Curator and CD Export Server Installation Guide

IMPAX 6.5.1

Installing and Configuring

Curator and the CD Export Server

AGFA

see more | do more

Copyright information

Trademark credits

Documentation warranty statement

Characteristics of the products described in this publication can be changed at any time without notice.

The information contained in this document is subject to change without notice. Agfa HealthCare N.V. and its affiliates make no warranties or representations, express, implied or statutory, with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Agfa HealthCare N.V. and its affiliates shall under no circumstances be liable for any damage arising from the use or inability to use any information, apparatus, method or process described in this document. Agfa HealthCare N.V. and its affiliates shall not be liable for errors contained herein or for incidental or consequential damage in connection with the furnishing, performance, or use of this manual.

2011 - 6 - 14

Manufacturer's responsibility

The manufacturer, installer, or importer will be responsible for the safety, reliability, and performance of the equipment only if:

- Installation, modifications, adjustments, changes, or repairs are performed by suitably qualified service personnel.
- The electrical installation of the site in which the equipment is used is according to an applicable safety standard (UL, CSA, or IEC/CDE).
- The equipment is used according to the instructions provided in the operation manuals.

External software licenses

(Topic number: 7696)

Information about third-party software licenses and copyrights can be found in *External software licenses* (refer to page 53).

Giving feedback on the documentation

(Topic number: 122201)

Thank you for taking the time to provide feedback. Your comments will be forwarded to the group responsible for this product's documentation.

To give feedback on the documentation

1. In an email subject line or body, list which product, version, and publication you are commenting on.

   For example, "IMPAX 6.4 SU01 Client Knowledge Base: Extended". (You can find this information in the footer of the publications.)
2. Describe the incorrect, unclear, or insufficient information. Or, if you found any sections especially helpful, let us know.
3. Provide topic titles and topic numbers where applicable.

   Including your personal contact details is optional.
4. Send the email to doc_feedback@agfa.com.

Sorry, we cannot respond directly to every submission and we cannot accept requests for changes in the product; instead, contact your product sales representative or the product's technical support channel.

Contents

Getting started

1

Understanding IMPAX, Curator, the CD Export server, and the hardware and software components required for Curator and the CD Export server helps ensure a successful installation.

Prerequisite knowledge: IMPAX installations

(Topic number: 7633)

The installation procedures require that you have general knowledge of computer hardware and software concepts and proficiency in operating and troubleshooting computer software.

What is IMPAX?

(Topic number: 6910)

IMPAX is an image archiving and communications system that eliminates the need for film because it receives, distributes, archives, and displays images. IMPAX automates the flow of information to integrate the Radiology department with the rest of the hospital. IMPAX can also integrate remote locations such as clinics or home offices to the system for offsite viewing of images.

Additional IMPAX documentation

(Topic number: 6911)

This guide is intended for service and administrative personnel who are installing or upgrading, configuring, and maintaining the Server components of the IMPAX 6.5.1 system.

For information about using the IMPAX software once it is installed, refer to the *IMPAX 6.5.1 Server Knowledge Base*, *IMPAX 6.5.1 Application Server Knowledge Base*, and *IMPAX 6.5.1 Client Knowledge Base: Extended*. These Knowledge Bases are installed on the Application Server. Refer to "Installing the IMPAX documentation" (topic number 15523) in the *IMPAX 6.5.1 Application Server Installation, Upgrade, and Configuration Guide*.

Opening the IMPAX 6.5.1 Server Knowledge Base

(Topic number: 58560)

Follow this procedure to open the IMPAX 6.5.1 Server Knowledge Base.

To open the IMPAX 6.5.1 Server Knowledge Base

1. Ensure that the IMPAX documentation has been installed.
2. Launch the IMPAX Administration Tools and log in. Select **Help** > **Help URL**. On the IMPAX Documentation page, click the **IMPAX Server Knowledge Base** link.

   or

   From a browser on a connected computer, navigate to https://*app_server_name*/impax/documents/server/default.htm

Opening the IMPAX 6.5.1 Application Server Knowledge Base

(Topic number: 58563)

Follow this procedure to open the IMPAX 6.5.1 Application Server Knowledge Base.

To open the IMPAX 6.5.1 Application Server Knowledge Base

1. Ensure that the IMPAX documentation has been installed.
2. On the Application Server, double-click the **AGFA IMPAX Knowledge Base** desktop shortcut. Select the **IMPAX Application Server Knowledge Base** link.

   or

   From a browser on a connected computer, navigate to https://*app_server_name*/impax/documents/appserver/default.htm

Opening the IMPAX 6.5.1 Client Knowledge Base: Extended

(Topic number: 58566)

Follow this procedure to open the IMPAX 6.5.1 Client Knowledge Base: Extended.

To open the IMPAX 6.5.1 Client Knowledge Base: Extended

1. Ensure that the IMPAX documentation has been installed.
2. Launch the IMPAX Client application and log in.

3. Press **F1**.

What is Curator?

(Topic number: 7018)

The Curator process is responsible for compressing incoming images into the Mitra Wavelet format and storing them in the web cache. These studies can be accessed by remote Clients over the World Wide Web or by local display Clients. Wavelet images provide the advantage of partial file transfer, meaning that IMPAX can display a low-resolution view of these images very quickly and can automatically update the display with higher resolution views as they cross the network, until the required resolution of image has been retrieved.

Multiple instances of Curator can be supported. If more than one Curator is installed, the first Curator instance that is started is considered the *master Curator*. The master Curator owns the web cache and is responsible for servicing requests from the IMPAX Application Server and from IMPAX Clients. The Autopilot running on the master Curator is responsible for the web cache. Each additional Curator checks for PREPARE jobs in the queue associated with the master Curator and writes to the web cache owned by the master Curator.

Understanding how Curator manages web images

(Topic number: 7021)

When accessing IMPAX over the Internet, connection speeds are typically much slower than within the hospital network. To minimize the effect on users, Curator processes images in the image cache, creates Mitra wavelet compressed images Mitra wavelet compressed images (lossless, by default), and stores the wavelet images in the web cache. Wavelet images provide the advantage of partial file transfer, meaning that IMPAX can display a low-resolution view of these images very quickly and can automatically update the display with higher resolution views as they cross the network, until the required resolution of image has been retrieved. The wavelet images can be accessed by both local and remote Clients.

The role of the master Curator

(Topic number: 7025)

To distribute the compression work, multiple Curators can run concurrently in IMPAX, contending for PREPARE jobs and storing curated images to the shared web cache or caches. The first Curator started is considered the *master* Curator, and any additional Curators are considered *secondary* or *slave* Curators.

When the master Curator is started, it creates a Curator job queue and starts managing the web cache. The master Curator and secondary Curators check for PREPARE jobs in the Curator job queue, process the images into Mitra wavelet format, and store the images in the web cache. Although

the Curator job queue and the web cache are owned by the master Curator, PREPARE jobs are associated with the Curator process that accepts the job.

The DICOM Storage Cache Server (using SPFTP) and DICOM Authenticated Storage Cache Server (using ASPFTP) provide images to the IMPAX Application Server and IMPAX Clients (respectively) and are installed with Curator. Because the master Curator owns the web cache, only it is responsible for servicing requests for wavelet images. The secondary Curator processes only curate images and store them to the web cache. Both master and slave Curators can read and write to the web cache, but to configure the distribution of wavelet images so that all Curators can service requests for images, a load balancer is required.

Note:

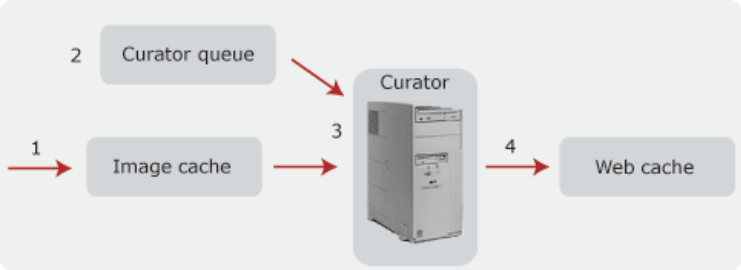
All Curator processes must have unauthenticated access to the shared web cache. If Curator and Network Gateway components are installed together, all caches (image and web) must be shared.

Autopilot is installed with all Curators, but only the Autopilot running on the master Curator is responsible for managing the web cache. If the master Curator fails or is unavailable for an extended period of time, a secondary Curator can be configured to take the role of the master Curator, taking ownership of the web cache and the Curator job queue.

Overview of Curator processes

(Topic number: 7034)

The following diagram illustrates the general flow of images between the image cache and web cache:



1. As studies arrive from the SCP or are retrieved from the archive, each study object is stored in the image cache and a STUDY_ARRIVED notification is created.
2. Task Scheduler receives the notification, creates a PREPARE job for the study, and places the job in the Curator job queue.
3. The next Curator to check the Curator job queue takes ownership of the PREPARE job and reads the study objects from the image cache.
4. Curator compresses the appropriate objects using the Mitra wavelet format and stores them in the web cache.

   For each object in the study, Curator considers the following:

   - If the object is already in the web cache, it is not processed again.

- If Mitra wavelet compression is required, the object is processed, compressed, and stored to the web cache. Curator generates a new DICOM header for each image.
- If Mitra wavelet compression is not required, the object is copied to the web cache. This prevents image access privilege problems and reduces partial study problems arising from studies being spread across multiple AE_REFs.

5. After the study is processed, Curator sends an MVF notification and, if configured, an EPR notification to indicate that new wavelet images are available.

How does Curator process images?

(Topic number: 7057)

The following changes are made to images processed by Curator:

- PALETTE data is converted to RGB without loss of data. Photometric interpretation is also changed to RGB.
- YBR_PARTIAL data is converted to YBR_FULL without loss of data.
- Any embedded overlays are burned into bit 11, with some loss of data.
- A slope/intercept is applied to pixel data to reduce the effective bits_stored to 12 bits, with some loss of data. Special logic is applied to CT images to preserve the Hounsfield Units.
- If the pixel data is not equivalent to the original, it is marked as lossy compressed. The Derivation description in the DICOM header file details the changes applied to the pixel data.

What is the CD Export server?

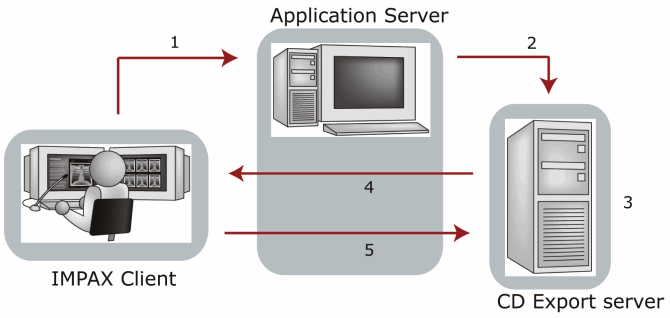
(Topic number: 7016)

The CD Export server processes burn jobs created by the IMPAX Client and prepares the zip files containing the data for the burn job.

Understanding how the CD Export server works with the IMPAX Client

(Topic number: 7020)

The AS300 MVFcdexport package installs the software required for the CD Export server. The CD Export server processes local burn jobs created by the IMPAX Client and prepares the zip files containing the data for the burn job.



Interactions with the IMPAX Client and Application Server

1. A burn request is created by the IMPAX Client, indicating the information to be included in the burn job.
2. The Application Server creates the burn job and notifies the CD Export server.
3. The CD Export server creates the zip file containing:
   - The DICOM files (images and dicomdir)
   - An Access database with information about the DICOM objects in the volume
   - The clinical report files created by the Application Server
4. The zip file is transferred to the Application Server, which then passes the file to the IMPAX Client to perform the burn job.
5. After the CD has been burned, the IMPAX Client creates a cleanup job to delete the zip files, images, and reports used for the burn job from the CD Export server cache.

Order of cluster installations

(Topic number: 7763)

The IMPAX cluster has many components and each depends on other components in the cluster. To correctly install and configure components in the cluster, follow this order of installation:

1. **Install the Database Server, Archive Server, and Network Gateway.**

   Install the core Server components and create the portable password file required to install other IMPAX components. Do not configure the AS300 Server components at this time; the Application Server must be installed before these Server components can be configured. Refer to the guide appropriate to your configuration.

   Required guide: One of *IMPAX 6.5.1 AS3000 Installation and Configuration Guide* or *IMPAX 6.5.1 AS300 Installation and Configuration Guide*

2. **Install the Application Server.**

   Install the Business Application services and IMPAX documentation on the Application Server.

   Required guide: *IMPAX 6.5.1 Application Server Installation, Upgrade, and Configuration Guide*

3. **Begin configuration of the Application Server.**

   Create and import an SSL certificate, configure ADAM (Windows Server 2003) or AD LDS (Windows Server 2008), compress web services, set connections to the image and audit servers, and set logging levels.

   Required guide: *IMPAX 6.5.1 Application Server Installation, Upgrade, and Configuration Guide*

4. **If you have installed a Windows-based Database Server, Archive Server, or Network Gateway, configure these components.**

   Configure database backups, image and web caches, and archives (if necessary). In clusters that include only Solaris-based systems, these configuration steps are done automatically during the installation.

   Required guide: *IMPAX 6.5.1 AS300 Installation and Configuration Guide*

5. **Install and configure Curator and the CD Export server.**

   If the site requires compressed web images, install and configure one or more Curator systems and set up the web cache. If you are installing multiple Curators, install and start the master Curator first, then install and start the slave Curators.

   If you will be using the CD Export feature in the IMPAX Client, install the CD Export server.

   Required guide: *IMPAX 6.5.1 Curator and CD Export Server Installation Guide*

6. **Complete the configuration of the Application Server.**

   Complete the optional Application Server configuration tasks that are applicable to the site.

   Required guide: *IMPAX 6.5.1 Application Server Installation, Upgrade, and Configuration Guide*

7. **Install and configure Clients.**

   Install and configure the IMPAX Client, the PACS system used to access images.

   Required guide: *IMPAX 6.5.1 Client Installation, Upgrade, and Configuration Guide*

If installing a standalone station (single-host AS300 with Application Server and Client), refer to the *IMPAX 6.5.1 Standalone Installation and Configuration Guide*.

If installing a single-server (single-host AS300 with Connectivity Manager and Application Server), consult Installing an IMPAX AS300 single-server in the *IMPAX 6.5.1 AS300 Installation and Configuration Guide*.

All documentation is available on the IMPAX Documentation DVD.

Order of Curator installations

(Topic number: 7036)

Three possible scenarios exist for working with Curator. For small AS300 sites, you may want to install and configure Curator on the single-host Database Server or on the Archive Server or Network Gateway. For medium-sized sites, we recommend installing Curator on its own machine, separate from the other server components. And for larger sites, we recommend installing two or more Curators on separate machines, working in a master-slave configuration.

If you are installing multiple Curators, the general installation order is as follows:

1. Install the master Curator and restart the system.

   The Curator job queue is created in the IMPAX database and is associated with the master Curator.

2. Set up the web cache for the master Curator.
3. If required, configure the default Curator settings in the database.
4. Install and start any secondary or slave Curator systems.

   No additional configuration is required for secondary Curators. Only one Curator job queue exists, and it is owned by the master Curator. The secondary Curators check this queue and write to the web cache as required.

   Although multiple Curators may be installed, each Curator places web representations of objects into the same web cache. The web cache is owned by the master Curator and managed by the Autopilot running on the master Curator.

Curator hardware and software requirements

(Topic number: 6714)

We recommend the following hardware and software for a dedicated Curator and CD Export server.

IMPAX Server: External software requirements

(Topic number: 6695)

The following software is required for most IMPAX AS300 servers. Unless otherwise indicated, Agfa does not provide the software as part of the IMPAX AS300 Server installation package.

Component	Requirements
Operating system	**For upgrades:** Windows Server 2003 R2 SP2, Standard or Enterprise Editions, 32-bit or 64-bit (only a dedicated Database Server can be run on Windows 64-bit) or **For new installs:** Windows Server 2008 SP2, Standard or Enterprise Editions, 32-bit or 64-bit (only a dedicated Database Server can be run on Windows 64-bit)
Database software	One of the following: • Oracle 10g 32-bit Server and Client (provided on Oracle for Windows 32-bit DVD) or

Component	Requirements
	• Oracle 10g 64-bit Server (provided on Oracle for Windows 64-bit DVD) or • Microsoft SQL Server 2005, Standard or Enterprise Edition, with Service Pack 3 (upgrades only) or Microsoft SQL Server 2008, with Service Pack 1 (upgrades only)
Browser	Internet Explorer 8.0
Java	
Documentation	Latest version of Adobe® Reader®
Remote access (optional)	Symantec pcAnywhere version 12.5
Antivirus	McAfee Antivirus 4.5 or higher

IMPAX Server: Hardware requirements

(Topic number: 6690)

The following hardware configuration is recommended for IMPAX AS300 servers (including single-server configurations).

Component	Requirements
Example systems	**Preferred:** HP ML370, DL380 (may be deployed with VMware ESX 3.5) **Supported:** Dell 1900, 2900, 2950, 6900*, 6950* Stratus® ftServer® 4300, 4410, or 5700 (dual CPU)
Hard drive	Minimum three drives Minimum drive size 40 GB Minimum drive size 73 GB NAS/SAN connections also supported
RAM	4 GB minimum
Number of CPUs	Two or four* CPUs, 2 GHz minimum each
RAID	Embedded RAID (for onboard storage)
Tape backup	DAT 72 tape drive, if required for database backup
Video	Integrated video

Component	Requirements
DVD	Yes
Network interfaces	100/1000 Mbps
Modem	N/A
Power supplies	Redundant (additional)
Peripherals	Mouse and keyboard

* The use of four-CPU socket servers for IMPAX is supported but not recommended.

** Stratus Servers are no longer supported for new installs.

IMPAX AS300 installation programs

(Topic number: 7684)

IMPAX 6.5.1 AS300 includes four installation programs—two for 32-bit Windows, and two for 64-bit Windows.

Program	Purpose
setup.bat (Oracle for 32-bit Windows DVD)	Install the appropriate version of Oracle Server or Client for 32-bit versions of Windows
setup.bat (Oracle for 64-bit Windows DVD)	Install the appropriate version of Oracle Server for 64-bit versions of Windows. Not supported for standalone configurations.
as300-installer.exe (IMPAX AS300 installation DVD)	• Install or upgrade an AS300 Database Server on a 32-bit version of Windows, under Oracle or SQL Server • Install or upgrade an AS300 single-host server (including standalone and single-server configurations) • Install or upgrade an AS300 Network Gateway, Archive Server, or Curator
as300-installer-x64.exe (IMPAX AS300 installation DVD)	Install or upgrade an AS300 Database Server on a 64-bit version of Windows under Oracle

Note:

SQL Server 2008 is not distributed with IMPAX but is available from the Agfa Parts Center.

Installing hardware and software

2

Other hardware and software components required by Curator and the CD Export server must be installed.

1. General installation notes for installing external software

(Topic number: 7061)

Restart the computer whenever any installation package asks you to do so. For instance, during the restart at the end of the Windows Server 2003 or Windows Server 2008 installation, the installation process registers files with Windows and replaces some files. For your installation to work properly, make sure that if you are asked to restart during the install, you do so before proceeding to the next step.

2. Installing Windows Server 2008

(Topic number: 94027)

Before installing the product software, Microsoft Windows must be installed. Before you begin the Windows installation, ensure that the proper CD drivers are installed.

Important!

If using RAID, configure it before installing Windows Server 2008. Use a hardware RAID configuration only, and not a software RAID configuration. Set up the hardware RAID configuration as described in the vendor's documentation.

To install Windows Server 2008

1. To boot the system, insert the Windows Server 2008 disc, choose an operating Window Boot Manager, and click **Next**.
2. On the Welcome screen, click **Install Now**.
3. From the list, choose **Windows 2008 Standard Edition** (**Full Installation**).
4. Accept the license agreement. Click **Next**.
5. Create a **C** partition as the location to install Windows.
6. Set the partition size to **40** GB. Click **Next**.
7. To set up Windows on the partition, click **Next** and follow the prompts to install Windows.
8. Select **Format the Partition using NTFS File System** and press **Enter**.

   The partition is formatted and files are copied. Depending on how big the partition is, this may take several minutes.
9. Follow the setup wizard.

After the installation is complete, the Initial Configuration Task screen is displayed.

3. Partitioning disks

(Topic number: 7032)

To store the files and programs required, create logical volumes as shown in the table in *Recommended disk partitions* (refer to page 18). This procedure assumes that the server has multiple disks. If it has only one disk, create all the logical volumes on the same disk.

Important!

Use the logical volumes only for their prescribed functions. Do not store unnecessary files in the logical volumes; doing so may negatively affect system performance.

Recommended disk partitions

(Topic number: 7056)

When partitioning disks, consider the following:

- If you have a large disk array (RAID), create more than one CACHE logical volume. Do not allocate more than 500 GB for each logical volume.
- For Autopilot to correctly monitor cache space, each cache created in the Administration Tools must be on its own logical volume.

In either of these cases, assign drive letters to each logical volume sequentially, starting at I, and name them with the drive letter appended: CACHE-I, CACHE-J, and so forth.

You must create subdirectories in the CACHE or WEBCACHE partitions to store the imaging data. The existing SYSTEM volume on C should be used for Windows and all program files. The C drive is 40 GB and is created while installing Microsoft Windows 2008.

Letter	Volume label	Size	Used for
H	LOGS	1 GB	Log files
I	WEBCACHE-I	Remaining space	IMPAX image files Consider labeling partitions on the Curator machine WEBCACHE-I, WEBCACHE-J, and so forth for the Mitra Wavelet images.

Note:

Throughout this document it is assumed that a CD or DVD device is assigned to drive D, and that the drive letters and names shown here are used. The volume letters and labels on your system may differ from those used here.

Creating logical volumes

(Topic number: 15469)

Before proceeding, ensure that you have determined how to partition the disks. See *Recommended disk partitions* (refer to page 18).

Creating logical volumes improves system performance.

To create logical volumes

1. Open the Windows Administrative Tools.
2. Select **Computer Management** > **Storage** > **Disk Management**.
3. Beside Disk 0, right-click **OSDisk (C:)** and select **Shrink Volume**.

   This restricts the C: drive to the specified size and moves the rest of the available disk space to Unallocated.
4. Right-click **Unallocated** and select **New Simple Volume**.
5. Follow the New Simple Volume Wizard, using the following settings:

Screen	Select
Specify Volume Size	Simple volume size in MB, as specified in the table in *Recommended disk partitions* (refer to page 18)
Assign Drive Letter or Path	• Select **Assign the following drive letter** • Select the letter specified in the table in *Recommended disk partitions* (refer to page 18)

Screen	Select
Format Partition	• Select **Format this volume with the following settings** • File system: **NTFS** • Allocation unit size: **Default** • Volume label: As specified in the table in *Recommended disk partitions* (refer to page 18) • Select the **Perform a quick format** checkbox.

6. To create any additional partitions, right-click the **Unallocated** space, select **New Simple Volume**, and repeat the previous step.
7. Exit Disk Management.

4. Configuring Windows Server 2008

(Topic number: 95230)

To configure Windows Server 2008, several tasks are involved.

Completing the initial configuration tasks for Windows Server 2008

(Topic number: 95233)

After installing Windows Server 2008, complete the initial configuration tasks as prompted.

To complete the initial configuration tasks for Windows Server 2008

1. If the Initial Configuration Tasks screen does not appear on-screen, it may have been disabled. Open it by running **C:\Windows\System32\Oobe.exe**.
2. Under Provide Computer Information, fill in the information as appropriate.
3. Under Update This Server, to ensure that Windows automatic updating and feedback is enabled, click **Enable automatic updating and feedback**.
4. In the Enable Windows Automatic Updating and Feedback dialog, select **Manually configure settings**.
5. Under Windows automatic updating, click **Change settings**.
6. In the Change settings dialog, set Windows to download but not install updates.
    a. Under Important Updates, select **Download updates but let me choose whether to install them**.
    b. Under Recommended Updates, clear the **Give me recommended updates the same way I receive important updates** checkbox.

c. Click **OK**.

7. Close the Manually Configure Settings dialog.
8. Close the Enable Windows Automatic Updating and Feedback dialog.
9. In the Windows update dialog, click **Check for updates** and follow the prompts to install the updates.

Upgrading Windows Server 2008 to Windows Server 2008 SP2

(Topic number: 107471)

CAUTION!

This topic provides only basic upgrade instructions. For complete installation instructions, refer to the applicable topics in the Windows Server 2008 SP2 TechNet.

To upgrade Windows Server 2008 to Windows Server 2008 SP2

1. Connect to the network or computer where you want to create the distribution folder.
2. In the shared folder, create a distribution folder for the service pack.
3. Copy Windows6.0-KB948465-*XXX*.exe into the distribution folder.
4. To install the service pack from a remote shared distribution folder, run **Windows6.0-KB948465-*XXX*.exe**.
5. Follow the instructions in the Setup Wizard.
6. When the installation process is complete, restart the computer.

When the computer restarts, log into Windows as an administrator-level user.

Adding roles and role services in Windows 2008

(Topic number: 104586)

When installing IMPAX on a machine running Windows 2008, configure the following roles and role services after Windows 2008 installation.

Roles:

- Web Services IIS Features

Role services:

- IIS 6 Management Compatibility

To add roles and role services in Windows 2008

1. Open the Windows Administrative Tools and select **Server Manager**.
2. Select **Roles** from the pane on the left.
3. Click **Add Roles**.

4. On the Before you begin page, click **Next**.
5. In the Add Roles wizard, select **Web Services (IIS)**.
6. On the Add Features Required for Web Server (IIS) dialog, click **Add Required Features**, then click **Next**.
7. For the following two screens, click **Next**.
8. In the Add Role Services dialog, select the **ASP.NET** checkbox.
9. In the Add Roles wizard, click **Add Required Roles Services**.
10. Select the **IIS 6 Management Compatibility** checkbox.
11. Click **Next** and follow the wizard.
12. To finish the installation, click **Install**.

    The installation could take several minutes.

Activating Windows Server 2008

(Topic number: 109368)

Windows Server 2008 must initially be activated.

To activate Windows Server 2008

1. If you have not already activated Windows Server 2008, open the Control Panel and select **System**.
2. Click the **Activate Windows now** link at the bottom of the screen.
3. Follow the on-screen prompts.

Configuring Windows Explorer to show all files

(Topic number: 47547)

We recommend that you display all available files in Windows Explorer.

To configure Windows Explorer to show all files

1. Open Windows Explorer.
2. Select **Tools** > **Folder Options**.
3. Switch to the **View** tab.
4. Under Files and Folders, select **Show hidden files, folders and drives.**.
5. Clear the **Hide extensions for known file types** checkbox.
6. To save the changes, click **OK**.

Deleting the hiberfil.sys file in Windows 2008

(Topic number: 118485)

By default, in Windows Server 2008, the hibernation feature is disabled. (We do not recommend that hibernation be enabled on production servers.) Nevertheless, the hiberfil.sys file used by the hibernation service may exist on the server, in the root folder of the drive where the operating system is installed. As this file can become very large, we recommend that it be deleted.

To delete the hiberfil.sys file in Windows 2008

1. Open a command prompt.
2. Type

   powercfg.exe /hibernate off
3. Exit the command prompt.

Creating a temporary directory

(Topic number: 49277)

Having a temporary directory on the server can be useful for storing files that you do not have to keep long-term.

To create a temporary directory

1. In Windows Explorer, select the C: drive.
2. Under Organize, select **New Folder**.
3. Rename the new folder **temp**.

Supporting security certificate validation

(Topic number: 47577)

IMPAX uses Windows security certificates to connect the various IMPAX components.

To support security certificate validation

1. Launch Internet Explorer.
2. In Internet Explorer, select **Tools** > **Internet Options**.
3. In the Internet Options dialog, switch to the **Advanced** tab.
4. Under Security section, clear the **Check for server certificate revocation** checkbox.
5. Click **OK**.
6. Exit and restart Internet Explorer.

5. Configuring the database connection

(Topic number: 7073)

If connecting to an Oracle on Windows AS300 database or an Oracle for Solaris AS3000 database, install and configure the Oracle for Client for Windows.

If connecting to a SQL database (supported for AS300 Database Server upgrades), configure the ODBC connection to the SQL Database Server (refer to page 24).

Configuring the ODBC connection to the SQL Database Server

(Topic number: 6813)

Configure the ODBC connection to the SQL Database Server for Windows. This connection is required for the Archive Server, Network Gateway, and Curator to communicate with an AS300 Database Server running under SQL Server (and therefore does not apply if using an AS300 Oracle for Windows database or if connecting to an AS3000 Database Server).

To configure the ODBC connection to the SQL Database Server

1. On the server to connect, open the Windows Administrative Tool and select **Data Sources (ODBC)**.
2. Switch to the **System DSN** tab.
3. Click **Add**.
4. In the Create New Data Source dialog, select **SQL Server**.
5. Click **Finish**.
6. In the Name field, type **mvf**.
7. In the Description field, type **mvf**.
8. In the Server list, type or select the Database Server name. Click **Next**.
9. If asked whether to overwrite the existing MVF_SQL, click **Yes**.
10. Select the **SQL Server Authentication** option.
11. In the Login ID and Password fields, type the username and password for the mvf user.

    Ensure that all systems have the same username and password for the Database Server.
12. Click **Client Configuration**.
13. In the Add Network Library Configuration dialog, select **TCP/IP**. Click **OK**.
14. Click **Next**.
15. Select the **Change the default database to** checkbox.
16. From the list, select **mvf**. Click **Next**.
17. Clear the **Perform translation for character data** checkbox.

18. Click **Finish**.
19. To test the connection, click **Test Connection**.
20. In the ODBC Driver Connect dialog, type the password for the mvf user and click **OK**.
21. When prompted that the connection was successful, click **OK**.
22. To close the Oracle ODBC Driver Configuration dialog, click **OK**.
23. To close the ODBC Data Source Administrator window, click **OK**.

6. Installing and configuring antivirus software

(Topic number: 10269)

Install and configure the antivirus software according to the manufacturer's instructions.

Note:

Once the IMPAX software is installed, create rules in the antivirus software to exclude IMPAX processes that are running on IMPAX Clients and Servers. For example, exclude .dcm and .inf files on IMPAX Client workstations and IMPAX web services on Application Servers.

7. Installing a modem

(Topic number: 7681)

The modem is an optional component. If necessary, install the external modem according to the manufacturer's instructions.

8. Installing and configuring pcAnywhere 12.5

(Topic number: 51626)

To allow remote service of the servers, install Symantec pcAnywhere software.

Note:

Not all servers are shipped with pcAnywhere. Some servers instead use Remote Desktop Connection. Install and configure pcAnywhere only when appropriate.

Installing pcAnywhere

(Topic number: 65883)

To connect to remote devices securely for support, install pcAnywhere 12.5 following the manufacturer's instructions.

Configuring pcAnywhere

(Topic number: 48237)

After installation, you must configure pcAnywhere.

To configure pcAnywhere

1. On the Desktop, double-click **Symantec pcAnywhere**.
2. At the Please Register Symantec pcAnywhere message, click **Register Later**.
3. At the prompt, click **Finish**.
4. Under Views, click **Go to Advanced view**.
5. Under pcAnywhere Manager, click **Hosts**.
6. Under Hosts, right-click **Modem** and select **Properties**.
7. On the Connection Info tab, verify that **modem** and **TCP/IP** are selected. Click **Apply**.
8. Switch to the **Settings** tab. Under Host startup, verify that **Launch with Windows** is selected. Click **Apply**.
9. Switch to the **Callers** tab.
10. From the Authentication type list, select **pcAnywhere**.
11. Click **New Item**.
12. On the Identification tab, type the login name and password, then type the password again in the Confirm password field.
13. Switch to the **Privileges** tab. Under Caller rights, select **Superuser–caller has full access rights to host machine**. Click **OK**.
14. Click **Apply**.
15. Switch to the **Security Option** tab. Under Session options, select the **Disconnect if inactive** checkbox. Click **Apply**.
16. In the Host Properties dialog, click **OK**.
17. Under Hosts section, right-click **Modem** and select **Start Host**.
18. Minimize the pcAnywhere Waiting window and confirm that the pcAnywhere icon is displayed in the system tray.
19. Close Symantec pcAnywhere.

9. Installing Adobe Reader

(Topic number: 7679)

Note:

This installation procedure requires a direct Internet connection. If the system does not have a direct Internet connection, you can use a local Software Update Server instead. To set up a Software Update Server, contact your IT department.

The IMPAX 6.5.1 guides, quick references, and task summaries ship with the product in PDF format. To view and print the files, install the latest version of Adobe Reader.

To install Adobe Reader

1. Go to http://get.adobe.com/reader.
2. Clear the checkbox for optional software such as the Google Toolbar and McAfee Scan.
3. Click **Download now**.
4. Run the install executable.
5. In the Acrobat Reader Installation Wizard, select the appropriate options on each screen. After each selection, click **Next**.

10. Upgrading to Internet Explorer 7

(Topic number: 47486)

We recommend that you upgrade all Windows 2003 IMPAX servers running earlier versions of Internet Explorer to Internet Explorer 7. To verify which version of Internet Explorer is being used, start Internet Explorer and select **Help** > **About Internet Explorer**. This procedure is not required for Windows 2008 server, as Internet Explorer 7 is included with Windows 2008 server.

To upgrade to Internet Explorer 7

1. Launch Internet Explorer on a computer connected to the Internet.
2. Go to

   http://www.microsoft.com/windows/internet-explorer/ie7/
3. From this page, you can either download Internet Explorer 7 or order it on CD.
4. Once you have obtained the software, run it on each server that needs upgrading.
5. To install the software, follow the on-screen prompts.

11. Enabling active content for the Knowledge Base

(Topic number: 7700)

In Internet Explorer 7, all scripts on web pages are blocked by default. The IMPAX Knowledge Bases use JavaScript for their Search functionality and to render glossary definition popups. If JavaScript is blocked by the browser, when you view a Knowledge Base page, the definitions of the glossary terms rendered with JavaScript cannot be viewed, and searching is impossible. Therefore, enable active content.

Enabling remote access to Knowledge Bases

(Topic number: 10019)

Perform this task to access Knowledge Bases installed on a different server (such as the Application Server).

To enable remote access to Knowledge Bases

1. In Internet Explorer, select **Tools** > **Internet Options**.
2. In the Internet Options dialog, switch to the **Security** tab.
3. Select **Trusted sites**.
4. Click **Sites**.
5. In the Trusted sites dialog, if you are connecting to the Knowledge Base using http:// rather than https://, clear the **Require server verification (https:) for all sites in this zone** checkbox.

   We recommend that https:// be used.
6. In the Add this website to the zone field, type or paste the name of the Application Server that the Knowledge Bases are installed on (**https://*server_name***).
7. Click **Add**.
8. Click **Close**.
9. Click **Custom Level**. In the Security Settings dialog, under Scripting, ensure that **Active scripting** is enabled. Click **OK**.
10. Click **OK**.

Enabling local access to Knowledge Bases

(Topic number: 10017)

To access the Knowledge Base from the IMPAX Documentation DVD or from a local drive, you must allow active content (including JavaScript) to run locally.

To enable local access to Knowledge Bases

1. In Internet Explorer, select **Tools** > **Internet Options**.
2. In the Internet Options dialog, switch to the **Advanced** tab.
3. Under Security, select the **Allow active content from CDs to run on My Computer** and the **Allow active content to run in files on My Computer** checkboxes. Click **OK**.
4. For the changes to take effect, close and restart Internet Explorer.

You can now run the Knowledge Bases from the DVD or from a local drive.

Installing and configuring Curator and the CD Export server

3

To create a dedicated Curator and CD Export server, you must install and configure the MVFCurator and MVFcdexport packages, along with the appropriate Default packages. Before proceeding, ensure that you have configured the server machine as outlined in *Installing hardware and software* (refer to page 17).

1. Installation overview

(Topic number: 7054)

Before installing Curator and the CD Export server, ensure that you have copied the mvf.portable.psd file to an accessible location. During the installation, the software requests this file and imports the mvf.psd file under C:\mvf.

CAUTION!

The mvf.portable.psd file contains sensitive information. To ensure that the security of the system is maintained, the password file should be deleted after all required components are installed.

32-bit AS300 installer packages reference

(Topic number: 7682)

The standard (32-bit) IMPAX AS300 installer groups the packages to install under four sections: default, database, archive, and optional. The following tables explain each package.

Default

Default packages	Purpose
MVFCore	Installs the DICOM services for IMPAX and contains several core Windows services and database tables used by IMPAX.
MVFCache	Installs the DICOM SCU and autopilot services used by IMPAX and spftp services. MVFCache includes mvf_compressor, used for lossy compression, and cache_migration, used to migrate cache volumes from a flat to a hierarchical structure.
MVFNetworkGateway	Installs the SCP and APIP-SCP services used by IMPAX. Install this package only on stations that require Network Gateway functionality. Servers that support only internal transfers, not incoming DICOM communications, do not require it.
AdministrationTools	Installs the Java Administration Tools application for configuring and managing IMPAX. It also copies the Java Runtime Environment (JRE) self-extracting executable onto the system. This package is not available in the 64-bit installer, but must be installed as part of the IMPAX cluster. Therefore, if installing a 64-bit dedicated Database Server under Oracle, be sure to install this package on another AS300 server in the cluster. The package can be installed on more than one server, but run only one instance at a time (by disabling the other Administration Tools services).
MVFocr	Installs the files necessary to enable Optical Character Recognition. This is an optional installation that works in conjunction with the MVFNetworkGateway package. Install it only if your system requires OCR. The OCR package installs default OCR templates to handle many different modality vendors. OCR training tools are not included with IMPAX.
VaultAgfa	Includes specific requirements and database extensions. Not required on 64-bit systems.

Database

Only one of the two Database Packages can be installed. Install these only on single-host servers or dedicated Database Servers. For new IMPAX standalone installations, only the Oracle Server package is supported.

Database packages	Purpose
Oracle Server Extension	Contains the files necessary to build an Oracle Server database to be used by IMPAX.
SQL Server Extension	Contains the files necessary to build a SQL Server 2008 database to be used by IMPAX. SQL Server 2000 is not supported.

Archive

Archive packages	Purpose
MVFhsm	Installs the HSM package.

Archiving considerations:

- If the server is used for viewing only (no archiving), do not install any archive package.
- PACS Store and Remember archiving is available but does not require an installation package. It does require an archive license. For details on setting up PACS Store and Remember archiving, refer to the *IMPAX 6.5.1 Server Knowledge Base*.

Optional

Depending on the configuration of IMPAX being implemented, certain packages may not be supported.

Optional packages	Purpose
MVFCompressor	Installs the MVF Compressor package, which includes mvf_compressor_scheduler. The mvf_compressor_scheduler process is responsible for scheduling the lossy compression of images.
MVFCurator	Installs the Curator package. The Curator process compresses incoming images into Mitra wavelet format and stores them in the web cache. Studies compressed by the Curator process are served locally or over a network to display clients.
MVFcdexport	Installs the CD Export server, used with the CD Export feature in the IMPAX Client. The CD Export server processes local burn jobs created by the IMPAX Client and prepares the zip files containing the data for the burn job. For instructions on using CD Export, refer to "Exporting and viewing images from CD or DVD" (topic number 8209) in the *IMPAX 6.5.1 Client Knowledge Base: Extended*.
MVFchangeaccepter	Installs a package related to the processing of change context (cc) objects. This feature is not required and we recommend that this package not be installed.
MVFpap	Installs the PAP package. A PACS Archive Provider (PAP) acts like a Service Class Provider (SCP) by receiving studies and allows sites to have their studies mirrored at another site through PACS Store and Remember archiving. This mirroring protects against data loss and enables studies at one PACS to be viewed at another. For instructions on configuring a PAP, refer to "Configuring a PACS Archive Provider (PAP)" (topic number 11586) in the *IMPAX 6.5.1 Server Knowledge Base*.

Optional packages	Purpose
MVForadg	Installs a set of scripts and tools for configuring and monitoring Oracle Data Guard. Data Guard is Oracle's high-availability solution. **Important!** Data Guard works **only** on servers running Oracle Enterprise Edition. Do not install it on a database server using SQL Server or Oracle Standard Edition, and do not include it on other types of servers (Archive Server, Network Gateway, Curator, standalone).

AS300 installer log files

(Topic number: 6780)

A log file containing detailed information about the system is created under C:\mvf\data\logs\SystemInfo.log.

2. Installing the Curator and CD Export server software

(Topic number: 7047)

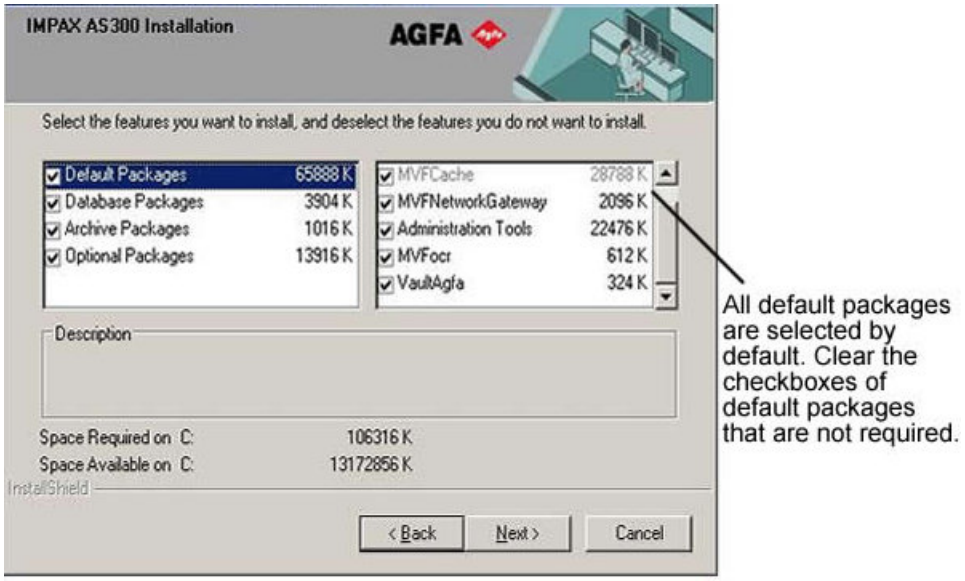
To install IMPAX AS300 software, you must be logged into Windows as an administrator-level user.

Use the IMPAX installer to install the necessary packages on the system.

To install the Curator and CD Export server software

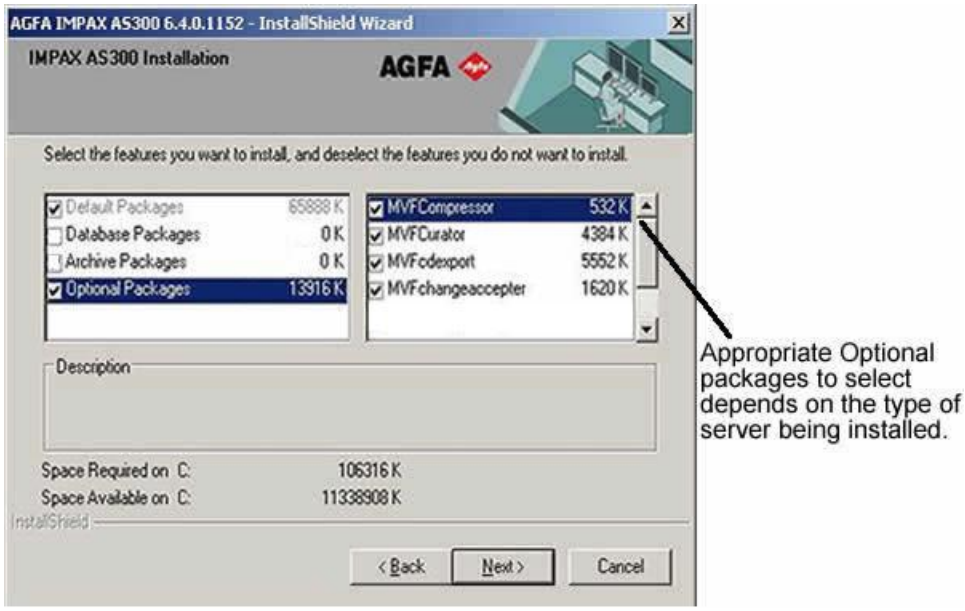
1. Insert the IMPAX AS300 DVD.
2. Navigate to D:\programs\mvf and double-click **as300-installer.exe**.
3. Type your name (minimum three characters).

   This information is recorded in the installer log file.
4. On the Welcome screen, click **Next**.
5. On the Select Components screen, all default packages are selected by default. Clear the checkboxes of all packages other than **MVFCore** and **MVFCache**.



6. Clear the **Database Packages** checkbox.
7. Clear the **Archive Packages** checkbox.
8. Select the **Optional Packages** label and select the appropriate packages. **MVFCurator** must stay selected. **MVFcdexport** is also required except, perhaps, on slave Curators.

   Normally, no other optional packages are required, so you can clear other selected checkboxes. In particular, clear the **MVFchangeacceptor** checkbox and do **not** select the **MVForadg** checkbox.



9. Click **Next**.
10. Browse to the location of the portable password file and click **OK**.
11. Type the temporary password used to create the portable password file and click **Next**.

The mvf.psd file is imported under C:\mvf.

12. On the Summary screen, click **Next**.

    The files are copied.

13. After all the packages have been installed, click **Yes, I want to restart my computer now**.

    If you are not prompted to restart the computer, manually restart it.

When the server restarts, log into Windows as an administrator-level user.

3. Setting up the Curator web cache

(Topic number: 7029)

If you did not create a web cache for Curator when you configured the Database Server, create the web cache now. The cache must be created from the Database Server.

Note:

For Autopilot to correctly monitor cache space, each cache must be on its own partition.

Although multiple Curators may be installed, each Curator places web representations of objects into the same web cache. This web cache is owned by the master Curator and is managed by the Autopilot running on the master Curator.

Creating a web cache volume

(Topic number: 7069)

You must manually create cache folders on the system. You can then configure the cache volume in Administration Tools on the Database Server.

To create a web cache volume

1. On the Database Server, log into the Administration Tools.
2. Click **Cache Manager**. 
3. Click **New Cache Volume**. 
4. Select **Web Cache**.
5. From the Station list, select the station where the master curator is installed.
6. In the Path field, type the path for the new cache volume.
   - Do not use a trailing slash or backslash at the end of the volume path, because this can create problems when retrieving images from the cache. For example, do not type **\\server\WEBCACHE1**; instead, use **\\server\WEBCACHE1**.

- All caches on the system (image and web) must be shared. Shared caches are specified without the volume letter; for example, instead of **\\server\f$\CACHE1**, use **\\server\CACHE1**.

7. Click **Add**.
8. In the Warning dialog, verify that the path is correct and click **Yes**.

Configuring cache folder permissions for remote caches and NAS

(Topic number: 7068)

If the cache is hosted remotely or if you are setting up network area storage (NAS), after the cache is created, create a user account for the ImpaxServerUser on the system hosting the cache.

To configure cache folder permissions for remote caches and NAS

1. On the Database Server, open a command prompt or terminal window.
2. Change to the **C:\mvf\bin** (AS300) or **/usr/mvf/bin/** (AS3000, logged in as root user) directory.
3. To obtain the password for the ImpaxServerUser, type

   passkey -M QUERY -u ImpaxServerUser (AS300) or **./passkey -M QUERY -u ImpaxServerUser**(AS3000)

   This password is used for the ImpaxServerUser account on the remote machine.
4. If the remote web cache is hosted on a Windows-based system, log into the machine as an administrator-level user. Using the built-in Windows 2003 Server security configuration, create an account for the ImpaxServerUser that uses the same password as the account on the Database Server.

   If the web cache is hosted on a Solaris-based system, install and configure a subprocess such as NFS or SAMBA.
5. If an ImpaxServerUser account cannot be used on the remote cache but rather a domain user needs to be used, create the domain user and add this user to the ImpaxServerGroup on the IMPAX machines requiring access (for example, the Curator). Update the IMPAX services to log in as this new domain user.

Configuring web cache folder permissions

(Topic number: 7077)

If the Curator web cache is on a Windows folder location, to ensure that the cache is accessible, give the Administrators account and Group account full read, write, and execute permissions on the cache folder.

To configure web cache folder permissions on Windows Server 2003

1. On the Windows 2003 server hosting the cache, open Windows Explorer.
2. Navigate to the location of the cache.

3. Right-click the cache folder and select **Sharing and Security**.
4. Select **Share this folder**.
5. Type an appropriate Share name.
6. Click **Permissions**.
7. Select **Everyone**, then click **Remove**.
8. Click **Add**.
9. In the field for object names, type **Administrators; ImpaxServerGroup**, then click **Check Names**.
10. If the names are not found, click **Advanced**, then click **Find Now**. Select the **Administrators** and **ImpaxServerGroup** accounts and click **OK**.
11. To close the Select Users or Groups dialog, click **OK**.
12. In the Permissions for *share_name* dialog, to give each user full read, write, and execute access to the cache volume folder, select each user and select **Full Control**.
13. Close the permissions and properties dialogs.

To configure web cache folder permissions on Windows Server 2008

1. On the Windows 2008 server hosting the cache, open Windows Explorer.
2. Navigate to the location of the cache.
3. Right-click the cache folder and select **Properties**.
4. Switch to the **Sharing** tab.
5. Click **Advanced Sharing**.
6. Select **Share this folder**.
7. Type an appropriate Share name.
8. Click **Permissions**.
9. Select **Everyone**, then click **Remove**.
10. Click **Add**.
11. In the field for object names, type **Administrators; ImpaxServerUser**, then click **Check Names**.
12. If the names are not found, click **Advanced**, then click **Find Now**. Select the **Administrators** and **ImpaxServerUser** accounts and click **OK**.
13. To close the Select Users or Groups dialog, click **OK**.
14. In the Permissions for *share_name* dialog, to give each user full read, write, and execute access to the cache volume folder, select each user and select **Full Control**.
15. Close the permissions and properties dialogs.

4. Configuring the number of concurrent Curator threads

(Topic number: 9121)

Concurrence defines how many curation threads should run at the same time (each one curating a different job). Curator performance is optimal when each processor on the machine has a curation thread. However, to allow other applications such as the SCP the processing time that they require, set the concurrency level to fewer than the number of processors.

On a single-processor system, the default concurrency level is set to 1. On a multi-processor system, the default concurrency level is set to the number of processors minus 1. For example, on a system with four processors, the default concurrency level is set to 3.

Note:

Hyperthreaded CPUs should not be counted as real cores; for example, in the G6 server series, the hyperthreading is an option.

To configure the number of concurrent Curator threads

1. Find the service reference value for Curator.
2. In CLUI, to check the concurrence on the machine running Curator, type

   SELECT concurrency FROM map_service WHERE service_ref = *Curator's_service_ref*
3. To change the default setting, type

   UPDATE map_service SET concurrency = *number_of_curation_threads* WHERE service_ref = *Curator's_service_ref*
4. Restart Curator.

5. Configuring Curator INI settings

(Topic number: 9122)

The Curator settings control how all Curators process images for the web cache. Although the Curator settings do not exist in the map_ini table when the system is first installed, the default behavior applies. To change the default behavior to suit your site, add the appropriate settings and values.

To configure Curator INI settings

1. In CLUI, to add a new Curator setting, type

   INSERT INTO map_ini (ini_section, ini_key, ini_value) VALUES ('CURATOR', '*ini_key*', '*ini_value*')

   or

To update an existing Curator setting, type

UPDATE map_ini SET ini_value=*ini_value* WHERE ini_section="CURATOR" AND ini_key="*ini_key*"

where *ini_key* is the Curator setting to change and *ini_value* is the updated value.

2. To prompt any Curator processes that are running to refresh their configuration settings for subsequent jobs, type

   SIGNAL database_updated

Curator INI settings: Reference

(Topic number: 9119)

The following table explains the Curator INI keys and their possible values.

ini_key	Default value	Description of possible values
AUTO_DELETE	F	**T**—Delete the study from the image cache when the web representation is created. Curator does not delete images or other non-image objects from the image cache that it has not created web representations for. The web cache copy cannot be sent to other PACS systems. **F**—Keep the image cache version as well as the web cache version. The image cache copy can be sent to other PACS systems. **Note:** Images compressed using Mitra Wavelet compression take longer to decompress than images compressed using standard compression. To provide faster access to images for local clients, configure Curator to keep image cache copy. We do not recommend deleting the image cache copy unless the server is configured to function strictly as a web server.
COLLECT_PERFORMANCE_METRICS	T	**T**—Collect performance metrics on prepare jobs and store them in map_job_metrics table. **F**—Do not collect performance metrics. The following metrics are recorded in the map_job_metrics table:

ini_key	Default value	Description of possible values
		• SERVICE_REF—Service ref of the curator process that handled the prepare job. • NUM_OBJECTS—Number of objects in the study being curated. • STAT1—Number of frames that were curated. • STAT2—Input size of study in MB. • STAT3—Raw size of study in MB. • STAT4—Amount of data written to web cache in MB.
DELETE_DUPLICATE_ JOBS	T	**T**—Duplicate PREPARE jobs are deleted. **F**—Duplicate PREPARE jobs are allowed.
MIN_MEM_FREE	300	Minimum amount of free memory, in MB, that Curator requires. If the amount of free memory falls below this number, Curator restarts. To have Curator ignore this, set the MIN_MEM_FREE to -1. If you change this from the default, select a value that is at least six times the uncompressed size of the largest image you intend to curate.
QFACTOR_REUSE	F	**T**—The Q Factor is reused between compatible images/frames within the series. **F**—The Wavelet Q Factor defined in the Web Compression Manager is ignored and the Q Factor is not reused. We recommend leaving this setting at F (False).
SEND_SIGNALS	T	**T**—Send STUDY-SIMPLIFIED MAP signal to the Client. **F**—Do not send the signal to the Client.

6. Changing the CD Export file storage location

(Topic number: 7078)

The following procedure applies only if the CD Export package has been installed. By default, files created by the CD Export process are stored on the C: drive of the CD Export server. For best

performance, we recommend that you change this location to a non-system drive that has ample disk space.

To change the CD Export file storage location

1. In CLUI, to change the CD Export storage location, type

   INSERT INTO map_ini (ini_section, ini_key, ini_value) VALUES ('CD_EXPORT', 'VOLUME_DIRECTORY', '*drive_location*')

   where *drive_location* is the location to store the CD Export files in. For example, you could specify h:\cdexport as the drive location.

2. To define the AE reference of the station where the CD Export storage location is, type

   INSERT INTO map_ini (ini_section, ini_key, ini_value) VALUES ('CD_EXPORT', 'VOLUME_DIRECTORY_AE_REF', '*ae_ref*')

   where *ae_ref* is the AE reference of the station where the VOLUME_DIRECTORY is located.

3. To update the system with the new settings, type

   signal database_updated 0 MVF_CDEXPORT

7. Installing a slave Curator

(Topic number: 9116)

If the site requires one or more slave Curators, install these servers by following these steps.

To install a slave Curator

1. Install and configure the external software by following the procedures in *Installing hardware and software* (refer to page 17).
2. Install IMPAX on the server by following the procedure in *Installing the Curator and CD Export server software* (refer to page 33).

   We recommend installing the MVFcdexport optional package on at least one of the slave Curators, to serve as a potential failover server for CD exporting.

3. Perform the following configurations: setting up Windows firewall rules (refer to page 41), configuring DEP (refer to page 42), enabling active content (refer to page 28), and enabling automatic updates.

8. Configuring Windows firewall exceptions

(Topic number: 15509)

The Windows firewall filters and blocks unsolicited incoming network traffic. In some circumstances, you may want to allow programs and services to access to a specific server port that is normally blocked by the Windows firewall.

Note:

To use QStar HSM with IMPAX, open port 160 for UDP messages.

To configure Windows firewall exceptions

1. Open Control Panel.
2. Select **Windows Firewall**.
3. Click **Change settings**.
4. Switch to the **Exceptions** tab.
5. Click **Add Port**.
6. Type the Name and Port number.

CAUTION!

If you click **OK** at this point, the port will be available to all IP addresses. To restrict the port to specific, trusted addresses, continue with the next step.

7. Click **Change scope**.
8. In the Change Scope dialog, click **Custom List**.
9. In the field under Custom List, enter a comma-delimited list of IP addresses to give access to the port.

Note:

Do not include spaces between IP addresses.

10. Click **OK**.
11. For any other ports to add, repeat from step 5.
12. When done, to close the Add a Port and Windows Firewall dialogs, click **OK**.

The new firewall rule takes effect immediately. You do not have to restart the server.

9. Configuring Data Execution Prevention (DEP)

(Topic number: 7192)

Data Execution Prevention (DEP) is on by default for all Windows programs. DEP is designed to help prevent damage from viruses and other security threats by marking some memory locations "non-executable" so that malicious code cannot be executed from memory locations that only Windows and other programs should use. This increased security, however, can cause problems with some programs that require this memory space, including IMPAX. If DEP remains on, you may encounter problems with Curator, ddo_store, or CD burns, among other features.

Note:

To successfully configure DEP, the directory C:\mvf\bin must already exist. Also, not every executable listed in step 7 may appear in the directory.

To configure Data Execution Prevention (DEP)

1. Right-click **Computer** and select **Properties**.
2. Under Tasks in the left pane, select **Advanced system settings**.
3. If not selected, switch to the **Advanced** tab.
4. Under Performance, click **Settings**.
5. Switch to the **Data Execution Prevention** tab.
6. In the Performance Options dialog, select **Turn on DEP for all programs and services except those I select**.
7. For each IMPAX executable in the list that follows, click **Add**, navigate to C:\mvf\bin, select the executable, and click **Open**:
   a. **curator.exe**
   b. **ddo_create.exe**
   c. **ddo_store.exe**
   d. **mvf_scp.exe**
   e. **mvf_scu.exe**
   f. **mvf_compressor.exe**
   g. **mvf_autopilot.exe**
8. Click **OK** and close all open dialogs.
9. Restart the system.

When the server restarts, log into Windows as an administrator-level user.

10. Synchronizing clocks on Windows-based IMPAX systems

(Topic number: 6752)

If the system time on the Application Server and the image server (ASPFTP server) differs, the authentication tickets provided by the IMPAX Client are rejected by the ASPFTP server and image retrieval fails. You must configure the IMPAX systems to automatically synchronize their system time with a common server and remain synchronized.

Note:

Also ensure that the time zone for the computer is set correctly.

The instructions that follow use the synchronization feature built into the operating system. When configured, Windows Time Service sets and synchronizes the system time with a standard time server.

Synchronizing Windows servers to an external time source

(Topic number: 58717)

Synchronize the Windows Server 2003 and Windows Server 2008 servers on your network to an external time source to ensure that image data streaming operates correctly.

CAUTION!

Serious problems might occur if you modify the registry incorrectly. These problems might require that you reinstall your operating system and there is no guarantee that these problems can be solved. We recommend that you back up the registry before you change it, so that you can back out the changes if necessary.

To synchronize Windows servers to an external time source

1. To open Registry Editor, select **Start** > **Run**, type **regedit**, and click **OK**.
2. To change the synchronization server to NTP, in the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Parameters\Type** subkey, change the REG_SZ value from NT5DS to **NTP**.
3. To specify if the local machine is a local time server, in the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Config\AnnounceFlags** subkey, change the REG_DWORD value to **5**.
4. To enable the NTPServer, in the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\NtpServer\Enabled** subkey, change the REG_DWORD value to **1**.
5. To specify where the computer obtains time stamps, in the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Parameters\NtpServer** subkey, enter the list of DNS names or IP addresses.

   If you use DNS names, append **,0x1** to the end of each DNS name.
6. To set the poll interval, in the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProviders\NtpClient\SpecialPollInterval** subkey, change the REG_DWORD value to the number of seconds between each poll.

   The recommended value is **900** Base **Decimal**, which polls the time server every 15 minutes.
7. To specify the maximum positive difference that triggers a synchronization, in the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Config**

MaxPosPhaseCorrection subkey, change the REG_DWORD value to the maximum number of seconds.

The recommended value is **3600** Base **Decimal**.

8. Similarly, to specify the maximum negative difference that triggers a synchronization, in the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Config\ MaxNegPhaseCorrection** subkey, change the REG_DWORD value to the maximum number of seconds.
9. Exit the Registry Editor.
10. To stop and restart the Windows Time server, at a command prompt, type **net stop w32time && net start w32time**.

    It may take up to an hour for this to take effect.

For more information, refer to the Microsoft Knowledge Base article KB 816042.

Synchronizing Windows servers to an internal time source

(Topic number: 58720)

Synchronize the Windows Server 2003 and Windows Server 2008 servers on your network to ensure that image data streaming operates correctly. To configure the Primary Domain Controller (PDC) master without using an external time source, change the announce flag on the PDC master. Choose either the Application Server or the AS300 server as the PDC master and synch the other servers to it.

CAUTION!

Serious problems might occur if you modify the registry incorrectly. These problems might require that you reinstall your operating system and there is no guarantee that these problems can be solved. We recommend that you back up the registry before you change it, so that you can back out the changes if necessary.

To synchronize Windows servers to an internal time source

1. To open Registry Editor, select **Start** > **Run**, type **regedit**, and click **OK**.
2. To specify if the local machine is a local time server, in the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Config\AnnounceFlags** subkey, change **REG_DWORD** to **A**.
3. Exit the Registry Editor.
4. To stop and restart the Windows Time server, at a command prompt, type **net stop w32time && net start w32time**.

   It may take some time for this to take effect.

Note:

The PDC master must not be configured to synchronize with itself.

Synchronizing with a time server when the IMPAX computer is not a member of a domain

(Topic number: 58572)

To ensure that image data streaming operates correctly when the IMPAX computer is not a member of a domain, use the synchronization feature built into the operating system.

To synchronize with a time server when the IMPAX computer is not a member of a domain

1. Open Control Panel.
2. Select **Date and Time**.
3. Switch to the **Server Internet Time** tab.
4. In the list, type or select the time server to synchronize with.

Synchronizing with a time server when the IMPAX computer is a member of a domain

(Topic number: 58569)

To ensure that image data streaming operates correctly when the IMPAX computer is a member of a domain, use the synchronization feature built into the operating system.

To synchronize with a time server when the IMPAX computer is a member of a domain

1. Open a command prompt.
2. Type

   w32tm /config /syncfromflags:manual /manualpeerlist:*time_server*

   where *time_server* is the DSN name or IP address of the time server. The *time_server* can be any Windows- or Solaris-based server.
3. To update Windows Time Service to use the new configuration, type

   w32tm /config /update
4. To synchronize the clock, type

   w32tm /resync

Troubleshooting IMPAX

A

As you install IMPAX servers, you may encounter various installation and configuration problems.

Troubleshooting: Installation of IMPAX software unsuccessful; must reinstall packages

(Topic number: 7685)

Issue

IMPAX Server was not installed successfully.

Details

If the IMPAX Server software installation was not successful, you may have to uninstall the IMPAX software and retry the IMPAX installation.

Solution

Before retrying the installation, attempt to determine why the installation failed and correct the problem, if possible. You can find specific error messages and more information on the installation in these log files:

- C:\mvf\data\logs\mitra_install.log
- C:\mvf\data\logs\build_mvf.log
- C:\mvf\data\logs\build-database.log
- C:\mvf\data\logs\add_impax_mvf.log

After the problem is determined and resolved, reinstalling the IMPAX software requires four steps:

1. Restart the system as indicated by the installer, even if failures have occurred.
2. Determine whether the security components were applied.

   If the installation failed after the security components were applied, you must log in using the AgfaService account to reinstall the IMPAX software. If the installation failed before the security components were applied, you must log in as a Windows administrator to reinstall the IMPAX software. Refer to the instructions that follow.
3. Uninstall the IMPAX software.
4. Install the IMPAX packages again, using the correct user account.

To uninstall the IMPAX software

1. Open Control Panel.
2. In Windows 2003, select **Add or Remove Programs**.

   In Windows 2008, select **Programs and Features**.
3. Select **AGFA IMPAX AS300**.
4. Click **Change**.
5. At the prompt, type your name and click **Next**.
6. On the Welcome screen, select **Modify**. Click **Next**.
7. Clear the checkboxes of all installed packages. Click **Next**.
8. On the Maintenance Complete screen, select **Yes, I want to restart my computer now** and click **Finish**.

   Important!

   Do not manually delete the C:\mvf folder as part of the uninstall. If you do, you will have to re-create and reimport the portable password files.
9. Log into Windows as the AgfaService user.

You can then reinstall the IMPAX packages.

Troubleshooting: Master Curator fails or is unavailable and must be reassigned

(Topic number: 7038)

Issue

Web images are not accessible.

Details

If the master Curator machine fails or is unavailable for an extended period of time, you may have to configure a secondary or slave Curator to take the role of the master Curator.

Solution

Reassign the master Curator so that a secondary or slave Curator takes ownership of the web cache and Curator job queue. (Using a load balancer with appropriate configuration may also help mitigate the risk of this happening.)

Note:

If the web cache volumes are on the local drive of the master Curator and this machine is down, the web cache is not accessible if the master Curator is then reassigned. (In most cases, the web cache is located on a network drive.)

To reassign the master Curator

1. In the Job Manager, halt the Curator job queue.

   If wavelet images are needed immediately, reassign a new master Curator without waiting until all jobs have completed.

   or

   Wait until all jobs have completed and are no longer in the queue.

2. In CLUI, to change the ownership of the web cache, type

   UPDATE osr_volume SET ae_ref = *AE_reference_of_slave_Curator* WHERE volume_type = 'W' AND ae_ref = (SELECT ms.ae_ref FROM map_queue mq, map_service ms WHERE mq.service_ref = ms.service_ref AND mq.queue_ref = (SELECT MIN(queue_ref) FROM map_queue WHERE queue_title = 'CURATOR'))

3. To change the ownership of the Curator job queue, type

   UPDATE map_queue SET service_ref = (SELECT sc.service_ref FROM map_service mc, map_service sc, map_queue mq WHERE mc.type = sc.type AND mc.protocol = sc.protocol AND mc.port = sc.port AND sc.ae_ref = *AE_reference_of_slave_Curator* AND mc.service_ref = mq.service_ref AND mq.queue_ref = (SELECT MIN(queue_ref) FROM map_queue WHERE queue_title = 'CURATOR')) WHERE queue_ref = (SELECT MIN(queue_ref) FROM map_queue WHERE queue_title = 'CURATOR')

4. To signal to all machines in the cluster that the master Curator has been reassigned, type

   UPDATE map_ref_count SET ref_count = ref_count + 1 WHERE name = 'DATABASE_UPDATE_REF'

5. In the Job Manager, restart the Curator job queue.

   The Autopilot running on the new master Curator is now responsible for managing the web cache.

Security and licenses

B

The AS300 installation process changes certain Windows armoring, groups, and accounts. Some of the software provided utilizes or includes software components licensed by third parties, who require disclosure of information about their copyright interests and/or licensing terms.

Securing Windows-based systems in IMPAX (armoring): Reference

(Topic number: 9311)

Changes are made during the Application Server installation and armoring procedure to ensure that the Application Server system is as secure as possible without affecting the functionality of the system. The following security measures are enforced during the armoring procedure:

- All unnecessary services and applications are disabled (refer to page 51).
- Insecure network services are disabled.
- The ODBC tracing executable is disabled. Disabling this executable ensures that user names and passwords are always encrypted in the trace log.
- Optional services and applications are not installed.
- All IMPAX services are configured to run under restricted user accounts that can access only the resources they need. These accounts are created during the IMPAX installation.
- A default list of firewall rules is added to the system automatically, blocking external access to unused ports where unsecured services could reside if accidentally configured and started. The default rules are sufficient in most cases, but new rules can be added to increase security for a particular setup.

Groups and accounts created for IMPAX

During the IMPAX installation, the ImpaxServerGroup is created and the list of files that this group has full access to is configured. The Administrators group is automatically created by Windows, however, the list of files that this group has access to (refer to page 52) is modified during the IMPAX installation.

The following accounts are created by the IMPAX installation program.

Account	Groups that it belongs to	Services that run under the account
ImpaxServerUser	• ImpaxServerGroup	• AgfaHealthcare • IMPAX App Server Data Manager • IMPAX Audit Event Log Manager • IMPAX Distributed License Manager • IMPAX Messaging Service
AgfaService	• Administrators	• Administrator account used by Agfa support

Note:

For a service on one machine in a network to access the resources (files and folders) that it needs on another machine in the network, a user account with the same user ID and password must be created on each machine. The user IDs and passwords are maintained in an encrypted password file on the Database Server. Refer to “Generating the AS300 portable password file” (topic number 7694) in the *IMPAX 6.5.1 AS300 Installation and Configuration Guide* or to “Generating and importing mvf.portable.psd” (topic number 6980) in the *IMPAX 6.5.1 AS3000 Installation and Configuration Guide*.

List of services disabled by the IMPAX installation: Reference

(Topic number: 9309)

The following services are disabled by the IMPAX installation. The Background Intelligent Transfer and Print Spooler services may be manually enabled on some systems to provide access to print functions and for the PACS Client Updater.

Note:

Any services that explicitly depend on these services will fail to start.

Name of service	Description of service
Background Intelligent Transfer	Used to download files from an HTTP server using idle network bandwidth allowing no interfering with client browsing.

Name of service	Description of service
Computer Browser	Allows a computer to act as a browser master to keep a list of computers that exists on a network.
Distributed File System	Integrates disparate file shares into a single, logical namespace and manages these logical volumes distributed across a local or wide area network.
Distributed Link Tracking Client	Enables client programs to track linked files that are moved within an NTFS volume, to another NTFS volume on the same computer, or to an NTFS volume on another computer.
Distributed Transaction Coordinator	Coordinates transactions that span multiple resource managers, such as databases, message queues, and file systems.
Print Spooler	Manages all local and network print queues and controls all printing jobs.
Windows Audio	Manages audio devices for Windows-based programs.
Windows Error Reporting Service (Windows Server 2008)	Collects, stores, and reports unexpected application crashes to Microsoft.
Windows Update (Windows Server 2008)	Enables the download and installation of Windows updates for Windows Server 2008.
WinHTTP Web Proxy Auto-Discovery Service	Implements the Web Proxy Auto-Discovery (WPAD) protocol for Windows HTTP Services (WinHTTP). WPAD is a protocol to enable an HTTP client to automatically discover a proxy configuration.
Wireless Configuration	Enables automatic configuration for IEEE 802.11 adapters.

The following services are set to manual by the IMPAX installation.

Name of service	Description
Cryptographic Services	Provides three management services: Catalog Database Service, which confirms the signatures of Windows files; Protected Root Service, which adds and removes Trusted Root Certification Authority certificates from this computer; and Key Service, which helps enroll this computer for certificates.

Files that IMPAX groups have access to: Reference

(Topic number: 9308)

The ImpaxServerGroup is created during the IMPAX installation. That group and the IIS_WPG group have full access rights to the following folders:

ImpaxServerGroup

Access type	Locations
Full	C:\Program Files\Agfa\Impax Business Services\Messaging Service

Access type	Locations
	C:\Program Files\Agfa\Sec\audit\log
	C:\Program Files\Agfa\Impax Business Services\License Manager
	C:\Program Files\Agfa\Impax Business Services\Audit Event Log Manager

IIS_WPG

Access type	Locations
Read/Execute	C:\Impax\CDExport
	E:\inetpub\wwwroot\AgfaHC.Connectivity.Web.Services
	E:\inetpub\wwwroot\AgfaHC.Messaging.Server.WebServices
	E:\inetpub\wwwroot\AgfaHC.Pacs.Web
	E:\inetpub\wwwroot\AgfaHC.Pacs.Web.Services
	E:\inetpub\wwwroot\AgfaHC.RIS.Web.Services
	E:\inetpub\wwwroot\AgfaHC.User.Web.Services
	E:\inetpub\wwwroot\AgfaHC.User.Security.Web.Services
	E:\inetpub\wwwroot\AgfaHC.User.Administration.Web.Services
	C:\Oracle
Full	C:\Impax\Logs
	C:\Program Files\Agfa\Sec\audit\log

External software licenses

(Topic number: 7744)

Some of the software provided utilizes or includes software components licensed by third parties, who require disclosure of the following information about their copyright interests and/or licensing terms.

AutoFac 2.1.13

(Topic number: 121742)

Autofac IoC Container

Copyright (c) 2007-2008 Autofac Contributors

http://code.google.com/p/autofac/wiki/Contributing

Other software included in this distribution is owned and licensed separately, see the included license files for details.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Cygwin

(Topic number: 121758)

Copyright 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010 Red Hat, Inc.

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License (GPL) as published by the Free Software Foundation version 2 of the License.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 59 Temple Place - Suite 330, Boston, MA 02111-1307, USA.

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc., 675 Mass Ave, Cambridge, MA 02139, USA. Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge

for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

1. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

   Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

2. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

   You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

3. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

    a. You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

    b. You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

    c. If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

    These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

    Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

    In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

4. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

    a. Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

    b. Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

    c. Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only

if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

5. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

6. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

7. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

8. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

   If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

   It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of

protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

9. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.
10. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

    Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.
11. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

1. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION
2. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF

THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

Editline 1.2-cstr

(Topic number: 121768)

Copyright 1992 Simmule Turner and Rich Salz. All rights reserved. This software is not subject to any license of the American Telephone and Telegraph Company or of the Regents of the University of California. Permission is granted to anyone to use this software for any purpose on any computer system, and to alter it and redistribute it freely, subject to the following restrictions: 1. The authors are not responsible for the consequences of use of this software, no matter how awful, even if they arise from flaws in it. 2. The origin of this software must not be misrepresented, either by explicit claim or by omission. Since few users ever read sources, credits must appear in the documentation. 3. Altered versions must be plainly marked as such, and must not be misrepresented as being the original software. Since few users ever read sources, credits must appear in the documentation. 4. This notice may not be removed or altered.

ICU License - ICU 1.8.1 and later

(Topic number: 13533)

COPYRIGHT AND PERMISSION NOTICE

Copyright © 1995-2003 International Business Machines Corporation and others. All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, provided that the above copyright notice(s) and this permission notice appear in all copies of the Software and that both the above copyright notice(s) and this permission notice appear in supporting documentation.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON INFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE BE LIABLE FOR ANY CLAIM, OR ANY SPECIAL INDIRECT OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.

All trademarks and registered trademarks mentioned herein are the property of their respective owners.

OpenSSL

(Topic number: 121771)

This is a copy of the current LICENSE file inside the CVS repository.

LICENSE ISSUES

==========

The OpenSSL toolkit stays under a dual license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts. Actually both licenses are BSD-style Open Source licenses. In case of any license issues related to OpenSSL please contact openssl-core@openssl.org.

OpenSSL License

/*

==========

* Copyright (c) 1998-2008 The OpenSSL Project. All rights reserved.

* Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/)"

*

* THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT ``AS IS'' AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THEIMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER

CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

*

===

*

* This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

*

*/

Original SSLeay License

/* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)

* All rights reserved.

* This package is an SSL implementation written by Eric Young (eay@cryptsoft.com). The implementation was written so as to conform with Netscapes SSL.

*

*This library is free for commercial and non-commercial use as long as the following conditions are aheared to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

* Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

*

* Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)" The word 'cryptographic' can be left out if the rouines from the library being used are not cryptographic related :-).

4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

*

*THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

* The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.]

*/

Xerces C++ Parser, version 1.2

(Topic number: 121761)

This product includes software developed by The Apache Software Foundation (http://www.apache.org/). Please read the LICENSE files present in the Help > About dialog of the IMPAX Client.

Zlib

(Topic number: 7595)

zlib.h -- interface of the 'zlib' general purpose compression library Version 1.2.1, November 17th, 2003

Copyright (C) 1995-2003 Jean-loup Gailly and Mark Adler

This software is provided “as-is”, without any express or implied warranty. In no event will the authors be held liable for any damages arising from the use of this software.

Glossary

A

APIP

Agfa Proprietary Imaging Protocol. Used to receive the proprietary format, reformat the images to DICOM and redirect them to the SCP. An APIP SCP is used specifically to receive images from certain older Agfa image sources.

Application Server

Intermediary server between IMPAX Client and IMPAX Server machines. LDAP, Documentation, and other Business Services reside on the Application Server.

ASPFTP

Authenticated Simple Partial File Transfer Protocol. A secure version of the SPFTP protocol.

Autopilot

Service that removes old and expired data when the cache starts to get full. This maintenance function keeps the database to a manageable size.

C

cache

Temporary storage area for data on a computer's local or external hard drives.

cc objects

Change Context (cc) objects are DICOM objects used to communicate and synchronize study metadata changes across multiple IMPAX clusters.

CLUI

Command Line User Interface. A command-line tool to help in the service of IMPAX MVF. CLUI allows you to execute SQL statements.

compression

Reduces the size of a file to save both file space and transmission time. Lossless, lossy, and wavelet are examples of compression types.

Curator

Curator is an IMPAX MVF server component. It is responsible for compressing incoming images into the Mitra Wavelet format and storing them in the web cache. These studies can be accessed by remote or local clients.

D

database

A collection of data that is organized so that its contents can easily be accessed, managed, and updated.

DICOM

Digital Imaging and Communications in Medicine. The standard communication

protocol used by a PACS, HIS, or modality to exchange information or images with other systems.

E

EPR

Electronic Patient Record. The combination of all available medical data about a patient, made available in computerized form. Electronic patient records are generally part of a health information system that allows for storage, retrieval, and modification of records.

F

firewall

On a local area network (LAN) connected to a larger network, the security system that prevents outside intrusion and that keeps internal information from getting out. Typically, all traffic must pass through the machine on which the firewall is implemented.

H

high availability

With a high-availability solution, a site is protected against system downtimes, either planned or unplanned. Redundant servers are put in place that can take over functionality should the primary server become unavailable.

Hounsfield Unit

A Hounsfield Unit (HU) is an X-ray attenuation (density) measurement used to describe voxel values in CT scanning. In a 12-bit CT image, the voxel values range from -1024 to +3071 HU. For example, water is defined as 0 HU, air as -1024 HU, fat as -100 to -20 HU, soft tissue as +20 to +80 HU, and bone as > +500 HU. A Hounsfield Unit does not change no matter how the image is displayed, since HU is calculated based on original pixel data.

HSM

Hierarchical Storage Management. An HSM archive system provides long-term storage of data and access to data. Studies archived with HSM are stored to a file system. A mount point and subdirectory to store studies to is specified. The HSM system handles data storage.

HTTP

Hypertext transfer protocol, a TCP-based protocol for transferring hypertext requests and information between servers and browsers.

I

image cache

Images arriving in the system and images retrieved from archive locations are stored in the image cache. These images are lossless compressed.

IP address

The Internet Protocol address is a numeric address that identifies the station to other TCP/IP devices on the network.

L

load balancing

Distributing processing and communications activity evenly across a computer network so that no single device is overwhelmed.

logical volume

Pooled logical extents can be concatenated together into virtual disk partitions called logical volumes or LVs. Systems can use LVs as raw block devices just like disk partitions: creating mountable file systems on them, or using them as swap storage. In computer storage, logical volume management provides a method of allocating space on mass-storage

devices that is more flexible than conventional partitioning schemes.

lossless compression

A compression algorithm in which all data that was originally part of the file is retained when the file is uncompressed.

M

master Curator

When using multiple Curators, the first Curator that runs, which owns the job queue.

modality

An imaging discipline, such as CT, or a device that gathers digital information, such as digitizers for X-ray film, MRI scanners, and CR devices.

MVF_SCU

A process that handles store and retrieve jobs for the PACS Store and Remember archive.

N

NAS

Network Attached Storage. A storage device attached directly to a Storage Area Network (SAN) or other direct network connection.

Network Gateway

The Network Gateway is part of the IMPAX MVF cluster. Essentially, this is the workflow manager of the IMPAX 6.0 and later system. The Network Gateway controls the studies coming into the cluster from an acquisition station, validates these incoming studies against information from the HIS or RIS, and routes the validated studies to cache or archive.

O

object

An object is usually an image, but may be a Structured Report Object or any other data object that is included as part of a study.

OCR

Optical Character Recognition is the recognition of printed or written characters by a computer. If a modality generates images into the system but not enough information about a study is sent, OCR templates read information directly from the burned demographics.

ODBC

Open Database Connectivity. A standard protocol for accessing relational databases based around SQL.

P

PACS

A Picture Archive and Communication Systems (PACS) makes it possible to electronically store, manage, distribute, and view images.

PAP

PACS Archive Provider. A PACS Archive Provider (PAP) acts like a Service Class Provider (SCP) in that it receives studies. However, it differs from an SCP in that the PAP can automatically register a study as PACS archived if the study originates from a source that the PACS stores to and remembers from, without having to queue the study for archiving back to the source. The PAP can also parse the private tags of the incoming DICOM objects to determine HIS verification and study status.

Q

Q Factor

Quality factor of lossy JPEG compression. The greater the Q Factor, the greater the image size.

S

SAN

Storage Area Network. A network of shared storage devices. In a Storage Area Network, all storage devices are available to all servers on a Local Area Network.

SCP

Service Class Provider. A DICOM server that receives requests from an SCU. The DICOM SCP accepts images for processing, processes find and retrieve requests, and handles storage commitment requests and replies.

SCU

Service Class User. Primarily sends DICOM requests to an SCP.

series

A set of consecutive images taken by a modality such as a CT, MRI, or PET. One study can consist of several series.

single-host configuration

A configuration in which the Database, Archive Server, and Network Gateway server components are all installed on a single server.

single-server configuration

An IMPAX single server is a Windows server that runs the AS300 Server software in a single-host configuration along with the Application Server and Connectivity Manager software.

slave Curator

When using multiple Curators, the secondary Curators. Though the master Curator owns the job queue, PREPARE jobs are associated with the Curator that started the job.

SPFTP

Simple Partial File Transfer Protocol. A proprietary transport protocol for communication within the IMPAX cluster.

SSL

Secure Sockets Layer. A protocol from Netscape Communications Corporation, which is designed to provide secure communications on the Internet.

standalone station

Windows server on which the IMPAX Client, AS300, and Application Server software are installed. Runs under Windows XP SP3. The standalone does not have its own installation program. To create a standalone , the AS300, Application Server, and Client installation programs are each run separately.

W

wavelet compression

Compression method using a proprietary compression algorithm that can be uncompressed only by systems that support that proprietary algorithm.

web cache

Images that have been compressed by Curator are stored in the web cache. These images are compressed using Mitra Wavelet compression to reduce their size for access over low bandwidth.

Index

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z