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# Global System Requirements



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LUMEDX Corporation  
555 12th Street  
Suite 2060  
Oakland, California 94607

Tel 800.966.0699

[www.lumedx.com](http://www.lumedx.com)

Revision History		
Revision	Date	Description
103-00994-022	11/29/2018	Updated Visual Studio and .NET requirements for the client workstations using Report Editors LXDocumentView Control.
103-00994-021	10/25/2018	HealthView Analytics removed from the SQL Reporting Server, updated Migration Server requirements for .NET, Visual Studio, and SQL Server.
103-00994-020	07/10/2018	Added support for Windows Server 2016 and SQL Server 2016 and 2017.
103-00994-019	06/05/2018	Removed R2 X64 from the SQL Server 2012 entries
103-00994-018	02/22/2018	Added support for Citrix XenApp 7.15 on Windows Server 2012 R2 X64.
103-00994-017	12/20/2017	Added Edge Server, Data Migration Server, and Integration Runtime Server requirements, added Citrix XenApp 7.15 to the Citrix Server, removed the limitations on Windows 10 and Microsoft Office.
103-00994-016	07/14/2017	Updated HealthView CardioPACS general requirements for use with Citrix and other virtual environments.
103-00994-015	04/28/2017	Removed 32-bit option for Windows 7, added cross reference to the Pre-Installation Guide for anti-virus information, updated support for .NET to 4.6.1, Windows 10, and Office 2016, updated HealthView CardioPACS Migration server support to include Laurelbridge, added Third-Party PACS products server,
103-00994-014	01/20/2017	Removed support for DS4208 barcode scanner, added support for Visual Studio 2015.

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# Hardware and Software General Requirements

The following general requirements and instructions apply to all LUMEDX systems:

- The hardware specifications listed in this document are the minimum required to provide a three to five year hardware lifecycle for new system deployments. The requirements are based on running LUMEDX products and listed third-party products only. Installation and performance of any additional non-LUMEDX products have not been taken into consideration and may have negative impact if not properly planned and provided for. Running additional applications, or running applications in a particularly large or busy site, will require additional resources. If you have questions regarding any of the hardware and software requirements, contact your LUMEDX project manager.
- LUMEDX requires a dedicated Administration Workstation for each environment at a site, for example, Apollo\_Prod, Apollo\_Test, Apollo\_Dev, so that both LUMEDX and site teams have a workstation to do product upgrades, troubleshooting, configurations, etc. This reduces the risk of server corruption when doing administrative and customization tasks on highly configured and complex environments. LUMEDX recommends that this workstation be set up as a VMWare Guest OS.
- Microsoft, Citrix, VMware, VERITAS, Tivoli, Right Fax Enterprise Fax Solutions, and other third-party products listed in this document are not LUMEDX products. LUMEDX products will work in these environments if your site has qualified support teams to ensure they are installed, configured, and maintained according to the manufacturer's installation and best practice procedures. Exception: LUMEDX does not support the use of HealthView CardioPACS Workstation, or any third-party software programs used in conjunction with HealthView CardioPACS Workstation, for diagnostic review of image data when used within a Citrix environment or any other virtual or remote desktop environment. The usage of such technologies may alter the quality and playback speed of the displayed image, leading to an incorrect diagnosis. Local PC I/O functions (e.g. file browsing, import, export, and writing to a CD/DVD) are not supported under a Citrix environment or any other virtual environment.

However, LUMEDX does have clients who have successfully deployed HealthView CardioPACS in Citrix or other virtual environments for non-diagnostic review of image data. This is not a supported environment, but LUMEDX is willing to facilitate communication between our existing clients who successfully deployed HealthView CardioPACS in Citrix or other virtual environments with clients who want to deploy HealthView CardioPACS in Citrix or other virtual environments.

For LUMEDX clients who deploy HealthView CardioPACS in Citrix or other virtual environments for non-diagnostic review of image data, LUMEDX will assist in investigating application errors for LUMEDX applications only. LUMEDX will not be able to assist in any issues related to or introduced by Citrix or other virtual environments such as performance, display, image quality, image scrolling, play back speed, etc.

To publish HealthView CardioPACS in Citrix or other virtual environments, clients should refer to the vendor documentation for publishing applications.

- LUMEDX recommends that all LUMEDX software be installed on the servers and workstations directly from the CD Image files. LUMEDX does not support workstation imaging or ghosting.
- Except where explicitly noted in the documentation, LUMEDX does not support custom work performed either by the client or by third parties not associated with LUMEDX.
- LUMEDX highly recommends using TCP/IP as the only network protocol for running ApolloLX Schedule over the network.
- LUMEDX cannot guarantee product latency and/or performance over a WAN due to variances in effective bandwidth and network topography.
- Unless otherwise specified in this document, all third-party software products must be maintained with the most recent Service Packs.

- The Edge Server reduces the risk of mission-critical patient data being unavailable.
- The Integration Runtime Server is required to set up a bridge between the hospital environment and the Azure environment to transfer data from the Apollo database to the reporting database in Azure SQL.
- Back-up processes must be scheduled during a lower usage time period.
- For information about pre-implementation setup and anti-virus software configuration for your network and LUMEDX system, refer to the *LUMEDX Pre-Installation Guide*.
- For the most up-to-date information about system configuration and installation, refer to the LUMEDX product guides and *Readme* files for the LUMEDX products that you want to install.
- LUMEDX uses WebEx or Mitel online meeting sessions for technical support and assistance. If your site does not support this method, then your site will need to supply LUMEDX with the relevant VPN information.
- Early Adopter support for other software on Client Workstations and Servers means that this software has received limited testing in-house at LUMEDX, but it has not been fully tested in all configurations in use at client sites. Use of this software in a production environment at client sites does not require a LUMEDX Pre-Installation Software Agreement. If any issues are discovered, please report them to LUMEDX Technical Support.

## LUMEDX Client Workstation Requirements

	Operating System	Other Software	Processor	Memory	Hard Drive / Storage Media	Peripheral Devices	#
<b>HealthView Workstation</b>	Windows 10 64-bit or Windows 7 64-bit	<ul style="list-style-type: none"> <li>• .NET Framework 4.6.1 and 4.0</li> <li>• Microsoft Office Professional with Access, Excel, Word, and Tools components.                             <ul style="list-style-type: none"> <li>○ 2016 32-bit, 2013 32-bit, or 2010 32-bit</li> </ul> </li> <li>• Internet Explorer 11 or 8, 32-bit</li> <li>• Adobe Reader</li> </ul> <p><b>LUMEDX Toolkit workstation additional requirements:</b></p> <ul style="list-style-type: none"> <li>• Microsoft Visual Studio 2015 or 2012: Standard, Professional, or Team Edition</li> <li>• .NET Framework 3.5</li> <li>• Microsoft Visual Basic 6.0</li> </ul> <p><b>ApolloLX Inventory Modules additional requirement:</b></p> <ul style="list-style-type: none"> <li>• Motorola DS4308 barcode scanner</li> </ul> <p><b>LUMEDX Report Editors using LXDocumentView Control requirements:</b></p> <ul style="list-style-type: none"> <li>• .NET Framework 4.6.1</li> <li>• Visual Studio 2015</li> </ul>	Dual Core	8 GB RAM	140 GB  20 GB partition for OS  Diagnostic CardioPACS workstations: 200 GB temp cache free space	104 key enhanced keyboard  Mouse  CD/DVD RW  LCD color monitor running at 1920x1080. Optimal usability: 20"-24".  <b>Diagnostic CardioPACS workstations:</b> Medical Device Grade Display 256MB Dual DVI Graphics Card, Dual DVI flat panel LCD color monitors with Resolution 1280x1024 @ 60Hz, Brightness 300cd/m2, Dot Pitch 0.27mm, Response Time 8 ms.	

## LUMEDX Client Workstation Requirements

	Operating System	Other Software	Processor	Memory	Hard Drive / Storage Media	Peripheral Devices	#
<b>Dedicated Administration Workstation</b>	Windows 10 64-bit or Windows 7 64-bit	<ul style="list-style-type: none"> <li>• LUMEDX Toolkit</li> <li>• .NET Framework 4.6.1, 4.0, and 3.5.</li> <li>• SQL Server Management Studio: SQL Server Workstation Components with the same Service Pack as the SQL Database File Server</li> <li>• Microsoft Office Professional with Access, Excel, Word, and Tools components.                             <ul style="list-style-type: none"> <li>○ 2016 32-bit, 2013 32-bit, or 2010 32-bit</li> </ul> </li> <li>• Internet Explorer 11 or 8, 32-bit</li> <li>• Adobe Reader</li> <li>• Microsoft Visual Studio 2015 or 2012: Standard, Professional, or Team Edition</li> <li>• Microsoft Visual Basic 6.0</li> </ul> <p><b>LUMEDX Report Editors using LXDocumentView</b></p> <p><b>Control requirements:</b></p> <ul style="list-style-type: none"> <li>• .NET Framework 4.6.1</li> <li>• Visual Studio 2015</li> </ul>	Dual Core	8 GB RAM	140 GB  20 GB partition for OS	Access to this workstation is for LUMEDX personnel using the VPN and RDP	

## LUMEDX Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
1.	SQL Database File Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	Apollo CDR Analytics Manager Reporting Database	<ul style="list-style-type: none"> <li>SQL Server 2017, 2016, 2012, or 2008 R2 Standard Edition: Database Engine, Integration Services, Workstation Components.</li> <li>Use of SQL Server 2008 requires the SQL Server 2005 Backward Compatibility package from Microsoft.</li> </ul>	Quad Core	16 GB RAM	300 GB dedicated partition for Apollo Shares and SQL databases.	
2.	Web Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	HealthView CardioPACS Web Service ECG Manager Web Service and Website Integration Manager AutoDistribution Suite	<ul style="list-style-type: none"> <li>IIS 7.5 or later</li> <li>Adobe Reader</li> <li>.NET Framework 4.6.1</li> </ul> <p><b>AutoDistribution additional requirement:</b></p> <ul style="list-style-type: none"> <li>Microsoft Fax Services or Right Fax Enterprise Fax Solutions</li> <li>Microsoft Office 2016, 2013, or 2010 32-bit.</li> </ul>	Quad Core	8GB RAM	100 GB dedicated partition for applications	



## LUMEDX Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
3.	Dashboard Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	Analytics Dashboards	<ul style="list-style-type: none"> <li>QlikView Server 12.0</li> <li>IIS 7.5 or later</li> </ul>	Quad Core	16 GB RAM  This requirement is based on a loaded QVW data file size of less than 2 GB and less than 15 concurrent users. Larger data files and/or additional concurrent users may require additional RAM.	500 GB dedicated partition for applications	
4.	Interface Server(s)	Windows Server 2016, 2012 R2, or 2008 R2 x64	Interfaces and supporting utilities: 1 to 6 interfaces per server  Analytics Manager Transfer Service  ECG Manager Acquisition Service  Modality Worklist if Orders to carts are needed	<ul style="list-style-type: none"> <li>Microsoft Office Professional with Access, Excel, Word, and Tools components               <ul style="list-style-type: none"> <li>2016 32-bit, 2013 32-bit, or 2010 32-bit.</li> </ul> </li> <li>SQL Server Workstation Components with the same Service Pack as the HealthView Database Server</li> <li>Microsoft Distributed Transaction Coordinator Service must be disabled</li> </ul>	Quad Core	8 GB RAM	100 GB dedicated partition for applications	

## LUMEDX Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
5.	SQL Reporting Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	Analytics Manager	<ul style="list-style-type: none"> <li>SQL Server 2017, 2016, 2012, or 2008 R2 Standard Edition components: Database Engine, Integration Services, SQL Reporting Services and Workstation Components.</li> <li>Use of SQL Server 2008 requires the SQL Server 2005 Backward Compatibility package from Microsoft. SQL Server 2008 is only supported for use with SQL Server 2008-compatible Reports modules.</li> </ul>	Quad Core	16 GB RAM	200 GB free space in a dedicated partition for applications and data	
6.	Hybrid SaaS Secure Transport Client	Windows Server 2016, 2012 R2, or 2008 R2 x64	None	N/A	Quad Core	4 GB RAM	20 GB partition for OS  100 GB free space in a separate partition for applications	
7.	Integration Runtime Server	One of the following: Windows Server 2016, 2012 R2, or 2008 R2 SP1, or Windows 10, 8.1, or 7 SP1	HealthView Analytics <ul style="list-style-type: none"> <li>Integration Runtime</li> <li>HL7 Listener</li> </ul>	<ul style="list-style-type: none"> <li>Microsoft Integration Runtime</li> <li>.NET Framework 4.6.1 or later</li> </ul>	2 GHz, Quad Core	8 GB RAM	80 GB	

## LUMEDX Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
8.	Citrix Server	Windows Server 2012 R2 or 2008 R2 x64	LUMEDX Workstation Clients for Apollo, ApolloLx, Analytics Manager, and ApolloLx Schedule  Exception: CardioPACS products are not supported in a Citrix environment	<ul style="list-style-type: none"> <li>Terminal Server</li> <li>Microsoft Office 2010 Enterprise 32-bit edition.</li> <li>Citrix XenApp 7.15 with Web Interface, Presentation Server, Delivery Services Console, and Licensing Server.</li> <li>Citrix Access Gateway on the Citrix Server or on the Netscaler in the DMZ.</li> <li>Adobe Reader</li> </ul>	Quad Core	16 GB RAM	40 GB partition for OS  50 GB free space in a separate partition for applications	
9.	HealthView CardioPACS Enterprise Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	HealthView CardioPACS	<ul style="list-style-type: none"> <li>.NET Framework 4.0</li> </ul>	2x – 2.4 GHz Quad Core	8 GB RAM	50 GB partition for OS  250 GB partition for application and log files  2x - 1 Gb NIC (redundant)  CD/DVD ROM  Local: RAID 5 or Attached: SAN, NAS or DAS. Must support SMB 2.1 or 3.0 shares with Windows NTFS permissions.  Redundant battery backup UPS recommended	

## LUMEDX Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
10.	HealthView ECG Manager Server	One of the following: Windows Server 2016, 2012 R2, 2008 x86 and x64, 2008 R2, or Windows 7 x86 or x64	N/A	<ul style="list-style-type: none"> <li>Microsoft .NET Framework 3.5, 3.0, or 2.0</li> <li>DatamedWL Service</li> <li>DatamedFT can be run inside a virtual machine that runs a compatible operating system. DatamedFT has been tested with VMWare Products: Server, ESX/ESXi Server, Workstation, and Fusion. The virtual machine must have access to the HASP USB security key, which typically resides on the host computer. For single-server installations, the key can be plugged into the host computer and assigned to the VM.</li> </ul>	Quad Core	1 GB	<p>40 GB for program operation.</p> <p>If EKGs will be archived, they require approximately 50-200MB per 1000 EKGs, depending on format.</p> <p>NIC 10/100/1000. Two NICs are required if the server straddles two LANs.</p> <p>One USB port for the DatamedFT license key.</p> <p>For fault-tolerant configurations including vMotion, a USB-to-Ethernet adapter such as AnywhereUSB can be used.</p> <p>Video: 1024 x 768 or greater</p>	

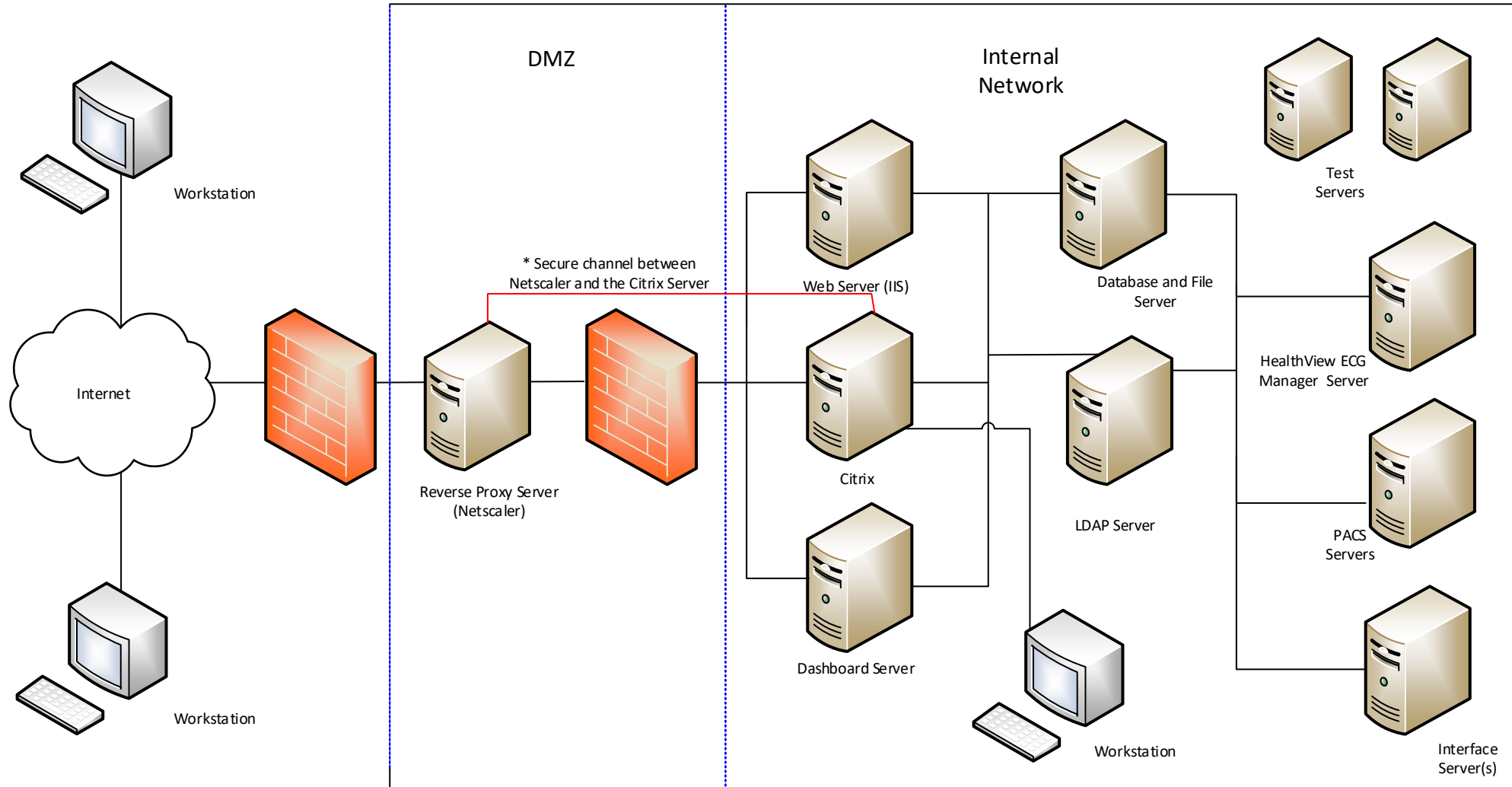
## LUMEDX Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
11.	Edge Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	Secure Transport Client TCPIP Receive Client TCPIP Send Client	<ul style="list-style-type: none"> <li>.NET Framework 4.6.1</li> </ul> <p><b>Auto Distribution Suite Additional Requirements:</b></p> <ul style="list-style-type: none"> <li>If you are using Auto Distribution, outbound communication into the hospital, Datamed, or Results Reporting, this server needs to connect to the LUMEDX Data Center via the VPN</li> <li>Adobe Reader 9</li> </ul> <p><b>HealthView ECG Manager Additional Requirements:</b></p> <ul style="list-style-type: none"> <li>DatamedRcv</li> <li>DatamedWL is required for orders to carts</li> </ul>	Dual Core	8 GB RAM	SAN, NAS or DAS. Must support SMB 2.1 or 3.0 shares with Windows NTFS permissions.  50 GB (OS Partition)  150 GB (Application Partition)  2x - 1 Gb NIC (redundant)  Redundant Power Supplies  Battery backup UPS  <b>ECGMS Additional Requirement:</b> <ul style="list-style-type: none"> <li>1x USB port</li> </ul> <b>AutoDistribution Additional Requirement:</b> Fax Modem	

## LUMEDX Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
12.	Data Migration Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	<ul style="list-style-type: none"> <li>• Apollo Advance</li> <li>• ApolloLX</li> <li>• Startup Config</li> <li>• Workstation Config</li> <li>• LUMEDX Conversion Tool (the conversion team will install)</li> <li>• Merge Utility (the Implementation team will install and run)</li> </ul> <p>To be used as a temporary repository only, not intended to be a permanent part of the LUMEDX system</p>	<ul style="list-style-type: none"> <li>• Net Framework 4.6.1</li> <li>• Microsoft Visual Studio 2015 or 2012: Standard, Professional, or Team Edition with SQL Server Data Tools (SSDT)</li> <li>• Microsoft Office Professional: Access, Excel, Word, and Tools components                             <ul style="list-style-type: none"> <li>○ 2016 32-bit, 2013 32-bit, or 2010 32-bit</li> </ul> </li> <li>• SQL Server 2017, 2016, or 2012 Standard Edition components: Database Engine, Integration Services, SQL Reporting Services Workstation Components, and Business Intelligence Deployment Studio.</li> </ul>	Dual Core	8 to 16 GB RAM	2 TB	

# Example HealthView Deployment

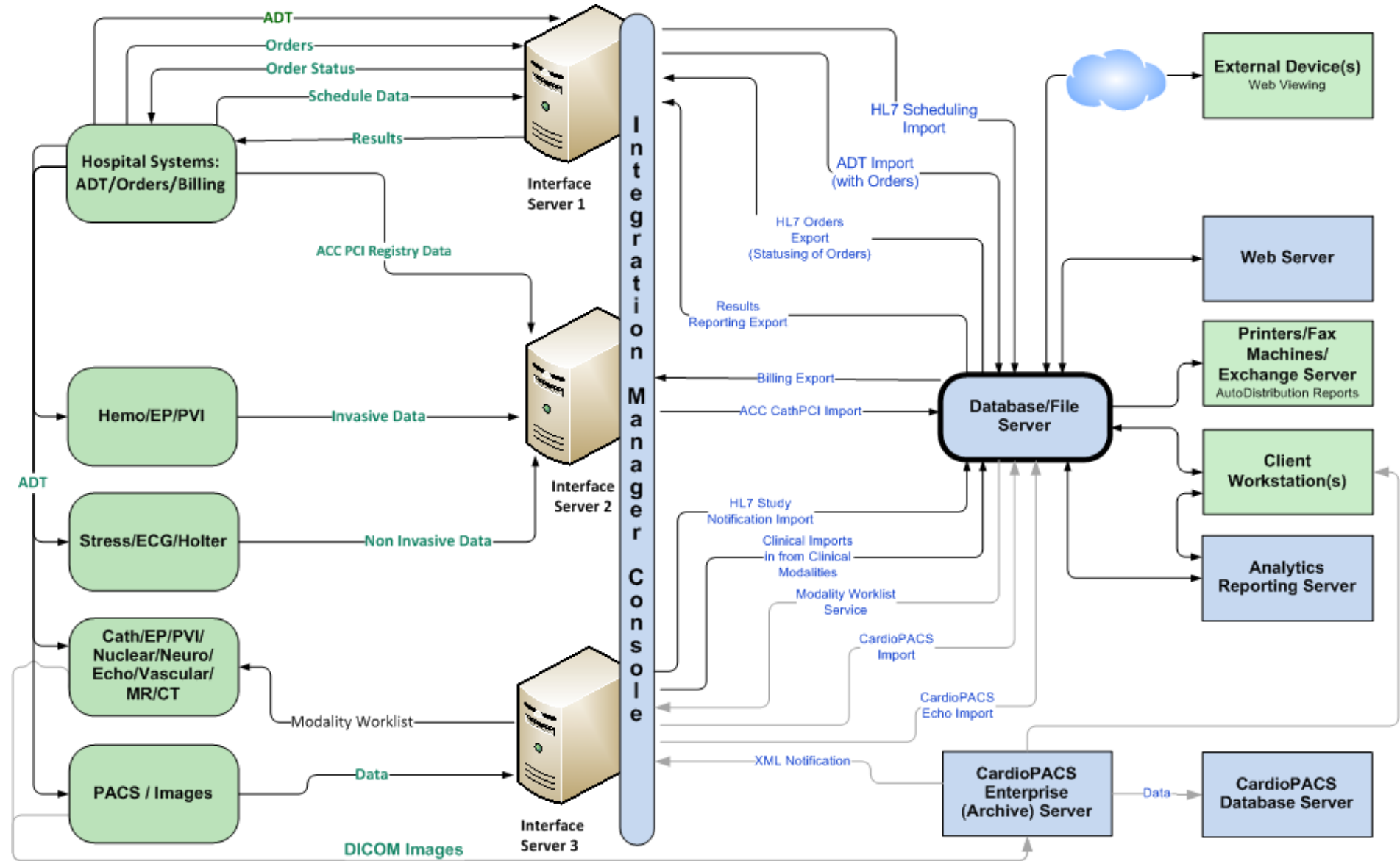


\* HealthView hands off the Citrix connection to the Citrix server which then creates the session based on communication with the Netscaler.

LDAP is only required for a Citrix Integration and/or a full CVIS implementation with HealthView

# Example Server and Data Flow Diagram

Legend: Blue-Apollo Green-Hospital Gray Connectors- Includes CardioPACS and Modality Worklist





## ComPACS (formerly CardioPACS 5) Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media
1.	ComPACS Practice/Department/Enterprise Server	Windows Server 2008 R2 x64  Release 10.10.7 and later will support Windows Server 2012 R2.	None	.NET Framework 4.0 and later	Dual Quad Core	8 GB RAM or more	2*180GB HDD mirrored  Optional: RAID 1/5/6 storage space on a DAS or NAS  Dual Gigabit NIC (teamed)  Fiber Channel HBA for connectivity to SAN
2.	ComPACS Database Server	Windows Server 2008 R2 x64  Release 10.10.7 and later will support Windows Server 2012 R2.	None	SQL Server 2005 64 bit  Database: SQL 2012	Dual Quad Core	8 GB RAM or more	100 GB free disk space for data and log files  Dual Gigabit NIC (teamed)  Fiber Channel HBA for connectivity to SAN
3.	ComPACS Web Server	Windows Server 2008 R2 x64  Release 10.10.7 and later will support Windows Server 2012 R2.	None	.NET Framework 4.0 and later  IIS 5, 6, or 7	Dual Quad Core	8 GB RAM or more	Dual Gigabit NIC (teamed)

### ComPACS Servers Detail Information

- ComPACS must operate in a SQL instance independent of other databases. In a single SQL server configuration where multiple databases reside, CardioPACS must exclusively be installed in a separate SQL instance.
- Blade servers and virtual servers are supported.
- Permanent software licenses are provided exclusively on USB hardware protection keys. Periodically renewable software licenses are alternatively available in the absence of a USB port.
- Specifications for highly available solutions and special configurations are available from your LUMEDX project manager.
- These requirements also support INVIA Corridor 4DM.
- Image storage is separate (SAN/DAS) and depends on usage.
- Windows Clustering is not supported.

## ComPACS and Laurelbridge to HealthView CardioPACS Migration Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
1.	HealthView CardioPACS Migration Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	To be used as a temporary repository only, not intended to be a permanent part of the CardioPACS system	.NET Framework 4.0	2x 2.4 GHz Dual Core	8 GB RAM	C: drive (OS) 25 GB D: drive (Application) 25 GB	

## Third-Party PACS Products Server Requirements

Line Item	Server	Operating System and Components	LUMEDX Products	Other Software	Processor	Memory	Hard Drive Storage Media	#
1.	PACS Third-Party Application Server	Windows Server 2016, 2012 R2, or 2008 R2 x64	Third-Party Integration products (INVIA, QLAB, etc.)	.NET Framework 4.0	2x 2.4 GHz Quad Core	8 GB RAM	100 GB partition for OS  100 GB partition for application and log files	