**RFMS SQL System**
# Specifications & Recommendations

## Table of Contents

# General Statement

This document is intended as a guideline for clients with less than 15 users and database size(s) of less than 2 GB. For clients with more than 15 users and/or databases larger than 2 GB, please review the recommendations in this document as a starting point reference for your system configuration.

- RFMS strongly recommends consulting with your local IT Professional, SQL Technician/Consultant, and SQL Vendor for all SQL Purchases, Configurations, and Builds (especially for clients larger than 15 users and larger than 2 GB databases) as modifications or adjustments per environment may be necessary.

- Recommendations in this document are directed toward a server running SQL Server Express for RFMS and do not consider any other SQL Instances, Programs, Functions, Databases, etc., that the client may also use. Please follow these recommendations at your own risk. They are designed to provide you with the best performance in RFMS as possible; however, they do not guarantee optimum performance as program speed and performance can be affected by multiple environmental variables.

**RFMS Core is comprised of two parts:**
- RFMS Program Files
- Microsoft SQL Database

The program and database both run wholly off the server(s). Therefore, the server needs to have the hardware capabilities to support the inbound and outbound network connections and the memory requirements for database usage. There is NO CLIENT SOFTWARE installed on the workstations. Instead, the workstations use a shortcut pointing to the program on the networked server (via a mapped drive or UNC Connection).

- **If SQL is already installed on your server, you will need to set it to Mixed Mode (Windows Authentication and SQL Authentication) and create a password for the SA Account.** If SQL is used for another function or program, please confirm that it will not be detrimental to change SQL to Mixed Mode, if it is not already set. If you cannot switch to Mixed Mode on the existing instance, you will need to install a separate SQL instance set to Mixed Mode.

# General Requirements for all Configurations

- **High-Speed Internet connection** for procuring RFMS Downloads, uploads/downloads from Vendors and for RFMS Remote Assistance

- **Wired Ethernet Connections** are strongly recommended. GB Network Cards, GB Switches, and Cat 5 Cabling at minimum. We do not recommend running the computer through an IP Phone, and we do not recommend running RFMS via Wireless Networks due to potential performance issues.

- **At least one printer that is either networked or cabled**. See the Printers & Printer Connections section for detailed specifications.

- **Provision for doing daily backups of RFMS Program Files and SQL Database**. (Consult with your Local IT Professional regarding best and most secure solutions).

- **An Uninterruptible Power Supply (UPS)** is required on the Server and recommended on the workstations. A UPS is a battery-backup unit; a simple surge-suppressor is NOT sufficient for protecting your equipment and data.

- **Monitor(s) with Minimum Resolution of 1920x1080.** Running RFMS at lower resolutions may create screen bleed issues, and the user may not be able to view all fields or buttons.

# Hardware / Software Recommendations
## (by Client User Count)

Notes pertaining to each of the following system setups:

- RFMS recommends **Standard Edition Server Software**.

- **32 or 64 Bit Operating Systems:**
  While RFMS should function on 32-bit Operating Systems and 64-bit Operating Systems, we recommend 64-bit server operating systems. If using 64-bit Operating System, make sure that you have the appropriate version of SQL for this.

- **Important Information about Memory and SQL:**
  The size of the database determines the amount of memory required for Microsoft SQL. Typically, Memory will be a 1:1 ratio (DB Size to Memory); however, SQL can take more if needed. This can be a 1:2 ratio (DB Size to Memory).

- **Clients with more than 15 users or database(s) larger than 2 GB in size:**
  Please consult with your local IT Professional, SQL Technician/Consultant, and SQL Vendor for all SQL Purchases, Configurations, and Builds as modifications or adjustments per environment may be necessary.

## Single User System

- Recommended: Intel Core i7 2.0GHz or faster computer, 16 GB or greater RAM, with a 7200RPM SATA hard drive
- Minimum required: Intel Core i5, 8 GB RAM, with a 7200RPM SATA hard drive.)
- See "Important Information about Memory and SQL" above.
- See the table below for recommended OS and SQL

## Workgroup System (For 2 - 5 User Configurations Only)

**Server:**
- Recommended: Intel Core i7 3.0 GHz or faster computer, 16 GB or greater RAM, with a 7200RPM SATA hard drive.
- Minimum required: Intel Core i5, 8 GB RAM, with a 7200RPM SATA hard drive.
- See "Important Information about Memory and SQL" above.
- Note: we recommend going with a higher-end processor for your server, such as the new second or third-generation Intel 'Core i7' or Xeon series quad-core processors.

**Workstation Computers:**
- Recommended: Intel Core i7 2.0GHz or faster computer, 16 GB or greater RAM, with a 7200RPM SATA hard drive.
- Minimum required: Intel Core i5, 8 GB RAM, with a 7200RPM SATA hard drive.
- See the table below for recommended OS and SQL

## Dedicated File Server System (For 5-15 User Configurations Only)

**Server:**
- Recommended: Xeon 3.0 Hz or faster computer, 16 GB or greater RAM, with a 7200 SATA or SAS hard drive.
- See "Important Information about Memory and SQL" above.
  **Note: we recommend going with a higher-end processor for your server, such as the new second or third-generation Intel 'Core i7' or Xeon series quad-core processors.**

**Workstation Computers:**
- Recommended: Intel Core i7 2.0GHz or faster computer, 16 GB or greater RAM, with a 7200RPM SATA hard drive.
- Minimum required: Intel Core i5, 8 GB RAM, with a 7200RPM SATA hard drive.
- See the table below for recommended OS and SQL

## Operating System and SQL Server – Current Recommendations

*Note: Since we develop RFMS in a Windows Environment, we will follow **Microsoft's Mainstream Support Cycle** as closely as possible. Please see the following link for Microsoft's current published lifecycle details.* [https://support.microsoft.com/en-](https://support.microsoft.com/en-) [us/lifecycle/search?alpha=server%202008](https://support.microsoft.com/en-us/lifecycle/search?alpha=server%202008)

| Product (Red indicates off support) | Microsoft Mainstream Support End Date | Purpose |
|---|---|---|
| Windows 10 Pro | October 14, 2025 | Single User Server or Workstations |
| Windows 11 Pro | N/A | Single User Server or Workstations |
| Windows Server 2016* | January 11, 2022 | Server |
| Windows Server 2019 | January 9, 2024 | Server |
| Windows Server 2022 | October 13, 2026 | Server |
| SQL Server 2016 (SP2)*† | July 13, 2021 | SQL |
| SQL Server 2017* | October 11, 2022 | SQL |
| SQL Server 2019 | January 7, 2025 | SQL |
| SQL Server 2022 | January 11,2028 | SQL |

***These versions are off support (Mainstream) and are no longer recommended**. They are listed here for reference only.*
*†**SQL 2016:** This went off support (Mainstream) on July 13, 2021. Even though Service Pack 3 does have support past this date, according to Microsoft, "When support for a product ends, support of all the service packs for that product also ends. The product's lifecycle supersedes the servicepack policy."*
*Additionally, earlier versions of SQL 2016 had reports of issues with Remote Desktop. If using SQL 2016,please make sure all Windows Updates have been applied.*

# SQL Server Compatibility Levels

With past versions of SQL, the Compatibility Level was mainly used to control feature changes related to the new version of SQL (disabling of old features or enabling of new features). This was also used to allow for backward application compatibility. With later versions of SQL, performance could be affected by not changing.

The below information should help when determining what level to change to. We strongly recommend testing this within your environment.

| SQL Server Version | Default Compatibility Level | Recommended Compatibility Level |
|---|---|---|
| SQL Server 2022 | 160 | 130 |
| SQL Server 2019 | 150 | 130 |
| SQL Server 2017* | 140 | 130 |
| SQL Server 2016* | 130 | 130 |
| SQL Server 2014* | 120 | 110 |
| SQL Server 2012* | 110 | 110 |

*These SQL Server versions are off support (Mainstream) and are no longer recommended. They are listed here for reference only.*

# Printers & Printer Connections

## Printer Specifics (Local and Remote)

**Laser and Inkjet Printers:**

Generally speaking, any printer that can print in Windows should print from RFMS Windows. However, RFMS recommends Hewlett-Packard laser printers in the LaserJet 4 series and later. Recommended printer properties are as follows:

- Capable of using PCL5 or later
- Capable of condensing or scaling print to 19cpi or smaller
- Capable of printing on Legal-size paper (8.5x14) as well as Letter-size paper (8.5x11)
- Can be USB, or Network
- If using an installed printer on an RD Server, make sure it is TS Compatible

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## Remote Printing

Printers can be set up in a variety of ways:

**Redirected Printers with Easy Print:**
When using Easy Print, it must be enabled on the RD Box. This will take your local printer and associate a Universal Printer on the RD Session to this Printer. This allows the Technician to keep the RD Box clean from driver installs for Printers (as well as updates to printer drivers).

**Physically Installed on RD Box (with VPN):**
To use this, you must install the printer on the RD Box. This is done identically to installing a network printer on a network pc.

- The printer driver must be TS Compatible. Installing a non-supported TS Compatible Printer on an RD Box could cause various issues from OS Issues, BSOD Issues, or failure to load correctly.

**Third-Party Add-on Programs:**
There are various options for this, which generally have a server install and a client install. This will allow the client to communicate to the Server Side through the RD Session and associate printers on the local system to the RD Session. They should show within RFMS as a printer selection. One program we have had success with is called TSPrint.

# Useful Links

1. SQL Database and Maintenance:
   https://rfmsinc.zendesk.com/hc/en-us/articles/201981486
2. Server Recommendations:
   https://rfmsinc.zendesk.com/hc/en-us/articles/204958197
3. Best Practices for Performance, Backups, and Data Integrity:
   https://rfmsinc.zendesk.com/hc/en-us/articles/115012732608
4. RFMS Database Backups:
   https://rfmsinc.zendesk.com/hc/en-us/articles/115012572827-RFMS-Backups
5. RFMS Program Update Instructions:
   https://rfmsinc.zendesk.com/hc/en-us/articles/201559487-RFMS-Program-Update-Instruction-Document
6. How to Set Up a Test and Practice Environment:
   https://rfmsinc.zendesk.com/hc/en-us/articles/115012573387
7. Remote Connection Recommendations:
   https://rfmsinc.zendesk.com/hc/en-us/articles/201555567-What-Does-RFMS-Recommend-for-Remote-Connections

# FAQ's

1. **I see that SQL Express can support up to 10 GB DB. Can I use this?**

   While SQL Express does support up to a 10 GB Database file, it does have limitations on memory handling. After approximately 1 GB of database memory use, the rest is pushed to the hard drive page file and can be **considerably slower,** particularly under higher loads.

2. **Can RFMS be run on a Small Business Servers, Server Foundation, or ServerEssentials?**

   These Servers are NOT recommended.

   We have seen issues when running the SQL version of RFMS on servers other than the Standard Edition Platform. The biggest problem is with memory allocation. Instead of allowing each program to use the amount of memory it needs, these servers take all the memory and allocate specific quantities to each program as it sees fit. This causes significant issues with SQL database caching. An issue related to SBS is with its large array of services functioning simultaneously, usually being used to support multiple business roles. This can cause issues when Exchange, Terminal Services, Microsoft SQL, and other services compete for memory and other resources.

   Therefore, WE DO NOT RECOMMEND SBS servers. If you have an SBS server and are experiencing performance issues, our ability for hardware support will be limited.

3. **Can the SQL Server be running on my Domain Controller or Terminal Server?**

   Microsoft DOES NOT recommend running SQL on a Domain Controller.
   Running SQL and TS (or Citrix) on the SAME server is NOT recommended.

   Because of memory, networking, and resource conflicts between SQL and Terminal Services, we recommend that you have Microsoft SQL located on a separate, dedicated server and not on your Terminal Server.

4. **Can RFMS be run across a VPN Connection to avoid Terminal Server?**

   Running RFMS locally through a VPN Connection is NOT recommended.

   While technically, RFMS will run locally when connected to a VPN, this is not recommended, and the performance will be inferior. If you need to use a VPN, either for security or to remotely access your network, you will need to utilize Remote Desktop through the VPN Connection. to run RFMS.

5. **What is the best method for running RFMS across Remote Connections?**

   For Remote Site Connectivity, Terminal Server/ Remote Desktop or Citrix is required. Because of the complex nature of Wide Area Networking and the many variables, you will want to contact your Terminal Server or Citrix specialist for assistance in the network design and set up before the installation of RFMS.

   Please see the below link for recommendations regarding remote connections: https://rfmsinc.zendesk.com/hc/en-us/articles/201555567-What-Does-RFMS-Recommend-for-Remote-Connections

6. **Can RFMS be run via Virtual Server within our location or via Cloud Server?**

   **Virtual Server:**

   RFMS can be run on a virtual server. If going with a virtualized server, ensure that the host server has enough resources to support the virtual server. The virtual server meets the system requirements outlined above for physical servers.

   **Cloud Servers:**

   RFMS can be run in a "cloud" (offsite) environment. The server should have the appropriate hardware to support SQL. A remote connection client like Citrix or RDS would be needed to connect to a "cloud" server. Please contact your IT Professional for more information.