

Instructions for Use

English

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Advanced Visualization Workspace

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1 Before You Begin

About the Product

Performance Characteristics

Advanced Visualization Workspace (AVW) is a software medical device that allows multiple users to remotely access clinical applications from compatible computers on a network. The system allows networking, selection, processing, and filming of multimodality DICOM images. This software is for use with off-the-shelf PC computer technology that meets defined minimum specifications.

The Advanced Visualization Workspace communicates with imaging systems of different modalities using the DICOM-3 standard.

Advanced Visualization Workspace Configurations

Advanced Visualization Workspace can be deployed in multiple configurations:

- **Thin Client-Server configuration**: This configuration enables widespread remote access via networked hospital PC's. The server and client application communicate through a local area network (LAN) or possibly through the Internet using a VPN connection. The Thin Client machine has the Graphical User Interface (GUI) and displays images while the central server retrieves and manages images and generates images for transmission to the client. Memory and CPU intensive operations such as 3D rendering take place on the server. Multiple users can login simultaneously and interact with datasets for review and interpretation. The client software can be deployed on a variety of PCs with different Operating System (OS) and hardware configurations. In addition, Advanced Visualization Workspace can be deployed on Philips managed public cloud allowing access to AV clinical applications over the internet from a standard web browser or a client. For additional information on AV applications over the internet, see section "Cloud Configuration" on page 199.
- **Standalone workstation configuration**:This configuration supports one (1) user working locally on the workstation.

Many viewing functions are included in the basic functions, including 2D slice view, thin slab/MPR view, 3D volumetric images and MIP view. Larger image sets are efficiently and conveniently reviewed and prepared using the Viewer's display and manipulation functions. Basic image manipulation functions include real-time zooming, scrolling, panning, windowing and rolling/rotating.

The enterprise server and the client-side systems communicate via TCP/IP network LAN behind the institution's firewall. Users may also communicate with the Advanced Visualization Workspace server computer over the Internet via a Virtual Private Network (VPN) connection using a broadband connection. The Server runs on Windows Server 2019 R2 (Standard Edition) OS or newer OS versions. Advanced Visualization Workspace client supports the following Microsoft Windows OS versions:

- Windows 11 (64 bit)

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- Windows 10 (64 bit)

Advanced Visualization Workspace Client provides storage and query/retrieve capabilities to and from imaging and PACS systems for the multiple modalities supported.

For application specific performance characteristics, please refer to the Measurement Accuracy section of each application that includes measuring function. For applications that do not include a measuring function for performance characteristics, please refer to the Indications for Use section of each application.

Note: The screen shots in the Instructions for Use can differ from the user interface screens on details. The screens captured in these Instructions for Use may not reflect the latest User Interface coloring of the product, however the Instructions For Use remain applicable in all other aspects.

About Screen

NOTICE

The images used in this section are examples only. For information on the version and build of your software, refer to the actual About screen of Advanced Visualization Workspace.

To display the About screen which displays labeling and product information, open the application and perform the following:

1. From the AVW Workflow Bar (right side of screen), click the  icon.
2. Select **Help** or **About**, depending on your configuration.

   The About screen opens.

To change the displayed language of this screen, select a language from the drop down list in the upper right corner (1).

To view labeling information for specific countries, use the **Other country labeling** dropdown (2).

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Fig. 1: About Screen for On Premise Configuration



Fig. 2: About Screen for Cloud Browser Configuration

Intended Use/Purpose

The Advanced Visualization Workspace processes clinical images from different modalities and enables advanced visualization of the images. When used by qualified personnel, it provides useful diagnostic information. Advanced Visualization Workspace can be used remotely by multiple users with compatible devices.

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Contraindications

This medical device is not to be used for mammography. The device is not intended for diagnosis of lossy compressed images.

Indications for Use

Philips Advanced Visualization Workspace is a software medical device that allows multiple users to remotely access clinical applications from compatible computers on a network. The system allows networking, selection, processing and filming of multimodality DICOM images. This software is for use with off-the-shelf PC computer technology that meets defined minimum specifications.

Advanced Visualization Workspace is intended to be used by trained professionals, including but not limited to physicians and medical technicians.

This medical device is not to be used for mammography.

The device is not intended for diagnosis of lossy compressed images.

- The CT Viewer is an image visualization and post-processing software application designed to visualize and analyze CT images supporting the physician's diagnostic process. The software application supports study review, side-by-side comparison, image fusion, 2D and 3D manipulation, series arrangement, and measurement of CT images.
- The Multimodality Viewer (MMV) is an image visualization and post-processing software application designed to visualize and analyze multi-modality images in order to assist clinician's diagnostic process. This software application supports study review, side-by-side comparison, image fusion, 2D and 3D manipulation, series arrangement, and measurements of MR, CT, PET, NM, US, DX, CR, RF and XA images. This software application also supports exporting the processed image series in a dedicated format for assisting neurosurgical procedures.
- The CT Acute Multi-Functional Review (AMFR) application provides dedicated tools for findings detection, visualization and assessment of vessels, bones, discs and spine anatomies, all within a single application.
- The Zero Footprint Viewer (ZFP) is indicated for viewing, sharing, measuring, manipulating and quantifying of images by referring physicians, clinicians and radiologists, using a web-browser based viewer with access to hospital network.

  ZFP does not create reports and is not intended for diagnosis.
- Multimodality Tumor Tracking (MMTT) is a multi-modality post-processing application used to display, process, analyze and quantify (in 2D and 3D) anatomical and functional images for a single study or over the course of multiple time points for CT, Spectral CT, Dual Energy CT, MR, PET/CT and SPECT/CT. The MMTT application is intended for use on tumors which are known/confirmed to be pathologically diagnosed cancer. It assists the clinician with the evaluation, quantification, follow-up and documentation of lesions.

  The qEASL (quantitative European Association for the Study of the Liver) is indicated to assess response after treatment (i.e. locoregional therapy) on multi-phasic contrast-enhanced MRI and CT.

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- The Multimodality Advanced Vessels Analysis (MM AVA) application is intended to assist the user in viewing, processing and quantifying vascular conventional or spectral CTA and MRA datasets of patients with suspected or diagnosed vascular diseases, for the analysis of vessel anatomy.
- The 3D Modeling application is intended for use as a software interface and image segmentation application for the transfer of DICOM imaging information to an output file. The 3D Modeling application output file can be used for fabrication of physical replicas using additive manufacturing method. The physical replicas can be used for treatment planning, surgical planning, training and education.

  The 3D Modeling application should be used in conjunction with other diagnostic tools and expert clinical judgment.
- The CT Bone Mineral Analysis (BMA) application supports users with the measurement of Bone Mineral Density (BMD) in one or multiple time points using an internal (phantom-less) calibration method on CT imaging.
- The CT Brain Perfusion (BP) application is a post processing software application intended to assist with the evaluation of an area of interest, to generate qualitative and quantitative information about changes in image intensity over time. It supports the analysis of dynamic/serial CT after injection of contrast agent, by calculating the parameters related to brain perfusion and displays the results as a composite (single image that is calculated from a set of time course images at a single location) images.

  The application is not intended to be used for acute ischemic stroke patient triage for treatment allocation (e.g. for extended time window for recanalization therapies according to: *Berge, E. et al. (2021) 'European Stroke Organisation (ESO) guidelines on intravenous thrombolysis for acute ischaemic stroke', European Stroke Journal, 6(1), p. I–LXII. doi:10.1177/2396987321989865*, and/or to Powers, W.J. *et al.* (2018) *2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association, Stroke.* doi:10.1161/STR.0000000000000158.)
- The CT Body Perfusion (Functional CT) application is intended for visualization, assessment and quantification of blood flow (perfusion), blood volume, time to peak and peak enhancement using dynamic CT data. The application provides whole-organ or single-location liver, lung and kidney perfusion calculations.
- CT Calcium Scoring is a post-processing application designed to assist in the quantification of high-density structures such as calcified lesions in the cardio-thoracic region.
- The CT Cardiac Viewer is indicated for viewing, processing and analysis of cardiac CT datasets.
- The CT Comprehensive Cardiac Analysis (CCA) application is intended to assist the user in viewing, processing and quantifying cardiac and coronary CTA datasets of patients with suspected or diagnosed cardiac disease including coronary artery disease, for the analysis of heart and coronary artery anatomy and cardiac function.

  CT Cardiac Plaque Assessment, an option within the CT CCA application, helps physicians determine the presence, extent, and properties of coronary plaques.
- CT Pulmo Auto Results is a fully automatic image analysis application that identifies several radiological findings (e.g. consolidation and ground-glass opacity) to support the management of adult patients with suspected or diagnosed COVID-19 pneumonia.

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- The CT Chronic Obstructive Pulmonary Disease (COPD) application supports users in viewing and analysis of Chest CT scans for the assessments of Chronic Obstructive Pulmonary Diseases. The CT COPD application enable localization of affected areas and calculate diseased lung volume and percentage of affected lungs based on low attenuation areas/volumes via a guided workflow for airway analysis, reviewing and measuring airway lumen, and assessing air trapped.
- CT Dental Planning application supports users in processing, viewing, and analyzing dental CT images. The application allows examination of the patient jaw anatomy and can assist surgeons in planning oral procedures like implantation of dental implants and jaw surgery.
- The CT Dual Energy Viewer is designed to assist in review and analysis of Dual-Energy CT Scans and assist in characterization and dual-energy analysis of different tissue materials based on their energy value.
- CT Liver Analysis is a post-processing application providing tools to assess the whole liver, hepatic and portal vasculature, liver segments as well as user-defined ROIs. The application supports the user in the analysis and assessment of quantification parameters of the liver, liver segments as well as user-defined ROIs from liver CT imaging.
- The CT Lung Nodule Assessment is intended for use as a diagnostic patient-imaging tool. It is intended for the review and analysis of thoracic CT images, providing quantitative and characterizing information about nodules in the lung in a single study, or over the time course of several thoracic studies. Characterizations include diameter, volume, and volume over time. The system automatically performs the measurements, allowing lung nodules and measurements to be displayed.
- The CT Pulmonary Artery Analysis application is designed to assist users during the assessment of suspected findings of Pulmonary Embolism (PE) on CT imaging.
- The CT Spectral applications allow the generation of images at energies selected from the available spectrum in order to provide information about the chemical composition of the body materials and/or contrast agents.

  The Spectral CT Viewer is a software application allowing visualization and analysis of spectral images derived from spectral data acquired with the IQon Spectral CT Scanner.

  The CT Spectral Magic Glass on PACS (sMGoP) provides a set of tools to review and analyze Philips spectral CT datasets directly within the PACS viewer.

  The CT Spectral Light Magic Glass (LMG) option enables the user to review spectral data in a range of CT applications that are not spectral-enhanced
- The CT TAVI Planning application is intended to be used for patients with aortic valvular disease, severe symptomatic aortic stenosis or tricuspid aortic valve. The intended part of the body for this application is the human heart specifically the ascending aorta, aortic root, coronary ostia and left ventricle in order to assess the aortic valve in pre-operational planning of transcatheter aortic valve replacement procedures.

  CT TAVI Planning is a non-invasive post-processing application providing 3D model-based segmentation of the aortic valve and aortic arch. The CT TAVI Planning application provides assessment and measurements of relevant heart structures for TAVI-device sizing, and allows the user to select a starting angle for C-arm position from the possible optimal positions from the CT TAVI and select a C-arm angle the user feels is appropriate to use in the catheterization laboratory by the Interventional team performing the procedure (to be used during the procedure itself). The physician retains the ultimate responsibility for making the determination of patient eligibility or which device is implanted based on their standard practices and additional imaging modalities such as echocardiography

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- The CT Multiphase Analysis application creates tissue enhancement maps from multi-phase conventional or spectral contrast-enhanced CT data.

  The application supports the following maps:

  – **Arterial Enhancement Fraction (AEF)**: The ratio between the absolute enhancement of the tissue in the arterial phase and the portal venous phase. The AEF map is intended for the assessment of liver lesions for oncology patients.

  – **Extracellular Volume (ECV)**: The absolute enhancement of the tissue in the equilibrium/late phase. The ECV map is intended for the assessment of myocardial fibrosis and the assessment of liver fibrosis.

- CT Virtual Colonoscopy application support visualization and analysis of the Colon from CT Scans and enables 3D visualization of the colon to support examination of virtual colonoscopy on Specifically acquired CT images. Based on the results from radiologists, the referring physician may determine whether a patient needs to be referred to a gastroenterologist.
- The CT Calcium Automated Analysis application is intended for use as a non-invasive post-processing software to evaluate calcified plaques in the coronary arteries, which indicate the presence of coronary artery disease. The CT Calcium Automated Analysis device analyzes existing adult (>18 years) non-cardiac-gated CT studies. The device generates a 4-category output representing the estimated quantity of calcium detected together with preview axial images of the detected calcium meant for informational purposes only. The device output is available to the radiologist as part of their standard workflow. The CT Calcium Automated Analysis results are not intended to be used on a stand-alone basis for risk attribution, clinical decision-making or otherwise preclude clinical assessment of CT studies.
- The MR Advanced Diffusion Analysis application can be used to perform image viewing, process and analysis of MRI Diffusion Weighted Images (DWI). The ADA application supports any oncology and neurology conditions for which diffusion and/or perfusion analysis are indicated as part of patient management.
- The MR Cardiac Viewer is indicated for side-by-side review of single, multiple or all available cardiac series in a default or in a user-defined viewing protocol. The MR Cardiac Viewer supports the user in review of cardiac anatomy and motion.
- MR Cardiac Functional Long Axis: The MR Cardiac Long Axis Functional application is indicated to assist the user with assessment of LV function from single and multi-slice long axis cardiac cine data.
- MR Cardiac Functional LV&RV: The MR Cardiac Functional Left Ventricle & Right Ventricle (LV&RV) application is indicated to support users with assessment of LV and RV function using multi-slice short axis and axial cardiac MR cine data.
- The MR Cardiac Temporal Enhancement application is indicated to assist users with review and analysis of individual rest or stress acquisitions and/or rest-stress comparison of multi-slice dynamic cardiac MR acquisitions in one application.
- The MR Cardiac Spatial Enhancement application allows review, segmentation and quantification of T1w and T2w multi-slice, single-phase short axis MR images. The application is indicated to support the user with assessment of myocardial tissue characteristics that may point to pathologies on the tissue level, such as fibrotic tissue.

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- The MR Cardiac Quantitative Mapping application allows to load, review and quantify MR T1 native, T1 Enhanced, T2 and T2* MR data and to generate parametric maps. The application is designed to visualize and quantify signal differences for regions of interest within or between acquisitions. It is indicated to support users with detecting abnormalities that affect the myocardium in a diffuse fashion, such as edema, fat buildup or storage diseases.
- The MR Cardiac Whole Heart application allows users to review cardiac anatomy on 3D or MRA images and segment the entire heart and surrounding vasculature to create a surface-rendered 3D model that can be exported for 3D printing. The application is indicated to assist users with demonstration of anatomical structures for multiple purposes such as communication with patients, support in planning of ablation procedures or educational purposes.
- The MR Cartilage Assessment Application is intended to assess the integrity of cartilage on MRI Data.
- The MR Diffusion application is designed to assist in evaluation of MR Diffusion Weighted Imaging (DWI) and Diffusion Tensor Imaging (DTI) data to analyze diffusion and anisotropic properties of tissue. The MR Diffusion Application supports any oncology and neurology conditions for which diffusion and anisotropic properties of tissue are indicated as part of patient management.
- MR Echo Accumulation enables the calculation of new images based on the selected sum of echo times, of MRI series with multiple echoes.
- The MR FiberTrak application supports the user with the viewing, processing and analysis of Diffusion Tensor Imaging (DTI) data from MR diffusion imaging and with the creation and visualization of white matter tracks (or diffusional structure) in the brain and spinal tracts. The MR FiberTrak application supports any related conditions for which tractography analysis is indicated to assist in therapeutic guidance, clinical decision making, or surgery preparation for central nervous system cancers, traumatic injuries, and neurological disorders.
- The MR Brain Function Analysis application assist users in the processing, viewing and analysis of fMRI Data. The application is designed to support the user to identify and visualize functional regions of the brain, relying on local metabolic and hemodynamic changes that occur in activated brain areas.
- MR Liver Health is a post-processing application providing tools to assess anatomical characteristics and MRI biomarkers (Fat Fraction, T2*/R2*, ADC (Apparent Diffusion Coefficient) and eADC (exponential ADC)), for the whole liver, its segments, and user-defined ROIs.
- MR Longitudinal Brain Analysis is a post-processing application to be used for viewing and evaluating neurological images provided by a magnetic resonance diagnostic device. The LoBI application is intended for viewing, manipulation, 3D- visualization and comparison of medical imaging and/or multiple time-points. The LoBI application enables visualization of information that would otherwise have to be visually compared disjointedly. The LoBI application provides analysis tools to help the user assess, and document changes in diagnostic and follow-up examinations. The LoBI application is designed to support the workflow by helping the user to confirm the absence or presence of lesions, including evaluation, quantification, follow-up and documentation of any such lesions. The physician retains the ultimate responsibility for making the final diagnosis and treatment decision.

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- The MR Permeability application is designed to visualize T1 Weighted Dynamic Contrast-Enhanced (DCE) 3D datasets and assist in analyzing the tissue response. The MR Permeability application supports any related conditions for which permeability analysis is indicated as part of patient management in the oncology or vascular domain.
- The MR Qflow application supports the visualization and quantification of blood flow dynamics by assisting in reviewing of MR phase-contrast data.
- MR SpectroView is a task-guided application for the post-processing and visualization of Proton Magnetic Resonance Spectroscopy (MRS) imaging, providing hydrogen single and multi-voxel spectra, metabolite maps, and/or ratio maps. The MR SpectroView Application supports the assessment and management of disorders and diseases in the Oncology and Neurology domain.
- MR Subtraction is a post-processing application enabling basic calculations between two volumes, including addition, subtraction and ratio from within a single dynamic MRI series. The MR Subtraction Application supports any condition or anatomy for which image enhancement or image calculations prior to image analysis is indicated as part of patient management.
- The MR T1 Perfusion post-processing software is indicated to evaluate the Time Intensity Curves (TIC) of a MR T1 signal enhancement series for patients with oncological lesions (including brain, prostate, and breast cancer) or inflammatory process (including musculoskeletal disorders, Crohn's disease).
- MR T2* Neuro Perfusion application is a post processing software application supporting the analysis of Dynamic Susceptibility Contrast (DSC) T2* perfusion studies to generate numerical and graphical results of TTP, T0, MTT, rCBV, corrected rCBV, rCBF, Tmax and K2 (leakage). Four methods are available for analysis, including Gamma Variate, Model Free, Leakage Correction and manual Arterial Input Function (AIF). AIF also enables Perfusion-Diffusion Mismatch analysis if a Diffusion input dataset is available in addition to the Perfusion series. The MR T2* Neuro Perfusion application is indicated for the evaluation of stroke, or assessment and follow-up of brain tumors.

  The Diffusion-Perfusion Mismatch in the application is not intended to be used for acute ischemic stroke patient triage for treatment allocation (e.g., for extended time window for recanalization therapies according to: *Berge, E. et al. (2021) 'European Stroke Organisation (ESO) guidelines on intravenous thrombolysis for acute ischaemic stroke', European Stroke Journal, 6(1), p. I–LXII. doi:10.1177/2396987321989865*, and/or to Powers, W.J. *et al.* (2018) *2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association, Stroke. doi:10.1161/STR.0000000000000158.)*

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Intended Users

Advanced Visualization Workspace is intended to be used by adequately trained and qualified medical professionals, including but not limited to physicians and medical technicians. The main clinicians or medical and para-medical professionals who use the Philips Advanced Visualization Workspace are listed below:

- Radiologists in the radiology department/clinic
- Nuclear Medicine Physician in NM department

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- 3D technologists in the radiology department
- NM Technologist in NM department

Other clinicians/roles using the Philips Advanced Visualization Workspace are listed below:

- Cardiologists and Cardiology technologists
- Oncologists and oncology technologists
- Referring Physicians

Intended Patient Population

As the Advanced Visualization Workspace is an advanced visualization solution, it does not limit the intended patient population nor the medical conditions to be diagnosed, treated and/or monitored. It also does not define any inclusion or exclusion criteria to apply to the intended patient population. Therefore, the decision to use Advanced Visualization Workspace and its applications and the applicability of its results for specific medical conditions and patients is left to the discretion of the user. The AVW clinical applications have specific indications for use, which are detailed in the individual IFU.

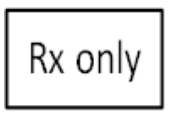
Residual Risk

One residual risk is associated with the Multimodality Viewer (MMV) application of Advanced Visualization Workspace.

This residual risk, regarding the use of the **Export to Surgical Nav. Format for MR Data** option, appears as a warning in the following section:

Multimodality Applications > Multimodality Review > Fusion Viewing > Registration > Registering Series

Limitations for Use



CAUTION

In the United States, Federal law restricts this device to sale by or on the order of a healthcare practitioner.



WARNING

Operation of the product with improperly configured components could expose the patient to safety hazard(s) and could result in non-serious injury.

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WARNING

Do not use the Advanced Visualization Workspace for any application until you have read, understood and know all the safety information, safety procedures and emergency procedures contained in this SAFETY section.

WARNING

Do not use the Advanced Visualization Workspace for any application until you have received adequate and proper training in its safe and effective operation. If you are unsure of your ability to operate this equipment safely and effectively DO NOT USE IT. Operation of this equipment without proper and adequate training could lead to clinical misinterpretation.

WARNING

Do not use the Advanced Visualization Workspace for any purpose other than those for which it is intended. Operation of the Advanced Visualization Workspace for unintended purposes, or with incompatible equipment, could lead to clinical misinterpretation.

WARNING

Use of this product in a way not described in these Instructions for Use, could lead to clinical misinterpretation.

WARNING

When running Advanced Visualization Workspace Client with a virtualization solution (Citrix XenDesktop®), a degradation in image quality, as well as skipped frames, may occur, based on the network bandwidth and virtual machine configuration.

NOTICE

When using a virtualization solution, images should be reviewed by a responsible physician to ensure appropriate clinical image quality.

NOTICE

When loading several phases with different scan and/or reconstruction parameters (for example: different zoom, pan, image number, FOV, matrix), the application performs automatic alignment between the phases. Image quality may be reduced due to this alignment.

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Cloud Client Configuration Limitations

WARNING

Image quality degradation and frame skipping

This configuration of AVW uses application streaming. This may affect image quality and cause frame skipping.

For additional information, see section “Streaming Information” on page 207.

Benefits

When used as specified in the Intended Use, under the circumstances and conditions specified in the Indications for Use, Advanced Visualization Workspace assists the user with the review and analysis of clinical image data on par with current - state of the art - clinical practices, thus realizing a positive impact on diagnosis and patient management.

Undesirable Side Effects

No undesirable side-effects related to the Advanced Visualization Workspace have been identified.

Measurement Accuracy

The Advanced Visualization Workspace image processing technology is state of the art, and therefore provides sufficient accuracy to be utilized as a medical device for clinical purpose.

A major factor in determining the accuracy of manual measurements is the ability to accurately place a measurement control point on an image displayed on a monitor. In addition, the measurement accuracy is also impacted by the image quality and the user’s interpretation of the image.

Factors impacting image quality

- Scanner’s calibration and quality control program, including the geometric accuracy, homogeneity, artifacts, contrast resolution, positioning and sensitometry when applicable.
- Imaging protocol, including spatial resolution (e.g., in-plane resolution, slice thickness), region of interest, reconstruction algorithm, data corrections (for example scatter), contrast agent, gating and acquisition sequences when applicable.
- Adherence to patient management and handling procedures, including contrast administration, scan scheduling, positioning and fixation protocols.
- Pre-existing patient comorbidities
- Residual patient motion and other motion artifacts, such as organ motion.

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The following aspects are contributing factors to the user's interpretation of an image

- Image viewing settings (e.g., window setting, zoom)
- Visualization options (e.g., MPR, MIP, or MinIP, volume rendering)
- Extent of the users' knowledge on performing measurements.
- Other relevant factors

Based on their knowledge and experience, clinical users are responsible for:

- Assessing the quality and relevance of the input image interpreting the image for a proper measurement
- Judging the accuracy of the measurements based on the given image quality
- Accurately positioning the measurement control points with the mouse point

In order to obtain an accurate measurement assessment when using Advanced Visualization Workspace, the clinical user must take into account that patient characteristics (demographic, physiological, etc.) are not automatically processed by Advanced Visualization Workspace and that it is the clinical users' responsibility to follow the indications for use and contraindications, in conjunction with the user's expertise.

For additional information, please refer to the section "Appendix: Generic Measurement Accuracy" on page 215.

About the Instructions for Use

This instruction for use is intended to assist users and operators in the safe and effective operation of the product described.

- The **"user"** is considered to be the body with authority over the product.
- The "**operators**" are those persons who actually handle the product.

Before attempting to operate the device, you must read this manual thoroughly, paying particular attention to all **Warnings**, **Cautions** and **Notes** incorporated in it. You must pay special attention to all the information given and procedures described in the Safety section.



When you see this symbol, refer to the "Instructions for Use" manual that came with your system.



WARNING

Warnings are directions, which if not followed, could result in non-serious injury to a user, patient or any other person, or could lead to a misinterpretation , and/or loss or damage of patient-related data.

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CAUTION

Cautions are directions, which if not followed, could cause damage to the product described in this Instructions for Use and/or any other device.

NOTICE

Notes highlight unusual points as an aid to an operator.

The "Instructions for Use" for the Advanced Visualization Workspace is supplied electronically and/or in printed volumes. The volumes typically include:

- **Instructions for Use** This volume explains how to use the Advanced Visualization Workspace. It also contains information about safety, data security, system start-up, software navigation, accessing patient data and filming.
- **Application instructions for use volumes:**
  - **Review** Depending on your version of Advanced Visualization Workspace, you may have multiple, modality specific Review volumes (e.g., CT Review; NM Review; MR Review; Multimodality Review, etc.) that explain how to use the various image viewers supplied with the system. Also included in these volumes are other processing techniques for displaying and analyzing patient studies.
  - **Analysis** Depending on your version of Advanced Visualization Workspace, you may have multiple, modality specific Analysis volumes (e.g., CT Analysis; MR Analysis; Multimodality Analysis, etc.) that explain how to use advanced applications.
- **System Administration Guide** This volume explains how to use the Advanced Visualization Workspace Management application. The local site administrators and service personnel are provided the functionality required to monitor Advanced Visualization Workspace usage, check for errors, add/delete users and groups and maintain the patient database.
- **Third party applications** Different versions of third party application "Instructions for Use" are available. Please select the appropriate documents for your version.
- **Electronic Instructions for Use.** An electronic (PDF) version of the "Instructions for Use" is provided. Please contact the administrator if you do not have access to this material.

Accessing Instructions for Use

The applicable Advanced Visualization Workspace Instructions for Use documents can be easily accessed via the Philips IFU web site:
http://www.philips.com/IFU

It is also possible to search the internet for the Philips Document Library.

The link for the Advanced Visualization Workspace PDF files appears in the Advanced Visualization Workspace **About** box. See below for additional information.

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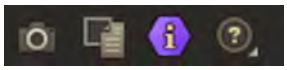
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NOTICE

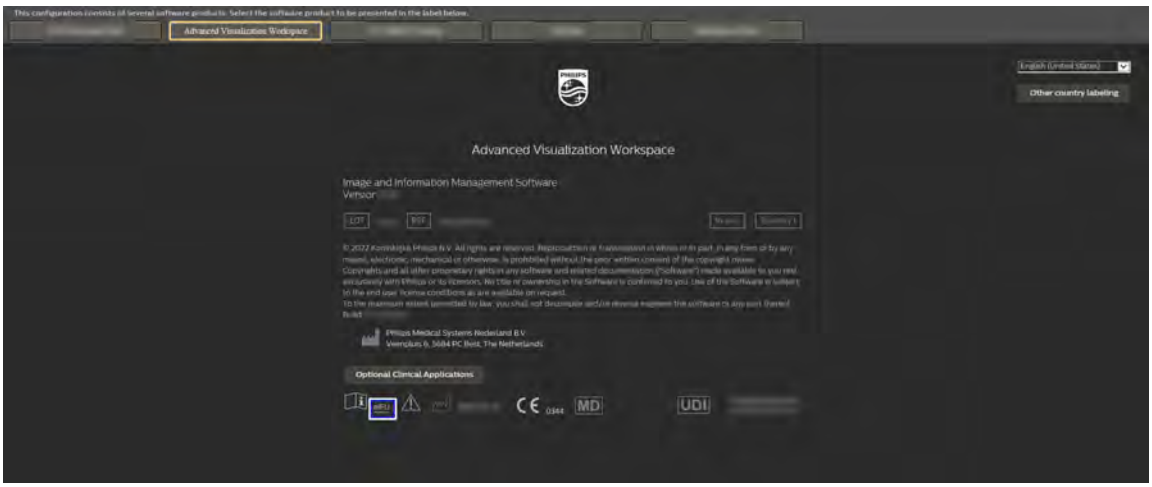
The images used in this section are examples only.

Accessing the Advanced Visualization Workspace PDF Files

- Access from AVW Server or Client:
  - Click on the **Open Help** icon  in the AVW Workflow Bar.

    
  - Select **Help/About** (depending on your configuration) from the displayed list.

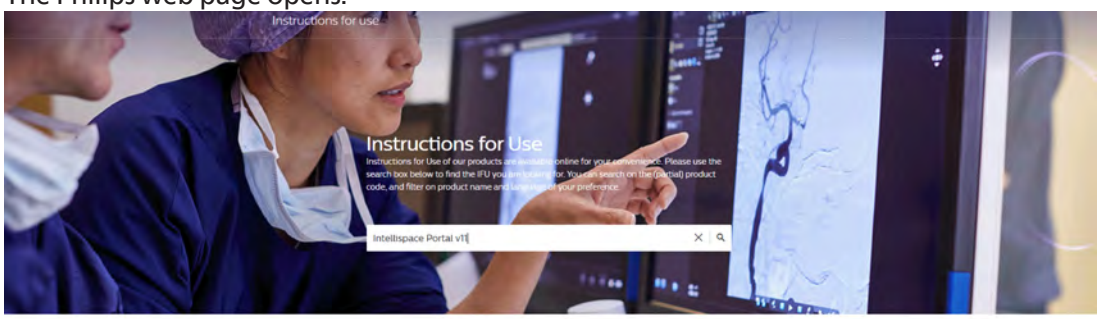
The About Box appears.

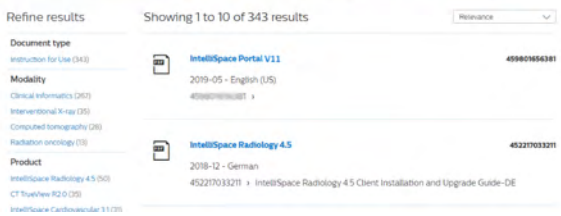


1. Click on the 

eIFU hyperlink located at the bottom of the page.

   The Philips web page opens.





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2. Use the search field to locate the required IFU document. It is recommended to type in the product name and version (e.g., Advanced Visualization Workspace V15) to display the list of applicable IFUs for the AVW version. If the document part number (300000XXXXXX) or name (e.g., MR Apps IFU, CT Analysis IFU) is known, these can also be entered as key words for searching.

   A list of results appears.
3. Once the required IFU is located and displayed in the results area of the screen, click on the document hyperlink.

NOTICE

It is possible to refine the results using the options on the left side of the page. Results can be refined according to Document type, Modality, Product and Language.

NOTICE

Advanced Visualization Workspace also provides online help, which can be accessed from the Help menu.

Ordering Printed Instructions for Use

You can contact your local Philips representative for a printed IFU.

A printed IFU can be also obtained by:

- Personally printing the printable PDF file provided.
- Placing an order through the public website http://www.philips.com/IFU .

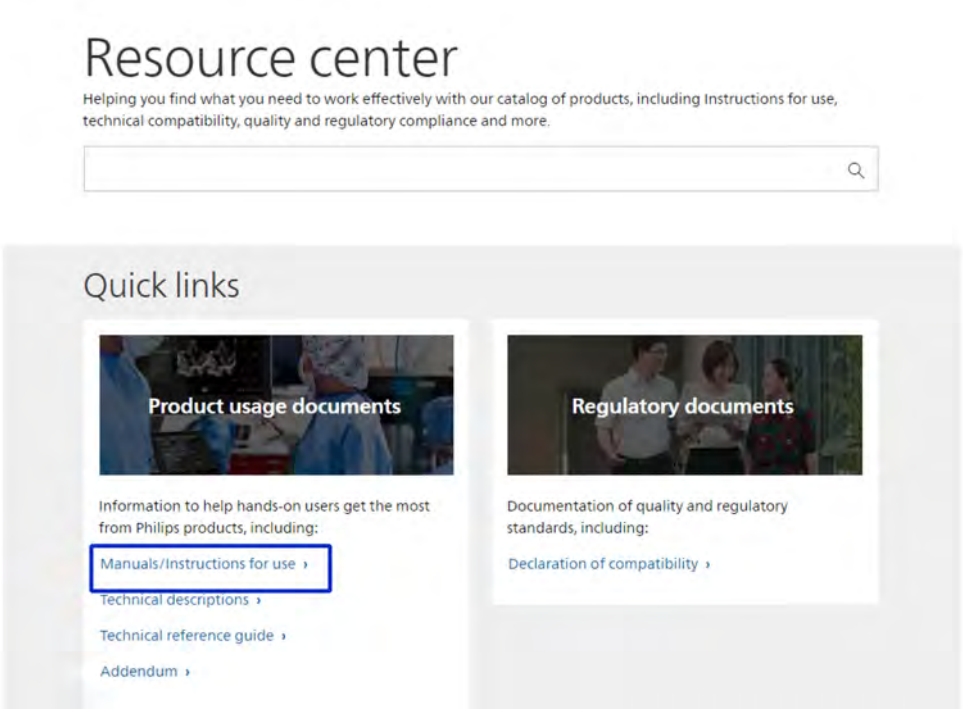
To place an order for a printed IFU:

1. Navigate to the site: http://www.philips.com/IFU and select the **Manuals/Instructions for use** link.

   The site that opens is dependent upon your location. The images provided here are examples only.

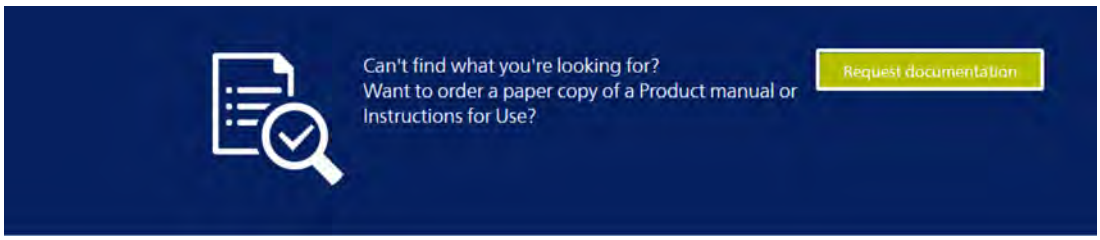
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The Search results page opens.

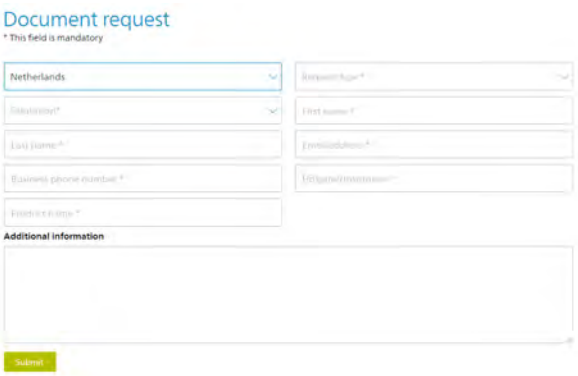
2. Scroll down the **Search results** page until you find the **Request documentation** button.



3. Click the **Request documentation** button.

   A document request form appears.

4. Fill in the required information and select **Submit**.



The printed IFU order will be provided within seven days using expedited delivery within the European Union.

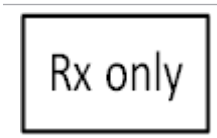
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Symbols Glossary

The following symbols may appear in the product documentation or on the labels attached to the product:

Symbol	Symbol Name	Symbol Description	Standard Number & Name	Symbol Reference Number
	Manufacturer	Indicates the name and address of the manufacturer.	EN ISO 15223-1:2021	5.1.1
	Translation Indication	Indicates that the information has undergone a translation which supplements or replaces the original information	Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, section 16.3	NA
	Date of manufacture	Indicates the date when the device was manufactured.	EN ISO 15223-1:2021	5.1.3
	Batch code	Indicates the Software Release/ Version number.	EN ISO 15223-1:2021	5.1.5
	Code number	Indicates the manufacturer's catalog number so that the device can be identified.	EN ISO 15223-1:2021	5.1.6

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Symbol	Symbol Name	Symbol Description	Standard Number & Name	Symbol Reference Number
	Consult instructions for use or consult electronic instructions for use	Indicates the need for the user to consult the instructions for use.	EN ISO 15223-1:2021	5.4.3
 **eIFU Indicator**	eIFU Indicator	Indicates an instruction to consult an electronic instructions for use (eIFU). The "consult instructions for use" symbol is accompanied by an eIFU indicator. This indicator may represent the manufacturer's eIFU website or any other appropriate indication on the use of eIFU (e.g. "IFU Kit").		
	Warning/Caution/ Notice Indicates that caution is necessary when operating the device or control close to where the symbol is placed, or that the current situation needs operator awareness or operator action in order to avoid undesirable consequences	**WARNINGS** are directions which if not followed could cause moderate to serious injury to an operator, patient or any other person, or could lead to a misinterpretation and/or loss or damage of patient-related data.. **CAUTIONS** are directions which if not followed could cause damage to the product described in this Instructions for Use and/or any other device. **NOTICES** highlight unusual points as an aid to an operator.	EN ISO 15223-1:2021	5.4.4
	CE Marking of Conformity	A marking by which a manufacturer indicates that a product is in conformity with the applicable requirements set out in European Union's harmonization legislation providing for its affixing.	Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices)	Annex V of MDR
	Prescription Device	Caution: In the United States, federal law restricts this device to sale by or on the order of a licensed healthcare practitioner.	21 CFR 801.109(b) (1) Prescription Devices	

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Symbol	Symbol Name	Symbol Description	Standard Number & Name	Symbol Reference Number
	Medical Device Indication	An indication that the device is a medical device.	Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices	
	UDI symbol	This symbol is used on the device label next to the UDI human readable indication (HRI) string.	Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices	
	Importer	The symbol will be followed by the medical device importer contact details: name and address.	Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, Article 13 (3)	
	Authorized Representative in Switzerland	Indicates the authorizes representative in Switzerland.	Not Applicable	

Glossary References: 1 EN ISO 15223-1:2021 Medical devices - Symbols to be used with medical devices labels, labeling, and information to be supplied - Part 1: General requirements.

Compatibility

The software product (" Advanced Visualization Workspace") described in this Instructions for Use communicates with other products using the DICOM-3 standard (e.g. with imaging systems of different modalities). Advanced Visualization Workspace uses the DICOM protocol to receive and send lossless images as described in the DICOM Conformance statement. See:

https://www.usa.philips.com/healthcare/resources/support-documentation/dicom-standalone-workstations

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In addition, Advanced Visualization Workspace uses HL7 through IntelliBridge Enterprise (IBE) for integration with HIS/RIS systems, to get patients ORM messages and send findings from clinical applications into a finalized RIS report (only supported for Client/Server and standalone workstation configurations).

Your local Philips representative or manufacturer can be contacted for any questions regarding compatibility with specific devices and/or components. Information on significant restrictions related to compatibility can be found in the Release Notes accompanying this Instructions for Use. Philips is not responsible for running compatibility validation of non-supported third-party software.

In case of off the shelf hardware (server/workstation) provided by Philips Health Systems personnel or a virtual machine provided by the hospital according to Philips defined specifications:

Changes and/or additions to the server/workstation should only be carried out by Philips Health Systems or by third parties expressly authorized by Philips Health Systems to do so.

Any addition or change to software products installed on the server/workstation or changes of operating system configuration is restricted, unless the other software equipment or components are recognized as compatible by Philips. A list of such software, equipment and components is available on request from your local Philips Representative, or the Manufacturer. Philips is not responsible for running compatibility validation of non-supported third-party software.

Any changes and/or additions must comply with all applicable laws and regulations that have the force of law within the jurisdiction(s) concerned, and with best engineering practice. Changes and/or additions carried out by persons without the appropriate training, and/or using unapproved spare parts, may lead to the Philips Health Systems warranty being voided. Philips is not responsible for any malfunction of Advanced Visualization Workspace, if Advanced Visualization Workspace runs on hardware that is not according to hardware specifications. If not supplied by Philips with the Advanced Visualization Workspace software, Philips is not responsible for any malfunction of the hardware used. As with all complex technical equipment, maintenance by persons not appropriately qualified and/or using unapproved spare parts carries serious risks of damage to the equipment and of personal injury.

Compliance

The Advanced Visualization Workspace complies with relevant international and national standards and laws. Information on compliance is supplied on request by your local Philips representative, or by Manufacturer.

This software product shall be installed on appropriate IT equipment that complies with relevant international and national laws and standards on EMC (Electro-Magnetic Compatibility) and Electrical Safety. Such laws and standards define both the permissible electromagnetic emission levels from equipment and its required immunity to electromagnetic interference from external sources.

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Supported Modalities

The system software supports handling of CT, NM, PET, SPECT, MR and Ultrasound data.

NOTICE

Do not attempt to load unsupported data into incompatible applications. For details on multi-vendor support, please contact a Philips representative.

Training

Users of the Philips Advanced Visualization Workspace must have received adequate training on its safe and effective use before attempting to operate the software product described in this Instructions for Use.

Training requirements for this type of software product will vary from country to country. It is for users to make sure that they receive adequate training in accordance with local laws or regulations which have the force of law.

If you require further information about training in the use of this software product, please contact your local Philips representative, or the Manufacturer.

Safety

Philips products are designed to meet stringent safety standards. However, all software medical devices require proper operation and maintenance, particularly with regard to human safety.

It is vital that you follow strictly all safety directions under the heading **Safety** and all **Warnings** and **Cautions** throughout this "Instructions for Use", to help ensure the safety of both patients and operators.

In particular, you must read, understand and know the information described in this Safety section before using this device.

You should also note the following information:

- Intended use of Philips Advanced Visualization Workspace. See section “Intended Use/ Purpose” on page 15.
- Contraindications. See section “Contraindications” on page 16.
- Training for operators of the Advanced Visualization Workspace. See section “Training” on page 34

NOTICE

Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

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Network Safety, Security, and Privacy

Philips recognizes that the security of Philips products is an important part of your facility's security-in-depth strategy. However, protection can only be realized if you implement a comprehensive, multi-layered strategy (including policies, processes, and technologies) to protect information and systems from internal and external threats.

Following industry-standard practice, your strategy should address:

- Physical security;
- Operational security;
- Procedural security;
- Risk management;
- Security policies; and
- Contingency planning.

The practical implementation of technical security elements varies by site and may employ a number of technologies, including firewalls, virus-scanning software, authentication technologies, etc.

As with any computer-based system, protection must be provided so that firewalls and/or other security devices are in place between the medical system and any externally accessible systems. The USA Veterans Administration has developed a widely used Medical Device Isolation Architecture for this purpose. Such perimeter and network defenses are essential elements in a comprehensive medical device security strategy.

Any device connection to an internal or external network should be done with appropriate risk management for product effectiveness and data and systems security. Additional security and privacy information can be found on the Philips product security website at:

www.philips.com/productsecurity

Please review Philips product security policies regarding remote service, patch management, anti-virus software and more in the “Product Security Policy Statement” and additional information sources available through this website.

NOTICE

Philips is not responsible for security of hospital managed systems (desktop PCs, laptops) where the Advanced Visualization Workspace client is installed.

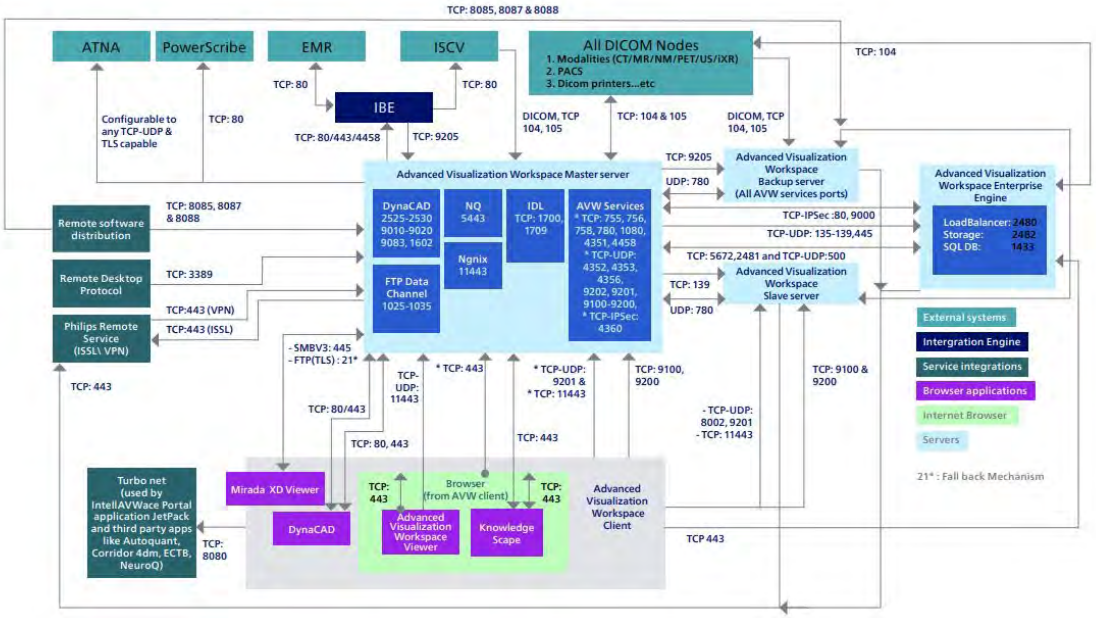
Advanced Visualization Workspace Port Map

For On-Premise Configurations

The following is a flow diagram detailing the ports to be opened between Advanced Visualization Workspace and hospitals, including Concerto CDB (Centralized Database) configuration.

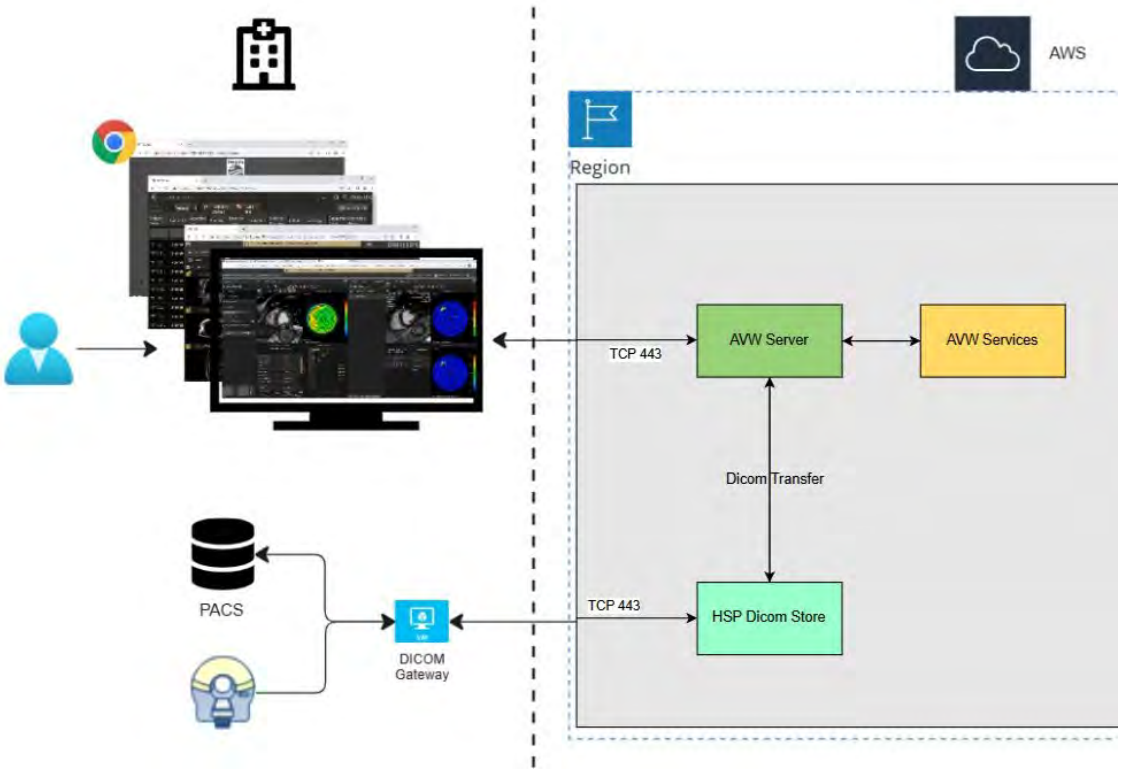
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For Cloud Configuration

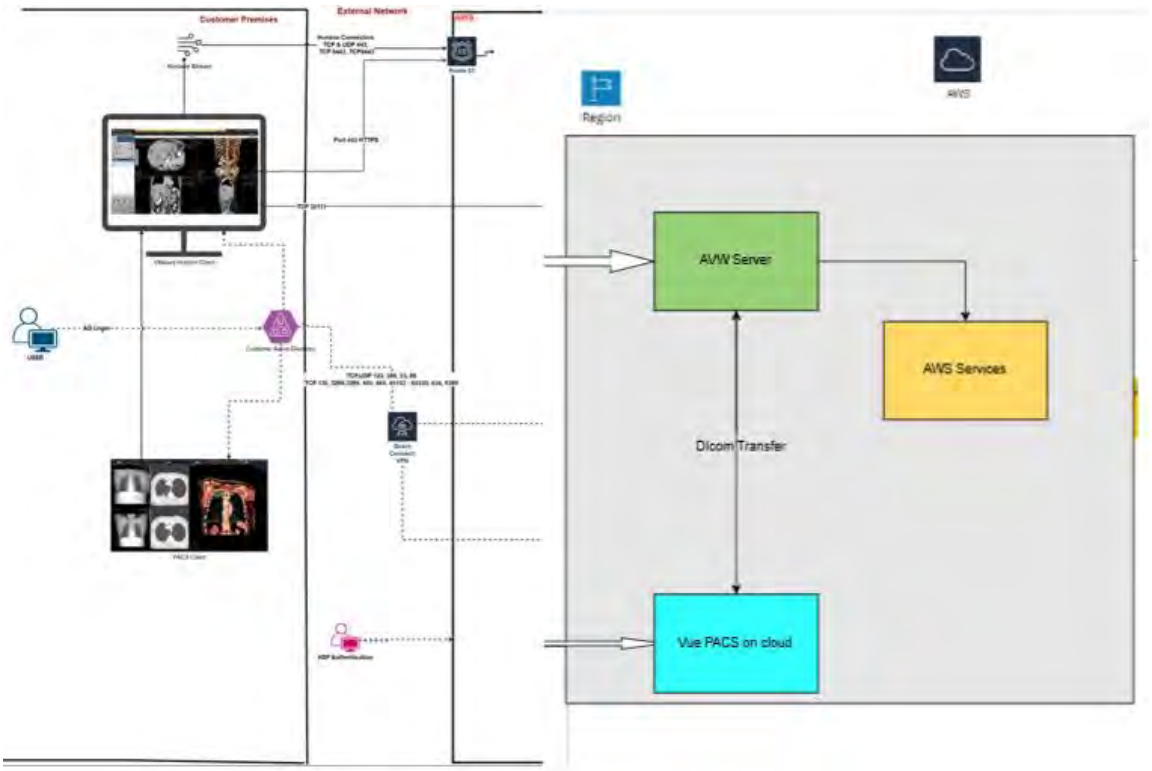
The following is a flow diagram detailing the ports to be opened between Advanced Visualization Workspace and hospitals, in a browser configuration.



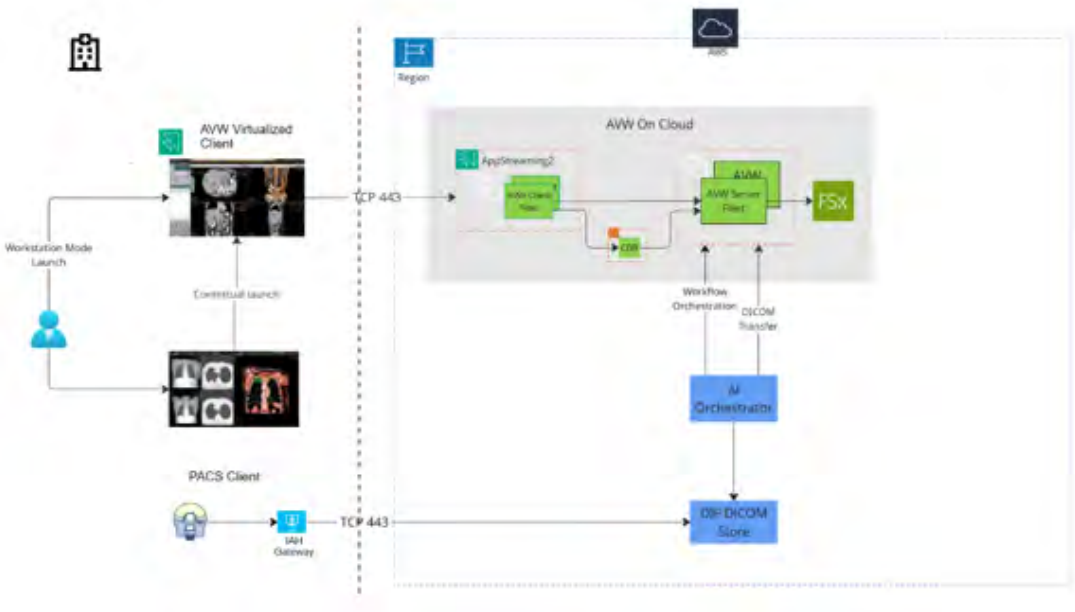
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The following is a flow diagram detailing the ports to be opened for a client streaming configuration.



The following is a flow diagram detailing the ports to be opened for a client streaming configuration.



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Regulatory Controls

Protect Patient's Health Information

One of the most important assets to protect with security measures is the patient's health related information.

Many governments require maintaining the confidentiality of this information. Therefore, strict security measures must be taken to guard this protected information.

NOTICE

Users in the U.S.A. may find guidelines at http://www.hhs.gov/ocr/hipaa/.

Prevent Unauthorized Device Modification

Philips sells highly complex medical devices and systems. We are required to follow government-regulated quality assurance procedures to verify and validate modifications to the operation of our medical devices.

Operators of this medical device must permit only Philips-authorized changes to be made to the Servers (or Workstation), either by Philips' personnel or under Philips' explicit published direction.

Software Installation

CAUTION

Installation of software not authorized by Philips or not specified in the Advanced Visualization Workspace system documentation may adversely affect the operation and security of the system, as well as the networks to which the system is connected. These adverse effects may not be immediately apparent to the user. Therefore users should not install unauthorized software onto the Advanced Visualization Workspace Server and Workstation.

Off-the-Shelf Software

The Advanced Visualization Workspace system may be used with the following off-the-shelf software products on local computer workstations and file servers.

Additional Software Recommended	Version	Description
Adobe Acrobat Reader (for Report & Help)	22.003.20258 and above	Required for approving reports
Windows Media Player	9.0 and above	Required for saving movies

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Additional Software Recommended	Version	Description
IMAPIv2	Version 2	Required for burning CDs and DVDs
DirectX	11.0	Recommended for a better CT/MR application experience
Microsoft Print to PDF	Feature of Microsoft Windows	Required to save reports in PDF format.
Microsoft Visual C++ 2013 (x64)	2013 (x64)	For 4D Flow and Autoquant applications
Microsoft Visual C++ 2015-2022 (x86 and x64)	2015 - 2022 (x86 and 64)	For MR Cardiac application
NVIDIA Graphics Card	With OpenGL 3.3 >=256 MB RAM	For 4D Flow application

Software Updates

Updates for this Philips software product can become available. Such updates are essential to keep the software product operating safely, effectively, and reliably.

Security Issues and Guidelines

In addition to the patient information and device integrity needs discussed in the preceding section on regulatory requirements, the following topics, issues, and guidelines should be understood and addressed by operators and owners. This applies to Philips Advanced Visualization Workspace Server and Workstation and not the client PCs.

Network Security

NOTICE

This section is not applicable for Cloud configuration. Cloud configuration requires an internet connection.

The Philips Advanced Visualization Workspace must be placed on a secure local computer network that has protections against viruses and other harmful computer system intruders. Make sure the equipment is connected to a local network that uses appropriate protection, such as a firewall and virus scanners.

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CAUTION

The Advanced Visualization Workspace system does not require open Internet connectivity for its standard Intended Use. It is strongly recommended that the Advanced Visualization Workspace Server/Workstation not be used for Internet browsing to prevent exposure to the public internet.

Remote Service

Remote Service provides a set of tools that enable Philips to perform monitoring and service actions, entirely or partly, from a remote location. Remote Service is designed to reduce system downtime and improve investigation of systemic issues.

Remote Service features include:

- automatic generation of alerts for Advanced Visualization Workspace server hard disk space usage
- remote assistance for workstations
- distribution of critical product software patches
- software distribution
- connectivity alerts
- miscellaneous alerts

NOTICE

For Cloud configuration, Remote Service is performed in the background and is not apparent to the user.

Positioning of Display Monitors

Unauthorized visual access to protected information can be minimized by positioning the system's display monitor so it faces a wall, to prevent viewing from doorways, hallways and other traffic areas.

NOTICE

Monitor position is a suggestion for use with monitors of the Advanced Visualization Workspace Client PCs and the Advanced Visualization Workspace Workstation.

To help in limiting unauthorized visual access, an unattended computer display automatically goes blank after a set period of time.

The Advanced Visualization Workspace system supports Automatic Logoff and Screen Lock for Client/Server/Workstation configurations. For additional information, see section "Automatic Logoff" on page 42.

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Room Access Control

Procedures must be put in place to limit physical access to the medical device, to prevent accidental, casual or deliberate contact by unauthorized individuals.

For AVW configurations located on your premises, access to the room containing the Advanced Visualization Workspace server or workstation should be controlled by policy and procedures that identify who is authorized to occupy specific areas. Check with your hospital's Safety and Security Office for more information on what measures are in place or how to implement room access controls.

User Login and Logout Protections

A consistent user login process (user names and passwords) provides good security of protected information. Minimum login standards include:

- Implementing strong passwords. This is the easiest and most effective method to increase security. Strong passwords consist of at least eight alphanumeric, mixed case characters, digits and special characters like '@' or '*'.
- Never use words that can be found in the dictionary.
- Never post or share user names and passwords.
- Change passwords periodically.

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CAUTION

It is strongly recommended that the password of pre-defined user accounts (at OS & application-level) on the Advanced Visualization Workspace system, be changed at the time of system deployment in your facility. Contact your Philips Service Engineer for more details.

Implemented Security and Privacy Features

It is the policy of Philips to adhere to all required standards and regulations. To assist the hospital in fulfilling security and privacy requirements such as the Health Insurance Portability and Accountability Act (HIPAA) requirements, introduced by the United States Department of Health and Human Services, General Data Protection Regulation (GDPR) from European Union regulation on information privacy in the European Union and the European Economic Area and UK GDPR which complies with Data Protection ACT 2018 with UK law, functionality has been added to the Advanced Visualization Workspace system.

Access Control

Intended to restrict access to the system to authorized users only:

- A user log-on/log-off procedure is required to gain access to the system.
- Access to the system is granted according to a customizable list of authorized users.
- Only username/password authentication is supported. No additional mechanisms like two-factor authentication using smart cards, etc., are supported.

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- Password complexity rules can be defined through the Advanced Visualization Workspace Management Tool
- Password expiration rules can be defined through the Advanced Visualization Workspace Management Tool
- Account Lockout Policy can be defined through the Advanced Visualization Workspace Management Tool.

Automatic Logoff

The Advanced Visualization Workspace system provides a configurable Client idle time out feature. The time out configuration can be done using the Advanced Visualization Workspace Management Tool. However, it is not possible to disable the automatic logoff feature.

After inactivity timeout, the Lock screen appears (with the last logged in user displayed).

NOTICE

The Lock screen is not applicable for Cloud configuration (when working in browser). The user is returned to the AVW Login screen.



When the Lock Screen appears:

- All clinical applications are closed
- Film and Report are restarted
- The Patient Directory is hidden

Once the Lock screen appears, users can:

- **Enter their password** - In this case the user is logged into the earlier session and the Patient Directory is displayed.

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- **Switch to a different user** - In this case, the user enters a different username and password from the last logged in user. The "new" user is logged into the AVW client with the same login preferences as the previous user (Authentication Source, Server IP, Connection, Program Language and Advanced Settings). If the new user wants to be logged in with a different preference, it is necessary to exit the Lock screen and log in using the AVW Login page.
- **Exit** - In this case the workflow is closed.

The behavior for inactivity timeout is different depending on the AVW environment:

- For a **remote client** user, the Lock screen appears when inactivity timeout occurs.
- For a **client on a server** user, the workflow the workflow is closed when inactivity timeout occurs.
- For an **AVW Workstation** user:
  - If the user is not an Admin user, no inactivity timeout occurs.
  - If user is an Admin user, on inactivity timeout, the workflow is closed.

Login From the Lock Screen

1. Type **Username.**
2. Type **Password**.

   When typing a password, input is hidden (asterisks appear instead of keyboard characters).
3. Click **Log on**.

Audit Trail

Required to log user activities which are information-security critical:

- Applies to logging-on, reading and/or modifying clinical information.
- The system supports detailed audit trail logs, which are IHE ATNA compliant.
- The audit trail logs are stored locally (in an encrypted form) on the system.
- Local audit logs can be viewed using the Audit Log Viewer. The Audit Log Viewer can be accessed by Hospital Administrators from the “IT Tools” folder present on the desktop of the Advanced Visualization Workspace system.

Additional Security and Privacy Features

HIPAA defines a number of physical and technical safeguards which are either required or addressable. Some features that could implement these functions are different or not implemented for reasons mentioned below. This section also lists other information related to security features that are not implemented and that the owner of the systems should be aware of.

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Encryption

Windows BitLocker, a full disk encryption feature (provided by the Windows OS) that protects data by encrypting entire volumes, can be enabled by the Hospital Administrator as needed, to encrypt data at rest on the Advanced Visualization Workspace server.

For data in transit, the Advanced Visualization Workspace system sup ports the IHEATNA profile, which enables secure transmission of ePHI between configured DICOM devices.

NOTICE

For data that is on the Cloud, disk encryption is the responsibility of Philips. Data on the Cloud is encrypted using AWS encrypted storage.

Physical Access to System

NOTICE

This section is not applicable for Cloud configuration.

The Advanced Visualization Workspace system should be placed in an access restricted area in the hospital. However, the following characteristics are to be taken into account for system operation and access control:

- The computer case is "service friendly" (e.g., accessing and removing the hard drive does not require tools). However, the computer case can be locked (e.g., by cable lock).
- Unauthorized changes to software, files or data on the Advanced Visualization Workspace system are not permitted and doing so may adversely affect the operation and security of the system.
- The system BIOS is not password protected and can be accessed during startup of the system if unauthorized access to the system is possible.

Backup Procedure

The system is not intended for permanently storing sensitive patient personal information. Information should be exported to a long-term storage device as soon as possible.

Emergency Access Procedure

NOTICE

This section is not applicable for Cloud configuration.

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The Advanced Visualization Workspace system does not have a built-in emergency user account. However, it supports the creation of unique user accounts and assignment of permissions to users. Hospital administrators can use this function to create an “emergency” user account with the necessary permissions. To avoid unauthorized access to patient data, ensure that knowledge of this generic “emergency” user account and access to the system is restricted.

The Advanced Visualization Workspace system does not allow or enforce generic account users to enter their real names, which restricts the system’s ability to track and audit the generic user account.

It is not possible to clearly mark data output (e.g., screen, print-out and exported data to DVD) as having been created during an emergency access operation.

Malware Protection

Anti-Virus Agnostic Support

- Philips highly recommends installing anti-virus software. All Advanced Visualization Workspace versions are anti-virus agnostic, including the following products:
  - Advanced Visualization Workspace Server
  - Advanced Visualization Workspace Workstation
- Advanced Visualization Workspace is designed to allow operation with any mainstream enterprise virus-scanning product which is supported by Windows OS.
- Anti-virus software should only be installed by IT professionals, according to the Advanced Visualization Workspace installation instructions.
- Philips recommends that you run antivirus software on any Advanced Visualization Workspace Products and keep the antivirus software up-to-date.

Anti-virus Software Policy

Customers can install any anti-virus software that does not conflict with Advanced Visualization Workspace. Otherwise, the Philips Field Service Engineer (FSE) will install Microsoft Defender software during Advanced Visualization Workspace installation.

Philips recommends that customers implement an industry recognized anti-virus solution, as an additional level of protection. The implementation of an anti-virus software solution on Advanced Visualization Workspace enables customers to maintain system protection in line with the local IT policy. The updating and operational management of the anti-virus solution and its virus definition file(s) is the responsibility of the customer.



CAUTION

Installing anti-virus software on the Advanced Visualization Workspace server is an action taken by the hospital IT administrator. The sole responsibility of such an action and its impact rests with the Hospital IT Administrator.

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NOTICE

It is the responsibility of Philips to provide malware protection for Cloud data.

Microsoft Security Updates

Microsoft Security Updates are routinely included with each new software release. Alternatively, Philips either installs monthly security patches remotely through PRS, or permits Advanced Visualization Workspace customers to install Microsoft security updates on their Advanced Visualization Workspace system. Philips is responsible for installing monthly security patches on cloud servers.

For a list of approved/validated Microsoft® security updates for the Philips Advanced Visualization Workspace Server/Advanced Visualization Workspace Workstation, please refer to the vulnerability evaluation report, called "Security Status" document(s). The document(s) are accessible via the following link:

www.philips.com/security

Once the web page loads, click the option/image for “Cyber-security information of Philips healthcare products”. A new web page will open. Follow the guidelines provided to first request access to the product security documentation and subsequently to access the document distribution platform, Philips InCenter. On Philips InCenter, look for the product group “Imaging Clinical Applications and Platform (ICAP)” to find the Security Status document(s) for the Advanced Visualization Workspace product.

With reference to the Security Status document, Philips permits customers to install only security updates which have the “Recommended Customer Action” as “Install recommended solution”. For each of these approved security updates, the Security Status document mentions the Knowledge Base (KB) Article related to each security update.

Customers can download the respective Microsoft security update referenced by the unique Microsoft® KB number from the Microsoft® TechNet website or access the same from an internal server/repository. Please ensure that you download/access only the updates that are applicable to the Microsoft® Operating System used on the Philips Advanced Visualization Workspace system.

Not Applicable Security Updates

Security updates that have the **Activity Status** as **Not applicable** in the Security Status document are not meant to be installed on the AVW product. Refer to the **Notes/Instructions** associated with the respective security update (in the Security Status document) for more information.

For example, security update **MS16-054 – Security Update for Microsoft Office (3155544)** is not applicable because Microsoft Office is not installed on the Advanced Visualization Workspace system.

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Hence, installation of these updates is not necessary, since an attempt to install them will lead to an error being shown. The error notification is only meant to indicate that the update is extraneous and not an indication of potential problems in the system – this error notification can be ignored.

Philips and Microsoft Updates

Philips AVW products use third party commercial computer Operating Systems (OS) like Microsoft Windows. We continuously monitor relevant vendor and industry/media security announcements and perform risk assessments on current medical devices that are affected by newly discovered vulnerabilities. Microsoft releases information on MS Windows security patches (hotfixes) on a regular basis. Impact assessments of these hotfixes by Philips product engineering teams typically begin within 48 hours of Philips awareness of a new security vulnerability or patch availability. Following assessment, an indication of Philips response for affected products is available to users typically by the end of each month. For cases when Microsoft publishes urgent security vulnerability announcements (in case of risk events, cyber-security attacks, detected incidents) and releases urgent patches, ICAP responds within five business days.

Depending on the nature of the threat and the affected product in question, a validated “fix” or software update may be released. If the recommended response requires a change to the system software of a medical device, a software update may be released. Information concerning the availability and applicability of such updates is likewise available via Philips standard service channels and, for some products, can be found via our website. In an effort to provide you with this important information in a timely and convenient manner, the Philips Product Security website features access to dynamic product-specific vulnerability information **https://www.usa.philips.com/healthcare/about/customer-support/product-security** .

This information is formatted into simple, product-specific tables listing known software vulnerabilities and their current status, recommended customer action and general comments. Please visit the Philips Product Security website to access this information.

If you have any questions regarding the vulnerability tables, patch management, or other product security interests, contact Philips by email: **productsecurity@philips.com** or directly contact your local Philips representative.

Safe Disposal of Software Components

Before disposing of the Advanced Visualization Workspace software components, AVW server and workstation drivers must be formatted in order to ensure that patient data is securely removed and cannot be recovered.

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System Description

Advanced Visualization Workspace is a software medical device that allows multiple users to remotely access clinical applications from compatible computers on a network. The system allows networking, selection, processing, and filming of multimodality DICOM images. This software is for use with off-the-shelf PC computer technology that meets defined minimum specifications.

The Advanced Visualization Workspace communicates with imaging systems of different modalities using the DICOM-3 standard.

It may be deployed in two configurations:

- **Thin Client-Server configuration**: This configuration enables widespread remote access via networked hospital PC's. The server and client application communicate through a local area network (LAN) or possibly through the Internet using a VPN connection. The Thin Client machine has the Graphical User Interface (GUI) and displays images while the central server retrieves and manages images and generates images for transmission to the client. Memory and CPU intensive operations such as 3D rendering take place on the server. Multiple users can login simultaneously and interact with datasets for review and interpretation. The client software can be deployed on a variety of PCs with different Operating System (OS) and hardware configurations. In addition, Advanced Visualization Workspace can be deployed on Philips managed public cloud allowing access to AV clinical applications over the internet from a standard web browser or streaming service.
- **Standalone workstation configuration**:This configuration supports one (1) user working locally on the workstation.

NOTICE

Advanced Visualization Workspace is a software-only medical device. It may be supplied with or without dedicated hosting hardware. For the sake of simplicity, within this document, any reference to the term "System" addresses Advanced Visualization Workspace medical software (with or without the hardware components). Any mention of specific third party hardware (e.g., cables, computers, monitors, workstations, servers, accessories etc.) refers to optional recommended non-medical components that can be purchased by the customer and shipped with the Advanced Visualization Workspace medical software.

All of the hardware components are not intended to operate as a working part/component of Advanced Visualization Workspace medical software and are recommended only as hosting hardware that complies with the Advanced Visualization Workspace medical software system requirements listed in this IFU.

Image Handling

- Viewing
- Manipulation
- Two and three-dimensional processing
- Analysis

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- Filming (Not applicable for Cloud configuration)
- Quick Review (Not applicable for Browser Cloud configuration)
- Limited number of concurrent clients
- Reading (and burning – if supported by client PC) CD's and DVD's (Not applicable for Cloud configuration)
- Save non-DICOM directly to labeled Multimedia viewer in AVW (Not applicable for Browser Cloud configuration)
- Clipboard – copy an image to paste in documents/PowerPoint presentations

NOTICE

Exercise caution when copying images to the Clipboard, as images may contain confidential patient information. Take appropriate measures to clear the Windows Clipboard.

- Integration with PACS: launch AVW with the same user login and same selected data for third-party applications (Not applicable for Browser Cloud configuration)
- Reporting

Performance

While the ultimate performance for any specific client depends on network performance and load and the number of users simultaneously requesting computation on the server, the intent of the Advanced Visualization Workspace is to have multiple users able to use the advanced visualization application with quality "interactive" performance over the network.

Requirements

Advanced Visualization Workspace Server

NOTICE

This section is not applicable for Browser Cloud configuration.

The Advanced Visualization Workspace Server is connected to an imaging system and has PACS connectivity capabilities. The imaging system pushes images to the AVW Server and the server can send and retrieve DICOM images from PACS.

A site can install multiple Advanced Visualization Workspace servers, in which case a user of an Advanced Visualization Workspace client can connect to a chosen server. Each Advanced Visualization Workspace server acts independently and is not aware of any other Advanced Visualization Workspace servers.

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Memory- and CPU-intensive operations such as 3D rendering take place on the server.

The Advanced Visualization Workspace server can be accessed by a wide variety of remote users and can be placed anywhere in the Radiology IT rooms.

The Advanced Visualization Workspace server is configured by Philips and is dedicated to running only the Advanced Visualization Workspace server software.

NOTICE

The Advanced Visualization Workspace client version must have the same software version as the Advanced Visualization Workspace server.

NOTICE

Generally, other than stipulating minimal requirements, Philips does not have control over the configuration of the client machines.

Broadcast Messages

NOTICE

This section is not applicable for Cloud configuration.

All on-line clients can receive broadcast messages and warnings. (e.g.:"AVW server will be down in 5 minutes").

Communication Equipment

The Advanced Visualization Workspace Server:

- Supports transfer rate 10, 100 and 1000 Mbit/sec. Time to transmit an image is also dependent on the matrix of the images provided by the modality.
- Connects to the hospital network and retrieves DICOM data from any DICOM node connected to the same network.
- Performs memory and CPU-intensive operations, such as volume rendering, that takes place on the server.
- Can be accessed by a wide variety of users and can placed anywhere in the radiology IT rooms.

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Hardware Requirements

Configuration	Processor	Memory	Storage	Video Card
HP DL360/ML350 Server	2x Intel Xeon E5-2643 v3 or v4 3.4 GHz or 1x Intel Xeon 6426Y 2.5GHz	32 or 64 GB or 128 GB	3 or 6 x1.2 TB SAS RAID5	Not Applicable
Dell T640/R640 Server	1x Intel Xeon Gold 6136 3.0 GHz or 6226R 2.9 GHz	32 or 64 GB	3 or 6 x1.2 TB SAS RAID5	Not Applicable
HP Z4 Workstation	Intel Xeon W-2145, 3.7GHz or Intel Xeon W-2245, 3.9 GHz	16 or 32 GB	256 GB M.2 SSD 1 TB SATA or M.2 SSD	NVIDIA P620 or T600 or T1000
HP Z440 Workstation	E5-1660v3 3.00 GHz or E5-1660v4 3.20 GHz	16 or 32 GB	1.2 TB SAS or 256 GB M.2 SSD and 1 TB SATA	NVIDIA K620 2 GB

Tab. 1: Advanced Visualization Workspace Server Hardware Requirements

Software, Networking and Security Specifications

Item	Requirements
General Installed Software	• Windows Server 2019 • Philips Advanced Visualization Workspace server software, including: – Proprietary AVW Server Application – Clinical application usability and IT Dashboard – Advanced Visualization Workspace Management Tool for managing user database and additional settings
Antivirus	All Advanced Visualization Workspace versions are anti-virus agnostic. For additional information see section “Malware Protection” on page 45. Philips highly recommends installing anti-virus software.

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Item	Requirements
Networking	• TCP/IP protocol only • Gigabit network card(s) • Static IP address • Dedicated 1 Gbps connections between Advanced Visualization Workspace servers (in case of a multi-server deployment • LAN Network bandwidth 100 Mbit/S and above (1 Gbps or above recommended) • VPN access (optional) • Domain based network environment recommended
Security	• No unused Windows services running • No shared drives • Windows access control defined by client (hospital site IT) • Encrypted users/groups database file • User management application available only to defined AVW administrators • Encrypted transfer over the network of username and password information • Event logging • Windows firewall • Administrative access through server console or remote desktop

Tab. 2: Advanced Visualization Workspace Server Software, Networking and Security Specifications

Server Virtual Machine Specifications

Item	Requirements
Virtualization Supported	• VMware vSphere 6.5 or later • Microsoft Hyper-V from Win Server 2016 or later • Nutanix AHV hypervisor, 20190906, or later • AWS for Cloud deployment

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Item	Requirements
Operating System (Should be pre-installed by the customer*)	• Windows Server 2019 - Standard, Datacenter and Enterprise Edition (English Only) • .NET version 3.5 installed (**Required**) and .NET 4.8 (or later) installed (**Recommended**) • Version should be clean of 3rd party software prior to installation • Latest security updates approved by Philips installed (can be done post AVW installation) • Operating system updates approved by Philips installed (can be done post AVW installation)
Storage	Two separate drives (must be local to the Virtual Machine): • Drive C (OS + apps): 150GB minimum • Drive D (Data): 0.5 – 5TB (In master-slave configurations, the slave's D drive should be 0.5TB) **Storage Requirements**: Drives should be optimized for reading performance with Random 4K IOPS = at least 250 MB/s.
Network Interface Card	• 1 or 10 Gbps Network interface card • It is highly recommended to use VMware's VMXNET3 driver when using the VMware. • In case of multi-server configuration, another NIC should be set up and connected by a private vSwitch to the rest.
Graphics Processing Unit (GPU)	For enabling Photo-realistic Volume Rendering (PRVR), GPU capabilities should be supported. The virtual machine should support a virtual GPU with the following characteristics: • 8GB RAM • Processing power equivalent with NDIVIA's T4/A2 GPU (8TFLOPS for Single Precision) • Compute APIs required: OpenCL 1.2 or higher
Anti-virus	Either Microsoft Defender version 2019 anti-virus software (part of Windows 2019 server) or anti-virus software of choice provided by customer.

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Item	Requirements
RAM / CPU requirements (Per number of concurrent users)	Advanced Visualization Workspace requires an Intel® CPU of Haswell model or later, up to 3rd Generation Intel® Xeon® Scalable Processors: • Up to 5 Concurrent Users: 8 Cores @ 2.9 GHz • More than 5 Concurrent Users: 12-16 Cores @ 2.9 GHz Resource consuming applications may require additional RAM. Please consult with a Philips representative. Deploying a server with lower base frequencies is possible and does not jeopardize the system's safety. CPU frequency directly affects the system's performance. It is not possible to trade the number of cores with core frequency in order to maintain performance. Increasing RAM above 64GB is not recommended and is not supported. Application stability may be affected. Concurrent user information is provided below.

Tab. 3: Server Virtual Machine Specifications

Concurrent User	Number of Cores	RAM [GB]
1–5	8	36
3	8	16
5	8	24
More than 5 and up to 10 (HX)	12	32-64

Tab. 4: RAM / CPU Requirements (Per Number of Concurrent Users)

Advanced Visualization Workspace Client

Advanced Visualization Workspace client software is deployed on a variety of PCs with multiple Operating System (OS) and hardware configurations. An unlimited number of clients can be installed.

Advanced Visualization Workspace specifications shall meet the minimal requirements below in order to ensure proper operation.



CAUTION

The following hardware specification and software specification are prerequisites for the Advanced Visualization Workspace client to be used for diagnostic purposes.

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Advanced Visualization Workspace Client Requirements	
Operating Systems	Advanced Visualization Workspace Client supports the following MS Windows OS versions: • Windows 11 64 bit • Windows 10 64 bit
CPU	• Minimum Processor: 4 Cores @ 2.4 GHz • Recommended Processor: 6 Cores @ 3.0 GHz
RAM	**Recommended:** 8 GB RAM or above **Minimum:** 4 GB RAM
Network Bandwidth	• **Minimum Network Speed**: 100 Mbps or above • **Recommended** : 1Gbps or above • **Latency**: Up to 20ms
Monitor	Monitor Resolution: • **Minimum**: 1280x1024 up to 12 MP • **Recommended**: 1280x1024 pixels or higher • **Layout**: Landscape • **Monitor color depth**: 24 bpp or higher (no monochrome monitors). • **Multi-monitor configuration**: Requires adequate display card and driver support
Software Pre-requisites	• Net Framework 4.8 (Or later) • Web-browser for AVW Management Tool/Zero Footprint Viewer: Chrome, Firefox, Microsoft Edge (latest version)
Storage Space	• **Recommended Free Disk Space**: 10 GB or above (on Drive C). • **Additional free disk space in order to burn DVD**: 9 GB • **Additional free disk space for iXR client**: 15 GB

Tab. 5: Advanced Visualization Workspace Client Requirements

AVW Client Permissions

NOTICE

This section is not applicable for Cloud configuration.

If the option **Apply restricted permission** was enabled during AVW Client installation, full access to the AWV folder is limited.

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- All future client upgrades (with restricted client permissions) require admin right to perform Auto upgrade.
- Folders with static files have read permission only.

Folder	User Group	Permissions
..\Philips Intellispace Portal**Data**	Authenticated Users	Read and Write, Create
..\Philips Intellispace Portal**Config**	Authenticated Users	Read and Write, Create
..\Philips Intellispace Portal**Bugrep**	Authenticated Users	Read and Write, Create
..\Philips Intellispace Portal**Log**	Authenticated Users	Read and Write, Create
..\Philips Intellispace Portal**System**	Authenticated Users	Read and Execute only
..\Philips Intellispace Portal**Spoon**	Authenticated Users	Read & write, Create, Delete

Client Server Network Requirements

Advanced Visualization Workspace clients may be connected to the server using the hospital LAN or home network connection via VPN:

- Hospital LAN (100 Mbit/s network or above)
- Home connection via VPN (above 5 Mbit/s Network Enterprise) with latency below 20 milliseconds

Additional Software Recommended (for optional features)
Adobe Acrobat Reader 22.003.20258 and above (recommended) for Report & Help
Windows Media Player 9.0 or above (for Saving Movies)
IMAPIv2 (for Burning CD/DVDs)
DirectX 11.0 for a better CT/MR application experience
Windows Management Instrumentation for MR & MMV applications
Microsoft Visual C++ 2013 (x64) 12.0.30501 for 4D Flow application
NVIDIA Grafics card with OpenGL 3.3, >=256 MB RAM for 4D Flow application

Citrix Requirements

The virtual machine (VM) running Advanced Visualization Workspace Client should have the following:

Citrix Requirements
CPU and RAM specifications within the recommended client requirements.

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Citrix Requirements
A monitor that meets the requirements of the AVW Client minimal requirements
A graphics card capable of supporting the required resolution.
Nominal network bandwidth between the VM and the AVW server: • The network bandwidth should be at least 100Mbps.

The computer used to connect to the Virtual Machine (VM) running AVW Client should have the following:

Citrix Requirements
Sufficient resources to run the Citrix receiver smoothly
A monitor that meets the AVW Client minimal requirements
A graphics card capable of supporting video running at full resolution.
Nominal network bandwidth between the user computer and the VM AVW Client: • When using a Citrix defined Lossless connection, network bandwidth should be at least 100Mbps. • When using a Citrix defined connection that supports video compression, network bandwidth should be at least 20Mps.

Advanced Visualization Cloud Hardware

The hardware for AVW Cloud configuration is virtual hardware.

Image Compression

WARNING

The Advanced Visualization Workspace system can display both lossless and lossy compressed images. The user's ability to analyze images depends on the quality of the image data the user intends to analyze. Lossy/irreversible compression affects the quality of the image. The user is responsible to ensure that the image's quality is adequate enough for the review purpose.

AVW System Server

AVW (Advanced Visualization Workspace) uses the DICOM protocol to receive and send lossless images. The AVW system server supports the following DICOM standard transfer syntaxes:

- ILE
- ELE

For internal database storage purposes, the AVW system server compresses original pixel data by using custom run-length encoding (RLE) algorithms (reversible, lossless algorithm).

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AVW (Advanced Visualization Workspace) Client

AVW (Advanced Visualization Workspace) supports JPEG lossy and lossless compression.

Lossy compression:

- Decreases the size of image files
- Helps reduce the time required to send files over the network

The JPEG lossy-compression algorithm reduces the amount of data transferred from the server to the client to represent an image. The algorithm uses a quality factor that trades image quality for compression.

The higher the quality factor, the less data is removed, and therefore the higher the quality of the image.

The system software enables all applications to support three levels of image compression to improve performance:

- Lossy 80% (low compression)
- Lossy 60% (medium compression)
- Lossy 40% (high compression)

If the user wants to save an image, the image will have full quality with no compression applied.

For those cases that the user wants to save only screen captures, the initial lossy compression annotation, along with the quality factor, is burnt into the image and therefore will be presented to the user for the specific screen capture.

The AVW client displays a lossy data label along with the compression quality factor indicator at the top of the viewport, as shown in the following figures:

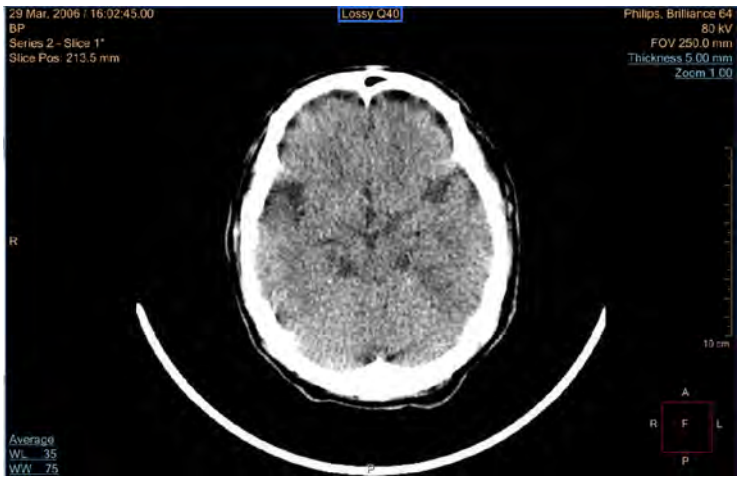


Fig. 3: Lossy Q40 Iimage

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Fig. 4: Lossy Q60 Image



Fig. 5: Lossy Q80 Image

Lossy Compression

Please note the following information on lossy compression:

- When the AVW system applies lossy compression to uncompressed DICOM images, it applies the compression to a copy of the images; the original DICOM images are left unmodified.
- Lossy image compression reduces the quality of an image.
- When the AVW system applies lossy compression during an interactive operation and the operation stops, the system displays the image in its uncompressed state.

Lossless Compression

Lossless compression reduces the size of the data stored on disk to represent the image without losing information. The amount of reduction for medical images is normally not very high.

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Screen Resolution

The Advanced Visualization Workspace system is designed to use common display resolution up to 3 MegaPixel.

- The Required (minimum) screen resolution is 1024x768.
- The Recommended screen resolution is 1280x1024 (or higher)

  For **NM Extended Application** - the required (minimum) screen resolution is 1280 x 1024 (or higher)

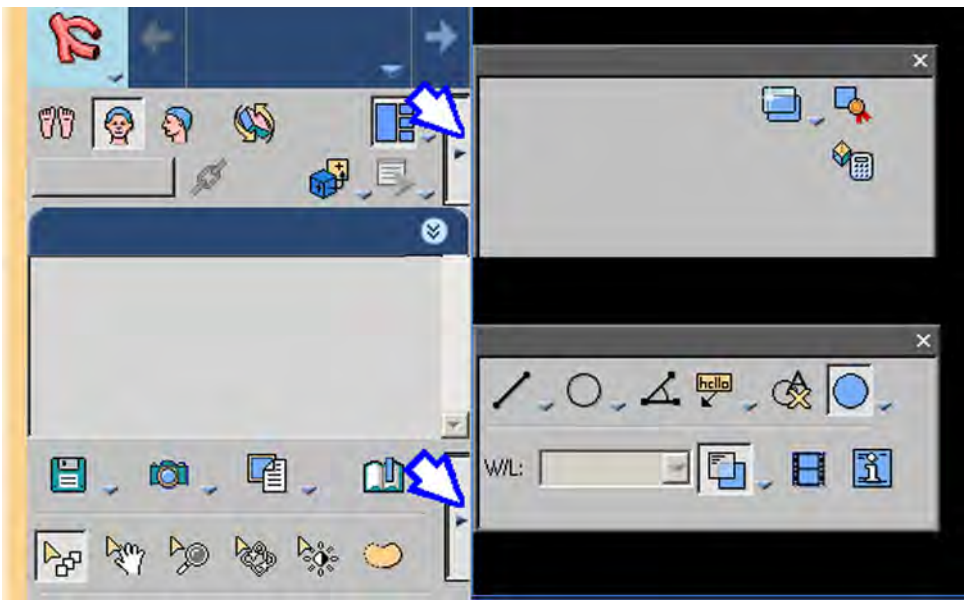
NOTICE

The Advanced Visualization Workspace Client does not run on a system having lower resolution than 1280x1024.

Low Resolution Displays

In the lower resolution display the standard layout of the AVW window is altered. All information shown on the higher resolution display is available on the lower resolution display, with these differences:

- Image viewports may be smaller.
- Some tools that are visible in the standard tool panels are hidden. In low resolution displays, top and bottom tool panels are reduced in size. If you need a tool that is not displayed in the main panel, click the **More tools** arrows:



- Lists and tables may be shortened and narrowed, with scroll bars added to make hidden rows and columns accessible.

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NOTICE

Some parts of the display appear the same, in high and low resolutions.

Multi-monitor Support

NOTICE

AVW Cloud browser configuration only supports single-monitor mode.
AVW Cloud streaming configuration supports multi-monitor mode with 100% scaling only.

In dual monitor spread (span) mode, both monitors should have identical screen resolution.

Test Patterns

For your convenience, the DEMO folder contains test patterns (in DICOM format) recommended by the American Association of Physicists in Medicine Task Group 18 for in-field display quality and performance evaluation. To read more about the test patterns and how to use them, please visit the AAPM website: http://www.aapm.org/pubs/reports/OR_03.pdf

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2 Get Started with Advanced Visualization Workspace

Advanced Visualization Workspace is a software medical device that allows multiple users to remotely access clinical applications from compatible computers on a network. The system allows networking, selection, processing, and filming of multimodality DICOM images. This software is for use with off-the-shelf PC computer technology that meets defined minimum specifications.

The Advanced Visualization Workspace communicates with imaging systems of different modalities using the DICOM-3 standard.

It may be deployed in two configurations:

- **Thin Client-Server configuration**: This configuration enables widespread remote access via networked hospital PC's. The server and client application communicate through a local area network (LAN) or possibly through the Internet using a VPN connection. The Thin Client machine has the Graphical User Interface (GUI) and displays images while the central server retrieves and manages images and generates images for transmission to the client. Memory and CPU intensive operations such as 3D rendering take place on the server. Multiple users can login simultaneously and interact with datasets for review and interpretation. The client software can be deployed on a variety of PCs with different Operating System (OS) and hardware configurations. In addition, Advanced Visualization Workspace can be deployed on Philips managed public cloud allowing access to AV clinical applications over the internet from a standard web browser.
- **Standalone workstation configuration**:This configuration supports one (1) user working locally on the workstation.

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User Threshold

Threshold is measured by the server resources.

- ~25,000 active slices simultaneously (2-5 clients)– one server configuration.
- ~30,000 active slices simultaneously (6-10 clients) – one server configuration.
- ~60,000 active slices simultaneously (11-15 clients) – dual server configuration.

Clients connect to the Advanced Visualization Workspace via LAN, WAN or any broadband internet connection through a secure VPN or an open I-net broadband network.

User Information

Most people are either a user or administrator of the Advanced Visualization Workspace client application though some users can be assigned both user and administrator privileges.

- Only one Advanced Visualization Workspace client application can be installed on a system.
- Only one user from the same client system can be logged into a system/personal computer at a time.

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- All users have the ability to select image compression.
- You can only connect to servers that are running the same version of software as the client.
- You can change patient details or anonymize a study (via De-Identify Patient). Both of these functions create new studies. The old study is not removed.
- Deletion of data must be done by the Advanced Visualization Workspace site administrator.
- You can logoff at anytime.
- The Advanced Visualization Workspace administrator can log you off at anytime.
- Time-out logs you off after a set time of no activity that has been determined by the Advanced Visualization Workspace administrator.

Launch Advanced Visualization Workspace

You can launch Advanced Visualization Workspace in two ways:

- Double-click on the **Advanced Visualization Workspace** icon on your desktop to launch the Advanced Visualization Workspace Client.
- From the Windows Start menu, select **Philips Advanced Visualization Workspace Client**, then select **Philips Advanced Visualization Workspace**.

Advanced Visualization Workspace Login

The login screen allows you to choose which Advanced Visualization Workspace server you connect to. The user interface stores information such as IP addresses, from the previously entered Advanced Visualization Workspace servers. Therefore you, the current user, can select between Advanced Visualization Workspace servers or enter information for a new Advanced Visualization Workspace server.

Users can select the user interface language from the drop down list.

Select Server and Verify Connection

If there is more than one server available:

1. Select desired Server from the drop-down list.

   Or:

   Click in the Server box, type the IP address.
2. Click **Verify Connection** to verify connection to the selected Advanced Visualization Workspace server.
3. (Optional) Click **Show Details** to view the detail logs. Copy to Clipboard allows you to copy and paste the log details into any document.
4. Click **Close** once you have verified connection.

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5. In the User Name and Password fields enter your user name and password that have been assigned by the Advanced Visualization Workspace Administrator.
6. From the Connection drop-down, select the type of connection you have for proper compression. This allows better performance when outside the main network.
7. (Optional) Advanced Settings allows Advanced Visualization Workspace to use the same communication protocol as a Web browser, which can flow through hospital firewalls/ gateways easier than TCP/IP.

   Select Advanced Settings when there are connection issues, for example when there is a need to go through a firewall.

   When using Advanced Settings, performance may become slower by 10 to 15% compared to regular connections.

   Compression is a digital process that allows data to be transmitted using a reduced number of bits. Compression only affects the viewing of the images. When images are exported (for example, filmed, save, and reported) they are lossless (100%). Use "Lossy compression" to improve system performance when the network connectivity is not optimal.

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WARNING

The Advanced Visualization Workspace system can display both lossless and lossy compressed images. The user's ability to analyze images depends on the quality of the image data the user intends to analyze. Lossy/irreversible compression affects the quality of the image. The user is responsible to ensure that the image's quality is adequate enough for the review purpose.

8. Select **Login**. A progress bar appears at the bottom of the Advanced Visualization Workspace login screen. Messages appear providing information about the launching process. After all background processing is completed the Advanced Visualization Workspace opens in the Directory application.
9. The **Authentication Source** drop-down list allows you to select between the following:
   - **AVW Database (default user database).** Use this option in case the users are managed by the AVW user database and not by the domain active directory.
   - **Select or type in the domain name.** Use this option in case the Advanced Visualization Workspace uses the domain (active directory) user database.

     When using the active directory user database, checking the **Integrated Windows Authentication** box allows you to connect to the Advanced Visualization Workspace using your current Windows credentials. When this box is checked the following settings change:

     - User Name, Password and Domain controls are grayed-out.

     – The authentication source changes to the current domain, and the name changes to the current logged-on user name.

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10. If your computer is equipped with two monitors, you can click Set Monitors to determine if one or two monitors will be used by the application, and if a single monitor is selected, on which monitor the application will run.

NOTICE

When logging in, a message may appear at the bottom of the screen if there are any pending issues (such as Server time out of sync). The message will disappear after a few seconds. To see the message again, refer to the **Client Taskbar Status Tool**.

Reconnect to AVW

NOTICE

This section is not applicable for Cloud configuration.

When there is a drop in connection, the client is able to reconnect if the drop does not take more than 30 seconds. A “disconnection” message flashes near the icon tray of the desktop. When connection is reestablished the message disappears.

Logout of Advanced Visualization Workspace

When you are finished with using the Advanced Visualization Workspace Client application, to exit properly click the **Logout** button or the **Exit** application button. The Logout action opens a dialog for you to confirm or cancel the exit action.

If confirmed, you are logged out of the application and returned to the Advanced Visualization Workspace login screen.

Session Time Out

If, while using a viewer package of the Advanced Visualization Workspace Client application, you are not interacting with the application, you may be logged out after a pre-determined amount of time. Click **Cancel** in the pop-up to avoid being logged off.

Administrator Logout

An administrator can always log a user off from the Advanced Visualization Workspace Management application at any time.

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Client Taskbar Status Tool

NOTICE

This feature is not applicable for Cloud via Browser configuration.

The Client Taskbar Status Tool displays details for the Advanced Visualization Workspace Server and Advanced Visualization Workspace Client, upon user request, for that specific point in time. Details are updated each time the tool is launched.

The following information appears for the Advanced Visualization Workspace Server:

- Server name
- Number of logged in users
- Memory usage (percentage)
- CPU usage (percentage)
- Slices usage (percentage)
- Messages

The following information appears for the Advanced Visualization Workspace Client:

- Download speed (in Mb/sec)
- Upload speed (in Mb/sec)
- Memory Usage (in percentage and available MB out of total MB)
- Messages

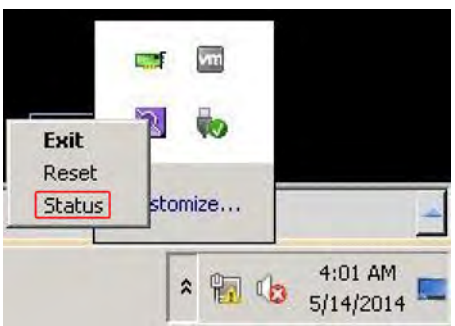
The following information appears for the Advanced Visualization Streaming Client:

- Estimated Bandwidth (in Mb/sec)
- Image representing network latency from on premise client (customer machine) to AVW client on cloud to AVW server on Cloud.

Launching the Client Taskbar Status Tool

1. Launch Advanced Visualization Workspace Client.

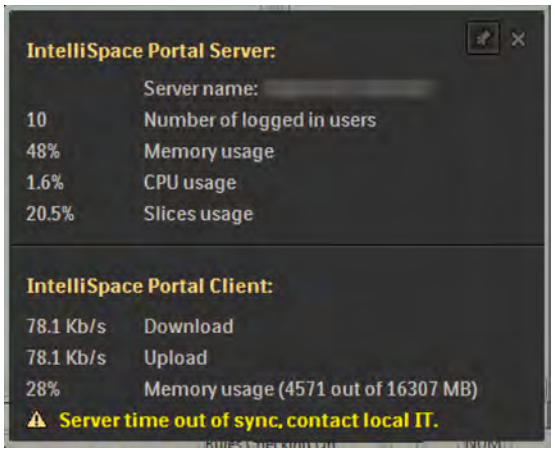
   Once the Advanced Visualization Workspace client is launched, the AVW icon appears in the system tray. If the icon does not appear, click the **Show hidden icons** button.



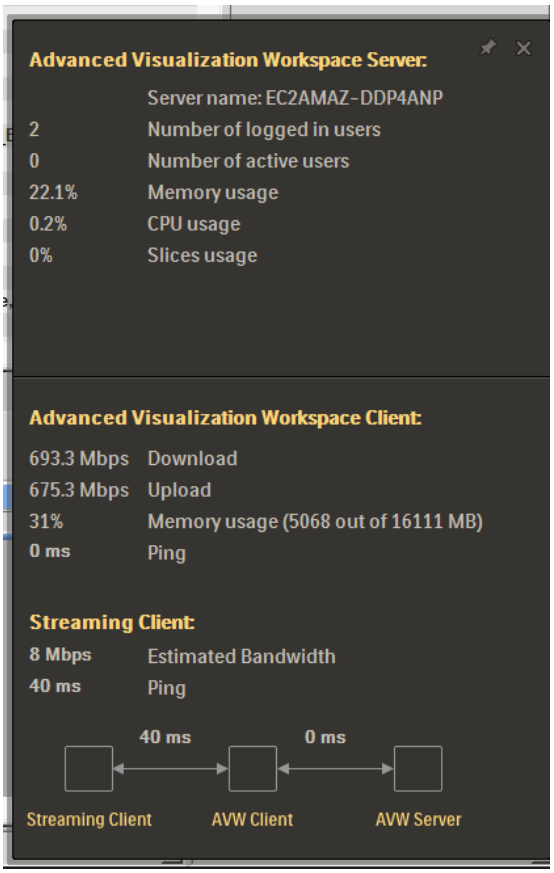
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2. Right-click on the icon and select **Status.**

   The Status information is displayed for five seconds and then disappears. To prevent the tool from disappearing, pin the tool to the desktop by selecting the pin icon in the upper right corner of the tool.



Example with Client and Server



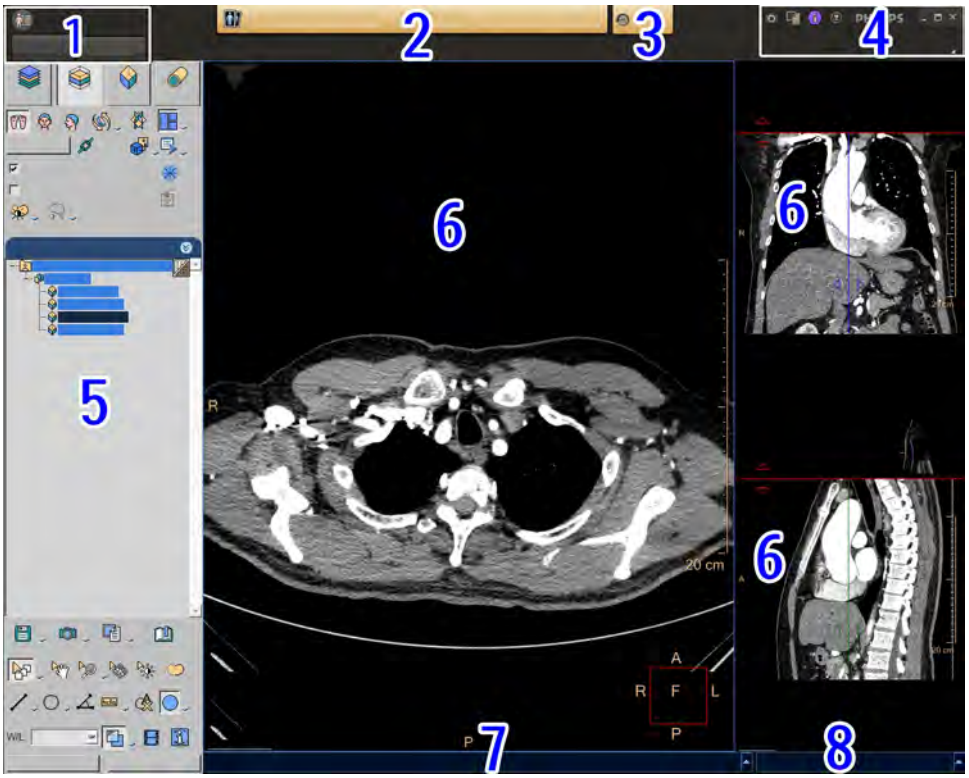
Example with AVW Streaming Client

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3 Workflow (Navigation)

The Advanced Visualization Workspace incorporates the Philips Guided Flow™ productivity features. The Advanced Visualization Workspace display has five portions:

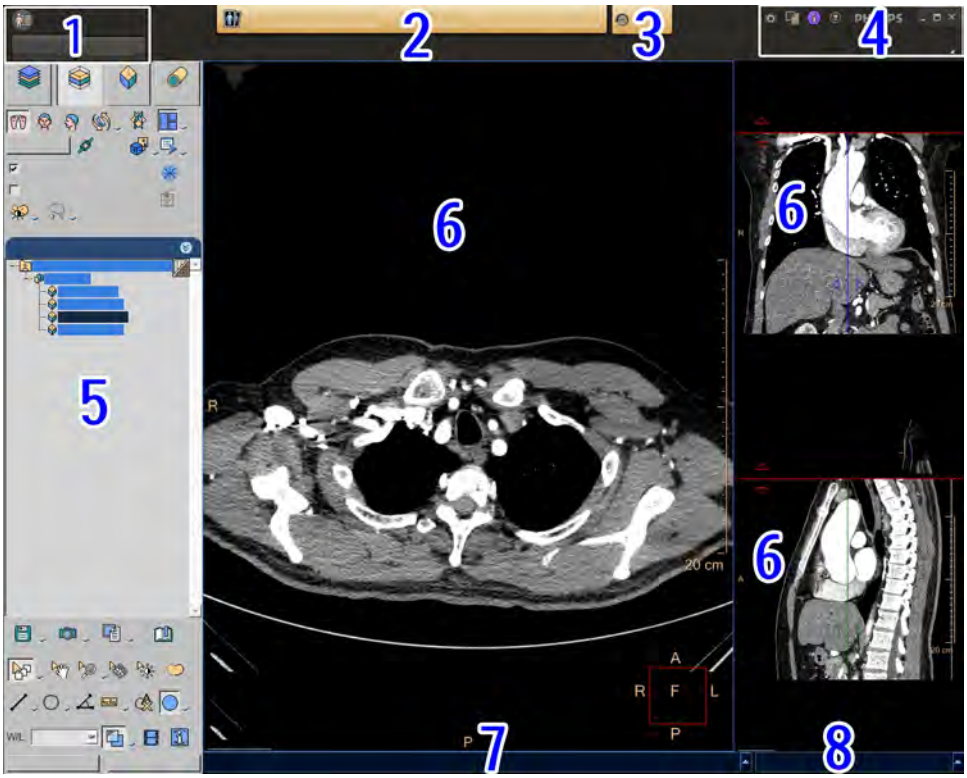
- Workflow bar and Workflow buttons (numbers 1-4).
- Control Panel (number 5).
- Image Area (number 6).
- Message bar (number 7).
- Progress bar (number 8).



Workflow Bar

The Workflow bar across the top of the window guides your activity sessions (numbers 1-4 below). The bar has buttons that become highlighted as you work your way through a session.

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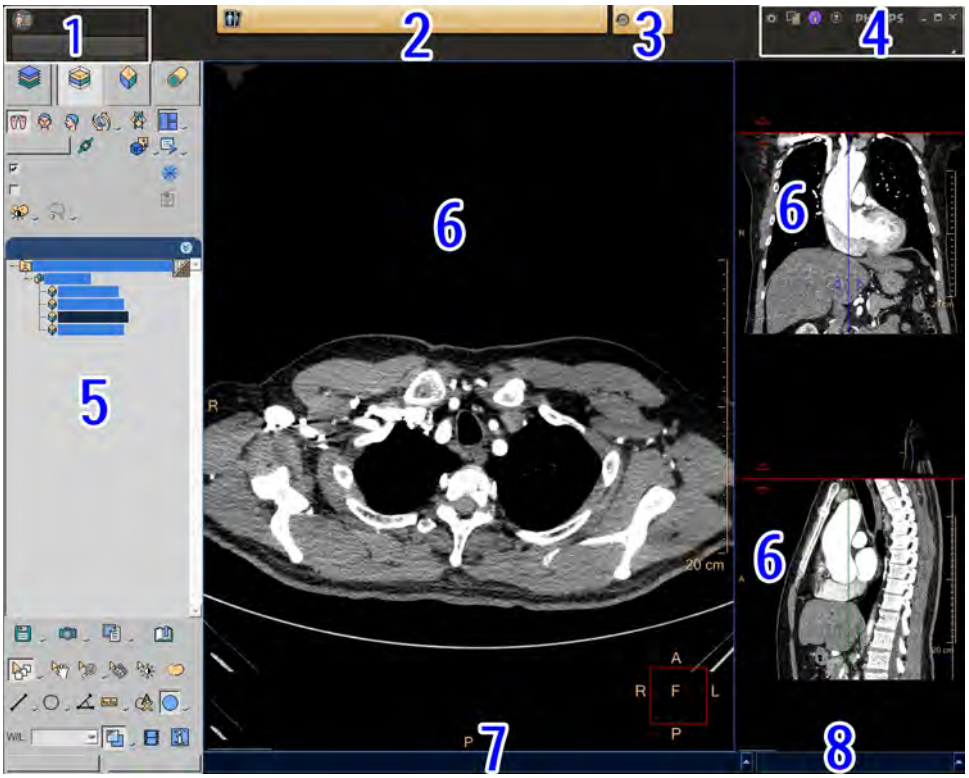
Grayed out buttons indicate **Inactive**; orange text on a button indicates **Active**; an orange box around an option indicates **Selected**.

Patient Directory, Review and Analysis

The **Patient Directory**, **Review** mode and **Analysis** modes are displayed as number 1 in the below image.

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Patient Directory

Starting in the Directory mode (number 1 below), you are presented with lists of available patient studies that are located in various storage devices. It also provides access to various utility functions. The Directory button is always in the "active state," allowing you to access its functions at any time during operation.



For usage instruction, see Directory.

Review

Review mode (number 2 below) is inactive as long as no study is loaded. Once a study is loaded into a Review application, the Review button becomes selected. You can then select various viewing modes and can employ many tools to examine and refine the views of the study. When a review application is opened, the text in the Review tab shall changes to the name of the selected application.

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From Review mode, you can move directly to Directory, Analysis (if active, Film, Report, or Help), and can perform any available functions. You can then resume the Review mode and continue exactly where you left off.

There can only be one patient loaded into the CT Viewer at a time. You can use the Quick Review (see section “Quick Review” on page 121) to view another patient at the same time if necessary.

Analysis

Analysis (number 3 below) is inactive as long as no study is loaded. It becomes highlighted when a study is loaded directly into the application from a Review application. When an analysis application is opened, the text in the Analysis tab changes to the name of the selected application.



From Analysis, you can move directly to Directory, Review (if active), Film, Report, or Help, and perform any available functions. You can then return to Analysis exactly where you left off.

You can have the same patient loaded into a Review application at the same time. If you have dual monitors, you can have the two applications open side by side.

For supported Analysis applications, it is possible to launch two Analysis applications (in addition to a Review application).

- The same application can be open twice, as a second analysis application.
- A second analysis application opens if:
  - The same study (as currently launched) is launched in a different (other than application currently launched) Analysis application.
  - The same study (as currently launched) is launched in the same (second) Analysis application.
  - A different study (same patient) is launched with the same application or other application than the application which is currently launched.

When two Analysis applications are open, the "Review" tab is disabled. To launch a Review application, launch from the Patient Directory, PACS or from one of the Analysis applications.

If a user launches a third, supported, application for the same patient, this application (the third) replaces the second one, and the second one is closed.

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The text on the tab of the currently working Analysis application is highlighted in yellow.

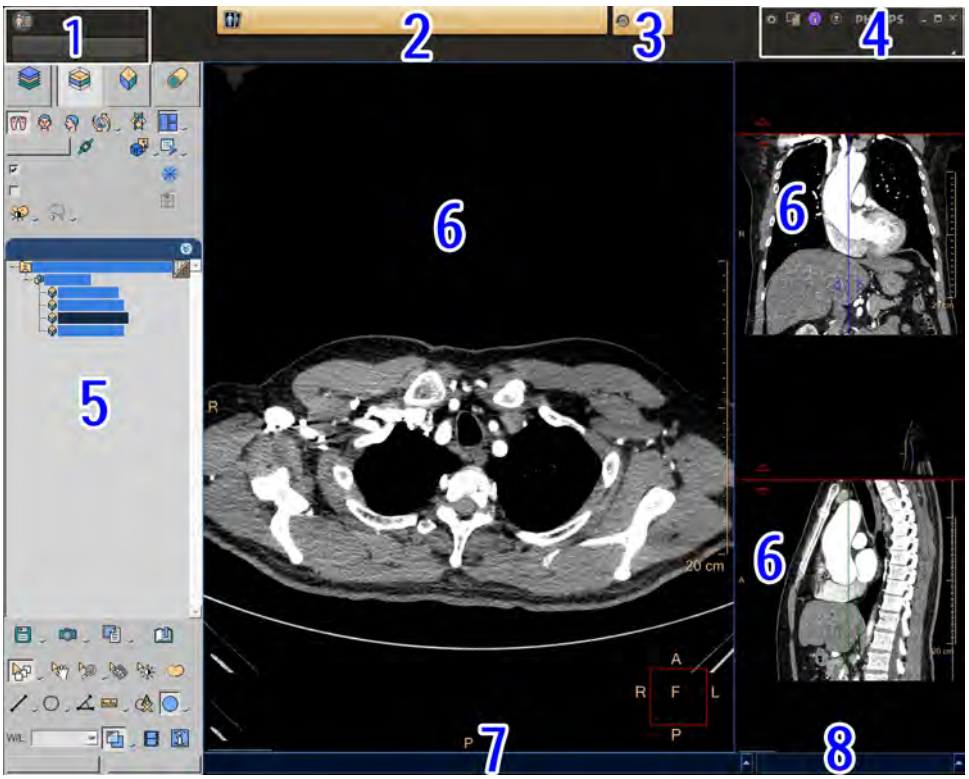
For applications that do not support the multi-Analysis tab scenario, if there is already an application open, the following notice message appears: **An analysis application is already running. One of these applications doesn't support opening side by side with another application. Application will be closed and unsaved results will be lost. Do you want to continue?**

NOTICE

If a study or data of a different patient (a patient other than the one in review), is launched, all currenty open applications are closed.

Patient Bar

The Patient Bar (number 2 below) provides patient information and prior study status. It is displayed in the center of the Workflow Bar whenever an Advanced Visualization Workspace application or viewers is displayed .



The Patient Bar reflects the patient details of the active study displayed in the currently open viewer or analysis application.

The Patient Bar is not displayed:

- When the Patient Directory is selected.
- When third-party applications are running

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- In any viewer applications that are shown as a floating window on top of the Patient Directory, including QR and Key Image Notes viewer. However, it is shown within the floating window.
- The Patient Bar is not displayed if no study is loaded.

The Patient Bar includes the following patient information:

- **Patient Name** - In the following order: Last Name, First Name, Middle Name
- **Patient ID**
- **Date of Birth**
- **Gender** - Displayed as either Male or Female

A tool tip appears when hovering over the patient bar. In addition to the information displayed in the Patient Bar, the tooltip displays the age of the patient after the Date of Birth.

Clicking on the Patient Bar opens the **Rich Patient Demographic** tray. In addition to Patient Details, the Rich Patient Demographic dialog displays Patient Demographics and Visit Details.

If De-identify of the viewed patient is supported in a viewer or an analysis application and the user activates this option, the patient bar is empty.

Dual Monitor Configuration

In dual monitor configuration, the Patient Bar only appears on the application screen and never appears on the patient directory side.

In dual monitor configuration, Spread mode, the Patient Bar only appears only on the Left monitor.

If two studies are loaded to the application, the Patient Bar displays the information of the active study.

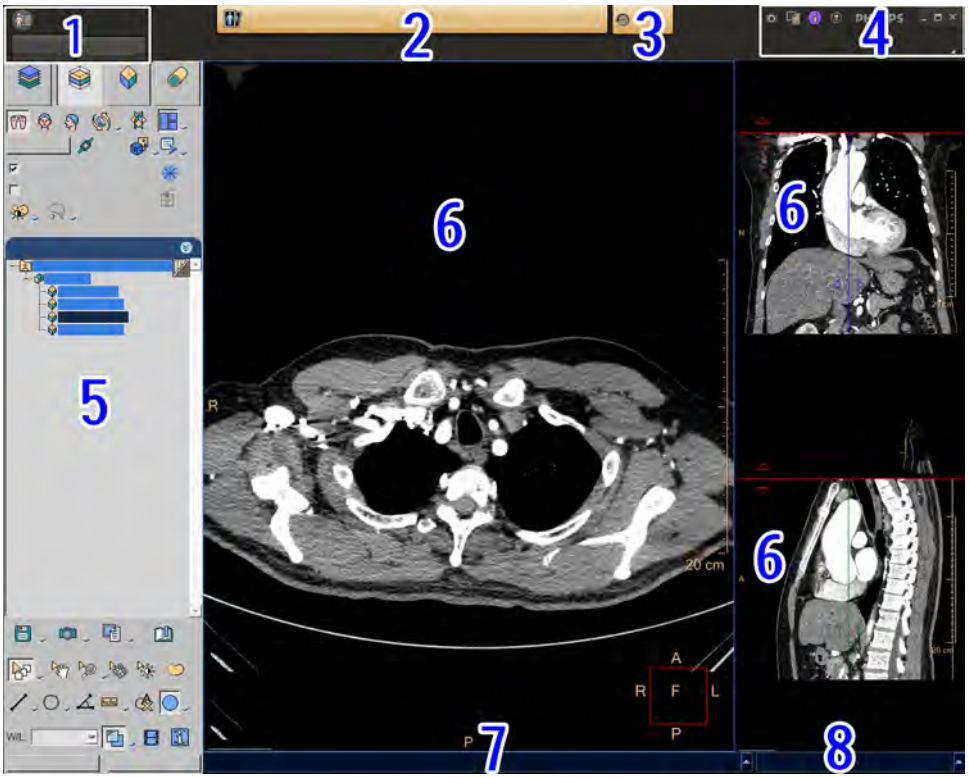
When two patient studies are loaded to an application and Compare Mode is used, the Patient Bar displays asterisks (*) for details that are not identical. For example, if loading a study and follow-up of a patient and there is more than one year between the study dates, all details are identical, except for Age (which has changed since the first study). In this case, Age is replaced with asterisks.

Priors

The Priors button (number 3 below) is used to retrieve prior studies for follow-up.

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Clicking the **Priors** button opens the **Study Selector** window. All Local and Remote Priors are retrieved automatically. The Retrieve Priors progress bar displays the progress of retrieving remote priors. The icon displayed on the Priors button changes according to the retrieval status:

Retrieving in progress

Retrieved successfully

Retrieval failure

The Study Selector window displays a list of all prior studies for the currently selected patient. This list shows all previous studies located on all local and remote folders and devices. To view a prior study, select a study from the **Study Selector** list and press **Open** to load.

If a study in the Priors selection window is located on a remote device, the **Fetch** button appears in the Priors column. Once this button is pressed, the study is copied to a local folder and is opened in the application that is currently running. Once the study is copied to a local folder, a green checkmark appears instead of the **Fetch** button.

The currently viewed study that appears in the list is marked with an icon in the Priors column.

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The **Recently Used** section of this window displays recently used user applications. With each use, the last application used is added to the list of applications. It is possible to hide applications by clicking on the arrow.

The **Review** and **Analysis** sections appear below the **Recently Used** section. These sections contain a list of Review and Analysis applications relevant for the selected study/studies in the Priors list section. To manually select an application to open a selected study, select the **More Apps** button at the bottom of the Priors window.

Using the Series Selector, it is possible to choose an application and study (or multiple studies).

The **Add Data to Running to Running Application** button allows opening a study with the currently running application . The button is only enabled when the currently open application supports this feature. When the button is pressed, the selected studies are added to the currently running application.

In addition to using the Priors button on the Workflow bar, Priors can be accessed from the Patient Directory in two ways:

- Select a patient in the Patient Directory and right-click **Retrieve Priors**.
- Select a patient in the Patient Directory and select **Retrieve Priors** under **Archive Manager**.

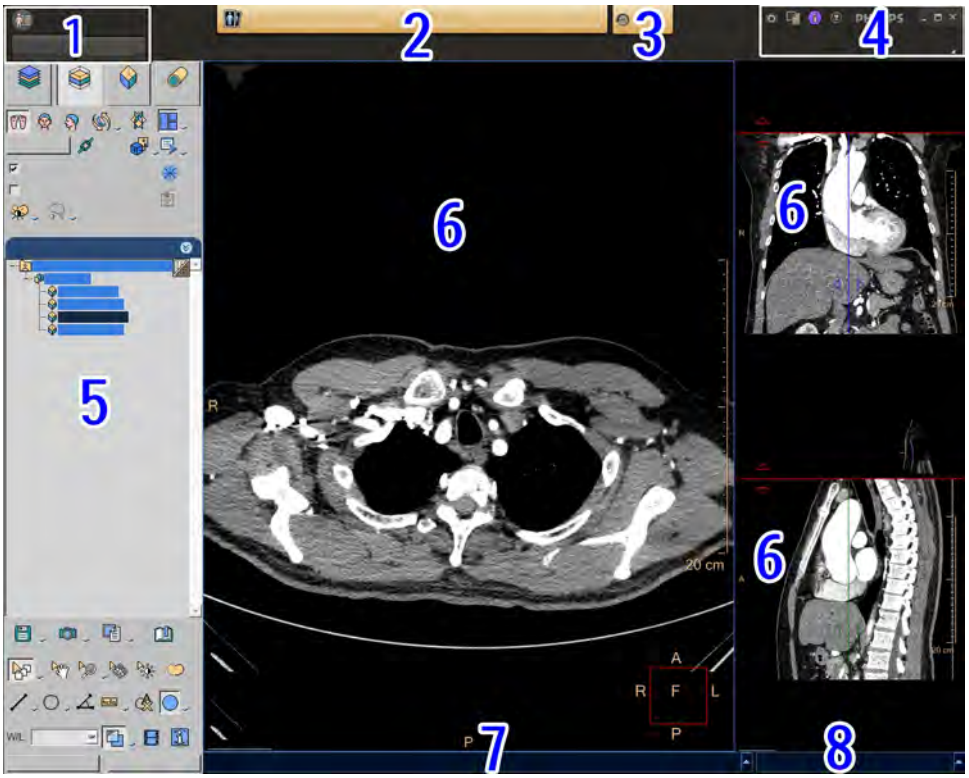
Film



The Film button (the first icon in number 4 below) provides access to the FilmView application. You have direct access to Film at all times. You can film from the Directory.

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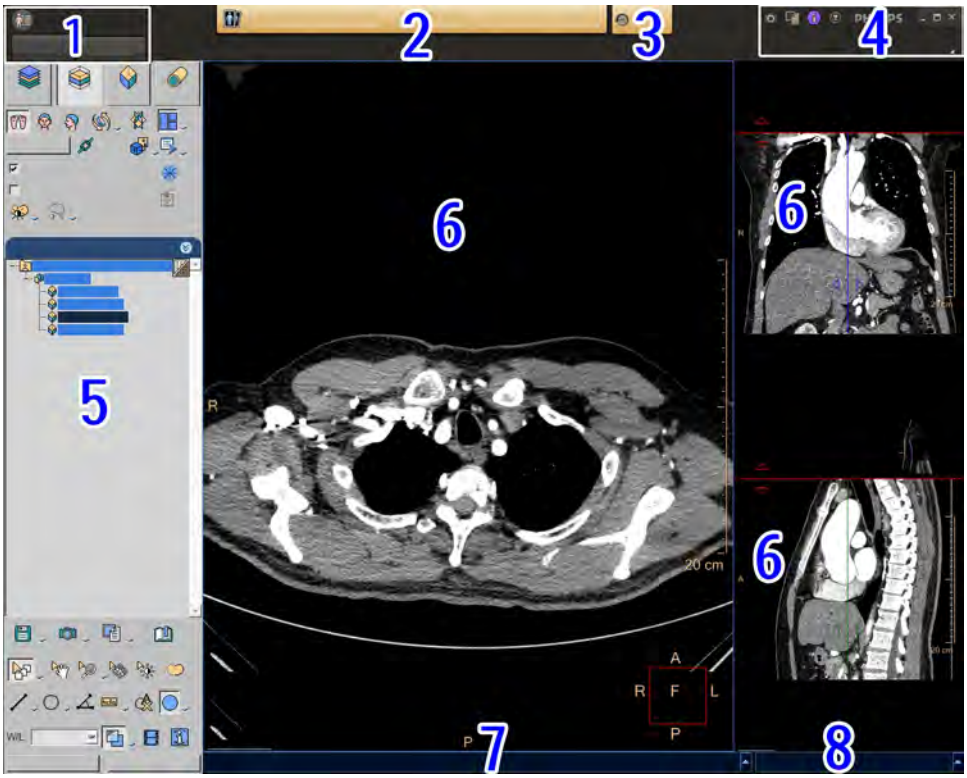
For usage instruction, see section “Film” on page 125.

Report



The Report button (the second icon in number 4 below) allows you to open the report editor. You have direct access to Report at all times.

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For usage instruction, see section “Report” on page 139.

Virtual Application Guide

Advanced Visualization Workspace (the third icon in number 4 below) provides access to a web based training tool which is accessed via the Virtual Application Guide button.

Once an application is open and data is loaded, click the Virtual Application Guide button. A web page opens with help content for the given application.

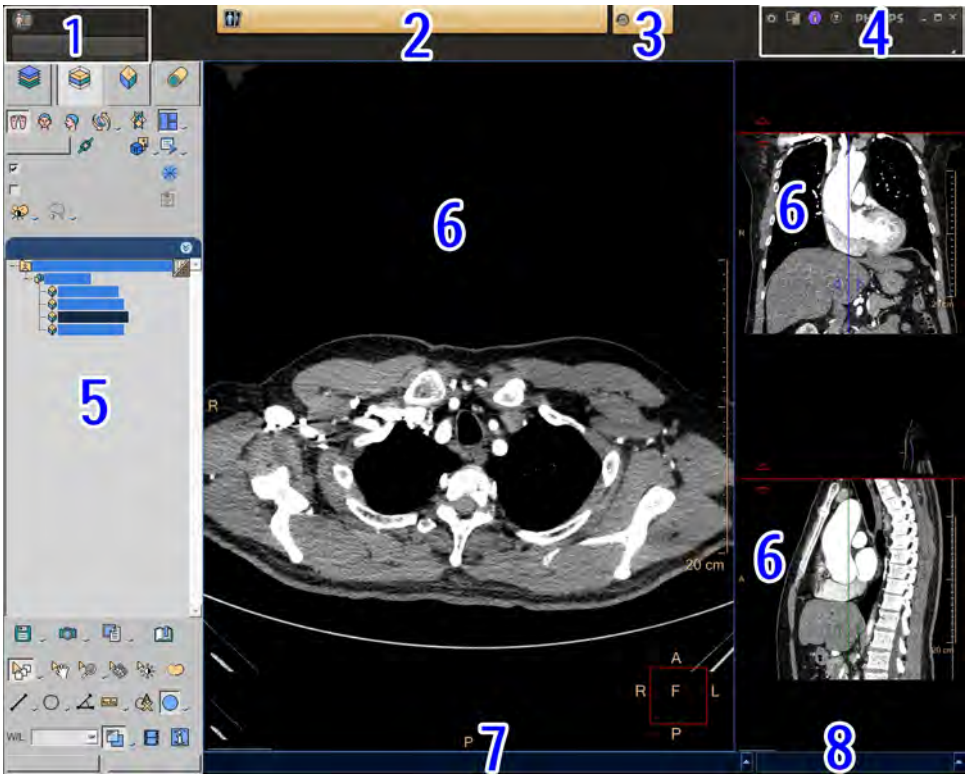
An internet connection is required to connect to Virtual Application Guide Video Help.

Help



The Help button (the fourth icon in number 4 below) provides access to the online Help system.

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Click the  Help button and select **Help** to access on Help.

The **Upload log** option should *only* be used under the guidance of service personnel. This option uploads log files to the server for examination by service personnel.

The **Philips Real Time Assistance** option enables communication with a Philips Remote Support representative. For additional information see section “Philips Real Time Assistance” on page 79.

Philips Real Time Assistance

Philips Real Time Assistance enables remote access capability for the Philips service organization. This feature enables the Service Organization to access client configuration files in order to diagnose issues.

Real Time Assistance can also be used to support clients or provide clinical training

This feature requires a license.

Real Time Assistance is available for Advanced Visualization Workspace clients without Workstation configuration, as well as for Demo laptops.

To communicate with a Remote Support representative:

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1. Click the **Help** icon  icon and select **Philips Real Time Assistance**.

   A new window opens.

NOTICE

If a license is not activated, the Philips Real Time Assistance option is disabled. A notification informs the user that the feature is enabled for Philips Service Agreement customers.

If a license is activated and an internet connection is not available, a notification appears below the Philips Real Time Assistance option requesting that the user contact a Philips Service representative.

2. Call the number provided in the window to receive a **Session ID** or contact your Philips service representative.
3. Enter the **Session ID** that you received and click **OK**. Only numbers can be typed in this field.

   A disclaimer screen appears.
4. Read the disclaimer and select either **Accept and join session** or **Cancel**.

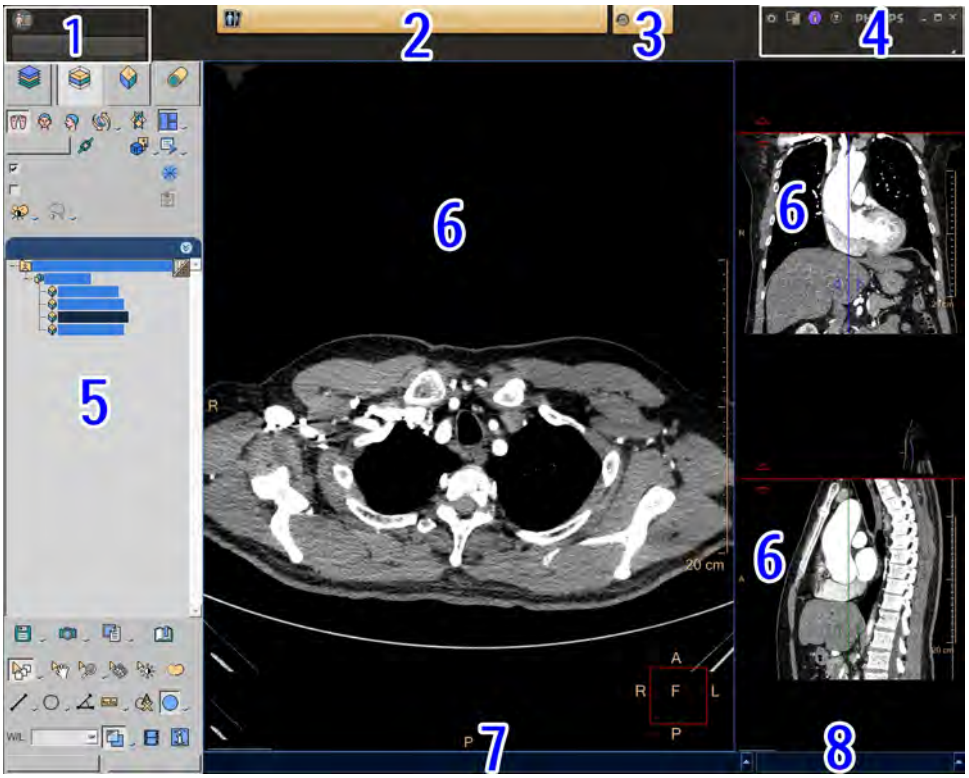
   If you select **Accept and join session**, a **Starting WebEx** message appears and a Remote Support session window opens. It may be necessary to install the WebEx plugin when launching for the first time. The Philips Support representative will guide you through the process and may request control of your system for support purposes.

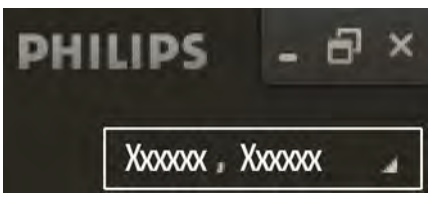
To disconnect from Remote Support, select **Leave Session**.

User

The User button (appears beneath Philips in number 4 below).

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The **User** button displays **Hello** and the login name of the currently logged in user.

Clicking on this button displays two options:

- **Preferences** - Opens the Preferences screen.
- **Exit** - Logs off the current user.

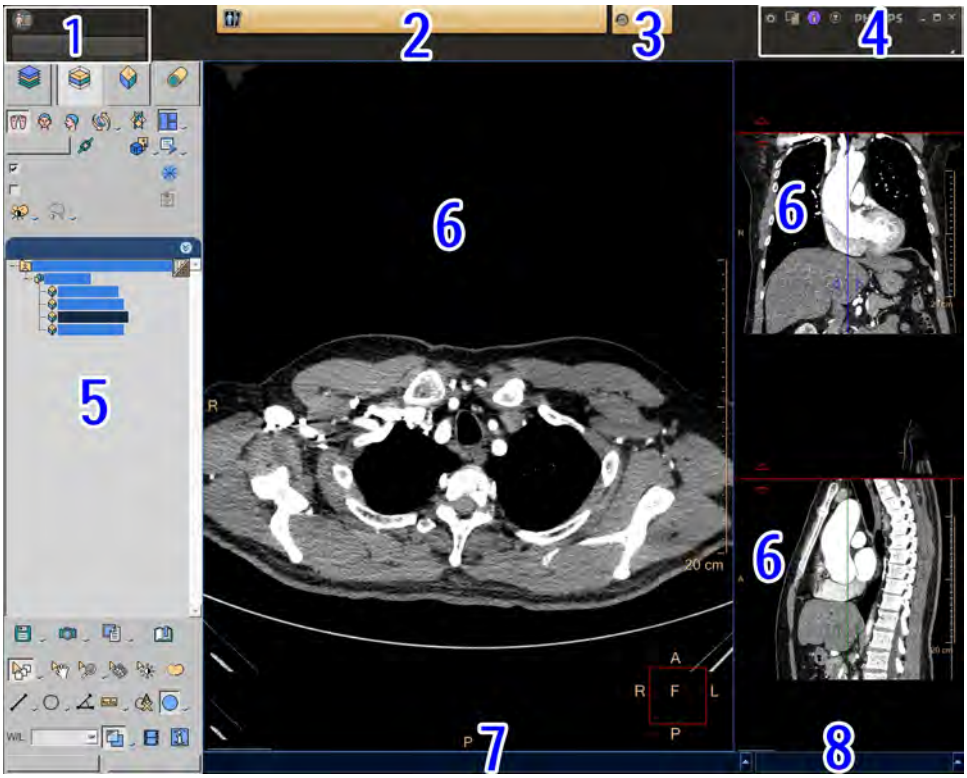
NOTICE

In PACS Integration, the **Exit** button does not appear.

Control Panel

The control panel (number 5 below) provides the tools needed to view and control the patient images. It appears along the left side of the Workspace window.

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The system anticipates your workflow. It offers you various choices and, depending on the choices you make, presents you with further logical steps and functions.

In general, the workflow proceeds from the top of the panel to the bottom. Let's follow the flow in the example control panel at left:

1. Prior to being presented this control panel you would have chosen the CT Viewer.
2. The CT Viewer control panel displays, you then have the option of selecting one of the four viewing modes: 2D, Slab, Volume, or Endo. Slab is the default.
3. If you select Slab, the Slab button appears depressed, and the Slab Tools control panel is presented. You can proceed with your viewing work. For example, you can select one of the orthogonal views (axial, coronal, or sagittal), and adjust the slab thickness.
4. As you progress in your work, you may select additional functions from the "tab" menus by clicking the tab drop arrow.

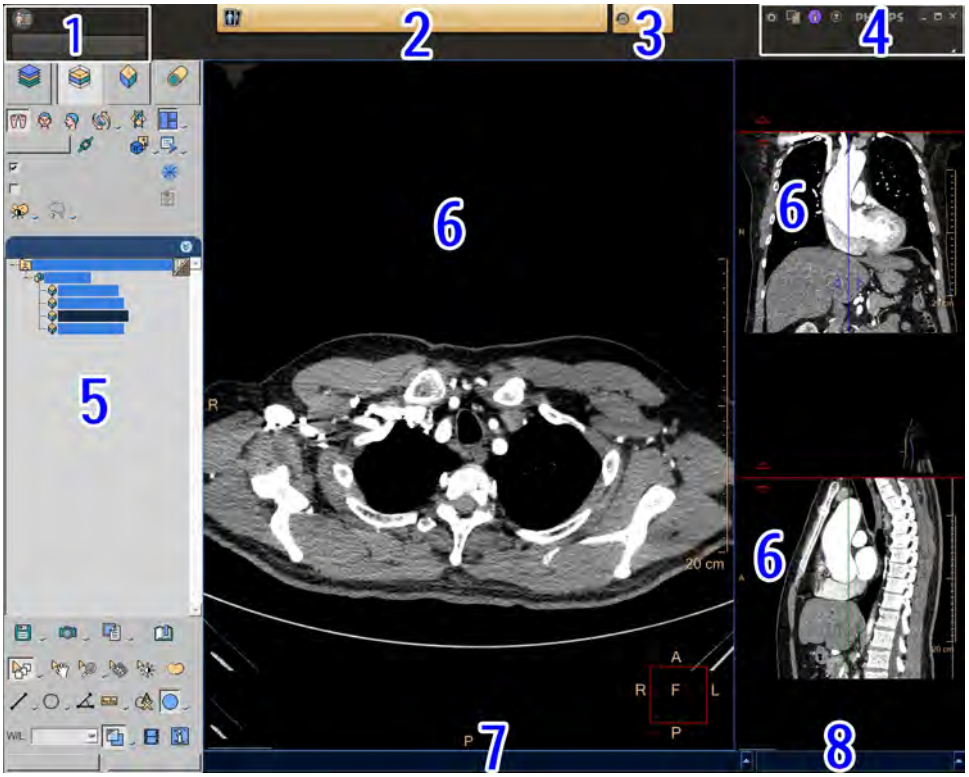
   For example, once you have manipulated the slab views as desired, your next desired function might be in the Batch or Cine or Clip options. Clicking on that tab would open a new set of tools for your use.
5. At the bottom of most control panels is the "Common Tools" area, from where you perform general functions such as annotate, zoom, and save images.
6. Finally, you can exit the application (or, if desired, you can cancel all your work by clicking "Reset.")

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Image Area

The Image Area (number 6 below) occupies the large portion of the display. Images, graphs, and other visual information are displayed in the Image Area.



Patient images can be displayed in either multiple formats, or in a single large image, or in other formats as determined by the application you are using.

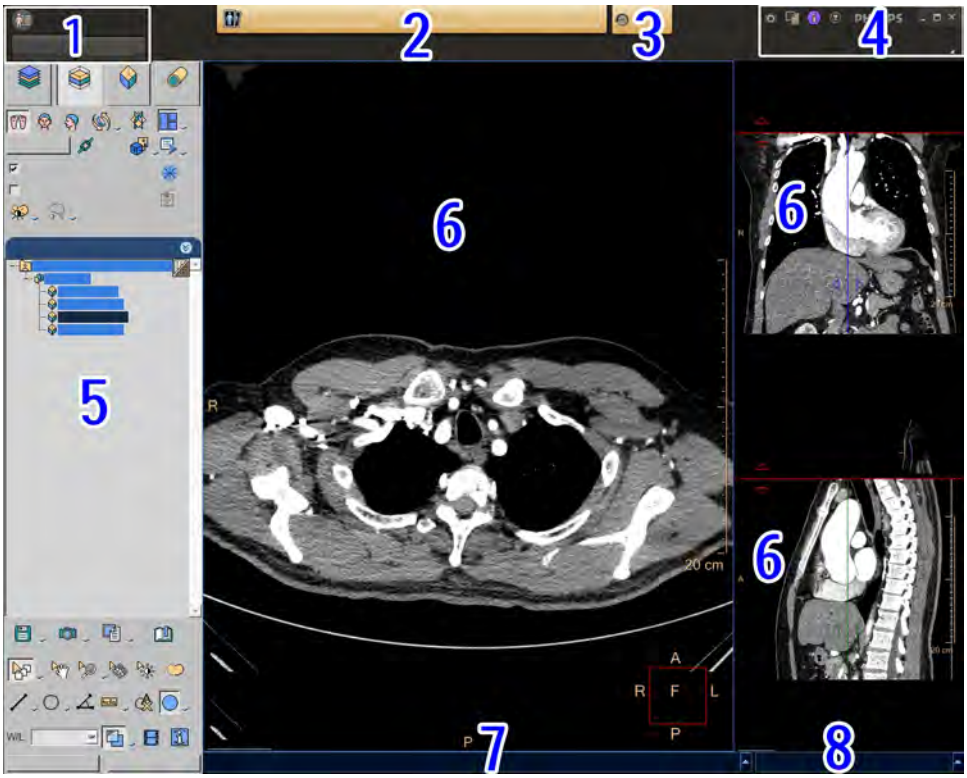
A typical format would be a larger image in the center/left area, and smaller reference images in a column at the right edge of the area.

Progress and Message Bars

There is a message bar (number 7 below) at the bottom of the screen where system messages are displayed.

There is a progress bar (number 8 below) during loading.

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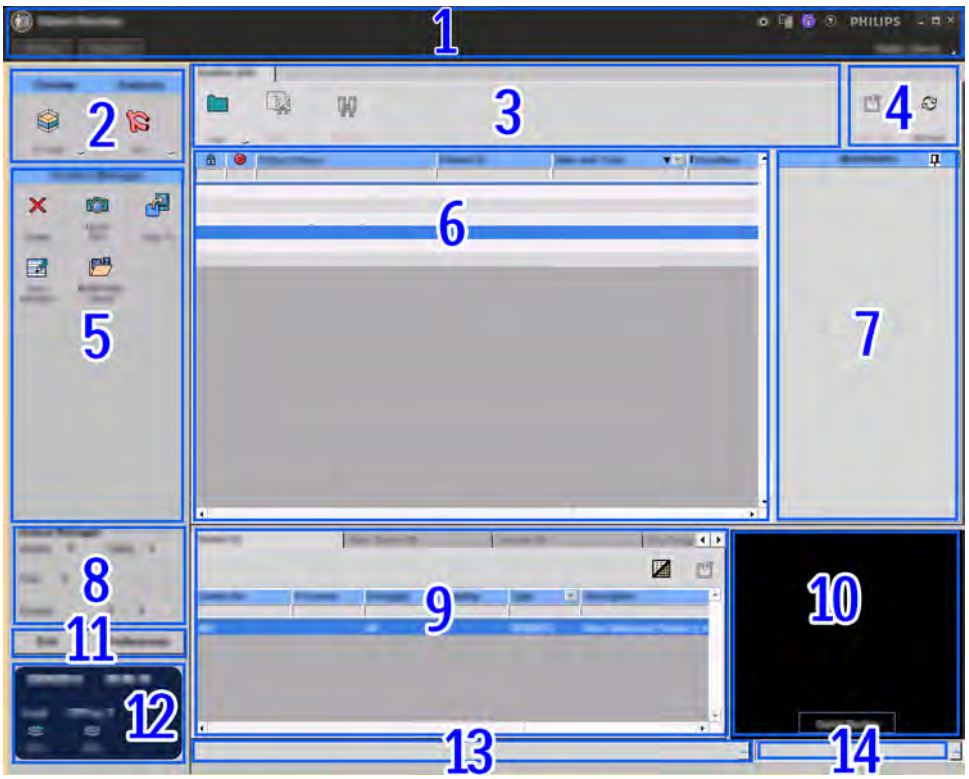
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4 Directory

These options are available from the Directory:

- Select and retrieve data from local and remote storage devices.
- Load data to any viewer or application
- Copy images and files from one device to another.
- Send images to film.
- Erase data from local and removable devices.
- Quickly review images in the Quick Viewer. See section “Quick Review” on page 121.
- Display the remaining free space on storage devices.
- Format removable media.

You can adjust the proportions of the various windows of the Directory display by dragging their borders to new positions as desired. To reset the display layout to the original state, right click over the Quick Review and choose Reset Layout.



1. Workflow bar, provides access to major functions. See section “Workflow (Navigation)” on page 69.
2. Select either a Viewer or an Analysis application.
3. Select a storage Device, to retrieve, copy, or save information.
4. Buttons that Clear Filter of the patient list, or Refresh display.
5. Archive Manager, to manage Patient and data files.
6. List of patient studies in the currently accessed Device.

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7. List of Bookmarks related to the current study.
8. Queue Manager, monitors progress of transfer, print, or Processing.
9. Series (and Files and Reports) connected to the current study.
10. Quick review of study (without using Viewer or Analysis).
11. Buttons to Logout from system, or access user Preferences. See section “Get Started with Advanced Visualization Workspace” on page 63 and section “Preferences” on page 165.
12. System status monitor.
13. Message bar displays information to the user.
14. Progress bar

System Notifications

A notification message appears below the Patient Bar in the following situations:

Low Disk Space	
No Disk Space	
CAUTION Demo - not approved for clinical use!	

Devices

Devices are storage locations that are accessible from AVW. A device may be Local, which means it is physically installed or connected to your system, like the hard drive, a CD drive, or a USB device. A device may also be Remote, which means it is accessible via your institution’s network.

Below the “Studies” title, AVW displays an icon of the currently selected device, and indicates the number of studies found on that device.



To access devices, click the down-arrow next to the current device icon to view a list of other available devices. The list offers Local and Remote devices. Click on the device you want to access. (If the device exists but is not available, a message will indicate that.) Only one device may be selected at a time.

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NOTICE

Patient health related information recorded on removable media may become accessible to unauthorized individuals and thus creates a privacy security risk. Please refer to the "Network Safety, Security and Privacy" section for more information.

Local Device



The Local device is located on the hard drive permanently installed on the AVW. This is where most patient studies will be located when you import them from connected and networked devices. It is the default “save” location, unless you direct saves to other devices.

NOTICE

Patient health related information recorded on removable media may become accessible to unauthorized individuals and thus creates a privacy security risk. Please refer to the "Network Safety, Security and Privacy" section for more information.

DEMO Device



This folder contains cases for demonstration purposes. These case cannot be deleted, and new cases cannot be added to this folder.

NOTICE

Patient health related information recorded on removable media may become accessible to unauthorized individuals and thus creates a privacy security risk. Please refer to the "Network Safety, Security and Privacy" section for more information.

CD/DVD Device



The CD/DVD device is the drive that allows you to read or copy Patient studies, images, and other data from CD or DVD disks. This device also reads disks that contain many types of files (in addition to patient files) including files like hospital logos, text documents, etc.

NOTICE

You must have Windows administrative permissions to burn DVDs for some operating systems (e.g., Windows XP).

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NOTICE

Patient health related information recorded on removable media may become accessible to unauthorized individuals and thus creates a privacy security risk. Please refer to the "Network Safety, Security and Privacy" section for more information.

Patient Confidentiality - Creating a Patient Disk

In this manual, the term "Patient Disk" refers to a CD or DVD disk you create for a single patient that contains studies and data of only that patient.



CAUTION

To have confidence that a Patient Disk contains only a single patient's medical information, you should use only the CD Prep function to create the disk (described later in this section). Do not use the Direct Record function.

The CD Prep function is an intermediate storage folder on the Local device where you can place studies and other data from a single patient. When you are ready to burn a Patient Disk you can examine the contents of the folder to be assured that no other patient files have been mixed in. Once you know that the CD Prep folder is correct, you can burn its contents to a Patient Disk.

The CD/DVD device employs a write-once storage process. (The process of writing data to CD or DVD is commonly called "burning" because the data is permanently etched onto the disk by a laser.) After data are burned onto a CD or DVD disk, the disk cannot be erased or rewritten. Once the burning process is started, it cannot be stopped. You cannot add more data to a CD or DVD once it has been burned.

NOTICE

You must have Windows administrative permissions to burn DVDs for some operating systems (e.g., Windows XP).

Blank CDs and DVDs

The CD/DVD device is compatible with the widely-available CD-R, DVD+R and DVD-R recordable disks. The CD/DVD device is compatible with the widely-available CD-R, DVD+R and DVD-R recordable disks.

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Storage Capacity

Blank CD disks can store up to approximately 700 MB of information, and blank DVD disks can store up to approximately 4.7 GB of information.

Philips DICOM Viewer

When you create a CD or DVD disk, the Philips DICOM Viewer is automatically burned to the disk. This viewer allows you to view the patient studies on any Windows-based Personal Computer.

When you insert a CD or DVD that was recorded on the AVW into a Windows PC, the Philips DICOM Viewer is automatically launched.

Create Patient Disk

NOTICE

Patient health related information recorded on removable media may become accessible to unauthorized individuals and thus creates a privacy security risk. Please refer to the "Network Safety, Security and Privacy" section for more information.

Step1: Verify Prep Folder is Empty



The CD Prep folder is automatically erased of its patient data content when a user logs out of the AVW client. If log out has not been performed, it is possible for previous patient data to still be stored in the CD Prep folder. Follow the procedure in the Warning below to clear the CD Prep folder of all contents before beginning to create a Patient Disk.



CAUTION

To guard against unauthorized release of patient data, be sure to log out of the AVW and log back in before sending any new patient data to the CD Prep folder.

Step 2: Copy Files to Prep Folder

Do not exceed the maximum storage space of the CD Prep, as indicated on the Disk Space bar (700 MB for CDs, and 4.7 GB for DVDs). Too much content will prevent burning process from starting.

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NOTICE

You must have Windows administrative permissions to burn DVDs for some operating systems (e.g., Windows XP).

1. After ensuring that the CD Prep Folder is cleared, use the Directory functions to find the patient series, images, data files, and/or reports you want to include on the Patient Disk.

   Those files may be located in the Local device's Patient and Series Lists, (including the Files and Report sub-lists), as well as other devices and locations, such as a networked AVW or scanner, or a PACS.
2. When you find an item for the Patient Disk, right-mouse click on it. This both highlights the item and opens the right-mouse menu.
3. In the right-mouse menu, click "Copy To...". (This same button is also in the Archive Manager tool panel.) The Devices selection window opens.

   
4. Click the CD Prep button.

   
5. Click **OK**. The selected patient file(s) will be copied to the CD Prep folder.
6. Repeat steps 1 through 5 (finding and copying items you want to burn to the Patient disk) until you have found all desired items.
7. Use the Disk Space progress bar to observe how much data you have placed into the CD Prep folder.

Step 3: Burn Disk

When the CD Prep folder contains all the files you want for the Patient Disk, perform this procedure.

NOTICE

You must have Windows administrative permissions to burn DVDs for some operating systems (e.g., Windows XP).

1. In the Studies tab, click the down-arrow next to the current device icon to access the list of Local devices.
2. Right mouse click on the CD icon to drop down the Device Management menu.
3. Click **Eject** to open the device tray.

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4. Place a blank CD or DVD disk into the tray and gently push the tray in. It automatically closes.
5. Click the **Record** button next to the Disk Space bar to begin the burning process. (The Record command also appears in the Device Management drop-down menu.)

   The “Record Disk” dialog opens to show the status of the process you are starting, including “Used Disk Space,” “Maximum Disk Space.” You can select to “Automatically eject disk” and you can enter the number of copies you want to burn.

   If the content of the CD Prep folder exceeds the capacity of the blank disk, the “Not Enough Space” message will display, showing the capacity of the blank disk and the amount you are trying to store. You can cancel the operation, delete some of the contents of the CD Prep folder, and try again.
6. When burning is complete, Remove CD. When all burning is finished, right-click the CD Prep icon in the Local device display and click the Clear command.
7. If you indicated earlier that you wanted more than one copy to be burned, you will be prompted to place another disk into the tray.

Step 4: Verify Disk Contents

To verify that the Patient Disk contains only files for the intended patient, perform the following procedure:

1. Insert the Patient Disk into the CD drive.
2. In Local devices list click the CD icon. The contents of the disk will display in the Patient Directory and Series lists.
3. Examine the list of files that are shown for the Patient Disk. The list should include only those patient files you placed into the CD Prep folder after you initially "cleared" it.

CD Prep Device



The CD Prep “device” is a factory-created folder on the local drive. It is an intermediate storage location for collecting files that you want to burn to a blank CD or DVD.

NOTICE

Patient health related information recorded on removable media may become accessible to unauthorized individuals and thus creates a privacy security risk. Please refer to the "Network Safety, Security and Privacy" section for more information.

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USB Device



The USB (Universal Serial Bus) device is any USB storage device of your choice (flash memory, portable hard drive, etc.). When you connect a USB device to AVW, a dialog is automatically opened. You will be asked to configure it by choosing a device path (for example H:) and a device name.

After a USB device is configured, a file is created on the device (file name: device_id.xml). When the USB is again inserted to the same workstation or another workstation, the system configures it by reading the file.



CAUTION

Do not delete the configuration file, because loss of patient data may occur.

To disconnect the USB, right click on the device icon and select 'Eject.'

You can create only one AVW folder on a USB.

The USB configuration works also for fire-wire.

NOTICE

Patient health related information recorded on removable media may become accessible to unauthorized individuals and thus creates a privacy security risk. Please refer to the "Network Safety, Security and Privacy" section for more information.

Eject USB Device

Right click on the USB device icon and select **Eject**.

When the confirmation notice appears in the message bar, it is safe to remove/disconnect the USB device.

Remote Device



Remote devices are those connected to AVW through your institution’s data network.

NOTICE

Patient health related information recorded on removable media may become accessible to unauthorized individuals and thus creates a privacy security risk. Please refer to the "Network Safety, Security and Privacy" section for more information.

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Device Management

Each type of device has management functions that can be accessed via a right mouse menu. The available device management functions vary, depending on the device's capabilities. For example, if you are accessing an already-recorded CD Patient Disk, you would not see the "Free Space" or "Import Data" functions, because these functions do not apply to that device.

Eject Device



Click this icon to eject a removable media device such as a CD/DVD or USB device. If the device is busy, a message displays indicating it is in use. Click on **Ok** to eject the device, or on Cancel to quit without ejecting.

Verify Device Connection



Click this icon to verify the status of the connection to a storage device. The connection may be identified as "not OK" for various reasons, depending on the device: there may be no media in the removable media device, or the institution's network may be down, or you may not have permission to access the device, etc.

Device Free Space



Click this icon to display the amount of free space available on a storage device. Note: The System Status Monitor in the lower-left corner of the Directory displays the proportion (%) of available free space on the Local drive and in the CD Prep folder. The Auto Delete option is available (see section "Preferences" on page 165) for users who want to insure that a certain amount of disk space is always kept free.

Clear Device



Click this icon to clear (delete the study, or series, or files from) the selected device.

Record to Device



Click this icon to record contents to the CD. A recording cannot be stopped before it completes. A dialog opens to offer to record multiple copies. If you request to do so, a message displays after burning, telling you to insert another blank CD disk.

Full Device Rebuild



Click this icon to try to recover the data on any local device (hard disk) by attempting to reconstruct the DICOM file system. A progress bar is displayed. You can perform rebuild on several folders simultaneously. You can work on other folders while a folder is being rebuilt.

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CAUTION

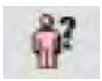
After rebuilding, locked files become unlocked and may be inadvertently erased. From the File menu, use the Lock Patients function to lock the files again. The system should be re-started after a rebuild.

Import Data



Click this icon to open a dialog box to import data to the active folder. A progress bar is displayed. You can import from a CD.

De-identify Patient Data on Device



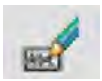
Click this icon to allow you to permanently eliminate the patient data from selected studies, to protect patient privacy. A duplicate study is created, without the identifying patient data (removes Accession number and Patient Birth date). The original studies are not deleted.

Send Link



Available functions are Copy Link to Clipboard and E-mail Link.

Rename Local Folders



Click this icon to open a dialog box to rename a selected local device (folder). Works only with user-defined devices (folders).

Remove Local Folders



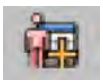
Click this icon to open a dialog box to remove (delete) a selected local device (folder). Works only with user-defined devices (folders).

Add Local Folder



Click this icon to open a dialog box to add (create) a new local device (folder).

Add Worklist



Click this icon to add (create) a new Worklist.

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Refresh Device List



Click this icon to search for connected USB devices that were not automatically identified.

Stop Connection



When AVW is connected to a remote device, this button is active. Click this button to end the network connection to a remote device.

Clear Filter



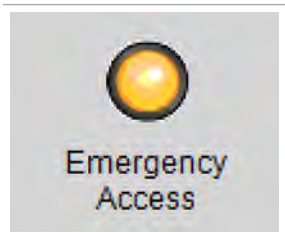
Resets the local patients filtering function, restoring the full list of patients.

Emergency Access

The Emergency Access button enables overruling data segregation and allows the user to view all exams across the Enterprise in case of emergencies.

The Emergency Access button is toggled on and off.

Only users with permission can use Emergency Access.

	User has emergency access.
	User selected emergency access.

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	User does not have permission or data segregation is disabled.

Refresh



Refreshes the patient list with newly arrived studies, if any.

Patient List

When you select one of the Devices from either the Local or the Remote list, AVW automatically searches the device for Studies, and displays them in the Patient List.

Patient List Column Display Options

To select the information displayed in the column, right-click the header. From the Studies menu, select or de-select the items you want to display. To make the selector disappear, move the mouse and click in a different location within the Patient Directory.

Transferred, Locked, Opened, Filmed, Processed and Exception Indicators



These filters are toggled off and on by clicking in the box below the icon.

- The Transferred icon (first column on the left) appears when the study has been successfully archived (see section “Preferences” on page 165).
- The Locked icon indicates that the study has been locked, and cannot be erased, either manually or by Auto Delete.
- The Opened icon indicates that a study was opened into a viewer or application, but does not mean that it has been reviewed.
- The blue  Film icon appears when the study has been filmed.
- The yellow  Film icon appears when a partial study/series has been filmed.
- The Processed icon indicates that the study has completed the body bone or skull removal.
- The  Exception icon indicates that the study was not segregated. The Exception icon only appears if Data Segregation is enabled.

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Patient List Functions

Patient list functions can be accessed by right mouse clicking on the study you want to work with. A menu appears.

Copy To



Click this icon to copy the highlighted study to your specified Local or Remote device.

Enable the **Export in Classic MR format for USB devices** to copy to a USB device.

The Copy To request can be monitored in the Queue Manager.

Delete



Click this icon to permanently delete the highlighted study.

Quick Review



Click this icon to launch the highlighted study into the Quick Review application. See also section “Quick Review” on page 121.

Export to



Click this icon to export a study to selected location in DICOM format.

Direct Record



Click this icon to burn the selected patient study directly to the CD device. You can still use the CD Prep folder as an intermediary device, if desired.

View DICOM Information



Click this icon to open the DICOM Information display window. There is a search function to find words in a document, and a Save Text File option to save to the Multi Media viewer.

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Lock and Unlock



Click this icon to lock an unlocked study (or unlock a locked study). Locked studies cannot be deleted, either manually or by Auto Delete.

Change Patient Details



After you select a study, you can click this icon to open the Change Patient Details dialog box. When you save the changes, a new study is created and saved to your selected device. (Original study is not deleted.)

De-identify Patient Data



Click this icon to open the De-identify Patient Data dialog box, where you can change patient details (good for protecting patient privacy). When you save the changes, a new study is created and saved to your selected device. (Original study is not deleted.)

NOTICE

Manually typing new patient details changes the details of all selected studies. All other available patient's details are cleared from the patient's study.

View



Click this icon to launch the highlighted study into the CT Viewer.

Add to Running Application



Click this icon to add data from the same patient or another patient to all running applications (not all applications support this function).

Send Link



Use in conjunction with the Zero Footprint Viewer. Send links to colleagues to share studies. Refer to the Zero Footprint Viewer Instructions for Use for additional information.

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Retrieve Prior Studies



Use to perform a manual prefetch of studies from PACS. See section “Prefetch” on page 113.

Exception Management

An **Exception** icon appears in the **Exception** column if the incoming data cannot be assigned to a Department as per the rules defined for Data Segregation.

The icon disappears once the study is assigned to a department(s).

Assign to a Department(s)

If an exception occurs, the user can assign or re-assign the department using the Context Menu option at the study level in the Patient Directory.

It is only possible to Assign to Departments for which the user has access.

Only users with permission can use **Assign to a Department(s)**.

Filter Patient List by Data Field

Filtering is a form of search where you type into the column’s search field the starting character(s) of a name (or other data) you are looking for.

Sort Patient List by Column Contents

Sort by the contents of a column: click on the column heading (for example, the Patient Name column).

Sort in the reverse order: click again on the column heading.

Sort also with a second parameter: press <shift> and click a second column heading.

Filter Patient List by Study Date

You can filter the Patient List according to when the study was acquired. Click on the arrow in the header of the Time column to drop down a selection list of limiting parameters.

Filter Patient List for PACS

The PACS search tool is active only when connected to a PACS that has been defined as a “large archive.” This avoids the time delay which could be created by opening a large directory. See also section “PACS Integrations” on page 149.

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CAUTION

A typical PACS system stores a very large number of studies. If you do not first apply a filter to the Patient List, it may take the Directory a very long time to access all of them, delaying your ability to use the AVW system. Be sure to apply a filter before accessing a PACS.

1. Select the **PACS (large archive)** from the Devices menu. The Search Parameters dialog box opens.
2. Set the desired parameters to create a search filter.
3. Click **OK**. The PACS (large archive) directory and the Search tool (binoculars icon) are now active.



4. To change the search request from the PACS, click the **Search** icon. The Search parameters dialog box opens.

   As long as the PACS (large archive) is connected, the Search icon remains active. The regular context sensitive search (at the top of each column) is also available.

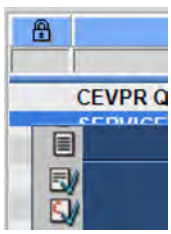
Clear PACS Filter

Click **Search**. The Search Parameters dialog box displays.

Click **Reset** to clear the filter.

Click **OK**.

Set Study Status



To assign the status, right-click a Study and select **Mark as read**; **Mark as unread**; or **Mark as completed** from the menu.

The Completed (or any other) status may be used to manually override the auto-assigned status or change the previously set status. You can manually change any status at any time.

Worklist

The Worklist function allows the AVW user to designate which patient studies will be listed in the Directory.

- A Worklist is used to specify various filtering parameters, including Device location, imaging Modality, Study Time (study age), and other study parameters.
- When a worklist is activated, the Directory lists only those patient studies that match a worklist's requirements

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- Standard worklists are provided from the factory. (12 factory default worklists cover each of the three modalities, CT, NM and MR.)
- A user can create up to 20 worklists to produce unique Directory list outcomes.
- Each individual (logged-on) user will have his or her own Worklists, with no access to other user worklists.
- All of a user's worklists (including factory worklists) can be edited, renamed, or deleted as desired.



Worklists are accessed from the Devices tab. Click on the Device drop down arrow to view your user worklists.

Create Worklist

If many studies are involved your worklist query, a long time could elapse before completion. To prevent this, the query stops after listing only the first 200 studies in the Patient Directory. If the studies you want are not listed, you need to create a new (or modify the current) worklist to limit the scope of the filtering. Saving the new worklist triggers a new query, and the system will fetch studies again.

If a remote device that is part of the worklist definition is not connected in the network, it will not be queried and no results will be listed.

If your worklist returns the maximum 200 studies without finding the studies you want, you have to filter using additional criteria. You can use the Directory's filtering and sorting features to help your search.

1. In the Worklists tab, right click on a worklist icon. A selection menu appears.
2. Click **Add Worklist**. The Configure Worklist dialog opens.
3. Type in a Name for the new worklist.
4. Click on **Choose Devices**.
5. Select all the devices you want the system to query for studies.

   You can choose only devices that are local to the server (local devices) or remote devices connected to the server (such as PACS devices, Extended Brilliance Workspace, etc.).

   Removable devices are NOT SUPPORTED.
6. Complete all other selections on the window:
   - Modality.
   - Study Time.
   - Study Status.
   - You can optionally enter Procedure Description, Referring Physician, Performing Physician, Institution Name, Station Name and Department Name.
7. Click **Save** to save the new worklist.

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Edit Worklist

1. Right click on the worklist you want to edit. A selection menu appears.
2. Click **Edit Worklist**. The Configure Worklist window opens.
3. Make changes to the worklist as desired.
4. To save the edited worksheet without renaming it, click **Save**.

   To create a new worksheet, change the Name as desired, and click **Save**.

Delete Worklist

Right click on the worklist you want to delete. A selection menu appears.

Click **Delete**, then click **OK** to affirm your action.

Series List

The Series list, located beneath the Patient list, allows you to display and select:

- Individual Series, Images (only active for studies containing NM, PET, etc.), Files, and Reports associated with the patient study you highlighted in the Patient List.
- View as Pictorials mode, which displays the same items as mini images.



At first, the Series List displays the list of all files and reports associated with that study, and highlights all of them darker blue.

- If you leave them all highlighted, and select the Review or Analysis function, all files will be loaded.
- If you do not want to work with all of the files, click on just the files you want. (Accumulate multiple files using the <Ctrl> button on the keyboard.)

Select Series

Click the **Series** tab.

Click in the text line of the series you want to access. The selected line is highlighted in darker blue. Hold <Ctrl> to pick additional lines.

Click Review or Analysis to begin viewing or analyzing.

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Series List Operations

The Series List operates like the Patient List. You can specify which columns will display, and you can sort like in the Patient list. See section “Patient List” on page 96.

Series List Sub-selection



The Sub-selection function allows you to limit how much data you load into the Review or Analysis application. The Sub-selection function (a button in Archive Manager) opens a window that shows the image list of the series you selected. From the window you can select the images you want to load.

1. Select a patient from the patient list.
2. Click **Sub selection**. The system displays a dialog box with Images List (default) and Surview View tabs.
3. You have several options for selecting images.
   - Click on the desired images, by holding <Ctrl> down and clicking individual images, or by holding <Shift> down and clicking the first and last in a range of images.
   - Turn off an entire series by clicking in its check box.
   - Use the “Select Every” function box in the Surview View to automate your selection.
4. If a dual Surview was loaded, use the two triangles on the right mid side of the Surview image to toggle between the two Surviews.
5. If a multi phase selection is needed use the Apply selection to a range.
6. After completing the selection click the desired application, viewer, or Quick Review.

In Preferences you can set the Sub-selection function to automatically activate before you start Analysis application. See section “Preferences” on page 165.

Apply Selection to Range



Open a study with multiple phases (for example, cardiac or pulmo). Select one phase. Select a range of images from the series. Click **Apply selection** to all series. The same sub selection (image x to image y) is now selected in all the other series. Open the application and the same sub-selection in all the phases (series) are loaded.

Series List Functions

Right click in one of the series fields to bring up a menu of functions. Series list functions can be accessed by right mouse clicking on the series you want to work with. A menu appears.

Copy To



Click this icon to copy the highlighted series to your specified Local or Remote device.

Enable the **Export in Classic MR format for USB devices** to copy to a USB device.

The Copy To request can be monitored in the Queue Manager.

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WARNING

Verify that images are copied or backed up successfully.

Delete



Click this icon to permanently delete the highlighted series.

Quick Review



Click this icon to launch the highlighted series into the Quick Review application. See also section “Quick Review” on page 121.

Run Processing

Use this feature to run algorithms prior to loading an application.

Direct Record



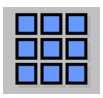
Click this icon to burn the selected patient series (or a sub-selection or individual files) directly to the CD device. You do not have to first transfer the file(s) to the CD Prep folder.

View DICOM Information



Click this icon to open the DICOM Information display window of the selected study. There is a search function to find words in the file. There is also a “Save [DICOM as a] Text File” option.

Select All Images



Click this icon to select every image of the highlighted series. When you use the three “Select All, or Every” buttons, the text in the Series List becomes italic.

Select Every Other



Click this icon to select every 2nd image.

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Select Every...

Click this icon to select every 3rd, 4th, or 5th image.

Change Patient Details



After you select a series, you can click this icon to open the Change Patient Details dialog box. When you save the changes, a new study will be created and saved to your selected device.

1. Select **Change Patient Details** from the Series list right mouse menu. This message displays: “Manually typing new patient details will change the details of the available fields only. All other available patient’s data will be cleared from the patient’s study. Please verify that the modified patient’s data is correct.”
2. Click **OK** after verifying the correct patient data. The Change Patient Details dialog box displays.
3. Make the desired changes.
4. Use the "Choose Devices..." function to select a device, then click **Save**. The new series is saved as a new study to the selected device. See also section “Devices” on page 86.

De-identify Patient Data

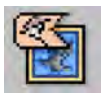


Click this icon to open the De-identify Patient Data dialog box, where you can change patient details (good for protecting patient privacy). When you save the changes, a new study is created and saved to your selected device. (Original study is not deleted.)

NOTICE

Manually typing new patient details changes the details of all selected studies. All other available patient’s details are cleared from the patient’s study.

View



Click this icon to launch the highlighted study into the Advanced Visualization Workspace Viewer.

Add to Running Application



Click this icon to add data from the same patient or another patient to all running applications (not all applications support this function).

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Send Link



Use in conjunction with the Zero Footprint Viewer. Send links to colleagues to share studies. See the Zero Footprint Viewer Instructions for Use for additional information.

Reports



Right click in one of the Reports to bring up a menu of functions. In addition to viewing, copying and printing a report, you can export a report (as a PDF or MSWORD file) to en external device. See section “Preferences” on page 165 and section “Multimedia Viewer” on page 109.

Change Free-space Calculation

The system recognizes and differentiates between CD and DVD media. Free space information displayed in the status area is the percent of free space on the CD or DVD. (Normal capacity of a CD is 700 MB; DVD capacity is 4.7 GB.)

Change the status area free space to display CD Prep free space by performing the following procedure:

1. Open Preferences.
2. The Patient Directory page opens.
3. Click on **Select devices...**.
4. Select a Local Device, click **OK** to close Local Devices window. Next to “Display free space on toolbox,” the option is CDPrep.
5. Click **OK**.

Use Bookmarks in the Directory



When you activate a saved Bookmark from the Directory, the application or viewer will be launched and the study will appear on the display at the same point of progress as when the bookmark was saved.

Select a study in the Directory. If the study has saved bookmarks, a mini image will appear in the Bookmarks window. If more than one bookmark has been saved, a drop-down arrow appears in the corner of the mini-image (as indicated at left). Click on the drop-down arrow to view more bookmarks.

Double click the desired bookmark mini image to load the study to the stage represented by the bookmark. Or, right click and choose Load Bookmark.

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Close the dialog without loading the bookmark by clicking anywhere outside the dialog. Or, double click on the state and the most recent bookmark is used when loading it's generating application.

View Bookmark Details in the Directory

To open a bookmark on the directory, double-click the bookmark.

Hover the mouse cursor over the bookmark image. A tooltip displays, including the following information:

- Name of the application.
- Patient ID.
- Name of the application that generated the bookmark.
- Patient name.
- Number of bookmarks.
- Time.

States, Bookmarks, and Remote Devices

It is not possible to copy a bookmark alone as a DICOM series to a remote device such as to a remote AVW system or a PACS system. To send a bookmark to a remote device, you must transfer the whole study.

It is not possible to load the bookmarks from a remote AVW system. The entire Patient study should be copied to the local workstation first.

All remote states will have the same fixed image.

The remote state will have a tooltip showing the number of bookmarks available within that state.

Right-click Menu

Right clicking on a state gives you 2 selections: load the bookmark and delete the bookmark.

Delete Multiple Bookmarks from Directory

Use the **Ctrl** key to select multiple bookmarks.

Select **Delete Bookmark** from the right-click menu.

Pin Bookmark Panel on Directory

By default the Bookmarks Panel is collapsed.

To open the panel, hover over the Bookmarks tab. To keep the panel open, click the **Auto Hide** button (the pin icon).

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Archive Manager

The Archive Manager provides access to various file-management functions.

Archive Manager Delete

Allows you to permanently remove selected images or data (that you have highlighted in the Patient or Series List). The system prompts you to confirm the selection before completing the deletion process.

WARNING

Verify that images are filmed or backed up before you delete them.

NOTICE

Delete will only be enabled if you have permission to delete.

Archive Manager Quick Film

Used to send the currently selected images in the Patient or Series List to the Film function. Quick film will be disabled for remote and removable devices.

Archive Manager Copy To

Use to copy the items currently selected in the Series List to another device. A dialog box opens with lists of available Local and Remote archive devices you can copy to.

Archive Manager Sub-selection

Allows you to select, from a series, specific images that you want to work with. First select the item(s) in the Patient or Series List that contain(s) specific images. Then click the Sub-selection button to open a dialog. See section “Series List Sub-selection” on page 103.

Archive Manager Multimedia Viewer

Use to launch the Multimedia Viewer which allows you to view non-DICOM files. See section “Multimedia Viewer” on page 109.

Archive Manager Files on CD or CDPrep

When the CD or CD Prep device is selected, the Files on CD or the Files on CD Prep icon appears. Use to launch the Multimedia Viewer to view any non-DICOM files that exist on the CD or CD Prep device. See section “Multimedia Viewer” on page 109.

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Multimedia Viewer



The Multimedia Viewer allows you to view non-DICOM files that you have saved or exported to the Multimedia folder, including movie files, text files, and graphic files. Snagit files saved as "Output type Catalog" go directly to this folder. Other files like Reports, JPEG files, AVI movies etc. arrive as exports from the patient study.

To view the directory and contents of these files, click Multimedia Viewer in the Archive Manager. A list of available files displays in the left window. Files are shown by their actual file names, not by patient names. See also section "Archive Manager" on page 108.

Click a file name to view the image. Sort like in the Patient Directory.

NOTICE

When there are no files or the files need to be formatted, this message appears at the bottom of the screen: "No media in device or media needs to be formatted."

Export Files



Select the desired file(s), then click this button to export the file(s). The Export Files dialog opens, where you can select a Local or Remote device. The device's folders are listed. Select the desired folder and click **OK**. See also section "Devices" on page 86.

	Click the Folder symbol to access sub folders.
	Click Back One Level to return one folder level.
	Click Create Folder to make a new folder at your current level.

Copy Files to CD Prep



Select the desired file(s), then click this button to copy the file(s) directly to the CD Prep folder. See also section "Devices" on page 86.

Delete Files



Select the desired file(s), then click this button to delete the file(s). Files are only deleted from the Multimedia Viewer.

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Import Non-DICOM File



Allows you to import files into the Multimedia viewer from a Windows directory. Select the desired file(s), then click this button to import the file(s). The Import Files dialog opens (similar to the Export Files dialog), where you can select a Local or Remote device. The device's folders are listed. Select the desired folder and click **OK**. During importation, a progress bar displays at the bottom of the screen. See also section "Devices" on page 86.

Play Movie



If the selected file is a movie file, this button is active. Click the button to play. Click it again to stop.

Launch Multimedia Viewer from CD/DVD or CD Prep Device



When the CD/DVD or CD Prep device is selected, this button appears in the Archive Manager. Click this button to launch the Multimedia Viewer to view any non-DICOM files that exist on the CD device. See also section "Archive Manager" on page 108.

Queue Manager

The Queue Manager is used to monitor and control the queues of background transactions, such as image Transfer, Print and Processing. The Print Queue is for printing from the Film viewer only, it does not include printing reports.

Click on Waiting, Failed, Print or Process to open the Queue manager window.

The Queue Manager has three queues (tabs):

- Transfer queue.
- Print queue.
- Processing queue.

Each queue includes the following lists:

- Sessions list.
- Patients list.
- Details list.

Queue Manager Session List

Source/Destination	This column shows where the study originated and where it is being copied
Studies Left	This column shows the number of studies left to be copied

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Status	This column shows the status of the file(s) being copied, it will show: • **Paused.** Transaction is suspended until user resumes progress. • **In Progress.** There is at least one transfer request in progress. • **Retry.** No transfer requests in progress, but there is at least one transfer request waiting for timeout to start retry. • **Failed.** Fatal error with no retries.
Show History	Click this checkbox to display finished transactions.
Retry Button	Click this button to change the status from Retry or Failed to In Progress (start executing the transfer requests).
Remove Button	Click this button to delete the selected sessions. All uncompleted transfers are terminated immediately. There is a warning and request for user confirmation.
Pause/Resume	Click this button to temporarily suspend the selected session. Click this button again to resume execution of the selected sessions.

Queue Manager Patients List

Source/Destination	This column shows where the study originated and where the copy will be located.
Patient name, ID, and Study ID	These columns help identify the study.
Waiting	This column give the number of images waiting to be copied.
Failed	This column shows the number of images that fail to transfer.
Completed/Total	This column gives the number of images that are completed out of the total amount.
Progress	This column displays how much of the session has been copied as a percentage.
Status	This column gives the status of the session; it displays waiting in queue, failed, or complete.
Owner	–
Show Failed	Click this checkbox to show all the sessions that failed to transfer.
Retry button	Click this button to change the status from Retry or Failed to Active (start executing the transfer requests).
Remove button	Click this button to delete the selected sessions. All uncompleted transfers are terminated immediately. There is a warning and request for user confirmation.
Rush button	Click this button to put the selected transfer requests second in the queue, after the currently executing request.
Transfer Now button	Click this button to interrupt the currently executing request and begin transferring the selected study.

Queue Manager Details List

Series Number	This column shows the series number being transferred from the study.
Series Description	This column gives the description of the study, like Carotid or Lung Nodule for example.

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Completed/Total	This column give the number of completed transferred images compared to the total number of images.
Time submitted	This column shows the time at which the transfer began.
Status	This column gives the status of the session; it displays waiting in queue, retry, failed, or complete.
Owner	–
Retry button	Click this button to change the status from Retry or Failed to In Progress (start executing the transfer requests).
Remove button	Click this button to delete the selected sessions. All uncompleted transfers are terminated immediately. There is a warning and request for user confirmation.

Prefetch Operations

Prefetch operations are listed on the Transfer tab in the Queue Manager. The **Transfer Type** column indicates the type of transfer. If the job is user-submitted, the job is indicated as **Copy**; if the job is a Prefetch, then the job is either indicated as **Manual Prefetch** or **Auto Prefetch**. See section “Prefetch” on page 113.

NOTICE

The Prefetch jobs in the Queue Manager will have lower priority than other jobs. For example: if an automatic Prefetch job is running and a logged-in user request a DIFFERENT patient from the same PACS, the manual request is placed at the beginning of the Queue, and will begin as soon as the currently running jobs are complete.

Auto Delete Studies

The Auto Delete function insures that a certain amount of storage space is always kept free for storage or new studies and data.

Auto Delete automatically launches when there are fewer than 11 GB (level can be configured by an IT or Clinical Administrator user) of free space remaining in the Local folder. The system checks the amount of free disk space before copying and invokes the Auto Delete mechanism if the 11 GB minimum is exceeded.

Auto Delete can be activated from Preferences and from LANConfig.

- From Preferences: Auto delete is activated and deactivated on the Patient Directory page of Preferences - for the Local folder only. See section “Preferences” on page 165.
- From the LAN-Config utility: Auto delete may be activated and deactivated by your Philips Field Service Engineer.
- From LAN-Config: The Service Engineer can also activate Auto Delete for freeing space on other devices. The settings for other devices are unaltered by the Preferences selection.

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- When activated from Preferences, the Auto Delete function overrides the LAN-Config setting (so that they both have the same status), and vice versa.

WARNING

It is recommended to always keep patient images properly backed up, especially when Auto Delete is activated (in Preferences).

- **Auto Delete does not delete Locked files.**
- **Auto Delete does not delete old studies that were recently accessed within the past two weeks.**

Auto Delete frees up disk space by deleting studies from the local archive according to the following principles:

- The oldest images are deleted first.
- Studies are deleted until the free disk space is greater than the free space value specified in the configuration.
- Files are deleted starting with the oldest last-accessed date.

Manually Delete Images

To maintain optimal speed on your system, delete images from the Local drive regularly (depending on system workload). Large amounts of information in the Archive can slow the system.

1. Select the images in the Directory.
2. Right-click on the study.
3. Select **Delete** from the menu.

Prefetch

Prefetch provides a mechanism for AVW to retrieve prior patient Studies from a single or multiple PACS, either automatically or manually. You define the rules to determine which Studies should be fetched.

Prefetch configuration is only available to administrative users with system-wide access.

To configure Prefetch go to **Directory > Preferences > Prefetch Settings**.

Prefetched Studies are flagged in the Patient Directory. Prefetch can be used to fetch Studies in the following ways:

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Upon Study Arrival

When a new Study is pushed to AVW (either from a scanner or PACS), AVW automatically fetches the prior Studies of the patient from the PACS. Certain DICOM tags of the new Study (e.g., Patient ID, Patient Name, Modality, Study Description, etc.) are used for determining the eligible priors Studies that need to fetched. For example, when the new MR Study for a particular patient is added to AVW, you can use certain information from the Study to also fetch other, prior CT, MR, and/or NM Studies of the same patient from the PACS.

Auto-prefetch based on new Study arrival is often used for:

- Organizations without a scheduling system but have PACS.
- Trauma situations, where the system automatically fetches prior exams.

The criteria for defining the new Study and the DICOM tags to be used for determining eligible prior Studies are configurable. See section “Prefetch Preferences” on page 196.

Using Modality Worklist

AVW periodically queries the RIS (or PACS) for scheduled examinations using the DICOM Modality Worklist query (MWL or DMWL). The results of the query (i.e., Patient ID, Patient Name, and the Modality) are used for fetching the prior exams of the Patient from PACS. For example, when a new CT exam for a particular patient is scheduled for today in the RIS, AVW uses this MWL information from RIS to fetch any of the prior CT, MR, and/or NM Studies of the individual from PACS. See section “Prefetch Preferences” on page 196.

Since the prior Studies are automatically fetched from the PACS, the priors will already be available in AVW even before the new Studies are pushed. The type of exams that require Prefetch, and the periodicity for fetching the MWL from RIS, are configurable.

Prefetch Based on Scheduled Orders

NOTICE

This feature requires the IBE option.

This option enables Advanced Visualization Workspace to monitor hospitals' scheduled exams and to fetch prior studies from the PACS based on the type of exams scheduled. An external device (server) named IntelliBridge Enterprise (IBE), monitors the HL7 ORM messages pertaining to orders and notifies AVW to trigger prefetch. Prefetch is triggered based on the rules configured in Preferences.

Manually

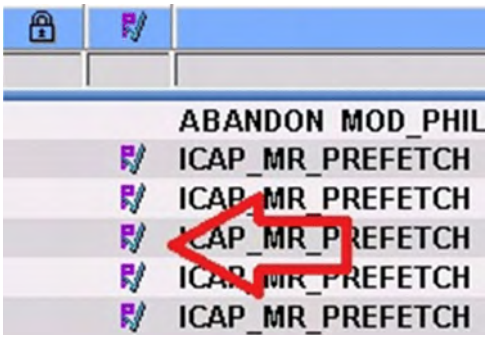
Once the system is configured, you can manually Prefetch any Priors directly from the Patient Directory by right-clicking on a Study and selecting **Retrieve Priors**. See section “Prefetch Preferences” on page 196.

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Identifying Prefetched Studies

Prefetched Studies are marked with an icon in the Patient Directory.



If you do not see the **Prior** icon, add it to the Patient List Column Display:

1. Right-click the column header in the Patient Directory.
2. Check **Prior** in the context menu.
3. To reposition the Prior column in the Directory, grab the header and move it to the right of left.

Perform Manual Prefetch

To manually fetch Prior Studies:

1. Go to the **Patient Directory** and Right-click on an existing Study.
2. Select **Prior Studies** from the context menu.



3. In the dialog box, select the Study (or Studies) you need and click the **Retrieve** button.

Once the Studies have been selected, they will be added to the Queue Manager. See section “Prefetch Operations” on page 112.

Delete Prefetch Studies

When auto-cleanup is triggered, all of the prefetched prior studies are purged as the first priority.

Prefetch Exams from PACS

NOTICE

By default the Study ID and Accession Nr. are switched for its value by the Sectra PACS. This is a known behavior of Sectra PACS and it can be corrected via a configuration in the PACS. Please contact the administrator of Sectra PACS for correcting this behavior.

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Key Image Notes (KIN)

Key Image Notes (KIN) are electronic notes that are added to images to increase informal communication between various users. These notes are used to mark and collect meaningful information on images while working.

The notes are collected while working and are stored within the Key Images tab in the Control area. Once a KIN is saved, a dialog opens that allows you to enter notes, define a context and define a destination.

Collected Key Image Notes can be viewed in the Key Images tab in the Patient Directory. Opening a study from the Key Image tab, launches the Key Images Viewer.

NOTICE

Depending on the application used, the icons shown for Key Images may be different than the icons shown in these instructions.

Saving Format in CT Applications (Including MMTT)

- When the selected image is a 2D image, the saved Key Image is an original 2D CT image. When reviewed later on, the window level can be changed and measurements can be performed.
- When the selected image is an MPR slice, the saved Key Image is an original 2D CT image. When reviewed later on, the window level can be changed and measurements can be performed.
- When the saved image is a Volume view, the saved image is the secondary screen capture of the displayed volume at the time the operation was done.
- When the saved image is a graph or table created by the application, the saved image is a secondary screen capture.

Saving format in MR and NM Applications (Including MMV)

For MR and NM, application Key Images are saved as a secondary screen captures in order to keep the annotations in the image.

Key Image Storage

The images are stored in the study that was launched as the primary study. If more than one study is selected in the application, the key images are saved to respective studies.

Supported Image Types and Correlated Rules

	Image Type
For original images without overlays (such as tissues) that are loaded to the Key Images Viewer, you can get measurements and change window level .	=[DERIVED\SECONDARY\MPR], Photometric interpretation=[MONOCHROME2] Note: annotation saved in CURVE tags

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	Image Type
For secondary capture images without overlays (such as tissues) that are loaded to the Key Images Viewer, you can get measurements but cannot change window level.	=[DERIVED\SECONDARY\MPR], Photometric interpretation=[MONOCHROME2] Note: annotation saved in OVERLAY tags
For secondary capture images with overlays (such as tissues) that are loaded to Key Images Viewer, you can get measurements but cannot change window level.	=[DERIVED\SECONDARY\MPR], Photometric interpretation=[RGB] Note: annotation saved in OVERLAY tags
For display images without overlays (such as tissues) that are loaded to Key Images Viewer, you can get measurements but cannot change window level.	=[DERIVED\SECONDARY\MPR], Photometric interpretation=[RGB] Note: annotation saved in OVERLAY tags

- When measurement tools are used on images which do not contain the required information in KIN viewer, the measurements do not appear (*** appears instead).
- The application does not display any measurements when the tools are drawn on image data which is not measurable (for example secondary screen capture s).
- The user cannot copy images to the clipboard from the KIN viewer, by using Ctrl+C keys.

Collecting and Viewing Key Image Notes

Collected Key Images are initially stored within the **Key Images** tab in the Control area.

Once images are collected, they can be saved with annotations. The saved image includes the image and the annotation. The saved image is exported as a Key Image Note object. The KIN object can be reviewed in the KIN Viewer.

There is a maximum number of 50 collected images.

- If more than 50 images are collected, (as a result of multiple selection), a message appears: "It is not possible to send more than 50 images to the key images bucket, please reselect the key images and send them again."
- If the bucket content plus the selected number of images is greater than 50 - a message appears: "The number of the key images in the bucket cannot exceed 50, please save the current content and clear the bucket , before adding more images."

To start collecting Key Image Notes:

1. Right-click on an image in the Image area.
2. Find the **Key Image Notes**  option and look to the right to verify which keyboard key is used to collect images. The default key to collect images is the space bar.
3. Select a reviewed image and press the space bar to collect it as a Key Image Note. A notification message appears at the bottom of the screen, indicating that an image was selected as a Key Image. The image is sent to the Key Image Note (KIN) area.

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Viewing Key Image Notes

1. Click on the  arrow in the Control Area to view the menu options.
2. Select  **Key Images**.

   The Key Images tab appears. The Key Images that were collected are displayed in this area.

Once saved, they are exported as a Key Image Object.

Saving Key Images

Key Images are saved from the Key Images tab using the icons at the bottom of the area. There are two save options available:



Save Key Image Notes



Save Selected Key Image Notes

Once one of the save options is selected, the **Save Key Image Notes** dialog opens.

The dialog includes three areas:

- **Enter Notes** - Notes that are relevant to the saved group of images can be added to the dialog. The **Enter Notes** field allows you to write free text up to 256 characters. Each note can be assigned to one context.
- **Define Context** - A Context can be selected from a list of already Defined Contexts. Each Key Image object can contain a single context. It is possible to create more codes if desired. The following contexts can be assigned to an image:
  - Of Interest (default)
  - For Teaching
  - For Surgery
  - For Report
  - For Collaboration
  - For Conference
  - For Patient
  - For Therapy
  - For Referring Physician
- **Destination** - Key Image Notes can be saved to any device that is configured on AVW. The destination shows a list of devices that are configured on AVW, to which the KOS Object along with Key Images will be saved. The user shall be able to select the context (only one)

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that will be attached to the saved object of key images Whenever the user saves a Key Iamge object - an new object shall be created in the study (it might lead to situation where there is more than one KO with the same context in the study)

1. Open the Key Images tab.
2. Select the Key Image or images you want to save.
3. Select the Save Key Image Note icon  or Save Selected Key Image Notes icon  from the Key Image Management tab (bottom of the Key Images tab).

   The **Save Key Image Notes** dialog box opens.
4. Type information into the **Enter Notes** field.
5. Select a Context from the list of defined contexts.
6. Select a local or remote device.
7. Select **OK**.

   A new KIN object is created in the study, with the notes and context that were entered into the dialog. The dialog closes. Key images are stored in the study that was launched as the primary study.
8. Go to the Key Images tab in the Patient Directory. Select the Key Image Note Viewer. The tab displays the number of images next to the title. The series description of a saved KIN object is Key Image.

To clear a selected Key Image, select the Clear Selected icon .

To clear all Key Images, select the Clear all icon .

Viewing Key Image Notes

Key Images can be viewed in the Patient Directory in the Key Images tab.

The Key Images Viewer provides the functionality required for viewing Key Image Notes. When one or more KIN objects is selected from the Patient Directory, via the **Quick Review** button in the Patient Directory, the Key Images Viewer is launched. The Key Image Notes can only be viewed via Quick Review.

The Key Images Viewer is divided to a control panel on the left side , a workspace area where the images are displayed, an upper line for operations, and status bar on the bottom.

- The left control panel includes the Key Images series selection. The Context and Notes are also shown in this panel. The operation button area allows sending the selected key images to film or report.
- The standard viewing options are supported in Key Images Viewer (layout, scroll, pan, zoom and window level) and appear in the upper control bar in the Key Images Viewer.
- Measurement tools appear in the upper control bar in the Key Images Viewer.

When you move the mouse over the Key Images, information on the Context, Patient name, Related studies, Creation time, Modalities and User Notes appears.

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Right-clicking on an image allows you to send the image report or film.

- When multiple KIN objects with different contexts are loaded to the viewer - the series is organized in the series selection tab in groups according to their context.
- When multiple KIN objects with different contexts are loaded to the viewer - the order of the groups is the same as how they appear in the save dialog.
- When using the Key Images Viewer, you can draw text annotations and basic graphic annotations on the key images displayed in the Key Images Viewer (same as in Quick Review).
- When using the Key Images Viewer, you can perform measurements on Key Images that contain the required information.

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5 Quick Review

The primary function of Quick Review is to allow you to view a second patient while reviewing a primary patient, without launching the CT Viewer.

Quick Review provides many of the same functions as the 2D Viewer, including reporting and filming.

Quick Review **DOES NOT OFFER** the following advanced 2D Viewer functions:	
Compare	Duplicate
Advanced Combined	Sort
Alternate Window	Bookmark
Clone	Relate

You can view a variety of image types in Quick Review:

- CT images.
- PET images.
- MultiFrame PET images.
- SPECT images.
- NM images.
- MR images.
- Secondary capture.

NOTICE

When loading data into an application, ensure the orientation shown on the images is consistent with the images' appearance. This precaution is required for data that contains wrong orientation information because the data will be incorrectly presented within the application.

Launch Quick Review



Select a patient series from the Directory. Click **Quick Review** in the mini image window in the lower right-hand corner of the Directory.

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Quick Review Viewing Tools

Use the viewing tools to change orientation and layouts, and to perform Combine functions. The Selection tools allow you to select one or more images so you can to perform the same manipulation on the image(s) of your choice, such as scrolling, panning, zooming, filming, or saving.

Combine

The Combine every: function is similar to Combine in the 2D CT Viewer, but it does not perform non-continuous combining of images. To combine a “from-to position,” perform combine first, then batch.

NOTICE

Combined images are created using original image orientation.

NOTICE

Combined images should not be used as the SOLE basis for clinical diagnosis.

Cine

A convenient way to view images in Quick Review is with the Cine function, available from the Common Tools.





Quick Review Functions



To access Quick Viewer functions, click the down arrow in the tab window, or hover the mouse over the tab window. The list of available functions displays.

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Series

The Series tree displays a list of the studies and series that are loaded into the viewer, and also other elements (like batches) that have been created.

View as Pictorials



By clicking on this button you can convert the list of series into mini images. Select the desired series by clicking its mini image.

Batch

The Batch function allows you to create a series of sequential images for viewing, saving, reporting and filming purposes.

Quick Review Common Tools

At the bottom of the Quick Review tool panel is the common tools area. These common tools provide many basic functions, including saving, filming, reporting, scrolling, measurements/ annotations, panning, zooming, rotating, and windowing.

Exit Quick Review

When you are finished using the Quick Review, click the **Exit** button.

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6 Film

The Film application is used for viewing, arranging, windowing, zooming and annotating filmed images from the server prior to sending them to be printed. All filmed images are stored in the Print History.

NOTICE

Print History holds only the last 10 film projects sent to printing. After more than 10 printed projects are sent to the list, studies are deleted in the order they were placed into the History, oldest first.

Film can be accessed by the Film button in the workflow bar. Many Film operations are similar to those in the Viewer applications.

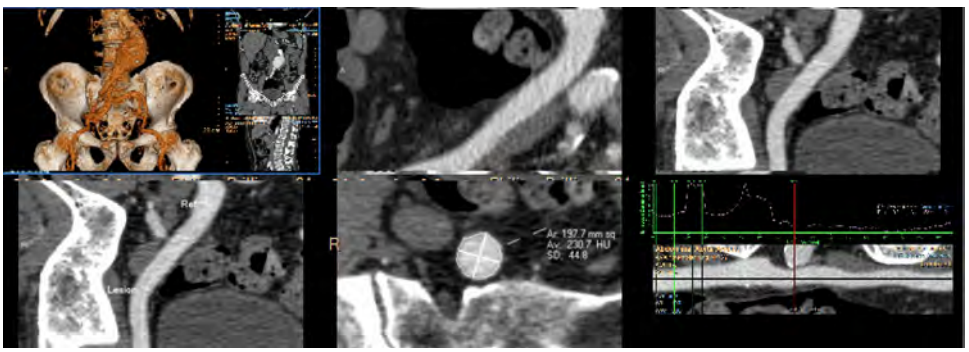
These are some advanced features of the Film application:

- The same image can be filmed side-by-side for comparison with different zoom and window parameters in the Dual mode.
- Better organization and economy of film can be achieved by filming in the Multiformat mode.
- Measurements and annotations can be added or deleted from the images.

NOTICE

If an image is saved as a secondary capture to filming, measurements are not possible.

In the example below, six film pages are shown. The pages selected in the Layout tools have a yellow border, identifying them as a Series. One image (top right) has a blue border. It is the Active image.



Film allows you to handle a Series as a group for purposes such as layout, widowing and zooming.

Other Film functions are based on the Active image, such as Page Break and New Page.

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Film Functions

The main functions of the Film application include:

- Multiple patients can be loaded and filmed simultaneously. Multiple patients cannot be mixed on the same film.
- Multiple Film Sections each with separate film settings. Sections allow flexibility in grouping multiple images as a single image.
- Easy arrangement of frames on a page.
- Overview mode for single view of the whole film section and easy arrangement of pages.
- Support for printing header and footer (a Preferences setting). See section “Preferences” on page 165.
- Background printing with print queue monitoring.
- Printing on DICOM and Windows printers.
- Saving film to PACS.

Patient Select

When you are working in AVW viewers and applications, you can send images to Film from different applications and from different patients.

The Film application can hold images from up to ten patients at once.

Only one patient at a time can be viewed and printed.

Click the down arrow and select the patient from the list.

Active Studies

Patient studies that have not been printed appear in a list. The studies in the list can be loaded and re-printed. The studies remain in the list even after logging off, unless deleted, or it the number remaining exceed 50.

Delete Study in Film Application

Right click on the Patient select menu. A drop-down menu appears. Click **Delete** patient.

Print History

After all images are printed, the study is moved from the active drop down list into Print history.

Film Viewing Tools

From the Layout tools you can select how the images display, adjust layout, change orientation and choose various image selection.

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Display

There are two Display settings, Normal and Overview. In both Normal and Overview the following actions can be performed:

- Pages within a series can be cut, copied or pasted.
- Series can be cut, copied or pasted.
- One or more images within a film series or over multiple pages can be selected for viewing and manipulations using the Ctrl/Shift keys.

Normal



Shows one film page at a time and displays the film in the selected page layout.

Overview



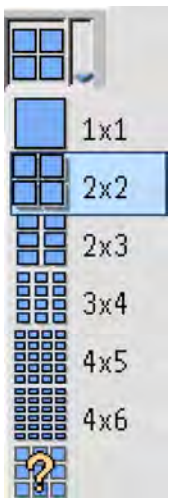
Shows all of the film pages for the patient in the same window.

Switch Monitors



If your Advanced Visualization Workspace is configured with 2 monitors, clicking this button switches the displays between the monitors.

Layout



This feature allows you to change the layout of the film. Select the layout from the drop-down menu or create a custom layout.

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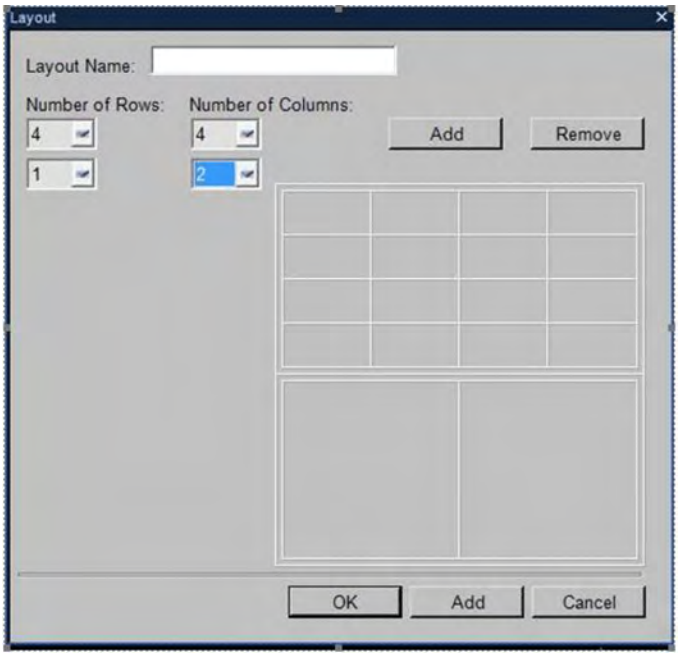
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Custom Layout

Users can create new customized layouts (and new customized mixed layouts) with up to ten rows and columns.

The selected rows and columns in the drop-down display a preview of the layout.

- To add another set of rows or columns, select **Add** (above the layout preview).



NOTICE

When selected, the **Add** button divides the layout display into equal parts.

When **Add** (below the layout preview), is selected, the layout is saved. Selecting **OK** updates the layout but does not save the layout.

The Layout name can be updated when creating the layout or can be renamed from the default name in the Layout manager.

Manage Layout

Manage Layout allows you to change the current layout as desired and save it as a new layout.

Add Layout



Click **Add layout** to access the list of factory layouts. This function allows you to return a factory layout to the list if it has been previously or accidently deleted. Also, you can add other layouts not otherwise shown in the layout drop down menu like 3x1+4x4, for example.

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Delete Layout



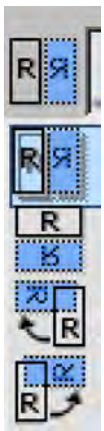
Select the layout from the list that you want to delete and click **Delete layout**. Deleted user-defined layouts are removed permanently.

Rename Layout



Rename layout allows you to rename the selected layout. A factory layout cannot be renamed.

Orientation



You can flip selected image(s) and section(s) horizontally and vertically and rotate clockwise and counter clockwise.

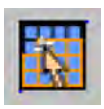
Selection

With the various Selection modes you can choose which images to manipulate.

This mode determines which image(s) are selected, not which image is active.

- An active image is within the selection.
- There can be only one active image.
- The Active image within the selection is marked with a blue border.
- Selected images are marked with a yellow border.

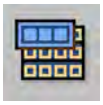
Select Remaining



Select Remaining allows you to select all the remaining images after the active image.

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Select Series



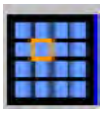
Select Series allows you to select a series.

Select All



Select All allows you to select all data.

Deselect



Deselect allows you to deselect images after using the previous three options, so just the active image is selected. Actions that can be performed in selection mode include:

Orientation	Pan
Delete	Zoom
Cut (not in Select All)	Windowing
Copy	Print
Save	Create series

Actions that can be performed based on the active image include:

Annotations	Print Active Image
Page Break (add/remove)	Paste (the active image locates where paste is performed)
Insert Parameter Image	Start series (the active image begins the first image of the new section).
Insert Blank Image	–

Additional Film Functions



To access additional Film functions, click the down arrow in the tab window, or hover the mouse over the tab window. The list of available functions displays.

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Film Series Tools

You can group images sent to the film viewer into a series. There can be a number of film series for each patient. Each film series can have its own print attributes (such as format) and may be treated differently with respect to layout, windowing. The Name column lists the series name. The Images column lists the number of images in a series.

Start Series

The Start Series options organize the way consecutive Series can be presented on the film. The various modes of the filming application control the placing of a Series on a page.

NOTICE

The section breaks are not affected by the layout selections. They are based on the Series.

Continuous Series



Allows you to place a series in a continuous section with no breaks.

NOTICE

The section breaks are not affected by the layout selections. They are based on the Series.

Next Row



If you have two series in the same row, this function allows you to move the next series images to another row.

NOTICE

The section breaks are not affected by the layout selections. They are based on the Series.

Next Page



Next Page - Allows you to place a Series onto the following page.

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NOTICE

The section breaks are not affected by the layout selections. They are based on the Series.

Create Series



The Create Series button makes the current selection of film images into a new series.

Film Format Tools

The Tools tab contains different tools that can be used to change the appearance of the images in a patient study.

Image Order

A section can have only one format. Choose one from the options (reorder, reverse, etc.).

Reorder



Allows the images to be dragged and dropped within the series.

Reverse



Reverses the order of images within the single section. Last becomes first and first becomes last.

Sort



Click the **Section Sort** button to open the dialog box. Sort the images in the active section according to the priority, the Sort by: parameters, and the sort direction. You can create, save and delete sort protocols.

Insert Page Break



Click this button to Insert a Page Break after the active image. When a page break is inserted the Remove Page break becomes active (use the drop-down arrow).

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Remove Page Break



Click this button to Remove Page Break after the active image. When a page break is inserted the Remove Page break becomes active (use the drop-down arrow).

Insert Blank Image



Insert a Blank image in front of the active image.

Insert Parameters

You can insert a parameter image before or after the active image.

Insert Parameter after Image



Insert a Parameter image after the active image. A parameter image has the patient information. You can have only one parameter per image. Click view mode and change the layout to better view the parameter image.

Insert Parameter before Image



From the drop-down, you can Insert a Parameter image before the active image.

Insert or Remove Row Break



Insert a row break after the active image. Remove the row break after the active image using the same tool.

Dual Mode



Dual Mode replicates each image in the active Series and displays it to the right of the original. In Dual Mode, if the page layout has an odd number of columns, then the last column in a page does not display. It is advised to change page layout to have an even number of columns before Dual Mode is turned on.

1. Click on an image in the desired series to duplicate it to make it active (blue border).
2. Click the **Dual Mode** button.
3. To view two different tissues or anatomical regions, Window and Zoom each of the groups separately.

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Cancel Dual Mode

From the Series list, select the series that has dual mode turned on. Click the **Dual Mode** button.

Multi Format Image



Use the Multi Format image function to select a number of images and combine them into a single image. The result is a secondary capture image.

1. Select the images to be combined into a multiformat page. You can hold down the <Ctrl> key to select multiple individual images. Hold down the <Shift> key to select a range of images.
2. Click the **MultiFormat** button. The MultiFormat Selection box opens.
3. Select the desired format.
4. Click **OK**.

Undo Multi Format Image



Click the drop down arrow at the Multi Format button. Click **Undo multi format image**.

Clone



Use the Clone function to copy the windowing, zoom, pan, enhancement, and inverse window parameters from one image (the “source”) to one or more other images (the “target”).

Edit Image

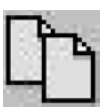
You can delete, cut, copy and paste images. Select the images you want to edit, then click the button for the edit function you want.

Cut Image



Click to cut the image(s) you selected. The cut image(s) remain in the cut/copy buffer and can be pasted.

Copy Image

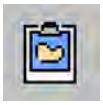


Click to copy the image(s) you selected. The copied image(s) remain in the cut/copy buffer and can be pasted.

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Paste Image



After cutting or copying image(s), select an image in the film display, following which you want to paste the images that are in the cut/copy buffer. Then, click to paste the image(s) you cut or copied.

Delete Image



Click to delete the image(s) you selected.

Set Up Printer for Film

From the Printers tab you can make a printer active, configure and define the settings of printers, set default printers. You can also print to client-defined Windows printers or a DICOM printer defined on the server.

Configure Printer is grayed out until you select a printer.

Your system administrator can remove the DICOM print privilege.

Supported Printers

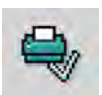
- DICOM color and black and white.
- Non DICOM network printers.
- Non DICOM printers directly connected to your PC.

Select Printer

The system may be connected to several printers. To select a different printer than the one currently set for your system:

- In the first box of the Printers tab select the drop down arrow. This opens the list of the available printers.
- Select the desired printer from the list.

Set Default Printer



Use the "Save as default" tool to set the current printer as the default printer. The next time you start the application, it defaults to the printer you made default.

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Configure Printer



Configure Printer is grayed out until you select a printer. The actual setting parameters vary, depending on the printer you select at your location. This selection brings up a configuration dialog for making the printer settings. Set the printer as desired.

Printing Images

To send image(s) to printer:

Note: If the Print button is disabled, refer to the Printers tab and select a printer.

1. Select a printer from the Printer drop down menu.
2. Define the Settings for the selected printer (such as dimension and orientation).
3. Select one of the following printing options:
   - Print — when selected, opens the Print dialog with the printing options (such as "All", "Current Page", "Selection", etc.) and enables sending image(s) to printer.
   - Print + Save — in addition to printing this option enables saving all of the images in either DICOM or Non-DICOM format and sending them to a selected printer or saving them to PACS.

     Note: "Page range" option only applies to printing.

Print History

The Print History stores copies of the last 10 previously printed patient studies. If you want to print additional copies of a previously printed patient, you can access the Print History and select a patient from the list.

Once more than 10 printed projects are sent to the list, studies are deleted in the order they were placed into the History, oldest first.

Print History list contains the following columns:

- **Name** shows the name of the patient.
- **Date** shows the date at which the patient study was printed.

Load Study from Print History



Go to the Print History tab. Select the patient study and click the **Load Patient** icon.

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Delete Study from Print History



Go to the Print History tab. Click the **Clear History** icon.

Delete Individual Study from Print History

Right click on the patient study. Click **Delete**.

Film Common Tools

The common tools area provides many basic functions, including saving, panning, zooming, and windowing. Common tools are, in general, common to all the Viewers, and are shared with many other applications of AVW.

Presentation States and Filming

Presentation states are supported in all viewing and clinical applications (except NM applications including 3rd party applications do not support presentation state).

- Save presentation states using the original images.
- Send images to filming. Filming supports images that contain presentation states.

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7 Report

Reports can be generated, edited, and printed in the Report application which you can access through the Report workflow button. Report allows you to change the report by editing the draft report after images and information from a given application have been stored in the Reporting database.

Report uses a basic word processing application. This allows you to make changes by using the functions of the application, and/or by using the options of the tool bars to the left of the report.

You can include information from the patient's scan into the report as well as add additional content such as:

- Analysis results.
- Sample images.
- Recommendations.
- Comments.

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NOTICE

The content of the Report depends on the Report template that was selected.

In the main viewport of Report is an image of the report as it will appear when saved and printed.

You can modify the report by adding new sections, choosing images to include, and make other changes to modify appearance of the final report.

NOTICE

A report is saved automatically as a draft in the Patient Directory throughout the editing process.

Along the top of the window are word processing tools.

Along the left of the window is the tool panel for selecting patient reports and determining other parameters you want to use for finalizing the report.

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Create Report

A report is not generated and cannot be edited until you send data or images from an application. Use this procedure to extract patient information from the current study into the Report application.

1. Click the **Report image(s)** button.
2. Select an option from the drop-down list. The list of options varies depending on the application you are using.
3. If the Patient History dialog opens, fill in all necessary information and click **OK**.

WARNING

Be careful when editing the Report. In some parts of the report it is possible to change analysis or patient information data received from an application.

Do not alter any feature of a data table or change any columns in the Findings section (but you may delete the entire Findings table).

Add Signing Physician

You can add, edit or delete a physician's name here.

1. Select **Physician Editor** from Signing Physician drop-down. Signing Physician Editor window opens.
2. Select **New** or **Edit**. The New Physician's Name dialog box opens.
3. Type in the physician's name. Once a physician's name has been added the Delete options become available.
4. Click **OK**. The name now appears in the Signing Physician drop-down.

Save Report

Reports can be saved as an Encapsulated PDF (DICOM embedded) or Secondary Capture file. PDF files are fully compatible and transferable to any PC equipped with Acrobat Reader software (version 5.0 or greater). Encapsulated PDF files contain a special DICOM file that allows them to be sent and viewed only by PACS systems that are configured to accept this type of file. Secondary Captures are DICOM files and can be sent to and read by any PACS or other DICOM system. Files can be saved to the CDR folder for recording to CD or DVD disks, or to any external drive.

NOTICE

It is the customer's responsibility to ensure that all reports that are exported or saved to external drives are signed via digital signature, as AVW has no control over reports that are exported to external drives.

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NOTICE

Report and screen images in this chapter are from various applications, and may differ from what you see on your system.

Approve Report

Approve report allows saving of the final report that can be sent to a PACS system. The Encapsulated PDF file is not accepted by all PACS vendors.

1. Click **Approve**. The Store Approved Report window opens.
2. Select **Save Type**.
3. Choose device. You can select more than one device at a time. Selected devices are highlighted in blue. To deselect, click the device a second time.
4. Click **OK**. The report is added to the Reports (DICOM Embedded PDF) or Series (Secondary Capture) tab in Patient Directory as an approved report.

Once a report is approved it cannot be edited or saved as a different file. Click **Refresh** in the Patient Directory if the report is not immediately viewable in either the Report or Series tab.

Print Report

Any Windows printer (not supplied by Philips Healthcare) is supported for printing reports. You can connect to a printer using a USB port or you can configure your application to a network printer.

To print a report, click the **Print report** button. Choose print properties. Printing of reports is done directly via the Windows printer queue.

Change Report Template

To change the template of the report (using the Template tool), you must change both the language and template before typing in the report to avoid losing all the manually entered data in the report.

Delete Report

A report can be deleted by either right clicking the report in the Patient Directory or from the Reports Tab in the Report application, selecting delete and confirming.

Patient List

At the top of the panel is a drop-down list of patients. To work on a specific patient's report, select the report from the list.

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Report Functions

In the middle of the tool panel are the function tabs, consisting of tools used to select, review, and edit reports.

Report Tab

The Reports tab lists the application and date of available reports for the selected patient.

Summary Images

Shows a preview of the image(s) sent from the clinical application. The images are also saved as DICOM files to the Directory in the series tab labeled Summary.

Use the scroll bar to navigate the summary images:

- Select image(s) by clicking on them. (To unselect an image, click on any area outside the image(s).) Selected images have a blue border around them.
- To select multiple images hold <Ctrl> on your keyboard and click the image(s) you want to select. The <Shift> key can be used to select a range of images in the Summary Images panel.

Save As Summary Images

Click this button to save the selected image(s). The image(s) are saved to the devices that are selected. This option allows you to name the image, change the image format (ex: JPEG or Secondary Capture), and select the target device.

Titles On and Off

By clicking this button you can turn the titles on the images either on or off. This will only remove the titles from the images sent to the report. Any saved images will still contain titles.

Add Selected Images to Report

Activated when image(s) are selected. Select the image to be added, then click this button. You can select individual images by holding down the <Control> key and clicking the desired images. You can select a range of images by holding down the <Shift> key and selecting the first and then the last image in the range of images to be added.

Add All Images to Report

By clicking this button you can add all of the images to the report. Images do not have to be selected.

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Edit Summary Images Layout

Choose layout, including size and placement of images. You can choose how to display the comments or captions on images using the custom option. Comments or captions can be placed on top, bottom, left, right or on top of image. Or you can choose image only with no caption.

Change Logo

You can choose which hospital logos to display. Logos can be loaded in Preferences. See section "Preferences" on page 165.

1. Click **Change logo** button, Change hospital logo window opens. Loaded hospital logos that are available display.
2. Choose logo.
3. Click **OK**.

You can also change the default logo by clicking on the **Set As Default** button. The new default will be saved to Preferences.

Insert Page Break

Page breaks can be inserted into reports.

Place the cursor in the document where you want the page break.

Click **Insert Page break** button, page break inserts. To remove a page break, place the cursor in the document where the page break was inserted and on your keyboard press either <backspace> or <delete>.

Insert Table

Place the cursor in the document where you want to add the table.

Click **Insert table** button to add table to the report.

The Insert Table dialog box opens. Define the table properties. Click **OK**.

Insert Picture

Place the cursor in the document where you want to add an image in the report.

Click **Insert picture** button.

Choose picture from your files to include in report.

Click **OK**.

Preset Text

Provides an option to create custom, predefined text for specific applications to include in a report.

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Create Preset Text for Report

Select application from drop-down for which to create text.

Click **Create a New Preset Text** button. Preset Text Editor box opens.

Enter Title, Category, and Preset text.

Click **Save**.

Preset Text now appears under specific application category in the Preset Text tab.

Add Preset Text to Report

This procedure adds the selected preset text to the report at the cursor location.

1. Select the preset category.
2. Select the preset title.
3. Place the cursor in the document where the text is to be place.
4. Click **Add Preset Text** button to add the text to the report.

Edit Selected Preset Text

Select the preset text category.

Select the preset text title.

Select the **Edit Preset Text** button. Make desired changes.

Click **Save**.

Delete Preset Text

Select the preset text category.

Select the preset text title.

Click **Delete the selected Preset Text** button.

A message appears for confirmation or deletion. Click **Yes**.

Show Thumbnails

Thumbnails can be turned on or off. Click the box next to show thumbnails. Shows the page thumbnails for the report and you can see how many pages are in a report. Click a page in the thumbnail to display a page of the report.

Form Mode

Form mode can be turned on to edit form fields in the report, for example check boxes. When Form mode is checked, the word processing functions are disabled.

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Select Report Language

Select the desired language to be used for the report. The language of your comments does not have to be the same as the language of the report template.

Access Reports from Directory

The right click menu for the report in the Patient Directory provides options relating to the report.

- View report.
- Finalize report (if still a draft).
- Print the report.
- Delete the report.
- Copy the report to a selected device.
- Export the report to a selected device.
- Send to multimedia viewer.

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IBE Report Export Option

The IBE Report Export option enables compliance with the HL7 (Health Level 7) document standard. The option enables hospitals to integrate findings from clinical applications into a finalized RIS report. The clinical report produced in the AVW application can be exported to RIS, HIS and EMR systems using the IBE option.

The IBE Export Report option requires a license. The feature is only enabled when the license is available

The status of the export report operation (success or failure) is logged to the logging repository as an event.

For additional information on IBE features, refer to section “Integration with Healthcare IT Systems” on page 161.

Exporting Reports

Exporting reports can be performed in two ways:

- **Auto send report to RIS in Read only format on Approval** option- When this option is enabled, all reports are automatically sent to RIS upon approval.
- **Context Menu** option - When **Auto send report to RIS in Read only format on Approval** is *not* selected, individual reports may be sent manually to RIS from the Patient Directory.

For additional information see section “Sending Reports to RIS” on page 146.

Configuring Auto Send

There are two options available for sending a Report to RIS. These options are:

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- **Send Report to RIS in Read only format on Approval**
- **Send Report to RIS in Editable format** - When this option is selected, you have the option to select the following:
  - **Send only Findings**
  - **Send entire Report**

These can be selected by navigating to the **Patient Directory** > **Preferences** > **Reporting**. This is a server level configuration applicable to all users connected to the server. Once this function is checked, all reports are automatically sent to RIS upon approval.

Sending Reports to RIS

Send Report to RIS in Read only format on Approval

Prerequisite: In order to use this function, the **Send Report to RIS in Read only format on Approval** button must be selected. The study must contain a Patient Identifier/Accession Number. If not included, it is not possible to export the report to RIS and an error message appears during export.

The **Send Report to RIS in Read only format on Approval** option can be set by navigating to **Directory** > **Preferences** > **Reporting**. This is a server level configuration applicable to all users connected to the server. Once this function is checked, all reports are automatically sent to RIS upon approval as defined in the settings.

1. Select a patient and load the patient study to the Advanced Visualization Workspace application.
2. Select the images.
3. Select **Send selected image(s) to report**

   A report appears.
4. Write the clinical report.
5. Once the report is completed, select the **Approve** button. Other options include **Send to RIS** or **Send to Dictation**, depending on the options selected in the **Reporting** page. If **Send Report to RIS in Read only format on Approval** was selected on the Reporting page, the other options will not be displayed.

   The Store Approved Report window opens.
6. In the **Save Type:** dropdown at the top of the page, select either **DICOM embedded PDF** or **Both Formats** and click **OK**.

NOTICE

Do not select the **Secondary Capture** option to export the report to RIS as it is not supported.

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A message appears in the message bar at the bottom of the screen with the report status (either **Report sent to RIS: RIS successfully** or **Exporting Report to RIS failed)** .

Context Menu Option

Reports can be exported one-by-one using the Context Menu (multiple selection of reports to export to RIS is not applicable).

Prerequisites:

- The study must contain a Patient Identifier/Accession Number. If not included, it is not possible to export the report to RIS and an error message appears during export.
- Reports must be approved before exporting to RIS. Draft reports cannot be sent to RIS.
- The **Send Report to RIS in Read only format on Approval** option should not be selected on the Reporting page (in Preferences).

1. Select a patient and load the patient study to the Advanced Visualization Workspace application.
2. Select the images.
3. Select **Send selected image(s) to report**

   A report appears.
4. Write the clinical report.
5. Once the report is completed, select the **Approve** button. Other options include **Send to RIS** or **Send to Dictation**, depending on the options selected in the **Reporting** page

   The Store Approved Report window opens.
6. In the **Save Type:** dropdown at the top of the page, select either **DICOM embedded PDF** or **Both Formats** and click **OK**.
7. In the Series (and Files and Reports) area, select the approved report.
8. Right-click on the report and select the **Export to RIS** option.

A message appears in the message bar at the bottom of the screen with the report status (either **Report sent to RIS: RIS successfully** or **Exporting Report to RIS failed**) .



The Export to RIS icon, indicating that the report was sent to RIS successfully, appears in the area at the bottom of the page displaying the series, files and reports connected to the current study.

If the export does not succeed, the Export to RIS icon will not appear for the failed report.

If the export fails, check the date and time stamp of success/failure for the all relevant report(s).

Resending a Report to RIS

If the report export fails, the report can be re-sent to RIS.

It is possible to resend a report that was previously sent to RIS. If a report is resent, a message appears informing you that the message was sent to RIS earlier and asks if you want to send it again. Select **Yes**. This message appears for successfully exported reports only and not for failed reports.

To resend a report:

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1. From the Series (and Files and Reports) area, select the approved report.
2. Right-click on the report and select the **Export to RIS** option.

NOTICE

The resent report should be saved as a new report in the external system.

Exporting to Dictation Systems

AVW requires a license for integration with PowerScribe 360.

The **Send Findings to Dictation** option must be enabled on the **Reporting** page under **Preferences** in order for this feature to work.

1. Click the  Send Findings to Report button.
2. Click the  Open Reporting button at the top of the screen.

   The application displays all results generated by the applications.
3. Click the **Send to Dictation** button to transfer to PowerScribe 360.

   Only table values and the text of Findings are transferred. Images are *not* transferred.

   PowerScribe 360 automatically detects that the new values are available. Once **OK** is selected, the values are inserted into the PowerScribe 360 report.

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8 PACS Integrations

Advanced Visualization Workspace can be integrated with your PACS. Applications Integrated via PACS work independently of Advanced Visualization Workspace. There are two types of integration: close integration and URL integration. Close integration is with iSite, Sectra and MDC, all other integrations are URL.

NOTICE

Depending on the version of your third-party application, some features described in this section may not be available.

Generally, most functionality of Advanced Visualization Workspace is available wherever a PACS-integrated application is running.

NOTICE

The PACS plug-in must be installed and configured before it can be used. Please contact the Advanced Visualization Workspace administrator or your Philips Healthcare representative for more information.

Launch AVW from PACS

Launching AVW from different PACS can be configured in several ways. Configuration is done when installing the system and according to the PACS limitations.

One option is when a button is defined: after choosing the data you would like to load to AVW, click on the customized button and Advanced Visualization Workspace will be activated.

Another option is through the context menu: right click on the data you would like to load to AVW and a context menu opens, with the option to launch AVW (in specific versions you can even select the application you would like the data to load on to).

NOTICE

When using the Advanced Visualization Workspace application, it is important to note the following:

- Preferences are saved for each PACS user.
- Workflow tabs available are: Preferences, Review, Analysis, Film, and Report (the Directory tab is not available).
- When an analysis application is activate, switching to a review application is by clicking on the Review tab.

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Film and reporting are enabled in Advanced Visualization Workspace when integrated. Additionally, integration includes the following features:

- Automatic Login: no need for Advanced Visualization Workspace user name/password.
- Login information for each user (ID, login time, logout time) sent to Advanced Visualization Workspace.
- Preferences are saved for each PACS user.
- Results images and bookmarks can be saved back to Advanced Visualization Workspace and PACS.
- The Advanced Visualization Workspace Client opens with the selected data straight to the selected application: no Patient Directory.

PACS Study Selector

When Series selection is not available from your PACS, or when there are additional Series available for the selected Study (in the AVW server) a **Study Selector** window will popup. The pre-selected study and series will be highlighted. You can add and\or change your Series selection.

It is possible to sort, search and filter the columns for selected series.

The study selector shows the selected studies in the top panel.

The middle panel shows all relevant series for the selected study in the following tabs: Series, Bookmarks, Automatic Series and Key Image Notes.

NOTICE

To load results, the Results Series should be selected with its relevant original Series.

There are two types of series with different values in the **Location** column:

- **Location column = AVW** : This means series are available on the Advanced Visualization Workspace server.
- **Location column = Archive**: This means series are available only on the PACS.

Loading series with a **Location = Archive** value is the same as loading from a **remote** device (it is slower).

Results


Studies/Series that contain results.


Studies/Series that do *not* contain results..


Unknown whether Studies/Series contain results.

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Bookmarks

You can only load one bookmark to an application. Loading other series with a bookmark is not possible. If you select a state containing several bookmarks, only the most recent bookmark will be loaded.

When launching a bookmark, the system automatically selects the relevant application. It is not possible to select an application when launching a bookmark (all applications are deactivated in the Study Selector).

NOTICE

In order to load a bookmark only a single bookmark can be selected.

Automatic Series

When launching automatic series, the system automatically selects the AutoBatchPreviewer application.

It is not possible to select an application when launching an automatic series (all applications are deactivated in the Study Selector). The original series and the last pre-processing result are launched automatically to AVA. When exiting the AutoBatchPreviewer application, the AVA application closes automatically.

Key Images

When launching key images, the system automatically selects the Key Image Notes (KIN) viewer application. It is not possible to select an application when launching Key Images (all applications are deactivated in the Study Selector.

NOTICE

The Study Selector is not closed when launching the KIN Viewer.

Automatic Saving

When you save bookmarks, results, etc., the system will automatically save the results back to PACS and local storage.

NOTICE

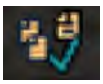
Automatic Save to local storage is done only if the study is also on a local device.

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Priors

With the Study Selector open, click on the **Show Priors** button. The system will search for available priors for this patient in the source device (e.g. PACS), as well as in Advanced Visualization Workspace local devices.



Prior studies are added to the studies panel and are marked with the priors icon.

By default, studies appear in descending order by Study Date, with the most recent study appearing on top.

Prior studies are identified by Patient ID and Patient Name.

PACS Film and Report

NOTICE

Film and Report cannot be opened directly from Study Selector without first opening an application.

Film and reporting are enabled in Advanced Visualization Workspace when integrated. The integration supports AVW's Film application for viewing, arranging, windowing, zooming, and annotating filmed images prior to sending them to print. The integrations also include the following:

- Automatic Login: No need for Advanced Visualization Workspace user name/password.
- Login information for each user (ID, login time, logout time) sent to Advanced Visualization Workspace.
- Preferences are saved for each PACS user.
- Results images and bookmarks can be saved back to Advanced Visualization Workspace and PACS.
- The Advanced Visualization Workspace Client opens with the selected data straight to the selected application: no Patient Directory.

PACS Compression Settings

Within each application, the compression can be adjusted as needed for performance.

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WARNING

The Advanced Visualization Workspace system can display both lossless and lossy compressed images. The user's ability to analyze images depends on the quality of the image data that the user intends to analyze. Lossy/irreversible compression affects the quality of the image. The user is responsible to ensure that the image's quality is adequate enough for the review purpose.

Patient Mismatch Handling

The system determines a match based on the patient name and the patient date of birth by comparing the information stored in PACS and in AVW. If a patient mismatch is detected for the same Series, the system will display a message requiring you to either continue or cancel. For example, if the same Series has a different patient name in PACS and AVW, you must actively choose to launch the Series in AVW.

PACS Preferences

You can set default viewing preferences such as window presets and the way patient information displays on the images.

PACS Monitor Settings

Using the Preferences, configure which monitor to open the application on. You can select between single and multiple monitors. The preferences are configured similar to that of the AVW client. To change the monitor preferences, launch AVW and select the **Monitor** option on the login page.

PACS Preferred Language

Advanced Visualization Workspace is launched in the language configured in the PACS. If AVW does not support the language configured in PACS, the default language is English.

Exit AVW Application (PACS)

Close the open application (Review and\or Analysis). Close Advanced Visualization Workspace client using **Exit** button. Launch Advanced Visualization Workspace with a new study: a warning message will pop up and previously opened study will close.

In some PACS, when you exit the client PACS Advanced Visualization Workspace closes as well.

Right click on the **Advanced Visualization Workspace** icon in the taskbar and select exit.

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Vue

Vue PACS allows users to launch Advanced Visualization Workspace applications from the Web-client and Desktop application.

Launch AVW from Vue

It is possible to launch AVW from the Archive explorer, Vue explorer (Web) and viewer (in addition to global or customized worklists).

For Vue 12.2.8 and above:

1. Right-click on a study or thumbnail.
2. From the menu, select **Philips Application (External applications)** and select the desired application.

The selected Study/Series automatically opens in the desired AVW application. If additional series are found in AVW, use the Series Selector to add them when loading the application.

Right-clicking on a bookmark launches AVW automatically.

Exit Application - Vue

In addition to the general exit instructions, see section “Exit AVW Application (PACS)” on page 153.

For Vue 12.2.8. and above you can also Exit from Vue (close).

Synchronization between the two applications occurs to ensure that Advanced Visualization Workspace closes.

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iSite

Advanced Visualization Workspace can be launched as part of Custom iSite Applications.

NOTICE

Depending on the version of your third-party application, some features described in this section may not be available.

Advanced Visualization Workspace applications are available from iSite Radiology (the work station) and from Enterprise (the web-client or desktop application).

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Loading Series with a Large Number of Images

If you are having problems loading a Series with a large number of images, an iSite administrator may need to change settings on the iSite server. Typically, the administrator should ensure the **Maximum Cache Size** (check the **Advanced** box on the **Export** tab) exceeds that of the largest Study you want to launch in iSite.

Launch AVW from iSite

It is possible to launch AVW from the shelf bar and Series Selector pages (in addition to the Work List). For iSite 4.5 and above: Right-click on a study or thumbnail, select **Philips Application** from the menu and, then choose the desired application.

The selected Study/Series will automatically open in the desired AVW application. If additional series are found in AVW, use the Series Selector to add them when loading the application.

If you right-click on a bookmark it launches AVW automatically.

For older versions of iSite, you can launch AVW from the shelf bar, thumbnails, and Work Lists.

Launch AVW from iSite Shelf Bar



To launch from the shelf bar, right-click on the grey bar and select **Philips Advanced Visualization Workspace** from the context menu (for iSite 4.5 and above, the applications list appears).

Load Multiple Series

In iSite, you can select multiple Series using **<Shift+left mouse button>** clicks.

Exit Application - iSite

In additional to the general exit instructions [see section “Exit AVW Application (PACS)” on page 153], you can also Exit from iSite (close). Synchronization between the two applications occurs to ensure that Advanced Visualization Workspace closes. When the iSite image window is closed, or when you exit iSite, Advanced Visualization Workspace automatically closes.

MDC

Advanced Visualization Workspace is integrated with MDC. The MDC PACS plug-in allows users to launch Advanced Visualization Workspace applications.

NOTICE

Depending on the version of your third-party application, some features described in this section may not be available.

Launch AVW from MDC

For MDC version 3.1 and above, the integration supports loading multiple Studies of the same patient into an AVW application.

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Launch AVW from MDC (Version 3.1 and Above)

After you select a patient (from the Patient List), right-click on the relevant Study (in the Study List). In the context menu, select **Clinical Application List** and select the relevant application.

In the new **Series Selector** window, select the relevant Series and click **OK**.

NOTICE

In MDC versions prior to 3.1, launch AVW using the button in the Image Viewer.

NOTICE

Data from multiple patients is not supported.

Exit Application - MDC

In additional to the general exit instructions [see section “Exit AVW Application (PACS)” on page 153], for MDC 3.1 and above you can also Exit from MDC (close). Synchronization between the two applications occurs to ensure that Advanced Visualization Workspace closes.

For versions before 3.1, exiting from Advanced Visualization Workspace when the PACS client exits, is possible using the cmd line configuration option **PacsProcessName**.

Sectra

Advanced Visualization Workspace is integrated with Sectra. The Sectra PACS plug-in allows users (version IDS7 and up) to launch Advanced Visualization Workspace applications. The integration supports loading multiple studies or series (of the same patient) into an AVW application. IDS5 also supports PACS integration. See section “Launch AVW from Sectra” on page 157.

NOTICE

Depending on the version of your third-party application, some features described in this section may not be available.

NOTICE

By default the Study ID and Accession Nr. are switched for its value by the Sectra PACS. This is a known behavior of Sectra PACS and it can be corrected via a configuration in the PACS. Please contact the administrator of Sectra PACS for correcting this behavior.

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Loading Series with a Large Number of Images

If you are having problems loading a Series with a large number of images, a Sectra administrator may need to change settings on the Sectra server. Typically, the administrator should:

1. Go to the `C:\Program Files\Sectra\Image Servers\config\config\qrscp\def` This path may be different depending on your installation.
2. Open the `qrscp` text file and search/go to the section called **Default values for all SCP processes**.
3. Under that section look for the attribute `scp_args < -n XXXX>`. Replace the `XXXX` with an appropriate number.
4. Save and Restart the server.

Launch AVW from Sectra

Advanced Visualization Workspace can be launched as part of Sectra (version IDS5 and up).

Launch Single Study or Series from Sectra

1. Select a patient from one of the worklists in the information window of the PACS client.
2. Select a study from the Worklist panel.
3. Double click on the desired study to open in the image window.
4. Right click on one of the displayed images to open a context menu. Use the **Clinical Applications > Philips Advanced Visualization Workspace: Launch** option.
5. The Series Selector dialog pops up with a list of all Series and the available applications to choose from.

Launch Multiple Series from Sectra

Loading multiple series is similar to launching a single series. However, the **Clinical Applications > Philips Advanced Visualization Workspace: Multi Select** option enables you to load multiple studies of the same patient.

1. Select a patient from one of the worklists in the information window of the PACS client.
2. Select a study from the Worklist panel.
3. Double click on the desired study to open in the image window.
4. Right click on one of the displayed images to open a context menu. Use the **Clinical Applications > Philips Advanced Visualization Workspace: Multi Select** option.
5. Repeat the previous steps for all series you want to load into AVW. The selected series is added to a list. The list is hidden until you are ready to launch the AVW application.
6. When done loading series, right click on one of the displayed images to open a context menu. Use the **Clinical Applications > Philips Advanced Visualization Workspace: Launch** option.

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7. A dialog pops up with a list of all series for that studies and the available applications to choose from.

Loading Different Sectra Patients

Loading multiple series from different patients is not supported. If you attempt to load multiple patients, the system will ask you if you want to replace previously selected series.

Click **Yes**. The system will automatically replace the previously loaded patient and save the current patient.

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9 Launching DynaCAD for Interventional and Non-interventional Studies

When using DynaCAD applications in Advanced Visualization Workspace-integrated mode, DICOM data sent from scanners to the AVW database is selectively (rule-based) transferred to the DynaCAD database, which takes several minutes and causes a delay in image availability for the medical staff.

The image becomes available for analysis only after the data is completely transferred.

To avoid this issue, when the image is required quickly (as in the middle of a biopsy), use the DynaLOC applications. These send DICOM data from the scanners directly to the DynaCAD database in addition to sending it to the AVW database. For relevant DICOM images, remove the rules for transferring from the AVW database to the DynaCAD database.

When configured as detailed in the Installation document (by a Field Service Engineer):

- Data can be transferred to the AVW and DynaCAD servers simultaneously from the scanner.
- After the transfer has been completed, the DynaCAD application can be launched from the AVW server or the Philips DynaCad application.
  - For non-interventional studies, launch DynaCAD through AVW to view the images.
  - For interventional studies launch the DynaCAD application from the Invivo Dynacad Client (using the DynaCAD icon on the desktop of AVW client machine).

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10 Integration with Healthcare IT Systems

Patient Demographic Updates and Reconciliation

Rich Demographic Updates

This is an Advanced Visualization Workspace licensed option which is enabled by default when the IntelliBridge Enterprise (IBE) license is available.

It can be manually enabled via Preferences on the **Patient Information** page. To enable this option, place a check mark in the **Automatically update Patient Information from Hospital Information Systems** check box to enable automatic updates.

This feature allows Advanced Visualization Workspace to maintain additional patient demographic information, (such as Patient ID, Name, Birth Date, SSN, Visit Information, Allergies) and keep it up to date with the latest information from HIS/EMR systems. Any updates made to patient information in HIS/EMR systems are also reflected in Advanced Visualization Workspace. All studies that belong to a specific patient, are updated with updated information, across all local folders in AVW. Patient demographic information is displayed in the Patient Bar in the application or via the **View Patient Info** Context Menu in the Patient Directory. Updates to patient information is only reflected if the studies for that patient are not in use in any application or preprocessing job. When patient information is being updated, users cannot start any application using the study.

Reconciliation

This option enables the reconciliation of patient information and keeps it synchronized with the latest information from HIS/EMR systems. The patient information updates are sent by HIS/EMR systems as HL7 messages. Advanced Visualization Workspace uses IntelliBridge Enterprise (IBE), which receives Patient Demographic changes/updates from incoming HL7 Admission Discharge and Transfer (ADT) messages and makes the respective updates/corrections in the Patient Database. This reconciliation occurs only when no application/user has loaded the study. The updates occur for patient records located in any of the local folders associated with AVW. When a patient record has been reconciled, access to this patient information reflects the latest updated information.

Example: In the event of an emergency situation in which a patient's ID is not known, a patient will be assigned a unique patient ID with a temporary name. If this option is enabled, once the patient's name is identified, IBE will check the database to see whether there is any information on this patient. If there is any information, IBE will send the information to Advanced Visualization Workspace. AVW will update the information for this user. A red icon appears in front of the Patient Name in the Patient Directory for studies already read, indicating that patient information has been updated.

Prefetch using Scheduled Orders

For additional information, see section “Prefetch Using Scheduled Orders” on page 198.

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Integration of Reports with RIS/EMR

It is possible to launch the EMR Viewer from the Advanced Visualization Workspace Client. AVW transfers the context of the Patient to the EMR Viewer, to ensure that the EMR Viewer displays the detailed results for the patient, which is opened on AVW Client.

While creating reports, it is possible to access the RIS/EMR systems to get the clinical context. However while creating reports, the findings from AVW need to be included. The reporting systems typically have capabilities to include the observations from various healthcare systems in the form of HL7 messages. To be able to export the findings from AVW to reporting systems as HL7 messages, AVW uses IntelliBridge Enterprise (IBE). Using the IBE option, AVW sends the findings information to IBE in a custom XML format and IBE converts this into HL7 messages, which are then transmitted to the reporting and/or EMR systems. The report is then stored into the EMR as a part of the patient's medical record.

Report Integration with the Power Scribe System

Report Integration with PowerScribe enables the sending of Advanced Visualization Workspace report findings from AVW to the PowerScribe dictation system. This feature requires a license and is only enabled when the license is available.

The **Send Findings to Dictation** option appears in the Report Editor. Clicking this button sends the findings present in the currently active report to the PowerScribe system.

Pre-requisites

- In order to use this function, the license must be present.
- The **Send Findings to Dictation** option must be enabled in AVW. To enable the option:
  - Click the **Preferences** button in the Patient Directory and select **Reporting** from the left side of the screen.
  - In the Reporting page, select **Send Findings to Dictation** and click **OK.**
- Studies must contain an Accession Number. If a study does not contain an Accession Number, findings cannot be sent to PowerScribe 360.
- A draft report must be present in the PowerScribe client to enable AVW to send findings to PowerScribe.

Sending Findings to Dictation

1. Load a patient study to an application and create findings in the application.
2. Send the findings to Report using the option **Send Findings**.
3. A report appears to fill in clinical or history information. Complete the report as required and click **OK**. Findings are sent to the report application.
4. Go to the reporting application. The findings should appear in the report that were sent from application.
5. If the findings are correct, then click the **Send Findings to Dictation** button.

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If the report findings were sent successfully, the message **Send Report Findings to PowerScribe System succeeded** appears in the Status Bar.

If the report findings were *not* sent successfully, a notification message appears in the status bar indicating the reason for failure.

NOTICE

Each time findings are sent from the AVW Reporting application, each study with a specific accession number will be replaced with the latest findings or results in PowerScribe 360 client. As a result, only the latest findings can be seen in PowerScribe client for a specific Accession number or study.

Discreet Report Integration with Hospital Reporting Systems

It is possible to export discreet finding information from Advanced Visualization Workspace applications directly to an external supported reporting system of the hospital.

The following applications support this feature:

- Comprehensive Cardiac Analysis (CCA)
- Transcatheter Aortic Valve Implantation Planning (TAVI)
- MR Cardiac Suite
- Multimodality Advanced Vessel Analysis
- CT Calcium Scoring
- Lung Nodule Assessment

Refer to the IFU of the specific application for assistance in activating this feature.

The trigger can be enabled/disabled inside the application based on the support available for that application in the hospital reporting system. This can be done in the AVW Management Tool configuration page, where IBE configuration is performed. In order for this feature to work, a license for IBE is required.

IBE performs an export to the configured external reporting system in the required format for that reporting system.

All the applications will export the findings in an application specific XML model, which can be used by an end reporting system after conversion by IBE.

This XML file will also be stored on the AVW server for a certain period (default is 14 days) which is configurable. For configuring IBE, the existing configuration page will be used to configure the IP address , port and also enabling which applications can allow this export.

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WARNING

You must verify all values exported from AVW applications to external report prior to performing any analysis on the report or finalizing the report.

You are responsible for ensuring that the results in the report are consistent with application values.

Failure to do so may result in erroneous values in reports, which may lead to a possible misdiagnosis.

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11 Preferences

The Preferences utility is used to access and modify your system's configuration setup. In Preferences you can adjust certain definitions of the system to fit your organization's specific needs and to make your system more user friendly.

All applications in Advanced Visualization Workspace are influenced to some extent by the preference settings. Some preferences are specific to one or more applications, and some apply system-wide.

The Preferences utility is launched from the Archive Manager in the Directory (the Preferences button is located near the bottom of the main tool panel).

To use Preferences, select a Preference category from a list, as shown at left. Only one Preference window can be opened at a time. When you are done viewing and/or setting preferences, use these buttons to finish:

- **Default.** Set the current preset to its factory default values.
- **OK.** Save all changes and exit the Preferences utility.
- **Cancel.** Discard all changes and end the Preferences work session.

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NOTICE

Unavailable fields are grayed out or hidden. Archive functions are not available while Preferences is in use. Some fields do not have a default value and will not be changed by the default button.

Patient Directory Preferences

These preference settings allow you to configure Patient Directory presets.

Auto Delete Old Studies from Local Folder

Activates the auto delete function (for the Local drive).

Always Use Sub Selection

Selecting this option opens the sub-selection feature whenever any application is launched.

Display Warning before Closing Application

By default you will receive a warning message when you try to load a new study into an already opened application. An option within the warning allows you to check "Do not show [this message] again." If you have turned the warning off, re-check this preference to re-display the warning.

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Display a Warning When Launching Application on Incomplete Dataset

If this option is selected and the user attempts to load a Study currently in transfer, the following warning appears: **The dataset you are trying to view is still being transferred. Viewing an incomplete study could lead to incorrect diagnosis! Do you still want to proceed?**

Select **OK** to load the application or **Cancel** to stop loading the study.

Device List Configuration

There are 3 types of Devices: local, remote, removable. (Note: USB devices are not shown in the devices list.) You can set these preferences on the folders:

- Change the order of the folders within each category only by drag and drop manipulations.
- Change the color of a folder using a right click on the folder (local devices only).

Display Transferred Icon

This preference allows you to select which devices and folders display a “Transferred” icon in the Directory. Click the **Select Devices** button to see the list of devices. Then select the desired devices (or folders), and then click **OK** to confirm the selection.

Display Free Space on Toolbox

You can have the amount of free memory space in the CDPrep folder displayed in the Patient Directory window.

Number of Recently Used Applications

You can specify the maximum number of applications shown in the “Recently Used” icon display.

Set Number of Studies Displayed

To change the maximum number of Studies displayed in the Patient Directory, go to **Directory > Preferences > Patient Directory** and scroll down to the “Max. studies to display” option. use the up and down arrows to change the number or type the desired number in the field.

Display Series Tab as Default

When enabled, if a new study is selected in the worklist, the **Series** tab is selected by default so that the Review/Analysis tabs are enabled, with the ability to select an application to launch the study.

This option is enabled by default.

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Windowing Preferences

These preference settings allow you to configure windowing presets for all applications that display images acquired in the CT, MR, and PET modalities. Use this preset to access the windowing levels modification (Name, Center, Width and Keyboard Short cut) for the system's presets. The Name, Center and Width of each preset can be changed. To change a field click on the field and type in the desired value.

NOTICE

To set preferences for Nuclear Medicine applications, see NM Preferences.

You can add your own presets, up to 20 total.

Allowed Values of Presets

Center: -1024 to 4095

Width: -1024 to 4095

Name Fields

Name fields can contain any combination of characters.

Delete a Windowing Preset

Click in the name field and delete it by highlighting it and pressing the keyboard <Delete> key. The entire row including Center and Width are also deleted.

Add or Edit Windowing Preset

Click in the name field and type in the desired name.

Enter the desired Center and Width values.

Click **OK**.

Restore Windowing Presets

Click **Default** to revert to factory settings.

Image Title Preferences

Any image titles that are selected to be displayed appear in bold type in the Image title list.

Image titles are displayed along the edges of viewports, and include patient and hospital information, and scan data.

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Some Image Titles are displayed in the viewports by default, as delivered from the factory.

Changes you can make to the display of image titles include removing titles from the display, adding new titles from a list of available titles, and determining where in the viewport you want titles to display. (Image titles for CT, MR, PET and SPECT modalities are provided in separate lists.)

Add Image Title to Viewport

Click on the desired title in the list of titles and drag it to the desired location. The title will appear in red text in the preview image.

Determine when Title Is Displayed

Use the Show title selector to determine when the title will be shown:

- **Always.** Displays in every viewport.
- In medium and large view ports.
- In large view ports only (too many titles may obscure the patient image in smaller viewports).
- **Never.** Select this to remove the title from all viewports.

Move Title Location in Viewport

Click on the title in the Title preview viewport and drag it to another location. A blue box surrounds the location where the title is positioned. (You can also remove a title from the preview image by dragging it back into the list.)

Ruler Display

You can have the ruler display in the image viewports according to the same parameters as Show titles: always, in medium and large view ports, in large view ports only, and never.

Measurement Preferences

These preference settings allow you to configure presets for Measurements.

NOTICE

To set preferences for Nuclear Medicine applications, see NM Preferences.

Show Coordinates when Drawing a Cursor

In addition to the normal displayed parameter when you draw a cursor, you can have the cursor's X and Y positions displayed.

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Show Ticks on Line

You can have a line displayed with ruler-like tick marks.

An ROI Should Measure

Set what the ROI measurements should measure.

- Average (HU).
- **STD.** Standard deviation.
- Minimum Value.
- Maximum Value.
- Area.
- Perimeter.
- **Effective diameter.** From the area of the ROI, the system calculates the diameter of a circle that has the same area as the ROI (unchecked by default).

Select Diameters

Once set, the measurement is displayed in the viewport along with other ROI-annotation information.

1. Go to **Directory > Preferences > Measurements**.
2. Check the **Select diameters** box in the "An ROI should measure" section.
3. Select one of the following: **Maximum & minimum diameters**; **Long & short axes**; or **Long & short axes via ROI centroid**.
4. Click **OK**. You may need to reopen the application for changes to take effect.

Check the **Show diameters graphics** box in Preferences to always display the diameter lines.

Set ROI Diameter Measurements - Right-click Menu

1. Load a study in any viewer or application.
2. Select an ROI tool (for example, Auto contour), and draw a new ROI.
3. Right-click the ROI annotation, go to **Properties**, and select either **Max & Min Diam**, **Long & Short Axes**, or **Long & Short Axes via centroid**.
4. To show the ROI diameters in the viewports, right-click the ROI annotation again, go to **Graphics properties**, and select **Show Diameters**.

Maximum & Minimum Diameters



The maximum diameter is calculated as the maximum diameter within the ROI passing via the ROI centroid. The minimum diameter is calculated as the minimum diameter crossing the centroid of the ROI (see illustration below).

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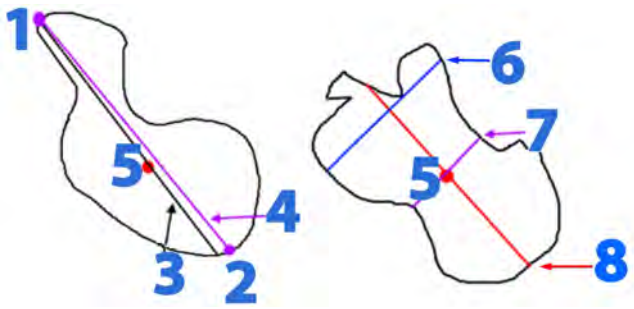
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Long & Short Axes

The long axis is calculated as the maximum diameter within the ROI connecting between the two farthest points on the ROI. The Short Axis is calculated as a diameter perpendicular to the maximum diameter (see illustration below).

Long & Short Axes via ROI Centroid

The long axis is calculated as the maximum diameter within the ROI connecting between the two farthest points on the ROI crossing the ROI centroid. The Short Axis is calculated as the largest diameter perpendicular to the maximum diameter and crossing the ROI centroid (see illustration below).



1. Farthest point on the ROI.
2. Farthest point on the ROI.
3. Maximum Diameter crossing the Centroid.
4. Maximum Diameter connecting the two farthest points (numbers 1 and 2).
5. Centroid.
6. Maximum Short Axis.
7. Short Axis passing the Centroid.
8. Maximum Diameter.

Default Graphic Color

You can change the displayed color of the measurement graphics (text, lines, calculated values) to blue, green, yellow, red, or white.

Default Text Size

You can select the desired size of the text of measurement data. Available sizes are small, medium, and large.

Show Manual Contouring Tools

The contouring tools can be made available in all, select, or none of the applications. Icons of the manual contouring tool are shown next to the selection box. These tools are named Flexi Contour, Edge Finder, Auto Contour, etc.

Save Images Preferences

Within each the application you can save your work. In Preferences, you can select the default storage device(s) to which your work will be saved.

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Default Save Devices

You can define one or more of the devices configured for your system as the default save location.

- One (or more) of the devices configured in the system.
- The device from which the images were loaded.

The selected device(s) are highlighted.

Click on a device to select it. Or: click on a selected (highlighted) device to un-select it.

Add Philips Logo to Movie and Image

This preference is on by default. It places the Philips logo on the bottom left corner of images and movies.

Segmentation Highlight Preferences

Segmentation is a function that allows you to control the viewing of a volume based on tissue definitions. Segments can be turned on or off in the display to make selected anatomical structures visible or invisible.

Segmentation presets are tissue definitions (Center and Width values, with a Name) that have been provided from the factory or were created by a user and saved. (You can create additional presets within various applications, including the Volume mode of the CT Viewer.)

Three Segmentation Presets automatically are provided when the system is shipped from the factory, Bone, Air, and Body.

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Setting Preferences

You can modify segmentation presets by clicking in the field and changing the names and Center and Width values.

You can also create new segmentation presets by typing names and values into blank fields.

The range of Segmentation Preset values are:

- Center: -1024, 4095
- Width: -1024, 4095

Reporting (Option) Preferences

Reporting is an option and this section may not be available. In addition, your AVW configuration may also effect which applications support reporting.

The Reporting feature of the Advanced Visualization Workspace allows you to create customized patient reports using pre-formatted templates. The following sections describe the functionality of the Report Template Editor application.

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A template is a specially designed formatting document that places the patient information, scan information, and images that you send from an application into an attractive, organized report. Reports are fully customizable and can be stored or printed for both internal and external use. Reports can be created in various languages. Templates can be created and modified in the Template Editor.

Change Report Logo

Change Report Logo allows you to change the default "hospital logo" that is automatically placed in your reports.

You can select your own image for the hospital logo portion of the report. There are two Philips' logos provided, one of them is set as the default logo. You can import your own logo and set it as default. The file type for hospital logos can be TIFF or JPEG, although JPEGs are recommended. Your organization should standardize the size and height/width ratios of the image(s) used as logos. This allows the hospital logos to be interchanged without having to re-size them.

Logos can be imported directly from a CD, DVD, floppy disk, USB drive, or other device accessible by your Advanced Visualization Workspace system, or can be loaded to the D: drive and imported from there.

Use this procedure to add a logo or set a default. (A logo is not required in a report.)

1. Click **Preferences**.
2. Select **Reporting** in the category tree.
3. Click **Change Report Logo**. The Logo Configuration box opens. This is where you can add a logo and set a default logo.

Add Logo

1. Click **Add Logo**.
2. Click **Browse**, select logo image file window opens.
3. Find, select and open the image file.
4. Enter a Logo Name.
5. Click **Add Logo**, logo is added to Logo Configuration.

Set Logo as Default

Click on one of the images in the logo configuration box to use as the default logo. The default image is highlighted with a green border.

Click **OK**.

Create Single Report Per

- **Study**: Click **Study** to generate a Combined report where reports can be generated for multiple applications.

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- **Application**: Click **Application** to generate reports per application only.

Factory Templates

Standard report templates (“factory templates”) are provided by the system manufacturer for many Advanced Visualization Workspace applications. Factory templates are supplied in many languages in addition to English.

- You cannot modify or delete a factory template or change its name.
- You can modify (edit) a factory template to create a user-defined template (with a new name) or you can create a completely new template in any of the supported languages.
- You can create a new template section and save it for future use in report templates.

Default Templates

A default template for a clinical application is the one that is used to create a report when you send data/images from the clinical application to report. There can only be one default template for an application. When you send data/images to Report, they are automatically sent to the template designated as default.

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Change Default Template

The default template is the one that the system will automatically use to generate the report from data you send from your currently running application.

1. From Reporting in Preferences click **Edit Report Templates** to launch the Template Editor. The Select Applications screen displays. See section “Use Report Template Editor” on page 178.
2. Select the application for which you want to change the default report template. (More than one application can be selected if you want to change the default templates of more than one application.)
3. Click the **Forward** button.
4. Select **Set Default Template**.
5. From the Default Template drop-down, select the report template you want to designate as the default template.
6. Click the **Forward** button. The template is now the default, and the Template Selection screen opens.

Custom Templates

In addition to using the factory templates supplied with your system, you can create and save your own template designs.

Designing and creating a new report template is a complex procedure. Unless you are trained in editing Advanced Visualization Workspace templates, it is recommended that you consult with a Philips factory representative before starting to edit or create a new report template.

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Do not alter any feature of a data table or change any columns in the Findings section, but you may delete the entire Findings table.

Auto Load Images to Report

Set this preference if you want to load the summary images directly to the report.

Open Comments when Sending Images to Report

You can set this preference to open a text dialog box for adding your comments when you are sending patient images and data to the Reporting application.

Save Approved Report Format

You can set this preference to save approved reports as either:

- DICOM embedded PDF file.
- Secondary Capture (DICOM file that can be sent to PACS).
- Both Formats.

Export Approved Report Format

You can set this preference to export approved reports as either: PDF or RTF.

Display Draft Reports for Time Period

Select this preference to display the draft reports for a specific time period. The available options are:

- One week
- One month
- Three months
- Six months
- Year
- All records

Select Image Format When Sending Images to Report (and to summary images series)

- **Secondary Capture**: Default option
- **Original**: When selected, non-square viewports with zoom or panned images may be cropped inside the report.

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NOTICE

This setting is applied to CT Applications and a subset of MR applications.

Select Applications

The Select Applications allow you to select one (or more) of the applications whose template(s) you want to edit.

Select Template

The Template Selection screen allows you to Create New Template, Edit Template or Set Default Template.

Create New Template

The Create New Template screen allows you to select from a list of template sections that exist for the reports associated with the selected application, create a user defined section, or edit a selected section.

WARNING

Be careful when creating new template sections or editing a report. It is possible to create a section or change a section that could affect the Findings or Patient Information data received from an application. Do not alter any feature of a data table or change any columns in the Findings section (but you may delete the entire Findings table).

Use Factory Sections to Create Template

Use this procedure only when you want to create a report using sections already supplied by the factory.

1. From Reporting in Preferences click **Edit Report Templates** to launch the Template Editor. See section "Use Report Template Editor" on page 178. The Select Applications screen displays.
2. Select the application for which you want to create a new report template. (More than one application can be selected if you want to create new templates for more than one application.)
3. Click the **Forward** button.
4. Click **Create New Template**.
5. Select the desired language from the drop-down list.
6. Click the **Forward** button. The Create New Template screen opens. The left column has a list of the factory-designed sections (and user-designed sections, if any) appropriate to the application you selected. The right column is blank.

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7. In the left column, click a section you want in the new template.
8. Click on the right-pointing arrow to move it to the right column. (To return a section to the left column, click the left arrow.)
9. Repeat step 7 for each section you want to include.
10. Arrange the section order as you want them to appear in the report by highlighting the sections and moving them up or down with the up and down buttons.
11. Click the **Forward** button. The Report Template Editor displays. See section "Use Report Template Editor" on page 178.
12. When done editing, click the **Forward** button. The Save Report Template dialog box opens.
13. Enter a new Template Name and select the Report Type.
14. Click the Forward button to exit.

The new template, after saving, is not the default template. Use the Set Default Template Procedure to select a new default template.

Use Custom Sections to Create Template

Use this procedure only when an existing factory section is not available that suits your needs.

WARNING

Be careful when creating new template sections. It is possible to create a section that could affect Findings or Patient Information data received from an application. Do not alter any feature of a data table or change any columns in the Findings section (but you may delete the entire Findings table).

1. From Reporting in Preferences click **Edit Report Templates** to launch the Template Editor. See section "Use Report Template Editor" on page 178. The Select Applications screen displays.
2. Select the application for which you want to create a new report template. (More than one application can be selected if you want to create new templates for more than one application.)
3. Click the **Forward** button.
4. Click **Create New Template**.
5. Select the desired language from the drop-down list.
6. Click the **Forward** button.
7. Click Create New Section on the bottom left of the Create New Template screen. The Report Template Editor will be launched.
8. Use the selection boxes in the left column of the template editor to insert your desired components in new template section you are creating. See section "Use Report Template Editor" on page 178.

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9. When done editing, click the **Forward** button. The Save Report Template dialog box opens.
10. Enter a new Template Name and select Report Type before exiting.

The section you created and saved will appear in the list of sections available for the application you selected. To edit a selected template section refer to workflow above. However, instead of selecting Create New Section from the Create New Template screen, select Edit Selected Section.

Edit Existing Report Template

Use the Template Editor tools to edit a template. See section “Use Report Template Editor” on page 178.

WARNING

Be careful when editing a report in Template Editor. In some parts of the report, it is possible to change Findings or Patient Information in the template that could effect data received from an application. Do not alter any feature of a data table or change any columns in the Findings section (but you may delete the entire Findings table).

1. From Reporting in Preferences click **Edit Report Templates** to launch the Template Editor. The Select Applications screen displays.
2. Select the application for which you want to create a new report template. (More than one application can be selected if you are creating more than one template. Selected applications are highlighted in blue.)
3. Click the **Forward** button.
4. Select **Edit template**.
5. Under the list of Existing templates, click the desired report template.
6. Click the **Forward** button.
7. A warning message appears. Click **OK**. The Report Template Editor displays. There, you can make changes to the template. See section “Use Report Template Editor” on page 178.
8. When done editing, click the **Forward** button. The Save Report Template dialog box opens.
9. Enter a new Template Name and select the **Report Type**.
10. Click the **Forward** button and then Click **Exit**. The template is saved and will now appear in the Existing Templates list for the specific application.

NOTICE

By clicking the Back button at anytime you will be prompted to confirm your decision. If you confirm, any changes will be lost. The system requires you to name your template. You cannot rename a Factory template.

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Use Report Template Editor

Use the Edit Report Templates function in Preferences to:

- edit existing templates for a given application;
- create new templates for your specific reporting needs; and
- change the default template for an application.

A template is a specially designed formatting document that places the information and images that you sent from the application into an attractive, organized report.

There are two parts to the Template Editor. The large window on the right shows the report in its editable form along with all available editing tools. The column on the left provides the template editor tools explained in the next section.

Report Template Editor

The Report Template Editor is your last work step from these functions:

- Edit existing template(s).
- Create new template.
- Create new section.
- Edit selected section.

There are two parts to the Template Editor. The large window on the right shows the report in its editable form along with all available editing tools.

The column on the left provides the template editor tools explained in the next section.

Insert Heading

Place the cursor in the document where you want to add the section heading.

Click **Insert Heading** button to insert a section heading.

Type a name in the blue section heading if desired.

Insert Table

Place the cursor in the document where you want to add the table.

Click **Insert table** button. The Insert Table dialog box opens.

Define the table properties by selecting Table size & AutoFit behavior.

Click **OK**.

Insert Check Box

1. Place the cursor in the document where you want a checkbox in the report
2. Click Insert **Check Box** button.
3. To access form field options window, double click the checkbox.

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4. Choose settings from the available form field options.
5. Click **OK**.

Insert Text Box

1. Place the cursor in the document where you want a text box in the report.
2. Click **Insert Text Box** button.
3. To access the text box selection form field options box, double click the text box selection field.
4. Choose options, click **OK**.

Insert Picture

Place the cursor in the document where you want an image in the report.

Click **Insert Picture** button. Insert picture window opens.

Choose picture from your files to include in report. Click **OK**.

Insert Field

1. Position the cursor where desired in the template.
2. Scroll to and highlight the field to add.
3. Click the yellow **Insert Field +** button.
4. Repeat as desired. You can add or delete from this list.

Set Summary Image Layout and Location

This creates a location and layout for patient images sent from the application, from 1x1 (one patient image) up to 4x4, as well as custom layouts up to 10x10 with comments.

1. Position the cursor where desired in the template.
2. Choose the desired layout. The selected image layout is added to the report.
3. If the custom layout was selected, the Summary Image Layout Dialog opens.
4. Select the format of the caption and the number of columns to be displayed.

Insert Section

This is a list of factory and user-defined sections that you can insert.

1. Position the cursor where desired in the template.
2. Highlight the section to add.
3. Click the yellow **Insert Section +** button.
4. Repeat as desired.

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Filming Preferences

Use the Filming Preferences to display the Film View Header and Footer. For administrators, set the FilmView preferences to determine number of pages allowed to be filmed.

Film View Header and Footer Information

These preferences allow you to define what information (“annotations”) appears in the header and footer of the film, and what size the annotations will have and where on the page they will be located.

Film Annotation Preferences

An annotation is a “title” that you can select to automatically appear in the header or footer of every film page that you create (for example, Patient Name, Patient ID, and Gender). Annotations may added or removed by clicking and dragging the “title” to or from the list.

Annotation Position

You can determine where each of the annotations will appear. Each annotation may be placed in the right, middle, or left header or the right, middle, or left footer position.

Some annotations like Logo and Page Number may only be located in either the header or footer.

Auto Size Image Titles

Enable this option to automatically size titles.

This option prevents image titles from showing a cut series number without a slice number (when using a 5 x 7 format).

Auto Size Header and Footer

You can limit the size of the header and footer. Alternately, you can select Auto Size Header and Footer, and the system will automatically adjust them.

Header and Footer Fonts

There are two font styles to choose from. You can select different font sizes and can choose to make the font Bold or Italic.

Header and Footer Logo

The logo may appear only in the header. You can select the desired logo using the Change Logo function, and you can set the logo’s size anywhere from 5 to 300.

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Page Numbers

The page number may appear only in the footer. You can select the desired format: number only, or page "3 of 5," for example.

System-wide Header and Footer Settings

You can set Header and Footer information to "Apply Defaults to all users." The Clinical Administrator has the option to mandate the defaults to all users.

Return Header and Footer to Factory Default

To return to the factory default settings select **Default**.

FilmView Preferences

Administrative users can either set the maximum number of pages that can be filmed per patient or determine the default layout used when printing.

1. Go to **Directory > Preferences > Filming** and scroll down to the Film View Preferences menu.
2. Set the maximum number of images allowed for printing.
3. Use the radio buttons to select either the maximum number of pages (for example, 2 pages) that can be printed or select the default page layout. The value entered must be between 1 and 100.

Maximum Number of Pages Allowed to Film per Patient

When the "Maximum number of pages allowed to film per patient" option is selected, the system will take the number of images sent into the film application and automatically determine the best layout for filming.

NOTICE

It is possible for a user to override the default settings when a request to film exceeds the maximum allowable pages. To override, the user must manually accept a warning. When an override is performed, a note in the system log is generated.

Default Page Layout for Filming

The "Default page layout for filming" option is used to control how the filming output is presented. Setting the default layout does not prohibit users from changing the layout in their printed film.

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NOTICE

The “maximum number of pages allowed” and the “Default page layout” options are mutually exclusive. Both options may not be activated at the same time.

Licensing

Your Advanced Visualization Workspace system consists of both Permanent applications and applications which can be Temporarily Licensed.

A Temporary License allows you to activate (for a 60 day trial period) any of the optional applications that are not currently installed on your system.

Permanent Licenses

This window displays a list of all permanently licensed applications included in your system.

Temporary Licenses

Displays a list of all applications that are available for temporary license. When the trial period is over, the temporary license for the new clinical application expires and it will no longer be available for evaluation. Contact your Philips Sales representative for purchase information about permanent licenses.

Application Preferences (Viewing Applications)

On this Preferences page you can set specific preferences for some of the Advanced Visualization Workspace applications. You can set these preferences only for the Viewing applications for which your Advanced Visualization Workspace page is licensed.

- **Force applications to use GDI+rendering** checkbox - When enabled, the system uses GDI + rendering if there are issues with Direct X.
- **Volume Angle Display** checkbox - Set this preference if you want the angle to be displayed as an image title at the bottom of the volume viewport.
- **Save RT Structure Sets as dense contours** checkbox - When enabled, the saved RT structure sets can be uses as dense contours.
- **Predefine Text for applications** - This is used to configure user defined text or labels that will appear in an application. Select the desired application from the dropdown list and select **Add**, to add text.

Spectral Application Settings

- **Burn Spectral label on image pixel data for all spectral image types when saving images** checkbox
- **Block measurements (which will block windowing as well)**
  - **Add warning regarding units of measure when saving non-HU based images** checkbox

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- **Automatically save "Spectral Info" as DICOM image when saving** checkbox
- **Show a "balloon" notification on top of the image every time Spectral result is displayed within Spectral application** checkbox - If checked, shows a distinctive visual marker upon displaying a Spectral result. This can help differentiate Spectral results from conventional results.

Spectral Pre-processing Settings

- **Burn Spectral label on image pixel data for all spectral image types when saving images** checkbox
- **Block measurements (which will block windowing as well)**
  - **Add warning regarding units of measure when saving non-HU based images** checkbox
- **Automatically save "Spectral Info" as Dicom image when saving** checkbox

Advanced Vessel Analysis Preferences

- You can set the increment of cross-sectional images (from 1 to 10).
- You can open the stent protocol editor of the analysis volume of the user manual set.
- When loading MR cases, place a check mark to start AVA in the Vessel Extraction stage by default.
- Place a check mark to enable Multi-Batch.

Dental

Protect Calibration parameters with password checkbox.

Comprehensive Cardiac Analysis Preferences

In this set of preferences, you can set the following parameters:

- Default Axial slab thickness of the main image in Segmentation stage.
- Default short axis images thickness in Functional stage.
- Default number of short axis images in Functional stage.
- **Default mode of Coronary Analysis**: Select which mode of Coronary Analysis stage in CCA you want to have open automatically: Coronary Analysis or Plaque Analysis. Plaque Analysis is the default setting.
- **Automatically disable vessel Label confirmation workflow**: Used to disable vessel label confirmation workflow. When enabled, the following message appears: **Factory Protocol is set on manual vessel confirmation workflow. When vessel label workflow is disabled, it is recommended to review the automatic vessel labels and ensure labeling accuracy manually.**
- **Automatically confirm vessels' labels when saving, filming or reporting images**
- **Enable automatic labeling of small vessels (Diagonal, Septal, Ramus Intermediate and obtuse marginal branches)**: Used to disable automatic labeling of small coronary vessels.

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- **Use new coronaries algorithm**: This is the default mode of the Coronary algorithm. It this option is not checked, the legacy coronary algorithm will be applied for coronary segmentation.
- **Enable 3D, Globe view display aligned to axial orientation**: Used to align 3D Global view display with axial image orientation for coronaries. The default mode of Globe Sphere, 3D map views are displayed aligned to the volume viewport in coronal orientation.

Cardiac Viewer Preferences

In this set of preferences, you can set the following viewing parameter: Default Axial slab thickness of the main image in Slab stage. The maximum Slab thickness is 400mm.

Calcium Scoring Preferences

Use the **Report images with seeded ROI's** checkbox to send all axial images, on which calcium was seeded, to the Report function when you click the Report Results button in Calcium Scoring. The images are sent consecutively, in ascending order.

Use the **Show the MESA percentile for the nearest supported age (45 for younger, 84 for older) by default** checkbox to automatically select the nearest MESA supported age option in the Patient Information dialog in the Calcium Scoring application.

Use the **Show MESA results for all 4 ethnicities by default checkbox** to show the MESA percentile info for all the ethnicities option selected in the Patient Information Dialog in the Calcium Scoring application.

COPD

Set default LA volume parameters:

- **Threshold for Threshold** - HU
- **Threshold for Percentile** - %
- **Share with all users** checkbox

Users with Administrative privileges can set these changes for all Users.

Interventional X-Ray

Show Interventional Bookmark checkbox : When selected, Interventional Bookmarks are displayed.

TAVI

- **Series description for Vascular Scene**: Allows users to enter a series description for the Vascular Scene.
- **The default distance from the Annulus plane to the Ascending Aorta plane**: Allows users to enter the default distance from annulus plane to the ascending aorta plane.

  Administrative users can share this default value entered with all of the users of the site.

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When an administrative user enables this option to share with all users, individual user preference value are overwritten by the Site preference value.

3D Print

This allows the selection of a 3D Print Vendor. Add the user email and password for the print vendor account.

Two Phased Application Launch

When an application is selected, this enables two-phased application launch to save time during application launch. This feature is available for Longitudinal Brain Analysis, Multimodality Viewer and Magic Glass applications.

CT Viewer

- **Enable High Image Quality during scrolling** - When selected, this enables high image quality during scrolling. This may result in slower scrolling performance. Users with Administrative privileges can set these changes for all Users.
- **Activate Automatic Registration and Link for Compare**: Used to enable automatic registration and link for compare.
- **Show Delta From Axial angle on main MPR image in Slab mode**: Activate the check box to enable the angle display. The Delta from Axial angle is (0,0,0) for axial (Transverse) orientation. When rotating the main image, the angle represents the change relative to axial.

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Regional Settings

Use the Regional Settings preferences to configure your Advanced Visualization Workspace for your country, region, and hospital preferences.

Online help is available in multiple languages, independent of the Program Language (selected at login). Use the **Operation Manual Language** drop-down to select an online help language.

Use the **Keyboard Languages** drop-down to select a different keyboard language.

To make the Regional Settings go into effect, Logout and restart the Advanced Visualization Workspace.

Processing (Option) Preferences

On this Preferences page you can make settings that control the detection (by reading DICOM parameters) of studies that may qualify for Processing (processing is the automatic removal of Body bone or Skull bone before the study is loaded into the application).

Processing is an available system option. Your system must be licensed for its use.

Computer memory must be sufficient for Processing. A message displays if your computer has insufficient memory to perform the Processing function.

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The Enable Processing function in this Preference page was previously located in the Patient Directory Preferences page.

Enable Processing

Check this box to activate the “zero-click” Processing option.

Leave this box unchecked if you do not want Processing to be performed automatically.

Smart Processing

The **Smart Processing** option enables preprocessing based on prior usage of the server.

When **Smart Processing** is selected, the system begins learning user preprocessing preference behavior. Once user habits are learned, **Smart Processing** begins.

The learning process occurs (in the background) over a period of time.

The **Learning Status** is displayed, along with an icon and tool tip, as described below.

- **In Progress** 

  The tool tip informs the user that **Smart Processing** is still learning usage habits and that preprocessing will operate according to the default rules set in Preferences (see section “Select Processing Detection Mode” on page 186).

- **Finished** 

  The tool tip informs the user that **Smart Processing** finished learning. In addition, the date and time of the most recent learning is displayed.

Place a check mark in this box to activate the **Smart Processing** option.

Leave this box unchecked if you do not want Smart Processing to be performed.

Select Processing Detection Mode

If you enable Processing, you can choose to run Processing as follows:

- Operate according to system default settings.
- Run Processing according to the following [protocols].

If you select both options, the system will first employ the system default settings to detect qualified studies. If the system settings fail to identify the studies, then the user-configured settings will be used.

Define Custom Detection Parameters for Processing

User-configured detection is based according to the Protocol Name under the following rules:

- The Modality should be CT.
- The series should have contrast.
- The Image type / SOP class UID: should be any SOP class which is not a secondary capture.

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A table is presented on the Preferences page for you to configure your desired detection methods. Below is an example of the user-defined table:

Protocol	Algorithm
CTA ABDOMEN (ELS)/CTA	Skull removal
CTA ABDOMEN (ELS)/CTA	Bone removal
NewProtocol	Skull removal

You can Add and Delete rows in the table. A scroll bar becomes available if you add more rows.

You can type text into the Protocol name column and can also cut and paste. (Ideally, you should copy the text from the image parameters dialog (CTV-2D)/ protocol name field.)

You can select the appropriate algorithm from a combo box menu.

If you enter the same protocol name on a new row, the following message appears: "The protocol name <protocol name> is already in use, it has an algorithm assigned to it. Please do the required changes in the relevant row."

Any changes you make in the Processing preferences page become effective immediately after you click the OK button in Preferences.

If you have Enabled Processing and have not selected either the system default method or the user-configured method, and click OK, the following message appears: "Please select the settings you wish the Processing to run on."

In the Patient directory/Series grid context menu, the "Bone Removal" and "Skull Removal" context menu options are always displayed regardless of the Processing detection method that is chosen in the Preference page.

Detecting Studies for Processing (AVA bone & skull removal)						
Modality = CT						
↓						
Acquisition = Helical						
↓						
Contrast - Yes						
↓						
Scan type	→	Body Routine Abdomen Chest Chest fast Liver	CTA Aorta CTA gated CTA PE CTA Renal CTA Runoff	CTA Carotid CTA COW	Head Neck	Other Scan Type Empty
		↓	↓	↓	↓	↓

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Detecting Studies for Processing (AVA bone & skull removal)					
Protocol Group	CTA	↓	CTA	CTA	↓
	↓	↓	↓	↓	↓
Run Algorithm	Body Bone Removal	Body Bone Removal	Skull Removal	Skull Removal	None

Pre-processing Configuration

For CT applications, the automatic data processing may be manually set using the following parameters: algorithm name, protocol name, procedure description, series description, and body part. To change the default behavior, make the change to the application preferences.

Login Preferences

You can set the Image Compression preference in this dialog window.

You can change your Password from a dialog window that opens.

Also available are options for setting the User Interface for Resolution and for showing the dialog for Minimum Requirement Verification.

Set Monitors / Application Windows

Any application window may be hidden or viewed using the minimize or maximize features of your computer's operating system.

To control which screen is used when an application is launched, use the Set Monitor preference either when launching the AVW client or by going to **Directory > Preferences > Login > Set Monitors**.

MR Application Preferences

NOTICE

MR application preferences can only be changed by an Administrator or a Clinical Administrator.

1. Click **Preferences** in the **Directory** screen to open the **Preferences** dialog box.
2. Click the **MR** expander in the list of preferences on the left side of the **Preferences** dialog box, and then click a category to display the preference settings.

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Processing Preferences

MR Processing preferences allow you to manage the settings for registration processing of data. When processing is enabled, intra-series registration is performed automatically when a series is imported to the Advanced Visualization Workspace system.

Automatic registration registers all volumes of a multi-dimensional MR series with the first volume in that series, and then saves the registered series with the study.

Processing can be enabled or disabled independently for the following types of registration:

- **Dynamic Registration**: rigid intra-series registration that is appropriate for fMRI data and Perfusion data.
- **Diffusion Registration**: affine intra-series registration that is appropriate for DWI data and DTI data.

The types of series to be applied for processing must be specified, leaving other series types unaffected.

By default, processing is disabled for both registration methods.

1. To enable processing for a registration method, select **Enable** below the registration method.
   ⇨ After enabling processing for a registration method, you must add a rule for each type of series that you want to apply processing to.
2. To add a processing rule, do the following:
   - Click **Add**.
   - Select a registration method in the **Algorithm** column.
   - Type a series description or protocol name (according to DICOM attribute definitions) in the **Protocol / Series Description** column.

NOTICE

You need to enter the full text of the description or protocol name. Partial matches are not supported. However, the text does not need to be case sensitive.

NOTICE

You can add multiple rules for each algorithm. If a series matches at least one rule, it will be processed. If no rules are present, processing is not performed, whether or not processing is enabled for the registration methods.

3. To remove a processing rule, select the rule and click **Remove**.
4. Optional step: to remove the original data after processing, select **Delete original series**.
   ⇨ Removing the original data after processing keeps the **Directory** clear of duplicate series.

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NOTICE

Before selecting **Delete original series**, ensure that the original data is always archived in another location, for example, a PACS. If processing does not provide good results for a series type, remove the processing rule for that series type, restore the original data from the archive, and then perform registration during analysis using the workflow steps of the analysis package.

⇨ Changes to processing rules take effect immediately; you do not need to restart the Advanced Visualization Workspace system.

Data Loading Preferences

MR Data Loading preferences allow you to define the scope of series selection when opening a study in a viewing package or an analysis package.

By default, the scope of selection includes *all* series in a study, irrespective of whether a subset of series is selected when the viewing package or analysis package is started.

However, depending on the configuration of your system, a large study might not load properly (a system message is displayed to inform you). In this case, clear the **Use study level selection** check box in the **MR Data Loading Preference** screen. You can then make a selection of specific series in the study and load only those series.

NOTICE

If you choose to select individual series from a study, ensure that you select *all* series that are required for analysis.

For example:

- To launch MR SpectroView, you need to explicitly select the original series and the anatomical reference series.
- To launch MR Permeability, you need to explicitly select the original series and the reference series.
- To open multi-vendor split series in MR Neuro Perfusion, you need to select all the split dynamic series to launch the application.

When you make a selection of multiple series and start an analysis package, only the selected series are displayed in the series browser. To add a series to an analysis after the analysis package has been started, right-click the series in the **Directory** and click **Add to running application**.

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Anatomical Reference Preferences

MR Anatomical Reference preferences allow you to specify the anatomical series that are considered for co-registration when co-registration is applied automatically during the analysis workflow.

1. To add a series to the list, click **Add** and enter the series description or the acquisition protocol name for the series.
2. To remove a series from the list, select the series and click **Remove**.

NM Preferences

Click **Preferences** to open the Preferences window. Expand the **NM Preferences** category.

NOTICE

The following Preferences are for Nuclear Medicine applications only.

Click the appropriate subcategory to view and change the associated preferences options. When you have finished working with the preferences, choose:

- **OK** to accept changes to the current properties;
- **Default** to reset the current properties to their factory settings; or
- **Cancel** to cancel changes to the current properties.

Windowing

Preference	Description
Windowing Model	Associates selected modalities with either an UpperLevel/LowerLevel or Window/Center windowing model.
Colormaps	Select the colormaps to use in the viewer from the list of available color mapping options. Those colormaps that are not selected are not available when you open the viewer.
Color Display	Set color display options by image modality for images displayed as single, reference, and floating.
Colormap Import	Import colormaps from external sources such as CDs or flash drives.

Viewing

Preference	Description
Activity Units	Show Activity Units in Bq (Si) or Ci (Traditional).

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Preference	Description
Display	Click in the box to change the units shown for height and weight. If the box contains a check, height and weight are shown in units of cm and kg. If the box does not contain a check, height and weight are shown in units of inches and lb.
Dynamic Image Compression Factor	Specify a compression factor.

Annotation

Preference	Description
DICOM Annotation	Specify minimum and maximum font sizes, font color and default annotation level.
Patient Info Banner	Specify whether to show the Patient Info Banner and what fields to display in the banner.
Orientation Label	Specify the default color and font size for the orientation label, and chose whether to show the label.
Graphic Text	Specify the default font size.
Predefined Text	Select an application from the drop-down list and type your predefined text into the box below the drop-down list. The text is associated with the application currently selected in the list. Specify the color for the text.

Tools

Preference	Description
Layout Management	Specify whether to import or export the selected layout for the NM Viewer. Click Browse to find layout files on the system or a USB device.
ICMT Extraction Settings	For NM Planar, when the "Enable Extraction with Acquisition Time" checkbox is enabled, the following is calculated: *Content time = Procedure start time + (Extracted Frame number) * actual frame duration* This checkbox is disabled by default (current time is considered as "Content time").

PET Preferences

Click **Preferences** to open the Preferences window. Expand the **PET Preferences** category.

NOTICE

The following Preferences are for Nuclear Medicine applications only.

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Click the appropriate subcategory to view and change the associated preferences options. When you have finished working with the preferences, choose:

- **OK** to accept changes to the current properties;
- **Default** to reset the current properties to their factory settings; or
- **Cancel** to cancel changes to the current properties.

Windowing

The NM Viewer windowing preferences allow you to associate data combinations with specific layouts.

NOTICE

The Pet Display Values preference listed below is similar to preferences shown in the Advanced Visualization Workspace Regional Settings Preferences window. However, the preferences listed below only apply to NM applications, while the preferences shown in the Regional Settings Preferences window only apply to CT applications. The windowing preferences you set here are not applied to CT applications.

Preference	Description
PET Display Values	Click to set the PET display values as SUV, Count, or Activity/Volume. The viewer defaults to SUV as its display value.
SUV Method	Click to select Body Weight, Lean Body Mass, or Body Surface Area as the default SUV method. Use SUV Body Surface Area or Body Mass Index only when patient gender, height and weight data was filled in during the acquisition. If this information is missing and you select either of these SUV Methods the system prompts you to enter the missing data. **References for calculating the SUV:** Body Surface Area--Wang Y, Moss J, Thisted R. Predictors of body surface area. J Clin Anesth. 1992; 4(1):4-10 Lean Body Mass--James WPT. Research on obesity. London. *Her Majesty's Stationery Office.* (ISBN 0-11-4500347). 1976. Body Mass Index--Eknoyan, Garabed (Jan 2008). "Adolphe Quetelet (1796- 1874)—the average man and indices of obesity." *Nephrol. Dial. Transplant*. 23 (1): 47–51.
Expanded PET Window/ Level	Click to set which PET window level to expand. Expand allows stretching of the grayscale. Expand Upper Level is used for Brain studies. Expand Lower Level is used by experienced users for specific applications.
Control Model	Define the cursor motion from the drop-down list and choose whether or not to invert your selection.
PET Scaling	Set the SUV Maximum scaling value at between 0.1 and 10.

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Preference	Description
Alpha Blending	Selecting the checkbox changes the appearance of the underlay with fused images. This is the default selection. You may want to deselect this checkbox when viewing SPECT images in order to obtain an aesthetically, more pleasing image. If you are not satisfied with the appearance of the lower level of the underlay, then deselect **Apply Threshold** for Alpha Blending.

Viewing

Preference	Description
3D Value Tools	Specify the Cursor Tool Diameter and the Sphere Diameter in mm. Additional statistics can be set to display when the cursor is active.
Display	Select checkboxes to display grams per milliliter (GML) as SUV and to display the timeline from newest to oldest. **Note**: GML is a specific measurement unit term that is used in place of SUV. This setting applies a small conversion factor to the GML data and changes the annotated units from GML to SUV. The source data must have the GML DICOM flag set in the header.
Initial Statistics Graph Display	Display Mean or Max.
Image Scrolling	Set the number of pixels the mouse must move before the screen will jump to the next image. Select Head or Feet to set the direction for the mouse scroll button from the Cursor Up drop-down window.
MIP	Adjust the depth weight and depth weight mode (exponential or linear).
Triangulation Cursor Type	Select the type of triangulation cursor you want to display on the images. You can choose to have the cursor display as Cross Hairs, Cross Line, or Cross Lines without a center. You can also choose to display the Cross Lines and Cross Lines without a center cursors in black and white only.
Initial Statistics Table Display	Display Mean and/or Max.

Tools

Preference	Description
Control Panel	Check the **Auto-Hide** box to start the NM Viewer with the Control panel in Auto-Hide mode.
Save All Format	Select a format for the Save All function. Set this to data if your receiving system can accept image data for the desired modalities.
Save Secondary Capture As	Select the file/frame combination that your viewing system can handle. Single Frame will produce multiple files each consisting of a single frame. Multi Frame will produce one file which consists of multiple frames.

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Preference	Description
Secondary Capture Type	Select RGB or Grayscale for the secondary captures.
Saving Range	Select the saving range.
Cardiac/Neuro	Select Square images if your cardiac and neuro studies should be saved as square images for viewing on those systems that require the X,Y pixel spacing to be the same.

Layouts

Preference	Description
Quick Layouts	Allows you to specify five groups of Quick Layouts. The names of the groups can be changed by double-clicking a Quick Layouts tab. Each group can contain up to four user/factory defined layouts. These layouts are selected from a drop down list. Once configured, these layouts will appear as always-available options in the Layouts section of the Control panel.
Layouts	Select which of the available layouts you want to use in the NM Viewer. Those layouts that are not specified as in use will not appear in the **Layout** panel in the Control panel when you open the viewer.
Multi-Study Launch Mode	Select **Use Comparison For Multiple Studies** to automatically start the viewer in comparison mode if appropriate data is selected at launch.
Data Characterization	Make a selection from the Orientation, Scan Phase, Parametric, and Cardiac State drop-down lists. Type any partial or full text that may be included in DICOM data to help characterize the data. The viewer uses the entries to match the data for display and linking.

ROI

ROI preferences control the appearance and annotation of ROIs drawn in viewers.

NOTICE

The Units preference listed below is similar to preferences shown in the Advanced Visualization Workspace Regional Settings Preferences window. However, the preferences listed below only apply to NM applications, while the preferences shown in the Regional Settings Preferences window only apply to CT applications. The ROI preferences you set here are not applied to CT applications.

Preference	Description
Statistics	Select which statistics to show with ROIs and the type of units.

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Preference	Description
Units	Specify whether to display ROI units in Counts, SUV or Activity Concentration.
Auto-SUV	Set the Auto SUV threshold value as **SUV ROI** or **SUV % of Max**. If you select **SUV % of Max**, you can adjust the % Max Points To Average.
Text Position	Choose where your selected statistics will display in relation to the ROI.

Automatic Registration

Preference	Description
Registration/Review Workstep Layout	Specify the default layouts for the registration and review worksteps.
Floating/Reference Image Point Color	Specify the default colors for floating and reference image points in Match Points registration.
Auto Start	Select the check box to automatically register images when you launch the registration workstep.
Save NM As Next Matrix Size	Select the check box to save registered NM data at a standard matrix size. The application increases the matrix to the next standard size, for example, 64×64, 128×128, and so forth. If you do not select this preference, then the registered NM data saves at a minimum matrix size that is determined from voxel size and re-sampled image field of view.

Prefetch Preferences

Prefetch configuration is only available to administrative users with system-wide access.

To configure Prefetch go to **Directory > Preferences > Prefetch Settings**.

General Prefetch Preferences

These settings apply to both automatic and manual Prefetch:

Preference	Option
Where Shall Priors Be Fetched From?	Select the PACS from which the Prior Studies should be retrieved. The option displays all PACS configured via the AVW LanConfig. You may select up the 3 PACS for Prefetch.
Maximum Studies to Retrieve Priors	Select the number of Prior Studies in the Prefetch. The default value is 3. A maximum of 10 may be configured.

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Preference	Option
Criteria for Identifying Matching Patients	Select the DICOM tags to be used for matching patients: • Patient ID • Patient Name • Both Patient ID and Patient Name • Custom options for Patient Identification or matching criteria – Patient Name: First Name, Last Name, Dot, Hyphen, Space – Patient ID – Date of Birth – Sex

Prefetch Upon Study Arrival Preferences

Configure the Prefetch settings as a set of one or more rules. Each rule should identify the eligible studies for which Priors are required and identify the relevant Priors which need to be fetched from PACS. Some helpful rules may be set to:

- New MR studies which have Procedure as BRAIN fetch the priors of MR, CT and NM for the last 2 years (Study Date Range).
- New CT studies which have Body Part as ABDOMEN fetch the prior MR and CT studies which have Body Part as ABDOMEN.
- New NM studies with Procedure as CARDIAC fetch All the Priors of last 5 years (Study Date Range).

The set of factory default rules may also be helpful when defining new rules.

Select the **Prefetch Upon Study Arrival** tab to configure.

Preference	Option
Fetch Priors Upon Study Arrival	Check the box to enable prefetching based on new Study arrival.
Interval for Accessing Modality Worklist	Define how prefetch identifies a new Study: • Last 2 days • Last 5 days • Last 10 days • Last 1 month
Applied Rules for Fetching	Use the buttons to add, disable, or delete rules. Multiple rules may be configured. To add a new rule: 1. Click **Add New**. 2. Define the parameters for identifying eligible Studies that require Priors for Postprocessing and reporting. Use any combination of Modalities, Body Part Examined, Procedure, or Series Description. 3. Define the parameters for identifying the relevant Priors that need to be fetched from PACS. Use any combination of Modalities, Body Part Examined, Procedure, Series Description, or Study Date Range (for example: last 6 months; last 1 year; last 2 years; last 5 years; or all).

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Prefetch Using Modality Worklist Preferences

Configure the Modality Worklist (MWL) query settings as a set of one or more rules. Each rule should identify the eligible Modality Worklist for which Priors are required and identify the relevant Priors which need to be fetched from PACS. Some helpful rules may be set for:

- All MR exams which are scheduled for Today and tomorrow fetch all the MR, CT and NM Priors.
- All CT exams which are scheduled for Today fetch all CT and MR priors of the last 5 years.

The set of factory default rules may also be helpful when defining new rules.

Select the **Prefetch Using Modality Worklist** tab to configure.

Preference	Option
Fetch Priors Based on Modality Worklist	Check the box to enable prefetching based on the MWL.
Devices Providing Modality Worklists	Select the RIS or PACS device you want to get the MWL from.
Interval for Accessing Modality Worklists	Indicate the time interval for fetching the RIS worklist: 15 minutes; 30 minutes; 1 hour; 2 hours; 4 hours; 8 hours; or 24 hours.
Applied Rules for Fetching	Use the buttons to add, disable, or delete rules. Multiple rules may be configured. To add a new rule: 1. Click **Add New**. 2. Define the parameters for identifying eligible Studies that require Priors for Postprocessing and reporting. Use any combination of Modalities, Scheduled Exam Date (Today, Tomorrow, or Today and Tomorrow). 3. Define the parameters for identifying the relevant Priors that need to be fetched from PACS. Use any combination of Modalities, Body Part Examined, Procedure, Series Description, or Study Date Range (for example: last 6 months; last 1 year; last 2 years; last 5 years; or all).

Prefetch Using Scheduled Orders

This feature enables Advanced Visualization Workspace to pre-fetch relevant prior studies using exam order information from scheduling systems. This ensures that before the new exam arrives at AVW, the relevant priors are already pre-fetched from the PACS/VNA and stored in the AVW database.

This feature requires the IBE option.

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12 Cloud Configuration

Cloud via Browser

Launch Advanced Visualization Cloud

To launch the Cloud Worklist:

1. Launch the customer specific URL provided by Philips.

   Example: **customerspecific.hsp.philips.com/zfp/**

   Users can select the user interface language from the drop down list.
2. Enter login credentials. Only AVW users are supported.
3. The worklist opens.

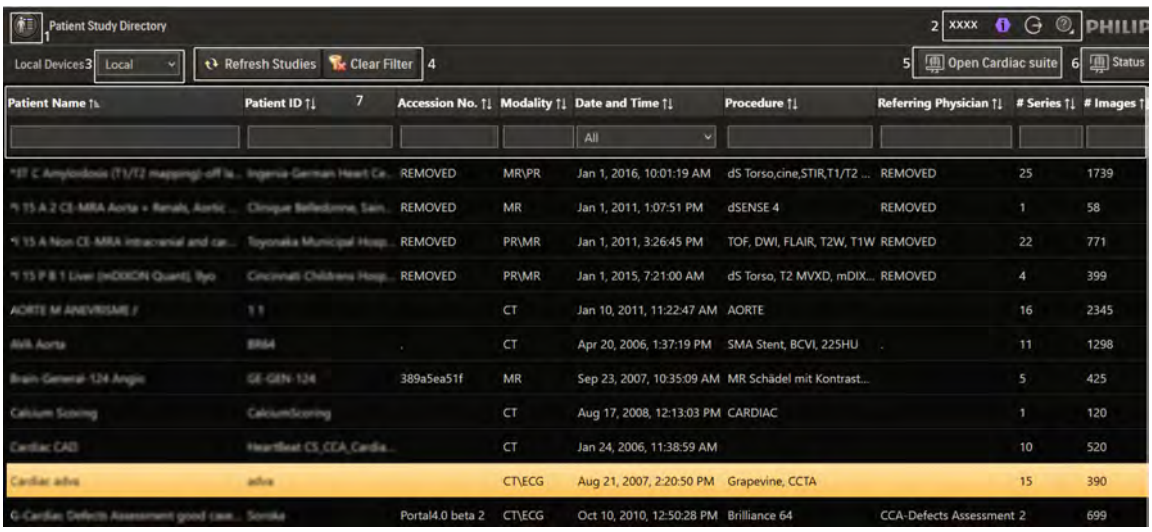
Logout of Advanced Visualization Workspace

When you are finished with using the Advanced Visualization Workspace Browser, to exit properly click the **Exit** application button. You are logged out of the application and returned to the Advanced Visualization Workspace login screen.

Directory

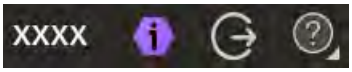
These options are available from the Cloud Directory:

- Select data from local storage devices.
- Load data to Cardiac Suite



1.		Patient Study Directory Icon- Used to access Patient Directory when located within the viewer.

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2.		User info/About/Logout/Configuration  *Note: XXXX represents the name of the currently logged in user.*
		Logout button
		Opens Virtual Application Guide
		Opens the About page.
3.		**Device Selection** - List of available devices.
4.		**Refresh Studies** - Use this button to refresh the studies with newly arrived studies, if any.
		**Clear Filter** - Use this button to reset the local patients filtering function, restoring the full list of patients.
5.		**Open Cardiac Suite**. Opens MR Cardiac Suite. For additional information, please refer to the MR Cardiac Suite workspace section of the Advanced VisualizationWorkspace MR Applications Instructions for Use.
6.		**Status**. Shows Preprocessing status. Options to return to Study List, Preprocessing or Export.
7.		Column header with type in boxes and dropdown box for filtering. See:section “Sort Patient List by Column Contents” on page 200, section “Filter Patient List by Data Field” on page 201 and section “Filter Patient List by Study Date” on page 201.

Worklist

1. Select **Status** (#6).

   The Preprocessing Status page opens, displaying all pre-processing jobs.
2. Select **Export** to display the export jobs listing results saved to PACS.
3. Select **Transfer Status** to display the status of incoming studies from pushed jobs.

Sort Patient List by Column Contents

Sorting Patient Studies

Click the title of a column heading (for example, the Patient Name column) to sort the column in ascending/descending order.

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Sorting Columns

To change the order of columns:

1. Place your mouse at the top of the column that you want to move.
2. Drag the column header to the desired location and release the mouse button once the header appears in the desired location.

Filter Patient List by Data Field

Filtering is a form of search where you type into the column's search field the starting character(s) of a name (or other data) you are looking for.

Filter Patient List by Study Date

You can filter the Patient List according to when the study was acquired. Click on the arrow in the header of the Time column to drop down a selection list of limiting parameters.

The **Date and Time** column includes a dropdown list. Options include **All**, **Today**, **Last 2 Days**, **Last 3 Days**, **Last Week** and **Last 2 weeks**.

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Cloud via Application Streaming

This configuration provides AVW as a Cloud solution. The solution deploys both AVW client and AVW server on a cloud infrastructure. The AVW client User Interface (UI) is built on desktop technologies, which cannot be directly accessed from on-premise AVW users.

The solution includes an application streaming technology (also known as application virtualization technology) that enables remote access to the AVW client UI from an on-premise client. The application virtualization technology continuously captures the remote application's UI, transports it over the network and renders it on the user's screen. It also captures the user's keyboard and mouse inputs, transports them over the network and inputs them to the remote application. To optimize this transportation of application UI over the network, the streaming technology uses image compression.

- Depending on the network conditions, the streaming technology chooses lossy or lossless compression.
- Depending on the network conditions and computing resources available on application client machine and the user's machine, the streaming technology may not be able to continuously transport all frames of the application UI, especially when the UI is changing at a high frame rate.

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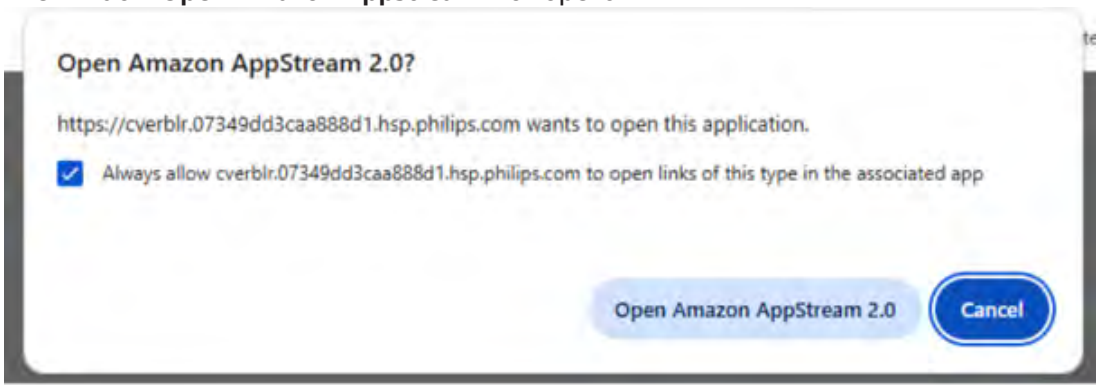
Launch Advanced Visualization Cloud Via Application Streaming

NOTICE

Prerequisite:

Prior to using AVW application streaming, client software of the selected application streaming technology, i.e. AWS WorkSpaces Application, must be installed and configured to use the customer-specific URL provided by Philips.

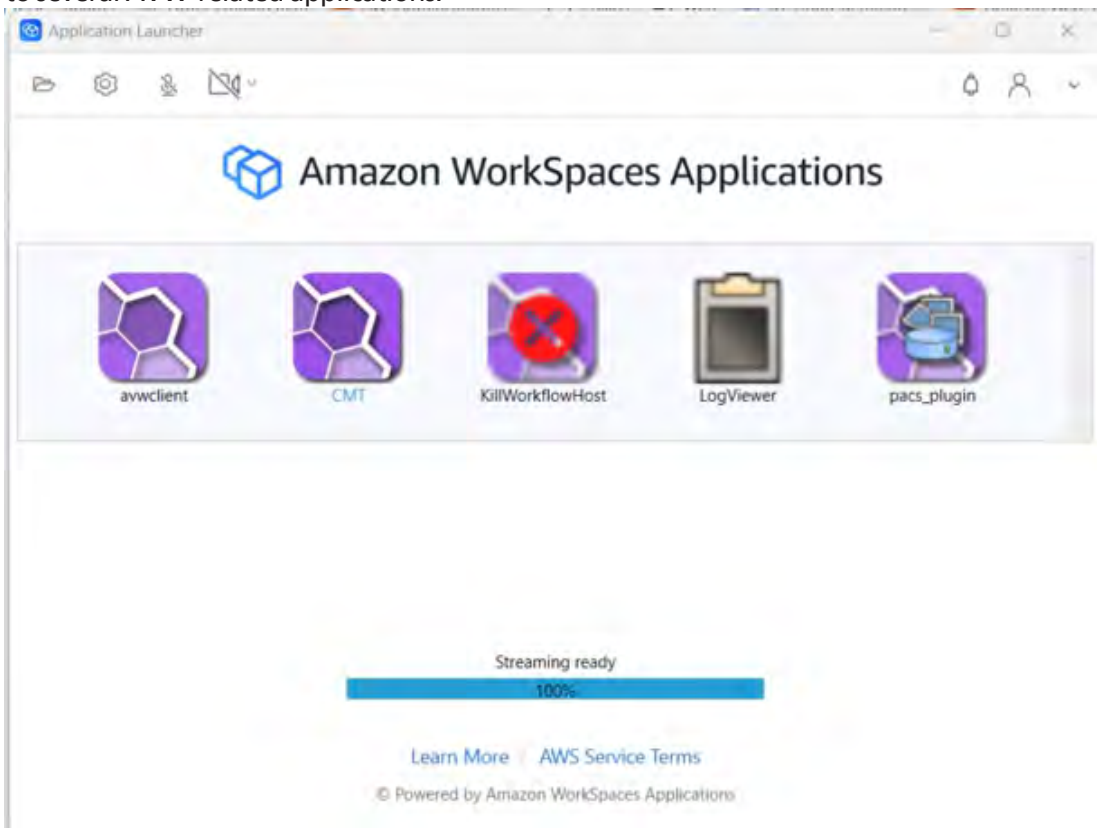
1. Open your browser and enter the application URL provided by Philips.
2. The window **Open Amazon Appstream 2.0?** opens.



   To avoid this window in the future, select the checkbox **Always allow...**.
3. Press the button **Open Amazon AppStream 2.0**. The sign-in portal opens.
4. No login credentials are required, as AVW takes credentials and permissions from the IA Manager login page.
5. The AVW client launches.

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6. **Amazon WorkSpaces Applications** appears on your Windows task bar, minimized as one of the running applications. If you select it, the application launcher opens with shortcuts to several AVW-related applications.

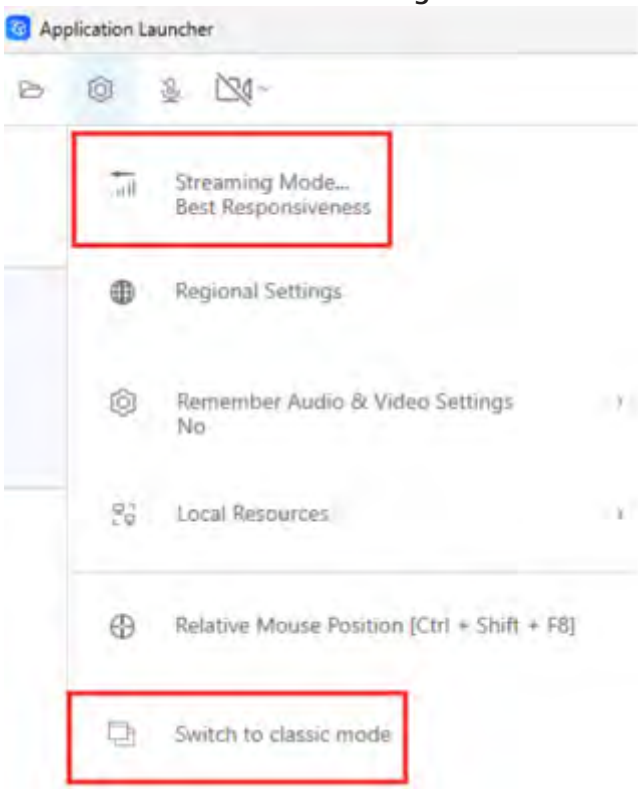


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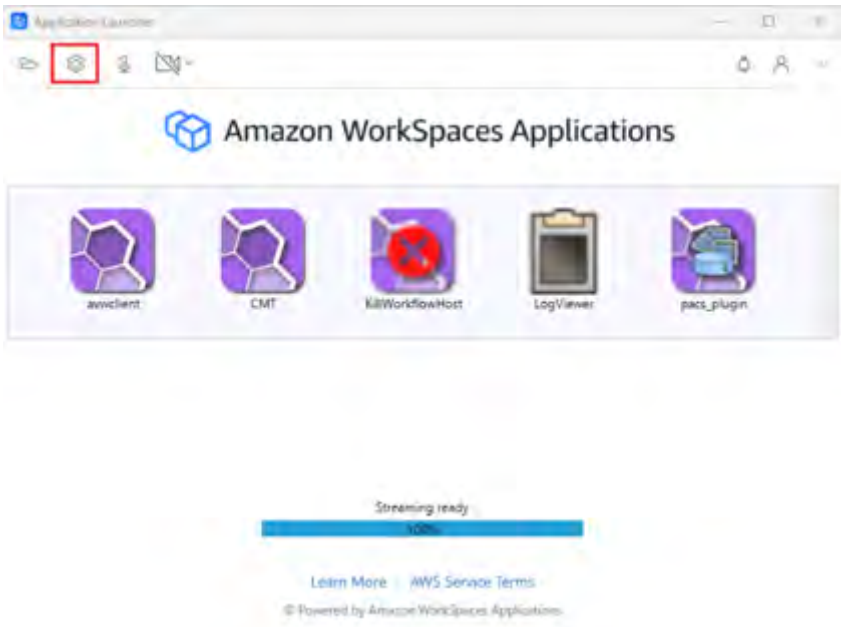
NOTE

To ensure better performance and user experience, the following streaming client settings should not be modified: Streaming mode and Switch to classic mode.



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Allow applications inside AppStream to access files from the local computer



To enable access, open Settings, highlighted by a red box in the previous image, and then:

1. Select **Local Resources > Local Drives and Folders**.
2. Select which drives or folders to share from the list, or add a specific folder by using the option **Add Folder**.
3. Press the button **Save my configuration**, and then close the window

WARNING

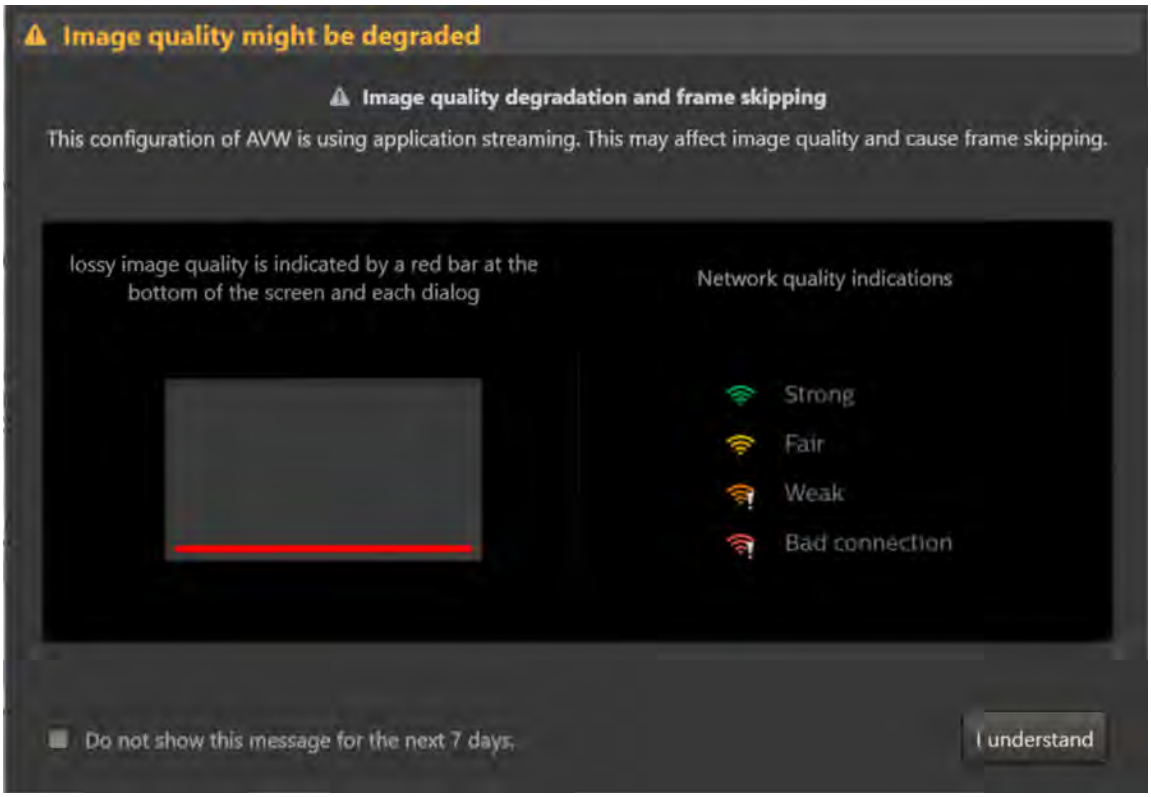
Image quality degradation and frame skipping

This configuration of AVW is using application streaming. This may affect image quality and cause frame skipping.

While using this cloud configuration, various messages and indications appear in the user interface to inform you that conditions may be sub-optimal. For additional information, see section “Streaming Information” on page 207.

After login, a dialog opens with the same warning, along with information on image and network quality, as in the following image:

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Review and click **I understand** to continue.

To stop this message from appearing for the next seven days, select the check box.

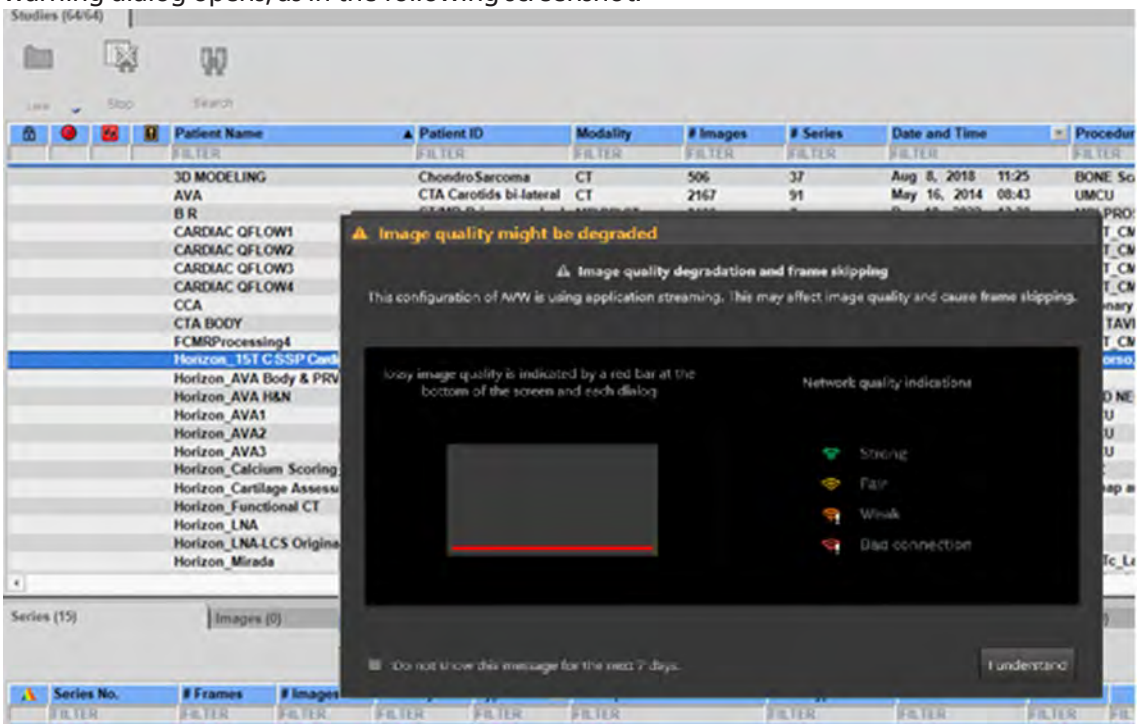
Once you are logged in, you may work in Advanced Visualization Workspace in your typical workflow, with a few exceptions. For additional information see section “Streaming Information” on page 207.

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Third Party Application Login and Indications

When launching a third-party application, the Image quality degradation and frame skipping warning dialog opens, as in the following screenshot:



By default, this message can be disabled for one day.

To stop this message from appearing for one day, select the check box.

Streaming Information

Network Quality Indicator



A network quality indicator icon appears at the top of the screen. The icon's color is based on current latency and packet loss, informing users of sub-optimal network conditions that may lead to skipping of images. The icon color changes based on the following definitions:

Icon Color	Latency	Packet Loss
Green (Strong)	0 to 30	<0.1
Yellow (Fair)	3 0 to 50	0.1<PL<2.5
Orange (Weak)	5 0 to 70	2.5<PL<5
Red (Bad Connection)	Greater than 70	PL>5

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A popup warning appears briefly if the icon is orange or red.

When hovering over the network indication, the following tooltip information appears: FPS, Latency (ms), and Packet Loss.

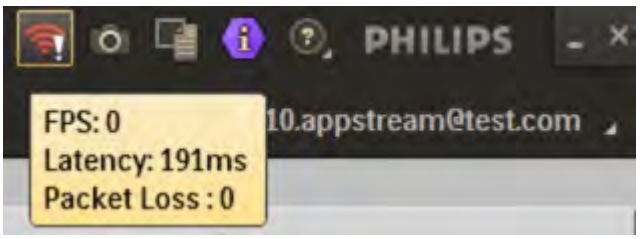
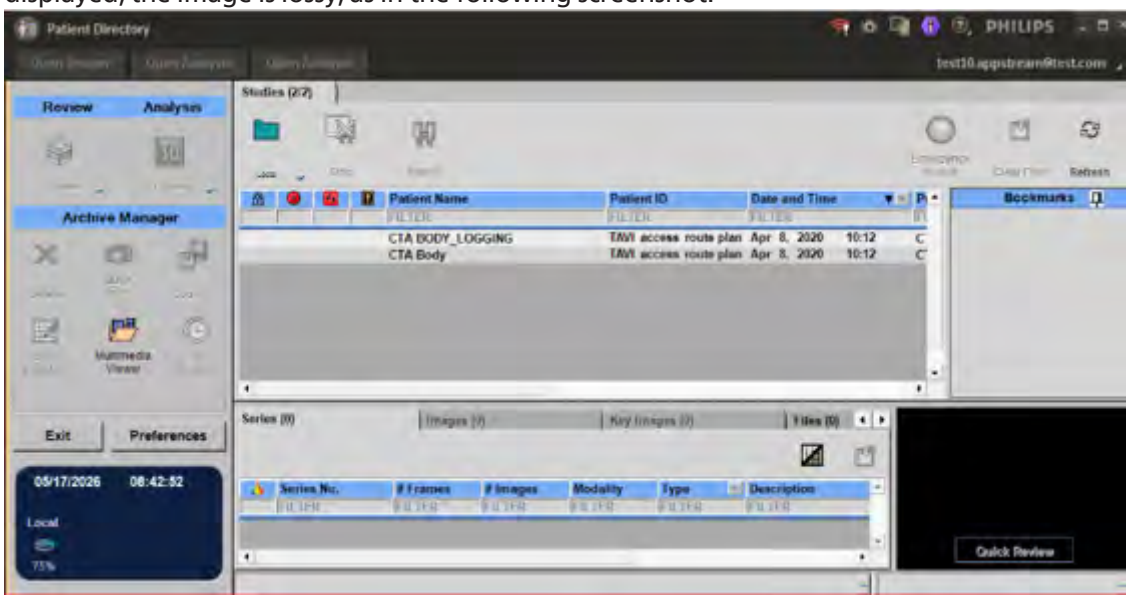


Image Quality

Lossless image quality is indicated by a red bar at the bottom of the screen. If a red bar is displayed, the image is lossy, as in the following screenshot:



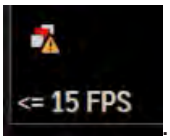
NOTICE

Frame skipping and lossy image Indications do not appear within third party applications.

Frame Skipping

Frame skipping may occur during scroll interactions (mouse wheel, keyboard up/down while keeping key pressed, continuous scroll) and cine/movie. A message **Potentially skipping frames** appears at the bottom of viewport when scrolling. In small viewports, the  icon indicates possible skipping.

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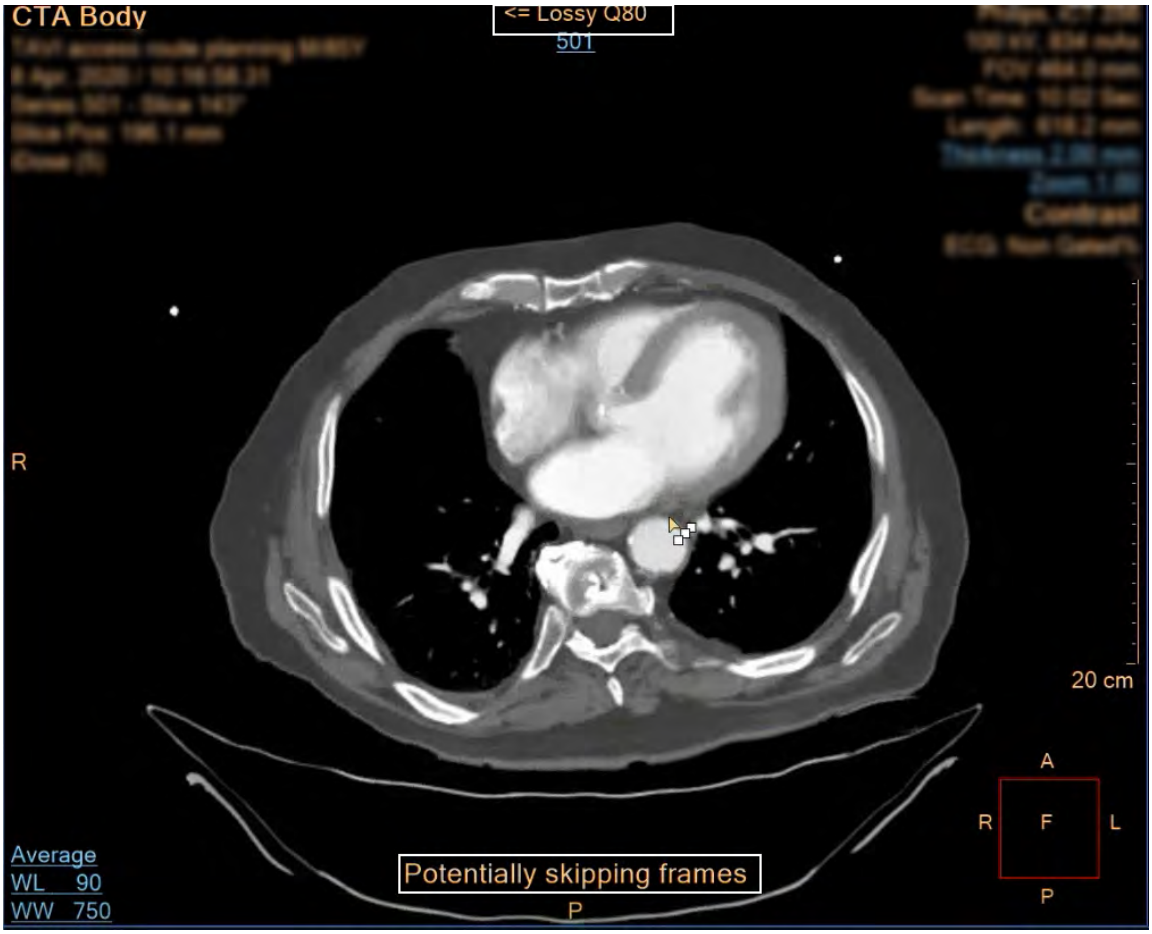
When playing a movie, an indication appears in the bottom left corner, 

. In this example, although AVW detects 15 frames per second, it is possible that the streaming reduces the frames per second and therefore, "**<=**" is added.

Lossy Images

When lossy images are shown, a text notification "<=" appears on the viewport in front of the **Lossy x%**.

In the example below, Quality Level 80% was selected (as a lossy compression option). However, due to possible compression, "**<=**" is added in front of the quality level.



Saving

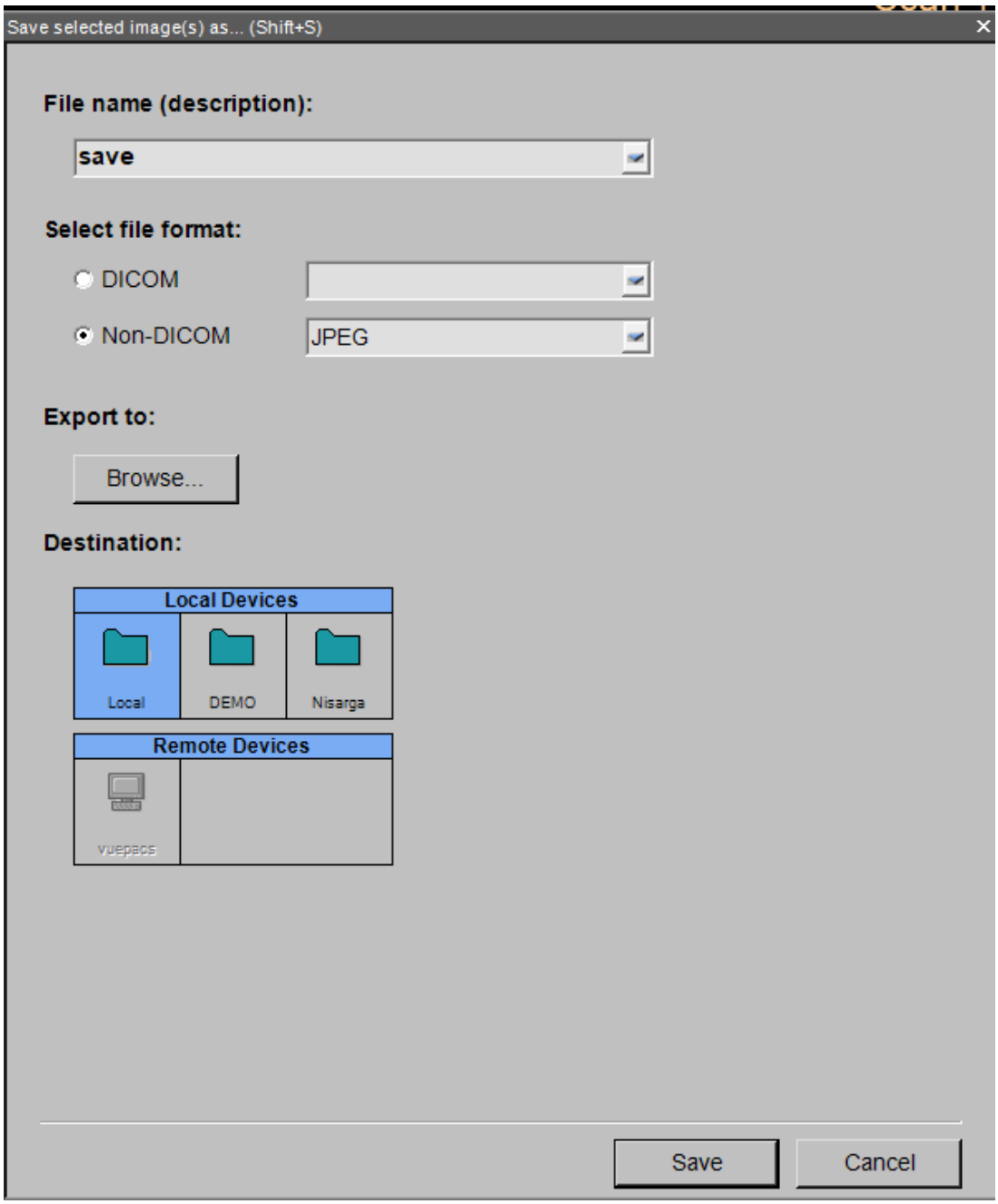
1. Select one of the Save options on the Control Panel (left side of screen).

   You can save DICOM file formats to either a local folder or to a configured, on-premise device.

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You can also save non-DICOM file formats to an on-premise device, but only to a folder shared via application streaming technology.



2. Type a file name and click **Save**.

   A confirmation message appears at the bottom of the screen.

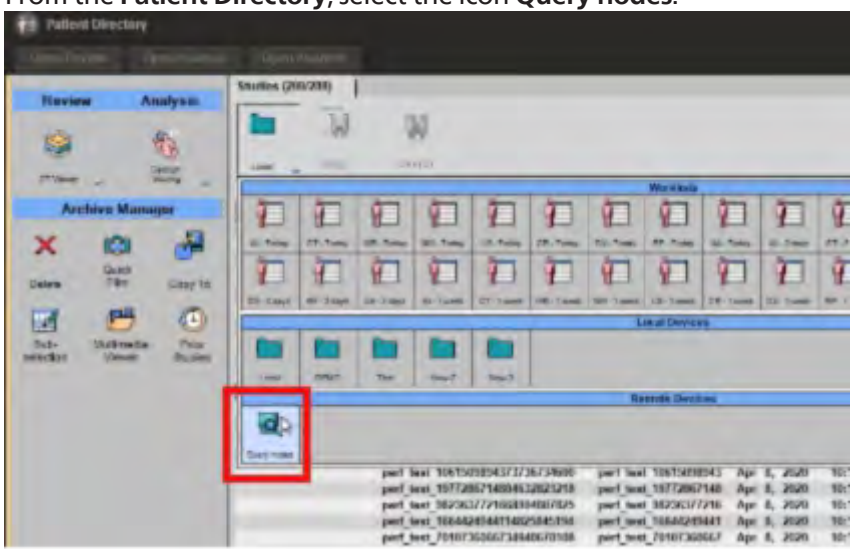
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Query/Retrieve

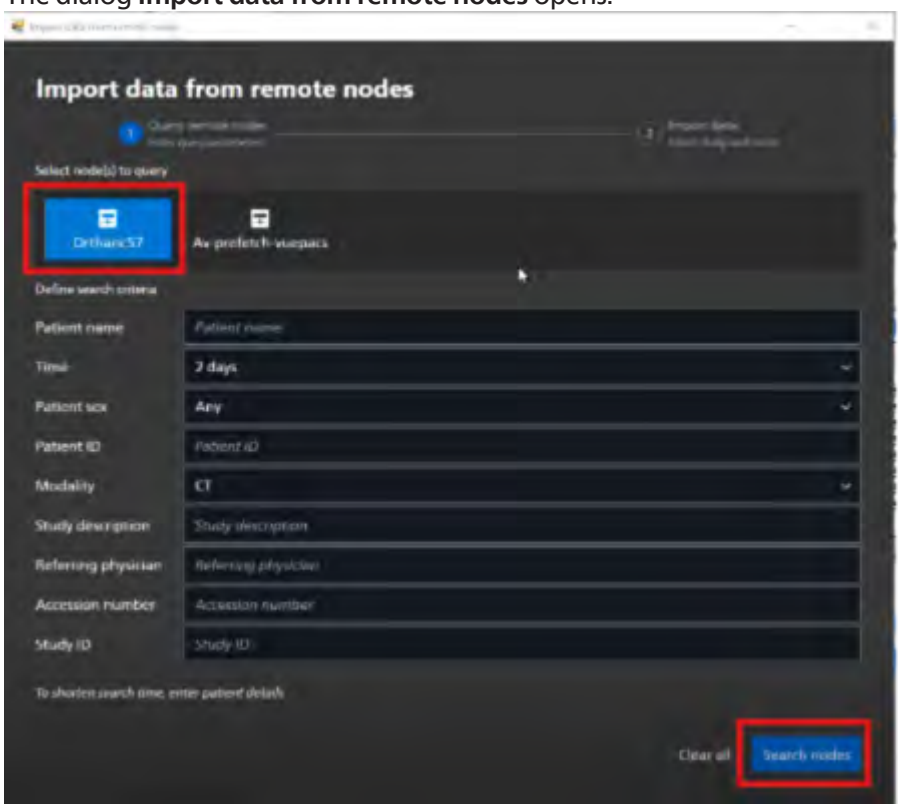
You can search for and retrieve imaging studies or series from remote systems, such as PACS or connected DICOM nodes. You can perform queries using defined criteria, e.g., patient information or date range, review matching results, and selectively import the required studies or series into the application for viewing and analysis.

To initiate a remote query:

1. From the **Patient Directory**, select the icon **Query nodes**.



The dialog **Import data from remote nodes** opens.



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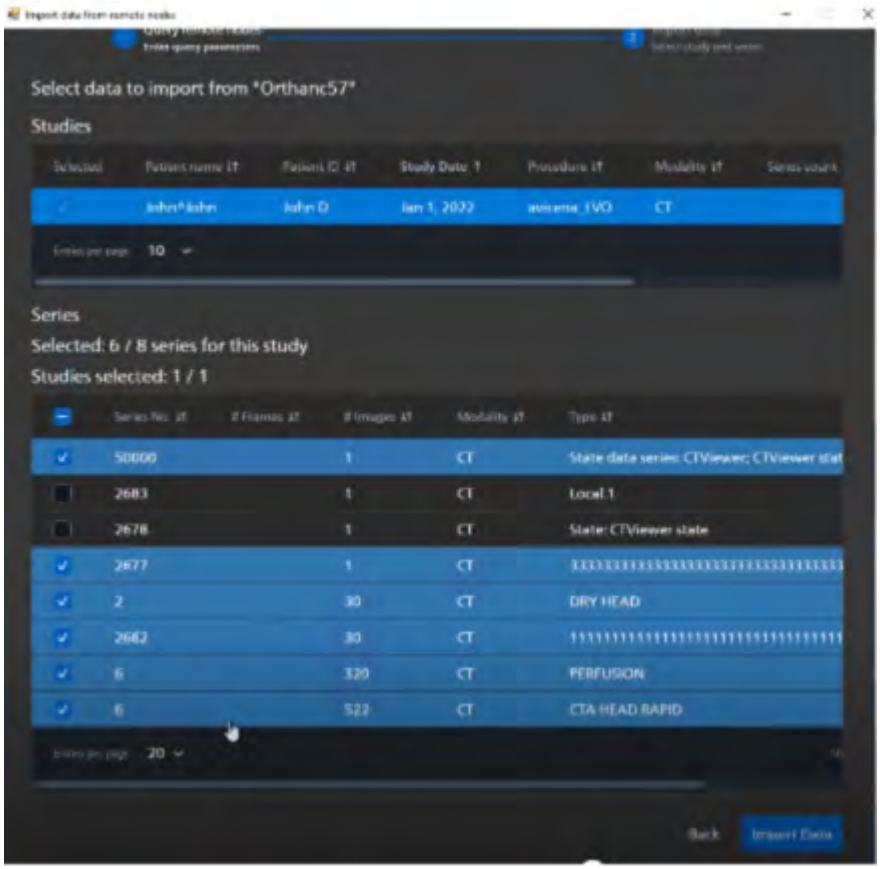
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2. Choose a remote node by selecting one of the configured remote systems, e.g., a PACS or DICOM node, from the list **Select node(s) to query**.
3. To filter the data, use the section **Define search criteria** to enter one or more query parameters, such as **Patient name** or **Time**. Then, execute the query by pressing the button **Search nodes**. The system retrieves and displays a list of matching studies or series.

Review query results

Select data for retrieval:

1. From the list, select one or more studies, or specific series, to import into the application.



2. Initiate retrieval by pressing the button **Import Data**. The progress of the query or import job is displayed.
3. Upon completion, the data is available on your primary local device.

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13 Zero Footprint Viewer

The Zero Footprint Viewer (ZFP) is a web based viewer (thin client) intended to be used by trained professionals, including but not limited to radiologists.

The ZFP software enables viewing images located on Advanced Visualization Workspace server, without installing Advanced Visualization Workspace client (thick client).

The Zero Footprint extends the availability of images that are available on Advanced Visualization Workspace to peer radiologists, other non-radiology physicians or referring physicians.

The software offers digital image processing, measurements, manipulation and quantification of images, communication and storage. Images are accessible to any web browser on a computer.

The ZFP Viewer is a multi-modality and multi-vendor standard advanced visualization viewing environment, that includes:

- Basic viewing capabilities including 2D, Slab, Fusion and Volume viewing modes.
- Viewing of CT, MR and NM (PET/SPECT) including multi-dimensional MR viewing and navigation.
- Multi-frame secondary captures of DX, CR, US, RF and XA modalities.

Studies are accessed via a bookmark URL link created on Advanced Visualization Workspace (the link can be shared with other users via email or any other communication tool that is available on the AVW Client).

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WARNING

Zero Footprint Viewer is not intended to be used as a primary diagnostic tool. Please refer to the applicable Advanced Visualization Workspace application for full diagnostic capabilities.

For additional information, refer to the Zero Footprint Viewer Instructions for Use.

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A Appendix: Generic Measurement Accuracy

Introduction

This section identifies the accuracy for the generic 2D and 3D line, area and volume-based measurements that can be performed on MR, CT and post-processed images using Advanced Visualization Workspace. The accuracy analysis is based on the accuracy of placing a point on an image (Position) and the methodology of error propagation.

Advanced Visualization Workspace offers the following generic measurements:

- Position (Pixel value)
- Distance (Length)
- Quotient of two lengths (Length 1 / Length 2)
- Angle
- Area
- Volume
- Pixel/voxel values and standard (statistical) calculations:
  - Threshold (limit or interval) based volume/area:
  - Mean
  - Standard deviation
  - Perimeter
  - Minimum / Maximum
  - Histogram
  - Chart

Since these measurements are generic, they are not limited in use to a specific clinical workflow. Therefore, it is not possible to generally compare the accuracy of these measurements to clinical requirements. Instead, the accuracy of these measurements are discussed in a way that is application-independent, providing information on the theoretical accuracy of these measurements, taking into account all influencing factors, and illustrating this with practical examples. It is the user's responsibility to apply these measurements to images of sufficient quality and generated according to "good clinical practices", considering the task at hand.

If specific application packages are available for measurements that need to be performed (for example vessel diameters in Multimodality AVA, colon polyp dimensions in CT Virtual Colonoscopy, and stroke volume in Comprehensive Cardiac Analysis) then the use of those should have preference as these measurements are optimized for that specific clinical task. The optimizations, which are design elements consist of a combination of selecting the appropriate

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viewport size and zoom factor and dedicated segmentation functions that assist with placing points and shapes. The accuracy of the specific clinical measurement is provided in the Instructions for Use of the respective application.

The accuracies of positions (coordinates) distances, angles, etc. depend on how accurately a user can position or adjust the cursor/point with respect to the image coordinate system (in mm). It is assumed that the user knows when the position of the cursor or contours (for instance on an edge of an anatomical structure) is correct. The accuracy considered here, will not include any uncertainties that the user may have about positions to be indicated, but will be limited to the 'technical' uncertainties that are related to the choice of pixel/voxel size (original image resolution), screen pixel size and zoom factor. Furthermore, it is assumed that the image, on which the measurements are performed, is adequate for the intended measurements and of sufficient quality. For ease of calculations and explanations, it is further assumed that screen pixels are square, and the original volume is isotropic. The first assumption is valid for common monitors, for instance with screen resolution of 1280×1024 pixels and 5:4 aspect ratio. The second assumption is acceptable as we present coordinates in a mm patient coordinate system.

Position Accuracy (Coordinate)

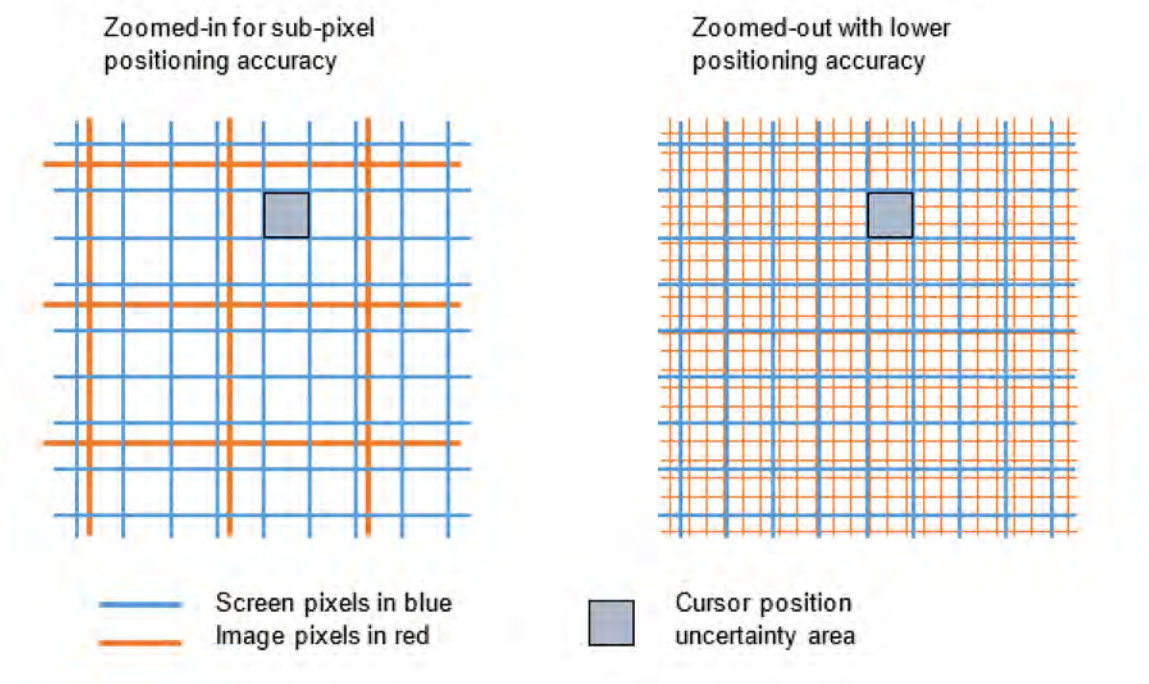
The source of any (technical) uncertainty is the positioning accuracy of the cursor. The returned coordinates represent the position of the cursor hotspot. The cursor can only be positioned with the resolution of the actual physical screen pixels. This means that the uncertainty (maximum possible difference from the returned value) in the position of the cursor is half the screen pixel size. If the screen pixel size equals δ mm, then the cursor position is determined with an accuracy of half a screen pixel ($\pm 0.5\ \delta$ mm). For sub-image-pixel/voxel accuracy of the returned coordinate values, the image should be zoomed such that the image pixels/voxels displayed on screen are sufficiently large compared to the screen pixels. In this way, the uncertainty in returned position becomes small compared to the real pixel/voxel size. If the image pixels are zoomed out to a smaller size compared to the screen pixels, the uncertainty in the position of the cursor can easily exceed the image pixel size.

If the real image pixel size equals α mm, and is zoomed to show on the screen as β mm as a result of an applied zoom factor $Z=\alpha/\beta$, then the uncertainty in the cursor position can be written as:

$$(x \pm \Delta p, \quad y \pm \Delta p, \quad z + \Delta p) \quad \text{with} \quad \Delta p = 0.5 \cdot \delta \cdot Z \ \text{mm}$$

The accuracy of the returned image coordinates depends, therefore, on the zoom factor of the displayed image. The user should ensure that the proper zoom factor is applied so that positions can be determined with the required accuracy.

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The table that follows shows numerical examples of positioning uncertainty where different zoom factors are applied on the images in which the position is measured (zoom in with a factor of 4, true size, and zoom out with a factor of 10).

Screen pixel size (mm)	Real pixel/voxel size (mm)	(Zoomed) pixel/voxel size on screen (mm)	Uncertainty in returned coordinate (cursor position) (mm)
0.2	1	4	0.025
0.2	1	1	0.1
0.2	1	0.1	1

Tab. 6: Uncertainty in returned coordinate (cursor position) for pixel size/zoom combinations

Error Propagation: Point-based Measurements

Propagation of uncertainty (or propagation of error) is the effect of variables' uncertainties (or errors, more specifically random errors) on the uncertainty of a function based on them. Uncertainties can also be defined by the relative error $(\Delta x)/x$, which is usually written as a percentage. As explained in the Introduction (see section "Introduction" on page 215), all generic measurements of Advanced Visualization Workspace are functions based on a set of coordinates.

Distance (Length: Distance Between Two Points Along a Straight Line)

The length L of the line between two points (x_1,y_1,z_1) and (x_2,y_2,z_2) is derived from the coordinates of the end points and defined as:

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$$L = \sqrt{{l_x}^2 + {l_y}^2 + {l_z}^2} \qquad with \qquad l_x = x_2 - x_1\,, \qquad l_y = y_2 - y_1\,, \qquad l_z = z_2 - z_1$$

The accuracy in returned distance/length values, measured as the distance between two indicated points, depends on the uncertainty in the positions of these points. The uncertainty in the length *L* can be derived from the uncertainties in the coordinates *x ,y ,z* (refer to section "Position Accuracy (Coordinate)" on page 216 for information on uncertainties).

The table that follows shows an *example* of numerical values of this uncertainty with a line with three different zoom factors applied (zoom in with a factor of 4, true size, and zoom out with a factor of 4).

Screen pixel size (mm)	Real voxel size (mm)	Zoomed voxel size on screen (mm)	End point 1 (x,y,z in mm)	End point 2 (x,y,z in mm)	Line length (mm)	Uncertainty in line length (mm)
0.2	1	4	100,125,104	133,140,118	38.86	0.08 (0.21%)
0.2	1	1	100,125,104	133,140,118	38.86	0.32 (0.82%)
0.2	1	0.25	100,125,104	133,140,118	38.86	1.28 (3.28%)

As the uncertainty in measured length is derived from the uncertainties in end-point locations, the user should ensure that the proper zoom factor is applied when indicating the endpoints for a length measurement.

Quotient of Two Lengths (Length 1/Length 2), such as Stenosis, Dilatation, etc.

These values are calculated as a quotient of the lengths of two user defined lines L_1 and L_2:

$$q = \frac{L_1}{L_2}$$

The relative uncertainty $\frac{\Delta q}{q}$ of the quotient is based on the uncertainty of the length of the lines, which in turn depends on the Position accuracy (see. presented in the first section.

The table that follows shows an *example* with a number of different zoom factors applied during definition of the endpoints of the two lines.

Screen pixel size (mm)	Real voxel size (mm)	Zoomed voxel size on screen (mm)	Line 1 (x,y,z vectors in mm)	Line 2 (x,y,z vectors in mm)	Quotient	Uncertainty in Quotient
0.2	1	4	65,10,0	70,75,0	0.72 (72%)	0.02 (2%)
0.2	1	1	65,10,0	70,75,0	0.72 (72%)	0.07 (7%)
0.2	1	0.25	65,10,0	70,75,0	0.72 (72%)	0.29 (29%)

As seen in the table above, the user should ensure that the proper zoom factor is applied when defining a line measurement.

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Angle Between Two Lines Defined by Three Points

L_1 and L_2 are vector descriptions of two lines defined by three user defined points. (x_1, y_1, z_1) ,(x_2, y_2, z_2), (x_3, y_3, z_3) , with L_1 passing through (x_1,y_1,z_1) ,(x_2,y_2,z_2) and L_2 passing through (x_2,y_2, z_2), (x_3,y_3,z_3). So, the lines meet in (x_2,y_2, z_2) thus defining an angle θ. This angle is calculated as the *arccos* of the dot-product of the two normalized vectors:

$$\theta = \cos^{-1}\left(\hat{\boldsymbol{L}}_{\boldsymbol{1}} \cdot \hat{\boldsymbol{L}}_{\boldsymbol{2}}\right) = \cos^{-1}\left(\frac{\boldsymbol{L_1} \cdot \boldsymbol{L_2}}{\|\boldsymbol{L_1}\|\|\boldsymbol{L_2}\|}\right)$$

The uncertainty in the resulting angle can be derived from the inaccuracies of the two lines which are a result from the inaccuracy of the three points. The table that follows shows an *example* of numerical values for this uncertainty with different zoom factors.

Screen pixel size (mm)	Real voxel size (mm)	Zoomed voxel size on screen (mm)	Line 1 (x,y,z vectors in mm)	Line 2 (x,y,z vectors in mm)	Angle (degrees)	Uncertainty in Angle (degrees)
0.2	1	4	65,10,0	95,35,10	27.30	0.17 (0.6%)
0.2	1	1	65,10,0	95,35,10	27.30	0.68 (2.0%)
0.2	1	0.25	65,10,0	95,35,10	27.30	2.73 (10.0%)

For this measure the angle size itself has an influence on the uncertainty of the calculated angle. Uncertainty is smallest for angles around 90 degrees, while it is largest for angles around 0 and 180 degrees.

Area Inside (Closed) Graphics Objects like Ellipse, Rectangle, Manual Contour

An area measurement returns the size of the area inside the contour of a (closed) graphics object. The graphic object represents a user defined contour (for instance a rectangle or ellipse). A graphic contour does not follow the pixel boundaries but follows a path with sub-pixel precision controlled by a number of user-positioned points. This means that it cuts through pixels, which will therefore, in general, be partly inside and partly outside the contour. The actual sizes of the fractions of pixel area that fall inside the contour are calculated, and only these fractions are counted as belonging to the area inside the graphics object. Accuracy therefore depends mainly on how accurate the user indicates the positions of the control points that define the contour.

The uncertainty in the position of these points is as determined above (see section “Position Accuracy (Coordinate)” on page 216): $\Delta p=0.5 \cdot \delta \cdot Z$ mm.

In the worst-case scenario, each user defined position is off by this value, and is also working in the same direction of enlarging or decreasing an intended area measurement a. In this case, the maximum error equals the length *l* of the contour times the maximum point positioning error:

$$\Delta a = l\Delta p = 0.5\, l\delta Z$$

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This worst-case situation is unlikely to occur. In general, the real error will be significantly smaller, as not all uncertainties will usually have effect in the same direction of enlarging or decreasing the measured area value. The table that follows shoes an *example* of some numerical values where the contour length is 60 mm. For instance, this relates to a rectangle of 20×10 mm, area 200 mm^2, or a circle with radius 9.5 mm, and an area of 283 mm^2.

Size (mm)	Real voxel size (mm)	(Zoomed) voxel size on screen (mm)	Length of Contour (mm)	Max Uncertainty in area (mm^2)
0.2	1	4	60.0	1.5
0.2	1	1	60.0	6
0.2	1	0.25	60.0	24

As seen in the table above, the user should ensure that the proper zoom factor is applied when defining a contour for area measurement.

Volume Inside (Closed) Graphics Objects like Ellipsoid, Rectangular Block

A volume measurement returns the size of the volume inside the surface of a (closed) 3-dimensional graphics object. The graphic object represents a user defined surface (for instance a rectangular block or an ellipsoid). A graphic surface does not follow the voxel boundaries, but follows a surface with subpixel precision defined by a number of user-positioned points and/or by 2D contours, which are themselves defined by user-positioned points. This means that it cuts through voxels, which will be partly inside and partly outside the surface. The actual sizes of the fractions of voxel volume that fall inside the surface are calculated, and only these fractions are counted as belonging to the volume inside the graphic object. Accuracy therefore depends mainly on how accurate the user indicates the positions of the control points or contours. The uncertainty in the position of the control points is as determined above (see section "Position Accuracy (Coordinate)" on page 216): $\Delta p=0.5 \cdot \delta \cdot Z$ mm.

In the worst-case scenario, each user defined position is off by this value, and is also working in the same direction of enlarging or decreasing an intended volume measurement. In this case the maximum error in a volume measurement equals the maximum point positioning error multiplied by the size of the surface *(S)*:

$$\Delta V = S \Delta p$$

This worst-case situation is unlikely to occur and in general, the real error will be significantly smaller, as not all uncertainties will usually have an effect in the same direction of enlarging or decreasing the measured volume value.

The table that follows shows numerical *examples* where the surface size is 1000 m^2. For instance, this relates to a rectangular block of 20×10×10 mm, volume 2000 mm^3, or a sphere with radius 8.9 mm, and a volume of 2953 mm^3.

Screen pixel size (mm)	Real voxel size (mm)	(Zoomed) voxel size on screen (mm)	Size of surface (mm^2)	Max Uncertainty in volume (mm^3)
0.2	1	4	1000	25
0.2	1	1	1000	100

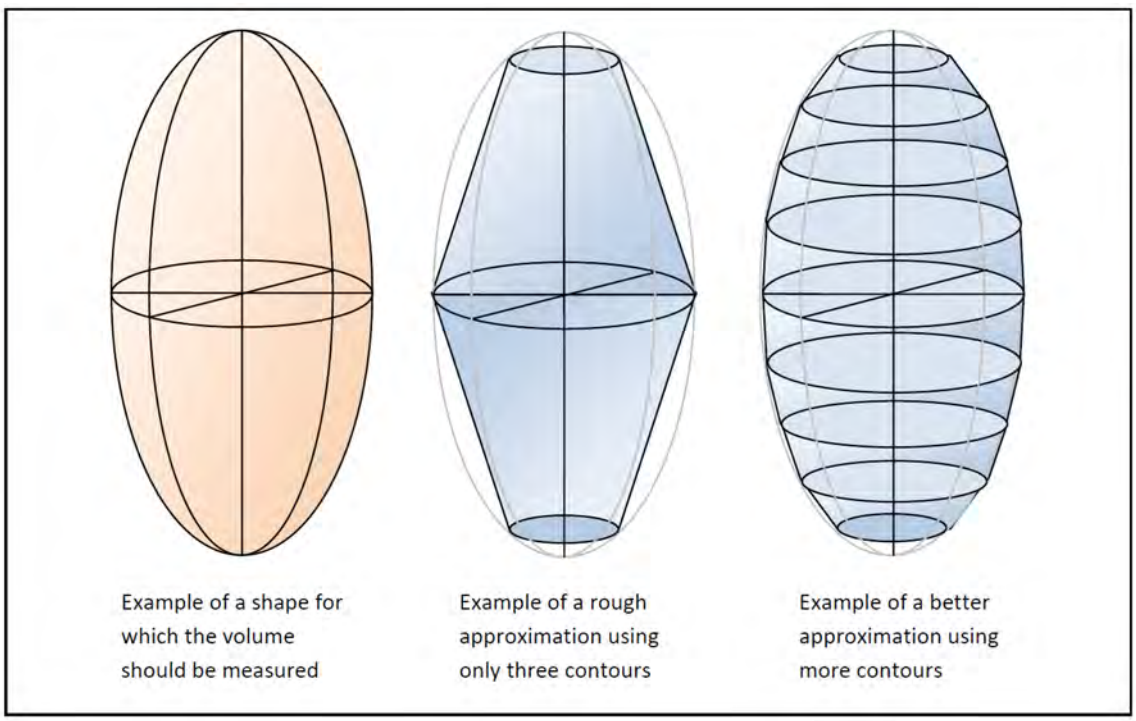
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Screen pixel size (mm)	Real voxel size (mm)	(Zoomed) voxel size on screen (mm)	Size of surface (mm^2)	Max Uncertainty in volume (mm^3)
0.2	1	0.25	1000	400

As shown in the table above, the user should ensure that the proper zoom factor is applied when defining a surface for volume measurement.

The user can manually define a volume, by drawing cross-section contours at multiple positions through an anatomical structure. The contour shapes are then interpolated automatically to form a surface. The result is visible on the screen, and the user can adjust and add contours until the result represents the structure sufficiently accurate for the task at hand. Using more contours to define the surface will result in a better approximation of the structure's volume, as is illustrated in the figure below using an ellipsoid structure as a simple example. Requirements for how well the generated surface should fit the structure depend on the clinical task. It is the user's responsibility to decide when the generated surface fits the structure close enough, based on clinical expertise and anatomical knowledge.



The uncertainty in positioning or defining the required contours and the resulting surface is as described in the relevant previous sections. It should be stressed however, that the main influence on accurate representation of the shape of the target structure, lies with the user who decides on placement, shape, and number of cross-sectional contours.

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Pixel/Voxel Values, Statistical Calculations and Descriptions

The returned image pixel/voxel value is the value of the image pixel/voxel under the cursor position, as provided by the acquisition system, including any effects from reconstruction, filtering or other processes that were applied by the acquisition system. The returned value disregards any interpolation methods, window settings, etc. that were applied to produce the pixel matrix as displayed on screen.

The profile function, which shows a graphical representation of the pixel/voxel values along a line, simply considers the line to be a string of positions and shows the value as retrieved from the image at each of those positions. Min, max, mean, and standard deviation of a set of pixel/voxel values inside a defined area or volume are determined with standard and commonly used and accepted calculations.

The histogram and chart are a graphical representation, intended to provide a visual impression of the value distribution in a set of pixels/voxels. The bin size of the histogram is automatically adapted to the number of values that are present in the set and may be adapted by the user in some application. Values of the pixels/voxel are provided by the acquisition system or by Advanced Visualization Workspace applications' post processing. For accuracy of the voxel/pixel values, refer to the application, device, or acquisition system's specific accuracy information.

Summary

Users should ensure that images are produced and displayed according to 'good clinical practices' guidelines (as described for instance in Practice Guidelines and Technical Standards of the ACR).

From the above analysis, to ensure accurate and repeatable measurements, a set of recommendations has been defined:

- Use a normal full screen viewing window with a single, dual, or quad (1, 2, or 4) image format. Do not exceed a four-window layout for any measurement.
- If films and measured data are desired for records, film in a similar large format. This maximizes the accuracy of the film result and minimizes discrepancies between monitor and film results.
- When measuring Average CT values, do not draw a ROI that includes or touches a high contrast boundary. For example, keep the border of the ROI well inside the organ or tissue, and away from neighboring higher or lower density structures.
- For increased accuracy, use an image zoom factor (magnification) greater than one (maximum zoom factor is 15 on all images).

The warnings and notice that follow were identified when using the generic measurements on volume rendered image types:

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WARNING

When performing distance or angle measurements on a volume rendered perspective image, the depth of the position pointed to must be well defined in the image.

Measurements on a volume rendered perspective image should be carried out very carefully and it is the user's responsibility to verify each point of reference. When measuring distances or angles, each point that is clicked on the volume-rendered image is related to a slice and an oblique plane. The depth of each point should be verified individually on the correspondent planes.

NOTICE

The endpoints of your measurement line must lie on data points that are sufficiently opaque so that no ambiguity exists regarding the depth of these points within the volume. Otherwise, the distance or angle will not display.

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