

**Optimizing the Performance of
JobOrder™ Business Process Management Software**

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"Server" Definition

Please note that when we say "Server", we are referring to the computer used as the JobOrder Server. Because we do NOT require any of the special software included with an Apple Server or a Window Server, please do not purchase an Apple Server or a Windows Server with Server software.

All true Server software supplied by Apple or by Microsoft should be removed before the JobOrder Server software is installed, unless you require it for other applications.

If it is appropriate, it is fine to purchase a computer labeled as a Server, such as a Dell PowerEdge, as long as you buy the minimum software configurations necessary to acquire the hardware features, such as RAID disk arrays, that you require. We recommend RAID 10 with a good quality dedicated controller to be the best combination of both speed and safety.

Windows Vista and Macintosh OS X 10.5.8 and OS X 10.6

The latest release of JobOrder, called JobOrder 2009, is certified for Windows XP, Windows Vista, and Macintosh OS X 10.5.8 ("Leopard") and OS X 10.6 ("Snow Leopard").

Although Windows Vista is certified, it is not recommended at the present time because of its multiple disadvantages. When we do eventually recommend Vista, it will be useful only for JobOrder Client and for JobOrder Solo, not for JobOrder Server.

Best Operating Systems for JobOrder

On Windows, the best operating system for JobOrder server is Windows XP / 2000 / 2003 / 2008 with the latest Service Packs.

On Windows, the best operating systems for JobOrder Client is Windows XP with the latest Service Pack. At the present time, Vista runs slower than Windows XP, so it is not recommended for JobOrder Client.

On Macintosh, the best operating system for JobOrder Server or JobOrder Client is Macintosh OS X 10.5.8 ("Leopard") or OS X 10.6 ("Snow Leopard").

JobOrder Server installation on Windows

Because Windows has so many options, we recommend that the JobOrder Server installation on Windows should be performed by Management Software, so that we can configure it and test it for optimum performance.

If you or your consultants are confident and skilled in Windows server installations, installation by Management Software is not necessary.

If you want Management Software to perform the installation, we recommend that you select one of the following installation choices:

1. You can send your Windows computer to our headquarters for JobOrder Server installation; or
2. We will purchase a new Windows computer for you, install JobOrder Server, and ship the server to your location; or
3. We will travel to your location and install and test JobOrder Server on your Windows computer.

Our time for this installation service will be billed at our regular Customer Support rates.

Before starting up the server, please run extensive diagnostic testing on all server hardware - RAM, hard drives, and network card.

Optimal Hardware Requirements for Macintosh

The three hardware components of a Client - Server system are the Server, the Network, and the Client. Each hardware component has a direct effect on the speed perceived by the user; each component should be as fast as possible, within budgetary constraints, to give the users the fastest response to their input and queries.

While these recommendations are not firm requirements, your satisfaction using JobOrder will rise in correspondence with how closely you follow our recommendations. Likewise, the speed at which JobOrder will run is directly proportional to the speed and configuration of each link in the Server - Network - Client chain. If you install JobOrder and the perceived speed is unsatisfactory, please implement more of these recommendations until speed becomes acceptable.

Given the relatively low cost of new Windows and Macintosh computers, we strongly recommend the installation of new computers whenever perceived speed is an issue.

Please note carefully that these optimal recommendations are not requirements. "Optimal recommendations" are based upon the _fastest_ desktop computers available.

Macintosh Solo, Client, and Server

Item	Macintosh Solo	Macintosh Client	Macintosh Server
Processor	2.8 GHz Intel Core 2 Extreme or 2.93 GHz quad-core Intel Xeon	2.8 GHz Intel Core 2 Extreme or 2.93 GHz quad-core Intel Xeon	2.93 GHz quad-core Intel Xeon
Memory	2.0 GB or more	2.0 GB or more	4.0 GB+12MB/user
Hard drive free space	250MB	250MB	1000Mb
Operating System	10.5.8 or 10.6	10.5.8 or 10.6	10.5.8 or 10.6

Macintosh Server

Each office must be provided with a Macintosh computer dedicated to 4D Server to run JobOrder for Workgroups or JobOrder Enterprise.

Do not run any other software on your JobOrder Server computer, except software that does not use significant processor time or conflict with JobOrder in any way.

Management Software will not provide installation Customer Support if the Server computer running JobOrder is also running any other programs.

We recommend that Spotlight and File Sharing be switched off.

Macintosh Clients

JobOrder's rich graphic displays require the most computing power you can supply. **Upgrading your 4D Client computers gives the single greatest speed improvement to JobOrder for Workgroups or JobOrder Enterprise. Adding extra memory to existing computers will also improve their speed. We recommend a minimum of 1 GB of RAM for Client computers and suggest 2 GB if you are using other memory-intensive programs at the same time.**

Macintosh Monitors

A 17" monitor (set to 1024 x 768 pixels) is the minimum acceptable monitor. A larger monitor is strongly preferred for optimum form visibility.

Network

We strongly recommend using Gigabit Ethernet switches and upgrading all computers to Gigabit Ethernet.

Optimal Hardware Requirements for Windows

Windows Solo, Client, and Server

Item	Windows Solo	Windows Client	Windows Server
Processor	Intel 3.30 GHz Quad Core Xeon	Intel 3.30 GHz Quad Core Xeon	Intel 3.30 GHz Quad Core Xeon
Memory	2.0 GB	2.0 GB	4.0 GB+12MB/user
Hard drive free space	250MB	250MB	1000MB
Operating System	Win XP (latest SP)	Win XP (latest SP)	Win XP (latest SP)

Windows Server

Each office must be provided with a Windows computer dedicated to 4D Server to run JobOrder for Workgroups or JobOrder Enterprise. Do not run any other software on your JobOrder Server computer, except software that does not use significant processor time or conflict with JobOrder in any way.

Windows Workstation 2008 is appropriate for running 4D Server; unless you require some Service not included with Windows Workstation, there is no JobOrder reason to run 4D Server on a Windows Server.

Windows NT, Windows 95, Windows 98 and Windows ME are not acceptable for 4D Server or 4D Client.

Management Software will not provide installation Customer Support if the Server computer running JobOrder is also running any other programs.

Be sure that your paging file is at least as large as the recommended size shown on the Virtual Memory control panel. JobOrder will run faster if a second processor is installed and configured correctly.

'Data Execution Prevention should be set to 'off'. To do this, right click on 'My Computer' Properties, Advanced, Performance, Settings, Data Executive Prevention'.

Windows Clients

JobOrder's rich graphic displays require the most computing power you can supply. **Upgrading your 4D Client machines gives the single greatest speed improvement to JobOrder for Workgroups or JobOrder Enterprise. Adding extra memory to existing computers will also improve their speed. We recommend a minimum of 1 GB of RAM for Client computers and suggest 2 GB if you are using other memory-intensive programs at the same time.**

Windows Monitors

A 17" monitor (set to 1024 x 768 pixels) is the minimum acceptable monitor. A larger monitor is strongly preferred for optimum form visibility.

Network

We strongly recommend using Gigabit Ethernet switches and upgrading all computers to Gigabit Ethernet.

Large installations

An example of a Dell computer (as of November 2008) appropriate for 25 to 50 JobOrder users is the PowerEdge 2950. An example of a Dell computer appropriate for over 50 JobOrder users is the PowerEdge 6850.

Use high-speed, dual-processor Xeon computers with at least 2 Gigabytes of RAM for 4D Server. Add hardware RAID drives. We recommend RAID 5 or RAID 10 with a good quality dedicated controller to be the best combination of both speed and safety. Consult Customer Support if you will have more than 75 simultaneously connected users.

There is no reason to go beyond 2 cores/processors, because 4D will use one and the OS will use the other (no need to assign affinity either). If you have more applications, more cores are going to pay off but not for a dedicated single application (i.e., one 4D instance).

If you want maximum speed then RAID 10 would be our first choice and that will not be available internally unless you go for a bigger chassis like the Dell 2950. You want the fastest SAS (Serial Attached SCSI) drives you can get @15K RPM. Always include Gigabit Ethernet, but avoid dual headed NICS with failover.

As an example, for 25 users we would recommend a Dell 2950 with a single dual core Xeon 5160 4MB Cache @ 3GHz with 4 146 GB SAS 15K drives shipped from the factory with RAID 10 (PERC 5 controller) and 4GB of RAM. You don't need that much RAM, but it is now the default.

Recommended Hardware Requirements for Macintosh

"Recommended computers" are based upon economical computers currently available from Apple or Dell.

Macintosh Solo, Client, and Server

Item	Macintosh Solo	Macintosh Client	Macintosh Server
Processor	2.4 GHz Intel Core 2 Duo or 2.66 GHz quad-core Intel Xeon	2.4 GHz Intel Core 2 Duo or 2.66 GHz quad-core Intel Xeon	2.66 GHz quad-core Intel Xeon
Memory	2.0 GB	2.0 GB	1.0 GB+12MB/user
Hard drive free space	250MB	150MB	1000MB
Operating System	10.5.8 or 10.6	10.5.8 or 10.6	10.5.8 or 10.6

Macintosh Server and Client

Each office must be provided with a Macintosh computer dedicated to 4D Server to run JobOrder for Workgroups or JobOrder Enterprise. Do not run any other software on your JobOrder Server computer, except software that does not use significant processor time or conflict with JobOrder in any way.

Network

We strongly recommend using Gigabit Ethernet switches and upgrading all computers to Gigabit Ethernet.

Recommended Hardware Requirements for Windows

Windows Solo, Client, and Server

Item	Windows Solo	Windows Client	Windows Server
Processor	3.0 Intel Core2 Duo	3.0 Intel Core2 Duo	3.0 Intel Core2 Duo
Memory	1.0 GB	1.0 GB	1.0 GB + 12MB/user
Hard drive free space	250MB	250MB	1000MB
Operating System	Win XP (latest SP)	Win XP (latest SP)	Win XP (latest SP)

Windows Server and Client

Each office should be provided with a Windows computer dedicated to 4D Server to run JobOrder for Workgroups or JobOrder Enterprise. Do not run any other software on your JobOrder Server computer, except software that does not use significant processor time or conflict with JobOrder in any way.

Windows Solo

Be sure that your paging file is at least as large as the recommended size shown on the Virtual Memory control panel.

Network

We strongly recommend using Gigabit Ethernet switches and upgrading all computers to Gigabit Ethernet.

Minimal Hardware Requirements for Macintosh

These are the minimum computer configurations - JobOrder performance will probably be unacceptable to your staff with computers below minimum configuration!

"Minimal Macintosh computers" are based upon typical computers purchased 2 to 3 years ago from Apple.

Macintosh Solo, Client, and Server

Item	Macintosh Solo	Macintosh Client	Macintosh Server
Processor	2.4 GHz Intel Core 2 Duo or dual 2.67 GHz dual-core Intel Xeon	2.4 GHz Intel Core 2 Duo or dual 2.67 GHz dual-core Intel Xeon	Dual 2.67 GHz dual-core Intel Xeon
Memory	1.0 GB	1.0 GB	1.0 GB + 12MB/user
Hard drive free space	250MB	150MB	1000MB
Operating System	10.5.8 or 10.6	10.5.8 or 10.6	10.5.8 or 10.6

Macintosh Server and Client

Each office must be provided with a Macintosh computer dedicated to 4D Server to run JobOrder for Workgroups or JobOrder Enterprise. Do not run any other software on your JobOrder Server computer, except software that does not use significant processor time or conflict with JobOrder in any way.

We do not recommend the use of Macintosh computers with G3 chips, such as the iMac, for use as JobOrder server computers. Problems of database corruption have been reported when running JobOrder Server on an iMac.

Networks

We strongly recommend using Gigabit Ethernet switches and upgrading all computers to Gigabit Ethernet.

Minimal Hardware Requirements for Windows

These are the minimum computer configurations - JobOrder performance will probably be unacceptable to your staff with computers below minimum configuration!

"Minimal Windows computers" are based upon typical computers purchased 2 to 3 years ago from Dell.

Windows Solo, Client, and Server

Item	Windows Solo	Windows Client	Windows Server
Processor	2.8 GHz Pentium 4	2.8 GHz Pentium 4	2.8 GHz Pentium 4
Memory	1.0 GB	1.0 GB	1.0 GB + 12MB/user
Hard drive free space	250MB	250MB	1000MB
Operating System	Win XP (latest SP)	Win XP (latest SP)	Win XP (latest SP)

Windows Solo

Windows 98 or ME should never be used for JobOrder

Be sure that your paging file is at least as large as the recommended size shown on the Virtual Memory control panel.

Windows Server and Client

Each office must be provided with a Windows computer dedicated to 4D Server to run JobOrder for Workgroups or JobOrder Enterprise. Do not run any other software on your JobOrder Server computer, except software that does not use significant processor time or conflict with JobOrder in any way.

JobOrder 2009 is generally compatible with Windows 2000. However, the Microsoft GDI+ graphics library must be installed. This library is available as a download from Microsoft:

<http://www.microsoft.com/downloads/details.aspx?FamilyId=6A63AB9C-DF12->

[4D41-933C-BE590FEAA05A&displaylang=en](#)

Network

We strongly recommend using Gigabit Ethernet switches and upgrading all computers to Gigabit Ethernet.

Optimal Operating System Configurations

Macintosh Server

All Macintosh 4D Server computers should run System 10.5.8. When installing a new system, always perform a “clean” install.

A general rule of thumb for 4D Server RAM is to start with 2 gigabytes of RAM for the first 2 users and add 12 megabytes for every additional simultaneous user.

4D Server should always be in the “foreground”. If 4D Server is moved to the background, for instance, when Retrospect or other backup software completes a backup, your clients may get very slow response from 4D Server. RETROSPECT OR OTHER BACKUP SOFTWARE SHOULD NEVER RUN ON THE SAME COMPUTER AS JOBORDER SERVER!

We require that you disable Time Machine on all Macintosh Server computers. Because the JobOrder data file is always open when JobOrder Server is running, Time Machine cannot back it up successfully. Time Machine must NEVER be used with the JobOrder data file. The JobOrder data file must be EXCLUDED from the files backed up by Time Machine. Please immediately exclude the JobOrder folder from the files being backed up.

The ONLY way to restore old JobOrder data files is from a Backup created by the JobOrder Server backup process.

We recommend that ‘Journaling’ be disabled on all Macintosh Server computers, unless you have a specific reason to enable Journaling.

Check every option in the Energy Saver control panel:

- 1- Switch off “Put hard disk(s) to sleep when possible”.
- 2- Switch off “Put computer to sleep when it is inactive for...”
- 3- Switch on “Restart automatically after power failure...”

Specify that Spotlight does NOT index the 4D data file and folder location by adding it to the “Privacy”, unless you have a specific reason to enable Spotlight.

Macintosh Clients

JobOrder requires an application partition size of at least 250 megabytes on 4D Client computers; allocating more RAM to the JobOrder application partition will sometimes increase the speed of JobOrder.

Please allow a minimum of 250 megabytes of available hard disk space.

If you ever run JobOrder in single-user mode, please note that the memory requirements are higher because single-user mode combines the functions of 4D Client and 4D Server. On Macintoshes, please give JobOrder in single-user mode at least 250 megabytes of memory.

Windows Server

Add at least 12 megabytes of memory for each additional, simultaneously connected client. Memory is very important for the performance of 4D Server on Windows; don't be surprised if 4 gigabytes of memory is required for optimum performance. Be sure that your paging file is at least as large as the recommended size shown on the Virtual Memory control panel.

Using CustomizerPlus 2003 (or later) allocate most of the RAM to 4D Server in blocks of 64,000 KB or larger; with 512 megabytes of RAM, 10 blocks of 64,000Kb would be sensible. Consult with our Customer Support Department for the optimal cache memory for your server.

If you are using Windows Server 2008, make sure that it is installed as a "Database" Server and not as a "File" Server. Set the Server Properties in the Network control panel to optimize for network applications. This setting is not available on Windows Workstations.

Set the front-most application to have maximum performance and make sure that the 4D Server is in front. Color Depth should be set to 256 or higher.

In Server optimization setup, select "Minimize memory used".

Windows Clients

We strongly recommend Windows XP (with latest Service Pack).

We do not support the use of Windows NT with JobOrder.

We do not support the use of Windows 98 with JobOrder.

We do not support the use of Windows ME with JobOrder.

We do not support the use of Windows 95 with JobOrder.

Windows Printer Drivers

When using HP printers, select the print driver in the Control Panel, right click, choose Properties, select Raster (versus Vector) under Graphic Properties.

Windows Instability

Please delete all temporary files remaining from old crashes (.tmp) because they can cause new crashes.

Preventative Measures

'DataCheck' is an essential utility for any production system, included with every JobOrder license. We strongly recommend that DataCheck be run every month followed by 'compacting' using 4D Tools. Our experience is that clients who use DataCheck and 4D Tools once a month have almost no data corruption problems. Clients who perform no preventative maintenance on their data may eventually encounter serious problems from unknown causes.

Before calling Customer Support at Management Software for any data file problems, please run DataCheck and perform 'Drop All Indices', then run the latest version of 4D Tools, and perform a 'Compact' or a 'Recover by Tags', depending upon the severity of the problem.

The nature of hard-disk storage can lead to corrupted data regardless of how well or poorly the software stored on it is written. A hard drive stores data on a delicate magnetic medium that is affected by a variety of factors, such as magnetic fields generated by office equipment and lightning, and is not at all permanent. Windows machines also need regular tune-ups. Without tune-ups, all computers suffer from memory and file fragmentation, slow down, and are more likely to crash. In fact, many crashes attributable to software actually caused by easily fixed hard-disk problems.

Security

Please place the computer running JobOrder on 4D Server in a room with controlled, locked access.

We also recommend strongly you protect the 4D Server computer with an Uninterruptible Power Supply (UPS). Our experience has been that 4D Server crashes can be caused by an unstable electrical power supply; once a UPS is installed, these problems disappear immediately.

Networking

Network problems are the most common problems in installing JobOrder. If JobOrder either runs slowly or does not run on your network, please have your network checked by the appropriate experts to make sure that you are using Ethernet with Category 5 wiring and that all connections are secure. Too many daisy-chained hubs, improperly crimped and pinned RJ45 connectors, poorly engineered mixture of old network wire, and bad network cards or adapters can compromise the integrity of the network.

If a particular computer cannot run JobOrder, please re-wire it with a direct connection to the Server to determine whether the problem is with the computer or with the network.

Buy the best cable you can afford and shield it where you can. Use only the best connectors and install them with care. Good cable is expensive, but not as expensive as the network administrator's time running down problems.

Exercise great care in installing the cable. For example, cable laid over a fluorescent light fixture can cause excessive noise in the network.

Test the network at high signal levels before doing anything important. Even something as simple as saturating the network with Apple's Inter/Pol utility and looking for lost packets can be very helpful.

A -10002 error is almost always a networking problem, such as a bad router. When a -10002 error occurs, please trace your network very carefully and search for subtle problems.

Backups

If you don't have good data, all of your effort to optimize JobOrder is worthless. **Please backup your data file every day with 4D Backup and save the backup on tape or other media. Save each daily backup for one week, save one weekly backup for one month, and save one monthly backup for 6 months. Store most backups off-site in a safe location.**

For detailed instructions on 4D Backup procedures see the 4D Backup document on our CD or at ftp.JobOrder.com.

Macintosh-specific recommendations:

Upgrade your network

We strongly recommend upgrading all computers to Gigabit Ethernet.

If your Ethernet network appears to be a bottleneck, upgrade to a 10/100/1000T switch hub and add 1000-BaseT cards to your computers.

Preventative Maintenance

Please also run TechTool Pro or Disk Warrior frequently. Directory errors on a hard drive are often cumulative in nature. Directory problems can cause unexpected quitting or unusual error generation in JobOrder.

Do not install TechTool Pro permanently on the Server. Run TechTool Pro from a separate CD or a separate volume or drive.

We do not recommend the use of Norton Utilities on a Macintosh.

File Sharing should ALWAYS be OFF when running 4D Server. By turning off File Sharing on the 4D Server computer, you eliminate the possibility of someone accessing the data file without permission, but it is important to also control the physical surroundings.

Wireless Networking

Airport Extreme is not practical for JobOrder Client - Server connections; it will be much slower than dedicated connections.

We do not recommend the use of the original Airport for JobOrder on Macintosh. Airport connections can often become too slow for practical use when they are overloaded.

If you must use JobOrder over Airport, please locate the Base Station as close to the computers running JobOrder as possible. Please use up-to-date Airport Base Stations and Airport cards, preferably Airport Extreme.

Windows-specific recommendations:

Upgrade your network

We strongly recommend upgrading all computers to 1000-BaseT (Gigabit Ethernet).

If your Ethernet network appears to be a bottleneck, upgrade to a 10/100/1000 T switch and add 1000-BaseT cards to your computers.

Eliminate network conflicts

If your network speeds seem perceptibly slow to you, the problem may be an over-loaded network, which must be handled by your network administrator.

Install a faster disk on the 4D Server computer

Upgrading the hard disk on the 4D Server computer can bring a significant improvement. Use RAID if possible. We recommend RAID 5 or RAID 10 with a good quality dedicated controller to be the best combination of both speed and safety.

Weird Errors

Very unusual errors can be caused by intermittent hardware problems. For example, problems can occur with the computer's motherboard, RAM chips, or hard disks. If a problem occurs but cannot be duplicated when tried on a different computer, be sure to check for all common hardware problems after checking first for system software problems.

Standard diagnostic actions include:

Plug and unplug peripherals to isolate problem

Reset PRAM

Pulled and reinstalled RAM

Unplug computer and wait for a few minutes before rebooting

Reinstall operating system

Problems can also be caused by bad cables, EMI/RF intrusions, such as radar arrays, radio or television towers, cellular phone relay towers, and pager broadcast re-transmitters. FM radio sub-band broadcast facilities can interfere with network packet transmissions.

Computer viruses

Please check for computer viruses with a good virus-checker, but do not install an active virus checker, such as Norton Antivirus, on the JobOrder server

computer while the server is running. Viruses are more common on Windows than on Macintosh.

On Windows, tell the antivirus software to ignore .4DD, .4DR, .4DS, .4DL, .4DB, and .4DC files.

Programming (Management Software's responsibility)

Focus on response speed in programming, especially in noticeably slow areas.

At Management Software we are continually examining our programming, looking for speed improvements. Please let us know any particular areas where you are experiencing slow response and we will focus on improving those areas.