American Medical Software®

Hardware Requirements

****Please Note: AMS does not support the implementation or maintenance of computer hardware. AMS will only provide assistance with issues originating from or through its software products.**

Advanced Hardware Requirements as of 4/15/2009

The following requirements are the minimum system requirements for running the AMS software. Minimum system requirements are defined as: If the user configures their system using the minimum specifications for their specific requirements (users, remote sessions), under a full load, the software should continue to work in an acceptable manner on any given workstation. For example, if the maximum number of users are running normal day to day operations, a user in the software should still expect to receive a response from a patient search in less than four seconds. ***Of course, choosing hardware with much faster computing power will improve the performance of the software!!***

Additional products from Pervasive Software are necessary prior to installation of the AMS software. **Version 9.52 of Pervasive is the required minimum. Version 10.01 or higher is highly recommended.** Offices with 5 computers or less require the Pervasive PSQL Workgroup Engine. For smaller sites desiring additional security, performance, or growth potential; the Pervasive PSQL Client/Server Engine is recommended. Sites with 6 or more computers require the Pervasive PSQL Client/Server Engine. Pervasive PSQL v10.01 or higher is recommended for Windows Vista products as it is designed for improved compatibility. Pervasive products are available to AMS clients at a discount from Goldstar Software. Contact Bill Bach or Mary Jo Van Sipma at 708-647-7665 or sales@goldstarsoftware.com. Helpful hints for installing and running the AMS system with Pervasive PSQL are available at http://www.goldstarsoftware.com/apps_ams.asp.

Peer-to-Peer Server or Stand Alone Workstation

A Peer-to-Peer Server is a workstation that is being used as a server on a small network of up to 5 computers.

SERVER REQUIREMENTS

- Microsoft Windows® XP Professional/Home (Service Pack 2), Windows Vista (Service Pack 1), Windows 2000 Professional (Service Pack 4), Windows 2000 Server (Service Pack 4), Windows 2003 Server (Service Pack 1) or Windows 2008 Server. Other Windows operating systems are not supported due to Microsoft support termination.
- Pervasive PSQL v9.52 Workgroup Engine is required. For additional security, performance, or growth potential, the Pervasive PSQL v9.52 Client/Server Engine is recommended.
- Intel Core2 Duo L-8400, AMD Athlon 64 3200+ or better. Quad Core Q9400 (recommended).
- 2 GB RAM.
- 40 GB of available hard drive space. 200+ GB of free hard drive space for the Electronic Medical Records Scanner Interface, as image files will take up considerably more disk space.
- 1024 x 768 resolution at 16-bit color depth or higher required.
- 24x CD-ROM or better.
- Flash drives are recommended for backups. Tape Backups are acceptable.
  Note: Due to the limited life cycle and reliability of CDs, DVDs, CD-RWs, and DVD-RWs; they are no longer a recommended media storage device for backing up your system. External Hard Drives are not recommended due to their inability to be rotated.
- 100Mbps PCI or onboard Network Interface Card capable of supporting full-duplex operations.
- All workstations must have Full Control NTFS permissions and Full Control share permissions to the AMS Data folder.

WORKSTATION REQUIREMENTS

- Microsoft Windows® XP Professional/Home (Service Pack 2), Windows Vista (Service Pack 1)or Windows 2000 Professional (Service Pack 4).
- Pervasive PSQL v9.52 Workgroup Engine required. For additional security, performance, or growth potential, the Pervasive PSQL v9.52 Client/Server Engine is recommended.

- AMD Athlon 1640B or better (Dual Core will improve Performance)
- 1 GB RAM - 2 GB required for Windows Vista.
- 8 GB Free disk space. (8 GB is all that AMS and Windows require to run. It is recommended, however, that hard drives of no smaller size than 40 GB be installed on all workstations.)
- 1024 x 768 resolution at 16-bit color depth or higher required

Dedicated File Server

A Dedicated File Server is a computer that is not used by anyone. The sole function is to ensure that the workstations have their data in nice quick fashion. They are commonly equipped with redundancy, such as Raid 5, which is 3 or more disks acting as and stripping data from one drive to the next, so that if a drive goes down you will not lose data.

Note: Processor speed is based on the number of concurrent users logged into the AMS Software.

SERVER REQUIREMENTS

- Microsoft Windows 2000 Server Service Pack 4, Windows 2003 Server Service Pack 1 or Windows 2008 Server.
- 40 GB of available hard drive space. 200+ GB of free hard drive space for the Electronic Medical Records Scanner Interface, as image files will take up considerably more disk space.
- **1 - 5 Users:**
  - AMD Athlon 1640B or better
  - 2 GB RAM
- **6 - 10 Users:**
  - Intel Core 2 Duo E8500 or higher
  - 2 GB RAM
- **11 - 25 Users:**
  - Intel Core 2 Duo E8500 or higher
  - 2 GB RAM
  - SCSI Drives (Raid 5) should be considered
- **26+ Users:**
  - Intel Core 2 Duo E8500 or higher
  - 2GB RAM
  - SCSI Drives (Raid 5) should be considered

RECOMMENDATIONS

- 80 GB free disk space and up to 200 GB free disk space for the Electronic Medical Records Scanner Interface.
- Gigabit Ethernet connection should be considered for 50+ users.

WORKSTATION REQUIREMENTS

- Microsoft Windows® XP Professional/Home (Service Pack 2), Windows Vista (Service Pack 1)or Windows 2000 Professional (Service Pack 4).
- Pervasive PSQL v9.52 Workgroup Engine required. For additional security, performance, or growth potential, the Pervasive PSQL v9.52 Client/Server Engine is recommended.
- Intel Celeron 440, AMD Athlon 64 3200+ or better (Dual Core will improve Performance)
- 1 GB RAM - 2 GB required for Windows Vista.
- 8 GB Free disk space. (8 GB is all that AMS and Windows require to run. It is recommended, however, that hard drives of no smaller size than 40 GB be installed on all workstations.)
- 1024 x 768 resolution at 16-bit color depth or higher required

Remote Connections

Note: HIPAA requires data be encrypted when transferred via the Internet.

REQUIREMENTS

Microsoft 2003 Terminal Services, Citrix Metaframe or equivalent Citrix Terminal Server. 1 to 3 Thin Clients can use the Same Dedicated Server. 4 or more Thin Clients should have a separate server for the Remote Connections (Thin Clients). Third party applications, such as GoToMyPc or LogMeIn which use 128 bit AES encryption are acceptable.

- **1 - 3 Thin Clients:**
  - Intel Core 2 Duo E8500 or higher
  - 2 GB RAM
- **4 - 10 Thin Clients:**
  - Intel Core 2 Duo E8500 or higher
  - 2 GB RAM
- **11 - 30 Thin Clients:**
  - Intel Core 2 Duo E8500 or higher
  - 2 GB RAM (More Ram should be considered)
  - Microsoft recommends Dual NIC (Network Interface Card) cards placed on different Subnets, 1 for the Thin Client Connection and the other for communicating to the AMS Dedicated Server.
- **31+ Thin Clients:**
  - Multiple Terminal Servers and Load Balancing - 1 Additional Server needed for Every 30 users (31-60 users - 2 Servers, 61-90 users - 3 servers, etc.)

Note: You will need to set up port forwarding on your firewall for the Remote Desktop Protocol (RDP). RDP uses TCP port 3389 by default, but can be configured to use another port for added security.

Privacy and Security with Remote Connections

HIPAA requires all Protected Healthcare Information (PHI) to be secured and protected from confidentiality failures when transferred over open networks, such as wireless LAN connections and the Internet. The AMS software alone does not protect against these failures, therefore great care should be made in selecting software and hardware to encrypt PHI and prevent against false nodes.

American Medical Software recommends that for remote connections you use Remote Desktop Protocol (RDP) through Windows Terminal Services. Although, RDP does offer 128 bit RC4 encryption, this encryption method has been found to be easily compromised and is not recommended for the transmission of PHI. Administrators should, in addition, ensure that all data is transported through Internet Protocol Security (IPSec) packets to create a Virtual Private Network (VPN).

Administrators must choose and implement VPN software and hardware that uses AES or 3DES for encryption and SHA-1 hashing to protect the integrity of the data
.
It is also worth mentioning that RDP alone does not prevent against Man in the Middle Attacks (MITM). To ensure node authenticity, administrators must set up their VPN's to use privately pre-shared keys, passwords, or use TLS (Transport Layer Services) to assign digital signatures to client machines.

The following is an example of a recommended secure remote environment:
The American Medical Software programs are installed on a Windows Server 2003 that is also running the Pervasive database server and is acting as a Windows Terminal Server. The server is connected to the Internet via a VPN router (configured with 3DES or AES encryption and set to use a SHA-1 authentication algorithm). A private key has been set up on the router and a static IP address (assigned by the Internet Service Provider.)

A remote computer connects through a remote desktop program (built into Windows). The remote desktop program connects to the IP address of the router via a VPN client software (provided by the VPN manufacturer). The client software is set up with the same key previously set up on the router. The VPN client software is also set up with the same type of encryption method (AES or 3DES) and authentication algorithm (SHA-1) to verify data integrity. Once the connection is established through the router, the RDP connects to the Terminal Server and a desktop is created for the user. All communications between sites are secure from intrusion because they are encrypted and encapsulated in the IPSec protocol.

Peripherals

- For printing of statements and the various forms and reports generated by the AMS software, recommended printers are the HP LaserJet P3005 Series printers. Inkjet printers and HP LaserJet 1000 Series printers are not supported. Dot Matrix printers are not supported either.
- For Electronic Claims Processing and downloading AMS Updates, an internet connection is required. A broadband internet connection such as DSL or Cable/Modem is highly recommended.
- For Electronic Medical Records Scanning Interface, a TWAIN compliant scanning device or digital camera is required. Additional RAM and hard drive space is recommended. The Scanner should be attached to a workstation on the network.
- For Tablet PC use, our software will run on Tablet PC's using the Windows® Vista Tablet PC Edition operating system.
- For the Handheld Pocket PC Module, a Pocket PC with Windows Mobile 5 (or higher) as the operating system is required. Handhelds running a Palm operating system are not compatible.
- Reserve Power Supply - A UPS Battery Backup is recommended for Power interruptions. In case of power failure, this will prevent loss of database information or corruption.

Networks

- TCP/IP Protocol
- 100 MB Switched Network running Full Duplex (More than 25 users Gigabit Network recommended)
- 256k upload for every 5 Remote Thin clients is recommended.

Wireless

Any wireless routing device is acceptable as long as WPA encryption protocol is enabled to meet HIPAA security standards.

Backups

For backing up the AMS data files, Flash drives are highly recommended due to their durability and versatility. Tape Backups are acceptable. Note: Because of the limited life cycle and reliability of CDs, DVDs, CD-RWs, and DVD-RWs, they are NOT the most superior storage media devices for backing up your system. External Hard Drives are not recommended either.