement information automatically updates. An algorithm calculates the measurements based on the inner edges of the boundary lines, similar to a caliper.

   The following 3 CTR measurements are automatically calculated and displayed in the viewport:

   - Inner: Inner Diameter
   - Outer: Outer Diameter
   - Ratio: % Result

4. To delete the CTR measurement, do one of the following:
   - For ZFP desktop, right-click the label or any boundary and select **Delete Annotation > Delete** from the pop-up menu.
   - For ZFP iPad, double-tap the label or any boundary and select **Delete Annotation > Delete** from the pop-up menu.

## 2.45 Logging Out of ZFP

1. If ZFP is connected to a Centricity PACS back-end server, select the **Logout** icon.

   This icon is located in the upper-right corner of the Viewer screen.

   If you have multiple browser tabs open and you log out from one tab, a web page displays for you to log in again.

   If ZFP is connected to an Enterprise Archive (EA) back-end server, or if you launched the ZFP viewer from an external application, you will not see the **Logout** icon.

   If you have multiple browser tabs open and you try to go to another tab, a logged-out message displays.

## 2.46 Logging In to ZFP After Logging Out

If ZFP is connected to a Centricity PACS back-end server, and ZFP has multiple browser tabs open:

1. Close one of the browser tabs with a ZFP session.

   *Result:* The **Log In** page displays. The remaining open browser tabs display a message that you have logged off.

2. To log back in to the ZFP viewer, click **Log On**.

## 2.47 Configuring ZFP Features

The configuration of certain ZFP features is done at the system level. For information about system-level settings for your site, see your System Administrator or GE Field Engineer.

# 3

# ZFP Support for GSPS

Grayscale Presentation States (GSPS) are defined by the DICOM standard to ensure consistent appearance of images across multiple image viewers and on the modality.

By default, when a study is loaded in the ZFP viewer, the system automatically applies the presentation state in a certain sequence, depending on the back-end server used: a Centricity PACS back-end server or an Enterprise Archive back-end server (EA).

## 3.1 Presentation State Order of Application with a CPACS Back-end

- If Requested Procedure Presentation State (RPPS) exists, then the Presentation State is applied to the study when it is launched in the ZFP viewer.
- If there is no RPPS or GSPS presentation states saved for the study, then the most recently created GSPS presentation state is applied when the original study is launched in the ZFP viewer.
- If RPPS saved state and GSPS information exist for the study, then the most recently created RPPS presentation state is applied.

**Note** Regardless of the type of back-end server used, the ZFP viewer supports the ability to remove all presentation states from a study.

## 3.2 Presentation State Order of Application with an EA back-end

If a study launched in the ZFP viewer had a GSPS already saved, then the presentation state is automatically applied when the study is launched in the ZFP Viewer.

**Note** Regardless of the type of back-end server used, the ZFP viewer supports the ability to remove all presentation states from a study.

## 3.3 Supported DICOM GSPS Annotations

**Graphic Annotation**

The ZFP viewer supports the following graphic annotations as presentation state information:

- Distance
- Angle Measurement
- Freehand ROI
- Ellipse
- Rectangle
- Circle
- Arrow

Graphic annotations are applied to an image. The graphics and text are defined in position and size relative to the image pixel coordinates or the annotations are defined in the specified space of the displayed area.

**Image Transformations: Pan, Flip, Rotate and Zoom**

Pan, flip, rotate, and zoom actions, (also known as DICOM Grayscale Spatial transformations) define a manner of panning, flipping, rotating and zooming an image.

The ZFP viewer supports the following image transformations as presentation state information:

- Pan
- Flip
- Rotate
- Zoom

The ZFP viewer does not support the following DICOM grayscale presentation states:

- Group Presentation States
- Mask Subtraction
- Bitmap Shutter
- Bitmap Overlay
- Graphic Layer
- Graphic Layer Activation
- Softcopy Presentation LUT – VOI, Modality

## 3.4 Display Shutters (DICOM Shutters)

The *display shutter* is a geometric mask that can be applied to an image for presentation purposes to neutralize (exclude) the display of any of the pixels located outside the shutter shape.

When the supported shutter information is available in a study's DICOM header information, then the ZFP viewer displays the shutters applied to the study. The following types of DICOM shutter (display shutter) are supported for display in the ZFP viewer:

- Ellipse
- Rectangle

**Note** The ZFP viewer does not support shutter through the Presentation State Object.

### Notes about types of shutters

**Note** A shutter that dynamically displays because it was saved with a study is called a DICOM shutter or a display shutter. A shutter that you create manually is called a manual shutter.

**Note** You can delete rectangle and ellipse DICOM shutters. To redisplay a rectangle or ellipse DICOM shutter that was saved with a study and that you deleted during your session, close the study and reopen it or reload the study.

**Note** ZFP supports the display and deletion of rectangle and ellipse DICOM shutters that were saved with the study outside of ZFP. Manual creation of rectangle shutters is supported. Manual creation of ellipse shutters is not supported.

## 3.5 Support for DICOM Lookup Tables

### Soft Copy Value of Interest (VOI) LUT

The VOI LUT transformation transforms the modality pixel values into pixel values which are meaningful for the user or the application. In the case of a linear transformation, the VOI LUT is described by the Window Center (0028,1050) and Window Width (0028,1051). In the case of a non-linear transformation, the VOI LUT is described by the VOI LUT Sequence.

The ZFP viewer applies soft copy VOI LUT if that data is available in the DICOM Header. The ZFP viewer does not support soft copy VOI LUT available through the Presentation State Object.

### Modality LUT

The Modality LUT transformation transforms the pixel values that are dependent on the modality manufacturer into pixel values which are meaningful for the modality and which are manufacturer independent (for example, Hounsfield number for CT modalities or Optical Density for film digitizers). The modality LUT values may represent physical units or they can be dimensionless.

**Note** The ZFP viewer applies Modality LUT if that data is available in the DICOM Header. The ZFP viewer does not support Modality LUT available through the Presentation State Object.

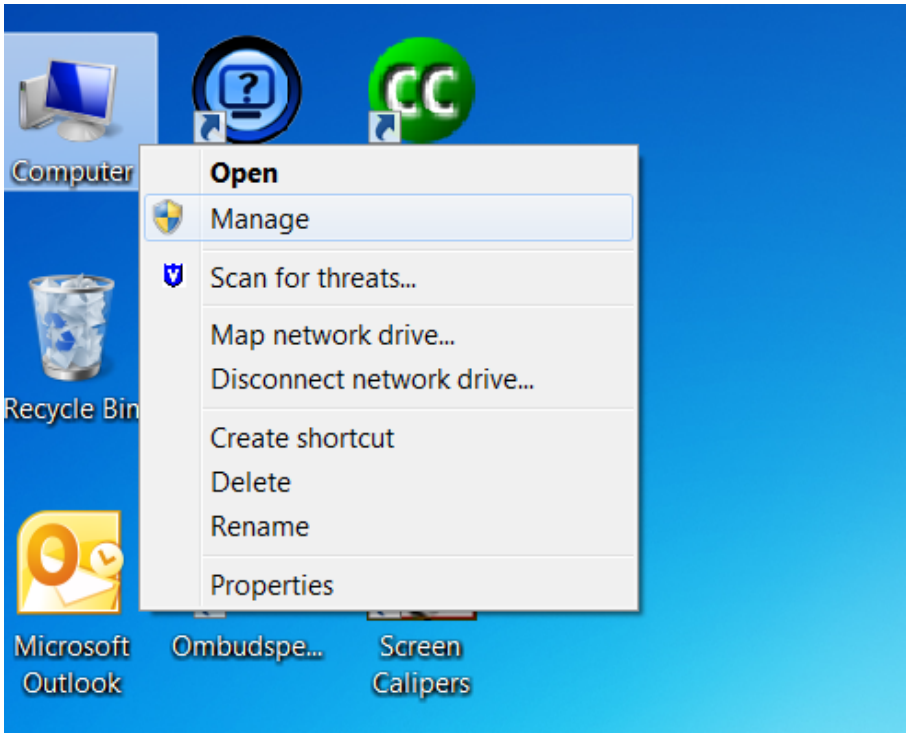
# A

# Update Video Drivers

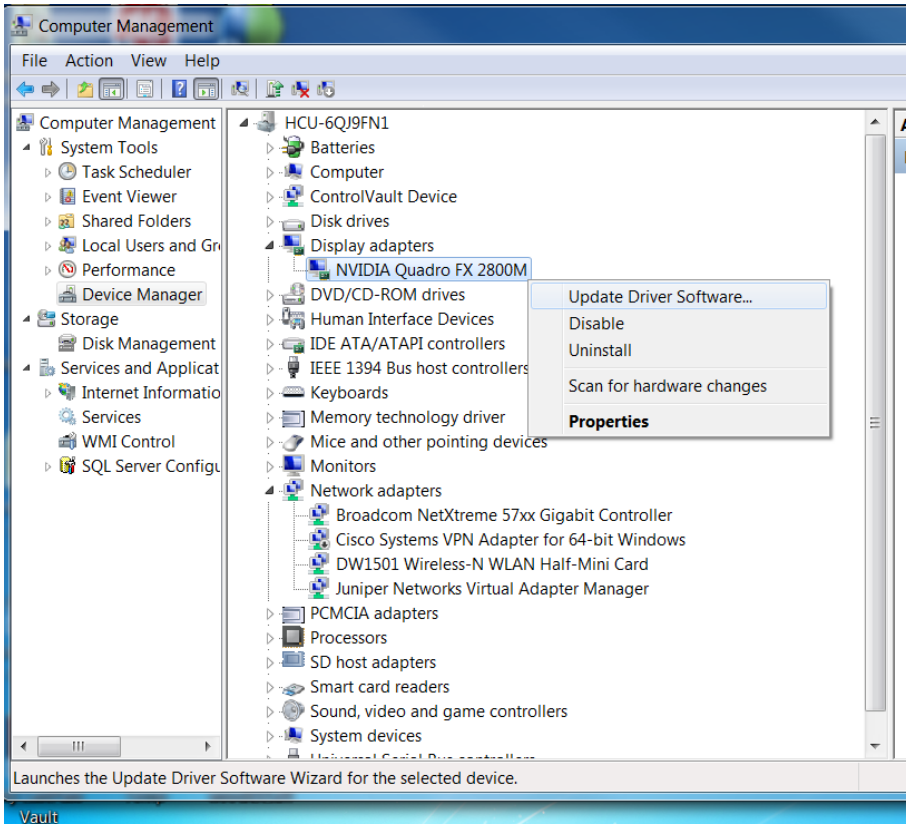
## Image Rendering Issues

Image rendering issues may be related to outdated video drivers. To update the video drivers:

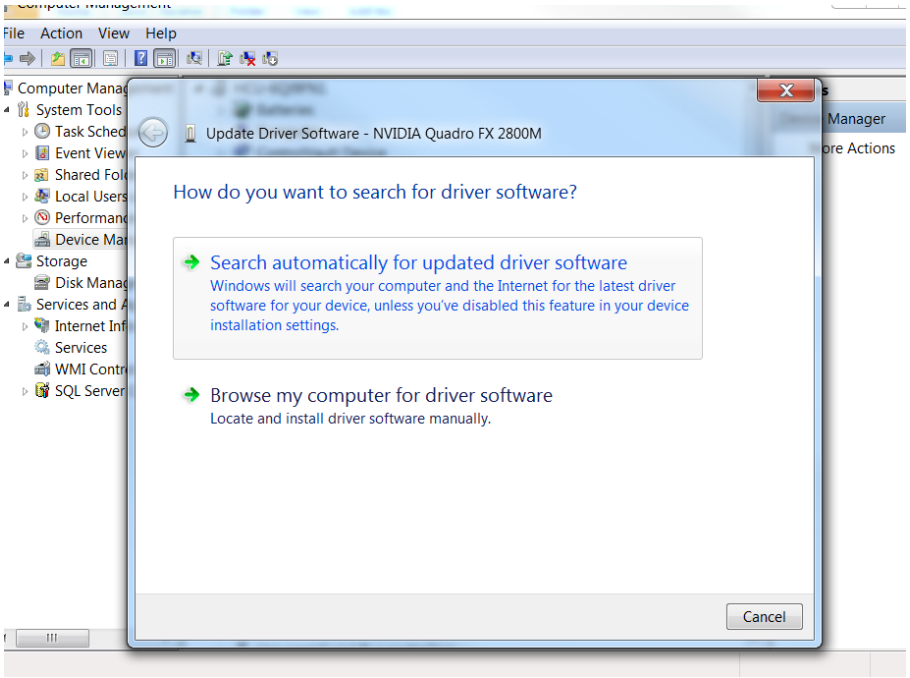
**1)** Right click **My Computer > Manage**.



**2)** Go to **Device Manager > Display adapters** and right-click on the listed graphics driver. One of the options will offer to update the driver software. Select the option for update.

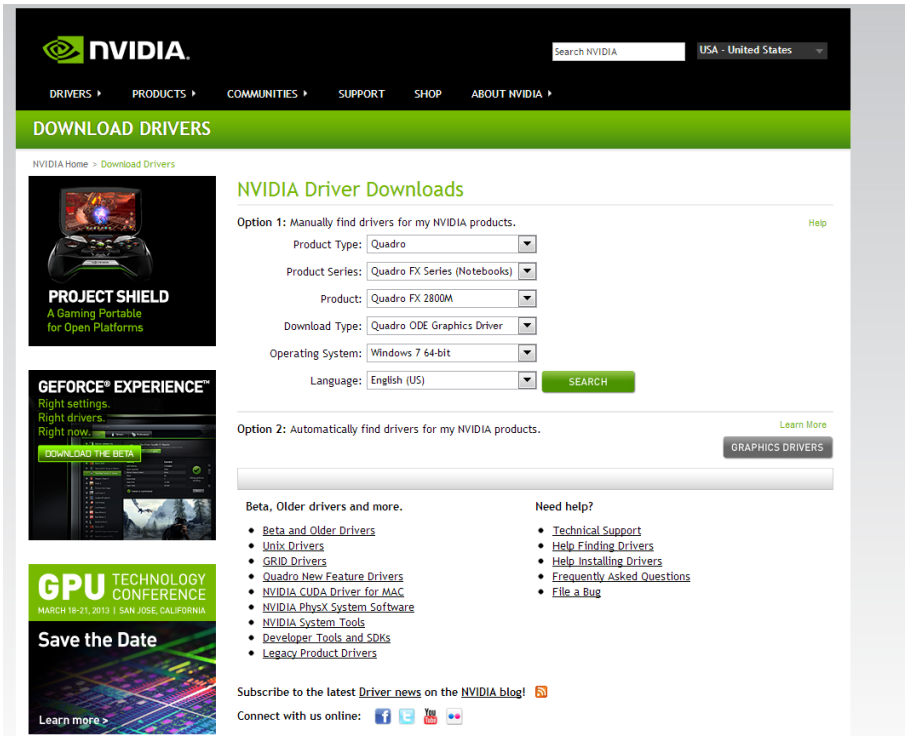



**3)** Click on the option **Search automatically for updated driver software**. The system will update the driver software.

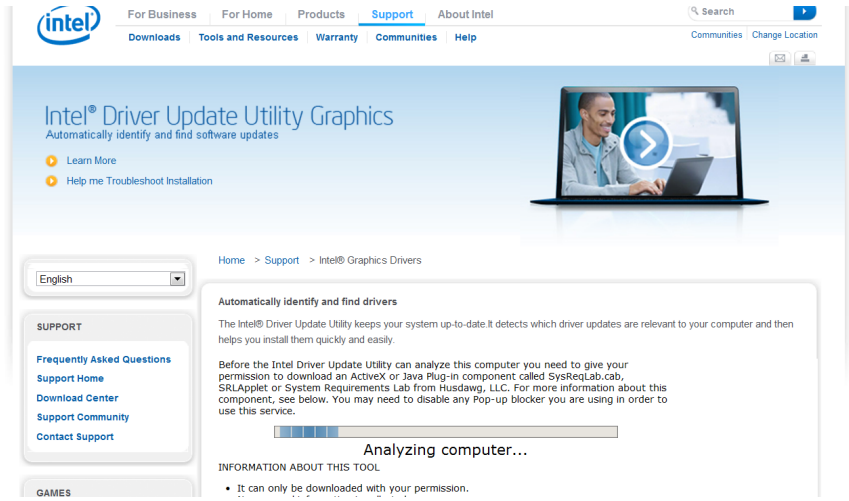



**4)** If Step 3 does not resolve the problem, the drivers can be updated by visiting the vendor website, for example:

- NVIDIA —




- Intel —



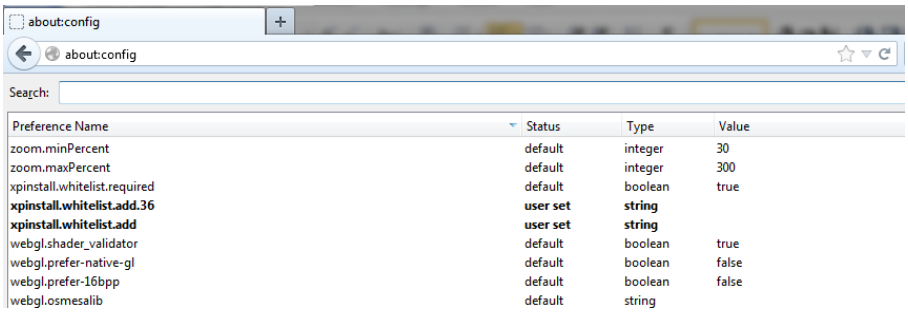

**Note** Depending on the vendor, you may have the option to get the drivers detected and updated using an ActiveX control. The user should allow the activeX control to be downloaded and run.

**5)** If the issue is still unresolved and the operating system is one of those not recommended (for example, windows XP), disable webGL for Firefox and Chrome browsers by following the instructions below.

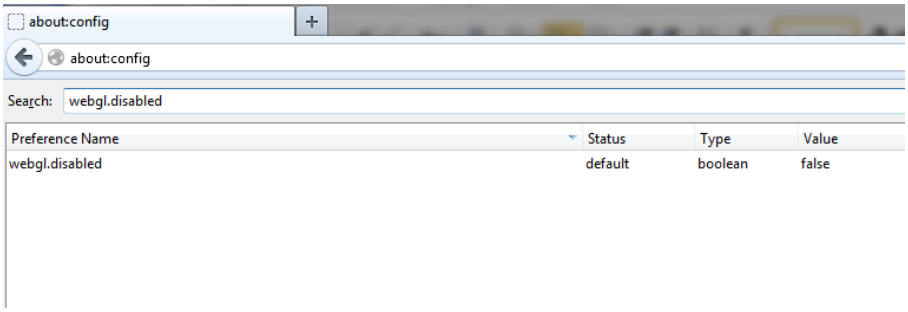
## Image Rendering Alternatives for Firefox and Chrome

- **Firefox**

1) Type about:config in the Firefox address bar and continue with the warning dialog.



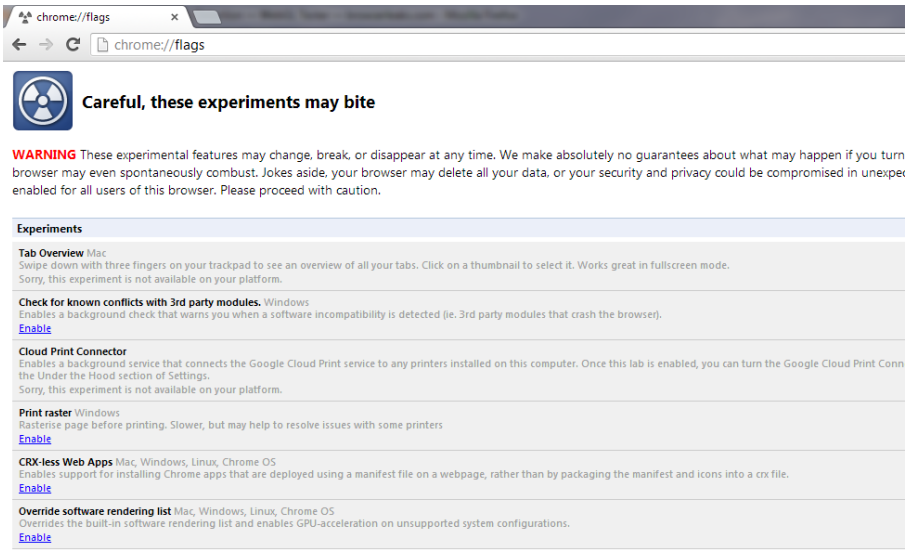

2) Type **Webgl** in the Filter box, then double-click **webgl.disabled** and set its value to **True**.



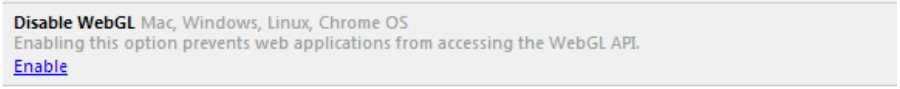

3) Restart the browser. WebGL is now disabled for Firefox.

- **Chrome**

1) In the address bar, type **chrome://flags/**.




2) Find the flag with the name **WebGL**, which has a description Disable WebGL.




3) Switch it to **Enable** to disable WebGL, or to **Disable** to enable WebGL.

4) Restart the browser. WebGL is now disabled for Chrome.

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