



WHITE PAPER

## Captaris<sup>®</sup> RightFax<sup>®</sup> and Microsoft SQL Server

An Overview of the Technical Relationship  
between the Two Products

## TABLE OF CONTENTS

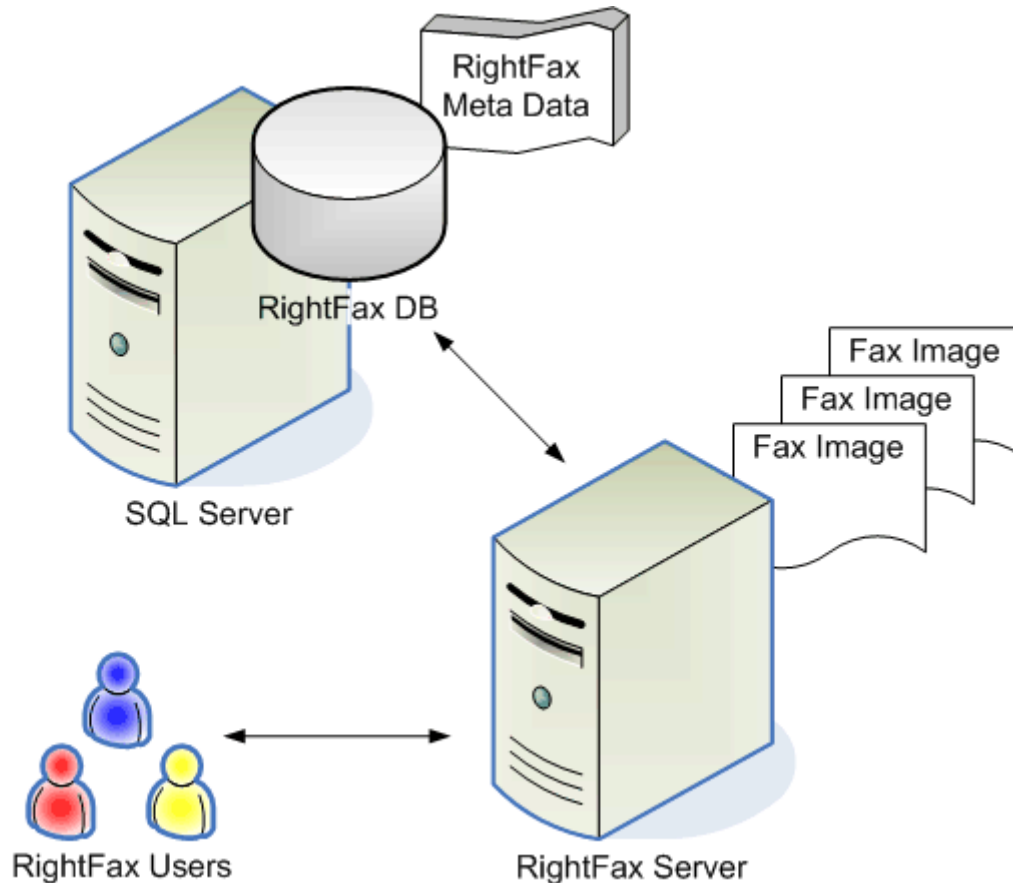
INTRODUCTION .....	3
RELATIONSHIP BETWEEN RIGHTFAX AND SQL SERVER .....	3
RIGHTFAX DATA FLOW AND SQL SERVER RESPONSE .....	4
FREQUENTLY ASKED QUESTIONS.....	5
SQL SERVER VERSIONS.....	5
RIGHTFAX EFFECT ON SQL SERVER.....	5
CONFIGURATIONS.....	6
LOGGING ON TO SQL SERVER AND SQL SERVER RIGHTS .....	7
END-USERS.....	7
MAINTENANCE AND TROUBLESHOOTING .....	7
MISCELLANEOUS.....	8
ABOUT CAPTARIS, INC. ....	9
APPENDIX A: RIGHTFAX DATABASE SCHEMA.....	10

## INTRODUCTION

This document describes the relationship between RightFax and SQL Server, and is intended for SQL Server administrators and other key stakeholders who need to know what occurs (and does not occur) on the SQL Server as it interacts with RightFax.

## RELATIONSHIP BETWEEN RIGHTFAX AND SQL SERVER

Figure 1



As Figure 1 indicates, RightFax documents (the "Fax Images" in the figure) are not stored on SQL Server. They are stored on RightFax itself or on a file share where multiple RightFax Servers can access them.

RightFax metadata is stored in the RightFax database on SQL Server. This metadata includes an event queue, dialing rules, a receive queue, a schema, and other tables that describe RightFax documents, users and server(s). The impact that this metadata has on SQL Server varies considerably based on a given installation—things like volume of RightFax document traffic, what metadata you want the database on SQL Server to catalog, the number of RightFax Servers (or modules) installed, and the number of SQL Servers installed.

In a collective, multiple RightFax Servers can share a single RightFax database that exists on a SQL Server. The same SQL Server can serve other databases for RightFax Servers that are not part of the collective, or other non-RightFax applications.

## RIGHTFAX DATA FLOW AND SQL SERVER RESPONSE

For every action RightFax takes, SQL Server updates one or more records. The update process varies considerably based on what type of installation you have and what you want the RightFax database on SQL Server to capture.

Basic inbound and outbound RightFax data flow:

### Inbound documents

1. The RightFax board server receives an incoming document.
2. The RightFax DocTransport module creates a record in the database on SQL Server (the metadata captured in the record depends upon what you want to catalog).
3. SQL Server returns metadata to RightFax for the user to whom the document is addressed.
4. RightFax performs the action prescribed for the user—route it to his or her email client, print it, etc. (The user's profile—and corresponding actions for inbound documents—depend upon what you have set up (with RightFax) for the user.)

### Outbound documents

1. RightFax receives a document from a user or a RightFax module.
2. The RightFax executable FaxServ.exe creates a record for the new document in the database on SQL Server.
3. The RightFax Workserver converts the document to a fax image, and the record in the database on SQL Server is updated.
4. The RightFax DocTransport module schedules the fax to be sent (scheduling is a RightFax configuration), and the record in the database on SQL Server updated.
5. RightFax sends the fax and creates a history record in the database on SQL Server.

## Frequently asked questions

### SQL SERVER VERSIONS

#### What versions of SQL Server does RightFax support?

RightFax 9.3 supports:

- SQL Server 2000 Standard Edition (32-bit and 64-bit)
- SQL Server 2000 Enterprise Edition (32-bit and 64-bit)
- SQL Server 2005 Standard Edition (32-bit and 64-bit)
- SQL Server 2005 Enterprise Edition (32-bit and 64-bit)
- SQL Server 2005 Express Edition (this comes with 9.3 as an option)

#### How many RightFax channels will require me to go from SQL Server Express to SQL Server? What's the threshold?

This is a common question and one that has no perfect answer. Many variables affect the answer, like the size and configuration of your RightFax system, what you want to store in the database on SQL Server, etc. Captaris has the same recommendation as Microsoft regarding SQL Server Express versus SQL Server: if performance is a concern, then SQL Server Express is not an option. Captaris pre-sales engineers can help you determine which product to use based on your anticipated configuration.

#### What is the point of delineation between SQL Server Express and SQL Server? Is it fax images? Users? Processors?

You need to evaluate your entire anticipated RightFax installation, and Captaris Pre-Sales Engineers can help you do that. The most common answer to this question involves processors and database size. SQL Server Express only supports one processor and a 4 GB maximum database size.

#### We are trying to evaluate where we want the SQL Server database to live. We do not allow MSDE into our environment. What are our options for the following choices?

- Install SQL Server 2000 Standard on the computer earmarked for RightFax (not recommended)
- Purchase a new server and install SQL Server 2000 Standard
- Use an existing SQL Server with similar criticality or business purpose that won't get stepped on by RightFax (and vice versa)

All three options are valid and fully supported. However if RightFax and SQL Server are installed on the same computer, memory and processing power can be an issue.

### RIGHTFAX EFFECT ON SQL SERVER

#### How much space is allocated on SQL Server?

The size of the SQL Server database is a function of SQL Server, not RightFax. RightFax doesn't allocate space; it simply stores data.

#### What's the relationship of fax sizes to SQL Server?

The size of a given fax coming through RightFax has no affect on SQL Server. The metadata that describes a given fax does impact SQL Server, but the extent of that impact depends entirely on what metadata you want to store in the RightFax database on SQL Server. Faxes are not stored in SQL Server, so a 100 page fax or a one page fax would have the same effect on SQL Server.

#### How many times a day does RightFax write to the database on SQL Server?

Almost continuously, but it depends on how you have set up your RightFax system, what metadata you want to capture in the database on the SQL Server, and how much RightFax document traffic exists.

## How large is the SQL Server database? For 10,000 records? 100,000 records? 1,000,000 records?

This is a common question and one that has no perfect answer. Many variables affect the size of the RightFax database on SQL Server. Note, though, that RightFax stores only metadata on SQL Server, not the fax images themselves. The RightFax database on SQL Server stores a one-line record for the fax and one line (sometimes more) for history records.

Benchmarks do exist, however. An otherwise minimal database with exactly 1,000,000 outgoing documents (all successfully sent, so they have history records) is 1,188,288 KB in the MDF with a 9 MB LOG file. Note that the same number of documents could generate the need for more disk space, depending on the multiple variables involved, like user choices, how SQL Server is configured, and SQL Server's storage methods. RightFax does not control these variables.

## How many faxes will SQL Server support? Millions?

The RightFax database on SQL Server *can* support millions of fax records (and more). How many it *will* support for your installation of RightFax depends on many variables, including SQL Server data compression and manipulation. RightFax has no control over most of those variables. However, the number of RightFax records that SQL Server can support has rarely been an issue for existing RightFax customers.

Scenario: Assume a RightFax server with 1023 channels, the maximum RightFax supports. Assume the server sent and/or received single-page faxes (single-page to produce the most faxes per unit time) 24x7x365, and you never once purged the records. In this scenario, it would take four years to reach 2,147,483,647 records in the database on SQL Server. And, in theory, RightFax can support that many records using SQL Server.

## How much space in the RightFax database on SQL Server does a user profile and history record take?

A user profile can have as much as 2 KB of data, but the actual amount for a user profile or history record depends on the length of the strings, what data you want the database on SQL Server to capture, and SQL Server data compression and manipulation.

## What "hit" does the RightFax database have on SQL Server?

The initial footprint of the database is about 3 MB. The growth size depends on the number of RightFax documents that are sent, received, and retained on a daily basis. At 1,000 faxes per day, with a one-year retention and 4 KB per record yields approximately 1,440 MB for the database.

## What is the approximate ratio of reads to writes?

This depends on your configuration. Captaris pre-sales engineers can help you determine this ratio based on your anticipated configuration.

## CONFIGURATIONS

### Can a common SQL Server support multiple RightFax Servers—some in a collective and some independent?

Yes. This is not an optimal configuration, but RightFax customers have done this successfully in the past. An alternative is to install multiple SQL Server instances on a single computer, each with a database named RightFax (as opposed to installing multiple databases with a single instance).

### How many databases exist on the SQL Server instance?

Captaris recommends one RightFax database per SQL Server instance.

## LOGGING ON TO SQL SERVER AND SQL SERVER RIGHTS

### How does RightFax log on to SQL Server? SQL Server Authentication or Windows? Do users have individual logons or does the application manage the SQL Server logon?

RightFax services use either the Windows DSN information or have specific DSN settings on the service itself. Example: the DocTransport and Database modules also have the information there for the DSN.

Captaris recommends that SQL Server be set up in mixed mode authentication. However, it can be set up for NT Authentication.

RightFax client applications only make requests to the RightFax Server for information, not directly to SQL Server. RightFax services request the data from SQL Server and provide it back to the user.

### If RightFax logs on with a common SQL Server account, can we designate our own password? Can it be easily changed?

Yes, the passwords being used for SQL Server can be changed as needed. The DSN configurations in the services and on the Windows DSN need to be updated as well.

### We prefer that all logons have DBOwner or lower privileges on the appropriate databases. Can you verify that no user or application logon has server-level roles?

RightFax supports this scenario. The services that access the database using the SQL Server account (after the initial install) need DBOwner access.

### What are the minimum necessary rights for the database?

On the initial install, an account with System Administrator (SA) privileges is required for the creation and setup of the RightFax database on SQL Server. After the install, an account with DBOwner rights can be used. This requires changes to the Windows DSN as well as the DSN info in the DocTransport Server and Database Modules.

### Is the SA account (and any account with system roles) independent from the application? Can we change the password at will without affecting RightFax?

During the initial RightFax Installation, a SQL Server account with SA privileges is required. After the installation is complete, the account can be lowered to DBOwner rights access without affecting RightFax.

## END-USERS

### Can users change data in the RightFax database on SQL Server?

No. This is not supported and may void any support to recover lost or corrupt data.

### Do users have ad hoc query privileges?

No, users make a call to the RightFax services. The services generate the request to, and access, SQL Server.

### Does RightFax provide any function that allows users access to SQL Server (to create backups, perform re-indexes, etc)? If such a function exists, can we disable it?

No such function exists. End-users cannot directly access SQL Server through RightFax. Users query RightFax, and RightFax queries SQL Server. You give users certain permissions when you configure their accounts, but none of those permissions has any affect on SQL Server.

Administrators, using RightFax administration tools that are not available to end-users, can perform these types of functions.

## MAINTENANCE AND TROUBLESHOOTING

### What recovery model is used? How critical is the data in terms of recoverability?

This is up to your organization and is not dependent on RightFax. We recommend that you follow Microsoft best practices regarding backup and recovery.

**How is this database supported? At my company, we have a very strict change control process. Any change to a production machine must be approved by a committee or, in an emergency, would go through me. How does Captaris help in situations like this?**

Our support policy is that you should not directly access or manipulate the database outside of the RightFax tools. If you're in a situation that requires otherwise, you should contact Captaris customer support or your Captaris technical account manager so we can advise you.

**How often is maintenance required? Backups?**

Maintenance is performed automatically by RightFax and SQL Server. Backup frequency is up to your organization. Both issues depend on your comfort level, as with any other application.

**Does RightFax comply with Microsoft best practices for replicating SQL Server in a non-clustered environment?**

RightFax does no SQL Server replication—that's a function of SQL Server. Beginning with RightFax 9.3, to make replication simpler, Captaris added primary keys to all tables (even those to which one generally wouldn't apply them) after establishing that overhead associated with having otherwise unnecessary primary keys is minimal.

**How does fax deletion work? Does it simply mark the record in the RightFax database on SQL Server for subsequent deletion or does it physically delete it?**

Fax records in the database on SQL Server are marked as deleted and later purged. Purging is done during maintenance with RightFax Enterprise Server, at a configurable age. Purging is manual for other RightFax Servers.

**SQL Server seems to be using far too much memory considering the size of the database and number of connections. What are the recommendations?**

Memory usage in SQL Server depends on numerous factors. See your SQL Server documentation for recommendations.

**Have you experienced deadlocking with RightFax?**

SQL Server resolves contention over the same data by detecting multiple connections waiting for data already locked by the other. When this happens, one connection's statement is terminated and the other connection(s) is/are allowed to execute. RightFax 9.3 detects this particular error as temporary and responds by sleeping for five seconds and re-executing the statement. This causes RightFax to throttle back its use of SQL Server when contention is at a maximum.

**What happens if the connection from RightFax to SQL Server is lost? Will faxes be lost?**

No, faxes will not be lost. In this scenario, incoming documents are not processed. They are cached by the RightFax BoardServer (in actlog.dat) until the connection to SQL Server is restored.

Outgoing documents are likewise not processed. RightFax services attempt to reconnect to SQL Server; if reconnection is not possible, the services sleep. When connection is reestablished, the query that initially failed is executed.

## MISCELLANEOUS

**One of the most heavily used stored procedures, "GetDTActivitySend," is using a cursor. These tend to use a lot of resources and are not ideal for high performance and scalable solutions. And this one is frequently involved in deadlock situations. Do other stored procedures use cursors? If they don't use cursors then what do they use?**

GetDTActivitySend is frequently involved in deadlock situations because, in addition to the requests from FaxServ.exe, the same table is used by all threads in each DocTransport module of each RightFax Server. Example: three RightFax Servers in a collective, each with three DocTransport modules, yields nine DocTransport modules vying for command of the next row in the DTActivities table. Hence, the reason for using cursors. Note that RightFax serializes its access to the DTActivities table through two connections per DocTransport module.

**When we use the API through code and issue a "mailbox open" we understand it performs a SQL Server request to get the detail of the faxes in the mailbox. Could you confirm whether it retrieves the whole contents of the mailbox or just the contents of the specified folder?**

Just the contents of the specified folder, not the entire mailbox. If the request is for a particular user's mailbox, and only for completed outgoing documents, RightFax queries SQL Server for only completed outgoing documents for that user. You can use many different filters to get fax lists, but they are all distilled to a single SQL Server query that returns only what was requested. RightFax does not request all documents and sort them after receiving them.

**How much faster is the SQL Server database than RAIMA?**

Captaris did not switch from RAIMA to SQL Server because of speed issues. However, we benchmarked RAIMA at up to 37 documents per minute (DPM). A single RightFax 9.3 Server with a dedicated SQL Server can handle 80 DPM.

**What is the hourly BPS data transfer rate over a WAN?**

This depends on the WAN. RightFax has no control over it.

**What is the minimum supported bandwidth between RightFax and SQL Server?**

It varies, depending on many variables, like RightFax system configuration, traffic, etc. Captaris pre-sales engineers can help you determine bandwidth based on your anticipated configuration.

**How can we change the port from 1433 to another for the SQL Server instance to avoid vulnerability?**

The initial install of RightFax installs to the default instance of SQL Server on TCP port 1433. To change it during RightFax installation, manually change the network port for the SQL Server instance to use 1433, and stop whatever is using 1433 for that time. After the install is completed, you can reconfigure the Windows DSN connection that RightFax uses back to the port you want the SQL Server instance (default or otherwise) to listen on.

**Does RightFax have any custom SQL Server Agent jobs? Please give me an idea as to what these are. I monitor (and get a page) for all jobs that fail, and high frequency jobs tend to have a higher propensity for failure.**

No, RightFax does not have SQL Server Agent jobs. RightFax does have automated processes that run during the server maintenance cycle (default at 2 a.m.) that have stored procedures.

**Are there any other syncing (with files, etc.) considerations? No.**

**Does RightFax require any special sort order or collation requirements? I read about keeping the page codes consistent, and I assume we will be using 1252, so a default install of SQL Server would work. Is this correct?**

The install uses the default page of the SQL Server during installation.

Regarding installations with character sets like Arabic, different collations are required. However, assuming SQL Server is of the corresponding type required, collation is not altered.

**Can I disable the named pipes network protocol on the server?**

No. This is not supported and may void any support to recover lost or corrupt data.

**What other documentation can I read?**

Captaris provides an extensive KnowledgeBase, a full documentation set with the RightFax software (including a database schema), numerous other technical whitepapers and offers technical training.

## **ABOUT CAPTARIS, INC.**

Captaris, Inc. is a leading provider of software products that automate business processes, manage documents electronically and provide efficient information delivery. Our product suite of Captaris RightFax, Captaris Workflow and Captaris Alchemy Document Management is distributed through a global network of leading technology partners. We have customers in financial services, healthcare, government and many other industries, and our products are installed in all of the Fortune 100 and many Global 2000 companies. Headquartered in Bellevue, Washington, Captaris was founded in 1982 and is publicly traded on the Nasdaq National Market under the symbol CAPA. For more information, please visit [www.Captaris.com](http://www.Captaris.com).

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# APPENDIX A: RightFax Database Schema

