



Product Data

Synapse Release Version 4.0.0

Workstation Software

Application

Synapse Workstation software is the multi-modality viewing software for Synapse Picture Archiving and Communication System (PACS). Synapse Workstation software provides viewing and manipulation of radiological data including images, reports, patient status and clinical information. It also provides for integrations to clinical applications including dictation systems, RIS and three dimensional processing applications. It is a multipurpose, enterprise wide application used for radiologist interpretation, in-house clinical review and physician desktop image & information access.

Synapse Workstation software is an entirely web-based, thin-client application using Internet technology at the foundation of its design. The only locally installed component is an ActiveX control plug-in to Internet Explorer® on Microsoft® Windows®. This design allows for a user interface that takes advantage of the familiar functions of Internet Explorer and Windows, such as back, forward, links, Favorites and right-click context menu while also providing powerful imaging functions necessary in today's radiology department and beyond.

As a thin-client application, Synapse is accessible by anyone connected to a Synapse web server via an intranet or the Internet over standard HTTP or a secure HTTPS (SSL) connection. Synapse users can be assigned different security levels to access patient and study folders and are

assigned different privileges around their ability to save or modify information stored in the Synapse database. All tools are available to all users regardless of their physical location or health provider function. Synapse is designed for the needs of the radiologist as well as clinicians, referring physicians, technologists and administrators from the same user application with the same tools and user interface.

Image and Display Features

- Intuitive use of colors and layout for worklists, PowerJacket™, icons and toolbars
- One hand mouse operation for common manipulation tools:
 - Window/Level
 - Zoom
 - Pan
- Double-click any image to display one-up
- Image processing presets with keypad shortcuts by modality
- New image processing sub-system that provides FUJIFILM image processing for FCT, CT, DX, MG and other general image types
- CR Image Processing including Dynamic Range Control (DRC) and Multi-Frequency Processing (MFP)
- CT Image Processing with DRC and sharpness enhancement

- Zoom to 1x (acquisition pixel = display pixel)
- Zoom to fit window
- Interactive region of interest with zoom, magnification and window/level
- Rotation and flip
- Manual and DICOM image shuttering
- Active overlays allow the user to enter information into the image itself (window level, zoom factor and others)
- Spine labeling feature that allows users to easily label vertebral and intervertebral levels within CT and MR
- Color display
- Annotations and measurements including:
 - Line length and line ratio ruler
 - Curved line measurement
 - Free text
 - Arrows
 - Density Values (Hounsfield Unit, Optical Density or Pixel Value depending on image type)
 - Elliptical, rectangular and freehand
 - ROI with calculated area, perimeter as well as mean and standard deviation of density
 - Label palette for spine labeling
- Annotation save

- Cine tool with speed and direction control, as well as support for cine of multiple linked series simultaneously
 - Adjustable CINE frames per second
 - AVI save
 - Independent series controls
 - Pause and reverse play
 - Clipping feature to allow playback of a subset of the CINE stack
- Drag and drop export of lossy JPEG images to desktop JPG or BMP file
- Stack-in-place – fast image stack scrolling via mouse control
- Middle mouse button fly-through for stack in place
- Image book marking (annotated images are auto-selected as bookmarks)
- Keyboard or mouse driven image series navigation
- Selectable image up-count
- Configurable page layout
- Drag/drop for copy and paste to other Windows applications
- Drag/drop to create Synapse shortcuts
- IntelliScroll – synchronized stack navigation
- IntelliLink – Crosshair 3D navigation with support for MG and PT modalities
- Relative window level operations may be linked between series or images in the same study to reduce the number of clicks during reading
- Cross-sectional reference lines
- Monitor calibration for true size display
- Lossless and lossy image decompression and display
- Selectable image compression version for initial display with support for changing version during display
- Customizable modality specific overlays for patient, study and image information (see release specification for detailed system defaults)
- Synapse integrated MIP / MPR / Fusion feature
- Context integration to third party Nuclear Medicine and 3D reconstruction products including:
 - Hermes
 - TeraRecon
 - Thinking Systems
 - Toshiba Advanced Visualization
 - Vital Images
- TraumaCAD / OrthoView orthopedic integration
- Multi-phasic series grouping by Temporal Position Indicator for MRI series split
- Mammography Toolset
 - Multiple CAD object support
 - CAD can be turned on/off independently from other annotations
 - Mouse over tooltip displays CAD manufacturer, version and marking type (calcification or density)
 - Enhanced breast bound quadrant view feature allows for showing small overlaps into adjacent quadrants.
 - CAD status displayed in image overlay
 - Pixel Padding support
 - Quadrant view
 - Image Linking allows propagation of window level, zoom and pan changes
 - MG image justification feature provides left, center, right image justification for MG images
 - Image context menu providers setup options with shortcut keys
 - Automatic and manual breast bounds image alignment for all digital mammography systems
- Customizable system populated work folders based on image, demographic, census and other HIS/RIS/DICOM provided data
- Synapse Dashboard aggregates information from Synapse folders and provides access to those folders similar to a worklist
- My History feature provides quick and easy access to all images previously viewed by that user
- Synapse installs with commonly used folders that can be duplicated and modified to make site-specific configurations
- Conference folders that can store shortcuts to any Synapse object for conferencing, collaboration and other manually managed workflows
- Folder columns can be sorted (up to 3 sorts at once) and filtered using on screen query by example
- Auto-compare selection for relevant priors can auto select “n” number of exams by one of the following criteria:
 - Same modality
 - Same procedure code
 - Related procedure code across modalities
 - Related procedure code and same modality
- Unread workflow automation macro
 - F8 to start workflow from an unread studies folder
 - F8 again to mark dictated and open next available study
 - F9 to skip and open the next available study
- Barcode scanning workflow automation option
- Ability to anonymize patient and study data
- Concurrency tracking and alerts to eliminate duplicate, simultaneous reads
- Group dictation feature allows grouping of unread studies by Patient ID, Visit Number or Order ID for the purposes of generating one report
- Dictation system integration via serial port, XML or TCP/IP communication

Workflow Features

- Reading protocols (detailed description in the next section)
- Customizable context menus per user with option to show most frequently used menu items

- Bi-directional dictation workflow that allows the dictation system to mark the study dictated
 - PowerScribe resident workflow where PowerScribe triggers Synapse to open study images
 - EPIC Radiant RIS driven workflow with content synchronization
 - Synapse workstation may connect to multiple dictation systems
 - Supported third party dictation products include:
 - 3M ChartScript
 - Agfa Talk Station
 - Centricity RIS
 - Crescendo DigiDictate-IP
 - Dolby Fusion
 - iRecorder
 - Lanier VoiceWriter
 - Magview (for MG)
 - MediSpeech
 - MedQuist SpeechQ
 - MedQuist Ovation
 - MRS (for MG)
 - Nuance RadWhere
 - Nuance PowerScribe 360
 - PC Dictation
 - PenRad
 - Provox Report
 - Spheris
 - WinScribe
 - Reservations allow users to lock an unread study for themselves or for another user, with the ability to define default time period that the study remains in a reserved state
 - Study reservation provides the ability to reserve studies and use quick filters for navigating to the set of reserved studies. The feature also simplifies the sending of images for review to the attending physician
 - Reservations Folder displays a list of reserved studies that can be sorted by priority and dictated using F8 / F9 macro
 - Study's folder icon changes if a user already has a study locked
 - Folder list provides configurable thresholds and warnings for image counts, study age, and reservation age
 - Subscription technology can:
 - Monitor any Synapse folder for content changes
 - Cache the content locally for faster image access – particularly useful for WAN-based teleradiology or tele-diagnosis
 - Alert user to new content availability
 - Automatically reserve the new content for the alerted user
 - Subscriptions can be reactivated when the user logs in from another workstation at any time
 - Icon in Synapse folders indicates which studies have cached locally
 - Temporary storage of all web pages and images in local Internet cache
 - Visual study indicator for studies completely stored in cache due to subscription
 - MultiView allows one Synapse workstation to be configured to access multiple Synapse systems
 - Optional sent status to allow for QC before exams are marked unread – configurable by modality
 - Option to hold MG (mammography) exams for reading for 'n' minutes to allow CAD to process
- ### Reading Protocols
- Reading protocols automate the display layout and sequence of images for study and its comparisons into multiple pre-defined reading protocol steps
 - Template reading protocols are for automation and display of exams for diagnosis and review
 - Instance reading protocols specify the display arrangement for a particular study and are used for conferencing and collaborating on specific studies
 - The best protocol is chosen on initial display and opening of a study
 - Users can choose a different protocol from a pull-down list
 - Users can move forward or backward through protocol steps
 - Each protocol step defines:
 - Page layout including monitor location and covered monitor count
 - Tile format for each view port
 - Apply tools settings (to all images or to selected images)
 - Overlay display status (on/off)
 - Application of image presets
 - Whether to display the current study only or with comparison(s)
 - Reading protocol steps can be reordered or deleted
 - Four levels of matching for template reading protocols
 - All studies
 - Specific modality
 - Specific procedure code(s)
 - Specific series combination using the DICOM series description name to match the protocol
 - For series matching, like series names can be standardized to be treated as a match (e.g. "Head w Contrast" = "Head With Contrast")
 - MG (mammography) images are grouped at the image level as opposed to the series level due to specific MG workflow requirements
 - Match is specific to the monitor count defined in the reading protocol
 - For series matching, near match will choose a reading protocol that is close to an existing RP if series or image names (MG case) are not an exact match to an existing reading protocol
 - Acceptable number of non-matches to establish a near match is configurable
 - Non-matching series appear in a protocol step named "Extra Views"
 - Duplicate named MG images can be stacked over one another with newest image on top to support retake workflow
 - Individuals can create their own user level reading protocols

- System level reading protocols can be created by administrators for use by all users
- Can be exported and imported between Synapse systems
- Can be copied via drag/drop between users, from system level to user and user to system level
- Can be deleted
- RP engine separates combined multi-echo and multiphase MR series into individual series on display

Information Features

PowerJacket™

- PowerJacket window enables access to clinical information in Synapse for a study
- PowerJacket provides access to:
 - Comparison exams
 - Study information
 - Reports
 - Notes
 - Documents
 - Series
- Comparison exam list can be grouped by:
 - Same modality
 - Related procedure code
 - Related procedure code and same modality
- CommonView™ (optional feature) can be configured to automatically search across multiple Synapse datasources for relevant comparisons
- Internal CommonView displays all studies for patients with multiple identifiers within the same database
- CommonView can display exact matches using available identifiers (MRN or MPI)
- CommonView can be configured to display near matches using configurable demographic criteria, including name, date of birth and gender
- Study information includes study, patient and visit information

- Study information comes from an integrated HL7 feed from the HIS/RIS or the DICOM header
- Report is accessible if one is available (requires optional HL7 integration for Synapse to receive the report)
- PowerJacket integration to third party web-based RIS systems (optional feature)
- Users with the appropriate privileges can add notes to a study
- Administrative users can delete notes
- Notes can be created as voice files or text
- Canned text notes can be configured by user
- Documents can be stored via drag and drop into the PowerJacket
- Documents can be added via direct scanning into Synapse
- Series Picker displays all available series for a displayed study
- Series Picker is configurable so it may be pinned regardless of the tab in focus
- Series Picker is user configurable to display thumbnail images or text (series description)
- Individual series can be dragged from the PowerJacket Series Picker to an available monitor view port for display
- Available study status indicators are configurable

Administrative Features

- Centralized user and workstation settings that provide roaming user profiles
- ESWAT enterprise Synapse web administration toolkit for system configuration
- Configurable auto logoff timeout
- Folder access is assignable by user or role

- Administration folders display system metrics and anomalies
- Integrated Active Directory authentication
- Desktop Synapse icon can be hidden
- Drag/drop for study, image, series, patient merging or reallocating
- MSI push supported installation of installed ActiveX control
- Weblink linking from other applications to Synapse using a structured URL call with specified context to patient, study, image, etc. (optional feature)
- Ad-hoc delete allows users with appropriate privilege to delete patient, study, series, or image. A safety mechanism is included that allows recovery of deleted data
- DICOM header export
- Windows and DICOM printing with color support and true size options
- Print composer with WYSIWYG function provides drag and drop images, as well as the ability to include mixed modalities in a single layout

DICOM Transfer

- To a datasource allows the user to transfer the contents of selected folders to any other datasource
- To a teaching archive allows the user to push images and DICOM key image notes to teaching archives
- To media allows the user to save images as DICOM files which can be anonymized before saving. Images can be burned directly to a local workstation CD burner
- To DICOM image viewer allows a user to view the DICOM header associated with an image

Workstation Operating System Support

OPERATING SYSTEM	VENDOR	BROWSER	COMMENTS
Windows XP Professional with SP2 or SP3, 32-bit only	Microsoft	Internet Explorer 7.0 Internet Explorer 8.0	Video card and/or PC should support DirectDraw
Windows XP Tablet with SP2 or SP3, 32-bit only	Microsoft	Internet Explorer 7.0 Internet Explorer 8.0	Video card and/or PC should support DirectDraw
Windows XP Home Edition with SP2 or SP3, 32-bit only	Microsoft	Internet Explorer 7.0 Internet Explorer 8.0	Video card and/or PC should support DirectDraw Windows Home does not support domain-based user authentication and may lead to additional user authentication dialog boxes to maintain security
Windows Vista Home Premium with SP1 or SP2, 32-bit only	Microsoft	Internet Explorer 7.0 Internet Explorer 8.0	Video card and/or PC should support DirectDraw
Windows Vista Business Premium with SP1 or SP2, 32-bit only	Microsoft	Internet Explorer 7.0 Internet Explorer 8.0	Video card and/or PC should support DirectDraw
Windows 7 Ultimate with SP1, 32-bit and 64-bit	Microsoft	Internet Explorer 7.0 Internet Explorer 8.0	Video card and/or PC should support DirectDraw
Windows 7 Professional with SP1, 32-bit and 64-bit	Microsoft	Internet Explorer 7.0 Internet Explorer 8.0	Video card and/or PC should support DirectDraw
Windows 7 Home Premium with SP1, 32-bit and 64-bit	Microsoft	Internet Explorer 7.0 Internet Explorer 8.0	Video card and/or PC should support DirectDraw

Supported Display Formats

ORIENTATION	NUMBER OF IMAGE DISPLAY MONITORS
Landscape	1, 2, or 4
Portrait	1, 2 or 4

- For all configurations, an additional productivity monitor to the left (usually color LCD) is supported
- True size monitor configuration requires a monitor with square pixel spacing (horizontal pixel width = vertical pixel height)
- Image display monitors should be the same display resolution and color palette (grayscale, color, etc.)

CPU Requirements

Synapse workstations are divided into clinical and diagnostic classes. Both types support Intel and AMD compatible CPUs.

WORKSTATION TYPE	APPLICATION MINIMUM	RECOMMENDED MINIMUM
Clinical	Single CPU	Dual CPU
Diagnostic	Dual CPU, quad core	Dual CPU, quad core

Recommended Memory Requirements

Diagnostic workstations typically have other clinical applications with significant memory requirements. It is highly recommended these workstations contain as much memory as possible on the hardware available for 64-bit operating systems. Windows 32-bit operating systems can address up to 4 GB memory.

- Synapse 32-bit workstations should contain a minimum and maximum of 4 GB of RAM.
- A minimum of 8 GB of RAM is recommended for Windows 7 (64-bit).

Internet Cache Size Requirement

Synapse uses the Internet Explorer internet cache for the temporary storage of image files and web pages. While there is no specific cache size requirement, a small cache could force Synapse to retrieve images from the server multiple times even in one session.

Document Scanner Support

Consult with your FUJIFILM representative for currently supported scanner models.

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