GE Healthcare

MUSE* v8

Cardiology information system

Customer-supplied hardware

Minimum Specifications

	MUSE Application / Database Server	MUSE Client Workstation	HL7 Server
Form Factor	Tower or Rack	Desktop or Mini Tower	Tower or Rack
Processor type and speed	Intel Xeon 2 GHz with 512k L2 Cache, or performance equivalent	Intel Pentium 4, 3.0 GHz, or performance equivalent	Two Intel Xeon, single core 2.8 GHz single core Xeon, or performance equivalent
System memory (RAM)	1 GB	512 MB (Windows XP) 1 GB (Windows 7)	2 GB
Hard disk	18 GB C: partition (system partition) 72 GB D: partition (database partition) – see "System Sizing Information" in the pre-installation manual for more information	4 GB (Windows XP) 16 GB (Windows 7) C: or D: partition	2 x 72 GB SCSI HDDS with 18 GB free on C: partition
RAID	Recommended	Recommended	Recommended
Optical drive	CD/DVD-ROM	CD/DVD-ROM	CD/DVD-ROM
Floppy drive	Customer preference	Required for local data acquisition from a floppy diskette.	Customer preference
Serial port	1* see "Optional hardware requirements" below	Required for local data acquisition or order download through a modem, or to support an outbound fax modem. Two would be required to support both modems.	1 or none – only required for remote modem support (if network connection not available)
Parallel port	Customer preference	Customer preference	Customer preference
USB 2.0 port	2	Required for SD Card Reader support and for either local data acquisition from, or for order download to an SD card.	2
Keyboard port	1	1	1
Mouse port	1	1	1
Video	Capable of 1024 x 768 resolution	1024 x 768 resolution	1024 x 768 resolution
Network	1-10/100/1000 Mbps Ethernet	1-10/100/1000 Mbps Ethernet	1-10/100/1000 Mbps Ethernet
Operating System	Supports: Microsoft Windows Server 2003 Std, SP2, R1/R2 (32-bit edition) Microsoft Windows Server 2008 Std, SP2, R1 (32-bit edition)	Supports: Microsoft Windows 2000 Pro, SP4 (32-bit edition) Microsoft Windows XP Pro, SP3 (32-bit edition) Microsoft Windows 7 Ultimate (32-bit edition) Microsoft Windows 7 Ultimate (64-bit edition)†	Supports: Microsoft Windows Server 2003 Std, SP2, R1/R2 (32-bit edition)
Database Application	Supports: Microsoft SQL Server 2005, SP4 (32-bit edition)	N/A	N/A

†Microsoft Windows 7 (64-bit edition) does not support modems

Optional hardware requirements
Digi AccelePort® 8-port PCI adapter (Digi part number 77000889) with 8-port DB9
- Configured for COM 3 - COM 10.
- Required for multiple CSI or Fax modems attached to a file server

Customer-supplied hardware

Recommended Specifications

	MUSE Application / Database Server	MUSE Client Workstation	HL7 Server
Form Factor	Tower or Rack	Desktop or Mini Tower	Tower or Rack
Processor type and speed	Dual Core Intel Xeon with 4 MB L2 cache, or performance equivalent	Core 2 Duo 2.13 GHz, or performance equivalent	Two Intel Xeon, single core 2.8 GHz single core Xeon, or performance equivalent
System memory (RAM)	2 GB	512 MB (Windows XP) 1 GB (Windows 7)	2 GB
Hard disk	18 GB C: partition (system partition) 72 GB D: partition (database partition) – see "System Sizing Information" in the pre-installation manual for more information	4 GB (Windows XP) 16 GB (Windows 7) C: or D: partition	2 x 72 GB SCSI HDDS with 18 GB free on C: partition
RAID	Recommended	Recommended	Recommended
Optical drive	CD/DVD-ROM	16 x DVD-ROM	CD/DVD-ROM
Floppy drive	Customer preference	Required for local data acquisition from a floppy diskette.	Customer preference
Serial port	1* see "Optional hardware requirements" below	Required for local data acquisition or order download through a modem, or to support an outbound fax modem. Two would be required to support both modems.	1 or none – only required for remote modem support (if network connection not available)
Parallel port	Customer preference	Customer preference	Customer preference
USB 2.0 port	2	Required for SD Card Reader support and for either local data acquisition from, or for order download to an SD card.	2
Keyboard port	1	1	1
Mouse port	1	1	1
Video	Capable of 1024 x 768 resolution	1280 x 1024 resolution	1024 x 768 resolution
Network	1-100/1000 Mbps Ethernet	1-100/1000 Mbps Ethernet	1-100/1000 Mbps Ethernet
Operating System	Supports: Microsoft Windows Server 2003 Std, SP2, R1/R2 (32-bit edition) Microsoft Windows Server 2008 Std, SP2, R1 (32-bit edition)	Supports: Microsoft Windows 2000 Pro, SP4 (32-bit edition) Microsoft Windows XP Pro, SP3 (32-bit edition) Microsoft Windows 7 Ultimate (32-bit edition) Microsoft Windows 7 Ultimate (64-bit edition)†	Supports: Microsoft Windows Server 2003 Std, SP2, R1/R2 (32-bit edition)
Database Application	Supports: Microsoft SQL Server 2005, SP4 (32-bit edition)	N/A	N/A

Optional hardware requirements
Digi AccelePort® 8-port PCI adapter (Digi part number 77000889) with 8-port DB9
  - Configured for COM 3 - COM 10.
  - Required for multiple CSI or Fax modems attached to a file server

†Microsoft Windows 7 (64-bit edition) does not support modems

Customer-supplied hardware

Virtual Hardware Specifications

	MUSE Application / Database Server	HL7 Server
Processor type and speed	One processor license allocated, 2.6 GHz or performance equivalent	Two processor licenses allocated, 2.8 GHz or equivalent
System memory (RAM)	1 GB minimum, 2 GB recommended	2 GB minimum, 4 GB recommended
Hard disk	Use the hard drive capacity recommended specifications for physical servers taking into account current size, expected growth, and ability to increase storage space as required	Use the hard drive capacity recommended specifications for physical servers taking into account current size, expected growth, and ability to increase storage space as required
Optical drive	Virtual CD/ROM needed for software installation	Virtual CD/ROM needed for software installation
Network	One virtual Network Interface Card (NIC) connected to 1 GB shared virtual switch	One virtual Network Interface Card (NIC) connected to 1 GB shared virtual switch
Operating System	Use the operating system recommended specifications for physical servers	Use the operating system recommended specifications for physical servers
Database Application	Use the database application recommended specifications for physical servers	Use the database application recommended specifications for physical servers

MUSE System Requirements

Networking requirements

To ensure proper MUSE system operation on a network, some form of NetBIOS name resolution such as WINS, DNS or LMHOSTS must be used. All routers, switches, WANs, LANs, and other networking infrastructure must support Microsoft TCP/IP. Network "health" and response times can affect the MUSE system performance. The amount of time required to display the Edit List or a particular test will depend on the number of tests on the Edit List, the speed of the network, and, in the case of a particular test, the size of that test.

File Server: Requires a static IP address

Clients: Either static or DHCP assigned IP addresses can be supported.

Physical layer

All network cabling must conform to the pertinent IEEE 802.X standard, and the customer must test it prior to system installation.

Connectivity

Each MUSE client must be able to connect to the MUSE file server over the network. See the pre-installation manual for more information about the required network ports.

Utilization

For optimum MUSE System performance, Ethernet bandwidth utilization, on average without the MUSE system running must be less than 18% of the available bandwidth for each MUSE system node's network segment. Total Ethernet bandwidth utilization on average must be less than 30% and the maximum peak utilization level must be less than 55%. The broadcast levels on any segment that a MUSE system node is connected to may not exceed 10%.

Reliability

The overall error rate of a network segment must be less than 2% of the available bandwidth. When integrating the MUSE System at a customer facility, additional integration charges may apply when either of the following conditions occur:

- The MUSE system network is not on a standalone Local Area Network (LAN)

- The MUSE system standalone LAN will be used to support any products, devices, or information other than GE Healthcare supported products specifically sold under this agreement.

Network printing requirements

The MUSE file server can be the print server or can send to a print server. UNC (Universal Naming Convention) paths are used to configure the destination for laser printing from within the MUSE application. The MUSE system does not print directly to Windows-defined printers.

The following three general options exist for MUSE network printing:

1. A printer connected directly to the network and then shared (or made for use) by a server. The server reduces collisions from multiple transmissions to this printer. It also provides queuing and possibly a retry mechanism.

2. A printer connected to an LPT port on a computer and then shared by that computer.

3. A printer connected to an LPT port on a computer, but not shared. This facilitates printing to MUSE EveryWARE clients and would be the intended use of setting up a printer this way.

NOTE: The first option is the preferred configuration for network printing for the MUSE system. It is recommended when generating Postscript Level 2 reports from a MUSE system to have Postscript software from Adobe® and a laser printer with 14 MB RAM or more.

Warranty

Standard warranty is one year for hardware.

Standard warranty is 90 days for software.

Ordering information

Visit gehealthcare.com or contact your local GE Healthcare representative.

Guidelines for VMware

Please refer to the 2034539-044 MUSE Cardiology Information System Pre-Installation Manual for specific implementation-related guidelines under the VM environment.

Microsoft Service Packs

The service packs for Windows Server and SQL 2005 as referenced in this document were the latest service packs available at the time of publication. Later Service Packs released by Microsoft may not always be documented in this manual, in this case refer to the GE Healthcare Product Security Web Site, http://prodsecdb.gehealthcare.com, or contact MUSE Technical Support to determine if later Service Packs have been qualified for use with the MUSE system or the HL7 Interface server.

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