GE HealthCare

AW VolumeShare 7 (AW4.7)

User Guide

$C\mathcal{E}_{0459}$

Revision History

Revision	Date	Reason for change
1	2015–04	Initial release.
2	2015–07	M3D release.
3	2016–01	Updated the Minimum system hardware requirements section.
4	2016–07	Updated with the following: • information on the uniqueness criteria of the **Patient List** • regulatory updates
5	2017–02	• Applied minor changes due to secured HTTP communication • Removed the list of available applications
6	2017–08	• Added notices on patient confidentiality • Removed Centricity as supported DICOM Viewer • Regulatory updates
7	2018–02	• Minor updates about using TLS network protocol • Updated Glossary section
8	2019-03	Updated with the following: • Hot keys for **Soft Switch** • Explanation of symbols used in documentation • Regulatory updates
9	2021-01	Updated with the following: • Unique Device Identifier (UDI) • SR Dose report conversion to PDF • Updated password policy • Updated hardware requirements • Clinical benefits • Performance characteristics • Regulatory updates • Minor updates
10	2021-09	• New hardware configuration available • SCSI devices limitation removed • Regulatory updates
11	2022-10	Updated with the following: • Product Description update • information on UDI location • login-related changes • SR Dose report conversion to SCPT • information on configuration verification • application installation procedure • USB option • disk encryption management • SLES Appliance License

Revision	Date	Reason for change
12	2023-09	Updated with the following: • option for backup encryption • DICOM Viewer for USB • updated clinical benefits and performance characteristics • updated safety messages • regulatory updates

Contents

1 Standards and Regulations

1.1 Standards compliance

This product complies with the regulatory requirements of the following:

- Regulation 2017/745 of the European Parliament and of the Council on medical devices (MDR).

  The CE label affixed to the product testifies compliance. First CE marked in 2015.

- Medical Device Good Manufacturing Practice Manual issued by the FDA (Food and Drug Administration, Department of Health and Human Services, USA).

- International Electrotechnical Commission (IEC), international standards organization, when applicable.

USA/HHS:

⚠ **CAUTION**

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

GE Medical Systems SCS is ISO 13485 certified.

The original document is written in English.

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http://www.gehealthcare.com

1.2 Reporting of serious incidents

Any serious incident related to the use of this GE HealthCare device should be reported to both the manufacturer and the health authority/competent authority where the device is installed.

- To report to GE HealthCare:
  - Either contact your local service representative
  - Or report to In-box.complaints@ge.com

- Please provide the following information[1]:
  - The catalogue number* or the model designation of the device as stated on its identification plate affixed on the device
  - The System ID/serial number/lot number of the device
  - The date of incident
  - The description of incident, including any patient or user impact/injury
  - Your contact information (facility, address, contact name, title, and telephone number)

[1]Refer to section 1.6 Unique Device Identifier (UDI) on page 9 when needed.

*For eDelivery digital kits:

1. Go to eDelivery Software portal (https://gehealthcare.flexnetoperations.com/flexnet/operationsportal/logon.do) and log in using your User ID and your password.

2. In the Recent Entitlements section, click **See all** to display the list of products you have purchased. Product names and their catalogue number are both displayed in the Product column.

1.3 Image annotations

Since the equipment allows the physician to store information about the patient using the function IMAGE ANNOTATIONS, the European Directive regarding the protection of the people with regard of data management on their private life and to the free circulation of these data requests the computerized file users (radiologists, physicians) not to store data related to the patient's:

- race,
- philosophical opinions,
- religious opinions,
- political opinions,
- etc.

1.4 Software content

Acknowledgement

This product includes software developed by the Apache Software Foundation (http://www.apache.org)

This product includes software developed by World Wide Web Consortium (W3C).

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1.6 Unique Device Identifier (UDI)

Regulatory agencies are requiring a unique device identification system to adequately identify medical devices through their distribution and use.

To display your AW VolumeShare 7 Unique Device Identifier (UDI), click the on-screen **Help** button ("**?**") and select **AW Products Regulatory Information** from the drop-down menu.

Your UDI is displayed in the AW VolumeShare 7 regulatory information file.

2 Introduction

2.1 Introduction

As with any medical imaging process, only qualified personnel should use this equipment. You must be aware of the limitations of the basic imaging modality and of ensuing image processing. This includes understanding the limitations of the initial series acquisition, image-processing technology used, and image display methods.

This **User Guide** is a training material available online on the workstation. Users need to review operating procedures on a regular basis, paying special attention to the Safety and Regulatory statements. Keep this **User Guide** available while using AW VolumeShare 7.

If you want to benefit from additional training, please contact your GE HealthCare User Services representative for assistance.

Software options can be ordered for AW VolumeShare 7. In this case, a specific operator manual will be delivered to you with specific information on operating the software applications.

All new users need to read .

All user guides are available:

- On the Internet at: https://www.gehealthcare.com/documentationlibrary

    1.1.   Click **Enter Customer Documentation Portal**.

    1.2.   Enter the part number of this User Guide in the search field.

    1.3.   Click **Search**.

- On AW VolumeShare

    2.1.   Click on the "**?**" tab.

    2.2.   Select a document.

Privacy and Security manuals can be accessed from the same website, by selecting **Product Security Portal**.

Language codes are listed in the following tables.

Language code	Language	Language code	Language
BG	Bulgarian	LT	Lithuanian
CS	Czech	LV	Latvian
DA	Danish	NL	Dutch
DE	German	NO	Norwegian
EL	Greek	PL	Polish
EN	English	PT-BR	Brazilian Portuguese
ES	Spanish	PT-PT	Portuguese
ET	Estonian	RO	Romanian
FI	Finnish	RU	Russian
FR	French	SK	Slovakian
HR	Croatian	SR	Serbian
HU	Hungarian	SV	Swedish
ID	Indonesian	TR	Turkish
IT	Italian	UK	Ukrainian
JA	Japanese	VI	Vietnamese
KK	Kazakh	ZH-CN	Simplified Chinese
KO	Korean		

A paper copy of this User Guide can be ordered at no additional cost. Please, send a request to your Sales or Service representative. They will transfer your request to CEMEURDIST@med.ge.com. In application of the EU Commission Regulation on electronic instructions for use of medical devices, in European Union, your request should be treated within 7 days.

2.2 Installation

The installation instructions are available in the AW VolumeShare 7 (AW4.7) Pre-Installation Manual.

2.3 Prerequisite software applications

There are no prerequisite software applications for AW VolumeShare 7.

2.4 Technical description

For technical description, refer to the AW VolumeShare 7 (AW4.7) Pre-Installation Manual and the AW VolumeShare 7 (AW4.7) Privacy and Security Manual.

For information on measurement accuracy, refer to the 2D Viewer, Filmer and Anonymous Maker user guide addendum.

2.5 IT networks characteristics and security measures

Refer to the AW VolumeShare 7 (AW4.7) Privacy and Security Manual.

2.6 User Interface note

Please note that the screen captures in this document are intended for demonstration purposes only and may not always be fully identical to the actual user interface (e.g., in color scheme). Use these screen captures as guides.

3 Product Description

3.1 Product description

The AW workstation is a stand-alone workstation with its own dedicated computer and image database. It supports functions for image display, manipulation, and selective recording (either on film or on disk).

The **AW VolumeShare 7** application is based upon a graphical multi-window, mouse-driven user interface.

Your AW workstation can be networked to other AW workstations, and to other imaging systems that use the DICOM standard, serving as a common workstation for images acquired on systems with different modalities.

AW VolumeShare 7 supports CT and MR, CR, XR (R&F and XA), DX, MG, NM, PET, RTImage, and U/S, OT, SR, SC (secondary captures), PR (GSPS), KO, REG (Spatial registration, Deformable spatial registration), RTDose, RTSTRUCT as well as RTPlan modalities.

AW VolumeShare 7 also supports Blending Softcopy Presentation State, X-Ray Radiation Dose SR and Encapsulated PDF object types.

NOTE

It may be necessary to purchase additional software options to view and/or create specific DICOM objects.

AW VolumeShare 7 is able to receive images from network and media in the following compressed formats: JPEG Lossless Process 14 (selection value 1), JPEG Lossy, Baseline Sequential with Huffman Coding (process 1), JPEG Lossy Extended (Process 2 & 4), JPEG 2000 Lossless ONLY, JPEG 2000 (Lossy).

For further information, refer to the AW VolumeShare 7 DICOM Conformance Statement.

AW VolumeShare 7 is available in two configurations:

- AW VolumeShare 7 without Volume Viewer, which includes the software providing DICOM functions along with multi–modality 2D image viewer with dedicated functions for review of CT, MR, X–Ray, DX, U/S and PET images, and the Filmer, a multimedia export tool.

- AW VolumeShare 7 with Volume Viewer, which additionally includes Volume Viewer, a 3D software package providing Volume Analysis, rendering, navigation and whole suite of volumetric visualization and analysis tools for CT, MR, 3D X–ray and PET.

Remark: AW workstation only provides the function of review for U/S and SC.

3.2 Clinical benefits

AW VolumeShare 7 (AW4.7) platform gathers multi-modality DICOM images from a variety of diagnostic imaging systems at the same location providing end user with selection, review, processing and filming solutions in the same reading environment. The combination of displayed images with dedicated annotations and measurements tools, aims to support clinicians in extracting clinically relevant data for diagnosis. AW VolumeShare 7 also provides print, save, import and export capabilities to generate and save images of interest for reporting and facilitate the review by referring physicians.

3.3 Performance characteristics

- Intuitive Patient Worklist for navigating, searching results with customization tools

- Preprocessing of DICOM images for faster review

- Display of multiple series/exams, from different dates and various modalities in a 2D Viewer

- Customizable layouts in single and dual monitor configuration and, in landscape and portrait orientations

- Basic images manipulations and annotations

- Basic measurement and export tools with specific modality tools

- Multiple DICOM import and export capabilities, including Key Image Notes

- Images collection, pages layout customization and data export including printing

- Enabler for a wide variety of applications for greater diagnostic capabilities

3.4 Contraindications

There are no contraindications.

3.5 Undesirable side effects

There are no undesirable side effects.

4 Safety and Regulatory

4.1 Overview

To assure an efficient and safe beginning for your facility's AW workstation, read this chapter before attempting to use the workstation.

This chapter is extremely important: it describes safety and regulatory information that you must thoroughly understand before beginning to use the system.

Make certain that your user guides are readily available at all times. Make a point to review procedures and safety precautions periodically.

Additional safety concerns are addressed in the computer equipment manufacturer's manual.

4.2 Safety

4.2.1 Introduction

Throughout the text in this manual, the following legends are used to differentiate safety–related information:

⚠ **WARNING**

This indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ **CAUTION**

This indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

This indicates a non–hazardous situation which, if not avoided, could result in equipment damage, lost time, or reduced image quality.

4.2.2 Symbols used in documentation

Symbol	Description
	Consult Instructions for Use: Indicates that the user shall read Instructions for Use.

Symbol	Description
	Manufacturer: Indicates the medical device manufacturer's name and address.
	Date of manufacture: Indicates the date when the medical device was manufactured.
CH | REP	**Authorized representative in Switzerland**: Indicates the authorized representative in Switzerland.
REF	**Catalogue number**: Indicates the manufacturer's catalogue number so that the medical device can be identified.
#	**Model number**: Indicates the model number or type number of a product. Indicates the model number or type of a product or a medical device family that have shared characteristics.
UDI	**Unique Device Identifier (UDI)**: Indicates a carrier that contains unique device identifier information.
LOT	**Batch code**: Indicates the manufacturer's batch code so that a specific medical device can be identified.
⚠	**General caution**: Used to highlight the fact that there are specific warnings or precautions associated with the application, which are not otherwise found on the label.
MD	**Medical Device**: Indicates this product is a medical device.
	Electronic Instructions for Use (e-IfU): Indicates this device is delivered with electronic instructions for use.
Rx only	**Prescription Use only:** United Stated federal law restricts this device to sale by or on the order of a physician.

4.2.3 Disclosure of Residual Risks

The disclosure of residual risks, according to EN ISO 14971, is providing relevant information so the users can make informed decisions on the use of the product.

Residual risk disclosure is covered in this Safety chapter listing the Cautions and Warnings of the product.

4.2.4 Indications for Use

AW VolumeShare 7 is a review workstation, which allows easy selection, review, processing and filming of multi–modality DICOM images from a variety of diagnostic imaging systems. When interpreted by a trained physician, filmed or displayed images on the AW monitor may be used as a basis for diagnosis, except in the case of mammography images.

NOTICE

For information on AW VolumeShare 7 with Volume Viewer, see Volume Viewer User Guide.

4.2.5 General

⚠ WARNING

When DICOM images containing non-western European characters (Chinese, Korean, Japanese, Arabic, Hebrew, Russian, Hungarian, etc.) are declared in the AW database, the textual information (i.e.: patient name, patient identifier, study description) is not displayed correctly in the browser and the applications.

In order to help identifying patients and exams, the patient name and patient ID will have to be present in ASCII characters together with the textual information provided in the non-western font sets.

⚠ CAUTION

Never switch off power to the workstation without first performing the shutdown procedure. Workstation database corruption may occur if the shutdown procedure is bypassed.

4.2.6 Access

NOTICE

The AW workstation includes hard disk drives which may hold medical data related to patients. Such equipment may in some countries be subject to regulations concerning the processing of personal data and the free circulation of such data. It is strongly recommended that access to patient files be protected from all persons not in medical attendance.

Access to the AW applications is protected by passwords. These passwords are set initially during installation on site. Non-trivial login and password must be set to avoid security/confidentiality issues. It is the responsibility of the users to prevent unauthorized access to the AW applications and patient data.

To prevent unauthorized access to patient data:

When leaving the station momentarily unattended, it is recommended to "lock" the screen(s) of the AW workstation by means of the Lock Screen function.

When leaving the station unattended for any length of time, close your user session and exit the AW applications. This returns the station to the "login" state ("Welcome" window).

When the workstation is in either of these states, knowledge of a user password is obligatory in order to restart using the AW applications.

4.2.7 Equipment

⚠ CAUTION

The computer unit and monitor(s) of the AW workstation require adequate ventilation to function safely. The user must take due care not to block any ventilation openings of the equipment since this may result in overheating and malfunctioning of the equipment.

NOTICE

Some devices which produce hard copies of images, including some laser printers, do not produce diagnostic-quality images. Only images produced by GE-recommended laser cameras which produce images on film emulsions, shall be used for diagnostic purposes.

Images from other hard copy devices shall be used only for administrative purposes, such as billing or other record keeping. They shall not be used for diagnostic purposes.

Refer to the appropriate acquisition system Operator Manuals for proper interpretation of image annotation.

4.2.8 Direct Connect

NOTICE

When accessing data on a remote device with Direct Connect, the user has to use only devices validated with the Direct Connect capability. The user has to ensure that for all the connected devices, it is impossible to modify remote data via Direct Connect. Connect only devices validated for Direct Connect to the GE private Direct Connect.

4.2.9 Installation

⚠ CAUTION

Only GE-approved hardware configurations may be used for the AW workstation. In particular, monitor screen size shall be at least 18 inches (diagonal). The use of unauthorized configurations or modifications may lead to sub-optimal performance of the system.

NOTICE

The monitor(s) of the AW workstation must be positioned so as to avoid reflections from room lighting or windows, or too much ambient light striking the monitor screen(s) directly. Incorrect positioning may lead to degraded image quality and critical features on the images not being clearly visible.

NOTICE

The types of monitor used with the AW workstation are not magnetically shielded. Placing the carton containing a monitor or the unpacked workstation near an MR magnet (inside the 1.3 Gauss line) will permanently damage the monitor and potentially void the warranty.

4.2.10 Accuracy

NOTICE

When performing measurements using the Basic Display software tools, the user shall be aware of the various factors that determine the accuracy of results.

⚠ **WARNING**

AW is not intended as a storage commitment or archive device. In the unlikely event of incomplete or corrupted image transfer, retrieve original images from your archiving or acquisition system.

NOTICE

Only use dates with a four-digit year and a three-character month. Note that dates are always in English.

4.2.11 Quality Assurance

⚠ **CAUTION**

To ensure consistent image quality from the AW workstation, it is the user's responsibility to implement a procedure of regular quality assurance checks.

4.2.12 Data Export

The AW VolumeShare 7 Data Export function allows you to export images (in the form of an "electronic film") to other systems that do not support the DICOM format.

⚠ **CAUTION**

The formats and image quality of exported electronic films are not suitable for diagnostic purposes. Additionally, the image quality may be degraded by the data compression techniques used by Data Export (depending on the compression settings).

Diagnosis shall only be performed on the original images in DICOM format.

4.2.13 Media exchange

⚠ **CAUTION**

If data transfer from the media is interrupted then detach the media and start the restoration again in order to avoid incomplete data (patients, exams, series or images) in the patient list.

⚠ **CAUTION**

When exporting data to a USB mass storage device (such as a USB key) using the Media Composer, the data exported to the USB device will not be fully DICOM compliant if images or series from an exam originate from different Media Composer sessions. In such cases, they will appear on the USB device as duplicate entries on the exam level. When retrieving data from a USB device, the user always has to sort the images/series by the Patient Name / Patient ID and review the list to make sure that all exams belong to the same patient.

If the exam list on the USB media is sorted by any criteria other than Patient Name / Patient ID additional entries may be missed for the selected patient.

NOTICE

Always ensure that any USB mass storage device (e.g., USB key) connected to the AW is safely removed/detached to avoid potential damages to the device or the data stored on the device.

4.2.14 Patient confidentiality

DICOM

⚠ **WARNING**

DICOM communications are not inherently secure.

Protection of sensitive data is a shared responsibility of user, site practices and product safety/configuration, please follow your local cybersecurity policies.

Data Export

NOTICE

Data Export does not apply encryption on exported data for generic interoperability. Protection of sensitive data shall be controlled by the site security policy.

Media Composer

NOTICE

Media Composer does not apply encryption on exported data for generic interoperability. Protection of sensitive data shall be controlled by the site security policy.

4.2.15 Safety-related software messages

Messages giving information and warnings relating to the current system status are displayed on the AW VolumeShare screens.

Some of these messages may be related to safety issues. For example, a message may warn that a screen or printed image will be enlarged or reduced, and this must be taken into consideration when making a diagnosis. It is important that users take note of and act on the information given in these messages.

In manuals intended for use in countries where the on–screen language is different from the local language, the table shows the displayed messages and gives a translation in the local language. In manuals intended for use in countries in which the on-screen language is available in the local language, the right side of the table is left blank.

Message	Translation
Please be aware that the images contained in this electronic film may have lost information due to a lossy compression, and are not for diagnostic use.	
Please note that the MPEG/AVI/MOV movies compressed with high image quality may not be played back correctly on slower machines - image skipping may occur.	
You have removed an USB device from the system without detaching (or un-mounting) it first. This can damage your filesystem. Please do not do this again.	
ATTENTION Do you really want to SHUTDOWN the system? This action will completely stop all software on the workstation. You will have to restart the whole station.	
Remove selected patient(s)?	
Remove selected exam(s)?	
Remove selected series?	
Remove selected image(s)?	
Context cleared on AW. An already started application might still contain the patient from the previous context. Please verify patient information on AW!	
Warning! Cannot restore (selected) patients. <patient name> Please detach the media and restore again to make sure each selected item is restored completely.	
Warning! Cannot restore (selected) exams. <patient name> Please detach the media and restore again to make sure each selected item is restored completely.	
Warning! Cannot restore (selected) series. <patient name> Please detach the media and restore again to make sure each selected item is restored completely.	
Warning! Cannot restore (selected) images. <patient name> Please detach the media and restore again to make sure each selected item is restored completely.	

4.3 Service

The AW workstation must be installed by your GE HealthCare Field Service Engineer.

For any modification to the hardware, software, or network configuration of this equipment, contact your GE HealthCare Service Engineer. Failure to do so may void your warranty or service coverage furnished by GE HealthCare.

In compliance with IEC 60950-1, the manufacturer is not responsible for any consequences caused by unauthorized modifications of this Type-B equipment. Contact GE HealthCare Service for any trouble associated with the AW workstation.

4.4 Emergencies

Do not use the workstation if an unsafe condition is known to exist.

In the event of a hardware-failure that could cause hazardous conditions (smoke, overheating, etc.), turn off power and unplug the power leads for the monitor(s), the desktop unit and any externally connected units.

4.5 Usability information

Operator profile

AW VolumeShare 7 is intended to be used by physicians (any sub-specialty) and technologists trained to use post processing review workstations. Interpretation of images may be done only by physicians trained in reading images of their corresponding modalities having knowledge of specific modality acquisition principles and quantitative analysis.

The users of the AW VolumeShare 7 software application shall be a CT, MR, nuclear medicine, or radiology technologist, radiologist, cardiologist, or physician qualified with advanced applications training for software competencies or other personnel that the owner feels is properly trained for this software use (radiology assistant, physician assistant, etc.).

Patient population

There are no limitations on the patient population.

Training

There is no mandatory AW platform specific training. However, to avoid usability error, it is recommended for users to consult the User Guide for specific software information and/or contact a GE HealthCare representative for applications training. A qualified individual is determined by the site. Make certain that the correct version of your operator manual is readily available at all times. Make a point to review the procedures and safety precautions periodically.

Before attempting to use the application, read Safety on page 15. It describes safety and regulatory information that you must thoroughly understand before you begin to use the software.

Application specification

AW VolumeShare 7 is a post processing workstation. Any data acquired on a variety of diagnostic imaging devices can be processed using AW VolumeShare 7.

AW VolumeShare 7 can be used for the medical purpose as it is described in Indications for Use on page 17. There is no limitation concerning patient population, the body or type of tissue, or the frequency of use.

AW VolumeShare 7 is a workstation that is suitable for desktop placement in any office location. It may or may not be connected to a local network.

5 Privacy and Security Information

5.1 Access controls

Account management

Removal of temporary or emergency accounts

The AW workstation does not provide the capability to create specific temporary or emergency accounts.

Disable inactive accounts

The AW workstation does not automatically disable inactive local user accounts.

The customer can enable the AW workstation enterprise authentication to manage the appropriate site authentication policy.

Automated audit actions

The AW workstation system will log account creation, modification, enabling, disabling, and removal actions, but will not provide any notification to specific user.

Access enforcement

When logged in, the user has access to the whole patient database.

The AW workstation does not support context based authorization that will offer features like:

- Time-of-Day restrictions,
- weekly schedule restrictions,
- patient consent restrictions,
- specific fields to trigger data restrictions,
- warnings related to access level restrictions.

When logged in, the users have access to all features.

Information flow enforcement

The user has to ensure that s/he has the appropriate authorizations to:

- import images from DICOM media.
- export images to DICOM media.

System use notification

The AW workstation does not offer a specific capability to configure a notification message displayed to users at login or when the Patient List is started.

Least functionality/authorized software

When logged in, a user has access to all applications and installed software.

5.2 Audit and accountability

Content of audit records/additional audit information

The AW workstation provides the following audit events:

- user client login,

- access to data,
  and

- export of data

along with date and time, source or destination, identity of the user and identity of the subject when applicable.

The audit logs cannot be extended or configured.

The information system does not provide centralized management and configuration of the content to be captured in audit records.

The AW workstation does not provide alerts nor customizable actions in case of an audit processing failure.

The AW workstation does not provide the capability to automatically process or search in audit records.

The AW workstation does not provide a functionality to export all logfiles to a remote server so that the site can identify and retain accounting of disclosures specific log files for a configurable retention period.

Response to audit processing failures/audit storage capacity

The AW workstation will automatically clean log files, including audit log files, when the maximum log file storage capacity has been reached.

Audit review, analysis, and reporting/process integration

The AW workstation does not have the capability to export audit log files except for some specific applications that access data to monitor the usage of applications.

The analysis of log files has to be done on the AW workstation itself.

Audit reduction and report generation/automatic processing

The AW workstation does not offer the capability to process audit records based on user's events of interest.

Protection of audit information

Audit backup on separate physical systems/components

The AW workstation does not back up audit records.

Cryptographic protection

The AW workstation does not encrypt audit records.

Non-repudiation

The hospital has to configure specific user accounts and ensure that radiologists do not log in as standard users in order to ensure an appropriate user audit.

5.3 Identification and authentication

Standards

The AW workstation can be configured to use the Linux account user authentication or the Enterprise Authentication system (LDAP).

Organizational users

The site has to ask the GE HealthCare Field Engineer to configure the Enterprise Authorization Authentication Administration (EA3) module to use the site identification and authentication methodology.

Network access to privileged accounts

No multifactor authentication is available to access accounts.

Network access to privileged accounts - replay resistant

The AW workstation does not define a customizable replay-resistant authentication mechanism.

Device-to-device/health information

The AW workstation does not provide control of sources of Personal Identification by default. By default, all incoming DICOM data are accepted.

When importing data from a DICOM interchangeable media, it is the user's responsibility to ensure that the source of Personal identification can be trusted.

Authenticator management

When creating a local user account, by default the AW workstation:

- enforces a minimum user account name length
- enforces a minimum password length
- forces for specific combination of characters to increase the password complexity
- forces a new password to be different from the previous one
- provides an option to enable password limited lifetime

but

- does not prevent the reuse of the same password for another user
- does not implement temporary password for system logons

It is the site's responsibility to set the password policy.

The AW workstation authentication method can be based either:

- on local Linux Account Management
  or

- on Enterprise Authentication Authorization Administration that supports LDAP, Microsoft® Active Directory® 2003 and/or 2008

These options are mutually exclusive. The selected authentication method can be set up by the GE HealthCare Field Engineer.

5.4 System and communications protection

Security function isolation

The AW workstation does not implement kernel code. It restricts access through user authentication and isolates kernel, application and user function by setting appropriate file system protections.

Transmission integrity

To enhance the security and transmission integrity of data transfer, it is recommended to use an encrypted protocol (e.g., DICOM TLS instead of standard DICOM, SFTP instead of standard FTP) whenever it is available.

Secure name/address resolution service

The AW workstation uses name/address resolution service coming from:

- information configured in file /etc/hosts.

- primary and secondary DNS servers provided by the organization if any.

The AW workstation does not implement DNS security features and does not provide additional data origin and integrity artifacts along with the authoritative name resolution data the system returns.

Process isolation

The AW workstation information system does not implement separate execution domain for each executing process.

Malicious code protection

Upon request, GE HealthCare Service can configure the Clam AV and activate the McAfee antiviruses on AW workstation to detect malicious code. The definition of virus can be regularly updated if the AW workstation can access a proxy to reach the Internet. The removal of such code has to be done manually.

Cryptographic protection

To enhance the security of data transfer, it is recommended to use an encrypted protocol (e.g., DICOM TLS instead of standard DICOM, SFTP instead of standard FTP) whenever it is available.

5.5 System and information integrity

Information system monitoring

The AW workstation does not provide tools to monitor inbound and outbound communications traffic or to alert in case of unusual activities or conditions.

The AW workstation does not provide tools to verify user defined security functions.

Software, firmware, and information integrity

The AW workstation does not implement integrity checking and specific anomaly responses - through alerts or system shutdown.

5.6 Privacy notice - GE HealthCare network link established

The InSite™/iLinq™ icon available on the AW workstation patient list changes when remote service connection is active.

6 Getting Started

6.1 Getting started

AW VolumeShare 7

The basic file and program management on AW VolumeShare 7 is controlled by the Linux operating system. The system administrator may at times have to use Linux commands for file or system management.

Windows

With the exception of the cursor, virtually everything you will see and work with on the workstation's monitor(s) is contained within graphical windows, from menus and control panels to lists and images. Several graphical windows can be displayed on the workstation screen(s) at the same time.

Use of the AW applications is largely independent of the monitor configuration. If more than one monitor is connected to the workstation, it will appear to the user as one large screen. In particular, the mouse pointer (see below) will move without interruption from one monitor screen to another. The application automatically displays images and windows so as to make optimal use of the monitor screen(s).

The main windows you will use are the control panels and display areas of the **Patient List**, **2D Viewer** and **Filmer**.

These main windows will give you access to other windows, such as the **Layout Manager** window in the **2D Viewer**, etc.

Cursor

The cursor is the on-screen tool which you maneuver across the screen using the mouse, to display pull-down menus, make function selections, and manipulate lists, images, and windows.

The cursor changes shape or orientation to indicate a change in function. Some examples:

When you point to the frame of a resizable window, the cursor changes to an arrow pointing to a line, to indicate that you can now "drag" on the frame to change its size.

When you click on a menu control to open a drop-down menu, the cursor changes to an arrow pointing to the right, to indicate you can now make a selection in the drop-down menu.

When you click and drag on an item to "drag and drop" it into a different location on the screen, the cursor changes to the shape shown at left, to indicate the "drag and drop" function is active.

Specific "drag and drop" operations are described in more detail in the appropriate sections of this manual.

Typical examples are the use of "drag and drop" to duplicate a button from a **Display Tools** panel into the **Preferred Tools** panel, or to load an image into the **Filmer** window.

The cursor changes into an hourglass if a function that you have selected takes more than a few moments to implement, and further function selection is unavailable until the procedure is completed.

Once the procedure is finished, the cursor returns to an arrow shape, indicating that the workstation is ready to accept further input.

Menus

Certain buttons activate specific functions directly. Others activate menus that allow you a choice of functions.

To select (or activate) a function in a menu, move the cursor on the menu item and click. The workstation carries out your command, and the menu disappears. When a menu item is shaded grey rather than white, it means the function is currently not available.

Most applications also use on–view menus, that are hidden until they are activated by means of the right mouse button. The contents of these menus depend on the context, i.e., on the type of view.

Annotations on the views can be active which means they can be modified by the user. Active annotations are displayed in red. Some are numerical (e.g., zoom), but some are also used to display a menu.

Tool tips

To help you to identify the various controls in the windows on the AW workstation, you can use the tool tip function. Move the mouse pointer onto the particular control (such as a button or a menu item): after a few seconds a small help window will pop up showing the function of the control.

NOTE

> This function is available on controls identified by an icon, but usually not on controls with a text legend (e.g., buttons such as **Apply** or **Done**).

Entering and editing Data

To enter data from the keyboard in the various fields, move the mouse pointer inside the field. The mouse pointer MUST remain inside the field during data entry.

While entering data, you can make corrections at any time. Point and click to position the text cursor at the desired position. You can now insert text at the cursor, or use the **Del** or **Backspace** key to delete the text in front of the cursor. The **Clear** button allows you to clear the entire contents of the window.

Login

1. If the workstation is in **power OFF** state, switch it on using the power switch. Take care that any external equipment connected to the workstation is already switched on before you switch on the AW itself.

    When the image disk is encrypted, the encryption passphrase must be entered to unlock the image disk unless configured for automated boot.

    The workstation is in **Login** state after it is switched on.

2. At the **Login** state, the **"Welcome"** window is displayed.

    Enter your *user name* and *password* in the dedicated text fields, then click the **Login** button or press **Enter**.

If the password is correct and is not expired, the system is now in **Application active** state (user session).

3. If the password is correct but has expired (if password expiration is enabled on the AW workstation or if the administrator reset it manually), the password must to be changed.

   Enter the expired password again and press **Enter**. The system will ask you to set a new password.

   Enter your *new password* in the dedicated text field, press **Enter**, then enter the *new password* again to confirm it.

   Your password is now changed and the system is in **Application active** state (user session).

NOTE

A user account is temporary locked after 30 unsuccessful login attempts.

NOTE

The encryption passphrase is set-up during the installation of the workstation and is different from the user passwords. Multiple encryption passphrases can be defined.

As the encryption is done at a low level of the system, the following message will be displayed in English to request the passphrase: **Please enter passphrase for disk AWImageEncrypt:**

NOTE

To prevent unauthorized access to patient data, it is recommended to return the workstation to the **Login** state at the end of each user session, by using the **Log out** button. Knowledge of a user password is required in this state to restart a user session.

7 Using the Applications

7.1 Overview
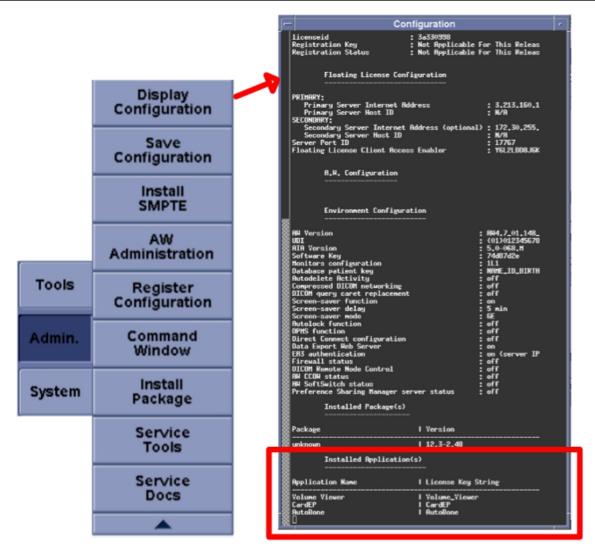
In the **Application active** state, the following applications are available:

Applications	Description
Patient List	The **Patient list** is the main screen that gives you access to data – to select and manage images and access primary applications. The list has one entry per Study Instance UID.
(Analyze)	The optional **Analyze** button may be assigned to a viewing and analysis software package say for instance Volume Viewer. If no application is assigned to the button, the legend is a '–' (dash) and the button is inactive. To assign the Volume Viewer to the **Analyze** tab, click **More...**, click and drag Volume Viewer from the list and drop on the tab.
2D Viewer	Use the **2D Viewer** to start 2D Viewer to display, manipulate, annotate and analyze the images. For detailed information about the features and functions of the 2D Viewer, refer to the 2D Viewer, Filmer and Anonymous Maker user documentation.
Filmer	Use the **Filmer** to load and arrange the images in the Filmer. For detailed information about the features and functions of the Filmer, refer to the 2D Viewer, Filmer and Anonymous Maker user documentation.
(?)	The **Online Documentation** button provides access to the Online Documentation. Click on it to open the list of the user documentation available on your AW. Select a document from the list: it opens in Adobe Reader, which allows for easy search.

7.2 Checking Installed Applications

Before you start using the applications, check which applications are installed on the Advantage Workstation (AW) system. To do so, select **Admin.** in the **Patient List** menu, then click **Display Configuration**. The **Configuration** window opens (see Illustration below).

You will find all installed applications listed at the bottom of the **Configuration** window as shown above.

For more information about the Patient List and the Admin menu, see sections and , respectively.

7.3 Patient List

7.3.1 Introduction

You use the **Local Patient List** to:

- *Select* exams, series and images in the database of your workstation, then select and start one of the available AW viewing and analysis software applications, such as the **2D Viewer** or **Mini Viewer**.

  To help you in making your selection, you can sort the lists by patient name, date, etc. By default, the exam list is sorted by patient name, and the series and image lists are sorted by number. This is indicated by an arrow to the right of the corresponding column name (labels at the top of the columns).

You can use a *filter* to show in the lists only those exams, series and images that meet certain criteria that you define.

You can change the order (from left to right) in which the columns are displayed in the lists:

- ◦ Move the mouse pointer onto the title of the column you want to move, click left and drag to the left or right to move the column to a new position.

It may happen that a column is too narrow to display a list entry in full. This is indicated by a small black arrow at the right of the entry. You can change the widths of the columns in the list:

- ◦ Move the mouse pointer onto the vertical line separating two columns, click left and drag to the left or right to change the column widths.

Lists can be sorted in ascending or descending order. This is indicated by the arrow in the column label pointing either upward or downward.

You can use the preview (**Mosaic**) display that shows reduced-size images from the currently selected series.

- • *Manage* the database of your workstation.

You can *transfer* images from the database onto removable media such as CD/DVD or USB mass storage devices.

You can *remove* images from the database (either because they are no longer required, or to free up disk space) by means of the controls in the Patient List, or by means of the **Autodelete** function. You can use the Lock/Unlock function to prevent images from being deleted inadvertently.

Used Disk Space management

The total image capacity will depend of various parameters: Auto delete, installed applications, Data Export usage, disk encryption.

Used Disk Space and Autodelete

The **Used Disk Space** display indicates how much disk space is used. If the workstation is used intensively, you will find that at times you will have to remove images from the image disk to make room for others.

You can choose between two methods to manage the images stored on your image disk and to maintain sufficient available disk space.

- ◦ You can regularly keep track yourself of the images stored on the image disk and the used disk space, and decide yourself on what images to remove to make room on the disk OR

- ◦ You can use the **Autodelete** function which automatically removes the "oldest" exams from the disk, whenever the available disk space drops below a certain level.

The **Autodelete** function can only be turned on or off by the AW System Administrator. When the **Autodelete** function is on, **Autodelete** ON is shown in the Patient List title bar. When it is off, nothing is shown. When the **Autodelete** function is active, it continuously monitors the used disk space. Should the available disk space drop below a certain (preset) level, the **Autodelete** function automatically starts removing the "oldest" exams (on a "first–in first–out" basis), and continues (an exam at a time) until sufficient disk space is again available. At the same time, the lists and used disk space display in the Local Patient List are updated.

NOTE

The **Autodelete** function searches for the "oldest" exam on the basis of the date of arrival of the images on the workstation, NOT the acquisition date.

NOTICE

If you use the **Autodelete** function, you shall be aware, that, with time, patient files will become incomplete (the "oldest" exams will have been removed), because **Autodelete** operates at the exam level, and removes exams automatically (unless they contain locked exams), without requiring confirmation from the user. Make sure to lock those exams that you do not want removed.

NOTICE

Do not select more than 50 items (exams, series or images) to remove at a time. If you exceed this limit some data may not be removed. For example, do not attempt to remove a set of 100 individual images; however, you can safely remove a series of 500 images by removing the series itself.

- *Transfer* images from your workstation to other workstations ("network push").
- Access *AW tools*, *administration* and *service* features (such as protocol management, lock screen, shutdown, InSite).

You use the **Remote Patient List** to:

- Select and transfer images stored on other workstations and imaging systems to your workstation ("network get"). If a Direct Connect network is established on the remote host, you can select an exam and launch an application without transferring the images to the local patient list.

You use the **Media Patient List** to:

- Select and transfer images stored on removable storage media such as compact disks or a USB device to your workstation ("restore").

NOTE

Users familiar with earlier versions of the AW Basic Display software should note that in the AW VolumeShare 7 Patient Lists most functions (such as drag–and–drop) are controlled with the left mouse button rather than the middle mouse button.

7.3.2 Patient List menu

7.3.2.1 Introduction

The **Patient List** menu is accessible from the Local Patient List window. The Patient list menu is shown in the Figure below.

NOTICE

Some of these functions are intended for the use of your GE HealthCare Field Service Representative only. Accessing these functions may lead to unpredictable results if you are not familiar with their functioning.

7.3.2.2 End Review

The **End Review** feature activates two automated functions as set in the End Review preferences window: **Auto–film** and **Auto–push**. The End Review can only be performed on data for a set of selected exams that belong to the same patient.

End Review provides the following options:

- **Auto Film** activates the predefined actions configured in the Filmer.
- **Auto Push** pushes the data by full exam or series created on the AW to multiple, selected hosts.

  NOTE

  This is activated only when the host system is selected to transfer data to **Full** and **Series created on this AW only**.

If you select **Series created on this AW only** you can customize the modalities with the **Customize** button. Click on **Customize**, and **Modalities** window is displayed. You can choose which modalities you do not want to push.

It can be applied to each host.

- **Display the settings window**

  The **Display the settings window for each "End Review"** checkbox is a preference setting. Check the box if you would like to display a pop-up window to confirm the end review. If you do not check the box, the configured actions will take place automatically when you click End Review.

- **Auto delete examinations after End Review**

  If you select the **Auto delete examinations after End Review** checkbox, when finishing network transfer successfully, all local exams are deleted at the end of auto push.

- **Abort**
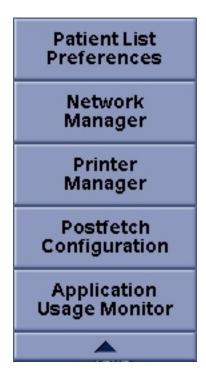
  Click to abort the Review.

- **Continue**

  Click to resume the Review.

7.3.2.3 Tools menu

Click on the **Tools** button in the Local Patient List control panel to display the **Tools** menu, with the following menu items:

Patient List Preferences

Layout

The icons displayed above each section of the patient list are set up in the **Patient List Preferences**.

The "Layout" settings determine which functions and lists are displayed in the Patient Lists. You can select which of the following functions should be displayed:

- **Remove** drop area (used to remove items from the Patient List by dragging with the mouse),

- **Remove**, **Network** and **Media** buttons above the lists,

- **Lock/unlock** buttons above the exams lists,

- **Set/reset eligibility** buttons above the exam lists,
- **Set/reset the End Review flag** buttons above the exam lists.

Click in the check box next to the function icon to activate it. Click again to deactivate it.

You can select which lists should be displayed in the Local Patient List:

- Exams list only, exams and series lists, or all lists.

Click in the check box next to the selected list display.

To use the icons:

- Click the icon above Exam/Series/Image list to complete the action. The column is automatically updated when you click the icon.

Network Manager

The **Network Manager** is used to configure remote hosts on the host machine. You can modify or delete the existing remote hosts, or create new remote hosts on the host machine.

Objective	How to achieve
Delete or modify an existing work-station	1. From the **Patient List** menu, click on **Tools**.
	2. From the **Tools** drop-down menu, select **Network Manager**. The Network Manager panel appears displaying the remote hosts on the local workstation.
	3. Select the remote host you want to configure. The selected remote host appears in the **Selected remote host** box.
	4. Click on **Modify** or **Delete** to configure the remote host, or click on **Close** to dismiss the changes.
Configure or create a new remote host on the host work-station	1. From the **Patient List** menu, click on **Tools**.
	2. From the **Tools** drop-down menu, select **Network Manager**. The Network Manager panel appears displaying the remote hosts on the local workstation.
	3. Click on **Create**. The **Define or modify remote host parameters** appears. Enter the details of the host machine.
	4. Click on **Save** to save the changes, or **Clear** to re–enter the specific details of the host machine. Click on **Cancel** to dismiss the changes.

NOTE

Network Manager is used by the default user name **sdc** only.

Printer Manager

Printer Manager is used by GE Service personnel only.

Postfetch Configuration

For detailed information and instructions about **Postfetch Configuration**, see Postfetch on page 73.

Application Usage Monitor

For detailed information and instructions about **Application Usage Monitor**, see Application Usage Monitor on page 75.

7.3.2.4 Admin menu

Click on the **Admin** button in the Local Patient List control panel to display the **Admin** menu.

Display Configuration: displays the current workstation configuration on the screen.

Save Configuration: for use by the AW system administrator only.

Install SMPTE: installs a SMPTE test pattern as a new and separate exam in the Patient List.

AW Administration: for use by the AW system administrator only.

Register Configuration: for use by GE HealthCare Service or under GE HealthCare Service supervision only.

Command Window: GE HealthCare Service only.

Install Package: GE HealthCare Service only.

Service Tools: GE HealthCare Service only.

Service Docs: GE HealthCare Service only.

Click here to close the **Admin** menu.

7.3.2.5 System menu

Click on the **System** button in the Local Patient List control panel to display the **System** menu.

Lock Screen: used to "lock" the screen(s) of the AW workstation when leaving the station unattended, to prevent unauthorized access to patient data.

To unlock the screen, touch any key and type in the user password.

NOTE

> The Lock Screen function should not be confused with the "screen saver" function which automatically blanks the workstation screen(s) after a preset time of inactivity (to prevent screen damage that can occur if a stationary image of high brightness is displayed for too long). To re-activate the screen(s), briefly move the mouse.

Restart Software: used to stop and restart the AW software, including the Patient List and those programs not visible to the user. Any work in progress is lost.

Change Password: allows a user to change his password.

Shutdown: click on this item to completely quit the AW environment and return to workstation's shutdown level. At this level, all workstation applications are completely inactive.

Click here to close the **System** menu.
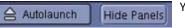
7.3.2.6 Logout button

You can use the **Log out** button to close the current user session and quit the AW environment and the workstation applications.

7.3.2.7 Autolaunch button

The **Autolaunch** button displays in the **Autolaunch** window if the Productivity Package is installed on the AW.

You can also use this button in Volume Viewer.

7.3.2.8 Status displays

The Patient List displays status and associated information in various locations. These status and associated displays are summarized below.

- Top of the Patient List control panel:

   • Software version, current user name and currently selected exam.

- Title bar:

   • Patient List type (Local, Remote or Media)

   • Current date and time (Local Patient List) or date and time of last refresh (Remote and Media Patient Lists)

   • Status of the **Autodelete** function (only if **Autodelete** is ON)

- Header bar of the **Exams** list:

   • Current filter

- In the **Status** panel:

	Filming Queue, click on the **Filming Queue** icon to display the **filming print queue**.
	Media status. A flashing green square indicates that a media restore operation is in progress, click on the **Media status** icon to display the **Media queues window**, to view and manage the media transfer operations in progress.
	Network status. A flashing green square indicates that a network transfer is in progress, click on the **Network status** icon to display the **Network queues window**, to view and manage the network transfer operations in progress that were initialized from the AW.

7.3.2.9 Media devices

7.3.2.9.1 Overview

The **Media** function includes one or more media devices. The installed media device(s) are indicated by the icon(s) located in the **Media** panel of the Local Patient List:

	Compact disk recording drive (cd/dvd/usb): Used to record image data in DICOM format on standard 5-1/4" recordable CD/DVD or USB Media Storage Device, and restore data from CD/DVD type compact disks or USBs.

NOTE

Recording media and data types differ between media devices, but the restore procedure is the same for CD, DVD and USB.

NOTE

Read the user documentation provided by the manufacturer of the media devices prior to use.

NOTE

AW supports CD -R, -RW, DVD +/-R, +/-RW and USB (FAT32 only) as storage media, these have been validated for performance and reliability of patient data recording on AW. Use of storage media not supported by AW may result in data loss or incompatibility with other systems.

Bear in mind that many USB mass storage devices use NTFS partition which is incompatible with AW. Therefore, in such cases, make sure that the USB device is formatted to FAT32 before you attempt to use it for patient data recording.

NOTE

Image data can also be recorded on CD/DVD/USB in PDF, HTML or **Data Only** format, using the **Data Export** function in the Filmer. Images recorded with **Data Export** are not in DICOM format and are not suitable for diagnostic purposes.

NOTE

Portable Media currently supports writing to a single CD/DVD or USB. All images need to fit on one single medium. But the number of copies higher than 1 are supported.

NOTE

Preparing the data is a background task. This means that you can close the **Media Composer** window and continue with other tasks while the Media Composer continues to prepare the data (this can take several minutes for big exams or when preparing several exams added to the list at the same time).

NOTE

Only the internal CD/DVD/USB recorder can be used for recording from the **Media Composer** or from **Data Export**.

NOTE

Any series added in the **Media Composer** list will be locked; i.e., they cannot be deleted from the **Patient List** until data is prepared.

NOTE

Writing to a USB mass storage device is not possible while it is being queried. Always detach the queried USB device before initiating the writing process.

NOTE

Never try to eject a disk or unplug an USB key from a media device while a recording or restore operation is in progress.
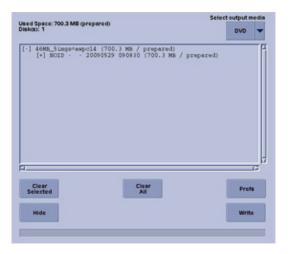
NOTE

In the case of USB mass storage devices, AW currently supports writing up to 60000 images in a single writing session, totaling 300000 images on the same USB device. That is, after the number of images has reached 300000 on a particular USB device, no additional images can be added.

NOTE

Regardless of the media storage device used, when you write more than 20000 images in a single session, or there are more than 150000 images on the target media device already, the CPU/memory usage will increase linearly with the number of images, slowing down the AW considerably. Therefore, it is highly recommended that you do not use any other AW functions during the writing process in such cases.

The **Media Composer** is the tool used to assemble a list of image data to be recorded on a CD/DVD/USB in DICOM format.

- Click **Clear Selected** to remove selected images from the list.
- Click **Clear All** to remove the images added to the Media Composer all at once.
- Click **Prefs** to access **Media Composer Preferences**. See description below for details.
- Click **Hide** to hide the Media Composer dialog.
- Click **Write** to start writing images to discs or copy images to a USB device.
- Click **DVD** to change output media type. Output media type can be changed even after the list has been prepared.

Clicking **Prefs** in the **Media Composer** allows you to manage the following settings:

- Select the desired DICOM Profile option: either **General Purpose** or **Compress XA 512 cardiac**. Default setting is **Compress XA 512 cardiac**.

- Select the **Add DICOM Viewer** option at **Embedded applications** to add DICOM Viewer to the recordable CD/DVD or USB.

  DICOM Viewer allows viewing the recorded images on a PC running any of the following Windows® operating systems: Windows XP (except Service Pack 1), Windows Vista®, Windows 7 or Windows 10. DICOM Viewer will start automatically when the CD/DVD is inserted in a CD/DVD reader. For instructions about using DICOM Viewer, click the **Help** icon in the toolbar.

  By default, this option is selected.

- At **Other Options**, select the **Downscan XA cardiac images to 512** option to downscan XA cardiac images of sizes 800x800, 1000x1000, 736x736, 608x608 and 864x864 to 512x512.

  By default, this option is not selected.

- Select the **Check full media** option to verify the entire content of the recorded media. When this option is not selected, only the directory structure and the accessibility of files are checked on the written media.

  By default, this option is selected.

- Enter the desired number of copies to be made in the text field at **Number of copies**.

- Use the text field at **Description of the institution creating the media** to add this information.

7.3.2.9.2 Add images

There are two ways to add exam(s), series or images to the **Media Composer** list:

- Select the item(s) in the Patient List.

- Click on the **Save selected exam/series/image(s)** button above the corresponding list.

- In the List of Media devices that is displayed, select **cd/dvd/usb** and click on **Save**.
  OR

- Select the item(s) in the Patient List and drag them onto the **cd/dvd/usb** icon at the bottom of the Patient List or to the **Media Composer** list.

The selected item(s) are entered in the **Media Composer** list.

7.3.2.9.3 Remove images

To remove one or more items from the **Media Composer** list:

- Select the item(s) in the list, and then click on the **Clear Selected** button.

To clear the entire **Media Composer** list:

- Click on the **Clear All** button.

7.3.2.9.4 Write media

Once the **Media Composer** list is set up to your satisfaction, you can start the recording process:

- Insert a blank CD/DVD into the internal CD/DVD recorder or plug in a USB mass storage device (such as a USB key) and click on **Write** in the **Media Composer** window.

Note that, when you use a USB device, you need to wait at least 10 seconds before you click **Write**.

- After recording and verifying are complete, a message is displayed. After viewing the verified message, eject the CD/DVD or unplug the USB device. You can close the **Media Composer** window and perform other tasks while the CD/DVD/USB device is being recorded, and monitor progress by means of the **cd/dvd/usb** icon. However, if a fault occurs while recording is in progress, or the AW software is restarted for any reason, recording will be halted, and the resulting material will be unusable.

7.3.2.9.5 Ejecting disk and removing USB mass storage device

As soon as a media device has been accessed for a recording or restore operation, the media device is locked, and you can no longer eject the disk (CD/DVD) by means of the eject button on the front of the drive or remove the USB device.

You must first perform a "detach" operation:

- USB:

  ○ Unplug the device if the recording and verification have been completed without errors. The device is automatically detached after a successful recording operation.

- ◦ Click on the arrow button below the media device icon in the Local Patient List and select **Detach** in the menu if only query has been performed.
    - ◦ Unplug the device if no actions have been performed using the USB device.
  - • CD/DVD: If the disk is not ejected automatically, press the eject button.

If **Detach** is displayed in grey and no recording or restore operation is in progress, the media device is already unlocked. Press the eject button to open the drive.

If a fault occurs (e.g., trying to start a restore operation with a blank disk in the drive), the "detach" operation is performed automatically, and the disk is ejected.

NOTE

Never try to eject a disk or USB key from a media device while a recording or restore operation is in progress.

7.3.2.9.6 Restoring images

- • Insert the media device (CD/DVD/USB) containing the images in the corresponding media device.
- • Wait at least ten seconds to allow the workstation to identify the media device.
- • Click on the icon of the media device in the Media panel in the Local Patient List (**cd/dvd/usb** icon illustrated).

- • This opens the **Media Patient List** for the selected media device.
- • In the **Media Patient List**, select the patient(s), exams(s), series and/or image(s) to be restored in the same manner as in the Local or Remote Patient List.
- • When you have made your selection, click on the corresponding **Restore** button above the list

  OR

  press and hold with the left mouse button on the selected patient, exam, series or image item(s) and drag directly onto the **Local Patient List** button at the bottom of the window.
- • Click on the **Local Patient List** button to return to the Local Patient List.

NOTE

If the media does NOT contain `DICOMDIR`, a simple file-selection application window is displayed. It lists the content of the media and you can select the images directly to be imported.

NOTICE

When recording or restoring data, do not select more than 50 items (patients, exams, series or images) to be recorded or restored at a time. If you exceed this limit some data may not be recorded or restored. For example, do not attempt to record or restore a set of 100 individual images; however, you can safely record or restore a series of 500 images by selecting the series itself to be recorded or restored.

7.3.2.9.7 Importing images

You can import images in DICOM format or in non-standard DICOM media exchange format (i.e., DICOM images without `DICOMDIR` file). In the latter case:
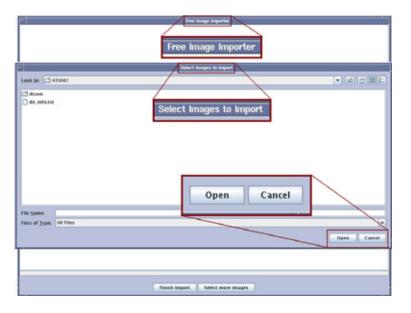
1. Insert the media (CD, DVD or USB) device from which you want to import non-standard DICOM images, and then click the (cd/dvd/usb) icon.

2. In the **Removable device(s)** dialog that opens, select the media device, and then click **OK**:
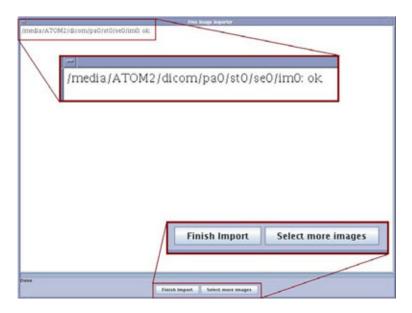
3. The **Free Image Importer**/**Select Images to Import** panels open:
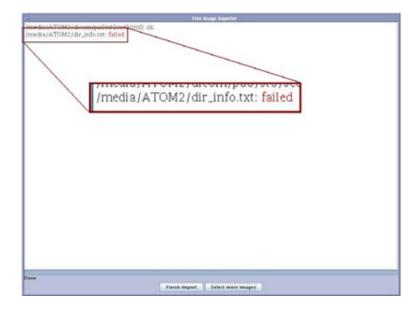
In the **Select Images to Import** panel select the images you want to import, then click **Open** or select **Cancel** to exit **Free Image Importer**.

4. The selected images are displayed in the window of the **Free Image Importer** panel:
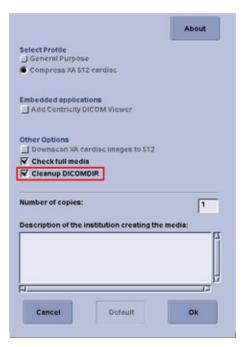
Click **Finish Import** to declare the selected image(s) on the Advantage Workstation or select **Select more images** to add further images to **Free Image Import**.

Note that, if you attempt to add files other than DICOM images, failure information will be provided for such files in the **Free Image Importer** panel:

7.3.2.9.8 Cooperative Selective Delete on USB

Media Composer provides the **Cooperative Selective Delete** function to remove selected images from a USB device on supported operating systems, and then automatically update the `DICOMDIR` file with the changes during the next Media Composer session. Note that this function is only available if the **Cleanup DICOMDIR** option is selected on the **Media Composer Preferences** dialog (see Illustration on the left).
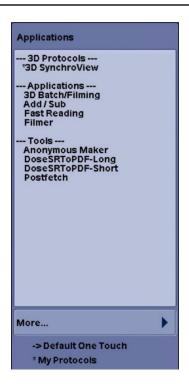
Use the `dir_info.txt` file added to the compilation when images are imported to a USB device to remove redundant images as follows:

- Open the `dir_info.txt` file on your personal computer using a text editor.

  The `dir_info.txt` file contains the following information about each image: Patient's Name/ Patient ID/Exam UID/Exam Description/Directory Location.

- Find the images you do not need, select and delete them, then save the file as text. Note that this change will leave the `DICOMDIR` file intact.

- In the next session when you import images to the same USB device containing the previously saved images and the `dir_info.txt` file, the `DICOMDIR` file will be updated with the information about the newly added images and the changes in the `dir_info.txt` file.

7.3.3 Applications menu

7.3.3.1 Introduction

Use the **Applications** menu to select and launch the software applications available on the workstation. The Applications menu is shown in the figure below.

Applications

--- 3D Protocols ---
  ⁺3D SynchroView

--- Applications ---
  3D Batch/Filming
  Add / Sub
  Fast Reading
  Filmer

--- Tools ---
  Anonymous Maker
  DoseSRToPDF-Long
  DoseSRToPDF-Short
  Postfetch

More...   ▶

  -> Default One Touch
  * My Protocols

To launch a protocol, simply click on the required protocol after the image for review/analysis is selected.

The applications displayed in the **Applications** menu depend on the software installed on the workstation and on the patient exam/series/ image(s) selected in the browser.

To select applications not listed, click on **[More...]** and launch the required application by clicking on it in the **More...** drop-down menu. You can add further applications to the applications list, simply drag and drop in the **Applications** menu any application from the list displayed in the drop-down menu.

7.3.3.2 One Touch Manager

The **Applications** menu provides a function (**One Touch Manager**, available from the **More...** drop-down list) to build one touch protocols, which allows you to launch an application directly by double–clicking on exams/series/images.

To launch an application directly by double–clicking on exams/series/images, you will have to build a one touch protocol first. A one touch protocol links images with the same features to one application. To build a one touch protocol, proceed as follows:

- Click **More...** in the **Applications** menu.

- Select **One Touch Manager** in the list: the **One Touch Manager** panel is displayed.

- Click **Add** to create a one touch protocol: the **Create/Modify an attachment** panel is displayed.

- Select/fill in **Application**, **Double–click preference**, **Label** area, **Advanced parameters** and **Attachment types**, tick **Mark Attachment as favorite** checkbox to make the application favorite and click **Ok**: this new protocol appears in the **One Touch Manager** panel.

- Click **Save** and **Close**: this protocol will always be listed in the **One Touch Manager** panel and will appear in the **Applications** menu whenever an image with these parameters is selected in the patient list.

NOTE

If you drag and drop a one touch protocol out of the **Applications** menu, a pop–up window will prompt you to confirm deletion. If you confirm, the protocol will be removed from the protocol list of the **One Touch Manager** panel and deleted.

NOTE

The **[Software Manager]** item at the top of the list is for the use of GE HealthCare Service only.

NOTE

All installed applications with a shortcut in the **Applications** menu will automatically appear in the **One Touch Manager** panel with " * " for **Modality**, **Image type** and **Protocol name**. They are displayed at the bottom of the list as low priority protocols, below one touch protocols. If you create a shortcut for an installed application, the application will appear in the **One Touch Manager** Panel above all previous installed applications and below one touch protocols.

NOTE

In the **AW Protocol/Layout Label** column of the **One Touch Manager** panel, protocols displayed with an arrow on their left have their double–click preference set to **"Yes"**. Protocols displayed without an arrow have their double–click preference set to **"No"**. The double–click preference for application shortcuts is set to **"No"** and cannot be modified.
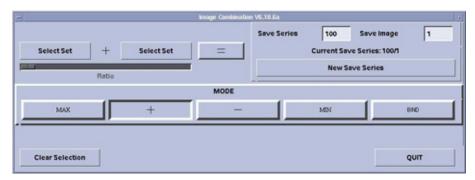
7.3.3.3 Image combination

The **Applications** menu also provides a function (**Add / Sub**, available from the **More...** drop-down list) to combine images. The image combination function allows you to perform various operations on one or two sets of images selected in the Browser and place the resulting images in a new series.

NOTE

Add / Sub accepts only CT, MR and Secondary Captures images. It works only on black & white images with 12 to 16 bit depth.

To activate this function, click left on the **Add / Sub** button in the Browser. The **Image Combination** command window opens:

If only one set is selected, each operation performed produces ONE resulting image.

If two sets are selected, images in the two sets are paired according to physical location in the patient's body.

Unpaired images in either set are ignored. Each operation performed produces ONE resulting image PER PAIR.

The images resulting from each operation are generated in the exam defined by the left-hand **Select Set** button.

Save series

Resulting images are always assigned a new series number and starting image number given by the **Current Save Series** field in the upper right corner of the **Image Combination** command window, and are stored as new series, unless you manually change it to a previously saved series number. In the latter case, the new series will be appended to the previously saved series.

NOTICE

Since "Comb" series contain images resulting from a combination of images having different locations in the patient's body, the absolute anatomical coordinates accompanying these series (shown both in the Browser and on the displayed images) are not accurate. Only relative geometrical measurements (i.e. distance, angle or area) made within a resulting image are accurate.

NOTE

Even though **Proc** and **Comb** series can, in certain cases, be "pushed" to other console types via the network, they can be displayed, analyzed and manipulated on AW VolumeShare workstations ONLY.

Maximum Pixel Value Extraction (MAX)

Maximum pixel value extraction is an operation that consists of finding maximum image intensity values pixel by pixel.

Two types of maximum pixel value extraction are possible:

- Extraction on one set alone,
- Extraction between two sets.

Image Addition (+)

Image addition is an operation that consists of adding image intensity values pixel by pixel.

Two types of image addition are possible:

- Image addition on one set alone,
- Image addition between two sets.

Image Subtraction (-)

Image subtraction is an operation that consists of subtracting image intensity values pixel by pixel.

Two types of image subtraction are possible:

- Image subtraction between two images in one set alone,
- Image subtraction between two sets.

Minimum Pixel Value Extraction (MIN)

Minimum pixel value extraction is an operation that consists of finding minimum image intensity values pixel by pixel.

Two types of minimum pixel value extraction are possible:

- Extraction on one set alone,
- Extraction between two sets.

Binding Series (BIND)

You can create a new series which consists of copies of selected images from one or more existing series.

NOTE

Save State information is not maintained in the new series generated in this way.

Closing the Image Combination Command Window

To close the **Image Combination** command window, click left on the **QUIT** button.

7.3.3.4 Preference sharing

The **Application** menu provides a function called **Preference Sharing** which is a tool to exchange preferences (defined for the 2D Viewer, Volume Viewer and Filmer applications) between users and workstations. Select it and **Preference Sharing Manager** starts with displaying the local preferences of all the registered applications.

NOTE

> If no applications have been registered for sharing preferences, a warning message is displayed during start up.

Preference Sharing Manager window contains the following buttons and features:

- **PSM Server**: It exports/imports preferences from the local PSM server.
- **USB Device**: It exports/imports preferences from a USB device.
- **[All Preferences/My Preferences]**: Select **All Preferences** to view all the preferences on PSM server. Select **My Preferences** to view preferences exported to the server from the logged in user using this host name.

  NOTE

  > This list is displayed only upon the selection of PSM server option.

  NOTE

  > An AW itself can be configured and used as a PSM server if this function is enabled. To activate the **PSM Server** function, contact your GE HealthCare Field Service Representative.

- **List of USB devices**: It shows all the plugged-in USB device names.

  NOTE

  > This list is displayed only upon the selection of USB devices option.

- **Refresh**: Refreshes local and target preference tables.
- **Import**: Imports preference(s) to target media (Server/USB).
- **Export**: Export preference(s) from target media (Server/USB).
- **Select All**: Selects all the preferences of all the applications.
- **Unselect All**: Unselects all the preferences of all applications.
- **Delete**: Deletes preferences on the server exported by current logged-in user using this host.

  NOTE

  > This is activated when **My Preferences** option is selected.

- **Clean PSM Content on Media**: Removes all preferences present on the selected USB device.

  NOTE
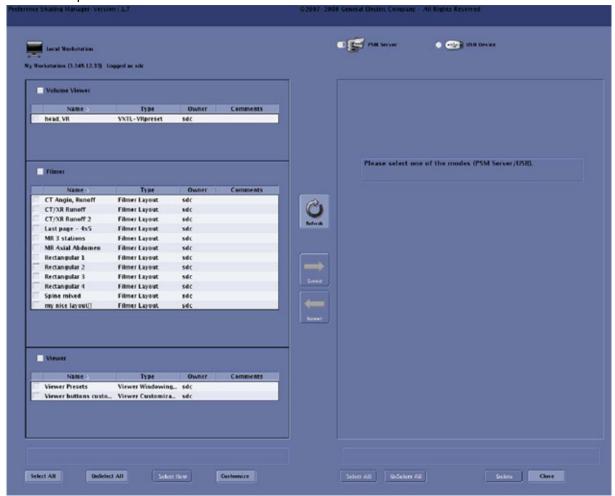
  > This is activated when **USB device** option is selected.

- **Close**: Closes **Preference Sharing Manager** window.

NOTE

Use the checkbox next to each application name to select/unselect all the preferences of that application. To select/unselect individual preferences, use the check box associated with the preference name.

Export/import preference to Server

- Select **PSM Server** option.

- To export preferences, select preference(s) of interest on the left side of **Preference Sharing Manager** window by clicking the checkbox next to them.

NOTE

To import, select the preferences on the right side of the window.

- Click **Export** button to export the preferences.

NOTE

Click **Import** button to import the preferences.

NOTE

To use this capability, a server shall be configured on the site.

Export/import preference to USB device

- Plug in the USB device.

- Select **USB device** option.

- If more than one USB is plugged in, select USB device of interest from the drop-down box.

- To export preferences, select preference(s) of interest on the left side of **Preference Sharing Manager** window by clicking the checkbox next to them.

NOTE

To import, select the preferences on the right side of the window.

- Click **Export** button to export the preferences.

NOTE

Click **Import** button to import the preferences.

NOTE

Preference Sharing Manager closes the open applications before import, so close them for import operation to proceed.

A progress bar is displayed during the export/import operation and upon completion of the operation. PSM displays a **Status** window. In case of any error, by hovering the mouse on comment column, reason for error is displayed as a tool tip.

Deleting exported preferences

The user is allowed to delete only those preferences that are exported by them using the local workstation.

To delete the preferences on PSM server:

- Select **My Preferences** from the drop-down list at the top.

- Select **Preference(s) of interest** on right side of **Preference Sharing Manager** window by clicking the checkbox next to the preference name.

- Click the **Delete** button at the right bottom of **Preference Sharing Manager** window.

Administering PSM Server

PSM allows AW administrator to perform the following operations on PSM Server. To perform these operations:

- Click **Service Tools**.

- Select the **Utilities** tab.

- Open **Advanced Service Tools**.

- Click **PSM Server Configuration**.

- Enter the root password.

- Click **Click here for PSM Server Configuration…**.

    NOTE

    If **Click here for PSM Server Configuration…** is not available, enable **Configure PSM** by setting it to **On** and clicking the **Apply** button.

- Enter the root password.

The following options will be displayed:

- **Clean Database**: This operation allows removing all the preferences stored on PSM server.

- **Backup/Restore**: This operation allows backing/restoring of server preferences from/to USB key.
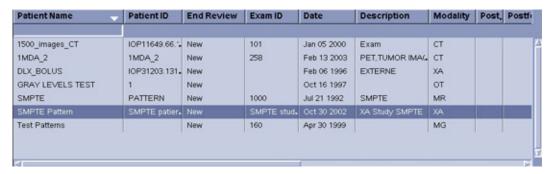
- **Reconcile Database**: This operation rebuilds the PSM server database if the PSM server database is corrupted/deleted.

7.3.4 Selecting and managing images

7.3.4.1 Local / Remote Patient List layout

The default (hierarchically structured) layout of the Local Patient List and Remote Patient List contain the following three lists:
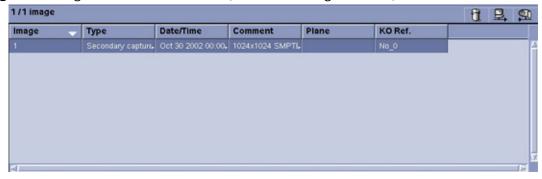
- **Exams**: the exams stored on the image disk for each patient (shown in the Figure below).

- **Series**: the series contained in the selected exam (shown in the Figure below).

- **Images**: the images in the selected series (shown in the Figure below).

For Media Patient Lists, a fourth, **Patients** list is also available, showing the patients stored on the removable media.

7.3.4.2 How to Select Images

When you start the AW software and the Patient List is displayed, the first exam in the list, the first series of that exam, and the first image of that series are selected (highlighted).

To change the selection:

- Click on the exam of your choice: the series list for the newly selected exam is displayed.

- Click on the series of your choice.

Once you have selected a series, all images in that series are automatically selected (only the first one is highlighted).

Multiple selection of exams, series and images in the Patient List is used for item management (removing images, network transfers). The same technique is also used to select a reduced group of images in a series to be used by a viewing application.

- To select more than one item (exam, series or image) in a list, hold the **Control** key and click on each item you wish to select.
- To deselect a previously selected item, hold the **Control** key and click on it again.
- If you select an item by clicking on it without holding the **Control** key, this will reset the current selection.

To select a sequential range of exams, series or images:

- Click on the first item. Move the cursor to the last item. Hold the **Shift** key and click on the last item.

NOTE

If you select multiple exams or series, the list of their components (series or images) will not be displayed in the Patient List. For example, if multiple exams are selected in the Patient List, the series and image lists will be displayed empty.

NOTE

Postfetch application checks the availability of the currently selected exams that have the same images declared as the exams stored on the chosen remote DICOM host. If there are prior exams of the configured modality, the application automatically pulls the images to the AW.
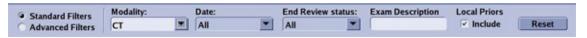
7.3.4.3 Filters

The **Filter** feature is used to filter the Patient List data based on Standard and Advanced filter modes. You can use **Filters** to filter the exam data in Local and Remote hosts. The AW displays exam data depending on the filter criteria as entered by you.

Standard Filters

Select **Standard Filters** in the **Filters** window for quick access to the standard filter options.

The **Standard Filters** panel is shown below.

Filtering criteria	Description
[Modality]	You can filter the Patient List data based on modality information criteria. The modalities available from a drop-down menu are **CT**, **MR**, **CR**, **XA**, **RF**, **MG**, **DX**, **NM**, **PT**, **OT**, **SR**, **US**, **KEY_OBJECT** or **All** of these.
[Date]	You can filter the Patient List data based on pre-defined date selection option. The pre-defined options available from a drop-down menu are **Today**, **This Morning**, **This Afternoon**, **Yesterday**, **The Day Before**, **Since 7 days**, **Since 30 days** or **All**.

Filtering criteria	Description
[End Review status]	You can filter the Patient List data based on the Review status for each exam. The options available from a drop-down menu are: **All** – All the Exams **New** – Exams for which End Review is not completed **Done** - Exams for which End Review is completed
[Exam Description]	This option creates filtered data that matches the description provided by the user with the Patient List's description. Enter the description in the textbox and click 'enter' to filter the data for the Exam description.
[Local Priors]	With the **Local Priors** box checked, the filtered data includes all the exams of the patient who matches the filter. Otherwise, the filtered data is the matched exams only.

Advanced Filters

Select **Advanced Filters** in the **Filters** window to manage the various advanced filter options. You can filter the Patient List data based on **Patient level**, **Exam level** and *Series level*. Use the **Filter Manager** button to create new custom filter and also modify the existing filter.

The **Advanced Filters** panel is shown below.

The **Advanced Filters** option provides a drop–down menu containing the following items:

- **[No Filter]**

  This option displays all available exams and series.

- **[Temporary Filter]**

  This option is used to create the temporary filter that is used for incidental queries. The temporary filter is supported for both Local and Remote AWs. The temporary filter is used only for the current session with the Patient List, and is not saved.

  The temporary filter applied to remote hosts does not support all the filter criteria of Patient, Exam, and Series levels.
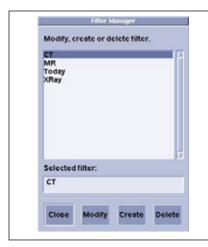
- **[Today]**

  This option displays exams and series for a patient who has had at least one series created today. All the exams of a given patient are displayed.

- **Custom filters**

  There are a list of custom filters displayed, for example – **[CT]**, **[MR]**, **[XRay]**, etc.

  To create, modify or delete a custom filter, select the **Advanced Filters** option in the **Filters** window and click the **Filter Manager** button to open the **Filter Manager** window.

	• To create a new filter, click on **Create** to open the **Define or modify filter** window.
Filter Manager Modify, create or delete filter. CT MR Today XRay Selected filter: CT Close Modify Create Delete	• To modify a filter, select it in the list. Click on **Modify** to open the **Define or modify filter** window. • To remove a filter, select it in the list, and then click on **Delete**. In the confirmation window that appears, click on **Yes** to remove the filter, or on **No** to cancel the operation. • To close the window, click on **Close**.

Entering data in the Filter window

The **Temporary Filter** definition window does not have the **Filter name** field, and has an **Apply** button instead of the **Save** button.

The upper part of the **Filter** window contains three levels: **Patient Level**, **Exam Level**, and **Series Level**, organized like a stack of index cards. Click on the "tabs" at the top of the "cards" to move between the levels.

A legend saying **"(used)"** on a "tab" indicates that an entry has been made on the "card" at that level.

Entering and editing data

To enter data from the keyboard in the various fields, move the mouse pointer inside the field. The mouse pointer MUST remain inside the field during data entry.

While entering data, you can make corrections at any time. Point and click to position the text cursor at the desired position. You can now insert text at the cursor, or use the **Del** or the **Backspace** key to delete the text in front of the cursor. The **Clear** button allows you to clear the entire contents of the window.

Filter name
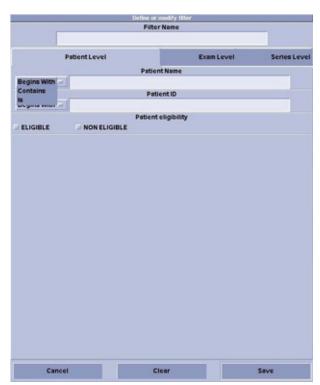
Enter the name under which the new filter will be saved in the **"Filter name"** field at the top.

Names and ID

You can set up "text filters" for:

- **Patient Name** and **Patient ID** (at the Patient level)
- Contents of the **Exam Description** field, and the names of the **Performing Physician**, **Referring Physician**, **Hospital** and **Accession Number** (at the Exam level)
- Contents of the **Series Description** field (at the Series level)

Entries for all of these are made in the same manner.

First click on the button at the left of the text field and select the desired mode: **[Begins with]** (default), **[Contains]** or **[Is]**, then move the mouse pointer into the text field and type the corresponding character chain. You can use upper case and lower case characters indifferently: the text filters are not case sensitive. When the filter is applied, each "text filter" character chain is compared with the corresponding Patient List entry. Empty "text filter" fields are ignored.
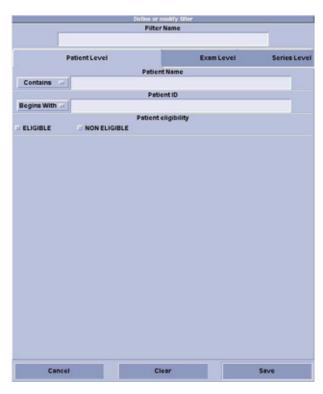
[Begins with]	Show only items for whom the Patient List entry starts with the character chain.
[Contains]	Show only items for whom the Patient List entry contains the character chain.
[Is]	Show only items for whom the Patient List entry corresponds exactly to the character chain.

The **[Contains]** filter mode is particularly useful if several files exist for the same item such as a patient, but the item (e.g., patient name) has not been entered identically each time. Entering "Smith" using this mode will show not only "SMITH, JOHN", but also "John Smith", "J. SMITH" and "MR Knee, SMITH J".

Patient eligibility
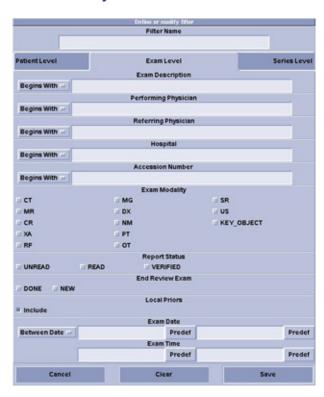
Select the **Patient Level** tab, and click on the checkbox next to the desired patient eligibility status (**ELIGIBLE** or **NON ELIGIBLE**). When the filter is applied, only exams with the selected patient eligibility status will be displayed in the Patient List. Note: if neither checkbox has been marked, exams for both "eligible" and "not eligible" patients will be shown.

You can use this feature to create a "manual worklist", i.e., select yourself which exams you want shown in the Patient List at a given moment rather than use filter criteria such as date or patient name.

To set the eligibility status of one or more exams, select the exam(s) in the Patient List, and then click on the "eligible" or "not eligible" button above the **Exam** list. You can now use an "eligible" or "not eligible" filter to show only the exams in the desired category.

Exam modality

Select the **Exam Level** tab, and click on the checkbox next to the desired modality or modalities to select it (more than one modality can be selected at the same time). When the filter is applied, only the exams that contain series with the selected modalities will be displayed in the Patient List. Click again on the checkbox to deselect an exam modality (the modality filter may not be available (displayed in grey) in the Remote Patient List, depending on the type of remote host (see Local / Remote Patient List layout on page 55).

Exam report status

Select the **Exam Level** tab, and click on the checkbox next to the desired exam report status (**"Unread"**, **"Read"** or **"Verified"**). When the filter is applied, only exams with the selected exam

report status will be displayed in the Patient List. If no checkbox has been marked, exams will be shown regardless of the exam report status.

NOTE

Changing the report status information (**"Unread"**, **"Read"** or **"Verified"**) of an exam does not update the information for that exam on external systems (HIS/RIS or PACS).

Local Priors

The **Local Priors** check box is also available in the **Advanced Filters** > **Temporary Filter** (> **Define or modify filter** window > **Exam Level** tab).

The status of the **Local Priors** box (checked or unchecked) remains unchanged when switching from **Standard Filters** to **Advanced Filters** > **Temporary Filter**.

End Review Exam

Select the **Exam Level** tab, and click on the checkbox next to the desired end review exam (**"Done"** or **"New"**). When the filter is applied, only exams with the selected end review exam will be displayed in the Patient List. If no checkbox has been marked, exams will be shown regardless of the end review exam.

Exam date

Click on the button at the left of the **Exam Date** field, select the desired option and enter the date(s):

[Between date]	Show only the exams for which the date is between the dates entered (start and end date included). The earlier date must be entered in the left field and the later date in the right field.
[Before date]	Show only exams for which the date is on or before the date entered.
[After date]	Show only exams for which the date is on or after the date entered.
[On date]	Show only exams for which the date is on the date entered.

To enter the date(s), move the mouse pointer into the **Exam Date** entry field(s) and type the desired date(s) on the keyboard, or use the **Predef** buttons on the right side of the **Exam Date** entry field.

NOTICE

As soon as an **Exam Date** field is filled in, the corresponding **Exam Time** field is set automatically to 00:00:00 (for a "start" date) or 23:59:59 (for an "end" date). Refer to Exam time on page 62 for details on how to change these time settings.

To enter a date from the keyboard, you use the MMM DD YYYY format (month day year). As an example, August 15, 1997 should be entered as AUG 15 1997.

To use the **Predef** button, click on it and then select the desired option from the drop-down menu:

[Today]	Place today's date in the date entry field.
[Yesterday]	Place yesterday's date in the date entry field.
[The day before]	Place the date of the day before yesterday in the date entry field.
[A week ago]	Place the date corresponding to the current day of the week, but a week earlier, in the date entry field. For example, if today is Wednesday, the date of Wednesday last week will be placed in the date entry field.

[Today – n...]	Place a date that is a given number of days prior to the present day in the date entry field. Move the mouse pointer into the Number of days field of the window that pops up, and enter the desired number of days. Click on **OK** to enter the date, or on **Cancel** to annul the operation.
[Calendar...]	Use the **Calendar** window described below.

NOTE

If you use the options **[Today]**, **[Yesterday]**, etc. to define a date in a Custom Filter, you should be aware that these dates are relative to the current date, i.e. the date is recalculated each time you use (apply) the filter.

As an example: assume you have entered **[After date]** and **[A week ago]** in a Custom Filter.

If you use this filter on March 15, all items on or after March 8 will be shown. If you now use this filter again on March 28, only those items on or after March 21 will be shown.

To enter a date using the **Calendar** window, click on **[Calendar...]**.

If necessary, use the up or down arrows to scroll through the list of months.

Click on the desired month and day, click **Apply**, then enter selected date in date entry field and close the window.

Click **Cancel** to annul operation.

Exam time

This function of the filter allows you to add a time reference to the **Exam Date** above it.

For instance, the following set–up:

Between date	: **Yesterday / Today**
	: **Noon / Noon**

will show in the Patient List only those exams that were performed after yesterday 12:00 AM and before today 12:00 AM.

To enter the time(s), you can either move the mouse pointer into the **Exam Time** data entry field(s) and type the desired time(s) on the keyboard, or you can use the **Predef** buttons on the right side of the date entry field.

To enter a time from the keyboard, you use the HH:MM:SS (hours:minutes:seconds) or HH:MM (hours:minutes) format. As an example, 5:15 PM should be entered as 17:15:00 or as 17:15.

To enter a time using the **Predef** button, click on it, then select **[Noon]** or **[00:00:00]** from the drop–down menu that appears.

NOTE

If an **Exam Date** field is empty, or not displayed, any data entered in the corresponding **Exam Time** field directly below it is ignored.

As soon as an **Exam Date** field is filled in, and the corresponding **Exam Time** field is empty, it is set automatically to

00:00:00 (for a "start" date) or 23:59:59 (for an "end" date). For the **[On date]** filter mode the left **Exam Time** field is set to 00:00:00, the right field to 23:59:59.

Series type

Select the **Series Level** tab, and click on the checkbox next to the desired series type (**"SCPT"**, **"Raw"** or **"Processed"**). When the filter is applied, only series with the selected type will be displayed in the Patient List. Note: if no checkbox has been marked, series will be shown regardless of the type.

Series Status

Select the **Series Level** tab, and click on the checkbox next to the desired series status (**"Archived"**/**"Not archived"**, **"Filmed"**/**"Not filmed"** and/or **"Saved"**/**"Not saved"**). When the filter is applied, only series with the selected status will be displayed in the Patient List.

NOTE

> If no checkbox has been marked, series will be shown regardless of the status.

To include exams in the Patient list, do not check the box **"Exclude all exams matching one of the criteria"**. Select the checkboxes to indicate the series of interest.

To exclude exams from the patient list, check the box **"Exclude all exams matching one of the series criteria"**. Select the checkbox to indicate the series that are not of interest. When the filter is applied, only exams that do not match the selected series criteria will be displayed in the Patient List.

Closing the Filter window

When you have defined the data in the filter window, you close the **Filter** window as follows:

- If you have defined a temporary filter: click on **Apply** to directly apply the filter to the lists, or click on **Cancel** to annul the operation. The **Filter** window closes.

- If you have defined a custom filter: click on **Save** to save the filter on the workstation database, or click on **Cancel** to annul the operation. The **Filter** window closes. Then, click on **Close** in the **Filter selection** window to return to the Patient List.

Default filter at startup

You can elect to apply a filter to a **Patient List** when first displayed. Separate settings are available for the **Local Patient List**, and for DICOM remote hosts in the Remote Patient List (the filter function is not available in the Media Patient List).

Notes

- *Empty fields*

  Fields that have no entries in them are not taken into account (except for the **Exam Time** field).

- **Patient Name**

  "Patient Name" refers to the contents of the **"Patient Name"** column in the Patient List, in other words the name under which the patient's image files are stored. This "name" does not

necessarily correspond to the patient's family name, or even start with the same letters (as in "MR knee, SMITH J").

- *Multi–modality exams*

  If an exam contains series with more than one modality (e.g., MR/OT for an MR exam with added screen captures), it will be shown in the Patient List whenever at least one of the modalities has been selected in the filter.

- **Exam Time**

  When using an exam date and exam time filter in the Remote Patient List for exams in DICOM format, the first exam time must be earlier than the last, regardless of the date.

  A filter **"Between Nov 1 14:00 and Nov 6 12:00"** will not function correctly because the first time (i.e. 14:00) is later than the last (i.e. 12:00).

NOTE

The software is supplied with predefined custom filters, such as **"CT"**, **"MR"** and **"XRay"**. You can modify or delete these predefined custom filters as required, like any other custom filter.

7.3.4.4 Mosaic

The **Mosaic** displayed on the right side of the Local Patient List has two tabs:

- The **Series** tab shows a reduced–size preview of the central (not the first) image of each series present in the series list.

- The **Images** tab shows a reduced–size preview of all images of the selected series. If the image is multi–frame, it is shown a reduced size preview of the representative frame (may not be the first one) of each image of the selected series.

Use the {scroll bar} on the side of the **Mosaic** window to scroll through the images, if more images are present in the images list than can be shown in the **Mosaic** window.

Selecting a series

- Select the **Series** tab.

- Click on an image in the **Series** display to select the corresponding series, in the same way as making a selection in the series list. A white border around the image indicates that the corresponding series has been selected.

- To select more than one series in the **Series** display, hold the **Control** key down and click the mouse button on each series you wish to select.

NOTE

Any selections you make using the **Series** display are reflected in the **Series list**, and vice–versa.

Selecting an image

- Select the **Images** tab.

- Click on an image in the Images display to select the corresponding image, in the same way as making a selection in the images list. A white border around the image indicates that the corresponding image has been selected.

- To select more than one image in the Images display, hold the **Control** key down and click the mouse button on each image you wish to select.

Window Width/Level

Initially the Mosaic window displays the preview images with the window width/level values, as they were loaded from the image disk. These values are not always suitable for proper display: the preview images may be almost unrecognizable, or may even be completely black or white.

You can change the window width/level (W/L) values of the preview images in the same manner as for the 2D Viewer application:

- Select the preview image to adjust (white border). Leave the mouse pointer on the image.

- Press **Control-A** on the keyboard to adjust W/L automatically,

  OR

  Use the **F5** to **F10** function keys to apply a preset W/L setting,

  OR

  Use the keyboard up, down, left, and right arrow keys,

  OR

  Use the middle mouse button:
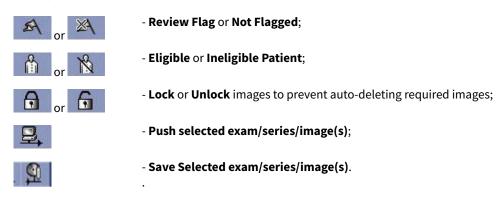
 Press and hold the middle mouse button on the preview image you want to adjust. The mouse cursor changes to the **Adjust W/L** graphic. Move the cursor to the left or to the right to decrease or increase window width (WW), and up or down to decrease or increase window level (WL).

7.3.4.5 Patient List display options

The Patient List header is shown below.

You can manually change the display options of the patient data in the local patient list. To change the preferences for the display options of a patient data, single click on the icon you wish to change the preference for the data. The column is automatically updated when you click on the icon. The options displayed are as follows:

 - **Review Flag** or **Not Flagged**;

 - **Eligible** or **Ineligible Patient**;

 - **Lock** or **Unlock** images to prevent auto-deleting required images;

 - **Push selected exam/series/image(s)**;

 - **Save Selected exam/series/image(s)**.

7.3.4.6 Networking

7.3.4.6.1 Overview

Normally, your AW workstation is connected ("networked") to other workstations and imaging systems. Networking gives you (or anyone else on your network) the ability to transfer images

between workstations and/or medical imaging systems quickly and easily. The other workstations and imaging systems that are networked to your AW workstation are termed "remote hosts".

NOTE

If more remote hosts are declared on the workstation than can be displayed on the control panel, a scroll bar allows you to scroll through the available remote hosts.

NOTE

AW4.7 currently supports 6 simultaneous incoming DICOM connections; any actions (i.e., query, push, or pull) using a 7th connection will be refused.

The **Network Panel** is shown below.

Some of the other remote hosts networked on the host machine indicate the type of workstation using an indicative icon. The icon assigned to a remote host is dependent on the connected workstation type selected during host creation using the **Network Manager** tool. Some of the icons reflected in the network panel are shown in the list below:

Remote Host Workstation

Direct Connect (DC) Workstation. The DC workstation is in direct link with the private network and the DC workstations can access applications directly on the DC remote workstations.

Direct Connect (DC) with CT

Direct Connect (DC) with MR

Media Storage

 MG Workstation

 MR Workstation

 PACS

 PET Workstation

 Review Workstation

 X–Ray Workstation

 CT Workstation

 Other Workstation

7.3.4.6.2 Direct Connect

The Direct Connect (DC) workstation is the mean by which software applications can access data stored on remote hosts without declaring the data or images in the local database. This means that the DC workstation is in direct link with the private network and the DC workstations can access applications directly on the DC remote workstations.

The DC workstation offers faster access to applications to study and analyze exam data. On review workstations, applications cannot be accessed on the remote hosts and, in such a scenario, you will

need to copy the exam data to the local database for further study. You can create new data or secondary captures using the DC host images in the local database.

On the patient search result, the data from the DC workstation is reflected on the data as DC. The arrow on the DC workstation icon on the network panel indicates that the host can be accessed through direct connect. Refer to list at the end of this section for the **DC** icon.

NOTE

> Contact your local GE HealthCare representative to know whether your remote workstations can be accessed through Direct Connect.

DC remote hosts can be connected in two different ways depending on the hospital configuration:

- The Direct Connect host shall be connected to the hospital system on a separate network port. This means that the data is being transferred using two different network connections – one port for the Direct Connect network and one port for the hospital network. There is no warning in case of two separate network port configuration.

- If the Direct Connect host is connected on the same physical network port as the hospital network, the data will be transferred using one network port. To warn users of single network port Direct Connect hosts, AW pops–up a warning at the start of the application and each time the user accesses the host manager – changes, adds or removes a host in the list. The pop–up warning lists all Direct Connect hosts using the hospital network. For Direct Connect with AW Server this method shall be used because AW Server does not have dedicated network port for Direct Connect.

7.3.4.6.3 Image transfer to Remote Host

To transfer images to a Remote Host:

1. Select the items you want to copy to the remote host in the exams, series or images list.

2. Click on the **Network push** button above that list. This opens the **Network Push** selection window.

3. Click on name of the desired remote host to select (highlight) it and click on **Push**.

   Alternatively, you can use the **Network** panel at the bottom of the Local Patient List.

4. Select the exam, series or image item(s) in the Local Patient List.

5. Press and hold with the left mouse button on the selected item(s) and drag directly onto the desired remote host icon in the **Network** panel. This starts the network transfer.

> **NOTICE**
>
> Do not attempt to transfer more than 50 items (exams, series or images) at a time. If you exceed this limit some data may not be transferred. E.g., do not attempt to transfer a set of 100 individual images; however, you can safely transfer a series of 500 images by selecting the series itself for transfer.

7.3.4.6.4 Image transfer from other stations (Remote Patient List)

The **Remote Patient List** window is the tool you use to select patients, exams, series, and images available on remote hosts and transfer them from the remote host to your workstation. Most of the items in the **Remote Patient List** window function in the same way as in the Local Patient List.

Some items may not be available: e.g., you cannot remove items stored on other workstations or other systems.

Differences compared to Local Patient List:

- In the Remote Patient List, patients and exams are listed separately, rather than in a single exams list as in the Local Patient List. To select patients, exams, series, and images in the lists, you use the same techniques as in the Local Patient List. The patient, exam, series and image lists in the **Remote Patient List** contain the same columns of information as in the Local Patient List. However, some of these columns may be empty in the **Remote Patient List**. The full information will be displayed in the Local Patient List after you have transferred the images to your workstation.

  Note that for images of the KEY_OBJECT type, the image list displays the information as shown in the illustration below:

  - **Date/Time**: Date and time the KEY_OBJECT was created,
  - **Document title**: If not available, the column remains empty,
  - **Images**: The number of images referenced by the KEY_OBJECT,
  - **Modality**: Simplified modality list referenced by the KEY_OBJECT.

- To help you in selecting images, you can sort the lists by patient name, date, etc. as in the Local Patient List.

- You can use filters to show only those items in the lists that meet certain criteria that you define, as in the Local Patient List. By selecting the **Standard** radio button on the **Filters** panel on the remote host, you can specify standard filters. By selecting the **Advanced** radio button on the **Filters** panel on the remote host, you can specify advanced filters.

  The last applied filter is automatically saved and applied at startup.

  Use of filters in the **Remote Patient List** is subject to certain limitations, depending on the type of remote host. In most cases, the corresponding areas in the Filter windows will be displayed in grey.

  In particular, some remote hosts (e.g., CT acquisition systems) do not support modality filters.

  Incompatibility between the current remote host and the use of filters is generally indicated by the fact that the items shown in the **Remote Patient List** do not correspond to the filter settings.

  In certain cases, a warning message is displayed: `Filter not supported`. Reset the **Remote Patient List** filter to **No Filter** and repeat the query of the remote host.

  Use caution when using filters in the **Remote Patient List**. Always check that the data that you have selected and transferred using a filter in the **Remote Patient List** correspond to your requirements.

To copy patients, exams, series or images from the remote host to your workstation:

1. Select the items you want to copy in the corresponding list in the **Remote Patient List**.

2. Click the **Network get** button above that list. This initiates the transfer.

Alternatively, press and hold with the left mouse button on the selected patient, exam, series or image item(s) and drag directly onto the Local Patient List icon at the bottom of the Remote Patient List to initiate the transfer.

NOTICE

Do not select more than 50 items (patients, exams, series or images) to transfer at a time. If you exceed this limit some data may not be transferred. For example, do not attempt to transfer a set of 100 individual images; however, you can safely transfer a series of 500 images by selecting the series itself for transfer.

When you first open a remote host, the patient lists are empty until you apply a filter by clicking the **Search** button. While the search for images which match the filter criteria is taking place you can cancel the search by clicking **Stop**. Once the images have been located, the lists will update and the button will change to **Refresh**. This list is up to date at the time of making the search, however, it is NOT refreshed (updated) automatically to show the changes in the data available on the remote host (arrival of new items or removal).
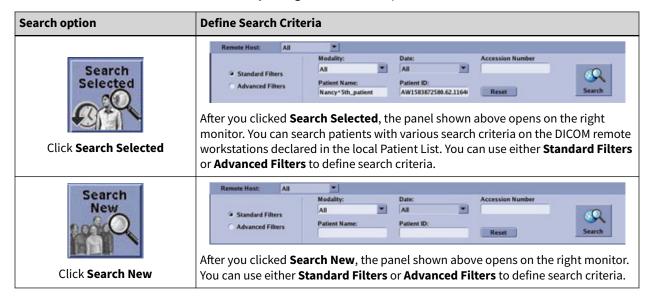
To refresh the **Remote Patient List**:

Click the **Refresh** button.
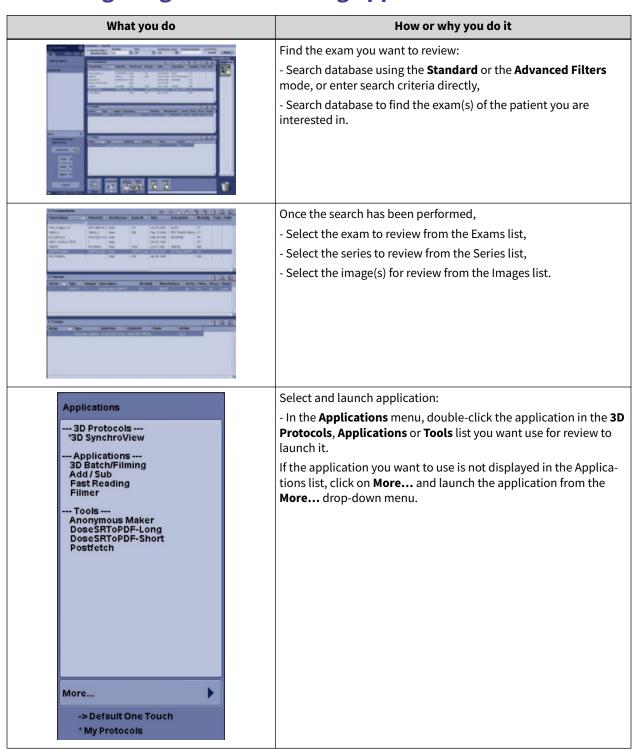
Date and time of the last refresh are shown above the lists in the **Remote Patient List**.

7.3.4.6.5 Search
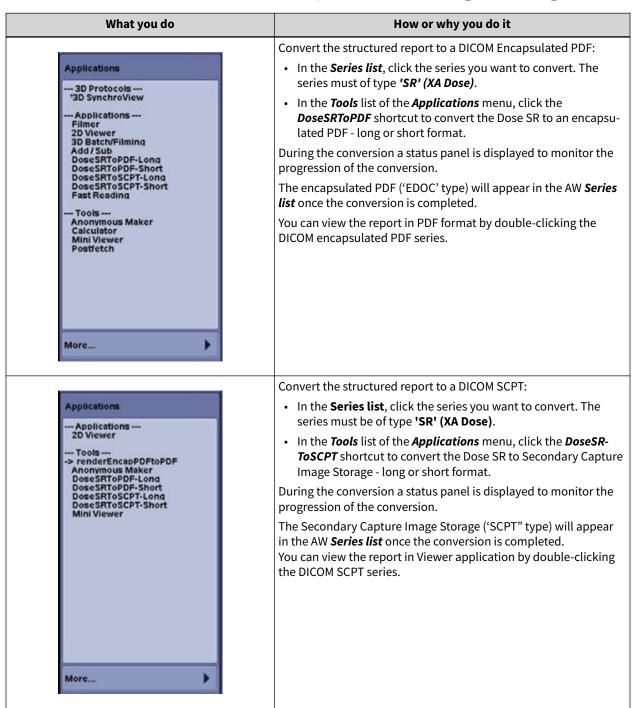
You can search for patient data in the local and remote workstations networked on the hosts. You can either search for more exams of a specific patient using the **Search Selected** option or search for exams not listed on the local database by using **Search New** option.

Search option	Define Search Criteria
Click **Search Selected**	After you clicked **Search Selected**, the panel shown above opens on the right monitor. You can search patients with various search criteria on the DICOM remote workstations declared in the local Patient List. You can use either **Standard Filters** or **Advanced Filters** to define search criteria.
Click **Search New**	After you clicked **Search New**, the panel shown above opens on the right monitor. You can use either **Standard Filters** or **Advanced Filters** to define search criteria.

7.3.5 Selecting images and launching applications - workflow

What you do	How or why you do it
	Find the exam you want to review: - Search database using the **Standard** or the **Advanced Filters** mode, or enter search criteria directly, - Search database to find the exam(s) of the patient you are interested in.
	Once the search has been performed, - Select the exam to review from the Exams list, - Select the series to review from the Series list, - Select the image(s) for review from the Images list.
	Select and launch application: - In the **Applications** menu, double-click the application in the **3D Protocols**, **Applications** or **Tools** list you want use for review to launch it. If the application you want to use is not displayed in the Applications list, click on **More...** and launch the application from the **More...** drop-down menu.

7.3.6 Converting/Displaying DICOM SR Dose report to encapsulated PDFs or to Secondary Capture Image Storage

What you do	How or why you do it
	Convert the structured report to a DICOM Encapsulated PDF: • In the **Series list**, click the series you want to convert. The series must of type **'SR' (XA Dose)**. • In the **Tools** list of the **Applications** menu, click the **DoseSRToPDF** shortcut to convert the Dose SR to an encapsulated PDF - long or short format. During the conversion a status panel is displayed to monitor the progression of the conversion. The encapsulated PDF ('EDOC' type) will appear in the AW **Series list** once the conversion is completed. You can view the report in PDF format by double-clicking the DICOM encapsulated PDF series.
	Convert the structured report to a DICOM SCPT: • In the **Series list**, click the series you want to convert. The series must be of type **'SR' (XA Dose)**. • In the **Tools** list of the **Applications** menu, click the **DoseSR-ToSCPT** shortcut to convert the Dose SR to Secondary Capture Image Storage - long or short format. During the conversion a status panel is displayed to monitor the progression of the conversion. The Secondary Capture Image Storage ('SCPT" type) will appear in the AW **Series list** once the conversion is completed. You can view the report in Viewer application by double-clicking the DICOM SCPT series.

NOTE

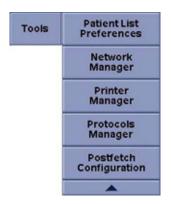End Of Review is automatically launched after the completion of the dose SR convertion to SCPT.

7.4 Postfetch

AW VolumeShare 7 provides the **Postfetch** function that allows you to transfer exams from a remote DICOM host to your Advantage Workstation. You activate this function manually from the **Applications** menu or can configure it to start automatically when AW VolumeShare 7 is launched.

NOTE

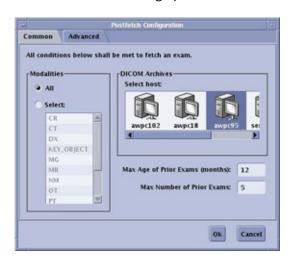>   The **Postfetch** function supports the TLS network protocol.

To configure the **Postfetch** function,

- Select **Tools** menu,
- Select the **Postfetch Configuration** menu item.

The **Postfetch Configuration** dialog box opens with the **Common** tab open by default.

You can set the following options in the **Common** tab:

1. Modalities:
    - **All**: **Postfetch** will pull in all related exams, regardless of their modality.
    - **Select**: **Postfetch** will pull in all exams of the modalities selected.

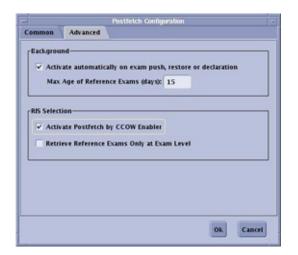   You can select one or more modalities.

2. **DICOM Archives**: Select the remote host from which you want to retrieve prior exams.

3. Maximum age of prior exams in months.

    The default value is 12.

4. Maximum number of prior exams.

    The default value is 5.

Click **Ok** to accept the selections or select **Cancel** to dismiss the setups.

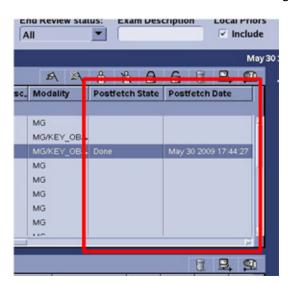Clicking the **Advanced** tab allows you to:

Background: When selected, **Postfetch** is automatically activated upon exam push, restoration or declaration.

You can also define the maximum age of the reference exams in days. The default value is 15. The reference exam is the one that contains the base data for the **Postfetch** mechanism.

If this option is selected and there are more recent exams than the reference exam, **Postfetch** retrieves all the newer exams and the older ones that are within the range defined at the **Max. Number of Prior Exams** in the **Common** tab and the maximum age in days at **Max. Age of Reference Exams (days)** in the **Advanced** tab.

NOTE

If Postfetch is initiated for an exam the modality of which has not been selected in the **Postfetch Configuration** dialog, **Postfetch** will not be performed and the application displays the "`Postfetch is not started on the following patients because they do not have series of the configured modalities (<modalities selected in the Postfetch Configuration dialog>)`" pop-up message.

The actual status of the **Postfetch** process/results is shown in the **Postfetch State** and **Postfetch Date** columns of the exam list.

The **Postfetch State** column can have three values:

- <Empty> (i.e., no **Postfetch** was performed for the exam)
- **In Progress** (i.e., **Postfetch** is being performed)
- **Done** (**Postfetch** completed for the exam)

The **Postfetch Date** column shows the date of the last performed **Postfetch** for the exam.

Note that if images (or even just one image) are deleted from an exam for which **Postfetch** has been performed, the Postfetch state and date information will be cleared.

8 Application Usage Monitor

8.1 Application Usage Monitor

You can use the **Application Usage Monitor** feature to view your application usage for a given period. Whenever you launch a compatible application with a new exam, the usage is counted.

For the actual, complete list of applications for which this feature is available, contact your GE HealthCare Service Representative.

NOTE

> Some applications do not log their usage. Therefore, check with your local GE HealthCare representative if the application you purchased is compatible with the **Application Usage Monitor** feature.

NOTE

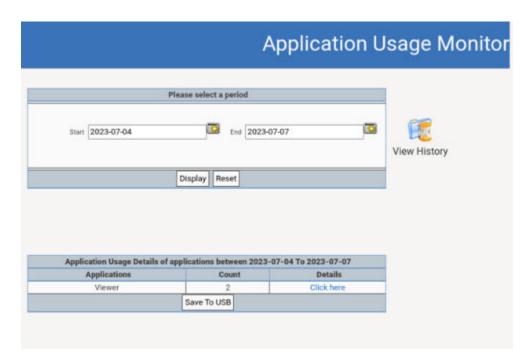> Application Usage is compacted upon time and potentially on the number of usage logs.

You can launch the software-metering tool from the **Tools** menu and you will see the following screen in the Firefox® browser provided on the station. This screen allows you to view a summary of the application usage for a selected period. Click the **Calendar** icon next to the **Start** and **End** fields to enter the start and end dates.

NOTE

> Calendar widget allows picking dates from current and previous years.
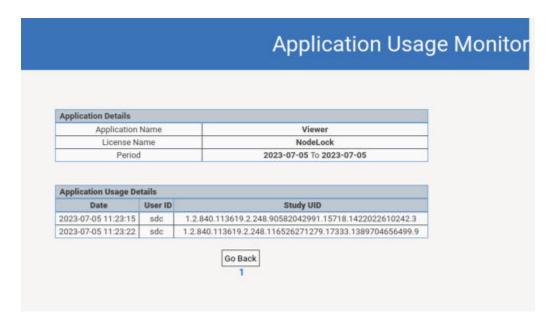
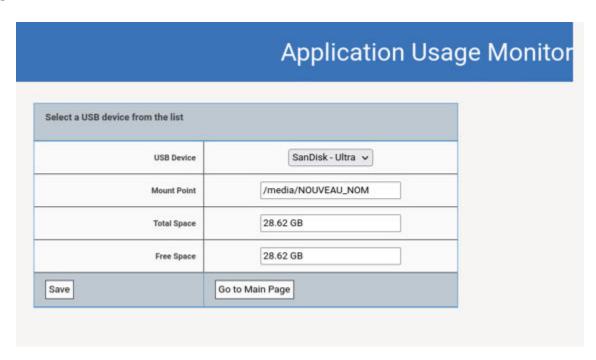Click the **Reset** button to clear the entered dates.

Figure 8-1

Click the **Display** button in Figure 8-2 to view the summary of application usage for the entered date range as below.

Figure 8-2

Clicking the **Click Here** link against each application name in Figure 8-2 allows you to view the usage details for that specific application as shown below. Close this browser to return to the screen shown in Figure 8-1 .
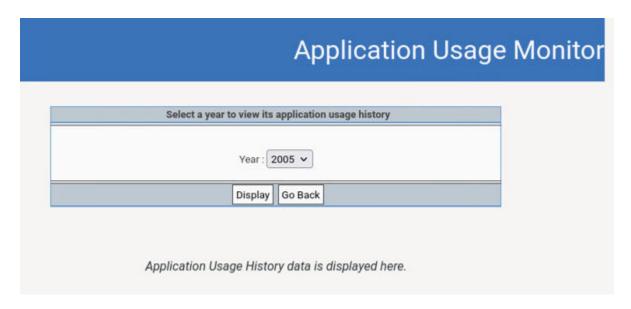
Figure 8-3

To save the application usage summary to a USB mass storage device, insert the USB device and click the **Save to USB** button shown in Figure 8-1 . You will be presented with a screen as below that allows selecting the USB device.

Figure 8-4

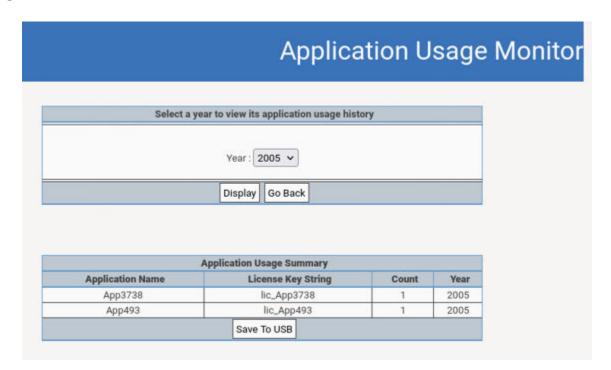Select the USB device and click the **Save** button. Information is saved to a file named `appusage_<ddm myyyy>_<ddmmyyyy>.csv` (e.g., `appusage_15042010_15052010.csv` for start date 15 April 2010 to 15 May 2010).

NOTE

The file can be opened using Microsoft® Excel® application for easy viewing.

Click the **History** link shown in , which opens the screen in a new browser shown in below.

Figure 8-5
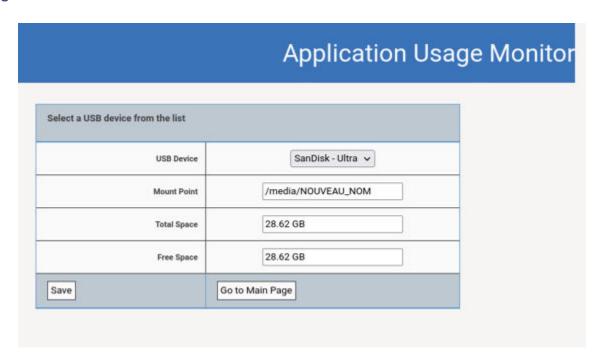
Select a year from the drop down list and click **Display** which displays the usage summary as shown in below.

Figure 8-6
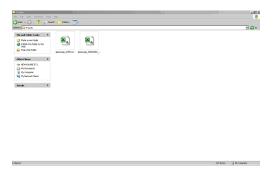
NOTE

Drop down box lists only 3 years prior to the current and previous years.

To save the application usage summary to a USB mass storage device, insert the USB device and click the **Save to USB** button shown in . The application will display the screen show in below that allows you to select the USB device.

Figure 8-7

Select the USB device and click **Save**. Information is saved to a file named `appusage_<yyyy>.csv` (e.g., `appusage_2008.csv` for year 2008).

By default, software-metering page appears in the language set on the AW system. However, the pages can be viewed in English via clicking the **View in English** link shown in .

9 Shutdown

9.1 Shutdown

When you perform a shutdown, all applications and activities are permanently halted.

Shutting down the workstation frequently will lead to unnecessary wear on system components, and is therefore not recommended. The workstation should normally be switched off completely only for maintenance purposes, to add or remove an external device, or to move it. *However, occasionally shutting down the workstation will perform various "housekeeping" tasks such as removal of temporary files, etc. which ensures continuing maximum performance from the workstation.*

> ⚠ **CAUTION**
>
> Never switch off power to the workstation without first performing the shutdown procedure. Workstation database corruption may occur if the shutdown procedure is bypassed.

To shut down the system:

- Open the **System** menu in the Patient List and select **Shutdown**.

  Window is displayed asking you, `Do you really want to SHUT DOWN the system?`

- Click on **Yes** to proceed, or on **No** to cancel the operation.

If you click on **Yes**, all applications and activities are halted, and the screen is cleared. The system is in the **Shutdown** state: the workstation is now completely shut down.

When in this state, you can add or remove an external device, or move the workstation.

Power failure

After an abrupt shutdown (power outage or mistakenly switching off the workstation when not in the **Shutdown** state):

- First set all power switches (workstation and external equipment) to OFF.

- Disconnect the power lead of the computer unit (this is necessary because the power supply button of the computer unit has no effect after a power failure).

- When the power supply has been restored, restart the system.

  Reconnect the power lead of the computer unit only AFTER all external equipment (e.g., monitor) is switched on.

Any abrupt shutdown may result in database corruption, if a database operation (save, image transfer) was in progress at the time.

If during the startup after an abrupt shutdown the system halts, and displays one or more warning messages:

- Leave the workstation in this state, and contact GE HealthCare Field Service.

If the AW software seems to start and function normally, but the Patient List shows patients with no exams, exams with no series, series with no images, or images which cannot be displayed:

• Shut down the workstation and contact GE HealthCare Field Service.

10 Troubleshooting

10.1 General

Various incidents (a software or hardware error, accidentally disconnecting an interconnection cable, unintentionally switching off/on of an external device, etc.) may lead to incorrect functioning of the software.

If this occurs:

- In the **Patient List**, open the **System** menu and select **Restart Software**.

  A confirmation message "`Do you really want to restart the software?`" is displayed.

  Select **Yes** to confirm.

If this still does not restore fully normal functioning:

- Perform a complete shutdown/switch–off/switch–on/restart sequence of the workstation.

10.2 Invalid configuration registration

If the registration of the AW workstation is incomplete or has failed, or any incompatible application is installed, the following message is displayed:

```
Important:

The Registration key is not Valid. It is not possible to launch applications
on this Workstation.

Ensure that installation of platform software and Applications is complete.

When complete, select "Register Configuration" option in Admin menu, and
attempt to auto register the configuration with , thus avoiding an unnecessary
service call.

If registration is unsuccessful, Please Contact Service.
```

When the above message is displayed, the following functions and features are disabled:

- Launching applications from the application menu or by double-clicking exams, series or images.
- **More...** drop-down list (and, consequently, all of its submenu items)
- **End Review** (but **End Review** preferences remain configurable)
- **2D Viewer**, **Filmer** and **Configurable** tabs
- **Mosaic**

In this case, follow the instructions the message provides, that is:

1. Click **Admin**.
2. Click **Register Configuration**.

   The **Perform AutoRegistration** button is activated.

3.   Click the **Perform AutoRegistration** button to auto-register your AW workstation with GE HealthCare.

4.   Restart the AW workstation.

NOTE

Restart is required only if the AW workstation was not restarted after the installation of a new application completed.

If the problem persists, contact your GE HealthCare User Services representative for assistance.

10.3 Virus detection

If McAfee is installed and site has a McAfee service, a message "**Virus detected and quarantined. Please contact GE HealthCare Service**" may be displayed. In that case, contact GE HealthCare Service to clean the system.

10.4 Configuration mismatch

If the AW workstation is misconfigured and a previously saved correct configuration is available, there is a possibility to restore the configuration backup.

The misconfiguration cases can be like:

- application or software feature shortcuts are not present
- the AW software language is not correct
- the keyboard layout is not the required one
- wrong monitor configuration such as:
  - all SW features are displayed on one monitor, but two monitors are connected
  - one monitor is installed but some SW features are not displayed on that monitor
- autodelete is working/not working
- screen auto lock is not set as before
- screen saver is not working as before

Warnings!

- Before restoring a previous configuration, always make sure that a backup is created based on the current configuration.
- AW configuration restore can be performed only by the GE HealthCare Service Engineer or Hospital IT person
- Restore only a previously known, well-working configuration.
- For any modification on the hardware, software, or network configuration contact the GE HealthCare Service Engineer. Configuration failure may void the warranty or service coverage furnished by GE HealthCare.

Refer to 11.5 Backup and restore configuration on page 91 for additional information about the AW workstation configuration backup and restore.

10.5 Verification of the Auto Configuration Registration status

If any user or Service Engineer action modifies the AW workstation configuration, that new configuration must be registered in the AWCCT (AW Configuration Collection Tool) database.

Important!

Until the configuration registration is not performed in AWCCT, the **access to all AW functions is restricted**.

The direct access to AWCCT is reserved for the GE Service Engineer. If the AW workstation is connected to the InSite Remote Service Platform (RSvP), the configuration registration can be done on a semi-automated way started by the **sdc** user.

Before performing any configuration update on the AW workstation, verify that the automated configuration registration is working properly.

1.   Login as **sdc** user (if not already done).

2.   On the AW Browser, on the Patient List in the bottom left corner, click the **Admin.** button.

     This opens a menu displaying the available AW software functions.

3.   Click **Register Configuration**.

     The **Register Configuration** panel is displayed.

4.   Verify that the **Perform Auto Registration** button is enabled.

     If yes, click the **Perform Auto Registration** button.

5.   Verify the status of the **Operation Status** field.

     In case of a successful registration, the following message is displayed: **Operation Success! The registration key has been successfully installed**.

Important!

If the **Perform Auto Registration** button is not enabled, **do not continue** the application installation with configuration change.

If the AW workstation configuration is changing without configuration registration, **none of the AW functions will be available** until a successful configuration registration is performed.

Contact a GE HealthCare Service Engineer if you are not sure if the Auto Registration is working on your AW.

If the application installation keeps the **exact same AW configuration** with only refreshment of the applications, **no new configuration registration is needed** in the AWCCT database.

10.6 Application installation using the Easy Install tool

In case of application or software option installation is going to be performed on the site without GE HealthCare Service Engineer support, make sure to perform the procedure before proceeding with the installation.

Important!

Contact a GE HealthCare Service Engineer if you are not sure if the Auto Registration is working on your AW workstation.

1. Login as **sdc** user (if not already done).

2. On the AW Browser, on the Patient List in the bottom left corner, click the **Admin.** button.

   This opens a menu displaying the available AW software functions.

3. Click **Install Package**.

   An installation note panel is displayed.

4. Click the **Yes** button to continue the installation procedure.

   The **Easy Install** window opens.

5. Applications can be installed from different media:

   - AW workstation hard disk (if the applications have already been pre-loaded)

   - dedicated Application installation CD-ROM or DVD-ROM
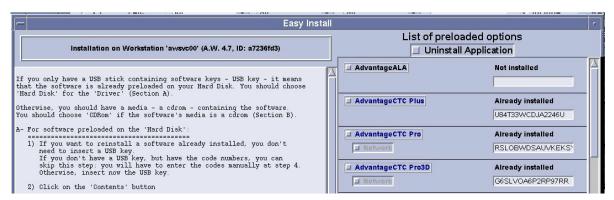
   - DVD collector

   - USB device

   Each case is explained in the following sections.

Installing applications from the AW workstation hard disk

Applications can be re-installed directly from the AW workstation hard disk if the application installation packages have been previously pre-loaded and their licenses are installed on the AW workstation.

Only those applications can be re-installed by the costumer that are marked as **Already installed** in the **Easy Install** tool.

1. in the **Easy Install** tool, under **Driver**, select the **Hard Disk** option, then click the **Contents** button.

   Installation instructions are displayed in the **Easy Install** window next to the list software options installed or pre-loaded on the AW workstation.

   NOTE

   This example may differ from what is displayed on your AW workstation, depending on the applications that have been preloaded or already installed.

2. Click the button(s) corresponding to each software application you want to select for re-installation.

   The application status will change from **Already installed** to **Ready to be installed**.

Important!

Change the status only for those applications that have their license keys displayed or where the *Network* option is enabled.

3.   Click *Install* to start the installation procedure of the first of the chosen application.

Important!

Make sure that the *Uninstall* checkbox is NOT selected inadvertently. This would mark selected applications as candidates to be uninstalled. (In this case, the *Install* button title is changing to *Uninstall*).

Important!

If during the application installation you are asked to enter the root password, cancel the installation and contact the site Service Engineer to support the application installation.

NOTE

Some applications may require additional configuration parameters, such as the IP address of the connected X-Ray system. Be sure to have such parameters prepared.

NOTE

If an application fails to install, error code **42** is displayed. Check the list of applications and related installation messages to identify the failure.

When the application has been installed, its status is changing to *Installation successful*.

After *Easy Install* successfully completes the installation of the selected application(s), an End Install message is displayed. This message is the confirmation that the selected application(s) were properly installed.

4.   Click the *Quit* button of the *Easy Install* tool.

If the installation actions modified the AW configuration, a *Registration Note* window is displayed.

5.   Click *Quit and Register* on the *Registration Note* window.

6.   Click the *Perform Auto Registration* button on the appearing *Auto Register* window.

7.   Verify the status of the *Operation Status* field.

In case of a successful registration, the following message is displayed: *Operation Success! The registration key has been successfully installed*.

Important!

If the registration is not successful, contact a GE HealthCare Service Engineer for intervention.

8.   On the AW Browser, on the Patient List in the bottom left corner, click the *System* button.

9.   Click *Restart Software*.

A confirmation message is displayed.

10. Click *Yes* to continue.

The AW browser restarts and applies the configuration change.

Installing applications from CD, DVD or DVD collector

1.   Place the CD, DVD or DVD collector containing the application installation file(s) into the DVD drive of the AW workstation.

2.   In the *Easy Install* tool, under *Driver*, select the *CD* option, then click the *Contents* button.

The installation instructions are displayed in the **Easy Install** window.
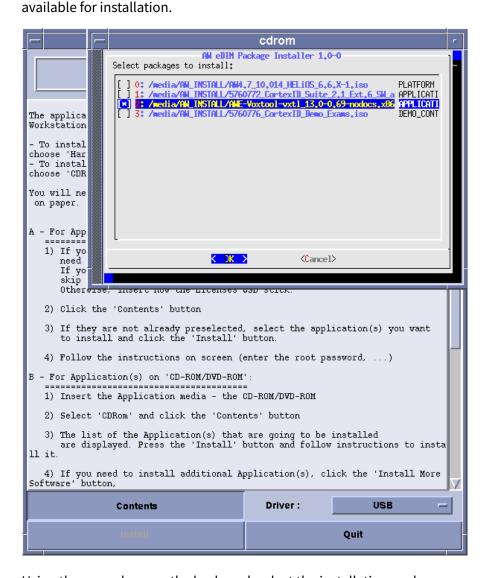
3. Continue the installation similarly to the procedure of installing apllications from the AW workstation hard disk described in the above section.

Important!

If any issue is experienced during the installation process, cancel it to restore the original configuration, then contact the site Service Engineer to support the application installation.

Installing applications from a USB drive

1. Connect the USB drive containing the application installation package(s) to the AW workstation.

2. In the **Easy Install** tool, under **Driver**, select the **USB** option, then click the **Contents** button.

On top of the **Easy Install** tool, a window opens listing the application installation packages available for installation.

3. Using the arrow keys on the keyboard, select the installation package you want to to install.

4. Press the Space bar to select an installation package.

Asterisks (*****) indicate which packages have been selected for installation. Note that the cursor must be inside the window to allow file selection.

5.   Click **OK** to close the window.

6.   Continue the installation similarly to the procedure of installing apllications from the AW workstation hard disk described in the above section.

Important!

If any issue is experienced during the installation process, cancel it to restore the original configuration, then contact the site Service Engineer to support the application installation.

11 AW Administration

11.1 Overview

When several users work regularly on the same AW workstation, the system can be set up to provide a separate access for each user, and each user can set up the workstation according to individual preferences and requirements. If a system has been set up for multiple users, certain tasks need to be performed regularly, such as management of the lists of authorized users, shared protocols and exam codes. When several workstations are installed on the same site, there are additional tasks to be performed such as moving users from one workstation to another, or making user data, protocols, etc. available on several workstations at the same time.

To ensure proper coordination, and coherence of user data across the workstations installed on the site, these tasks should normally be performed by a single person, the Administrator.

NOTE

> This chapter will refer to "The Administrator". However, the person designated as Administrator may vary from site to site. It can be the data processing manager for the site, or an experienced user. A single user on an individual workstation may act as his own Administrator.

The user interface of the **AW Administration** function uses a question-and-answer type text dialog that does not require knowledge of Linux commands (Linux is the operating system used on the AW workstation). However, to use the **AW Administration** function effectively, you should have a basic understanding of the functioning of the workstation file system and the use of recordable CD/DVDs or USB media for saving and restoring data.

NOTICE

> The **AW Administration** function gives you full control over user data such as the list of authorized users, passwords, stored user preferences and individual settings, and shared data such as protocols and exam codes. Always take due care to avoid any inadvertent loss of such data when using the **AW Administration** function.

11.2 Starting AW Administration

To start using the **AW Administration** function, open the **Admin.** menu in the AW Patient List and select the **AW Administration** menu item. This opens the **AW Administration** window. Move the mouse pointer inside the window, type the Administrator's password and validate with **Enter** (the password is not displayed on the screen).

The **Main Menu** is displayed.

NOTE

> The Administrator's password can be changed according to site policy. Consult your site manager or GE HealthCare Field Engineer.

The **Main Menu** gives you access to the main Administrator tasks:

- Creation and maintenance of the users list.

- Setup of the screen autolock, screen-saver and autodelete function.

- Backing up the complete workstation configuration on CD-ROM or USB drive with two options: encrypted or not encrypted backup.

- Restoring the workstation (encrypted/not encrypted) configuration from CD-ROM or USB drive:

    ◦ Restoring the whole configuration

    ◦ Restoring the whole configuration except license ID dependent files, passwords, keyboard configuration, remote access config and certificates

    ◦ Restoring remote hosts and printers only

- Configuring password complexity.

- Managing encryption options for systems having an encrypted image disk.

Save and Restore

You can save the workstation configuration, including the current list of users, and the current shared protocols and exam codes, on a CD–R/RW (recordable compact disk, referred to as "cdrom" in the menus) or on USB drive, and restore them at a later time either on the same or on another workstation.

You can use this function to transfer one or more users from one workstation to another without the user(s) having to reconstruct individual settings and preferences, and to assure that the same shared protocols and exam codes are available on all workstations under your responsibility.

You also use this function when a workstation becomes temporarily unavailable (e.g. for maintenance), to transfer all user data to a replacement workstation.

It is considered advisable to regularly save the workstation configuration, which includes all user data (users list, user settings and preferences, shared protocols and exam codes) as a precaution against data loss, such as user data being deleted unintentionally.

A backup of the workstation configuration is also advised whenever an end user has made significant changes, such as creating new protocols. Since site conditions (number of users, number of workstations, installed applications, local rules and regulations) can vary considerably from site to site, it is the responsibility of the Administrator to determine to what extent regular back-up of user data is required, and to implement the necessary procedures. Consult GE HealthCare Service for advice on back-up procedures if required.

11.3 User management

When several users work regularly on the same AW VolumeShare 7 workstation, the system can be set up to provide an individual and separate access for each user.

With separate user access, each user can set up the workstation according to individual preferences and requirements. At the end of a session, a user's settings and preferences are saved on the workstation, so as to be available again at the start of the next session for that user, regardless of what changes were made by other users in the interval. At the start of each work session, the user obtains access to the patient database and all functions and features of the AW system by entering her/his user's name and the associated password in the login (″Welcome″) window. Passwords are used to identify each individual user, and to prevent unauthorized access to patient data or unintentional modification of individual user settings. Passwords must follow security rules defined on the AW and configured by the Administrator. Each user should take due care not to divulge her/his password, and

to change it regularly. The Administrator can manually enforce a user to change her/his password at first login.

NOTE

> If no individual users are defined (as is the case initially after installation of the software, or if the feature is not required), the default user name is `sdc`. The Administrator is responsible for changing this user's password according to site policy.

NOTE

> The list of users can be set independently for each workstation (see Safety on page 15), or managed by the hospital domain administrator when the EA3 mode is ON. In both cases, you can use the default user name `sdc` to log on. Click **Tools** > **Display Configuration** to check whether the EA3 mode is ON or OFF.

Enterprise Authentication Authorization Audit (EA3)

To set the EA3 mode to ON or OFF:

- Display the root menu.
- Click **Service Tools**.
- Click **EA3 Configuration**.
- Type in `ON` or `OFF`.
- Enter the root password.

NOTE

> When toggling the EA3 mode to ON or OFF, local users may be removed.

User management procedures

The **User Management** menu contains the following commands:

- Display the list of users,
- add a user,
- remove a user,
- rename a user,
- set a user password,
- restore users from a config media.

11.4 Configuration

The **Autolock** function, enabled by default, automatically locks the screen(s) after a preset delay. Its purpose is to prevent unauthorized access to patient data. A password must be entered to unlock the screen(s):

- To continue a current user session, the user's password must be entered,
- To end the current user session and return to the login state (`"Welcome"` window), the default user password can be used (`adw4.7` at installation),
- The Administrator can also use the Administrator password to unlock the screen(s), if required.

The **Screen-Saver** function automatically blanks the workstation screen(s) after a preset time of inactivity (to prevent screen damage that can occur if a stationary image of high brightness is

displayed for too long). In this case, the screen(s) can be re-activated by briefly moving the mouse; no password is required.

The **Autodelete** function, when enabled, continuously monitors the used disk space and automatically removes the "oldest" exams when the available disk space drop below a preset level.

Administrator

The Administrator can enable or disable the **Autolock**, **Screen-Saver** and **Autodelete** functions and set the respective parameters (delays, etc.) in accordance with user requirements.

11.5 Backup and restore configuration

Backup

You can save (backup) the complete current workstation configuration, including the user's configurations, shared protocols and exam codes, on a CD–R (recordable CD)/CD-RW (rewriteable CD) or on USB drive.

To use the backup function:

- Have a backup media (BLANK CD–R/RW or USB drive with enough available space) to hand.
- Enter the **Backup section** in the **AW Administration** menu and follow the instructions on the screen.
- Insert the blank CD–R/RW in the CD writer or plug in the USB drive when requested.

  The system will record the workstation configuration on the backup media, then read back the recorded data for verification. A message will indicate when the operation is completed. Wait until the operation is finished. An interruption of the procedure (e.g., attempting to remove the CD–R/RW before recording and read-back are finished) will make the CD–R/RW unusable.
- Store the backup media in a safe place. Repeat the procedure for a duplicate copy if required.

It is recommended to save the workstation configuration regularly. This will allow you to restore the configuration and custom settings (in particular newly created end user configurations and protocols) in case of a problem, or to transfer the complete configuration to another workstation.

Restore

You can restore a complete workstation configuration recorded previously on a CD–R/RW or on USB, either onto the same or onto a different workstation. The restored data will include the users' configurations, shared protocols and exam codes.

> **NOTICE**
>
> Restoring a workstation configuration will result in any previous configuration data present on the workstation being overwritten.

> **NOTICE**
>
> Restoring a configuration that includes licenses to a different system can render the system inoperable as the license strings must match the system ID.

To use the restore function:

- Have a configuration media (CD–R/RW or USB drive) with the configuration to be restored to hand.

- Insert the CD–R/RW in the CD drive or plug in the USB.

- Enter the **Restore section** in the **AW Administration** menu and follow the instructions on the screen.

- A message will warn you that the current configuration will be overwritten. Type *restore* and **Enter** to continue, or just type **Enter** to cancel the operation. If you confirm the operation, the system will restore the complete workstation configuration from the configuration media (CD–R/RW or USB). A message will indicate when the operation is completed.

- Remove the configuration media (CD–R/RW or USB) and store it in a safe place.

For more information on supported media storage devices, see **DICOM Conformance Statement**.

11.6 Disk Encryption Management

The Administrator can manage the encrypted passphrase and change boot option for systems having an encrypted image disk.

The configuration of disk encryption depends on hospital site policy and is applied by GE HealthCare Service at installation time.

12 Planned Maintenance

12.1 Introduction

To ensure effective operation of the equipment planned maintenance procedures should be carried out at the intervals specified.

12.2 Planned Maintenance performed by the Field Service Engineer

Planned Maintenance (PM) should be performed as specified in the chart below by a GE HealthCare Service Representative or similarly qualified and trained personnel.

The following table lists the preventive maintenance tasks. The detailed procedures are described in the AW VolumeShare 7 Service Manual, PLANNED MAINTENANCE chapter.

Task	Job Card in AW VolumeShare 7 Service Manual	Interval (months)
Perform external cable visual check	PM001	12
Clean monitor, keyboard and mouse	PM001	12
Clean workstation externally and internally	PM001	12
Replace BIOS backup battery	PM005	36 to 60
Run HP Diagnostics reliability program (optional, use in case of hardware issues)	TSG005	12
Check monitors alignment, brightness and contrast level, using SMPTE pattern (optional, in case of image display issue)	PM006	12
Check the Printing operation (if applicable)	PM003	12
Check Filesystem and Healthpage (no red status)	PM004	12
Check InSite functionality	PM002	12
Check Application Updates (FMI, orders)	PM002	12
Save Site parameters on new CDROM and label	PM002	12
Check that AW is properly declared in CRM (GIB/SIE-BEL)	PM002	12
Upload current Configuration File to AWCCT	PM002	12
Store product documentation, software media and latest configuration backup CD on site	PM002	12
Inform Customer, OLCs, Checkout Team, and other site FEs if password(s) have changed	TSG014	12

12.3 Quality Assurance

⚠ **CAUTION**

To ensure consistent image quality from the AW workstation, it is the user's responsibility to implement a procedure of regular quality assurance checks.

This section describes the minimum periodic quality assurance checks recommended by GE HealthCare to obtain consistent image quality on the AW workstation during the lifetime of the equipment. Local regulations may require more frequent or additional checks.

The actual implementation of quality assurance checks and periodic maintenance schedules for the AW workstation remains the responsibility of the end user.

Cleaning of monitor screen(s)

To ensure good image review conditions, the monitor screen(s) should be free of dust, fingerprints, and other marks.

Recommended frequency of checks

Daily, or on days when clinical image reviews are planned.

Procedure

Verify that each monitor screen is free of dust, fingerprints and any other marks, that may interfere with image review.

Corrective action

When required, clean the monitor screen(s) using a dry, soft, lint–free cloth or cleaning tissue. If necessary, the cloth or tissue may be dampened with demineralized water.

NOTE

Any other cleaning methods may lead to damage of the anti–reflective screen coating.

Further action

If dirt or other marks remain present on the screen(s), the source of the problem must be identified, and corrective action taken, before any further clinical image reviews are performed using the affected monitor(s).

Monitor calibration

To maintain consistent image quality on the AW workstation during the lifetime of the equipment, regular checks are required to assure that the monitors are calibrated and that the brightness and contrast settings are at the appropriate level for image review.

An SMPTE (Society of Motion Picture and Television Engineers) test pattern is used to provide a standard image. This SMPTE test pattern also allows an easy check of focus, linearity and geometry of the display.

Recommended frequency of checks

Monthly, and after any service or maintenance on the AW system, or when the system is moved to a different location.

Prerequisites

The SMPTE test pattern must be available in the Local Patient List.

If the test pattern is not yet installed:

- In the Patient List control panel, select **Admin.** to open the **Admin.** menu, then select **[Install SMPTE]**. The test pattern is loaded into the Patient List. It is shown as a separate exam with name "SMPTE".

Procedure

Important: For valid results, it is essential that this procedure is performed under the normal ambient lighting conditions for the area where the workstation is installed.

In the Patient List, select the "SMPTE" exam, and start the **2D Viewer** from the navigation bar (or double–click on the "SMPTE" name in the exam list).

Initially, the SMPTE test pattern is displayed in the top left quarter of the Viewer window (2x2 layout). To enlarge the test pattern to fill the entire display area (as required for checking monitor calibration):

Click the **Layout options** button, point to **Split Screen**, and select the 1x1 (full-screen) layout. Refer to the 2D Viewer, Filmer and Anonymous Maker user documentation for details on how to use **Layout options**.

If you are using a two–monitor configuration:

1. Select the "SMPTE" exam, and start the **2D Viewer**.

2. Click the **Layout options** button, point to **Split Screen**, select the "both screens" option button in the top right hand corner, and select the 1x1 (full-screen) layout.

3. Display the SMPTE test pattern on the second screen:

    3.1. Click the ![icon] (**opens the MiniBrowser**) button to open the **Navigator**.

    3.2. In the **Navigator**, left-click the SMPTE series in the **Navigator** and drag it on the second screen.

Each monitor should now display the SMPTE test pattern filling the entire 2D Viewer display area.

- Verify the window width and level settings for the displayed image(s):
    - Window width = **100** (WW annotation),
    - Window level = **1024** (WL annotation).
- If necessary, adjust the W/L settings using the middle mouse button or the active annotations. Refer to the 2D Viewer, Filmer and Anonymous Maker user documentation for details on how to adjust window W/L.

NOTE

Make sure that window width and level are exactly at the specified settings.

- Examine the displayed image for the following features (see Figure 12-1 SMPTE test pattern (DRAFT, provisional illustration) on page 96 below):
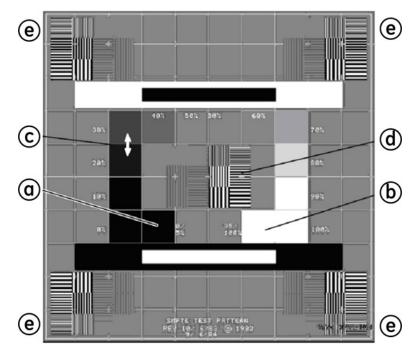
- ◦ Verify that the 0%–5% contrast (a) is visible.

- ◦ Verify that the 95%–100% contrast (b) is visible.

- ◦ Verify that each 10% grey level step (square) from 0% to 100% can be clearly distinguished from the adjacent squares (c).

- ◦ Verify that all line–pair patterns, both at the center (d) and in each corner (e), are clearly distinguishable down to the smallest line spacing.

  NOTE

  This refers to the black–and–white line pairs, not to the adjacent low–contrast line pairs.

- If your station is equipped with two monitors, repeat this check for the second monitor.

Figure 12-1 SMPTE test pattern (DRAFT, provisional illustration)

Expected results

The 0%–5% contrast and the 95%–100% contrast shall be visible and each 10% grey–scale step from 0% to 100% shall be distinguishable from the adjacent ones. The line–pair patterns at the center and corners of the SMPTE test image shall be distinguishable.

A monitor that meets these conditions is considered to be correctly calibrated.

Corrective action

If not all the contrast steps are clearly distinguishable, use the procedure described below to adjust contrast and brightness of the affected monitor.

If the results are still unsatisfactory, or if any other faults are present (line–pair patterns not clearly distinguishable, linearity or geometry errors, color fringes, etc.), call your GE HealthCare Field Engineer.

Adjusting contrast and brightness

Locate the contrast and brightness control buttons on the front of the monitor, under the screen.

Press the appropriate monitor button to display the On Screen Display (OSD) menu in order to access the contrast and brightness settings. This menu disappears again automatically after a few seconds. If the menu interferes with the viewing of the SMPTE pattern, see the monitor's user manual for instructions on how to move it to a different position on the screen.

If your configuration has one or two LCD (liquid crystal display) monitors, use the following procedure:

1.   Set the brightness to the maximum value (100). The 95%–100% contrast (b) should be visible. Brightness can be adjusted to a slightly lower value if required, depending on user preferences.

2.   Set the contrast to the minimum value (0), then increase contrast slowly until the 0%–5% contrast (a) becomes distinguishable.

     After any adjustments of contrast and brightness:

3.   Repeat the checks detailed above.

Further actions

If a monitor still fails the test after the corrective action described above, the source of the problem must be identified, and corrective action taken, before any further clinical image reviews are performed using the affected monitor. Contact your GE HealthCare Field Engineer if any adjustment or calibration is required other than the basic brightness and contrast adjustment described above.

Record

Record the results on a chart such as the one shown below.

Date:		
Facility:		
Room:		
Operator:		
Monitor:	**Left**	**Right**
Check WL=100, WW=1024		
0%–5% contrast		
95%–100% contrast		
Grey–scale steps		
Line pairs (center)		
Line pairs (corners)		
Were adjustments needed?		

13 Product Limitations

13.1 Product limitations

Software affected	Description of Problem	Suggested Action or Workaround
Networking	Advantage Net/SdcNet cannot be used for connecting AW4.7 to any device supporting these protocols.	Use DICOM Networking.
Patient List	The Patient List displays at study level only the referring physician and the radiologist name. The radiologist name contains either the Attending Physician or the Physician reading Study. The Operator name is never displayed. AW exchanges DICOM data correctly in every character set, but displays textual patient information (e.g., patient name) always in Latin-1 (Western European) characters. That is, patient information in Chinese, Japanese and Korean (CJK) characters will not be displayed correctly.	N/A
Filming	Digital DASM and Video Analog DASM cannot be connected to the AW4.7.	Sales representative can provide alternatives for some printers.
MOD (magneto-optical disk)	No MOD Drive can be connected to the AW4.7.	MOD is not supported on AW4.5 and higher. Restore all images on AW4.4 or prior and network images to AW4.7.
Media (CD, DVD, USB)	Removing images may take a long time.	Avoid removing a partial set of images.
	Some DVD readers may not read the DVD burnt by AW.	Read the DVD burnt by AW from the AW or from a DVD Writer.
	Some specific image types are not compatible with the DVD DICOM profile.	Select the CD or USB output instead of DVD on the **Media Composer**.
	Images having icons cannot be compressed on interchange media.	Save the images on a CD or DVD without compression.
	Images having compressed icons cannot be restored from interchange media.	Restore non-compressed images from interchange media.
	Images can be deleted after they're sent to the **Media Composer** but preparation is not started yet.	Do not delete images until the creation of the interchange media is successfully finished.
	Media save/restore feature will not work correctly after a USB device is disconnected without using the media detach feature.	Always use the Media detach feature also for USB.
	Media save/restore feature will not work correctly when the computer is turned on with a USB device attached.	Remove all USB devices before starting/restarting the computer.

Software affected	Description of Problem	Suggested Action or Workaround
Filmer	When loading patients into **Autolaunch** or **Preprocessing** a different Filmer window is started for each patient and images from different patients cannot be mixed into a dedicated Filmer.	Reload the Volume directly from the Patient List if you need to mix images in the Filmer.
DataExport	Unable to access web server from remote PC.	This is not installed by default for security reasons. Field engineer should run `install.http` to install service and check firewall configuration when necessary.
	When the Electronic Film is reloaded from the disk, it is not possible to regenerate a QuickTime VR movie from the Filmer.	N/A
	Some USB keys are not recognized by the hardware.	N/A
	USB keys containing non English characters can cause unexpected behavior in the system.	Please insert the USB key into a Windows computer and check whether the file and directory names on the USB key contain English letters only. If any file or directory name contain letters other than English then delete it or rename to contain English letters only.
Keyboard	Internet and Windows shortcut keys are disabled.	Launch Firefox from application launcher on Patient List.
Direct Connect	Some functionalities are not available when accessing data through Direct Connect.	Retrieve images on the local workstation.
	Created data are always stored on the local workstation.	Push images on remote station if needed.
	Selecting simultaneously examinations of different hosts is not possible.	Retrieve images on the local workstation.
	If the remote station on which the exams are reviewed through Direct Connect is being switched off, the local station may freeze.	Wait until the remote station is rebooted or switch off the local station if the problem remains.
Hardware support	AW4.7 may not be installed on HP X4000, HP XW8000, HP XW8200, HP XW8400, HP XW8600 or HP Z800.	Upgrade the hardware.
Postscript printing	The printing (postscript + DICOM) is blocked on AW4.7.	To re-enable printing please call your GE HealthCare Field Engineer.
Preference Sharing	Supported features in 2D Viewer: • Layout manager protocols • Mouse mode Preference • WL Presets • Display Preferences	N/A
	Supported features in Filmer: Layouts	N/A

Software affected	Description of Problem	Suggested Action or Workaround
	Supported features in Volume Viewer: • Protocols • VR Presets • Display Options	N/A
	Supported features in Advanced Applications: Display Options	N/A
	Supported features in Administration: • User names/passwords • **Autodelete**	N/A
	Preferences cannot be exported or imported to/from a remote PSM server.	Use a USB device to export or import preferences to/from another workstation.
Add/Sub	Images containing information in Chinese, Japanese and Korean (CJK) characters are not compatible with **Add/Sub**. The system displays the error message "`Add/Sub does not support images having patient names or descriptions longer than 68 characters`".	Do not use **Add/Sub** with images containing CJK characters.
Disk encryption	Reading and writing performances of DICOM images may be degraded due to the task of disk encryption/decryption.	N/A
	Disk encryption may be configured to enter a passphrase to unlock the encrypted disk at each reboot before the user login.	Contact the AW System Administrator to configure the disk encryption mechanism to use the automated boot option.

14 Appendices

14.1 Minimum system hardware requirements

The hardware environment for system operating is a PC based workstation or network.

1. Configuration of PC

	Configuration 1 (z820)	**Configuration 2 (z440)**	**Configuration 3 (z4g4)**	**Configuration 3bis (z4g4)**
Processor	Dual Intel Xeon E5–2630 v2	Single Intel Xeon E5-1660 v3	Single Intel Xeon W-2135	Single Intel Xeon W-2245
Memory	32GB DDR3-1600 MHz or Higher ECC Registered DIMM (8 x 4GB Four channel)	32GB DDR4-2133MHz or higher ECC Registered DIMM (4 x 8GB Four channel) Upgradable to 64GB	32GB (2x16GB) 2666MHz or higher DDR4 ECC Registered Memory (4 channels) Upgradable to 64GB	64GB (4x16GB) DDR4-2933MHz or higher ECC Registered DIMM (4 channels)
Disks	1 x 300GB SFF SAS 2 x 300GB SFF SAS	1 x SSD 256GB SATA 2 x SSD 512GB SATA	1 x SSD 256GB SATA 2 x SSD 512GB SATA	1 x 512GB M.2 NVMe 1 x 1TB M.2 NVMe
Network	2 x embedded 1GB Eth ports 1 x additional 1GB Eth port	1 x embedded 1GB Eth port 1 x additional 1GB Eth port	2 x embedded 1GB Eth ports 1 x additional 1GB Eth port	2 x embedded 1GB Eth ports 1 x additional 1GB Eth port
Graphic	NVIDIA Quadro® NVS310	NVIDIA Quadro® NVS310	NVIDIA Quadro® P620	NVIDIA Quadro® P620 or alternate
Connector	Serial port	Serial port (for interventional applications)	N/A	N/A

2. Configuration of Monitor

	Monitor configuration
Type	Color LCD
Size	19"
Resolution	1280 X 1024
Display position	Landscape

14.2 SLES Appliance License

SLES Appliance License.

The Branded Product may include components of the SUSE Linux Enterprise Server product (SLES). Licensee acknowledges and agrees to the following restriction with respect to use of SLES notwithstanding the license grant in the SLES end user license agreement that may accompany or otherwise apply to the copy of SLES Licensee received with the Licensed Software: Licensee agrees to use SLES solely for the purpose of running the Branded Product and not as a general purpose operating system. If Licensee did not receive a copy of the SLES end user license agreement, it can be found at http://www.suse.com/licensing/eula/

15 Glossary

15.1 Glossary

Administrator

The person in charge of managing user lists, shared protocols etc. when the workstation has been set up for multiple users.

Alphanumeric (A/N)

Keyboard letters, numbers, and symbols.

Angle

Graphical tool that allows you to measure an angle.

Annotation

Generally, workstation-supplied text which accompanies an image when it is displayed on-screen, describing when and how that image was acquired, with what parameters. Also, text and graphics provided by the user.

Area

Statistical measurement that represents the size of an ROI in mm^2 (on calibrated images such as CT and MR) or $pixels^2$ (on uncalibrated images).

AVI

Image data format used to compress a cine sequence for data export. The AVI format uses lossless compression to store the data. This allows replay with the same image quality as the original.

CD

Compact Disk; used for storage of digital data (such as software or image files). A compact disk can be read–only (CD–ROM) or recordable (CD–R).

Cine

An image display mode used for viewing a series of images at up to 30 images per second.

Cine Paging

Another term for "Cine Loop".

Cine Sequence

Set of images displayed in rapid succession so as to give the impression of a moving picture.

Command Window

Window used to enter Linux commands.

Computed Radiography (CR)

Computer-controlled process of acquisition of X–ray data.

Computed Tomography (CT)

Process of deriving anatomic information by computer synthesis of X-ray data.

Control Menu

A window menu which provides options for manipulating the window.

Control Panel

Window in the Patient List or 2D Viewer that provides a palette of on-screen tools.

CRT

Cathode Ray Tube. The component (electron tube, "TV" tube) that displays the images in a conventional workstation monitor.

Delete Page

Function that allows the user to clear a scrapbook page manually after saving or filming images.

Delete After Print and Delete After Save

Functions that allows user to clear a scrapbook automatically after filming or saving images.

Disk

Electronic component on which images, patient data, and the computer software are stored. See Image Disk and System Disk.

Display Normal

Function which removes user-applied changes of window width/level, zoom factor, image scroll and orientation, and inverse video, from an image.

Drag and Drop

To use the Click and Drag technique to copy or move an on–screen object (such as a selected series or image in the Patient List, or a selected view in the 2D Viewer) to a different destination.

Electronic Film

A set of images assembled by means of the Filmer. When saved on the workstation, an electronic film consists of two series, a "scrapbook" series that contains the images and an SR (DICOM Structured Report) series that contains the layout information. Optionally, it can contain a KEY_OBJECT.

Ellipse

Graphical tool that allows you to define an ROI.

Encapsulated PDF

A PDF document encapsulated into a DICOM object.

Erase Graphics

Function that allows you to remove graphics from an image.

Exam

In MR, a single study, including all its component series and scans. In CT, all images made from data taken of a patient after entering a particular scan cycle. In CR and X–ray, all images made on a patient at a particular time.

Fast Paging

An image display mode used to rapidly move through a series of images, e.g., to search for a particular image, controlled manually by the middle mouse button.

Format

Denotes the configuration and number of images within an SID or MID display.

Free draw

Graphical tool that allows you to define a free-hand drawn ROI.

FTP

File Transfer Protocol; network protocol used to communicate between two computer systems for file transfers.

Get

The act of retrieving images from another workstation via networking.

Graphics

User-applied ROIs.

Hide

Function that allows you to temporarily remove image graphics.

Horizontal Flip

Function that allows you to change the orientation of a displayed image.

Host

AW workstation or other imaging system, connected to a network.

HTML

HyperText Markup Language; language used to create electronic documents. An HTML document normally consists of a set of files that can contain text, images and cine sequences, combined with formatting markers and "hyperlinks" that allow you to move rapidly through the contents.

HTTP

HyperText Transfer Protocol; network protocol used to communicate between computer systems connected through an intranet or the Internet, using HTML.

Image

In this document the term "image" is used to designate the part of the exam data being processed and displayed on the workstation screen. Depending on the display settings, a view (q.v.) can display an entire image, or part of it (zoom).

Image Disk

The component in the workstation on which images and patient data are stored.

Image Display Area

During use of a viewing application, the portion of the screen(s) where images are displayed. Also View Area.

Image Manipulation

A function by which you can change the appearance of an image (e.g., rotate/flip, zoom, or adjust window w/l).

Interchange Media

Removable data storage media, used for recording and restoring image data, such as CD-Rs (recordable compact disks) and CD–ROMs (read-only compact disks). Used in particular to exchange data between systems that are not connected by a network.

JPEG

Format used to compress images for data export. The JPEG format uses lossy compression to store and transfer the data. This allows faster data transfer and uses less disk space, but results in a reduction in the image quality compared to the original. JPEG is the abbreviation of Joint Photographic Experts Group.

KEY_OBJECT

You can flag an image as key image in the Filmer, 2D Viewer and Volume Viewer.

LCD

Liquid Crystal Display. The solid–state component that displays the images in a flat–screen workstation monitor.

Left Rotate

Function that allows you to change the orientation of a displayed image.

Linux

The operating system used on AW workstations.

Login

The workstation's state after the user first has turned on the power to all components.

Magnetic Resonance Imaging (MR or MRI)

Creation of images using the magnetic resonance phenomenon. Current application involves imaging the distribution of hydrogen nuclei (protons) in the body.

Manual Cine

An image display mode used for viewing a series of images as a sequential "animation" of all images in the series, controlled manually by the middle mouse button.

Media

Abbreviated term for Interchange Media.

Media Device

Device to record and/or read image data on removable data storage media (see Media).

Mammography (MG)

Process of digital X-ray image acquisition optimized for breast examinations.

MID

Multiple Image Display: display format used by a viewing application, where more than one image is displayed on the monitor screen. Also: image filming/saving mode, where all images displayed in the view area of the viewing application are placed in a single slot of a scrapbook.

Mean

Statistical measurement that represents the average pixel value in an ROI.

Mouse

A hand-operated device used to move the cursor across the screen(s), and/or to invoke functions.

MOV

QuickTime movie file.

MPEG

Image data format used to compress a cine sequence for data export. The MPEG format uses lossy compression to store the data. This allows faster data transfer and faster replay, and uses less disk space, but results in a reduction in the image quality compared to the original. MPEG is the abbreviation of Motion Picture Experts Group.

Nuclear Medicine (NM)

Process of imaging the distribution of radioactive tracer substances in the patient anatomy.

OSD

On Screen Display. Menu that appears on a monitor screen when adjusting the monitor's display settings such as brightness and contrast. This menu is controlled directly by the monitor, and is totally independent of the workstation.

Paging

Function that allows you to view a series of images as if reading a book, page by page.

PDF

Portable Document Format; proprietary file format that allows to compress an electronic document containing text, images, layout, etc. and save it as a single file.

Pixel

Abbreviation for "picture element", the smallest unit a computer screen can display.

Pixel Value Marker

Another term for the Report Cursor.

PNG

Portable Network Graphics; format used to compress images for data export. The PNG format uses lossless compression to store and transfer the data, allowing them to be restored with the same image quality as the original.

Positron Emission Tomography (PET)

Process of deriving anatomic information by computer synthesis of positron radiation data.

Pull

Another term for "Get".

QTVR

QuickTime VR movie is a series of images of a given object taken from different angles.

Push

The act of sending image data to another workstation on your network.

Recover Database

Function that corrects a corrupted database (GE HealthCare Service only).

Rectangle

Graphical tool that allows you to define an ROI.

Remote Host

Other AW workstations or other imaging system connected to your workstation via a network.

Report Cursor

Graphical tool that allows you to read the value of any pixel on the image being viewed.

Right Rotate

Function that allows you to change the orientation of a displayed image.

ROI

Region Of Interest; operator-defined area of an image to be statistically analyzed.

Scrapbook

A set of secondary capture (SCPT) images saved on the workstation hard disk as part of an electronic film.

Scroll

A way to move an image around within its frame.

Series

Specific type of images within a study; a subset of an exam.

Sequence

Another term for "Series".

SFTP

Secure File Transfer Protocol; network protocol used to securely communicate between two computer systems for file transfers.

Show

Function that allows you to restore hidden graphics to an image.

SID

Single Image Display; display format used by a viewing application, where an entire monitor screen is used for the display of a single image.

Slot

Another term for the individual image frames that make up a scrapbook page.

Smooth curve

Another term for "Spline".

SMPTE

(Abbreviation for Society of Motion Picture and Television Engineers). Designates the test pattern used when adjusting the contrast and brightness settings on the workstation's monitors.

Spatial

A Cine Loop mode in which a series of images is automatically and continuously displayed in 1, 2, 3, 4... ...4, 3, 2, 1 order. Also see Temporal.

Spline

Graphical tool that allows you to define an ROI by means of a spline (smooth curve) trace.

Standard Deviation

Statistical measurement that provides a measure of variability of pixel values within an ROI.

Straight line

Graphical tool that allows you to measure the distance between two points on an image.

Synchronization

When two or more series are displayed in separate viewports, paging of these series can be synchronized. Synchronization can be numerical or spatial, i.e., when paging through one of the series, the images in the other series with either the same image number (or with an offset), or the same spatial location, will be displayed.

System Disk

The component in the workstation on which the computer software is stored.

Temporal

A Cine Loop mode in which a series of images is automatically and continuously displayed in 1, 2, 3, 4... 1, 2, 3, 4... order. Also see Spatial.

TLS

Transport Layer Security; a cryptographic protocol that provides communications security over a computer network.

Vertical Flip

Function that allows you to change the orientation of a displayed image.

View

Part of the workstation screen, used to display image data. The view area of the AW VolumeShare screen normally contains four views. A view can display an entire image, or part of it (zoom).

View Area

During use of a viewing application, the portion of the screen(s) where images are displayed. The view area normally contains four views, but a single view can be enlarged so as to take up the entire view area.

Viewport

When more than one image series is displayed at the same time, each series is displayed in a separate viewport (frame) on the monitor screen(s). Each viewport can contain one or more views.

Window

Describes the range of pixel values that are assigned a shade of grey. Narrow windows offer greater resolution and contrast of anatomy having similar densities. It also helps you find the values for anatomy in which you are interested. In CT, broad windows are useful for chest and scout images.

Window Level

The window level is defined as the center value of the range of pixel values that are assigned a shade of grey.

Window Width

The window width is defined as twice the number of intensities above and below the currently set window level.

Window Width/Level Adjust

Adjustment which is marginally similar to the brightness and contrast controls on a TV set.

Zoom

Function that allows you to shrink or enlarge a displayed image.

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