Cyncly Flooring

JobRunner and FloorManager System and Network Requirements

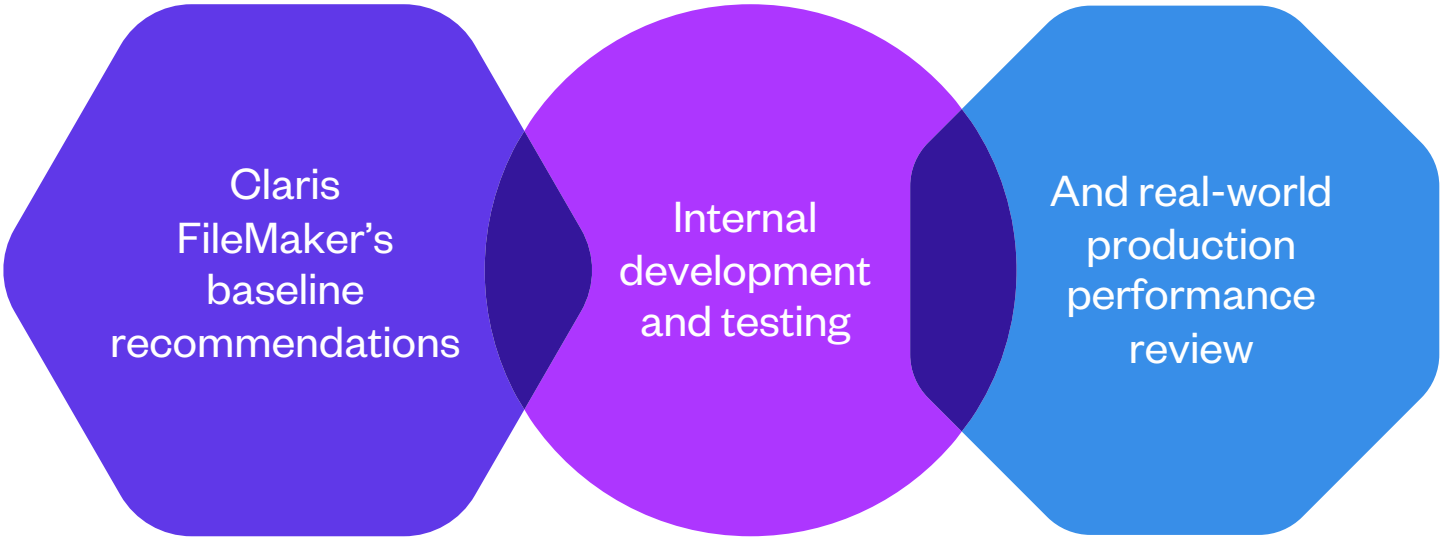


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Overview

Both JobRunner and FloorManager run on Claris's FileMaker platform. Below are the system requirements for running either JobRunner, FloorManager, or both applications. Systems that deviate from the requirements will result in loss of optimal performance. All requirements are based on:



Pacific Solutions recommends servers be designed with business use in mind and have a 3-year extended onsite warranty.



Bare Metal Servers versus Virtualized Servers



Pacific Solutions supports both bare metal and virtualized servers but for optimal performance, a bare metal (non-virtualized) environment is advised. In a virtualized environment, the virtual machine server running the JobRunner/FloorManager server competes with the host's hypervisor and other virtual machines for the host's available resources. In a bare metal (non-virtualized) environment, all the host's resources are available to the JobRunner/FloorManager server providing for optimal performance.

Claris does provide generic baseline hardware and OS recommendations, but they note ultimately, "it is the customer's responsibility to provide and maintain an adequate machine", and to "monitor the machines to determine the stress being placed upon the physical hardware." Based on extensive testing, optimal server, workstation, and network specifications for JobRunner/FloorManager use is outlined later in this document and should be followed.

Cloud Servers

Cloud (Azure, AWS, Oracle, Google, etc.) instances are supported that meet (1) server, (2) workstation, and (3) networking requirements.

Server Lifecycle

Pacific Solutions bases their server specifications on a 3–5-year lifecycle for a server. A server can operate for years beyond this average lifecycle but may not operate at optimal performance. Based on server selection, individual parts (e.g., storage drives, RAM, operating system) can be replaced extending the life of the existing server while maintaining optimal JobRunner/FloorManager performance. Other parts (most notably, the CPU) may not, and a full server replacement might be required.

Server Exclusivity

JobRunner/FloorManager Server instance is resource intensive. To ensure best performance, Pacific Solutions recommends not using the server for hosting other applications such as Microsoft Exchange, ProSeries, and Microsoft SQL Server.

For those that would like to use their physical host as both the FileMaker server and the FileMaker user platform (aka an RDP terminal session host for users), Pacific Solution recommends setting up a dedicated server or virtual machine for the remote desktop session. The FileMaker server and FileMaker desktop platforms must be fully isolated from one another especially for companies that would like to integrate Tableau or JotForm. A shared environment will result in frequent interruptions of service.



Server Sizing

Pacific Solutions categorizes servers as:

Category	Small	Medium	Large	Extra Large
Peak Number of JobRunner/ FloorManager Users	1-5	6-18	19-30	30+
Total Ledger Entries	0 – 400,000	400,001-800,000	800,001-1,600,000	>1,600,000
Size of Database Set	0-14.99GB	15-24.99GB	>25GB	

Peak (maximum concurrent) number of users is the first criteria evaluated. Then general ledger entries and the size of a client's JobRunner/FloorManager database set are evaluated to determine if the server should be sized up. A server should be sized up to meet the number of ledger entries or the size of the database set. It is not recommended to size down a server. If your company is new to JobRunner/FloorManager, these categories can be ignored since the starting number of ledger entries will be under 1000 and the size of the initial database set is less than 500MB.

Peak Number of Users

The peak number of users is the maximum number of users who will be accessing JobRunner/FloorManager at any given moment. Your company may have 15 JobRunner/FloorManager user licenses but if only five (5) users are accessing the system at any given moment, your company's peak number of users is five.

It is important not to underestimate the peak number of users because this may impact JobRunner/FloorManager performance. For instance, in the example above, based on the peak number of users, a company may elect for a small server which is optimal (ignoring the total number of ledger entries and database set size) for five users but if on a particular day, if ten (10) users decide to use JobRunner/FloorManager at the same time, optimal performance maybe impacted. If ten users will be using JobRunner/FloorManager regularly, a medium server would deliver the best results (based solely on number of users and ignoring total ledger entries and database set size).

Total Number of Ledger Entries

Total number of ledger entries is one of two factors in determining if a company should size up their server (go from small to medium or medium to large).

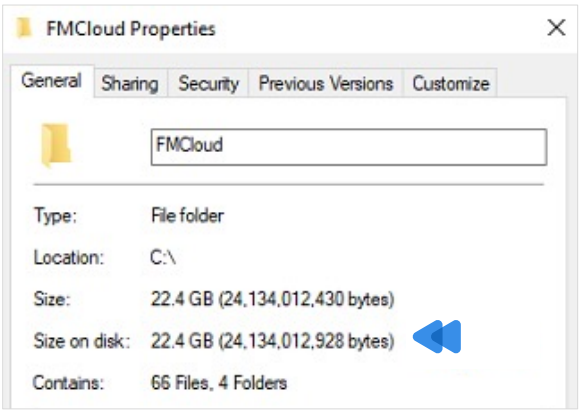
Please contact Pacific Solutions for assistance in determining the total number of ledger entries.

Size of Database Set

The size of the database set is how much hard drive storage space your full set of JobRunner/FloorManager databases occupies. To determine the size, locate your daily offsite backup directory. For most companies, this is located at C:\FMCloud.

01 Right click on the directory and select Properties.

02 Identify the size on disk entry. This is the size of your database set.



03 Select Cancel to exit the dialog box.

Your company will have to size up its JobRunner/FloorManager server if the size of the database set calls for a larger server.

Example One:

If your company has 10 users, a medium-sized server would be recommended. If the size of the database server is 30GB, then a large server would be needed instead.

Example Two:

If your company has 5 users, a small-sized server would be recommended. If the total ledger entries are 200,000, a small sized server would still be recommended. If the database set is 15GB, consider sizing up to a medium sized server for optimal performance.

Example Three:

If your company has 5 users, a small-sized server is recommended. If the total ledger count is 500,000, sizing up to a medium sized server is recommended. If the database set is 16GB, a medium-sized server would still be recommended.

Usually, the ledger count, and the size of the database set align very closely but in cases when they don't, a company does not have to size up twice.

Server Specification Baseline Requirements

Small Server

	JobRunner/FloorManager Requirements: Bare Metal (Non-Virtualized) Environment	JobRunner/FloorManager Requirements: Virtualized Environment
Hypervisor	• N/A	• VMWare ESXi 7.0u2 or above* • Pacific Solutions does not support other hypervisors such as Microsoft Hyper-V, Proxmox, or VMWare ESXi editions below 7.0u2.
Operating System	• Windows Server 2022 Standard/Datacenter (w/ Desktop Experience) * • Windows Server 2019 Standard/Datacenter (w/ Desktop Experience) * • *Windows Server Datacenter is compatible with FileMaker Server 20 but has not been fully tested	• Windows Server 2022 Standard/Datacenter (w/ Desktop Experience) * • Windows Server 2019 Standard/Datacenter (w/ Desktop Experience) * • *Windows Server Datacenter is compatible with FileMaker Server 20 but has not been fully tested
CPU	• Physical Cores: 4 • Total Threads: 8 • Cache: 12M • Base CPU Frequency: 3.0 GHz	• Physical Cores: 4 • Dedicated vCPU: 8 • Cache: 12M • Base CPU Frequency: 3.2GHz
RAM	• 32GB DDR4	• Dedicated: 32GB
OS Drive	• 500GB NVMe SSD* • *OS Drive must always have a minimum of 20% free drive space	• 500GB NVMe SSD* • *OS Drive must always have a minimum of 20% free drive space • ***Virtual Disk Configuration should be Thick Provision Lazy Zeroed**
Storage (Backup) Drive	• 1TB SATA 7200RPM HDD	• 1TB SATA 7200RPM HDD
Network	• 1 Gigabit Ethernet NIC	• 1 Gigabit Ethernet NIC
RAID Configuration (Optional but recommended)	• 1, 5, 10	• 1, 5, 10
External Power Supply	An uninterruptable power supply configured for graceful shutdown in case of a power outage.	An uninterruptable power supply configured for graceful shutdown in case of a power outage.

Medium Server

	JobRunner/FloorManager Requirements: Bare Metal (Non-Virtualized) Environment	JobRunner/FloorManager Requirements: Virtualized Environment
Hypervisor	• N/A	• VMWare ESXi 7.0u2 or above* • Pacific Solutions does not support other hypervisors such as Microsoft Hyper-V, • Proxmox, or VMWare ESXi editions below 7.0u2.
Operating System	• Windows Server 2022 Standard/Datacenter (w/ Desktop Experience) * • Windows Server 2019 Standard/Datacenter (w/ Desktop Experience) * • *Windows Server Datacenter is compatible with FileMaker Server 20 but has not been fully tested.	• Windows Server 2022 Standard/Datacenter (w/ Desktop Experience) * • Windows Server 2019 Standard/Datacenter (w/ Desktop Experience) * • *Windows Server Datacenter is compatible with FileMaker Server 20 but has not been fully tested.
CPU	• Physical Cores: 6 • Total Threads: 12 • Cache: 12M • Base CPU Frequency: 3.2 GHz	• Physical Cores: 6 • Dedicated vCPU:12 • Cache: 12M • Base CPU Frequency: 3.5GHz
RAM	• 32GB DDR4	• Dedicated: 32GB
OS Drive	• 1TB NVMe SSD* • *OS Drive must always have a minimum of 20% free drive space.	• 1TB NVMe SSD* • *OS Drive must always have a minimum of 20% free drive space. • ***Virtual Disk Configuration should be Thick Provision Lazy Zeroed**
Storage (Backup) Drive	• 2TB SATA 7200RPM HDD	• 2TB SATA 7200RPM HDD
Network	• 1 Gigabit Ethernet NIC	• 1 Gigabit Ethernet NIC
RAID Configuration (Optional but recommended)	• 1, 5, 10	• 1, 5, 10
External Power Supply	An uninterruptable power supply configured for graceful shutdown in case of a power outage.	An uninterruptable power supply configured for graceful shutdown in case of a power outage.

Large Server

	JobRunner/FloorManager Requirements: Bare Metal (Non-Virtualized) Environment	JobRunner/FloorManager Requirements: Virtualized Environment
Hypervisor	• N/A	• VMWare ESXi 7.0u2 or above* • Pacific Solutions does not support other hypervisors such as Microsoft Hyper-V, • Proxmox, or VMWare ESXi editions below 7.0u2.
Operating System	• Windows Server 2022 Standard/Datacenter (w/ Desktop Experience) * • Windows Server 2019 Standard/Datacenter (w/ Desktop Experience) * • *Windows Server Datacenter is compatible with FileMaker Server 20 but has not been fully tested.	• Windows Server 2022 Standard/Datacenter (w/ Desktop Experience) * • Windows Server 2019 Standard/Datacenter (w/ Desktop Experience) * • *Windows Server Datacenter is compatible with FileMaker Server 20 but has not been fully tested.
CPU	• Physical Cores: 8 • Total Threads: 16 • Cache: 12M • Base CPU Frequency: 3.5 GHz	• Physical Cores: 8 • Dedicated vCPU: 16 • Cache: 12M • Base CPU Frequency: 3.5GHz
RAM	• 32GB DDR4	• Dedicated: 32GB
OS Drive	• 1TB NVMe SSD* • *OS Drive must always have a minimum of 20% free drive space.	• 1TB NVMe SSD* • *OS Drive must always have a minimum of 20% free drive space. • ***Virtual Disk Configuration should be Thick Provision Lazy Zeroed**
Storage (Backup) Drive	• 4TB SATA 7200RPM HDD	• 4TB SATA 7200RPM HDD
Network	• 1 Gigabit Ethernet NIC	• 1 Gigabit Ethernet NIC
RAID Configuration (Optional but recommended)	• 1, 5, 10	• 1, 5, 10
External Power Supply	An uninterruptable power supply configured for graceful shutdown in case of a power outage.	An uninterruptable power supply configured for graceful shutdown in case of a power outage.

Extra Large Server

For companies that will have 30+ peak users (or over 1,600,000 ledger entries), please contact Pacific Solutions for assistance in determining the appropriate server specifications. An extra-large server may be required.

Server Networking

Speed

Pacific Solutions recommends internet service with reliable **download speeds of at least 25Mb/s and upload speeds of at least 10Mb/s.**

Network Switches

If a switch is part of your company's network topology, it should be rated for a gigabit/second of network traffic. If you are laying down new cable, please use cat6 or greater network cables.

Wired and Wireless Networks

For stability and speed on the local area network, Pacific Solutions recommends wired networks rather than wireless networks. If you will be using wireless technology, please read on.

If using wireless technology, Pacific Solutions recommends Wi-Fi Certified 6 routers or access points. If you need Wi-Fi coverage for greater than 1500 sq. ft, consider a mesh Wi-Fi product. Mesh systems include a main router plus one or more satellite devices that you place around your home to distribute the Wi-Fi signal better. Pacific Solutions does not recommend using Wi-Fi "range extenders," which can diminish network service and cause radio interference.

If the Wi-Fi radio in your laptop or desktop is not capable of at least Wi-Fi 5 (802.11ac), you may experience slower speeds or other connectivity issues.



WAN, LANs, and VPNs

JobRunner/FloorManager's performance is limited over WAN connections.

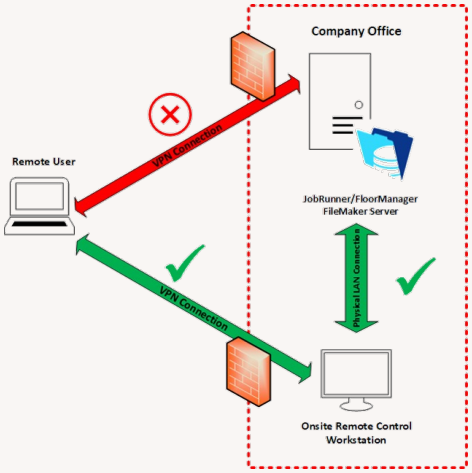
Your desktop JobRunner/FloorManager application must be launched from a system on the same physical LAN as your JobRunner/FloorManager server resides on.

If working remotely or at a different facility than where your JobRunner/FloorManager server resides, you have two options:

01 Remote into an office computer that resides on the same physical LAN as your JobRunner/FloorManager server and run the JobRunner/FloorManager application from the office computer.

02 Remote into a terminal (RDP) server that resides on the same physical LAN as your JobRunner/FloorManager server and run the JobRunner/FloorManager application from the terminal server.

Pacific Solutions **does not support** the use of a VPN (client side, site-to-site, etc.) to connect to an office network, and then run the JobRunner/FloorManager application from a remote computer. Doing so will result in dramatically decreased response times (increased latency) when using JobRunner/FloorManager.



Cloud Networks

For companies using a cloud server, Pacific Solutions cannot guarantee performance of using a virtual private network. Please check with your cloud provider that your cloud LAN (e.g., Azure VNet, AWS VPC) will guarantee advertised speeds and no bottlenecks (e.g., LAN over a WAN) exist.

Server Firewall Requirements

JobRunner/FloorManager Server requirements do not deviate from the firewall requirements for FileMaker as stated on the Claris website.

FileMaker Server requires a web server in all deployments. The web server serves web publishing clients, hosts the web-based Admin Console application, and handles some data transfer tasks. FileMaker Server requires that port 80 is available for web connections and port 443 is available for secure web connections. These ports are used by FileMaker Server even if web publishing is disabled. If the FileMaker Server installer detects existing websites using these ports, you must disable those websites and make the ports available.

Ports marked as “Available” are used locally on the FileMaker Server. These ports must not be used for anything else but do not need to be opened by the firewall.

Port number	Used by	Open/ available	Purpose
80	Workstations	Open	HTTP
80	FileMaker Server, Workstations	Open	Progressive downloading of container data to all clients, redirects to port 16000 for Admin Console
443	Workstations	Open	HTTP
443	FileMaker Server, Workstations	Open	HTTPS: Uploading databases from FileMaker Pro, inserting data in externally stored container fields from all clients, and authenticating FileMaker Pro clients using a User Connections License." Used for remote access to Admin Console for FileMaker Server 19.4.1
2399	FileMaker Server, Workstations	Open	ODBC and JDBC sharing. Port 2399 only needs to be open to support ODBC and JDBC clients.
16000	FileMaker Server	Open	Used for both Admin Console (in FileMaker Server 19.3 and earlier) and internal communication with Secondary machine. It should be exposed to internet/public for Admin Console remote access.
16001	FileMaker Server	Available	Used for local access to Admin Console
16002	FileMaker Server	Open	FileMaker Internal, Port 16002 must be open on the Primary machine, open in the firewall, and available on the Secondary machines

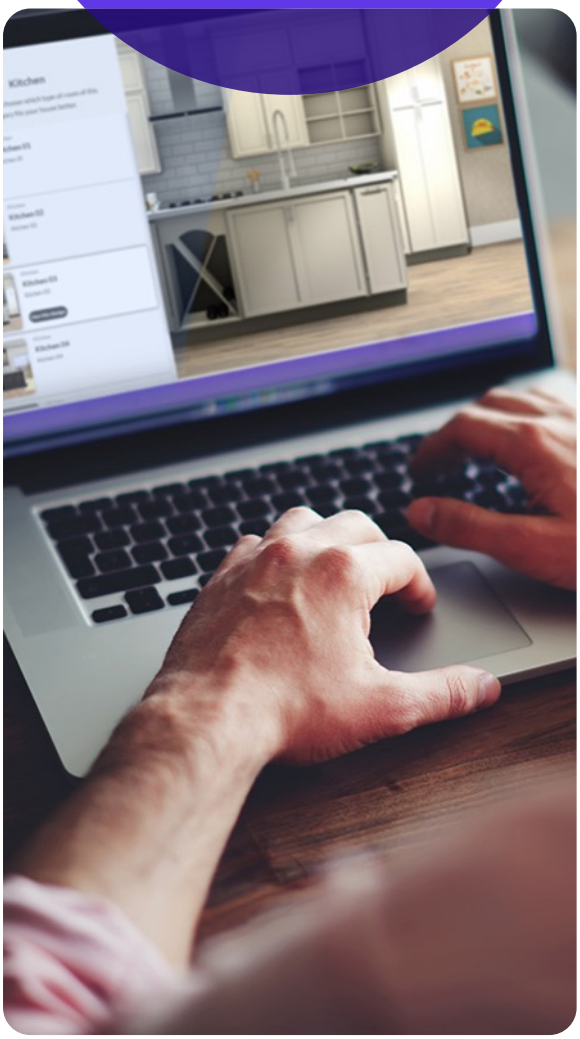
Workstation Requirements

The JobRunner and FloorManager user platform must run on individual workstations separate from the FileMaker server. As a reminder, workstations that deviate below these requirements will result in loss of optimal performance.

	Windows Workstations	Mac Workstations
Operating System	Windows 10/11 Pro/Enterprise Editions (64-bit only)	macOS Sonoma 14.0 macOS Ventura 13.0 macOS Monterey 12.0
CPU	Processor Type: Intel or AMD Base Processor Speed: 2GHz or greater	Processor Type: Intel/Apple Silicon M1, M2 or M3 Base Processor Speed: 2GHz or greater
Memory	8GB DDR4 or greater	8GB DDR4 or greater
Hard Drive	250GB* *70GB must always be free on the operating system partition. *SSD drive type is preferred but not mandatory.	250GB* *70GB must always be free on the operating system partition. *SSD drive type is preferred but not mandatory.
Network	1GB Network Interface	1GB Network Interface

Printers

The use of printers is optional but if using one, Pacific Solutions recommends an HP inkjet or laser printer. The inkjet cartridges and toner for HP printers and copiers are available at nearly every office supply, making them very convenient. Their printers are also very durable. The printer should be able to be used in a network environment.



Hardware and OS Deviation Agreement

If your company elects to use hardware or hardware that does not meet the minimum system recommendations, Pacific Solutions will ask for a hardware and deviation agreement to be signed. The deviation agreement allows for JobRunner/FloorManager to be used and operated on the desired equipment of choice, but it acknowledges since a deviation was exercised, Pacific Solutions cannot support the underlying FileMaker databases until compliant hardware and/or operating system conditions are met.

JobRunner and FloorManager Server Best Practices

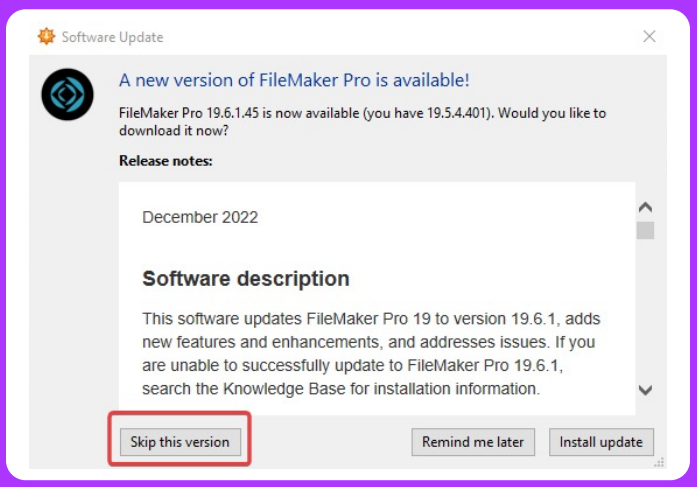
Windows Updates

Pacific Solutions recommends keeping the following items in mind with regards to Windows Updates:

1. Querying, downloading, and installing of Windows updates should occur after hours.
2. When installing updates, the 'FileMaker Server' service should be stopped to avoid database corruption.

FileMaker Updates

If you are presented with the following prompt, please click **'Skip this version.'** For any update, Pacific Solutions will complete on behalf of your organization after it has been tested for compatibility.



Virus Scanners

Please exclude the following directories and their child directories from live scans:

C:\Pacific

C:\Program Files\FileMaker Server

C:\conf

Backups

After-hours backups of the JobRunner and FloorManager servers must occur daily. Employing the 3-2-1 backup rule is ideal but Pacific Solutions recommends at minimum a:

1. Local backup of C:\conf and C:\FMCloud
2. Offsite (cloud) backup of C:\conf and C:\FMCloud



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