



AW ONE

AW Server 3.2

AW ONE is GE HealthCare's ecosystem of processing and advanced visualization solutions across platforms and applications.

With its own valuable features and capabilities, the AW Server 3.2 platform encompasses the necessary hardware, operating system, and user interface for accessing the patient list and deploying AW ONE's broad portfolio of advanced visualization applications, automated workflows, and more.

This document is an overview of the features, specifications, use cases, and other key information of AW Server 3.2.



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Overview

AW Server 3.2 aims to improve speed, efficiency, productivity, and resource management so valued customers can achieve and exceed departmental and organizational goals. AW Server 3.2 can deploy an extensive portfolio of advanced visualization applications. With a local database platform option receiving DICOM® images from your modalities and prior exams from your PACS, this streamlined advanced visualization workflow engine enables rapid preparation and communication of 3D results throughout your organization.

Key features

- Choice of IT-friendly rack mount chassis or virtualized deployment on VMWare® and Microsoft® Hyper-V™ environments.
- Patient list for management of images on server or workstation local database.
- Advanced search functionality to query patient exam history on all connected DICOM-compliant devices.
- Enhanced filtering of the patient list by modality, date, end review status, exam description, and institution name.
- Pre-processing for automation and acceleration of workflows.
- Historical patient exam timeline displays relevant prior exams based on primary exam criteria.
- Dual monitor client support for symmetric displays².
- 2D Viewer for image display, manipulation, annotation, review.
- Integrated filmer with enhanced flexibility to perform filming and data exporting tasks.
- Improved End of Review automates networking processed images to predefined DICOM host automatically upon generation.
- Delivers diagnostic quality client software to PC and MAC®¹ clients and specific GE HealthCare Computed Tomography (CT), Magnetic Resonance Imaging (MRI), and Molecular Imaging (MI) consoles.
- Anonymous Maker allows users to anonymize exams.
- Provides common tools by 2D and 3D applications, e.g. window/level, zoom, pan, distance measurement, 2D ROI selection.
- Supports core AW Volume Viewer software.
- Supports advanced applications³ for automated post-processing vessel analysis and oncology with streamlined reporting.
- Supports IT remote “lights-out” management.
- Distributed cluster deployment provides IT departments high availability across data centers.
- Third party PACS integration supports launching advanced applications directly from the PACS workflow.
- DICOM Direct Connect⁴ (DDC) enables quick access to DICOM images by directly fetching data from a VNA, PACS, or modality consoles which limits routing images to multiple destinations for post processing.
- Accessible through the most common HTML5 web browsers.

AW Server purchasing and configuration options

AW Server 3.2 platform encompasses the necessary hardware, operating system, and user interface for accessing the patient list and deploying AW ONE's broad portfolio of advanced visualization applications, automated workflows, and more.

AW Server 3.2 may be purchased as a turnkey solution, including off-the-shelf enterprise-class server hardware, which supports concurrent processing.

AW Server 3.2 may also be purchased as a single user workstation-based configuration that includes 64-bit technology and multicore processor hardware, providing cutting edge performance for one user and a single or dual monitor display.

AW Server 3.2 is also available as a virtual machine and may be purchased for use with existing VMware or Microsoft Hyper-V installations for large enterprises that choose to centralize their infrastructure.

The horizontally scaled configuration of virtualized AW Servers is known as the AW Enterprise.

Tight integration between AW Server 3.2 and GE HealthCare's Universal Viewer can provide a single environment for 2D and advanced visualization radiology workflows.

Indications for use

AW Server is a medical software system that allows multiple users to remotely access AW applications from compatible computers on a network. The system allows networking, selection, processing, and filming of multi-modality DICOM images. Both the client and server software are only for use with off-the-shelf hardware technology that meets defined minimum specifications.

The device is not intended for diagnosis of mammography images. The device is not intended for diagnosis of lossy compressed images. For other images, trained physicians may use the images as a basis for diagnosis upon ensuring that monitor quality, ambient light conditions, and image compression ratios are consistent with clinical application.

Product details

Standard applications and capabilities

Separate application licenses must be purchased to access applications. Two viewer applications that are often sold in conjunction with an AW Server include 2D Viewer and Volume Viewer. Details for these applications and other capabilities are described below.



2D Viewer

The 2D Viewer is an application used to display, manipulate, annotate, and review 2D images by a trained physician for diagnostic interpretations.

Display customization

Display customization allows the user to manage layouts to display data. Key benefits include:

- Allows modification of number of exams or series displayed to facilitate either single or multi-exam reviews.
- Standard layouts provide flexibility to tailor the image display from 1x1 to 8x8. The current layout is retained if the images are from the same modality and orientation.
- Annotation levels allow selection of the image information fields to display.
- Toolbar customization enables control of which buttons are displayed based on user preference.

Study navigation

- The navigator lets users assign a series to a view on the fly.
- Cine mode provides temporal, spatial, or manual playback loops.
- With two exams or series loaded, Cine mode supports a side-by-side display format with synchronized playback loops for more efficient comparisons.

Image review

The initial image window and level setting is based on the DICOM header. Once displayed, several methods of adjusting image window and level are provided.

Provides routine image manipulation features:

- Flip/rotate, zoom, pan, magnifying glass
- Inverse video: Inverts grayscale color map
- Display normal: Lets you return the image to its default viewing parameters

Features and tools

Users can access the following features using a single mouse click directly on the image. Having these direct manipulation tools easily at hand provides fast access with less distraction from the review by eliminating the need to return to the graphical user interface controls.

Several tools are available:

- 2D distance
- Angle
- Report cursor
- Box ROI, elliptical ROI and free-hand ROI

The program continuously updates statistics.

The annotation feature enables the highlighting of areas of interest by adding text and line/arrow pointers to any image feature.

The copy/paste/erase feature enables copy/paste/removal of any text or graphic placed on an image.

Cross-reference indicates the position of the current slice over the scout or localizer or any other non-parallel series.

Save allows storing a copy of the image as it appears on the screen for future review.

The key images feature allows users to flag images and create key objects.

Batch filming

The print series feature lets users automatically batch film an entire series with a single keystroke.

For additional information on the 2D Viewer, please review the 2D Viewer product data sheet.

Product details *(cont.)*

Standard applications and capabilities *(cont.)*



Volume Viewer

Volume Viewer is a multi-modality AW ONE advanced visualization application. It provides excellent 3D visualization and processing capabilities for reading and comparing CT, MR, 3D X-ray, PET, PET/MR, and PET/CT datasets. It features a breadth of high-performance analysis tools such as multiplanar reformat, volume rendering, and navigation.

Volume Viewer is the prerequisite application for what are known as Volume Viewer Foundation (VVF) applications within the AW ONE advanced visualization application portfolio. VVF applications share a similar user interface and have some interoperability. For detailed description of Volume Viewer features, please refer to the Volume Viewer product data sheet.



Filmer

The integrated Filmer enhances the efficiency of the review station and gives users greater filming and exporting flexibility. This feature supports two modes: the mini filmer mode and full-screen mode, which provides the ability for customization and film layout template creation.

Three key mechanisms give users flexibility:

1. Free format filming
2. DICOM structured reporting (SR)
3. Data export (HTML/PDF and JPEG, PNG, MPEG, or AVI)

With the Filmer, users can easily extract significant images from any AW ONE advanced visualization application (2D Viewer, Volume Viewer⁵ etc.).

- You can film images individually by dragging and dropping to the on-screen Filmer, or by a single keystroke.
- Multiple image formatting allows filming multiple images in a single page frame.
- With Film MID users can send multiple images to a single Filmer frame.
- Batch filming is supported by applications that provide that capability (print series in the 2D Viewer and batch film protocols in Volume Viewer⁵).

Communication between applications and the Filmer is accomplished in the mini filmer mode, which provides a minimized footprint. The mini filmer mode provides the following:

- Compatibility with batch filming from Volume Viewer⁵.
- Store and position images transferred from an application.
- Type of export (film, media, database).
- Rapid switching between full-screen filmer and application.

The resulting electronic films become a quick summary of the patient study and radiological interpretation which can then be reviewed by clinicians and physicians. They can also be saved as independent files (DICOM SR and Secondary Captures) for teaching purposes. Electronic film can contain one or several pages with specific layouts for each page or all pages.

A flexible edit mode provides the ability to easily add, manipulate, format, or delete images from the film. Images can contain text and graphics from measurements and your annotations, and may be window/leveled, magnified, flipped, rotated, or cine. Additional annotations can be added to the image in edit mode.

Preview mode displays the film as it will be printed or exported, considering the layout applied to each page and the compression level specified for non-DICOM exporting (JPEG/PNG and MPEG/AVI/QTVR).



Printing

AW Server 3.2 includes printing capabilities from local client Windows application, post-script, and network DICOM printing in black and white or color.

Product details *(cont.)*

Standard applications and capabilities *(cont.)*



Workflow capabilities

- Third party PACS integration provides an interface to launch AW ONE advanced visualization applications directly from the PACS client in the same context.⁶
- DICOM media import/export allows exams/series/images selection within AW Server client and workstation configuration to load DICOM data to local (USB, CDROM or DVD).
- Ability to manually adjust image compression during user interaction including lossless to multiple lossy levels to improve performance for slow network situations.⁸ Static images will always be displayed at full resolution.
- Save state creation allows users to save the exam to the database in an intermediate post-processing state at any time, and later restore it, allowing multiple radiologists or technologists to contribute the post-processed study.
- Common tools by 2D and 3D applications (window/level, zoom, pan, distance measurement, 2D ROI selection).
- Smart Suggestions provides intelligent application or protocol selection. By presenting the most relevant application based on the DICOM data selected for post processing.
- AW Server 3.2 provides local DICOM database allowing rapid launching of 3D applications and temporary storage of derived imagery.
- DICOM Direct Connect utilizes DICOM standards for data retrieval to improve your workflow environment by directly accessing DICOM data from multiple archival sources and loading that information into your desired AW ONE application for analysis.⁷



IT and security capabilities

- Active directory integration allows enterprise user authentication. Directories supported include Microsoft® Active Directory® (MSAD) and other LDAP authentication services.
- Provides a centralized user management system in case integration with enterprise directory is unavailable.
- Centralized web-based administration interface for configuration, diagnostics, usage and day-to-day server management.
- Provides group privileges for full access to exams or to enforce mandatory exam search by configurable criteria.

IT and security capabilities *(cont.)*

- Centralized Enterprise Audit trails capture user access to patient data using industry standard protocols: IHE ATNA compliant audit messages (RFC3881), TCP, BSD Syslog, and Reliable Syslog (Cooked profile Experimental) transport to third party audit repositories. Audit logs are kept on local storage and managed with log rotation.
- Display of annotations and patient protected information can be controlled for privacy.
- Provides support for deployment of client software through Microsoft Windows® Installer (MSI), making it easy to manage enterprise client PCs.¹⁰
- Features a stateful server firewall to track network connections and detect malicious intrusion attempts.
- Allows thin client access over the internet with either http port (80) or encrypted https port (443).¹⁰

Performance

Performance and interactivity of AW advanced visualization applications depends on the network bandwidth, latency, and client workstation configuration. For optimal performance, a minimum network bandwidth of 40 Mbps with a latency of 2.7 ms or lower is required. High bandwidth such as a hardwired local area network (LAN) permits faster interactions at lower compression ratios.

AW Server may also be used over WIFI or WAN/Internet although performance will depend on round-trip latency between the client workstation and the server. A minimum of 3 Mbps bandwidth per client with latency less than 50 ms is recommended for reasonable performance when compression is used.

To optimize performance, GE HealthCare's "smart compression" technology applies a user-selectable level of compression to displayed images only while you page, browse, or rotate the images. Images are displayed automatically at full fidelity once user interaction stops. A clear visual display on the images indicates when compression is being applied. The device is not intended to meet diagnostic quality criteria with lossy-compressed images.

Supported compression levels:

- Lossless
- Lossy 15:1 (compression ratio is 15:1)
- Lossy 22:1 (compression ratio is 22:1)
- Lossy 33:1 (compression ratio is 33:1)

Specifications and requirements



Turn-key server specifications

AW Server 3.2 is deployed as a physical server in either an L, XL, or XXL size or as a Workstation.⁹

Turn-key server hardware specifications listed here are minimum server hardware capabilities. Specific server hardware is subject to change without prior notice.

AW Server 3.2 software is also supported on some previously deployed AW Server systems although slice counts may be restricted by available memory.

Size	L
Active concurrent users ¹	3
Processor	2 Intel® Xeon® Silver-4510 12-core CPUs
Memory	256 GB RAM
Disk drive	OS: 800 GB SSD x2 - RAID-1, 800 GB Storage: 960 GB SSD x4 - RAID-5, 2.88 TB
Network	4 1-Gbps NICs
Management	Dedicated embedded lights out manager
Power	Fully redundant power and cooling
OS	SUSE Linux 15

Size	XL, XXL
Active concurrent users	6, 12
Processor	2 Intel Xeon Gold 6542Y 24-core CPUs
Memory	512 GB RAM
Disk drive	OS: 800 GB SSD x2 -RAID-1, 800 GB Storage:1.6 TB SSD x6 -RAID-5, 8 TB
Network	4 1-Gbps NICs
Additional NIC	2 ports 10 Gbps
Management	Dedicated embedded lights out manager
Power	Fully redundant power and cooling
OS	SUSE Linux 15

Workstation configuration

Size	Workstation HP Z2G9
Active concurrent users	1
Processor	IntelCore i7 13700k (3.40 GHz 16cores 30 MB Cache 125 W)
Memory	128 GB (4x32 GB) DDR5 4800 MHz or higher UDIMM ECC Memory
Disk drive	M.2 1st slot 1 TB SED NVMe OS disk, M.2 2nd slot 2 TB SED NVMe image disk
Network	Intel I350-T4 ethernet card
GPU	NVIDIA® Quadro® T1000e 8 GB Graphics Card
Optical drive	9.5 mm Slim Blu Ray Disc Writer
Power	700 W.Wide -range (PFC)
OS	SUSE Linux 15

Cache, which is subject to overhead can store approximately:

- 6,400,000 256*256*16 bits uncompressed images or
- 1,600,000 512*512*16 bits uncompressed images or
- 400,000 1024*1024*16 bits uncompressed images or
- 100,000 2048*2048*16 bits uncompressed images

Operating environment

Temperature	+5°C to +35°C (40° to 95° F)
Humidity	10% to 85% (relative non-condensing)
Altitude	0 to 5000 m (16,404 ft.)
Acoustics	LWAd less than 4.3 Bels
Shock	40 G peak, half-sine, 2-3 ms

Non-operating environment

Temperature	-40°C to +60°C (-40° to 140° F)
Humidity	10% to 90% (relative, non-condensing)
Altitude	0 to 12192 m (37,000 ft.)

Specifications and requirements *(cont.)*

Monitor (Workstation Configuration)

Screen Options	Single 27"	Dual 24"
Medical Grade	No	Yes
Resolution	Native resolution 1280 x 1024 (5:4 aspect ratio)	1920 x 1200
Power	AC 100 - 240 V : 50 / 60 Hz	AC 100 - 240 V : 50 / 60 Hz
Approximate weight	6.96 kg (15.34 lbs)	7.8 kg each (17.19 lbs)

Footprint

Height	35.56 cm (14 in)
Width	17.01 cm (6.7 in)
Depth	38.61 cm (15.2 in)
Approximate Weight	15 kg (33 lbs)



Virtualized server specifications

AW Server 3.2 is available for deployment as a software only system on existing VMware and Microsoft Hyper-V installations.

AW Enterprise, the horizontally scaled node configuration of virtualized AW Servers in conjunction with DICOM Direct Connect, enables scaling to support up to a 75-node cluster solution.

This provides an on-premises, multi-site enterprise solution that can grow as organizational needs for advance visualization solutions expand.

Customers provide a virtual machine environment for which CPU and RAM overcommit are not recommended. Hyperthreading can be enabled within the virtual machine environment.

Hard disk drives are required to store all VM data with thick provisioning.

- Intel Xeon CPU with SSE® 4.1, AES® (45 nm or better)
- VMware ESXi® Host Virtual Machine Hardware Version 14
- Microsoft Hyper-V hypervisor Generation Type 1



VM configuration requirements

Virtual machines supporting AW Server must be configured with the following resources:

L: 8 core vCPU, 96 GB vRAM, 1 NICs, 400 GB OS, 500 GB - 6 TB vHDD (IOPS 800 or better). L system supports up to 3 concurrent users.¹⁰ Supports AW Enterprise.

XL: 16 core vCPU, 152 GB vRAM, 1 NICs, 400 GB OS, 500 GB - 6 TB vHDD (IOPS 800 or better). XL system supports up to 6 concurrent users.¹⁰

XXL: 24 core vCPU, 152 GB vRAM, 1 NICs, 400 GB OS, 500 GB - 6 TB vHDD (IOPS 800 or better). XXL system supports up to 12 concurrent users.¹⁰



Server licensing

AW Server 3.2 may be acquired either as a single physical installation or as a virtual installation. Applications licenses are sold separately.



Thin-client requirements

AW Server delivers user-installable client software to enable access to applications and data on the server.

Minimum HW configuration

Processor	2.33 GHz Pentium®4 minimum, Pentium dual core processors recommended for optimal performance
Memory	4 GB minimum
Disk drive	500 MB free space available
Network card	100 Mbps minimum (1000 Mbps recommended)
Internet connection	Customer-provided IPSEC VPN, for internet/WAN operation
Mouse	Two or three-button mouse. Three button mouse suggested for best use of function.

Specifications and requirements *(cont.)*



Monitors

AW Server 3.2 L, XL, and XXL supports identical horizontally aligned dual monitor clients with a recommended combined resolution of 4 MP (2x2MP),¹¹ larger monitors may be used.¹²

AW ONE applications may take advantage of the dual screen support to allow larger or more numerous views.



Screen resolution

Minimum: 1280H x 1024V with full color (24 bit)

Recommended: dual 2 MP (1600 x 1200) or a single 3 MP (1536 x 2048)

Web Client: recommended monitor resolution up to 12 MP (4200 x 2800) in a single display configuration or up to 2 x 6 MP (2800 x 2100) in a dual display configuration. In case of monitor resolutions exceeding 4 MP, appropriate scaling settings (150% or higher) in the operating system should be applied to ensure readability of texts.



Supported client operating software

- Windows 11 64 bit
- Mac Parallels® (Mac OS Catalina 10.15.7 or higher, Parallels 10. Windows 11 64 bit)
- AWS3.2_OS (Workstation configuration)



Supported web browsers

- FireFox¹⁴
- Safari¹⁴
- Chrome¹⁴
- MS Edge¹⁴



User interface languages

- Chinese¹³
- French
- Norwegian
- Danish
- German
- Portuguese
- Dutch
- Italian
- Russian¹³
- English
- Japanese¹³
- Spanish
- Finnish
- Korean¹³
- Swedish



Keyboard layouts

- Danish
- Dutch
- Finnish
- French
- Canadian French
- German
- Italian
- Norwegian
- Portuguese
- Spanish
- Swedish
- United States English
- United Kingdom English



Standards

- DICOM Storage Service Class for RT, CT, MR, CR, X-ray (Angio and R&F), Digital X-ray (DX), MG, NM, PET, Key Image Notes (KIN), Structured Reporting (SR), Grayscale Softcopy Presentation State (GSPS), U/S, Secondary Capture, Secondary Capture Color DICOM Image Objects.
- DICOM Service Class User (SCU) for image send and Service Class Provider (SCP) for image receive.
- DICOM Storage Commitment Service Class User (SCU)
- DICOM print (Color and B&W)



Regulatory compliance Rx Only

This product complies with the Regulation (EU) 2017/745 of the European Parliament and the Council on the medical device (MDR). This product or its features may not be available in some countries or regions. Please contact your GE HealthCare sales representative.

About GE HealthCare Technologies Inc.

GE HealthCare is a trusted partner and leading global healthcare solutions provider, innovating medical technology, pharmaceutical diagnostics, and integrated, cloud-first AI-enabled solutions, services and data analytics. We aim to make hospitals and health systems more efficient, clinicians more effective, therapies more precise, and patients healthier and happier. Serving patients and providers for more than 125 years, GE HealthCare is advancing personalized, connected and compassionate care, while simplifying the patient's journey across care pathways. Together, our Imaging, Advanced Visualization Solutions, Patient Care Solutions and Pharmaceutical Diagnostics businesses help improve patient care from screening and diagnosis to therapy and monitoring. We are a \$19.7 billion business with approximately 53,000 colleagues working to create a world where healthcare has no limits.

Follow us on [LinkedIn](#), [X](#), [Facebook](#), [Instagram](#), and [Insights](#) for the latest news, or visit our website <https://www.gehealthcare.com/> for more information.

References:

1. Requires purchase of Parallels 11 and Windows 11 64-bit software.
2. Maximum resolution recommendations vary based on the network bandwidth and latency; maximum resolution might be limited by the specific clinical applications. When utilizing the web client dual screen support is provided through installation of a browser extension.
3. Requires purchase of appropriate application licenses.
4. Requires purchase of backend integration license. Only compatible with certain GE HealthCare CT consoles check CT Scanner product data sheet.
5. Please refer to Volume Viewer datasheet for details.
6. Requires purchase of separate application licenses.
7. Not all AW applications will support DDC, check with your sales representative for the latest list.
8. Smart Compression is manually applied to all applications except Next Generation apps which the technology is inherit within the application automatically.
9. For security reasons, GE HealthCare always recommends VPN access to the server.
10. Number of supported clients depends on the server configuration, purchased licenses, network and client monitor resolution.
11. Dual monitors are only supported through thin client and in Web Client through browser extension .
12. Maximum resolution recommendations vary based on the network bandwidth and latency; maximum resolution might be limited by the specific clinical applications.
13. Limited to Windows clients only, not available on Linux clients.
14. AW Server supports the latest versions of the identified browser. It is the user's responsibility to ensure browsers are on current version.

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